TITLE: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

VOLUME: 1086 ISSUES: 1-4

Patents #4,716,594-4,722,097

DATE: January 5 - 26, 1988

PUBLICATION NO: 10,426

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VOL
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Vol. 1086 Number 1

OFFICIAL GAZETTE

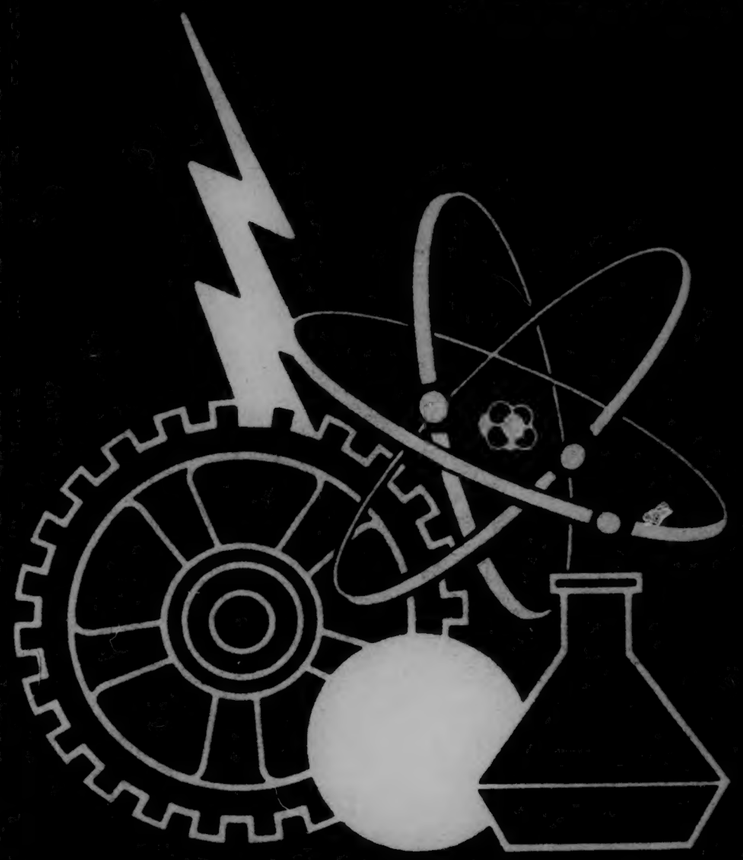
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 5, 1988



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
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OF COMMERCE

Patent
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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 5, 1988 Volume 1086 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the Official Gazette from July 1, 1964, through December 31, 1987. These notices and rule changes are currently in effect unless otherwise noted.

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INFORMATION AND CORRESPONDENCE

(1) Official Patent Office Mailing Address Remains Washington, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) Group Number on all Communications Going to the Examining Groups

Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

THERESA A. BRELSFORD,
Nov. 23, 1983. *Assistant Commissioner for Administration.*

[1037 OG 25]

(3) Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

DONALD J. QUIGG,
Nov. 28, 1983. *Deputy Commissioner of Patents and Trademarks.*

[1037 OG 25]

(4) Identification for Application Correspondence

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL–85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

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(5) **Identifying Application Correspondence With Issue Batch Number**

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

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(6) **Hand Delivery of Papers**

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

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(7) **Post Card Receipt Reminder**

Applicants and the agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

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(8) **Acknowledgement of Receipt of a Patent or Trademark Application**

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-adressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

THERESA A. BRELSFORD,
July 19, 1982. *Acting Assistant Commissioner for Administration.*

[1021 O.G. 96]

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(9) **Inclusion of Preliminary Classification on Filing Receipts**

In response to a request from a patent attorney, we will print the preliminary classification assigned to an application on the filing receipt. It will show the class only and will be labeled "PRELIMINARY CLASS:". The new field will appear on the filing receipt shortly. We will not accept requests to correct the filing receipt for errors in or changes to the preliminary class.

THERESA A. BRELSFORD,
Feb. 18, 1987. *Assistant Commissioner, for Administration.*

[1076 OG 25]

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(10) **Status Inquiries**

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the *Official Gazette* are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

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(11) **Change of Address**

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact

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that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice or change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
May 28, 1975. *Deputy Assistant Commissioner for Patents.*

[935 O.G. 1352]

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(12) **Change of Address or Practitioner in a Plurality of Patent Applications**

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations or power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

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(13) **Express Mail**

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the *Official Gazette* of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
May 15, 1975. *Acting Assistant Commissioner for Administration.*

[936 O.G. 1554]

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(14) **Certificate of Mailing Procedures**

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the *Official Gazette* on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the *Official Gazette* on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, the sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the *Official Gazette* (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
(Date of Deposit)

_____
Name of applicant, assignee, or
Registered Representative

_____
Signature

_____
Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certificate of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 20]

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(15) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded, in view of Public Law 98–144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC §6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1.
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May.
Independence Day, July 4.
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11.
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

DONALD J. QUIGG,
July 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1069 OG 12]

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(16) **Closing of Patent and Trademark Office on Monday, Jan. 26, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Jan. 26, 1987, the Patent and Trademark Office will consider Jan. 26, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purpose of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Jan. 27, 1987.

DONALD W. PETERSON,
Jan. 28, 1987. *Acting Assistant Secretary and Commissioner of Patents and Trademarks.*

[1075 OG 29]

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(17) **Closing of Patent and Trademark Office on Monday, Feb. 23, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington,

D.C. metropolitan area, including the Patent and Trademark Office, on Feb. 23, 1987, the Patent and Trademark Office will consider Feb. 23, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Feb. 24, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.
Feb. 27, 1987.

[1076 OG 68]

(18) Filing of Papers During Unscheduled Closings of the Patent and Trademark Office

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

DONALD W. PETERSON,
Acting Assistant Secretary and Commissioner of Patents and Trademarks.
Feb. 11, 1987.

[1076 OG 15]

(19) Change in Drafting Practice

Effective Apr. 12, 1982, the Patent and Trademark Office is terminating its drawing correction service.

In order to effect any changes in the drawings, applicants will be responsible for submitting either new drawings or having the drawings corrected by a bonded commercial draftsman, at applicant's expense, in the manner specified below. The new practice will permit applicants to delay correction of drawings in almost all cases until after the Notice of Allowance is mailed.

The initial list of bonded commercial draftsmen appears below. This list will be expanded as more commercial draftsmen are bonded. Applicants will, at least initially, be supplied with a current list of the bonded draftsmen with all Office actions requiring a drawing change.

The following is a letter which will be supplied, at least initially, to applicants in all Office actions requiring a drawing change. This letter explains the procedures for accomplishing the above, sets forth the time period within which the drawings must be corrected, and lists all of the currently bonded commercial draftsmen.

U.S.Department of Commerce, Patent and Trademark Office

Attachment to Paper Number
Serial No.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities (Draftsman's objections on PTO–948)

In order to correct any informalities in the drawings, applicants *MUST* comply with options (a) or (b) below. Failure to do so will result in *ABANDONMENT* of the application.

a) File new drawings with the changes incorporated therein. Applicant may delay filing the new drawings until the application is allowed by the examiner. If delayed, the new drawings *MUST* be filed within the *THREE MONTH* statutory period set for payment of the base issue fee in the **"NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE"** (PTOL–85). Also, if delayed, the drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsman and which indicates the following in the upper right hand corner:

Date of the Notice of Allowance
Issue Batch Number
Serial Number

b) Request a commercial bonded drafting firm (see list below) to make the necessary corrections.

A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE* DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE IN THE "NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE" (PTOL–85). NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

2. Corrections other than Informalities Noted by the Draftsman on the PTO–948

All changes to the drawings, other than informalities noted by the Draftsman, *MUST* be made in the same manner as above except that, if delayed option (a) is selected, normally, a sketch of the changes to be incoroprated into the new drawings *MUST* be approved by the examiner before the application will be allowed. If option (b) is selected, normally, applicants must submit, in duplicate, a separate paper containing a sketch of the proposed changes before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

3. Listing of Bonded Draftsmen

Graphe-Tech
11301 Rockville Pike
Kensington, Md. 20895
(301) 881–9400

Ultra Graphics, Inc.
Suite 300
3720 Farragut Ave.
Kensington, Md. 20795
(301) 946–1343

Mantech International Corp.
4th Fl.
Alexandria, Va. 22301
(703) 548–3879

Ord-Marine Engineering
10315 Kensington Pkwy.
Kensington, Md. 20895
(301) 949–3282

National Graphic Center
205 W. Jefferson St.
Falls Church, Va. 22046
(703) 838–5793

Kirby Lithographic Co.
2900 South Eads St.
Arlington, Va. 22202
(703) 684–7600

Mil-R Production
2107 Mt. Vernon Ave.
Alexandria, Va. 22314
(703) 838–5793

Quinn Pat. Drwg. Service Co.
2021 Crystal Plaza Dr.
Arlington, Va. 22202
(703) 521–1650

Patent Reproduction Co.
26 "N" St., S.E.
Washington, D.C. 20003
(202) 488–7096

Technical Illustrator
1911 Jeff. Davis Hwy.
Suite 600–CMI
P.O. Box 2627
Arlington, Va. 22202
(703) 920–8900

IT IS SUGGESTED THAT APPLICANTS DETACH THIS LETTER FROM THE OFFICE ACTION AND ATTACH IT TO THE FRONT OF APPLICANT'S FILE AS A REMINDER THAT, IN ORDER TO AVOID ABANDONMENT, A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE*, OR NEW DRAWINGS SUBMITTED, DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE. NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

Currently there is a large backlog of applications pending before the Office draftsmen. Applicants whose applications are part of this backlog are strongly encouraged to have the necessary drawing corrections made by one of the bonded commercial draftsmen to expedite the issuance of their applications. If there has been authorization to charge a deposit account for these corrections, the authorization will not be processed. If a fee has been paid with cash, a refund will be processed.

The requirement of 37 CFR §§1.85, 1.86(b) and 1.123(a), specifying that drawings, or corrections to the drawings, may or must be made by the Office, is hereby waived.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.
Mar. 16, 1982.

[1017 O.G. 4]

(20) Response to Drawing Requirements

The "Change in Drafting Practice" announcement, made in Mar. 1982 (1017 O.G.4), indicated that corrections to drawings or formal drawings had to be filed within a three-month period set in a Notice of Allowance (Rev. 2–85).

Henceforth, the period for response for filing corrections to drawings or formal drawings will be set in the Notice of Allowability, PTOL–37.

For your information, the period for response is a shortened statutory period of three (3) months, which may be extended under the provisions of 37 CFR 1.136 (a). The three (3) month shortened statutory period is calculated from the "Date Mailed" indicated on the Notice of Allowability (Rev. 2–85).

JAMES E. DENNY,
Deputy Assistant Commissioner for Patents.
Apr. 30, 1985.

[1055 OG 12]

(21) Submission of Drawings

As further clarification of the O.G. Notice of Oct. 29, 1985, drawings for patent applications do *not* need to be submitted on bristol board.

Since corrections are now the responsibility of applicants, it is more convenient for the original drawings to be kept in their possession. Copies only need to be supplied to the Patent and Trademark Office. Whether or not bristol board is used for the copies is the applicant's choice. However, the copies that are submitted to the Office must be on strong, white, smooth, and non-shiny paper. High quality copies are necessary not only for the patent examination process, but for printing purposes.

If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

We will be revising 37 CFR to clarify the requirements for drawing submissions.

This change is being made for the convenience of applicants and attorneys.

THERESA A. BRELSFORD,
Assistant Commissioner, for Administration.
Nov. 25, 1985.

[1061 OG 12]

(22) Discontinuation of Drawing Comparison Fee

The Patent and Trademark Office no longer requires a $10 (ten dollar) comparison fee payment with the submission of formal sheets of drawings to replace originally filed informal drawings. Accordingly, no fee should be submitted, and all existing requirements for a drawing comparison fee are hereby rescinded.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.
June 9, 1982.

[1020 O.G. 10]

(23) New Patent Drawing Correction Procedures

Drawings charged out from the Patent and Trademark Office, for the purpose of making changes or corrections, will be released from the Drafting Branch after the mailing of the Notice of Allowance. Most drawings should be available for charge out one week to ten days after the Notice of Allowance mail date. The major exception to this procedure will be when the examiner requires that drafting corrections be made prior to the Notice of Allowance issuance. We anticipate that this exception requirement will occur only for Design applications being appealed.

Unless a duplicate copy of the Drafting Letter has been filed by the attorney/applicant, the Office will not normally provide the commercial bonded draftsman with copies of either examiner approved drawing correction letters or a copy of the Patent and Trademark Office draftsman's noted informalities. It is the applicant's responsibility to provide copies of the necessary drawing corrections and the noted informalities. When drawings are borrowed from the Office draftsman, the serial number, batch number, and Notice of Allowance mailing date should be identified.

If for any reason a corrected and/or substitute drawing is not acceptable, a letter will be sent to the attorney/applicant. A bonded commercial draftsman must present a copy of this letter in order to borrow the unacceptable drawings.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.
June 28, 1982.

[1020 O.G. 18]

(24) Listing of Commercial Bonded Draftsmen

The following listing of bonded draftsmen supersedes the listing published on Sept. 24, 1985 at 1058 O.G. 27.

John A. Ballard
2001 Jefferson Davis Hwy.
Suite 705, Crystal Plz. 1
Arlington, Va. 22202
(703) 685–7228

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Anthony L. Costantino
17300 Lafayette Dr.
Olney, Md. 20832
(301) 924–3491

Robert MacCollum
Patent Drafting Services
13108 Engelwood Dr.
Silver Spring, Md. 20904
(301) 622–3940

Mason, Fenwick and Lawrence
1730 Rhode Island Ave., NW.
Washington, D.C. 20036
(202) 293–2010

Mil-R Productions
3110 Mt. Vernon Ave.
Suite 100
Alexandria, Va. 22305
(703) 548–3879

Gerald M. Murphy
P.O. Box 2098
Eads St. Station
Arlington, Va. 22202

Suzanne Nahmias
P.O. Box 9252
Arlington, Va. 22209
(703) 528–8157

Oliver Patent Drafting Service
1205 Darlington St.
Forestville, Md. 20747
(301) 336–0351

Patent Reproduction Co.
26 N St., SE.
Washington, D.C. 20003
(202) 488–7096

Quality Patent Printing
P.O. Box 2404
556 S. 22nd St.
Arlington, Va. 22202
(703) 892–6212

Quinn Patent Drawing Services
1416 Duke St.
Alexandria, Va. 22134
(703) 548–3766

Karen L. Robertson
P.O. Box 2128
Eads St. Station
Arlington, Va. 22202

Philip Sweet T/A and For Oblon
Fisher, Spivak, et al., P.C.
1755 S. Jefferson Davis Hwy.
Crystal Square Five
Suite 400
Arlington, Va. 22202
(703) 521–5940

TEM Patent Drafting
P.O. Box 15809
Arlington, Va. 22215

Publication of this list does not constitute a recommendation or endorsement of any individual or firm by the Patent and Trademark Office. All arrangements for drafting related services are the sole responsibility of users of such services.

THERESA A. BRELSFORD,
Mar. 11, 1987. *Assistant Commissioner for Administration.*

[1077 OG 4]

(25) **Submission of Corrected Drawings in Allowed Applications**

When drawings need to be corrected in an allowed application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

THERESA A. BRELSFORD,
Jan. 14, 1985. *Assistant Commissioner for Administration.*

[1051 OG 3]

(26) **Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities and Enforcement Procedures**

Agency: Patent and Trademark Office, Department of Commerce
Action: Notice
Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.
Effective Date: July 1, 1987
For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557–2290.
Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR 101–20.109–10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101–20.3 (41 CFR §§101–20.300 through 101–20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101–20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of $2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

1. User Passes
   a. Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.
   b. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of $5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.
   c. Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.
   d. Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

2. Use of Search Areas
   a. The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:

Patent Public Search Rm., Mezzanine and Microfilm Center	8:00 a.m.—8:00 p.m.*
Trademark Public Search Rm.	8:00 a.m.—5:30 p.m.*
Assignment Search Rm., Public Service Center, and Scientific Library	8:30 a.m.—5:00 p.m.*
Patent Examining Organizations, Trademark Examining Law Offices and all other public access areas of the PTO	8:30 a.m.—5:00 p.m.*

* Clearing of these areas would begin prior to this time to ensure all visitors are out of the building by the time designated.

   b. Materials available for search purposes in the Patent and Assignment Search Rooms and patent application file histories shall not be removed from those areas.
   c. Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.
   d. Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.
   e. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.
   f. Visitors to a Patent Examining Group Search Area must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.
   g. Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

3. PROHIBITIONS
The following are prohibited:

   a. Conduct which is rude or abusive to PTO employees or others.
   b. Smoking and consumption of food or beverages in other than designated areas.
   c. Loud talking or any conduct which may be disruptive to others.
   d. Use of radios, televisions, typewriters, photographic equipment, dictation equipment and other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.
   e. Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.
   f. Reserving seats or work areas.
   g. Affixing messages to walls, telephone booths or other government property, except designated message boards.
   h. Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.
   i. Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.
   j. Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in th Patent Public Search Room for public use.
   k. Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.
   l. Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101–20.3, and appropriate sections of Department Organization Orders 10–14 and 30–3 of the Department of Commerce, the procedures appearing below are established.

1. Violations involving unauthorized removal of PTO files, documents, records or government property.
   a. Each observed or reported violation will be investigated.
   b. Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.
   c. Each incident involving unauthorized possession of PTO material or government property shall be immediately reported by telephone or in person to the Office or Group Director of the area from which the material or property was taken.

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d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.
e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.
f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.
g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.

2. Other violations of public use regulations.
a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.
b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.
c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.
d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.
e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.
f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.

3. Factors to be Considered in Assessing Penalties.
a. Penalties will be determined on a case by case basis.
b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.
c. Penalties may be assessed as follows, depending on circumstances:

(1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.
(2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.
(3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.
(4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as *any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.*

4. Record of Penalties Imposed.
A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

5. Use of Public Facilities During Suspension or After Revocation of User Pass.
No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

6. Absence of Assistant Commissioner for Administration.
In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

7. Absence of Designated PTO Officials.
In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

8. Assistance.
PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1. and 2.

9. Appeals.
Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

THERESA A. BRELSFORD,
May 11, 1987. *Assistant Commissioner for Administration.*

[1079 OG 6]

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(27) **Unlawful Removal of Labels**

We have found a large number of security labels, torn from Search Room patent copies, in stack areas of the Public Search Room. We remind persons removing security labels or otherwise mutilating Search Room patent copies, or removing Search Room patent copies from the Search Room without authorization, that such acts are criminal offenses punishable by fine, imprisonment or both.

You should be aware that engaging in such acts violates the prohibition against "the willful destruction of or damage to property; the theft of property." 41 Code of Federal Regulations §101–20.303. Violations are punishable by "a fine of not more than $50 or imprisonment of not more than 30 days, or both." 41 Code of Federal Regulations §101–20.315.
You should also be aware that engaging in such acts subjects you to punishment under the following criminal provision in Title 18 U.S. Code, §2071:

> (a) Whoever willfully and unlawfully conceals, removes, mutilates, obliterates, or destroys, or attempts to do so, or, with intent to do so takes and carries away any record, proceeding, map, book, paper, document or other thing * * * shall be fined not more than $2,000 or imprisoned not more than three years, or both.
> (b) Whoever, having custody of any such record, proceeding, map, book, document, paper, or other thing, willfully and unlawfully conceals, removes, mutilates, obliterates, falsifies, or destroys the same, shall be fined not more than $2,000 or imprisoned not more than three years, or both; and shall forfeit his office and be disqualified from holding any office under the United States.

UNLESS THE REMOVAL OF SECURITY LABELS FROM SEARCH ROOM PATENT COPIES CEASES, THE OFFICE WILL TAKE APPROPRIATE ACTION, SUCH AS EXERCISING ITS AUTHORITY UNDER 41 CODE OF FEDERAL REGULATIONS §101–20.301 TO INSPECT PACKAGES, BRIEFCASES AND OTHER CONTAINERS BROUGHT INTO, WHILE ON, OR BEING REMOVED FROM THE SEARCH ROOM.

GERALD J. MOSSINGHOFF,
Mar. 28, 1983. *Commissioner of Patents and Trademarks.*

[1029 OG 136]

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(28) **Out-of-Town Request for Files**

Delays are being experienced in receiving files ordered from the Federal Records Center in Suitland, Md. Therefore, more time must be allowed when out-of-town requestors are ordering patented files or abandoned or registered trademark files in advance of their arrival in the area. Until recently, a five-day notice was sufficient to obtain a file located in the Federal Records Center. Now we are suggesting that ten days be allowed when ordering Suitland files. A 24-hour notice is still normally adequate when the file is located in the PTO File Repository in Crystal City. Out-of-town requests for files should be directed to Ms. Jacqueline Waldo on (703) 557–2977. Requestors will be notified by phone, prior to planned arrival date, whether or not the requested file will be available.

THERESA A. BRELSFORD,
July 10, 1984 *Assistant Commissioner for Administration.*

[1045 O.G. 3]

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(29) **Use of Certificate of Correction Forms**

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on the Certificate of Correction form, PTO–1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of Form PTO–1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.
The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.
Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.
Copies of form PTO–1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

RICHARD J. SHAKMAN,
May 10, 1977. *Assistant Commissioner for Administration.*

[959 O.G. 3]

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(30) **ARS Patent Culture Collection Initiation of Fees**

As a result of recent policy changes, the ARS Culture Collection (NRRL) henceforth will charge a user fee for deposit and distribution of microbial cultures maintained in conjunction with U.S. and foreign patent applications. User fees apply to patent cultures only; as it has in the past, the ARS Culture Collection will continue to exchange other microbial germplasm with the scientific community without charge. The fee schedule will apply to all patent cultures deposited after Sept. 30, 1983. A fee of $500.00 will be charged for each strain, payable at the time of deposit. A $20.00 fee will be charged for the distribution of all released patent cultures that have been deposited after Sept. 30, 1983. There will be no charge for distribution of patent cultures already on deposit or for others received before this date. Checks, in U.S. dollars, should be made payable to the Agricultural Research Service, USDA. USDA laboratories and designated cooperators will be exempt from fee assessment. The types of microorganisms accepted by the ARS Culture Collection are the same as announced in the past and include industrially important bacteria, yeasts, molds, and *Actinomycetales.* Viruses and highly pathogenic or especially fastidious microorganisms are not accepted. Further information on types of microorganisms accepted and conditions for deposit may be obtained by contacting A. J. Lyons, Curator, ARS Patent Culture Collection, Northern Regional Research Center, USDA-ARS-NCR, 1815 N. University St., Peoria, Ill. 61604 (Tel. 309/685–4011).

[1033 OG 26]

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(31) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

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Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. If a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

THERESA A. BRELSFORD,
Aug. 3, 1984. *Assistant Commissioner for Administration.*

[1045 O.G. 28]

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(32) Subscription Pricing Information

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section

First-class domestic mailing	$375.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	13.00
Single copies each, foreign	16.25

Back copies will not be furnished.

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer, 1984.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
Sept. 11, 1984. *Assistant Commissioner for Administration.*

[1047 O.G. 11]

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(33) Subscription Pricing Information

The annual subscription prices on the following publication have been changed as indicated below:

Title: Patent and Trademark Office Notices

First-class domestic mailing	$ 71.00
First-class foreign mailing	not available
Third-class domestic mailing	57.00
Third-class foreign mailing	71.25

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer 1984.

Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
May 7, 1984. *Assistant Commissioner for Administration.*

[1042 O.G. 58]

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(34) Rules Service Company Address Change

The Patent and Trademark Office has been notified of a change in the address and telephone number of the Rules Service Company which publishes a looseleaf Rules of Practice in Patent and Trademark Cases with a revision service. The new address and telephone numbers are:

Rules Service Company
4341 Montgomery Avenue
Bethesda, Maryland 20014
(301) 656-4660

SIDNEY A. DIAMOND,
Apr. 7, 1980. *Commissioner of Patents and Trademarks.*

[994 O.G. 10]

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(35) Patent and Trademark Office Services

The Patent and Trademark Office is making every effort to utilize its resources as effectively and efficiently as possible. However, delays in some services are being experienced. To improve services, the PTO is taking the following steps:

Beginning with the issue of January 1, 1980, the original formal drawing which is supplied by the patent applicant and is 8 1/2 by 14 inches (21.0 by 29.7 cm.) is being stored within the patented file in the Patent Search Division. This is a change from the earlier practice under which the drawing is stored in a separate location from the patent file wrappers. The new procedure will simplify obtaining the complete patented file. This procedure will be used for a three month trial period and then reevaluated for its effectiveness.

Effective December 3, 1979, sale of tokens and maintenance of all token operated photocopy and microfilm reader-printer equipment throughout the Patent and Trademark Office are being performed by a private contractor, T S Info Systems, Inc. (TSI). Improved quality and timeliness of copy service to the public are anticipated.

All token sales are made between the hours of 8:30 A.M. and 5:00 P.M. at the token sales booth in the Record Room located in Building CP-4. When purchasing tokens by check, please make the check payable to "TSI" rather than "Commissioner of Patents and Trademarks." Tokens will not be sold at the cashier's window in CP2.

Effective February 1, 1980, charges for tokens to PTO customer deposit accounts will no longer be accepted.

Effective immediately, no requests for new patent or trademark drawings will be accepted by the Patent and Trademark Office. New drawings will be prepared only for requests already received. All currently available drafting time and facilities are required to correct the backlog of drawings needing correction prior to issue. When this backlog has been eliminated, a notice will be issued to that effect and new drawings can again be prepared for the public.

Effective immediately, three additional special mail room boxes will be established in the PTO:

Box 4 will be used for all mail for the Office of Legislation and International Affairs.

Box 5 will be used for documents which are related to trademarks and for which *no fee* is required at the time of filing; e.g., amendments to applications and requests for extensions of time to file an opposition. For mail directed to the Trademark Trial and Appeal Board, put "Attention TTAB" on the envelope in addition to "Box 5."

Box 7 will be used for reissue applications which are involved in litigation and any subsequently filed papers for these applications.

Mail appropriately addressed will be sorted and forwarded on a more timely basis.

Applicants and other users of the PTO services can assist in improving the efficiency of office by doing the following:

Use the following special PTO box numbers for forwarding particular types of mail. The boxes should be used only for the specified purpose.

Box 2—Replenishment of funds in deposit accounts.

Box 4—Mail for the Office of Legislation and International Affairs.

Box 5—"No fee" mail related to trademarks.

Box 7—Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.

Box 8—All papers for the Office of the Solicitor.

Box 9—Coupon orders for U.S. patent and trademark copies.

Box 10—Orders for certified copies of patent and trademark applications.

Box PCT—Mail related to applications filed under the Patent Cooperation Treaty.

Only that material for which the special box was established should be enclosed.

The special box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

Envelopes should be addressed:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Consider the fact that some PTO services are experiencing delays, and allow sufficient lead time for services requested of the Office. Where possible, urgent items which require no fee should be hand delivered to the appropriate area.

Minimize the number of inquiries to the PTO regarding acknowledgment of receipt of applications, fee papers, orders for patent copies, etc.

Include a self addressed return post card with newly filed applications. The serial number assigned the application will be stamped on the post card, which will constitute the means by which the application can be identified.

Use commercial services for preparation of new patent and trademark application drawings.

On all papers which are filed in patent and trademark applications and are being sent to an examining group, include the appropriate identifying data, such as examining group number, examiner's name, and the number of the application paper to which the response is directed. The paper should also identify the type of document being presented (e.g., response to Office action #___, amendment, etc.). The name and telephone number of the individual representing the applicant also should appear on all papers.

These steps have been devised in an effort to minimize delays in services. We solicit the help and cooperation of the public.

SIDNEY A. DIAMOND,
Jan. 4, 1980. *Commissioner of Patents and Trademarks.*

[990 O.G. 184]

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(36) Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks

1. *Service of court papers*

This notice supersedes the Solicitor's Notice of Sept. 10, 1982 [1023 *Official Gazette* 3 (Oct. 5, 1982)].

Court papers may be served on the Solicitor in the following manner:

A. By hand between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor located in Crystal Plz., Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Fl., Rm. 5-C-15, Arlington, Va.

B. By mail in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215.

Court papers mailed to an address other than the Solicitor's service address above, or hand-delivered to the Office of the Solicitor, are deemed to be served when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the Patent and Trademark Office in connection with an application or other proceeding pending in the Office should not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be filed in the Office and will be returned. No exceptions will be made to this policy.

2. *Filing of a notice of appeal to the Federal Circuit*

A notice of appeal from a decision of the Board of Patent Appeals and Interferences in an *ex parte* or *inter partes* patent matter or a decision of the Trademark Trial and Appeal Board in an *ex parte* or *inter partes* trademark matter must be timely filed.

A certificate of mailing under 37 CFR §1.8 *cannot* be used for the purpose of effecting "filing" of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit. *In re Thrifty*, 231 USPQ 560 (Comm'r. Pat. 1986), *mandamus denied mem.*, Misc. No. 137 (Fed. Cir. Nov. 21, 1986) (unpublished). Thus, a notice of appeal which reaches the Patent and Trademark Office after the due date, is not considered to be timely filed, even though mailed prior to the due date with a certificate of mailing under 37 CFR §1.8.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any of the following ways:

A. By mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service *only*) under 37 CFR §1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

(37)

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand to the Office of the Solicitor.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit should *not* be mailed to the Solicitor's mail service address.

JOSEPH F. NAKAMURA,
June 8, 1987. *Solicitor.*

[1079 OG 72]

(37) **Appeals to CAFC**

In every case of an appeal to the CAFC from a decision of the Board of Patent Appeals and Interferences or the Trademark Trial and Appeal Board, a copy of the notice of appeal should be separately transmitted to the Office of the Solicitor at the time the original notice is filed with the Commissioner. The Solicitor's copy should be sent in an envelope addressed as follows:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attn: Office of the Solicitor

In lieu of mailing, the copy for the Solicitor may be hand-delivered to the Office of the Solicitor. Sending a copy of the notice of appeal to the Solicitor's Office will prevent or reduce delays in docketing appeals in the CAFC.

DONALD W. PETERSON,
July 17, 1987. *Deputy Commissioner of Patents and Trademarks.*

[1081 OG 14]

(38) **Sale of Copies of Reexamination Requests**

Copies of reexamination requests, all cited references, and the file wrapper and contents of the patent file for which reexamination is requested are available at a charge of $0.30 per page. Orders for such copies must indicate the control number assigned the reexamination request. Orders should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Customer Services Division.

GERALD J. MOSSINGHOFF,
July 31, 1981. *Commissioner of Patents and Trademarks.*

[1010 O.G. 4]

(39) **Electronic Patent Data Dissemination Guidelines**

Introduction

The U.S. Patent and Trademark Office (PTO) has undertaken a program to fully automate its operations. As a result of the automation, new forms of patent data will be created and new techniques will become available to facilitate the end use of one of the largest technical information resources of the nation, the files of U.S. and foreign patents. To fulfill its mission to disseminate such information and to aid in the management of the electronic information resources, the PTO has formulated the following general principles and guidelines regarding electronic, digital patent data dissemination and distribution.

To the extent that formal regulations will be necessary to carry out these guidelines, separate formal rulemaking procedures will be undertaken. The purpose of this notice is to inform the public as early as possible of the PTO's present policies in automating its patent operations.

The public is urged to consider and submit comments on these guidelines. Please address comments to:

J. Howard Bryant
Administrator for Automation
U.S. Patent and Trademark Office
Washington, D.C. 20231

Background

In response to P.L. 96–517, the PTO prepared and submitted to Congress on Dec. 13, 1982, its plan for the complete automation of its operations by 1990. The mandate to develop the plan stemmed from the recognition that problems of increasing magnitude threaten the effectiveness of the U.S. patent system. These problems relate to the increasing difficulty of maintaining the integrity of the all-paper hand-file and retrieval search files on which patent examination depends. Surveys indicate that at any one time, about seven percent of the search files are missing or misfiled. The process of matching the 20,000 documents of correspondence and other items that arrive in the PTO daily to the 240,000 pending patent applications is prone to a high rate of error. The already enormous data base in the patent examining search files alone — more than 25,000,000 documents— is projected to double by the end of the century. The solution to these problems is the application of computer technology to the functions of the PTO. The automation plan was developed around the concept of an essentially paperless office, using computer processable, electronic data bases to replace the existing paper files. Data will be converted to computer processable form from applications and patent search files using a variety of technical methods — optical character recognition, digital facsimile scanning, and word processing. Once the electronic data base is created, patent examiners and other PTO personnel will use it to perform searches, conduct examinations, and prepare office actions. A specially configured electronic workstation will be used to support these functions. The electronic data base also will provide the data to print the *Official Gazette* and to make copies of patents for sale to the public.

Automation is being accomplished in three stages, beginning with the installation of a proof-of-concept system to prove and refine the application of the technology to the patent process. Once proven, the test installation will be expanded in the second stage to support all of the internal functions of the PTO. In the third stage, public access to patent information will be expanded, and electronic interconnections between cooperating foreign patent offices will be established.

Considerable progress has been made in implementing the automation plan. A $300 million contract has been awarded to the Planning Research Corp., teamed with the Chemical Abstracts Service (a not-for-profit arm of the American Chemical Society) to provide computer software and equipment, together with supporting services, for an Automated Patent System (APS). Installation of the Automated Patent System for Stage 1 will begin late in 1984 and its evaluation will be completed in the summer of 1985. Part of the electronic data base — the text of patents from 1970 to the present — is available as a by-product of patent printing. Two pending procurement actions will provide for the conversion into computer processable form of the remainder of the backfile of U.S. patents and all future applications. Agreements have been reached with the European and Japanese Patent Offices to exchange electronic patent data bases. In brief, the most significant initial steps leading to the automation of the PTO have been carried out as planned.

(40)

As a result of the automation program, the PTO plans to create or obtain and maintain the following electronic data bases in its Automated Patent System(APS):

1. All U.S. patents, patent application files, and related patent data such as bibliographic, classification, status, and ownership information;
2. A comprehensive collection of foreign patent documents and related patent data such as bibliographic and classification information, captured by the PTO or obtained through exchanges with other patent offices, intergovernmental organizations, or other entities.
3. A collection of selected non-patent technical literature.

These data bases will be accessed using electronic workstations with dual, high-resolution displays, and software that provides the capability to use index and full text search techniques. These search techniques include the ability to search according to the current U.S. Patent Classification System, and an international patent classification system. The patent examiners will also be provided with access to selected commercial search data bases using their electronic workstations.

The PTO considered several approaches to the dissemination of patent data, and adopted the following general principles and guidelines.

I. Dissemination Goals and Objectives

It is the goal of the PTO to achieve effective, widespread dissemination of patent information to all segments of the U.S. public.

A. This will be accomplished directly by providing electronic data base search and retrieval services in public search facilities located in the PTO and other locations which may be established by the Government. To the extent technically feasible and economically viable, services also will be provided in cooperation with Patent Depository Libraries (PDLs), under provisions of 35 U.S.C. 13. PDLs are Federal, state and local government or non-commercial university libraries designated by the PTO to offer public, nonprofit access to patent collections.
B. The PTO will pursue its dissemination goal indirectly by encouraging the private sector to offer commercial patent search and retrieval services outside the public search facilities and PDLs. The PTO will seek to avoid competition with private sector firms in providing such services to the public.

II. Direct Dissemination to the Public

A. The PTO will seek to provide the following in the public search facilities:
   1. Electronic access to all the capabilities of the Automated Patent System (APS) that will be available to patent examiners, excluding pending and abandoned applications not accessible under 35 U.S.C. 122, at user fee rates based on the marginal cost of providing the access; and
   2. Access at commercial rates, to commercial data bases that are available to the patent examiners.
B. To the extent that it is technically feasible and economically viable, the PTO will seek to provide in the PDLs access to the capabilities of the Automated Patent System, excluding pending and abandoned applications not accessible under 35 U.S.C. 122, at user fee rates based on the marginal cost of providing those services.

III. Distribution to Commercial Data Base Vendors

The PTO will pursue its dissemination goals indirectly by making its electronic patent data available to commercial data base vendors that provide commercial search and retrieval services to the public. The PTO will provide its data to such commercial data base vendors under the following conditions:

A. All U.S. patent data created by the PTO will be made available in bulk form, that is on magnetic tape or another suitable medium.
B. In general, the PTO will not distribute the data received from another patent office but will seek to have contractual arrangements established directly between the other patent office and the commercial data base vendor. The PTO will not act as a service agent or representative of another office unless there is a special need that cannot be met otherwise.
C. Fees charged to commercial data base vendors for bulk U.S. patent data will be based on the marginal cost of providing such distribution services plus a fair market value charge for the data, as set by the PTO.
D. Normally, arrangements with commercial data base vendors will be non-exclusive. Bulk resale of PTO data by commercial data base vendors will be prohibited by the terms of the bulk sale agreement.

IV. Exchange of International Data

International electronic patent data exchanges between the PTO and other patent offices will be made when deemed to be advantageous. Dissemination of data obtained through data exchanges will be based on the following guideline: all data obtained by exchanges from other patent offices will be obtained under agreements that will permit the data to be incorporated into the Automated Patent System (APS). If the data cannot be incorporated into the Automated Patent System (APS), it will be governed by these guidelines as they apply to commercial data bases.

GERALD J. MOSSINGHOFF,
June 8, 1984. *Commissioner of Patents and Trademarks.*

[1044 O.G. 11]

(40) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
[Docket No. 70470–7070]

Electronic Data Dissemination Policies and Guidelines

Agency: Patent and Trademark Office, Commerce.
Action: Proposed Amendment of Electronic Patent Data Dissemination Policies and Guidelines: Request for Public Comment.
Summary: The U.S. Patent and Trademark Office (PTO) issues this notice to request comments on policies and guidelines for the dissemination and distribution of electronic patent and trademark data by the PTO. The purposes of this notice are (1) to inform the public of the PTO's intention to amend its pricing policy for data base products, and to expand the scope of its dissemination policies and guidelines to encompass patent and trademark electronic data; (2) to explain the current situation with regard to public access to automated patent and trademark search rooms and libraries; and (3) to solicit public comments on the intended proposals. The proposed pricing would amend the policies and guidelines published in 49 FR 24585 on June 14, 1984.
Date: Comments should be submitted no later than Sept. 21, 1987.
Address: Comments should be addressed to: Donald J. Quigg, Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231.
For Further Information Contact: Bradford R. Huther at 703–557–1572.
Supplementary Information: This notice follows the form of a notice of proposed rulemaking in that the text of the amendment of policies and guidelines is accompanied by this Supplementary Information section containing introductory and background material.

The Patent and Trademark Office has determined that this notice is not a major rule within the meaning of section 1(b) of Executive Order 12291. Therefore, a Regulatory Impact Analysis has not nor will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this amended policy statement by the Administrative Procedure Act under 5 U.S.C. 553(b)(A), no initial or final Regulatory Flexibility Analysis has to be or will be prepared. This notice does not contain a collec-

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tion of information for purposes of the Paperwork Reduction Act.

It is the intention of the PTO to revise immediately its pricing policy for the sale of its data base products in compliance with OMB Circular A–130 entitled "Management of Federal Information Resources." Under the revised pricing policy, PTO would recover only the marginal cost (i.e., that amount that is sufficient to cover the costs of reproduction and dissemination). This will result in a lowering of most fees charged for data base products. It is also the intention of the PTO to explain the situation under Public Law 99–607, the 1986 legislation authorizing appropriations for the PTO, with regard to public access to the patent or trademark search rooms and libraries, and to solicit public comments on alternatives for funding public access to those search rooms and libraries. Such comments will be considered by the PTO in formulating further modifications to the PTO's current information guidelines and policies, which modifications will be published at a later date in the form of a separate proposed rulemaking.

Background

In response to Public Law 96–517, the 1980 legislation which amended patent and trademark laws, the PTO prepared and submitted a plan for the automation of its operations to Congress on Dec. 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would replace the PTO's all-paper patent and trademark files, and thereby improve their integrity and quality; and (2) would support searches, examinations, office actions and other office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and within calendar year 1987 will be fully operational to retrieve and display all information as a substitute for paper file searches.

An Automated Patent System (APS) is being installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS — large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with dual resolution display graphics control devices and laser printers — were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group. Optical disk storage units were subsequently installed to house the test data base of digital images of U.S. and foreign patents. Other equipment that will be needed to simulate the system's performance under full workload conditions will be installed and evaluated during 1987.

The text of U.S. patents issued since 1975 was entered in the system to provide the data base for use with full text searching capabilities of APS. Images of all U.S. and selected foreign patents in the testbed group's search files have been converted to digital form and are being placed on optical disks for use in electronic classification and combined text classification searches. Work has begun to digitize the entire backfile of U.S. patents. Through exchange agreements with the European and Japanese Patent Offices, European patents issued since 1920 and all Japanese patents have been or will be converted to a common facsimile standard and key patents will be entered for on-line retrieval.

Text search capabilities of APS are now being made available to all PTO examiners. A decision on the deployment of the digital image retrieval and other electronic searching capabilities is planned to be made in 1988. Additional system capabilities for office automation and other administrative support will be added to those already installed in the testbed over the next several months to supplement the search and retrieval capabilities. Examiners will be provided with access to commercial data bases, such as industry-specific data bases, through APS, from the electronic workstations.

At the present time, neither the trademark nor the patent automated systems has been deployed to the public search rooms. It is expected that the trademark automated system could be ready for public deployment prior to the end of the current authorization cycle, which is Sept. 30, 1988. According to the 1987 edition of the Automation Master Plan, full deployment of the automated patent system to the public search room is scheduled for fiscal year 1991. Public evaluation of the automated patent system is scheduled to begin in fiscal year 1987.

Under the provisions of Public Law 99–607, which authorizes appropriations through Sept. 30, 1988, "The Commissioner of Patent and Trademarks may not impose a fee for use of public patent or trademark search rooms and libraries. The costs of such rooms and libraries shall come from amounts appropriated by Congress." In anticipation of the need to propose authorizing legislation for fiscal years 1989 through 1991, comments are being requested regarding three potential funding alternatives to support the automated public search rooms. They are:

(1) Use of taxpayer revenues. The costs of supporting the automated public search rooms could be covered by funds appropriated specifically for that purpose by Congress. No statutory changes would be required for this option. Presently, the paper search rooms are being supported with appropriated funds. Under current funding levels and, in the absence of authority to charge fees for this purpose, the public's access to automated search rooms would be restricted.

(2) Use of general fee revenues. The marginal costs of supporting the automated public search rooms could be apportioned as a cost of prosecuting an application or derived from the total available fee revenues collected by the PTO. Under this alternative, the costs for the automated public search rooms would be borne by all users of the patent and trademark systems. The user charge prohibition in Public Law 99–607 would have to be modified to permit this option.

(3) Establish specific user charges for access to the public search rooms. Under this alternative such charges for access to the automated trademark and patent systems in the public search rooms would be consistent with the guidelines of OMB Circular A–130, and would be established through the rulemaking process. The marginal costs for the public search rooms under this alternative would be borne only by those who actually use the public search rooms. The user charge prohibition in Public Law 99–607 would have to be rescinded to permit this option.

ELECTRONIC DATA DISSEMINATION POLICIES AND GUIDELINES

The Patent and Trademark Office proposes to amend its notice entitled Electronic Patent Data Dissemination Policies and Guidelines, published in 49 FR 24585 on June 14, 1984, as follows:

The title of the guidelines would be changed to read Electronic Data Dissemination Policies and Guidelines.

Guideline III, paragraphs C and D would be amended to read:

C. Fees charged to commercial data base vendors for bulk data developed by the PTO will be based on the marginal cost of providing such distribution services.

D. Normally, arrangements with commercial data base vendors will be non-exclusive. Bulk resale of PTO data by commercial data base vendors will be permitted subject to the terms of each bulk data sales agreement.

A new Guideline V, entitled Data Base Product Pricing would be added as follows:

V. Data Base Product Pricing.

Fees charged to the public for U.S. patent and trademark data products will be based on the marginal cost of providing such products.

RENE D. TEGTMEYER,
Aug. 17, 1987. *Assistant Commissioner for Patents.*

[1082 TMOG 9]

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(41) Computer Aided Search for Class 364 Subclasses 200 and 900

In 1975 the Patent and Trademark Office installed an experimental computer search system for searching the computer and digital data processing system arts classified in Class 364/200 and 900. This system, known as Computer Controlled Microform Search System (CCMSS), functioned until 1983 when it could no longer be kept operational.

A new computer aided search system, Computer Aided Search and Patent Image Retrieval (CASPIR), has been installed and is available to the public. The new system possesses features similar to the previous system in that each subclass is searchable using a topic index list of approximately 400 terms, which may be combined with Boolean logic into a search question. The user is able to view from 5 to 12 pages of documents meeting the search strategy under computer control of a microfilm viewer.

CASPIR has all of the original data base of the CCMSS (which covered patents dated 1950–1981). In addition, its data base, coded and filmed, has been updated through Sept., 1984.

It is anticipated that CASPIR will be updated according to the following schedule. Once a month the codes assigned to new documents will be entered into the data base by Patent and Trademark Office personnel. Documents thus entered will not be available on the microfilm viewer but will show up on the data terminal in response to search questions. Users would need to consult search room paper files to see the documents. To assure efficient filming and maximum use of the film strips, the filming of coded documents will take place on a quarterly basis — Jan., Apr., July and Oct. Following this procedure, the coded data base should not be more than one to two months behind current patent issue dates and the filmed copies of coded documents should not be more than three to four months behind current patent issue dates.

Terminals are currently available for public use in Crystal Plz. 2, Room 5C–22. Reservations for terminal use may be made by calling 703–557–3651 during normal business hours. Patent and Trademark Office personnel are available to assist the user in terminal operation. Effective Mar. 11, 1985 these public terminals will be moved to the Public Search Room in Crystal Plz. CP3–1A–3. Reservations for use may then be made by contacting Mr. Bernard Thomas at 703–557–2276.

EARL LEVY,
Feb. 5, 1985. *Director, Group 230 Patent and Trademark Office.*

[1052 OG 56]

(42) Availability of Concordance — Fifth Edition

The Patent and Trademark Office announces the availability of the "Concordance Fifth Edition-1985 United States Patent Classification to International Patent Classification" which relates the U.S. Patent Classification, as revised through Feb. 29, 1984, (Classification Order No. 929) to the Fourth Edition of the International Patent Classification, 1984, as published for the World Intellectual Property Organizations by Carl Heymanns Verlag K. G., Munich.

Copies of the Concordance are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 003–904–00611–1. The price for this publication is $6.50 for U.S. and $8.15 for foreign mailing.

WILLIAM S. LAWSON,
July 3, 1985. *Administrator for Documentation.*

[1057 OG 20]

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(43) Availability of Copies of the Magnetic Tape of the Fourth Edition of the International Patent Classification (IPC)

The Assembly of the IPC Union has decided to make available copies of the magnetic tapes of the IPC through the International Bureau of the World Intellectual Property Organization.

The IPC Assembly made the following decisions:

"The International Bureau should put at the disposal of the Industrial Property Offices of any country member of the IPC Union which so wishes the magnetic tape. . .of the IPC *at cost,* provided that any such Office receiving a tape accepts the three conditions set forth. .below:

(i) the tape is used by those Offices. . .for the purposes of carrying out their functions,
(ii) no reproduction of the tape or its contents, in whole or in part, is made in the form of paper copies or microfiches, except in the case of on-line printouts, and
(iii) the tapes or copies thereof, in whole or in part, are not made available to any third party."

The Committee of Experts of the IPC Union decided that the tape (in English *or* French language) would be made available to Industrial Property Offices of countries being members of the IPC Union at the price of 1,000 Swiss francs.

In order to carry out its function of disseminating patent information contained on IPC tapes, the U.S. Patent and Trademark Office may need the assistance of qualified U.S. public organizations or private companies. Accordingly, the Office will consider requests from such organizations or companies interested in disseminating such information.

The Committee also decided that, subject to the conditions enumerated in (ii) and (iii) above, the tapes would be made available for the following prices to any public organization or private company authorized by its government:

- for internal use only, at the price of 5,000 Swiss francs; and
- for exploitation of the tape on a commercial basis, at the price of 30,000 Swiss francs.

The Patent and Trademark Office will authorize United States public organizations and private companies to purchase the tape under these conditions and at the agreed upon prices quoted.

For further information contact:

Office of International Patent Classification
Crystal Square, Bldg. 4, Room 108
U.S. Patent and Trademark Office
Washington, D.C. 20231
Tel: (703) 557–3756

Feb. 1, 1985. WILLIAM S. LAWSON, *Administrator for Documentation.*

[1052 OG 56]

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(44) Simultaneous Issue of Patents

Applicants and their attorneys who desire the simultaneous issue of allowed applications must submit the request to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Publications
CP–2, Room 5C26

The request must contain the following information about *each* allowed application for which simultaneous issue is requested:

(1) serial number
(2) filing date
(3) name(s) of inventor(s)
(4) title of invention
(5) date of allowance

Separate copies of the request must accompany *each* Issue Fee Transmittal (PTO–85b).

Questions concerning this practice may be directed to Mr. Stanley J. Bania, Director, Office of Publications, Area Code (703) 557–3794.

Aug. 25, 1978. RICHARD J. SHAKMAN, *Assistant Commissioner for Administration.*

[974 O.G. 16]

RECORDS AND FILES

(45) Assignee Names

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL–85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL–85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL–85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN, *Assistant Commissioner for Administration.*

[942 O.G. 186]

(46) Submission of Uniform Assignee Names on the Issue Fee Payment Form PTOL–85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL–85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL–85b should ensure that the same company name form is used for all patents issuing to a particular company.

Nov. 17, 1977. RICHARD J. SHAKMAN, *Assistant Commissioner for Administration.*

[965 O.G. 8]

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(47) Assignments Affecting Applications of Joint Inventors

Over the past several years, the Assignment Branch of the Patent and Trademark Office has been charging a single fee for recording the assignment of a patent or patent application of joint inventors when separate assignment documents are executed by the joint inventors and then filed together for recording.

This practice is in error because it conflicts with 37 CFR 1.21 Miscellaneous Fees and Charges (h) Recording of Documents which states:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or applications . . . . . $20.00.

Effective Nov. 1, 1984, the Assignment Branch will charge in accordance with the above regulation, the fee of $20.00 for each assignment document of the joint inventors which relates to the patent or patent applications.

Oct. 1, 1984. THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1047 O.G. 49]

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(48) Title of Invention Carried on Office Records

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

Aug. 31, 1977. BRADFORD R. HUTHER, *Acting Assistant Commissioner for Administration.*

[962 O.G. 23]

(49) Notice to Patent Owners and Parties Responsible for Paying Maintenance Fees Concerning Fee Address and Payor Number

37 CFR 1.363, effective Nov. 1, 1984, provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The "fee address" is in addition to the "correspondence address" under 37 CFR 1.33 which will continue to be used for all reexamination and interference purposes. If no separate "fee address" is specified, the "correspondence address" will also be used for maintenance fee correspondence.

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payor number" will be assigned to each "fee address" when a "fee address" is presented to the Office in a patent or earlier upon request. A request for a "payor number" before a maintenance fee is paid or due will permit a patent owner to request that the "fee address" or "payor number" be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenance fees will be sent to the "fee address".

The Patent and Trademark Office has established a procedure for assigning a "payor number" upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments. Under the procedure, a patent owner or other party may request a "payor number" for a particular "fee address" by writing to: Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231. Each request for a "payor number" should include:

— the "fee address" to be used by the Office, and
— the telephone number of the fee addressee to be used to resolve problems.

After receipt of a "payor number", it may be used to indicate to the Patent and Trademark Office the "fee address" to be used in particular patents on which maintenance fees will become due and in applications in which issue fees have been or are being paid. Any request for entry of a "payor number" or "fee address" in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a "payor number" has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a "payor number" has not been previously entered in the Office records for a patent, the mere indication of a "payor number" at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the "payor number" of record in the Office for that patent.

Oct. 19, 1984. THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1048 O.G. 48]

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(50) New System To Monitor Patent Applications

During this summer the Patent and Trademark Office will begin implementation of a new office-wide computer system, the Patent Application Locator and Monitor System (PALM 3), for monitoring the location and status of pending patent applications. The system will also have the ability to print data on certain form letters such as the Notice of Allowance, using computer-controlled printers located in the Examining Groups. This will permit the Notice of Allowance to be printed and mailed by the Groups shortly after the Examiner has decided that an application is in condition for allowance. Under the new system, the Notice of Allowance will be mailed prior to completion of final issue revision by the Group clerical staff. In those applications where an Examiner's Amendment is required, it will normally be mailed as an attachment to the Notice of Allowance.

When existing printing backlogs have been eliminated, this accelerated mailing should reduce the time between allowance by the examiner and issuance of the patent grant in most cases. The nature and/or extent of the revisions or processing requirements subsequent to mailing of the Notice of Allowance may result in little or no reduction in the time required for the printing of a few patents. In addition, it is possible that, as a result of this additional processing, withdrawal or correction of the Notice for a given application may be required. For instance, prosecution might be reopened as a result of the Quality Review Program. In situations where the Base Issue Fee has been paid and the Notice of Allowance is subsequently withdrawn, the applicant may request that a refund be made or that the fee be credited to a Deposit Account.

Applicants will continue to receive a three part Notice of Allowance packet, but, as a result of automated printing, the Notice will be produced in a slightly revised format. This new format will have the following application data printed thereon:

—Serial Number
—Filing Date
—Total Claims Allowed
—Date of Mailing
—Examiner Name and Group Art Unit
—First Named Applicant
—Title of the Invention
—Base Issue Fee Due (Utility Applications Only)
—Attorney's Docket Number
—Class and Subclass Where Issued

Copy (a) of the new Notice of Allowance will be used as applicant's record copy in the current manner. Copy (b) will continue to be used as a transmittal for the fee with copy (c) required when a charge to a deposit account is authorized. The new version of copy (c) will also have a section to notify the Office of a change in an inventor's address. Note that this address change need not be signed by the inventor. This procedure eliminates the need for the separate Inventor's Address Change form (PTOL–231) now in use.

One other change to current practice will also be implemented as a result of the new system. Beginning with patents issuing in the late fall of this year, advance orders for patent copies will only be sent to the correspondence address of record in the application. This practice will permit computer generation of mailing labels for the orders and thereby eliminate the need for the separate, pink Advance Order form (PTO–721) now in use. Requests for advance orders will now be made in a special section of copy (b) of the Notice of Allowance. During the transition from the old order method to the new, it will be necessary to send some advance orders to the correspondence address of record in the application rather than some other address as has been requested on an earlier submitted Advance Order Form.

While the major impacts on the public will be limited to those discussed above, one other minor matter should be mentioned. It is anticipated that, due to the absence of data in the master data base, some information occasionally may not be printed on the Notice of Allowance or on other form correspondence. However, this does not necessarily mean that a corrected Notice or form letter is required. Furthermore, since the data base is not used for printing of the patent grant, the missing information should appear on the final issued patent if it is in the application file wrapper. This problem is expected to diminish as the implementation of the system proceeds and the data base becomes more complete. The cooperation of applicants and their representatives during this

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system implementation is sincerely appreciated by the Patent and Trademark Office.

June 16, 1980. SIDNEY A. DIAMOND, *Commissioner of Patents and Trademarks.*

[997 O.G. 9]

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(51) **Policy Regarding Storage, Retention and Availability of the Foreign Patent Documents in the Numeric Collection of the Patent & Trademark Office***

The U.S. Patent and Trademark Office (PTO) maintains the largest collection of foreign patent documents in the United States. This collection is a major technical information resource that supports the patent examination function as well as the PTO's mission of disseminating technical information. The collection is divided into two parts—the classified collection which is distributed among the examiners' search files, and the numeric collection which is maintained by the PTO's Scientific Library. A large portion of the numeric collection is in paper form, but it also includes considerable microfilm with some overlap between the two forms. Some of the documents are republished versions of earlier publications (e.g., unexamined and examined applications). One of the PTO's objectives has been to reduce the bulky paper foreign patent files in the numeric collection by replacing them, where possible, with good quality microfilm and by eliminating duplicates. A number of other considerations bear on the management of this collection. Because of the importance of the collection, the PTO has established a policy intended to ensure the effective storage, retention, and availability of the foreign patent documents in its numeric collection. The purpose of this notice is to inform the public of this policy which is set forth below.

The public is invited to consider and submit comments on the policy. Please address comments to:

William S. Lawson
Administrator for Documentation
U.S. Patent and Trademark Office
Washington, D.C. 20231

General Policy

The U.S. Patent and Trademark Office (1) is the National repository for all foreign patent documents, except design patents; (2) will maintain, in numerically retrievable collections, as many as possible of these documents for which there is or may be a reasonable level of need, and (3) will make these documents conveniently accessible to the PTO and to the public.

Implementation

1. The Scientific Library is responsible for policy implementation.

2. At least all post-1920 foreign patent documents needed to meet "Minimum Documentation" requirements of the Patent Cooperation Treaty will be housed in the Scientific Library in either paper or microfilm form.

3. All paper copies of foreign patent documents not needed to meet "Minimum Documentation" requirements will be housed either in the Scientific Library or other storage space in accordance with usage activity. The documents with greater activity will be housed in the Scientific Library until space therein is exhausted and the remaining documents will be housed in the other storage space.

4. All foreign journals (official gazettes) will be housed in the Scientific Library.

5. All paper copies of foreign patent documents needed for copy request fulfillment will be stored in a form accessible for prompt retrieval.

6. Whenever feasible, paper copies of foreign patent documents will be replaced by good quality microfilm.

7. 16mm roll microfilm will be the microform preferred for PTO use and archival storage. If 16mm microfilm is not available or is unacceptable, the Library may decide, on a case-by-case basis, whether a different microform should be obtained.

8. All microfilm of foreign patent documents intended for use by the PTO and the public will be housed in the Scientific Library. All archival microfilm will be housed in a facility that is suitable for the preservation and protection of the microfilm and for needed access.

9. Paper copies of foreign patent documents will be disposed of if good quality microfilm of the corresponding documents is available in the Library, good quality *archival* microfilm is available in the PTO, and the PTO has the legal rights to sell paper copies made from the microfilm and to reproduce the microfilm for internal use; paper copies for which there is little or no demand may be disposed of despite the availability of only marginal-quality microfilm. Paper copies for which good quality microfilm is available in the Library, but for which the other conditions noted above are not met, will be retained, although they need not be stored in a form accessible for prompt retrieval. However, such documents will be stored in accordance with a procedure designed to ensure preservation of the documents, adequate records of stored material and efficient utilization of space.

10. Where an application has been republished, a decision will be made on a "country-by-country" basis as to whether the duplicate version or versions of the initial document will be retained. The basis for this decision will be the current or anticipated utility of the duplicate documents to the PTO and the public.

11. Collections of paper copies that are not needed by the PTO will be disposed of promptly. Such collections will first be offered, for a limited time, to developing countries through the World Intellectual Property Organization. Collections which cannot be disposed of in this manner may then be disposed of, preferably by offering them for sale, as part of some exchange, or as gifts. However, if unneeded paper copy collections cannot be disposed of in a beneficial manner within a reasonable period of time, they will be discarded.

12. Requests for copies of foreign patent documents from within the PTO and from the public will be fulfilled promptly.

13. Fees to the public for copies of foreign patent documents will be set at a level commensurate with full cost recovery and with the provision of prompt, efficient copy service.

14. As the complete text of foreign patent documents is captured in electronic form and becomes retrievable, numerically and otherwise, to the PTO and to the public, in the automated patent system, paper copies will be disposed of and the retention of microfilm reconsidered.

15. It is recognized that this policy does not provide for all possible circumstances regarding the foreign patent document collection and there may be limited instances where some deviation from the policy is justified. In such cases, the deviation will be justified in writing by the Program Manager of the Scientific Library and approved by the Administrator for Documentation and the Assistant Commissioner for Patents.

Nov. 26, 1984. WILLIAM S. LAWSON, *Administrator for Documentation.*

[1052 OG 3]

*The PTO also maintains a very large, technologically classified collection of foreign patent documents. This policy *does not* apply to the classified collection.

FEES AND PAYMENT OF MONEY

(52) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 2

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish fee related procedures and fees in amounts which would comply with the requirements of either Public Law 96–517 or H.R. 6260, dependent upon which is effective on Oct. 1, 1982. This action is necessary at this time in view of the requirements to establish fees and procedures contained in Public Law 96–517 and the requirements which would also be present under H.R. 6260 enacted as a Public Law. This final rule is being issued in two sections with the first section relating to patent fees and the second section relating to trademark fees. This final rule is also being issued in alternative form so that the proper fees and procedures will become effective on Oct. 1, 1982, under either Public Law 96–517 or the Public Law which results from enactment of H.R. 6260. Thus, if Public Law 96–517 remains fully effective on Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96–517 and H.R. 6260, as well as those specific to Public Law 96–517, contained in Alternative A of each section, will become effective. Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96–517 and H.R. 6260, as well as those specific to H.R. 6260, contained in Alternative B of each section, will become effective. Thus, the intended effect of this action is to adopt rules which will be effective on Oct. 1, 1982, establishing patent and trademark fees and procedures regardless of whether Public Law 96–517 remains fully effective or whether H.R. 6260 has been enacted.
Effective Date: Oct. 1, 1982. However, prior to Oct. 1, 1982, the Department of Commerce will publish a document confirming the amendments under either Alternative A or Alternative B set forth herein depending upon enactment of H.R. 6260 as a Public Law.
For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557–3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3–11A13, Washington, D.C. 20231.
For Further Information Contact: As to the trademark rules contact Miss Maude Williams by telephone at (703) 557–2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3–11C17, Washington, D.C. 20231.
Supplementary Information:

SECTION I—REVISION OF PATENT FEES

Background

A notice of proposed rulemaking was published in the *Federal Register* on June 28, 1982, at 47 FR 28042–28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57–120. An oral hearing was held on July 9, 1982. Fourteen written letters and statements were submitted. Five persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These rule changes are designed primarily to implement the Patent and Trademark Office fees which are provided for by Public Law 96–517, or which would be set in, or provided for by, the Public Law resulting from H.R. 6260.

Public Law 96–517

Public Law 96–517 presently requires that fees be established by the Commissioner for the processing of patent applications from filing through issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. Public Law 96–517 requires that by Oct. 1, 1982, fees for the processing of patent applications, other than design patents, be set by the Commissioner to recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. Similarly, fees for processing design patents are to be set to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. By Oct. 1, 1982, fees for all other services or materials related to patents are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

Public Law 96–517 also requires that fees be set for maintaining all patents filed on or after Dec. 12, 1980, other than design patents, in force. It also requires that maintenance fees must recover 25 per centum of the estimated cost to the Office of processing patent applications, other than design patent applications, by the fifteenth fiscal year following Dec. 12, 1980. Under Public Law 96–517, the maintenance fees are due 3½, 7½, and 11½ years after grant of the patent.

Public Law 96–517 is presently effective and this rule change is designed to implement the fee provisions of that law if it remains fully effective on Oct. 1, 1982. The changes which will become effective on Oct. 1, 1982, under Public Law 96–517 (without enactment of H.R. 6260) are (1) the rule changes common to Public Law 96–517 and H.R. 6260, and (2) the rule changes under only Public Law 96–517, which appear in Alternative A.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. H.R. 6260 would establish a number of statutory fees which the Commissioner is required to charge. Among the more significant of these are fees for filing a patent application, issuing, and maintaining a patent in force. The fees for filing a patent application and issuing a patent would be set forth in §41(a) of Title 35, United States Code, as proposed to be amended by H.R. 6260. Certain other fees, such as appeal fees, the fee for filing a disclaimer, and fees for filing petitions seeking to revive an abandoned application and for extensions of time, would also be set in §41(a) of Title 35, United States Code. Section 41(b) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would set forth the fees for maintaining a patent in force. These fees would be due 3½, 7½, and 11½ years after grant of the patent or within a grace period of six months thereafter. Section 41(c) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would provide for the acceptance of maintenance fees after the statutory grace period under certain conditions and with certain effects.

H.R. 6260 would also provide for the reduction by 50 per centum in the fees paid under §41(a) and (b) of Title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established, and to be established therefor.

Section 41(d) of Title 35, Untied States Code, as proposed to be amended by H.R. 6260, would also provide that the Commissioner establish fees for all other processing, services, or materials related to patents which are not covered in §41(a)–(c) of Title 35, United States Code, to recover the estimated average cost to the Office of the processing, services, or materials.

The changes which will become effective on Oct. 1, 1982, *upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982,* are (1) the rule changes common to Public Law 96–517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. H.R.

6260 includes other provisions which would be the subject of other proposals for rulemaking.

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a patent application, or during the term of a patent. A number of significant changes are made in order to implement either Public Law 96–517 or H.R. 6260.

Under H.R. 6260, and Alternative B of this rule making, fees under §41(a) and (b) of Title 35, United States Code, would be reduced by 50 per centum for independent inventors, small business concerns, and nonprofit organizations. H.R. 6260 would give the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking, in Alternative B, implements the fee system which would be established by H.R. 6260 and lists all applicable fees.

* * * * *

Another significant change relates to fees established under Public Law 96–517 and which would be established by H.R. 6260 for petitions for extensions of time to take actions required by the Commissioner in an application. H.R. 6260 would establish a fee of $50 for filing a petition for a first one-month extension of time, an additional fee of $100 for filing a petition for a second one-month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a petition for a third one-month extension of time which would expire three months after the end of the time period set for taking action. A fourth one-month extension with an additional fee of $200 could be requested if additional time was available under the statute. Under H.R. 6260, the Commissioner would have authority to issue regulations providing when, within any maximum time period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. The Commissioner would also not be precluded by H.R. 6260 from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause. This rulemaking implements the extension of time provisions of H.R. 6260 by permitting applicants in the majority of situations to file the petition for an extension of time and the fee at the time of and along with the filing of the response for which a non-statutory or shortened statutory time period has been set. This will reduce the amount of paperwork involved and should significantly reduce the expenses of applicants and the Office since resources now devoted to the separate processing of petitions for extensions of time will no longer be required to be expended thereon. The fees are set to provide a proper control on the number of extensions of time given. The same procedures relating to extensions of time which would be established under Alternative B and H.R. 6260 will also be established under Alternative A and Public Law 96–517. Thus, whether the rules are effective on Oct. 1, 1982, under Public Law 96–517 and Alternative A, or under H.R. 6260 and Alternative B, the same procedures for obtaining extensions of time will be in effect with the only differences being in the amount of the fees.

Another significant change relates to the implementation of the fee for revival of an unintentionally abandoned application which would be authorized under H.R. 6260. H.R. 6260 would establish two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees would be applicable to petitions to accept the delayed payment of the fee for issuing a patent. Under H.R. 6260, a fee of $50 is established in §1.17(l) for filing a petition for revival under §§133 or 151 of Title 35, United States Code, in accordance with standards presently in effect where the delay resulting in the abandonment, or the delay in payment of the issue fee, was unavoidable. Under H.R. 6260, a fee of $500 is established in §1.17(m) for filing each petition for revival, or for acceptance of the delayed payment of an issue fee, where the abandonment or the failure to pay the issue fee was unintentional. A mere statement that abandonment was unintentional plus the $500 fee is all that is required in this case for this purpose. Under H.R. 6260 and this rulemaking an applicant would have a choice of which petition and fee to file seeking revival depending on the circumstances involved. The changes discussed in this paragraph cannot be made effective without enactment of H.R. 6260 as a Public Law.

The rulemaking also provides for fees for filing certain petitions which have, in some cases, heretofore, been decided without a charge. These fees are established under Public Law 96–517 and are provided for by the amendment of §41(d) of Title 35, United States Code, which would be introduced by H.R. 6260. Under §41 of Title 35, United States Code, as amended by Public Law 96–517 or as it would be amended by H.R. 6260, fees are authorized for the processing of various petitions desiring certain actions to be taken regarding patent applications, for the recording of assignments, for reexamination of patents, and for the processing of international applications under the Patent Cooperation Treaty. In general, fees are not being required for those petitions which are supervisory in nature. For example, where applicants are petitioning from an allegedly improper action of the examiner, it is felt that such petitions should be processed and decided without charge since they are not asking for any special privilege but are attempting to correct an allegedly incorrect Office holding. The changes discussed in this paragraph will be in effect on Oct. 1, 1982, whether the rules become effective under Public Law 96–517 and Alternative A, or under H.R. 6260 and Alternative B.

Many of the fees currently set forth in §1.21 are being increased to reflect the cost of currently performing that service.

DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this proposal under three different categories. Those changes which are common to Public Law 96–517 and H.R. 6260 appear first and are numbered 1–54. Those changes which relate only to Public Law 96–517 appear as Alternative A and are numbered 55–62. Those changes which are dependent upon enactment of H.R. 6260 appear as Alternative B and are numbered 63–71. The changes common to Public Law 96–517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

Rule Changes Common To Public Law 96–517 and H.R. 6260

The following sections are changed, effective Oct. 1, 1982, under either Public Law 96–517 or H.R. 6260:

Section 1.11 is amended to change the reference for the reexamination request fee to §1.20(c).

Section 1.12 is amended to break the section into four paragraphs. Paragraph (a) maintains current practice but adds specific reference to §1.19(a)(5) which sets the cost of copies.

Paragraph (b) maintains current wording except for inserting "patent" after "abandoned" and changing "his" to "applicant's". Paragraph (c) includes new language relating to obtaining copies of assignment records not open to the public. Access can be obtained only with the applicant's permission or by petition with fee to the

Commissioner for such access in particular situations. No change in the showing required by petition to obtain access is intended by this amendment. Paragraph (d) contains present language except for reference to the specific rule which sets forth the charge for time consumed in making assignment searches.

New paragraph (e) of §1.14, sets forth the two ways in which access can be obtained to patent applications which are not open to the public. The two ways are (1) by petitioning and paying the petition fee and approval of the Commissioner of such petition and (2) by obtaining written approval from the applicant.

New §1.19 provides fees for copies of various documents supplied by the Office. The fees have been grouped into 5 paragraphs. New paragraph (a) provides fees for uncertified copies. Subparagraphs (a)(1) and (2) indicate the prices of printed patent copies. Subparagraph (a)(3) provides a single fee for a copy of an application, as filed, for each 50 pages, or fraction thereof. This practice should make it much easier to determine the amount of the required fee. Subparagraph (a)(4) sets a single fee for a copy of each 100 pages, or fraction thereof, of a patent file wrapper. Subparagraph (a)(5) provides for a charge of 30 cents per page for copies of Office records other than those covered by subparagraphs (a)(1) through (4). Subparagraph (a)(6) provides a fee for a microfiche copy of a microfiche.

Paragraph (b) of §1.19 sets fees for certified copies of Office documents. Subparagraph (b)(1) sets a fee for certifying Office records. Subparagraph (b)(2) provides a single fee for searching assignment records, preparing an abstract of the title and certification thereof. Subparagraph (b)(3) provides a fee for comparing copies not prepared by the Office prior to certification in order to provide basis for certification. Paragraph 1.19(c) sets the fees for subscribing to all of the patents issued annually in particular subclasses. This charge is in addition to the normal copy charge under §1.19(a)(1) and (2). Paragraph 1.19(d) sets the fee for providing patent copies to libraries under 35 U.S.C. 13. Paragraph 1.19(e) provides fees for lists of United States patents in particular subclasses.

Section 1.21 is amended to contain those miscellaneous fees which do not relate to the topics covered in §§1.16–1.20. All of the fees in §1.21 are established under the authority given the Commissioner by 35 U.S.C. 41(d) as amended by Public Law 96–517 or as proposed in H.R. 6260. Paragraph 1.21(a) establishes fees for admission to the examination for registration to practice, registration, reinstatement and issuance of certificates of good standing of patent attorneys and agents. Subparagraph 1.21(b)(1) sets forth the fee for establishing and reinstating deposit accounts, while subparagraph 1.21(b)(2) sets forth the fee due when the balance at the end of each month is below $40. Paragraph 1.21(c) sets the fee for filing a disclosure document. Paragraph 1.21(d) sets the fee for renting a delivery box. Paragraph 1.21(e) sets the fee for an international-type search report. Although all national applications now receive what is known as an international-type search, if a report thereof is desired in addition to an Office action, the fee set in §1.21(e) is required. Paragraph 1.21(f) sets a fee for searching Office records for purposes not otherwise specified. Paragraph 1.21(g) sets the fee for tokens for copying machines. Paragraph 1.21(h) sets the fee for recording assignments, agreements, and other documents. Paragraph 1.21(i) sets forth the fee for publishing a notice of availability of a patent for licensing or sale in the *Official Gazette*. Paragraph 1.21(j) sets the fee for the Office providing a duplicate or replacement of a permanent Office user pass. Paragraph 1.21(k) indicates that the Commissioner may specify charges for items and services not otherwise specified at a level to recover the actual cost of providing such an item or service by the Office.

Section 1.24 is revised so that the denomination of coupons sold by the Office will be in more convenient amounts.

Section 1.25 is amended to provide, in paragraph (a), a reference to the fee for establishing a deposit account and a service charge if the end of the month balance is below $40.00. Paragraph (b) is amended by revising the present sentence to refer to post-issuance fees and by adding a second sentence which would specifically provide in the regulations for the possibility of an applicant giving a general authorization to charge any fee due under §§1.16–1.18 in a particular application to a deposit account during the entire pendency of the application. This general authorization would not apply after the patent issues, e.g., to maintenance fees. The last sentence of paragraph (b) permits fees during reexamination to be charged to a deposit account by filing an authorization with the request for reexamination.

Section 1.26 is amended to provide in paragraph (a) that a withdrawal of a request for an oral hearing will not entitle appellant to a refund. Paragraph 1.26(a) raises the amount which will not be refunded without specific request from fifty cents to one dollar. Paragraph (b) relating to refunds of international search fees during subsequent examination of a national application is deleted since such refunds are now covered by reductions in the appropriate fees paid under §1.445 rather than solely by direct refunds. Paragraph (c) is amended to bring the spelling of "requester" into conformance with that used in other sections of the regulations.

Section 1.45 is amended to provide in paragraphs (b) and (c) for a petition and petition fee to be filed to correct misjoinder of inventorship situations in pending applications. The fee will cover the additional time required by the Office to process such applications.

Section 1.47 is amended to provide for petitions and fees for filing applications signed by less than all inventors, or a person not the inventor.

Section 1.51 is amended to refer to the filing fees in new §1.16 and to add a new paragraph (c) indicating that applicants may file authorizations to charge fees required under any of §§1.16–1.18 to deposit accounts.

Section 1.52 is amended to add a reference in paragraph (a) to new paragraph (d). New paragraph (d) provides in the rules for filing an application in a language other than English if a verified English translation and fee under §1.17(k) are timely submitted.

Section 1.55 is amended in paragraph (b) to require a petition and fee for processing priority papers submitted after the issue fee is paid.

Section 1.75 is amended to add a reference to §1.16 and a sentence referring to the fee for multiple dependent claims set forth in §1.16(d).

Section 1.85 is amended to delete the sentence relating to mounting of informal drawings.

Section 1.86 is removed to delete the reference to the Office draftsman making drawings since such service is no longer available.

Section 1.102 is amended by revising paragraph (a) and adding new paragraphs (c) and (d). Revised paragraph (a) refers to paragraph (b) and added paragraphs (c) and (d). Paragraph (c) requires a petition but no fee where the basis for the petition to make special is the applicant's age or health or the impact of the invention on improving the environment or conservation of energy. Paragraph (d) requires a petition and the fee set forth in §1.17(i) for petitions to make special on grounds other than those above.

Section 1.103 is amended in paragraph (a) to provide for filing a petition and the fee set forth in §1.17(i) for a suspension of action except that no fee would be required where the reason for the suspension is the fault of the Patent and Trademark Office. Paragraph (b) is amended to clearly indicate that suspensions are directed to actions by the Office and not responses by the applicant.

Section 1.104, paragraph (d) is amended to change the fee reference to correspond to §1.21(e).

Section 1.134 is added to indicate that unless applicant is notified of any non-statutory or shortened statutory period in an Office action, a maximum period for response of six months is allowed.

Section 1.135 is amended to provide that if no response is filed within the time set in the Office action under §1.134 or as it may be extended under §1.136, the

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application will be abandoned unless an Office action indicates that another consequence, such as disclaimer, will take place. Paragraph (b) is amended to include a reference to paragraph (a). Paragraph (c) is amended to add that applicant's reply must be a bona fide attempt to respond as well as to advance the case to final action in order for applicant to be given an opportunity to supply any omission.

Section 1.136 is amended to revise the title and provide for two distinct procedures to extend the period for action or response in particular situations. The procedure which is available for use in a particular situation will depend upon the circumstances. Paragraph 1.136(a) permits an applicant to file a petition for extension of time and a fee as in §1.17(a), (b), (c), or (d) up to four months after the end of the time period set to take action except (1) where prohibited by statute, (2) in interference proceedings, or (3) where applicant has been notified otherwise in an Office action. The petition and fee can be filed prior to or with the response. The filing of the petition and fee will extend the time period to take action up to four months dependent on the amount of the fee paid except in those circumstances noted above. Paragraph 1.136(a) will effectively reduce the amount of paperwork required by applicants and the Office since the extension will be effective upon filing of the petition and payment of the appropriate fee and without acknowledgment or action by the Office and since the petition and fee can be filed with the response. Paragraph (b) provides for requests for extensions of time upon a showing of sufficient cause when the procedure of paragraph (a) is not available. Although the petition and fee procedure of §1.136(a) will normally be available within 4 months after a set period for response has expired, an extension request for cause under §1.136(b) must be filed during the set period for response. The sentence in paragraph (b) relating to who may grant an extension under paragraph (b) is eliminated thereby providing additional flexibility to designate persons to act on requests under paragraph (b). Extensions of time in interference proceedings are governed by §1.245.

Section 1.165, paragraph (b) is amended to delete therefrom the last sentence which refers to a fee for mounting copies. Since little or no need has been found for this provision in the rules, it is deleted.

Section 1.171, as amended, adds a reference to §1.19 (b)(2) which sets forth the fee for title reports.

Section 1.177 is amended to require a petition and fee as set forth in §1.17(i) where it is desired that divisions of a reissue issue on different dates.

Section 1.181 is amended to indicate in paragraph (d) that if a petition to the Commissioner is filed under the provisions of a section which requires a petition fee and the required fee is not paid, the petition will be dismissed. The amendment to paragraph (g) deletes the reference to §1.183.

Section 1.182 is amended to add a sentence requiring any petition filed under this section to be accompanied by the petition fee set forth in §1.17(h).

Section 1.183 is amended to specifically refer to the inherent authority of the Commissioner to suspend or waive the rules at the Commissioner's initiative. The amendment also indicates the Commissioner's authority to designate others to act for the Commissioner in appropriate circumstances. The rule language also requires the payment of the petition fee set forth in §1.17(h) if a petition to suspend or waive the rules is filed.

Section 1.191 is amended to change the fee reference for filing a notice of appeal to §1.17(e) and delete the word "primary" since some actions which are subject to appeal are not made by a "primary" examiner.

Section 1.192, paragraph (a), is amended to refer to the fee for filing an appeal brief set forth in §1.17(f). The present language requiring a showing of sufficient cause for extensions of time for filing the brief and an indication that an oral hearing is desired at the time of filing the brief are removed from paragraph 1.192(a). Under the amendment to paragraph 1.192(a), the provisions of §1.136 will apply to extensions of time for filing the brief. The time for requesting an oral hearing is now set in §1.194(b).

Section 1.194 is amended to revise paragraphs (b) and (c) to refer to the fee for oral hearing in §1.17(g) and to indicate in paragraph (b) that any request for an oral hearing must be made within one month after the mailing date of the examiner's answer.

Section 1.197, paragraph (b), is amended to modify the last sentence relating to extensions of time to make the provisions of §1.136 applicable thereto. Paragraph 1.197(b) is also amended to limit requests for rehearing, reconsideration or modification of a Board decision to one. This will not significantly change present practice since such requests are now required to be filed within thirty days from the date of the original decision.

Section 1.231, paragraph (a)(1), is amended to change the reference to the fee for filing a request for reexamination to §1.20(c).

Sections 1.245 and 1.246 are amended to indicate that the provisions of §1.136 do not apply to time periods in interferences.

Section 1.263 is amended to add a reference to the fee for filing a disclaimer contained in §1.20(d).

New section 1.268 is added to provide a rule relating to the filing of interference settlement agreements. The rule generally follows 35 U.S.C. 135(c) and provides for filing of petitions and fees in paragraphs 1.268(b) and (c).

Section 1.292, paragraph (a), is amended to require the payment of the fee set forth in §1.17(j) with any petition for the institution of public use proceedings.

Section 1.304, paragraph (a), is amended to provide for extension of the time period for filing an appeal or civil action to be subject to the provisions of §1.136 and refer to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals.

Section 1.311 is amended to designate the present section as paragraph (a) and revise it in several ways. Paragraph (a) indicates that the notice of allowance will be sent to the correspondence address as indicated under §1.33. The issue fee (§1.18) is indicated as being due 3 months from the date of mailing of the notice of allowance. Paragraph 1.311(b) permits an authorization to be filed either before or after the mailing of the notice of allowance to charge the issue fee to a deposit account.

Section 1.312 is amended to divide the section into two paragraphs and require a petition and payment of the fee under §1.17(i) for any amendment filed after payment of the issue fee.

Section 1.313 is amended to provide in paragraph (a) clear basis for the Office withdrawing applications from issue on its own initiative or upon petition by applicant accompanied by the petition fee set forth in §1.17(i). Any accompanying amendment must comply with the requirements of §1.312. Paragraph (b) clarifies when an application will be withdrawn from issue after assignment of the issue date and patent number.

Section 1.314 is amended to revise the wording to eliminate reference to a portion of the issue fee and adds reference to the possibility that an application in which the issue fee was paid can be withdrawn from issue under §1.313 or the issuance thereof deferred pursuant to a petition by the applicant and the payment of the petition fee under §1.17(i).

Section 1.321 is amended to include references in both paragraphs (a) and (b) to the statutory disclaimer fee in §1.20(d) and delete the reference to §1.21.

Section 1.324 is amended to include reference to the fee in §1.20(b) and change the word "application" to "petition".

Section 1.331, paragraph (a), is amended to add a new sentence which gives the citation of the fee for recording assignments and to indicate that instruments recorded on the Government register under Part 7 of Title 37, Code of Federal Regulations, do not require payment of such fee.

Section 1.332 is amended to refer to the fee in §1.21 (h) for recording an assignment.

Section 1.334 is amended to divide the rule into three paragraphs and also require an address of the assignee so that correspondence can be directed to the assignee if required. New paragraph (c) provides for filing a petition and the fee set in §1.17(i) seeking to have the patent issue to the assignee where such assignment has not been recorded at the time the issue fee is paid.

Section 1.341, paragraph (h), is amended to refer to the fee set forth in §1.21(a)(2) for registration of an attorney or agent.

Section 1.347 is amended to add a sentence referring to the fee set forth in §1.21(a)(3) for reinstatement of an attorney or agent.

Section 1.445 is amended to increase the PCT transmittal fee and search fee to a level needed to cover the cost of performing the required functions. Paragraph 1.445(a)(2) is also amended to provide, in effect, for a reduction in the international search fee due to the United States Patent and Trademark Office as an International Searching Authority where a corresponding United States national application with fee has been filed. In addition, paragraph 1.445(a)(4) is amended to credit the national fee required under §1.16(a)–(d) where an international search fee has been paid on the corresponding international application to the United States as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. The supplemental search fee for inventions in addition to the first, where lack of unity of invention has been found, is reduced since the present fee is more than is required to cover the costs. The national fee amount is the same as the national application filing fees in §1.16(a)–(d).

Section 1.446(b) is revised to permit a refund of a portion of the search fee to the extent set forth in §1.445(a)(4), if such refund is requested at the time of paying the national fee.

Section 1.451 is amended in paragraph (b) to revise the citation of the fees for a certified copy.

Section 1.510 is amended to cite the section which sets forth the fee for requesting reexamination. There is no change in the amount of this fee.

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Alternative B—Rule Changes Under H.R. 6260

The following sections will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to that date:

Section 1.16 in Alternative B establishes in the regulations those statutory fees which would be charged by the Commissioner for filing patent applications under H.R. 6260. Section 1.16 also includes additional filing fees set in 35 U.S.C. 41(a)(1) to cover the cost of examining complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. Section 1.16 also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under 35 U.S.C. 41(a) as it would be amended by H.R. 6260, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in §112 of Title 35, United States Code, or any claim depending therefrom, is considered as separate dependent claims in accordance with the number of claims to which reference is made.

The fees in §1.16 are reduced by 50 per centum for applications filed by small entities, i.e., independent inventors, nonprofit organizations and small business concerns, in accordance with H.R. 6260. Therefore, two fees are listed under each paragraph.

New §1.16 relates to application filing fees. Paragraph (a) sets a basic filing fee of $300 which will be required in all original patent applications. The term "original" as used in the regulations means "non-reissue". An "original" application can be a first filing, a division, a continuation, or a continuation-in-part application. Paragraph 1.16(b) provides for an additional fee of $30 for each independent claim in excess of 3 in an original application. New paragraph 1.16(c) provides for an additional fee of $10 for each claim in excess of 20, whether independent or dependent. A multiple dependent claim is considered to be that number of claims to which direct reference is made. Also, any claim which refers to a multiple dependent claim is considered for fee calculation purposes to be the number of claims to which direct reference is made in the multiple dependent claim. Paragraph 1.16(d) provides for a new fee of $100 in each application which contains one or more multiple dependent claims. The note following paragraph 1.16(d) is intended to clearly indicate that the applicant, attorney, or agent may pay any additional fees required under paragraphs (b), (c) and (d) of §1.16, or cancel such claims without payment of such additional fees, either at the time of filing or by the time a response is due to any notice of fee deficiency mailed by the Office. If the fees are not paid or the claims cancelled by the end of the period set for response to the notice of fee deficiency, the application will be held abandoned. New paragraph 1.16(e) establishes the amount of the surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application. This fee is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. New paragraph 1.16(f) provides for a filing fee of $125.00 for a design application.

Paragraphs 1.16(g) and (h) incorporate into the regulations the filing fees for plant and reissue applications.

Paragraphs 1.16(i) and (j) set forth the additional claim fees required in reissue applications based on claims in excess of those in the original patent.

New §1.17 relates to patent application processing fees which are normally due during the time a patent application is pending. New paragraphs (a), (b), (c) and (d) provide for the payment of an extension fee for obtaining an automatic extension of time upon filing a petition as provided for in §1.136(a). The extension fee can be paid during the period for which an extension of time to respond is desired, or after the original period for response has expired, provided that any maximum statutory period which may apply has not expired. The fees set forth in §1.17 are the total fees required under §1.136(a) for the periods indicated and any extension fee previously paid to extend a particular period is credited toward the total extension fee required. Paragraph (e) sets forth the fee for filing a notice of appeal to the Board of Appeals. Paragraph (f) sets forth the fee for filing an appeal brief for appellant. Paragraph (g) provides for a new fee for requesting an oral hearing before the Board of Appeals. Paragraphs (h) and (i) set forth fees which will be required with petitions to the Commissioner under those sections of the regulations which specifically indicate that such petition fees are required. The amount of the fees are set at two levels based on the degree of complexity of the petitions in order to recover the estimated average cost to the Office of processing the petitions. Paragraph (j) provides for a fee to be paid with any petition for institution of a public use proceeding to cover the estimated average cost of such a proceeding. Paragraph (k) sets forth a new fee for processing an application filed with a non-English language specification. The fee will cover the additional processing costs involved in such applications. New paragraph (l) incorporates into the regulations the fee which will be charged for filing a petition to revive or to accept

late payment of the issue fee where the delay was unavoidable. New paragraph (m) incorporates into the regulations the fee which will be established in 35 U.S.C. 41(a)7, as amended by H.R. 6260, to be charged for a petition for the revival of an unintentionally abandoned application for patent or for the unintentionally delayed payment of an issue fee.

Since paragraphs 1.17(h), (i), (j) and (k) are established under the authority given the Commissioner under 35 U.S.C. 41(d) as it would be amended by H.R. 6260, only one level of fee is set. H.R. 6260 only provides for the reduction of fees charged to small entities of those fees established in 35 U.S.C. 41(a) and (b).

New §1.18 sets the amount of the issue fees specified by H.R. 6260. New paragraph (a) establishes an issue fee of $500.00 for all original and reissue patents except for designs and plants. New paragraph (b) sets the amount of the issue fee for a design patent. New paragraph (c) sets forth the issue fee for a plant patent. All fees in §1.18 will be reduced by 50 per centum for small entities.

New §1.20 sets fees for various post-issuance functions performed by the Office. New paragraph (a) sets forth a fee for providing a certificate of correction of an applicant's mistake. New paragraph (b) sets a fee to accompany a petition to correct inventorship in a patent under §1.324. New paragraph (c) transfers the $1,500.00 fee for requesting reexamination from present §1.21(x) to this new section. New paragraph (d) provides for a fee for filing a disclaimer under §1.321. Maintenance fees required by Public Law 96–517 and which would be set in H.R. 6260 are placed in this section. Specific maintenance fees, which are required by Public Law 96–517, for those patents resulting from applications filed on and after Dec. 12, 1980 and up to the date of enactment of H.R. 6260 are being established at this time in paragraphs 1.20(e)–(g). New paragraphs 1.20(h)–(j) incorporate into the regulations the maintenance fees which would be provided in 35 U.S.C. 41(b) by H.R. 6260. The fees in paragraphs 1.20(a)–(c) are only set at one level because they are established under 35 U.S.C. 41(d). The fees in paragraphs 1.20(e)–(g) are only set at one level because they are established under Public Law 96–517 and are not subject to reduction for small entities. The details implementing the payment of maintenance fees are not being established at this time.

Section 1.66 is amended to provide for the use of an apostille of a foreign official to attest to oaths or affirmations made in foreign countries in accordance with 35 U.S.C. 115 and 261, as amended by H.R. 6260.

Section 1.137, as amended, designates the existing section as part of paragraph (a), adds a reference to the new fee under §1.17(l) for a petition for revival where the delay which resulted in abandonment was unavoidable, indicates that the petition must be promptly filed, and states when the showing that the delay was unavoidable must be verified. New paragraph 1.137(b) provides for filing a statement and a fee under §1.17(m) for revival of an application which was unintentionally abandoned, and also indicates when such petitions can be filed. Paragraph (c) requires that any petition for revival under paragraph (a) of §1.137 be promptly filed and that a terminal disclaimer, equivalent to the period of abandonment of the application, be filed with any petition under paragraph (a) filed more than six months after the date of abandonment.

Section 1.155 is amended to refer in paragraph (a) to §1.18(b) which sets forth the issue fee for a design application. Paragraph 1.155(b), as amended, includes a reference to the fee for delayed payment of the issue fee set forth in §1.71(l) where the delay in payment was unavoidable, indicates that the petition must be promptly filed, and states when showings that the delay was unavoidable must be verified. New paragraph 1.155(c) provides for acceptance of the late payment of the issue fee where the delay was unintentional upon petition and payment of the fee set forth in §1.17(m). New paragraph 1.155(c) also indicates when such petitions can be filed. Paragraph 1.155(d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where petition under paragraph (b) of §1.155 is not filed within six months of the date of abandonment.

Section 1.316 is amended to implement the statutory provisions of 35 U.S.C 41(a) with regard to petition fees for revival of applications abandoned for failure to pay the issue fee. Paragraph (b) is amended to provide for petitions for revival with the fee in §1.17(l) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions for revival with the fee in §1.17(m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where a petition under paragraph (b) of §1.316 is not filed within six months of the date of abandonment.

Section 1.317 is amended to implement the statutory provisions of 35 U.S.C. 41(a) with regard to petition fees for patents lapsed for failure to pay the remaining balance of the issue fee. Paragraph (a) is amended to show that it applies only to patents in which the issue fee was paid prior to Oct. 1, 1982. Issue fees paid on or after that date will be in accordance with §1.18. Paragraph (b) is amended to provide for petitions with the fee in §1.17(l) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions with the fee in §1.17 (m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of lapse of the patent where a petition under paragraph (b) of §1.317 is not filed within six months of the date of lapse.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Written comments were received from three patent law groups and eleven individuals. The three patent law groups were (1) the American Patent Law Association whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office; (2) the Patent, Trademark and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of The Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups and by 3 individuals on their own behalf.

These comments appear below along with responses thereto.

Comments received relating to §§1.9, 1.27 and 1.28 and the forms of Part 3 are not discussed in substance in this rule change since additional time for submitting written comments is provided until Aug. 13, 1982. All comments presented to these rules will be discussed in a later rule promulgation.

Comment:

One person argued that it is unreasonable to require fees to lengthen a shortened statutory period.

Reply:

A shortened statutory time is provided for by statute. The shortened period helps reduce patent pendency time and speed the disclosure of technology and information about patent rights. Many applicants can reply within the present three month shortened period which has been in effect for over fifteen years. The fee for extending the time provides a positive method for applicants to obtain an extension of time while still expediting the prosecution of their applications.

Comment:

Another person commented that H.R. 6260 should be rejected in that the fee levels are too high.

Reply:

The consideration of the merits of H.R. 6260 is not before the Office in this rule change.

Comment:

Three patent bar groups and two individuals presented comments relating to the effect of the new extension of time fees in §1.17 and the effect thereof on the current practice of granting an automatic one-month extension of time if a timely first response to a final rejection is filed by the applicant.

Reply:

The Office plans to terminate the automatic one-month extension of time practice on Oct. 1, 1982. It is felt that the extensions of time which are readily available under §§1.17 and 1.136 will meet the needs of applicants. The amount of the fees required to obtain an extension will be the same for periods of response before and after final rejection.

Comment:

One suggestion was made to permit the filing of an appeal without the appeal fee where the Office has not acted on a timely response after final rejection by applicant.

Reply:

Such a procedure is not possible under the provisions of H.R. 6260 since it calls for the appeal fee "On filing an appeal" in §41(a)6.

Comment:

Two comments were received requesting that the rules be changed to make the due date for paying the fee for an oral hearing on appeal after the examiner's answer on appeal.

Reply:

A change in the rules has been made to provide that the fee for an oral hearing is due no later than one month after the date of mailing of the examiner's answer.

Comment:

Two comments were received requesting that no charge for revival of an abandoned application be made where the abandonment resulted from the non-receipt of an Office action by the applicant.

Reply:

It is present Office practice to remail any Office action which is not received at applicant's correspondence address and start anew the response period. This procedure will continue in the future under the revised rules.

Comment:

Three patent bar groups and two individuals indicated that the proposed deletion of the refund provisions due to PCT search reports in §1.26(b) and §1.446(b) would make the cost of filing under the Patent Cooperation Treaty prohibitively high and does not recognize the benefit of an earlier search on a corresponding application.

Reply:

In view of these comments, proposed §1.445(a) (2) and (4) and §1.446(b) have been amended to provide a credit of $250 where there is a corresponding application.

Comment:

One individual requested that the multiple dependent claim practice set forth in §1.75(c) be changed to permit one multiple dependent claim to refer to another multiple dependent claim as permitted under European practice.

Reply:

This suggestion cannot be adopted since it is contrary to 35 U.S.C. 112 and cannot therefore be changed by rule.

Comment:

One suggestion was made to change "official" to "Office" in §1.135(b).

Reply:

The suggestion has been adopted.

Comment:

One suggestion was made to allow refund of the oral hearing fee if an oral hearing is not held.

Reply:

This suggestion was not adopted since such refund is not appropriate in view of the fact that the fee is stated to be "for requesting an oral hearing" and not the actual conduct thereof.

Comment:

Three patent bar groups raised the question as to whether an applicant would be permitted to revive an unintentionally abandoned application under §1.137(b) after having been unsuccessful in the unavoidable approach under §1.137(a) and suggested that this be made clear when the proposed rules are promulgated.

Reply:

Yes, an applicant under certain conditions could use §1.137(b) after having been unsuccessful in the unavoidable approach under §1.137(a).

Comment:

Several comments related to the possibility of reviving applications unintentionally abandoned up to 15 years ago.

Reply:

In view of the comments received, §1.137(b) is being implemented to provide only for the revival of applications which were unintentionally abandoned for a reasonable but limited period of time. This should create no substantial problems in regard to intervening rights situations. It would permit some greater flexibility than that originally proposed but should have no significant effect on the current case backlog, pendency or number of interferences pending.

Comment:

One comment was received pointing out that the availability of an "unintentional abandonment" revival under §1.137(b) should not result in stricter holdings in "unavoidable abandonment" revival petitions under §1.137(a).

Reply:

The Office plans to continue to use the current criteria used to decide petitions to revive applications unavoidably abandoned.

Comment:

One written comment questioned whether the Commissioner has statutory authority to revive unintentionally abandoned applications.

Reply:

If Congress did not intend the Commissioner to have such authority there would have been no reason to establish fees in §41(a)7 in H.R. 6260. The legislative history of H.R. 6260, House Report No. 97–542 (Committee on the Judiciary), also makes the Congressional intent clear. The provisions in H.R. 6260 relating to unintentional abandonment are substantive in addition to setting the fee.

Comment:

One letter questioned what is intended by the statement in §1.137(b) that the Commissioner may require additional information where there is a question whether the abandonment was unintentional.

Reply:

Additional information would be required only where there is an indication that the abandonment was intentional, for example, where an express abandonment has been filed. The record should be clear how such an express abandonment was unintentional if the petition is to be granted.

Comment:

One comment raised the question as to whether in a petition to revive on grounds that the delay was unavoidable under §1.137(a), it would be sufficient that a registered attorney's statement be submitted which merely recites facts as related to him or her by another.

Reply:

Statements must be made, where possible, by the person having direct personal knowledge of the facts. No change in the "showing" required or the persons making them is intended in such petitions. The rule merely clari-

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fies that a statement by a registered attorney or agent need not be in the form of an oath or declaration.

Comment:

One comment suggested that §1.317 be changed to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.

Reply:

Section 1.317 has now been changed to provide for this lapse situation.

Comment:

Three patent bar groups and one individual indicated that a full credit of the amount equal to the international search fee be made where both a U.S. national and international seach are made by the United States Patent and Trademark Office.

Reply:

While a complete credit is not considered proper in view of additional processing work (including searching) required in the second application, a credit of $250 has been provided in revising §1.445(a) (2) and (4).

Comment:

One person commented that the term "patent" should be inserted after "abandoned" in §1.12(b).

Reply:

The suggestion has been adopted.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of other changes which have been made as a result of the comments received and further review of the proposed rulemaking are identified below.

Implementation of the changes to §1.9, new §§1.27 and 1.28, and the deletion of Part 3 are being deferred for further comments by Aug. 13, 1982. See the discussion below.

Subparagraph (a) (5) of §1.19 has been changed from that proposed by referring to subparagraphs (1) through (4) rather than (3) and (4) in order to clarify that copies of patents cannot be ordered at the rate set in subparagraph (a) (5). Instead, copies of patents must be ordered under paragraphs (a) (1) and (2) of §1.19.

Section 1.24 has been changed from that proposed to provide for the sale of 40-cent coupons. Coupons in this denomination may be useful in view of the charge of forty cents for a printed copy of a registered mark in §2.6(m) of Alternative A of the trademark rules.

Sections 1.137, 1.155 and 1.316 have been changed from that proposed in Alternative B to further specify the conditions under which unintentionally abandoned applications can be revived.

Sections 1.192 and 1.194 have been changed from that proposed so as to allow a request for an oral hearing and the payment of the required fee therefor to be made one month after the date of the examiner's answer. Previously, appellant was required to indicate a desire for an oral hearing at the time of filing the brief. The sections will now permit appellant to consider the examiner's answer before deciding whether to request an oral hearing and pay the required fee.

Section 1.317 has been changed in Alternative B to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.

Section 1.445(a) (2) and (4) have been changed from that proposed to provide for a reduction in the international search fee where there has been a corresponding United States national application and a credit to the national fee where an international search fee has been paid in a corresponding international application and the international search has been made by the United States Patent and Trademark Office.

Section 1.446(b) has been changed from that proposed to permit a refund of a portion of the search fee to the extent set forth in §1.445(a) (4), if such refund is requested at the time of paying the national fee.

IMPLEMENTATION OF PATENT FEE REVISION

The effective date of the patent fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96–517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96–517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of specific sections is set forth below:

IMPLEMENTATION OF SPECIFIC SECTIONS

The various sections will be implemented in the manner set forth below:

§1.16 National application filing fees.

Any national patent application filing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section. Any additional fees which become due under §1.16 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include a multiple dependent claim for the first time, the fee set forth in §1.16(d) must be paid.

The surcharge in §1.16(e) of Alternative B is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. The statutory authority for the late filing of the fee or the oath or declaration becomes effective six months after enactment of H.R. 6260 as a Public Law.

§1.17 Patent application processing fees.

Any patent application processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

The extension fees which must accompany a petition for an extension of time become effective on Oct. 1, 1982, and apply to any application for which the period for responding, i.e., taking action, expires on Oct. 1, 1982, or thereafter. If a response or action by the applicant was due before Oct. 1, 1982, and was not filed timely or an extension of time until Oct. 1, 1982, or thereafter, was not obtained, then §1.136(a) cannot be used to obtain an extension. *Any response or action required before Oct. 1, 1982, cannot have its time extended by using §1.136(a).* If one or more previous extensions have been granted prior to Oct. 1, 1982, extending the time for taking action until Oct. 1, 1982, or thereafter, the fees which are due for additional extensions under §1.136(a) will be as set forth in §1.17(a)–(d) under either Alternative A or B.

* * * * *

The previous practice of extending the shortened statutory period an additional month upon the filing of a timely first response to a final rejection is being discontinued effective with any first response to a final rejection filed on or after Oct. 1, 1982. Applicants can obtain additional time for response after that date by paying the appropriate fee for the same. An object of the previous practice, as expressed in §714.13 of the Manual of Patent Examining Procedure, was to obviate the necessity for appeal or filing a continuing application merely to gain time to consider the examiner's position in reply to a response timely filed after final rejection. Under §1.136(a) the object of the previous practice can be achieved without continuing the previous practice. Thus, under §1.136(a) an applicant can file a timely first response to a final rejection within the initial period without having to file an appeal or a continuing application if the examiner's response is not received prior to the expiration of the initial period for response. If the timely first response places the application in condition for allowance no additional response and no extension fee from applicant is required. If the examiner's advisory action indicates the timely first response did not place the application in condition for allowance the applicant may then consider the examiner's position to determine whether further prosecution is desirable. If further prosecution is not desired the application can be abandoned without further response or expense. If further prosecution is desired, the applicant can petition and pay the necessary fee to extend the time to the extent appropriate up to the maximum permitted by statute. The availability of this flexibility under §1.136(a) eliminates the necessity for the previous practice. Further, under H.R. 6260 extensions of time would be granted in most instances by virtue of the payment of fees rather than without fees as in the previous practice. The elimination of the previous practice after final rejection is thus consistent with the letter and spirit of H.R. 6260.

After an applicant has petitioned and paid the extension fees of $550 for response within the fourth month pursuant to §1.136(a), any further extensions which are permitted under the statute must be obtained under §1.136(b).

A petition for extension of time under §1.136(a) may incorporate by reference a previously filed response without including an additional copy of the response in circumstances where the response was received late and the petition is filed to extend the time so that the response will be considered timely.

The appeal fees set forth in §1.17(e)–(g) are due for notices of appeal or briefs filed, or requests for oral hearings filed, on or after Oct. 1, 1982. If more than one appeal occurs in an application, the fees are due for each notice of appeal, each brief, and each request filed for an oral hearing as long as a decision on the merits by the Board of Appeals resulted from the first notice of appeal, brief, and request for an oral hearing. If the examiner reopens prosecution in the application after appeal and prior to the decision by the Board of Appeals then the fee for the notice of appeal, brief, and request for an oral hearing will apply to a later appeal which does result in a decision by the Board of Appeals. No refund of any appeal fees is permitted since such are due on filing or on requesting an oral hearing. No fee is required for a reply brief.

The fees for petitions set forth in §1.17(h)–(j) and (1) apply to any such petition filed on or after Oct. 1, 1982. The fee set forth in §1.17(m) of Alternative B would apply, with enactment of H.R. 6260 prior to Oct. 1, 1982, to petitions (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent. Section 1.137(b) of Alternative B would apply to applications unintentionally abandoned by failure to prosecute, e.g., failure to respond to an Office action. Sections 1.155(c) and 1.316(c) of Alternative B would apply to applications in which the payment of the fee for issuing a patent is unintentionally delayed. These sections would be implemented, with enactment of H.R. 6260 prior to Oct. 1, 1982, by making them effective as to any applications which would be covered by the literal language of the sections. In addition, and for a transition period between Oct. 1, 1982, and Dec. 31, 1982, a petition to revive an unintentionally abandoned application would be granted if (i) the application received a decision on a petition to revive the application on or after Oct. 1, 1981, and before July 30, 1982, or (ii) a petition was filed or renewed on or after Oct. 1, 1981, and before July 30, 1982, provided in the case of both (i) and (ii) that a petition to revive was filed within one year of the date of abandonment. The dates in question were chosen so as to permit this remedial provision to be given as wide an application as possible to benefit applicants whose applications have previously been unintentionally abandoned, but who could not meet the previous requirements for a showing that the delay resulting in the abandonment was unavoidable. The dates were also chosen to prevent an applicant whose application has been abandoned for an unduly long period from attempting to take advantage of this new provision, possibly to the detriment of individuals or companies who had begun to make, use, or sell the subject matter of the application after the date of abandonment of the application. By using these dates the possibility of reviving the application of an applicant who has, in effect, abandoned the invention under 35 U.S.C. 102(c) is minimized. Implementing these sections in the manner set forth would be appropriate and proper in view of the legislative history of H.R. 6260, contained in House Report No. 97–542 (Committee on the Judiciary), which indicates that the Commissioner can establish time limits within which petitions to revive or to accept late payment of issue fees can be filed. Thus, it is entirely proper to limit such petitions in the manner set forth in order to prevent abuses from occurring. To ensure that abuses do not occur, §§1.137(b), 1.155(c), 1.316(c), and 1.317(c) specifically indicate that waivers of the time periods involved will not be considered via petitions under §1.183.

The fee set forth in §1.17(k) is required for any application filed on or after Oct. 1, 1982, with a specification in a non-English language.

§1.18 Patent issue fees.

Any patent issue fee paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section even if the notice of allowance was mailed prior to Oct. 1, 1982, and indicates different amounts due. If the issue fee is paid prior to Oct. 1, 1982, any balance of issue fee due must be paid in accordance with §1.317.

§1.19 Document supply fees.

The document supply fees set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§1.20 Post-issuance fees.

The post-issuance fees set forth in §1.20(a)–(d) apply to any petitions, requests, or actions filed on or after Oct. 1, 1982. The amounts of the maintenance fees are included in §1.20.

Maintenance fees will be required for any patent actually applied for on or after Dec. 12, 1980, whether or not the patent is entitled to the benefit of an earlier filing date under 35 U.S.C. 120 or a right of priority under 35 U.S.C. 119. For reissue patents, the controlling date would be the filing date of the original patent. For example, maintenance fees would only be required where the application for the original patent was filed on or after Dec. 12, 1980. As to patents resulting from interna-

tional applications filed under the Patent Cooperation Treaty, maintenance fees will be required on all patents resulting from international applications having PCT filing dates on or after Dec. 12, 1980.

The details implementing payment of the maintenance fees are not being established at this time since such fees will not be due for some time and additional consideration of the problems thereof is required.

§1.21 Miscellaneous fees and charges.

The miscellaneous fees and charges set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§1.445 International application filing and processing fees.

Any international application filing and processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

Implementation Of Certain Sections Deferred For Further Comments

In view of the comments and the recommendations received at the hearing on July 9, 1982, the period for written comments on §1.9(c), (d), (e), and (f), and on §§ 1.27 and 1.28, has been extended until Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). Comments received at the hearing on July 9, 1982, expressed the view that there is no necessity to publish final rules on §1.9(c), (d), (e), and (f), and on §§1.27 and 1.28, by August 2, 1982, and that further time for consideration and comment was necessary. Persons commenting stated a belief that the pressure of time does not apply to §§1.27 and 1.28 as it does apply to the fee rulemaking. Accordingly, the period for written comments on these sections is extended until Aug. 13, 1982. After receiving written comments by Aug. 13, 1982, the changes to §1.9 and proposed §§1.27 and 1.28 will be adopted as final rules with such modifications as are found to be appropriate after review of the comments. These rule changes, with any appropriate modifications thereof, must become effective on Oct. 1, 1982, with enactment of H.R. 6260 prior to Oct. 1, 1982. Accordingly, adoption of the changes to §1.9 and new §§1.27 and 1.28 is being deferred at this time to permit additional written comments by Aug. 13, 1982. However, these rule changes will be adopted, with any appropriate modifications, as soon as possible after receipt of the additional written comments. No additional proposal will be published and no additional hearing will be held prior to adoption of final rules on the changes to §1.9 and on new §§1.27 and 1.28.

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 3 was also extended until Aug. 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change. Since it is not essential that this deletion be published by Aug. 2, 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 3 as proposed.

SECTION II—REVISION OF TRADEMARK FEES

Background

A notice of proposed rulemaking was published in the *Federal Register* on June 28, 1982, at 47 FR 28063–28065 and in the *Official Gazette* on June 29, 1982, at 1019 TMOG 110–119. An oral hearing was held on July 9, 1982. Three written letters and statements were submitted. Three persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These amendments establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks.

Public Law 96–517

Public Law 96–517 authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks. Public Law 96–517 requires that by Oct. 1, 1982, fees for the filing and processing of an application for the registration of a trademark or other mark be set to recover in the aggregate 50 percent of the estimated average cost to the Office of such processing. Also by Oct. 1, 1982, fees for providing all other services and materials relating to trademarks and other marks are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. This bill would amend the fee provisions to be implemented on Oct. 1, 1982. H.R. 6260 would repeal the provisions in Public Law 96–517 requiring that filing and processing fees be set to recover in the aggregate 50 percent of the estimated average cost of such processing to the Office, and that fees for providing all other services and materials relating to trademarks and other marks be set to recover the estimated average cost to the Office of performing the service or furnishing the material. In passing H.R. 6260, the House of Representatives recommended a fee schedule to the Commissioner for fiscal year 1983. The fees set in Alternative B adopt the House recommendation.

This rule change, therefore, is also designed in the alternative to implement the fee provisions as they would be amended by H.R. 6260. The rule change contains changes which are common to Public Law 96–517 and H.R. 6260, as well as alternative rule changes which are specific to Public Law 96–517 (Alternative A) and to H.R. 6260 (Alternative B).

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a trademark application, or during the life of a registration.

Rule changes for implementing provisions of Public Law 96–517 or H.R. 6260 other than the fee provisions have not been included. Rule changes for implementing provisions other than the fee provisions will be published in a later rulemaking proposal.

DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this document under three different categories. Those changes which are common to Public Law 96–517 and H.R. 6260 appear first and are numbered 72–76. The change which relates only to Public Law 96–517 appears as Alternative A and is numbered 77. The change which is dependent upon enactment of H.R. 6260 appears as Alternative B and is numbered 78. The changes common to Public Law 96–517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

The specific rules for which changes are made are §§2.6, 2.85, 2.101, 2.146, 2.162 and 2.167.

Rule Changes Common to Public Law 96–517 and H.R. 6260

Section 2.85, paragraph (e), is amended to delete reference to late filed fees for oppositions and affidavits. The manner in which such fees shall be handled is described in the pertinent sections for affidavits and oppositions.

Section 2.101, paragraph (c), is amended to delete the reference to a service charge which will no longer be charged for late-filed fees for oppositions.

Section 2.146, paragraph (b), is amended to add a fee for filing a petition to the Commissioner. Paragraph (f) of this section which indicates that no fee is required is deleted.

Section 2.162, paragraph (d), is amended to remove the reference to a service charge for late-filed fees on §8 affidavits.

Section 2.167, paragraph (g), is added to establish procedures relating to the fee for affidavits under §15, 15 U.S.C. 1065, and to state the Office's action when no fee or an insufficient fee is filed.

* * * * *

Alternative B—Rule Change Only Under H.R. 6260

Section 2.6 is revised to establish the fees recommended by the House of Representatives under H.R. 6260 for filing and processing applications for the registration of trademarks or other marks and for providing services and materials relating to trademarks or other marks. The $10 fee recommended by the House for certified copies appears in paragraphs (n) and (o) as a fee of $6.50 for a copy of a registered mark showing title and/or status and a fee of $3.50 for certification.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on several of the sections. All of the comments included in the written submissions and the oral testimony were considered in adopting the changes set forth herein.

Written comments were received from three individuals. Oral comments were presented at the hearing on behalf of a patent and trademark law group, the American Patent Law Association, and an organization of trademark owners and lawyers, the United States Trademark Association. One individual spoke on behalf of a law firm and expanded upon the points raised in his previously submitted written comments.

These comments appear below along with responses thereto, where appropriate.

Comment:

The representative of the trademark association spoke favorably about the proposal presented. The organization opposed 100% recovery of trademark costs from user fees. It was felt that such an approach reflected a misconception that trademarks benefit only their owners and not consumers and the economy as a whole. The speaker solicited the assistance of the Patent and Trademark Office in altering this viewpoint.

Comment:

The representative of the bar group questioned the fairness of the Office in establishing the fees under Alternative B. It appeared that the Office had accepted the USTA proposals only where they were higher. In all cases where the USTA recommendations were lower than those proposed, the difference was split. The filing fee was singled out as the most unfair fee.

Reply:

In Alternative B, the rules adopt the fee levels recommended by the House Committee on the Judiciary in House Report No. 97–542. The Report recognizes that the Office needs to recover a certain amount of fee income over the next three years. The application filing fee is expected to furnish more than 60% of the estimated annual income. It could not be reduced further without endangering operations. The reduction from $200.00 to $175.00 per class was covered to a large extent by higher fees for other services.

Comment:

The philosophy of H.R. 6260 is to recover no more than 100%. Final fees should recover this level and no more.

Reply:

Projecting processing costs three years in advance can never be absolutely accurate. The Office must have sufficient funds to process anticipated workloads under the fees set during fiscal years 1983–1985 when costs are expected to be somewhat higher than present costs.

Comment:

One suggestion involved retaining Part 4 of 37 CFR, at least for the present. Occasional users of the registration system find it to be a readily available reference. Certain information in the forms is available from no other source. The speaker believed the time pressures to implement the fee changes precluded proper consideration of the merits of Part 4.

Reply:

The period for comment on deletion of Part 4 has been extended to August 13, 1982 to allow for additional public comment and internal consideration.

Comment:

The suggestion was made that references to affidavits and oppositions should be eliminated from §2.85(e) as the handling of late filed fees for these items is already covered directly in §§2.101(c), 2.162(d) and 2.167(g).

Reply:

This suggestion was implemented.

Comment:

A suggestion was made that §§2.101(c), 2.162(d) and 2.167(g) dealing with oppositions and affidavits under Section 8 and Section 15 be amended to require payment of all late filed fees within the time period specified in the notification by the Office.

Reply:

All of the sections state that the affidavit or opposition "will not be refused if the required fee(s). . . are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office." This language is considered sufficient to require payment of all fees or have the opposition, affidavit or declaration refused.

Comment:

One suggestion was made to either cite §2.6 in all sections being changed relative to fees or to cite it in none.

Reply:

Citations of §2.6 have been added to §2.101(c) and §2.146(b) to conform to §2.162(d) and §2.167(g).

Comment:

It was suggested that the fee for a combined section 8 and 15 affidavit needed to be specified in the rules.

Reply:

Section 2.6 has been changed to provide this combined fee.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of changes which were made as a result of the comments received and further review of the proposed rulemaking are identified below.

Deletion of Part 4 has been deferred for further comments by Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). As elimination of Part 4 is not essential to the setting of fees, and does not have to be in place 60 days before implementation, it was decided to ask for further public comment.

Section 2.85(e) has been revised to eliminate the references to oppositions and affidavits. Because the handling of late filed fees for these items is specified elsewhere,

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these references in §2.85(e) were redundant and confusing.

Both alternatives of §2.6 have been revised to add a fee for a combined affidavit under sections 8 and 15 of the Act. In order to prevent possible confusion by users of the Trademark system, it was included separately.

IMPLEMENTATION OF TRADEMARK FEE REVISION

The effective date of the trademark fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on October 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96–517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96–517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to October 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of Section 2.6 is set forth below:

IMPLEMENTATION OF SECTION 2.6

Fees set forth in Section 2.6 must be paid in the amounts set forth in this section on or after Oct. 1, 1982. Any additional fees which become due under §2.6 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include additional classes, the fee set forth in §2.6(a) must be paid per class added.

IMPLEMENTATION OF CERTAIN SECTIONS DEFERRED FOR FURTHER COMMENTS

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 4 has also been extended until August 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change (see 47 FR 32458, July 27, 1982). Since it is not essential that this deletion be published by Aug. 2, 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 4 as proposed.

OTHER CONSIDERATIONS RELATING TO PATENT AND TRADEMARK FEE REVISIONS

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et. seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) for several reasons. Public Law 96–517 and H.R. 6260 have both taken into consideration the impact they may have on small entities. The fees under Public Law 96–517 are set to recover 50% of patent and trademark processing costs rather than full costs and generally the rate of increase in the fees is less than that of inflation since the last increase in fees in 1965. Further, the rules implementing Public Law 96–517 take into consideration small entities by setting a lower patent filing fee than issue fee to recover the required level of patent processing costs. The lower filing fee permits a small entity to file a patent application for a relatively low cost and not have to pay the higher balance of fees required to achieve Public Law 96–517 recovery levels until examination is complete and it is known that a patent will issue. Under H.R. 6260 and this rulemaking, small entities would be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to requests for extensions of time, will be reduced.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and under Sections 31 and 41 of the Trademark Act of July 5, 1946, 15 U.S.C.§§1113, and 1123, Parts 1 and 2 of Title 37, Code of Federal Regulations, are amended as set forth below.

July 14, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

* * * * *

[Note: H.R. 6260 became Public Law 97–247 on Aug. 27, 1982. Rules that became effective Oct. 1, 1982 are those rules common to Public Law 96–517 and H.R. 6260 and those set forth in Alternative B. The adopted rules are reproduced in the notice entitled "Revision of Patent and Trademark Fees Confirmation," published at 1022 O.G. 21, which is reprinted immediately following this notice.]

[1021 O.G. 19]

(53) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 2714–129]

Revision of Patent and Trademark Fees Confirmation

Agency: Patent and Trademark Office, Commerce.
Action: Confirmation of rules.
Summary: This document confirms certain rule changes for patent and trademark fees and fee-related procedures which take effect on Oct. 1, 1982. These rule changes implement H.R. 6260 which was enacted as Public Law 97–247 on Aug. 27, 1982.
Effective Date: Oct. 1, 1982.
For Further Information Contact: As to the patent rules contact: R. Franklin Burnett, by telephone at (703) 557–3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3–11A13, Washington, D.C. 20231.

As to the trademark rules contact: Miss Maude Williams, by telephone at (703) 557–2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3–11C17, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office is required by law to publish a notice in the Federal Register of its fees at least 60 days before the effective date thereof (35 U.S.C. 41(g)). Thus, on July 30, 1982 a final rule document was published at 47 FR 33086 setting forth rule changes for patent and trademark fees and procedures which take effect on Oct. 1, 1982. The document was based on the public law in effect at that time, Public Law 96–517, and on H.R. 6260, which was then pending but is now Public Law 97–247. The final rule document published on July 30, 1982, in the Federal Register sets out—

(1) rules that are common to both Pub. L. 96–517 and H.R. 6260 (now Pub. L. 97–247);
(2) Alternative A which contains rule changes implementing Pub. L. 96–517 alone; and
(3) Alternative B which contains rule changes implementing H.R. 6260 (now Pub. L. 97–247).

H.R. 6260 was enacted as Public Law 97–247 on Aug. 27, 1982, and the Patent and Trademark Office hereby confirms that the rule changes common to both Pub. L. 96–517 and H.R. 6260 and Alternative B are those which go into effect on Oct. 1, 1982. The rules under Alternative A are hereby withdrawn. Additional rule changes required by Public Law 97–247 will be made the subject of separate rulemakings.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons set out in the preamble, 37 CFR Parts 1 and 2 are confirmed as being amended by the final rule published on July 30, 1982 at 47 FR 33086 as set forth below.

Sept. 14, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

1. The rule changes made in Alternative A relating to patents which begin at 47 FR 33107 and in Alternative A relating to trademarks which begin at 47 FR 33112 are hereby withdrawn.
2. Confirmed as effective Oct. 1, 1982 are the rule changes published July 30, 1982 common to Public Law 96–517 and H.R. 6260 (now Public Law 97–247) and Alternatives B. The rule changes relating to patents common to Public Law 96–517 and H.R. 6260 (now Public Law 97–247) were published on July 30, 1982 at 47 FR 33099. The rule changes relating to patents under Alternative B were published at 47 FR 33108. The rule changes relating to trademarks common to Public Law 96–517 and H.R. 6260 (now Public Law 97–247) were published on July 30, 1982 at 47 FR 33111. The rule changes relating to trademarks under Alternative B were published at 47 FR 33112. Corrections to the July 30, 1982 publication were published on Aug. 4 and 5, 1982 at 47 FR 33688 and 33959.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

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(54) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 3 and 4
[Docket No. 2827–167]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish procedures for the payment of fees under §41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for independent inventors and nonprofit organizations as required by the public law resulting from H.R. 6260. This action is necessary at this time in order that the procedures for paying the reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by the public law resulting from H.R. 6260. This final rule also deletes Parts 3 and 4 which contain outdated sample forms and corrects a reference to a section which appears in §1.451.
Effective Date: Oct. 1, 1982.
For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557–3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3–11A13, Washington, D.C. 20231.

As to the trademark rules contact Miss Maude Williams by telephone at (703) 557–2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Room 3–11C17, Washington, D.C. 20231
Supplementary Information: Notices of proposed rulemaking relating to the revision of patent and trademark fees were published in the *Federal Register* on June 28, 1982, at 47 FR 28042–28065 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57–120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086–33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on Aug. 10, 1982, at 1021 O.G. 19–94. In view of comments received at the hearings, additional time for comment on the rules covered by this change was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458.

This final rule is being adopted as soon as possible after the enactment of the public law resulting from H.R. 6260. The Patent and Trademark Office has determined that the requirement of 5 U.S.C. 553 (d) for publication not less than 30 days before its effective date does not apply to this final rule since it will reduce patent fees for independent inventors and nonprofit organizations.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which

are provided for by the public law resulting from H.R. 6260.

Public Law Resulting From H.R. 6260

The public law resulting from H.R. 6260 provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of Title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The public law resulting from H.R. 6260 gives the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. The public law resulting from H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking establishes regulations defining independent inventors and nonprofit organizations. The Small Business Administration is establishing the definition of a small business concern for the purpose of paying reduced fees under the public law resulting from H.R. 6260. This rulemaking also establishes the procedures which will be followed by independent inventors and nonprofit organizations when paying the reduced fees.The procedures to be followed by small business concerns when paying the reduced fees will be established in a separate final rule.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraphs (c), (e), and (f) which define "independent inventor" and "nonprofit organizations" as used in Title 37, Code of Federal Regulations, Chapter I. Each of these along with "small business concern" is identified as a "small entity" for purposes of paying fees which are set under §41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Paragraph (d) of §1.9 relates to the definition of small business concern which is being established by the Small Business Administration. Accordingly, proposed paragraph 1.9(d) is not being promulgated at this time.

The public law resulting from H.R. 6260 authorizes the Commissioner to establish regulations defining independent inventors and nonprofit organizations. Section 1.9(c) defines an independent inventor as any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization. Once an individual sole inventor, or one of several joint inventors, has assigned, granted, conveyed, or licensed, or comes under an obligation to assign, grant, convey, or license, any rights to the invention to anyone who could not likewise obtain status as a small entity, the inventor(s) will no longer be entitled to pay fees in the amounts established for an independent inventor (§1.9(c)). Section 1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to another individual or individuals who could qualify as an independent inventor or inventors if they had made the invention. In addition,§1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to a small business concern or nonprofit organization. Under the circumstances described in the previous two sentences the individual inventor could still qualify as an independent inventor. However, if the independent inventor assigned, granted, conveyed, or licensed, or came under an obligation to assign, grant, convey, or license, any rights to the invention to any individual or organization which could not qualify as a small entity (§1.9 (f)), then the inventor would no longer qualify as an independent inventor.

Proposed section 1.9 (d) relating to the definition of a small business concern is not being promulgated at this time.

Section 1.9(e) defines a nonprofit organization by utilizing and broadening the definition contained in 35 U.S.C. 201 (i). The term "university or other institution of higher education" as used in §1.9 (e) means an educational institution which (1) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate, (2) is legally authorized within the jurisdiction in which it operates to provide a program of education beyond secondary education, (3) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree, (4) is a public or other nonprofit institution, and (5) is accredited by a nationally recognized accrediting agency or association. The definition of "university or other institution of higher education" as set forth herein essentially follows the definition of "institution of higher education" contained in 20 U.S.C. 1141(a). Institutions which are strictly research facilities, manufacturing facilities, service organizations, etc., are not intended to be included within the term "other institution of higher education" even though such institutions may perform an educational function or publish the results of their work.

Section 1.9(f) identifies an independent inventor, a small business concern, or a nonprofit organization as a "small entity" for purposes of paying fees set under §41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Fees established under §41 (c) or (d) of Title 35, United States Code, will not be reduced for small entities since such a reduction is not permitted or authorized by the public law resulting from H.R. 6260. Paragraphs (c), (e), and (f) of §1.9 should be read together with §§1.27 and 1.28 which deal with establishing status as a small entity and the effect thereof.

New §1.27 provides in paragraph (a) that any person seeking to establish as a small entity, as defined in §1.9 (f) for the purpose of paying reduced fees, must file a statement to that small entity. Paragraph 1.27(b) provides specifically for inventors filing statements claiming status as independent inventors. Paragraph 1.27 (c) relating to claiming status as a small business concern is not being promulgated at this time, but will be subject of a separate final rule. Paragraph 1.27 (d) provides for claiming status as a nonprofit organization. Under §1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

New §1.28 provides guidance as to the effect of failure to establish, or notify the Office of any change from, small entity status. Paragraph 1.28 (a) provides that once status as a small entity has been established in an application or patent, without the filing of a further verified statement pursuant to §1.27, unless the Office is notified of a change in status. Under paragraph 1.28 (a), status as a small entity in one application or patent does not affect any other application or patent except in applications filed under §1.60 where a reference is made to a verified statement in a parent application. Paragraph 1.28 (b) requires that notification of any change in status resulting in loss of entitlement to small entity status be filed in the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. Section 1.28 also provides guidance as to the effect of improperly establishing status as a small entity. The intent of the reduced fees for small entities is to soften the impact of the fee increases under §41(a) and (b) of Title 35, United States Code, as such sections are amended by the public law resulting from H.R. 6260, upon those who are least able to absorb the increased fees without overall damage to their ability to participate in the patent system through the filing, issuing and maintaining of patents. Accordingly, any attempt to improperly establish status as a small entity will be viewed as a serious matter by the office and paragraph 1.28(d) indicates that any attempt to fraudulently establish status as a small entity or pay fees as a small entity will be considered as a fraud practiced or attempted on the Office. In addition, improperly and through gross negligence establishing status as a small entity or paying fees as a small entity will be considered as a fraud practiced or attempted on the Office. Normally, the Office will not question a claim to status as a small entity. However, if the Office must resolve such an issue in a question arising before it, the Office will look to the actual or practical status of the individual or oganization claiming status as a small entity rather than the professed or apparent status.

Section 1.451, paragraph (b), is amended to correct a reference to another section of the regulations.

Parts 3 and 4 are removed to eliminate all of the patent and trademark forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available for sale to the public from the Superintendent of Documents and which includes full size copies of substantially all the forms in the Code of Federal Regulations in view of the difficulty of keeping such forms is not mandatory.

Discussion of Significant Differences Between Proposed and Final Rules

A number of changes which have been made to §§1.9, 1.27 and 1.28 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (c) of §1.9 has been changed from that proposed to simplify the definition by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention". No change in substance is intended by removing these words since the phrase "any rights in the invention" obviously is inclusive of all rights regardless of how they are, or would be, transferred. The words "or otherwise" have also been removed to simplify the definition without a change in substance.

Paragraph (d) of §1.9 is not being promulgated by this rule change.

Paragraph (e) of §1.9 is changed from that proposed by adding the words "located in any country" in item (e) (1) to clarify the fact that a university or other institution of higher education can qualify regardless of location. Paragraph (e) is also changed from that proposed by adding an item (4) to clarify that a nonprofit organization if it could qualify as a nonprofit organization under item (2) or (3) of paragraph (e) "if it were located in this country." Thus, under paragraph (e) of §1.9 nonprofit organizations will be treated the same for purposes of paying fees regardless of location.

Paragraph (a) of §1.27 has been changed from that proposed by substituting the words "any fee paid as a small entity". This change is intended to clarify the fact that a verified statement is not required with every fee.

Paragraph (b) of §1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern or nonprofit organization is to be filed by "the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization . . ." The term "official" as used in paragraph (b) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern or nonprofit organization. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Paragraph (c) of §1.27 relating to claiming status as a small business concern is not being promulgated at this time, but will be the subject of a separate final rule.

Paragraph (d) of §1.27 has been changed from that proposed in the same manner as paragraph (b) of §1.27 has also been changed from that proposed by adding a reference to §1.9 (e)(4).

Paragraph (a) of §1.28 has been changed from that proposed by adding the words "or patent" in the first and third sentences since the failure to establish status as a small entity could occur in a patent as well as in an application. An exception to the requirement for a verified statement has also been inserted into paragraph (a) of §1.28 for applications filed under §1.60 where the status as a small entity has been established in a parent application and is still proper. Under this change in paragraph (a) of proposed §1.28, the application filed under §1.60 "must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired."

Paragraph (b) of §1.28 has been completely rewritten from that proposed to remove the requirement that the notification of a change in status resulting in loss of entitlement to small entity status must be filed prior to paying the next fee due. Instead, paragraph (b) of §1.28 provides that after establishment of small entity status, "fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue is due or any maintenance fee is due." Paragraph (b) of §1.28 is also changed from that proposed by removing the sentence stating that payment of any fee as a small entity serves "as a representation that such payment as a small entity is proper at the time the payment is made." This change does not sanction the payment of improper fees, but is no longer necessary in view of another change in paragraph (b) which specifically provides that notification of any change in status resulting in loss of entitlement to small entity status "must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." The effect of the changes to paragraph (b) of §1.28 is to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. This means that only four checks are required during the pendency and term of a patent after initial establishment of small entity status if such establishment was prior to payment of the issue fee. The last sentence of paragraph (b) has been changed from that proposed by inserting the words "of change in status" after "notification" for clarity.

Paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error occurred. This change from paragraph (c) as proposed will reduce paperwork and will provide a three-month grace period to correct errors with no explanations required for correction during that three-month period. The change has also been made to alleviate concerns about paragraph (d) of §1.28 which is being adopted as proposed.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the patent rules and forms affected by this final rule were received from three patent law groups and thirteen individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

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Comment:
One comment suggested that the definition of "independent inventor" be simplified.
Reply:
The definition of "independent inventor" has been simplified without a change in substance by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention."
Comment:
One comment suggested that there is no need to include any more than a simplified statement that a "nonprofit organization includes a university or other institution of higher education"
Reply:
The suggestion has not been adopted since it is the intent of the rules to delineate as clearly as possible what organizations can qualify as nonprofit organizations without having to expend undue resources deciding each request on a case-by-case basis.
Comment:
One comment suggested that §1.9(e) discriminates against foreigners and thus violates the principle of national equality set forth in the Stockholm text of the Paris Convention for the Protection of Industrial Property.
Reply:
Section 1.9(e), as promulgated, defines a nonprofit organization in such a way that it is clear that foreigners are not excluded.
Comment:
One comment questioned whether or not government organizations can qualify as nonprofit organizations and more specifically, whether or not a government research facility can qualify under the broad definition of a nonprofit scientific or educational organization. Another comment recommended that §1.9(e) be expanded to include the U.S. Government in the definition of a "nonprofit organization."
Reply:
Government organizations as such, whether domestic or foreign, cannot qualify as nonprofit organizations as defined in §1.9(e). Section 1.9(e) was based upon 35 U.S.C. 201(i), as established by Public Law 96–517. The limitation to "an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)(3)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a))" would by its nature exclude the U.S. government and its agencies and facilities, including research facilities and government corporations. State and foreign governments and governmental agencies and facilities would be similarly excluded. Section 1.9(e) is not intended to include within the definition of a nonprofit organization government organizations of any kind located in any country. A university or other institution of higher education located in any country would qualify, however, as a "nonprofit organization" under §1.9(e) even though it has some government affiliation since such institutions are specifically included.
Comment:
One comment was directed to, and opposed, Public Law 96–517 and H.R. 6260 rather than the specific provisions of §§1.9, 1.27 and 1.28 on the ground that the concept of a self-supporting agency is ill-conceived, shortsighted and wrong.
Reply:
Public Law 96–517 and H.R. 6260 are not issues for consideration in this rule change.
Comment:
One comment asserted that the imposition of different fees depending upon the status of an applicant is unwise, unworkable, and will not "improve the efficiency of the Patent Office", while another comment urged the Office to "disavow the proposal for a two-tier fee system and adopt a different approach to assuring that patent and trademark fees are set so that individual inventors and small businesses can continue to obtain the protection of the patent and trademark system." Another comment supported the two-tier fee system, particularly as related to universities.
Reply:
The imposition of different fees is a legislative mandate imposed by the public law resulting from H.R. 6260 and is not an issue for consideration in this rule change.
Comment:
Four comments expressed concern that small entity status is required to be confirmed each time a fee as a small entity is paid. Alternative procedures which involve (1) confirming status at the time of filing and at the time the issue fee is paid, or (2) allowing a statement of status to hold for a period of time were recommended.
Reply:
The last sentence in §1.27(a) states that "[s]uch a verified statement need only be filed once in an application or patent and remains in effect until changed." It was not intended that such statements would be required each time a fee is paid. In order to clarify §1.27(a), the first sentence has been changed to require the statement prior to or with the first fee paid as a small entity. Thereafter, notice is only required where a change in status occurs. In addition, §1.28(b) has been rewritten to provide that "[o]nce status as a small entity has been established in an application or patent, fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due."
Comment:
One comment suggested that a paragraph 1.27(e) be added which would require confirmation of small entity status at the time of paying the patent issue fee and each maintenance fee and that this be done by a statement which designates the applicant's small entity status as of the close of the last fiscal year next preceding the date of the statement.
Reply:
The suggested paragraph has not been added. However, paragraph (b) of §1.29 has been completely rewritten to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. Instead of requiring papers to be filed confirming status as suggested in the comment, the rules as adopted require that "[n]otification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." Paragraph (b) of §1.28, as promulgated, is considered preferable to the suggested paragraph (e) of §1.27 since it will eliminate the filing of a confirming statement where there has been no change in status as a small entity. This reduces unnecessary paperwork.
Comment:
One comment suggested that verified statements of small entity status need not be filed in Rule 60 applications.
Reply:
The suggestion was adopted and is reflected by the change in §1.28(a). In such applications, it will be sufficient to include a reference to a verified statement establishing small entity status in a parent application if status as a small entity is still proper and desired.
Comment:
One comment suggested that proposed paragraph 1.28(b) be amended by inserting the words "believed to be" after "small entity is" in the second sentence.
Reply:
Paragraph (b) of §1.28 as promulgated does not contain the sentence to which the suggestion is directed.
Comment:
One comment suggested that paragraph (c) of §1.28 be amended by deleting the word "verified" so that a statement explaining how an error in good faith occurred can be made "on the basis of information and belief."

Reply:
The suggestion has not been adopted. However, paragraph (c) of §1.28 as promulgated permits the correction of errors without a verified statement if the correction is accomplished within three months after the date the error occurred.
Comment:
Three comments expressed concern about the provision dealing with fraud on the Patent and Trademark Office because of some questionable act in connection with paying fees as a small entity and indicated that some persons have raised a question as to the Office's authority to designate the payment of a lesser fee as fraud. The comments suggested that proposed §1.28 be withdrawn and turned over to an ad hoc group of Patent and Trademark Office officials and practitioners for immediate examination and timely comment.
Reply:
The period for comments was extended until Aug. 13, 1982, as an alternative to, and in response to, the suggestion that §1.28 be withdrawn and turned over to an ad hoc committee. The extended period for comments has now expired and all comments which have been received have been carefully considered. In response to the statement that some persons have raised a question regarding the Office's authority to designate payment of a lesser fee as fraud, no authority has been cited which would establish or suggest that the Office does not have the authority to adopt this section. Paragraph (d) of §1.28 has been strictly limited to those situations in which there is an attempt to fraudulently establish entity, or improperly and through gross negligence establish status or pay fees as a small entity. Paragraph (d) of §1.28 is clearly within the rule-making authority provided to the Commissioner pursuant to 35 U.S.C. 6 to protect the integrity of the system established by the public law resulting from H.R. 6260, whereby fees are reduced for small entities. In order to alleviate the concerns expressed about paragraph (d) of §1.28, paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error is not corrected within three months of the date on which the error occurred. This three-month grace period to correct errors with no explanations required for correction during that three-month period should reduce the concern about paragraph (d) of §1.28.
Comment:
One comment by an attorney (1) objected to and requested removal of the second sentence of §1.28(d) because he has to rely on the information provided by the client and does not have the facilities to check the reliability of information the client provides relating to the client's status as a small entity, and (2) raised the question as to how much investigation any attorney or other individual must make in order to avoid being guilty of "gross negligence" under §1.28(d).
Reply:
The rules do not authorize an attorney to sign a verified statement establishing status as a small entity on behalf of a client. The client has to sign the verified statement. Paragraph (b) of §1.27 requires that any verified statement filed on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47. Paragraph (d) of §1.27 requires that any verified statement filed on behalf of a nonprofit organization must be signed by an official of the nonprofit organization empowered to act on behalf of the organization. The intent of paragraphs (b) and (d) of §1.27 is that the verified statement be signed by the person in the best position to know the facts as to whether or not status as a small entity can be properly established. Insofar as the attorney's irresponsibilities and duty to investigate are concerned, these do not differ from those presently owed the Office under §§1.56, 1.346, and 1.555.
Comment:
One comment suggested that paragraph (d) of §1.28 be replaced by a provision under which a "stiff fine" would be assessed against "a wrongdoer who has not paid fees in good faith."
Reply:
The suggestion has not been adopted. Assessing a fine as the only penalty against "a wrongdoer who has not paid fees in good faith" might tend to encourage the payment of incorrect fees on the theory that it is unlikely that such a matter would be brought to the attention of the Office.
Comment:
Three comments opposed the proposed deletion of Part 3 for the reasons that (1) it is useful to have an up-to-date set of forms and (2) there does not seem to be a pressing need to delete the forms.
Reply:
The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which includes full size copies of substantially all of the forms in Part 3. Since the forms currently in Part 3 are not "up-to-date" as was suggested in the comment, no present need is seen to maintain Part 3.

Response to Comments on the Trademark Rules

Specific comments were received on the proposed deletions of Part 4. All of the comments included in the written submissions and the oral testimony were considered.
Written comments were received from four individuals. Oral comments restating previously submitted written comments on Part 4 were presented by one individual on behalf of his law firm.
These comments appear below along with replies thereto.
Comment:
One comment stated that there are rules in Part 4 which are not set forth elsewhere. Such guidelines and information include, among others, the types of commerce on which an application may be based and a requirement for the use of bond paper for typed drawings.
Reply:
Part 4 does not really carry the effect of rules because the forms are not mandatory, but are merely illustrative. The information referred to by this individual can be found elsewhere, such as in the Trademark Manual of Examining Procedure. Furthermore, despite the fact that the forms do not carry the force of rules, any correction or modification to them requires the cumbersome and time-consuming processes that are associated with a rules change.
Comment:
Several comments reflected the opinion that some attorneys, particularly those who do not specialize in trademark matters, may rely on the forms that appear in Part 4. It was believed that these individuals may not have or be aware of the compilation of forms identified as the "Patent and Trademark Office Forms Booklet." In the absence of such forms in Part 4, these individuals may devise their own application formats. Such a practice would result in increased informalities which, in turn, would result in unnecessary correspondence and delayed prosecution. In addition, the commenters believed that the number of written and oral inquiries to the Office of the Director of the Trademark Examining Operation would increase dramatically.
Reply:
The Office of the Director of the Trademark Examining Operation currently has a general information telephone line to answer inquiries and to accept requests for trademark application forms and related literature. While the Office of the Director indicates the availability of the forms booklet to many callers, copies of the appropriate trademark application form are sent to those individuals who request them. It is more likely that an individual who is unaware of the trademark application form would call the Office of the Director to request an application form than create one for the particular purpose.

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Comment:
One individual, aware of the Office's plans for automation of the trademark program, saw the present deletion of the forms to be inappropriate. This individual felt that the deletion of the forms at this point would signal to the user community that the Office no longer had any interest in receiving applications in any particular format. To take such a position within a year or two of the introduction of a rigidly standardized application format was, in the opinion of this commenter, unwise. The adoption of a machine-readable application form would require greater, rather than diminished, reliance on a prescribed format.
Reply:
Within the next year or two, the Office will begin experimenting with the use of optical character recognition (OCR) equipment to automate the current data capture processes. Trademark application formats that are compatible with this equipment are likely to require special sizing and printing and, as such, are not acceptable for reduced size printing in the Code of Federal Regulations. If the existing forms were to be maintained in Part 4, they would remain available for use by applicants. As a result, the implementation of the new standardized application formats would be made more difficult.
Comment:
One commenter believed that since the next reprinting of Volume 37 of the Code of Federal Regulations will be in July, 1983, there is no pressing need to eliminate Part 4 at this time. This individual felt that users of the trademark registration system should be given additional opportunity to consider the significance of removing Part 4.
Reply:
Only four comments have been received on the deletion of Part 4. The elimination of Part 4 at this time will guarantee that the forms do not appear in the 1983 reprinting of the CFR. Of course, they will appear in the 1982 version of the CFR booklet and will be available until the new edition is published. In this matter, future access to these forms will be limited and those requiring help may contact the Office and receive the proper trademark forms.

Implementation of §§1.9, 1.27, and 1.28

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which small entity status is available and desired.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conversation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et. seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L 96–354) for several reasons. The public law resulting from H.R. 6260 has taken into consideration the impact the increase in fees may have on small entities. Under the public law resulting from H.R. 6260 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are place upon the public.

List of Subjects in 37 CFR Parts 1, 3 and 4

Administrative practice and procedure, Colleges and universities, Courts, Fraud, Inventions and patents, Nonprofit organizations, Small businesses, Trademarks.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

Aug. 26, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1022 OG 29]

(55) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 2909–187]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish a definition and procedures for the payment of fees under section 41(a) and (b) of Title 35, United States Code, by small business concerns as required by Pub. L. 97–247. This action adopts the definition of a "small business concern" for purposes of paying patent fees established by the Small Business Administration and is necessary at this time in order that the procedures for paying reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by Pub. L. 97–247.
Effective Date: Oct. 1, 1982
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3–11A13, Washington, D.C. 20231.
Supplementary Information: A notice of proposed rulemaking was published in the Federal Register on June 28, 1982, at 47 FR 28042–28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57–120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086–33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982 at 47 FR 33959. The final rule was also published in the *Official Gazette* on Aug. 10, 1982, at 1021 O.G. 19–94. In view of comments received at the hearings, additional time for comment on certain rules, including those covered by this change, was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134–40140.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by Pub. L. 97–247.

Public Law 97–247

Pub. L. 97–247, signed Aug. 27, 1982, provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41(a) and (b) of title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The Commissioner has established regulations defining independent inventors and nonprofit organizations. Pub. L. 97–247 defines small business concerns by reference to Section 3 of the Small Business Act and regulations established by the Small Business Administration. The Small Business Administration has now established the definition of a small business concern for the purpose of paying reduced fees under Pub. L. 97–247. That definition is hereby incorporated into the patent rules of practice in §1.9(d). This rulemaking also establishes the procedures which will be followed by small business concerns when paying the reduced fees.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraph (d) which defines small business concern as used in Title 37, Code of Federal Regulations, Chapter I. A small business concern is identified as a "small entity" for purposes of paying fees which are set under section 41(a) and (b) of Title 35, United States Code, as amended by Pub. L. 97–247.

Section 1.9(d) defines a small business concern by reference to and incorporation of §121.3–18 of Title 13, Code of Federal Regulations. A small business concern is defined therein as any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. The section further defines affiliates of concerns and defines also the terms "employees" and "number of employees." Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees a business concern has is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Business concerns located in any country which meet the small business definition and which comply with the applicable procedures can qualify as a "small business concern". Under the definition, a small business concern would no longer qualify as a small business concern if any rights were assigned to any individual or concern which could not qualify as a small entity pursuant to §1.9(f), or if the concern came under an obligation to assign any rights to any individual or concern which could not qualify as a small entity.

Section 1.9(d) also incorporates paragraph (b) of 13 CFR 121.3–18 which provides for appeals to the Small Business Administration from Patent and Trademark Office adverse initial size determinations.

Paragraph 1.27(c) provides for claiming status as a small business concern. Any person seeking to establish status as a small entity, for the purpose of paying reduced fees, must file a statement to that effect prior to or with the payment of the first fee paid as a small entity. Under §1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

A number of changes which have been made to §§1.9 and 1.27 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (d) of §1.9 has been changed from that proposed so as to incorporate into §1.9(d), the definition established by the Small Business Administration in §121.3–18 of Title 13, Code of Federal Regulations. The definition differs from that proposed in specifying the number of employees constituting a small business concern and specifying that the concern must be one which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license any rights in the invention to any person or concern which could not be classified as an independent inventor, small business concern, or nonprofit organization.

Paragraph (c) of §1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern is to be signed by "the owner or an official of the small business concern empowered to act on behalf of the concern." The term "official" as used in paragraph (c) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the rules affected by this final rule were received from three patent law groups and a number of individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.
Comment:
Two comments urged that in view of the "exceedingly complex" definitions of a "small business" in 13 CFR 121.3, the patent system and those associated with it would be best served by setting forth clear guidelines as to whether or not a business qualifies as a small business without reference to the Small Business Act and without incorporation by reference of "the too many pages of SBA regulatory definition."
Reply:
Pub. L. 97–247 specifically refers to section 3 of the Small Business Act and regulations established by the Small Business Administration for determining whether or not a business concern qualifies as a small business concern. Pub. L. 97–247 therefore does not permit the establishment of guidelines without reference to the Small Business Act and regulations established by the Small Business Administration. Section 1.9(d), however, does incorporate the definition as established in §121.3–18 of Title 13, Code of Federal Regulations. This will enable persons to utilize §1.9(d) without also referring to a copy of Title 13, CFR.
Comment:
One comment argued that §1.27 should be corrected or clarified to indicate that a small business concern would be entitled to the 50 percent fee reduction even though it may grant a non-exclusive or even an exclusive license to some non-small entity.

Reply:
The suggestion has not been adopted. Section 1.27 requires that the concern qualify as a small business concern as defined in §1.9(d). Section 1.9(d) defines a small business concern by incorporating 13 CFR 121.3–18, which in turn defines a small business concern as one not exceeding a particular size "which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section." The intent of both 13 CFR 121.3–18 and 37 CFR 1.9(d) and 1.27(c) is to limit the payment of reduced fees under section 41 (a) and (b) of Title 35, United States Code, to those situations in which all of the rights in the invention are owned by small entities, i.e., independent inventors, small business concerns, or nonprofit organizations. To do otherwise would be clearly contrary to the intended purpose of the legislation which contains no indication that fees are to be reduced in circumstances where rights are owned by non-small entities. Adopting the suggestion might, for example, permit a non-small entity to transfer patent rights to a small business concern which would pay the reduced fees and grant an exclusive license to the non-small entity.
Comment:
One comment suggested that the specific Small Business Administration regulations which are applicable be specified in §1.9(d).
Reply:
The definition of a small business concern as established by the Small Business Administration is now incorporated into §1.9(d).

Implementation of §§1.9 and 1.27

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which the individual inventor, small business concern, or nonprofit organization meets the qualifications established for small entity status.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) for several reasons. Pub. L. 97–247 has taken into consideration the impact the increase in fees may have on small entities. Under Pub. L. 97–247 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Small businesses.

Amendment of Regulations

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and Pub. L. 97–247, Part 1 of Title 37, Code of Federal Regulations, is amended as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. Section 1.9 is amended by adding a new paragraph (d) to read as follows:

§1.9 Definitions.

* * * * *

(d) A small business concern as used in this chapter means any business concern as defined by the Small Business Administration in 13 CFR 121.3–18, published on September 30, 1982 at 47 FR 43273. For the convenience of the users of these regulations, that definition states:

§121.3–18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code

(a) Pursuant to Pub. L. 97–247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error; and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

2. Section 1.27 is amended by adding a new paragraph (c) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such.

Sept. 23, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc.82-26941 Filed 9-29-82; 8:45 am]
BILLING CODE 3610-16-M

SMALL BUSINESS ADMINISTRATION
13 CFR Part 121

Definition of Small Business for Paying Reduced Patent Fees Under Title 35, United States Code

Agency: Small Business Administration.
Action: Final rule.
Summary: The Small Business Administration in conjunction with the Patent and Trademark Office is establishing a definition of small business for the purpose of paying patent fees under section 41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for small business concerns as required by Pub. L. 97–247. The definition would be implemented by the Patent and Trademark Office, which has recently published its regulations on the fee reduction procedures (47 FR 40134, Sept. 10, 1982).
Effective Date: Oct. 1, 1982.
For Further Information Contact:
R. Franklin Burnett (703) 557–3054.
Harvey Bronstein (202) 653–6373.
Supplementary Information: Pub. L. 97–247 provides that funds available under the Act to the Patent and Trademark Office "shall be used to reduce by 50 per centum the payment of fees under Section 41 (a) and (b) of Title 35, United States Code, by small business concerns as defined in Section 3 of the Small Business Act and by regulations established by the Small Business Administration."

A notice of proposed rulemaking relating to the definition of a small business was published in the **Federal Register** on Aug. 31, 1982 (47 FR 38331). The regulation being issued is the same as that which was proposed. In order to be a small business, the number of employees of the concern, including those of its affiliates, may not exceed 500 persons. Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of a business concern is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year.

The definition also requires a small business for this purpose to be one "which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section."

Discussion of Comments

One comment from the American Patent Law Association, whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office, expressed "no comment regarding the definition" and expressed "[t]hanks for all that's been done toward a hopefully workable definition." The remaining comments were from individual patent attorneys rather than comments on behalf of any organization.

Two comments raised questions about the intended scope of the term "license." It was suggested that clarification is needed as to what is included within the scope of the term. One comment susggested that, "[a]t the very least, the record should reflect that the definition is not intended to reach implied licenses to use and resell patented articles purchased from a small business." The comment is correct insofar as it suggests that such "implied licenses" are not intended to be included within the scope of the term. Likewise, an order by the applicant to a firm to build a proto-type machine or product for the applicant's own use is not considered to constitute a license for purposes of the definition.

Another suggestion was that the regulation be reworded to deny small business status where revenue above a certain dollar amount was received from licensing rights under the invention to a concern which could not qualify as a small entity. It was also suggested that the term "exclusive license of any of the rights in the invention" be used instead of the term "license." The latter two suggestions have not been adopted. Adoption of these suggestions would cause the regulation to become more complicated, and does not appear necessary to aid small concerns in accord with the purposes of the legislation. In addition, it could substantially broaden the number of concerns which could qualify with a resulting excessive loss of revenue to the Patent and Trademark Office. It is not seen likely that the restriction on licensing would unduly or adversely affect the ability of the small business concern to participate in the patent system.

Another comment which was made related to a firm which is a subsidiary of a university or other nonprofit organization. The suggestion was made that the number of employees of the university or other nonprofit affiliate be excluded from consideration in determining whether or not the business concern qualifies as a small business concern. The suggestion has not been adopted since the situation raised is already treated under the definition of nonprofit organization established by the Patent and Trademark Office on Sept. 10, 1982, at 47 FR 40134–40140. Under that Patent and Trademark Office regulation, a wholly owned subsidiary of a nonprofit or university is considered a part of the university or nonprofit and thus is already eligible for the fee reduction.

One comment suggested that the regulation contain language specifying that concerns meeting its requirements are also independently owned and operated and not dominant in their field of operation under the Small Business Act. It is not necessary to include this language since this regulation already contains an affiliation test for this purpose; and it is generally unlikely that a small concern would be found to be dominant. The legislative history of the Small Business Act indicates that "The mere fact that a small business makes a particular product or item and is dominant in its field with respect to the particular product or item is not intended to disqualify it from the benefits of this Act * * * "(House Report 494, 83rd Congress, 1st Session 1953). SBA Size Appeals Board precedents have consistently stated that dominance under the Act and the SBA regulations is not viewed in narrow industry subdivisions. It, therefore, does not appear that concerns defined as small business under this provision would be dominant within the meaning of the Small Business Act.

Another comment suggested that foreign concerns should not be eligible as small business under this provision. Since this patent legislation was enacted by the Congress with knowledge of the Paris Convention for the Protection of Industrial Property, there is no indication that Congress intended that foreign small business not be eligible for the fee reduction. It is the view of the Patent and Trademark Office that excluding foreign

small concerns would violate U.S. treaties in the patent area.

This comment also questioned whether the Patent and Trademark Office should make initial size determinations, or whether they could more appropriately be made by SBA. Since the fee reduction procedure is part of the patent application and of other Patent and Trademark Office actions and may involve Patent law questions, it would be administratively infeasible to have initial size determinations made by the SBA. The Patent and Trademark Office recently issued regulations (Sept. 10, 1982, 47 FR 40134) which set forth the fee reduction procedures.

Other Considerations Relating to the Rulemaking

Environmental, energy, and other considerations: The rule will not have a significant impact on the quality of the human environment or the conservation of energy resources.

Small business concerns will be benefited by the rule. The proposed rule will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). Public Law 97–247 has taken into consideration the impact it may have on small entities and has reduced the fees, therefore, by 50 per centum.

The Small Business Administration has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 13 CFR Part 121

Small businesses, Inventions and patents.

PART 121—SMALL BUSINESS SIZE STANDARDS

Accordingly, pursuant to Section 3 of the Small Business Act and Pub. L. 97–247, Part 121 of Title 13 of the Code of Federal Regulations is amended by adding §121.3–18 to read as follows:

§121.3–18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code.

(a) Pursuant to Pub. L. 97–247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

ROBERT B. WEBBER,
Sept. 23, 1982. *Acting Administrator.*

[FR Doc. 82-26940 Filed 9-29-82; 8:45 am]
BILLING CODE 3525-01-M

[1023 O.G. 23]

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(56)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 31–201–229]

Revision of Patent Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to clarify the practice under certain sections of Public Law 97–247 of 1982 and to make certain other changes and clarifications in practice which have been found desirable after some experience. The rulemaking changes the practice under §§1.27 and 1.28 with regard to subsequently establishing small entity status and qualifying for a refund of fees paid in full. The changes in other rules clarify and improve the practice in certain areas.
Effective Date: Apr. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) clarify the small entity status of independent inventors, small business concerns and nonprofit organizations having funding agreements with a federal governmental agency as defined in 35 U.S.C. 202(c) (4); 2) rewrite §1.28 to provide a system for obtaining a refund of a portion of a fee paid in full when small entity status is established within two months of the date of such payment; 3) provide that a separate statement establishing small entity status is not required in an application filed under §1.62 when such status has been established in the parent application; and 4) modify certain other rules to clarify practice.

New §1.21(1) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to §1.53(d). This new paragraph, as well as the changes to §§1.53 and 1.78, indicate that in order to obtain benefit of a prior U.S. application, either the basic filing fee or the processing and retention fee of §1.21(1) must be paid. Section 1.53(d) further establishes that the application will be disposed of if the required fee is not paid within a set period. Section 1.56(b) requires submission of copies of foreign patent documents, non-patent publications, or other non-patent items of information disclosed pursuant to the duty to disclose. New §1.191(d) clarifies that §1.136 applies in patent applications and that §1.550(c) applies in reexamination proceedings: to all time periods set forth in §§1.191-1.194, 1.196 and 1.197.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules: Section 1.5, paragraph (a) is amended to remove a reference to §1.55, which is no longer appropriate and to clarify how letters to the Office are to be identified.

Section 1.6 is amended as proposed to clarify the manner in which letters and papers, including fees, filed in accordance with §1.10 by "Express Mail" are date stamped when received in the Patent and Trademark Office. Such letters and papers, which comply with §1.10, will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or federal holidays within the District of Columbia.

Section 1.10, paragraphs (a) and (c), are amended to clarify that papers deposited as "Express Mail" on a Saturday, Sunday, or a federal holiday within the District of Columbia will be stamped with the date of the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. A cross reference to §1.6(a) has also been added to the rule. This change was not contained in the notice of proposed rulemaking but is being made to avoid confusion and to ensure that the Office's practice in date-stamping of papers is clearly understood. The change was suggested by a comment received on the proposed rules.

Section 1.14 is amended as proposed to revise paragraph (b) to clarify that only complete patent applications as defined in §1.51(a) which become abandoned will be retained for a period of twenty years from the filing date. Incomplete applications will be retained as provided in §§1.21 and 1.53.

Section 1.19, paragraph (b)(3), is amended as proposed to clarify that only copies made from Office records, but not prepared by the Office, will be compared with the original prior to certification of the copies. The Office will not compare copies made from some other copy or record with Office records for purposes of certification. The stated charge of ten cents per page would not be sufficient to make a word-by-word comparison. The requirements of the public appear to still be served by limiting the use of the comparison fee to Office records.

Section 1.21 is amended as proposed to revise paragraph (b) (2) and establish a new paragraph (1). The change in paragraph (b) (2) is in accord with the change in §1.25 (a). New paragraph (1) provides a fee for processing and retaining any application which is abandoned pursuant to §1.53(d). Such applications have received a filing date pursuant to 35 U.S.C. 111 but have been abandoned for failure to complete the application by filing the oath or declaration, filing fee or surcharge (§1.16(e)). The fee covers the handling, filming, processing, data input and storage required to retain an application. The fee is not due in any application in which the basic filing fee was paid.

Section 1.25 is amended as proposed to revise paragraph (a) to set the minimum deposit for a deposit account at $1000 and to clarify that an amount sufficient to cover all fees as well as services, copies, etc., requested must always be on deposit. This minimum amount is considered necessary and proper in view of the substantial increase in the amounts of fees being charged to deposit accounts and the processing costs of handling overdrawn accounts. Paragraph (b) clarifies that fees may be charged against a deposit account only where sufficient funds are on deposit to cover the entire amount of the fees. Paragraph (b) also clarifies that an authorization to charge a fee to a deposit account will not be considered payment on the date the authorization to charge is effective as to that fee unless sufficient funds are present in the account to cover the fee.

Section 1.27 is amended as proposed to revise paragraphs (b), (c) and (d) to provide clearly that an independent inventor, small business concern, or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a federal agency pursuant to 35 U.S.C. 202(c) (4). Section 1.27 is amended to state that such a license does not constitute a license or a conveyance of rights which would preclude qualifying for small entity status. The amendment is necessary for clarification and to avoid frustrating the intent of Public Law 97–247 and Public Law 96–517 when taken together.

The text of Title 35, United States Code, §202(c) (4) reads as follows:

§202. Disposition of rights

(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

* * * * *

(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

Section 1.28 is amended as proposed to revise paragraph (a) to clarify that a separate verified statement is not required to be filed in a file wrapper continuing application filed pursuant to §1.62, if status as a small entity has been established in the parent application and is still proper. Section 1.28(a) also permits a refund of a fee timely paid in the full amount if within two months of the date of the full timely payment: (1) small entity status is properly established, and (2) a refund is requested. Under §1.28(a), no request for a refund filed later than two months after the date on which a full fee has been paid will be entertained even if additional time is sought to file the request. The two-month period referred to in §1.28(a) is not a period for response under §1.136 and cannot be extended. Section 1.28(a) provides for, in somewhat modified form, the practice presently in effect pursuant to a waiver of §1.28 published at 1023 O.G. 77 on Oct. 26, 1982 and extended at 1027 O.G. 115 on Feb. 15, 1983. The revised refund procedures in §1.28(a) will apply to any fees timely paid in full on or after the effective date of the final rule. The refund procedures set forth in the Patent and Trademark Office *Official Gazette* Notice entitled "Filing of Verified Statements Claiming Small Entity Status" published at 1023 O.G. 77 on October 26, 1982, and the *Official Gazette* Notice entitled "Requirement for Filing Verified Statements Claiming Small Entity Status" published at 1027 O.G. 115 on Feb. 15, 1983, continue in effect until the effective date of the final rule.

Section 1.52(d) is amended as proposed to clarify that the verified English translation of a non-English language application and the fee set forth in §1.17(k) can be filed with the application or within such time as may be set by the Office.

Section 1.53, paragraphs (b) and (d), are amended to clarify in paragraph (b) that the application for patent must be filed in the name of the actual inventor or inventors by giving all their names as required by §1.41. Paragraph 1.53(d) states that if a correspondence address is provided, notice will be provided to that address where the appropriate filing fee or oath or declaration does not accompany the application. Paragraph 1.53(d) also provides that if the required filing fee is not paid, or the processing and retention fee is not paid, within one year of the date of mailing of notification pursuant to paragraph 1.53(d) or within one year from the filing date if no correspondence address is included in the ap-

plication, the application will be disposed of. The paragraph further indicates that no copies will be provided or certified by the Office of an application which has been disposed of or in which neither the basic filing fee nor the processing fee has been paid. Finally, paragraph 1.53(d) specifies that if no correspondence address is included in the application, applicant will have two months from the filing date to file the fee, oath or declaration and to pay the surcharge set forth in § 1.16(e) in order to prevent abandonment of the application.

Section 1.55, paragraph (b), is amended as proposed to correct an error in referring to paragraph (a) of this section.

Section 1.56 is amended as proposed to revise paragraph (b) and add a new paragraph (j). Paragraph 1.56(b) requires that a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form being disclosed pursuant to §1.56 accompany such disclosures unless the copy is not in the possession of the person making the disclosure. In such a situation, a statement to that effect is required. Paragraph 1.56(b) also adds "or her" to refer to both genders. New paragraph 1.56(j) states that applicant will be notified if a copy or statement required pursuant to §1.56(b) is not submitted and that applicant will be given a time period within which to file the copy or a statement that the copy is not in the possession of the person making the disclosure. Such a time period would be extendable under §1.136. Failure to respond in a proper and timely manner would result in abandonment of the application.

Section 1.59 is amended as proposed to clarify that the Office will furnish copies of papers received in the Office at the usual cost only if the basic filing fee or the processing and retention fee has been paid.

Section 1.60 is amended to break the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended §1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph 1.60(b) provides that the signing of the oath or declaration can be omitted if the prior application was complete as set forth in §1.51(a). New paragraph 1.60(b) also requires that a true copy of the prior complete application be filed. The final rule also clarifies that the copy of the oath or declaration filed must show the applicant's signature or contain an indication it was signed. Paragraph 1.60(b) also provides that only amendments reducing the number of claims or adding a reference to the prior application will be entered before calculating the filing fee and granting the filing date.

Section 1.62 is amended as proposed to revise paragraphs (a) and (d). Paragraph 1.62(a) provides that the file wrapper continuing procedure is applicable only to prior complete applications under §1.51(a). Paragraph 1.62(d) clarifies that the filing fee referred to is the basic filing fee.

Section 1.78 is amended as proposed to change the title to more explicitly define the contents of the section. Paragraph 1.78(a) specifies that in order for an application to claim the benefit of a prior filed copending national application, the prior application must be complete as set forth in §1.51(a) or be entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16, or be entitled to a filing date as set forth in §1.53(b) and have paid the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d).

Section 1.121 is amended as proposed to revise paragraph (e) to specify how amendments to the description and claims are to be made in reissue applications.

Section 1.123 is amended as proposed to clarify that the sketch showing proposed amendments to the drawing with its cover letter should be a separate paper.

Section 1.135 is amended as proposed to remove paragraph (d) since it is not necessary in view of the ability to obtain extensions of time under §1.136(a) by petition and payment of fee.

Section 1.136 is amended as proposed to clarify in paragraphs (a) and (b) that the extension of time practice under this section does not apply in interference proceedings or in reexamination proceedings. Extension of time practice in interference proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.245. Extension of time practice in reexamination proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.550(c).

Section 1.191 is amended as proposed to add a new paragraph (d) to provide that the time periods for appeal and review set forth in §§1.191–1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

Section 1.192 is amended as proposed to revise paragraph (a) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.197 is amended as proposed to revise paragraph (b) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.304 is amended as proposed to clarify that extensions of time periods set forth therein are subject to the provisions of §1.245 for interferences or §1.550(c) where reexamination proceedings are involved rather than to §1.136 which applies in all other cases.

Section 1.550 is amended as proposed to revise paragraph (c) to clarify that the time for taking any action, including appeal, by a patent owner in a reexamination proceeding is governed solely by this section.

Section 1.555 is amended to revise paragraphs (a) and (b). In paragraph 1.555(a) "prior art" statement has been changed to "information disclosure" statement to conform to the language of §1.98. Paragraph 1.555(b) requires that disclosures pursuant to this paragraph be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. Thirty-five letters presenting written comments were received. No oral testimony was presented at the public hearing conducted on Oct. 18, 1983. All of the comments were considered in adopting the changes set forth herein. Comments appear below with responses thereto.

Comments from Associations

Comment:

The American Patent Law Association commented that they were in full accord with most of the proposed changes. They submitted comments and suggestions from some members. The Patent, Trademark and Copyright Section of the American Bar Association did not render an official section position on the proposed rule changes but polled its members and found the majority of the member responding either to favor the proposed rule changes or to view them as acceptable. They also submitted comments and suggestions from some members. The United States Trademark Association commented on the proposed rules concerning deposit accounts.

Reply:

The efforts and input of these organizations are appreciated. Specific comments and suggestions from individual members of the organizations are covered below.

Comments from Individuals

Comment:

One comment was received that the proposed amendment to §1.6 was unnecessary and possibly improper.

Reply:

The amendment to §1.6 has been adopted as proposed. The amended rule sets out the Patent and Trademark Office practice which has been in effect. No papers are stamped as having arrived in the Office on Saturday, Sunday, or a federal holiday within the District of Columbia no matter how the papers are filed. Article 4, C(3) of the Paris Convention says that the period of priority shall be extended until the first following working day "when the Office is not open for the filing of applications in the country where protection is claimed". To accept papers through use of "Express Mail" or some other way on Saturdays, Sundays or federal holidays within the District of Columbia would raise the possibility that the Office would be viewed as open for the filing of papers on such days and thereby remove the current ability to file a priority claiming application on the first working day if the priority year ended on a non-working day. The final rule avoids this implication.

Comment:

One comment indicated that the change to §1.6 should not be applied retroactively to papers filed before the clarifying language was placed in the rule.

Reply:

Any such fact situation will be reviewed through the normal petition procedure.

Comment:

One comment suggested that §1.10 be amended rather than §1.6 with regard to papers deposited as "Express Mail" on a Saturday, Sunday, or federal holiday within the District of Columbia.

Reply:

This comment has been adopted in that both §§1.6 and 1.10 have been amended to avoid any possible confusion.

Comment:

One comment suggested that §1.19(b) (3) be changed to permit the Office to certify material not copied from the records of the Office when reproduction of Office records is not feasible or possible.

Reply:

This comment has not been adopted. The Office will only certify that material is a copy of an Office record if, in fact, the material was reproduced from the Office record.

Comment:

One person commented that the $100 processing and retention fee under §1.21 was excessive and unnecessary.

Reply:

The fee is considered proper and necessary in view of the cost to the Office in handling, filming, processing and storage required to retain an application which has a filing date but in which no basic filing fee has been paid. If this expense is not covered by the applicant, it must be recovered from other sources.

Comment:

Twenty-seven comments were received on the proposal to amend §1.25 to raise to $1000 the minimum balance required in a deposit account. The amount is also referred to in §1.21(b) (2). These comments generally suggested that the $1000 amount was too high for account holders who did not use their accounts for charges other than small fees such as for patent copies. Several comments received acknowledged that the minimum balance for deposit accounts should be raised and suggested various amounts less than the proposed $1000. Several comments suggested a separate account category for persons who do not use their accounts for other than small fees. Two comments suggested that the Office accept credit cards for payment of fees.

Reply:

These comments and suggestions have not been adopted. The fees for filing, processing and issuing of patent and trademark applications have increased so as to make the present $40 minimum balance for deposit accounts totally inadequate. A number of persons objecting to the $1000 minimum balance acknowledged that they used their deposit accounts as a safeguard against failure to calculate or to submit proper fees by a check. An account with a very low balance obviously cannot be effective as a safeguard when a patent filing fee is $300 and a patent issue fee is $500. Dealing with overdrawn accounts causes administrative problems for the Patent and Trademark Office. An authorization to charge an account without sufficient funds to cover a charge will not be effective as payment and may result in loss of rights to an applicant. Also, unnecessary expense will be incurred by an applicant if an insufficient balance in an account results in abandonment of an application and the necessity of filing a petition to revive under 37 CFR 1.137(b) with the requisite $500 fee. Experience has shown that many single practitioners and small firms have failed to have sufficient funds in their accounts when needed. The increase of the minimum balance in deposit accounts to $1000 is seen to be necessary and proper. A failure to raise the minimum balance in deposit accounts to $1000 would serve as an incorrect indication that the Patent and Trademark Office views a minimum balance of less than $1000 as acceptable. If it is not possible for a small firm or individual to maintain a minimum balance of $1000, the deposit account could still be retained and used by paying the service charge set forth in §1.21(b) (2) for any month in which the balance at the end of the month is below $1000. The use of credit cards is not considered viable since legislation would be required to do so.

Comment:

Two comments were received suggesting that a license to a federal agency in an invention made by a federal employee should not preclude the employee from qualifying as a small entity and that §1.27 should be amended to cover this situation.

Reply:

These comments have not been adopted. Such an amendment was not proposed and the public has not had an opportunity to comment on it.

Comment:

One comment suggested that the time for filing a verified statement claiming small entity status to obtain a refund of a filing fee pursuant to §1.28 should run from the date of mailing of the filing receipt due to difficulty in identifying the new application before the filing receipt is received. Three persons suggested that the period for establishing small entity status and requesting a refund should be three months rather than two months as proposed.

Reply:

These comments have not been adopted. An application may be identified before the filing receipt is issued in a number of ways including title, inventor's name, filing date and attorney docket number. Also, a postcard may be included with filing of the application to learn the application serial number. The two month period for obtaining a refund is seen to be adequate since the small entity practice is no longer new and the public has had time to become familiar with it. It allows sufficient time to have a small entity statement executed and sent to the Patent and Trademark Office.

Comment:

One comment suggested that it should be made clear that an application filed in a foreign language (§1.52(d)) without including a signed oath or declaration can receive a filing date under the provisions of §1.53(b).

Reply:

The regulations permit and this reply makes it clear that an application filed in a language other than English can receive a filing date by complying with § 1.53(b).

Comment:

Three comments were received suggesting that the proposed language not be added to §1.53(b). One comment alleged that the requirement to name the inventors upon filing a patent application is not required or even authorized by statute.

Reply:

35 U.S.C. 111 says that application for patent "shall be made, or authorized to be made, by the inventor". The rules of practice (§1.41(a)) contain the same requirement. The amendment to §1.53(b) is only clarifying the rules by also placing the requirement in that section. Further, United States patent practice has long required that the inventors be named at the time of filing.

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Comment:
One person commented that the language of §1.53(d) should be changed to reflect that only one of the filing fee or processing and retention fee must be paid to prevent the application being disposed of.
Reply:
The language of the rule is seen to be unambiguous in this regard.
Comment:
One person commented that the language of §1.53(d) should be changed to establish a time within which the processing and retention fee may be paid to prevent the application being disposed of when no correspondence address has been provided.
Reply:
The suggestion has been adopted.
Comment:
One person suggested that §1.56(b) which states that copies of disclosed documents must be filed is inconsistent with §1.56(j) which provides that such copies must be filed unless they are not in the possession of the person making the disclosure.
Reply:
The language of §1.56(b) has been modified to clarify this point.
Comment:
Three persons commented that the requirement of §1.56(b) that copies of disclosed documents be supplied was an unnecessary burden. One person commented similarly on the requirement of §1.555 that copies of disclosed documents be supplied. Another person suggested that the proposed amendment to §1.56(b) would require submission of a complete document even if only a small portion were relevant.
Reply:
The Office agrees with another person who commented that the "requirement that disclosers in application and reexamination proceedings provide copies of disclosed documents which they have is fair and reasonable and should aid the Examiner in making an informed as possible decision in any given proceeding". The portion of a document required to be submitted under §1.56(b) is the portion which is material to the examination of the application under §1.56(a).
Comment:
One person commented that the proposed amendment to §1.78(a) would appear to require that a petition for correction of inventorship under §1.48 be filed in a parent application as well as in the continuing application in which the inventorship was corrected.
Reply:
The amendment to §1.78 does not change the practice regarding the filing of petitions under §1.48.
Comment:
One person commented that §1.123 is unclear as amended in not referring to the paper requesting that amendments to the drawing be made.
Reply:
The Patent and Trademark Office no longer makes amendments to the drawings. Applicants must submit new drawings with the changes or use bonded draftsmen to make the amendments. A paper requesting that the Office make the amendments is therefore inappropriate.
Comment:
Four persons commented that §1.135(d) should not be deleted since they thought it desirable to be able to ratify unsigned papers without paying any fee.
Reply:
The statute and rules now provide for obtaining extensions of time through simple petition and payment of fee and for revival through a simple statement that the abandonment was unintentional and the payment of a fee. Further, a filing date can now be obtained on filing an application without the oath or declaration. The handling of unsigned papers by the Patent and Trademark Office causes administrative problems and expense to the Office and delays the processing of applications. The emergency-type situations involving loss of rights which the previous practice was intended to cover have been substantially eliminated by the changes in the law and rules.
Comment:
One person commented that §1.191(d) was undecipherable in that it refers to a number of other rules.
Reply:
This section was intended to serve as a point of summarization for the applicable extension of time rules in appeals before the Board of Appeals. The section is seen to adequately serve that purpose.
Comment:
One person commented that the final sentence of §1.555(b) needs clarification.
Reply:
This sentence was not changed by the proposed rules and is seen to be clear as written.
Comment:
One person commented that proposed §1.555(b) requires copies and does not make any exceptions or qualifications on this requirement.
Reply:
The language of §1.555(b) has been clarified to require filing of a copy of each foreign patent document or nonpatent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354). Public Laws 96–517 and 97–247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to filing of small entity statements in applications filed under §1.62 will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97–247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Part 1, is amended as follows:

1. Section 1.5 is amended by revising paragraph (a) to read as follows:

§1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

2. Section 1.6 is amended by revising paragraph (a) to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt except where such letters and papers are filed in accordance with §1.10. Any such letters and papers filed in accordance with §1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

* * * * *

3. Section 1.10 is amended by revising paragraphs (a) and (c) to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia. See §1.6(a).

* * * * *

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) (unless the certificate date is a Saturday, Sunday, or federal holiday within the District of Columbia—see §1.6(a)) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

4. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to §1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

5. Section 1.19 is amended by revising paragraph (b) (3) to read as follows:

§1.19 Document supply fees.

* * * * *

(b) * * *

(3) For comparing copies, made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, with the original, prior to certification of the copies, per page	$0.10

* * * * *

6. Section 1.21 is amended by revising paragraph (b) (2) and by adding a new paragraph (1) to read as follows:

§1.21 Miscellaneous fees and charges.

* * * * *

(b) * * *

(2) Service charge for each month when the balance at the end of the month is below $1000	$2.00

* * * * *

(1) For processing and retaining any application abandoned pursuant to §1.53(d) unless the required basic filing fee has been paid	$100.00.

7. Section 1.25 is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1000 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1000.

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An

authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.27 is amended by revising paragraphs (b), (c) and (d) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47 of this part, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) of this part specifying under which one of §1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph.

9. Section 1.28 is amended by revising paragraph (a) to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to §1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under §1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under §1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under §1.60 or §1.62 of this part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 of this part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except those filed under §1.60 or §1.62 of this part. Applications filed under §1.60 or §1.62 of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

* * * * *

10. Section 1.52 is amended by revising paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(d) An application may be filed in a language other than English. A verified English translation of the non-English language application and the fee set forth in §1.17(k) are required to be filed with the application or within such time as may be set by the Office.

11. Section 1.53 is amended by revising paragraphs (b) and (d) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by §1.41. No new matter may be introduced into an application after its filing date (§1.118).

* * * * *

(d) If the application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided, and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. If the required filing fee is not timely paid, or if the processing and retention fee set forth in §1.21(1) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the fee, oath or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application or one year from the filing date to pay the processing and retention fee set forth in §1.21(1) to prevent disposal of the application.

* * * * *

12. Section 1.55 is amended by revising paragraph (b) to read as follows:

§1.55 Claim for foreign priority.

* * * * *

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his or her attorney or agent, when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

13. Section 1.56 is amended by revising paragraph (b) and by adding a new paragraph (j) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his or her own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

* * * * *

(j) If any disclosure pursuant to this section does not include a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or a statement that a copy thereof is not in the possession of the person making the disclosure, applicant will be so notified and given a period of time within which to file the copy a statement that a copy is not in the possession of the person making the disclosure. The time period set may be extended under §1.136.

14. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(1)) has been paid.

15. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a) and (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

16. Section 1.62 is amended by revising paragraphs (a) and (d) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application.

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

* * * * *

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17. Section 1.78 is amended by revising the title and paragraph (a) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in the same applicant's prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(1) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

18. Section 1.121 is amended by revising paragraph (e) to read as follows:

§1.121 Manner of making amendments.

* * * * *

(e) In reissue applications, both the descriptive portion and the claims are to be amended by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See §1.173.

* * * * *

19. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

20. Section 1.135 is amended by removing paragraph (d).

21. Section 1.136 is revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

22. Section 1.191 is amended by adding a new paragraph (d) to read as follows:

§1.191 Appeal to Board of Appeals.

* * * * *

(d) The time periods set forth in §§1.191 through 1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

23. Section 1.192 is amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved.

* * * * *

24. Section 1.197 is amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states.

* * * * *

25. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to §1.197(b) or §1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of §1.136 or §1.550(c) as to decisions of the Board of Appeals, or §1.245 as to decisions of the Board of Patent Interferences.

* * * * *

26. Section 1.550 is amended by revising paragraph (c) to read as follows:

§1.550 Conduct of reexamination proceedings.

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.

* * * * *

27. Section 1.555 is amended by revising paragraphs (a) and (b) to read as follows:

§1.555 Duty of disclosure in reexamination proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. All such individuals who are aware, or become aware, of patents or printed publications material to the reexamination which have not been previously made of record in the patent file must bring such patents or printed publications to the attention of the Office. An information disclosure statement, preferably in accordance with §1.98, should be filed wihin two months of the date of the order for reexamination, or as soon thereafter as possible in order to bring such patents or printed publications to the attention of the Office.

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility on behalf of the patent owner for the reexamination proceeding or through a patent owner acting in his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the reexamination.

* * * * *

Nov. 30, 1983.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1038 O.G. 275]

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(57) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40442–49092]

Final Rules for Patent Maintenance Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the payment of patent maintenance fees. Public Law 96–517, enacted on Dec. 12, 1980 and Public Law 97–247, enacted on Aug. 27, 1982, provided for the payment of maintenance fees at intervals of 3½, 7½ and 11½ years from the date of grant of the patent for maintaining in force an original patent, a reissue patent of an invention, and under Public Law 96–517, a plant patent and reissues thereof. The changes provide specific rules and procedures which will assist patentees in avoiding the inadvertent expiration of a patent for failure to pay the appropriate maintenance fee.
Effective Date: Nov. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) establish a set of rules and procedures for the payment of patent maintenance fees; and 2) effect the provisions of Public Laws 96–517 and 97–247 with respect to payment of maintenance fees. The proposed rules were published on Apr. 24, 1984, in Vol. 49 of the *Federal Register*, pages 17692 through 17698; and on May 8, 1984, at Vol. 1042 of the *Official Gazette*, pages 22 through 38. A public hearing was held on the proposed rule changes on June 26, 1984.

A public briefing on the Office's maintenance fee payment plans was announced at 49 *Federal Register* 2806 on Jan. 23, 1984, and at 1038 *Official Gazette* 293 on Jan. 31, 1984. The public briefing was held on Feb. 22, 1984.

Discussion of Specific Rules

Section 1.1., is amended as proposed to add a new paragraph (d) to provide a "Box M. Fee" in the Patent and Trademark Office to which all maintenance fee correspondence and payments should be directed. Changes in small entity status in patents and changes in the "fee address" under §1.363, as well as payments of maintenance fees should be directed to "Box M. Fee".

Section 1.9, paragraph (d) is amended as proposed to make a change in citation and title of the rule of the Small Business Administration which relates to the small business size standard for paying reduced patent fees. This change was published in the Federal Register as a final rule on Feb. 9, 1984 at 49 Fed. Reg. 5024–5048. The wording of the rule itself was not changed. This change is made to bring the wording of title 37, Code of Federal Regulations into conformance with title 13, Code of Federal Regulations.

Section 1.17, is amended as proposed to establish in paragraph (h) a fee of $120 for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (h) of §1.17 is also amended to establish a fee of $120 for reconsideration of a decision on petition refusing to accept the delayed payment of a maintenance fee in an expired patent.

Section 1.19, is amended as proposed to add new paragraphs (f) and (g). New paragraph (f) provides for a $10.00 fee for a microfiche copy of a patent file wrapper record. Microfiche copies of these patent files have recently become available for patents issued after Jan. 1, 1984. No fee had previously been set by rule for this service. This fee is not directly related to maintenance fees but is set at this time for convenience. New paragraph (g) establishes a $3.00 fee for providing an uncertified statement indicating either the status of payment of maintenance fees due on a patent or the expiration of a patent. This charge does not apply to any receipt normally provided to the fee addressee as a result of the payment of a maintenance fee, but does apply in any other instance when written evidence of the status of payment of maintenance fees on a patent is requested, whether by the patentee or a member of the public.

Section 1.20, is amended as proposed to add new paragraphs (k), (l) and (m). New paragraph (k) provides

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for a $100.00 surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982. Since Public Law 96–517 did not provide for small entities, the surcharge amount of $100 applies to all such patents. New paragraph (l) provides for a $100 surcharge for patentees other than a small entity and a $50 surcharge for small entity patentees when paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant based on an application filed on or after Aug. 27, 1982. This surcharge of $100 is subject to a 50% reduction for small entities pursuant to Public Law 97–247. New paragraph (m) provides for a $500 surcharge for accepting payment of a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee. This $500 surcharge applies only under Public Law 97–247 where the patent is based on an application filed on or after Aug. 27, 1982 and where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable. The requirement that the delay be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. However, the amount of evidence required will depend upon when the showing that the delay was "unavoidable" is made. This surcharge does not apply to patents based on applications filed prior to Aug. 27, 1982 since acceptance of a maintenance fee after expiration of a patent for non-timely payment is not possible under Public Law 96–517. Since this surcharge is provided for under 35 U.S.C. 41(c), it is not subject to a 50% reduction for small entities. The surcharge in paragraph (m) is not in addition to the surcharge in paragraph (l), but is in lieu thereof.

Section 1.33 is amended as proposed to add a new paragraph (d) which allows a "correspondence address" or change thereto to be filed during the enforceable life of the patent. The "correspondence address" will be used in correspondence relating to maintenance fees unless a separate "fee address" has been specified. Paragraph (d) also includes a reference to §1.363 relating to the "fee address" to be used for maintenance fee purposes.

New §1.362 is added to provide for times for payment of maintenance fees. New paragraph (a) sets forth the requirement that maintenance fees as set forth in §1.20(e)-(j) must be paid in order to maintain a patent in force if the application maturing into a patent was filed on or after Dec. 12, 1980 and is subject to the payment of maintenance fees. The maintenance fee amounts set in §1.20(e)-(g) are subject to adjustment in accordance with the provisions of Public Law 96–517. The maintenance fee amounts set in §1.20(h)-(j) are subject to adjustment in accordance with the provisions of Public Law 97–247 on Oct. 1, 1985, and every third year thereafter, to reflect fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Other patent fees are also subject to similar adjustments.

New paragraph (b) of §1.362 stipulates that no maintenance fees are due for plant patents if the plant patent application was filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees. New paragraph (c) defines the pertinent application filing dates for purposes of determining whether maintenance fees are applicable. Paragraph (c) (1) establishes that for national applications not claiming benefit of an earlier application, the actual United States filing date controls. Paragraph (c) (2) establishes that for national applications claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date controls. Paragraph (c) (3) provides that for continuing national applications claiming benefit of a prior application under 35 U.S.C. 120, the actual United States filing date of the continuing application is the controlling date. Paragraph (c) (4) provides that for a reissue application, the United States filing date of the application which matured into the original patent upon which the reissue application is based will control. Paragraph (c) (5) establishes that for an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty controls. This is consistent with 35 U.S.C. 363.

Paragraph (d) of new §1.362 sets forth the time periods when maintenance fees can be paid without a surcharge. Those periods, referred to generally as the "window period," are the six-month periods preceding each due date, i.e., 3 years through 3 years and six months, 7 years through 7 years and six months, and 11 years through 11 years and six months after grant of the patent. The "due dates" are defined in 35 U.S.C. 41(b). A maintenance fee paid on the last day of a window period can be paid without surcharge. The last day of a window period is the same date (anniversary date) the patent was granted 3 years and six months, 7 years and six months, or 11 years and six months after grant of the patent. Paragraph (d) has been modified from the proposal to add "and" between items (2) and (3) and change the comma at the end of the paragraph to a period.

Paragraph (e) of new §1.362 sets forth the grace periods during which maintenance fees, under either Public Law 96–517 or Public Law 97–247, may be paid with the surcharge under §1.20(k) or (l). The grace periods are the six-month periods immediately following each due date, i.e., after 3 years and six months and up to 4 years, after 7 years and six months and up to 8 years, and after 11 years and six months and up to 12 years after grant of the patent. A maintenance fee may be paid with the surcharge on the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant to prevent the patent from expiring.

Paragraph (f) of new §1.362 specifies that where the last day for paying a maintenance fee falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. For example, if the "window period" provided by paragraph (d) for paying a maintenance fee without surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee can be paid without surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. Likewise, if the grace period provided by paragraph (e) for paying a maintenance fee with surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee could be paid with surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. In the latter situation, the failure to pay the maintenance fee and surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday will result in the patent expiring on a date (4, 8, or 12 years after the date of grant) earlier than the last date on which the maintenance fee and surcharge could be paid. This situation results from the provisions of 35 U.S.C. 21, but those provisions do not extend the expiration date of the patent if the maintenance fee and any required surcharge are not paid when required. For example, if the grace period ended on Saturday, the maintenance fee and surcharge could be paid on the next succeeding business day, e.g. Monday, but the patent will have expired at midnight on Saturday if the maintenance fee and surcharge were not paid on the following Monday. Paragraph (f) has been modified from the proposal to explicitly refer to "any necessary surcharge" for clarity since the ability to pay on the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia applies to the maintenance fee, including any necessary surcharge.

Paragraph (g) of new §1.362 establishes that if the proper fees are not received within the time period specified in paragraphs (d), (e), or (f) the patent expires at the end of the grace period set forth in paragraph (e). Paragraph (g) also specifies that a patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

New §1.363 is added as proposed to provide for a "fee address" for maintenance fee purposes. New paragraph (a) specifies that the correspondence address used during prosecution of the application will be used unless 1) a "fee address" is provided for maintenance fee purposes when submitting the issue fee, 2) a correspondence address change for all purposes is filed after payment of the issue fee, or 3) a "fee address" or a change in the "fee address" is filed after payment of the issue fee.

Paragraph (b) of new §1.363 specifies that an assignment does not result in a change of address for maintenance fee purposes. Due to the possible expiration of a patent for failure to timely pay the appropriate maintenance fee, patentees should ensure that the Patent and Trademark Office is properly notified of the proper "fee address" to which all maintenance fee communications are to be directed. Under both Public Law 96–517 and Public Law 97–247 the burden is on the patentee to timely pay maintenance fees. The Patent and Trademark Office will attempt to assist patentees through appropriate courtesy notices. However, the failure to receive one or more notices will not relieve the patentee of the obligation to timely pay the appropriate maintenance fee to prevent the patent from expiring by operation of law if the maintenance fee is not paid. Section 1.363 does not provide for maintenance fee correspondence to be directed to more than one address.

New §1.366 is added to establish the guidelines and procedures for submission of maintenance fees, including any necessary surcharges. New paragraph (a) states that the patentee may pay maintenance fees and any necessary surcharges or any person or organization may pay maintenance fees and any necessary surcharges on behalf of the patentee without filing in the Patent and Trademark Office evidence of authorization by the patentee to pay maintenance fees. This will enable patentees to pay the maintenance fees and any necessary surcharges themselves or authorize some person or organization to pay maintenance fees and any necessary surcharges on their behalf. No verification of the authority to pay maintenance fees and any necessary surcharges in a particular patent will be made by the Patent and Trademark Office. While anyone may pay the maintenance fees and any necessary surcharges on a patent, any Patent and Trademark Office notices relating to maintenance fees will be mailed to the "fee address" set forth in §1.363. Paragraph (a) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity.

Paragraph (b) of new §1.366 specifies that a maintenance fee and any necessary surcharge for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid, and at the proper time, i.e., within the periods set forth in §1.362. Paragraph (b) has been modified from the proposal by changing "proper amount" to "amount due on the date the maintenance fee and any necessary surcharge are paid." This change results from adoption of a suggestion that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased to reflect increases in the Consumer Price Index. Under paragraph (b) as adopted herein, if the amount of the maintenance fee is correct on the date it is paid and credited to the patent, a later change in the maintenance fees to reflect changes in the Consumer Price Index will not require a modification in the amount paid. However, in order for the maintenance fee to be considered paid it must be submitted in accordance with §1.366. Paragraph (b) has also been modified from the proposal to explicitly refer to §1.362(f) for purposes of clarity where the last day for paying a maintenance fee with or without a surcharge falls on a Saturday, Sunday, or a federal holiday within the District of Columbia. In such circumstances, the fee with any necessary surcharge may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. The maintenance fee and any necessary surcharge may be paid in the manner set forth in §1.23, i.e., it should be in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. As indicated in §1.23, if the maintenance fee payment is sent in any other form, the Office may delay or cancel the credit until collection is made. For example, a personal or other uncertified check drawn on a United States bank which is not immediately negotiable, e.g., because of lack of signature or insufficient funds, will not constitute payment of a maintenance fee. However, a personal check drawn on a United States bank can be used if it is immediately negotiable. Any remittance from foreign countries must be payable and immediately negotiable in the United States for the full amount of the maintenance fee required.

Paragraph (b) of new §1.366 also provides that maintenance fees may be paid by an authorization to charge a deposit account established pursuant to §1.25. The authorization to charge the deposit account must be submitted within the periods set forth in §1.362 and must be limited to maintenance fees payable on the date of submission. The authorization to charge the deposit account can not, under paragraph (b), be submitted prior to the third, seventh, or eleventh year after the grant of the patent. If an authorization to charge a deposit account were submitted to pay the maintenance fee due at three years and six months after grant, a new authorization to charge a deposit account or other form of payment will have to be submitted at the appropriate time for each of the maintenance fees due at 7 years and six months and 11 years and six months. Paragraph (b) also specifies that any payment or authorization filed at any time other than that set forth in §1.362(d), (e) or (f) will not serve as a payment of the maintenance fee, except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner pursuant to §1.378. Paragraph (b) also specifies that a payment of less than the required amount, a payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds, will not constitute payment of a maintenance fee on a patent. The authorization is required to authorize the immediate charging of the fee to the deposit account. An authorization would be improper if it only authorized the fee to be charged at a later date, e.g., on the last possible day of payment without surcharge. Such an authorization would not serve as payment of the maintenance fee. Any payment which fails to result in the entire proper amount of the maintenance fee being present on the due date will not constitute payment of the maintenance fee. Paragraph (b) also specifies that the certificate of mailing procedures of §1.8 or the mailing by "Express Mail" provisions of §1.10 may be utilized in paying maintenance fees. The specific requirements of either §1.8 or §1.10 must be fully complied with if either is used.

Paragraph (c) of new §1.366 establishes the data necessary and desired when submitting maintenance fee payments and any necessary surcharges. New paragraph (c) specifies that maintenance fee payments and any necessary surcharges must include at least the 1) patent number and 2) United States application serial number. Paragraph (c) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity since the identifying information must also be supplied when submitting surcharges. The wording of §1.366(c) has also been changed from the proposal to clarify that the required application serial number is that of the application upon which the patent issued. This change from the proposal makes clear that the serial number required to be submitted is not that of a prior parent application but rather, the actual application which matured into the patent for which maintenance fees are to be paid. If the maintenance fee is being paid on a reissue patent, the serial number required is that of the reissue application. Since this required information will be used

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as a cross-check to ensure that the maintenance fee is properly credited, the application serial number must correspond to the patent which issued therefrom. If less than the required information is submitted, the Office will not credit the payment. Additionally, if notice is required that the proper identifying data has not been submitted, it would result in requiring the payment of a surcharge if the necessary data is submitted after the "window period" closes. If the required information is not submitted until after the end of the grace period, the patent would have expired because of the failure to properly identify the patent to which the maintenance fee payment is to be credited prior to the expiration of the grace period. The patentee in such a circumstance could proceed under §1.378, if appropriate, or could file a petition under §1.377 within the period set therein seeking to have the maintenance fee accepted as timely even though all of the proper identifying data was not present prior to the expiration of the grace period.

Paragraph (d) of new §1.366 specifies that the following information should also be submitted for each patent on which a maintenance fee or surcharge is paid: 1) whether it is the 3½, 7½, or 11½ year fee, 2) whether small entity status is being changed or claimed with the payment, 3) the amount of the maintenance fee and any surcharge being submitted, 4) any assigned payor number, 5) patent issue date and 6) United States application filing date. Paragraph (d) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity. Paragraph (d) has also been changed from the proposal to emphasize that when the payment is being made on a reissue patent the required patent number and application serial number are those of the reissue patent and reissue application. Where the payment is a maintenance fee and any necessary surcharge on a reissue patent, in addition to the information requested for all payments, paragraph (d) as adopted herein also requests certain identifying data relating to the original patent, i.e., original patent number, original patent issue date, and original United States application filing date. The reason for requesting the original patent number, original patent issue date, and original United States application filing date is that the original filing and issue dates are the dates which control if and when maintenance fees must be paid to prevent the reissue patent from expiring. The reference to a payor number has been added. A payor number will be assigned to each "fee address" in order to facilitate data input and subsequent changes in the location of the "fee address." Details of the "payor number" system will be announced to the public in a future *Official Gazette* notice. Although the submission of the information requested in paragraph (d) is not mandatory, it would expedite the processing of the maintenance fee payments.

The final rule thus requires less mandatory information, i.e., the patent number and U.S. application serial number, than would have been required by the proposed rule. The required information is considered to be the least that is required to make a cross-check and thus assure that the maintenance fee is being credited to the proper patent. The patent issue date and the application filing date, which were included in the proposed rule as mandatory information, are included in the final rule as desirable, but not mandatory, information The effect of this change is that an error in either the patent issue date or the application filing date, or both, by the person paying the maintenance fee would not result in a refusal to accept the maintenance fee and to credit the payment thereof to the patent, if the patent number and United States application serial number were correct, i.e., in agreement. However, if any error included either the patent number or the United States application serial number such that they were not in agreement the payment would not be accepted and credited until correction was made. The date of the correction would be the date the maintenance fee payment is credited as being made.

Paragraph (e) of new §1.366 specifies that maintenance fee payments and any surcharges relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. Maintenance fee payments and surcharge payments relating thereto which are co-mingled with payments for other fees or charges, e.g., application filing fees, issue fees, petition fees, document supply fees, etc., will not be accepted. The maintenance fees require processing by a separate area of the Office and are not processed in the same manner as other fees and charges. Maintenance fees for a number of patents can be submitted together in one submission and one payment. Paragraph (e) specifies that if maintenance fee payments for more than one patent are submitted together, they should be submitted on as few sheets as possible, listing the patent numbers in increasing patent number order. If the payment submitted, which can be made as a single payment, is insufficient to cover the maintenance fees and any surcharges for all the listed patents, the payment will be applied in the order the patents are listed. In such a circumstance where the fees are insufficient, the maintenance fee and any surcharge for one or more of the last listed patents will not be paid.

Paragraph (f) of new §1.366 serves as a reminder to patentees of the necessity to check for the loss of small entity status prior to paying each maintenance fee on a patent. This is already a requirement of §1.28(b). Paragraph (f) provides that notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. If status as a small entity has been previously established by filing a statement and such status is checked and is found to be proper, no notification is required. It is not necessary to file new verified statements claiming small entity status at this point if the status as a small entity has been established and is still proper even if rights have been transferred to a small entity who has not previously filed a verified statement. The requirement is to notify the Patent and Trademark Office of the loss of entitlement and to pay the maintenance fee in the proper amount for other than a small entity where appropriate. The refund provisions of §1.28(a) for later submitted small entity statements will apply to maintenance fees.

Paragraph (g) of new §1.366 provides that maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a). A patentee cannot obtain a refund of a maintenance fee which was due and payable on the patent. Any duplicate payment will be refunded to the fee address.

New §1.377 is added as proposed to provide a mechanism for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (a) of new §1.377 specifies that a patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee. This petition may be used, for example, in situations where an error is present in the identifying data required by §1.366(c) with the maintenance fee payment, i.e., either the patent number or the application serial number are incorrect. A petition under §1.377 would not be appropriate where there is a complete failure to include at least one correct mandatory identifier as required by §1.366(c) for the patent since no evidence would be present as to the patent on which the maintenance fee was intended to be paid. If the maintenance fee payment with an incorrect mandatory identifier was made near the end of the grace period, the patent might expire since the Office would not credit the fee to a patent. For patents based on applications filed between Dec. 12, 1980 and Aug. 27, 1982, there is no provision for acceptance of a maintenance fee after the grace period such as in §1.378 and so the filing of a petition under §1.377 would provide an avenue for seeking relief. A petition under §1.377 would not be appropriate where the patentee paid a maintenance fee on one patent when the patentee intended to pay the maintenance fee on a different patent but through error identified the wrong patent by patent number and application serial number. Likewise, a petition under §1.377 would not be appropriate where the entire maintenance fee payment, including any necessary surcharge, was not filed prior to expiration of the patent.

Paragraph (b) of new §1.377 specifies that any petition under new §1.377 must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of. The petition must be accompanied by the petition fee of $120 provided for in the amendment to §1.17(h). Paragraph (b) also provides that the petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to have resulted from an error by the Patent and Trademark Office.

Paragraph (c) of new §1.377 specifies that any petition filed under the section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (c) of §1.377. The petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

New §1.378 is added as proposed to establish the procedure for acceptance of the delayed payment of a maintenance fee in an expired patent in order to reinstate that patent. This procedure is only available under Public Law 97–247 where the application on which the patent is based was filed on or after Aug. 27, 1982. If the maintenance fee is due under Public Law 96–517, i.e., the application on which the patent is based was filed on or after Dec. 12, 1980, and before Aug. 27, 1982, the delayed payment of the maintenance fee is not provided for by statute and cannot be accepted after expiration of the patent, and the patent cannot be reinstated.

Paragraph (a) of new §1.378 provides that the Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable. The surcharge set forth in §1.20(m) must be paid as a condition of accepting payment of the maintenance fee. No separate petition fee is required for this petition. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the intervening rights provisions of 35 U.S.C. 41(c) (2).

Paragraph (b) of new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed within six months of the expiration of the patent. Under paragraph (b), the petition must include the required maintenance fee set forth in §1.20(h)-(j); the surcharge set forth in §1.20(m); and a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee. In view of the requirement to enumerate the steps taken to ensure timely payment of the maintenance fee, an argument that the patentee was ignorant of the requirement to pay maintenance fees will not constitute a showing of unavoidable delay. Evidence that despite reasonable care on behalf of the patentee and/or the patentee's agents, and reasonable steps to ensure timely payment, the maintenance fee was unavoidably not paid, could be submitted in support of an argument that the delay in payment was unavoidable. For example, an error in a docketing system could possibly result in a finding that a delay in payment was unavoidable if it were shown that reasonable care was exercised in designing and operating the system and if it were shown that the patentee took reasonable steps to ensure that the patent was entered into the system to ensure timely payment of the maintenance fees.

Paragraph (c) of new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed more than six months after the expiration of a patent. These requirements are much more stringent in view of the heavy burden of proof that the delay was unavoidable. The legislative history of Public Law 97–247, House Report No. 97–542 (Committee on the Judiciary), indicates that "[a]fter the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable." The six month period provided for petition under paragraph (b) is considered to be a reasonable period of time within which to seek reinstatement of a patent which expired for failure to pay the maintenance fee. Any petition filed more than six months after expiration must meet the more stringent requirements of paragraph (c). Under paragraph (c), the petition must include the same elements as in paragraph (b) and, in addition, must demonstrate that the failure to pay the maintenance fee was unavoidable due to circumstances outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing in a petition under paragraph (c) must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable. In contrast to a petition under paragraph (b), a showing in a petition under paragraph (c) of an error in a docketing system will not be sufficient to find that the delay was unavoidable. Instead, a petition filed under paragraph (c) must demonstrate that the circumstances resulting in the delay were entirely outside the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee, e.g., serious efforts without success to raise the funds required to pay the maintenance fee.

Paragraph (d) of new §1.378 requires that a petition filed under §1.378 be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (d) of §1.378. Under paragraph (d), the petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

Paragraph (e) of new §1.378 provides a mechanism for obtaining reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a). This mechanism is a petition for reconsideration which may be filed within two months of, or such other time as set in the decision refusing to accept the delayed payment of the maintenance fee. In contrast to petitions filed under paragraph (a), the petition for reconsideration filed under paragraph (e) of new §1.378 will require the separate petition fee set forth in the amendment to §1.17(h). Paragraph (e) also provides that after the decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. Paragraph (e) also provides for refund of the maintenance fee and the surcharge set forth in §1.20(m) if the delayed payment of the maintenance fee is not accepted. The refund will be made following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Paragraph (e) specifies that the fee for filing the petition for recon-

sideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Eight letters submitting written comments were received. Oral testimony was presented by two persons (one person testified on behalf of the American Intellectual Property Law Association) at the public hearing conducted on June 26, 1984. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

One comment suggested that the surcharge set at 37 CFR 1.20(m) for accepting a maintenance fee after expiration of the patent should be reduced from $500.00 to $50.00 and that this amount should be reduced by 50 percent for small entities.

Reply:

The suggestion has not been adopted. The surcharge set at 37 CFR 1.20(m) is considered to be appropriate in view of the importance of the relief being obtained. Before a surcharge under 37 CFR 1.20(m) is due the patent will have already expired due to the failure to pay a maintenance fee within a one-year period provided for the payment. Setting a lower amount as the surcharge would tend to denigrate the importance of the relief obtained by the acceptance of a maintenance fee after expiration of a patent. Further, a lower surcharge amount is not justified in view of the ample opportunity for payment of the maintenance fee which is presented by the one-year period in which payment can be made and the fact that the public is now on notice that maintenance fees are due and payable. Further, the Patent and Trademark Office will provide courtesy notices regarding the need to pay maintenance fees at a plurality of points in time before the patent expires. Such a notice now appears on the patent grant and presently plans are to print such a courtesy notice on the Notice of Allowance and the Issue Fee Receipt. Notices will be printed in the *Official Gazette* listing the patent number ranges of patents on which maintenance fees can be paid and a notice will be mailed to the patentee during the grace period if the maintenance fee is not paid. Therefore, relatively few patentees should fail to pay the maintenance fee before expiration of the patent due to unavoidable circumstances. The surcharge set at 37 CFR 1.20(m) is established pursuant to 35 U.S.C. 41(c) and therefore the small entity provisions of Public Law 97–247 do not apply to this fee. Also, Public Law 97–247 provides that the surcharge set at 37 CFR 1.20(m) could be in addition to any surcharge established for payment of the maintenance fee during the grace period as set at 37 CFR 1.20(1). The Patent and Trademark Office has established a separate surcharge set at 37 CFR 1.20(m) not in addition to the surcharge set at 37 CFR 1.20(1), but in lieu thereof. The amount set at 37 CFR 1.20(m) is not seen to be excessive.

Comment:

Two comments suggested that the small entity reduced fee provisions of Public Law 97–247 should have been applied to maintenance fees required under Public Law 96–517.

Reply:

The maintenance fee amounts under Public Law 96–517 set at 37 CFR 1.20(e)-(g) were previously set and are not part of the present rulemaking. It should be noted, however, that Public Law 96–517 did not provide for reduction of fees for small entities. Reductions of fees for small entities were established in Public Law 97–247 only for fees under 35 U.S.C. 41(a) and (b) thereof. The maintenance fee levels in 37 CFR 1.20(e)-(g), however, were established under 35 U.S.C. 41(c) of Public Law 96–517 rather than 35 U.S.C. 41(a) or (b) of Public Law 97–247. Therefore, the fee amounts previously set at 37 CFR 1.20(e)-(g) are not seen to be subject to reduction for small entities.

Comment:

One comment suggested that the Office permit any of the maintenance fees to be paid in advance, either at the time of paying the issue fee or during any of the window periods. Another comment suggested that the Office should accept a fee payment earlier than the window period if the fee has no possibility of being changed due to changes in the Consumer Price Index.

Reply:

These suggestions have not been adopted. The second comment listed above points out the problem with regard to the suggestion in the first comment. Public Law 97–247 provided for adjustments of the maintenance fees every third year to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Allowing maintenance fees to be paid in advance would preclude such adjustments to these maintenance fees unless very burdensome administrative steps were implemented to require adjustments in the fee amount previously paid when the maintenance fees are adjusted at a later time. Requiring maintenance fees to be paid in a consistently time-ordered basis as in §1.362 will also be helpful administratively and for budgeting purposes. As to the second comment above, it is not seen that there would be substantial benefit to the public since the period would be short during which a maintenance fee could not change due to changes in the Consumer Price Index. Thus, the patentee would only be able to make the maintenance fee payment a short time before the period during which payment may be made pursuant to §1.362.

Comment:

Two comments suggested that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased toreflect increases in the Consumer Price Index.

Reply:

These comments have been adopted by an appropriate change in paragraph (b) of §1.366. Maintenance fees which are paid during the window period in the amount required on the date of payment will be accepted as proper and full payment. If the maintenance fees change after such a proper payment, no adjustment in the amount will be required or permitted. Thus, if the maintenance fee increases before the close of the window period, the patentee will not be required to make up any deficiency between the amount properly paid during the window period and the new increased fee. Likewise, if the maintenance fee decreases before the close of the window period, no refund will be permitted of part of the maintenance fee properly paid in the amount due when the payment was made. Payments must be made in the amount proper on the date of payment. For example, if payment is made during the grace period, the payment must be made in the amount then required irrespective of the amount of the maintenance fee which would have been due if payment had been made during the window period.

Comment:

Three comments were directed to the proposed requirements in §1.366(c) for data identifying the patent upon which maintenance fee payments are being made. One comment indicated that many computer annuity systems now existing have a data base designed to accept only two identifying numbers. This comment and one other comment suggested that the patent number and issue date be required to be submitted with the maintenance fee to identify the patent number. Another comment suggested that the required identifying data be the patent number, issue date, name of the inventor and title of the invention.

Reply:

The suggested changes to the proposed rule have been adopted in part. The requirement for identifying data to uniquely identify the patent for which maintenance fees are being paid is an important one. The Patent and Trademark Office and the public must be able to determine with certainty which patents are in force and which patents have expired because the maintenance fees were not paid. The comments seem to recognize that at least two identifiers are necessary so that a cross-check can be made to avoid errors. The suggested use of the issue date with the patent number would not provide a reliable cross-check. In excess of one thousand patents usually issue on each issue date. Therefore a mistake in the last four digits in the patent number supplied with the maintenance fee payment would often not be detected by use of the issue date as a cross-check. The Patent and Trademark Office has determined that the two best identifying data units for use as a cross-check are the patent number and the application serial number. These identifiers are unique since each is specific to one patent or application and are thus required to be provided with a maintenance fee payment by the final rule. The application serial number and the patent number are both listed on the issued patent and in the *Official Gazette* and therefore should be readily available to patentees.

Comment:

One comment suggested that no petition fee should be charged for filing a petition under 37 CFR 1.377 seeking review of a decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent. The comment further suggested that, if a fee is charged, the filing of a petition thereunder should be presumed to be a request for a return of the petition fee if it is determined that the refusal to accept and record a maintenance fee payment was due to Patent and Trademark Office error.

Reply:

The suggestion that no petition fee be charged has not been adopted. The petition fee, although required in advance, will be retained by the Patent and Trademark Office only in those instances where the refusal to accept and record the fee resulted from an error on the part of someone other than the Patent and Trademark Office. In those instances where the refusal to accept and record the fee resulted from a Patent and Trademark Office error the Office intends to refund the petition fee, either based upon the request included in the petition or upon the initiative of the Office. The reason for including a request for a refund, where appropriate, in the petition is to ensure that such request is not inadvertently overlooked. In view of the expense involved, it would be inappropriate to process a petition without a petition fee where the error necessitating the petition was made by the petitioner or someone acting on behalf of the patentee.

Comment:

One comment suggested that the term "unavoidable" should be more specifically defined in 37 CFR 1.378(b)(3) and (c)(3), if possible.

Reply:

As stated in this rulemaking, the requirement that the delay in payment of the maintenance fee be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. This standard has been in effect for many years and should be well understood by the public. The rule is seen to be adequate as written, especially in view of the discussion in this rulemaking which includes several specific examples based on when the petition to accept the delayed payment of a maintenance fee is filed.

Comment:

One comment suggested that Public Law 97–247 should be "liberally interpreted" to permit acceptance of delayed payments of maintenance fees required under Public Law 96–517. Proposed 37 CFR 1.378 was limited to patents issuing on applications filed on or after Aug. 27, 1982, the effective date of Public Law 97–247.

Reply:

The final rule has not been changed from the proposal. The remedy suggested by the comment cannot be provided in view of the language of 35 U.S.C. 41(c)(1) which applies only to maintenance fees required by 35 U.S.C. 41(b) of Public Law 97–247. Section 17(a) of Public Law 97–247 clearly states "the maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act."

Comment:

Several of the comments received were directed to proposed statutory changes which were said to be desirable in the area of maintenance fees.

Reply:

These comments were not suggesting that the proposed rules were not in compliance with the present statutes, but rather that the statutes themselves should be changed. These comments are beyond the scope and purpose of this rule change.

Implementation of Maintenance Fee Payment Procedures

The Patent and Trademark Office is presently developing its internal working procedures for processing maintenance fee payments and for notifying the public as to the status of maintenance fee payments on particular patents. The first maintenance fees become due early in 1985. In order to be as helpful as possible in informing the public as to the Patent and Trademark Office's current plans it is useful to outline the basic procedures the Patent and Trademark Office intends to adopt to process maintenance fees so that the interrelationship with the rules is understood. These basic procedures are subject to change as experience and circumstances dictate.

Notices by the Patent and Trademark Office

Under the statutes, the Patent and Trademark Office has no duty to notify patentees when their maintenance fees are due. It is the responsibility of the patentee to assure that the maintenance fees are paid to prevent expiration of the patent. The Patent and Trademark Office will, however, provide some notices as reminders that maintenance fees are due, but the notices, errors in the notices, or the lack of notices, will in no way relieve a patentee from the responsibility to make timely payment of each maintenance fee to prevent the patent from expiring by operation of law. The notices provided by the Patent and Trademark Office will be merely courtesy in nature and intended to aid patentees. These notices, errors in these notices, or the lack of notices, will in no way shift the burden of monitoring thetime for paying maintenance fees on patents from the patentee to the Patent and Trademark Office.

Preprinted Standard Notice Wording

The patent grant currently includes a reminder that maintenance fees may be due. The Notice of Allowance and Issue Fee Receipt are presently planned to be revised to contain reminder notice wording that maintenance fees may be due.

Official Gazette Notice

A notice will appear in each issue of the *Official Gazette* which will indicate which patents have been granted 3, 7 and 11 years earlier, that the window period has opened and that maintenance fee payments will now be accepted for these patents.

Another *Official Gazette* notice published after expiration of the grace period will indicate any patent which has expired due to non-payment of maintenance fees and any patents which have been revived under 35 U.S.C. 41(c). An annual compilation of such expirations and revivals will also be published.

Courtesy Reminder Notice

Since patentees are expected to maintain their own record systems and since most patentees are expected to pay their maintenance fees during the "window period" to prevent payment of a surcharge, the Office will not send any reminder notices to patentees at the fee address until after the grace period has begun. This will reduce and simplify the mailing of notices but still give patentees an opportunity to pay their maintenance fees with surcharge during the grace period before expiration of

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their patents. Such notices will be mailed to the fee address as set forth in §1.363.

Action Notices

The Office will issue a receipt for payment of maintenance fees after entry of the maintenance fee payment. Such a receipt will provide an opportunity for the patentee to check if the Office has properly credited the payment. The original document submitted by the patentee when paying the maintenance fee will also be appropriately marked and returned to the fee address. If actual experience indicates that they are not needed, the receipt notices and/or the return of the original document may be discontinued.

The patentee will also be notified by mail at the fee address as set forth in §1.363 of any expiration or revival of the patent.

Fee Address

The patentee may provide the Patent and Trademark Office with a fee address under §1.363, which address may be different from the correspondence address under §1.33, when submitting the issue fee or in a separate later-filed paper. The fee address will be used by the Office for all correspondence directed to the patentee concerning maintenance fees. If no separate fee address is provided by the patentee under §1.363, the correspondence address under §1.33 will also be used for maintenance fee purposes.

Payment of Maintenance Fees

Transmittals of maintenance fees may be limited to a single patent or may involve several patents. If a transmittal involves several patents they should be listed in increasing numerical order. The following format is suggested for use when paying maintenance fees and any necessary surcharges. Although only the mandatory identification elements consisting of the patent number and United States application serial number, set forth in §1.366(c) are required, the items referred to in §1.366(d) should also be included to expedite processing of maintenance fees and any necessary surcharges. In addition,

February 22, 1987

Commissioner of Patents and Trademarks
Box M. Fee
Washington, D.C. 20231

Dear Sir:

Enclosed is a check drawn for the amount of $1,500 for the payment of the maintenance fees on the following patents.

Patent Number	Serial Number	Patent Date	Application Filing Date	Payment Year	Small Entity	Amount Paid	Surcharge	Fee Code
P.P.5,188	380,062	Feb. 7, 1984	May 20, 1981	4	—	$ 200.00	—	170
Re. 31,522	481,494	Feb. 14, 1984	April 1, 1983	4	—	$ 200.00	$100.00	170/176
*(4,374,741)	—	(Feb. 22, 1983)	(July 21, 1981)	—	—	—	—	—
4,429,419	339,620	Feb. 7, 1984	Jan. 15, 1982	4	—	$ 200.00	—	170
4,429,433	412,101	Feb. 7, 1984	Aug. 27, 1982	4	No	$ 400.00	—	173
4,429,439	458,474	Feb. 7, 1984	Jan. 17, 1983	4	Yes	$ 200.00	—	273
**4,432,000	380,681	Feb. 14, 1984	Aug. 26, 1981	4	—	$ 200.00	—	170
				Subtotals		$ 1,400.00	$100.00	
				Total Amount Paid		$1,500.00		

The Commissioner is hereby authorized to charge any deficiency in the required fee or to credit any overpayment to Account No. 12–3456.

Respectfully submitted,
John Doe
(703) 557–3054

*Note: Information from original patent is included in parenthesis for the reissue patent for which payment is being made.
**Note: Application filing Date is the PCT International Filing Date.

the indication of the fee code used by the Patent and Trademark Office would assist in proper financial crediting within the Office. It is also suggested that the telephone number of the person submitting the payment be supplied.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). Public Law 97–247 has taken into consideration the impact it may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no siginificant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The maintenance fee payment information collection requirement contained in the final rules has been submitted to OMB for review under Section 3504(h) of the Paperwork Reduction Act. Comments relating to this requirement should be directed to the Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for Commerce, Patent and Trademark Office.

List of Subjects in 37 CFR Part I

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 96–517 and Pub. L. 97–247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

Part I [Amended]

37 CFR, Part I, is amended as follows:

1. Section 1.1 is amended by adding a new paragraph (d) to read as follows:

§1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(d) Payments of maintenance fees in patents and other communications relating thereto should be additionally marked "Box M. Fee."

§1.9 [Amended]

2. Paragraph (d) of §1.9 is amended by changing the citation "13 CFR 121.3–18, published on Sept. 30, 1982 at 47 FR 43273." to "13 CFR 121.12." and by changing the words "§121.3–18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code" to "§121.12 Small business for paying reduced patent fees."

3. Section 1.17 is amended by adding to the end of paragraph (h) the following:

§1.17 Patent application processing fees.

* * * * *

(h) * * *

- §1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent

- §1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent

4. Section 1.19 is amended by adding new paragraphs (f) and (g) to read as follows:

§1.19 Documeat supply fees.

* * * * *

(f) Microfiche copy of patent file record $10.00

(g) Uncertified statement as to status of the payment of maintenance fees due on a patent or expiration of a patent . . . . . $ 3.00

5. Section 1.20 is amended by adding new paragraphs (k), (l), and (m) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $100.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9 (f)) . . . . . $ 50.00
By other than a small entity $100.00

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $500.00

6. Section 1.33 is amended by adding a new paragraph (d) to read as follows:

§1.33 Correspondence respecting patent applications, reexamination proceedings, and other proceedings.

* * * * *

(d) A "correspondence address" or change thereto may be filed with the Patent and Trademark Office during the enforceable life of the patent. The "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified. See §1.363 for "fee address" used solely for maintenance fee purposes.

7. A new center heading and §1.362 is added to Subpart B to read as follows:

Maintenance Fees

§1.362 Time for payment of maintenance fees.

(a) Maintenance fees as set forth in §1.20(e)-(j) are required to be paid in all patents based on applications filed on or after Dec. 12, 1980, except as noted in paragraph (b) of this section, to maintain a patent in force beyond 4, 8 and 12 years after the date of grant.

(b) Maintenance fees are not required for plant patents based on applications filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees.

(c) The application filing dates for purposes of payment of maintenance fees are as follows:

(1) For an application not claiming benefit of an earlier application, the actual United States filing date of the application.

(2) For an application claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date of the application.

(3) For a continuing (continuation, division, continuation-in-part) application claiming the benefit of a prior patent application under 35 U.S.C. 120, the actual United States filing date of the continuing application.

(4) For a reissue application, the United States filing date of the original non-reissue application on which the patent reissued is based.

(5) For an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty which is considered to be the United States filing date under 35 U.S.C. 363.

(d) Maintenance fees may be paid in patents without surcharge during the periods extending respectively from:

(1) 3 years through 3 years and 6 months after grant for the first maintenance fee,

(2) 7 years through 7 years and 6 months after grant for the second maintenance fee, and

(3) 11 years through 11 years and 6 months after grant for the third maintenance fee.

(e) Maintenance fees may be paid with the surcharge set forth in §1.20(k) or (l) during the respective grace periods after:

(1) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee,

(2) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and

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(3) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

(f) If the last day for paying a maintenance fee without surcharge set forth in paragraph (d) of this section, or the last day for paying a maintenance fee with surcharge set forth in paragraph (e) of this section, falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee and any necessary surcharge may be paid under paragraph (d) or paragraph (e) respectively on the next succeeding day which is not a Saturday, Sunday, or federal holiday.

(g) Unless the maintenance fee and any applicable surcharge is paid within the time periods set forth in paragraphs (d), (e) or (f) of this section, the patent will expire as of the end of the grace period set forth in paragraph (e) of this section. A patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

8. A new §1.363 is added to Subpart B to read as follows:

§1.363 Fee address for maintenance fee purposes.

(a) All notices, receipts, refunds, and other communications relating to payment or refund of maintenance fees will be directed to the correspondence address used during prosecution of the application as indicated in §1.33(a) unless:

(1) a "fee address" for purposes of payment of maintenance fees is set forth when submitting the issue fee, or

(2) a change in the correspondence address for all purposes is filed after payment of the issue fee, or

(3) a "fee address" or a change in the "fee address" is filed for purposes of receiving notices, receipts and other correspondence relating to the payment of maintenance fees after the payment of the issue fee, in which instance, the latest such address will be used.

(b) An assignment of a patent application or patent does not result in a change of the "correspondence address" or "fee address" for maintenance fee purposes.

9. A new §1.366 is added to Subpart B to read as follows:

§1.366 Submission of maintenance fees.

(a) The patentee may pay maintenance fees and any necessary surcharges, or any person or organization may pay maintenance fees and any necessary surcharges on behalf of a patentee. Authorization by the patentee need not be filed in the Patent and Trademark Office to pay maintenance fees and any necessary surcharges on behalf of the patentee.

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in §1.23 or by an authorization to charge a deposit account established pursuant to §1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in §1.362(d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under §1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate of mailing procedures of either §1.8 or §1.10 may be utilized in paying maintenance fees and any necessary surcharges.

(c) In submitting maintenance fees and any necessary surcharges, identification of the patents for which maintenance fees are being paid must include the following:

(1) the patent number, and

(2) the serial number of the United States application for the patent on which the maintenance fee is being paid.

(d) Payments of maintenance fees and any surcharges should identify the fee being paid for each patent as to whether it is the 3½, 7½ or 11½ year fee, whether small entity status is being changed or claimed, the amount of the maintenance fee and any surcharge being paid, any assigned payor number, the patent issue date and the United States application filing date. If the maintenance fee and any necessary surcharge is being paid on a reissue patent, the payment must identify the reissue patent by reissue patent number and reissue application serial number as required by paragraph (c) of this section and should also include the original patent number, the original patent issue date and the original United States application filing date.

(e) Maintenance fee payments and surcharge payments relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. If maintenance fee and surcharge payments for more than one patent are submitted together, they should be submitted on as few sheets as possible with the patent numbers listed in increasing patent number order. If the payment submitted is insufficient to cover the maintenance fees and surcharges for all the listed patents, the payment will be applied in the order the patents are listed, beginning at the top of the listing.

(f) Notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. See §1.28(b).

(g) Maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a).

10. A new §1.377 is added to Subpart B to read as follows:

§1.377 Review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

(a) Any patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee.

(b) Any petition under this section must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of, and must be accompanied by the fee set forth in §1.17(h). The petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

(c) Any petition filed under this section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

11. A new §1.378 is added to Subpart B to read as follows:

§1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent based on application filed on or after Aug. 27, 1982.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c) (2).

(b) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section within six months of the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section more than six months after the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and the failure to timely pay the maintenance fee was due entirely to circumstances outside of the control of the patentee. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee and the circumstances which were outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable.

(d) Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in §1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in §1.20(m) will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. The fee set forth in §1.17(h) for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

GERALD J. MOSSINGHOFF,
July 30, 1984. *Commissioner of Patents and Trademarks.*

[1046 O.G. 28]

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(58) **Revision of Patent and Trademark Fees**

The purpose of this notice is to remind the public of changes in patent and trademark fees, effective Oct. 1, 1982, pursuant to Public Law 97–247, enacted Aug. 27, 1982. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982, at 47 FR 33086–33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Patent and Trademark Office Official Gazette on Aug. 10, 1982, at 1021 O.G. 19–94. In view of the enactment of Public Law 97–247, the "Alternative A—Rule Changes Under Only Public Law 96–517" relating to both patents and trademarks will *not* become effective. Instead, the "Rule Changes Common To Public Law 96–517 and H.R. 6260" and "Alternative B—Rule Changes Under H.R. 6260" will become effective for other patents and trademarks on Oct. 1, 1982. H.R. 6260 is now Public Law 97–247.

The Patent and Trademark Office has recieved a number of questions regarding the implementation of the changes in fees. The final rule published in the Federal Register on July 30, 1982, and in the Official Gazette on Aug. 10, 1982, contains implementing instructions which should be carefully read and followed. The final rule includes in the implementing instructions the following.

> *"Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amont and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office."*

A "Certificate of Mailing under §1.8" is *not* "proper" for items which arespecifically excluded from the provisions of §1.8. Section 1.8 of Title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper." Such items include, *inter alia*, the filing of national and international applications for patent and the filing of trademark applications. Any application for patent or trademark filed, i.e., received in the Office, on or after Oct. 1, 1982, must include the fees which are effective on Oct. 1, 1982, since §1.8 does not apply to, and specifically excludes from its provisions, the filing of applications for patents and trademarks.

GERALD J. MOSSINGHOFF,
Sept. 14, 1982. *Commissioner of Patents and Trademarks.*

[1022 O.G. 59]

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(59) **Filing of Verified Statements Claiming Small Entity Status**

In view of the fact that the rules implementing the definition of small business concern were not published in the Federal Register until Sept. 30, 1982, any verified statement claiming small entity status will be accepted as

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timely filed if (1) the first fee in a patent application has been paid on or after Oct. 1, 1982, but before Feb. 27, 1983, in the amount established for a non-small entity and (2) such verified statement is filed within 3 months of the date of payment of the first fee in a patent application paid on or after Oct. 1, 1982, but before Feb. 27, 1983. If such a verified statement is timely filed within three months of the date of payment of the first fee paid on or after Oct. 1, 1982, but before Feb. 27, 1983, the statement will be treated as though it were present on the date the fee was paid. The correct amount of the fee will be determined and any excess will be refunded upon request. Section 1.28(a) of 37 CFR is waived until Feb. 27, 1983 to the extent it is inconsistent with this practice.

DONALD J. QUIGG,
Oct. 15, 1982. *Acting Commissioner of Patents and Trademarks.*

[1023 O.G. 77]

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(60) **Effect on Small Entity Status of License Pursuant to 35 USC 202(c)(4)**

Public Law 96–517 added a new chapter 38 to Title 35 of the United States Code entitled "Patent Rights in Inventions Made With Federal Assistance." Under the provisions of the statute, each funding agreement between a Federal agency and an individual, small business firm or nonprofit organization must provide, inter alia, that ". . . the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid up license to practice or have practiced for or on behalf of the United States any subject invention . . ." See 35 U.S.C. 202(c)(4).

Under provisions of 37 CFR 1.9 and 1.27, an independent inventor, small business concern or nonprofit organization cannot qualify for reduced patent fees if it has assigned, granted, conveyed or licensed or is under an obligation under contract or law to assign, grant, convey or license any rights in the invention to other than an individual who could be classified as an independent inventor if that person had made the invention, a small business concern or a nonprofit organization. The Federal agencies do not qualify as nonprofit organizations for paying reduced patent fees under the rules. Applying this construction to the licensing of an invention to a Federal agency by an independent inventor, small business concern or nonprofit organization pursuant to a funding agreement under 35 U.S.C. 202(c)(4) would preclude their qualifying for paying reduced fees. This, however, would frustrate the intent of Public Law 97–247 and Public Law 96–517 when taken together.

This notice will serve as clarification that an independent inventor, small business concern or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a Federal agency pursuant to 35 U.S.C. 202(c)(4). A license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license for purposes of 37 CFR 1.9 or a transfer of rights for purposes of 37 CFR 1.27. Any other license or rights to a Federal agency will, of course, preclude qualification as a small entity for purposes of paying reduced fees.

Applicants who have previously paid fees which were not reduced for small entity status because of a license to a Federal agency pursuant to 35 U.S.C. 202(c)(4) may claim a refund by filing the proper verified statement as required by 37 CFR 1.27 and by making reference to this notice.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents and Trademarks.*

[1027 OG 71]

(61) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50725–5025]

Revision of Patent Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark office is amending the rules of practice in patent cases, Part I of title 37, Code of Federal Regulations to adjust fee amounts. This action is necessary at this time because operating costs have increased over the past three years and the Commissioner is authorized by §41(f) of title 35, United States Code, to adjust fees established in §41 (a) and §41(b) of title 35, United States Code, on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index. Fees for other processing, services or materials related to patents as provided by §41(d) and §376 of title 35, United States Code, are being adjusted to recover the estimated average cost to the Office of such processing, services or materials.
Effective Date: Oct. 5, 1985.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557–1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to adjust patent fees because costs have increased and the Commissioner is authorized to (1) adjust statutory patent fees set forth in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations occurring during the previous three years in the Consumer Price Index (CPI), as authorized by §41(f) of title 35, United States Code, (2) adjust fees for processing, services, or materials related to patents which have been established by the Commissioner in accordance with § 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing, services or materials, and (3) adjust fees for filing and processing an application under the Patent Cooperation Treaty which have been established by the Commissioner to recover the estimated average cost of such processing in accordance with Section 376 of title 35, United States Code.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

A notice of proposed rulemaking was published in the *Federal Register* on June 21, 1985, at 50 FR 25896–25902. Corrections of typographical errors were published on July 1, 1985, at 50 FR 27030, and on July 15, 1985, at 50 FR 28596. The notice also was published in the *Official Gazette* on July 2, 1985, at Vol. 1056, pages 6 through 25. An oral hearing was held on July 18, 1985. Fifteen written letters and statements were submitted. One person testified at the oral hearing. Full consideration has been given to all of these letters, statements, and testimony.

Background Information: Patent and Trademark Office fees are authorized by sections 41 and 376 of title 35, United States Code. Section 41(a) of title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in § 41(a) of title 35, United States Code. Section 41(b) of title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after Aug. 27, 1982.

The provisions of Public Law 96–517 also authorize maintenance fees for applications other than design and plant patent applications filed on or after Dec. 12, 1980 and before Aug. 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Public Law 97–247 authorized the reduction by 50 percent in the fees paid under §41(a) and §41(b) of title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. This authorization will expire on Sept. 30, 1985. Legislation has been introduced to authorize this reduction for an additional three years. If such authority is not continued, the small entity reduction will be rescinded and appropriate amendments to the regulations will be made.

Section 41(f) of title 35, United States Code, provides that fees established in §41(b) of title 35, United States Code, "may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored.

Policy for applying the Consumer Price Index: The Department of Labor's Consumer Price Index (CPI) is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictated that the Mar. through Sept. 1985 inflation rate be projected in the original rulemaking proposal. This estimate resulted in a cumulative three-year CPI of 11.7 percent applied to patent fees.

Based upon actual data through June 1985 and projecting the CPI to Sept. 30, 1985, the Administration's revised projected cumulative CPI for the three-year (1982–1985) period is 11.8 percent. The Patent and Trademark Office has used the 11.8 percent projection in adjusting the fees established in §41(a) and §41(b) of title 35, United States Code. The revised CPI projection has not caused a change from the proposal in any of the §41(a) and §41(b) fees.

After application of the 11.8 percent projected fluctuation in the CPI to fees set forth in §41(a) and §41(b), amounts for all non-small entity fees were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees below $100 were rounded to the nearest even number so that all comparable small entity fees would be in whole numbers. Section 41(d) of title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in §41(a) and §41(b) of title 35, United States Code, "to recover the estimated average cost to the Office of such processing, services or materials."

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation Treaty are keyed to full cost recovery of the processing costs under the Treaty.

The general guidelines used by the Patent and Trademark Office in determining the non-statutory fees are set forth in OMB Circular A–25. Costs were determined from the best available records and included direct and indirect costs to the Office of carrying out the activity.

Since these non-statutory fees are expected to remain in place for the three year fee cycle 1986–1988, the calculated costs were then adjusted by a mid-cycle inflation rate of 6.21 percent derived from the Administration's inflation projection. After application of the projected mid-cycle inflation rate, amounts were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

The fees established under §41(d) and §376 of title 35, United States Code have been modified from the proposal. For the first fee cycle (1983–1985), fees established under §41(d) and §376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under §41(d) and §376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish §41(d) and §376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or workload, and (3) greater reliance upon and use of the individual fee costs developed by the PTO's Office of Finance.

It is intended that the amount of any fee due and payable on or after Oct. 5, 1985 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under § 1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under §1.8" is *not* "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper". Such items include, *inter alia*, the filing of national and international applications for patents and the filing of trademark applications. The provisions of §1.10 of title 37, Code of Federal Regulations relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to *any paper or fee* (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated on or after Oct. 5, 1985, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

It is further intended that the amount due and payable for services provided in Fiscal Year 1986 will be the amount set in this rulemaking even if the fee becomes due prior to Oct. 5, 1985. Such fees include, but are not limited to, the annual service charge for subscription services (§1.19(c)(1)) and the annual rental for a delivery box (§1.21(d)).

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

DISCUSSION OF SPECIFIC RULES

Section 1.16 National application filing fees

Section 1.16 is amended to adjust patent application filing fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(d) and (f)-(j) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.16, paragraph (e) is amended to adjust the patent application surcharge fee authorized by §111 of title 35, United States Code. Paragraph (e) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.17 Patent application processing fees

Section 1.17 is amended to adjust patent application processing fees established in §41(a) of title 35, United

States Code, and set forth in paragraphs (a)-(g), (l) and (m) of this section to reflect fluctuations in the Consumer Price Index. The wording of paragraph (l) has been broadened to include reference to applicaitons abandoned under §371(d) of title 35, United States Code.

Section 1.17, paragraphs (h)-(k) are amended to adjust the patent application processing fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Paragraphs (h)-(k) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing petitions to the Commissioner, public use proceedings, and non-English language specifications.

Section 1.18 Patent issue fees

Section 1.18 is amended to adjust patent issue fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(c) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.19 Document supply fees

Section 1.19 is amended to adjust the fees authorized by §41(d) of title 35, United States Code for services and materials as set forth in paragraphs (a)-(c), (e) and (f) of this section to recover the estimated average cost to the Office of the specified services and materials. Paragraphs (a)-(c) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified in these paragraphs. Section 1.19 has been modified further to reduce the fees specified in paragraphs (e) and (f), which were not proposed for adjustment to more precisely recover the estimated average cost to the Office of supplying the documents.

Section 1.19, paragraph (a) is amended further to clarify the services and documents provided. It would provide for copies of specific documents at a flat fee. Copies of general Office records would be provided at a per page fee. Paragraph (a)(4) has been modified from the proposal to provide copies of a patent file wrapper and its contents at $75 for each 200 pages or a fraction thereof.

Section 1.19, paragraph (b) is amended further to delete subparagraph (3). A flat fee for comparing and certifying copies of documents made from Office records is provided in new paragraph (i) of this section.

Section 1.19, paragraph (c) is amended further to provide for ten subclasses with the annual service charge.

Section 1.19 is amended to provide in new paragraph (h) a $10 per document flat fee for an uncertified copy of a non-United States patent document. This fee would apply to copies of foreign patent applications such as those which are published at 18 months or when allowable for opposition.

Section 1.19 is amended to provide in new paragraph (i) a flat fee for comparison and certification of each copy of a document made from Office records but not prepared by the Office.

Section 1.19 is amended to provide in new paragraph (j) a fee for duplicate filing receipts and corrected filing receipts due to applicant error.

Paragraphs (i) and (j) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified.

Section 1.20 Post-issuance fees

Section 1.20, paragraphs (a)-(c) are amended to adjust patent post-issuance fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Section 1.20 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the post-issuance fees set forth in paragraphs (b)-(c). Section 1.20 has been modified further to reduce the fee set forth in paragraph (a), which was not proposed for adjustment, to more precisely recover the estimated average cost to the Office of providing a certificate of correction.

Section 1.20, paragraphs (d) and (h)-(j), are amended to adjust patent post-issuance fees established in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraphs (e)-(g), are amended to adjust post-issuance fees authorized by Section 2 of Public Law 96–517, as modified by Section 404 of Public Law 98–622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are adjusted to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraph (k), is amended to adjust the patent maintenance surcharge fee authorized by Section 2 of Public Law 96–517. Paragraph (k) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.20, paragraph (l), is amended to adjust the post-issuance fee authorized by §41(b) of title 35, United States Code. Paragraph (l) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.21 Miscellaneous fees and charges

Section 1.21 is amended to adjust the miscellaneous fees and charges authorized by §41(d) of title 35, United States Code and set forth in paragraphs (a)-(f), (h) and (i) of this section to recover the estimated average cost to the Office of such processing. Section 1.21 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the miscellaneous services for which fees were set forth in paragraphs (a)(2)-(a)(6), (b)(1), (d)-(f), (h)(1) and (i). Section 1.21 has been modified further to reduce the fees specified in paragraphs (c) and (h)(2), which were not proposed for adjustment, to more precisely recover the estimated average cost to the Office of those services.

Section 1.21, paragraph (g), is modified from the proposal to change the term "copy machine tokens" to "CopiShare card."

Section 1.21, paragraph (k), is amended to change the word "section" to "part" to clarify that any charge not provided for in these rules would be made at actual cost.

Section 1.21 is amended to provide in new paragraph (m) a $20 fee for processing checks returned "unpaid" by a bank.

Section 1.24 Coupons

Section 1.24 is amended to adjust the fee for the purchase of coupons for patents to make it comparable to the fee required for the purchase of U.S. patents.

Section 1.24 is amended to delete reference to forty cent coupons which are no longer sold by the Patent and Trademark Office.

Section 1.25 Deposit accounts

Section 1.25 is amended to establish a restricted subscription deposit account to be used exclusively for subscription orders of patent copies as issued. A minimum deposit of $300 is required to establish and maintain, without payment of a monthly service fee, a restricted subscription deposit account.

Section 1.26 Refunds

Section 1.26 is amended to change paragraph (c) to provide for a refund of $1,300 if the Commissioner decides not to institute reexamination proceedings. The $1,300 refund would apply to those instances where the reexamination fee of $1,770 under §1.20(c) was paid. The current $1,200 refund will be made in those cases where the current $1,500 reexamination fee was paid.

Section 1.53 Serial number, filing date, and completion of application.

Section 1.53 is amended to change paragraph (c) to reduce to $15 the handling fee charged in the event a specification or drawing is not submitted within the time period set by the Office. Section 1.53 has been modified to more precisely recover the estimated average cost to the Office of handling an application with missing parts.

Section 1.297 Publication of statutory invention registration

Section 1.297, paragraph (b), is amended to modify the statement to be printed on each statutory invention registration. The language of the statement is modified so as to be more easily understood.

Section 1.445 International application filing and processing fees

Section 1.445, paragraphs (a)(1)-(a)(4), are amended to adjust the fees authorized by §376 of title 35, United States Code, for international application processing to recover the estimated average cost to the Office of such processing. The cost of the international search fee set forth in paragraph 1.445(a)(2)(i) has been reduced and the amount credited by the Office under paragraph 1.445(a)(2)(ii) is not changed. Paragraphs (a)(1) and (a)(3) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing international applications. However, the amount of the credit under 1.445(a)(4) is somewhat less than at present and is the same as in the proposed rules.

Section 1.445(a)(5) is amended to adjust the surcharge authorized by §371(d) of title 35, United States Code.

Paragraph (a)(5) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index and to provide for a small and large entity amount to be consistent with §1.16(e).

Section 1.445(a)(6) is amended to adjust the processing fee for an English translation filed after 20 months from the priority date to recover the estimated average cost to the Office of such processing. Paragraph (a)(6) has been modified from the proposal to more precisely recover the estimated average cost to the Office of processing an English translation and to be consistent with §1.17(k).

Section 1.446 Refund of international application filing and processing fees.

Section 1.446 is amended to delete paragraph (b). The substance of the deleted material is included in section 1.445, paragraph (a)(4).

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Fifteen letters submitting written comments and eight questions by telephone were received. Oral testimony was presented by one person at the public hearing conducted on July 18, 1985. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

PTO fees are already too high and burdensome to the patent community.

Reply:

There has been no indication that PTO fees are burdensome to the patent community. In 1984, we expected to receive 107,000 patent applications and actually received 109,539. In 1985, we are currently receiving applications at an annual rate of approximately 116,000.

The PTO is adjusting patent processing and patent service fees because costs have increased. The Commissioner may adjust patent statutory fees by changes which have occurred during the past three years in the Consumer Price Index (CPI). This authority is provided by 35 U.S.C. 41(f). The intent of the Congress in indexing the statutory patent fees set in 1982 to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation. Indexing of statutory patent fees was not intended to raise additional revenues beyond the rate of inflation.

The Commissioner also is authorized to adjust nonstatutory patent fees to recover the estimated average cost to the Office of processing, services and materials. This authority is provided by 35 U.S.C. 41(d). As previously discussed, several of the proposed fees have been modified to more precisely recover the estimated average cost to the Office of processing, materials and services.

Comment:

PTO has failed to abide by the provisions of Public Law 96–517 and the accompanying report (House Report 96–1307). Specifically, the PTO has failed to abide by the 50 percent recovery limitation for patent processing fees and the restrictions on the use of fee income.

Reply:

Public Law 96–517, although enacted into law, was never fully implemented because the Congress passed H.R. 6260 which was enacted as Public Law 97–247 on Aug. 27, 1982. Public Law 97–247 provides for an eventual 100 percent cost recovery through processing and maintenance fees except for the subsidy for certain small entities, and contains no restrictions on the use of income from fee revenues.

This rulemaking adjusts, by the Consumer Price Index (CPI), the patent processing (41(a)) and patent maintenance (41(b)) fees established by Public Law 97–247. The CPI adjustment allows the programs supported by §41(a) and (b) fees to keep pace with inflation. Any growth in the aggregate rate of recovery of fees versus costs in this second cycle of fees is due primarily to the first time collection of maintenance fee receipts.

The restrictions on the use of income from fee revenues, which were included in House Report 96–1307 accompanying Public Law 96–517, were based upon a 50 percent recovery of patent costs from user fees. Then-Commissioner Mossinghoff testified before the Subcommittee on Courts, Civil Liberties, and Administration of Justice, when Congress was considering H.R. 6260, that the Administration's PTO user fee program was proposed to improve the quality of service at the PTO by reducing patent pendency, trademark pendency and automating patent and trademark operations. The Commissioner went on to say that "The major increases in the three program areas will be paid for by the sharp increase in user fees that we are recommending." The Congressional debate on this proposal indicates that the Subcommittee approved these innovative fee provisions in order to improve the level of patent and trademark services provided to users of the Office.

Comment:

Fees should relate to the actual "costs of processing patent applications" and should not include "overhead" expenses.

Reply:

The fees applicable to patent filing, issuance and maintenance fees were established by the Congress and set forth in 35 U.S.C. §41(a) and (b). Regardless if Congress included "overhead" expenses when setting these statutory patent fees, these fees may be adjusted only to reflect the fluctuations in the CPI every three years. Fees

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for other processing, services or materials related to patents are set by the Commissioner pursuant to 35 U.S.C. 41(d) to recover the Office's estimated average cost. The legislative history of Public Law 97–247, including the accompanying House Report, does not provide guidance regarding how "estimated average cost" was to be determined. These fees were determined under the general guidelines of OMB Circular A–25, entitled "User Charges," which established general policies for developing an equitable and uniform system of charges for certain government services and property. Circular A–25 provides that a reasonable charge should be imposed to recover the full cost to the Government of rendering a service to an identifiable recipient, who receives a substantial benefit not accruing to the general public, e.g., receiving a patent. The concept of full cost recovery includes an appropriate overhead charge. Therefore, the inclusion of overhead expenses in calculating the costs of processing patent applications is appropriate.

Comment:

The PTO does not include a description of any cost containment measure.

Reply:

The PTO has taken all possible measures to contain costs. During fiscal year 1985, a zero-based analysis was conducted of all programs and their associated funding. The purpose of the review was to assure that adequate resources were available to meet the PTO's most important priorities while addressing unanticipated costs such as, the full absorption of the fiscal year 1985 pay raise, new pay scale for patent examiners, higher postal and telephone rates, greater use of PTO services, etc. The PTO's annual budget request is thoroughly reviewed by the Department of Commerce, by the Office of Management and Budget, and by the Congressional Appropriations Committees prior to enactment. The PTO is complying with the President's Deficit Reduction Program. The fiscal year 1986 budget request reflects reductions to travel, printing and consultants as required by the Deficit Reduction Act of 1984; administrative cost savings; and grade reductions and pay cuts. The PTO program to reduce patent pendency, once achieved in 1987, will require less resources than are currently expended. The Automation program, too, as it achieves its major milestones, will deliver cost benefits.

Comment:

The PTO has proposed to adjust fees because costs have increased but they did not include an explanation of how costs were calculated.

Reply:

Patent statutory fees, which are set forth in 35 U.S.C. 41(a) and (b), can be adjusted on Oct. 1, 1985 and every three years thereafter to reflect fluctuations which have occurred in the Consumer Price Index (CPI). The costs of processing a patent application from receipt to issue or abandonment were calculated in 1982 at the time the present fees were set by statute. The most significant elements of processing a patent application are compensation costs, space and the costs incurred for printing the *Official Gazette* and patent grants.

As a result of these increases to the major costs incurred in the processing of a patent application, the PTO is adjusting the statutory 41(a) and (b) patent fees by the full CPI of 11.8 percent in order to recover the projected budgeted collections for patent processing for the years 1986–1988.

Non-statutory patent and patent service fees are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A–25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property. The cost of all processing, services and/or materials associated with each non-statutory (§41(d)) patent fee was determined. Since these fees are expected to remain in place for three years (1986–1988), each cost was adjusted by a mid-cycle inflation rate of 6.21 percent which was derived from the Administration's 1986–1988 inflation projection.

Comment:

The PTO has proposed to set §41(d) fees at a level which exceeds the estimated average cost to the Office. PTO's cost calculations do not support the proposed §41(d) fees.

Reply:

Fees established pursuant to 35 U.S.C. 41(d) and 376, non-statutory patent and patent service fees, are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A–25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property.

The PTO employed cost-finding techniques for determining the costs of all processing, services and/or materials associated with each non-statutory patent fee. These costs were documented by the Director, Office of Finance and reviewed by each responsible Assistant Commissioner. Since the revised fees are expected to remain in place for the next three years (1986–1988), each cost was adjusted by the mid-cycle inflation rate of 6.21 percent. The fee was then set based upon this inflated cost.

For the first fee cycle (1983–1985), fees established under §41(d) and §376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under §41(d) and §376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish §41(d) and §376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or in workload, and (3) greater reliance upon and use of the individual fee costs developed by PTO financial analysts.

In modifying the proposed fees, the PTO used the raw cost data derived for each fee, adjusted that amount by the projected mid-cycle inflation rate of 6.21 percent, and rounded the adjusted cost by applying standard arithmetical rules. Fees of $100 or more were rounded to the nearest $10. Fees between $99 and $2 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

Comment:

The increase in maintenance fees appears to be driven by non-cost considerations. Since they have just begun to be collected, there could be no actual cost histories on which to base the adjustments.

Comment:

The increase in claim fees seem to be proposed without any seemingly real increase in cost specifically attributable to these items.

Reply:

Patent statutory fees such as claim and maintenance fees, which are set forth in 35 U.S.C. 41(a) and (b), may be adjusted every three years to reflect changes which have occurred in the Consumer Price Index (CPI) for the prior three years. The costs of processing, issuing and maintaining patents were calculated in 1982 at the time the present fees were set by statute. Patent maintenance fees as set forth in both Public Laws 96–517 and 97–247 are one of several sources of income available to the PTO to cover the costs of processing, issuing and maintaining a patent. The most significant elements of processing, issuing and maintaining patents are personnel compensation, benefits, space and printing costs. Since 1982, these costs have risen in an amount equal to and in some cases, in an amount exceeding, the CPI increase for the individual year.

As a result of these cost increases, the PTO is adjusting §41(a) and §41(b) patent fees and the Public Law 96–517 maintenance fees by the full CPI of 11.8 percent.

Comment:

PTO's proposed adjustments to §41(a) and §41(b) fees are higher than the 11.7 percent fluctuation in the Consumer Price Index because of the rounding principles PTO has applied.

Reply:

The intent of the Congress in indexing the statutory patent fees, 35 U.S.C. 41(a) and (b), to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation with regard to the fees set in 1982. Indexing of statutory patent fees was not intended to be a method of raising additional revenues, nor has the PTO used it for that purpose, but rather for administrative ease. Rounding will ease the administration of these fees by permitting the PTO and users to deal in increments of ten when the adjusted fee is $100 or greater or in even amounts when the fee is below $99. This will ease implementation of the 50 percent reduction in fees for small businesses, non-profit organizations and individuals. Moreover, any surpluses which may result are for the short-term only. By applying routine techniques, there should be a balancing out of shortfalls and surpluses in the long-run.

Comment:

The fee for a deferred declaration under 34 U.S.C. 111 should be changed so that such a fee would only be required if the declaration were filed later than three months from the actual filing date.

Reply:

The suggestion for permitting the declaration to be filed up to three months after the actual filing date without a surcharge has not been adopted. It would place administrative burdens on the Office since it would encourage the late filing of oaths or declaration.

Comment:

There appears to be no justification for the significant increase to the surchage fees.

Reply:

In proposing adjustments to penalty surcharge fees, the PTO considered the costs incurred in providing special handling to certain cases, and proposed to set the fee at a level that would recover costs and preclude unnecessary resort to pertinent procedures but not so high as to be burdensome where resort to these procedures is necessary. In response to several comments received on the proposed surcharge fees, the proposal has been modified to limit the adjustments to surcharge fees set forth in §1.16(e), §1.20(k), §1.20(l) and §1.445 (a)(5) to changes which have occurred during the past three years in the Consumer Price Index.

Comment:

Patent Cooperation Treaty (PCT) fee increases far exceed the 11.7 percent average increase applied to national applications. This increase could seriously affect use of PCT system.

Reply:

The PCT fees set under 35 U.S.C. 376 are based on cost recovery and are not adjusted by the Consumer Price Index. The fees under §1.445 are set to reflect estimated average processing costs. A reduction was made in the amount of the international search fee if performed by the U.S. Patent and Trademark Office. While the credit for a prior U.S. search is unchanged and other PCT fees are increased, the overall adjustment level of PCT fees is generally in line with the CPI.

Comment:

The small entity reduction should be adopted for the PCT surcharge.

Reply:

The final rule has been modified from the proposal to provide for small and large entity amounts in §1.445(a)(5). This is to correspond to a similar fee in §1.16(e).

Comment:

The proposed fees for a copy of a patent file wrapper and its contents (1.19(a)(4)) are unfair at the breakpoint. It would be more equitable to charge $75 for each 200 pages or fraction thereof.

Reply:

In proposing a fee of $75 for up to 200 pages and $350 for 201 pages or more for a copy of a patent file wrapper and its contents, the PTO was attempting to move to a flat fee for this service. Since there were objections to the breakpoint, the final rule has been modified from the proposal to reflect a fee of $75 for each 200 pages or fraction thereof.

Comment:

The proposed increase in §1.20(c) regarding requests for reexamination and the related decrease in §1.26(c) relating to refunds where reexamination is not ordered, appeared to be set from a revenue generating standpoint rather than being cost-driven.

Reply:

While the comment does not suggest what the fees should be, it is noted that the two fees have to be considered together. The notice of proposed rulemaking set a fee of $1,800 for filing a request for reexamination, which was an increase from the previous fee of $1,500. This fee has been modified from the proposal and is now set at $1770. The refund where reexamination is denied was proposed to be raised from $1,200 to $1,300, which raises the refund from the amount previously refunded. The amount refunded has not changed from the proposal. The relative amounts of the initial fee and the refund are set to obtain the necessary recovery of costs from reexamination.

Comment:

A separate schedule of fees should be instituted for interference proceedings, but such fees should apply only to junior parties, since interferences are conducted primarily for their benefit.

Reply:

The rules already provide for certain fees relating to interference proceedings; see §1.644(e) and (f), and §1.666(b) and (c). In general, however, the PTO decided in 1982 that the costs of interference proceedings should be factored into the fees charged in connection with the processing and examination of patent applications, because (1) an interference is a proceeding instituted by the PTO, and (2) it would not be administratively feasible to attempt to provide a fee schedule to cover the myriad of different situations which may occur in the course of an interference. Since these reasons are still considered applicable, the suggestion has not been adopted.

Comment:

The proposed fee for admission to the examination (1.21(a)(1)) for registration to practice is too high for students who often sit for the exam and it is inappropriate because administering the exam is not a service to the public but a cost of operating the PTO.

Reply:

The fee for admission to the examination for registration to practice reflects the costs of conducting the examination twice a year nationwide. The significant increase is due to the fact that the fee had been understated in relation to cost during the 1983–1985 fee cycle. Fees established in this rulemaking will more pre-

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cisely recover the estimated average cost to the Office of administering and grading the examination and are consistent with the cost recovery principles of OMB Circular A–25.

Comment:

The proposed fee for requesting a regrading of an examination (1.21(a)(6)) should be waived if the regrading request was necessitated by a PTO error.

Reply:

Any fee may be refunded if paid by mistake or paid in excess of that required. See 35 U.S.C. 42(d).

Comment:

The PTO should retain the present fee for admission to the examination to practice before the Office (1.21(a)(1)) and increase the fee payable upon registration to practice (1.21(a)(2)).

Reply:

This suggestion has not been adopted in this rulemaking. The fees for admission to the examination and for registration to practice have been set to recover the cost of those services.

Comment:

The proposed fee for reviewing a decision of the Director of Enrollment and Discipline (1.21(a)(5)) appears to be low in view of the significant amount of time and effort involved in a review.

Reply:

The fee for this service, as modified, recovers the estimated average cost to the Office of providing the service.

Comment:

The fees for processing an application filed with a specification in a non-English language (1.17(k)) and for filing an English translation of an international application later than 20 months after the priority date (1.445 (a)(6)) appear to be in excess of cost.

Reply:

The final rules have been modified from the proposed to provide for a fee of $26, the cost of processing applications filed with non-English language specifications in both domestic and international cases.

Comment:

An extension of time to Aug. 16, 1985 for the submission of comments was requested.

Reply:

The PTO is required by 35 U.S.C. 41(g) to publish a notice of fee increases in the *Federal Register* at least 60 days prior to the effective date of the fee increase. In order to have the proposed fee increases become effective near the start of the fiscal year, the extension of time could not be granted.

Comment:

Why were there no proposals to adjust trademark fees?

Reply:

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

Comment:

Do we plan to verify the inflation rate before publication of the final rules?

Reply:

The projected inflation rate has been verified. The Administration's latest projected annual cumulative Consumer Price Index for the three year period 1982–1985 is 11.8 percent. Application of this index to §41(a) and §41(b) fees results in no change from the proposal.

Other Considerations: The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96–354). The principal impact of the major patent fees has already been taken into account in Public Law 97–247, which provided small entities with a 50 percent reduction in the major patent fees. Although that legislation will expire on Sept. 30, 1985, legislation has been introduced to reauthorize the 50 percent reduction in patent fees for an additional three years. The rule change adjusts fees to reflect the change in the Consumer Price Index and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41, 111, 157, 302, and 376 and Public Laws 96–517, 97–247 and 98–622, the Patent and Trademark Office is amending 37 CFR Part 1 as set forth below.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is revised to read as follows:

§1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§1.9(f)) $170.00
By other than a small entity $340.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f)) $17.00
By other than a small entity $34.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (§1.9(f)) $6.00
By other than a small entity $12.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(f) For filing each design application:

By a small entity (§1.9(f)) $70.00
By other than a small entity $140.00

(g) Basic fee for filing each plant application:

By a small entity (§1.9(f)) $110.00
By other than a small entity $220.00

(h) Basic fee for filing each reissue application:

By a small entity (§1.9(f)) $170.00
By other than a small entity $340.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§1.9(f)) $17.00
By other than a small entity $34.00

(j) In addition to the basic filing fee in a reissue application; for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes):

By a small entity (§1.9(f)) $6.00
By other than a small entity $12.00

(Note, see §1.445 for international application filing and processing fees).

(35 U.S.C. 6, 41, 111; Public Law 97–247)

3. Section 1.17 is amended by revising paragraphs (a)-(m) to read as follows:

§1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a):

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(b) Extension fee for response within second month pursuant to §1.136(a):

By a small entity (§1.9(f)) $85.00
By other than a small entity $170.00

(c) Extension fee for response within third month pursuant to §1.136(a):

By a small entity (§1.9(f)) $195.00
By other than a small entity $390.00

(d) Extension fee for response within fourth month pursuant to §1.136(a):

By a small entity (§1.19(f)) $305.00
By other than a small entity $610.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§1.9(f)) $65.00
By other than a small entity $130.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§1.9(f)) [illegible]
By other than a small entity $130.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $140.00

§1.47 — for filing by other than all the inventors or a person not the inventor.
§1.48 — for correction of inventorship.
§1.182 — for decision on questions not specifically provided for.
§1.183 —to suspend the rules.
§1.295 — for review of refusal to publish a statutory invention registration.
§1.377 — for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§1.378(e) — for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§1.644(e) — for petition in an interference.
§1.644(f) — for request for reconsideration of a decision on petition in an interference.
§1.666(c) — for late filing of interference settlement agreement.
§§5.12, 5.13, & 5.14 — for expedited handling of foreign filing license.
§5.15 — for changing the scope of a license.
§5.25 — for retroactive license.

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $72.00

§1.12 — for access to an assignment record.
§1.14 — for access to an application.
§1.55 — for entry of late priority papers.
§1.102 — to make application special.
§1.103 — to suspend action in application.
§1.177 — for divisional reissues to issue separately.
§1.312 — for amendment after payment of issue fee.
§1.313 — to withdraw an application from issue.
§1.314 — to defer issuance of a patent.
§1.334 — for patent to issue to assignee, assignment recorded late.

§1.666(b) — for access to interference settlement agreement.

(j) For filing a petition to institute a public use proceeding under §1.292 ..... $860.00

(k) For processing an application filed with a specification in a non-English language (§ 1.52(d)) $26.00

(l) For filing a petition (1) for the revival of an unavoidably abandoned application under 35 U.S.C. 133, or 371 or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§1.19(f)) $280.00
By other than a small entity $560.00

(35 U.S.C. 6, 41, 157, 376; Public Law 97–247)

4. Section 1.18 is revised to read as follows:

§1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§1.9(f)) $280.00
By other than a small entity $560.00

(b) Issue fee for issuing a design patent:

By a small entity (§1.9(f)) $100.00
By other than a small entity $200.00

(c) Issue fee for issuing a plant patent:

By a small entity (§1.9(f)) $140.00
By other than a small entity $280.00

(35 U.S.C. 6, 41, Public Law 97–247)

5. Section 1.19 is amended by revising paragraphs (a)-(c), (e) and (f), and by adding new paragraphs (a)(7), and (h)-(j) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent or color statutory invention registration $1.50
(2) Printed copy of a plant patent or statutory invention registration in color $6.00
(3) Copy of patent application as filed ... $9.00
(4) Copy of patent file wrapper and contents, per 200 pages or a fraction thereof . $75.00
(5) Copy of Office records, except as otherwise provided in this section, per page . $.50
(6) Microfiche copy of microfiche, per microfiche ..... $.50
(7) Copy of patent assignment record $1.50

(b) Certified copies of Office documents:

(1) For certifying Office records, per certificate $3.00
(2) For a search of assignment records, abstract of title and certification, per patent . $12.00

(c) Subscription services:

(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and ten subclasses $7.00
(2) For annual subscription to each additional subclass in addition to the ten covered by the fee under paragraph (c)(1) of this section, per subclass ..... $.70

* * * * *

(e) List of patents in subclass:

(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof . $1.00
(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof $1.00

(f) Microfiche copy of patent file record $6.00

* * * * *

(h) Uncertified copy of a non-United States patent document, per document $10.00

(i) To compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document $5.00

(j) Additional filing receipts:

Duplicate $14.00
Corrected due to applicant error $14.00

(35 U.S.C. 6, 41, 157)

6. Section 1.20 is amended by revising paragraphs (a)-(l) to read as follows:

§1.20 Post-Issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§1.323) $29.00

(b) Petition for correction of inventorship in patent (§1.324) $140.00

(c) For filing a request for reexamination (§1.510(a)) $1,770.00

(d) For filing each statutory disclaimer (§1.321):

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant .. $225.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant .. $225.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years, the fee is due by seven years and six months after the original grant .. $445.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant $670.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) $225.00
By other than a small entity $450.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) $445.00
By other than a small entity $890.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§1.9(f)) $670.00
By other than a small entity $1,340.00

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 ..... $110.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

* * * * *

(35 U.S.C. 6, 41, 302; Public Laws 96–517, 97–247, 98–622)

7. Section 1.21 is amended by revising paragraphs (a)-(i) and (k), and adding a new paragraph (m) to read as follows:

§1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:

(1) For admission to examination for registration to practice, fee payable upon application $250.00
(2) On registration to practice $81.00
(3) For reinstatement to practice $9.00
(4) For certificate of good standing as an attorney or agent $10.00
Suitable for framing $88.00
(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c) $92.00
(6) For requesting regrading of an examination under §10.7(c) $92.00

(b) Deposit accounts:

(1) For establishing or reinstating a deposit account $8.00
(2) Service charge for each month when the balance at the end of the month is below $1,000 ..... $20.00
(3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued $20.00

(c) Disclosure document:

For filing a disclosure document $6.00

(d) Delivery box:

Local delivery box rental, per annum $43.00

(e) International-type search reports:

For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application $28.00

(f) Search of Office records:

For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof $14.00

(g) CopiShare card:

Cost per copy $0.20

(h) Recording of documents:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or application $7.00
(2) Where a document to be recorded under paragraph (h)(1) of this section refers to more than one patent or application, for each additional patent or application $2.00

(i) Publication in *Official Gazette*:

For publication in the *Official Gazette* of a notice of the availability of an application or a patent for licensing or sale, each application or patent $7.00

* * * * *

(k) For items and services, that the Commissioner finds may be supplied, for which

fees are not specified by statute or by this part, such charges as may be determined by the Commissioner with respect to each such item or service . . . . . actual cost

* * * * *

(m)For processing each check returned "unpaid" by a bank $20.00

(35 U.S.C. 6, 41)

8. Section 1.24 is proposed to be revised to read as follows:

§1.24 Coupons.

Coupons in denominations of one dollar for the purchase of trademark registrations and one dollar and fifty cents for the purchase of patents, designs, defensive publications, and statutory invention registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50 and the one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75. These coupons are good until used; they may be transferred but cannot be redeemed.

(35 U.S.C. 6)

9. Section 1.25, paragraph (a), is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1,000 is required for paying any fees due or in ordering any services offered by the Office. However, a minimum deposit of $300 may be paid to establish a restricted subscription deposit account used exclusively for subscription order of patent copies as issued. At the end of each month, a deposit account statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. Charges to accounts with insufficient funds will not be accepted. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1,000. For restricted subscription deposit accounts, a service charge (§1.21(b)(3)) will be assessed for each month that the balance at the end of the month is below $300.

* * * * *

(35 U.S.C. 6)

10. Section 1.26 is amended by revising paragraph (c) to read as follows:

§1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,300 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

(35 U.S.C. 6, 41)

11. Section 1.53 is amended by revising paragraph (c) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period with which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $15.00 handling fee.

* * * * *

12. Section 1.297, paragraph (b), is revised to read as follows:

§1.297 Publication of statutory invention registration.

* * * * *

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

(35 U.S.C. 6, 157)

13. Section 1.445 is amended by revising paragraph (a) to read as follows:

§1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $170.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with fee has been filed $420.00

(ii) Corresponding prior United States national application with fee has been filed $250.00

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2), per additional invention $140.00

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited, if requested at the time of filing, by an amount of $170.00 where an international search fee as required by paragraph (a)(2)(i) of this section has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Only one such credit is permitted based on a single international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b)) . . $26.00

* * * * *

(35 U.S.C. 6, 376)

14. Section 1.446 is amended by removing paragraph (b):

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) [Reserved]

(35 U.S.C. 6, 376)

July 31, 1985. DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1057 OG 24]

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(62)

Public Law 96–517
96th Congress
An Act

To amend the patent and trademark laws.

Dec. 12, 1980
[H.R. 6933]
Patent and trademark laws, amendment.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 29 the following new chapter 30:

"CHAPTER 30–PRIOR ART CITATIONS TO OFFICE AND REEXAMINATION OF PATENTS

" Sec.
"301. Citation of prior art.
"302. Request for reexamination.
"303. Determination of issue by Commissioner.
"304. Reexamination order by Commissioner.
"305. Conduct of reexamination proceedings.
"306. Appeal.
"307. Certificate of patentability, unpatentability, and claim cancellation.

35 USC 301.

"§ 301. Citation of prior art

Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

35 USC 302.

"§ 302. Request for reexamination

"Any person at any time may file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title. The request must be in writing and must be accompanie- by payment of a reexamination fee established by the Commissioner of Patents pursuant to the provisions of section 41 of this title. The request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested. Unless the requesting person is the owner of the patent, the Commissioner promptly will send a copy of the request to the owner of record of the patent.

Fee.

35 USC 303.

"§ 303. Determination of issue by Commissioner

"(a) Within three months following the filing of a request for reexamination under the provisions of section 302 of this title, the Commissioner will determine whether

a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, with or without consideration of other patents or printed publications. On his own initiative, and any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him or cited under the provisions of section 301 of this title.

Record.

"(b) A record of the Commissioner's determination under subsection (a) of this section will be placed in the official file of the patent and a copy promptly will be given or mailed to the owner of record of the patent and to the person requesting reexamination, if any.

Refund.

"(c) A determination by the Commissioner pursuant to subsection (a) of this section that no substantial new question of patentability has been raised will be final and nonappealable. Upon such a determination, the Commissioner may refund a portion of the reexamination fee required under section 302 of this title.

35 USC 304.

"§ 304. Reexamination order by Commissioner

"If, in a determination made under the provisions of subsection 303(a) of this title, the Commissioner finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination. If the patent owner files such a statement, he promptly will serve a copy of it on the person who has requested reexamination under the provisions of section 302 of this title. Within a period of two months from the date of service, that person may file and have considered in the reexamination a reply to any statement filed by the patent owner. That person promptly will serve on the patent owner a copy of any reply filed.

Filing period.

35 USC 305.

"§ 305. Conduct of reexamination proceedings

"After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Appeals, will be conducted with special dispatch within the Office.

35 USC 132, 133.

35 USC 306.

"§ 306. Appeal

"The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and may seek court review under the provisions of sections 141 to 145 of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

35 USC 134.
35 USC 141–145.

35 USC 307.

"§ 307. Certificate of patentability, unpatentability, and claim cancellation

"(a) In a reexamination proceeding under this chapter, when the time for appeal has expired or any appeal proceeding has terminated, the Commissioner will issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable, confirming any claim of the patent determined to be patentable, and incorporating in the patent any proposed amended or new claim determined to be patentable.

"(b) Any proposed amended or new claim determined to be patentable and incorporated into a patent following a reexamination proceeding will have the same effect as that specified in section 252 of this title for reissued patents on the right of any person who made, purchased, or used anything patented by such proposed amended or new claim, or who made substantial preparation for the same, prior to issuance of a certificate under the provisions of subsection (a) of this section."

35 USC 252.

SEC. 2. Section 41 of title 35, United States Code, is amended to read as follows:

35 USC 41.

"§ 41. Patent fees

"(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

"(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

"(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

"(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

35 USC 13.

Waiver

"(e) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

35 USC 132.

"(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three years.

"(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register."

Notice

SEC. 3. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42.

"§ 42. Patent and Trademark Office funding

"(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

"(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

"(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office.

"(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required."

Refund.

SEC. 4. Section 154 of title 35, United States Code, is amended by deleting the word "issue".

SEC. 5. Section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended to read as follows:

"§ 31. Fees

"(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material. However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

Notice.

"(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with any occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups."

Waiver.

Indian products, exception.

SEC. 6. (a) Title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 37 the following new chapter 38:

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"CHAPTER 38–PATENT RIGHTS IN INVENTIONS MADE WITH FEDERAL ASSISTANCE

"Sec.

"200. Policy and objective.
"201. Definitions.
"202. Disposition of rights.
"203. March-in rights.
"204. Preference for United States industry.
"205. Confidentiality.
"206. Uniform clauses and regulations.
"207. Domestic and foreign protection of federally owned inventions.
"208. Regulations governing Federal licensing.
"209. Restrictions on licensing of federally owned inventions.
"210. Precedence of chapter.
"211. Relationship to antitrust laws.

35 USC 200.

"§200. Policy and objective.

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

35 USC 201.

"§201. Definitions

"As used in this chapter—

"(a) The term 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.

"(b) The term 'funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

"(c) The term 'contractor' means any person, small business firm, or nonprofit organization that is a party to a funding agreement.

"(d) The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.

"(e) The term 'subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.

"(f) The term 'practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

"(g) The term 'made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"(h) The term 'small business firm' means a small business concern as defined at section 2 of Public Law 85–536 (15 U.S.C 632) and implementing regulations of the Administrator of the Small Business Administration.

"(i) The term 'nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

35 USC 202.

"§202. Disposition of rights

Funding agreement.

"(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: *Provided, however,* That a funding agreement may provide otherwise (i) when the funding agreement is for the operation of Government-owned research or production facility, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter or (iii) when it is determined by a Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counterintelligence activities that the restriction or elimination of the right to retain title to any subject invention is necessary to protect the security of such activities. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter.

Written determination.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration.

Copy to Comptroller General.

Copy to SBA.

Contrary agency determinations.

"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred and twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

Report to congressional committees.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

Funding agreement requirements.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

"(2) A requirement that the contractor make an election to retain title to any subject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times.

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: *Provided,* That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

"(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor); (B) a prohibition against the granting of exclusive licenses under United States Patents or Patent Applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (C) a requirement that the contractor share royalties with the inventor; and (D) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including pay-

ments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

"(8) The requirements of sections 203 and 204 of this chapter.

Rights, retention.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

Rights, transfer or assignment.

"(e) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

Third-party licensing, prohibition.

"(f)(1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

35 USC 203.

"§203. March-in rights

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines that such–

"(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

"(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

"(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

35 USC 204.

"§204. Preference for United States industry

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

Waiver.

35 USC 205.

"§205. Confidentiality

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

35 USC 206.

"§206. Uniform clauses and regulations

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter and the Office of Federal Procurement Policy shall establish standard funding agreement provisions required under this chapter.

35 USC 207.

"§207. Domestic and foreign protection of federally owned inventions

"Each Federal agency is authorized to–

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title as determined appropriate in the public interest;

35 USC 281 *et seq.*

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

35 USC 208.

"§208. Regulations governing Federal licensing

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

35 USC 209.

"§209. Restrictions on licensing of federally owned inventions

Development or marketing plan.

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention, except that any such plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Manufacture in U.S.

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that–

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention,

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public.

Antitrust factors.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

Small business preference.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

Antitrust factors.

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such license will tend

substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

Record.

"(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Terms and conditions.

"(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are being made by the licensee with particular reference to the plan submitted: *Provided,* That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

35 USC 210.

"§210. Precedence of chapter

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

"(1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of Aug. 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

"(2) section 205(a) of the Act of Aug. 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);

91 Stat. 1320.

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1395(c); 80 Stat. 721);

64 Stat. 154.

"(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

68 Stat. 944.

"(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (e) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

88 Stat. 1887.
42 USC 5908.

"(12) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901); 88 Stat. 1878);

"(13) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);

"(14) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(15) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);

"(16) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);

"(17) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);

"(18) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(19) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

"(20) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);

7 USC 178j.

"(21) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and

92 Stat. 1316.

"(22) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

Rights, disposition.

"(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on Aug. 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions. Any disposition of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

Disclosure.

"(d) Nothing in this chapter shall be construed to require the disclosure of intelligence sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or methods.

35 USC 211.

"§211. Relationship to antitrust laws

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law."

(b) The table of chapters for title 35, United States Code, is amended by adding immediately after the item relating to chapter 37 the following:

"38. Patent rights in inventions made with Federal assistance."

SEC. 7. AMENDMENTS TO OTHER ACTS.—The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889–1891).

Effective dates.

SEC. 8. (a) Sections 2, 4, and 5 of this Act will take effect upon enactment.

35 USC 41 note.

(b) Section 1 of this Act will take effect on the first day of the seventh month beginning after its enactment and will apply to patents in force as of that date or issued thereafter.

(c) Section 3 of this Act will take effect on the first day of the first fiscal year beginning on or after one calendar year after enactment. However, until section 3 takes effect, the Commissioner may credit the Patent and Trademark Office appropriation account in the Treasury of the United States with the revenues from collected reexamination fees, which will be available to pay the costs to the Office of reexamination proceedings.

(d) Any fee in effect as of the date of enactment of this Act will remain in effect until a corresponding fee established under section 41 of title 35, United States Code, or section 1113 of title 15, United States Code, takes effect.

(e) Fees for maintaining a patent in force will not be applicable to patents applied for prior to the date of enactment of this Act.

(f) Sections 6 and 7 of this Act will take effect on the first day of the seventh month beginning after its enactment. Implementing regulations may be issued earlier.

(g) Sections 8 and 9 will take effect on the date of enactment of this Act.

Computerized data and retrieval system, report to Congress
35 USC 14 note.

SEC. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future.

SEC. 10. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"Computer program."

"A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

17 USC 117.

"§117. Limitations on exclusive rights: Computer programs

17 USC 106.

"Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

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"(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

Approved Dec. 12, 1980.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 96–1307, Pt. I (Comm. on the Judiciary) and No. 96—1307, Pt. 2 (Comm. on Government Operations).
CONGRESSIONAL RECORD, Vol. 126 (1980):
Nov. 17, considered and passed House.
Nov. 20, considered and passed Senate, amended.
Nov. 21, House concurred in Senate amendment.

(63)

Public Law 97-247
97th Congress
An Act

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and the the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation. 15 USC 632.

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, $121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows: Fees.

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. 35 USC 112.

"2. For issuing each original or reissue patent, except in design or plant cases, $500.

"3. In design and plant cases:

"a. On filing each design application, $125.

"b. On filing each plant application, $200.

"c. On issuing each design patent, $175.

"d. On issuing each plant patent, $250.

"4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30. for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"5. On filing each disclaimer, $50.

"6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

"7. On filing each petition for the revival of an unintentionally abondoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50. 35 USC 133, 151.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

"a. On filing a first petition, $50.

"b. On filing a second petition, $100.

"c. On filing a third or subsequent petition, $200.".

(b) Section 41(b) of title 35, United States Code, is amended to read as follows: Maintenance fees.

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, $400.

"2. Seven years and six months after grant, $800.

"3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an application maintenance fee. No fee will be established for maintaining a design or plant patent in force." Expiration. Surcharge.

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period. Maintenance fee, delayed payment. Surcharge.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection."

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 113 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50." Fees. 35 USC 13.

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occuring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored,". Adjusted fees.

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover the aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or funished the material.".

(g) Section 42(c) of the title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.".

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in-chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this Applications.

35 USC 112.
35 USC 113.
35 USC 115.

title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by secti115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.".

Filing date.

SEC. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.".

SEC. 7. Section 6 of the title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (a) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "stille"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentance.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive.".

SEC. 12. Section 21 of title 35, United States Code, is amended–

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

Filing date.

"(a) The Commissioner may be rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.";

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase ", or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a)9" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents for designs shall be granted for the term of fourteen years."

Effective dates.
35 USC 41 note.

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on Oct. 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

§294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

Awards.
9 USC 1 *et seq.*
35 USC 282.

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

Modification.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

Notice.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

Modification.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration.".

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved Aug. 27, 1982.

LEGISLATIVE HISTORY—H.R. 6260

HOUSE REPORT No. 97-542 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 128 (1982):
June 8, considered and passed House.
Aug. 12, considered and passed Senate.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):
Aug. 28, Presidential statement.

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(64) 97TH CONGRESS HOUSE OF REPRESENTATIVES REPORT

2d Session No. 97-542

PATENT AND TRADEMARK OFFICE AUTHORIZATION

May 17, 1982.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration proposal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by $8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

SYNOPSIS OF H.R. 6260

SECTIONS 1—3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of $76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately $79 million for a total budget of $155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of $118,961,000 of which $29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been $89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level $21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (Oct. 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on

Oct. 1, 1982, this amount will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96-517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost. . .of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks.An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96-517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	*Proposed fee*
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combines section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10
Copies of trademarks	1
Assignments	(1)

[1]100 plus for each mark in addition to 1.

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.

Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.

Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.

Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.

Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the patent Cooperation Treaty.

Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".

Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.

Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.

Section 11 limits the declaration of interferences under the trademark law to situations where extraordinary circumstances exist.

Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.

Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.

Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.

Section 15 corrects a mistaken citation in P.L. 96-517.

Section 16 creates a uniform term for design patents.

Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.

Section 18 permits voluntary arbitration of patent disputes.

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SECTION-BY-SECTION ANALYSIS

SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be $154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be $167 million and $176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, $121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by 2.5 million over that authorized in Public law 97-35. The President is recommending a supplemental appropriation of $2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not specifically established by statute. The processing and service fees, which would be established at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applications may correct, without prejudice, errors in payment of the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of $500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be $200 and the issue fee $250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of $300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of

claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of $50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of $115. In addition, a fee of $115 is due on filing a brief in support of the appeal, and a fee of $100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commissioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of $500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of $50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of $500 or a fee of $50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was intentional as opposed to being unintentional or unaviodable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of $50 is established for filing a request for a first one month extension of time, an additional fee of $100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, $400; at seven years and six months after grant, $800; and at eleven years and six months after grant, $1,200. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace priod the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at $50.

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Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the trademark fees collected are used to fund trademark operations only and not the processing of patent applications.

SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name.

The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is

sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" . Although it is believed by some that omission of the words " in commerce" may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of Mar. 3, 1881 and the Act of Feb. 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestablility. It will also make section 15 consistent with sections 22 and 33 of the Act.

SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes or services in return for goods or services of value to the Patent and Trademark Office.

SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on Oct. 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other for-

eign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

SECTION 15

This section corrects an incorrect citation. Public Law 96–517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C. §41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96–517. This section corrects that oversight.

SECTION 16

This section sets a uniform term of fourteen years for all design patents.

SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co.* v. *Pep Mfg. Co.* 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and *Beckman Instruments, Inc.* v. *Technical Developments Corp.* 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due tot he many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availablity of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their Jan. 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on Jan. 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office on Mar. 4,

1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely

ALICE M. RIVLIN, *Director.*

CONGRESSIONAL BUDGET OFFICE, COST ESTIMATE

1. Bill number: H.R. 6260.

2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.

Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level $2.5 million above the amount already appropriated, and would provide a $76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 thorugh 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96–517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96–517, which assumes the ultimate recovery of approxiamtely 50 percent of all processing costs.

The President's 1982 budget includes a request for a $2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately $8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified	2.5	76.0	....	....	....
Estimated	....	6.8	86.4	86.8	....
Subtotal	2.5	82.8	86.4	86.8	....
Total estimated outlays	2.4	61.9	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be $121.5 million, and total 1983 outlays are estimated to be $79.8.

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The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of $167 million and $176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately $6.8 million, $7.4 million, and $7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law	....	47.8	52.7	57.7	....
Added by H.R. 6260	....	31.2	35.3	39.3	....
Total—H.R. 6260	....	79.0	88.0	97.0	....

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Mary B. Maginniss.

10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE
PART 1—PATENT AND TRADEMARK OFFICE

* * * * *

CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

* * * * *

§3. Officers and employees.

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief *appointed under section 7 of this title.* The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

* * * * *

§6. Duties of Commissioner.

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and] programs, *or exchanges of items or services* regarding domestic and international patent and trademark law *or the administration of the Patent and Trademark Office,* and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize

such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed $100,000 in any year, to the Department of State for the purpose of making special payments to international intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

[(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

* * * * *

§13. Copies of patents for public libraries.

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 [(a)9] *(d)* of this title.

* * * * *

CHAPTER 2—PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

* * * * *

§21. [Day for taking action falling on Saturday, Sunday, or holiday] *Filing date and day for taking action.*

(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a *Federal* holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

* * * * *

CHAPTER 4—PATENT FEES

* * * * *

§41. Patent fees

[(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

[(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

[(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Tradmark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, $500.

3. In design and plant cases:

a. On filing each design application, $125.

b. On filing each plant application, $200.

c. On issuing each design patent, $175.

d. On issuing each plant patent, $250.

4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, $50.

6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, $50.

b. On filing a second petition, $100.

c. On filing a third or subsequent petition. $200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, $400.

2. Seven years and six months after grant, $800.

3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

(3) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

[(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.]

(f) The fees established in subsection (a) and (b) of this section may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

§42. Patent and Trademark Office funding.

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. *Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.*

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

* * * * *

CHAPTER 11—APPLICATION FOR PATENT

* * * * *

[§111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

* * * * *

§115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or when, made in a foreign country, before any diplomatic or consular office of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] *is* proved by certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States* and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

§116. [Joint inventors] *Inventors.*

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf

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of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] *through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application,* and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

* * * * *

CHAPTER 16—DESIGNS

* * * * *

§173. Term of design patent.

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

* * * * *

PART III—PATENTS AND PROTECTION OF PATENT RIGHTS

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CHAPTER 25—AMENDMENT AND CORRECTION OF PATENTS

* * * * *

[§256. Misjoinder of inventor.

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

§256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without and deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

CHAPTER 16—OWNERSHIP AND ASSIGNMENT

* * * * *

§261. Ownership; assignment.

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

CHAPTER 29—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

Sec.

281. Remedy for infringement of patent.

* * * * *

294. Voluntary arbitration.

* * * * *

§294. Voluntary arbitration.

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

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TRADEMARK ACT OF 1946

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Sec. 8 (a). Duration of registration—Cancelation at end of 6 years unless affidavit of use filed.

Each certificate of registration shall remain in force for 20 years: *Provided,* That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patent and Trademark Office an affidavit showing that said mark is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

Sec. 8(b). Cancelation of republished prior registrations unless affidavit of use filed.

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is [still] in use

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in commerce or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

* * * * *

Sec. 11. Acknowledgments and verifications.

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority [shall] *is* proved by a certificate of a diplomatic or consular officer of the United States *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* and shall be valid if they comply with the laws of the state or country where made.

* * * * *

Sec. 13. Opposition to registration of marks on the Principal Register.

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file [a verified] *an* opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause *when requested prior to the expiration of an extension.* The Commissioner shall notify the applicant 86 of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as may be prescribed by the Commissioner.

SEC. 14. A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

> *Provided,* That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

Sec. 15. Incontestability under certain conditions of right to use mark.

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade name continuing from a date prior to the date of [the publication] *registration* under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in conncection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided,* That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.

Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affidavit of the filing thereof.

Sec. 16. Interference.

[Whenever application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive, the Commissioner may declare that an interference exists.]*Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to decieve.* No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

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§31. Fees

Aug. 27, 1982

[H.R. 6260]

Patent and Trademark Office

Appropriation authorizations

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

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(65) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1

Rules of Practice in Patent Cases; Reexamination Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent cases to provide procedures for the reexamination of patents. Public Law 96–517 amended the patent act to authorize reexamination proceedings as a means for improving the quality of United States patents. The Patent and Trademark Office intends, through this amendment of its rules, to provide patent owners and the public with guidance on the procedures the Office will follow in conducting reexamination proceedings.
Date: Effective date: July 1, 1981.
For Further Information Contract: Mr. R. Franklin Burnett by telephone at [703]557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.

Supplementary Information: This rule change relates to a procedure for reexamination of patents as provided for in Public Law 96–517, section 1 of which relates to reexamination and becomes effective on July 1, 1981.

Background

A notice of proposed rulemaking was published in the Federal Register on Jan. 13, 1981 at 46 FR 3162–3175 and in the *Official Gazette* on Feb. 17, 1981 at 1003 O.G. 36–47.

The proposed rulemaking set forth two somewhat distinct procedures directed towards determining and improving the quality and reliability of United States patents. The procedures were (1) provisions for reexamination of patents as provided for in Pub. L. 96–517, section 1 of which relates to reexamination and becomes effective on July 1, 1981, and (2) provisions for inter partes protest proceedings in a patent application between the patent applicant and a member (or members) of the public who has (have) access to the application file.

An oral hearing was held on Apr. 16, 1981. Fifty-nine written letters and statements were submitted. Nineteen

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persons testified at the oral hearing which resulted in 107 pages of testimony.

Discussion of General Issues Involved

After careful consideration of the comments which have been received, the part of the proposed rulemaking relating to reexamination of patents as set forth in new Chapter 30 which Pub. L. 96–517 added to Title 35 of the United States Code [35 U.S.C. 301–307] is being adopted with certain changes. The remainder of the proposal relating to inter partes protest proceedings is not being adopted.

The comments relating to the proposed rules for inter partes protest proceedings were generally mixed, with a majority of persons and associations submitting comments either opposed to these proposed rules or indicating that adoption of the proposed rules should be delayed or deferred for further study and consideration.

A number of comments were received requesting some further changes to the rules be made. The thrust of some of the suggested changes would be to remove public access to reissue applications and to limit public participation in the examination of reissue applications. The changes suggested included restoring the rules in these areas to essentially their pre-1977 form. In particular, it was suggested that §1.175 be amended to eliminate paragraph (a)(4). These changes were not a part of the published proposal and are not being adopted at this time. Their consideration and adoption would require a new notice of proposed rulemaking.

Further, since the subject matter of reissue applications is already known to the public the necessity for maintaining them in confidence is not compelling. The elimination of paragraph (a)(4) of §1.175 would not have a significant effect since less than one-fourth of the currently filed reissue applications are based solely upon the 1977 change to §1.175. Under the present circumstances, it is more appropriate to defer any consideration of such changes until this issue has been reviewed further and possibly until some experience is gained under the rules adopted herein relating to reexamination. Such experience may indicate the desirability of either retaining the 1977 change to §1.175, deleting the 1977 change, or making different changes in the rules.

The comments relating to reexamination were generally favorable with most of the comments indicating general approval of the proposed rules. Among the more often mentioned specific comments were suggestions relating to public notice of reexamination requests and/or orders. A number of comments also related to requester and/or third party participation in the reexamination proceeding and also to the scope of the proceeding.

After careful review of the comments and suggestions it has been decided to adopt the suggestions relating to the publication in the *Official Gazette* of requests for reexamination for which the fee has been paid. In addition, any reexaminations ordered at the initiative of the Commissioner will also be announced in the *Official Gazette*. The announcement will include at least the date of the request or any Commissioner initiated order, a reexamination request or order control number, the patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

The suggestions and comments relating to more participation in the reexamination proceeding by the requester and third parties have been adopted only to a limited degree. The requester will in general have only that participation provided by the rules as proposed. However, any citations under §1.501 by any person will be entered in the patent file up until the date of an order to reexamine. The essentially ex parte nature of the proceeding is believed to be in keeping with the spirit and intent of the statute even though the statute does not require ex parte proceedings. Ex parte proceedings will minimize the costs and other effects of reexamination requests on patentees, especially individuals and small businesses.

The scope of the reexamination proceeding which was originally proposed has been essentially adopted in the final rules. The suggestions that the rules be broadened to include other issues have not been adopted since the other issues would unduly complicate the proceedings, raise the expense of the proceedings and raise questions whether such issues can be considered under Pub. L. 96–517.

Discussion of the Major Specific Issues Involved

The rules relating to reexamination proceedings are directed to the procedures set forth in new Chapter 30 of Title 35 of the United States Code (35 U.S.C. 301–307). This Chapter provides for the citation of prior art in patents, filing of requests for reexamination, decisions on such requests, reexamination and appeal from reexamination decisions, and the issuance of a certificate at the termination of the reexamination proceedings. Present §§1.1, 1.5, 1.11, 1.33, 1.34, 1.36, 1.104, 1.107, 1.109, 1.111, 1.112, 1.113, 1.115, 1.116, 1.121, 1.191, 1.192, 1.196, 1.197, 1.231, 1.248, 1.301, and 1.303 are amended to provide for reexamination procedures. A new "Subpart D-Reexamination of Patents" includes new §§1.501, 1.510, 1.515, 1.520, 1.525, 1.530, 1.535, 1.540, 1.550, 1.552, 1.555, 1.560, 1.565, and 1.570. Paragraph (b) of §1.291, relating to prior art citations in patents, is deleted, since provisions therefor appear in §1.501.

Section 1.1, as amended, provides for communications relating to reexamination proceedings to be marked "Box Reexam" to speed internal Office mail processing. No comments were received concerning this section. The proposal has been modified to indicate that only requests should be marked "Box Reexam".

Section 1.5, as amended, provides for all letters relating to a reexamination proceeding to be identified by patent number and a reexamination request control number. No comments were received concerning this section. Section 1.5 has been modified to also include reference to the Group Art Unit and the examiner, if known.

Section 1.11, as amended, provides for all papers made of record in reexamination proceedings to be open to inspection and copying by the public. Eighteen comments were received relating to publication of a notice in the *Official Gazette*. A new paragraph (c) has been added which provides for the publication of requests with sufficient fees paid and orders initiated by the Commissioner. Proposed paragraph "c" has been adopted as paragraph "d".

Section 1.33, as amended, has a new paragraph (c) relating to which address communications for the patent owner will be sent and who may sign papers filed. Four comments were received on this section relating to whom the mail should be addressed. One proposal, which suggested use of the current address of the attorney or agent of record, was adopted.

Section 1.34, as amended, provides for the appointment of an attorney or agent in a reexamination proceeding. Only one comment was received on this section which proposed a rule specifically allowing attorneys to file requests without identifying their clients. Since any person may request reexamination, such a rule is not felt necessary.

Section 1.36, as amended, provides for the revocation and withdrawal of powers of attorney in a reexamination proceeding. No comment was received. Section 1.36 is adopted as proposed with an additional change which added "or her" near the end.

Section 1.104, as amended, broadens the present section to also include reexamination. Three comments were received on §1.104. All comments indicated that the examiner should not make a prior art search. Although no complete new search by the examiner is required, the use of patents and printed publications in addition to those submitted by the requester is clearly indicated in 35 U.S.C. 303(a). According, §1.104 is adopted as proposed. .

Section 1.107, as amended, provides for the citation of prior art by the examiner in a reexamination proceeding. The amended rule also refers to foreign published applications, as well as patents. No comments were received on this section. It is adopted as proposed.

Section 1.109, as amended, provides for the examiner to supply reasons for allowance in a reexamination proceeding if the examiner believes that the record does not make clear the reasons for allowing a claim or claims. No comments were received on this section. Except for a clarifying change in language, it is adopted as proposed.

Section 1.111, as amended, provides for replies by the patent owner in a reexamination proceeding. One comment was received which suggested a clarification. The suggestion was adopted. Other non-substantive changes have been made in the proposed section to shorten the sentences for clarity.

Section 1.112, as amended, provides for reexamination and reconsideration of the patent under reexamination after responses by the patent owner. Three comments were received on this section.

The wording has been changed as suggested to avoid any confusion between "reexamination" and "reexamine". The sentences have also been shortened for clarity.

Section 1.113, as amended, provides for a final rejection or action in a reexamination proceeding. One comment was received which pointed out a possible conflict between the amendment rights of section 305 and the final rejection of section 1.113. No problem is seen in this regard because of the provision of section 305 which states that"reexamination will be conducted according to the procedures established for initial examination." The section is adopted as proposed with the last sentence being divided into two sentences for clarity.

Section 1.115, as amended, provides for amendments by the patent owner in a reexamination proceeding. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity.

Section 1.116, as amended, provides for amendments after final action in reexamination proceedings. One comment was received which was the same as that mentioned and responded to in Section 1.113 above. The sentences have been shortened for clarity.

Section 1.121, as amended, contains a new paragraph (f) which requires a complete copy of any new or amended claim when presented during reexamination proceedings. Two persons commented on this section. One proposed side-by-side presentation of amended and original claims. The other proposed that exactly the same procedure be used as is now in effect for amending reissue claims. Neither suggestion was adopted since neither lends itself to printing only the amended claims in a certificate as easily as the procedure set forth in §1.121(f). The proposed section was revised to also provide for the amendment of the description. In addition, the last three sentences of §1.510(e) have been inserted as the last three sentences of §1.121(f) in order to provide a more complete description therein of the manner of making amendments, including the numbering of claims, the restriction on scope of the claims and the prohibition against the introduction of new matter.

Section 1.191, as amended, provides for appeal to the Board of Appeals by the patent owner from any decision adverse to patentability, in accordance with 35 U.S.C. 306. One comment was received on proposed §1.191 which urged that the requester should also be entitled to appeal. This proposal was not adopted because it is not provided for in the law and could result in harassment if permitted. The section is adopted as proposed except that "primary" contained in the existing rule is retained.

Section 1.192, as amended, provides two months from the date of the Notice of Appeal for the patent owner to file an appeal brief in a reexamination proceeding. Five comments were received relating to §1.192 which proposed that the period for filing an appeal brief in a reexamination appeal be two months as in other appeals. The proposed rule has been adopted with the suggested two month period. The sentences have been shortened for clarity.

Section 1.196 and §1.197 are being amended to refer to "appellants", which is a term which includes both applicants and patent owners.

These two sections were not published for comment, however, the issues involved were presented in proposed§§1.191 and 1.192. Paragraph (c) of §1.197 has also been rewritten for clarity.

Section 1.231(a)(1), as amended, provides for a motion that a patent claim is unpatentable in an interference proceeding where reexamination thereof has also been requested.

Three comments were received concerning §1.231. All comments related to when interference or reexamination proceedings would be suspended. Section 1.565 provides basis for such suspensions. Decisions will be made on a case by case basis, depending on the particular fact situation. The sentences in §1.231(a)(1) have been shortened and rearranged for clarity.

An amendment was proposed to delete the last two sentences of §1.247 relating to proof of service. No comments were received concerning this section but, on reconsideration, no need for such deletion is felt necessary and no change is being adopted.

Section 1.248, as amended, includes a new paragraph (b) relating to methods of serving papers and proof of service. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity and to conform to the Federal Rules of Civil Procedure.

Section 1.291, as amended, deletes paragraph (b). Former paragraph (b) dealt with the citation of prior art provisions. It was deleted since the provisions are now covered by §1.501. Five persons commented on §1.291. One comment relating to filing protests in reexamination proceedings was not adopted since such proceedings are ex parte in nature and are limited to consideration of prior art patents and printed publications cited by the public prior to the order. Two persons mentioned providing a procedure for citation of prior art by patentees. Citation of prior art by patentees is included in §1.501. The two other comments related to the content of protest proceedings, which are not part of this final rule. Section 1.291 is adopted as proposed except that the paragraph designation of (c) is not being changed.

Section 1.301, as amended, provides for appeal by the owner of a patent in reexamination proceedings to the U.S. Court of Customs and Patent Appeals. Four comments were received relating to §1.301. One person suggested the insertion of "any" as the fourth word in the section. This suggestion was adopted. The other three comments related to appeals in inter partes protest proceedings which are not a part of this promulgation. Section 1.301 is adopted as proposed with only the above mentioned change.

Section 1.303, as amended, provides for remedy by civil action under 35 U.S.C. 145 for the owner of a patent in reexamination proceedings. No comments were received concerning this section. The changes from the proposal are the insertion of "any" as the fourth word in the section as suggested in §1.301 and the addition of, "306" to the title.

New §1.501 provides a system for citation of patents and printed publications to the Patent and Trademark Office for placement in the patent file by any person during the period of enforceability of the patent in accordance with 35 U.S.C. 301. Seventeen persons commented on §1.501. Nine comments indicated that citations should be limited to patents or printed publications. Six comments indicated that persons citing art should be required to apply it to at least one claim. Three persons held the opposite view. The final rule wording provides for citations limited to patents and printed publications where the person making the citation states the pertinency and applicability of the citation to the patent and the bearing the citation has on the patentability of at least one claim of the patent. The final

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rule provides that a citation made by the patent owner may include an explanation of how the claims differ from the prior art cited. Any citations which include items other than patents and printed publications will not be entered in the patent file. This does not, of course, limit in any manner the kinds and types of information which can be relied upon in protests against pending patent applications, whether such be original applications or reissue applications. Four persons stated that a separate letter requesting confidentiality should be required in cases desiring confidentiality. This provision was not considered to be necessary. One comment requested clarification of the term "period of enforceability of a patent." The meaning of this term appears to be clear since it includes any period for which recovery can be had for infringement. Under usual circumstances, this would be the term of the patent plus the six years provided by 35 U.S.C. 286. Five comments were received relating the paragraph (c) concerning service of citations on the patent owner. The wording has been clarified. A suggestion was made that prior art copies and translations of non-English documents be required. This suggestion was not adopted since such documents are not absolutely essential until a request for reexamination has been filed. However, if the person citing the patents or printed publications desires that they be considered in any subsequent reexamination proceedings, copies and any necessary English translation should be included with the citation. A proposal was also made to charge a fee to prevent harassment. This proposal was not adopted since the mere citation of prior art is not considered to constitute harassment. A suggestion was made to change the title of the section. This suggestion was adopted in slightly modified form.

New §1.510 sets forth procedures for any person to request reexamination in accordance with 35 U.S.C. 302. Paragraph (a) of new §1.510 limits the period for such request to the period of enforceability of the patent for which the request is filed and requires payment of the fee for requesting reexamination. Paragraph (b) of new §1.510 indicates what each request for reexamination must include. Paragraph (c) of new §1.510 indicates under which conditions a request for reexamination will be considered. Paragraph (d) of new §1.510 indicates the date on which the entire fee is received will be considered to be the date of the request for reexamination. Upon reconsideration of the paragraph as proposed, it was considered more appropriate to base the filing date of the request for reexamination on the receipt of the fee for requesting reexamination rather than include other matters. Proposed paragraph (d) has been amended accordingly and is adopted. Paragraph (e) of new §1.510 covers amendments which a patent owner can propose. Such amendments can accompany a request for reexamination by the patent owner. The paragraph, with changes in wording for clarity, is adopted as proposed. A new paragraph (f) was added to clarify that requests for reexamination may be filed by attorneys or agents on behalf of a requester. Nineteen persons commented on §1.510. One person inquired as to whether confidential requests would be accepted. In response thereto, §1.510 provides that any person may file a request for reexamination. That person's name will not be maintained in confidence. One suggestion was made to permit comment and rebuttal before the decision under §1.515. No need for such a procedure is seen since the only question to be considered is whether or not a substantial new question of patentability has been raised. An opportunity for comment and rebuttal is provided after the issuance of the order. One comment was received which desired provision for supplemental requests at a reduced fee. This proposal was not adopted since it is felt that all requesters should share equally in the cost. One comment was received which proposed that duplicate copies of the request be filed in the Office so that one copy would be available for public inspection at all times. This proposal was not adopted since it would appear to create more problems than it would solve. One comment was received that only "readily available" translations should be required. It is felt that if a document is considered to be sufficiently pertinent to request reexamination, that an English translation should be provided to insure complete and proper consideration. A suggestion was made relating to paragraph (b)(5) that direct service be limited to registered patent attorneys. No need for such a restriction is seen. Various other comments relating to procedures were considered but were not adopted.

New §1.515 relates to a determination as to whether the request has presented a substantial new question of patentability under 35 U.S.C. 303. Paragraph (a) of new §1.515 requires that the determination be made within 3 months of the filing date of the request. Paragraph (b) of new §1.515 refers to the refund provisions. Paragraph (c) of new §1.515 provides for review by petition to the Commissioner of any decision refusing reexamination. Seven persons commented on §1.515. Several comments were received suggesting that the term "reexamination" should be dropped before "examiner". This proposal was adopted. Several persons requested that all art cited in the patent file at the time of the order under §1.525 be considered when deciding whether a substantial new question of patentability is presented in the request. This is possible under the provision of §1.515(a) which permits "consideration of other patents or printed publications", but is not required insofar as prior art not relied upon in the request is concerned. One person suggested that "is" be changed to-affirms-in paragraph (c). This proposal has been adopted. One commentor questioned whether a right to review was available under paragraph (c) if reexamination was ordered. No right to review exists in such a case because all claims will be reviewed in view of all prior art during the reexamination under §1.550.

New §1.520 provides for reexamination at the initiative of the Commissioner under the provisions of the last sentence of paragraph (a) of 35 U.S.C. 303. Six persons commented on §1.520. One comment was received that indicated that the section did not include a reference to patents "discovered by the Commissioner" which is contained in 35 U.S.C. 303(a). This phrase has been added to the rule. A request was made that the sentence "Normally requests from outside-will not be considered." be deleted from the rule. The sentence is being retained since the rule wording provides an easy reference for Office policy. Two comments were received that indicated a desire to have any decisions not to reexamine in Commissioner initiated situations be made part of the patent file. This proposal was not adopted since the basis for not reexamining may involve many policy issues in addition to whether a substantial new question of patentability exists in the case. If all papers in such a case would be made part of a file, it may lead to conclusions that there are no new questions of patentability when this question may not have been addressed because the reexamination was not ordered for other reasons such as little or no interest in a patent about to expire. One comment stated that the section safeguards the rights of the patentee. The language referring to the designation and delegation of authority to appropriate Patent and Trademark Office officials is deleted as unnecessary since the Commissioner's authority to designate and delegate is implicit and understood.

New §1.525 provides for ordering reexamination where a substantial new question of patentability has been found pursuant to §§1.515 or 1.520. Six comments were received relating to §1.525. One comment was made that the attorney should be able to return notices to the sender if he is unable to contact the patent owner. This topic has not been added to the rules but will be handled on a case by case basis. One comment requested that the patent owner have the option to request that the reexamination be performed by an examiner (1) other than the original examiner, or (2) other than the examiner who issued the order. Comments were also received on both sides of the question as to whether the original examiner should conduct the reexamination. In response, it would appear to be inappropriate to allow an interested party to select the examiner. Under the section, the only limitation placed on the selection of the examiner by the Office is that the same examiner whose decision was reversed on petition ordinarily will not conduct the reexamination. Paragraph (b) has been changed to provide that the notices published in the *Official Gazette* will be considered to be constructive notice.

New §1.530 relates to the statement and proposed amendments provided for in the second sentence of 35 U.S.C. 304. Amendments submitted by the patent owner cannot enlarge the scope of a claim in the patent. Amendments will not be effectively entered into the patent until the certificate under §1.570 and 35 U.S.C. 307 is issued. Nine comments were received on §1.530. Several persons felt that the patent owner should be allowed to comment before the decision under §1.515 is made. Providing for such a comment would delay the decision under §1.515 which must be made within three months following the filing date of the request. Further, no need is seen for a statement relating to whether a new question of patentability is present since the patent owner has the opportunity to address any issues of patentability only after the first Office action. One comment questioned whether paragraph (d) also related to the description. This paragraph has been amended to clarify the matter. One person questioned whether an amendment could be filed with a statement. Paragraph (b) clearly answers this question in the affirmative. Several comments requested more time than two months for the patent owner to file a statement. In reply, the law in section 304 indicates that a reasonable period of not less than two months be provided for the patent owner's statement. If the period is too short in particular situations, extensions of time can be requested. It is felt that two months should be retained in the rule in view of the "Special Dispatch" required in reexamination cases. The proposed second sentence of paragraph (b) has not been adopted since §1.525(b) now provides for the publication of notices of the filing of all requests which are accompanied by the proper fee.

New §1.535 provides for reply by the reexamination requester to the statement under §1.530 of the patent owner and for service on the patent owner of any such reply. The last sentence of proposed §1.540 has been added as the last sentence of §1.535. Five persons commented on §1.535. Four persons indicated that the requester should be given additional opportunity to comment. The reasons for the limited participation are that it is all that is required under the law, it prevents to a great degree, harassment of a patent owner, it results in a less expensive proceeding for all parties, and it results in an earlier conclusion of the proceedings.

New §1.540 relates to the consideration of statements under §1.530 and replies under §1.535. One comment was received that the phrase "may result in their being refused" was worded too loosely. In the absence of any specific suggestion, the proposed wording is considered to be adequate and is adopted as proposed. In addition, it is appropriate that the Office retain discretion as to consideration in such cases.

New §1.550 covers the basic items relating to the conduct of reexamination proceedings. These proceedings basically follow the same procedures used for examining patent applications. The patent owner will be required to serve the reexamination requester with any response by the patent owner to the Office, in order to remove the necessity of the requester having to continuously monitor the file wrapper. Fourteen persons commented on §1.550.

Several persons commented that they felt that at least some input by third parties should be permitted. Paragraph (e) has been revised to permit third party input up until the time of the order. Several comments were received that the periods for response should be extended to be similar to those in regular application Office actions. Although problems may arise in certain cases and extensions of time may be granted, it is felt that relatively short response times are necessary in order to process reexaminations with "special dispatch." A question was raised as to the effect of failure to respond to an Office action. Paragraph (d) has been amended to clarify this matter.

New §1.552 covers the scope of reexamination in a reexamination proceeding. While it is not intended that the examiners will routinely complete a new search when conducting reexamination, the examiners will be free to, and will, very likely, conduct additional searches and cite and apply additional prior patents and publications when they consider it is appropriate and beneficial to do so. Insofar as the actual reexamination is concerned, the examination as to original patent claims is only on the basis of patents or printed publications. However, narrowed amended claims or new claims limited to the original disclosure will also be examined for compliance with other sections of the statute (35 U.S.C. 112 and 132) which are necessary in order to ensure that any amended or new claims are supported, valid, and do not introduce new matter. New §1.552 also provides that questions relating to matters other than those identified in paragraphs (a) and (b) of the section would merely be noted by the examiner as being an open question in the record. Patent owners could then file a reissue application if they wish such questions to be resolved. Ten persons commented on §1.552. Several persons commented that the question of fraud should be considered in reexamination proceedings. Comments were also received that the proceedings should be limited to patents and printed publications. The rules have been written to follow the statute which speaks only to reexamination based on patents and printed publications. Mixed comments were also received concerning the retention of the second sentence of paragraph (c). The paragraph is being adopted as proposed with the addition of a reference to the fact that the examiner will note the existence of unresolved questions in an Office action. In addition, the phrase "raised or" has been deleted from paragraph (c) as unnecessary.

New §1.555 covers the duty of disclosure by a patent owner in a reexamination proceeding involving the owner's patent. Nine persons commented on §1.555. Four persons supported placing a duty of disclosure on the patent owner. One comment was received that an oath or declaration be required of the patent owner in a reexamination so as to minimize the appearance and occurrence of any fraudulent acts and to emphasize the patentee's obligation of candor. While the suggestion for an oath or declaration has not been adopted, §1.555 does place an obligation of candor on the patent owner insofar as bringing patents or printed publications to the attention of the Office is concerned. The necessity for an oath or declaration in addition to the obligation placed on the patent owner by §1.555 is not apparent at this time. Accordingly, the suggestion has not been adopted. Two persons felt the duty of disclosure should apply to both the patent owner and requester. This proposal was not adopted since no sanction could be easily applied against the requester who violated such a rule. One person suggested broadening the duty requirements to include information in addition to patents and printed publications. Although such a practice may be desirable, no need is seen to require information under the reexamination rules which cannot be used during the reexamination. One person felt that there should be no duty of disclosure requirement in reexamination proceedings since the Office will be considering specific prior art and the presence or absence of other prior art does not seem terribly relevant. This suggestion was not adopted since the issue of patentability is not limited to the specific prior art presented and the duty to disclose is consistent with current practice under §1.56. The section is adopted as proposed except for the indication that prior art statements should be filed in accordance with §1.98. Also, the section has been divided into two sentences for clarity.

New §1.560 relates to the conduct of interviews in reexamination proceedings. Seven comments were received directed to §1.560. One comment requested elimination of interviews. This suggestion was not adopted since interviews have been found to be very helpful in

resolving issues. Five comments were received which indicated that the requester should be permitted to attend all interviews. This suggestion was not adopted because of the otherwise ex parte nature of the examination. Two comments were received which indicated that interviews should be permitted before the first Office action. This suggestion was not adopted since such interviews would be held at a time when the Office has not yet taken a position on the allowability of the claims under reexamination. Section 1.560 is adopted as proposed.

New §1.565 provides for the Commissioner to determine which, if any, proceedings should be stayed, consolidated, or suspended, if concurrent proceedings involving the patent under reexamination are instituted or in progress. Four comments were received concerning§1.565. One comment pointed out the desirability of combining copending reexamination proceedings. This concept has been accepted and a new paragraph (c) has been added to cover this matter. Two comments voiced concern over the possibility of delay resulting from stayed, suspended or combined cases. Although some delay may result, it is felt that a resolution of all issues should occur at an earlier date. Decisions as to whether to delay or combine cases will be made on a case by case basis to minimize delays and to protect the interests of all parties concerned. One comment was made to allow the patent owner to comment prior to any decision to stay proceedings by the Commissioner. The desirability of such comment will be decided on a case by case basis and is not considered desirable for placement in the rules. The addition of paragraph (c) and the insertion of "is or" before "becomes" in the first sentence of paragraph (b) are the only changes from the proposed rule.

New §1.570 concerns the issuance of the reexamination certificate under 35 U.S.C. 307 after conclusion of reexamination proceedings. The certificate will cancel any patent claims determined to be unpatentable, confirm any patent claims determined to be patentable, and incorporate into the patent any amended or new claim determined to be patentable. Three commentors mentioned §1.570. Two persons questioned the statutory authority for paragraph (d). In response to the concern for statutory authority, it is the position of the Office that once all of the claims have been canceled from the patent, the patent ceases to be enforceable for any purpose. Accordingly, any pending reissue or other Office proceeding relating to a patent in which such a certificate has been issued will be terminated. This provides a degree of assurance to the public that patents with all the claims canceled via reexamination proceedings will not again be asserted. One commentor indicated that copies of the certificate should be part of subsequently sold copies of the patent. Such a practice is intended but is not being made part of the regulations.

Environmental, energy, and other consideration: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

[Text of adopted rules appears in 37 CFR. revised July 1, 1982.]

May 12, 1981. RENE D. TEGTMEYER,
Acting Commissioner of Patents and Trademarks.

May 15, 1981. ROBERT B. ELLERT,
Acting Assistant Secretary for Productivity, Technology, and Innovation.

[FR Doc. 81–16031 Filed 5–26–81; 8:45 am]

[1007 O.G. 30]

(66)

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 & 5
[Docket No. 21223–239]

Revision of Patent Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to implement the sections of Public Law 97–247 of 1982 which become effective on Feb. 27, 1983, and to make other miscellaneous changes. The other miscellaneous changes are being made to clarify and improve the rules where appropriate. The rulemaking also is amending Part 5 of 37 CFR to establish procedures for expediting the granting of a license under 35 U.S.C. 184 permitting the filing of a patent application in a foreign country.
Effective Date: Feb. 27, 1983.
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) implement the changes in practice in the Patent and Trademark Office provided for in Public Law 97–247 enacted on Aug. 27, 1982; 2) clarify or rewrite certain rules; and 3) expedite the granting of licenses under 35 U.S.C. 184.

This rule change contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves.

Certain of the changes are housekeeping in nature.

A number of final rules have already been issued to implement Public Law 97–247. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086–33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on Aug. 10, 1982, at 1021 O.G. 19–94. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134–40140 and on Sept. 21, 1982 at 1022 O.G. 29–46. A "Revision of Patent and Trademark Fees Confirmation" was published on Sept. 17, 1982 at 47 FR 41272–41283 and on Sept. 28, 1982 at 1022 O.G. 61–97. A final rule relating to the definition of "small business concern" was published on Sept. 30, 1982 at 47 FR 43272–43276 and on Oct. 19, 1982 at 1023 O.G. 23–29.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules:

Section 1.4

Section 1.4 is amended as proposed to add a reference to Subpart D relating to citation of prior art and reexamination.

Section 1.6

Section 1.6 is amended as proposed to insert "federal" before "holidays" in paragraphs 1.6(a)-(c) in accordance with §21(b) of Title 35, United States Code, as amended by Public Law 97–247. New paragraph 1.6(d) will establish in the regulations a procedure under which papers and fees which could not be filed on a particular date because of an interruption or emergency in the United States Postal Service which is so designated by the Commissioner, may be promptly filed after the ending of such a designated interruption or emergency and be considered as having been filed on that particular date. Authority for such a practice is found in §21(a) of Title 35, United States Code, as amended by Public Law 97–247.

Section 1.7

Section 1.7 is amended as proposed to insert "federal" before "holiday" in accordance with 35 U.S.C. 21(b), as amended by Public Law 97–247.

Section 1.8

Section 1.8 is amended to remove in paragraph 1.8(a) the references to §§3.55 and 4.23, which sections were removed from the rules by the rulemaking entitled "Revision of Patent and Trademark Fees" published in the Federal Register on September 10, 1982 at 47 Fed. Reg. 40134–40140. The change in paragraph 1.8(a)(i) results from the change made in §111 of Title 35, United States Code, by Public Law 97–247. Under the revised rule, the certificate of mailing procedure would be available for filing patent oaths or declarations and filing fees. However, the certificate of mailing procedure could not be used for filing patent specifications and drawings to obtain a filing date. Such papers can be filed under new §1.10. The final rule clarifies that each paper or fee filed under §1.8 must include its own certificate of mailing. The proposed amendment to §1.8(a)(viii) referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, has been adopted as a final rule as published on Oct. 26, 1982 at 47 FR 47380–47382 and therefore is not republished here.

Section 1.10

Section 1.10 is amended as proposed to provide a procedure for assigning the date on which any paper or fee is deposited as "Express Mail" with the United States Postal Service as the filing date of the paper or fee in the Patent and Trademark Office. Authority for the Commissioner to establish such a procedure is provided in §21(a) of Title 35, United States Code, as amended by Public Law 97–247 for any paper or fee required to be filed in the Patent and Trademark Office. This procedure covers the filing of all documents, including patent and trademark applications, and fees since they are required to be filed in the Patent and Trademark Office for processing. Questions were raised during the public hearing and in the written comments regarding the authority of the Commissioner to promulgate §1.10 insofar as it would provide for the use of "Express Mail" to file patent and trademark applications. The argument advanced was that the amendment of 35 U.S.C. 21(a) by Public Law 97–247 did not permit the Commissioner to adopt rules whereby "Express Mail" could be used to file patent and trademark applications since such applications are not papers or fees "required to be filed in the Patent and Trademark Office." It was urged that this language of 35 U.S.C. 21(a), in conjunction with amended 35 U.S.C. 111 which states that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office," prevents adoption of proposed §1.10.

The arguments presented are not supported by the legislative history or by the literal language of the statute. Section 111 of Title 35, United States Code, before and after Public Law 97–247, requires patent applications to be made "in writing to the Commissioner." This is apparent from the first sentence of 35 U.S.C. 111 which provides that "[a]pplication for patent shall be made. . .in writing to the Commissioner." Thus, one seeking a patent is "required" to make application for the same "in writing to the Commissioner." The written application clearly constitutes a "paper or fee required to be filed in the Patent and Trademark Office." Section 21(a) of Title 35, United States Code, authorizes the Commissioner to adopt rules whereby "any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." The authority provided by section 21(a) extends to "any paper or fee" to which the Commissioner, by an appropriate rulemaking, so extends it. The Commissioner can, therefore, by rule, establish that "any paper or fee," including a patent or trademark application, is "filed" or "received in the Patent and Trademark Office" when it is deposited with the United States Postal Service. The terms "filed" and "received" as used in 35 U.S.C. 21(a) and 111 can therefore be given the same meaning by an appropriate rulemaking by the Commissioner.

The legislative history, H.R. Rep. No. 542, 97th Cong., 2nd Sess. 8A (1982), clearly supports the interpretation set forth herein. In discussing new subsection (a) which has been added to section 21 of Title 35, United States Code, the Report emphasizes that the authority extends to "any paper or fee which is required to be filed" in the Patent and Trademark Office. The Report specifically states that the "requirements governing whether any given paper or fee may be given the filing date of the day on which it was . . . deposited with the United States Postal Service will be set forth in regulations established by the Commissioner." Clearly no restrictions were placed by the statute or the legislative history on the types of papers or fees which the Commissioner can consider as having been filed in the Patent and Trademark Office on the date of deposit with the United States Postal Service.

The new procedure, in paragraph 1.10(a), requires the use of the "Express Mail Post Office to Addressee" service of the United States Postal Service. This service provides for the use of a mailing label on which the Post Office clearly indicates the date on which it was deposited. Paragraph 1.10(b) requires (1) that the number of the "Express Mail" mailing label be placed on each paper or fee and (2) that a certificate of mailing by "Express Mail", signed by the person mailing the paper or fee, be included on each paper or fee and state the date of deposit as "Express Mail" in the United States Postal Service. The requirement that each paper or fee have the number of the "Express Mail" mailing label and the certificate of mailing by "Express Mail" included thereon is necessary so that the Patent and Trademark Office can verify when each paper or fee was filed if questions relating thereto arise. The number and certificate must be placed on each separate paper and each fee transmittal either directly on the document or by a separate paper firmly and securely attached thereto. It is not necessary that the number and certificate be placed on each page of a particular paper or fee transmittal. Merely placing the number and certificate in one prominent location on each separate paper or fee transmittal will be sufficient.

Under new paragraph 1.10(c), the Office will accord the paper or fee the date of deposit as "Express Mail" as the filing date without further proof unless a question is present regarding the date of mailing. If, however, more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date, or if other questions regarding the date of mailing are present, new paragraph 1.10(c) provides that the person mailing the paper or fee may be required to file (1) a copy of the "Express Mail" receipt showing the actual date of mailing and (2) a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement (oath or declaration) unless made by a person registered to practice before the Patent and Trademark Office.

The certificate of mailing procedure of §1.8(a) continues to be available in addition to the proposed procedure under §1.10. The final rule (§1.10) has been changed from that proposed to allow for a reasonable time between mailing and delivery rather than only for one day since actual delivery in one day is not always provided from all areas of the country. The final rule clarifies that each paper or fee must include its own certificate of mailing by "Express Mail." This rule is being promulgated at this time so that individuals who desire to use the service may do so after the effective date.

The "Express Mail" service is seen to be preferable to other types of postal services because a readily legible mailing date is provided to both the applicant and the Patent and Trademark Office on the "Express Mail" label. Also, the labels are of uniform size and can therefore be kept on file relatively easily by the Office, if such is determined to be necessary or desirable. Registered mail and certified mail, on the other hand, provide only a postmark for the mailing date when such mail arrives in the Patent and Trademark Office and such postmarks are often illegible. Also, such mail arrives in various size envelopes which do not easily lend themselves to being filed so that the postmark may be retained. Administrative burdens including lack of certainty of mailing date and storage are considered greater for registered or certified mail than for "Express Mail." The Patent and Trademark Office will monitor closely the use of "Express Mail" by the public and may reconsider permitting the use of other forms of service provided by the United States Postal Service.

Section 1.17

Section 1.17, paragraph (h), is amended as proposed to remove the reference to §1.45 and add a reference to new §1.48 relating to the correction of inventorship in patent applications.

Section 1.22

Section 1.22 is amended to recognize that filing dates may be assigned without payment of the basic filing fee as authorized by §111 of Title 35, United States Code, as amended by Public Law 97–247. New paragraph 1.22(b) indicates that fees paid to the Office should be itemized in such a manner that the purpose for which the payment is submitted can be clearly determined by Office personnel for proper processing. The final rule includes clarification that it refers to patent and trademark fees and charges.

Section 1.24

Section 1.24 is amended as proposed to remove the reference to coupons in denominations of forty cents since coupons in this denomination are no longer necessary.

Section 1.41

Section 1.41 is amended as proposed to require in paragraph 1.14(a) that a patent be applied for in the name of the actual inventor or inventors and that the full names of the inventors be stated. Paragraph 1.41(b), as amended, clarifies the definition of the word "applicant". New paragraph 1.41(c) permits any person authorized by the applicant to file an application for patent in order to receive a filing date on behalf of the inventor or inventors, but the oath or declaration for the application must be made by all of the actual inventors in accordance with §§1.63 and 1.64. Under new paragraph 1.41(d), a showing may be required from the person initially filing an application that the filing was authorized.

Sections 1.42 and 1.43

Sections 1.42 and 1.43 are amended as proposed to remove the requirement that the legal representative sign the application papers in view of the changes in 35 U.S.C. 111, as amended by Public Law 97–247. The oath or declaration must still be signed. Several occurrences of the masculine gender in §1.42 have been removed.

Section 1.45

Section 1.45 is amended as proposed to remove present paragraphs 1.45(b) and (c) in view of new §1.48 and remove the requirement that joint inventors sign the application papers. The joint inventors are, however, still required to make the oath or declaration in accordance with new §§1.63 and 1.64.

Section 1.46

Section 1.46 is amended as proposed, with two commas being added for clarity, to permit anyone to file the application if authorized by the inventor or inventors or one of the persons mentioned in §§1.42, 1.43, or 1.47.

Section 1.47

Section 1.47 is amended as proposed to change the reference for the rule on oaths or declarations from §1.65 to §1.63.

Section 1.48

Section 1.48 adds a new section relating to correction of inventorship as authorized by §116 of Title 35, United States Code, as amended by Public Law 97–247. Under §1.48, if the correct inventor or inventors are not named in an application for patent, the application could be amended to name only the actual inventor or inventors so long as the error in the naming of the inventor or inventors occurred without any deceptive intention on the part of the actual inventor or inventors. Section 1.48 requires that the amendment be diligently made and be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee. Correction will be permitted, if diligently requested, in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Office has the authority to substitute the true inventor for the erroneously named person. If deceptive intention was present on the part of other individuals substantively involved in the preparation or prosecution of the application their conduct will be considered and appropriate action taken under 37 CFR 1.56. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to different, but actual, joint inventors; conversions from erroneously identified joint inventors to different but actual, joint inventors; and conversions from erroneously identified joint inventors to a different, but actual, sole inventor will also be permitted. In each instance, however, the Office will have to be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name. The final rule language has been modified from that proposed to follow more precisely the language of the statute and the legislative history by permitting correction where the error occurred without any deceptive intention on the part of the actual inventor or inventors.

Section 1.51

Section 1.51 is amended to change the reference in paragraph (a)(2) to new §1.63 for the requirements of an oath or declaration and to change paragraph (b) with regard to the required time for filing information disclosure statements. The final rule has been modified from that proposed by eliminating the word "material" before the "information disclosure statement" and the title has been changed to substitute "a complete" for "an" to be more precise.

Section 1.52

Section 1.52 is amended as proposed to revise paragraph 1.52(c) relating to interlineations, erasures, cancellations or other alterations in application papers to specify that such changes must be made before the signing of any accompanying oath or declaration and should be dated and initialed or signed by the applicant on the same sheet of paper. Paragraph 1.52(c), as amended, prohibits making alterations in the application papers after the signing of an oath or declaration referring to such application papers. Under paragraph 1.52(c), as amended, amendments to application papers made after the signing of an oath or declaration referring to the application papers can only be made in the manner provided by §§1.121 and 1.125–1.125.

Section 1.53

Section 1.53 is amended to revise the title to indicate that the section, as amended, relates to application serial numbers, filing dates and completion of applications. Paragraph 1.53(a) indicates that a serial number is assigned to any filed application for identification purposes, even if the application is incomplete or informal. Paragraph 1.53(b) provides that a filing date is assigned to an application as of the date a specification containing a description and claim and any required drawing are filed in the Patent and Trademark Office. Although the filing fee and oath or declaration can be submitted later, no amendments can be made to the specification or drawings which will introduce new matter. This practice is authorized by 35 U.S.C. 111 as amended by Public Law 97–247. New paragraph 1.53(c) provides for notifying applicant of any application incomplete because the specification or drawing is missing and giving the applicant a time period to correct any omission. If the omission is not corrected within the time period given, the application will be returned or otherwise disposed of and a handling fee of $50.00 will be retained from any refund of a filing fee. New paragraph 1.53(d) provides that, where a filing date has been assigned to a filed specification and drawing, the applicant will be notified and be given a period of time in which to file the missing fee, oath or declaration and to pay the surcharge due. The time period the Office plans to set is one month from the date of notification by the Patent and Trademark Office, but in no case less than two months after the date of filing of the application. New paragraph 1.53(e) indicates that a patent application will not be forwarded for examination on the merits until all required parts have been received. New paragraph 1.53(f) indicates that international applications filed under the Patent Cooperation Treaty which designate the United States of America are considered to have a United States filing date under PCT Article 11(3), except as provided in 35 U.S.C. 102(e), on the date the requirements of PCT Article 11(1)(i) to (iii) are met. Paragraphs 1.53(b) and (c) have been modified from those proposed by changing the word "received" to the word "filed." The word "receipt" in paragraph 1.53(c) has also been changed to "filing". These changes have been made to ensure that the language of §1.53 cannot be considered to conflict with the use of "Express Mail" to file patent applications and obtain a filing date as of the date of deposit as "Express Mail" with the United States Postal Service.

Section 1.54

Section 1.54 is amended as proposed to designate the existing section as paragraph (a) and add a reference to §1.53. Paragraph 1.54(b) is added to indicate that applicant will be informed of the serial number and filing date of the application.

Section 1.55

Section 1.55 is amended to limit the section to claims for foreign priority by removing paragraphs (a) and (d) and redesignating paragraphs (b) and (c) as paragraphs (a) and (b). Paragraph 1.55(a) is amended to change the reference from §1.65 to new §1.63. The final rule language includes a reference to 35 U.S.C. 172 which modifies 35 U.S.C. 119 for design patents.

Section 1.56

Section 1.56 is amended to revise paragraph (c) to remove reference to signing of the application but to add reference to signing of the oath or declaration pursuant to new §1.63. Paragraph 1.56(c) has also been modified from that proposed to break it down into four items as suggested by a comment. Under paragraph 1.56(c), an application may be stricken from the files if an oath or declaration pursuant to §1.63 is signed in blank, is signed without review of the oath or declaration by the person making the oath or declaration, or is signed without the review of the specification, including the claims, as required by §1.63(b). Paragraph 1.56(c) also provides for an application to be stricken from the files if application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

Section 1.57

Section 1.57 is removed as proposed since the requirements relating to applicant's signature to the oath or declaration of the application are adequately covered in other sections.

Section 1.59

Section 1.59 is rewritten as proposed to refer to and conform with the changes proposed in §1.53.

Section 1.60

Section 1.60 is amended to require the applicant to supply a copy of the originally signed application in all cases where the §1.60 filing procedure is used. The Office will no longer prepare copies. The Office, by a separate final rule, published at 47 F.R. 47242 on October 25, 1982, has adopted a new §1.62 to provide for the filing of a file wrapper continuing application which greatly lessens the need for the Office to continue to prepare copies under §1.60. The final rule language makes clear that the statement accompanying a true copy of the parent application must be a verified statement unless made by a person registered to practice before the Office.

Section 1.62

Section 1.62 is amended to avoid inconsistency with 35 U.S.C. 111 which becomes effective on February 27, 1983. 35 U.S.C. 111 as of that date permits filing dates to be granted to patent applications without receipt of the basic filing fee, or oath or declaration. Section 1.62 is therefore being amended to permit the granting of a filing date in accordance with §111. This amendment of §1.62 is necessary to ensure compliance with 35 U.S.C. 111. The Patent and Trademark Office finds that it would be impractical not to amend §1.62 so as to grant a filing date in accordance with 35 U.S.C. 111 and not doing so might also be construed to prevent applicants from taking advantage of the provisions of 35 U.S.C. 111 authorizing the delay in the filing of the fee and oath or declaration. If §1.62 is not amended in the manner set forth in this final rule, questions may be raised as to compliance with 35 U.S.C. 111 as it will exist effective February 27, 1983. Revised paragraph 1.62(a) indicates the minimum requirements for granting of a filing date. Paragraphs 1.62(b) and (c) cover the filing fee and oath or declaration requirements, respectively. Paragraph 1.62(d) relates to later filing of the filing fee or oath or declaration as provided for in 35 U.S.C. 111. Paragraphs 1.62(e)-(i) are identical to former paragraphs 1.62(b)-(f).

Section 1.63

Section 1.63 is added to replace 1.65 relating to the required content and execution of an oath or declaration filed as a part of a patent application and is intended to state the minimum contents thereof. An applicant may, if desired, choose to include one or more additional averments in the oath or declaration such as, for example, stating that the patent is not barred under the provisions of 35 U.S.C. 102. Paragraph 1.63(a) provides that the

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oath or declaration, (1) be executed in accordance with §1.66 or §1.68, (2) identify the specification to which it is directed in some definite manner such as giving the title of the invention or serial number of the application, if previously filed, (3) identify each inventor and his or her residence and country of citizenship, and (4) state whether the inventor is a sole or joint inventor of the claimed invention.

Paragraph 1.63(b) further requires the oath or declaration to state that the person signing the oath or declaration (1) has reviewed and understands the contents of the identified specification, (2) believes the named inventor is the original and the first inventor, and (3) acknowledges the duty to disclose information which is material. While paragraph 1.63(b) requires the person signing the oath or declaration to review and understand the specification including the claims, it is not intended to require that such person be skilled in patent law so as to grasp the legal implications of claim language and drafting. The person must recognize, however, that what is being claimed is the subject matter which that person regards as his or her invention pursuant to 35 U.S.C. 112.

Paragraph 1.63(c) requires that any application in which a claim for foreign priority is made identify in the oath or declaration the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed.

Paragraph 1.63(d) requires that the oath or declaration in a continuation-in-part application, which discloses and claims subject matter in addition to that disclosed in the prior copending application, state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the parent application and the national or PCT international filing date of the continuation-in-part application. This latter requirement is not new, but is included to serve as a reminder to the person making the oath or declaration of this duty to disclose material information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the continuation-in-part application. For example, in circumstances where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120, the duty to disclose extends to any material information, as defined in §1.56(a) measured from the filing date of the continuation-in-part application. This would include the first foreign patenting, and any foreign patenting subsequent to the first which materially differs therefrom, of the subject matter of the parent application which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application. Any publication of the parent application, other than foreign patenting, or any public use or sale in the United States of the subject matter of the prior application, which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application, would also come within §1.56(a) in such circumstances. See *In re Ruscetta and Jenny*, 118 U.S.P.Q. 101 (C.C.P.A. 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 U.S.P.Q. 426 (C.C.P.A. 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces, Co., Inc.*, 339 F. Supp. 859, 173 U.S.P.Q. 295 (Del. 1972).

Section 1.64

Section 1.64 is added as proposed to clearly indicate who must sign the oath or declaration of a patent application.

Section 1.65

Section 1.65 is removed as proposed because the oath or declaration requirements set forth therein are covered by new §1.63.

Section 1.67

Section 1.67 is amended as proposed to remove all of paragraphs (a) and (b) and substitute therefor new wording. Paragraph 1.67(a) indicates that a supplemental oath or declaration meeting the requirements of new §1.63 may be required to correct deficiencies or inaccuracies present in an earlier oath or declaration. Paragraph 1.67(b) requires a supplemental oath or declaration to be filed (1) when a claim is presented embracing material not originally claimed and (2) when a subsequently filed oath or declaration under §1.53(d) refers to an amendment which includes improper new matter. Paragraph 1.67(b) also clearly states the prohibition against entry of new matter after the filing date of the application.

Section 1.69

Section 1.69, paragraph (b), is amended as proposed to change the time at which a translation of a non-English language oath or declaration which has not been supplied by the Office must be filed. The time period for filing the translation is changed to two months after notification that a translation is required. The reference to §1.65 in paragraph 1.69(b) is changed to §1.63.

Section 1.70

Section 1.70 is amended to refer to §1.63 for the requirements to be met when an oath or declaration is filed under 35 U.S.C. 371(c)(4). The wording of the title in the final rule is changed to reflect more clearly the subject matter of the rule.

Section 1.77

Section 1.77 is amended as proposed to change paragraphs (h) and (i) to refer to the abstract of the disclosure and signed oath or declaration, respectively.

Section 1.97

Section 1.97 is amended to change the title from "prior art statement" to "information disclosure statement". This change is appropriate since the designation "information disclosure statement" more accurately characterizes the nature and content of the information which may be included in such a statement. Information which is required to be submitted pursuant to §1.56 may ultimately be determined not to be "prior art," but nevertheless may be "material" pursuant to §1.56. Section 1.97 has also been modified from that proposed by eliminating the word "material" since information submitted pursuant to §1.97 may be considered to be of questionable materiality or may be determined, upon examination, not to be "material". Section 1.97 now provides that an information disclosure statement should be filed with the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. Paragraph 1.97(b) has been amended in recognition that applicant may choose to furnish other material information in another manner or statement. Paragraph 1.97(b) now also refers to section 1.56(a) for the definition of "material information". The amendments to paragraph 1.97(b) do not in any manner reduce the obligation to submit material information as defined in §1.56(a).

Section 1.98

Section 1.98 indicates that information disclosure statements should list prior art with all of the information which is required to print such citations on the front page of a patent. The final rule states clearly that the publication date indicated on the document should be submitted. This will not serve to preclude a showing of a different, actual publication date. Another purpose of the citation requirements in this section is to permit ready reference to the document from its citation.

Section 1.99

Section 1.99 is amended to change the title to be consistent with the amendment to §1.97.

Section 1.101

Section 1.101 is amended to indicate specifically that applications which are to have their examination advanced pursuant to §1.102 will be taken up for examination out of order by the examiner. The final rule is also modified to set out when international applications which have complied with the requirements of 35 U.S.C. 371(c) are taken up for action.

Section 1.118

Section 1.118 is amended as proposed to designate the previous section as new paragraph (a) and amend it to clearly state that no new matter may be introduced into an application and to make specific reference to §§1.53, 1.63 and 1.67. New paragraph 1.118(b) indicates how improper amendments which introduce new matter in the specification or claims will be handled by the examiner.

Section 1.123

Section 1.123 is amended to require all corrections to drawings to be made by bonded draftsmen at applicant's expense since the Office does not have sufficient draftsmen to make such corrections. Sketches of any desired corrections will, however, still require approval of the examiner. The final rule makes clear that changes in the drawing may be made by submission of substitute drawings.

Section 1.125

Section 1.125 is amended to relax the prohibition against substitute specifications which are not required by the examiner. The section, however, adds the requirement that any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Under the section the statement must be a verified statement if made by a person not registered to practice before the Office. The final rule specifies that a substitute specification may not be accepted unless it is clear to the examiner that processing of the application would be facilitated thereby.

Section 1.131

Section 1.131 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent as long as the patent upon which the rejection is based does not claim the rejected invention. Section 1.131 cannot be used to overcome a rejection based upon a United States patent claiming the rejected invention. This is true regardless of whether the rejected claims are contained in an application being examined or a patent being reexamined. Section 1.131 is inapplicable if the same invention is being claimed by the United States patent upon which the rejection is based. Under the section as amended, the same person or persons who would make the affidavit or declaration in an application will be required to make the affidavit or declaration on behalf of the owner of the patent under reexamination.

Section 1.132

Section 1.132 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent.

Section 1.137

Section 1.137 is amended as proposed to except from the provisions of paragraph (b) those applications abandoned pursuant to §1.53(d) because the fee, oath, or declaration and the surcharge were not submitted. Section 111 of Title 35, United States Code, as amended by Public Law 97–247, requires that any delay in submission of the fee and oath be shown to be unavoidable. Thus, paragraph (b) of §1.137 permitting revival where abandonment was unintentional is inapplicable to the revival of applications which become abandoned pursuant to §1.53(d).

Section 1.141

The proposed amendments to §1.141 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 1.153

Section 1.153 is amended to change the reference for oath and declaration requirements from §1.65 to §1.63 and to conform the language of the rule to be consistent therewith.

Section 1.154

Section 1.154 is amended as proposed to revise paragraph (e) to refer to the signed oath or declaration requirements of §1.153(b).

Section 1.162

Section 1.162 is amended as proposed to change the reference from §1.65 to §1.63.

Section 1.163

Section 1.163 is amended as proposed to change the wording of the section to clearly indicate that a signed oath or declaration is required rather than a signed specification.

Section 1.172

Section 1.172 is amended to indicate clearly that the reissue oath is signed and sworn to rather than the reissue application. The final rule has been modified from that proposed by referring to a "reissue oath" rather than to "reissue oaths".

Section 1.174

Section 1.174 is amended as proposed to remove the requirement that photoprints of original drawings be securely mounted or pasted on sheets of drawing board because paper drawings are acceptable.

Section 1.175

Section 1.175 is amended as proposed to change the reference to the oath or declaration from §1.65 to §1.63.

Sections 1.301, 1.302 and 1.303

The proposed amendments to sections 1.301, 1.302 and 1.303, referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, have been adopted as final rules as published on Oct. 26, 1982 at 47 FR 47380–47382 and corrected on Nov. 5, 1982 at 47 FR 50142 and therefore are not republished here.

Section 1.324

Section 1.324 is amended to include wording similar to that in §1.48 for correction of inventorship in applications.

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Section 1.325

Section 1.325 is amended as proposed to include reference to the reexamination procedure.

Section 1.335

Section 1.335 is added as proposed to provide a new section relating to the filing in the Patent and Trademark Office of notices of arbitration awards. Such filing is required under §294 of Title 35, United States Code, as added by Public Law 97–247. The final rule has also been modified in response to a comment to indicate that the notices of arbitration awards are intended to be placed in the patent files.

Section 1.565

The proposed amendments to §1.565 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 5.12

Section 5.12 is amended as proposed to separate the section into two paragraphs. Paragraph (a) provides that the filing of an application for an invention made in the United States is considered to include a petition for a license for foreign filing. If a license is granted, it will be indicated on the filing receipt. If it is not granted, no indication of the denial will appear. Failure to grant a license should be considered a denial of a first petition for a license. A subsequent petition may be filed under §5.12(b). Section 5.12(b) is essentially the text of §5.12 in its previous form. No rights to file a petition for license are being removed.

Withdrawal of Proposed Amendments To Sections 1.141 and 1.565.

A number of the speakers at the public hearing held on Dec. 16, 1982, urged that the amendments to §§1.141 and 1.565 be deferred or dropped pending further study. Those urging that the proposed amendments to §1.141 not be adopted at this time included speakers from the American Patent Law Association, from Committee 103 of the American Bar Associations's Patent, Trademark & Copyright Section, and from the Bar Association of the District of Columbia. The Boston Patent Law Association urged that the amendment to §1.565 be removed or held in abeyance. The American Patent Law Association indicated that more time was needed for its committees to analyze the issues in the proposed amendments to §§1.141 and 1.565.

In response to the recommendations received at the public hearing, the proposed amendments to §§1.141 and 1.565 are being withdrawn at this time to permit the public to study the issues involved and make any further recommendations considered appropriate. Pending the further study referred to by the speakers at the hearing and consideration of any recommendations resulting therefrom, the Office will continue to operate under present §§1.141 and 1.565 as interpreted by the Manual of Patent Examining Procedure and relevant Patent and Trademark Office and judicial precedents.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Forty-eight letters presenting written comments were received and seven persons testified at the public hearing on Dec. 16, 1982.

Comments appear below along with responses thereto.

Comment:

One comment objected to inadequate notice regarding these proposed rule changes.

Reply:

The proposed rules notice was published in the Federal Register on Oct. 27, 1982. This is more than seven weeks prior to the date of the hearing and four months prior to the effective date of the final rules. Such periods are considered to be reasonable in view of the fact that the legislation requiring the rule changes was only enacted on Aug. 27, 1982 and that other rule changes were required to be implemented by Oct. 1, 1982.

Comment:

One comment proposed that "Patent and Trademark Office" should be used in the rules rather than merely "Office".

Reply:

The proposal has been adopted in the final rules in those locations where confusion may otherwise result.

Comment:

Five comments requested that promulgation of §§1.10, 1.63, 1.97, 1.141 and 1.565(e) be delayed and the period for comment extended until Mar. 30, 1983.

Reply:

Amendments to §§1.141 and 1.565 are not being promulgated at this time to provide time for further consideration and study as requested. If after study, a rule change is felt desirable, a new proposal will be issued. New §1.10 is being promulgated to make it available to applicants as it was intended in the statute. New §1.63 is being added and §1.65 deleted to reduce the formal statements required. If desired, the old oath and declaration forms may continue to be used if the statement is included that applicant "has reviewed and understands the contents of the specification, including the claims". For continuation-in-part applications, it is necessary to also include language is conformance with §1.63(d). Section 1.97 is being promulgated to remove problems relating to the time period in the current wording and to clarify the section in general.

Comment:

One person questioned why Sunday was not mentioned in §1.6(b) or (c).

Reply:

Section 1.6(b) and (c) are limited to weekdays which by definition excludes Sunday.

Comment:

Two comments were received which proposed that only a certificate of mailing procedure as in §1.8(a) be used for determining the date of deposit under 35 U.S.C. 21.

Reply:

The filing date of an application is considered to be much more critical than the filing dates of papers accepted under §1.8. The application filing date is often critical for determining if a statutory bar exists, whether foreign priority can be claimed and who is the senior party in an interference. Therefore, papers filed for purposes of receiving an application filing date should have some clear indication of the date of receipt by the United States Postal Service. Such a practice would also probably require storing all of the envelopes in the file wrapper for record purposes.

Comment:

Three comments were received which stated that private courier services should also be provided for in §1.10.

Reply:

Section 21(a) as amended by Public Law 97–247 provides for filing dates being given only when "deposited with the United States Postal Service." Although private courier services may be used to deliver papers to the Patent and Trademark Office, the actual date of receipt by the Patent and Trademark Office will be considered to be the filing date.

Comment:

A comment was received which argued that the Post Office date stamp should be stamped on the mailing label instead of having to enter the label number on each document.

Reply:

Stamping the mailing label would not add anything since the postal clerk receiving the "Express Mail" must already indicate the date and time of deposit and initial the label. A purpose of placing the label number on each paper is to permit several papers to be placed in a single envelope. The mailing labels may be retained in the Patent and Trademark Office for later verification.

Comment:

Seven comments were received that the requirement that the item be received the following day (§1.10(b)) was unnecessarily restrictive.

Reply:

Section 1.10 does not require that the item be received the next day in the Patent and Trademark Office in order to receive the date of deposit as the mailing date. The one day reference has been deleted. Further proof of mailing may be required where an unreasonable period of time is involved and supporting evidence is not otherwise available to the Patent and Trademark Office. Documents deposited with the United States Postal Service will be given a filing date which corresponds to the date of receipt indicated by the postal clerk on the "Express Mail" mailing label.

Comment:

Four comments indicated that §1.10 does not assist in placing applicants and attorneys outside the Washington area on the same footing as those in Washington.

Reply:

The main purpose of §1.10 is to implement 35 U.S.C. 21(a) in a manner which would provide for granting filing dates for papers and fees as of the date of their deposit with the United States Postal Service. Certainly these provisions using "Express Mail," together with the certificate of mailing procedure available under §1.8, will go a long way in reducing last minute deliveries to the Patent and Trademark Office by persons outside the Washington area.

Comment:

Two comments stated that the comments accompanying§1.10(c) should be clarified to explain the meaning of "more than one day."

Reply:

The final rule has been clarified.

Comment:

It was proposed by one person that the "affidavit or declaration" under §1.10(c) be waived if the statement is made by a registered attorney or agent.

Reply:

The suggestion has been adopted.

Comment:

It was indicated by one person that certified mail provides proof of mailing date under §1.10 by virtue of the Post Office stamp on the certified mail receipt card.

Reply:

The information on the certified mail receipt card is of no benefit to the Patent and Trademark Office since it is immediately returned to the sender. The Patent and Trademark Office would not be able to retain any information which gives proof of the date of mailing.

Comment:

Three comments raised questions as to the need to make the acceptance of the "Express Mail" contingent upon the performance of the Post Office in §1.10(c).

Reply:

The acceptance of the "Express Mail" is not contingent upon "next day delivery". The reference in §1.10(c) to proof of mailing merely provides a basis for the Office requiring proof of mailing where an explanation appears to be necessary to clarify the record. Such information is expected to be required only in a few instances. The rule has also been revised to clarify this matter.

Comment:

Five persons suggested the use of registered or certified U.S. mail for obtaining filing dates under 35 U.S.C. 21.

Reply:

Registered mail does not provide any information or evidence to the Patent and Trademark Office as to the date of mailing other than the postmark, which is often unreadable. Storage of envelopes containing such postmarks is also burdensome. The deficiency of certified mail has already been discussed.

Comment:

One person questioned what treatment will be accorded a paper placed in an "Express Mail" box receptacle after the box has been cleared for the last time on a given day.

Reply:

The paper will be considered to be deposited as of the date of receipt indicated on the "Express Mail" mailing label by the Postal Service clerk.

Comment:

One person commented that he found the idea of using a declaration or affidavit to establish a date of deposit unacceptable because it exposes the integrity of the assignment of filing dates to the risk of deception.

Reply:

The use of declarations or affidavits is usually intended to help explain activities which can be supported by exhibits. For example, if the Office copy of the mailing label was not entirely readable, applicant's copy of the "Express Mail" mailing label could accompany a declaration and serve as the basis for granting a filing date.

Comment:

Three persons objected to permitting only the individual who places the correspondence in an "Express Mail" facility to execute the certificate of express mailing under §1.10(c).

Reply:

The wording of §1.10(c) differs from §1.8 because the documents which are expected to be filed under §1.10 are patent and trademark applications. The filing dates of such documents are very important and should therefore be based on personal knowledge.

Comment:

One comment was received which suggested that §1.10 be adopted with an effective date retroactive to a year earlier.

Reply:

Such an earlier date is not possible since the statutory authority for §1.10 does not come into effect until Feb. 27, 1983.

Comment:

One comment proposed designating the Patent and Trademark Office as an "Express Mail" Post Office to make lower rates available.

Reply:

Such a designation is not possible.

Comment:

One person requested that the Patent and Trademark Office publish a form of certificate of mailing by "Express Mail" suitable for purposes of §1.10(b).

Reply:

A suggested form is included in the preamble of this rule change.

Comment:

One comment proposed that §1.10(c) clearly state what evidence will be necessary and sufficient to prove a filing date by mailing.

Reply:

A specific answer cannot be given since it is dependent upon the particular fact situation and what evidence is actually available.

Comment:

Two comments questioned whether P.L. 97–247 authorized a rule such as §1.10 granting filing dates as of the mailing date.

Reply:

The question raised by this comment has been treated in the discussion of §1.10 supra.

Comment:

One comment proposed that §1.10 be corrected to read—Any paper or fee *required* to be filed—to more closely conform with 35 U.S.C. 21(a).

Reply:

No need is seen to change §1.10 as suggested since, if a patent is desired, it is "required" that each paper relating to an application be filed in the Patent and Trademark Office.

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Comment:
One comment indicated that the requirement to place the "Express Mail" label number on each paper and fee is not realistic.
Reply:
The placement of the label number on each paper or fee allows later verification of the mailing dates of all different papers mailed in one envelope and is not seen to be overly burdensome.
Comment:
A question was raised as to whether the "Express Mail" label number should be placed on every page.
Reply:
The label number need not be placed on each page. It should, however, be placed on the first page of each separate document, such as, a new application, amendment, assignment, and transmittal letter for a fee, along with the certificate of mailing by "Express Mail". Although the label number may be on checks, such a practice is not required.
Comment:
A question was raised by one party as to the location within the Patent and Trademark Office of the mailing labels where papers to different applications are placed in the same envelope.
Reply:
The mailing labels from all "Express Mail" packages are expected to be removed and initially retained centrally in the Mail Room of the Patent and Trademark Office. The number on each document will allow direct access to the appropriate mailing label if any questions should arise.
Comment:
One comment suggested that §1.22(b) be amended to exclude itemization of all fees where a general authorization to charge a deposit account has been given.
Reply:
Even where fees are charged to a deposit account, it is desirable to know specifically which fees are to be paid. Therefore, the suggestion has not been adopted.
Comment:
One comment was received which suggested adding a sentence to §1.41(d) indicating that the filing of an oath or declaration executed by the applicant would constitute proof of authority to file the application.
Reply:
Such an additional sentence is not considered to be necessary since the Patent and Trademark Office does not intend to utilize the provisions of §1.41(d) unless a controversy arises.
Comment:
One comment was received which suggested the addition to the end of §1.42 of the words "except for patents granted to the assignee either of the inventor or of the legal representative of the inventor."
Reply:
No change is considered to be necessary since few, if any, problems have arisen without such additional wording in the past. The existing rule wording "upon proper intervention" also provides protection for assignees.
Comment:
One comment was received which indicated that §1.46 does not clearly authorize an assignee of a part interest to cause an application to be placed on file.
Reply:
Although §1.46 may not make this point clear, it is clear from §1.41(c).
Comment:
One comment recommended that the requirement to show diligence in correcting inventorship under §1.48 be deleted.
Reply:
It is felt that corrections of inventorship should be diligently made in patent applications. The naming of correct inventorship is necessary for the Patent and Trademark Office to make decisions on topics such as double patenting, priority claims and first inventorship.
Comment:
It was recommended in one comment that the verified statement of facts required by §1.48 "by the original named inventor or inventors" be replaced by a requirement that he or they merely assent to the statement of the facts since others may be better able to provide the best evidence.
Reply:
Since it is the original inventorship that is being changed, it is believed that all of the previously named inventors should positively indicate their agreement with the facts in the case. Affidavits by other individuals may also be supplied where such persons have direct personal knowledge of certain aspects of the case.
Comment:
One comment indicated that "it seems a reasonable presumption that if ownership is unaffected, deceptive intent is absent" in a §1.48 correction of inventorship situation and that such a presumption could be written into the rules.
Reply:
Even if applications are commonly owned, the wrong inventorship could be deceptively named to obtain rights which are only available to the same inventive entities. The report on Public Law 97–247 also states that "the commissioner must be assured of the presence of innocent error, without deceptive intention . . ." before permitting a substitution of a true inventor's name.
Comment:
One person suggested that the deceptive intent in §1.48 refer to the acts of the actual inventors rather than to both the alleged and actual inventor or inventors.
Reply:
This suggestion has been adopted in both §§1.48 and 1.324, but deceptive intention on the part of other parties is subject to review under §1.56.
Comment:
One person suggested that in §1.48, line 3 "may" be changed to—must—.
Reply:
The suggestion has not been adopted. Corrections may only be made if the conditions set forth in §1.48 are satisfied.
Comment:
Two comments objected to the insertion of "material" in §1.51(b).
Reply:
This word has been removed and does not appear in the final rule.
Comment:
One comment suggested changing "an" to—a complete—in the title of §1.51.
Reply:
This suggestion has been adopted.
Comment:
One comment indicated that §§1.52(c) and 1.56(c) seemed overly inflexible and harsh when considering minor grammatical changes.
Reply:
Although §1.56 indicates that applications "may" be stricken, rather than "must" be stricken, it is still considered important to maintain a clear line in the regulations against changes in the original applications made after the execution of the application oath or declaration. The line between grammatical changes and changes relating to the merits is frequently unclear.
Comment:
Three comments noted an apparent inconsistency between proposed §§1.10 and 1.53 as to whether §1.10 relates to the filing of patent applications.
Reply:
Section 1.10 does relate to the filing of patent applications. In order to clarify the wording, "received" in §1.53(b) has been changed to "filed".
Comment:
One comment was received suggesting that a sentence be added to §1.53(d) to indicate that PCT applicants cannot submit late filing fees, oaths or declarations under 35 U.S.C. 371.
Reply:
Such a reference in §1.53 does not appear appropriate because this section relates to "filing dates". In the PCT situation, the filing date was already granted at the time of filing the PCT international application.
Comment:
One comment was received which suggested that §1.53(a) be rewritten to indicate all applications are assigned serial numbers but not accorded filing dates.
Reply:
The proposal was not adopted since it is considered unnecessary.
Comment:
One person suggested that §1.53(b) be amended to specify that only "a specification *purporting* to contain a description and at least one claim . . ." is needed to obtain a filing date.
Reply:
No change is being made since a determination must be initially made as to whether or not a specification has been filed. In any case, sufficiency of the specification must later be checked by the examiner.
Comment:
One person indicated that the time period for filing a correction to a defect in an application is left entirely within the discretion of the Commissioner and that any setting of periods of time would be tantamount to an exercise of rulemaking authority. Section 1.53(d) should be provided with an explicit time limitation.
Reply:
No specific time period is considered to be necessary in the regulations. The Commissioner has full authority and discretion under the statute in 35 U.S.C. 111 to set periods of time. The statute does not require the Commissioner to use the rulemaking process to set time periods for response to an action or requirement by the Patent and Trademark Office in a patent application.
Comment:
Two comments were received objecting to the use of the words "or otherwise disposed of" in §1.53(c).
Reply:
This wording has existed in §1.53(b) in the past without objection. No need is seen to depart from this wording at this time.
Comment:
One person questioned whether the change in §1.54(b) would result in return post cards not being stamped with the application serial number.
Reply:
No change is intended in the existing return post card practice.
Comment:
One comment proposed adding another sentence to §1.154(b) indicating that foreign priority claims will be acknowledged on the filing receipt.
Reply:
This proposal is not being adopted since the examiner must determine whether the statutory requirements of 35 U.S.C. 119 have been met before an acknowledgment can be sent.
Comment:
One comment suggested that the Patent and Trademark Office indicate on the filing receipt both the filing date under §1.10 and the actual date of receipt.
Reply:
The actual date of receipt can be obtained by requesting a receipt from the Postal Service. The actual date of receipt cannot be placed on the filing receipt because of current computer limitations. The suggestion is therefore not being adopted at this time.
Comment:
One comment was received indicating that it is not clear whether or not an application based on a specification and drawing, but containing no oath or declaration or filing fee, could serve as the basis for a priority claim under 35 U.S.C. 120.
Reply:
If the filed specification and drawings fully disclose the invention as required by 35 U.S.C. 112, the application may serve as a basis for a priority claim under §120 even if no oath or declaration, or no fee has been filed, as long as the continuing application is filed prior to the abandonment of the first application under §1.53(d).
Comment:
One comment suggested that §1.55(b) be removed since the requirements of the statute are fully set forth in 35 U.S.C. 119.
Reply:
Although the statutory requirements set forth basic requirements, it is felt that the more specific details of §1.55(b) provide needed guidance for applicants.
Comment:
Two persons questioned the meaning of "inspection and review" in §1.56(c) and suggested certain amendments.
Reply:
The words "inspection and" are being removed to eliminate any redundancy. The paragraph has also been broken down into four items as proposed by a comment.
Comment:
One suggestion was made that applicant be allowed to order a copy of the parent patent, with payment of fee, when filing a §1.60 application.
Reply:
Such a practice is contrary to the intent of the rule change. The problems the Patent and Trademark Office is attempting to solve by the change, which are caused by poor copies and delays in processing, would remain with such a practice.
Comment:
Two persons suggested that §1.60 be amended to drop "and claimed" from the title.
Reply:
The suggestion has been adopted.
Comment:
One person suggested that §1.60 be modified to drop the requirement for verification by affidavit when the statement is made by a registered patent attorney or agent.
Reply:
The suggestion has been adopted.
Comment:
One comment noted that there is no specific requirement in §§1.56, 1.63 or 1.98 to identify foreign applications filed more than one year prior to the U.S. filing date.
Reply:
Section 1.63(b)(3) broadly requires applicant to acknowledge the duty to disclose information material to the examination of the application. This information includes foreign patents based on applications filed more than a year prior to the filing date of the United States application and which issue before the filing date of the United States application.
Comment:
One person felt that §1.63(b)(1) will be a disaster for the patent system since the inventor may not be physically able to review and understand the invention or because the legal language format used in claims may not be understood by the inventor. Five persons argued that adoption of §1.63 would result in raising the defense that the inventor did not understand the claims in each patent infringement suit.
Reply:
The inventor is not expected to understand all the legal interpretations or limitations in a claim. The inventor is expected to recognize that what is being claimed is the subject matter which the inventor regards as his or her invention pursuant to 35 U.S.C. 112. The physical factors have to some extent existed in past practice and have been handled on a case-by-case basis where necessary. The situation outlined would exist in any signing of a legal document. The wording of §1.63 has been explained in the preamble to minimize occurrences of problems.
Comment:
One comment noted that many inventors do not know whether additional subject matter is claimed in a continuation-in-part application under §1.63(d).
Reply:
The wording in §1.63(d) is considered to be appropriate and in accordance with case law. If uncertainty ex-

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ists the attorney or agent, if any, should clarify the matter and §1.63(d) should be followed.

Comment:

One person proposed that §1.63(d) be modified to explicitly require the disclosure of foreign patents granted before the filing of the continuation-in-part application.

Reply:

Section 1.63(d) has been amended to clearly indicate that material information pursuant to §1.56(a) between the filing date of the parent application and the filing date of the continuation-in-part application must be disclosed. The discussion of new §1.63 refers to material foreign patents published during this time interval.

Comment:

Two comments indicated concern with the parenthetical language in proposed §1.63(d) in that it would create severe problems.

Reply:

Paragraph (d) of §1.63 has been amended to remove such problems.

Comment:

One comment suggested adding—he or she is aware of—after information in §1.63(b)(3) and (d).

Reply:

This suggestion is not adopted since such wording is already present in §1.56(a).

Comment:

One comment suggested that §1.63(c) clarify what is intended by "the first filed foreign application," particularly in view of 35 U.S.C. 119, third paragraph.

Reply:

The rule has been amended to clarify the matter.

Comment:

One comment was received suggesting changes be made in the title and that paragraph (b) of §1.70 refer to §1.63 instead of "this section."

Reply:

The change suggested to the title has been made. The suggestion to paragraph (b) has not been made since it is considered unnecessary.

Comment:

Three comments were received which indicated that the wording of §1.97(a) would require an immediate filing of disclosure information if the filing receipt is received just before three months after filing.

Reply:

The wording of §1.97(a) has been changed to remove this problem.

Comment:

One comment was received which urged that the title of §1.97 and contents of §1.97(b) not be changed, since the proposed wording would not require filing of the closest prior art.

Reply:

The proposed changes are not intended to make any changes in the type of information which is to be submitted to the Office. The proposal has been adopted in modified form.

Comment:

One person indicated preference for the use of "prior art" in §§1.51(b), 1.97, 1.98, and 1.99 since it does not create an inferred admission that the information submitted is material. Five comments favored the removal of "prior art" from §1.97 but objected to the addition of "material".

Reply:

The rule change was proposed to answer arguments that the use of the term "prior art" implied that the information was a reference against applicant's invention. Since the majority of the comments supported modifying the rule, the use of the terms "prior art" as well as "material" are being dropped.

Comment:

Two comments were received concerning §1.98(a) suggesting that the "place of publication" be clarified or removed.

Reply:

This suggestion has not been adopted since the "place of publication" is not mandatory. It is intended to mean the city and country of publication. Also the citation of the "place of publication" is consistent with the §1.107(a) requirements.

Comment:

It was suggested by one person that §1.101 be amended to clarify when PCT international applications which have entered the national stage should be taken up for examination.

Reply:

An amendment has been made to §1.101 as suggested to clarify that they are taken up in order based on the date they have entered the national stage by compliance with the requirements of 35 U.S.C. 371(c).

Comment:

One comment was presented suggesting that the words "which are not examined on the merits" in §1.101 be removed.

Reply:

The suggestion has been adopted.

Comment:

One comment urged returning to the use of the Office draftsmen for minor corrections to reduce the burden under proposed §1.123.

Reply:

Some minor corrections may be made by the Office draftsmen on a time-available basis. However, since the Office currently has only a few draftsmen who are responsible for reviewing and approving all drawings, very little time is presently available for making corrections.

Comment:

Four suggestions were made to amend §1.123 to specifically provide for the filing of substitute drawings if corrections are required.

Reply:

These suggestions have been adopted.

Comment:

One comment was received indicating that §1.125 should indicate to whom it should be clear that acceptance of a substitute specification would facilitate processing.

Reply:

An amendment has been made to clarify that it should be clear to the examiner.

Comment:

One comment suggested removal of the last sentence of §1.137(b) to permit §1.183 petitions to be filed to waive time periods for requesting revival of unintentionally abandoned applications.

Reply:

No change in §1.137(b) is considered to be appropriate at this time since §1.137(b) only became effective on Oct. 1, 1982.

(Since changes to §1.141 are not being promulgated in this rule change, comments and replies to this section are not included.)

Comment:

One comment pointed out that the reference to a "period of twelve months" in §1.153 was indefinite.

Reply:

Section 1.153 has been amended to remove the indefiniteness.

Comment:

One comment was presented which suggested that §1.172 refer to a "reissue oath" rather than to "reissue oaths."

Reply:

This suggestion has been adopted.

Comment:

One comment suggested the insertion of "the filing of" before "each patent" in §1.335(a) and (b).

Reply:

The suggestion has been adopted.

(Since the proposed addition of a new paragraph (e) to §1.565 is not being adopted in this rule change, comments and replies to this section are not included.)

Comment:

One suggestion was made that a procedure be designed in which foreign filing licenses could be

granted by return post card without losing the time required to send the filing receipts.

Reply:

It is felt that the procedure under §5.12 should be adopted at this time and be placed into operation. If after some experience additional modifications are found desirable, further changes could be made. To introduce several alternative procedures at this time is considered to be too complex and may endanger the success of the proposed procedure.

Comment:

One comment requested that the Office grant a prospective foreign filing license under §5.12 for all data and amendatory material to be filed abroad.

Reply:

Such petitions are not part of this proposed change but this concept is being considered in a separate rule change proposal.

Comment:

One comment suggested that the Filing Receipt specifically indicate whether or not a license has been denied under §5.12.

Reply:

The proposed practice under §5.12 would indicate on the Filing Receipt when a license is granted. On other cases in which a license is not granted further review is required. A license may still be granted at a later date.

Comment:

One comment stated that it should be possible to petition at any early date for a foreign filing license as well as obtain one on the filing receipt.

Reply:

It will still be possible to petition earlier for a license under revised §5.12.

Implementation Of Patent Procedure Revisions

The effective date of the patent procedure revisions contained in this rulemaking is Feb. 27, 1983. The various sections will be implemented in the manner set forth below:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

The "Guidelines under §1.10" set forth below provide guidance in implementing §1.10:

Guidelines under §1.10

A) The certification under §1.10 requires a signature of the person depositing the paper with the United States Postal Service as "Express Mail". Specifically, if the certification under §1.10 appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification under §1.10.

B) When possible, the certification under §1.10 should appear on an upper portion of the first page of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper or fee it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., complete application, specification and drawings, responses to rejection or refusal, notice of appeal, etc. If the serial number of the application is not known, the identification should include at least the name of the inventor(s) and the title of the invention. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

D) In situations wherein the correspondence includes papers for more than one application e.g., a single envelope containing separate applications or papers for various parts of the Patent and Trademark Office, each paper must have its own certification and the "Express Mail" label number as part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a notice of appeal), each paper should also have its own certification as a part thereof or attached thereto.

F) Practitioners may place the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

"Express Mail" mailing label number _____

Date of Deposit _____

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

_____
(Typed or printed name of person mailing paper or fee)

_____
(Signature of person mailing paper or fee)

§1.48 Correction of inventorship.

Any patent application pending on or after Feb. 27, 1983, is subject to the provisions of this section.

§1.53 Serial number, filing date, and completion of application.

The provisions of this section apply to any patent application filed on or after Feb. 27, 1983.

§1.63 Oath or declaration.

The provisions of §1.63 will become effective on Feb. 27, 1983, and will apply to any oath or declaration filed on or after that date. However, in order to provide a smooth transition from the old oath or declaration requirements to the new, the Office will continue to accept between Feb. 27, 1983, and June 30, 1983, any oath or declaration in compliance with §1.65 as it existed immediately prior to Feb. 27, 1983, so long as that oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective July 1, 1983, all oaths or declarations filed under §1.51(a)(2) as a part of a patent application must fully comply with §1.63.

A suggested format for a declaration is set forth below:

Declaration For Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

_____

the specification of which

(check one) ☐ is attached hereto.
☐ was filed on _____ as
Application Serial No. _____
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____
Full name of second joint inventor, if any _____
Second Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____

(Supply similar information and signature for third and subsequent joint inventors.)

The declaration form set forth above is specifically designed for use where the specification is attached to the form and the specification and declaration are filed at one time, and also where the declaration form is filed after the specification and drawings in accordance with §1.53. The form can be used where foreign priority is claimed under 35 U.S.C. 119 and where the benefit of one or more United States applications is claimed under 35 U.S.C. 120. Appropriate modifications can be made in the form so long as compliance with the rules is maintained. For example, if the form is being used as a supplemental declaration form which is being submitted after numerous amendments the form might appropriately be modified by changing the words "was amended on" to "with amendments through."

§1.335 Filing of notice of arbitration awards.

The written notices required by this section should be directed to the attention of the Office of the Solicitor, which Office will be responsible for processing of such notices.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act. (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The rule change will not have a significant averse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) for several reasons. Public Law 97–247 has taken into consideration the impact it may have on small entities. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to foreign filing license petitions, will be reduced.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Courts, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97–247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Parts 1 and 5, are amended as follows:

1. Section 1.4 is amended by revising paragraph (a) to read as follows:

§1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises: (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§1.31 to 1.352; of international applications in Subpart C, §§1.401 to 1.482; of reexamination of patents in Subpart D, §§1.501 to 1.570; and of trademark applications, §§2.11 to 2.189.

* * * * *

2. Section 1.6 is revised to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

(b) Mail placed in the Patent and Trademark Office pouch up to midnight on weekdays, excepting Saturdays and federal holidays, by the post office at Washington, D. C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch.

(c) In addition to being mailed or delivered by hand during office hours, letters and other papers may be deposited up to midnight in a box provided at the guard's desk at the lobby of building 3 of the Patent and Trademark Office at Crystal Plaza, Arlington, Virginia and at the main entrance (14th Street) of the Department of Commerce Building, Washington, D. C., on weekdays except Saturdays and federal holidays, and all papers deposited therein are considered as received in the Patent and Trademark Office on the day of deposit.

(d) If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any paper or fee which is (1) promptly filed after the ending of the designated interruption or emergency and (2) accompanied by a statement indicating that such paper or fee would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

3. Section 1.7 is revised to read as follows:

§1.7 Times for taking action: Expiration on Saturday, Sunday or federal holiday.

Whenever periods of time are specified in this part in days, calendar days are intended. When the day, or the last day fixed by statute or by or under this part for taking any action or paying any fee in the Patent and Trademark Office falls on Saturday, Sunday, or on a federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding day which is not a Saturday, Sunday, or a federal holiday. See §1.304 for time for appeal or for commencing civil action.

4. Section 1.8 is amended by revising the introductory text of paragraph (a) and paragraph (a)(1), (a)(2) introductory text, and (a)(2)(i) to read as follows:

§1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if: (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231, and deposited with the U.S. Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they also include a certificate for each paper or fee stating the date of deposit. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of a national patent application specification and drawing or other papers for the purpose of obtaining an application filing date;

* * * * *

5. A new section 1.10 is added to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service.

(b) Any paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing, be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and any such paper or fee must also include a certificate of mailing by "Express Mail" which states the date of mailing by "Express Mail" and is signed by the person mailing the paper or fee.

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

6. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph—$120.00

—§1.47—for filing by other than all the inventors or a person not the inventor
—§1.48—for correction of inventorship
—§1.182–for decision on questions not specifically provided for
—§1.183–to suspend the rules

—§1.268–for late filing of interference settlement agreement

* * * * *

7. Section 1.22 is revised to read as follows:

§1.22 Fees payable in advance.

(a) Patent and trademark fees and charges payable to the Patent and Trademark Office are required to be paid in advance, that is, at the time of requesting any action by the Office for which a fee or charge is payable with the exception that under §1.53 applications for patent may be assigned a filing date without payment of the basic filing fee.

(b) All patent and trademark fees paid to the Patent and Trademark Office should be itemized in each individual application, patent or other proceeding in such a manner that it is clear for which purpose the fees are paid.

8. Section 1.24 is revised to read as follows:

§1.24 Coupons.

Coupons in denominations of one dollar are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents and trademark registrations; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50. These coupons are good until used; they may be transferred but cannot be redeemed.

9. Section 1.41 is revised to read as follows:

§1.41 Applicant for patent.

(a) A patent must be applied for in the name of the actual inventor or inventors. Full names must be stated, including the family name and at least one given name without abbreviation together with any other given name or initial.

(b) Unless the contrary is indicated the word "applicant" when used in these sections refers to the inventor or joint inventors who are applying for a patent, or to the person mentioned in §§1.42, 1.43, or 1.47 who is applying for a patent in place of the inventor.

(c) Any person authorized by the applicant may file an application for patent on behalf of the inventor or inventors, but an oath or declaration for the application (§1.63) can only be made in accordance with §1.64.

(d) A showing may be required from the person filing the application that the filing was authorized where such authorization comes into question.

10. Section 1.42 is revised to read as follows:

§1.42 When the inventor is dead.

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may make the necessary oath or declaration, and apply for and obtain the patent. Where the inventor dies during the time intervening between the filing of the application and the granting of a patent thereon, the letters patent may be issued to the legal representative upon proper intervention.

11. Section 1.43 is revised to read as follows:

§1.43 When the inventor is insane or legally incapacitated.

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may make the necessary oath or declaration, and apply for and obtain the patent.

12. Section 1.45 is amended by removing paragraphs (b) and (c) and the designation (a) to the first paragraph and by revising the text to read as follows:

§1.45 Joint inventors.

Joint inventors must apply for a patent jointly and each must make the required oath or declaration: neither of them alone, nor less than the entire number, can apply for a patent for an invention invented by them jointly, except as provided in §1.47.

13. Section 1.46 is revised to read as follows:

§1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in §1.334.

14. Section 1.47 is revised to read as follows:

§1.47 Filing when an inventor refuses to sign or cannot be reached.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the omitted inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and by the required fee (§1.17(h)) and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and by the required fee (§1.17(h)) and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

15. A new section 1.48 is added to read as follows:

§1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee.

16. Section 1.51 is amended by revising paragraphs 1.51(a)(2) and (b) to read as follows:

§1.51 General requisites of a complete application.

(a) * * * * *

(2) An oath or declaration, see §§1.63 and 1.68.

* * * * *

(b) Applicants are encouraged to file an information disclosure statement. See §§1.97 through 1.99.

17. Section 1.52 is amended by revising paragraph (c) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to §1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers (§1.56(c)). After the signing of the oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§1.121 and 1.123–1.125.

* * * * *

18. Section 1.53 is revised to read as follows:

§1.53 Serial number, filing date, and completion of application.

(a) Any application for a patent received in the Patent and Trademark Office will be assigned a serial number for identification purposes.

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office. No new matter may be introduced into an application after its filing date (§1.118).

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $50.00 handling fee.

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified and given a period of time within which to file the fee, oath, or declarsation and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

(e) An application for a patent will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(f) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

19. Section 1.54 is revised to read as follows:

§1.54 Parts of application to be filed together; filing receipt.

(a) It is desirable that all parts of the complete application be deposited in the Office together; otherwise a letter must accompany each part, accurately and clearly connecting it with the other parts of the application. See §1.53 with regard to completion of an application.

(b) Applicant will be informed of the application serial number and filing date by a filing receipt.

20. Section 1.55 is revised to read as follows:

§1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by §1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in §1.17(i).

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

21. Section 1.56 is amended by revising paragraph (c) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(c) Any application may be stricken from the files if:
(1) An oath or declaration pursuant to §1.63 is signed in blank;
(2) An oath or declaration pursuant to §1.63 is signed without review thereof by the person making the oath or declaration;
(3) An oath or declaration pursuant to §1.63 is signed without review of the specification, including the claims, as required by §1.63(b);
or
(4) The application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

* * * * *

§1.57 [Removed]

22. Section 1.57 is removed.

23. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

24. Section §1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. Signing and execution of the application papers by the applicant may be omitted provided the copy is supplied by and accompanied by a statement by, the applicant or his or her attorney or agent that the application papers comprise a true copy of the prior application as filed. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

25. Section §1.62 is revised to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification and drawings from a prior application to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on a prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior application.
(b) The filing fee for a continuation, continuation-in-part, or divisional application under this section is based on the number of claims remaining in the application after entry of any preliminary amendment and entry of any amendments under §1.116 unentered in the prior application which applicant has requested to be entered in the continuing application.
(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In a continuation or divisional application which discloses and claims only subject matter disclosed in a prior application, no additional oath or declaration is required.
(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.
(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number.
(f) The filing of an application under this section will be construed to include a waiver of secrecy by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.
(g) The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.
(h) The applicant is urged to furnish the following information relating to the prior application to the best of his or her ability:
(1) Title as originally filed and as last amended;
(2) Name of applicant as originally filed and as last amended;
(3) Current correspondence address of applicant;
(4) Identification of prior foreign application and any priority claim under 35 U.S.C. 119.
(i) Envelopes containing only application papers and fees for filing under this section should be marked "Box FWC".

26. A new section 1.63 is added to read as follows:

§1.63 Oath or declaration.

(a) An oath or declaration filed under §1.51(a)(2) as a part of an application must:
(1) Be executed in accordance with either §1.66 or §1.68;
(2) Identify the specification to which it is directed;
(3) Identify each inventor and the residence and country of citizenship of each inventor; and
(4) State whether the inventor is a sole or joint inventor of the invention claimed.
(b) In addition to meeting the requirements of paragraph (a), the oath or declaration must state that the person making the oath or declaration:

(1) Has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration;
(2) Believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought; and
(3) Acknowledges the duty to disclose information which is material to the examination of the application in accordance with §1.56(a).

(c) In addition to meeting the requirements of paragraphs (a) and (b) of this section, the oath or declaration in any application in which a claim for foreign priority is made pursuant to §1.55 must identify the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.
(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

27. A new section 1.64 is added to read as follows:

§1.64 Person making oath or declaration.

(a) The oath or declaration must be made by all of the actual inventors except as provided for in §§1.42, 1.43, or 1.47.
(b) If the person making the oath or declaration is not the inventor (§§1.42, 1.43, or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state.

§1.65 [Removed]

28. Section 1.65 is removed.

29. Section 1.67 is revised to read as follows:

§1.67 Supplemental oath or declaration.

(a) A supplemental oath or declaration meeting the requirements of §1.63 may be required to be filed to correct any deficiencies or inaccuracies present in an earlier filed oath or declaration.
(b) A supplemental oath or declaration meeting the requirements of §1.63 must be filed (1) when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented, and (2) when an oath or declaration submitted in accordance with §1.53(d) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into an application after its filing date even if a supplemental oath or declaration is filed (§1.53(b); §1.118). In proper cases the oath or declaration here required may be made on information and belief by an applicant other than inventor.

30. Section 1.69 is amended by revising paragraph (b) to read as follows:

§1.69 Foreign language oaths and declarations.

* * * * *

(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under §1.63, the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

31. Section 1.70 is amended by revising the title and paragraph (a) to read as follows:

§1.70 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must file an oath or declaration in accordance with §1.63.

* * * * *

32. Section 1.77 is amended by revising paragraphs (h) and (i) to read as follows:

§1.77 Arrangement of application elements.

* * * * *

(h) Abstract of the disclosure.
(i) Signed oath or declaration.

* * * * *

33. The center heading preceding §1.97 and section 1.97 are revised to read as follows:

INFORMATION DISCLOSURE STATEMENT

§1.97 Filing of information disclosure statement.

(a) As a means of complying with the duty of disclosure set forth in §1.56, applicants are encouraged to file an information disclosure statement at the time of filing the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. If filed separately, the disclosure statement should, in addition to the identification of the application, include the Group Art Unit to which the application is assigned as indicated on the filing receipt. The disclosure statement may either be separate from the specification or may be incorporated therein.
(b) A disclosure statement filed in accordance with paragraph (a) of this section shall not be construed as a representation that a search has been made or that no other material information as defined in §1.56(a) exists.

34. Section 1.98 is amended by revising the title and paragraph (a) to read as follows:

§1.98 Content of information disclosure statement.

(a) Any disclosure statement filed under §1.97 or §1.99 shall include: (1) A listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The disclosure statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the disclosure statement to be pertinent. All United States patents listed should be identified by their patent numbers, patent dates and names of the patentees. Each foreign published application or patent should be cited by identifying the country or office which issued it, the document number and publication date indicated on the document. Each printed publication should be identified by author (if any), title of the publication, pages, date and place of publication.

* * * * *

35. Section 1.99 is revised to read as follows:

§1.99 Updating of information disclosure statement.

If prior to issuance of a patent an applicant, pursuant to his or her duty of disclosure under §1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be includ-

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ed in a supplemental information disclosure statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of §1.98.

36. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102 and those applications in which the Office has accepted a request for waiver of patent rights filed under §1.139. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

37. Section 1.118 is revised to read as follows:

§1.118 Amendment of disclosure.

(a) No amendment shall introduce new matter into the disclosure of an application after the filing date of the application §1.53(b)). All amendments to the specification, including the claims, and the drawings filed after the filing date of the application must conform to at least one of them as it was at the time of the filing of the application. Matter not found in either, involving a departure from or an addition to the original disclosure, cannot be added to the application after its filing date even though supported by an oath or declaration in accordance with §1.63 or §1.67 filed after the filing date of the application.

(b) If it is determined that an amendment filed after the filing date of the application introduces new matter, claims containing new matter will be rejected and deletion of the new matter in the specification and drawings will be required even if the amendment is accompanied by an oath or declaration in accordance with §1.63 or §1.67.

38. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner. The paper requesting amendments to the drawing should be separate from other papers.

39. Section 1.125 is revised to read as follows:

§1.125 Substitute specification.

If the number or nature of the amendments shall render it difficult to consider the case, or to arrange the papers for printing or copying, the examiner may require the entire specification, including the claims, or any part thereof, to be rewritten. A substitute specification may not be accepted unless it has been required by the examiner or unless it is clear to the examiner that acceptance of a substitute specification would facilitate processing of the application. Any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Such statement must be a verified statement if made by a person not registered to practice before the Office.

40. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant or the owner of the patent under reexamination shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the applicant or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the applicant's or patent owner's application was filed in this country.

* * * * *

41. Section 1.132 is revised to read as follows:

§1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

42. Section 1.137 is amended by revising paragraph (b) to read as follows:

§1.137 Revival of abandoned application.

* * * * *

(b) An application unintentionally abandoned for failure to prosecute, except pursuant to §1.53(d), may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date of abandonment of the application. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in §1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three month period set forth in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

* * * * *

43. Section 1.153 is amended by revising paragraph (b) to read as follows:

§1.153 Title, description and claim, oath or declaration.

* * * * *

(b) The oath or declaration required of the applicant must comply with §1.63.

44. Section 1.154 is amended by revising paragraph (e) to read as follows:

§1.154 Arrangement of specification.

* * * * *

(e) Signed oath or declaration (See §1.153(b)).

45. Section 1.162 is revised to read as follows:

§1.162 Applicant, oath or declaration.

The applicant for a plant patent must be the person who has invented or discovered and asexually reproduced the new and distinct variety of plant for which a patent is sought (or as provided in §§1.42, 1.43, and 1.47). The oath or declaration required of the applicant, in addition to the averments required by §1.63, must state that he or she has asexually reproduced the plant. Where the plant is a newly found plant the oath or declaration must also state that it was found in a cultivated area.

46. Section 1.163 is amended by revising paragraph (b) to read as follows:

§1.163 Specification.

* * * * *

(b) Two copies of the specification (including the claim) must be submitted, but only one signed oath or declaration is required. The second copy of the specification may be a legible carbon copy of the original.

47. Section 1.172 is amended by revising paragraph (a) to read as follows:

§1.172 Applicants, assignees.

(a) A reissue oath must be signed and sworn to or declaration made by the inventor or inventors except as otherwise provided (see §§1.42, 1.43, 1.47), and must be accompanied by the written assent of all assignees, if any, owning an undivided interest in the patent, but a reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

* * * * *

48. Section 1.174 is amended by revising paragraph (a) to read as follows:

§1.174 Drawings.

(a) The drawings upon which the original patent was issued may be used in reissue applications if no changes whatsoever are to be made in the drawings. In such cases, when the reissue application is filed, the applicant must submit a temporary drawing which may consist of a copy of the printed drawings of the patent or a photoprint of the original drawings of the size required for original drawing.

* * * * *

49. Section 1.175 is amended by revising the introductory text of paragraph (a) to read as follows:

§1.175 Reissue oath or declaration.

(a) Applicants for reissue, in addition to complying with the requirements of §1.63, must also file with their applications a statement under oath or declaration as follows:

* * * * *

50. Section 1.324 is revised to read as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors.

51. Section 1.325 is revised to read as follows:

§1.325 Other mistakes not corrected.

Mistakes other than those provided for in §§1.322, 1.323, 1.324, and not affording legal grounds for reissue or for reexamination, will not be corrected after the date of the patent.

52. A new §1.335 is added to read as follows:

§1.335 Filing of notice of arbitration awards.

(a) Written notice of any award by an arbitrator pursuant to 35 U.S.C. 294 must be filed in the Patent and Trademark Office by the patentee, or the patentee's assignee or licensee. If the award involves more than one patent a separate notice must be filed for placement in the file of each patent. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the award.

(b) If an award by an arbitrator pursuant to 35 U.S.C. 294 is modified by a court, the party requesting the modification must file in the Patent and Trademark Office, a notice of the modification for placement in the file of each patent to which the modification applies. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the court's order modifying the award.

(c) Any award by an arbitrator pursuant to 35 U.S.C. 294 shall be unenforceable until any notices required by paragraph (a) or (b) of this section are filed in the Patent and Trademark Office. If any required notice is not filed by the party designated in paragraph (a) or (b) of this section, any party to the arbitration proceeding may file such a notice.

53. Section 5.12 is revised to read as follows:

§5.12 Petition for license.

(a) Filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject matter of the application. The filing receipt will indicate if a license is granted. If the initial automatic petition is not granted, a subsequent petition may be filed under paragraph (b) of this section.

(b) Petitions for license under 35 U.S.C. 184 should be presented in letter form and should include petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

GERALD J. MOSSINGHOFF,
Dec. 23, 1982. *Commissioner of Patents and Trademarks.*

[1027 OG 9]

(67) **Deposit Accounts—Statutory Fee Charges**

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

(68) **Request for Refunds**

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER,
Assistant Commissioner for Finance & Planning.

[1024 O.G. 59 (11–23–82)]

(69) **Deposit Account Authorizations**

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed." A general authorization would not apply to document supply fees under §1.19, such as those required for certified copies; to post-issuance fees under §1.20, such as those required for maintenance fees; or to miscellaneous fees and charges under §1.21, such as assignment recording fees.

Many applications filed prior to Oct. 1, 1982, contain broad language authorizing *any* additional fees which might have been due to be charged to a deposit account. The Patent and Trademark Office does not interpret such broad authorizations, filed prior to Oct. 1, 1982, to include authorization to charge to a deposit account the issue fee or other fees in sections 1.16, 1.17 and 1.18 except those associated with the paper containing the broad authorization. However, such a broad authorization filed in an application on or after Oct. 1, 1982, will be interpreted as authorization to charge the issue fee; as well as any other fee set forth in §§1.16, 1.17 or 1.18. Fees under sections 1.19, 1.20 and 1.21 will not be charged as a result of a general authorization under section 1.25.

It is recommended that authorizations to charge fees to deposit accounts include reference to the particular fees or fee sections of the rules which applicant intends to authorize. For example, if filing and processing fees under §§1.16 and 1.17 only are intended to be included in the authorization, and not the issue fee under §1.18, the authorization could read: "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of the application to Deposit Account No. _____." Such an authorization would clearly exclude issue fees under 37 CFR 1.18 while including all the filing and processing fees listed in 37 CFR 1.16 and 1.17. Similarly, if it were intended to authorize the charging of fees relating only to a specific paper, the authorization could read "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. _____." Such authorizations would cover situations in which a check to cover a filing and processing fee under 37 CFR 1.16 and 1.17 was omitted or was for an amount less than the amount required.

It is extremely important that the authorization be clear and unambiguous. If applicants file authorizations which are ambiguous and which deviate from the usual forms of authorizations, the Office may not interpret the authorizations in the manner applicants intend. In such cases applicants could be subject to further expenses, petitions, etc. in order to correct fees which were not charged as intended due to an ambiguous authorization.

GERALD J. MOSSINGHOFF,
July 1, 1983. *Commissioner of Patents and Trademarks.*

[1032 OG 32]

(70) **Notice to All Deposit Account Holders**

Beginning Oct. 7, 1983, please *mail deposit account remittances only* to:

Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

To expedite credit to your deposit account and the treasury, and arrangement has been made between the Patent and Trademark Office, Treasury Department, and the First National Bank of Chicago utilizing a special "lockbox" depositary to receive deposit account remittances.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks and be accompanied by *the top portion of your deposit account statement.* Submit only remittances for deposit accounts to this new address. All other correspondence should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

LEONARD L. NAHME,
Director Office of Finance.

[1035 OG 27]

(71) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00.

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscription and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557–3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557–3227.

THERESA A. BRELSFORD,
June 23, 1986. *Assistant Commissioner, for Administration.*

[1068 OG 37]

(72) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

DONALD W. PETERSON,
Oct. 5, 1987. *Deputy Commissioner.*

[1083 TMOG 44]

APPLICATION CONTENT

(73) **Use of Metric System of Measurements in Patent Applications**

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'-Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

(74) **Filing of Patent Applications Pursuant to 37 CFR 1.60**

Applicants are reminded that 37 CFR 1.60 was amended effective Feb. 27, 1983 to require applicants to furnish a copy of the prior application upon filing.

Some applicants continue to request that the copy be made by the Patent and Trademark Office as was done under the practice prior to Feb. 27, 1983. Others are filing a copy of the specification of the prior application, but not a copy of the oath or declaration. The Office will no longer make such copies as part of processing the new application.

The requirements of 37 CFR 1.60 must be complied with before a filing date will be granted for the continuing application.

It should be noted that 37 CFR 1.60 has been amended effective Apr. 1, 1984 to divide the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended 37 CFR 1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph (b) requires that the prior application be complete as set forth in 37 CFR 1.51(a) in order to properly file an application under 37 CFR 1.60. A complete application under 37 CFR 1.51(a) includes a signed oath or declaration. If the prior application was not a complete application (37 CFR

1.51(a)), a continuation or divisional application cannot be filed utilizing the provisions of 37 CFR 1.60 and any continuation or divisional application must include new application papers and be filed in accordance with 37 CFR 1.53.

Paragraph (b) of 37 CFR 1.60 also requires that a true copy of the prior complete application be filed. The copy must include the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication (on the oath or declaration) that it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. See the final rulemaking published in the Jan. 4, 1984 Federal Register at 49 FR 548–556 and reprinted in the Jan. 24, 1984 Official Gazette at 1038 O.G. 275–283.

GERALD J. MOSSINGHOFF
Apr. 6, 1984. *Commissioner of Patents and Trademarks.*

[1042 O.G. 18]

(75) Information in Oath/Declaration Necessary to Identify the Specification in Accordance with 37 CFR 1.63

Section 1.63 of 37 CFR requires that an oath or declaration "identify the specification to which it is directed." Since filing dates are now granted on applications with the oath or declaration being filed later with a surcharge, the question has arisen as to what information must be supplied in the oath or declaration to identify the specification to which it is directed and to comply with the rule.

The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application serial number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in in order to adequately identify the specification in compliance with 37 CFR 1.63.

The following combinations of information supplied in an oath or declaration are acceptable as minimums for identifying a specification:

(1) name of inventor and application serial number;
(2) name of inventor, attorney docket number which was on the application as filed, and filing date of the application;
(3) name of inventor, title of invention and filing date;
(4) name of inventor, title of invention and reference to a specification which is attached to the oath or declaration at the time of execution and filed with the oath or declaration;
(5) name of inventor, title of invention and a statement by a registered attorney or agent that the application filed in the PTO is the application which the inventor executed by signing the oath or declaration.

If the oath or declaration is filed with an "attached" specification as indicated in item (4) above, it must be accompanied by a statement that the "attached" specification is a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application. Such statement must be a verified statement if made by a person not registered to practice before the Office.

Oaths or declarations which do not meet the requirements set forth above will not be accepted as complying with 37 CFR 1.63 for completing an application. Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)). Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not completely filled in but contain sufficient information to identify the specifications to which they apply as detailed above.

GERALD J. MOSSINGHOFF,
Sept. 12, 1983. *Commissioner of Patents and Trademarks.*

[1035 OG 3]

(76) Extension of Transition Period to File Oaths or Declarations in Compliance with 37 CFR 1.63

The Federal Register of Jan. 20, 1983 indicated at 48 FR 2706 that all oaths or declarations filed on and after Feb. 27, 1983, must comply with the requirements of 37 CFR 1.63 except for the transition period as noted below.

The Office indicated that it would continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983 during a transition period ending June 30, 1983, provided that the oath or declaration was attached to and was executed as a part of an application.

Although the Office is not required to do so, it intends to make translated declaration forms available to the public in at least the more frequently required non-English languages. Since these non-English language translations are not yet available, the transition period is extended to end on Sept. 30, 1983 rather than on June 30, 1983. During this period, the Patent and Trademark Office will continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983, if the oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective Oct. 1, 1983, all oaths or declarations filed under 37 CFR 1.51(a)(2) as a part of a patent application must fully comply with 37 CFR 1.63.

DONALD J. QUIGG,
May 31, 1983. *Acting Commissioner of Patents and Trademarks.*

[1031 OG 53]

(77) Graphical Illustrations in the Specification

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

WILLIAM FELDMAN,
Jan. 12, 1978. *Deputy Assistant Commissioner for Patents.*

[967 O.G. 2]

(78) Inclusion of Copyright or Mask Work Notices in Patents

Under current intellectual property laws, it is possible to obtain copyright protection or mask work protection as well as patent protection for certain designs and technologies. On occasion, an author/inventor considers it desirable to include a notice of copyright or mask work in a design or utility patent which discloses material on which copyright or mask work protection has previously been established.

The inclusion of a copyright or mask work notice in a patent that discloses material on which copyright or mask work protection has previously been established, would serve to publicize and thereby protect the various intellectual property rights of the author/inventor. Further, this publication would tend to protect the public by militating against an unintentional encroachment into these rights. The presence of an unrestricted copyright or mask work notice in a patent could have an inhibiting effect on public dissemination of the patent disclosure to the extent it discourages the facsimile reproduction of the patent. This possible effect would be contrary to the mission of the Patent and Trademark Office to disseminate knowledge and information publicly by way of patent issuance, publication, and distribution. To avoid this effect, it is considered necessary to include an appropriate authorization of the author/inventor with any copyright or mask work notice appearing in a patent.

In light of these considerations, the Patent and Trademark Office will permit the inclusion of a copyright or mask work notice in a design or utility patent application, and thereby any patent issuing therefrom, which discloses material on which copyright or mask work protection has previously been established, under the following conditions:

(1) The copyright or mask work notice must be placed adjacent to the copyright or mask work material. Therefore, the notice may appear at any appropriate portion of the patent application disclosure, including the drawing. However, if appearing on the drawing, the notice must be limited in print size from ¼ inch to ½ inch and must be placed within the "sight" of the drawing immediately below the figure representing the copyright or mask work material. If placed on a drawing in conformance with these provisions, the notice will not be objected to as extraneous matter under 37 CFR 1.84.
(2) The content of the notice must be limited to only those elements required by law. For example, "©1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited, and under current statutes, legally sufficient notices of copyright and mask work respectively.
(3) Inclusion of a copyright or mask work notice will be permitted only if the following authorization is included at the beginning (preferably as the first paragraph) of the specification to be printed for the patent:

> A portion of the disclosure of this patent document contains material which is subject to [copyright or mask work] protection. The [copyright or mask work] owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all [copyright or mask work] rights whatsoever.

(4) Inclusion of a copyright or mask work notice after a Notice of Allowance has been mailed will be permitted only if the criteria of 37 CFR 1.312 have been satisfied.

The inclusion of a copyright or mask work notice in a design or utility patent application, and thereby any patent issuing therefrom, under the conditions set forth above will serve to protect the rights of the author/inventor, as well as the public, and will serve to promote the mission and goals of the Patent and Trademark Office. Therefore, the inclusion of a copyright or mask work notice which complies with these conditions will be permitted. However, any departure from these conditions may result in a refusal to permit the desired inclusion. If the authorization required under condition (3) above does not include the specific language "(t)he [copyright or mask work] owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, . . .", the notice will be objected to as improper by the examiner of the application. If the examiner maintains the objection upon reconsideration, a petition may be filed in accordance with 37 CFR 1.181.

RENE D. TEGTMEYER,
Mar. 20, 1987. *Assistant Commissioner for Patents.*

[1077 OG 22]

(79) Use of Color Drawings in Utility Patents

This notice supersedes the Official Gazette notice, dated Aug. 6, 1986, published at 1070 O.G. 10 on Sept. 9, 1986.

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be appropriate. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of §1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes.

In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, a set of color drawings will be attached to the Letters Patent. Moreover, copies of the patent with color drawings attached thereto will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary to recover the actual costs associated therewith.

Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

It is anticipated that such a petition will be granted only when the Patent and Trademark Office has determined that a color drawing is the only practical medium by which to disclose in a printed utility patent the subject matter sought to be patented.

It is emphasized that a decision to grant the petition should not be regarded as an indication that color drawings are necessary to comply with a statutory requirement. In this latter respect, clearly it is desirable to file any desired color drawings as part of the original appli-

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cation papers in order to avoid issues concerning statutory defects (e.g., lack of enablement under 35 USC 112 or new matter under 35 USC 132). The filing of the petition, however, may be deferred until acceptable drawings are required by the examiner.

The petition should be directed to the attention of the Office of the Deputy Assistant Commissioner for Patents.

July 24, 1987.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1082 OG 25]

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(80) **Multiple Dependent Claims and New Drawing Filing Requirements**

Introduction

On January 24, 1978, Public Law 94–131 (pages 108–115 of "Patent Laws," August 1976 issue) and the Patent Cooperation Treaty came into force. This public law amends the patent statute, Title 35, United States Code, by providing for procedures and requirements set forth in the Patent Cooperation Treaty. Some of these statutory amendments also effect the laws governing the processing and examination of regular United States national applications filed on and after January 24, 1978.

The amendments of the patent law which will affect *U.S. patent applications filed on and after January 24, 1978,* relate to two elements of the patent application: the claims and the drawings. With regard to claims, the amendments to 35 U.S.C. 41 and 112 provide for multiple dependent claims in accordance with PCT Rule 6.4. With regard to drawings, the amendment to 35 U.S.C. 113 changes the requirements for filing drawings in order to obtain a filing date in accordance with PCT Article 7.

Purpose

This memorandum establishes in more detail the new procedures required by the amended statute. Any questions concerning these instructions may be directed to either Mary Turowski (extension 7–3776) in the administration area or Louis Maassel (extension 7–3070) in the examining area.

Revised 37 CFR sections 1.75(c), (f) and (g); and 1.81 and 1.83(c) were published in the *Official Gazette* of February 21, 1978.

Multiple Dependent Claims

Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim.

The second paragraph of 35 U.S.C. section 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus, section 112 authorizes multiple dependent claims, as long as they are in the alternative form (e.g., "A machine according to claims 3 *or* 4, further comprising . . ."). Cumulative claiming (e.g., "A machine according to claims 3 *and* 4, further comprising . . .") is *not* permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as "A device as in claims 1, 2, 3 or 4, made by a process of claims 5, 6, 7 or 8" is improper. Section 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may *not* serve as a basis for any other multiple dependent claim, either directly or indirectly. These limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim.

The amendment of the second paragraph of section 112 further clarifies that the limitations or elements of each claim incorporated by reference into a multiple dependent claim must be considered separately. Thus, a multiple dependent claim, as such, does not contain all the limitations of all the alternative claims to which it refers, but rather, contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration. Hence, a multiple dependent claim must be considered in the same manner as a plurality of single dependent claims.

Restriction Practice

For restriction purposes, each embodiment of a multiple dependent claim will be considered in the same manner as a single dependent claim. Therefore, restriction may be required between the embodiments of a multiple dependent claim. Also, some embodiments of a multiple dependent claim may be held withdrawn while other embodiments are considered on their merits.

Handling of Multiple Dependent Claims by the Application Division

The Application Division will be responsible for verifying whether multiple dependent claims filed with the application are in proper alternative form, that they depend only upon prior independent and single dependent claims and also for calculating the amount of the filing fee. A new form, PTO–1360, has been designed to be used in conjunction with the current fee calculation form PTO–875.

Handling of Multiple Dependent Claims by the Examining Group Clerical Staff

The examining group clerical staff is responsible for verifying compliance with the statute and rules of multiple dependent claims added by amendment and for calculating the amount of any additional fees required. This calculation should be performed on form PTO–1360.

If a multiple dependent claim (or claims) is added in an amendment without the proper fee, the amendment will not be entered until the fee has been received. In view of the requirements for multiple dependent claims, no amendment containing new claims or changing the dependency of claims will be entered before checking whether the paid fees cover the costs of the amended claims. The applicant, or his attorney or agent, will usually be contacted to pay the additional fee in the same manner as currently in existence for such defects. Where a letter is written in insufficient fee situations, a copy of the multiple dependent claim fee calculation form PTO–1360 will be included for applicant's information.

Handling of Dependent Claims by the Examiner

Should any multiple dependent claim be in an application filed prior to January 24, 1978 or include a claim association or claim structure that violates any of the prohibitions, the claim will be objected to as not being in proper form as required by 37 CFR 1.75 in the next Office action. Such an improper claim will not be further treated on the merits.

When referring to a singular dependent claim or a single embodiment of a multiple dependent claim, as when making a rejection, such a claim or embodiment will be referred to by using the number of all of the claims involved in that claim or embodiment, starting with the highest. For example, if claim 2 was dependent on claim 1, the notations would be 2/1. If in the same application, claim 3 was independent and claim 4 was multiple dependent on claims 2 or 3, the notations would be 4/2/1 and 4/3. Furthermore, if claim 5 depended from claim 4, the notations would be 5/4/2/1 and 5/4/3. Each of these embodiments will be treated individually. It would be possible for claim 4/2/1 to be rejected under section 102 and claim 4/3 to be indicated as avoiding the prior art and being allowable if rewritten in independent form. A number of embodiments may be grouped together if there is a common ground of rejection, but it must be clear how each embodiment is treated.

A claim, such as claim 4, will not be allowed until all embodiments covered thereby are allowable. If an embodiment of a multiple dependent claim avoids the art while other embodiments are rejected over prior art, a statement will be made that that embodiment avoids the art and would be allowed if rewritten in separate dependent or independent form. Wording similar to the following may be used:

> "Embodiment ____ would be allowable if rewritten as a proper dependent or independent claim which contains only the limitations of this embodiment."

Calculation of Fees When Multiple Dependent Claims are Presented, Use of Form PTO–1360

To assist in the computation of the fees for multiple dependent claims, a separate "Multiple Dependent Claim Fee Calculation Sheet," form PTO–1360, has been designed for use with the current "Patent Application Fee Determination Record," form PTO–875. Form PTO–1360 will be placed in the file wrapper by the Application Division where multiple dependent claims are in the application as filed. If multiple dependent claims are not included upon filing, but are later added by amendment, the examining group clerical staff will place the form in the file wrapper. If there are multiple dependent claims in the application, the total number of independent and dependent claims for fee purposes will be calculated on form PTO–1360 and the total number of claims and number of independent claims will then be placed on form PTO–875 for final fee calculation purposes.

If at least $65 is included with the application on filing, but the total fee is insufficient, a "Notice of Insufficient Fee," form PTO–1094, is placed in the file wrapper by the Application Division as is currently done. The notice will be mailed by the examining group in accordance with established procedures.

Calculating Fees for Multiple Dependent Claims Proper Multiple Dependent Claims

Amended section 41(a) of title 35, U.S.C., provides that claims in multiple dependent form cannot be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim would be considered to be that number of dependent claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim would also be considered as the same number of dependent claims as referred to in the multiple dependent claim from which it depends.

Improper Multiple Dependent Claim

If any multiple dependent claim is improper, Application Division may indicate that fact by placing an encircled numeral "1" in the "Dep. Claims" column of form PTO–1360. The fee for any improper multiple dependent claim, whether it is defective for not being in the alternative form or for being directly or indirectly dependent on a prior multiple dependent claim, will only be one, since only an objection to the form of such a claim will normally be made.

This procedure also greatly simplifies the calculation of fees. Any claim depending from an improper multiple dependent claim will also be considered to be improper and be counted as one dependent claim.

FEE CALCULATION EXAMPLE

Claim Number
1 Independent
2 Dependent on claim 1
3 Dependent on claim 2
4 Dependent on claim 2 or 3
5 Dependent on claim 4
6 Dependent on claim 5
7 Dependent on claim 1 or 4
8 Dependent on claim 1 or 5
9 Dependent on claim 8
10 Independent
11 Dependent on claim 1 or 10
12 Dependent on claim 1 and 10

FORM PTO-1360 (11-78) — U.S. DEPT. COMM. PAT. AND TRADEMARK OFFICE

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET
(FOR USE WITH FORM PTO-875)

	AS FILED IND.	AS FILED DEP.	AFTER 1ST AMDT IND.	AFTER 1ST AMDT DEP.	AFTER 2ND AMDT IND.	AFTER 2ND AMDT DEP.
1	1					
2		1				
3		1				
4		2				
5		2				
6		2				
7		(2)				
8		(2)				
9		(2)				
10	1					
11		2				
12		(2)				
TOTAL IND.	2					
TOTAL DEP.		14				
TOTAL CLAIMS		16				

Comments on Fee Calculation Example

Claim 1.–This is an independent claim; therefore, a numeral "1" is placed opposite claim number 1 in the "Ind." column.

Claim 2.–Since this is a claim dependent on a single independent claim, a numeral "1" is placed opposite claim number 2 in the "Dep." column.

Claim 3.–Claim 3 is also a single dependent claim, so a numeral "1" is placed in the "Dep." column.

Claim 4.–Claim 4 is a proper multiple dependent claim. It refers directly to two claims in the alternative, namely, claims 2 or 3. Therefore, a numeral "2" to indicate direct reference to two claims is placed in the "Dep." column opposite claim number 4.

Claim 5.–This claim is a singularly dependent claim depending from a multiple dependent claim. For fee calculation purposes, such a claim is counted as being that number of claims to which direct reference is made in the multiple dependent claim which it depends. In this case, the multiple dependent claim number 4 it depends from counts as 2 claims; therefore, claim 5 also counts as 2 claims. Accordingly, a numeral "2" is placed opposite claim number 5 in the "Dep." column.

Claim 6.–Claim 6 depends indirectly from a multiple dependent claim 4. Since claim 4 counts as 2 claims, claim 6 also counts as 2 dependent claims. Consequently, a numeral "2" is placed in the "Dep." column after claim 6.

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Claim 7.–This claim is a multiple dependent claim since it refers to claims 1 or 4. However, as can be seen by looking at the "2" in the "Dep." column opposite claim 4, claim 7 directly depends from a multiple dependent claim. This practice is improper under 35 U.S.C. 112 and Rule 1.75(c). Following the procedure for calculating fees for improper multiple dependent claims, a numeral "1" is placed in the "Dep." column with a circle drawn around it to alert the examiner that the claim is improper.

Claim 8.–This claim is a multiple dependent claim since it refers to claims 1 or 5. However, since claim 5 depends from multiple dependent claim 4, claim 8 indirectly depends from multiple dependent claim 4 through claim 5. This practice is improper. See MULTIPLE DEPENDENT CLAIMS, paragraph 2, above. Consequently, a numeral "1" is placed in the dependent claim column with a circle drawn around it.

Claim 9.–Claim 9 is improper since it depends from an improper claim. If the base claim is in error, this error cannot be corrected by adding additional claims depending therefrom. Therefore, a numeral "1" with a circle around it is placed in the "Dep." column.

Claim 10.–Here again we have an independent claim which is always indicated with a numeral "1" in the "Ind." column opposite the claim number.

Claim 11.–This claim refers to two independent claims in the alternative. A numeral "2" is therefore placed in the "Dep." column opposite claim 11.

Claim 12.–Claim 12 is a dependent claim which refers to two claims in the conjunctive ("1 *and* 10") rather than in the alternative ("1 *or* 10"). This form is improper under 35 U.S.C. 112 and Rule 1.75(c). Accordingly, since claim 12 is improper, an encircled numeral "1" is placed in the "Dep." column opposite claim 12.

Calculation of Filing Fee

After the numbers of "Ind." and "Dep." claims are noted on form PTO–1360, each column is added. In this example., there are 2 independent claims and 14 dependent claims or a total of 16 claims. The number of independent and total claims can then be placed on form PTO–875 and the fee calculated. In this example, the total number of claims 16 minus 10 leaves 6, which is multiplied by $2 for an additional total claim fee of $12. The total number of independent claims in the example is 2, which minus 1 is 1, which times the $10 rate is $10. The total filing fee is therefore $65 + $12 + $10, or total of $87.

Drawing Requirements

Revised 35 U.S.C. 113 relaxes the previous requirements for submission of drawings on filing under certain conditions. The first sentence of 35 U.S.C. 113 does require a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention. In this situation the lack of a drawing renders the application incomplete and as such, the application cannot be given a filing date until the drawing is received. The second sentence of 35 U.S.C. 113 deals with the situation wherein a drawing is not necessary for the understanding of the invention but the case admits of illustration and no drawing was submitted on filing. The lack of the drawing in this situation does not render the application incomplete but rather is treated much in the same manner as an informality. The examiner should require such drawings in almost all such instances. Such drawings could be required during the processing of the application but do not have to be furnished at the time the application is filed. The applicant is allowed at least two months from the date of the letter requiring drawings to submit them.

Handling of Drawing Requirements Under the First Sentence of 35 U.S.C. 113

Under the revised provisions the Application Division examiner will continue to make the initial decision in all new applications as to whether a drawing is "necessary" under the first sentence of 35 U.S.C. 113.

If during examination an examiner feels that a filing date should not have been granted in an application because it does not contain drawings, the matter will be brought to the attention of the Supervisory Primary Examiner (SPE) for review. If the SPE decides that drawings are required to understand the subject matter of the invention, the SPE will return the application to the Application Division with a memorandum requesting cancellation of the filing date and identifying the subject matter required to be illustrated.

Handling of Drawing Requirements Under the Second Sentence of 35 U.S.C. 113

35 U.S.C. 113 also deals with the situation wherein the drawing is not necessary for the understanding of the invention, but the subject matter admits of illustration by a drawing and the applicant has not furnished a drawing. The lack of the drawing in this situation does not render the application incomplete but rather is treated as an informality. A filing date will be accorded with the original presentation of the papers, despite the absence of drawings. In these situations, a drawing or further illustration will normally be required by the examiner. This may be done either prior to examination in a separate letter or in the first Office action and may be handled in much the same manner as informal photocopy drawings are presently handled. The examiner should require drawings where appropriate as early as possible, since the possession of the drawing at that time would facilitate the examination process. A letter requiring drawings may contain wording similar to the following:

> "The examiner has decided that the subject matter of this applicaton admits of illustration by a drawing and that a drawing would facilitate the understanding of the subject matter disclosed. (Continue with a specific mention of those items of which drawings are desired.) Applicant is required to furnish a drawing under 37 CFR 1.81. (Incorporate in Office action or set two-month period for response.)"

The applicant will be given at least two months from the date of such requirement to submit drawings. If the requirement for drawings is included in an Office action, the time for supplying the drawings will be the same as the time of response to the Office action. Upon receipt of the drawing within the period set, the examiner will check the drawings for new matter. If new matter is included, the drawing will not be entered. It will be objected to as containing new matter. A new drawing without such new matter may be required if the examiner still feels a drawing is needed under 37 CFR 1.81 or 1.83. The examiner's decision would be reviewable by petition to the Commissioner under Rule 1.181. The decision on such a petition would be handled by the Group Director. If a drawing is not timely received in response to a letter from the examiner which requires a drawing, the application becomes abandoned for failure to respond.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Feb. 8, 1978.

[968 O.G. 7]

(81) **Use of Symbol "Ø" in Patent Applications**

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "O" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any questions about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the patentee's expense (37 CFR 1.323) because the intended symbol was not accurately presented by the Greek upper or lower case Phi letters (I, 0) in the patent application.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Dec. 20, 1978.

[978 O.G. 152]

(82) **U.S. Accession to Hague Convention Abolishing the Requirement of Legalization for Foreign Public Documents**

On Oct. 15, 1981, the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" entered into force between the United States and twenty-eight foreign countries that are parties to the Convention. The Convention applies to any document submitted to the United States Patent and Trademark Office for filing or recording, which is sworn to or acknowledged by a notary public in any one of the member countries. The Convention abolishes the certification of the authority of the notary public in a member country by a diplomatic or consular officer of the United States and substitutes certification by a special certificate, or apostille, executed by an officer of the member country. Accordingly, the Office will accept for filing or recording a document sworn to or acknowledged before a notary public in a member country if the document bears, or has appended to it, an apostille certifying the notary's authority. The requirement for a diplomatic or consular certificate, specified in 37 CFR 1.66 and note 1 of 37 CFR 3.45, will not apply to a document sworn to or acknowledged before a notary public in a member country if an apostille is used.

The member countries that are parties to the Convention are:

Austria	Italy	Spain
Bahamas	Japan	Suriname
Belgium	Lesotho	Swaziland
Botswana	Liechtenstein	Switzerland
Cyprus	Luxembourg	Tonga
Fiji	Malawi	U.K. of Great Britain and N. Ireland
France	Malta	United States
Germany Fed. Rep. of	Mauritius	Yugoslavia
Hungary	Netherlands	
Israel	Portugal	
	Seychelles	

The Convention prescribes the following form for the apostille:

Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

APOSTILLE
(Convention de La Haye du Oct. 5, 1961)

1. Country: . . . . . .
This public document
2. has been signed by . . . . . .
3. acting in the capacity of . . . . . .
4. bears the seal/stamp of . . . . . .
. . . . . .

Certified

5. at . . . . . 6. the . . . . . .
7. by . . . . . .
8. No. . . . . .
9. Seal/stamp: 10. Signature:
. . . . . .

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Nov. 5, 1981.

[1013 O.G. 3]

(83) **Simulated or Predicted Tests or Examples**

In order to provide for uniform practice before the Patent and Trademark Office, the following clarification of current Office practice relating to simulated or predicted tests or examples is being set forth. This notice specifies the Office policy which is currently in effect and is considered to have been in effect in the past in this area. The wording of the MPEP provisions prior to this amendment went further than was intended. The amended sections below spell out more clearly the Office's position from the start.

The following wording will be substituted in revision number 8 for that presently in paragraph D of section 608.01(p) of the Manual of Patent Examining Procedure.

MPEP §608.01(p)

"D. Simulated or Predicted Test Results or Prophetic Examples

Simulated or predicted test results and prophetical examples (paper examples) are permitted in patent applications. Working examples correspond to work actually performed and may describe tests which have actually been conducted and results that were achieved. Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted. Paper examples should not be represented as work actually done. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense.

The first and last paragraphs of MPEP section 707.07(1) are being deleted.

DONALD J. QUIGG,
Apr. 15, 1982. *Deputy Commissioner of Patents and Trademarks.*

[1018 O.G. 27]

(84)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1 [Docket No. 71008–7208]

Variety Denomination Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of practice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.
Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.
Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557–3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will, in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professional societies, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act.

In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the Official Gazette as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.
Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This colletion of information requirement has been cleared by OMB under control No. 0651–0011.

The General Counsel of the Department Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part I is proposed to be amended by revising §§1.72, and 1.17 and adding a new §1.168 as set forth below. All proposed additions are printed between arrows.

PART I - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§1.17 Patent application processing fees.

• • • • •

(h) • • •

► §1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .
§1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . . ◄

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§1.72 Title and abstract.

• • •

► (c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in §1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new §1.168 is proposed to be added, to read as follows:

► §1.168 Variety denomination, submission to the Office, examination.
(a) The variety denomination submitted by the patent applicant under §1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

(1) must enable the plant variety to be identified;
(2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder;

(3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
(4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.
(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.
(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in §1.17(h).
(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States.
(f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.
(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in §1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.
(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the public objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122.◀

RENE TEGTMEYER,
Sept. 18, 1987. *Assistant Commissioner for Patents.*

[1085 OG 15]

EXAMINATION OF APPLICATIONS

(85) Examination of Claims For Patentability Under 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic. "A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 163 USPQ 673 (decided December 8, 1969). "Office policy has consistently been to follow *Graham* v. *John Deere Co.*, 148 USPQ 4559 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test. "The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and 'a synergistic result,' but clearly decided whether the claimed inventions were unobvious 'on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test. "Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

C. MARSHALL DANN,
July 8, 1976. *Commissioner of Patents & Trademarks.*

[949 O.G. 3]

(86) Translations of Foreign Language References

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible. 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If indentifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Oct. 26, 1977. *Deputy Assistant Commissioner for Patents.*

[964 O.G. 24]

(87) Restriction Between Inventions

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

(88) Restriction Policy and Practice

The purpose of this notice is to inform the public of the results of the survey that was conducted on restriction requirements made under 35 U.S.C. 121 in the Patent Examining Groups and to report clarifications that have been implemented as a result of a review of restriction policy and practice.

The survey involved about 320 patent applications in which a restriction only Office action had been prepared by an examiner in the period between July—Sept. 1983. The selection of applications was proportioned among Groups according to the volume of restriction requirements during the period. The statistics collected (Appendix A) and the definitions (Appendix B) for each item on the survey form are provided at the end of this notice.

Some of the significant findings of the survey include:

- 19% (61/320) of the requirements surveyed were not reasonable based on a review of the record
- 35% (88/249) of the requirements surveyed (not involving an election of species) were not supported by any reasons, or contained reasons which were clearly inapplicable to the facts
- 41% (53/128) of the actions following an election and traverse did not address the arguments contained in the traverse
- 91% (48/53) of a sample of 53 applications surveyed —the attorney or agent of record had no record of receiving a telephone call requesting an oral election

In response to the results of this survey, existing guidelines in Chapter 800 of the Manual of Patent Examining Procedure (MPEP) have been reviewed with each examiner and supervisor in the Patent Examining Corps in order to promote uniformity of practice and compliance with existing guidelines. A follow-up survey will be conducted in early 1985. In addition, as a result of a review of our existing policy and guidelines, the following clarifications have been made:

(1) Telephone Practice (MPEP 812.01)
Except in those cases where the requirement for restriction is complex, the application is being prosecuted by the applicant pro se, or the examiner knows from past experience that an election will not be made by phone, the examiner should make a telephone call to the attorney or agent of record and request an oral election in accordance with MPEP 812.01, first paragraph.
If an election cannot, or will not, be made orally at the time of the call or within a reasonable time thereafter, generally three working days, the Office action requiring the election in writing should contain the following sentence
"A telephone call was made to (name of attorney or agent) on (date) to request an oral election to the above restriction requirement, but did not result in an election being made."

(2) Multiple Inventions In A Continuing Application
Where claims to multiple inventions within the meaning of 35 U.S.C. 121 are presented in a continuing application (continuation, division, continuation-in-part including those which may be filed under 37 CFR 1.60 or 1.62), the examiner should make (or repeat) an appropriate requirement for restriction and require an election by the applicant UNLESS
(1) the applicant acknowledges the previous requirement in the parent application and clearly indicates which invention is to be prosecuted if the requirement is repeated. The examiner should make any proper requirement for restriction in the first Office action, state how applicant has indicated an election (e.g. statement in a preliminary amendment or transmittal letter), and include an action on the merits on the claims of the elected invention;

or

(2) The application is a continuation, but not a division or CIP filed as a File Wrapper Continuation (FWC) under 37 CFR 1.62. The examiner should assume that the requirement and election made in the parent application carries over unless otherwise indicated by applicant. The exmainer's first action should include a repetition of the restriction requirement made in the parent application to the extent it is still applicable in the continuation and an indication that prosecution is being continued on the invention elected and prosecuted by applicant in the parent application.

The policy and practice of making requirements final and seeking review by way of petition (37 CFR 1.144) remains unchanged in a continuing application, whether a requirement for election was first made in the parent and renewed in the continuation application or was made for the first time in the continuation application.

(3) Product, Process of Making, Process of Using (MPEP 806.05(i))
Practice in this situation is being amended to conform to Rule 13.2(i) of the Patent Cooperation Treaty (PCT) so that a three way requirement can be required only where the process of making is not "specially adapted" to make the product (i.e. the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.
The Manual of Patent Examining Procedure will be revised to reflect these clarifications in the next revision.

GERALD MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Aug. 1, 1984.

[1046 O.G. 2]

(89) Restriction Practice Survey II

This notice is intended to inform the public of the results of a follow-up survey of applications containing a written restriction requirement. The results of the first survey were reported in the Official Gazette on Sept. 4, 1984 (1046 OG 2; Restriction Policy and Practice). Survey II involved 319 applications selected at random in the Patent Examining Groups from those in which a restriction only action had been credited to an examiner in the period of July—Sept. 1984. This period was after the Corps Management Meeting on June 5, 1984 in which restriction policy and practice were reviewed with all SPEs and Directors, and followed the distribution of review materials to all examiners. The results of Survey II showed significant improvements over the results of Survey I, but the results were still not considered satisfactory in several aspects.

Survey Procedure: The selection of applications was generally proportioned among the Groups to correspond to the relative proportion of restriction only actions that were completed in each Group in the last quarter of FY 84. A minimum of ten applications were surveyed from each Group. The distribution was as follows:

110 – 16	210 – 11	310 – 10
120 – 37	220 – 10	320 – 18
130 – 33	230 – 10	330 – 24
150 – 47	240 – 30	340 – 30
	250 – 13	350 – 20
	260 – 10	
TOTALS 133	84	102

The survey team consisted of the same people who conducted the first survey. One person from the survey team reviewed each selected application file and completed the survey form regarding the restriction requirement(s) in the file. The same survey form was used in each survey.

In the event an application file could not be located or was not readily available, a different application was selected for the survey. In general, the substitute application was selected from those requirements completed by the same examiner assigned to the original application.

The survey did not include any design applications.

Survey Results: Statistical results of the survey are set forth on the survey form used in the Appendix including summaries on a Corps and discipline level. References in this notice to "Item ____" refer to the numbered items indicated on the survey form. These results indicate an improvement in all areas which were identified as acute problems in the first survey. We did not do a telephone survey to determine whether applicant's representative had been called prior to writing the requirement.

In addition to the survey, the statistics on restriction requirements before and after the training effort following the first survey are of interest. Statistics show that the number of restriction only actions has decreased 36% Corps-wide (52% in Group 120 which had the highest volume in the first survey) following our training effort. These statistics are shown below.

Quarter	Total First Actions	Total Corps Restriction Requirements	Group 120 Restriction Requirements
Apr–Jun 1984	32,035	2,771	514
Jul–Sep 1984	32,216	1,939	220
Oct–Dec 1984	28,158	1,522	212
	(32,358)*	(1,775)*	(247)*
Oct–Dec vs Apr–Jun		−36%	−52%.

*Figures adjusted (7/6 of actual) to reflect a 7 pay period quarter for comparison with the Apr.–June and July–Sept. quarters which included 7 pay periods.

In addition, 24% of the applications in the second survey contained a specific reference to a telephone call that was made by the examiner, but did not result in an election being made. It was also apparent that some of the requirements were sufficiently complex to warrant a written communication.

The applications reviewed in the second survey resulted in the conclusion that 9% of the requirements that were made were not reasonable on the record that was reviewed (Item 10 – 30/319). This compares to 19% (61/320) in the first survey. Of the 30 cases in which a conclusion of unreasonableness was made, the requirement was traversed in 22 (73%) of those cases, not traversed in 7 cases (23%), and no response was filed in 1 case. In the 22 cases where the unreasonable requirement was traversed, the requirement was withdrawn in 10 cases, not withdrawn in 8 cases, and no subsequent action had been made in 4 cases. In the first survey, 11 unreasonable requirements were withdrawn out of 61 made. The survey form on each of the unreasonable requirements in the second survey was returned and discussed with the Group Director.

In our opinion, the reasons provided by the examiner for insisting upon restriction were not proper (either non-existent or based on the wrong criteria) in 18% (Item 5j – 57/319) of the applications surveyed — compared to 35% in the first survey. In many of these cases, the reviewer determined that the requirement was justified, but for reasons which the examiner did not set forth in the requirement.

Our second survey revealed that applicant had traversed the requirements in 134 cases (Item 7c), and that where the examiner had given another action in those cases (Item 8 – 98), the reasons in the traverse had not been responded to in 30% (Item 8b – 30/98) of the cases. This represents a very modest improvement of the results in the first survey where 41% (53/128) had not responded to the arguments presented in applicants traverse.

In addition to the statistical results, the survey team met to discuss some of the problems observed during the survey. Several members of the team again observed that problems were more likely to arise where complex requirements involving a large number of claims and/or inventions are encountered, and where the claim schedule required the application of combination—subcombination criteria to show patentable distinctness (MPEP 806.05c – two-way distinctness). Where three or more inventions are presented in a single application, it was observed that the examiner rarely showed distinctness among all of the combinations of groups (e.g. I–II, II–III, I–III). Another observation that was frequently made was that many of the problems with incomplete requirements could have been avoided by the use of the form paragraphs and associated instructions.

Further Action: While the second survey indicated that significant improvements have been realized in our pursuit of uniformity in restriction practice, we have not achieved an acceptable level of performance in several areas. The same types of problems predominated in each survey, but are now at a reduced level. There is clearly a continuing need for supervisory review.

Supervisors will take the opportunity to emphasize the following points to examiners in their Art Units:

(1) Use of telephone when appropriate to minimize pendency time;
(2) Reasons to support the requirement (to satisfy the criteria for independence of patentable distinctness) *and* reasons for insisting upon restriction should be given in each written requirement. Mere conclusions are not sufficient;
(3) The substance of arguments contained in applicant's traverse should be responded to in the Office action following the traverse;
(4) A showing of two-way distinctness is required in situations where combination-subcombination criteria are applicable (MPEP 806.05c); and
(5) Use of appropriate form paragraphs should be encouraged.

In addition, each Group will review all restriction requirements made in the Group in a pay period at least once every six months.

Finally, review of restriction practice will not be made a component part of the Quality Review Program on an ongoing basis because of the desirability of identifying problems of this type before prosecution is over and the desirability of maintaining their focus on substantive issues. Of course, the Quality Review Staff will continue to bring problems with restriction requirements to the attention of the Director when they are encountered in the course of their review procedures.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1053 OG 5]

(90) Revised Practice Re Markush-Type Claims

This notice deals with Markush-type generic claims which include a plurality of alternatively usable substances or members. In most cases, a recitation by enumeration is used because there is no appropriate or true generic language. In many cases, the Markush-type claims include independent and distinct inventions. This is true where two or more of the members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

In applications containing claims of that nature, the Examiner may require a provisional election of a single species prior to examination on the merits. The provisional election will be given effect in the event that the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. Should the Markush-type claim be found not allowable, examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

As an example, in the case of an application with a Markush-type claim drawn to the compound C-R, wherein R is a radical selected from the group consisting of A, B, C, D, and E, the Examiner may require a provisional election of a single species, CA, CB, CC, CD, or CE. The Markush-type claim would then be examined fully with respect to the elected species and any species considered to be clearly unpatentable over the elected species. If on examination the elected species is found to be anticipated or rendered obvious by prior art, the Markush-type claim and claims to the elected species shall be rejected, and claims to the non-elected species would be held withdrawn from further consideration. As in the prevailing practice, a second action on the rejected claims would be made final.

On the other hand, should no prior art be found that anticipates or renders obvious the elected species, the search of the Markush-type claim will be extended. If prior art is then found that anticipates or renders obvious the Markush-type claim with respect to a *non-elected species*, the Markush-type claim shall be rejected and claims to the non-elected species held withdrawn from further consideration. The prior art search, however, will not be extended unnecessarily to cover all non-elected species. Should applicant, in response to this rejection of the Markush-type claim, overcome the rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be re-examined. The prior art search will be extended to the extent necessary to determine patentability of the Markush-type claim. In the event prior art is found during the re-examination that anticipates or renders obvious the amended Markush-type claim, the claim will be rejected

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and the action made final. Amendments submitted after the final rejection further restricting the scope of the claim will not be entered.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the Examiner is encouraged to examine all claims on the merits, even though they are directed to independent and distinct inventions. In such a case, the Examiner will not follow the above procedure and will not require restriction.

This notice supersedes the practice set out in 922 O.G. 1016. dated May 1, 1974.

Although the above practice is now in effect, a rule change proposal is also being considered to provide for prosecution of multiple inventions in a single patent application by submission of additional fees.

DONALD W. BANNER,
Oct. 23, 1978. *Commissioner of Patents and Trademarks.*

[976 O.G. 128]

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(91) **Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371**

The purpose of this notice is to set forth procedural guidelines for deciding questions of unity of invention which may arise in international applications when searched by the United States Patent and Trademark Office (USPTO) as an International Searching Authority and when examined during the national phase in the United States as a Designated Office after entry under 35 U.S.C. 371 in connection with the Patent Cooperation Treaty (PCT).

The May 28, 1986, decision in *Caterpillar Tractor Co. v. Commissioner of Patents and Trademarks*, Civil Action No. 84–1212–A, (E.D. Va.) held the Patent and Trademark office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing legislation. In the Caterpillar international application, the USPTO, when acting as an International Searching Authority, held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging such a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically designed" as found in PCT Rule 13.2(ii) means that the process and apparatus can only be used with each other as set forth in the Manual of Patent Examining Procedure (MPEP) §806.05(e).

Therefore, in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 as interpreted in *Caterpillar* will be followed when considering unity of invention of claims of different categories without regard to 37 CFR 1.141. No change is being made in the restriction practice under 37 CFR 1.141(b) and (c) in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT or U.S. national applications. Such a change in U.S. national restriction practices would require a statutory change in the fee levels to cover the additional examining effort required in individual patent applications.

PCT Rules 13.1 and 13.2 are reproduced below:

PCT RULE 13
Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

PCT Rule 13 only will be applied in the restriction practice used in national phase applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations".

Guidelines As to Implementation of Revised Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371

(1) The revised practice for international and national phase applications will *not* be used for national applications filed under 35 U.S.C. 111.

(2) The revised practice will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues. Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations are *not* affected for any applications by this notice.

(3) The expression "and as set forth in §§1.141" in 37 CFR 1.481(a) will no longer be considered operative in view of the decision in *Caterpillar Tractor Co.*, supra. The criteria of §1.141 continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 as they were in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, practice will continue as set forth in MPEP Chapter 800 as modified in 1046 OG 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be required where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.

(4) The criteria of PCT Rule 13 will be applied when determining unity of invention of claims to different categories of invention in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371.

(5) The revised practice will apply to all international applications before the PTO as an International Searching Authority in which no search report has been issued and in all pending national stage applications entered under 35 U.S.C. 371 in which a holding of lack of unity of invention (requirement for restriction) has not been made final by the examiner or acquiesced in by the applicant as of the date of this notice.

(6) In applying PCT Rule 13 to international applications as an International Searching Authority and to national phase applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, of claims to the categories which meet the requirements of any one of PCT Rule 13.1(i) to (iii).

In view of the court's treatment of the USPTO's distinctness test in Caterpillar, the USPTO will also permit in the same international application the following two combinations:

(a) an independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.

(b) an independent claim for a given product and an independent claim for a process of using the said product.

If the different categories of claims do not fall within any *one* of PCT Rule 13.2(i) to (iii) or additional combinations (a) or (b) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (a) or (b) above, unity of invention may not be present. Further, an independent claim for a use in PCT Rule 13.2(i) and combination (b) above is construed as being limited to a claim directed to a process.

In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (a) above, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

Detailed Explanation

Under PCT Rule 13.2, Unity of Invention as to different categories of inventions is covered on the basis of 4 different categories of invention. They are:

A. a product
B. a process (for manufacture)
C. a use of the said product
D. an apparatus or means for carrying out the process for manufacture.

PCT Rule 13.2 provides for grouping of certain of these different categories of inventions and retaining unity of invention.

i. PCT Rule 13.2(i) provides for grouping claims to:

A. a product
B. a process for the manufacture of said product
C. a use of the said product

ii. PCT Rule 13.2(ii) provides for grouping claims to:

B. a process (e.g. for the manufacture of a product)
D. an apparatus or means for carrying out the said process.

iii. PCT Rule 13.2(iii) provides for grouping claims to:

A. a product
B. a process for the manufacture of the product
D. apparatus or means for carrying out the process.

Also permitted by the USPTO are combinations:

(a) A. a product
B. a process for the manufacture of said product

(b) A. a product
C. a use of the said product

If an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (a) or (b) above, and no additional categories of invention are present, unity of invention exists and no additional search fees should be required or restriction requirement made.

For example, if an application contains claims to only a process for the manufacture of a product and claims to a use of a product and no product claims is present, there is lack of unity of invention since the provisions of Rule 13.2(i) do not apply and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also, if claims to all three categories of PCT Rule 13.2(i) are present at the time of the first Office action and all the product claims are canceled in the response to the first Office action, a requirement for restriction could be made, if appropriate, in the second Office action in view of the independent inventions remaining in the application. PCT Rule 13.2(i) would no longer apply since all three categories of claims would no longer be present in the application. However, the fact that claims to a certain category of invention are unpatentable does not affect the question of unity of invention provided the unpatentable claims are retained in the application.

Where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above included in an application, unity of invention may be lacking between the claims drawn to the categories set forth in any *one* of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above, and the claims to the additional category of invention. For example, if an application contained claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a use of the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product could be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention so that more than one paragraph of PCT Rule 13.2 and combinations (a) or (b) above applies, the examiner will inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (iii) and (ii), and then combinations (a) or (b) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in accordance with theprovisions of Chapter 800 of the MPEP.

Under PCT Rule 13.2 and combinations (a) and (b) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing and one use. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims will be considered as the elected invention. The first recited invention of each additional category which is related as described in paragraph 7

below with the first invention as indicated in the previous sentence will be considered elected. Accordingly, for example, if multiple products are claimed, the first recited product is constructively elected and the first recited process, if multiple processes adapted for making and/or using the product are claimed, is also constructively elected. Any such holding by the examiner will be made in the form of a restriction requirement in an application entered in the USPTO under 35 U.S.C. 371. Such a restriction requirement would be made on the basis of criteria set forth in MPEP Chapter 800. Applicant would have the right to traverse such a restriction requirement in the response to the Office action.

(7) The inventions recited by the claims of different categories must be drawn to related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (a) and (b) above must be able to be made by the claimed process for manufacture and the use claimed must be able to use the claimed product. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be able to carry out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be able to make the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(9) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

(10) Any prior notices or policies relating to unity of invention which are inconsistent herewith are superceded to the extent they are inconsistent with this notice.

Appropriate changes in the Code of Federal Regulations will be proposed in due course to adjust the level of the search fees and national fees of §1.445 to recover the cost of searching and examining international applications with claims to different categories of invention in a single international application. The fees were originally set based on the unity of invention practice previously in effect.

If necessary, additional guidance for processing applications under PCT Rule 13 will be issued as experience is gained.

DONALD J. QUIGG,
Aug. 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1070 OG 11]

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(92)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 61231–7086]

Unity of Invention and Patent Cooperation Treaty [Chapter II]

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Final Rulemaking.
Summary: The Patent and Trademark Office hereby amends its regulations (1) to change the practice in handling unity of invention issues in international applications under the Patent Cooperation Treaty (PCT) and those entering the national stage under 35 U.S.C. 371 and (2) to establish procedures necessary for patent applicants to proceed under Chapter II of the Patent Cooperation Treaty. This rule change is being made because (1) the current rules for handling unity of invention issues in international applications are not consistent with the court decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, 231 USPQ 590 (E.D. Va. 1986), and (2) legislation implementing Chapter II of the Patent Cooperation Treaty has recently been enacted. The promulgated rules will result in (1) the treatment of unity of invention issues in international applications consistently with the court decision while retaining the current practice for national applications filed under 35 U.S.C. 111, and (2) procedures adequate for applicants to proceed under Chapter II of the Patent Cooperation Treaty.
Effective Date: July 1, 1987.
For Further Information Contact: Louis O. Maassel by telephone at (703) 557–3070 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This final rule change relates to (1) questions of unity of invention which may arise in international applications when searched as an International Searching Authority and when examined as an International Preliminary Examining Authority by the United States Patent and Trademark Office (USPTO) and during the national stage in the United States as a Designated Office after entry under 35 U.S.C. 371 pursuant to the Patent Cooperation Treaty (PCT) and (2) procedures to be followed and fees to be paid under Chapter II of the Patent Cooperation Treaty. The rule change will also increase the amount of the international search fees and national fees in international applications in view of increased average effort required by the USPTO because of changes in the rules relating to unity of invention. No fees are being established under 35 U.S.C. 41.

Background Information

Unity of Invention

The May 28, 1986, decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, 231 USPQ 590 (E. D. Va., 1986) held that the Patent and Trademark Office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing rules. In the Caterpillar international application, the USPTO, acting as an International Searching Authority, had held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically designed" as found in PCT Rule 13.2(ii) means that the process and apparatus have unity of invention if they can only be used with each other, as set forth in the Manual of Patent Examining Procedure (MPEP) §806.05(e).

Therefore, when the Patent and Trademark Office considers international applications as an International Searching Authority, as an International Preliminary Examining Authority, and during the national stage as a Designated or Elected Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 will be followed when considering unity of invention of claims of different categories without regard to the practice in national applications filed under 35 U.S.C. 111. No change is being made in the current restriction practice in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT international applications or in U.S. national applications. Any such change in U.S. national restriction practice would require a statutory change in the fee levels in order to cover the additional examining effort required in individual patent applications.

The unity of invention procedures set forth in the rules are already being substantially followed by the examiners in the USPTO as a result of the notice signed on Aug. 15, 1986, and published in the Official Gazette on Sept. 9, 1986 at 1070 O.G. 11. The notice of Sept. 9, 1986 and any prior notices or policies relating to unity of invention which are inconsistent with the rules and procedures in this final rules notice are superseded to the extent that they are inconsistent.

The unity of invention practice set forth in PCT Rule 13 will be applied in national stage applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations". However, continuing applications filed under 35 U.S.C. 111 of international applications under the provisions of 35 U.S.C. 365(c) will be subject to the same restriction practice as other United States national applications filed under 35 U.S.C. 111. However, it is noted that where several inventions have been searched in the parent international application, the examination of such inventions in a continuing national application may not be burdensome and the examiner may consider all the inventions in such an application without making a restriction requirement.

Implementation of Unity of Invention Practice in International Applications and National Stage Applications Entered Under 35 U.S.C. 371

(1) The practice established by these rules for international and national stage applications will *not* be applied to national applications filed under 35 U.S.C. 111.

(2) The practice established by these rules will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues.

Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations is *not* affected for any applications by this rule change.

(3) The criteria of §1.141 would continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 in a manner similar to that in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, national restriction practice will continue as set forth in MPEP Chapter 800, as modified in 1046 O.G. 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be made where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, claims to the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. This concept is included in paragraph 1.141(b).

(4) Under the rules, the criteria of PCT Rule 13.2 will be applied when considering unity of invention of claims drawn to different categories of invention in international applications as an International Searching Authority, International Preliminary Examining Authority, and as a Designated or Elected Office in international applications which enter the national stage under 35 U.S.C. 371.

(5) Under the rules, in applying PCT Rule 13.2 to international applications as an International Searching Authority, an International Preliminary Examining Authority and to national stage applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, claims to the categories which meet the requirements of any one of PCT Rule 13.2(i) to (iii).

Under the rules, the USPTO will also permit in the same international or national stage application the following two combinations:

(1) An independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.

(2) An independent claim for a given product and an independent claim for a process of using the said product.

Under the rules, if an application contains a combination of categories of claims which do not fall within any *one* of the combinations of PCT Rule 13.2(i) to (iii) or additional combinations (1) or (2) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (1) or (2) above, unity of invention may not be present.

Further, an independent claim for a use in PCT Rule 13.2(i) and combination (2) above will be construed as being limited to a claim directed to a process of using. In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (1) above, under the rules, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

Under the rules, if an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (1) or (2) above, and no additional categories of invention are present, unity of invention will exist and no additional fees will be required or restriction requirement made.

For example, if an application contained claims to only a process for the manufacture of a product and claims to a use of a product and no product claim is present, there will be lack of unity of invention since the provisions of Rule 13.2(i) do not apply because claims to all categories of invention set forth in PCT Rule 13.2(i) are not included in the application and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also if claims to all three categories of PCT Rule 13.2(i) were present at the time of the first Office action in a national stage application and all the product claims are rejected in the first Office action, a requirement for restriction could also be made, if appropriate, in view of independent inventions being in the application without an allowable linking (product) claim.

Under the rules, where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2 (i), (ii), (iii) or combinations (1) or (2) above are included in an application, unity of invention may be lacking between the claims drawn to the combination of the categories of invention set forth in any *one* of PCT Rule 13.2(i), (ii), or (iii) or combinations (1) or (2) above, and the claims to the additional category of invention. For example, if an application contains claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a process of using the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product can be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention under the rules so that more than one paragraph of PCT Rule 13.2 and combinations (1) or (2) above applies, the examiner would inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (ii) and (iii), and then combinations (1) or (2) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in

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accordance with the provisions of Chapter 800 of the MPEP.

(6) Under PCT Rule 13.2 and combinations (1) and (2) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing the product and one use of the product. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims would be considered as the elected invention under the rules. The first recited invention of each additional category which is related to the first invention as indicated in the previous sentence will be considered elected. Accordingly, for example, if multiple products are claimed, the first recited product will be considered to be constructively elected and if multiple processes adapted for making and/or using the product are claimed, the first recited process will also be constructively elected. Any additional inventions of the same category will be subject to payment of additional fees during the international stage. In a national stage application submitted under 35 U.S.C. 371 any such holding by the examiner will be made in the form of a restriction requirement. Such a restriction requirement will be made on the basis of criteria set forth in MPEP Chapter 800. Applicant will have the right to traverse such a restriction requirement in the response to the Office action.

(7) Inventions of different categories, to have unity of invention, must be related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (1) and (2) above must be capable of being made by the claimed process for manufacture or being used in the claimed process of use. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be capable of carrying out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be capable of preparing the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(8) Under §§1.494 and 1.495, applicants must indicate on all application papers filed for entry under 35 U.S.C. 371 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

Patent Cooperation Treaty, Chapter II

The Patent Cooperation Treaty became effective for the United States on Jan. 24, 1978. The United States, however, was one of six countries (out of the 40 countries who have ratified or acceded to the Treaty) which had reservations not to be bound by Chapter II. The document removing the reservation as to Chapter II was deposited with the Director General of the World Intellectual Property Organization on Apr. 1, 1987. Accordingly, Chapter II of the Treaty for the United States of America, Pub. L. 99–616 and these final regulations become effective 3 months later on July 1, 1987.

Chapter I of the Patent Cooperation Treaty provides a standardized application format and a centralized filing procedure for international patent applications. Pursuant to Chapter I, an applicant may submit an International application, designating those member countries in which the applicant desires patent protection. Filing an international application has the same effect as filing a separate application in all designated member states with respect to the filing date. In addition, by filing an international application, the applicant does not have to incur the expenses associated with national patent prosecution in the designated countries until 20 months from the priority date of the international application. During this period, the applicant obtains an international search report citing prior art deemed to be relevant to the claims of the invention contained in the international application. This helps the applicant decide whether to proceed with patent prosecution in the various countries originally designated.

Chapter II of the Patent Cooperation Treaty provides two further benefits for the applicant. First, an additional 10 months is allowed, for a total of 30 months from the priority date of the international application, before the applicant must decide whether to proceed with national patent prosecution in the elected countries. Second, the applicant is provided with an international preliminary examination report. In contrast to the international search report, which provides citations of prior art pertinent to the invention, the international preliminary examination report is a non-binding opinion from an International Preliminary Examining Authority as to whether the invention is novel, involves an inventive step (is non-obvious), and is industrially applicable. A preliminary examination report will be established within 28 months from the priority date. This preliminary examination report, together with the additional 10 months before the decision to proceed with national prosecution is required, places the applicant in a better position to consider commercial factors associated with the invention and to decide whether to pursue patent protection in the various elected countries.

To take advantage of these benefits provided by Chapter II, an applicant must file a "Demand" for a preliminary examination in an appropriate International Preliminary Examining Authority prior to the expiration of the 19th month from the priority date and pay certain fees. The final rules establish the amounts of some of the necessary fees and procedures under Chapter II and also group all the rules unique to international applications in a separate area of the regulations. The rules fall into three groups: (1) those directed to procedures under Chapter I, (2) those directed to procedures under Chapter II, and (3) those directed to entering the national stage under 35 U.S.C. 371.

Changes From the Proposed Rules

In §1.475, a new paragraph (f) has been added which sets forth in the rules the exact wording of PCT Rule 13. PCT Rule 13 was included in the proposed rules as a footnote. The incorporation of the wording of PCT Rule 13 into §1.475(f) will make it easier to refer to and easier to locate. Sections 1.475, 1.476, 1.487 and 1.499 are also changed to refer to §1.475(f) rather than footnote 1.

In §1.480(c), the wording has been clarified by adding a reference to the election of the United States.

Section 1.484(f) has been modified from the proposal to permit more than one interview in those situations where the examiner considers that an additional interview would be helpful.

In §1.485, paragraph (b) has not been included since the substance thereof is set forth in §1.484(d).

In §1.492(a)(2) and (3), "i" has been deleted in order to refer to both §1.445(a)(2)(i) and (ii).

An additional paragraph (a)(4) has been added to §1.492 and an additional paragraph (b) has been added to §1.496 which provide for a substantially reduced national fee and special procedure, respectively, where the application has satisfied the requirements of novelty, inventive step (non-obviousness) and industrial applicability before the United States International Preliminary Examining Authority as to the identical claims which are in the application at the national stage in the Patent and Trademark Office. Amendments during subsequent prosecution will only be permitted in response to an examiner's rejections or objections. Thus, no new claims are permitted. Therefore, most of such cases will require little or no prosecution to satisfy the requirements for patentability. The title of §1.496 has been broadened in view of the new paragraph (b) and proposed§1.496 has been redesignated as paragraph (a).

In §§1.494 and 1.495, an additional paragraph has been added to indicate the date of abandonment of an international aplication as to the United States if the requirements of 35 U.S.C. 371(c) are not timely fulfilled.

Response to Comments Received

Specific comments were received on several of the proposed rules, particularly those relating to unity of invention and fees. Sixteen letters submitting written comments were received. Oral testimony was presented by five persons at the public hearing conducted on Apr. 6, 1987 resulting in 46 pages of testimony. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules or requesting clarification thereto appear below with responses thereto.

Comment:

A question was raised as to whether the deadline for filing a continuing application under 35 U.S.C. 365(c) and 120 was 20 or 22 months under Chapter I and 30 or 32 months under Chapter II.

Reply:

The Patent and Trademark Office considers the international application to be pending until the 22nd month from the priority date if the United States has been designated and no Demand for International Preliminary Examination has been filed prior to the expiration of the 19th month from the priority date and until the 32nd month from the priority date if a Demand for International Preliminary Examination which elected the United States of America has been filed prior to the expiration of the 19th month from the priority date provided that a copy of the international application has been communicated to the Patent and Trademark Office within the 20 or 30 month period, respectively. If a copy of the international application has not been communicated to the Patent and Trademark Office within the 20 or 30 month period respectively, the international application becomes abandoned as to the United States 20 or 30 months from the priority date respectively. These periods have been placed in the rules as paragraph (h) of §1.494 and paragraph (i) of §1.495. A continuing application under 35 U.S.C. 365(c) and 120 may be filed anytime during the pendency of the international application.

Comment:

A comment was received concerning the situation where a continuing application is filed under 35 U.S.C. 365(c) of an international application which claims priority of an earlier filed foreign application as to (1) whether the applicant must specifically claim priority in the continuing application and (2) whether the certified copy of the priority application which may have been communicated to the Patent and Trademark Office by the International Bureau may be relied upon without any need to file a certified copy of the priority application in the continuing application.

Reply:

As to item (1), it is necessary under the statute for the applicant to claim priority in the continuing application. Otherwise there is no indication that such benefit is desired in the continuation and the information may not be present for printing of any subsequent patent.

As to item (2), the certified copy of the priority application communicated by the International Bureau is placed in a folder and is not assigned a U.S. serial number unless the national stage is entered. Such folders are disposed of if the national stage is not entered. Therefore such certified copies may not be available if needed later in the prosecution of a continuing application. An alternative would be to physically remove the priority documents from the folders and transfer them to the continuing application. The resources required to request transfer, retrieve the folders, make suitable record notations, transfer the certified copies, enter and make of record such copies in the continuing applications is substantial. Accordingly, the priority documents in folders of international applications which have not entered the national stage may not be relied on.

Comment:

One comment raised the question whether a continuing application filed under 35 U.S.C. 111 and entitled to the benefit of a prior international application designating the United States under 35 U.S.C. 365(c) and 120 would be subject to the PCT unity practice of §1.499 or the national restriction practice under §1.141.

Reply:

A continuing application filed under 35 U.S.C. 111 would be subject to the national restriction practice as set forth in §1.141 and Chapter 800 of the Manual of Patent Examining Procedure. Only those international applications entering the national stage under 35 U.S.C. 371 and §1.494 or §1.495 would be subject to the unity of invention practice set forth in §1.499.

Comment:

Five comments were made to the effect that the unity practice set forth in the rules was not consistent with the unity of invention criteria currently under discussion in the WIPO "harmonization" treaty meetings.

Reply:

At the present time there appears to be no agreed upon unity practice in the harmonization meetings. Only a discussion document has been prepared by WIPO. The Patent and Trademark Office is currently making a very intensive study of unity of invention in the United States, Japan and the European Patent Office. The practice which may result from this study and subsequent discussions is also not clear at this time. For these reasons as well as the fee implications of such a change, it is considered preferable to proceed with a clarification of the unity of invention practice which is to be used as part of the regulations for use by patent applicants and examiners at this time and, if modification of the practice is required in the future, appropriate changes in the law and the rules will be made at that time.

Comment:

Two comments argued that the difference in treatment of unity of invention is contrary to 35 U.S.C. 372(a).

Reply:

35 U.S.C. 372(a) states:

> All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent and Trademark Office.

This section is interpreted as relating only to substantive questions of patentability which includes matters such as the definition of prior art. See PCT Article 27(5). If section 372(a) were interpreted to include items other than those relating to substantive questions of patentability, items such as requirements to obtain a filing date would be included. Clearly, an international application must only meet the filing date requirements of PCT Article 11(1) even though a U.S. national application must meet the requirements of 35 U.S.C. 111.

Comment:

One comments was received stating that the U.S. rules should define prior art for PCT purposes and also the manner of issuing International Preliminary Examination Reports.

Reply:

Prior art for PCT purposes is already defined in PCT Rule 64 and the procedures are set forth in PCT Rules 66 and 70. To repeat the substance of these PCT rules in the U.S. rules would be duplicative and possibly lead to different interpretations if different wording was used.

Comment:

One comment inquired whether the International Preliminary Examining Report was binding on a USPTO examiner in the national stage.

Reply:

An International Preliminary Examination Report is not binding on a USPTO examiner. PCT Article 33(1) clearly states that the "objective of the international preliminary examination is to formulate a preliminary and non-binding opinion." Since the USPTO has had no experience with International Preliminary Examination Reports prepared by foreign offices, as well as foreign offices having no experience with Reports prepared by the USPTO, the degree of reliance on such Reports in the national stage cannot be determined at the present time. Studies underway with the European Patent Office and the Japanese Patent Office regarding inventive step and other matters and experience with Reports from other

International Preliminary Examining Authorities may be helpful in further addressing this question in the future.

Comment:

Two comments were received asking why §1.141(b) was being changed since there was no change in U.S. restriction practice.

Reply:

No change is being made in U.S. restriction practice in applications filed under 35 U.S.C. 111. The amendments to §1.141 basically delete expressions used in the Patent Cooperation Treaty which are not used in U.S. national practice. The criteria deleted from §1.141(b) still remain in Chapter 800 of the Manual of Patent Examining Procedure.

Comment:

One comment was made that any interpretation by the PTO of the PCT Unity language will carry over to the Harmonization Treaty.

Reply:

The U.S. delegation to the WIPO harmonization meetings has several times requested that guidelines be prepared for consideration with the Unity of Invention Article and Rules. Any interpretation of future treaty wording would be controlled by the guidelines.

Comment:

Three comments were received that the PTO is attempting to promulgate a variation of PCT Rule 13 which is contrary to the Caterpillar decision because the U.S. rules are not identical in scope with PCT Rule 13.

Reply:

The U.S. rules relating to Unity of Invention are considered to be in accordance with PCT Rule 13 and the Caterpillar decision. Rules 1.475, 1.487 and 1.499 are not identical with PCT Rule 13.2 because the U.S. rules are somewhat broader because additional combinations are included. The U.S. rules are also consistent with the Caterpillar decision because this decision related only to the interpretation of the expressions in PCT Rule 13.2.

Comment:

One comment inquired as to the amount of the handling fee.

Reply:

The amount of the handling fee is set forth in the SCHEDULE OF FEES appearing at the end of the PCT Rules. These fees are stated in Swiss Francs. The current amount for the Handling Fee is 200 Swiss Francs. The amount in U.S. dollars will be established by the Director General based on the current exchange rates as provided in PCT Rule 57.2(c).

Comment:

One comment proposed that a rule be implemented under which an examiner must complete the first written opinion within two months of the filing of the Demand.

Reply:

Although the Office will expect an examiner to begin the International Preliminary Examination as early as possible after receipt, delay in issuing the written opinion may occur because the International Preliminary Examination fee was paid later than the filing of the Demand under PCT Rule 58.2, the application contains defects in form or contents or the application lacks unity of invention. Thus, such a rule would not be appropriate.

Comment:

One comment questioned the need to re-impose restriction (holding of lack of unity of invention) if a linking claim is not allowable.

Reply:

There is no mandatory requirement that the examiner impose a holding of lack of unity if the linking claim is shown to lack novelty and inventive step. However, if such a possibility did not exist, applicants could present broad generic claims to entire classes of inventions and thereby prevent any subsequent holding of lack of unity by the examiner.

Comment:

One comment suggested that applicants in national patent applications be allowed to take advantage of the PCT unity criteria by paying a surcharge.

Reply:

Such a fee is not provided for under 35 U.S.C. 41 and would appear to require legislative action.

Comment:

Three comments suggested that the increases in the search fees were either unlawful or inconsistent with the spirit of the Patent and Trademark Office Authorization Act passed by Congress in 1986 in view of the freeze imposed thereby.

Reply:

The Patent and Trademark Office Appropriations Act (Public Law 99–607) at Sec. 3(b) states.

> (b) PATENT FEES.—The Commissioner of Patents and Trademarks may not, during fiscal years 1986, 1987, and 1988, increase fees established under section 41(d) of title 35, United States Code, except for purposes of making adjustments which in the aggregate do not exceed fluctuations during the previous 3 years in the Consumer Price Index, as determined by the Secretary of Labor. The Commissioner also may not establish additional fees under such section during such fiscal years.

The legislative history also makes clear that the prohibition against fee increases relates only to those fees established under section 41(d) and indicates that fees for new types of processing, services, or materials are not prohibited. The prohibition in the appropriation authorization is strictly limited to fees established under 35 U.S.C. 41(d) and does not affect the authority of the Commissioner to set fees under the Patent Cooperation Treaty. Note 35 U.S.C. 376 which authorizes the Commissioner to set fees for both the international and national stages. The new services relating to unity of invention are clearly not within the scope of the appropriation authorization restriction.

Comment:

Three comments stated that the $100 fee increase for an international search is clearly excessive.

Reply:

The increase in the search fee is to recover the average estimated additional cost of processing international applications with claims to more inventions than were permitted when the current search fees were established. The increase is established also to provide for an expected higher percentage of international applications containing claims to more than one category of invention. If experience shows these expectations were in error, fees will be adjusted in the future.

Comment:

One comment stated that the increase in the international search fee was not justified by *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, 231 USPQ 590 (E. D. Va. 1986) which merely clarified an aspect of existing law and did not change it.

Reply:

The decision in the Caterpillar case indicated that the Office's criteria for unity of invention on which the amount of the search fee was determined were too strict in construing the language of the Treaty and that broader criteria were permitted under the terms of the Treaty. Fees under the Patent Cooperation Treaty were set based on pre-Caterpillar interpretations of PCT Rule 13.2 by the Patent and Trademark Office. Since such broader criteria require a more extensive search than that on which the search fee was previously calculated, an increase in the search fee is necessary to cover the cost of the additional search required under the broader criteria in accordance with the Caterpillar decision.

Comment:

One comment stated that the increase in the international search fee penalizes an applicant presenting clearly a single invention.

Reply:

A broadening of the interpretation of unity of invention and the increase in the average amount of work required in searching an international application results in a higher fee being required. A more narrow interpretation of unity of invention permits a lower average fee and would tend to benefit applicants with a clearly single invention. The Caterpillar decision and majority of comments received supported a more liberal interpretation of unity of invention. Testimony at the hearing indicated a preference for spreading any additional costs among all applicants.

Comment:

One comment was received which suggested that §1.484(d) be amended by adding a further sentence.

> If, after receipt of any response to the written opinion, the Examiner is of the opinion that some or all of the claims are not patentable, the Examiner shall issue a second written opinion which identifies any patentable subject matter, including any suggestions for claim modification to properly define the invention.

Reply:

The wording of the proposed sentence is clearly inappropriate since the International Preliminary Examination Report does not make any determination of "patentability." Note PCT Article 35(2). Furthermore, the time limits for issuing an International Preliminary Examination Report are such that there may not be sufficient time in most cases to issue a second opinion and receive a response thereto. Modifications in the interview practice are a more practical way of assuring a more complete and thorough international preliminary examination.

Comment:

One comment suggested that §1.484(f) be amended to read:

> An applicant will be permitted *at least* [no more than] one personal [or telephone] interview, which must be conducted *prior to 27 months from the priority date* [during the non-extendable time limit for response by the applicant to the written opinion].

Reply:

A less restrictive interview policy has been incorporated into §1.484(f). The period for an interview cannot be delayed until the 27th month from the priority date since this is the time at which the examiners will be required to complete their Reports in order to allow time for reviews and mailing.

Comment:

One comment proposed that §1.485 be amended as follows:

> The time limit for response in a written opinion of the International Preliminary Examining Authority may not be extended *to expire beyond 27 months from the priority date, without the permission of the Group Director.*

Reply:

No need is seen to limit the end of the response period to the end of the 27th month since the period will be set by the examiner when a written opinion is mailed. The time limit cannot be extended (§1.484(d)) due to tight time frames for establishing the International Preliminary Examination Report within 28 months from the priority date. The time limits for response to a written opinion are set forth in PCT Rule 66.2(d).

Comment:

Two written comments and the oral testimony indicated that the fees for entering the national stage should be considerably less after an international search and preliminary examination. The small $40.00 reduction in national stage fees is criticized as too small and a token fee of $40–$50 is stated as being more reasonable.

Reply:

The fees are based on an adjustment of the U.S. filing fee based on estimated additional work or savings. However, in view of the comments, an additional basic nation fee level has been added as §1.492(a)(4) for those situations where the Patent and Trademark Office has established an International Preliminary Examination Report which indicates that all the claims entering the national stage have satisfied the criteria of PCT Articles 31(1) to (4). Current studies of the benefit of having PCT search reports from the searching authorities indicate an improvement in quality but no overall reduction in search or examining time. The search report from other than international searching authorities, with rare exceptions, does not allow the USPTO examiner to eliminate any part of the national search.

Comment:

One comment argued that reciprocal treatment should be given to foreign applicants for benefits given U.S. applicants.

Reply:

Although the European Patent Office offers a 20% reduction of only the search fee portion of its national stage entry fees, the resulting fee of a little under $1000 at current exchange rates is still more than twice the amount of the highest U.S. national fee. In Japan the national fee for requesting examination is currently 26,000 yen (a little under $200 at current exchange rates) where the search report was not prepared by the Japanese Patent Office and 6,000 yen if the search report was prepared by the Japanese Patent Office.

Comment:

One comment urged that the U.S. rules match the less restrictive EPO rules with regard to the issuance of more than one written opinion and providing additional opportunity for the applicant to communicate with the examiner.

Reply:

The proposed rules (§1.484) have been modified to provide for a less restrictive interview practice. The examiner should permit interview(s) during the time limit for response to the written opinion where such interviews would be useful and time is available to permit issuance of the International Preliminary Examination Report prior to the deadline of 28 months after the priority date.

Although nothing in the rules limit the proceedings to one written opinion, most demands are expected to be filed near the end of the 19th month deadline. Preparation of the first written opinion may be delayed because the fees were not paid at the time of filing the Demand, formal errors are found in the documents or unity of invention is lacking. The time limits for a reply to the first written opinion will normally be set at 2 months, although 3 months may be given where the time limit for reply ends prior to 25 months from the priority date. Response by the 25th month will allow the examiner 2 months to prepare the International Preliminary Examination Report.

However, a Demand may be filed much earlier than 19 months from the priority date and International Preliminary Examination may begin early as provided for in PCT Rule 69.1(b). Where time and other circumstances permit, a second written opinion may be provided, possibly with a one month time limit for reply.

Comment:

One comment stated that proposed §1.485(b) is a duplication of §1.484(d).

Reply:

Proposed paragraph (b) has been deleted in final rule 1.485.

Comment:

One comment stated that procedures for the manner of issuing International Preliminary Examination Reports should be set forth in the U.S. rules.

Reply:

Items already specifically covered in the PCT articles and rules are not needed in U.S. rules. The agreement with WIPO also regulates these matters as do the PCT search and preliminary examination guidelines.

Comment:

One comment stated that the treatment of the International Preliminary Examination Report (IPER) by the USPTO at the national stage is not clear.

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Reply:
The IPER will be considered along with other relevant information when conducting a national examination for patentability. PCT Article 33(1) indicates that the objective of the International Preliminary Examination Report is to formulate a preliminary and non-binding opinion; it is not binding on any office. Any new questions relating to patentability may be raised.
Comment:
One comment stated that a dual standard of unity defies logic.
Reply:
The dual standard is necessary since the fees for patent applications filed under 35 U.S.C. 111 were set based upon an application being limited to one invention as defined at the time the fees were set which differs from the interpretation of unity under PCT required in view of the Caterpillar decision.
Comment:
One comment stated that if additional PCT international search fees are required they should be made by statutory change.
Reply:
The Commissioner is authorized by statute (35 U.S.C. 376) to set the national fee for PCT origin applications. Any change in national restriction practice for applications filed under 35 U.S.C. 111 would be made only after statutory change.
Comment:
One comment indicated that in view of the Caterpillar decision holding the Office interpretation of "specifically designed" to be an unreasonable interpretation, the Office is proposing a double standard.
Reply:
U.S. national law under 35 U.S.C. 121 does not require a consideration or interpretation of "specifically designed" to be made. This must only be made in PCT cases and those entering the national stage under 35 U.S.C. 371.

Discussion of Specific Rules

Section 1.8 is amended to indicate clearly that the certificate of mailing procedures thereunder may not be used for the filing of papers and fees relating to international applications. It should be noted that the provisions of §1.10 regarding the filing of papers or fees by "Express Mail" apply to all papers and fees to be filed in the Patent and Trademark Office, including those relating to international applications.

Section 1.61 "Filing of applications in the United States of America as a Designated Office" is removed and the substance thereof moved to new §1.494. Section 1.70 "Oath or declaration under 35 U.S.C. 371(c)(4)" is removed and the substance thereof moved to new §1.497. These moves result in the rules relating to the international applications entering the national stage being located in a single area of the rules.

Section 1.101 is amended to remove the discussion of the order of examination for international applications entering the national stage, which is covered by new §1.496.

Section 1.141 is amended to basically return the rule to its wording prior to the 1978 rule change implementing the Patent Cooperation Treaty and will be directed solely to national applications. This will avoid confusion with PCT Rule 13.2 which was interpreted by the court in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, supra, to have a different meaning than intended in present §1.141. It does, however, retain for applicants the ability to claim a "reasonable number" of species rather than only 5, which limit existed prior to the 1978 rule change. Paragraph (b) continues the practice stated in the *Official Gazette* notice of Aug. 1, 1984 published at 1046 O.G. 2. Unity of invention in international applications before the USPTO as an International Searching Authority under Chapter I of the Patent Cooperation Treaty is covered by §1.475. Unity of Invention before the USPTO as an International Preliminary Examining Authority under Chapter II of the Patent Cooperation Treaty is covered by §1.487. Unity of invention in international applications entering the national stage under 35 U.S.C. 371 is covered by §1.499.

Section 1.401 is amended to include the definition of some terms used for Chapter II of the Patent Cooperation Treaty.

Section 1.414 is amended to include reference to the United States Patent and Trademark Office functioning as an Elected Office under Chapter II of the Patent Cooperation Treaty as well as a Designated Office under Chapter I.

Section 1.416 is added to indicate and describe the functioning of the United States Patent and Trademark Office as an International Preliminary Examining Authority under Chapter II of the Patent Cooperation Treaty.

Section 1.431 and 1.432 are amended, in accordance with PCT Rule 15.4(b)(ii) and amended 35 U.S.C. 361, to indicate that the time limit for payment of the designation fee is one year from the priority date or one month from the date of receipt of the international application if that one month time limit expires after the expiration of one year from the priority date.

Section 1.445 is amended to increase the amount of the international search fees to provide for recovery of the average additional cost of processing applications with claims to more inventions than were permitted under the unity of invention criteria used when the previous international search fee amounts were established. The amounts for national stage fees are removed from §1.445 and are now set forth in §1.492.

The international search fee and national fees were previously established based on the effort and cost to the Office of searching and examining a single invention as defined by the United States Patent and Trademark Office prior to the decision in the Caterpillar case. Since additional effort will be required to search and examine an average application under the new rules defining unity of invention, the average international search and national fee must also be increased to cover the additional cost to the Office.

Section 1.475 "Changes in person, name, or address of applicants," is redesignated as §1.472 to allow the grouping of rules into PCT Chapter I, PCT Chapter II and national stage related rules. No change other than redesignation is made.

A new §1.475 is added to relate to unity of invention before the International Searching Authority. Paragraph (a) clearly indicates that PCT Rule 13 is to be followed in all such cases and paragraph (b) adds combinations acceptable under unity of invention in addition to those set forth in PCT Rule 13.2. Paragraph (c) relates to the handling of claims to categories in addition to the combinations specified in paragraph (b). Paragraph (d) relates to situations in which more than one invention of the same category of invention is recited in an international application. Paragraph (e) makes clear that inventions of different categories must be related, rather than independent, for unity of invention to exist. Paragraph (f) sets forth PCT Rule 13 for the convenience of patent applicants.

Section 1.481, regarding determination of unity of invention before the International Searching Authority, is redesignated as §1.476 and amended to delete reference to §1.141 from paragraph (a).

Section 1.482 is redesignated as §1.477 and amended to make clear in the title that it deals with protests to findings of lack of unity of invention before the International Searching Authority. The amendment to paragraph (b) corrects an error in referring to another paragraph of the section.

A new §1.480 is added to deal with the Demand for an international preliminary examination. Paragraph (a) indicates that a Demand is required to be filed to obtain an international preliminary examination and that the preliminary examination fee of §1.482(a)(1) and the handling fee of §1.482(b) are due at the time of filing of the Demand. If the fees are not paid at the time of filing of the Demand, the United States Patent and Trademark Office acting as an International Preliminary Examining Authority will provide an opportunity to pay the fees in accordance with PCT Rules 57.4 and 58.2.

Paragraph (b) of §1.480 specifies that the Demand must be made on a standardized form as required by PCT Rule 53.1 and that such forms are available from the United States Patent and Trademark Office.

Paragraph (c) of §1.480 specifies that, if the Demand is made prior to the expiration of the 19th month from the priority date, the provisions of PCT Article 39 and § 1.495 shall apply to allow entry into the national stage prior to the expiration of 30 months after the priority date. The final rule has been changed to add reference to the election of the United States. If the Demand is not filed prior to the expiration of the 19th month from the priority date, the provisions of PCT Article 22 and § 1.494 shall apply to allow entry into the national stage prior to the expiration of 20 months after the priority date.

Paragraph (d) of §1.480 indicates that withdrawal of a proper Demand will not entitle applicant to a refund of the preliminary examination fee even if no claims are found that can or will be searched (PCT Article 34(4)(a)). A Demand that is so informal that it would be considered under the PCT Rules as if it had not been submitted will not be considered a proper Demand under the rule. A change in purpose after the filing of a Demand will not entitle an applicant to a refund of the preliminary examination fee. PCT Rule 57.6 states that in no case shall the handling fee, or any supplement to the handling fee, be refunded.

A new §1.482 is added to specify the international preliminary examination fees. Paragraph (a) sets a lower fee for the international preliminary examination where an international search fee has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority. Paragraph (a) also sets a lower additional preliminary examination fee for the preliminary examination of additional inventions found in the international application where a supplemental search fee has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority. Paragraph (b) indicates that the handling fee is prescribed in PCT Rule 57 and any necessary supplement to the handling fee shall be paid directly to the International Bureau in accordance with PCT Rule 57.1(b).

A new §1.484 is added to describe the conduct of international preliminary examination. The rule describes that, if necessary, a written opinion will be established after consideration of any defects in accordance with PCT Rule 66.2 and after an examination to determine if the claimed invention has novelty, involves an inventive step (is non-obvious) and is industrially applicable. A written opinion prior to the international preliminary examination report would not be necessary if the international application does not contain any defects as mentioned in PCT Rule 66.2 and if all claims are found to be novel, involve an inventive step (non-obvious) and are industrially applicable. The written opinion will set a time limit for applicant to respond in accordance with PCT Rule 66.2(d). The time limit for reply will normally be two months but will be three months where the time limit will expire prior to 25 months from the priority date. The time limit may not be extended due to the tight time constraints under Chapter II of the Patent Cooperation Treaty. An international preliminary examination report will be established and one copy will be submitted to the International Bureau and one copy to applicant. The rule specifies that no international preliminary examination report will be established prior to issuance of an international search report and that no international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority. Paragraph (f) specifies that at least one personal or telephone interview with the examiner will be permitted during the international preliminary examination. Additional interviews are permissible if the examiner determines that it would be helpful. Additional interviews will be governed, in part, by the time remaining before the time for issuance of the international preliminary examination report. The period during which the interview(s) can be held is limited by the non-extendable time limit for response by the applicant to a written opinion. Although nothing in this or any other rule limits the number of written opinions which may be established prior to the International Preliminary Examination Report, in most cases time will limit the number of written opinions to one.

A new §1.485 is added to deal with amendments by applicant during international preliminary examination. An applicant is permitted by the rule to make amendments at the time of filing of the Demand and within the period set in any written opinion on the application as defined in §1.484. Amendments under the rule would be required to be made by submitting replacement sheets and a description of how the replacement sheet differs from the replaced sheet. If an amendment cancels an entire sheet, that amendment should be communicated by letter without a replacement sheet. Proposed paragraph (b) is not promulgated because the substance thereof is set forth in §1.484(d).

New §1.487 defines what constitutes unity of invention before the International Preliminary Examining Authority. The standards for unity of invention generally parallel those set in §1.475 regarding proceedings before the International Searching Authority.

New §1.488 is added to set forth how the International Preliminary Examining Authority will proceed in handling determinations regarding the unity of invention criteria of §1.487.

New §1.489 sets forth the procedures to be followed by an applicant who wishes to protest a holding of lack of unity of invention by the International Preliminary Examining Authority. The additional fees would be required to be paid if more than one invention is to be examined, but could be accompanied by a request for refund and a statement setting forth reasons for disagreement with the holding of lack of unity of invention or why the required additional fees are excessive. This rule is in accordance with PCT Rule 68.3(c).

New §1.491 is added to define the start of the national stage. Section 1.491 is the first rule in a new group of rules relating to applications entering the national stage pursuant to 35 U.S.C. 371.

New §1.492 is added to set forth the fees and charges for international applications entering the national stage under 35 U.S.C. 371. The basic national fee is set forth in paragraph (a) at four levels to reflect the benefit that the United States Patent and Trademark Office will derive from having previously conducted an international preliminary examination or an international search. In § 1.492(a)(2) and (3), "(i)" has been deleted in order to refer to both §1.445(a)(2)(i) and (ii). Paragraph (a)(4) which makes reference to §1.496(b) has been added in view of comments received that indicated that in some instances substantial reliance may be placed upon the International Preliminary Examination Reports by the Patent and Trademark Office. The rule also sets the fee for an independent claim in excess of 3 (paragraph (b)), for presentation of each claim in excess of 20 (paragraph (c)) and for an application containing a multiple dependent claims (paragraph (d)). Paragraphs (e) and (f) include the fees previously contained in §1.445 and include the alternative times for entering the national stage pursuant to §1.494 or §1.495.

New §1.494 is added to contain substantially the provisions of former §1.61 in amended form. This section relating to filing application documents in the United States Patent and Trademark Office to enter the national stage has been grouped with other sections relating to the nation stage for the convenience of applicants and examiners involved in the prosecution of international applications entering the national stage. The rule applies where no Demand for international preliminary examination has been filed prior to the expiration of the 19th month from the priority date. If such a Demand were filed, §1.495 would apply.

Section 1.494(f) requires that a specific indication be given by the applicant when entering the national stage that the documents being submitted are being submitted under 35 U.S.C. 371. If no clear indication is found, the documents will be considered to be for a regular national application under 35 U.S.C. 111. Paragraph (g) makes clear that the various time limits set out in the rule, some of which are set by the PCT, may not be extended pursuant to §1.136 or otherwise. The extension of time provisions, including petition and payment of a fee, set out in §1.136(a) do not apply to the time limits of the rule or time limits set by the International Searching Authority or the International Preliminary Examining Authority. New paragraph (h) clarifies when an international application designating the United States becomes abandoned as to the United States.

New §1.495 is added to deal with filing application documents in the United States Patent and Trademark Office to enter the national stage where a Demand for international preliminary examination has been filed with an International Preliminary Examining Authority prior to the expiration of the 19th month from the priority date. In such a case, an applicant will have 30 months from the priority date to enter the national stage. The rule parallels in many respects §1.494. New paragraph (i) clarifies when an international application electing the United States becomes abandoned as to the United States.

New §1.496 is added to specify in paragraph (a) that international applications in the national stage will be taken up for action based on the date when the requirements of 35 U.S.C. 371(c) are met. Paragraph (b) indicates that applications entering the U.S. national stage only with claims which have been found in an International Preliminary Examination Report to have satisfied the criteria for novelty, inventive step (non-obviousness) and industrial applicability as defined in PCT Article 33(1) to (4) will be taken up for action before other applications. Preliminary amendments may accompany the filing of the national stage application to cancel claims which do not satisfy the criteria. These applications will have paid the lower filing fee set in §1.492(a)(4) and most will not require extensive prosecution, i.e., objection or rejection before resolving the issue of patentability. Amendments will not be permitted to be made in such applications other than in response to objections as to form or to cancel claims in response to a rejection made by the examiner in the national stage application. Such a rejection could be necessary, for example, where applicant submits information in accordance with the duty of disclosure under 37 CFR 1.56(a).

New §1.497 is added to contain substantially the wording of removed §1.70. This rule relates to the oath or declaration required to enter the national stage and is grouped with other national stage entry requirements.

New §1.499 is added to cover unity of invention during the national stage. The provisions of the section are basically parallel to those of §§1.475 and 1.487. Paragraph (f) indicates the manner of handling a finding of lack of unity of invention on grounds other than those involving different categories of invention.

Environmental, Energy, and Other Considerations

The rule change does not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354) because considerable savings can potentially be achieved under Chapter II of the Patent Cooperation Treaty because additional time is provided for applicants to decide whether to proceed with the cost of foreign prosecution and savings will in fact be achieved under the unity of invention practice and the provision for reduced fees for small entities entering the national stage in making an application for a United States patent.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirement contained in these rules was submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirement and has assigned OMB control number 0651–0021 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by a 35 U.S.C. 6 and 376(b) and Pub. L. 99–616, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.8 is amended by revising paragraph (a)(2)(xi) to read as follows:

§1.8 Certificate of mailing.

(a) * * *
(2) * * *
(xi) The filing of international applications for patent and all papers and fees relating thereto.

* * * * *

§1.61 [Removed]

3. Section 1.61 is removed.

§1.70 [Removed]

4. Section 1.70 is removed.

5. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102. See §1.496 for order of examination of international applications in the national stage.

* * * * *

6. Section 1.141 is revised to read as follows:

§1.141 Different inventions in one national application.

(a) Two or more independent and distinct inventions may not be claimed in one national application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one national application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (§1.75) or otherwise include all the limitations of the generic claim.

(b) Where claims to all three categories, product, process of making, and process of use, are included in a national application, a three way requirement for restriction can only be made where the process of making is distinct from the product. If the process of making and the product are not distinct, the process of using may be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product can be made.

Subpart C—International Processing Provisions

7. The authority for Subpart C is revised to read as follows:

Authority: Pub. L. 94–131, 89 Stat. 685; Pub. L. 99–616, 35 U.S.C. 351 through 376.

8. Section 1.401 is amended to redesignate paragraph (g) as paragraph (i) and add new paragraphs (g) and (h) as follows:

§1.401 Definitions of terms under the Patent Cooperation Treaty

* * * * *

(g) "Demand'," when capitalized, means that document filed with the International Preliminary Examining Authority which requests an international preliminary examination.

(h) "Annexes" means amendments made to the claims, description or the drawings before the International Preliminary Examining Authority.

* * * * *

9. Section 1.414 is revised to read as follows:

§1.414 The United States Patent and Trademark Office as a Designated Office or Elected Office.

(a) The United States Patent and Trademark Office will act as a Designated Office or Elected Office for international applications in which the United States of America has been designated or elected as a State in which patent protection is desired.

(b) The United States Patent and Trademark Office, when acting as a Designated Office or Elected Office during international processing will be identified by the full title "United States Designated Office" or by the abbreviation "DO/US" or by the full title "United States Elected Office" or by the abbreviation "EO/US".

(c) The major functions of the United States Designated Office or Elected Office in respect to international applications in which the United States of America has been designated or elected, include:

(1) Receiving various notifications throughout the international stage and

(2) Accepting for national stage examination international applications which satisfy the requirements of 35 U.S.C. 371.

10. Under "General Information," a new §1.416 is added to read as follows:

§1.416 The United States International Preliminary Examining Authority.

(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office and in other Receiving Offices as may be agreed upon by the Commissioner, in accordance with agreement between the Patent and Trademark Office and the International Bureau.

(b) The United States Patent and Trademark Office, when acting as an International Preliminary Examining Authority, will be identified by the full title "United States International Preliminary Examining Authority" or by the abbreviation, "IPEA/US."

(c) The major functions of the International Preliminary Examining Authority include:

(1) Receiving and checking for defects in the Demand;

(2) Collecting the handling fee for the International Bureau and the preliminary examination fee for the United States International Preliminary Examining Authority;

(3) Informing applicant of receipt of the Demand;

(4) Considering the matter of unity of invention;

(5) Providing an international preliminary examination report which is a non-binding opinion on the questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), and to be industrially applicable; and

(6) Transmitting the international preliminary examination report to applicant and the International Bureau.

11. Section 1.431 is amended by revising paragraph (d)(2) to read as follows:

§1.431 International application requirements.

* * * * *

(d) * * *

(2) The designation fee, or the amount necessary to cover all the designations made in the request if not paid by the applicant within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date.

* * * * *

12. Section 1.432 is amended by revising paragraph (b) to read as follows:

§1.432 Designation of States and payment of designation fees.

* * * * *

(b) The designation fees may be paid upon filing of the international application, but must be paid before the expiration of one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date. Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation. Failure to timely pay at least one designation fee will result in the withdrawal of the international application.

13. Section 1.445 is amended by revising the title and paragraph (a) to read as follows:

§1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14), $170.00.

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed, $520.00.

(ii) A corresponding prior United States national application with basic filing fee has been filed, $350.00.

(3) A supplemental search fee when required, per additional invention, $140.00.

§1.475 [Redesignated as §1.472]

14. Section 1.475 is redesignated as §1.472.

15. A new §1.475 is added following the heading, "Unity of Invention," to read as follows:

§1.475 Unity of invention before the International Searching Authority.

(a) An international application before the International Searching Authority will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see paragraph (f) of this section).

(b) An international application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see paragraph (f) of this section) or to the combination of—

(1) A product and a process for the manufacture of said product, or

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories set forth in PCT Rule 13.2 (see paragraph (f) of this section) or a combination set forth in paragraphs (b)(1) or (2) of this section, unity of invention may not be present.

(c) If an international application contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see paragraph (f) of this section) or in a combination set forth in paragraphs (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the inventions to be searched. Any such holding by the examiner will be made of record as a holding of lack of unity of invention.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

(f) The wording of PCT Rule 13 is as follows:

PCT Rule 13—Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

13.3 Claims of One and the Same Category

Subject to Rule 13.1, it shall be permitted to include in the same international application two or more independent claims of the same category (i.e., product, process, apparatus, or use) which cannot readily be covered by a single generic claim.

13.4 Dependent Claims

Subject to Rule 13.1, it shall be permitted to include in the same international application a reasonable number of dependent claims, claiming specific forms of the invention claimed in an independent claim, even where the features of any dependent claim could be considered as constituting in themselves an invention.

13.5 Utility Models

Any designated State in which the grant of a utility model is sought on the basis of an international application may, instead of Rules 13.1 to 13.4, apply in respect of the matters regulated in those Rules the provisions of its national law concerning utility models once the processing of the international application has started in that State, provided that the applicant shall be allowed at least two months from the expiration of the time limit applicable under Article 22 to adapt his application to the requirements of the said provisions of the national law.

16. Section 1.481 is redesignated as §1.476 and is amended by revising paragraph (a) to read as follows:

§1.476 Determination of unity of invention before the International Searching Authority.

(a) Before establishing the international search report, the International Searching Authority will determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13 (see §1.475(f)) and §1.475.

* * * * *

17. Section 1.482 is redesignated as §1.477 and is amended by revising the title and paragraph (b) to read as follows:

§1.477 Protest to lack of unity of invention before the International Searching Authority.

* * * * *

(b) Protest under paragraph (a) of this section will be examined by the Commissioner or the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

* * * * *

18. A new Section 1.480 is added preceded by a heading to read as follows:

International Preliminary Examination

§1.480 Demand for international preliminary examination.

(a) On the filing of a Demand and payment of the fees for international preliminary examination (§1.482), the international application shall be the subject of an international preliminary examination. The preliminary examination fee (§1.482(a)(1)) and the handling fee (§1.482(b)) shall be due at the time of filing of the Demand.

(b) The Demand shall be made on a standardized printed form. Copies of the printed Demand forms are available from the Patent and Trademark Office. Letters requesting printed forms should be marked "Box PCT".

(c) If the Demand is made prior to the expiration of the 19th month from the priority date and the United States of America is elected, the provisions of §1.495 shall apply rather than §1.494.

(d) Withdrawal of a proper Demand will not entitle applicant to a refund of the preliminary examination fee or handling fee.

19. A new Section 1.482 is added to read as follows:

§1.482 International preliminary examination fees.

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of, $370.00.

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of, $570.00.

(2) An additional preliminary examination fee when required, per additional invention:

(i) Where a supplemental search fee as set forth in § 1.445(a)(3) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, $125.00.

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, $190.00.

(b) The handling fee is due on filing the Demand. Any necessary supplement to the handling fee shall be paid directly to the International Bureau.

(35 U.S.C. 6, 376)

20. A new §1.484 is added to read as follows:

§1.484 Conduct of international preliminary examination.

(a) An international preliminary examination will be conducted to formulate a non-binding opinion as to whether the claimed invention has novelty, involves an inventive step (is non-obvious) and is industrially applicable.

(b) No international preliminary examination report will be established prior to issuance of an international search report.

(c) No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority.

(d) The International Preliminary Examining Authority will establish a written opinion if any defect exists or if the claimed invention lacks novelty, inventive step or industrial applicability and will set a non-extendable time limit in the written opinion for the applicant to respond.

(e) If no written opinion under paragraph (d) of this section is necessary, or after any written opinion and the response thereto or the expiration of the time limit for response to such written opinion, an international preliminary examination report will be established by the International Preliminary Examining Authority. One copy will be submitted to the International Bureau and one copy will be submitted to the applicant.

(f) An applicant will be permitted a personal or telephone interview with the examiner, which must be conducted during the non-extendable time limit for response by the applicant to a written opinion. Additional interviews may be conducted where the examiner determines that such additional interviews may be helpful to advancing the international preliminary examination procedure. A summary of any such personal or telephone interview must be filed by the applicant as a part of the response to the written opinion or, if applicant files no response, be made of record in the file by the examiner.

21. A new §1.485 is added to read as follows:

§1.485 Amendments by applicant during international preliminary examination.

The applicant may make amendments at the time of filing of the Demand and within the time limit set by the International Preliminary Examining Authority for response to any written opinion. Any such amendments must—

(1) Be made by submitting a replacement sheet for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled and

(2) Include a description of how the replacement sheet differs from the replaced sheet.

If an amendment cancels an entire sheet of the international application, that amendment shall be communicated in a letter.

22. A new §1.487 is added to read as follows:

§1.487 Unity of invention before the International Preliminary Examining Authority.

(a) An international application before the International Preliminary Examining Authority will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see §1.475(f)).

(b) An international application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see §1.475(f)) or to the combination of —

(1) A product and a process for the manufacture of said product or

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories of invention set forth in PCT Rule 13.2 (see §1.475(f)) or a combination set forth in paragraphs (b)(1) or (2) of this section, unity of invention may not be present.

(c) If an international application contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see §1.475(f)) or a combination set forth in paragraphs (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the inventions to be examined. Any such holding by the examiner will be made of record as a holding of lack of unity of invention.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

23. A new §1.488 is added to read as follows:

§1.488 Determination of unity of invention before the International Preliminary Examining Authority.

(a) Before establishing any written opinion or the international preliminary examination report, the International Preliminary Examining Authority will de-

termine whether the international application complies with the requirement of unity of invention as set forth in §1.487.

(b) If the International Preliminary Examining Authority considers that the international application does not comply with the requirement of unity of invention, it may:

(1) Issue a written opinion and/or an international preliminary examination report, in respect of the entire international application and indicate that unity of invention is lacking and specify the reasons therefor without extending an invitation to restrict or pay additional fees. No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority.

(2) Invite the applicant to restrict the claims or pay additional fees, pointing out the categories of invention found, within a set time limit which will not be extended. No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority, or

(3) If applicant fails to restrict the claims or pay additional fees within the time limit set for response, the International Preliminary Examining Authority will issue a written opinion and/or establish an international preliminary examination report on the main invention and shall indicate the relevant facts in the said report. In case of any doubt as to which invention is the main invention, the invention first mentioned in the claims and previously searched by an International Searching Authority shall be considered the main invention.

(c) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Preliminary Examining Authority may raise the objection of lack of unity of invention.

24. A new §1.489 is added to read as follows:

§1.489 Protest to lack of unity of invention before the International Preliminary Examining Authority.

(a) If the applicant disagrees with the holding of lack of unity of invention by the International Preliminary Examining Authority, additional fees may be paid under protest, accompanied by a request for refund and a statement setting forth reasons for disagreement or why the required additional fees are considered excessive, or both.

(b) Protest under paragraph (a) of this section will be examined by the Commissioner of the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

(c) An applicant who desires that a copy of the protest and the decision thereon accompany the international preliminary examination report when forwarded to the Elected Offices, may notify the International Preliminary Examining Authority to that effect any time prior to the issuance of the international preliminary examination report. Thereafter, such notification should be directed to the International Bureau.

25. A new §1.491 is added preceded by a new heading to read as follows:

National Stage

§1.491 Entry into the national stage.

An international application enters the national stage when the applicant has filed the documents and fees required by 35 U.S.C. 371(c) within the periods set forth in §1.494 or §1.495.

26. A new §1.492 is added to read as follows:

§1.492 National stage fees.

The following fees and charges for international applications entering the national stage under 35 U.S.C. 371 are established by the Commissioner under 35 U.S.C. 376:

(a) The basic national fee;

(1) Where an international preliminary examination fee as set forth in §1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§1.9(f)) $150
By other than a small entity $300

(2) Where no international preliminary examination fee as set forth in §1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in §1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By small entity (§1.9(f)) $170
By other than small entity $340

(3) Where no international preliminary examination fee as set forth in §1.482 has been paid and no international search fee as set forth in §1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§1.9(f)) $225
By other than a small entity $450

(4) Where the international preliminary examination fee as set forth in §1.482 has been paid to the United States Patent and Trademark Ofice and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see §1.496(b)):

By a small entity (§1.9(f)) $25
By other than a small entity $50

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f)) $17
By other than a small entity $34

(c) In addition to the basic national fee, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§1.9(f)) $6
By other than a small entity $12

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§1.9(f)) $55
By other than a small entity $110

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic national fee or oath or declaration later than 20 months from the priority date pursuant to §1.494(c) or later than 30 months from the priority date pursuant to §1.495(c):

By a small entity (§1.9(f)) $55
By other than a small entity $110

(f) For filing an English translation of an international application later than 20 months after the priority date (§1.494(c)) or for filing an English translation of the international application or of any annexes to the international preliminary examination report later than 30 months after the priority date (§1.495(c) and (e)), $26.00.

(35 U.S.C. 6, 376)

27. A new §1.494 is added to read as follows:

§1.494 Entering the national stage in the United States of America as a Designated Office.

(a) Where no Demand has been filed with an appropriate International Preliminary Examining Authority by the expiration of 19 months from the priority date (see § 1.495), the applicant must fulfill the requirements of PCT Article 22 and 35 U.S.C. 371 within the time periods set forth in paragraphs (b) or (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) The applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date—

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office;

(2) A translation of the international application into the English language, if it was originally filed in another language;

(3) The basic national fee (see §1.492(a); and

(4) An oath or declaration of the inventor (see § 1.497).

(c) The applicant may furnish any required English translation of the international application, the basic national fee and the oath or declaration of the inventor after 20 months but not later than the expiration of 22 months from the priority date. The payment of the processing fee set forth in §1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in §1.492(e) is required for acceptance of the basic national fee or the oath or declaration of the inventor later than the expiration of 20 months after the priority date.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 20 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 20 months from the priority date will be considered to be cancelled.

(e) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

(f) The documents and fees submitted under paragraphs (b) and (c) of this section must be clearly identified as a submission to enter the national stage under 35 U.S.C. 371, otherwise the submission will be considered as being made under 35 U.S.C. 111.

(g) The time limits set out in paragraphs (b), (c) and (d) of this section may not be extended pursuant to § 1.136 or otherwise.

(h) An international application becomes abandoned as to the United States 20 months from the priority date if a copy of the international application is not communicated to the Patent and Trademark Office prior to 20 months from the priority date where the United States has been designated but not elected prior to 19 months from the priority date. If a copy of the international application is communicated within 20 months to the Patent and Trademark Office, an international application will become abandoned as to the United States 22 months from the priority date if the required English translation(s), fees and oath or declaration under 35 U.S.C. 371(c) are not filed within 22 months from the priority date.

28. A new §1.495 is added to read as follows:

§1.495 Entering the national stage in the United States of America as an Elected Office.

(a) Where a Demand has been filed with an appropriate International Preliminary Examining Authority and not withdrawn by the expiration of 19 months from the priority date, the applicant must fulfill the requirements of 35 U.S.C. 371 within the time periods set forth in paragraph (b) or (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) The applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date—

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office;

(2) A translation of the international application into the English language, if it was originally filed in another language;

(3) The basic national fee (see §1.492(a); and

(4) An oath or declaration of the inventor (see § 1.497).

(c) The applicant may furnish any required English translation of the international application, the basic national fee and the oath or declaration of the inventor after 30 months but not later than the expiration of 32 months from the priority date. The payment of the processing fee set forth in §1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in §1.492(e) is required for acceptance of the basic national fee or the oath or declaration of the inventor later than the expiration of 30 months after the priority date.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 30 months from the priority date will be considered to be cancelled.

(e) A translation into English of any annexes to the international preliminary examination report, if the annexes were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Translations of the annexes which are not received by the expiration of 30 months from the priority date may be submitted within 32 months from the priority date accompanied by the processing fee set forth in §1.492(f). Translations of the annexes which are not timely received will be considered to be cancelled.

(f) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is con-

sidered necessary, if the international application or other document was filed in a language other than English.

(g) The documents submitted under paragraphs (b) and (c) of this section must be clearly identified as a submission to enter the national stage under 35 U.S.C. 371, otherwise the submission will be considered as being made under 35 U.S.C. 111.

(h) The time limits set out in paragraphs (b), (c), (d) and (e) of this section may not be extended pursuant to §1.136 or otherwise.

(i) An international application becomes abandoned as to the United States 30 months from the priority date if a copy of the international application is not communicated to the Patent and Trademark Office prior to 30 months from the priority date and a Demand for International Preliminary Examination which elected the United States of America has been filed prior to the expiration of 19 months from the priority date. If a copy of the international application is communicated within 30 months to the Patent and Trademark Office, an international application will become abandoned as to the United States 32 months from the priority date if the required English translation(s), fees and oath or declaration under 35 U.S.C. 371(c) are not filed within 32 months from the priority date.

29. A new §1.496 is added to read as follows:

§1.496 Examination of international applications in the national stage.

(a) International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless an express request for early processing has been filed under 35 U.S.C. 371(f), no action may be taken prior to one month after entry into the national stage.

(b) A national stage application filed under 35 U.S.C. 371 may have paid therein the basic national fee as set forth in §1.492(a)(4) if it contains, or is amended to contain, at the time of entry into the national stage, only claims which have been indicated in an international preliminary examination report prepared by the United States Patent and Trademark Office as satisfying the criteria of PCT Article 33(1)–(4) as to novelty, inventive step and industrial applicability. Such national stage applications in which the basic national fee as set forth in §1.492(a)(4) has been paid may be amended subsequent to the date of entry into the national stage only to the extent necessary to eliminate objections as to form or to cancel rejected claims. Such national stage applications in which the basic national fee as set forth in §1.492(a)(4) has been paid will be taken up out of order.

30. A new §1.497 is added to read as follows:

§1.497 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371 pursuant to §1.494 or §1.495, he or she must file an oath or declaration in accordance with § 1.63.

(b) If the international application was made as provided in §1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by §1.63 to state.

31. A new §1.499 is added to read as follows:

§1.499 Unity of invention during the national stage.

(a) An international application which has entered the national stage by meeting the requirements of 35 U.S.C. 371 will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see §1.475 (f)).

(b) An application in the national stage containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see §1.475(f)) or to the combination of—

(1) A product and a process for the manufacture of said product or

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories of invention set forth in PCT Rule 13.2 (see §1.475(f)) or a combination set forth in paragraphs (b)(1) and (2) of this section, unity of invention may not be present.

(c) If an application in the national stage contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist in an application in the national stage where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see §1.475(f)) or a combination set forth in paragraph (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the elected invention to be examined. Any such holding of an election by the examiner will be made in the form of a restriction requirement which confirms the election made by the presentation of the claims. Such a restriction requirement would be made on the basis of whether the inventions are independent and distinct. Applicant has the right to traverse such a restriction requirement in the response to the Office action in which the election is indicated.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

(f) If the examiner finds that a national stage application lacks unity of invention, the examiner may in an Office action require the applicant in the response to the Office action to elect the invention to which the claims shall be restricted, this official action being called a requirement for restriction. Such requirement may be made before any action on the merits but may be made at any time before the final action at the discretion of the examiner. Review of any such requirement is provided under §§1.143 and 1.144.

DONALD J. QUIGG,
Apr. 28, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 87–11977 Filed 5–27–87; 8:45 am]
BILLING CODE 3510–16–M

[1079 OG 32]

(93) Revised Procedures for Recording Searches and Considerations of Certain Prior Art

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO–892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass*, including all United States and foreign patent documents and other publications placed therein. The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass*, for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B, 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.
3. *An update of a search previously made.*
   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.
   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. _____)" will be recorded. If the parent has been patented, the patent number "Pat. N. _____" instead of serial number in the above phrase will be recorded.
4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO–1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. "SEARCH NOTES" Box Entries

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search*, or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant. The classification will be recorded, followed by "(Cursory)."
2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise. The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.
3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:
   a. *Abstracting publications*, such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index and the period covered will be recorded.
   b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.
   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.
   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).
   Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.
   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.
   There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service.
   These search systems include many data bases.
   A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.

4. A search of only the *publications in a subclass.* The class and subclass followed by "(publications only)" will be recorded.
5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention. The serial number of a parent application that is still Pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted. The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. Not Recorded

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below:

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*
In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.
2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*
In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Feb. 22, 1977.

[956 O.G. 1546]

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(94) **Prior Art Cited by Applicants**

Effective immediately, applicants are encouraged to use new form PTO–1449, "List of Prior Art Cited by Applicant," when preparing a prior art statement under 37 CFR 1.97–1.99. A copy of the form is included herewith from which suitable reproductions can be made. This form, which will enable applicants to provide the PTO with a uniform listing of prior art citation, supersedes form PTO–3.72.

While the filing of prior art statements is voluntary, the procedure is governed by the guidelines of Section 609 of the Manual of Patent Examining Procedure and 37 CFR 1.97 through 1.99. To be considered a proper prior art statement, form PTO–1449 shall be accompanied by an explanation of relevance of each listed item, a copy of each listed patent or publication or other item of information and a translation of the pertinent portions of foreign documents (if an existing translation is readily available to the applicant), and should be submitted in a timely manner as set out in MPEP Sec. 609.

Examiners will consider all prior art citations submitted in conformance with 37 CFR 1.98 and MPEP Sec. 609 and place their initials adjacent the citations in the boxes provided on the form. Examiners will also initial citations not in conformance with the guidelines which may have been considered. A reference may be considered by the examiner for any reason whether or not the citation is in full conformance with the guidelines. A line will be drawn through a citation if it is not in conformance with the guidelines and has not been considered. A copy of the submitted form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original of the form will be entered into the application file.

Each citation initialed by the examiner will be printed on the issued patent in the same manner as prior art cited by the examiner on form PTO–892.

The reference designations "AA," "AB," etc. (referring to applicant's reference A, Applicant's reference B, etc.) will be used by the examiner in the same manner as examiner's reference designations "A," "B," "C," etc. on Office Action Form PTO–1142.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 15, 1980.

[998 O.G. 8]

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(95) **Report on the Quality Reinforcement Program**

The Patent and Trademark Office (PTO) has instituted a Quality Reinforcement Program to identify services offered by the PTO that are in need of improvement. As a part of this program, the Office, in cooperation with the American Intellectual Property Law Association (AIPLA), has completed an evaluation of selected practices performed by both patent examiners and representatives of patent applicants during the examination process. The results of this evaluation are detailed in Volume I of the PTO Report of the Quality Reinforcement Program. A summary of the findings of this report is presented below. This summary is presented to report on the findings and to solicit suggestions from both the public and employees of the Patent & Trademark Office on steps that might be taken to raise the level of performance of those practices found to be in need of improvement. The full report and evaluation, which is quite extensive with over 350 pages, is available at the PTO.

Address: Comments and inquiries should be addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231, to the attention of Edward Kubasiewicz, Director, Examining Group 250, Rm. CP4–9D19.

Date: Comments should be submitted by June 16, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

SUMMARY OF VOLUME I — REPORT ON CURRENT LEVEL OF PERFORMANCE OF SELECTED PATENT EXAMINING CORPS PRACTICES

This is a summary of Volume I of the Quality Reinforcement Program Report, which addresses the current level of performance of selected Patent Examining Corps practices. This summary presents a background of the Quality Reinforcement Program and a synopsis of conclusions reached for each selected practice.

Background of the Quality Reinforcement Program

On Feb. 25, 1986, President Reagan issued an executive order establishing a comprehensive program for the improvement of productivity throughout all of government. From this executive order the Department of Commerce evolved a Productivity Improvement Program entitled PROJECT PRIDE. The program was announced as encompassing productivity, quality excellence and client satisfaction.

The role of U.S. Patent and Trademark Office (PTO) in PROJECT PRIDE centers around quality, and is entitled the Quality Reinforcement Program.

The goal of the PTO program is to improve the quality of patent examining functions and the timeliness and quality of other public services. In particular, the program focuses on improving the quality of practices performed in three different areas of the PTO, i.e., the Patent Examining Corps, the Office of Administration and the Office of Documentation.

The quality of an issued patent and the record before the PTO in the patented file are extremely important to the patent owner and to others who may be competitors or otherwise affected by the patent. Investment decisions and the recoupment of research, development and marketing expenditures often depend upon patent protection. Potential licensees and infringers need to know where they stand in regard to an issued patent. Patent owners and others need to be able to have a high degree of confidence in the validity of a patent. Valid patents and a clear and correct file record will help to eliminate unnecessary and expensive patent litigation costs which are currently estimated to total at least $800 million per year.

The concern for productivity and productivity improvement is not a recent development at the PTO. During the past quarter of a century one of the most pressing problems for the Office has been a large and growing backlog of unexamined patent applications and the resulting long pendency time between filing an application and issuance of a patent. The average pendency of patent applications in 1964 was 37 months. However, average pendency dropped steadily in the 1970s until it culminated in an average pendency of 18 months in 1977. This pendency was shortlived due to a loss of adequate resources. However, pendency is once again falling and it is expected that an average pendency of 18 months will be achieved in 1989.

Historically, the Office has successfully responded to situations similar to the one in which it presently finds itself. Beginning in the 1960s when the backlog of new applications exceeded 200,000, a program designed to drastically increase the productivity of the Corps was initiated. Part of that program was what has since become known as "compact prosecution". An increased staff of examiners was reinstructed to take a new approach toward examining in which patentable subject matter was looked for and indicated as early in the prosecution of the case as possible, references were automatically furnished with actions, attorneys were urged to originally file claims of the broadest possible range of scope, telephonic prosecution was instituted, first actions and application disposals became the measure of examiners' performance, preprinted first action forms were designed, etc.

The question before the Office now is whether sufficient attention is being given to quality. The intent of the Quality Reinforcement Program, as it applies to the Patent Examining Corps, is to take stock of the present situation and to consider whether any corrective action needs to be taken to improve the quality of the examination process.

The Office is currently using and improving various tools to assure a quality examined patent. These tools include the quality review program, supervisory reviews of examiner work through the performance appraisal system and through the promotion and signatory authority programs, improved and expanded examiner training, development of the automated patent system to improve the quality of examiner searching, recruitment of "top-of-the-class" new examiners, and detailed and clear guidlines on examining policy and procedure.

The Quality Reinforcement Program is a new quality tool for improving the actual quality of the patents issued as well as the record behind the issuance of these patents. This new program differs from the quality review program in that this program looks at the key pieces of the patent examining process that contribute to and make up the end product or patent rather than looking only at the end product. The Quality Reinforcement Program focuses on the effectiveness and consistency with which examiners apply existing law and procedures and how they communicate their findings to applicants. The program also focuses on the attorney's contribution to this work product. Lastly, the program focuses on the timeliness of some of the services provided by the Corps' clerical support staff. Such focusing is not intended to be carried out one time only. Rather, the methodology used in this program will be applied to any key pieces, identified by PTO personnel or the bar in the future, as needing a review of the type dictated by this program. The aim in short is to build quality and timeliness from the ground up and to maintain them at a high level.

This report presents and analyzes the findings of the Quality Reinforcement Program only as the findings relate to practices performed in the Patent Examining Corps. The portion of the program reported in this volume represents a cooperative effort between the Corps and the American Intellectual Property Law Association (AIPLA) through its Ad Hoc Committee on Quality. The focus is on certain practices involved in the prosecution, examination and processing of patent applications by both the PTO and by patent applicants and their representatives.

Methodology

The methodology adopted for the program comprises the following process:

1. select target practices,
2. determine the current quality or performance level of the target practices,
3. compare the current performance of the target practices to the desired level of performance,
4. implement, where appropriate, steps to raise the current level of performance to the desired level,
5. subsequently, determine the level of performance of the target practices, and
6. compare the current level of performance to the subsequently determined level of performance to determine what, if any, change has occurred.

Target Practices

A number of practices were targeted for the program as a result of complaints and concerns, raised by the bar and PTO personnel. The targeted practices are identified as follows:

A. Explanations of Rejections

This program targeted examiner "explanations of rejections" as a practice to be reviewed based in part on a de-emphasis by the Office on the degree to which examiners were required to include detailed explanations of the supporting rationale behind their rejections during the 1970s. The PTO instituted the use of an abbreviated, handwritten form (PTO–1142) for the preparation of first Office actions during the early 1970s. The form provided for a cryptic description of how the references were being combined in a §103 rejection and provided little space for explanation of the supporting rationale behind rejections. The form was mandatory for all first actions, and was discontinued in 1982 primarily due to complaints from the patent bar and the courts that examiner explanations of rejections were not sufficient. The inclusion of "explanations of rejections" as a targeted practice for this program enables the evaluation of whether further improvement is needed in this area.

B. Final Rejection Practice

This program targeted "final rejection practice" for review based in part on the conflicting needs of PTO and patent applicants/attorneys in this area of practice. In order to reduce the time applicants must wait to obtain a patent and to increase efficiency of the examination process, the PTO uses various incentives for examiners to make their rejections final early in the prosecution.

To the contrary, patent applicants often desire to have the examiner repeatedly reconsider his or her position or to continue to amend the claims. These conflicting incentives often lead to disputes relating to the propriety and/or timeliness of final rejections and to whether amendments are entered after an action has been made final.

C. Information Disclosure Statements

This program targeted "information disclosure statements" for review based upon concerns expressed by both applicants/attorneys and by the Patent Examining Corps over the submission of these statement.

Patent examiners, in the interest of efficiency and productivity, are benefited by the disclosure to the Office of all material information relating to the patentability of the application prior to their first Office action. However, this must be balanced against the practical reality that applicants/attorneys often don't become aware of material information until later in the prosecution, and don't have readily available translations of foreign documents or copies of documents for submission to the PTO. This practice looks at the extent to which the practical needs of both the PTO and the applicant/attorney are served by the procedures relating to "information disclosure statement".

D. Interviews

This program targeted "interviews" for review to determine the extent to which personal discussions are held between examiners and attorneys and to evaluate whether the parties consider personal interviews to be a productive or helpful means for clarifying issues that may not have been clearly communicated in earlier written communications. Selection of "interviews" as a targeted practice was based in part on isolated complaints by some examiners that interviews were not always productive for them and by some attorneys that some examiners are reluctant to hold interviews.

PTO procedures require that all business with the Office be conducted in writing (37 CFR §1.2). To comply with this rule and still accommodate request for oral discussions with examiners, it is PTO policy that the substance of all personal interviews must be reduced to writing (see §713.04 of the MPEP). Selection of "interviews" as a targeted practice was also based on concerns that the written record include an explanation of the substance of all oral interviews. Under this practice, the program focused on determining the perceptions of examiners and attorneys about interviews.

E. Responses by Applicant

This program targeted "responses by applicant" for review to determine the extent to which practitioners representing patent applicants submit responses to examiner actions that are complete and in compliance with current rules and procedures. Specific activities under this topic, such as the extent to which explanations of why claims are considered unobvious over the art cited by the examiner and the degree of compliance with 37 CFR §1.116 when amendments are presented after a final rejection, were selected based upon some complaints by examiners about attorney responses in these areas.

F. Completeness of the Record

This program targeted "Completeness of the Record" for review based primarily upon the importance of a complete file record to those who must review patented files and make important decisions based upon the facts and determinations therein. The necessity of insuring a complete file record has been urged by such diverse interests as federal court judges, potential licensees, potential infringers, and those attempting to avoid infringement.

This topic looks at the extent to which examiners insure a complete file record by including a statement of reasons for allowance where appropriate, fully and properly record the search of the prior art, and check foreign priority information for accuracy and completeness. This topic does not look at the extent to which examiners explain their rejection; see targeted practice A, "Explanation of Rejections." The extent to which applicants file complete responses is covered in targeted practice E, "Responses by Applicant."

G. Compact Prosecution

This program targeted "Compact Prosecution" for review based upon its importance as a key element in current PTO efforts to reduce pendency time of applications to an average of 18 months. The premise behind compact prosecution is that pendency time will be minimized if each stage of prosecution is fully and thoroughly conducted by both examiners and applicants. The demands of such a standard have inevitably led to complaints from each side relating to the completeness of considerations and the willingness to take that "extra step". Examiners have been criticized for confining searches to only what is literally claimed, and for failing to indicate possible areas of patentability at the earliest possible stage. Applicants have been criticized for failure to claim all limitations that might be considered patentable prior to the initial search by the examiner, for amending the claims to include these limitations only after first action, and for failing to correct significant formal deficiencies prior to initial examination.

H. Appeal Practice

This program targeted "Appeal Practice" for review primarily due to the recent and substantial increase in the backlog of appealed applications awaiting decision by the Board of Patent Appeals and Interferences. Primary emphasis was placed on determining the extent to which appellant's brief and the examiner's answer are formally complete so that expeditious consideration may be given by the Board.

As a result of the high priority being given by the PTO to reduce the backlog of cases at the Board, additional survey questions were included to determine the extent to which additional requirements beyond those currently in effect for the preparation of the appellant's brief and examiner's answer would be useful to examiners and the Board.

I. Allowances After Appeal Brief

This program targeted "Allowances after Appeal" for review in response to complaints that examiners often allow cases after appellant has filed a brief when the cases should have been allowed before the brief was filed.

J. Processing Times

This program targeted "Processing Times" for review based upon its importance to the PTO goal of reducing pendency of patent applications to 18 months.

DETERMINATION OF CURRENT LEVELS OF PERFORMANCE

The step of determining the current level of performance of the targeted practices was accomplished through a number of surveys.

One survey, called the Applications Survey, was an internal factual survey that involved selecting a sample of 150 applications on a random basis from all the examining groups. A survey team, comprising three Supervisory Patent Examiners (SPEs) and three reviewers from Qualtiy Review, performed a detailed review of the applications according to a questionnaire, which was developed with the joint cooperation of the AIPLA Ad Hoc Quality Committee.

A second survey, called the AIPLA Survey, was an opinion questionnaire provided by the AIPLA to 5500 of its members. The questionnaire was developed jointly with the AIPLA Ad Hoc Quality Committee. The AIPLA questionnaire sought the perception of the attorneys of the quality of the work performed by the Corps relative to the targeted practices. Space was provided for the respondents to include comments on the questionnaire. Over 1100 attorneys responded to the questionnaire.

Another survey, called the Examiners Survey, was also an opinion questionnaire provided to all patent examiners and SPEs on a voluntary and anonymous basis. The questionnaire queried the examiners and SPEs about the practices of the practitioners before the PTO. Space was provided for the respondents to include comments on the questionnaire. Over 650 responses were received.

A fourth survey, called the Appeals Survey, was also an internal factual survey. The questionnaire was developed with the cooperation of the AIPLA Ad Hoc Quality Committee. The questionnaire sought data about the practices carried out in the appeal process in the PTO. For this survey, 60 applications were selected on a random basis from all the examining groups. The survey team performed a detailed review of the applications according to the questionnaire.

Three other surveys were used to gather data. All of these surveys were developed and conducted by the Office of Quality Review. Two surveys involved the review of 1878 allowed applications concerning information disclosure statements. Another survey involved the review of 290 applications allowed after appellant had filed an appeal brief, but before an examiner's answer was prepared.

Relative to the processing times, PALM reports were used to obtain data on the practices targeted for this activity.

COMPARISON OF CURRENT LEVELS TO DESIRED LEVELS

The step of comparing the current levels of performance to the desired or standard levels of performance was accomplished by setting out the desired or standard level for each target practice. Next, all the information provided by the surveys was analyzed for each target practice and compared to the desired or standard level for the target practice. The analysis resulted in the following general conclusions. (A detailed listing of all conclusions for each targeted practice is presented in Section VII of Volume I of the Quality Reinforcement Program Report.)

SUMMARY OF CONCLUSIONS

A. Explanations of Rejections

1. **Identification of Statutory Basis for Rejection**
   Over 95% of the rejections under 35 USC §§103 and 112, second paragraph (clarity), cited the statutory basis for the rejection. With respect to rejections under 35 USC §102, 92% of the rejections cited the statutory basis. Hence, no significant improvement is needed in specifying the statutory basis of a rejection based on 35 USC §§102, 103 or 112, second paragraph.
   With respect to rejections under 35 USC §112, first paragraph, 14–19% of the rejections based on a non-enabling disclosure and 42% of the rejections based on new matter failed to cite the statutory basis. Hence, improvement is needed in specifying that a rejection, based on new matter or the lack of an enabling disclosure, is under 35 USC §112, first paragraph.

2. **Explanation of Rejections Based on Prior Art**
   Approximately two-thirds of the rejections reviewed failed to explain why the claimed invention would have been obvious in view of the applied prior art. Over 75% of the attorneys responding to the AIPLA survey perceived rejections under 35 USC §103 as lacking an explanation of why the claimed invention would have been obvious. Moreover, 70 comments from attorneys (the highest for any topic) were critical of the explanations of rejections under 35 USC §103. Hence, significant improvement is needed to assure that rejections based on prior art appropriately communicate the rationale for such rejections.

3. **Explanation of Rejections Under 35 USC §112, First Paragraph, Non-Enabling Disclosure**
   Nineteen percent of all the non-enabling disclosure rejections reviewed failed to give reasons in support of the rejection. Hence, improvement is needed in explaining why a disclosure is non-enabling.

4. **Explanation of Rejections Under 35 USC §112, First Paragraph, New Matter**
   With respect to rejections based on new matter, 35% of the rejections reviewed failed to point out the language considered to be new matter, and 40% of these rejections did not give a reason why the language was considered new matter. Hence, significant improvements are needed in pointing out the language that is considered to be new matter, and explaining why the new matter is not supported by the disclosure as originally filed.

5. **Explanation of Rejections Under 35 USC §112, Second Paragraph**
   Approximately 90% of the rejections reviewed pointed out the claim language considered unclear. Thus, no significant improvement is needed in pointing out *what* claim language is considered unclear in rejections under the second paragraph of §112.
   Twenty-three percent of the non-final rejections reviewed failed to explain why the language was considered unclear. In final actions, 8% of the rejections failed to explain why the language was considered unclear. Hence, improvement is needed in explaining *why* the claim language is considered unclear in rejections under the second paragraph of §112.

6. **Alternative Rejections Under 35 USC §§102/103**
   Three percent of the actions reviewed contained alternative rejections under 35 USC §§102, 103. Ten percent of the examiners' answers re-

viewed contained similar rejections. The number of alternative rejections under either §102 or §103 was sufficiently low so that no further action is required.

B. Final Rejection Practice

1. **Timely Development of Issues in Examiner and Attorney Communications**

The perception surveys indicate that examiner actions and attorney responses leading up to final rejection do not adequately develop the issues. The objective Applications Survey data indicate that 32% of examiners' non-final actions do not fully respond to all arguments raised by the applicant. Improvement is needed by both examiners and attorneys in fully developing the issues prior to final.

Final rejections were found to treat all claims, but were deficient in answering all arguments presented by the applicant and in treating affidavits and declarations submitted to overcome rejections. Improvement is needed in responding to all issues raised during the prosecution when making a final rejection.

2. **Appropriateness of Final Rejection**

Thirteen percent of the final actions surveyed were considered premature. However, 91% of the final rejections reviewed were considered to be reasonable. Thirty-nine percent of the attorneys responding to the AIPLA survey perceived final actions as proper only occasionally or rarely.

Though examiners appear to be doing an acceptable job in making reasonable and proper final rejections, some improvement is needed. However, attorney perception is substantially lower than the factual findings. This may be due to a desire by attorneys for a more liberal after final procedure rather than improper examiner application of the current procedure.

3. **Advisory Actions**

Advisory actions were found to be mailed in a timely manner.

Thirty-three percent of the amendments filed after final were improperly refused entry. Only 46% of the attorneys responding to the AIPLA survey perceived that reasons given by examiners for the non-entry of amendments after final were clear almost always or most of the time. Moreover, only 50% of these attorneys perceived their response to final rejections to have been given full consideration.

In only 39% of the instances when an amendment to existing claims was entered after final did the advisory action clearly specify the grounds of rejection applicable to the amended claims.

Hence, significant improvements are needed in assuring that amendments after final:

a. are not arbitrarily refused entry,
b. are given sufficient consideration, and
c. communicate the ground of rejection for any claim amended after the final rejection.

C. Information Disclosure Statements

1. **Frequency and Timeliness of Submissions**

Information disclosure statements are submitted either as statements in the specification or as separate papers in approximately 60% of the applications. Eighty-two percent of the statements are submitted prior to the first action. However, 47% are filed more than three months from the filing date. In 1978, just after 37 CFR §1.56 was amended, only 21% of the statements were filed more than three months after the filing date. Twelve percent of applications on appeal had statements filed after the final rejection. Two percent of the statements are filed after the application has been allowed.

Only 11% of the statements filed more than three months after the filing date contained an explanation for the delay.

Hence, significant improvements are needed for assuring that information disclosure statements are filed in a timely manner, and with an explanation for the delay when filed late.

2. **Submission Includes Explanation of Relevancy of Documents**

The explanation of the relevance of the art is substantially below standard whether the citation is incorporated in the specification or is in a separate paper. Hence, significant improvement is needed in assuring that explanations of the relevance of documents cited in information disclosure statements are provided.

3. **Copy of Documents Supplied**

Copies of cited documents, regardless of type, are not provided in approximately 60% of cases when statements are incorporated into the specification. Even when eliminating those statements citing only U.S. patent documents, the Applications Survey still shows a 25% level of noncompliance for specification-incorporated statements. There is a need for improvement in supplying copies of documents cited in specification-incorporated statements.

4. **Translation of Foreign Documents Provided**

Either a translation or a statement that a translation is not readily available is generally not provided when the citation is incorporated in the specification. While compliance with the standard is better when the citation is in a separate paper, compliance is still poor. Improvement is needed.

5. **Form PTO–1449 or Equivalent**

Since the use of PTO form 1449 is not mandatory, this section merely reports the degree to which the form is voluntarily used and is thus informational only. Form PTO–1449 is used in about 70% of disclosure statement submissions when the submission is in a separate paper. The form is used in about 25% of the disclosure statements incorporated in the specification.

6. **Miscellaneous**

Examiners considered art submitted prior to first action in 93% of cases reviewed. Improvement is needed to insure 100% compliance.

While the survey results indicate a perception by examiners that related copending applications are not being fully disclosed, no objective survey data was recorded on this topic. Since attorneys are only required to cite related applications that are *material*, the survey question does not measure perceived performance against the current standard. No conclusions can be reached based upon the survey data.

D. Interviews

1. **Interviews in General**

The results of the AIPLA survey indicate that, of the attorneys responding to the survey,

a. 75% perceived interviews as productive,
b. 89% perceived interviews to be kept as scheduled,
c. 68% perceived examiners to be adequately prepared, and
d. 85% perceived the interview summary form to be completed adequately.

The results of the Examiners Survey indicate that, of the examiners responding to the survey,

a. 53% perceived interviews as productive,
b. 96% perceived interviews to be kept as scheduled,
c. 88% perceived attorneys to be adequately prepared, and
d. 67% perceived attorneys as making the substance of the interview of record.

The survey results indicate that attorneys perceive that examiners are willing to grant at least one interview if timely requested. No need for improvement would appear necessary. A substantial number of attorneys (approximately 30%) feel that examiners are only occasionally or rarely willing to discuss and attempt to resolve substantive issues at interviews. However, examiners often express the desire to reserve commitments until after an interview so that full consideration of all points could be made. It cannot be concluded from the survey data whether examiners could be making more substantive commitments at interviews. No need for improvement is indicated. Some improvement is needed by attorneys in ensuring that an adequate written record of the substance of all interviews is provided.

2. **Telephone Restriction**

As a general policy, the examiner should telephone the attorney of record and request an oral election when making a restriction requirement. In 62% of the restriction requirements reviewed, the policy was followed. However, the telephone is not required to be used when examiners know that an election will not be made by phone. The number of instances of the remaining 38% where no restriction was made for this reason was not determined. Hence, while it appears that some improvement is needed, the degree of need for improvement cannot be determined without further study.

E. Responses by Applicant

1. **Responses under 37 CFR §1.111**

Approximately 90% of the responses reviewed were technically fully responsive to Office actions. However, the percentage of responses that explained why the claimed invention would have been unobvious in view of the prior art was significantly lower. Moreover, some of the comments from examiners indicate that they feel responses often argue references individually rather than address the combination of references set forth in the prior Office action. At least part of this may be due to the lack of an examiner explanation in rejections how references are used and combined.

Hence, no significant improvement is needed in assuring that responses under §1.111 treat all objections and rejections. However, significant improvement is needed in assuring that responses include an explanation of why it would have been unobvious to combine or modify the references in the manner suggested by the examiner.

2. **Responses Under 37 CFR §1.116**

Only 16% of the amendments filed after a final rejection that were reviewed presented a showing of good and sufficient reasons why they were necessary and why they were not presented earlier. Moreover, 48% of the examiners and SPEs responding to the Examiners Survey perceived that attorneys generally do not start serious prosecution or make substantial amendments until after the final rejection.

Hence, significant improvement is needed in assuring that responses under §1.116 explain why an amendment was not presented earlier.

3. **Appeal Briefs — Responses to Rejections**

Ninety-four percent of the briefs reviewed contained an explanation why the examiner's modification of the references would have been unobvious. Hence, no significant improvement is needed in assuring that briefs adequately communicate why the examiner's rejection is considered improper.

4. **Affidavits/Declarations Submitted to Overcome Rejections**

Approximately 20% of affidavits/declarations are not filed in a timely manner. Hence, improvement is needed in assuring that affidavits/declarations are submitted in a timely manner.

Examiner perception of the sufficiency of affidavits to either establish proper "nexus" when asserting commercial success or to present evidence to substantiate an allegation of "secondary considerations" was very low, indicating a need for at least some attorney improvement.

F. Completeness of the Record

1. **Reasons for Allowance**

In 22% of the applications reviewed, the reason for allowance was not clear from the record. Moreover, only 50% of the attorneys responding to the AIPLA Survey perceived the reason for allowance made of record by the examiner, as clearly establishing why the claims were allowed. Hence, significant improvement is needed in assuring that the record clearly explain why the claims were allowed.

2. **Recordation of Searches**

Eighty-five percent of the applications surveyed had search boxes properly filled out by the examiner. Approximately 45% of the applications, wherein an automated search was made, were lacking information about the automated search. Hence, improvements are needed in assuring that the search data are recorded in a complete and accurate manner.

3. **Foreign Priority Data Verified**

The priority/PCT data appearing on the face of the file wrapper were not verified in 23% of the applications reviewed. Hence, a significant improvement is needed in assuring that the priority/PCT data appearing on the file jacket are verified.

G. Compact Prosecution

1. **Adequacy of Applications Prior to First Action**

Applications should be devoid of obvious informalities. Significant improvement is needed in foreign origin applications since 70% of the examiners surveyed perceived foreign applications as containing substantial formal deficiencies almost always or most of the time. However, only 16% of the examiners perceived U.S. origin applications as containing substantial formal deficiencies.

The disclosure should be readily understandable and the claims should clearly define the invention to enable the examiner to conduct an adequate search. Improvement is needed in foreign origin applications since 20% of the examiners surveyed perceive such applications as lacking an adequate disclosure to permit examination almost always or most of the time. However, 97% of these examiners perceive U.S. origin applications as containing an adequate disclosure.

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Claims should be presented that range from the broadest to the most detailed that applicant is willing to accept. Substantial improvement is needed in this area since the Applications Survey shows that only approximately 60% of the applications surveyed contained such a range of claims.

2. **Searches**
The first search should cover the invention as described and claimed. Substantial improvement is needed in conducting a more thorough search at the time of the first action since 50% of the applications surveyed revealed newly applied art in subsequent actions that should have been applied in a previous action.
A search should be made in the issuing class/subclass. Improvement is needed in this area because 11% of the allowed applications reviewed did not indicate that the issuing class/subclass was searched.

3. **Indication of Allowable Subject Matter**
Examiners should communicate certain aspects or features of applicant's invention that if properly claimed would receive favorable consideration. Significant improvement is needed in this area since only 59% of the applications that were deemed appropriate for an indication of allowable subject matter had such an indication.

H. Appeal Practice

1. **Appellant's Brief — Format**
Ninety-five percent of the briefs reviewed contained a concise explanation of the invention. However, only 46% of the explanations contained a reference back to the drawings and/or specification. Hence, a significant improvement is needed in assuring that appellant's explanation of the invention refers to the drawing and/or specification. Ninety-five percent of the briefs reviewed contained a copy of the claims. Hence, no significant improvement is needed in assuring that appellants provide a copy of the claims on appeal.
In addition, formal matters that are not currently required in briefs were found to be included in the surveyed briefs to the following extent,

a. 27% of the briefs included a separate summary of the issues on appeal,
b. 53% of the briefs included a citation of the references as well as an explanation of each reference,
c. 7% of the briefs included a reference back to the drawings or specification in the copy of the claims presented in the brief; however, 58% of the examiners surveyed thought that an appeal brief would be more useful if the claims on appeal were read on the drawings or specification, and
d. 2% of the briefs pointed out an exemplary claim; however 60% of the examiners surveyed thought that an appeal brief would be more useful if appellant is required to state whether all the claims on appeal stand or fall together.

The formal requirements of the brief should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the brief.

2. **Examiner's Answer — Format**
Ninety percent of the answers surveyed identified the status of all the claims in the applications. One hundred percent of the answers cited all the references relied upon in the appeal and pointed out any deficiencies in the copy of the claims provided by appellant. Hence, no significant improvements are needed in the format of the examiners' answers, as measured against the formal requirements for examiner's answers.
In addition, formal matters that are not currently required in examiner's answers were found to be included in the surveyed answers to the following extent,

a. 15% of the answers included a summary of the issues on appeal,
b. 40% of the answers included an explanation of the invention, and
c. 28% of the answers included an explanation of the references.

The formal requirements of the examiner's answer should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the examiner's answer.

3. **Examiner's Answer — Completeness**
Seventy-two percent of the answers reviewed responded to every significant argument raised in the briefs. Hence, a significant improvement is needed in assuring that examiners' answers respond to every significant argument/issue raised by appellants.

4. **Post Examiner's Answer Practice**
The Appeals Survey shows that a substantial number of reply briefs are merely noted with no further comment by the examiner. The findings are inconclusive regarding the propriety of the reply briefs or whether reply briefs are being treated properly by examiners.

I. Allowance After Appeal Brief

Thirty-nine percent of applications allowed after an appeal brief had been filed were found to have no change in appellant's position. Hence, significant improvement is needed in assuring that applications are allowed at the earliest appropriate stage of prosecution.

J. Processing Times

1. **Mailing of Office Actions**
Substantial improvement in mailing Office actions earlier than one month from the day when the examiners are given credit for the Office action has been accomplished since the inception of the Quality Reinforcement Program.

2. **Mailing of Notices of Allowance**
Substantial improvement in assuring that Notices of Allowances are mailed promptly has been accomplished since the inception of the Quality Reinforcement Program.

3. **Responses to Amendments After Final**
Substantial improvement in mailing responses to amendments after final has been accomplished since the inception of the Quality Reinforcement Program.

Perceptions

In addition to reaching conclusions on the current level of performance of each target practice, the program determined the opinions of patent examiners and representatives of applicants on various topics involved in the examination process. A summary of their perceptions is presented below.

Examiner legal proficiency was perceived by attorneys to be in definite need of improvement.

Examiner technical competency, care in doing the job, and neatness of attire were perceived by attorneys as more positive than negative, but in need of improvement.

Clerical competency and care in doing the job were perceived by attorneys to be in definite need of improvement.

Clerical functions including neatness of attire, cooperativeness, courteousness and availability were perceived as being more positive than negative, but with substantial room for improvement.

Attorney handling of foreign origin applications was perceived by examiners to be deficient in preparation of the case for examination. Attorney practices including continued prosecution after final, interview practice, submission of information disclosure statements and explanation of reasons for disagreement with §103 rejections were also of concern to examiners.

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(96) **Report on Results of an Oct. 1985—Feb. 1986 Survey on the Citation by Applicants of Information Disclosure Statements in Patent Applications**

This report summarizes the data compiled from a sample of 1200 allowed utility applications surveyed in the Office of Quality Review during the period of Oct. 1, 1985 to Feb. 14, 1986.

For purposes of the survey, a "citation", whether appearing in the specification or in a separate paper, is defined as either (1) a listing of patents or publications together with a concise explanation of the relevance of each listed item (i.e. an "information disclosure statement" under 37 CFR 1.98(a)), or (2) a "mere listing" of patents or publications. In addition, a "reference", or "document", is defined as any patent or other publication cited by applicant.

This survey report is similar to and presented in the same general format as the survey reports published in the Official Gazette of Nov. 23, 1976, pages 1356 and 1357, of Sept. 26, 1978, pages 22 and 23, and of Aug. 12, 1980, pages 8 and 9. It should be noted, however, that the phrase "prior art statement" used throughout the three previous survey reports has been replaced by the more appropriate phrase "information disclosure statement" reflecting the current terminology of 37 CFR 1.97–1.99 as amended.

This survey indicates, among other things, that 60% of the sampled applications include citations by applicants. This is somewhat less than the 63% finding in the survey reported in the 1980 O.G. and the 64% finding in the 1978 survey but still represents an improvement over the 54% finding in the 1976 survey. In addition, more citations are being submitted later in the prosecution than previously. The percentage of applications having citations submitted in separate papers has increased while the percentage of applications having such papers submitted within three months of the filing of an application is down from 79% in 1978 and 73% in 1979 to 53% presently. Also, while the percentage of applications having citations accompanied by copies of references cited has increased, overall compliance with Office guidelines has decreased.

A separate, recent informal review of citations made after allowance similarly indicated frequent noncompliance with the guidelines of Section 609 of the Manual of Patent Examining Procedure. Often, citations were in the form of prior art search reports made by foreign patent offices many months or years earlier, submitted without copies of the references, discussion of materiality, or any explanation for the late submission. The Office is presently considering action to remedy these problems.

The statistics are otherwise presented without comment as follows:

		Chem.	Elec.	Mech.	Total
(1)	Number of applications in sample	350	415	435	1200
	(Percent of total sample)	29%	35%	36%	100%
Number of applications having citations submitted in:					
(2)	Separate papers only	69	82	82	233
	(Percent of sample 2/1)	20%	20%	19%	19%
(3)	Both separate paper *and* in specification	41	60	44	145
	(Percent of sample 3/1)	12%	14%	10%	12%
(4)	The specification only	121	94	121	336
	(Percent of sample 4/1)	35%	23%	28%	28%
(5)	Total number of applications having citations	231	236	247	714
	(Percent of sample 5/1)	66%	57%	57%	60%

Application in which the applicant submitted citations in the *specification*.

		Chem.	Elec.	Mech.	Total
(6)	Number of applications including citations in the specification	162	154	165	481
	(Percent of applications having citations in the specification 6/1)	46%	37%	38%	40%
(7)	Number of applications including mere listing of references in the specification	12	6	17	35
	(Percent of applications having mere listing of references in the specification 7/1)	3%	1%	4%	3%
(8)	Number of applications including information disclosure statements in the specification	150	148	148	446
	(Percent of applications having disclosure statements in the specification 8/1)	43%	36%	34%	37%
(9)	Number of applications including information disclosure statements in the specification which included copies of the references	67	55	65	187

	(Percent of applications, with disclosure statements in the specification, having copies of the references 9/8)	45%	37%	44%	42%
(10)	Number of applications including information disclosure statements in the specification which comply fully with the guidelines (37 CFR 1.97–1.99; MPEP §609) (e.g. timely filed, translations where applicable, etc.)	46	45	40	131
	(Percent of applications, with disclosure statements in the specification, which fully comply with CFR and MPEP 10/8)	31%	30%	27%	29%
(11)	Number of applications including information disclosure statements citing non-English documents in the specification	60	56	31	127
	(Percent of applications, with disclosure statements in the specification, citing non-English documents 11/8)	40%	24%	21%	28%

Applications in which applicant submitted citations in *separate papers*.

		Chem.	Elec.	Mech.	Total
(12)	Number of applications including citations in a separate paper	110	142	126	378
	(Percent of applications having citations in separate papers 12/1)	31%	34%	29%	32%
(13)	Number of applications including separate paper citations submitted within 3 months of the filing date of the application	48	88	65	201
	(Percent of separate paper citations submitted within 3 months 13/12)	43%	62%	52%	53%
(14)	Number of applications including separate paper citations which include a copy(s) of the reference(s)	103	134	114	351
	(Percent of separate paper citations including copy(s) of the reference(s) 14/12)	94%	94%	90%	93%
(15)	Number of applications including separate paper citations which cited a non-English document	47	53	43	143
	(Percent of separate paper citations citing non-English documents 15/12)	43%	37%	34%	38%
(16)	Number of applications including separate papers with information disclosure statements	88	100	81	269
	(Percent of separate paper citations having disclosure statements 16/12)	80%	70%	64%	71%
(17)	Number of applications including separate paper citations which fully comply with the guidelines (37 CFR 1.97–1.99; MPEP §609)	31	58	37	126
	(Percent of separate paper citations which fully comply with CFR and MPEP 17/12)	28%	41%	29%	33%

Applications in which applicant submitted *more than ten* citations.

		Chem.	Elec.	Mech.	Total
(18)	Number of applications having more than ten citations	32	25	22	79
	(Percent of applications having more than ten citations 18/1)	9%	6%	5%	7%

Aug. 15, 1986.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

[1070 OG 24]

(97) **Express Abandonments**

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(i) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Apr. 7, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 2]

(98) **Notice of Abandonment for Failure to Prosecute Application**

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: _____ In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976: 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

(99) **Requirement for a Response Under 37 CFR 1.136 and 1.137 Where a Continuing Application is Being Filed.**

This notice is intended to clarify the requirements for a response as required by 37 CFR 1.136 or 1.137 in situations involving a petition for extension of time or a petition to revive an abandoned application for the purpose of filing a continuing application.

In those instances where an extension of time or a revival of an abandoned application is sought solely for the purpose of filing a continuing application under 35 U.S.C. 120 and where the prior application is to be abandoned in favor of the continuing application, the filing of a response as required by 37 CFR 1.111, 1.113, 1.192 or other regulation is considered to be an unnecessary expenditure of resources by the applicant. Accordingly, in these situations, the Patent and Trademark Office will accept the filing of a continuing application as a response under 37 CFR 1.136 or 1.137.

To facilitate processing by the Office, any such petition for extension of time or petition to revive should specifically refer to the filing of a continuing application and also include an express abandonment of the prior application conditioned upon the granting of the petition and the granting of a filing date to the continuing application.

GERALD J. MOSSINGHOFF,
May 13, 1983. *Commissioner of Patents and Trademarks.*

[1031 OG 11]

(100) **Petitions Under 37 CFR 1.183 to Waive One the Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)**

Petitions to revive an unintentionally abandoned application (37 CFR 1.137(b)) or to accept an unintentionally late paid issue fee (37 CFR 1.155(c) or 1.316(c)) must befiled within one year of the date on which the application became abandoned.

In the last sentence of the above-noted subsections of 37 CFR, the Commissioner of Patents and Trademarks has indicated that petitions under 37 CFR 1.183 to

waive any time period requirements for filing a request pursuant to these subsections will not be considered, but will be returned to the applicant. However, it has become apparent that under certain very limited conditions, the interests of the patent system would be better served by considering such petitions.

These very limited conditions arise when an application becomes abandoned due to an action or inaction by applicant and the Patent and Trademark Office performs a positive, documented and Official act* (e.g., by issuing an Official document) which could lead a reasonable individual to conclude that the action or inaction was appropriate. If this conclusion is a contributing factor in the applicant's failure to realize the true, abandoned status of his application in time to file a petition under one of the above-noted subsections, then conditions exist under which a §1.183 petition will be considered.

For example, if an applicant files papers for a continuing application under 37 CFR 1.60 or 1.62 on a date when the parent application is abandoned (e.g., the applicant neglected to obtain an extension of time in the parent application), the requirements of these regulations are not satisfied and the papers should not be processed into an application. However, if in spite of this error the Office issues a filing receipt for the continuing application, a reasonable individual could conclude that the continuing application had been properly filed on a date when the parent application was pending. Further, if the lack of copendency between the parent and the continuing applications is not discovered until after one year from the date on which the parent application became abandoned, the opportunity to obtain copendency by reviving the parent application under 37 CFR 1.137(b) is lost. As an additional example, if an applicant submits a check for payment of the issue fee and the payment is improper (e.g., the check is not timely submitted or is returned to the Office unpaid due to insufficient funds), the application should be held abandoned. However, if in spite of the improper issue fee payment the Office issues the application as a patent, a reasonable individual could conclude that the issue fee payment had been proper. Further, if the improper issue fee payment is not discovered until after one year from the date on which the application became abandoned, the opportunity to request acceptance of a late paid issue fee under 37 CFR 1.155(c) or 1.316(c) is lost.

The abandonment problems described in the above-noted examples are clearly attributed to an error on the part of the applicant. Nevertheless, such a problem could be aggravated when the Office performs a positive, documented and Official act* which, in the circumstances recounted above, may be a contributing factor in the loss of an opportunity to rectify this problem by filing a petition under one of the above-noted subsections. In light of these factors, the Commissioner will exercise his authority under 37 CFR 1.183 to waive the one year period requirement for filing a petition pursuant to 37 CFR 1.137(b), 1.155(c) or 1.316(c) providing the following strictly limited conditions are present:

(1) The applicant's action or inaction which caused the application to become abandoned was clearly an unintentional oversight which resulted from a bona fide attempt, as evidenced by Patent and Trademark Office records, to comply with patent statutes, rules and procedures in order to keep the application pending as desired; and

(2) The Office performed a positive, documented and Official act* which could lead a reasonable individual to conclude that the action or inaction was proper and this conclusion was a contributing factor in the applicant's failure to realize the true abandoned status of his application in time to file a petition under one of the above-noted subsections; and

(3) A petition under 37 CFR 1.183 and one of the above-noted subsections is filed within three (3) months of the date applicant is notified by the Office or otherwise becomes aware of the abandoned status of the application; and

(4) The petition is accompanied by a terminal disclaimer with fee under 37 CFR 1.321 dedicating to the public a terminal part, equivalent to the period of abandonment, of the term of any patent granted on the application or on any application entitled to the benefit of the filing date of the application under 35 USC 120.

For a transitional period of three (3) months from the date of this Notice, the requirement for filing a petition within three (3) months of the date referred to in condition (3), above, will not be enforced providing:

(a) the abandoned application could have been restored to pending status if a petition under one of the above-noted subsections had been timely filed; and

(b) the applicant made a bona fide attempt, as evidenced by Patent and Trademark Office records, to restore the abandoned application to pending status within three months of the date applicant was notified by the Office or otherwise became aware of the abandoned status of the application.

Applicants should note that this is intended to be a very limited extension of the Commissioner's discretion in exercising his authority to waive the one year period required under the above-mentioned subsections. For this reason, the above-noted conditions and provisions will be strictly adhered to and any petition under §1.183 which fails to comply with these conditions or provisions will be denied.

*NOTE: THE FAILURE OF THE PATENT AND TRADEMARK OFFICE TO SEND AN OFFICIAL COMMUNICATION (E.G., A NOTICE OF ABANDONMENT) IS *NOT* CONSIDERED TO BE A POSITIVE, DOCUMENTED AND OFFICIAL ACT WITHIN THE MEANING OF THIS NOTICE.

JAMES E. DENNY,
Aug. 26, 1985. *Deputy Assistant,*
Commissioner for Patents.

[1059 OG 4]

(101) **Procedure for Handling Amendments under 37 CFR 1.116**

On Oct. 1, 1982, pursuant to Public Law 97–247, the Patent and Trademark Office discontinued the previous practice in patent applications of extending without fee the shortened statutory period for response to a final rejection upon the filing of a timely first response to a final rejection (37 CFR 1.116). Since Oct. 1, 1982, applicants are able to obtain additional time for a first or subsequent response to a final rejection by petitioning and paying the appropriate fee under 37 CFR 1.136(a), provided the additional time does not exceed the six month statutory period.

In order to continue to encourage the early filing of any first response after a final rejection and to take care of any situations in which the examiner does not timely respond to a first response after final rejection which is filed early in the period for response, the Office is changing the manner in which the period for response is set on any final rejection mailed after Feb. 27, 1983.

Under the changed procedure, if an applicant initially responds within two months from the date of mailing of any final rejection setting a three-month shortened statutory period for response and the Office does not mail an advisory action until after the end of the three-month shortened statutory period, the period for response for purposes of determining the amount of any extension fee will be the date on which the Office mails the advisory action advising applicant of the status of the application, but in no event can the period extend beyond six months from the date of the final rejection. This procedure will apply only to a first response to a final rejection and will be implemented by including the following language in each final rejection mailed after Feb. 27, 1983:

A shortened statutory period for response to this final action is set to expire three months from the date of this action. In the event a first response is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than six months from the date of this final action.

For example, if applicant initially responds within two months from the date of mailing of a final rejection and the examiner mails an advisory action before the end of three months from the date of mailing of the final rejection, the shortened statutory period will expire at the end of three months from the date of mailing of the final rejection. In such a case, any extension fee would then be calculated from the end of the three-month period. If the examiner, however, does not mail an advisory action until after the end of three months, the shortened statutory period will expire on the date the examiner mails the advisory action and any extension fee may be calculated from that date.

Statutory periods set in Office actions mailed before Feb. 28, 1983, will not be effected by this change in procedure.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents*
and Trademarks.

[1027 OG 71]

(102) **Expedited Procedure for Processing Amendments and Other Responses After Final Rejection (37 CFR 1.116)**

In an effort to improve the timeliness of the processing of amendments and other responses under 37 CFR 1.116, and thereby provide better service to the public, the Patent and Trademark Office (PTO) is establishing, effective immediately, an expedited processing procedure which the public may utilize in filing amendments and other responses after final rejection under 37 CFR 1.116. In order for an applicant to take advantage of the expedited procedure the amendment or other response under 37 CFR 1.116 will have to be marked as a "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)" on the upper right portion of the amendment or other response and the envelope must be marked "Box AF" in the lower left hand corner. The markings preferably should be written in a bright color with a felt point marker. If the response is mailed to the Office, the envelope should contain only responses under 37 CFR 1.116 and should be mailed to "Box AF, Commissioner of Patents and Trademarks, Washington, D.C. 20231." Instead of mailing the envelope to "Box AF" as noted above, the response may be hand-carried to the particular Examining Group or other area of the Office in which the application is pending and marked on the outside envelope "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)".

Upon receipt by the PTO from the Postal Service of an envelope appropriately marked "Box AF," the envelope will be specially processed by the PTO Mail Room and forwarded promptly to the Examining Group, via the Office of Finance if any fees have to be charged or otherwise processed. Upon receipt of the response in the Examining Group it will be promptly processed by a designated clerical employee and forwarded to the examiner, via the Supervisory Primary Examiner (SPE), for action. The SPE is responsible for ensuring that prompt action on the response is taken by the examiner. If the examiner to which the application is assigned is not available and will not be available for an extended period, the SPE will ensure that action on the application is promptly taken to assure meeting the PTO goal described below. Once the examiner has completed his or her consideration of the response, the examiner's action will be promptly typed and mailed by clerical employees designated to expedite the processing of responses filed under this procedure. The Examining Group supervisory personnel, e.g., the Supervisory Primary Examiners, Supervisory Applications Clerk, and Group Director are responsible for ensuring that actions on responses filed under this procedure are promptly processed and mailed.

The PTO goal is to mail the examiner's action on the response within one month from the date on which the amendment or response is received by the PTO. The PTO is establishing monitoring procedures to determine how well the goal is being achieved. If the goal of mailing the action on the response within one month or less is not achieved in a high percentage of applications, e.g., at least 90–95% of appropriately marked responses, after a reasonable trial period, the PTO will institute further changes in procedures in the future which will give appropriate relief to applicants in cases where the delay is due to Office processing.

Applicants are encouraged to utilize this expedited procedure in order to facilitate PTO processing of responses under 37 CFR 1.116. If applicants do not utilize the procedure by appropriately marking the envelope and enclosed papers, the benefits expected to be achieved therefrom will not be attained. The procedure cannot be expected to result in achievement of the goal in applications in which the delay results from actions by the applicant, e.g., delayed interviews, applicant's desire to file a further response, or a petition by applicant which requires a decision and delays action on the response. In any application in which a response under this procedure has been filed and no action by the examiner has been received within the time referred to herein, plus normal mailing time, a telephone call to the SPE of the relevant Group Art Unit would be appropriate in order to permit the SPE to determine the cause for any delay. If the SPE is unavailable or if no satisfactory response is received, the Group Director of the Examining Group should be contacted.

Any comments on this expedited procedure during the trial period are invited and should be directed to the attention of Rene D. Tegtmeyer, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231.

DONALD J. QUIGG,
Sept. 20, 1985. *Commissioner of Patents and*
Trademarks — Designate.

[1059 OG 19]

(103) **New Procedures for Recordation of Interviews**

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the Official Gazette of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in section 713.04 of the Manual of Patent Examining Procedure

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(MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

—Serial Number of the application
—Name of applicant
—Name of examiner
—Date of interview
—Type of interview (personal or telephone)
—Name of participant(s) (applicant, attorney or agent, etc.)
—An indication whether or not an exhibit was shown or a demonstration conducted
—An identification of the claims discussed
—An identification of the specific prior art discussed
—An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
—The signature of the examiner who conducted the interview
—Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 21]

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(104) **Viewing of Video Tapes During Interviews**

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (½ inch tape) cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment should be done through and by the examiner conducting the interview.

RENE D. TEGTMEYER,
May 6, 1986. *Assistant Commissioner for Patents.*

[1067 OG 4]

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(105) **Statements Filed Under Atomic Energy Act And NASA Act**

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an applicaton which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have firsthand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Aug. 13, 1973. *Deputy Assistant Commissioner for Patents.*

[914 O.G. 2]

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(106) **NOTICE OF CHANGES IN THE ADMINISTRATION OF 42 U.S.C. 2182 AND 2457 (PROPERTY RIGHTS STATEMENTS TO DOE AND NASA).**

Effective Nov. 1, 1986, the PTO will change the procedures under which property rights statements to the Department of Energy (DOE), 42 U.S.C. 2182, or National Aeronautics and Space Administration (NASA), 42 U.S.C. 2457 are requested and processed. These statements are required before a patent can issue on any invention useful in the production or utilization of special nuclear material or atomic energy (for the Department of Energy) or having significant utility in the conduct of aeronautical and space activities (for the National Aeronautics and Space Administration).

Currently, the PTO waits until after an application is otherwise in condition for allowance before property rights statements are requested. Under the new procedure, if a statement is necessary, an informal request for the statement will be issued shortly after filing. The request will identify which chapter(s) of the statute apply and an informal period of 45 days will begin running from the mail date of the notice.

If no response is received within 45 days, a formal notice will be issued. The statutory period for response to the formal notice is 30 days. There is no provision for extension of this time limit, and the penalty for failure to file an acceptable, timely statement is abandonment. In view of these strict time limits and penalties, applicants are strongly urged to take advantage of the period for informal correspondence by responding to the so-called 45-Day Letter. Additionally, the new 45-Day Letter will provide extensive information on the format and content of an acceptable statement. This should relieve many of the difficulties applicants currently experience in generating the statement. See also 914 OG. 2 for additional information on the form and content of property rights statements.

The statement should be an accurate reflection of the ownership of the invention on which patent protection is granted. Thus, if during prosecution before the examiner the claimed invention is so changed or the property rights situation so altered as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. In those rare situations where property rights may be changed by an amendment to the claims after the statement has been filed, applicants are reminded that failure to submit such additional information where appropriate may be considered a false representation of material facts and render the patent owner vulnerable to sanctions as set forth in the above statutes. The PTO will not review applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

The text of the new 45-Day Letter is reproduced below.

* * * * *

The subject matter of this application appears to:

— be "useful in the production or utilization of special nuclear material or atomic energy " as recited in 42 U.S.C. 2181 (Department of Energy (DOE)).

— have significant utility in the conduct of aeronautical and space activities as recited in 42 U.S.C. 2457 (National Aeronautics and Space Administration (NASA)).

Accordingly, no patent can issue on this application unless applicant(s) file a statement (under oath or in the form of a declaration as provided by 37 CFR 1.68) setting forth (1) the full facts concerning the circumstances under which the invention was made and conceived and (2) the relationship (if any) of the invention to the performance of any work under any contract or other arrangement with the Agency(ies) noted above. On the reverse side of this form is an example of an acceptable format for this statement. The language appearing in paragraphs III and/or IV of the example *must* appear if applicant is attempting to establish that no relationship (under item 2 above) exists.

If the invention disclosed in this application was developed under a contract, grant or cooperative agreement between the Agency(ies) indicated above and a person, small business or nonprofit organization and rights to the invention have been determined by specific reference to 35 U.S.C. 202 in the contract, grant or cooperative agreement, then applicant need not submit the statement described above. Instead, applicant may file a verified statement (under oath or in the form of a declaration, 37 CFR 1.68) setting forth the information required by 35 U.S.C. 202(c)(6).

IF NO STATEMENT HAS BEEN RECEIVED WITHIN FORTY-FIVE DAYS OF THE MAIL DATE INDICATED ABOVE, a formal requirement for statement will then be issued. No provision is made for extension of the statutory thirty-day period for response to the formal requirement and the penalty for failure to file an acceptable and timely statement is abandonment of the application. Therefore, applicants are strongly encouraged to submit a statement at this time in order to avoid the issuance of a formal requirement.

IT IS IMPORTANT TO NOTE that the statement must accurately represent the property rights situation of the claimed invention if and when the application is found allowable. Thus, if during prosecution before the examiner, the claimed invention is so altered or the property rights situation so changed as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. Failure to submit such additional information where appropriate may be considered as false representation of material facts and render the patent owner vulnerable to loss of patent rights and other sanctions as set forth in the statutes. The PTO will not review allowed applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

Any questions regarding this requirement should be directed to Licensing and Review at (703) 557–4948.

* * * * *

The following is an example of an acceptable property rights statement. Statements of this type are, of course, only suitable for situations in which *NO* Agency funds or other considerations were involved in the making or conception of the invention. While this example is in the form of a declaration, a sworn document is equally acceptable.

* * * * *

I (We)_____,
citizens of _____residing at _____,
declare:

That I (we) made and conceived the invention described and claimed in patent application Serial Number _____filed in the United States of America on _____, titled _____

_____.

(Check and complete either I. or II. below)

____I. (For Inventors Employed by an Organization)

That I (we made and conceived this invention while employed by _____

That the invention is related to the work I am (we are) employed to perform and was made within the scope of my (our) employment duties;

That the invention was made during working hours and with the use of facilities, equipment, materials, funds, information and services of ____(name of employer)____.
Other relevant facts are _____

That to the best of my (our) knowledge and belief (and/or based upon information provided by _____

of _____):

—OR—

____II. (For Self-Employed Inventors)

that I (we) made and conceived this invention on my (our) own time using only my (our) own facilities, equipment, materials, funds, information and services. Other relevant facts are _____

That to the best of my (our) knowledge and belief:

(Check III and/or IV below as appropriate)

____III. The invention was not made or conceived in the course of, or in connection with, or under the terms of any contract, subcontract or arrangement entered into with or for the benefit of the United States Atomic Energy Commission or its successors: Energy Research and Development Administration or the Department of Energy.

—AND/OR—

____IV. The invention was not made (conceived or first actually reduced to practice) under nor is there any relationship of the invention to the performance of any work under any contract of the National Aeronautics and Space Administration.

The undersigned inventor(s) declare further that all statements made herein of his or her (their) own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor's Signature:
Post Office Address:
Date:

Inventor's Signature:
Post Office Address:
Date:

* * * * *

Information regarding these changes in the processing of property rights statements may be obtained by calling or writing Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231 (703–557–2877).

DONALD J. QUIGG,
Sept. 16, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1071 OG 14]

(107) **Extension of Time Limit**

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(c), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Nov. 28, 1977. *Deputy Assistant Commissioner for Patents.*

[965 O.G. 14]

(108) **TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS**

Chapter 1—Patent and Trademark Office, Department of Commerce

Part 1—Rules of Practice in Patent Cases

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to §1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to §1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office Official Gazette in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

Purpose of Rules

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

Reissue Applications

Amended §1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed within §1.175(a) (1) unless the applicant believes that to be the case. Section 1.175(a) (4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

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Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended §1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for §1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new §1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended §1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the *Official Gazette*. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the *Official Gazette*. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, §1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the *Official Gazette* announcement of filing.

A substantial majority of the comments received favored adoption of §1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of §1.11(b) is for clarity. The word "furnished" is changed to "obtained" in §1.11 for clarity.

Protests and Public Use Proceedings

Amended §§1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new §1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to submit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of §1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of §1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond §1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§1.291(c) and 1.292(b) for clarity.

In §1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

Duty of Disclosure

Amended §1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored §1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of §1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of §1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of §1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in §1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of §1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in §1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed§1.56. The court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making."[6]

Although the third sentence of §1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of §1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of §1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of §1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New §1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in §1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus §1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from §1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing §1.56 to encompass conduct of this sort.[8] Moreover, §1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In §1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negli-

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[1]See *In re Clark*, F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).
[2]See it *In re Oda*. 443 F.2d 1200, 170 USPQ 268 (CCPA 1971).

[3]*International Paper Co.* v. *Fibreboard Corp., 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).*
[4]*923 O.G. 2; 930 O.G. 1454; 938 O.G. 945*

[5]U.S.—, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

[6]U.S. at—, 48 L. Ed. 2d at 763, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.
[7]See discussion accompanying proposed rules in Federal Register of Oct. 6, 1978, page 43731, first sentence.
[8]*Norton* v. *curtiss*, 433 F.2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

gence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with §1.56. Similar comments were directed to §§1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under §1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In §1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in §1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended §1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of §1.65 to avoid confusion with the prior art statement of §1.97 through 1.99.

Amended §1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although §1.346 is limited to papers filed in Office proceedings, the amendment to §1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under§1.348 for a groundless allegation of improper conduct in a court proceeding.

Prior Art Statement

New §§1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in §1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in §1.56. The only criterion contained in §§1.97 through 1.99 as to content of the art cited is in §1.97(b). This subsection indicates that the statement will be construed as a representation that the prior are listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not representation that a search has been made or that no better art exists.

In §1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of §1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974[10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§1.97 through 1.99. In order to allow applicants, attorney and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expresaly set forth in §1.56, applicants will perceive that it is to their advantage to use the procedures of §§1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as §1.51(a) and adding new §1.51(b) which contains a reference to §§1.97 through 1.99.

[9]E.g., Federal Register of Sept. 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, §131(b).
[10]Notice of Aug. 12, 1974, 926 O.G. 2.
[11]BNA's Patent, Trademark and Copyright Journal, No. 301, Oct. 28, 1976, page D-1.

Foreign Language Oaths

Amended §1.52 and new §1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the *Official Gazette* at a later date.

The change in §1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of §1.69.

Although very few persons opposed §§1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure. §608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filling an English translation of an oath or declaration filed under §1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

Decisions and Files Made Public

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act[12] required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation[13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended §1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under §1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended §1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

Patent Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral argu-

[12]USC 552.
[13]*Irons* v. *Gottschalk*, Slip Opinion, No. 74–1365 (D.C. Cir., Oct. 21, 1976).

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ments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that §1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearing is held.

In appeals where the appellant has requested an oral hearing §1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing §1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, §1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed §1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing §1.196(b) will not be modified, but a new §1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new §1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

Reasons for Allowance

New §1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive: when an examiner allows a claim on the first Office action after citing very close prior art: and when the examiner allows a claim after remand from the Board of Appeals (see new §1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal. [Text of adopted rules appears in 37 CFR, revised 7–1–77]

Effective Date. These amendments become effective on March 1, 1977, except for §§1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§1.65 and 1.69 which become effective on January 1, 1978.

C. MARSHALL DANN,
Jan. 18, 1977. *Commissioner of Patents and Trademarks.*

Betsy Ancker-Johnson, Ph.D.
Jan. 19, 1977. *Assistant Secretary for Science and Technology.*

[955 O.G. 1054]

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(109) **Guidelines for Implementation of Recently Revised Rules**

Recently a number of rules relating to Patent Examining and Appeal procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the *Official Gazette* at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97–1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(Note.—These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the *Official Gazette* and will include certain identifying data as specified in section 1.11(b). Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.
2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 19, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closest prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filling of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmit an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

[14] Mar. 20, 1975, 933 O.G. 1010.
[15] MPEP, §1209.
[16] See notice of Mar. 20, 1975, 933 O.G. 1010.

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After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL–327), an examiner's amendment (PTOL–37), or a Notice of Allowance (PTOL–85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(*b*) A timely affidavit under 37 CFR 1.131 with respect to the material cited; or
(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following:

> If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL–327) or Examiner's Amendment (PTOL–37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals.

Under Section 1.194, the following procedures will be in effect:

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.
2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.
3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.
4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.
5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a desire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed:

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided. In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.
2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.
3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.
4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowingly be ignored. If protests are not timely submitted or if they fail to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO–892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

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(110) **Further Guidelines Relating to 37 CFR 1.175 and 1.291, as Amended Effective March 1, 1977**

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented. The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two *Official Gazette* publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22–32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401–1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred." This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificity about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)–(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97–1.99 to comply with the duty of disclosure required by Sec-

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tion 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be availale to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)

The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401–1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and subsections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments*, If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

The Filing of Protests Under 37 CFR 1.291

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Offical Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest

can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

The Examiner's Consideration of Protests

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO—892. If the examiner does not cite all of the prior art or other documents of form PTO–892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO–892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on . . . . and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by . . . ."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of the Office.

If the protestor has access to the application, the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

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> "The protest, as filed _____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made within ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

Nov. 13, 1978. DONALD W. BANNER, *Commissioner of Patents & Trademarks.*

[977 O.G. 11]

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(111) Expedited Processing of Reissue Applications and Applications Having Issues of Fraud or Failure to Comply With The Duty of Disclosure

The Patent and Trademark Office has been experiencing increasing delays in the examination of reissue applications and other applications in which charges or questions of fraud or failure to comply with the duty of disclosure have been raised or are apparent on the record. Consideration of these charges involves considerable expenditures of resources and time. They also tend to delay prompt consideration on the merits in view of the prior art, etc. Considerable duplication of effort and expenditures of resources and time also may occur when the Office considers applications in circumstances where the same issues are concurrently being considered in Court.

Deferral of Fraud Issues

Effective immediately, the Office is instituting a policy of delaying consideration of issues of fraud or failure to comply with the duty of disclosure in any application until all other issues are settled.

Accordingly, under this procedure, applications having issues of fraud or failure to comply with the duty of disclosure will continue to be referred to the Office of the Assistant Commissioner for Patents, but will then be promptly returned, along with any appropriate examining instructions, to the Director of the Examining Group for immediate action by the Examiner. Decisions on Petitions to Strike applications pursuant to 37 CFR 1.56(d) will be deferred pending resolution of the patentability issues before the Examiner. Any such Petitions to Strike filed after the Office of the Assistant Commissioner has initially reviewed the application and returned it for immediate action will be acknowledged by the Examining Group Director and action on the Petition will be deferred pending completion of the patentability issues before the Examiner. Examiners will note in their Office actions the existence of issues of fraud or failure to comply with the duty of disclosure without commenting on the substance of such issues and will indicate that the issues will be considered after all other matters have been disposed of. Matters other than fraud or failure to comply with the duty of disclosure raised in a Petition to Strike, e.g., patentability in light of a reference, will be treated by the Examiner or other appropriate official. Petitions relating to procedural matters involving the examination of the applications, e.g., requests for protestor participation in interviews, will be decided by the appropriate Examining Group Director. Applications which have been referred to the Office of the Assistant Commissioner and which are required to be returned thereto before allowance or after abandonment of the application will have a notation placed on the face of the application file by the Office of the Assistant Commissioner requiring such return.

Suspension of Action Where There is Concurrent Litigation

In order to avoid duplication of effort, actions in applications in which there is an indication of concurrent litigation will be suspended automatically unless and until it is evident to the examiner, or the applicant indicates, that: (1) a stay of the litigation is in effect; (2) the litigation has been terminated; (3) there are no significant overlapping issues between the application and the litigation; or (4) it is applicant's desire that the application be examined at that time.

Expedited Examination of Reissues

All reissue applications, except those under suspension because of litigation, will be taken up for action ahead of other "special" applications; this means that all issues not deferred will be treated and responded to *immediately.* Furthermore, reissue applications involved in "stayed litigation" will be taken up for action in advance of other reissue applications.

Insofar as reissue applications for patents in litigation are concerned, the Office is presently considering modifications to the rules to provide for their examination within the two-month waiting period now provided by Section 1.176. Until appropriate modifications are made to the rules, the Office will entertain petitions under 37 CFR 1.183 to waive the delay period of 37 CFR 1.176. In addition, the Office is presently considering requiring the prompt disclosure of the existence of litigation related to a pending application.

Time monitoring systems are being put into effect which will closely monitor the time used by applicants, protestors, and examiners in processing reissue applications of patents involved in litigation in which the court has stayed further action.

Applicants in reissue applications involved in litigation which has been stayed, dismissed, etc. for consideration by the Patent and Trademark Office will normally be given one month to respond to Office actions in those situations where the Office determines that the reissue applicant can readily prepare a response in such time. This one month period may be extended upon a showing of clear justification. Of course, up to three months may be set for response if the Examiner determines such a period is justified.

Applicants and protestors submitting papers for entry in reissue applications of patents involved in litigation are requested to mark the outside envelope and the top right hand portion of the paper with the words *"REISSUE LITIGATION"* and with the unit of the PTO in which the reissue application is located—e.g., Assistant Commissioner for Patents, Board of Appeals or Examining Group. The notations preferably should be written in a bright color with a felt point marker. Papers marked *"REISSUE LITIGATION"* will be given special attention. Also, the PTO will place a prominent notation on the application file to indicate the existence of litigation.

The purpose of these changes is to reduce the time between filing and final action insofar as possible while still giving all parties sufficient time to be heard. This notice is supplemental to, and in some respects modifies, the earlier published notices on this subject and particularly the notice published at 977 O.G. 11 on December 12, 1978.

June 5, 1979. DONALD W. BANNER, *Commissioner of Patents and Trademarks.*

[983 O.G. 24]

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(112) Prior Art Cited by Patent Offices in Other Countries

Section 1.56 of Title 37 of the Code of Federal Regulations requires patent applicants and others associated with the prosecution of a patent application before the U.S. Patent and Trademark Office to call to the Office's attention information which is material to examination. Where related or corresponding patent applications have been filed in other countries, prior art may be cited by the Patent Offices of those other countries in connection with the examination of the applications filed there. Where prior art is cited by those other Patent Offices while the U.S. application is pending, citations which are material to examination in this country and known to any of the individuals covered by Section 1.56 must be called to the attention of this Office. Attorneys and agents are reminded of their obligations in this respect.

It is suggested, of course, that such prior art be cited to the U.S. Patent and Trademark Office in a prior art statement which complies with the provisions of Section 1.97–1.99 of 37 CFR.

Apr. 23, 1979. DONALD W. BANNER, *Commissioner of Patents and Trademarks.*

[982 O.G. 36]

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(113) Documents Cited in PCT International Search Report

This notice is intended to clarify which documents listed on an international search report prepared under the Patent Cooperation Treaty (PCT) should during the national stage before the Patent and Trademark Office (PTO):

(1) be listed and copies thereof submitted by the applicant to the PTO in an information disclosure statement filed under 37 CFR §§1.97–1.99,

(2) be supplied to the applicant with an Office action, and

(3) be listed by the examiner for printing on the front page of any resulting patent.

If the United States is designated in an international (PCT) application a copy of the search report will be mailed to the United States as a Designated Office by the International Bureau about 19 months after the priority date. This search report, without copies of the ci-

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ted documents is placed in the national stage application file.

Accordingly, examiners in the PTO who are examining a national stage application will have a copy of the listing of documents cited in the International Search Report but they may not have copies of the documents cited therein and/or they may not have any available English translations of the cited documents. While the PTO is presently receiving copies of documents cited in PCT search reports of the European Patent Office and the Japanese Patent Office in a temporary trial program, the program may be discontinued at any time and applicants cannot rely upon this program to provide the examiner with copies of references or with any available English translation.

Citation of International Search Report Documents in Information Disclosure Statements

Applicants and/or applicant's attorney in PCT national stage applications, to ensure compliance with 37 CFR 1.56, should cite and supply copies of the documents cited in the PCT International Search Report which are "material" as defined in 37 CFR 1.56, preferably by an information disclosure statement under 37 CFR §§1.97–1.99.

A primary concern of the Patent and Trademark Office and the applicant should be that prior art cited in the PCT International Search Report which is material to the examination of the United States national stage application be fully considered during the examination of the United States national stage application. The best manner of ensuring such consideration is through a cooperative effort by all of the persons involved in the prosecution and examination of the United States national stage application. The applicant and his or her foreign patent attorney or agent obviously have access to, and presumably consider, the citations in the PCT International Search Report. With rare exceptions, the International Search Reort is prepared prior to the time at which applicant enters the United States national stage under 35 U.S.C. 371. Thus, applicant and his or her foreign attorney or agent are in a position to have reviewed the citations in the PCT International Search Report and call the attention of the United States patent attorney to those documents which are material. Under present case law, e.g., *Gemveto Jewelry Company, Inc.* v. *Lambert Bros., Inc.*, 216 U.S.P.Q. 976 (S.D. N.Y. 1982), foreign patent attorneys representing applicants for U.S. patents through United States correspondent patent attorneys are held to the same standards of conduct which apply to their United States counterparts. Since foreign applicants and their foreign patent attorneys have presumably considered the citations in the PCT International Search Report, and are under a duty to disclose the material citations contained therein, the preferred practice is to have this disclosure made via an information disclosure statement under 37 CFR §§1.97–1.99.

This will ensure that material citations contained in the PCT International Search Reort are considered by the examiner during the exmination of the United States national stage application. To the extent that the examiner does review the citations without an information disclosure statement having been submitted, the foreign applicant will obviously benefit therefrom. However, the foreign applicant and applicant's attorney cannot rely upon such a review by the examiner being conducted so as to relieve them of their dury to adequately disclose material prior art.

Copies of Documents Supplied With Office Actions

Copies of documents cited by the examiner in U.S. national stage applications will be provided as set forth in Section 707.05(a) of the MPEP. That is, copies of documents cited by the examiner will be provided to applicant except where the documents:

(1) are cited at allowance
(2) have been referred to in applicant's disclosure statement, and
(3) where the documents are cited and have been provided to applicant by the PTO in a parent national or international application.

Listing of Documents Cited in PCT International Search Reports by Examiners for Printing on Patents

The examiner should review all copies of documents cited in the International Search Report and should cite those documents which are material to the subject matter claimed in the national stage application. In those instances where documents are cited in the PCT search report but neither a copy of the documents nor an English translation (or English family member) is provided, the examiner may exercise discretion in deciding whether to take the necessary steps to obtain the copy and/or translation.

Where an information disclosure statement has been filed and copies have been submitted in conformance with 37 CFR 1.98 and section 609 of the Manual of Patent Examining Procedure (MPEP), the examiner must list all citations on form PTO–892 as part of the next regular Office action following receipt thereof unless such citations are listed by applicant on form PTO–1449.

Insofar as the citation by the examiner in an Office action of all of the documents cited in a PCT International Search Report is concerned where 37 CFR 1.98 has not been followed, it is not seen to be appropriate for the examiner to automatically cite, in the national stage application, each document listed in the PCT international search report. It has been the experience of the PTO that many documents listed on the PCT international search report are not relevant to the claims in the U.S. national stage application or that an English language equivalent document is used by the examiner.

May 23, 1986. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1067 OG 32]

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(114) **Extensions of Time in Reexamination Proceedings**

This notice is intended to clarify extension of time practice as it relates to reexamination proceedings, and supplement the provisions of Section 2265 of the Manual of Patent Examining Procedure (MPEP).

The provisions of 37 CFR 1.136(a) and (b) are *NOT* applicable to reexamination proceedings under any circumstances. Public Law 97–247 amended 35 U.S.C. 41 to authorize the Commissioner to charge fees for extensions of time to take action in an "application". A reexamination proceeding does not involve an "application". 37 CFR 1.136 authorizes extensions of the time period only in an application in which an applicant must respond or take action. There is neither an "application", nor an "applicant" involved in a reexamination proceeding.

Requests for an extension of time to file a patent owner's statement under 37 CFR 1.530 or respond to any Office action in a reexamination proceeding must be filed under 37 CFR 1.550(c). These requests for an extension of time will be granted only for sufficient cause and must be filed on or before the day on which action by the patent owner is due. In no case will mere filing of a request for extension of time automatically effect any extension. Although the appeal provisions of 37 CFR 1.192(a), 1.197(b), and 1.304(a) set time periods applicable to reexamination as well as application proceedings, they also include a further proviso making these time periods subject to the extension provisions of 37 CFR 1.136. However, for the reasons set forth above, the extension provisions of 37 CFR 1.136 are limited to application proceedings and do not apply to reexamination proceedings. Therefore, any request for an extension of time in a reexamination proceeding to file a brief or reply brief, a request for reconsideration or rehearing, or a notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, will be considered under the provisions of 37 CFR 1.550(c). The regulations setting a time period in which any of these actions must be taken set a time for reply within the meaning of 37 CFR 1.550(b), which time can be extended under 37 CFR 1.550(c).

The extension-of-time practice in reexamination proceedings in which a final Office action has been mailed continues to be reflected in MPEP Section 2265. That is, the after-final practice in reexamination proceedings did not change Oct. 1, 1982, and the automatic extension of time policy for response to a final rejection and associated practice are still in effect in reexamination proceedings.

Extensions of time for a requester of a reexamination, who is not the patent owner, are available only in rare circumstances. A request for an extension of the time period to file a petition from the denial of a request for reexamination can only be entertained by filing a petition under 37 CFR 1.183 with appropriate fee to waive the time provisions of 37 CFR 1.515(c). No extensions will be permitted to the two-month time for filing a reply by the requester under 37 CFR 1.535. This two-month period is set by statute (35 U.S.C. 304) and cannot be extended.

Feb. 17, 1983. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1028 OG 18]

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(115) **Loss of Patent Rights Due to Failure to Timely Respond During Reexamination**

This notice is intended to remind patent owners and patent practitioners that patent rights can be, and have been, lost as a result of the failure to timely respond to an Office action, or meet a time deadline, in a reexamination proceeding. Failure to timely respond, meet a time deadline, or timely request an extension of time results in termination of a reexamination proceeding under 37 CFR 1.550(d) and issuance of a reexamination certificate under 37 CFR 1.570 in accordance with the last action of the Office. Neither the statute nor the rules provide for reviving the terminated proceeding. A certificate must issue.

Practitioners are reminded that requests for an extension of time in a reexamination proceeding must be filed under 37 CFR 1.550(c) with an appropriate justification and not by payment of an extension of time fee under 37 CFR 1.136(a). Further, such requests must be filed on or before the day on which the response is due.

The statute requires that reexamination be conducted with special dispatch. Accordingly, such proceedings are treated "special" throughout the PTO including the setting of two month shortened statutory periods for response to Office actions wherein extensions of time are controlled by the Office under §1.550(c) and not by the patent owner under §1.136(a). Further, special monitoring of reexamination is regularly conducted *throughout* the Office to insure timeliness. Applications are separately tracked and monitored in the PTO's PALM (Patent Application Locating and Monitoring) system. Particularly attention is given to newly filed requests to insure that the determination on whether or not to order reexamination is mailed within the three month statutory deadline. The reexamination file wrapper is quickly compiled and forwarded to the examining group within one month of the filing of the request for reexamination by a special Reexamination Preprocessing Unit located in the Application Branch. For ease of identification, reexamination files have a special and unique "control number" identification numbering system separate and apart from the regular "serial number" series used for regular patent applications. The reexamination files are bright orange in color to insure that they are not "lost in the crowd" of regular application files. The reexamination files are stored together in each examining group separate and apart from regular applications. A special printing cycle for accelerated publication of the reexamination certificate is utilized.

It has become apparent that many practitioners have not read the rules or if they have read the rules they have been unwilling to appreciate the significance of the special dispatch requirement of the statute and the intent of the regulations implementing that special dispatch. As noted above, appropriate rules have been drafted and extraordinary steps have been taken within the PTO to implement the special dispatch requirement. In contrast, as evidenced by recent petitions in reexamination proceedings, it appears that some practitioners have not adopted appropriate and necessary special docketing and operating procedures to insure proper and timely compliance with the special dispatch requirement and the regulations adopted for its implementation. It is expected that practitioners will take the steps necessary to provide appropriate in-house special docketing and operating procedures which earmark reexamination cases as different and apart from regular applications. These steps should be taken to insure timely response in reexamination proceedings and to prevent the loss of patent rights. The existence or non-existence of such steps and the manner in which any steps are implemented will be a significant consideration in reviewing any petition requesting a waiver of the rules to accept a late response in a reexamination proceeding.

The public is hereby put on notice that the rules relating to timely response and extension of time practice in reexamination proceedings will be *strictly enforced* in the future.

July 10, 1987 DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

[1081 OG 5]

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(116) **Clarification of Reexamination Practice and Change in Reexamination Certificate Wording**

I. *Clarification of Reexamination Practice.*
This notice is intended to clarify the options open to the patent owner *in a reexamination proceeding* when an allowable dependent claim depends from a rejected or cancelled *patent* claim.

A. *Leave dependent claim in dependent form.*
It is unnecessary in a reexamination proceeding to rewrite an allowable dependent patent claim in independent form when the dependent patent claim depends from a rejected or cancelled *patent* claim. The allowable dependent patent claim may remain in the printed format as it appears in the patent even though the patent claim upon which it is dependent is cancelled. Since the original patent claim numbers are not changed in a reexamination proceeding the content of the cancelled base patent claim would remain in the printed patent and would be available to be read as a part of the allowed dependent patent claim.
If a new claim (a claim other than a claim appearing in the patent) has been later cancelled, a claim which depends thereon will be rejected as incomplete and must be rewritten. New claims which depend from a rejected or cancelled patent claim do not have to be rewritten.
If the patent owner elects to leave a dependent claim (original or new) in dependent form when the independent patent claim is rejected or cancelled, the reexamination certificate would indicate (1) that the patentability of an allowed unamended dependent patent claim "is confirmed" or (2) that a new dependent claim is "determined to be patentable". The independent patent claim (cancelled or rejected at the time of the issuance of the reexamination certificate) would be indicated as "cancelled". Note that if the dependent patent claim which is left in dependent form is amended (e.g., correction of a misspelled word) the certificate would indicate the claim "to be patentable as amended". The independent patent claim is considered to be incorporated by reference in

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the dependent claim even though the independent claim is cancelled from the patent by the certificate.

B. *Combine claims into independent claim.*

It is also permissible for the patent owner to amend either the dependent or independent patent claim to incorporate the subject matter of the other. If the patent owner elects to rewrite one of the dependent or independent claims to include the subject matter of the other and cancel the other claim, the rewritten claim would be indicated on the certificate as being "patentable as amended". The other claim which was cancelled would be indicated on the certificate as "cancelled".

C. *Present new claim and cancel patent claims.*

It is also permissible for the patent owner to present a new claim incorporating the subject matter of the independent and dependent patent claims and cancel the independent and dependent patent claims. In this case the certificate would indicate "new claim ___ is added and determined to be patentable". The cancelled independent and dependent patent claims would be indicated as "cancelled".

NOTE: This Practice Applies Only to Reexamination and Does Not Change Current Practice Relating to Original and Reissue Applications

II. *Change in Reexamination Certificate Wording.*

The Office is also modifying the language of reexamination certificates directed to claims that are cancelled (for any reason) by dropping the language "having been finally determined to be unpatentable" since the existing language may not be accurate in all cases and since the patent and reexamination files are open to the public and the record speaks for itself. The certificate will merely state such a claim "is cancelled". This change will be effective with the July 17, 1984, Official Gazette issue.

DONALD J. QUIGG,
June 14, 1984. *Deputy Commissioner of Patent and Trademarks.*

[1044 O.G. 11]

(117) **Priority Claims Based on Inventors Certificates**

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, application for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 14]

(118) **Requirements for Priority Documents, Priority Based on Application for Industrial Design**

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

C. MARSHALL DANN,
Aug. 15, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 14]

(119) **Right of Priority (35 U.S.C. 119) Based on a Foreign Application Filed Under a Bilateral or Multilateral Treaty**

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

C. MARSHALL DANN,
Aug. 9, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 2]

(120) **Using Certificate of Correction to Perfect Claim for Priority Under 35 USC 119**

Under 35 USC 119, an applicant may assert a right of priority and claim the benefit of an earlier filing date in a foreign country. In this regard, 35 USC 119 states:

> No application for patent shall be entitled to this right or priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent and Trademark Office before the patent is granted. . . .

The failure to perfect a claim to foreign priority benefits prior to issuance of the patent may be cured by filing a reissue application; *Brenner* v. *State of Israel*, 158 USPQ 584 (CA DC 1968).

However, under certain conditions, this failure may also be cured by filing a Certificate of Correction request under 35 USC 255 and 37 CFR 1.323. For example, in the case of *In re Van Esdonk*, 187 USPQ 671 (Comr. 1975), the Commissioner granted a request to issue a Certificate of Correction in order to perfect a claim to foreign priority benefits. In that case, a claim to foreign priority benefits had not been filed in the application prior to issuance of the patent. However, the application was a continuation of an earlier application in which the requirements of 35 USC 119 had been satisfied. Accordingly, the Commissioner held that the "applicants' perfection of a priority claim under 35 USC 119 in the parent application will satisfy the statute with respect to their continuation application."

Although *In re Van Esdonk* involved the patent of a continuation application filed under 37 CFR 1.60, it is proper to apply the holding of that case in similar factual circumstances to any patented application having benefits under 35 USC 120. This is primarily because a claim to foreign priority benefits in a continuing application, where the claim has been perfected in the parent application, constitutes in essence a mere affirmation of the applicant's previously expressed desire to receive benefits under 35 USC 119 for subject matter common to the foreign, parent, and continuing applications.

In summary, a Certificate of Correction under 35 USC 255 and 37 CFR 1.323 may be requested and issued in order to perfect a claim to foreign priority benefits in a patented continuing application if the requirements of 35 USC 119 had been satisfied in the parent application prior to issuance of the patent and the requirements of 37 CFR 1.55(a) are met.

However, a claim to foreign priority benefits cannot be perfected via a Certificate of Correction if the requirements of 35 USC 119 had not been satisfied in the patented application, or its parent, prior to issuance and the requirements 37 CFR 155(a) are not met. In this latter circumstance, the claim to foreign priority benefits can be perfected only by way of a reissue application in accordance with the rationale set forth in *Brenner* v. *State of Israel, supra.*

RENE D. TEGTMEYER,
July 25, 1986. *Assistant Commissioner for Patents.*

[1069 OG 38]

(121) **Abstract of the Disclosure**

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster*, 512 F2d 676, 185 USPQ 152 (CCPA 1975). However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

WILLIAM FELDMAN,
Dec. 30, 1977. *Deputy Assistant Commissioner for Patents.*

[967 O.G. 2]

(122) **Supplemental Guidelines for The Implementation of 37 CFR 1.109—Reasons for Allowance**

A recent review of recorded statements of reasons for allowance indicates the need for a better understanding regarding implementation of new Rule 109 (37 CFR 1.109).

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These guidelines are supplemental to those published in the **Official Gazette** at 957 O.G. 11 on April 12, 1977 and amplified in Section 1302.14 MPEP, Rev. 52, April 1977.

In determining whether reasons for allowance should be recorded the primary consideration lies in the first sentence of the Rule.

> "If the examiner believes that the record of the prosecution *as a whole* does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning." (Emphasis added.)

In most cases the examiner's actions and the applicant's response make evident the reasons for allowance, satisfying the "record as a whole" proviso of the rule. This is particularly true when applicant fully complies with 37 CFR 1.111(b) and (c), 37 CFR 1.119 and 37 CFR 1.133(b). Thus where the examiner's actions clearly point out the reasons for rejection and the applicant's response explicitly represents reasons why claims are patentable over the reference, the reasons for allowance are in all probability evident from the record and no statement should be necessary. Conversely, where the record is not explicit as to reasons, but allowance is in order, then a logical extension of 37 CFR 1.111, 1.119 and 1.133 would dictate that the examiner should make reasons of record and such reasons should be specific.

Where specific reasons are recorded by the examiner, care must be taken to insure that such reasons are accurate, precise and do not place unwarranted interpretations, whether broad or narrow, upon the claims. The examiner should keep in mind the possible misinterpretations of his statement that may be made and its possible estoppel effects. Each statement should include at least: (1) the major difference in the claims not found in the prior art of record, and (2) the reasons why that difference is considered to define patentably over the prior art if either of these reasons for allowance is not clear in the record. The statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth.

Under the rule, the examiner must make a judgement of the individual record to determine whether or not reasons for allowance should be set out in that record. These guidelines, then, are intended to aid the examiner in making that judgement. They comprise illustrative examples as to applicability and appropriate content. They are not intended to be exhaustive.

Examples of When It Is Likely That a Statement Should Be Added to the Record

1. Claims are allowed on the basis of one (or some) of a number of arguments and/or affidavits presented and a statement is necessary to identify which of these were persuasive, for example:

   a. When the arguments are presented in an appeal brief.
   b. When the arguments are presented in an ordinary response with or without amendment of claims.
   c. When both an affidavit under 37 CFR 1.131 and arguments under 102 and 103 are presented.
2. First action issue:

   a. Of non-continuing application wherein claims are very close to cited prior art and differences have not been discussed elsewhere.
   b. Of continuing applications wherein reasons for allowance are not apparent from the record in the parent case or clear from preliminary filled matters.
3. Withdrawal of a rejection for reasons not suggested by applicant, for example:

   a. As a result of an appeal conference.
   b. When applicant's arguments have been misdirected or are not persuasive alone and the Examiner comes to realize that more cogent argument is available.
   c. When claims are amended to avoid a rejection under 35 USC 102 but arguments (if any) fail to address the question of obviousness.
4. Allowance after remand from the Board of Appeals.
5. Allowance coincident with the citation of newly found references that are very close to the claims, but claims are considered patentable thereover:

   a. When reference is found and cited (but not argued) by applicant.
   b. When reference is found and cited by Examiner.
6. Where the reasons for allowance *are* of record but in the Examiner's judgement, are unclear (e.g. spread throughout the file history) so that an unreasonable effort would be required to collect them.
7. Allowance based on claim interpretation which might not be readily apparent, for example:

   a. Article claims in which method limitations impart patentability.
   b. Method claims in which article limitations impart patentability.
   c. Claim is so drafted that "non-analogous" art is not applicable.
   d. Preamble or functional language "breathes life" into claim.

Examples of Statements of Suitable Content

1. The primary reason for allowance of the claims is the inclusion of .03 to .05 percent nickel in all the claims. Applicant's second affidavit, in example 5 shows unexpected results from this restricted range.
2. During two telephonic interviews with applicant's attorney, Mr.—on 5/6 and 5/10/77, the Examiner stated that Applicant's remarks about the placement of the primary teaching's grid member were persuasive, but he pointed out that applicant did not claim the member as being within the reactor. Thus, an amendment doing such was agreed to.
3. The instant application is deemed to be directed to an unobvious improvement over the invention patented in Pat. No. 3,953.224. The improvement comprises baffle means *12* whose effective length in the extraction tower may be varied so as to optimize and to control the extraction process.
4. Upon reconsideration, this application has been awarded the effective filing date of S.N. ———. Thus the rejection under 35 USC 102(d) and 103 over Belgian Patent No. 757,246 is withdrawn.
5. The specific limitation as to the pressure used during compression was agreed to during the telephone interview with applicant's attorney. During said interview, it was noted that applicants contended in their amendment that a process of the combined applied teachings could not result in a successful article within the amended pressure range. The Examiner agreed to rely on this statement (see page 3, bottom, of applicant's amendment), and the case was allowed.
6. In the Examiner's opinion, it would not be obvious to a person of ordinary skill in the art first to eliminate one of top members 4, second to eliminate plate 3, third to attach remaining member 4 directly to tube 2 and finally to substitute this modified handle for the handle 20 of Nania (see Fig. 1) especially in view of applicant's use of term "consisting."

Examples of Statements That Are Not Suitable as to Content

1. The 3 roll press couple has an upper roll 36 which is swingably adjustable to vary the pressure selectively against either of the two lower rolls. (Note: The significance of this statement may not be clear if no further explanation is given.)
2. The main reasons for allowance of these claims are applicant's remarks in the appeal brief and an agreement reached in the appeals conference.
3. The instant composition is a precursor in the manufacture of melamine resins. A thorough search of the prior art did not bring forth any compositions which corresponds to the instant compositions. The Examiner in the art also did not know of any art which could be used against the instant composition.
4. Claims 1–6 have been allowed because they are believed to be both novel and unobvious.

The examiner should *not* include in his statement any matter which does not relate directly to the reasons for allowance. For example:

5. Claims 1 and 2 are allowed because they are patentable over the prior art. If applicants are aware of better art than that which has been cited, they are required to call such to the attention of the Examiner.
6. The reference Jones discloses and claims an invention similar to applicant's. However, a comparison of the claims, as set forth below, demonstrates the conclusion that the inventions are non-interfering.

WILLIAM FELDMAN,
Jan. 24, 1978. *Deputy Assistant Commissioner for Patents.*

[968 O.G. 6]

(123) **Practice/Re: New Grounds of Rejection After Appeal Brief Has Been Filed**

A new practice has been implemented in the Patent Examining Corps to promote uniformity and adherence to guidelines in situations where a new ground of rejection is made in an Office action after an appeal brief has been filed. Under this practice Supervisory Patent Examiner approval is required for any new ground of rejection made after the filing of an Appeal Brief. This requirement extends to new grounds of rejection made either in an examiner's answer or in an Office action reopening prosecution. Evidence of that approval should appear on applicant's copy of the Office action or answer as well as the record copy. Consultation with or approval by the Group Director is no longer required in these situations.

This new practice does not alter the existing guidelines for reopening prosecution (MPEP) 706.7(e) or for making a new ground of rejection in an examiner's answer (MPEP 1208.01). Appropriate modification will be made to applicable Sections of the Manual of Patent Examining Procedure in a future revision.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[970 O.G. 94 (5–23–78)]

(124) **Commercial Success and Other Considerations Bearing on Obviousness**

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are made in the Manual of Patent Examing Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy, *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) ; *In re Palmer.* 172 USPQ 126, 451 F.2d 1100 (CCPA 1971) ; *In re Fielder and Underwood,* 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro,*425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston,* 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams,* 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin,* 448 F.2d. 791. 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli, et al.* 176 USPQ 305, (CCPA 1973)]; [*In re Noznick, et al,* 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America,* 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

RENE D. TEGTMEYER,
July 10, 1978. *Assistant Commissioner for Patents.*

[973 O.G. 34]

(125) **Handling of Dependent Claims by the Examiner**

Effective immediately, the following practice will be followed by patent examiners when making reference to a dependent claim—either singular or multiple. The new practice is intended to simplify and streamline our current practice (MPEP 608.01(n), Revision 55, January 1978) which experience indicates was unnecessarily burdensome in many cases.

1. When identifying a singular dependent claim which does not include a reference to a multiple dependent claim, either directly or indirectly, reference should be made only to the number of the dependent claim.
2. When identifying the embodiments included within a multiple dependent claim, or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, each embodiment should be identified by using the number of the claims involved, starting with the highest, *to the extent necessary* to specifically identify each embodiment.
3. When all embodiments included within a multiple dependent claim or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, are subject to a common rejection, objection or requirement, reference may be made only to the number of the dependent claim.

The following table illustrates the intended differences between current and the revised practice where each embodiment of each claim must be treated on an individual basis:

Claim Number	Claim Dependency	Identification: Current Practice	Identification: Revised Practice
1	Independent	1	1
2	Depends from 1	2/1	2
3	Depends from 2	3/2/1	3
4	Depends from 2 or 3 .	4/2/1	4/2
		4/3/2/1	4/3
5	Depends from 3	5/3/2/1	5
6	Depends from 2, 3 or 5	6/2/1	6/2
		6/3/2/1	6/3
		6/5/3/2/1	6/5
7	Depends from 6	7/6/2/1	7/6/2
		7/6/3/2/1	7/6/3
		7/6/5/3/2/1	7/6/5

When all embodiments in a multiple dependent claim situation (claims 4, 6 and 7 above) are subject to a common rejection, objection or requirement, reference may be made only to the number of the individual dependent claim. For example, if 4/2 and 4/3 were subject to a common ground of rejection, reference should be made only to claim 4 in the statement of that rejection.

The provisions of 35 USC 132 require that each Office action make it explicitly clear what rejection, objection and/or requirement is applied to each claim embodiment.

WILLIAM FELDMAN,
Oct. 17, 1978. *Deputy Assistant Commissioner.*

[976 O.G. 128]

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(126) **Microorganisms—Patentable Subject Matter**

The decision of the Supreme Court in *Diamond* v. *Chakrabarty* (206 U.S.P.Q. 193) held that microorganisms produced by genetic engineering are not excluded from patent protection by 35 U.S.C. §101. It is clear from the Supreme Court decision that the question of whether or not an invention embraces living matter is irrelevant to the issue of patentability.

Accordingly, the Patent and Trademark Office is now examining patent applications including claims to microorganisms which had been under suspension. Assuming that the products involved were the result of human intervention and were not products of nature, such claims will not be rejected under 35 U.S.C. §101 as directed to unpatentable subject matter.

SIDNEY A. DIAMOND,
July 29, 1980. *Commissioner of Patents and Trademarks.*

[997 O.G. 24]

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(127) **Department of Commerce**
Patent and Trademark Office

Designation of International Depository Authorities under the Budapest Treaty

The Budapest Treaty and the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure came into force on Aug. 19, 1980 with respect to the United States, Bulgaria, France, Hungary, and Japan. A copy of the Treaty was published in the *Official Gazette* on Aug. 23, 1977 (961 O.G. 21–26).

This Treaty authorizes each State for which the Treaty is in effect to designate a depository on its territory to serve as an international depository authority. More than one depository may be designated. Each such depository will be authorized to receive and store deposits, and dispense samples thereof, in compliance with the Treaty and the patent laws of each State adhering thereto. The Treaty is open for adherence by any member State of the Paris Union for the Protection of Industrial Property.

The Commissioner of Patents and Trademarks hereby solicits requests from private and public depositories located in the United States to serve as international depository authorities. Requests should be addressed to: Sidney A. Diamond, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Each request must explain and, to the extent practicable, provide evidence of the depository's capacity to meet the obligations of the Treaty. Such request must also include an offer by the depository to assume the cost of transferring deposits made under the Treaty to another international depository authority in the event of default of any of its Treaty obligations. The availability of funds for such transfer, if needed, must be available through a bond, special reserve fund, escrow or other means judged suitable by the Commissioner.

Requests will be promptly evaluated by the Commissioner of Patents and Trademarks, and each requesting depository promptly notified of the decision reached. Questions or inquiries concerning this notice may be addressed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557–3065.

The World Intellectual Property Organization, in Geneva, Switzerland, the Secretariat for the Paris Union, has provided a memorandum explaining the role and obligations of international depository authorities. This memorandum is reproduced below for the guidance of depositories in requesting recognition as an international depository authority.

MEMORANDUM

For the purposes of prospective international depository authorities under the Budapest Treaty

Introduction

1. This memorandum contains informations for the benefit of any depositary institutions (culture collections) that may wish to become "international depositary authorities" under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (done at Budapest on Apr. 28, 1977). Its brevity is such that it cannot be exhaustive. Any interested person requiring full information should refer to the relevant provisions of the Budapest Treaty and the Regulations under it (any reference hereinafter to an "Article" or to a "Rule" is a reference to an Article of the Budapest Treaty or to a Rule of the Regulations under it).

Objectives of the Budapest Treaty

2. Disclosure of the invention is a generally recognized requirement for the grant of patents (for the purposes of this memorandum, the word "patent" also covers other titles of protection, such as inventors' certificates). Normally, an invention is disclosed by means of a written description. Where an invention involves the use of a microorganism that is not available to the public, such a description is not sufficient for disclosure, since the invention could not be used by a person skilled in the art. That is why in the patent procedure of an increasing number of countries it is necessary not only to file a written description but also to deposit, with a depositary institution, a sample of the microorganism. When protection for the invention is sought in several countries, the complex and costly procedures of the deposit of the microorganism might have to be repeated in each of those countries. The objective of the Budapest Treaty is precisely to obviate such multiple deposits: under the Treaty a single deposit with one "international depositary authority" is sufficient for the purposes of patent procedure before the industrial property offices of all Contracting States, and of intergovernmental organizations granting regional patents which have declared that they recognize the effects of the Treaty (Articles 3(1)(a) and 9(1)(a)).

General Remarks on International Depositary Authorities

3. "International depositary authorities" are depositary institutions that have acquired the status of international depositary authorities. To obtain this status, a depositary institution has to be located on the territory of a Contracting State or of a member State of one of the organizations referred to in the preceding paragraph, and has to benefit from "assurances" furnished by that Contracting State or organization to the effect that the institution complies and will continue to comply with the requirements referred to in paragraph 5 below (Article 6(1)). The action for acquiring this status is taken by the State or organization concerned (Article 7 and Rule 3). There is nothing to prevent it from making more than one depositary institution acquire such status: it is therefore possible for there to be several international depositary authorities located on the territory of one and the same State.

4. An international depositary authority can lose its status either entirely (in which case "termination of status" is spoken of) or partly, in other words in respect of certain types of microorganisms only (in which case "limitation of status" is spoken of). Loss of the status occurs if the State or organization whose action brought about the acquisition of the status denounces the Treaty or withdraws the declaration of recognition of the effects of the Treaty (in which case the loss of status can only be total), or if the State or organization withdraws its assurances regarding the international depositary authority, or again by virtue of a decision of the Assembly of Contracting States taken at the request of another Contracting State or another organization (Articles 8, 9(4) and 17(4); Rule 4).

Requirements Which Have to be Met by International Depositary Authorities

5. The requirements referred to in paragraph 3 above which a depositary institution has to meet in order to become a depositary authority are the following (Article 6(2) and Rule 2):

(a) The institution has to have a continuous existence. It has to be impartial and objective—which means among other things that it has to be free of any dependence on interests that are liable to prejudice the disinterested performance of its functions—and it has to be available, for the deposit of microorganisms, to any depositor under the same conditions. These requirements, which in fact seem self-evident, are designed to give the public in general and depositors in particular fundamental guarantees of reliability as to the smooth operation of the system. On the other hand, the legal status of the institution is irrelevant: it may be either public or private.

(b) The institution has to have the necessary staff and facilities to perform its scientific and administrative tasks, which consist among other things in:

(i) accepting for deposit any or certain kinds of microorganisms;

(ii) examining the viability of the microorganisms deposited with it and issuing a receipt to the depositor and any required viability statement (see paragraphs 7 and 8 below);

(iii) storing the deposited microorganism for at least 30 years (Rule 9(1)) in such a way as to keep them viable and uncontaminated;

(iv) providing for sufficient safety measures to minimize the risk of losing the deposited microorganisms,

(v) complying with respect to the microorganisms deposited under the Treaty with the requirement of secrecy which means giving no information to anyone on the question whether a microorganism has been thus deposited and giving no information to anyone (except to a person who is entitled to a sample—see paragraph 10 below) on any microorganism thus deposited (Rule 9(2));

(vi) furnishing, rapidly and in an appropriate manner, samples of the deposited microorganisms to all those who are entitled to such samples (see paragraph 10 below).

Handling of Microorganism Deposits by the International Depositary Authority

6. *Reception of the microorganism.* The international depositary authority may require that the microorganism be deposited in an appropriate form and quantity, and that it be accompanied by a form established by that authority. In such a case, the said authority has to communicate its requirements (and any amendments to them) to the International Bureau in order that the latter may communicate them to all the depositors concerned (Rules 6.3 and 13.2(b)(v)). When it receives the microorganism, the international depository authority notes the date of receipt of the deposit and gives it an accession number (Rule 7.3(iii) and (v)). It issues a receipt to the depositor attesting the receipt and acceptance of the deposit (Rule 7). The model of the international form for the receipt, the use of which will be mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

7. *Viability test.* The international depositary authority promptly tests the viability of the microorganism; it also undertakes viability tests at reasonable intervals, depending on the kind of microorganism and its possible storage conditions, or at any time, if necessary for technical reasons or at the request of the depositor (Rule 10.1).

8. *Viability statement.* The international depositary authority issues a statement concerning the viability of the microorganism to the depositor or to any person receiving a sample of the microorganism (see paragraph 10 below) (Rule 10.2). The model of the international form for the viability statement, the use of which is mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

9. *Storage of the microorganism.* The international depositary authority stores the microorganism for a period of at least 30 years after the date of its deposit, or until five years have elapsed without its having received a request for a sample, the period expiring later being applicable (Rule 9.1). It complies with the requirement of secrecy at all times (see paragraph 5(v) above). Where it cannot furnish samples of the deposited microorganism for any reason, it notifies the depositor of the fact, indi-

cating the reason and informing him that he is entitled to make a new deposit (Article 4).

10. *Furnishing of samples.* The Regulations contain detailed provisions specifying who is entitled to receive samples of the microorganism, and when (Rule 11). The depositor himself is entitled to receive a sample at any time. He may authorize third parties to have samples furnished to them, whereupon the third parties receive a sample on presentation of their authorizations. Any industrial property office to which the Treaty applies may receive a sample on request if it needs the microorganism for the purposes of a patent procedure. Any other person may obtain a sample on request if an industrial property office to which the Treaty applies certifies that, under the applicable law, that person has a right to a sample of the microorganism concerned; the Regulations specify in detail the certification procedure. The use of a form (whose contents will be established by the Assembly and communicated by the International Bureau to all international depositary authorities) is mandatory for the request and certification. There is an alternative procedure wherey the industrial property office from time to time communicates to international depositary authorities lists of the accession numbers given to the deposit of the microorganisms referred to in the patents granted and published by it; the effect of this communication is to authorize those authorities to furnish samples of the microorganisms to anyone. It should be stressed that it follows from the foregoing that the international depositary never has to decide itself whether it has the right to furnish a sample since it only does so if it has the authorization of the depositor or of an industrial property office. The international depositary authority furnishes the sample in a container marked with the accession number given to the deposit and accompanied by a copy of the receipt for the deposit. It notifies the depositor of the furnishing of the sample.

11. *Communication of the scientific description and/or proposed taxonomic designation.* If the depositor has indicated a scientific description and/or proposed a taxonomic designation of the deposited microorganism, the international depositary authority must communicate it, on request, to any person entitled to receive a sample of the said microorganism (Rule 7.6).

12. *Fees.* For the procedure under the Treaty and the Regulations, the international depositary authority has the right to charge a fee in certain cases (specified in Rule 12.1). The two main fees are the fee for the storage of the microorganism (which is a single fee for the entire period of storage) and the fee for the furnishing of a sample (the furnishing of samples to industrial property offices is free of charge, however). The international depositary authority fixes the amounts of fees at its discretion, but they must not vary on account of the nationality or residence of the persons who have to pay them.

SIDNEY A. DIAMOND,
July 14, 1978. *Commissioner of Patents and Trademarks.*

[999 O.G. 2]

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(128) **Entry Into Force of the Budapest Treaty**

The Patent and Trademark Office announces the entry into force on Aug. 19, 1980 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure with respect to the United States, Hungary, Bulgaria, France and Japan. A copy of the Treaty was published in the Official Gazette on Aug. 23, 1977 (961 O.G. 21–36).

Following entry into force of the Treaty, each state adhering or acceding thereto will be authorized to nominate depositories on its territory to serve as international depository authorities. Upon compliance with certain procedural steps set forth in the Treaty, each such depository will be designated an international depository authority.

No depository in the United States or elsewhere has yet been nominated or designated to serve as an international depository authority. It is expected, however, that some depositories will shortly be designated both in the United States and other States adhering to the Treaty. Public notice will be provided of the designation of each international depository authority and its requirements for patent deposits.

An application for a patent in any adhering States involving the action of a microorganism, for which a deposit is required, may make the required deposit in any international depository authority. The fact and date of making the deposit will be recognized for all patent purposes in each State adhering to the Treaty. No further deposit will be required for national patent processing or enforcement, provided a deposit is properly made under the provisions of the Treaty.

An application for a United States patent will not be required to proceed under the provisions of the Budapest Treaty, however. Such an applicant may rely instead on a deposit made in any depository meeting the requirements set forth in *In re Argoudelis, et al.*, 168 USPQ 99 (CCPA, 1970) and reprinted in section 608.01(p), Manual of Patent Examining Procedure.

Questions or information regarding the Budapest Treaty may be directed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557–3065.

SIDNEY A. DIAMOND,
July 14, 1980. *Commissioner of Patents and Trademarks.*

JORDAN J. BARUCH,
July 16, 1980. *Assistant Secretary for Productivity, Technology and Innovation.*

[997 O.G. 10]

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(129) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the American Type Culture Collection, Rockville, Md., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

SIDNEY A. DIAMOND,
Dec. 30, 1980. *Commissioner of Patents and Trademarks.*

BUDAPEST Notification No. 11

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the American Type Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Nov. 17, 1980, of a written communication from the Government of the United States of America, relating to the American Type Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The American Type Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 3, 1980.

[1002 O.G. 116]

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(130) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the Agricultural Research Culture Collection, Peoria, Ill., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

SIDNEY A. DIAMOND,
Dec. 30, 1980. *Commissioner of Patents and Tradmarks.*

BUDAPEST Notification No. 12

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the Agricultural Research Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Dec. 2, 1980, of a written communication from the Government of the United States of America, relating to the Agricultural Research Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The Agricultural Research Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 8, 1980.

[1002 O.G. 116]

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(131) **Request for Certification of Deposits Made Under the Budapest Treaty**

Deposits of microorganisms made in International Depositary Authorities are subject to the regulations of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. Rule 11.3(a) of the Treaty regulations establishes a procedure by which an industrial property office shall assure the depositary that release of a sample is proper. Pursuant to the Treaty, the United States Patent and Trademark Office receives requests for certification that release of a sample of a deposited microorganism is proper under United States law. Effective immediately, all such requests for certification shall be directed to the Director, Patent Examining Group 120, United States Patent and Trademark Office, who has been delegated the authority to act on requests for certification under Rule 11.3(a) of the Budapest Treaty regulations.

DONALD J. QUIGG,
Sept. 4, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1083 OG 5]

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(132) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 70635–7135]

Deposit of Biological Materials for Patent Purposes

Agency: Patent and Trademark Office, Commerce.
Action: Advance Notice of Proposed rulemaking
Summary: This advanced notice of proposed rulemaking sets forth proposed rules and guidelines that the Patent and Trademark Office (PTO) is considering to govern the deposit of biological materials for patent purposes.

Every patent must contain a written description of the invention adequate to instruct a person skilled in the art to which the invention pertains how to make and use the invention. In certain instances, such as with some biotechnological inventions, the written description of the invention may not in itself be adequate to permit reproduction of the invention. In these cases, the written description must be supplemented by a deposit of the biological material which constitutes the invention or on which the invention depends if the biological material is not otherwise known and readily available to those skilled in the art. The deposited material becomes unconditionally available to the public at the time the patent is granted.

The rules being considered for proposal by the PTO prescribe the conditions under which a deposit must be made, the kinds of materials that may be deposited, the type of depository which is acceptable to the Office, the time for making an original deposit, the procedures and obligations applicable to the making and maintaining of a deposit and its possible replacement, the term of a deposit and other matters relating to the deposit of a biological material. In general, the rules being considered by the PTO would continue and clarify both long-standing practices of the Patent and Trademark Office and judicially developed principles of patent law. The explanations associated with the rules that are ultimately adopted along with the substantive content of the comments and responses will be incorporated into a set of guidelines that will be published in the Manual of Patent Examining Procedure.

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In response to a draft policy statement on the deposit of biological materials for patent purposes, which was circulated among interested bar and industry groups and published in the BNA-Patent, Trademark and Copyright Journal on May 22, 1986, the PTO received twenty five (25) written comments directed to that draft statement. This advance notice addresses the comments received. Interested persons are invited to comment on the rules being considered for proposal. A proposed rulemaking could be made as early as Jan. 1988. A hearing could be held as early as Mar. 1988.

Date: Comments must be received on or before Nov. 30, 1987 to insure consideration.

Address: Address written comments to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

Mark to the attention of Stanley D. Schlosser. (703) 557–3065. All comments received will be publicly available for inspection in the PTO in Rm. 11C28, Crystal Plz. Bldg. 3 (2021 Jefferson Davis Hwy., Arlington, Va.).

For Further Information Contact: Mr. Stanley D. Schlosser by telephone at (703) 557–3065.

Supplementary Information: An applicant for a patent involving biological material must meet the same requirements for disclosing the invention as apply to other kinds of technology. These requirements are set forth in the first paragraph of §112 of the patent law (Title 35, United States Code). The invention must be described in such full, clear, concise and exact terms as to enable a person skilled in the relevant technology to make and use the invention. The best mode contemplated by the inventor for carrying out the invention must also be disclosed. The statutory requirements for claiming inventions set forth in the second paragraph of 35 U.S.C. 112 also apply to inventions involving biological material. That is, claims must particularly point out and distinctly claim that which applicants for patent regard as their invention.

Where the invention involves a biological material and words alone are not sufficient to describe the invention adequately to meet the requirements of 35 U.S.C. 112, the required biological material completing the written description must either already be known and readily available and likely to continue to be available or be deposited into a suitable depository. Samples of the deposited material must be publicly and unconditionally available upon issuance of the patent. The deposit will be considered part of the patent disclosure and taken into account in determining the scope of the invention and related questions of infringement. As indicated above, the requirement for making a deposit only applies in situations where the biological material is essential to a complete disclosure and either is not known and readily available to the public, or cannot be readily produced from publicly available material according to the information contained in the patent.

A new chapter of rules of practice devoted exclusively to biological inventions, entitled "Deposit of Biological Materials for Patent Purposes", would be added, beginning with proposed new rule 1.200. This new chapter would specifically incorporate into patent practice judicially developed principles applicable to the deposit of biological materials and would be consistent with the duties and responsibilities of the United States as a signatory country to the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. It must be recognized, however, that a comprehensive body of patent law has not yet been developed by the courts dealing with the treatment of inventions relating to biological material. In situations where the courts have not provided specific guidance, appropriate rules and procedures are extracted or implied as far as possible from available decisions and existing practices.

The rules being considered for proposal are intended to apply to patent rights pursued under §101 of the patent law (Title 35, United States Code). Patent applications filed under the Plant Patent Act (35 U.S.C. 161–164) would be unaffected by this advanced notice. However, comments are solicited on the question of whether the Office should consider requiring a deposit of plants in appropriate circumstances where it is clear that a deposit is possible and is necessary to complete the description of an invention under 35 U.S.C. 162, first paragraph.

New rule 1.200 would be proposed to define the nature of biological material that falls within the scope of the rules. The definition is not intended to provide an exhaustive list of materials which may be deposited in accordance with these procedures. Rather, the need for a deposit and the types of material which must be deposited will be developed through experience and judicial decisions. Meanwhile, some guidelines can be provided.

First, biological material includes material that is capable of self-replication, either directly or after insertion into a host. Assuming the continued viability of the samples deposited, this should provide a reproducible supply of the biological material for the term of the deposit. Chemical compounds, no matter how important or defined their biological activity, are not regarded as biological material within the scope of these regulations. Chemical compounds are capable of description at least through the identification of starting materials and explanation of appropriate procedures used in making the compounds. It must not require undue experimentation in order to make or use the chemical compound from the written description in the patent application. Thus, materials such as proteins, enzymes, or other complex organic materials need not be deposited where the written description alone is adequate to enable those skilled in the art to make and use the claimed invention.

Plant material must be deposited when the patent application is filed outside the Plant Patent Act if needed to meet the requirements of 35 U.S.C. 112. As with other biological material, the deposit of plant material together with the written specification must enable those skilled in the art to make and use the claimed invention. Thus, if a plant itself is claimed, deposit of plant cells can be accepted only if the deposited cells will develop into the plant for which a patent is sought through the exercise of procedures either known in the art or taught in the application disclosure. Seeds may be deposited, but must be deposited in sufficient quantity to insure an adequate and timely supply once a patent is granted. The PTO solicits comments on the setting of an appropriate minimum number of seeds to ensure availability of the seed through the enforceable life of the patent. The replacement provisions of proposed rule 1.204 would also apply to replenishing the supply of seeds but may require special provisions because of the time required to provide new seeds - e.g. the replacement provision could be coupled with a terminal disclaimer provision for appropriate reasons. If a hybrid variety is claimed, the PTO will take a position that applicant must deposit the parent lines of the hybrid variety unless applicant is able to establish that propagation of the variety can be achieved by micropropagation or other techniques from the hybridized seed or plants grown from such seed. In the latter case, the deposit of the hybrid seed itself would make an adequate deposit.

While the proposed rules under consideration would be applicable to multicellular living organisms other than plants, including animals, it is anticipated that inventions relating to the development of animals having new and otherwise patentable characteristics will rely on the identification and description of a known and readily available animal that will be treated in a reproducible process to obtain the new animal variety. The PTO is presently not aware of any organization that is willing and able to undertake the responsibilities of a suitable depository for live animals.

Rule 1.201 would be proposed to provide an operative definition of when a deposit is required and also define when a biological material would be considered to be known and readily available to the public so that a separate deposit would not be required. The third paragraph of this rule would provide that there is no presumption that a specific biological material is required for the practice of an invention simply because it is mentioned in an application disclosure. The need to make a deposit of a biological material in accordance with these rules is necessitated only where the biological material is essential to meet one or more of the requirements of 35 U.S.C. 112 and is not known and readily available and cannot be obtained through procedures known in the art or described in the application from known and readily available materials.

If a biological material is known and readily available at the time the patent is granted, and there is no reasonable basis to believe that the biological material will cease to be available during the life of the patent, no requirement for a separate deposit would be made.

While it is not possible to list all circumstances under which a biological material may be considered to be known and readily available to the public, it is clear that the written description in the specification should be sufficient to allow one of ordinary skill in the art to identify and to obtain the known and readily available material. The present commercial availability of the biological material through normal commercial suppliers, particularly suppliers not under the control of those relying on the availability of the biological material, would make the material known and readily available. The mere fact that the biological material is commercially available only through the patent holder or the patent holder's agents or assigns shall not by itself justify a finding of non-availability, absent a reason to believe that access to the biological material would later be improperly restricted. Since the public has a continuing interest in the availability of information and materials necessary to make and use an invention claimed in a patent, regardless of the patent holder's interest, actual distribution of the biological matter in the marketplace may be required if commercial availability is to be relied on to establish that a specific biological material is known and readily available to the public.

Evidence that a biological material is known and readily available may also take the form of a reference in printed publications or a declaration of accessibility by those working in the field to which the invention relates which establishes wide distribution and ready availability of the biological material. The probative value of this type of evidence will depend on whether the evidence establishes that the biological materials are known and accessible without restriction to those who desire to obtain and test the biological material.

Evidence that a biological material is known and readily available may take the form of a statement showing that it is readily identifiable and available in nature in useful form or that it is available in nature coupled with the existence of a reliable screening test or procedure defined in the specification disclosure or known to those skilled in the art that could be used to isolate the required biological material with reasonable predictability from an identified genus of biological material. See *Tabuchi* v. *Nubel*, 194 USPQ 521 (CCPA 1977). A deposit made of a biological material that was known and accessible without restriction to those who desired to obtain and test the biological material would also satisfy the definition of being known and readily available to the public. However, since a mere reference to a biological material deposit in a patent would not necessarily mean that it was accessible without restriction to the public the burden would be on the applicant to establish its ready availability without restriction as through a statement from the depository.

New rule 1.202 would be proposed to define an acceptable depository for the deposit of biological materials for patent purposes for applications before the United States Patent and Trademark Office. This rule states that a deposit may be made either in an International Depositary Authority (IDA) as established under the Budapest Treaty or a depository recognized to be suitable by the Patent and Trademark Office. The depository may be domestic or foreign to the United States, public or private. While it would be administratively convenient for the Patent and Trademark Office to limit acceptable depositories to an IDA, such a restricted policy would not provide a patent applicant with the type of flexibility and availability necessary in the event no available IDA would accept a deposit of a particular biological material. Nevertheless, a depository other than an IDA would be called upon to essentially establish compliance with the administrative and technical requirements set forth in the Budapest Treaty for IDAs in order to establish suitability of the depository to the Office. While there is a desire to provide flexibility to a patent applicant in selecting an appropriate depository, these guidelines are not intended to permit each patent applicant to become its own depository since both the patent owner and the public have an interest in the continued availability and accessibility of the deposit during the enforceable life of a patent and the public has a continuing interest in its availability when the patent is no longer enforceable.

Paragraph (c) of new rule 1.202 indicates that the Office will recognize the transfer of a sample to a suitable depository from a depository which either defaults or discontinues the performance of any of the tasks it should perform. Where such a transfer takes place after a patent issues, a suitable Certificate of Correction would be acceptable to identify the new depository and/or accession number. An appropriate amendment to a pending application to identify the new depository and/or accession number would not constitute new matter. Cf. *In re Lundak*, 227 USPQ 90 (Fed. Cir. 1985).

Paragraph (d) of new rule 1.202 sets forth the procedure for notifying the Commissioner of the intent to be recognized as a suitable depository by the Patent and Trademark Office. The depositories recognized as suitable by the Office will be published in the Official Gazette of the Patent and Trademark Office as will the identity of a depository which has defaulted or discontinued its performance under these rules.

New rule 1.203 would be proposed to set forth the time for making an original deposit. An original deposit may be made at any time before the application is filed or during pendency pursuant to a requirement that will be made no later than the date the Notice of Allowance and Issue Fee Due is mailed. The decision in *Lundak* indicated that a specification disclosure need not be enabling until such time as a patent is granted. Unless the examiner and applicant agree on whether a deposit is required, what must be deposited and the appropriate conditions, the deposit issues will be resolved pursuant to a rejection under 35 U.S.C. 112. The time specified in this particular rule for making a suitable deposit is the last practical moment that the Office can insure that a deposit has been made in accordance with these regulations before a patent is granted. After the issue fee is paid in an application the application undergoes preparation for printing for a period of 8 to 10 weeks so that all the information necessary for printing should be in the application file and should have been approved by the examiner as conforming to these regulations at the time the issue fee is paid. Where a deposit is made after the Notice of Allowance and Issue Fee Due is mailed, applicant would be required to file an amendment under 37 CFR 1.312 to add a description of the accession number and depository together with any required statement.

Unless the regular deposit is made before the effective filing date of an application for patent in the United States, a verified statement will be required from a person in a position to corroborate that the biological material described in the application as filed is the same biological material which is deposited in a suitable depository. The nature of this corroboration will depend on the circumstances in the particular application under consideration including the length of time between the application filing date and the date of deposit.

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New rule 1.204 would be proposed to define the circumstances and procedures for replacing a deposit which is necessary for patent purposes. Failure to replace a deposit within three (3) months after learning or receiving notice from a depository that a replacement is needed may cause the application or patent involved to be treated by the PTO as if no deposit were made. The Patent and Trademark Office will apply a rebuttable presumption of an identity between the original and the replaced sample in the event a deposit is replaced where the application or patent making reference to the deposit is relied upon during any Patent and Trademark Office proceeding.

New rule 1.205 would be proposed to define the term of a deposit to be a minimum of 5 years after the most recent request for the furnishing of a sample of the deposited biological material and at least 30 years after the date of deposit. Any deposit which is made pursuant to the Budapest Treaty will be for a term acceptable to the Office. However, where a deposit is not made under the Budapest Treaty, samples must be stored under an agreement that would make them available for at least the term specified in the Budapest Treaty so long as it extended beyond the enforceable life of the patent for which a deposit was made. The enforceable life of a patent includes the original term of seventeen years, shortened by any terminal disclaimer or lengthened by any patent term extension, plus six (6) years to cover the statute of limitations and any additional time beyond this period where the enforceability of the patent remains in litigation.

The period for storing a deposit as literally stated in the Budapest Treaty is likely to cover almost all of the circumstances before the Patent and Trademark Office. However, in the event that the period of storage would expire before the earliest possible expiration date of the enforceable life of the patent, one of the basic intents of Congress to insure that the public can practice the invention claimed in an expired patent may be frustrated, and it is not believed that the period set forth in the Budapest Treaty intended for such a situation to arise. The availability of the deposited biological material which is essential for making and/or using the subject matter claimed in the patent is a legitimate ground for concern on the part of the Patent and Trademark Office. *Ex parte Lundak* (decided Aug. 21, 1984, reversed on other grounds *In re Lundak*, 227 USPQ 90 (Fed. Cir. 1985)). The Board of Patent Appeals considered the possibility that an initially enabling disclosure might become nonenabling over a period of time. *In re Metcalfe*, 410 F2d. 1378, 161 USPQ 789 (CCPA 1969). Suggesting that a rule of reason approach similar to that applied by the Court in *Metcalfe* should continue to inhere in the deposit procedure of the Patent and Trademark Office, the Board suggested that it was appropriate to insist that the depository be contractually obligated to maintain the deposit for at least a reasonable time after expiration of the patent rights. In determining whether the period is sufficient to extend beyond the enforceable life of the patent, neither the possibility of patent term extension nor the possibility of protracted litigation will be considered. Where the minimum period of storage would not extend beyond the enforceable life of the patent, as where there is prolonged pendency of an application or continuation or divisional applications are involved, one approach would be to require applicant to undertake to request a sample every five years beyond the 30 years measured from the date of deposit so that the deposit would be stored for a period beyond the enforceable life of the patent.

A non-viable deposit cannot be relied upon to supplement a written description in a patent application. Experience has shown that as many as 10% of the deposits made with American Type Culture Collection (ATCC) on which a viability test was conducted were not viable when received at the depository. The requirement for verification of the viability of deposits is consistent with the Budapest Treaty and is a subject of proposed new rule 1.206.

The viability of a deposit made under the Budapest Treaty is a requirement. Thus, a mere statement by applicant, an authorized representative of applicant or assignee that the deposit has been accepted under the Budapest Treaty would satisfy this rule. Otherwise, viability may be tested by the depository or any other entity provided that the material tested is received from the depository. The viability test must conclude that the deposited biological material is capable of reproduction directly or indirectly and no evidence will be required to satisfy the deposit requirement relative to the ability of the deposited material to perform any function described in the application. However, as with any other issue of description or enablement, if the examiner has evidence or reason to question the objective statements made in the application, applicants may be required to demonstrate that the deposited biological material will perform in the manner described.

A viability statement for each deposit which is not made under the Budapest Treaty must be filed in the patent application and contain the information identified in paragraph (b) of proposed new rule 1.206. The examiner shall not question the conclusion in a viability statement issued by a depository recognized under either proposed new rule 1.202(a) or (b). If the viability test indicates that the deposit is not viable upon receipt, or the examiner cannot for scientific or other valid reasons accept a statement of viability received from the applicant, the examiner shall so notify the applicant stating the reasons for not accepting the statement and proceed with the examination process as if no deposit had been made.

New rule 1.207 would be proposed to address the conditions under which a deposit must be made in order to satisfy access to the deposit. First, access during the pendency of an application to a deposit must be available to one determined by the Commissioner to be entitled thereto under 37 CFR 1.14 and 35 U.S.C. 122. A deposit pursuant to the Budapest Treaty meets this requirement. Secondly, the deposit must be made under conditions that all restrictions on the availability to the public of the deposited biological material will be irrevocably removed upon the granting of the patent. Conditions on the release of a deposited biological material such as identifying the ultimate recipient of the material, or a provision on the further transfer of the material, or any other stipulation that acts as a precondition to the release of the biological material referenced in an issued patent will be considered to be a prohibited restriction on the availability to the public of the biological material so deposited. The depository may be asked to provide to the depositor such information as the identity of sample recipients but not as a precondition to release after the patent is granted.

Since the mere description of a deposit or identity of a deposit in a patent specification is not necessarily an indication that a requirement for deposit or compliance with these rules has been made, the Office will certify whether a deposit was stated as having been made under conditions which make it available to the public provided the request contains the information set forth in Paragraph (c) of proposed new rule 1.207.

New rule 1.208 would be proposed to set forth the procedures which would be followed by an examiner once the examiner determines that a specific biological material is both essential to make and use the claimed invention and is not known and readily available within the meaning of rule 1.201(b). It is only when the examiner has made these determinations based on the record in the application being considered that the need for a deposit of the identified biological material must be considered. A deposit accepted by an IDA under the Budapest Treaty shall be accepted for patent purposes by the PTO if additional statements are made that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent, and the deposit will be replaced if viable samples cannot be dispensed by the depository.

A deposit under the Budapest Treaty would mean that a viable deposit has been made (Budapest Rule 10) in an acceptable depository (IDA) for a period of five years after the most recent request and at least 30 years from the date of deposit (Budapest Rule 9) under conditions that access to the deposit will be available during pendency of the patent application to one determined by the Commissioner to be entitled thereto under 37 CFR 1.14 and 35 U.S.C. 122 (Budapest Rule 11.1). Assurance of reasonably permanent availability of the deposited material through the depository is reasonably assured through the deposit of a viable culture under the Budapest Treaty and the requirement to make a new deposit in §1.204(a). It is sufficient if a written statement is made by applicant, an attorney or agent prosecuting the application or a person representing the assignee that a deposit has been accepted by an IDA under the Budapest Treaty under conditions that all restrictions on the availability to the public of the deposit will be irrevocably removed upon the granting of the patent. A suitable statement would be as follows:

1) I am (relationship to application)
2) Viable samples of
Material:
Accession Number:
Deposit Date:
were deposited and will be maintained with
3) (Name and Address of Depository)
4) Under terms which are in accordance with the provisions of the Budapest Treaty.
5) Upon issuance of a patent on this application, all restrictions on the availability of the deposited material to the public will be irrevocably removed.

Date_____Name_____

If the examiner determines that a deposit is required and has not been made in compliance with these rules, the examiner shall reject all the affected claims in the application under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed or why a deposit which was made cannot be accepted for patent purposes. Although the Court in *Lundak* indicated that the enablement requirement of 35 U.S.C. 112 need not be satisfied until the patent issues, the only way the Office can efficiently and effectively address the deposit issue is during the examination of the application. After the examiner has determined that a deposit is required, and until a deposit in accordance with these rules is made, or until the Office is assured in writing that a deposit in accordance with these rules will be made up to and including the date the issue fee is paid, or the examiner is convinced that a deposit is not required under the circumstances of the application being considered, the rejection will be made and maintained by the examiner. Written assurance may take the form that an identified specimen will be deposited and maintained in an IDA under the Budapest Treaty before the issue fee is paid under conditions that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent, or any other specific assurance that the examiner can recognize and accept that there are no outstanding issues to be resolved on the deposit question.

In the circumstances where the Office has received written assurance that an acceptable deposit will be made before or on the date of payment of the issue fee, and there are no other outstanding matters to be considered relative to the patentability of the claims, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the required deposit be made within three (3) months. The period for satisfying the requirement for deposit will be extendable under 37 CFR 1.136(a), as is the case with a requirement for drawing corrections made at the time the Notice of Allowance and Issue Fee Due is mailed. In appropriate circumstances, relief also may be available under 37 CFR 1.136(b) if sufficient cause is shown for an extension of time in order to make the appropriate deposit. Sufficient cause would be decided by the appropriate Group Director. Failure to make the required deposit in accordance with the requirement will result in abandonment of the application for failure to prosecute. Since the opportunity exists to request extensions of time under 37 CFR 1.136 to make a viable deposit, no application should go abandoned for failure to make a viable deposit. However, the Office reserves the right to require the filing of a terminal disclaimer where the time required to make a viable deposit unreasonably delays the issuance of a patent.

The contents of the specification regarding any deposit made are specified in new rule 1.208(d). In addition to such identifying criteria as accession number for the deposit and the name and address of the depository, the specification should include the date of deposit (i.e. the date from which the term of deposit specified in new rule 1.205 is to be measured) and a taxonomic description of the deposit. This written description is that required by 35 U.S.C. 112, first paragraph and should be sufficient to characterize and distinguish the biological material deposited. This written description will serve to inform the public of the essential characteristics of the deposited material once the patent is granted, and will facilitate the examination process which necessarily involves comparisons with prior art biological material.

OTHER CONSIDERATIONS

The rule change being considered for proposal is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The rule changes being considered for proposal are not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The proposed deposit practice will not impose extra work on patent applicants (whether small or large businesses or individuals).

The Patent and Trademark Office has determined that this rule change being considered for proposal is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, state or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

Any information collection requirements that may be contained in the proposed rulemaking resulting from proceedings under this advance notice will be submitted for OMB approval at the time the proposed rulemaking is announced.

List of subjects in 37 CFR Part 1.

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out and under authority of 35 U.S.C. 6, 37 CFR Part 1 is being considered for proposed amendment by adding new rules 1.200 to 1.208 as set forth below.

PART 1 - Rules of Practice in Patent Cases

DEPOSIT OF BIOLOGICAL MATERIAL

1.200 Biological Material

For the purposes of these regulations pertaining to the deposit of biological material for patent purposes, the term biological material shall include material that is capable of self-replication either directly or after insertion into a host. Representative examples include bacteria, fungi including yeast, algae, protozoa, cell lines, plant tissue cells and seeds. Viruses, vectors, cell organelles

and other non-living material existing in and reproducible from a living cell may be deposited by deposit of the host cell capable of reproducing the non-living material. Materials analogous to conventional chemical compounds such as proteins and enzymes are not subject to these regulations.

1.201 Need to Make a Deposit

(a) Where a claimed invention is, or relies on, a biological material, the requirements of the first and second paragraphs of 35 U.S.C. 112 apply. Applicant is required to comply with these requirements in the written description of the invention, which may include reference to known and readily available biological material. If the written description does not meet the requirements of 35 U.S.C. 112, the specification may be supplemented by a deposit of samples of the biological material necessary to meet those requirements in a depository and under conditions complying with these regulations.

(b) Biological material need not be deposited if it is known and readily available to the public or can be made or isolated in a reproducible manner from known and readily available material. Biological material will be considered to be known and readily available to the public if samples of the biological material are known and accessible without restriction to those who desire to obtain and test the biological material. Samples will be considered to be accessible even though some requirement of law or regulation of the United States or of the country in which the depository institution is located permits access to the material only under conditions imposed for safety, public health or similar reasons.

(c) The reference to a specific organism or other biological material in a specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit in accordance with these regulations is required.

1.202 Acceptable Depository

(a) A deposit may be made in any International Depositary Authority (IDA) as established under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.

(b) A deposit may be made in any depository recognized to be suitable by the Office. Suitability will be determined by the Commissioner on the basis of the administrative and technical competence, and agreement of the depository to comply with the terms and conditions applicable to deposits for patent purposes. The Commissioner may seek the advice of impartial consultants from the biotechnology industry on the suitability of a depository. The depository must:

(i) have a continuous existence;
(ii) exist independent of the control of the depositor;
(iii) possess the staff and facilities sufficient to enable it to examine the viability of a deposit and store it in a manner which ensures that it is kept viable and uncontaminated;
(iv) provide for sufficient safety measures to minimize the risk of losing biological material deposited with it;
(v) be impartial and objective; and
(vi) furnish samples of the deposited material in an expeditious and proper manner.

(c) If any depository under (a) or (b) defaults or discontinues the performance of any of the tasks it should perform, the Office will recognize as a substitute in any pending application or patent a viable deposit made with an IDA or depository recognized to be suitable by the Office which is transferred to said depository from the defaulting depository in the manner required for replacing a deposit under §1.204.

(d) A depository seeking status under (b) must direct a communication to the Commissioner which shall:

(i) indicate the name and address of the depository to which the communication relates;
(ii) contain detailed information as to the capacity of the depository to comply with the requirements of (b), including information on its legal status, scientific standing, staff and facilities;
(iii) indicate that the depository intends to be available, for the purposes of deposit, to any depositor under these same conditions;
(iv) where the depository intends to accept for deposit only certain kinds of biological material, specify such kinds;
(v) indicate the amount of any fees that the said depository will, upon acquiring the status of suitable depository under (b), charge for storage, viability statements and furnishing of samples of the deposit.

(e) Once a depository is recognized to be suitable by the Commissioner or has defaulted or discontinued its performance under this section, notice thereof will be published in the Official Gazette of the Patent and Trademark Office.

1.203 Time of Making an Original Deposit

(a) An original deposit may be made at any time before filing an application for patent or during pendency of the application for patent pursuant to a requirement that will be made by the examiner no later than the date the Notice of Allowance and Issue Fee Due is mailed.

(b) When the original deposit is made in a depository defined in §§1.202(a) or (b) after the effective filing date of an application for patent, a verified statement will be required from a person in a position to corroborate the fact that the biological material described in the application as filed is the same biological material which is deposited in the depository defined in §§1.202(a) or (b).

1.204 Replacement of Deposit

(a) Where a depository possessing the original deposit cannot furnish samples of the deposit for any reason, the depository shall, promptly after having noted its inability to furnish samples, notify the depositor of such inability, indicating the cause thereof, and the depositor shall be required to make a new deposit of the biological material which was originally deposited within three months of receiving notification that the depository cannot furnish samples. The replacement shall be made in the same depository as the original deposit except (1) where the original depository has lost its status under §§ 1.202(a) or (b) or no longer carries out its obligations applicable to the involved deposit; or (2) where the depository for health or other legitimate reasons is unable to provide samples to requesters outside of the jurisdiction where the depository is located.

(b) An applicant or patent owner shall notify the Office in writing as soon as reasonably possible after a replacement deposit is made in each application or patent affected. This notification shall state the name and address of the depository, the accession number for the deposit, the date of making the deposit, the results of a viability test (as provided for in §1.206), the reason for making the replacement deposit, and a statement that the replacement deposit is to the best of the depositor's knowledge identical to the original deposit. The notification shall be placed in each application or patent file.

(c) A depositor's failure to replace a deposit within three months after learning or after receiving written notice from a depository that a replacement is needed may cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

(d) In the event a deposit is replaced, the PTO will apply a rebuttable presumption of an identity between the original and the replaced sample where the application or patent making reference to the deposit is relied upon during any Office proceeding.

1.205 Term of Deposit

A deposit shall be made for a term of at least thirty (30) years after the date of a viable deposit and at least five (5) years after the most recent request for the furnishing of a sample of the deposited biological material was received by the depository. In any case, samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made.

1.206 Viability of Deposit

(a) A deposit of biological material must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository or by another provided the material tested is received from the depository. The test must conclude only that the deposited material is capable of reproduction. No evidence is necessarily required relative to the ability of the deposited material to perform any function described in the patent application.

(b) A viability statement for each deposit not made under the Budapest Treaty must be filed in the application and must contain:

(i) name and address of the depository
(ii) name and address of the depositor
(iii) the date of deposit
(iv) the identity of the deposit and the accession number given by the depository
(v) the date of the viability test
(vi) the procedures used to obtain a sample if the test is not done by the depository, and
(vii) a statement that the deposit is capable of reproduction.

(c) If a viability test indicates that the deposit is not viable upon receipt, or the examiner cannot, for scientific or other valid reasons, accept the statement of viability received from the applicant, the examiner shall proceed as if no deposit has been made. The examiner will accept the conclusion set forth in a viability statement issued by a depository recognized under §§1.202(a) or (b).

1.207 Furnishing of Samples

The deposit must be made under conditions that assure that

(a) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under §1.14 and 35 USC 122, and

(b) All restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent.

(c) Upon request, the Office will certify whether a deposit has been stated to have been made under conditions which make it available to the public as of the issue date of the patent grant provided the request contains:

(i) The name and address of the depository
(ii) The accession number given to the deposit
(iii) The patent number and issue date of the patent referring to the deposit
(iv) The name and address of the requesting party.

1.208 Examination Procedures

(a) The examiner shall determine in each application for an invention if a deposit is needed, in case one has not been made, or if a deposit actually made is acceptable for patent purposes. A deposit accepted in any depository under the Budapest Treaty shall be accepted for patent purposes if made under conditions complying with §1.207(b). If a deposit is required and has not been made in accordance with these regulations, the examiner shall in an Office action reject the affected claims in the application under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed and/or why a deposit actually made cannot be accepted.

(b) The applicant shall respond to a rejection under paragraph (a) of this rule by (1) making an acceptable deposit or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee or (2) establishing that the involved biological material is known and readily available to the public or (3) arguing why a deposit is not required under the circumstances of the application considered. Other replies to the examiner's action shall be considered non-responsive. The rejection will be repeated until either (b)(1) or (b)(2) is satisfied or the examiner is convinced that a deposit is not required.

(c) If an application is otherwise in condition for allowance except for the required deposit and the Office has received a written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the required deposit be made within three months. The period for satisfying this requirement is extendable under 37 CFR 1.136. Failure to make the required deposit in accordance with this requirement will result in abandonment of the application for failure to prosecute.

(d) For each deposit made pursuant to these regulations, the specification shall contain:

(i) accession number for the deposit;
(ii) date of the deposit;
(iii) taxonomic description of the deposit; and
(iv) name and address of the depository.

COMMENTS AND RESPONSES

The following responses are directed to the comments received in response to the draft policy statement on the deposit of biological materials for patent purposes. The comments are arranged to generally correspond to the order of topics addressed in the draft guidelines.

Comment:
The guidelines should make explicit that it is the Examiner's, not the applicant's, burden to show that a written description is not adequate to describe the invention as claimed. This has been a real problem in that simply because a microorganism or other biological material is involved in a particular claimed invention, it is automatically assumed that a deposit should be required. This is, of course, quite out of touch with reality especially when it comes to inventions relating to recombinant technology.
Response:
This suggestion has been in effect, since the PTO clearly has the initial burden of giving reasons, supported by the record as a whole, as to why the written description is not sufficient to enable one skilled in the art to make and use the claimed invention in the absence of a particular microorganism or other biological material. All assertions that the written description is not enabling without a deposit must be supported by the examiner with (1) evidence or (2) reasons to support the conclusion of noncompliance. New rule 1.201(c) being considered for proposal also provides explicitly that there is no presumption that a specific material is required simply because it is described in the specification.
Comment:
If enablement and description requirements can be met with a written description, is a deposit required solely for compliance with the best mode requirement?
Response:
The best mode requirement of the first paragraph of 35 U.S.C. 112 is a separate and distinct requirement from the enabling requirement. *In re* Newton, 414 F2d 1400, 163 USPQ 34 (CCPA 1969). The best mode requirement is a safeguard against the possible selfish desire on the part of some people to obtain patent protec-

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tion without making a full disclosure. The requirement does not permit an inventor to disclose only what is known to be the second-best embodiment, retaining the best as a trade secret. The fundamental issue that should be addressed is whether there was evidence to show that the quality of an applicant's best mode disclosure is so poor as to effectively result in concealment. *In re* Sherwood, 615 F2d 809, 204 USPQ 537 (CCPA 1980). If a deposit is the only way to comply with the best mode requirement then the deposit must be made.

Comment:

We regret that the PTO has not attempted to provide some guidance as to the circumstances under which a biotechnology invention will be deemed to be reproducible from the written description alone. One such circumstance would appear to be where sequence data for the transcriptional unit of rDNA vector is available either directly from the specification, or from the published literature.

Response:

While such guidance may be of some assistance, it may be of momentary value because of the changing nature and development of technology. In addition, useful guidelines would be difficult in view of the tremendous variety of factual circumstances that play a role in determining whether the claimed invention can be practiced without undue experimentation. Some guidance is available in *Ex Parte Forman,* 230 USPQ 546 (BPAI 1986) where the Board of Patent Appeals and Interferences summarized eight (8) factors to be considered in a determination of "undue experimentation."

Comment:

Please consider replacing the word "define" in the phrase "define the metes and bounds of the claimed invention" with the word —support— because applicant should be allowed to select representative biological samples to place on deposit which support rather than define the "metes and bounds" of the claimed invention.

Moreover, the deposited biological sample which applicant demonstrates, by the description in the application, to be operable should be deemed sufficient by the PTO to satisfy the deposit requirement and provide adequate basis for applicant to claim variants of the deposited material. Another comment expressed concern that limiting claims to the deposited material (*Ex Parte Jackson*) may become the norm in patent examination practice if such language is included.

Response:

Claims are required to set out and circumscribe a particular area with a reasonable degree of precision and particularity. 35 U.S.C. 112, second paragraph. This requirement is separate and distinct from the requirement of the first paragraph of 35 U.S.C. 112 that the specification disclosure enable one skilled in the art to make and use the invention to a degree commensurate in scope with the claims. Under appropriate circumstances, it may be necessary to specially recite and limit the claims to the deposited biological material in order to adequately define the metes and bounds of the claimed invention. *Ex parte Jackson,* 217 USPQ 804 (Bd. App. 1982). However, the mere facts that a claimed invention requires the use of a living organism or that samples of a living organism that may be used in the claimed invention have been deposited are *never alone* sufficient to require applicant to comply with the deposit guidelines or limit any claim to the deposited material.

Comment:

There is interest that the Patent and Trademark Office be required to print deposit information on the front page of the issued patent - analogous to the cited references rather than buried in the general text.

Response:

At the last meeting of the WIPO Permanent Committee on Patent Information, a revised standard was approved recommending use of INID (*I*nternationally agreed *N*umbers for The *I*dentification of *D*ata) codes to identify bibliographic data on the front page of patent documents. A new INID Code (83) has been approved to identify information concerning the deposit of microorganisms, e.g., under the Budapest Treaty.

The PTO is not considering the publication of deposit information on the front page of an issued patent because of the substantial administrative burden that would be involved for a relatively small number of patents. No compelling need or rationale is apparent that would justify the cost for the rare case where such a format may be more convenient.

Comment:

The practice of presenting a microorganism for deposit in connection with a patent application was initially adopted as a means for complying with the requirements of Section 112. The PTO's current proposal would make a deposit mandatory under administrative rulemaking, for compliance with the requirements of 35 U.S.C. 112 in an invention which "depends on the use of biological material".

Response:

The PTO proposal does *not* make a deposit mandatory for an invention which depends on the use of biological material. The PTO policy and deposit requirements are intended to provide guidance in thos situations when it is determined that a deposit is necessary to satisfy one or more requirements of 35 USC 112. The proposed rules concern the requirements and procedures for making a suitable deposit if it is determined that a deposit is required before a patent can be granted. The guidelines associated with the proposed rules recognize that the specification may properly rely on information which is publicly available.

Comment:

Some recognized culture collections do not make their strains readily available. What can a requester do if it is found that the biological material is not readily available. Most of us do not have access to legal recourse.

Response:

The PTO will assume that any deposit made according to these regulations will be readily available upon the granting of the patent. This is a rebuttable presumption that could be overcome only by evidence of the nature which would show that the patent relied upon is inoperative. Since every patent is presumed valid and since that presumption includes the presumption of operability, the burden of proof is high. The PTO does not have the resources to police the depositories such that the depositor must assume the risk that the depository selected will preserve and maintain the deposit made.

Comment:

It was suggested that the statement that the availability of the biological material must be such that there is no reasonable basis to question the continued availability of the biological material beyond the enforceable life of a patent was overly stringent. Citing *In re Metcalfe,* 410 F.2d 1378, 161 USPQ 789 (CCPA 1969).

Response:

The suggestion that the proper perspective should be whether there is reasonable basis to believe that the biological material will cease to be available during the life of the patent has been adopted.

Comment:

The draft guidelines indicated that a material would be considered to be known and readily available to the public even though some requirement of law or regulation restricted access to material for safety, public health or similar reasons. It has been suggested that the term "national security" be specifically defined in the list of exceptions since this constitutes the basis which precludes making available to the public significant amounts of governmental information. It was further suggested that the phrase "of either of the United States or of the state in which the depositor or the depository institution is located" be added after regulation in the acknowledgment of the fact that biotechnology is an international industry. Finally, it was noted that companies may find it advisable to restrict access even in the absence of any formal legal requirement for product liabilty reasons so that the PTO should regard more leniently restrictions

which are fully imposed for public health reasons even if not required by law or regulation, and particularly if they are required by an insurer.

Response:

First, the PTO has not seen fit to add national security as a specific item which would permit restriction on access to a biological material which would still be considered to be known and readily available. It is difficult to determine with any degree of certainty what any country may consider to be national security. Further, an invention which involved national security matters would not be published before the restrictions on access to that invention involving national security were removed.

Secondly, while the international scope of the biotechnology industry is clearly recognized, the proposal to include the country or state in which the depositor is located would appear to be unnecessary so long as the requirement of law or regulation would apply to the depository institution where the deposit is located. Accordingly, the suggestion has been adopted to this extent.

Finally, it is believed inappropriate for the PTO to accept a biological material to be known and readily available to the public on the basis of what some private insurer may require of the depositor. Unless the restriction is based on some requirement of law or regulation which restricts access to the material for safety, public health or similar reasons, the PTO will not consider that a biological material is known and readily available to the public.

Comment:

It was suggested that a biological material should not have to be deposited if it could be readily reproduced from materials known and available to the public based on the description of how to make and use found in the disclosure.

Response:

This suggestion has been adopted in the first sentence of new rule 1.201(b) being considered for proposal which includes the statement that the biological material need not be deposited if it can be made or isolated in a reproducible manner from known and readily available material.

Comment:

The guidelines had stated that the fact that the biological material had multiple known uses would tend to provide assurance that the required biological material would continue to be available. It was noted that this might be construed to mean that a recitation of multiple uses in applicant's disclosure is evidence that the biological material would be readily available to the public which clearly it is not.

Response:

The person making the comment accurately noted that the two have no bearing one to the other. However, if there was evidence that the biological material had been put to use for more than one purpose by a variety of people, it would be considered to constitute at least an indication that the biological material in question was known and accessible to those who desire to obtain at least a sample of the subject biological material. It would have been evidence of distribution in commerce, consistent with the idea that it was known and readily available.

Comment:

With respect to biological material that is known and readily available, the initial guidelines indicated that the written description in the specification should contain information on the biological material to the extent available. This, according to the comment, could be construed as requiring an enormous amount of information.

Response:

This comment is well taken. Accordingly, new rule 1.201(b) would be proposed to require that the written description of the biological material should be sufficient to allow one of ordinary skill in the art to identify and obtain the publicly available material.

Comment:

The initial guidelines stated that material would be considered to be known and readily available if the biological material was known and accessible to those who would desire a sample to practice the invention. The comment indicated that the word "practice" implies a right to utilize the deposited materials and thus the invention. This right does not exist absent a license if the material is protected by a patent. Experimental use is not a right but rather an exception to a finding of infringement and thus subject to different burdens of proof. It was suggested that the word "test" be substituted for practice.

Response:

This suggestion would be adopted in new rule 1.201(b) since the concept of whether a biological material is known and readily available to the public is not determined on the basis of whether or not its manufacture, use or sale would infringe an existing patent.

Comment:

There is no statutory basis in U.S. law for supporting the position that availability of the biological material must extend beyond the enforceable life of a patent. To require otherwise is to inequitably place a patentee in a position that amounts to guaranteeing a supply of the "manufacturing facilities" to competitors at little or no cost and at a time when the competitors are free to use the deposited material without an accompanying benefit to the ex-patentee.

Response:

This provision finds specific basis in the decision of *Ex Parte Lundak,* and is based on one of the basic principles of the patent system - i.e. that a patent is an exclusionary right granted for a "limited" time and that the public is not excluded from practicing the invention once the patent expires. This does not mean that the patentee must be a perpetual supplier of the biological materials that may be necessary to practice the invention. However, it does mean that the patentee should not be permitted to place a limitation on the accessibility of the necessary biological material once the patent expires. As noted by the Court in *In re Metcalfe,* 410 F2d. 1378, 161 USPQ 789 (CCPA 1969) it is always possible that the practice of a given patented invention may become impossible because an essential material becomes unavailable due to a lack of raw materials, public disaster, or other occurrence not within the control of the patentee. The proposed regulations contemplate that the patentee would not control the availability of the biological material once the patent has expired.

Comment:

The phrase "known and readily available" should be in the disjunctive. There is no case regarding regular chemical inventions that chemicals used by an applicant need to be both known and readily available.

Response:

The phrase "known and readily available" was selected to indicate public accessibility to those wishing to test the biological material. A material may be known in the sense that its existence has been published, but is not available to those who wish to test that particular known biological material. In addition, a biological material may be available in the sense that those having possession of it would make it available upon request, but no one has been informed of its existence. Consequently, the concept of known and readily available is considered to accurately define the level of public accessibility to the biological material intended.

Comment:

An examination of the PTO policy statement on the deposit of biological materials suggests that the only safe procedure for satisfying the requirements of 35 U.S.C. 112 would be to require a deposit or to establish that the biological material is readily available in nature or can be obtained by some type of screening procedure. The other criteria set forth pertaining to "known and readily available to the public" did not appear to have sufficient safeguards for access during the term of the patent and after its expiration date.

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Response:

While there is clearly an element of risk involved in trying to preserve living matter over an extended period of time even with a deposit, the Office believes that where there is a sufficient indication that the biological material has reached a sufficient level of accessibility and availability for distribution which is intended to be captured by the concept of "known and readily available" the public interest has been served as necessary to support a patent grant. The incentives provided by the patent system should not be constrained by the possibility that a disclosure that was once enabling would become non-enabling over a period of time through no fault of the patentee. *In re Metcalfe*,.

Comment:

Several people made comments relative to the commercial availability of the biological material being an indicator that the material was known and readily available. Suggestions were made to substitute "applicant or applicant's assignee" for those relying on the availability of the biological material and to clarify the "patent holder's agent".

Response:

The PTO does not want to guess or be constrained by any particular business relationship that may be created to control accessibility of the biological material to the public. The concept was intended to embrace the situation where an applicant or a patentee before the Patent and Trademark Office relying on the public availability of the biological material through a commercial supplier is not likely to restrict access once the patent is granted.

Comment:

While some characterize the PTO's concern for commercial suppliers under the control of those relying on the availability of the biological material as almost insulting, others indicated that they could appreciate the PTO's concern when the patent holder controls commercial availability. One person suggested that a patent owner who tried to restrict access after a decision was made not to enforce the patent would run the risk that a disgruntled requester would seek treble damages anti-trust action based on patent misuse, or a requester might file a complaint with the FTC or the anti-trust division of the U.S. Department of Justice. Moreover, it was suggested that a disappointed requester could certainly notify the PTO of the incident which might result in a disciplinary proceeding against the patent counsel, and would certainly discredit subsequent attempts by the same patent owner to rely on an allegation of commercial availability. It was also suggested that it would be appropriate for the PTO to suggest one or more means by which a patent owner could provide acceptable assurance that the biological materials would remain available such as by deposit of a performance bond which would be forfeited if the biological material is not provided to a lawful customer upon tender of payment.

Response:

The PTO does not have the resources or expertise to engage in the type of enforcement procedures suggested in these comments. Further, there is clearly no evidence at this point in time to provide for the mere possibility that a commercial supplier may be motivated to eliminate or otherwise restrict access to the biological material once the patent is no longer enforceable or a decision is made not to enforce the patent.

The PTO will accept commercial availability as evidence that a biological material is known and readily available only when the evidence is clear and convincing that the public has unrestricted access to the material. A product could be commercially available but only at a price which effectively eliminates its accessibility to those desiring to obtain a sample. The relationship between an applicant relying on a biological material and the commercial supplier relied upon is simply one factor that would be considered in determining whether the biological material was known and readily available. However, the mere fact that the biological material is commercially available only through the patent holder or the patent holder's agents or assigns shall not by itself justify a finding of non-availability, absent reason to believe that access to the biological material would later be improperly restricted.

Comment:

Several comments were received directed to the use of printed publications providing evidence that the biological material is known and available to the public. It was suggested that the probative value of this type of evidence should depend not only on the number of publications but also the character and institutional affiliation of the publications. It was also suggested that foreign applicants would rightfully object to consideration of whether the publications are domestic or foreign. One comment stated that the concept of peer review should be eliminated and that inquiry be made into whether the publication policy of the journal makes references to the availability of cited material, and whether that policy is in fact enforced. Finally, it was indicated that it. was impractical to expect an applicant to provide a tally or comprehensive search of technical journals and patent literature to establish availability of biological materials.

Response:

The PTO does not believe that it is possible to list all the possible factors that might be considered relevant or how they would be weighed under any particular factual circumstances to determine whether a biological material is known and readily available to the public. However, it is considered appropriate to list exemplary factors that might be considered in determining the probative value of this type of evidence. There was no intent to discriminate between domestic and/or foreign applicants or publications, but the reference to domestic and foreign publications could be an indication of the scope of distribution of the biological material in question. Thus, publications in a single country, whether it be domestic or foreign to the United States, would suggest more limited distribution than references and publications of both domestic and foreign origin. Finally, there is no requirement to demonstrate that a biological material is known and readily available by any particular set of facts, but the PTO has provided some guidance in proposed rule 1.201(b) and associated text as to the variety of circumstances that an applicant may use to establish that a biological material is known and readily available to the public.

Comment:

The language pertaining to declarations of accessibility which indicate a preference for those who are not members of the same organization as applicants in the application should be deleted because it suggests a higher level of credibility attaches to the declaration of such an individual.

Response:

While it is recognized that the declaration executed by any declarant is subject to the same penalties under § 1001 of Title 18 of United States Code, it can be agreed that the evaluation of declarations should be based solely on their merit and not the organizational relationship between the inventor and the declarant. However, the preference was directed not to the credibility of the declarant, but whether accessibility was known beyond the confines of the organization of which both the applicant and the declarant were members. The knowledge might be compared to an uncataloged manuscript in a library that was distributed among the staff of an organization which included that library but was unknown to people outside that organization. Again, the mere fact that applicant and declarant were members of the same organization should not by itself justify a finding that the biological material in question is not known and readily available. Other factors such as the nature of the organization, distribution of the biological material, and procedures or mechanisms for access would also be considered.

Comment:

The meaning of the term "abundantly" as modifying the availability in nature of the biological material was not understood. It was pointed out that a rare microorganism might be readily obtained if a good screening procedure was available. It was also pointed out that it was not understood what is meant by evidence of being available in nature since a description in the patent of a precise geographic location should be sufficient because this is an instance when a deposit is not required.

Response:

These suggestions have been essentially adopted. As noted in one of the comments, the decision by the PTO Board of Patent Appeals and Interferences (Reinhardt, U.S. Patent 4,548,814) held that a description of the precise geographic location of Marine Tunicates used in the patent was adequate to satisfy the enablement requirement. However, use of the term "readily" to define availability is considered appropriate to define that degree of availability which would be reasonable under the circumstances. For example, when an applicant tried to rely on patent applications which had been opened for public inspection in Rhodesia, Panama and Luxembourg to fulfill the enabling requirement, the Court held that when no guide at all has been given in the application, an applicant must show that anyone skilled in the art would actually possess the requisite knowledge or would reasonably be expected to check the source which the applicant relies upon to complete his disclosure and would be able to locate the information with no more than reasonable diligence. In re *Howarth*, 210 USPQ 689 (CCPA 1981).

Comment:

It was suggested that there is no good reason why a previous deposit can be relied upon only when it is referred to in a United States patent or statutory invention registration as opposed to a foreign patent. One person went so far as to suggest that any reference to a microorganism deposited in one of the recognized depositories should be sufficient in and of itself.

Response:

Since the arrangement made with the depository is one between the depository and the depositor, the simple deposit of a biological material in a recognized depository is not sufficient in and of itself to satisfy the requirement of the biological material to be known and readily available. However, if the deposit has been accepted under the Budapest Treaty and made under conditions that all restrictions on its accessibility will be irrevocably removed upon the granting of the patent, whether the deposit is referenced in a United States or foreign patent document would not make any difference. However, there may be limitations on release of the biological materials that are permitted in other countries but which are not within the scope of the conditions accepted in the United States once the patent has been granted. Consequently, the mere reference in any document, be it a United States patent or a patent in a country foreign to the United States is not in and of itself sufficient to establish that it is known and readily available unless the deposit has been made under conditions which are consistent with those specified in these proposed rules.

Comment:

It would be very helpful if you included a statement to the effect that if a deposit meets the requirement of the Budapest Treaty, the Office will accept the deposit.

Response:

An explicit provision to this affect would be included in new rule 1.208(a). It would state that a deposit accepted in any depository under the Budapest Treaty shall be accepted for patent purposes if made under the conditions complying with 1.207(b)-that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. The additional requirement of 1.207(b) must be stated since the Budapest Treaty leaves to the national laws the specific provisions to obtain access to a sample after the patent has issued. The requirement to maintain a viable deposit of the biological material (1.204a) recognizes the public interest in the availability of the information and materials to make and use the claimed invention.

Comment:

The inventor of a biological invention should not be hostilily discriminated against by satisfying a higher burden to prove enablement but should instead be treated on the same basis as are all other applicants. The proposed guidelines should allow for and recognize that in many instances a deposit simply is not required.

Response:

There was no intent in the proposed guidelines nor in the proposed rules to alter in any way the standard of enablement required by 35 U.S.C. 112, first paragraph. The rules being considered by the PTO specifically indicate that a biological material need not be deposited if the written description is sufficient to meet the requirements of 35 U.S.C. 112 or if the biological material is known and readily available to the public or can be made or isolated in a reproducible manner from known and readily available materials. See new rules 1.202(a) and (b) being considered for proposal. In addition, it is specifically stated that the mere reference to a specific organism or other biological material in a specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit is required to be made. See new rule 1.201(c) being considered for proposal.

Comment:

Requiring that the deposits be made in an IDA is excessively burdensome, particularly to a small inventor and those academic institutions which generate in the course of a typical research program dozens or even hundreds of hybridomas which must then be deposited if the institution is to comply with PTO deposit guidelines. Depositing of biological materials (when required) at any location should be sufficient providing that the averments for appropriate access and supply of viable material can be made. The patentee has the most at stake in insuring that the deposit is maintained and available during the life of the patent. If the deposit is permanently lost, the patent will be lost also. The entire rationale for requiring an independent depositor is to remove the responsibility from the patentee and place it in the hands of an independent third party. If the depository is required to replace a strain if it becomes non-viable, it would appear that double depositing is necessary. The logical thing, according to one comment, is either to have the third party depository entirely responsible for the culture or to permit the depositor to maintain his own cultures.

Response:

The concept of an independent depository or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or an internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidently alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the free access to the biological material for any purpose once the term of the patent expires. Further, while the PTO is constrained to approve independent depositories other than an IDA, the PTO has neither the resources nor capability to assess the individual capability of any party that wishes to act as its own depository. The rules under consideration are intended to minimize depositories that will be found acceptable.

The concept of having an independent depository in addition to the requirement of the depositor to replace a culture which is no longer viable is based on the premise that the patent owner has an interest in maintaining the accessibility of the deposit during the enforceable life of the patent for its own protection, and has an obligation to the public to ensure access to that deposit during the period of enforceability so that a third party could test

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the biological material, and availability to the public after the patent expires. A patentee should not be able to intentionally convert a patented biological material to a trade secret merely because it was no longer interested or able to enforce the patent.

Comment:

A depository does not normally notify the depositor when his strains are supplied to third parties except under the Budapest Treaty. Does this mean we must now change our policy.

Response:

No.

Comment:

Several comments were received to the effect that due to the nature of deposits, and the ease with which harmful infringing acts can be practiced following access to deposited material, it is reasonable to require that minimum restrictions be made before a request for access to a deposit is satisfied. Such minimum restrictions should include (1) identification of the ultimate recipient and (2) an averrment that the ultimate recipient will not use the deposited materials for any uses which would infringe a valid claim and (3) a prohibition against transfer to third parties. The thrust of these arguments is that a patentee has a definite interest in knowing to whom the deposited material is being released and such restrictions would provide the patentee with some measure of protection against those who would unfairly profit from the required deposit. It was concluded that these provisions would not in any substantive way interfere with the purpose of a deposit under 35 U.S.C. 112 or the public disclosure function served by the patent system.

Response:

While the unique nature of a deposit in satisfying the enabling or other requirements of 35 U.S.C. 112 is recognized, every patent is required to place in the hands of those skilled in the art to which the invention pertains the information required to make and use the invention without undue experimentation. The PTO does not restrict or otherwise monitor the sale of other patent documents containing an enabling disclosure nor place any limits on the further disposition of patents that it sells. Consequently, there is no basis in the law for treating a patent directed to an invention requiring the use of a deposited biological material in any manner different from a patent which does not require a deposit. Patents not requiring a deposit may involve subject matter which is just as difficult to detect infringement as it may be where no deposit is required.

The PTO recognizes the unique nature of an invention which requires the deposit of a sample of a biological material as part of the disclosure, particularly as it relates to the attendant risks that the sample may be used in a way or location that would avoid infringement of the patent. The PTO, however, solicits comments on the advisability of and rationale for seeking a provision in the law that would permit the type of restrictions on access to a deposit after the patent issues that are recommended in the Apr. 8, 1987 WIPO report on the Industrial Property Protection of Biotechnological Inventions. These recommendations, on which we are seeking comment, were as follows:

> Samples shall be furnished only if the requesting party has undertaken vis-a-vis the owner of the patent on which the request is based, for the period during which the patent is in force:
> (i) not to make the deposited biological material or any biological material derived therefrom available to any third party;
> (ii) to use the deposited biological material or any biological material derived therefrom only for experimental purposes concerning the invention;
> (iii) not to export the deposited biological material or any biological material derived therefrom to any other country or, if the sample was obtained in the country where the depository institution is located and that country is not the country in or for which the patent on which the request was based has been granted, to any other country than the country in or for which the relevant patent has been granted;
> (iv) the requesting party shall have the burden of proof concerning compliance with the undertakings referred to in subparagraphs (i-iii); and
> (v) for the purposes above, any biological material shall be deemed to be derived from the deposited biological material if it is derived therefrom by culturing or in any other way of replication, provided that the derived matter still exhibits those characteristics of the deposited biological which are essential for the carrying out of the invention.

Comment:

The guidelines appear to ignore that the identification of ultimate recipient and limitations on further transfer are required in many cases under the export control laws administered by the Commerce Department. Depositories such as the ATCC regularly apply for licenses before releasing strains. It would appear entirely consistent, therefore, to allow depositors to require that requesters comply with the export control laws since the depository must do so in any event.

Response:

The rules being considered by the PTO require only that the depositor make the deposit under such conditions that all restrictions made by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. This condition does not affect laws or regulations that restrict access for public health or safety reasons.

Comment:

The requirement for the patentee to notify the depository promptly after issuance of the patent is unwise and unnecessary. One comment suggested that the use of the word "promptly" is vague and presents the opportunity for problems to arise. The provision was considered unnecessary because the depository releases the deposit when the requester provides the depository with a copy of the issued patent.

Response:

This provision has been removed from the rules being considered by the PTO. However, it should be noted (new rule 1.201(c) being considered for proposal) that the mere reference to a specific biological material in the specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit in accordance with Office policy has been made. A procedure is defined in new rule 1.207(c) being considered for proposal whereby the Office would certify whether a deposit has been made under conditions which make it available to the public as of the issue date of the patent grant.

Comment:

Some of the comments received on the requirement for a viability statement provide an adequate response to other comments received. For example, some comments indicated that there should be a presumption that the microorganism is alive and that such testing should not be required. On the other hand, one comment was received to the effect that we should be aware of the problem that material shipped to depositories which, presumably, was viable when shipped, is received and when tested is not viable. This is not uncommon at the ATCC. Another comment indicated that if a viability statement is required it should be done by the depository if the biological material is deposited in a public depository. Another comment indicated that this person was pleased that we have included the third party competent to test for viability option. In some cases tests for viability can require expertise which might not be available at a depository. This option could be very helpful.

Response:

Based on the evidence and comments received to date, the PTO is convinced that the requirement for a viability test is appropriate.

Comment:

A deposit for either the enforceable life of the patent or for the 30/5 years of the Budapest Treaty should be considered acceptable. While the Budapest Treaty is an executive agreement, and therefor cannot override any clear dictate of 35 U.S.C. 112, it seems presumptuous for an office of an executive department to adopt a policy which is contrary to that embodied in an executive agreement.

Response:

The period literally defined in the Budapest Treaty is considered acceptable for a deposit made under that Treaty. However, it is not difficult to imagine a situation where the period defined in the Budapest Treaty would not necessarily extend beyond the enforceable life of the patent. In the Board's decision in Ex *Parte Lundak*, it was noted that one of the basic principles of the patent system was that the public would not be prohibited from practicing the invention after the enforceable life of the patent. Implicit in that basic principle is the logic that a depositor should not be able to make a deposit under conditions that do not provide for storage beyond the enforceable life of the patent. Nor do we believe that the Budapest Treaty contemplated that the deposit would not be available while the patent is in force. The patentee need not be a guarantor of the availability of the deposited material after the enforceable life of the patent, but neither should the patentee be permitted to provide for storage only up to the date the patent expires.

Comment:

The requirement for corroboration goes beyond the holding in *Lundak*. The requirement is unprecedented in ex parte prosecution. The PTO has regularly accepted Rule 131 declarations without corroboration, and to require it in the deposit situation would be completely inconsistent. The guidelines also fail to address what would be sufficient corroboration.

Response:

The degree of corroboration required would depend on circumstances in the individual application. For a situation such as *Lundak* where a mistake was made relative to the presence of a deposit at the time of filing followed by a deposit within a week to ten days, a verified statement tracing the steps undertaken to deposit the biological material from the point of time of the filing date of the application to the actual deposit would be sufficient. It is the function of the description requirement to ensure that the subject matter that is later claimed in the patent was described in the application as originally filed. Consequently, an applicant who waits to make the deposit until sometime after the filing date of the application has the burden of showing that which is later deposited was the same biological material as existed and was described in the application as originally filed. Corroboration can take any form which is suitable to establish the fact, as opposed to a bare statement made on information and belief, that the deposited material is the same as that which existed as of the filing date of the application. If the material was viable and capable of reproduction as of the time of deposit, the verified statement should indicate that the material was viable and capable of reproduction as of the filing date.

Comment:

It would seem that the two month formalities notice under Ex Parte *Quayle* would be appropriately used in instances where an application is allowable but assurance of public accessibility has not yet been made. There is no statutory authority for setting a three month period for response which would not be extendable upon payment of the appropriate fee.

Response:

The PTO believes that once the issue of deposits has been either resolved or is in dispute, no additional time should be necessary. The basic concern is an adverse impact on pendency and disclosure to the public for no apparent reason. If an applicant is going to dispute the necessity of a deposit or the conditions under which it is made, then an appropriate appeal can be taken on that issue. If applicant agrees that a deposit is necessary, the three month period to pay the issue fee is considered adequate to get that job done. Nevertheless, provision has been made in new rule 1.208(c) being considered for proposal for an extension of time under 37 CFR 1.136.

Comment:

There should be more specific guidelines as to the form of assurances that will be accepted for making an appropriate deposit. An averment by the applicant, assignee or attorney, in papers submitted during pendency of the application should be acceptable to the PTO. Deceit by such applicant, attorney or assignee should be dealt with in the same manner as deceit in conventional chemical cases.

Response:

The Office will accept any assurance made in the record with the intent that the PTO rely on applicant to fulfill the deposit requirement as set forth in these proposed rules. The PTO will ensure that applicants have filed a statement that all conditions have been satisfied before the application is allowed to become a patent.

Comment:

The PTO policy and guidelines should not make statements or predictions as to burden of proof during enforcement or other actions in a court of law. The indication that the burden of proof to establish an identity between the replaced sample and the original deposit may be on those seeking to enforce the patent outside the PTO goes against a statutory presumption of validity.

Response:

The rules being considered by the PTO are limited to the presumption that the PTO will make in any proceeding involving the patent before the PTO.

Comment:

It has been suggested that the procedure to be followed when biological material becomes unavailable be separate from the rest of the paragraph dealing with replacement deposits so that these separate situations are not viewed as one. For example, cessation of availability of biological material not previously deposited can result from, for example, the bankruptcy of the sole commercial supplier of the material. Under such circumstance, a deposit of no longer readily available material would be required.

Response:

Since the necessity or desirability of replacing a deposit may arise from a number of circumstances, the PTO does not consider it appropriate to define separate rules or procedures for making a replacement under each circumstance. The rules being considered by the PTO are limited to a replacement right only for the original depositor. As one comment observed, the law on property rights in biological materials is somewhat unclear at this time and redeposit by a party other than the original depositor might be considered an act of conversion, depending on the precise circumstances. Moreover, the PTO has indicated an intention of applying a rebuttable presumption that once a biological material has been deposited for the term and under conditions specified in these rules under consideration by the PTO, the biological material deposited would be considered to be known and readily available to the public.

Comment:

The guidelines are unclear as to the ability to obtain the benefit of a foreign priority date. Apparently, the PTO is aware that *Lundak* held that 35 U.S.C. 112 requires that a deposit be made and a reference added to the specification before the U.S. patent issues Thus, 35 U.S.C. 119 affords the benefit of the priority date even if the priority document fails to mention a deposit and even if a deposit had not been made.

Response:

The PTO will follow the same procedures for handling a claim for foreign priority in all applications. The examiner will acknowledge a claim for foreign priority when all formal requirements are met and will not consider the merits of an applicant's claim of priority unless a reference is found with an effective date between the date of foreign filing and the date of filing in the United States or when an interference situation is under consideration. Where the merits of a claim for priority need to be determined, the examiner will follow the guidelines in

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Section 201.15 of the Manual of Patent Examining Procedure in making that determination. It must also be emphasized that applicants may not be granted priority in applications filed in countries foreign to the United States if they fail to make a deposit in a permanent depository acceptable to that foreign country before the filing date of the application in the United States.

Comment:

If a deposit is found to be contaminated, what option does a depositor have? Can the deposit be replaced and the original deposit date be retained?

Response:

If a deposit can still be considered to be viable, even though contaminated, the rules being considered by the PTO would not permit replacement of the original deposit. While there may be an appropriate mechanism for substitution of a deposit number in an existing application, the original deposit, even though contaminated, would provide the best evidence of whatever it was that was originally deposited and should be preserved.

Comment:

If a deposit does not produce the product for which it was deposited (antibiotic, for instance), what option does a depositor have? Can the deposit be replaced and the original date retained?

Response:

Any deposit which is made in accordance with the rules being considered by the PTO would have only a viability statement associated with it. There is absolutely no proof that the material originally deposited was capable of producing the product for which it was deposited. While it's clearly in the interest of the public to have a deposit available to it which is capable of making the product for which it was deposited, the destruction or replacement of the best evidence of what was originally deposited should not be lost if made in association with an existing patent. Perhaps the depositories should consider preservation of samples of the original deposit in conjunction with a deposit which is neither contaminated nor incapable of producing the product for which it was deposited.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

June 19, 1987.

[1082 OG 47]

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(133) **Plant Life — Patentable Subject Matter**

The decision by the Board of Patent Appeals and Interferences in Ex Parte Hibberd (Sept. 18, 1985) held that the Plant Patent Act (35 USC 161–164) and the Plant Variety Protection Act (7 USC 2321 et seq.) do not represent the exclusive forms of protection for plant life covered by these acts, and that there is no irreconcilable conflict between these plant-specific statutes and 35 USC 101. It is clear from the Board decision that plant life is not excluded from patent protection under 35 USC 101.

Accordingly, the Patent and Trademark Office is now examining applications including claims to plant life — e.g., plants per se, seeds, plant parts. To the extent that the claimed subject matter is directed to a "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980)), such claims will not be rejected under 35 USC 101 as being directed to unpatentable subject matter.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks—Designate.

Oct. 8, 1985.

[1060 OG 4]

(134) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 21001–201]

File Wrapper Continuing Application Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases to provide a new procedure for filing continuation, continuation-in-part, and divisional patent applications. This procedure is being provided to simplify filing and processing of continuation, continuation-in-part and divisional patent applications which have heretofore required a new set of application papers. By using the application which is to be abandoned, the procedure will eliminate many of the problems currently involved in preparing and processing such continuing patent application papers.
Effective Date: Feb. 27, 1983.
For Further Information Contact: Mr. Louis O. Maassel by telephone at (703) 557–3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office is amending the rules of practice for patent cases to permit an applicant to file a continuation or division of a pending patent application by simply filing a request therefor and paying the necessary application filing fee. To file a continuation-in-part application, an amendment adding the additional subject matter and an oath or declaration relating thereto is also required.

The "file wrapper continuing" (FWC) procedure is incorporated in the rules by adding a new §1.62. Under this simplified procedure, any continuing application such as a continuation, continuation-in-part, or divisional application may be filed by using the papers in the copending prior application, which application will become automatically expressly abandoned. Under the FWC procedure, a new serial number is assigned and the specification, drawings and other papers in the parent application file wrapper are used as the papers in the continuing application. Changes in inventorship may be made. The "file wrapper continuing" (FWC) procedure is available for utility, design, plant, and reissue applications to the full extent that continuing applications can now be filed in such applications. Use of the FWC procedure will automatically result in express abandonment of the prior application as of the date that the continuation, continuation-in-part, or divisional application is filed.

The FWC procedure could be used for any continuation, continuation-in-part or divisional application provided the applicant wishes the copending prior application to become abandoned. If a divisional application is desired without abandonment of the parent application, the procedure under §1.60 should be used. Applicant also has the option of filing new application papers with a reexecuted oath or declaration.

Background

The notice of proposed rulemaking was published in the Federal Register on Nov. 7, 1980 at 45 FR 73965 and in the Official Gazette on Dec. 9, 1980 at 1003 O.G. 9. An oral hearing was held on Feb. 4, 1981.

Discussion of Major Issue Involved

A continuation or divisional application is an application in which the disclosure is identical to an earlier application. However, the claims may be changed. Continuation applications are often filed in situations where the applicant feels that the issue of patentability has not been satisfactorily resolved before the examiner and the application is not in condition for an appeal from the final rejection to the Board of Appeals. Divisional applications are filed voluntarily or as a result of a requirement for restriction by the examiner in a prior application. Continuation-in-part applications are filed where additional subject matter is added and claimed in the application. Under 35 U.S.C. 120 of the patent law, a continuation, continuation-in-part or divisional application may be filed during the pendency of the prior application and the benefit of the filing date of the prior application for the subject matter disclosed therein may be obtained.

The practice under §1.60 has resulted in a number of problems, especially difficulties in obtaining good-quality copies of prior applications. In addition, the practice involves unnecessary handling and processing delays.

Under new §1.62, the specification, claims and drawings, and any amendments in the prior application are made available for use in the continuation, continuation-in-part, or divisional application. A new filing fee is required in accordance with 35 U.S.C. 41 and 37 CFR 1.16. The only other statutory requirement under 35 U.S.C. 111 is a signed oath or declaration. Since a continuation or divisional application cannot contain new matter, the oath or declaration filed in the prior application would supply all the information required under the statute and rules to have a complete application and to obtain a filing date. Accordingly, the previously-filed oath or declaration will be considered to be the oath or declaration of the §1.62 continuation or division. However, if a continuation-in-part application is being filed, or a correction of inventorship is being made, then a new oath or declaration must be signed and filed by the applicant.

The original disclosure of an application filed under §1.62 will be the original parent application as executed by the inventor(s). However, the filing fee will be based on the claims in the §1.62 application after entry of any unentered amendments under §1.116 in the prior application and any preliminary amendment which may accompany the FWC request and filing fee. The Certificate of Mailing Procedure under 37 CFR 1.8 will not apply to filing a request for a "File Wrapper Continuing" application since the filing of such a request is considered to be a filing of application papers for the purpose of obtaining an application filing date (37 CFR 1.8(a)(i)).

The applicant may file a signed FWC request and the regular filing fee under §1.16 and other necessary papers with the Patent and Trademark Office, either by mail addressed to "Box FWC" or in person with the mail room. An individual check or deposit account authorization should accompany each FWC application, since combined checks delay processing.

The Correspondence and Mail Division will sort out all "Box FWC" envelopes upon receipt and deliver them to a reader for prompt special handling. The reader would apply the "Mail Room" date stamp and mark the categories of the fees. The papers for each FWC application would be assigned a regular national serial number and be placed in a "Jumbo" size file wrapper. The Special Handling Branch will review the FWC request for accuracy and completeness and assign the filing date if everything appears to be in order. Problems will be handled, insofar as possible, by calling the applicant or attorney by telephone. There will be no need for any processing of the FWC application by the Classification or Examination Branches of Application Division since there are no papers to be examined and the FWC application will be routed to the group assigned the prior application. When the FWC application file wrapper is received in the examining group, the parent application will be promptly obtained and processed by a clerical staff member.

All of the correspondence from the Office in a FWC application will refer to the FWC application serial number and filing date and will be processed in the same manner as any other continuation, continuation-in-part or divisional application. The first action final rejection procedures set forth in §706.07(b) of the Manual of Patent Examining Procedure will also apply to FWC applications filed under §1.62.

The PALM III system will supply information to authorized persons as to the location of the parent application file wrapper and will tie the parent application number to the FWC application number.

The provisions of §1.62 provide that if any application in the file wrapper is available to the public that all applications in the file wrapper will be available to the public.

Some of the anticipated benefits of the new §1.62 procedure are the following:

For the Applicant

1. Formal requirements will be minimal.
2. A more prompt first action in the continuing application should be received in view of reduced processing time. The Application Division can process promptly all §1.62 applications with minimal effort. In the examining groups, the applications will be given high priority for processing purposes.
3. Amendments made to the specification, drawings and claims of the prior application will carry over into the §1.62 continuing application and will not need to be reubmitted in the continuing application.

For the Public

1. The pendency of a series of applications should be reduced since the time delay before examination and issuance of a continuing application filed under the §1.62 procedure would be reduced.
2. The entire record of prosecution could be in one file wrapper under the §1.62 procedure, even if several continuing applications are filed. This will result in easier access by the public to a series of applications if a patent is later issued.

For the Patent and Trademark Office

1. The workload of reviewing and processing new application papers in the Application Division will be reduced.
2. The examining group clerks will not be required to again enter amendments made in the prior application.
3. Less storage space will be required under §1.62 since there will be fewer papers to store.
4. The prior application file history and references cited therein will be readily available to the examiner under §1.62 and will not need to be ordered from abandoned files.
5. The Office will not be required to prepare a copy of the prior application file under the §1.62 procedure.

Discussion of Comments Received

After careful consideration of the comments which have been received, the proposed rulemaking relating to file wrapper continuing application procedure is being adopted with certain changes. A total of 23 comment letters were received. Six of these letters were received from patent law organizations. Two persons presented oral comments at the hearing. The comments of 6 letters supported the proposed rulemaking without further suggestions for change. Only one letter opposed the proposal.

Seven of the letters urged adoption of a procedure whereby an applicant could pay a fee to have a final rejection withdrawn so that prosecution could be extended in an application rather than filing a continuing application. This suggestion was not adopted for several reasons. Such a procedure could not be used for filing of continuation-in-part applications, the average pendency of applications in the Office would be extended, and significant problems in internal record systems would be created.

A number of comments were received which presented specific suggestions to proposed §1.62. Four letters commented that the requirement of proposed §1.62(a)(4) to supply information as to title, applicant, correspon-

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dence address, etc. in order to file under §1.62 could easily lead to filing errors.

In final §1.62(a)(3) only the serial number, filing date and applicant's name of the prior application are required. The filing of information relating to the title, applicant's name, etc. is however urged in paragraph (e) of final §1.62 and is needed to prepare Office records and the filing receipt.

One comment letter was received which indicated that a specific reference should be made to unentered amendments filed under 37 CFR 1.116. Such a reference has been added to paragraph (a)(2) of §1.62.

Two letters objected to the requirement in proposed §1.62(a)(2) that a new set of claims be presented. This requirement has been deleted from final §1.62.

A number of general comments were also presented relating to §1.62. One comment argued that the proposed practice would encourage abuse by examiners of the second action final rejection practice. In response to this argument, it is felt that the proposed procedure would not create any new problems.

One comment indicated that problems involving access to the file wrapper may arise. It is felt, however, that access problems should not arise in view of paragraph (c) of final §1.62 which relates to waiver of secrecy. The current PALM III computer record system is capable of indicating the location of both the prior and continuing applications.

One comment was received relating to proposed §1.138 which indicated that the reference to §1.60 was confusing. The reference to §1.60 has been deleted in final§1.138.

New §1.62 sets forth the requirements of the file wrapper continuing procedure.

Section §1.138 is amended so that a registered attorney or agent could, without being of record, file a §1.62 application and expressly abandon a pending prior application. Such an action would not affect applicant's rights to any great extent since the prior application would only be expressly abandoned if a filing date was granted to a continuing application.

Other Considerations

Environmental, Energy, and Other Considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980(44 U.S.C. 3501 et seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities because it adds no burdens and does simplify filing procedures (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to preparing application papers and amendments, will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

Sept. 30, 1982. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[FR Doc. 82-29283 Filed 10-23-82; 8:45 am]
BILLING CODE 3510-16-M

[1024 O.G. 59]

(135) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1

Reissue, Reexamination, Protest and Examination Procedures in Patent Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases (1) to eliminate consideration of the so-called "no defect" reissue applications, (2) to limit the participation by protestors during the examination of patent applications, (3) to reject and permit appeal to the Board of Appeals for failure to comply with the duty of disclosure rather than striking applications without appeal rights, and (4) to clarify the interface between patent application examination and patent reexamination in certain areas. These changes are intended to (1) reduce the prosecution costs of patent applicants, and (2) permit some of the Patent and Trademark Office resources now devoted to consideration of the so-called "no defect" reissue applications, and to extensive participation by protestors during application examination, to be directed toward reduction of the backlog of pending patent applications. The changes are also intended to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. The rule changes are further intended to clarify the interface between the duty of disclosure during patent application examination and the duty of disclosure during patent reexamination, as well as the treatment of concurrent reissue and reexamination proceedings on the same patent.
Effective Date: July 1, 1982.
For Further Information Contact: Mr. R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the Federal Register on Nov. 10, 1981, at 46 FR 55666–55672 and in the Official Gazette on Dec. 8, 1981, at 1013 O.G. 19-25. An oral hearing was held on Feb. 4, 1982. Forty-two written letters and statements were submitted. Fourteen persons testified at the oral hearing which resulted in 113 pages of testimony. Consideration was also given to the comments presented at the oral hearing on Apr. 16, 1981, relating to the proposed rules for implementing patent reexamination.

Objectives of Rule Change

The rule change is designed to adopt and implement suggestions from members of the public for changes in patent examination practice considered desirable in light of the implementation of statutory patent reexamination, contained in Public Law 96–517. Many of the persons who commented in writing and at the hearing held on Apr. 16, 1981, on the proposed rules for implementing patent reexamination favored modification of patent examination rules as amended herein. This rule change is designed to implement the suggestions received and, in particular, to reduce the prosecution costs of patent applicants by limiting the amount of participation by protestors during the patent application examination process.

The rule change also seeks to reduce the amount of time required by the Patent and Trademark Office to examine protested applications by limiting protestor participation. The technical expertise of the Patent and Trademark Office will continue to be available to make determinations of patentability on the basis of prior art and related facts on an ex parte basis. However, the patent examiners in the Office are not trained as hearing examiners and have no substantial experience in handling inter partes matters. Under the rule change, protestor participation will be limited to the filing of papers in opposition to the grant of a patent with no Office communications to the protestor resulting therefrom beyond an acknowledgment of receipt of a protest or petition to strike in reissue applications. The opportunity to comment on Office actions and applicants' responses is eliminated. The rule change also intends to accomplish these purposes by eliminating the consideration of reissue applications not initially presented to correct defects pursuant to 35 U.S.C. 251.

The rule change is also designed to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. This is accomplished by amending §1.56(d) to provide that the claims in an application be rejected if upon examination pursuant to 35 U.S.C. 131 and 132 it is found that applicant is not "entitled to a patent under the law" because of fraud or a violation of the duty of disclosure. The rejection would be made under the same conditions and circumstances previously used to strike an application, i.e., "clear and convincing evidence" of fraud or any violation of the duty of disclosure through bad faith or gross negligence. The statute, 35 U.S.C. 131, provides for examination of an application "and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent * * *" Section 132 of Title 35, United States Code, makes provision for the rejection of a claim for a patent as a result of the examination directed by 35 U.S.C. 131. While questions of fraud and violations of the duty of disclosure have historically been dealt with by the Commissioner through the mechanism of striking the affected application, there is no statutory requirement that the Commissioner act in that manner. Clearly the Commissioner can choose how, and by whom, the examination directed by 35 U.S.C. 131 can be made. 35 U.S.C. 132 authorizes a rejection in those circumstances where applicant is not "entitled to a patent under the law." The rule change simply modifies the mechanism and procedures which the Commissioner will use where the applicant is not "entitled to a patent under the law" because of failures to comply with §1.56(d).

The rule change is also designed to clarify the interface between patent application examination and patent reexamination in certain areas. The two areas involved are duty of disclosure and concurrent proceedings involving a patent under reexamination and for which a reissue application has been filed.

Sections 1.56, 1.106, 1.175, 1.193, 1.291, 1.555, 1.565, and 1.570 are amended to accomplish the purpose indicated above.

Discussion of Specific Rules

Access and Publication of Reissue Applications

The changes proposed in §1.11 are not being adopted since only one of the twenty-two comments favored the changes.

The publication of notices of the filing of reissues and provisions for public access to reissues will therefore continue as at present. Such publication eliminates the need for interested members of the public to periodically monitor the patent files to determine if a reissue application has been filed.

Amendments to §1.56

A large majority of the comments supported the amendments to §1.56. A number of comments questioned the advisability of having relatively inexperienced or non-attorney examiners handle questions of fraud or violation of the duty of disclosure. In response thereto, the amendments to the rule do not require that such questions be handled by the examiner who examines the application for questions of obviousness, enablement, etc. The Office presently plans to have questions of possible fraud or violation of the duty of disclosure examined by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Several comments suggested that the provisions for striking an application pursuant to existing paragraph (c) of §1.56 are inconsistent with the rejection for fraud or violation of the duty of disclosure contemplated in the amendment to paragraph (d). In response thereto, it is pointed out that paragraph (c) of §1.56 makes striking of the application discretionary with the Commissioner. It is thus more appropriate to retain this authority to strike the application in appropriate circumstances rather than to make it subject to a rejection. No inconsistency is seen between the different routes under paragraphs (c) and (d) of §1.56. Several comments were received indicating concern about the possible delay of a decision by the Board of Appeals pending consideration of a fraud or duty of disclosure question. In response to these concerns, it is pointed out that less time overall will be required by having the Board of Appeals consider the matter once rather than in a series of separate decisions. Further, expense to the applicant will be minimized by one appeal rather than two. The amendments to §1.56 are adopted as proposed except for some clarifying changes in paragraph (g).

Section 1.56 is amended by revising the title and paragraph (d), and by adding new paragraphs (e) through (i). The revision to the title and paragraph (d) provides for the rejection of claims upon examination pursuant to 35 U.S.C. 131 and 132 on the ground that applicant is not entitled to a patent under the law if it is established by clear and convincing evidence (1) that any fraud was practiced or attempted on the Office in connection with the application, or in connection with any previous application upon which the application relies, or (2) that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the application, or in connection with any previous application upon which the application relies. Under amended paragraph (d), any rejection which would be made would include all the claims in the application.

The standards to be used in rejecting the claims under paragraph (d) as amended, would be the same as those utilized by the Commissioner in striking applications pursuant to present paragraph (d), i.e., clear and convincing evidence of fraud or any violation of the duty of disclosure through bad faith or gross negligence. Consistent with present practice, the revision of paragraph (d) looks to fraud or a violation of the duty of disclosure through bad faith or gross negligence with relation to the application under consideration or any previous application upon which the application relies.

The phrase "in connection with the application" is construed in the same manner as in the present unamended paragraph (d). For purposes of this section, a reexamination proceeding on a patent would be considered as being "in connection with the application" insofar as consideration of any subsequent reissue application is concerned. The phrase also includes within its scope the mere refiling of the subject matter of an application in another application without relying in the second application upon the first application. Thus, an appropriate rejection upon examination pursuant to 35 U.S.C. 131 and 132 based on conduct or actions proscribed by §1.56(d) could not be avoided merely by refiling the subject matter of the appli

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cation in a second or subsequent application which did not rely upon the earlier application. The phrase "in connection with any previous application upon which the application relies" is intended to include all applications upon which the application under consideration relies, either directly or indirectly. For example, an application to reissue a patent obviously relies upon the application which resulted in the patent sought to be reissued. Likewise, continuation applications, continuation-in-part applications, and divisional applications also rely upon one or more parent applications.

New paragraph (e) of §1.56 normally delays the examination of an application for compliance with paragraph (d) of §1.56 until such time as (1) all other matters are resolved, or (2) appellant's reply brief pursuant to §1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals, at which time the appeal will be suspended for examination pursuant to paragraph (d) of this section. Present plans are to have this examination on the question of fraud or violation of the duty of disclosure conducted by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Paragraph (e), as added, would thus permit the resolution of issues arising under §1.56(d) to be delayed until consideration of such issues is necessary and appropriate. The practice under new paragraph (e) is generally consistent with present practice under paragraph (d) which normally delays the substantive resolution of fraud and duty of disclosure issues until other issues have been resolved in favor of applicant. Under new paragraph (e) an appeal would be suspended for examination pursuant to amended paragraph (d) of §1.56 once appellant's reply brief pursuant to §1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals. If no questions of possible violation of §1.56 are raised or evident on the record before the examiner, no examination for compliance with paragraph (d) of §1.56 will be undertaken. New paragraph (e) provides for the reopening of prosecution of the application to the extent necessary to conduct the examination pursuant to amended paragraph (d) of §1.56 including any appeal pursuant to §1.191. New paragraph (e) also indicates that where an appeal has already been filed based on a rejection on other grounds, any further rejection under amended paragraph (d) will be treated in accordance with amended §1.193(c).

New paragraph (f) continues the present long standing practice whereby any member of the public can file a petition to strike an application from the files pursuant to paragraph (c) of §1.56. Such petitions are currently being filed without specific mention in §1.56. Under revised§1.56 petitions to strike an application for a violation of §1.56 are limited to violations of paragraph (c), with any violations of paragraph (d) being subject matter for rejection under paragraph (d). New paragraph (f) requires that any such petition alleging a violation of paragraph (c) which is entered in the application file must: (1) Be timely filed, (2) specifically identify the application to which the petition is directed, and (3) be served on the applicant or be filed with the Office in duplicate in the event service is not possible. New paragraph (f) does not specifically limit a "timely petition" to any particular point in the examination of the application. Such petitions will generally be considered "timely" if they are filed before final rejection or allowance of the application by the examiner. Whether or not a petition filed after final rejection or allowance of the application by the examiner is considered "timely" will depend upon the circumstances and the point in the prosecution at which the petition is submitted.

New paragraph (f) requires that the petition specifically identify the application to which the petition is directed. While an identification by application serial number is not essential, the identification must include enough specificity that the Office can determine with certainty the application to which the petition is directed. Paragraph (f) requires service of the petition on the applicant, or a duplicate copy in the event service is not possible, before the petition will be entered. While the Office might, in some circumstances, reproduce and serve a petition on the applicant, a member of the public would have no assurance that this would be done and, under paragraph (f), could not rely upon the Office doing so. Paragraph (f) also requires that any petition filed by an attorney or agent comply with §1.346.

New paragraph (g) of §1.56 assures a member of the public that a petition to strike an application for violation of paragraph (c) of §1.56 which meets the requirements of paragraph (f) will be considered by the Office. Language has been added to conform to additional language in §1.291(c). The Office will send petitioner an acknowledgment of the entry of a petition to strike in a reissue application file. However, the Office will not communicate with the member of the public filing such a petition in non-reissue applications, except for the return of any self-addressed postcard which was enclosed which merely acknowledges receipt of the petition. The member of the public filing the petition will not be permitted to contact the Office as to the disposition, or status, of the petition, or to participate in any Office proceedings relating to the petition. No further papers will be acknowledged or considered unless they raise new issues which could not have been earlier presented and thereby constitute a new proper petition. Mere arguments relating to the Office's decision on the petition or applicant's response to the petition would not qualify as a new proper petition. The disposition of the petition, once one has been filed, will, under paragraph (g), be an ex parte matter between the Office and the applicant. Paragraph (g) provides for communication by the Office with the applicant regarding a petition to strike the application which has been entered in the application file. Under new paragraph (g) the applicant could be required by the Office to respond to the petition. Any such response would be ex parte and would not be served on the member of the public filing the petition.

New paragraph (h) of §1.56 provides that any member of the public may seek to have the claims in an application rejected pursuant to the amended paragraph (d) of §1.56 by filing a timely protest in accordance with §1.291. New paragraph (h) also requires that any such protest filed by an attorney or agent seeking a rejection of claims pursuant to amended paragraph (d) of §1.56 must be in compliance with §1.346. One comment suggested that the last sentence of paragraph (h) is redundant since §1.346 applies without any specific mention. After careful consideration of the comment the sentence is being retained in order to emphasize and remind attorneys and agents of the obligations imposed by §1.346.

New paragraph (i) provides for the Office requiring the applicant to supply information pursuant to paragraph (a) of §1.56 in order for the Office to decide any issues relating to paragraphs (c) and (d) of §1.56, whether or not such issues arise as a result of a petition or a protest, or arise from other sources, e.g., an examiner discovering the issue while studying the application file. Any requirements for information under new paragraph (i) will be ex parte in nature between the Office and the applicant. The ex parte nature of the requirements for information under new paragraph (i) differs from past practice under which information was required, or requested, from applicant and one or more petitioners or protestors in some cases.

Rejection of Claims

Five comments were submitted relating to new paragraph (c) of §1.106. Two of the comments favored the paragraph as written and three recommended modification or clarification of the paragraph to ensure that it is not inconsistent with *In re Ruff, et al.*, 45 CCPA 1037, 118 USPQ 340 (CCPA 1958), and subsequent decisions. No modification or clarification of the paragraph is considered necessary since the intent of the paragraph was not to change current practice, but was merely to emphasize the importance placed on admissions and to make §1.106 more closely reflect current practice, which includes practice following *In re Ruff, et al.*, and subsequent decisions. The amendments to §1.106 are adopted as proposed.

Section 1.106 is amended to include a new paragraph (c) which emphasizes the importance placed on admissions by the applicant or the patent owner in a reexamination proceeding insofar as matters affecting patentability are concerned. Paragraph (c) includes a reference to the use of rejections based upon facts within the knowledge of the examiner as provided in §1.107. Paragraph (c) does not constitute a change in practice, but does result in §1.106 more closely reflecting current practice.

Reissue Oath or Declaration

Ten persons commented on §1.175. Four comments were received in support of the proposed change. Three of these favorable comments were from patent law groups. Of the six comments received opposing the change, two were from patent law groups. Eleven comments received at the Apr. 16, 1981, hearing on reexamination argued for retraction of the "Dann Amendments" which included §1.175(a)(4). Four comments at the Apr. 16, 1981, hearing favored retaining the "Dann Amendments". The arguments supporting the change were generally that paragraph (a)(4) was not necessary in view of the new reexamination procedure. The arguments opposing the deletion were generally that an inter partes practice before the Office is desirable from the standpoint of the judiciary and for a complete resolution of issues. After careful consideration of all of the arguments and the resources available in the Patent and Trademark Office, it is felt that the practice under paragraph (a)(4) of §1.175 should be discontinued and paragraph (a)(4) should be cancelled.

The numbering of paragraphs (a)(5) and (6) is not being changed. Proposed paragraph 1.175(a)(6) is being adopted as new paragraph 1.175(a)(7). The proposed wording is otherwise being adopted without change.

Amended §1.175 eliminates paragraph (a)(4). Under paragraph (a)(4), the Office gave advisory opinions on patentability over additional prior art without any changes in the patent claims. The courts have generally refused to give preclusive effect to these advisory opinions. See *PIC, Inc.* v. *Prescon Corp.*, 485 F. Supp. 1302, 205 USPQ 228 (D. Del. 1980), and *Rohm and Haas Co.* v. *Mobil Oil Corp.*, 525 F. Supp. 1298, 212 USPQ 354 (D. Del. 1981). Accordingly, in view of the implementation of patent reexamination pursuant to Pub. L. 96-517 it is appropriate to discontinue the advisory opinions provided pursuant to §1.175(a)(4). Under amended §1.175 an applicant for reissue of a patent will be required to file with the reissue application a statement under oath or declaration specifically averring a defect in the patent, e.g., "a defective specification or drawing," or an excess or insufficiency in the claims. Amended §1.175 also requires, in paragraphs (a)(5) and (a)(6), that applicant specify "errors" as opposed to "what might be deemed to be errors." Amended §1.175 effectively eliminates Office consideration of the merits of "no defect" reissue applications since any such "no defect" reissue applications filed after July 1, 1982, the effective date of the changes to §1.175, will not be examined as to questions of patentability. In addition, §1.175(a)(7) has been added to parallel the provisions in §1.65 requiring the same acknowledgment of the duty of disclosure in the oath or declaration of reissue applications as in the case of non-reissue applications.

Delay in Examination of Reissue Applications

Six comments were received relative to the proposed changes in §1.176. One comment supported, and five comments opposed, deleting the two month waiting period before action could be taken by an examiner in a reissue application. The opposing comments favored retaining the two month period to provide an opportunity for interested parties to submit information relating to the examination of a reissue application after notice of the filing thereof has been published in the Official Gazette. Since the notices under §1.11 will continue to be published, no need is seen to change §1.176. The proposed change is therefore not adopted.

Examiner's Answer

Only one comment was made relating to the proposed addition of paragraph (c) to §1.193. It suggested including a minimum time period for response in the rule. This suggestion was not adopted because in some circumstances it may be appropriate to set a shorter or a longer period for the reply brief. The amendments to §1.193 are adopted as proposed.

Paragraph (c) adds to §1.193 a provision that any decision rejecting claims pursuant to §1.56(d) in an application already on appeal from a rejection based on other grounds shall constitute a supplemental examiner's answer introducing a new ground of rejection and removing the suspension of the appeal introduced pursuant to §1.56(e). Prior to entering any such supplemental examiner's answer under paragaph (c), the Office may require information from applicant pursuant to paragraph (i) of §1.56. Under paragraph (c) of §1.193, the appellant may file a reply to the supplemental examiner's answer. Paragraph (c) provides that the appellant's reply to the supplemental examiner's answer will be considered and responded to as necessary with appellant being provided with an additional month, or such other time as may be set, within which to reply to any such response from the Office. After introduction of a supplemental examiner's answer pursuant to paragraph (c) and any replies and response thereto, the application will be forwarded to the Board of Appeals for consideration.

Protests by the Public Against Pending Applications

Fifteen persons commented on the proposed amendment of §1.291. Two persons suggested that protests be acknowledged by more than the return of a self-addressed postcard. The suggestion has been adopted to the extent of providing for an acknowledgment of the entry of a protest in a reissue application file to be sent to the member of the public filing the protest. The suggestion has not been adopted insofar as original applications are concerned since these applications are generally required to be kept in confidence under 35 U.S.C. 122. Further, the use of return postcards is an established method of receiving acknowledgment from the Office that a paper has been filed. By merely returning the postcard to a protestor in an application for an original patent and directing Office initiated communications solely to applicant, the amount of Office resources required will be minimized.

Several persons commented that the protest proceeding should be more inter partes. The weight of the comments received at the hearings held on Apr. 16, 1981, and Feb. 4, 1982, and in writing, favored ex parte proceedings. To ensure that the proceedings are essentially ex parte, a sentence is being added to paragraph (c) of § 1.291, indicating that active participation by a member of public ends with the filing of the protest. To retain the inter partes nature of the protest would be contrary to the majority of the comments received and to one of the major purposes of the rule change, i.e., to reduce the amount of time spent by the Office in examining protested applications. The amendments to paragraphs (a) and (b) of §1.291 are adopted as proposed and paragraph (c) is being revised as indicated above.

Amended §1.291 continues to permit protests by the public against pending original and reissue applications. The protest may include any grounds which the member of the public filing the protest believes to be applicable.

Amended paragraph (a) of §1.291 provides for entry of a protest in the application file if the protest specifically identifies the application, is timely submitted, and is either served upon the applicant in accordance with §1.248, or filed with the Office in duplicate, in the event service is not possible. The comments made above in the

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discussion of new paragraph (f) of §1.56 regarding the timeliness of the filing or submission, specific identification of the application, and service on the applicant, are also applicable to the amendments of paragraph (a) of §1.291. The requirement that the Office acknowledge the filing of a protest is deleted from paragraph (a), but is covered in paragraph (c).

New paragraph (b) of §1.291 assures members of the public that a protest will be considered by the Office if (1) it specifically identifies the application to which it is directed; (2) it is timely submitted; (3) it is properly served upon the applicant in accordance with §1.248, or is filed with the Office the duplicate in the event service is not possible; (4) it includes a listing of the patents, publications or other information relied upon and a concise explanation of the relevance of each listed item; (5) it includes a copy of each listed patent or publication or other item of information in written form, or at least the pertinent portions thereof; and (6) it includes an English language translation of all the necessary and pertinent parts of any non-English language document relied upon. It is considered desirable that §1.291 advise members of the public as to the contents which should be included in any protest since there will be no Office communications directed to the member of the public submitting the protest under paragraph (c). Thus, under paragraph (c) members of the public will not be given an opportunity to complete any protest which is incomplete. Amended paragraph (c) provides for the acknowledgment of the entry of a protest in a reissue application file.

Amended paragraph (c) of §1.291 provides that a member of the public filing a protest in an application for an original patent will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard acknowledging receipt of the protest. Amended paragraph (c) of §1.291 does not permit the member of the public filing the protest, or any other member of the public, to contact the Office as to the disposition, or status, of the protest or to participate in any Office proceedings relating to the protest. The disposition of the protest, once it has been filed will, under paragraph (c), be an ex parte matter between the Office and the applicant. However, applications which are open to the public may be inspected pursuant to §1.11.

Amended paragraph (c) provides for the Office to communicate with the applicant regarding any protest entered in the application file. Under paragraph (c), the applicant could be required by the Office to respond to the protest. Any response would be ex parte and would not be served on the member of the public filing the protest. Paragraph (c) provides for the Office to require applicant to supply information pursuant to pargraph (a) of §1.56 in order for the Office to decide any issues raised by the protest. Requirements for information under paragraph (c) will be ex parte in nature between the Office and the applicant. The ex parte nature of the requirements for information under paragraph (c) differs from past practice under which information could be required, or requested, from applicant and one or more protestors. Under amended paragraph (c), the active participation of the protestor ends with the filing of the protest and no further submission on behalf of the protestor will be acknowledged or considered unless such submission raises new issues which could not have been earlier presented, and thereby constitutes a new protest. Mere arguments relating to an Office action or an applicant's response would not qualify as a new protest.

Duty of Disclosure in Reexamination Proceedings

Only two comments were received relative to proposed§1.555. One comment argued that the Office should never ignore a violation of the duty of disclosure or leave it hanging. In response thereto, neither the statute nor the presently existing reexamination rules provide for reexamination on grounds other than those based on patents or printed publications. The second comment questioned whether a patent owner has a duty to cite new prior art after a request but prior to an order to reexamine. No further clarification of the section is necessary since §1.555(a) specifies when the patent owner should file a prior art statement in a reexamination proceeding. The amendments to §1.555 are adopted as proposed.

Amended §1.555 makes the duty of disclosure in reexamination proceedings more consistent with the duty of disclosure in patent applications. Paragraph (a) of §1.555 specifies that a duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner or involved employees of the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. This rule is consistent with the duty set forth in §1.56(a) insofar as patent applications are concerned, except that in paragraph (a) of §1.555 the patent owner is specified rather than the inventor as set forth in paragraph (a) of §1.56. This does not, however, impose the responsibility for compliance with the duty of disclosure on a corporate entity or organization but leaves the responsibility with involved individuals in the corporation or other organization. Paragraph (a) of §1.555 places a requirement on the individuals identified to bring to the attention of the Office patents or printed publications material to the reexamination which have not been previously made of record in the patent file and specifies how that should be accomplished.

Amended paragraph (b) of §1.555 essentially parallels existing paragraph (b) of §1.56 and makes similar provisions applicable to disclosures in reexamination proceedings.

Amended paragraph (c) of §1.555 provides that the duties of candor, good faith, and disclosure required in paragraph (a) of §1.555 have not been complied with if any fraud was practiced or attempted on the Office or there was any violation of the duty of disclosure through bad faith or gross negligence by, or on behalf of, the patent owner in the reexamination proceeding. The language of paragraph (c) refers to fraud or violation of the duty of disclosure in the reexamination proceeding since such conduct during the pendency of applications is covered by §1.56.

Amended paragraph (d) of §1.555 affirms that the responsibility for compliance with §1.555 rests upon the individuals identified in paragraph (a). Paragraph (d) also provides that no evaluation will be made in the reexamination proceeding by the Office as to compliance with §1.555. Paragraph (d) of §1.555 also provides that questions of compliance with §1.555 which are discovered during a reexamination proceeding will be noted as unresolved questions in accordance with present §1.552(c). Paragraph (d) will not preclude the patent owner from filing a reissue application to have questions of candor, good faith, and duty of disclosure considered and resolved, including such questions which arise during a reexamination proceeding, so long as the requirements of 35 U.S.C. 251 have been met. Paragraph (d) does not preclude suspension or disbarment proceedings under present §1.348 based upon conduct during a reexamination proceeding.

Concurrent Office Proceedings

Four comments were received on §1.565. One comment proposed adding a sentence at the end of paragraph (b) of §1.565 reflecting that reexamination would only be stayed in extraordinary situations. This suggestion has not been adopted since it is considered inappropriate to attempt to further define by rule the circumstances under which a stay of the reexamination may be appropriate. Two comments were received raising questions as to the treatment, during a merged reissue and reexamination proceeding, of broader claims which are present therein because of a reissue application which contained broadened claims. No clarification or change is necessary since the broadened claims are

properly in the merged proceeding during the period it is merged. Such broader claims which are present in both the reissue and reexamination files during the pendency of the merged proceeding will be treated in accordance with the reissue statute and case law during the pendency of the merged proceeding. If the merged proceeding ceases to exist because of the abandonment of the reissue application, the claims in the reexamination file, including any broadened claims, will be examined in accordance with the reexamination statute and rules. Finally, one comment did not agree with merging reissue and reexamination proceedings because the merger is not seen to produce cost savings or other salutary results. One of the reasons for the merged proceedings is to ensure that claims of differing scope and inconsistent responses are not presented at the same time in different proceedings in the same patent. Moreover, since the proceedings are concurrent rather than sequential, a significant savings in resources and overall pendency time may be realized by merging in many cases.

The amendment to §1.565 clarifies the proposed language of paragraph (b), eliminates from paragraph (b) the last two sentences relating to the treatment of concurrent reexamination and reissue proceedings, and adds a new paragraph (d) relating to this subject. The clarification in paragraph (b) is intended to avoid misinterpretations relating to stay determinations where concurrent litigation or reissue applications are involved.

Under new paragraph (d), which is consistent with the practice presently in effect under paragraph (b), if a reissue application and a reexamination proceeding on which an order pursuant to present §1.525 has been mailed are pending concurrently on a patent, a decision will normally be made to merge the two proceedings or to stay one of the proceedings. New paragraph (d) also provides that where merger of a reissue application and a reexamination proceeding is ordered, the merged examination will be conducted in accordance with present §§1.171–1.179. The examiner, in examining the merged proceeding, will apply the reissue statute and case law, in addition to applicable provisions of §§1.171–1.179, to the merged proceeding. This is appropriate in view of the fact that the statutory provisions for reissue applications and reissue application examination include, *inter alia*, provisions equivalent to 35 U.S.C. 305 relating to the conduct of reexamination proceedings. New paragraph (d) of §1.565 makes clear that the patent owner must place and maintain the same claims in the reissue application and the reexamination proceeding during the pendency of the merged proceeding. Under new paragraph (d) of §1.565 the examiner's actions and any responses by the patent owner in a merged proceeding will apply to both the reissue application and the reexamination proceeding and will be physically entered into both files. New paragraph (d) also provides that any reexamination proceeding merged with a reissue application shall be terminated by the grant of the reissued patent. The amendments to §1.565 are adopted with the changes or clarification indicated in paragraph (b).

Reexamination Certificate

Section 1.570, as amended, revises paragraph (e) to refer to new paragraph (d) of §1.565 rather than paragraph (b) in order to reflect the changes in §1.565.

No comments were received concerning the section and it is adopted without change.

Interim Procedures on Applications Pending on Effective Date

On July 1, 1982, the revised procedures of §§1.56(d) and 1.193(c) will apply to any applications then pending which have not been the subject of a final Office decision on questions of fraud or violation of the duty of disclosure. Any petition to strike an application from the files or any protest against a pending application filed prior to July 1, 1982, will be governed by the rules in effect prior to that date. Any applications filed under §1.175(a)(4) prior to July 1, 1982, will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned. For a discussion of the interim practice in effect prior to July 1, 1982, see 1013 O.G. 18–19.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

List of Subjects in 37 CRF Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Lawyers.

Amendment of Regulations

(Text of adopted rules appear in 37 CFR, revised July 1, 1983.)

Apr. 6, 1982. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[FR Doc. 82-13613 Filed 5-18-82; 8:45 am]
BILLING CODE 3510-16-M

[1019 O.G. 37]

(136) **Interim Reissue, Reexamination, Protest, And Examination Procedures In Patent Cases Pending Proposed Revision of 37 CFR §§1.11, 1.56, 1.106, 1.175, 1.176, 1.193, 1.291, 1.555, 1.565, and 1.570.**

This notice sets forth, in general, the practice the Office intends to follow pending a final determination on the "Notice of proposed rulemaking" published in the Federal Register on November 10, 1981, at 46 F.R. 55666–55672. The "Notice of proposed rulemaking" is also being published in this issue of the Official Gazette.

Practice Relating To §1.11

Any reissue application which is presently open to inspection by the general public pursuant to present §1.11(b), and any reissue application filed before the effective date of a change in the rule, will continue to be open to inspection by the general public. No restriction of access to those reissue applications is contemplated at this time, either during their pendency before the Office, or after an abandonment of the reissue application. The filing of reissue applications will continue to be announced in the Official Gazette pending revision of §1.11(b).

Practice Relating To §1.56

Any issues arising under §1.56(d) prior to the effective date of a change in paragraph (d) will continue to be handled in accordance with paragraph (d) as it presently exists. If paragraph (d) is amended as proposed, the Office presently intends to apply the revised procedures to any applications then pending which have not been the subject of a final Office decision on questions of "fraud" or violation of the duty of disclosure.

Any petitions to strike applications from the files which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure.

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Any petition to strike an application from the files which is filed after the date of publication of this Notice will be considered in accordance with the procedure set forth in the "Notice of proposed rulemaking" insofar as participation by the petitioner is concerned. Since the provisions of 37 CFR 1.56 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of petitions to strike applications, it is considered appropriate and proper to restrict participation on behalf of a petitioner as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any petition to strike an application from the files which is filed after the date of publication of this Notice must include a self-addressed postcard specifically identifying the petition and the application to which the petition is directed if an acknowledgement of the filing of the petition is desired. A member of the public filing a petition to strike an application after the date of publication of this Notice will not receive any communications from the Office relating to the petition, other than the return of a self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the petition. All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect.

Practice Relating To §1.106

No interim practice is necessary regarding this proposed revision since it would not constitute a change in practice, but would merely make §1.106 more closely reflect current practice.

Practice Relating To §1.175

Any applications filed under §1.175(a)(4) prior to the effective date of any change in the rule will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned.

Practice Relating To §1.176

The examination of any applications filed prior to the effective date of any change in the rule will continue to be delayed for two months after the announcement of the filing in the Official Gazette, except where the delay period is waived by a decision on a petition under 37 CFR 1.183.

Practice Relating To §1.193(c)

No interim practice is necessary regarding this proposed revision since the practice of rejecting claims pursuant to §1.56(d) will not be adopted prior to the effective date of a change in paragraph (d).

Practice Relating To §1.291

Any protest against a pending application which is filed after the date of publication of this Notice in the Official Gazette will be treated essentially in accordance with the procedures set forth in the "Notice of proposed rulemaking." Any protests which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure. Since the provisions of 37 CFR 1.291 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of protests filed under §1.291, it is considered appropriate and proper to restrict participation on behalf of a protestor essentially as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any protest filed after the date of publication of this Notice will be acknowledged as set forth in present §1.291 on a self-addressed postcard which protestor is hereby advised to include with the protest. The self-addressed postcard must specifically identify the protest and the application to which the protest is directed, to the extent such identifying data for the application is known. A member of the public filing a protest against a pending application after the date of publication of this Notice will receive no communication from the Office relating to the protest, other than the self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the protest as set forth in present §1.291(a). All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect. Pending adoption of the proposed rulemaking the Office will consider protests which comply with present §1.291(a) even though the protest does not include all the items enumerated in proposed new paragraph (b) of §1.291.

Practice Relating To §1.555

No interim practice is necessary regarding this proposed revision since it merely makes §1.555 more closely parallel §1.56 and more specifically defines the responsibility of a patent owner in a reexamination proceeding.

Practice Relating To §1.565

No interim practice is necessary regarding this proposed revision since it merely clarifies, but does not change, present practice.

Practice Relating To §1.570

No interim practice is necessary since this proposed revision merely reflects the paragraph change proposed in §1.565.

CONCLUSION

The present interim procedures will be in effect until further notice and pending a final determination on the proposed rulemaking.

DONALD J. QUIGG,
Nov. 16, 1981. *Deputy Commissioner of Patents & Trademarks.*

[1013 O.G. 18]

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Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227–18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing. The changes simplify the obtaining of licenses for filing foreign patent applications and for filing amendments, modifications, and supplements in foreign patent applications. Under the revised rules (1) the export, but not actual filing, of technical data to a foreign country for purposes related to the filing and prosecution of a patent application may be done either under appropriate export agencies' rules or by a license issued by the Commissioner of Patents and Trademarks, (2) certain licenses issued by the Commissioner for filing foreign patent applications include a license to file amendments, modifications, and supplements, containing additional matter in foreign applications, (3) specific contents of a petition for retroactive license are established and (4) fees are set for expedited handling of requests for foreign filing licenses and for certain petitions. These changes will result in reduced work for both patent applicants and the Patent and Trademark Office and at the same time strengthen national security protections.
Effective Date: June 1, 1984.
For Further Information Contact: Kenneth L. Cage by telephone at (703) 557–2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to simplify and expedite the granting of licenses under 35 U.S.C. 184. It contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves. Notice of proposed rulemaking was published May 23, 1983, at 48 FR 23144 and corrected June 7, 1983, at 48 FR 26319.

Discussion of Specific Rules

Section 5.11(a) has been substantially restructured and modified from the proposal. Under §5.11(a), a license from the Commissioner of Patents and Trademarks is always needed for the act of filing a patent application in a foreign patent office unless the six-month period has passed or the invention was not made in the United States.

Amended §5.11 (b) and (c) would clarify in the regulations that the export of technical data to a foreign country may be done under appropriate export agencies' rules controlling the export of technical data—Department of State (22 CFR Parts 121–130); Department of Commerce, International Trade Administration Office (15 CFR Part 379); or the Department of Energy (10 CFR Part 810)—or by license from the Commissioner. Compliance with the appropriate export agencies' rules or the license from the Commissioner is required before *exporting* technical data in the form of a patent application or data in any form if related to preparing, filing, and prosecuting a patent application in a foreign country, if the United States application has not been on file for six months at the time of export, or no application has been filed in the United States. It is optional from whom approval for export is obtained. In fact, for certain technical data being exported to certain countries, a specific request for a license or approval from any of the export agencies would not be necessary. However, a single license from the Commissioner would cover both export and filing and avoid any question whether a specific license or approval is required from any of the export agencies. Approval from the appropriate export agencies for export would require a separate additional license from the Commissioner for the filing of the foreign patent application. The rule changes will make the rules more closely conform with the regulations of other agencies which deal with the export of technical data to a foreign country.

The definition of export in these regulations will be controlled by the definition of export in the appropriate regulations of the export agencies having jurisdiction over the export of technical data related to the patent application. (15 CFR 379.1, 22 CFR 125.03 and 10 CFR 810.7).

The requirement of complying with the rules of the export agencies or the Commissioner before exporting an application to a foreign country is not intended to change long-standing Patent and Trademark Office interpretation of 35 U.S.C. 184 or in any way interpret the language in 35 U.S.C. 184 "file or cause or authorize to be filed" as requiring a license before technical data related to the filing or prosecution of an application is exported to a foreign country, such as to a foreign attorney or agent or corporation for review or revision for later filing. It does, however, reflect the delegations the Commissioner has received from other agencies and which are referenced in §§5.18, 5.19 and new §5.20 and clarifies that a patent applicant must be licensed for export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application either by appropriate export agencies or by the Commission. The language "related to the preparation, filing or possible filing and prosecution of a foreign patent application" in §5.11(b) is used rather than "support a patent application" as used in §5.18 or "foreign filing" as used in §5.19 to make clearer that the latter two phrases include the export of technical data in the form of explanations or possible claim language or the like sent to a foreign agent or other person in relation to a foreign patent application. However, a license from the Commissioner would not substitute for approvals required by appropriate export agencies if technical data is exported for purposes not related to the filing or possible filing and prosecution of a foreign patent application. For example, a license from the Commissioner would not cover export of technical data in a U.S. patent application to a foreign research laboratory to support a research project.

Further, the rule is intended to reflect that every exportation of technical data related to filing or possible filing or prosecution within six months of a United States filing without a license from the Commissioner is prohibited unless the applicant complies with the rules of the appropriate export agencies. For example, where an application has been exported to a foreign agent with an authorization to file a foreign patent application, the export of the application may be under a general license from the International Trade Administration of the Department of Commerce. A license from the Commissioner is always necessary for the actual filing of the foreign patent application. In another example, where a validated license is needed under 15 CFR Part 379 to export technical data in the form of a patent application, applicants will need to obtain an International Trade Administration license or obtain a Commissioner's license prior to the act of export. Under either example, a license from the Commissioner is required before the application is filed in a foreign patent office. In the latter example, a single license from the Commissioner will permit both export and filing of the application.

This rule is promulgated under the authority of 35 U.S.C. 6 and delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978. Authority for this rule also exists under 35 U.S.C. 188.

The amended rule assures adequate protection of sensitive material under Title 35, United States Code and provides regulatory consistency with the Arms Export Control Act, as amended, the Export Administration Act, as amended, the Atomic Energy Act of 1954, as amended, the Nuclear Non-Proliferation Act of 1978, and their implementing regulations. The sanctions which apply for failure to obtain a license from either the Commissioner or the appropriate export agencies prior to export are the sanctions specified in the export acts. The sanctions which apply for failure to obtain a license from the Commissioner prior to the filing of a foreign application are the sanctions specified in Title 35, United States Code.

Section 5.11(d), proposed as §5.11(b), states that applications under secrecy order under §5.2 cannot be exported to an international agency or filed in a foreign country except in accordance with §5.5.

Section 5.11(e), proposed as §5.11(c), states that a license pursuant to paragraph (a) is not required where the invention was not made in the United States, or the United States application was on file for six months without a secrecy order being issued.

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Section 5.11(f), proposed as §5.11(d), states that a license for foreign filing may be revoked at any time upon written notice. Similarly, an authorization for foreign filing resulting from the passage of six months from the filing of a United States patent application may be revoked by the imposition of a secrecy order. The revocation is effective as of the date of the notice and is not intended to be applicable to any prior acts by applicants relying in good faith on the grant of a license.

The language of §§5.12(b), 5.13, and 5.14 have been clarified from the proposal to reflect that the §1.17(h) requirement for a fee is for the expedited handling of a license. No fee is required for a routine, non-expedited request for a foreign filing license.

Section 5.15 has been changed from the form proposed. Amended §5.15 defines licenses for foreign export and filing of two different scopes. The §5.15(a) scope license, the grant of which is indicated on the filing receipt in accordance with §5.12(a) published at 48 FR 2696. (Jan. 20, 1983) and 1027 OG 9 (Feb. 1, 1983), permits the subsequent export and filing of technical data for purposes related to the preparation, filing or possible filing and prosecution of the foreign application and of any amendments or modifications to the application in a foreign country, even if "additional subject matter" were introduced; provided the additional subject matter does not change the general nature of the subject matter disclosed and does not pertain to certain categories of potentially sensitive material which are set forth in §5.15(a)(4).

The phrase "change the general nature of the subject matter disclosed" is intended to cover situations where the additional subject matter so alters the character of the disclosure that national security review is appropriate. This phrase is intended to permit a broad range of amendments, modifications and supplements, including additional subject matter. The following examples are intended to further clarify the meaning of the language "general nature of the subject matter disclosed" in §5.15(a):

Example 1—The physical data on a named compound. If a licensed disclosure gives the name and structure of a compound, the general nature of the subject matter disclosed includes physical data such as boiling point, melting point or specific gravity of the compound. If a name of a compound is disclosed, the structure of the compound is also within the general nature. If the licensed disclosure deals with the hardness of a claimed alloy, the disclosure of tensile strength is within the general nature.

Example 2—A known specie of a known genus. If the genus "lower alkyl" is disclosed, the inclusion of the species "methyl" is within the general nature, as would be homologs and isomers of that genus.

Example 3—Comparison data of the disclosed compound to data on prior art compounds. If the licensed disclosure contains a disclosure of the compounds of a pesticide invention, and pesticidal activities, the comparison of pesticidal data of a known compound representing the closest prior art is within the general nature.

Example 4—A specific optimum temperature within a specified temperature range. If a licensed disclosure has a range of 0°C to 120°C, the disclosure of an optimum temperature of 100°C is within the general nature.

Example 5—Activity data on compounds of the invention. If activity data on 30 of 50 named compounds is disclosed, the disclosure of activity data on other named compounds of the invention is within the general nature.

Example 6—Additional subject matter and utilities. If a licensed disclosure describes a chemical herbicide for weed control, the disclosure of chemical warfare uses or human toxic properties (other than to demonstrate safety or absence of such toxicity) *is not* within the general nature. If a licensed disclosure describes an analog computer for microwave telephone transmission, the addition of a cryptographic encoding or decoding device and utility *is not* within the general nature. If a licensed disclosure describes a battery power source for a satellite, the addition or substitution of a nuclear isotopic power source *is* within the general nature, but would be within the control of §5.15(a)(4)(ii).

A §5.15(b) scope license is limited to the original subject matter disclosed at the time the license was granted and does not cover "additional subject matter" as the phrase is currently interpreted (*In re Gaertner,* 202 USPQ 714 (CCPA 1979)).

Under §5.15(c), a license with the scope of §5.15(a) could also be granted pursuant to a §5.13 or §5.14 petition. If granted, the §5.15(a) scope of license will be indicated on the license grant. For instance, under §5.15(c) an applicant who filed a United States patent application before Feb. 27, 1983, when the filing receipt license practice became effective could request a §5.15(a) scope license which, if granted, will cover the subsequent filing of amendments, modifications or supplements, including additional matter in a corresponding foreign patent application. The licenses under §§5.12(b), 5.13, and 5.14 are normally limited in scope to the original subject matter disclosed at the time the license was granted unless a license of the §5.15(a) scope is indicated on the license grant. If a petition for a license under §5.12(b) is granted prior to the grant of the §5.12(a) filing receipt license, the former would merge into the latter and would be considered a §5.12(a) license for the purpose of §5.15.

A new §5.20, not included in the proposal, sets forth the specific authority of the Commissioner to license foreign filing, possible filing or prosecution of a patent application in a foreign country under 35 U.S.C. 184 regarding unclassified activities in foreign atomic energy programs. This change only reflects the existing relationship between 37 CFR 5.11 and 10 CFR §810.7 and alerts patent applicants in this technology to the Commissioner's authority. The term "sensitive nuclear technology" used in paragraph (b) of §5.20 is defined in 10 CFR §810.3(q).

A new §5.25, proposed initially as §5.20 and modified, sets forth in the regulations the requirements to be met for the granting of a retroactive license. The requirements include (1) a list of the foreign countries in which the patent application material was filed; (2) the date(s) of filing of the foreign application(s); (3) an oath or declaration which (i) states that the subject matter filed is not subject to a secrecy order under 35 U.S.C. 181, (ii) makes a showing of diligence in attempting to obtain the license upon discovery of the error, and (iii) makes a showing of facts which support a conclusion of inadvertence; and (4) includes the required fee. The section also provides in paragraph (b) for review from a denial of a petition for a retroactive license. The section further provides in paragraph (c) that the granting of a retroactive license pursuant to §5.25 does not excuse any violation of regulations of the export agencies which may have occurred because of the failure to obtain an appropriate license prior to export.

Sections 5.21, 5.22 and 5.23 have been redesignated to become §§5.31, 5.32 and 5.33, respectively.

Significant Differences Between Proposed and Final Rules

Section 1.17

Section 1.17(h) is amended to include a specific reference to §5.25 petitions for retroactive licenses for which the petition fee is charged, rather than having the present retroactive license fee under §1.182 petitions. The fee for §5.12(b) licenses is new and applies only where expedited handling of these license requests is sought. This fee for expedited handling is also referred to in §§5.13 and 5.14. Section 5.15(c) provides for a fee for changing the scope of a license.

Section 5.1

The proposed amendment to §5.1 is not being adopted and is withdrawn.

Section 5.11

Section 5.11 is amended to control the *export* of technical data in the form of an application or data in any form if related to preparing, filing, or prosecuting a patent application in a foreign country, if the United States application has not been on file for at least six months prior to the date of transmittal, or if no application has been filed in the United States. Export approvals, if required, may be provided by appropriate export agencies—Department of State; Department of Commerce, International Trade Administration or Department of Energy—or by the Commissioner. This will enable the Patent and Trademark Office and the export agencies to better reflect and exercise the export control functions set forth in the Arms Export Control Act, as amended, the Export Administration Act of 1979, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, respectively.

Under these Acts, the export of technical data is the activity to be controlled. The final rule differs from the proposed rule in that the Patent and Trademark Office will not be the sole export control authority over technical data in the form of an application, or data in any form, if related to preparing, filing, or prosecuting a patent application. Applications will have the option to obtain necessary export approvals either (1) from appropriate export agencies or (2) from the Commissioner. The Commissioner will continue to be the sole licensing authority for the act of filing an application in a foreign patent office.

Paragraphs (a), (b), and (c) of §5.11 control export activity by requiring either an export agency approval or a Commissioner's license for export of technical data in connection with foreign filing of an application and to that extent implement the Arms Export Control Act, the Export Administration Act, the Atomic Energy Act and the Nuclear Non-Proliferation Act. If a license is obtained from the Commissioner under §5.12, §5.13 or §5.14, no separate approval for the export of technical data to a foreign country in connection with a patent application is required from the export agencies.

It is emphasized that the scope of the Commissioner's license is limited to exporting and filing technical data in the form of an application, or in any form, if related to preparing, filing and prosecuting a patent application or for consideration of the filing of a patent application in a foreign country. A Commissioner's license does not authorize selling or using technical data in a foreign country or exporting data for other purposes. These latter acts continue to require separate approvals from the appropriate export agencies.

Also, the export of technical data in any form to a foreign country for purposes other than related to filing or supporting the filing of a patent application is not controlled by Title 35, U.S.C. or the regulations in Part 5. The exportation of data to a foreign country in such cases would be subject only to other laws and regulations such as the export and arms control regulations. Approval for the export of such technical data for purposes related to filing, possible filing, or supporting the filing of a patent application will be available from the appropriate export agencies or the Commissioner. On the other hand, the Commissioner will be the sole licensing authority for the act of filing the application in a foreign patent office.

Section 5.11(d), proposed as §5.11(b), states that an application cannot be exported to a foreign country when the corresponding United States application is under secrecy order except under §5.5

Section 5.11(e), proposed as §5.11(c), states that no license is required if the invention was not made in the United States, or the application was on file in the United States at least six months and is not under a secrecy order issued under §5.2

Section 5.11(f), proposed as §5.11(d), states that any license for foreign filing may be revoked at any time by written notification. It has been amended to further clarify that revocation also applies to authorizations resulting from the passage of six months from the filing date of a United States patent application when a secrecy order is imposed.

Section 5.12

Section 5.12(b) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.13

Section 5.13 is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.14

Section 5.14(a) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

The other changes in §5.14 make grammatical corrections and do not alter the intent of the section.

Section 5.15

Section 5.15(a) broadens the scope of licenses granted under §5.12(a). Section 5.15(a), as proposed, is changed to clarify the scope of a §5.15(a) license and delete certain of the exclusions originally proposed. This license permits exporting technical data to and filing corresponding subject matter in an application in any foreign country. The license also permits amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application, to be exported and filed in any foreign country. This license includes additional matter which does not change the general nature of subject matter disclosed and does not pertain to certain prohibited subjects or areas listed on various export restriction lists established by the Department of State and the Department of Energy.

These changes also permit an applicant to take action in the prosecution of the foreign or international application and submit supporting data such as affidavits, test data or the like as long as it directly relates to the filing, possible filing or prosecution of the application and does not pertain to the prohibited subjects or areas enumerated in §5.15(a)(4). The changes in §5.15(a) obviate the problems in *In re Gaertner,* supra, by providing a license scope which covers the type of activity involved in that case.

Amended paragraph (b) of §5.15 is the same as proposed paragraph (b) except for changes for consistency.

Amended paragraph (c) of §5.15 differs from §5.15(c) as proposed by including a reference to §5.14 and specifically permitting an applicant to petition for a change of the scope of a license.

New paragraph (d) of §5.15 is similar to proposed paragraph (d) with only changes for consistency.

New paragraph (e) of §5.15 is similar to proposed paragraph (e) with only changes for consistency.

Paragraph (f) of §5.15 is similar to proposed paragraph (f) with only changes for consistency.

Paragraph (g) is adopted essentially as proposed.

Section 5.17

Section 5.17 is similar to proposed §5.17 with only consistency changes.

Section 5.20

Section 5.20, not included in the proposal, is new and clarifies the existing authority of the Commissioner under the unclassified activities in foreign atomic energy programs. Under 10 CFR 810.7, the license of the Commissioner under 37 CFR 5.11 pursuant to 35 U.S.C. 184

constitutes information available to the public and generally authorized activity.

Section 5.25

Section 5.25, proposed initially as §5.20, is new and sets forth the requirements for petitioning for a retroactive license.

Section 5.31 and 5.32

Sections 5.21 and 5.22 are redesignated as §§5.31 and 5.32, respectively.

Section 5.33

Section 5.23 is redesignated as §5.33 and adopted as proposed.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony were considered.

Twenty-one letters presenting written comments were received and nine persons testified at the public hearing on July 20, 1983. Comments appear below along with the responses.

Comment:

One comment objected to the amendment of §5.1 to include "transmittal for" filing.

Reply:

This comment has been adopted by deleting the phrase from the final rule.

Comment:

Three comments requested an explanation of the conditions when a license may be revoked under §5.11(d) be clearly set forth and asked whether, if revocation occurs, past acts are valid and whether there will be compensation for damages.

Reply:

The section has been revised to further clarify the conditions under which a license may be revoked. The power to revoke licenses has been expressly included in all issued licenses for a number of years. Section 5.11(d) as proposed, merely recognizes in the rule the fact that licenses can be revoked. With the advent of the filing of a U.S. application becoming a request for a foreign filing license under §5.12(a), a regulatory procedure clarifying the revocation practice was appropriate. Revocation will be effective only as of the date of revocation and prior acts predicated on the license would be in compliance with 37 CFR Part 5. The rule as proposed has been clarified to indicate that revocation may apply either to a license specifically granted by the Commissioner or to an authorization to file a foreign application resulting from the passage of six months from the filing of a United States patent application. No compensation is available for revocation of a license.

Comment:

Eighteen comments requested the amendment of §5.11 to eliminate the license requirement for "transmittal for filing" and substitute the requirement for "filing" only.

Reply:

The proposal has been adopted by eliminating the requirement for a license from the Commissioner prior to transmitting or exporting an application abroad. The regulations have been clarified to emphasize the requirements for the export of technical data in the form of an application. An applicant has a choice of exporting such applications under authority of either (1) the appropriate export agencies controlling the export of technical data —Department of State; Department of Commerce, International Trade Administration; or Department of Energy or (2) a license from the Commissioner. While a license from the Commissioner is required only for filing an application abroad, the provisions of §§5.18, 5.19 and 5.20 reflect the Commissioner's authority to license the export of technical data in the form of an application for purposes related to filing in addition to the foreign filing of the application in a foreign country.

Comment:

Six person objected to the transmittal license requirement and argued that the Patent and Trademark Office lacks authority under 35 U.S.C. 184 to require pre-filing (transmitting) licenses. It was also argued that foreign filing licensing is not the conduct of proceedings under 35 U.S.C. 6.

Reply:

The final rules do not require a license from the Commissioner for export (or transmittal). The export provisions of §5.11 are issued under 35 U.S.C. 6 and pursuant to delegations under the regulations of the export agencies.

Comment:

One comment argued that the constitutional right of freedom of speech would be impaired by requiring a license for published material.

Reply:

A constitutional argument of prior restraint by export licensing of the International Traffic in Arms Regulations was reviewed by the Ninth Circuit in the case of *United States* v. *Edler*, 579 F. 2d 516 (9th Cir. 1978) cert. denied 449 U.S. 1084 (1981). No prior restraint within first amendment protection was found by the Court.

Comment:

One comment stated that the $120 petition license fee under §5.12(b) is too high, and a $60 fee would be more reasonable.

Reply:

The license fee under §5.12(b), §5.13 and §5.14 is not applicable to routine licensing requests. It is only applicable to expedited processing of license requests which require special efforts by the Patent and Trademark Office. The $120 petition fee better reflects the costs to the Patent and Trademark Office for providing expedited handling.

Comment:

One comment proposed the deletion of the last sentence of paragraph §5.14(a) since under §5.12(a) only those cases having interest from a security standpoint are refused a license.

Reply:

This suggestion has not been adopted because the provision may apply to petitions filed prior to receipt of a filing receipt license where expedited handling is requested.

Comment:

One comment stated that §5.15(d) appears to be redundant since it applies only to cases on file for six months and on which no secrecy order has been imposed.

Reply:

Under §5.15(d), a license is not needed for cases in this category if no additional subject matter is added. This section complements §5.15(b) where a license of narrow scope is granted.

Comment:

One comment raised the question whether §5.15(a) as to amendments, supplements, and modifications includes continuation-in-part applications.

Reply:

Continuation-in-part applications are included within the term "amendments, supplements, and modifications." *Beckman Instruments, Inc.* v. *Coleman Instruments*, 143 USPQ 278 (7th Cir. 1964).

Comment:

Two comments requested that the expreas language in §5.15(a)(3) be amended to state that "Technical Data" relating to articles, materials and supplies be limited to the validated license requirements of §§379.4(c) and 379.4(d) of the Export Administration Regulations and no other sections, or alternatively, that paragraph (a)(3) be deleted in its entirety.

Reply:

The final rules do not include §5.15(a)(3) as proposed.

Comment:

Two comments proposed that the two-tier licensing structure of §5.15(a) and §5.15(b) be amended to reflect a broad one-tier system based on §5.15(a).

Reply:

The two-tier system reflects different treatment for applications within the inspection scope of 35 U.S.C. 181 and those outside of its inspection scope. Security review occurs on all applications with inspection cases having a narrow license grant, and noninspection cases having a broad license grant. This inspection case treatment is necessary for the Patent and Trademark Office to meet its responsibilities under 35 U.S.C. 184 and particularly 37 CFR 5.18, 5.19, and 5.20 where the State, Commerce and Energy Departments accept the Commissioner's licenses in lieu of their own export approval.

Comment:

One comment indicated that proposed §5.15(a)(3) was of such wide scope that licenses will always be needed. The example cited was that this section would require licenses for all amendments filed in North Korea and Cuba.

Reply:

The comment is correct and the provisions of §5.15(a)(3) have been deleted. The country of destination restrictions did not provide a workable mechanism for technology review under the provisions of 35 U.S.C. 181.

Comment:

Three comments recommended making a §5.15(a) scope license available pursuant to a §5.14 petition where an application was filed prior to Feb. 27, 1983, or where an initial automatic §5.12(a) petition was not granted after Feb. 27, 1983 or where the general nature of the invention changed but is still outside of the provisions of §5.15(a)(4).

Reply:

This provision has been adopted to allow the Commissioner to issue broadened licenses upon a §5.14 petition in the above circumstances. New §5.15(c) allows the Commissioner to convert the scope of a license from §5.15(b) to a §5.15(a) license.

Comment:

Two comments proposed the extension of a §5.15(a) license upon petition after one or more years after the United States filing date or after grant of a §5.15(b) license.

Reply:

This suggestion has been adopted in §5.15(c) which will provide the mechanism by petition at any time to convert the scope of a license. This is promulgated since errors may occur in the denial of a §5.15(a) license. Also, the initial determination of the sensitive nature of technology may be altered by changes in the security classification guidelines. Procedurally, such petitions will be referred to the appropriate defense agencies for their review of the technology prior to the grant of any license.

Comment:

One comment requested clarification on how and under what circumstances a §5.12(b) license granted under §5.15(c) has the same scope as a license granted under §5.12(a).

Reply:

Licenses granted under §5.12(a) will have the §5.15(a) scope because the applications are not within the inspection scope of a 35 U.S.C. 181 referred to the defense agencies for security review. Under §5.15(c), applications which are not referred to defense agencies pursuant to petitions under §§5.12, 5.13 and 5.14 will have a license of the scope of §5.15(a).

Comment:

Three comments suggested an amendment to proposed§5.20(4) to delete the "inadvertence" standard and substitute "through error without deceptive intent."

Reply:

Inadvertence is a statutory standard which cannot be altered by rulemaking. Further, judge-made law has determined the metes and bounds of this term which further proscribes the rulemaking authority of the Commissioner. In *Barr Rubber Products Co.* v. *Sun Rubber Co.*, 149 USPQ 204, 209 (S.D.N.Y., 1966) inadvertence was defined as "lack of care or attentiveness: inattention" or "an effect of inattention: a result of carelessness; an oversight, mistake, or fault from negligence."

Inadvertence signifies want of attention, and an action which is deliberately taken with full knowledge of the law and facts is not inadvertent. *In re Application of Nov. 22, 1952*, 153 USPQ 410, 411 (Asst. Commr. 1967).

Implementation of Patent Procedure Revisions

The various sections will be implemented by the Commissioner on the effective date of the rules by the acceptance of petitions under the various sections. The broadened license scope of §5.15(a) will apply as of the effective date of these rules to all cases having filing receipt licenses under §5.12(a) which became effective on Feb. 27, 1983. The provisions of this broad license do not apply to acts of export or filing which occurred prior to the effective date of these rules. No other action will be required by an applicant to receive the benefits of this change.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The Acting General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354) for several reasons. Under this rulemaking, small entities would be able to obtain licenses without filing separate requests therefor. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, simplifying existing procedures where possible.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in cost or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Paperwork Reduction Act. The collection of information requirement of this rule is included in a PTO request for approval pending before the OMB. Upon assignment of a control number by OMB, we will publish an appropriate amendment of the affected rules.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Small businesses.

37 CFR Part 5

Classified information, Foreign relations, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41 and 181–188 and by delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, the Patent and Trademark Of-

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fice is amending Parts 1 and 5 of Title 37 of the Code of Federal Regulations as set forth below:

PART 1—[AMENDED]

1. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of Part 1 or 5 listed below which refers to this paragraph $120.00
—§1.47—for filing by other than all the inventors or a person not the inventor
—§1.48—for correction of inventorship
—§1.182—for decision on questions not specifically provided for
—§1.183—to suspend the rules
—§1.268—for late filing of interference settlement agreement
—§§5.12, 5.13 & 5.14—for expedited handling of foreign filing license
—§5.15—for changing the scope of a license
—§5.25—for retroactive license

2. The table of contents and heading for Part 5 are revised to read as follows:

PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

Secrecy Orders

Sec.
5.1 Defense inspection of certain applications.
5.2 Secrecy order.
5.3 Prosecution of application under secrecy orders; withholding patent.
5.4 Petition for rescission of secrecy order.
5.5 Permit to disclose or modification of secrecy order.
5.6 General and group permits.
5.7 Compensation.
5.8 Appeal to Secretary.

Licenses for Foreign Exporting and Filing

5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting international application.
5.12 Petition for license.
5.13 Petition for license; no corresponding application.
5.14 Petition for license; corresponding U.S. application.
5.15 Scope of license.
5.16 Effect of secrecy order.
5.17 Who may use license.
5.18 Arms, ammunition, and implements of war.
5.19 Export of technical data.
5.20 Export of technical data relating to sensitive nuclear technology.
5.25 Petition for retroactive license.

General

5.31 Effect of modification, rescission or license.
5.32 Papers in English language.
5.33 Correspondence.

Authority: 35 U.S.C. 6, 41, 181–188 and the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

3. The center heading preceding §5.11 and the text of §5.11 are revised to read as follows:

Licenses for Foreign Exporting and Filing

§5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

(b) The license from the Commissioner of Patents and Trademarks referred to in paragraph (a) would also authorize the export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application without separately complying with the regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of the Office of Export Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy).

(c) Where technical data in the form of a patent application, or in any form is being exported for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application, without the license from the Commissioner of Patents and Trademarks referred to in paragraphs (a) or (b) of this section, or on an invention not made in the United States, the export regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) must be complied with unless a license is not required because a United States application was on file at the time of export for at least six months without a secrecy order under §5.2 being placed thereon. The term "exported" means export as it is defined in 22 CFR Parts 121–130, 15 CFR Part 379 and 10 CFR Part 810.

(d) If a secrecy order has been issued under §5.2, an application cannot be exported to, or filed in, a foreign country (including an international agency in a foreign country), except in accordance with §5.5.

(e) No license pursuant to paragraph (a) of this section is required if:

(1) The invention was not made in the United States, or

(2) The United States application is not subject to a secrecy order under §5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country.

(f) A license pursuant to paragraph (a) of this section can be revoked at any time upon written notification by the Patent and Trademark Office. An authorization to file a foreign patent application resulting from the passage of six months from the date of filing of a United States patent application may be revoked by the imposition of a secrecy order.

4. Section 5.12 is amended by revising paragraph (b) to read as follows:

§5.12 Petition for license.

* * * * *

(b) Petitions for license should be presented in letter form and must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, the petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

5. Section 5.13 is revised to read as follows:

§5.13 Petition for license; no corresponding application.

If no corresponding national or international application has been filed in the United States, the petition for license under §5.12(b) must be accompanied by the required fee (§1.17(h)), if expedited handling of the petition is also sought, and a legible copy of the material upon which a license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition.

6. Section 5.14 is amended by revising paragraphs (a) and (c) to read as follows:

§5.14 Petition for license; corresponding U.S. application.

(a) When there is a corresponding United States application on file, a petition for license under §5.12(b) must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, and must identify this application by serial number, filing date, inventor, and title, but a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.

* * * * *

(c) When the application to be filed or exported abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency for filing in the Receiving Office, must be furnished with the petition. If however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

7. Section 5.15 is revised to read as follows:

§5.15 Scope of license.

(a) Grant of a license under §5.12(a) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal papers to the foreign country or international agencies;

(2) To make amendments, modifications and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application;

(3) To take any action in the prosecution of the foreign or international application; and

(4) To add subject matter or take any action under paragraphs (a) (1)–(3) of this section which does not change the general nature of the subject matter disclosed at the time of filing, unless the subject matter added involves technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121–130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Grant of a license under §5.12(b) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to forward all duplicate and formal papers to the foreign patent agency or international patent agency and to make amendments, modifications or supplements to and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under §5.12(b) pursuant to §5.13 or §5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. The change in the scope of a license will be as of the date of the grant of the change in scope.

(d) In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter.

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing or which involves the disclosure of subject matter listed in paragraphs (a)(4) (i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under §5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(4) (i) or (ii) of this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under §5.12(b), additional subject matter is not introduced.

(g) A license does not apply to acts done before the license was granted. See §5.25 for petitions for retroactive licenses.

8. Section 5.17 is revised to read as follows:

§5.17 Who may use license.

Licenses may be used by anyone interested in the export, foreign filing, or international transmittal for or on behalf of the inventor or the inventor's assigns.

9. A new §5.20 is added to read as follows:

§5.20 Export of technical data relating to sensitive nuclear technology.

(a) Under regulations (10 CFR 810.7) established by the United States Department of Energy, an application filed in accordance with the regulations (37 CFR 5.11–5.33) of the United States Patent and Trademark Office and eligible for foreign filing under 35 U.S.C. 184, is considered to be information available to the public in published form and a generally authorized activity for the purposes of the Department of Energy regulations.

(b) Inquiries concerning the export of sensitive nuclear technology other than related to the filing or prosecution of a foreign patent application should be made to the Attention: Secretary, United States Department of Energy, Office of International Security Affairs, Washington, D.C. 20858.

§5.21 [Redesignated as §5.31]

10. Section 5.21 is redesignated as §5.31.

§5.22 [Redesignated as §5.32]

11. Section 5.22 is redesignated as §5.32.

12. A new §5.25 is added to read as follows:

§5.25 Petition for retroactive license.

(a) A petition of retroactive license under 35 U.S.C. 184 shall be presented in accordance with §5.13 or §5.14, and shall include:

(1) A listing of the foreign countries in which the patent application material was filed,

(2) The dates on which the material was filed,

(3) A verified statement containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order.

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was inadvertently filed abroad without the required license under §5.11 first having been obtained, and

(4) The required fee (§1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of inadvertence. The showing of facts should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute inadvertence should cover the period from the time of filing until actual filing of the petition under this section.

(b) If a petition for a retroactive license is denied, a time period of not less than thirty days shall be set, during which the petition may be renewed. Failure to renew the petition within the set time period will result in a final denial of the petition. A final denial of a petition stands unless a petition is filed under §1.181 within two months of the date of the denial. If the petition for a retroactive license is denied with respect to the invention of a pending application and no petition under §1.181 has been filed, a final rejection of the application under 35 U.S.C. §185 will be made.

(c) The granting of a retroactive license does not excuse any violation of the export regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) which may have occurred because of the failure to obtain an appropriate license prior to export.

13. Section 5.23 is redesignated as §5.33 and revised to read as follows:

§5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Commissioner of Patents and Trademarks (Attention Licensing and Review), Washington, D.C. 20231."

Feb. 24, 1984. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[FR Doc. 84-4884 Filed 4-3-84; 8:45 am]
BILLING CODE 3510-16-M

[1042 O.G. 3]

(138) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227–18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final rule: Change of effective date
Summary: The Patent and Trademark Office amended the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing by publishing a notice in the Federal Register on Apr. 4, 1984, at 49 Fed. Reg. 13456–13463. The notice set an effective date of June 1, 1984. However, title 35, United States Code, section 41(g) provides that "No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register." Since these rules establish fees and the effective date of the rules was slightly less than 60 days after the publication of the final rule change in the Federal Register, it is necessary to set a later effective date.
Date: The effective date of the rule change published at 49 Fed. Reg. 13456–13463 is changed to June 4, 1984.
For further information contact: Kenneth L. Cage by telephone at (703) 557–2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Apr. 30, 1984. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[1042 O.G. 58]

(139) **Office of Patents and Trademarks**
Revision of the Scope of the Secrecy Order for Defense Agency Use

The Patent and Trademark Office (PTO) is revising the scope and format of the Secrecy Orders issued under the Invention Secrecy Act of 1951, 35 U.S.C. 181 et seq., 37 CFR Part 5. The present forms of Secrecy Orders are very restrictively worded to control disclosure or use of an invention under Secrecy Order. The PTO previously would only authorize disclosure or use of a Secrecy Order invention by the grant of a special permit. Permits authorize limited disclosure and permissible use of the invention depending upon the nature of the technical data and national security controls. To receive a permit, a patent applicant had to petition the Commissioner, or the defense agency sponsoring the Secrecy Order would issue or could have sua sponte issued a permit with the Order.

The revised Secrecy Orders will permit disclosure and use consistent with the national security controls needed on the technical data in a patent application. The features of existing permits are incorporated into the Orders which will eliminate the need, in many cases, for the applicant to separately petition for a permit to authorize various degrees of disclosure or use.

These revisions to the scope and format of a Secrecy Order are intended to place essentially the same national security controls on the technical data in patent applications as those on other types of technical data. With respect to publication or disclosure of information which would, in the opinion of the sponsoring Agency, be detrimental to the national security, the revised Secrecy Orders will be consistent with existing national security and export control procedures. The revised Secrecy Orders will also clarify the procedures for handling and custody of applications subject to a Secrecy Order.

The three new Secrecy Order formats to be used by the defense agencies of the Department of Defense are as follows:

(1) Secrecy Order and Permit for Foreign Filing in Certain Countries

This Secrecy Order will be used for those patent applications that contain technical data whose export is controlled by the guidelines contained in DOD Directive 5230.25, dated Nov. 6, 1984, (codified as 32 CFR Part 250) which relates to export control under 10 U.S.C. 140(c) and the Militarily Critical Technologies List (MCTL). See 50 U.S.C. App. 2404(d).

This Secrecy Order is intended to permit widest utilization of the technical data while still controlling any publication or disclosure which would result in an unlawful exportation. This type of Secrecy Order sets forth the applicable export controls for technical data in either the Commodity Control List (CCL) 15 CFR Parts 379, 399.1 or the Munitions List of the International Traffic in Arms Regulation (ITAR), 22 CFR Part 121.

The countries where corresponding patent applications may be filed will be identified in the Order. The Order specially authorizes use of the invention for legitimate business purposes. The definition of this term in the Order is identical to that found in DOD Directive 5230.25, 32 CFR Part 250. The level of security control requires that the subject matter must be safeguarded under conditions that provide adequate protection and prevent access by unauthorized persons. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the Order.

Following is a sample copy of this type of Secrecy Order:

Serial No.:
Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] Reference

Goods Accompanied by Sophisticated Know-How
Keystone Equipment or Materials

ITAR[2] Reference

Goods Accompanied by Sophisticated Know-How

Secrecy Order and Permit for Foreign Filing in Certain Countries

(Title 35, United States Code, Sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include both selling or producing products for the commercial domestic marketplace or for the commercial foreign marketplace, providing that any required expert license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or governments overseas after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and the United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no informa-

[1]Export Control Commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).
[2]International Traffic in Arms Regulations (ITAR), 22 CFR 120–130.

[3]The term legitimate business purposes is to be interpreted consistent with DOD directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 48040 (Dec. 10, 1984).

tion pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and permit with the first papers to be filed in the foreign patent office.

The foreign government may require a waiver in writing of any claim to compensation for loss or damage due solely to the imposition of secrecy on the invention. Belgium, France, the Federal Republic of Germany, the Netherlands, Turkey and the United Kingdom normally require such a waiver in writing.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(2) Secrecy Order and Permit for Disclosing Classified Information

This Secrecy Order will be used for those patent applications which contain technical data that is either classified under Executive Order 12356, National Security Information, 47 FR 14874, Aug. 6, 1982, or properly classifiable under a security guideline where the patent application owner has a current DOD Security Agreement, DOD form 441. This Agreement requires the protection of classified technical data as prescribed in the Industrial Security Manual (ISM), DOD 5220.22–M.

The intent of this Secrecy Order is to treat classified technical data in a patent application in the same manner as any other classified material under the Industrial Security Manual (ISM). Accordingly, this Secrecy Order will include a notification of the classification level of the technical data in the application, and provided a level of protection at that classification level. The Order will apply to owners of patent applications who have a current DOD Security agreement (DD Form 441) under the ISM. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the order.

The following is a copy of this second type of Secrecy Order:

Serial No:
Filed:
Applicant:
Title:
To be protected at Classification Level of:
Top Secret, Secret, Confidential, or Special Instructions
Sponsoring Agency & Address:

Secrecy Order and Permit for Disclosing Classified Information

(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses classifiable information. The unauthorized disclosure of such matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patent and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, and 186 (1951).

The subject matter of the above-identified application has been determined to be encompassed by E.O. 19865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is subject to the "Industrial Security Manual for Safeguarding Classified Information."

The principals shall protect the subject matter as required by the Industrial Security Manual for Safeguarding Classified Information and may disclose the subject matter of the above-identified application to other persons having the requisite clearance on a "need-to-know basis" *provided* the person to whom the subject matter is disclosed is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed. The declassification, in whole or in part, of the subject matter of the above-identified application does not modify this Secrecy Order. The requirements of this Secrecy Order remain in effect until the Secrecy Order is rescinded or modified by the Commissioner of Patent and Trademarks. The fact that the subject matter as a whole is declassified should be brought to the attention of the sponsoring agency.

This permission to disclose does not authorize the disclosure of the subject matter of the above-identified application through (1) the filing of any foreign application without specific permission of the Patent and Trademark Office, or (2) the export of any item or data without any export license which may be required.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(3) Secrecy Order

This Secrecy Order will be used for those patent applications that contain properly classifiable technical data under a security guideline where the patent application owner does not have a DOD Security Agreement under the ISM.

This Secrecy Order is substantially the same as the Secrecy Order in use up to now, and will be used where the other types of Orders do not apply. This Order may be issued by direction of agencies other than the Department of Defense. Unless issued with the initial Order, modifications to the Secrecy Order and/or permits under 37 CFR 5.1 et seq. will be needed for additional disclosure.

The following is a copy of this third type of Secrecy Order:

Serial No:
Filed:
Application:
Title:
Sponsoring Agency & Address:

Secrecy Order

(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter the unauthorized disclosure of which would be detrimental to the national security, and you areordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized by the Commissioner of Patents and Trademarks.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

Since the disclosure of the subject matter of the above-identified application would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

Each Secrecy Order forbids the publication or disclosure of the invention except as specially authorized. By revising these Secrecy Orders to conform with existing export and classification authority, the burden on patent applicants to seek additional permits for disclosure and/or foreign filing under 37 CFR Part 5 will be reduced. The new Secrecy Orders reflect the level of secrecy required by law and regulation for various technologies and will place National Security and export controls on the patent application in harmony with other applicable export and classification controls. Also, this change will reduce the risk of disclosure of the subject matter of the invention by providing greater guidance on the safeguarding of the subject matter invention.

Information regarding the new Secrecy Orders may be obtained by calling Mr. Kenneth L. Cage, Director, Special Laws Administration Group, at (703) 557–2877 or by mail directed to Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231.

Sept. 9, 1986.

DONALD W. PETERSON,
Deputy Commissioner of Patents and Trademarks.

[FR Doc. 86–21023 Filed 9–16–86; 8:45 am]
BILLING CODE 3510–16–M

[1071 OG 31]

(140) **Guidelines for Extension of Patent Term Under 35 U.S.C. 156**

This notice is intended to establish initial guidelines for patent owners who are seeking extensions of patent terms pursuant to newly enacted 35 U.S.C. 156. These guidelines will be effective until further notice. Section 156 of Title 35, United States Code, provides that a patent owner seeking an extension of the term of a patent pursuant to its provisions must submit an application to the Commissioner of Patents and Trademarks (hereinafter Commissioner) within a certain defined period of time. Section 156 specifies certain components the application is to contain, including "such patent or other information as the Commissioner may require." See 35 U.S.C. 156(d) (1) (E). Section 156(d) (4) also provides that "[a] n application for the extension of the term of a patent is subject to the disclosure requirements prescribed by the Commissioner." Section 156(h) provides that the "Commissioner may establish such fees as the Commissioner determines appropriate to cover the costs to the Office of receiving and acting upon applications under this section." The purpose of this notice is to provide the guidelines which a patent owner or its agent should use in deciding whether to submit an application for the extension of the term of a patent to the Patent and Trademark Office and in actually making the submission of such an application. This notice is divided into a number of sections set forth below which treat various determinations which have to be made by a patent owner or its agent prior to submission of an application and further includes guidelines as to the actual content of an application for extension of the term of a patent.

A patent owner or its agent should use the guidelines in the various sections set forth below in determining whether a patent is subject to, and meets the conditions for, extension of its term. If so, the patent owner or its agent should also use the guidelines set forth below in preparing and filing an application for extension of the patent term. If any application for extension of the term of a patent is filed in accordance with 35 U.S.C. 156 before the date on which this notice is published in the Official Gazette and is not in compliance with the requirements of this notice, applicant will be notified of the deficiencies in the application and will be given a period of time within which to correct the deficiencies.

Guidelines

§A. *Patents subject to extension of the patent term.*

(a) Any patent which claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, is subject to being extended in accordance with 35 U.S.C. 156.

(b) The term "product" referred to in paragraph (a) of this section means (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

§B. *Conditions for extension of term of a patent.*

The term of a patent may be extended if:
(a) the patent claims a product or a method of using or

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manufacturing a product as defined in §A of this notice;
(b) the term of the patent has never been previously extended except for any interim extension issued pursuant to 35 U.S.C. 156(e) (2);
(c) an application for extension is submitted pursuant to §D of this notice;
(d) the product has been subject to a regulatory review period as defined in 35 U.S.C. 156(g) and by the Secretary of Health and Human Services before its commercial marketing or use;
(e) the product has received permission for commercial marketing or use and (i) the application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or used under the provision of law under which the applicable regulatory review period occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;
(f) the term of the patent has not expired before the submission of an application pursuant to §D of this notice; and
(g) no other patent has been extended for the same regulatory review period for the product.

§C. *Applicant for extension of patent term.*

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of §D of this notice.

§D. *Application for extension of the term of a patent.*

(a) An application for extension of the term of a patent must be made in writing to the Commissioner of Patents and Trademarks. The filing date of an application for extension of the term of a patent is the date on which the complete application for extension and a duplicate of the papers thereof, certified as such, are received in the Patent and Trademark Office or filed pursuant to the provisions of 37 CFR 1.10. The provisions of 37 CFR 1.8 should not be used to file an application for the extension of the term of a patent.
(b) A complete application for the extension of the term of a patent comprises:
(1) a complete identification of the approved product as by appropriate chemical and physical structure or characteristics;
(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;
(3) an identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;
(4) a statement that the application is being submitted within the sixty day period permitted for submission and an identification of the date of the last day on which the application could be submitted;
(5) a complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, and the date of issue;
(6) a copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings, in the form of a cut-up copy of the original patent with only a single column of the printed patent securely mounted or reproduced in permanent form on one side of a separate paper;
(7) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;
(8) a statement that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claims and demonstrates the mannerin which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;
(9) the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period;
(10) a brief description of the activities undertaken by the applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;
(11) a statement that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;
(12) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to any determinations to be made relative to the application for extension; and
(13) the prescribed fee for receiving and acting upon the application for extension (see §F of this notice) and an oath or declaration as set forth in paragraph (c) of this section.
(c) Any application for extension of the term of a patent submitted pursuant to paragraphs (a) and (b) of this section must include an oath or declaration signed by the owner of record of the patent or its agent which specifically identifies the application papers and the patent for which an extension is sought and avers that the person signing the oath or declaration:
(1) has reviewed and understands the contents of the application being submitted pursuant to this section;
(2) believes the patent is subject to extension pursuant to §A of this notice;
(3) believes an extension of the length claimed is fully justified under 35 U.S.C. 156; and
(4) believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in §B of this notice.
(d) If any application for extension of the term of a patent submitted pursuant to this section is held to be incomplete, applicant may seek to have that holding reviewed by filing a petition pursuant to 37 CFR 1.182 within such time as may be set, or if no time is set, within one month of the date on which the application was held incomplete.

§E. *Interim extension of the term of a patent.*

An applicant who has filed an application for extension pursuant to §D of this notice may request one or more interim extensions for periods of up to one year pending a final determination on the application. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions for periods of up to one year until a final determination is made without a request by the applicant. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§F. *Fee for receiving and acting on an application for extension of the term of a patent.*

Pursuant to 35 U.S.C. 156(h) the Commissioner has determined that a fee of $750.00 is appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of the term of a patent filed pursuant to 35 U.S.C. 156. The fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess or required to submit any deficiency.

§G. *Address for application for extension of the term of a patent and communications relating thereto.*

All applications for extension of the term of a patent and any communcations relating thereto intended for the Patent and Trademark Office should be addressed to the Commissioner of Patents and Trademarks, Box Patent Ext., Washington, D.C. 20231. When appropriate, the communication should also be marked to the attention of a particular individual.

§H. *For further information contact:*

R. Franklin Burnett by telephone at (703) 557–3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. 156. They will provide appropriate guidance to patent owners and their agents pending appropriate changes which will be made in Title 37 of the Code of Federal Regulations.

DONALD J. QUIGG,
Sept. 25, 1984. *Acting Commissioner of Patents and Trademarks.*

[1047 O.G. 16]

(141) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 60594–7007]

Rules for Extension of Patent Term

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Part 1 of Title 37, Code of Federal Regulations, to provide the rules and procedures under which extensions in the terms of patents may be sought pursuant to the provisions of 35 U.S.C. 156 which was enacted on Sept. 24, 1984 in Title II of Pub. L. 98–417, the "Drug Price Competition and Patent Term Restoration Act of 1984." The new 35 U.S.C. 156 provides that, upon application to the Commissioner of Patents and Trademarks, the term of a particular patent, which claims a product or a method of using or manufacturing a product as defined in the Public Law, may be extended under certain circumstances and conditions where the product has been subject to a regulatory review as defined in Pub. L. 98–417 and by the Secretary of Health and Human Services, before its commercial marketing or use. The rule changes amending Part 1 of Title 37 would provide specific procedures for the submission of such applications to the Patent and Trademark Office and for the determination and issuance of certificates of patent term extension (PTE) by the Patent and Trademark Office on the applications submitted.
Effective Date: May 26, 1987.
For Further Information Contact: Charles E. Van Horn by telephone at (703) 557–3637 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: A notice of proposed rulemaking was published in the **Federal Register** on July 30, 1986, at 51 FR 27205–27215 and in the Official Gazette on Aug. 19, 1986, at 1069 O.G. 25–34. An oral hearing was held on Sept. 15, 1986. Sixteen written letters and statements were submitted. Two (2) persons testified at the oral hearing which resulted in ten (10) pages of testimony.

Objectives of the Rule Change

The rule change makes some clarifications and additions to the initial operating guidelines which were published as "Guidelines for Extension of Patent Term under 35 U.S.C. 156" in the Official Gazette of the PTO on Oct. 9, 1984. Several of the changes are designed to adopt and implement suggestions from members of the public.

Discussion of Specific Rules

Section 1.1 is amended to indicate that applications for extension of patent terms and any communications relating thereto intended for the Patent and Trademark Office should be directed to "Box Patent Ext."

The filing of an application for an extension of the term of a patent would be considered timely if received in the Patent and Trademark Office on or before the statutory deadline, or if the application is deposited with the U.S. Postal Service in accordance with the provisions of §1.8 or §1.10 of this part before the statutory deadline. The filing of an application for an extension of the term of a patent would be treated in the same manner as the filing of any paper required to be filed in the Patent and Trademark Office within a set period of time and not subject to the exceptions enumerated in 37 CFR 1.8(a).

Section 1.20 is amended to add paragraph (n) to establish a fee of $550.00 for filing an application for extension of the term of a patent pursuant to §1.740. This amount is set to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of patent term as provided in 35 U.S.C. 156(h) based upon PTO experience in processing applications for patent term extension during the first two years of implementation.
Comment: The reduction in the fee for filing an application for patent term extension from $750.00 to $550.00 has raised the question of how to obtain refunds for those applications filed under the initial operating guidelines.
Reply: When the final rules are approved, refunds will be made to those who paid the higher fee without any request being filed. Although the final rules do not take effect until 60 days from publication in the **Federal Register**, the fee of $550.00 should be paid with any application filed after the date of this publication of the final rules.
Comment: It has been suggested that a lower fee be set for the filing of a patent term extension application which would be applicable to small entities.
Reply: This suggestion has not been adopted since there is no statutory provision for such a fee structure.

A new "Subpart F—Extension of Patent Term" is added to Part 1 to include §§1.710 through 1.785.

Section 1.710 defines the patents subject to extension of the patent term. Paragraph (a) of §1.710 defines the patents subject to extension in terms of the subject matter being claimed therein. Under paragraph (a) of §1.710 a patent to (1) a product, (2) a method of using a product, (3) or a method of manufacturing a product can be extended as long as the product meets the definition contained in paragraph (b) of §1.710, and as long as the other conditions and requirements for extension of patent term are met. Paragraph (b) of §1.710 follows the language of 35 U.S.C. 156 and defines a "product" as meaning (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" as defined in paragraph (b) of §1.710 means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) in-

cluding any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

Comment: It has been proposed that §1.710 be modified to specifically acknowledge that patents claiming pharmaceutical compositions or formulations of the "product" are eligible for extension or alternatively to modify the term "product" to include such compositions or formulations.

Reply: "Product" is specifically defined in 35 U.S.C. 156(f) as follows. For a human drug product, the term means "the active ingredient of a new drug, antibiotic drug or human biological product (as those terms are used in the Federal Food, Drug and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity, or in combination with another active ingredient." A patent is considered to claim the product where it claims the active ingredient per se, or claims a composition or formulation which contains the active ingredient(s) and reads on the composition or formulation approved for commercial marketing or use.

Comment: It has been suggested that the language of §1.710(b) be modified to read "(1) a human drug product (i.e., the active ingredient of a new drug, antibiotic drug or human biological product, as those terms are used in the Federal Food, Drug, and Cosmetic Act and/or the Public Health Service Act)", with a similar modification at the bottom of the paragraph.

Reply: Since the language used in this section of the rule tracks the statutory language on which it is based and to avoid possible confusion or unnecessary ambiguity, the proposed modification has not been adopted.

Comment: It has been suggested that the definition of the term "product" be broadened to specifically refer to product-by-process claimed products.

Reply: The term "product" as defined in the statute and rules is considered to encompass any means of defining a product. Product-by-process claims are only an alternative form available to claim a product. Neither the proposed rules nor statute limit the manner of claiming a product.

Section 1.720 defines the conditions under which the term of a patent may be extended. The conditions for extension are:

(1) The patent must claim a product or a method of using or manufacturing a product as defined in §1.710;

(2) The term of the patent must never have been previously extended except for any interim extension issued pursuant to §1.760;

(3) An application for extension must be submitted in compliance with §1.740;

(4) The product must have been subject to a regulatory review period as defined in 35 U.S.C. 156(g) before its commercial marketing or use;

(5) The product must have received permission for commercial marketing or use and (i) the permission for the commercial marketing or use of the product must be the first received permission for commercial marketing or use under the provision of law under which the applicable regulatory review occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use must be the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent;

(6) The application must be submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred, or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension must be submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of the product manufactured under the process claimed in the patent;

(7) The term of the patent must not have expired before the submission of an application in compliance with §1.741; and

(8) No other patent term must have been extended for the same regulatory review period for the product.

Comment: It has been suggested that §1.720(e) be modified to avoid combining the two statutory requirements that (1) the product is an approved product, that is, it has received permission for commercial marketing or use and (2) that the application be submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use.

Reply: The section has been modified to be more consistent with the underlying statutory language. In addition, subsection (e)(i) has been changed to (f), the term (ii) has been cancelled and subsections (f) and (g) have been relettered as (g) and (h) respectively. Thus, each statutory requirement is separately provided for as suggested.

Comment: The rule appears to distinguish between the date when commercial marketing or use is "first *permitted*" for products made by DNA method inventions, versus the date a product first "*received* permission" for commercial marketing or use. Since this distinction is not required by the statute which uses the language "first permitted commercial marketing or use" in each case, is there some other policy reason for the apparent distinction?

Reply: No distinction was intended, simply a different combination of words used to describe the same date—i.e. the date of "first permitted commercial marketing or use."

Comment: It has been suggested that patent term extension should not be available for a patent in which a terminal disclaimer has been filed and particularly where such a terminal disclaimer was necessary to avoid double patenting.

Reply: The suggestion has not been adopted since there is no statutory basis for denying an application for patent term extension where the term of the patent sought to be extended is affected by a terminal disclaimer.

Section 1.730 requires that an application for extension of a patent be submitted by the owner of record of the patent or its agent and that the application must comply with the requirements of §1.740. The application papers submitted would be required to clearly reflect and establish the authority of the person submitting the application to do so on behalf of the owner. See §1.740(b). For example, if the person submitting the application is the owner of record, the application papers would be required to so reflect. If the person submitting the application is doing so as the agent of the owner of record, the application papers must so reflect and establish the authority of the agent to act on behalf of the owner, e.g., as an officer of a corporate owner.

Comment: It has been suggested that §1.730 be deleted as being redundant with §§1.720(c) and 1.740(b).

Reply: This suggestion has not been adopted. Section 1.730 repeats the statutory requirement as to those eligible to file the application for patent term extension. Sections 1.720(c) and 1.740(b) reflect the Commissioner's rule making authority as to what is necessary to demonstrate that the statutory requirement has been met by defining (1) who must sign the oath or declaration which accompanies an application for patent term extension and (2) the contents of the oath and declaration. Thus the sections are not redundant.

Section 1.740 establishes the contents and requirements of an application for extension of patent term. Paragraph (a) of §1.740 requires that the application be made in writing to the Commissioner of Patents and Trademarks. The certified duplicate of the application papers will serve as the copy to be submitted by the Commissioner to the Secretary of Health and Human Services in order that the Secretary may determine the applicable regulatory review period as required by Pub. L. 98–417.

Paragraph (a) of §1.740 further specifies the contents of a formal application for extension of patent. If the application does not meet all formal requirements when submitted, the applicant will be notified of the informalities and may seek to have that holding reviewed under §1.740(c). In accordance with paragraph (a) of §1.740, a formal application for the extension of the term of a patent shall include:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics that would permit the Commissioner to make a determination of whether the patent claims the approved product, or a method of making or using the approved product;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of a human drug product, an identification of each active ingredient in the product and as to the product and each active ingredient, a statement that they have not been previously approved for commercial marketing or use under the Federal Food Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved;

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to proposed §1.720(f) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

(8) A copy of any disclaimer, certificate of correction, receipt or statement of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period.

(i) For a human drug product, this information will include the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) was initially submitted and the NDA number; and the date on which the NDA was approved;

(ii) For a food or color additive, this information will include the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the application was approved;

(iii) For a medical device, this information will include the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which an application for product approval under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

In the cases where there is no regulatory event to reflect the commencement of the testing or approval phase of the regulatory review period, applicants should include in the application the dates that they claim initiate either the approval or the testing phases and an explanation of their reasonable basis for why they conclude that these dates are the relevant dates. For instance, when the clinical trials are conducted outside the United States, the testing phase for a medical device begins on the date the clinical investigation involving the device was begun. An applicant should include an explanation as to why the date claimed is the date on which such clinical investigations had commenced. If the applicant had any means of substantiating that date, that information should be included in the application.

Finally, on this separate page in the application there should be a statement as to the length of the regulatory review period claimed including an explanation of how the applicant determined the length of the regulatory review period. It should be noted in the application that this particular calculation is made solely with respect to section 156(G)(1) thru (3) of Title 35 of the United States Code and does not take into account any other limitations or restrictions on the length of possible patent extension.

(11) A brief description beginning on a new page of the significant activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities. This description should include an identification of significant communications of substance with the Food and Drug Administration (FDA) and the dates related to such communications. For example, these activities would include the dates of the submission of new data to the FDA, communications between FDA and the applicant with respect to the appropriate protocols for testing the product, and communications between FDA and the applicant that are attempts to define the particular requirements for premarketing approval of this particular product.

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined and whether the 14 year limit of 35 U.S.C. 156(c)(3), the five year limit of 35 U.S.C. 156(g)(4)(A) or (B) or the two year limit of 35 U.S.C. 156(g)(4)(C) applies.

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to the determination of entitlement to the extension sought (see §1.765);

(14) The prescribed fee for receiving and acting upon the application for extension (see §1.20(n));

(15) The name, address, and telephone number of the person to whom contacts and correspondence relating to the application for patent term extension are to be directed;

(16) A duplicate of the application papers, certified as such; and

(17) An oath or declaration as set forth in paragraph (b) of this section.

Paragraph (b) of §1.740 requires that an oath or declaration signed by the owner of record of the patent or its agent accompany the application as a part thereof. An application for extension filed without an oath or declaration is not a formal application. The oath or declaration filed as a part of the application must specifically identify the application papers and the patent for which an extension is sought and include averments that the person signing the oath or declaration:

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney

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or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters.

(2) Has reviewed and understands the contents of the application being submitted pursuant to §1.740;

(3) Believes the patent is subject to extension pursuant to §1.710;

(4) Believes an extension of the length claimed is fully justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in §1.720.

In signing the oath or declaration referred to in paragraph (b) of §1.740 an official of a corporate owner or an attorney or agent acting on behalf of the owner is representing that he or she is the agent of the owner and has authority to act on behalf of the owner in filing the application for patent term extension. Note also §1.730.

Paragraph (c) of §1.740 provides for review of a holding that an application for patent term extension is informal by the filing of a petition with any appropriate fee, if necessary, pursuant to §§1.181, 1.182 or 1.183 of this title. Should an applicant disagree with the holding of informality and wish to have the holding reviewed, a petition under 37 CFR 1.181 would be appropriate. If applicant chooses to provide additional information to correct the informality, a petition under 37 CFR 1.182, accompanied by the required fee, should accompany such a filing.

The failure to timely comply with any requirement of these regulations which is not an explicit requirement of the statute may be waived under the appropriate circumstances in accordance with 37 CFR 1.183. While timely action is expected, relief under 37 CFR 1.183 may be appropriate in view of the tight time deadlines and other circumstances involved in filing an application for extension of the patent term. Any such petition must be filed with the required fee within such time as may be set, or if no time is set, within one month of the holding.

Comment: It has been suggested that §1.740 be modified in order to permit the obtaining of a filing date for an application should it be found not to meet all of the requirements of §1.740(a). The suggestion arises from a concern that an application which was filed within the 60 day filing period provided by statute and which was subsequently found to be informal within the meaning of the rules, might lose the filing date for failing to meet all requirements of the rules at the time of filing. Since the period for filing an application for patent term extension is limited by statute, it might not be possible for an applicant to correct such informalities within the statutory period of 60 days and could result in the loss of rights to an extension. In this regard it has also been suggested that the rules be modified to allow a filing date for a "substantially complete application" which might have been determined by the Patent and Trademark Office to be incomplete or informal.

Reply: This suggestion has been essentially adopted by providing a new section designated 1.741 which specifically defines the requirements which must be met in order for an application to be entitled to a filing date. These requirements are those set forth in 35 U.S.C. 156(d)(1). Section 1.740(b) has been relettered as (a) and defines what constitutes a "formal application". Subparagraph (c) now provides for notice to applicant in the event that the application as filed is found to be informal as well as applicant's recourse to such a holding. If the requirements of §1.741 are met, the filing date will have been established as provided therein even if the application is held to be informal under §1.740.

Comment: Clarification of the requirements of §§1.740 (a)(1) and 1.740 (a)(4) has been requested with regard to products or methods of making or using them so as not to require the submission of trade secret information unless necessary for a determination of eligibility for patent term extension or at least enable the PTO to maintain the information of this type as a trade secret.

Reply: There is no provision in the statute or proposed rules for withholding from the public any information that is submitted to the PTO or FDA relating to an application for patent term extension. If proprietary or trade secret information is submitted to the Office, and specifically identified as such, it will be maintained in secret by the PTO until a certificate of patent term extension is issued. Identification should be made by page, line and word as necessary. If such information was necessary to a determination of eligibility or any other PTO responsibility under 35 U.S.C. 156, it will be made public at the time the certificate is issued. Otherwise, the trade secret information will be expunged from the file and returned to the patent term extension applicant, if the information regarded as a trade secret is specifically identified.

Comment: Section 1.740(a)(4) is confusing because it is unclear whether an applicant for a patented formulation that combines two active agents must submit information as to the regulatory review periods for each active ingredient separately, the combined active agents, or all of the above.

Reply: All of the above is correct, so that a determination can be made under 35 U.S.C. 156(a)(5).

Comment: Section 1.740(a)(4) should be modified to include a statement that the applicant is not prejudiced by the rule requirements in obtaining a patent term extension where some, but not all, active ingredients have been approved by the FDA for commercial marketing or use prior to approval of the new chemical entity (NCE) claimed in the patent for which a PTE application has been filed.

Reply: The basic issue presented by this comment is whether a patent claiming an approved product containing an old active ingredient (approved by FDA in a prior regulatory review) and a new active ingredient is eligible for patent term extension. The PTO has a long standing policy of not addressing an issue in advance of receiving an application presenting the issue for determination. However, the concept of patent term restoration appears to be directed to those situations where a new chemical entity is involved as an active ingredient, regardless of the content of the balance of the formulation approved by the FDA.

Comment: It has been suggested that §1.740(a)(4) be deleted as redundant with §§1.740(a)(1) and 1.740(a)(3) and might be interpreted as requiring information not authorized by statute.

Reply: Section 1.740(a)(4) requires a statement, by applicant, that each active ingredient present in the approved product has not been previously approved for commercial marketing and use. This is a different requirement from either §1.740(a)(1) or §1.740(a)(3) which require an indentification of the approved product and an identification of the date on which the product received permission for commercial marketing or use. This information is important to a determination of eligibility under 35 U.S.C. 156(a)(5). As to the question of information authorized by statute, 35 U.S.C. 156(d)(1)(E) permits the Commissioner to request any such information required.

Comment: It has been suggested that §1.740(a)(6) be modified to include a requirement that the application, in identifying the patent for which extension is sought, include the date of expiration and such information should take into account any terminal disclaimer.

Reply: Section 1.740(a)(6) has been modified to require a statement of the expiration date.

Comment: It was observed that the proposed rules no longer require a "reissue style" cut-up copy of the original patent.

Reply: The observation is accurate since the PTO has found that a cut-up copy has not been required and only adds unnecessary work for the applicant and bulk to the application.

Comment: It has been suggested that §1.740(a)(8) be modified by adding the requirement for a copy of any decision by a court of competent jurisdiction, which decision is adverse to the validity of the patent.

Reply: This suggestion has not been adopted because the patent owner or agent has a duty of disclosure under §1.765 which would reasonably include the obligation to bring such a decision to the attention of the Office.

Comment: It has been suggested that the comments in the proposed preamble regarding §1.740(a)(10) be revised to reflect that this subsection does not require a statement of the length of the regulatory review period and how it was determined.

Reply: This observation concerning the requirements of §1.740(a)(10) was correct since there was no requirement that a description be provided as to how the regulatory review period is determined. However, since it would be helpful to the FDA in confirming its own calculation to have a statement concerning the length of the regulatory review period, including how the length was determined, these requirements have been made a part of §1.740(a)(10).

Comment: It is suggested that the language of §1.740 (a)(11) which calls for a description of the activities carried out by the "applicant" is too restrictive since other parties may be involved in or sponsoring the FDA approval work.

Reply: The provisions of §1.740(a)(11) have been modified to point out that a description of the activities of the marketing applicant before the FDA is requried.

Comment: It has been suggested that §1.740(a)(11) should be modified to require a description of "significant" or "material" activities undertaken by the marketing applicant during the applicable review period. It is argued that the section taken in combination with the related discussion in the proposed preamble places too great a burden on an applicant, i.e. submission of summaries of all communications and all dates of any activities regarding the FDA approval process.

Reply: The section has been modified so as to require a brief description of the significant activities undertaken by the marketing applicant during the applicable regulatory review period and the significant dates applicable thereto. Thus the requirements of this section may be met by an identification of significant communications of substance with the FDA during the regulatory review period and the dates related to such communications. There is no intent on the part of the PTO to broaden the burden of the statute, in regard to the description of the activities to which this section pertains, by requiring submission of insignificant details. The PTO does not read the statute to require an applicant to establish the existence of due diligence during the regulatory review period in order to have a complete application. It is recognized that the regulatory review process may be continuous and protracted. Not all communications are material to that process but certainly all of those which are significant to the regulatory review process should be identified. It is sufficient that the description of the activities briefly identify those significant activities undertaken by the marketing applicant in order to identify significant events in the effort directed toward regulatory approval of the product.

Comment: It has been suggested that the requirement of §1.740(b)(1) that the person signing or declaring other than either the patent owner or corporate owner with the authority to obligate the corporation must have "specific" written authority to sign the oath or declaration was confusing and might well work a hardship on applicants since the rule is unclear as to just what type of authorization is required.

Reply: This section has been modified to include an attorney or agent who has general authority to take action on behalf of the patent owner with respect to patent matters so long as that person is registered to practice before the Patent and Trademark Office.

Comment: It has been suggested that §1.740(c), which permits an applicant whose application has been found to be informal to file a petition with the required fee pursuant to §§1.181, 1.182 or 1.183, is unduely burdensome for minor informalities. It has been suggested, therefore, that an applicant be given a period in which to resubmit the application in corrected form together with a fee and avoid the filing of the described petition.

Reply: This suggestion has not been adopted since the PTO expects that the application will be complete and formal as filed. A petition, with the appropriate fee, as necessary is a well recognized mechanism for reviewing a holding that a defect exists or curing a defect in papers that have been submitted and providing an opportunity for applicant to explain how the defect occurred.

Section 1.741 provides that the filing date of an application for patent term extension will be the date on which an application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10 and which includes all of the following:

(1) An identification of the approved product;

(2) An identification of the Federal statute under which regulatory review occurred;

(3) An identification of the patent for which an extension is being sought;

(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsection (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services to determine the period of the extension; and

(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

Section 1.741(b) provides that if an application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under §1.181.

Section 1.741 has been provided in response to concerns presented in many of the written comments received as to the limited statutory time period for filing an application for patent term extension and the possibility of not obtaining a filing date within the 60 day period during which the statute requires such an application to be filed. The rule now provides that the filing date will be that date on which the application is filed with the PTO and meets those requirements specifically set forth. These requirements are those specifically required by the statutory language of 35 U.S.C. 156(d)(1). The PTO will consider each of these statutory requirements to be satisfied in an application which provides sufficient information, directed to each requirement, to act on the application, even though further information may be desired by the PTO or Secretary before a final determination of eligibility and length of patent term extension is made.

Section 1.750 covers the determination of eligibility for extension of the term of a patent which will be made by the Patent and Trademark Office on the application for extension. As provided for by Pub. L. 98-417, and as set forth in this section, it is intended that the determination as to whether a patent is eligible for an extension can be made solely on the representations contained in the application for extension filed in compliance with §1.740 of this part. Section 1.750 does, however, provide that further information may be required of applicant by the Commissioner or other officials or the Commissioner or other officials may make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. In circumstances where further information is required by the Office, the applicant will be given a time period within which to respond. The failure to file a response within the period provided may result in a final determination adverse to the granting of an extension of patent term unless the response period is extended. An extension of time to respond may be requested under the provisions of 37 CFR 1.136. Under appropriate circumstances, a request for information may contain a statement that the

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provisions of 37 CFR 1.136(a) are not available. The intentional failure to provide the information requested also will result in a final adverse determination.

A final determination may be made at any time after an application is filed, but no later than when a certificate of extension is issued. Section 1.750 provides that a single request for reconsideration of a final determination may be filed within one month or within such other time period set in the final determination. Section 1.750 also provides that the determination may be delegated to appropriate Patent and Trademark Office officials. A notice will be mailed to applicant containing the determination as to eligibility of the patent for extension and the period of time of the extension of the term, if any. This notice shall constitute the final determination as to eligibility and any period of extension of the patent term. If no response to the notice of final determination is received, the certificate of patent term extension will be issued in due course.

Comment: It has been suggested that §1.750 be modified to expressly recognize that the rules being simultaneously promulgated by the FDA (Subpart B) provide for the FDA to give the PTO assistance in making eligibility determinations under the statute and that the PTO may seek such assistance and make such independent inquiries as it deems desirable in determining eligibility.

Reply: The §1.750 has been modified by adding, immediately following the term "information", the phrase "or make such independent inquiries as desired".

Comment: It has been suggested that §1.750 be modified to permit applicant to respond to a request for information or a notice under this section under the provisions of 37 CFR 1.136(a) upon payment of the appropriate fee. Applicant could thus extend the time for the required response without meeting the requirements of 37 CFR 1.136(b).

Reply: Sections 1.740(c) and 1.750 have been modified to permit extensions under 37 CFR 1.136. However, if time is of the essence for a particular reason, applicant should anticipate that a requirement made by the PTO would include a statement that extensions under 37 CFR 1.136(a) were not available.

Comment: It has been suggested that §1.750 should be modified to provide notice to applicant, 30 days prior to a final determination of eligibility for extension of the identity of all patents or claims eligible for extension in order to permit time to choose which patent to extend and which to withdraw prior to the issuance of the certificate.

Reply: This proposal has not been adopted since applicant will be given an opportunity to elect in the notice of final determination. See §1.770.

Comment: It has been suggested that the identification of a final route of appeal should be set forth as a second paragraph of §1.750.

Reply: This proposal has not been adopted since no appeal is provided for by the legislation and the PTO does not determine the jurisdiction of the Federal Courts.

Section 1.760 provides for one or more interim extensions for periods of up to one year each where a complete application in compliance with §1.741 has been filed by an applicant and a final determination pursuant to §1.750 has not been made on the application. Section §1.760 provides that the Commissioner may issue an interim extension with or without a request by the applicant. The section also provides that if an interim extension is granted, a notice will be issued to the applicant for the extension of the patent term, the notice would be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the interim extension will be published in the Official Gazette of the Patent and Trademark Office. In order for an interim extension to be granted, the application in compliance with §1.741 must have been filed prior to the expiration date of the patent even though the interim extensions may not actually be granted until after the original expiration date of the patent. In no event will interim extensions be granted under §1.760 for a period of patent term extension longer than that to which the patent would be eligible.

Comment: It has been suggested that §1.760 be clarified as to whether the one year limitation appearing therein applies to each such extension or all such extensions added together could only be for a period of up to one year.

Reply: The section has been modified by adding the term "each" following the term "year", to make it clear that multiple extensions of up to one year each can be granted under appropriate circumstances.

Comment: It has been suggested that §1.760 be modified to require a shorter filing period than the present 3-months prior to expiration of the patent where appropriate.

Reply: While §1.760 provides that a request for an interim extension "should" be filed three months prior to the expiration of the patent, this time frame is not mandatory. Note further that the Commissioner may issue such an interim extension without the filing of a request. Any request filed within a shorter period of time will be considered, particularly where it is not possible to make an earlier request. The provisions of the rule state a highly desirable time frame for making a request but not a mandatory time limit.

Comment: It has been suggested that §1.760 be modified to provide that on issuance of an interim extension that the PTO will notify the patent holder, make the decision a part of the official record of the patent and publish the determination in the **Federal Register** and the Official Gazette of the PTO.

Reply: The section has been modified as suggested.

Comment: It has been suggested that §1.760 be modified to provide for a single request for reconsideration of a PTO decision denying a request for an interim extension and that the patent would be granted an interim extension during the time required for reconsideration and any subsequent appeal.

Reply: While a request for reconsideration which was timely filed would be considered, a determination that an interim extension will not be issued would only occur where the Commissioner is not convinced that the subject patent is eligible for extension under 35 U.S.C. 156. Therefore, an interim extension while applicant sought reconsideration would also be improper.

Section 1.765 defines the duty of disclosure in patent term extension proceedings. Paragraph (a) of §1.765 specifies the individuals on whom the duty rests and the extent of the duty. Paragraph (b) of §1.765 requires that disclosures pursuant to the section be accompanied by a copy of each written document being disclosed and specifies to whom the submission is to be made, i.e., the Patent and Trademark Office or the Secretary, as appropriate. Such disclosures would be able to be made through an attorney or agent.

Paragraph (c) of §1.765 precludes a determination of eligibility for an extension or the issuance of a certificate if clear and convincing evidence of fraud or attempted fraud on the Office or the Secretary is determined to be present or the duty of disclosure is determined to have been violated through bad faith or gross negligence in connection with the patent term extension proceeding. Since the determination as to whether a patent is eligible for extension pursuant to §1.750 may be made solely on the basis of the representations made in the application for extension, a final determination to refuse a patent term extension because of fraud or a violation of the duty of disclosure is expected to be rare.

Paragraph (d) of §1.765 precludes submissions to the Patent and Trademark Office by or on behalf of third parties, thereby making patent term extension proceedings in the Office an *ex parte* matter between the patent owner or its agent and the Commissioner. Under paragraph (d) of §1.765, submissions by third parties to the Office will be returned, or otherwise disposed of, without consideration. Paragraph (d) does not affect submissions authorized by Pub. L. 98-417 to be made to the Secretary during determination of the applicable regulatory review period.

Comment: It has been suggested that the language of section 1.765(d) is too limited in not permitting information bearing on violations of the duty of disclosure as well as other information relevant to the determination of eligibility of the patent for extension of term to be submitted to the Office by third parties.

Reply: Although Congress specifically provided for public input into the determination of the length of the regulatory review period, no such provision was made for proceedings before the PTO. Since applicant already has a duty of disclosure to both the PTO and FDA, and Congress expected that it would be an administratively simple proceeding, no input from third parties is considered appropriate.

Comment: It has been suggested that the definition of the phrase "patent term extension proceeding" should be spelled out.

Reply: Since the phrase clearly encompasses all phases of the proceeding between the filing of an application for the extension of the term of a patent until either the issuance of an extension certificate or a final denial of eligibility no longer subject to petition, request for reconsideration or appeal, defining the phrase is not deemed a necessary part of the rules.

Comment: It has been suggested that the phrase "information material to the" in line 12 of §1.765(a) be changed to___ material adverse to a___, in order to avoid unnecessary submission of evidence or information which has no bearing on the proceedings.

Reply: This suggestion has been adopted since it is not intended to require information or evidence which has either no bearing on the proceeding or is material to a favorable determination by the Office of the Secretary.

Comment: It has been suggested that §1.765 is unclear in that it applies the duty of disclosure relating to the patent term extension application to "each attorney or agent who represents the patent owner." There was concern of the effect of this broad duty of disclosure, for example, in a large corporation.

Reply: The language in this section specifically limits the duty of disclosure to those who are substantively involved on behalf of the patent owner in a patent term extension proceeding.

Comment: It has been suggested that §1.765 should be clarified as to whether the duty of disclosure extends to prior art discovered since issuance of the patent.

Reply: Section 1.765(b) specifically states that an attorney, agent or patent owner has no duty to transmit information which is not material to the determination of entitlement to the extension sought.

Section 1.770 provides for the express withdrawal of an application for extension of the term of a patent if the written declaration of withdrawal signed by the owner of record or its agent is filed in the Office, in duplicate, before a determination is made pursuant to §1.750. Under §1.770, an application for extension of the term of a patent may not be expressly withdrawn after the date permitted for response to the final determination pursuant to §1.750. Section 1.770 also provides that an express withdrawal is effective when acknowledged in writing by the Office and that the filing and acceptance of an express withdrawal does not entitle applicant to a refund of the filing fee for the application for patent term extension or any portion thereof.

Comment: It has been suggested that §1.770 be modified to set forth reasons for withdrawal of an application for patent term extension.

Reply: Section 1.770 permits the withdrawal of an application for patent term extension for any reason prior to the date permitted for response to the final determination pursuant to §1.750. Since reasons may arise at a later date for the withdrawal of such an application for patent term extension which are not contemplated at this time, it is preferable not to limit the reasons for withdrawal of the application under this section, but to deal with each reason on a case-by-case basis.

Comment: It has been suggested that §1.770 be modified to permit the withdrawal of a patent term extension application within the 30 day period for response provided for in §1.750.

Reply: This proposal has been adopted.

Section 1.775 provides the procedure for calculating the length of patent term extension for a human drug product.

Paragraph (a) of §1.775 specifies that the extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer.

Paragraph (b) of §1.775 provides that the patent term would be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services but reduced, where appropriate, by the time periods provided in paragraph (d).

Paragraph (c) defines the length of the regulatory review period which is determined by the Secretary of Health and Human Services.

For a human drug product, the regulatory review period is defined in 35 U.S.C. 156(g)(1)(B) as the sum of:

(1) The number of days in the period beginning on the date an exemption under section 505 or 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved human drug product and ending on the date an application was initially submitted for the drug product under section 505 or 507 above or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act or subsection (b) of section 505 or 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date the application was approved under the section.

This period is then reduced, where appropriate, by the time periods described in paragraph (d).

Paragraph (d) of §1.775, defines the term of the patent extension by indicating that

(1) The time period determined from paragraph (c) would be reduced, where appropriate by

(i) The number of days in the periods of paragraph (c)(1) and (c)(2) of §1.775 which were on and before the date on which the patent issued

(ii) The number of days from paragraphs (c)(1) and (c)(2) of §1.775 during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence; and

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) after the period has been reduced in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) of §1.775. Half days will be ignored for purposes of subtraction.

(2) Adding the number of days determined in paragraph (d)(1) to the original term of the patent as shortened by any terminal disclaimer;

(3) Adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;

(4) Comparing the dates for the ends of the periods obtained from (d)(2) and (d)(3) with each other and selecting the earlier date;

(5) If the original patent issued after Sept. 24, 1984, (i) by adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained in paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date.

(6) If the original patent was issued before Sept. 24, 1984

(i) If no request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by (A) adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer and (B) by comparing the dates obtained in paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date;

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(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug and Cosmetic Act, before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by (A) adding 2 years to the original expiration date of the patent or any earlier date set by terminal disclaimer, and (B) by comparing the dates obtained in paragraph (d)(4) and (d)(6)(ii)(A) with each other and selecting the earlier date.

Comment: It has been suggested that the PTO publish a form for the use by patent term extension applicants in the calculation of the extension under §§1.775, 1.776 and 1.777.

Reply: This suggestion has been adopted. Suitable forms will be available from the PTO.

Comment: It has been suggested that §§1.775(d)(1)(ii); 1.776(d)(1)(ii) and 1.777(d)(1)(ii) be modified so as to avoid the double subtraction of any period for which an applicant has been found to have acted without due diligence where such period occurred prior to the issuance of the patent. This double subtraction would occur since both the period of regulatory review prior to the issuance of the patent and the total period of time in which applicant has been determined to have acted without due diligence is subtracted from the length of the regulatory review period on which the calculation of the period of extension of the patent is based.

Reply: This suggestion has not been adopted since the statute makes clear that any part of the regulatory review period which occurs before the patent was granted should not be counted toward patent term extension, and makes equally clear that any period in which the marketing applicant failed to exercise due diligence, thereby unnecessarily adding to the length of the regulatory review period after the patent issued, should not be considered in determining the length of the extension period.

Comment: It has been suggested that the language "half days will be ignored for the purposes of subtraction" which appears in §§1.775(d)(1)(iii), 1.776(d)(1)(iii) and 1.777(d)(1)(iii) should be clarified.

Reply: The language in question appears in the sections which describe how the length of extension of the patent term to which an applicant is entitled is to be determined. Specifically the above listed sections are directed to the subtraction of one-half of the number of days in the period defined by subsection (c)(1), of the same section, after that period has been reduced in accordance with subsections (d)(1)(i) and (d)(1)(ii) from the regulatory review period as previously determined. Since one-half of an odd number of days will result in a fraction or one-half day, the above language, which appears in all three sections, indicates that the one half-day will be ignored and thus will not be subtracted from the regulatory review period.

Section 1.776 provides the procedure for calculating the patent term extension for a food additive or color additive. The paragraphs correspond to those of §1.775.

Section 1.777 provides the procedure for calculating the patent term extension for a medical device. The paragraphs correspond to those of §1.775 with the major difference being in the calculation of the regulatory review period.

Comment: It has been suggested that subsection (c) of §1.777 be modified in order for the definition of the "date a clinical investigation on humans involving the device was begun" to be consistent with the definition provided by FDA(21 CFR 60.22(c)(1).

Reply: This suggestion has not been adopted since the PTO has used the language of the statute and has left to FDA the determination of the length of the regulatory review period.

Section 1.780 specifies that once a determination is made pursuant to §1.750 that a patent is eligible for extension, a certificate of extension, under seal, will be issued to the applicant for the extension of the term of the patent. Section 1.780 also provides that the certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Section 1.780 also provides for notification of the issuance of the certificate of extension to be published in the *Official Gazette* of the Patent and Trademark Office.

No certificate or extension will be issued if the term of a patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to §1.750 would indicate that no certificate will issue.

Comment: It has been suggested that §1.780 be modified to clarify the situations contemplated where a patent might be eligible for extension but the patent cannot be extended. If the only possible exceptions are those of §§1.765 and 1.785, the rule should so state this fact.

Reply: It is difficult to contemplate all the situations that might arise, but situations have occurred where the patent and approved product meet all the eligibility requirements of section 720, but the term of the patent cannot be extended because the patent issued less than three years before the product was approved by FDA.

Section 1.785 specifies the procedures to be followed where multiple applications are filed for extension of the same patent or of different patents for the same regulatory review period for a product. Pub. L. 98–417 and §1.785 provide that only one patent may be extended for a regulatory review period for any product. Under §1.785, if more than one application for extension of the same patent is filed, the certificate of extension of the term of the patent, if appropriate, would be issued based upon the first filed application for extension of patent term. If applications are filed by a single applicant for extensions of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension will be issued on the application for extension of the patent having the earliest date of issuance of those for which extension is sought unless all but a single application for the extension of one patent term is voluntarily withdrawn by applicant.

If applications are filed by different applicants for extension of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension will be issued on the application of the holder of the regulatory approval granted with respect to the regulatory review period. If the holder of the regulatory approval granted with respect to the regulatory review period is not an applicant, the certificate of extension will issue to the applicant for extension which holds express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension. If the holder of the regulatory approval is not an applicant and has not given a prior express and exclusive authorization to seek extension based on the regulatory review period, the certificate of extension will be issued on the application for extension of the patent having the earliest date of issuance of those for which extension is sought.

An application for extension will be considered complete and formal whether it contains the identification of the holder of the regulatory approval granted with respect to the regulatory review period or express and exclusive authorization from the holder of the regulatory approval to rely on the regulatory review period for extension. A request may be made of any applicant to supply such information regarding the authorization on which applicant relies from the holder of the regulatory approval on which the application for extension is based. The failure to provide such information within the period for response shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval and is not authorized by the holder of the regulatory approval to seek the extension being sought.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities because patented drugs are generally not commercialized by small entities (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirement contained in this proposed rule has been submitted by OMB for review under section 3504(h) of the Paperwork Reduction Act.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Pub. L. 98–417, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

PART 1—[AMENDED]

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is amended by adding a new paragraph (f) before the note to read as follows:

§1.1 All communications to be addressed to the Commissioner of Patents and Trademarks.

* * * * *

(f) All applications for extension of patent term and any communications relating thereto intended for the Patent and Trademark Office should be additionally marked "Box Patent Ext." When appropriate, the communication should also be marked to the attention of a particular individual, as where a decision has been rendered.

3. Section 1.20 is amended by adding a new paragraph (n) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(n) For filing an application for extension of the term of a patent (§1.740) 550.00

* * * * *

4. A new Subpart F—Extension of Patent Term, consisting of §§1.710 through 1.785 is added to read as follows:

Subpart F—Extension of Patent Term

Sec.

1.710 Patents subject to extension of the patent term.
1.720 Conditions for extension of patent term.
1.730 Applicant for extension of patent term.
1.740 Application for extension of patent term.
1.741 Filing date of application.
1.750 Determination of eligibility for extension of patent term.
1.760 Interim extension of patent term.
1.765 Duty of disclosure in patent term extension proceedings.
1.770 Express withdrawal of application for extension of patent term.
1.775 Calculation of patent term extension for a human drug product.
1.776 Calculation of patent term extension for a food additive or color additive.
1.777 Calculation of patent term extension for a medical device.
1.780 Certificate of extension of patent term.
1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

Subpart F—Extension of Patent Term

Authority: 35 U.S.C. 6 and 156.

§1.710 Patents subject to extension of the patent term.

(a) A patent is eligible for extension of the patent term if the patent claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, and meets all other conditions and requirements of this subpart.

(b) The term "product" referred to in paragraph (a) of this section means—

(1) A human drug product which means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(2) Any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act.

§1.720 Conditions for extension of patent term.

The term of a patent may be extended if:

(a) The patent claims a product or a method of using or manufacturing a product as defined in §1.710;

(b) The term of the patent has never been previously extended except for any interim extension issued pursuant to §1.760;

(c) An application for extension is submitted in compliance with §1.740;

(d) The product has been subject to a regulatory review period as defined in 35 U.S.C. 156(g) before its commercial marketing or use;

(e) The product has received permission for commercial marketing or use and—

(i) The permission for the commercial marketing or use of the product is the first received permission for commercial marketing or use under the provision of law under which the applicable regulatory review occurred, or

(ii) In the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use is the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent;

(f) The application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred, or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the

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manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;

(g) The term of the patent has not expired before the submission of an application in compliance with §1.741; and

(h) No other patent term has been extended for the same regulatory review period for the product.

§1.730 Applicant for extension of patent term.

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of §1.740.

§1.740 Application for extension of patent term.

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents and Trademarks. A formal application for the extension of patent term shall include:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of a human drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved.

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to §1.720(f) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

(8) A copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period as follows:

(i) For a patent that claims a human drug product, the effective date of the investigational new drug (IND) application and the IND number, the date on which a new drug application (NDA) was initially submitted and the NDA number, and the date on which the NDA was approved;

(ii) For a patent that claims a food or color additive, the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the FDA published a Federal Register notice listing the additive for use;

(iii) For a patent that claims a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which an application for product approval under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

(11) A brief description beginning on a new page of the significant activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to the determination of entitlement to the extension sought (see §1.765);

(14) The prescribed fee for receiving and acting upon the application for extension (see §1.20(n));

(15) The name, address, and telephone number of the person to whom inquiries and correspondence relating to the application for patent term extension are to be directed;

(16) A duplicate of the application papers, certified as such; and

(17) An oath or declaration as set forth in paragraph (b) of this section.

(b) Any oath or declaration submitted in compliance with paragraph (a) of this section must be signed by the owner of record of the patent or its agent, specifically identify the papers and the patent for which an extension is sought and aver that the person signing the oath or declaration:

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters,

(2) Has reviewed and understands the contents of the application being submitted pursuant to this section;

(3) Believes the patent is subject to extension pursuant to §1.710;

(4) Believes an extension of the length claimed is justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in §1.720.

(c) If any application for extension of patent term submitted pursuant to this section is held to be informal, applicant may seek to have that holding reviewed by filing a petition with the required fee, as necessary, pursuant to §1.181, §1.182 or §1.183, as appropriate, within such time as may be set in the notice that the application has been held to be informal, or if no time is set, within one month of the date on which the application was held informal. The time periods set forth herein are subject to the provisions of 37 CFR 1.136.

§1.741 Filing date of application.

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

A complete application shall include:

(1) An identification of the approved product;

(2) An identification of the Federal statute under which regulatory review occurred;

(3) An identification of the patent for which an extension is being sought;

(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services to determine the period of the extension; and

(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

(b) If any application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under §1.181.

§1.750 Determination of eligibility for extension of patent term.

A determination as to whether a patent is eligible for extension may be made by the Commissioner solely on the basis of the representations contained in the application for extension filed in compliance with §1.740. This determination may be delegated to appropriate Patent and Trademark Office officials and may be made at any time before the certificate of extension is issued. The Commissioner or other appropriate officials may require from applicant further information or make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. A notice will be mailed to applicant containing the determination as to the eligibility of the patent for extension and the period of time of the extension, if any. This notice shall constitute the final determination as to the eligibility and any period of extension of the patent. A single request for reconsideration of a final determination may be made if filed by the applicant within such time as may be set in the notice of final determination or, if no time is set, within one month from the date of the final determination. The time periods set forth herein are subject to the provisions of 37 CFR 1.136.

§1.760 Interim extension of patent term.

An applicant who has filed a formal application for extension in compliance with §1.740 may request one or more interim extensions for periods of up to one year each pending a final determination on the application pursuant to §1.750. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions, without a request by the applicant, for periods of up to one year each until a final determination is made. The patent owner or agent will be notified when an interim extension is granted and notice of the extension will be published in the Official Gazette of the Patent and Trademark Office. The notice will be recorded in the official file of the patent and will be considered as part of the original patent. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§1.765 Duty of disclosure in patent term extension proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services rests on the patent owner or its agent, on each attorney or agent who represents the patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

(b) Disclosures pursuant to this section must be accompanied by a copy of each written document which is being disclosed. The disclosure must be made to the Office or the Secretary, as appropriate, unless the disclosure is material to determinations to be made by both the Office and the Secretary, in which case duplicate copies, certified as such, must be filed in the Office and with the Secretary. Disclosures pursuant to this section may be made to the Office or the Secretary, as appropriate, through an attorney or agent having reaponsibility on behalf of the patent owner or its agent for the patent term extension proceeding or through a patent owner acting on his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the determination of entitlement to the extension sought.

(c) No patent will be determined eligible for extension and no extension will be issued if it is determined that fraud on the Office or the Secretary was practiced or attempted or the duty of disclosure was violated through bad faith or gross negligence in connection with the patent term extension proceeding. If it is established by clear and convincing evidence that any fraud was practiced or attempted on the Office or the Secretary in connection with the patent term extension proceeding or that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the patent term extension proceeding, a final determination will be made pursuant to §1.750 that the patent is not eligible for extension.

(d) The duty of disclosure pursuant to this section rests on the individuals identified in paragraph (a) of this section and no submission on behalf of third parties, in the form of protests or otherwise, will be considered by the Office. Any such submissions by third parties to the Office will be returned to the party making the submission, or otherwise disposed of, without consideration by the Office.

§1.770 Express withdrawal of application for extension of patent term.

An application for extension of patent term may be expressly withdrawn before a determination is made pursuant to §1.750 by filing in the Office, in duplicate, a written declaration of withdrawal signed by the owner of record of the patent or its agent. An application may not be expressly withdrawn after the date permitted for response to the final determination on the application. An express withdrawal pursuant to this section is effective when acknowledged in writing by the Office. The filing of an express withdrawal pursuant to this section and its acceptance by the Office does not entitle applicant to a refund of the filing fee (§1.20(n)) or any portion thereof.

§1.775 Calculation of patent term extension for a human drug product.

(a) If a determination is made pursuant to §1.750 that a patent for a human drug product is eligible for exten-

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sion, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§1.321).

(b) The term of the patent for a human drug product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a human drug product will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(1)(B), it is the sum of —

(1) The number of days in the period beginning on the date an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved human drug product and ending on the date an application was initially submitted for such drug product under those sections or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act, subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for a human drug product will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984,

(i) By adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by—

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by—

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.776 Calculation of patent term extension for a food additive or color additive.

(a) If a determination is made pursuant to §1.750 that a patent for a food additive or color additive is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date set by terminal disclaimer (§1.321).

(b) The term of the patent for a food additive or color additive will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a food additive or color additive will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(2)(B), it is the sum of—

(1) The number of days in the period beginning on the date a major health or environmental effects test on the additive was initiated and ending on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product; and

(2) The number of days in the period beginning on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product, and ending on the date such regulation became effective or, if objections were filed to such regulation, ending on the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, ending on the date such proceedings were finally resolved and commercial marketing was permitted.

(d) The term of the patent as extended for a food additive or color additive will be determined by

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) The number of days equal to one-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date a regulation for use of the product became effective or, if objections were filed to such regulation, to the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, to the date such proceedings were finally resolved and commercial marketing was permitted;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984,

(i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no major health or environmental effects test was initiated and no petition for a regulation or application for registration was submitted before Sept. 24, 1984, by

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a major health or environmental effects test was initiated or a petition for a regulation or application for registration was submitted by Sept. 24, 1984, and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.777 Calculation of patent term extension for a medical device.

(a) If a determination is made pursuant to §1.750 that a patent for a medical device is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date as set by terminal disclaimer (§1.321).

(b) The term of the patent for a medical device will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a medical device will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(3)(B), it is the sum of

(1) The number of days in the period beginning on the date a clinical investigation on humans involving the device was begun and ending on the date an application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act; and

(2) The number of days in the period beginning on the date the application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act, and ending on the date such application was approved under such Act or the period beginning on the date a notice of completion of a product development protocol was initially submitted under section 515(f)(5) of the Act and ending on the date the protocol was declared completed under section 515(f)(6) of the Act.

(d) The term of the patent as extended for a medical device will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period pursuant to paragraph (c) of this section:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 515 of the Federal Food, Drug, and Cosmetic Act or the date a product development protocol was declared completed under section 515(f)(6) of the Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984, (i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no clinical investigation on humans involving the device was begun or no product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a clinical investigation on humans involving the device was begun or a product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.780 Certificate of extension of patent term.

If a determination is made pursuant to §1.750 that a patent is eligible for extension and that the term of the patent is to be extended, a certificate of extension, under seal, will be issued to the applicant for the extension of the patent term. Such certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the certificate of extension will be published in the Official Gazette of the Patent and Trademark Office. No certificate of extension will be issued if the term of the patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to §1.750 will indicate that no certificate will issue.

§1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

(a) Only one patent may be extended for a regulatory review period for any product (§1.720(g)). If more than one application for extension of the same patent is filed, the certificate of extension of patent term, if appropriate, will be issued based upon the first filed application for extension.

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the applications are otherwise

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eligible for extension pursuant to the requirement of this subpart, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent having the earliest date of issuance of those patents for which extension is sought.

(c) If an application for extension is filed which seeks the extension of the term of a patent based upon the same regulatory review period as that relied upon in one or more applications for extension pursuant to the requirements of this subpart, the certificate of extension of patent term will be issued on the application only if—

(1) The applicant for extension is the holder of the regulatory approval granted with respect to the regulatory review period, or

(2) The holder of the regulatory approval granted with respect to the regulatory review period is not an applicant and the applicant for extension holds express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension, or

(3) The holder of the regulatory approval granted with respect to the regulatory review period is not an applicant and no applicant for extension holds an express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension and the application is for extension of the patent having the earliest date of issuance of those patents for which extension is sought based upon the same regulatory review period.

(d) An application for extension shall be considered complete and formal regardless of whether it contains the identification of the holder of the regulatory approval granted with respect to the regulatory review period or express and exclusive authorization from the holder of the regulatory approval to rely on the regulatory review period for extension. When an application contains such information, or is amended to contain such information, it will be considered in determining whether an application is eligible for an extension under this section. A request may be made of any applicant to supply such information within a non-extendable period of not less than one (1) month whenever multiple applications for extension of more than one patent are received and rely upon the same regulatory review period. Failure to provide such information within the period for response set shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval and is not expressly and exclusively authorized by the holder of the regulatory approval to seek the extension being sought.

(e) Determinations made under this section shall be included in the notice of final determination of eligibility for extension of the patent term pursuant to §1.750 and shall be regarded as part of that determination.

DONALD J. QUIGG,
Jan. 9, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 87-6045 Filed 3-23-87; 8:45 am]
BILLING CODE 3510-16-M

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(142) **Guidelines for the Submission of Applications for Interim Protection of Mask Works Under 17 U.S.C. 914**

Chapter 9 of Title 17 of the United States Code, The Semiconductor Chip Protection Act of 1984, establishes a new form of intellectual property protection mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded" that represent the three-dimensional patterns in the layers of a semiconductor chip. This chapter provides a 10 year term of protection mask works measured from their date of registration on first commerical exploitation anywhere in the world. Mask works might be registered in the United States Copyright Office within two years' of first commerical exploitation to maintain this protection.

This chapter denies protection to foreign owners of mask works unless the works are first commercially exploited in the United States. It is contemplated that foreign countries will eventually obtain full protection by concluding treaties or enacting chip protection legislation. In order to encourage steps toward a regime of internatonal comity in mask work protection, Section 914(a) provides that the Secretary of Commerce may extend the privilege of interim protection under the Semiconductor Chip Act to nationals of foreign nations under certain conditions. These are: (1) that the foreign nation in question is making progress (either by treaty negotiation or legislative enactment) toward a regime of mask work protection generally similar to that under the Act; (2) that its nationals and persons controlled by them (such as subsidiaries or affiliated companies) are not engaging and have not in the recent past engaged in chip piracy or the sale of products containing infringing semiconductor components; and (3) that entry of the Secretary's order would promote the purposes of the Act and of achieving international comity toward mask work protection.

This notice establishes initial guidelines that specify the content and procedures for the submission of petitions for the Secretary of Commerce to issue or to terminate an Order extending the privilege of making interim registrations for mask works pursuant to chapter 9 of Title 17 of the United States Code. The Assistant Secretary of Commerce and Commissioner of Patents and Trademarks has been delegated the responsibility to receive petitions, conduct proceedings, make findings, and issue or terminate Orders. These guidelines set forth, in accordance with the statutory provisions, the persons eligible to initiate such proceedings, the procedures to be followed, and the information required to be submitted so that the Commissioner can make the determination required by the statute.

A. DEFINITIONS

As used in these guidelines:

(a) "Commissioner" means the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.
(b) "Interim registration" means a registration of a mask work with the Register of Copyrights by a foreign national, domiciliary or sovereign authority made pursuant to an Order issued under these guidelines.
(c) "Order" means an action by the Commissioner issuing or terminating an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9 of title 17, U.S.C.
(d) "Petition" means a request that the Commissioner issue or terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations or mask works pursuant to Chapter 9 of title 17, U.S.C.
(e) "Proceeding" means a proceeding to issue or to terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9, of title 17, U.S.C.
(f) "Secretary" means the Secretary of Commerce.

B. Effective Date of Guidelines

These guidelines shall come into force on the date of signature of H.R. 6163 by the President.

C. Initiation of Proceedings

(a) The Commissioner may initiate proceedings under these guidelines on his own motion or as directed by the Secretary.
(b) The Commissioner shall initiate proceedings under these guidelines upon receipt of a petition.

D. Submission of Petitions

(a) Petitions may be submitted at any time, however the effective date of any Order shall not precede the coming into force of Chapter 9 of 17 U.S.C.
(b) Petitions shall be submitted to the Commissioner for review and evaluation.

E. Content of Petitions

(a) Any petition requesting that the Commissioner issue an Order extending the privilege of making interim registration under Chapter 9 of 17 U.S.C. must include:

(1) A statement of the foreign governmental agency in charge of developing legislation or negotiating a treaty for the protection of mask works in a manner generally similar to the provisions of Chapter 9 of 17 U.S.C.: (i) that it is making good-faith efforts and reasonable progress toward developing and enacting such legislation or toward entering into such a treaty, and (ii) providing substantive information regarding the entity in the foreign nation to whom the responsibility has been delegated and the procedures that will be followed including any expected target dates for action.
(2) A statement by the appropriate foreign government or foreign governmental agency, including such supporting evidence as may be available, that neither that nation or persons controlled by them are engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works.
(3) Information from the party submitting the petition that provides evidence of the progress or the actual efforts undertaken by the foreign nation. Such information should include:

(i) Copies of bills introduced in the foreign legislature;
(ii) Copies of legislative proposals by responsible agencies;
(iii) Records of international proceedings or negotiations showing efforts toward developing an appropriate treaty;
(iv) Reports of governmental or private sector commissions studying and making recommendations on appropriate measures to protect mask works in semiconductor chip products;
(v) Correspondence between private sector organizations and responsible governmental organizations; and
(vi) Any other material including executive proclamations, resolutions or regulations that would support the claim of good-faith efforts and the absence of misappropriations or the absence of unauthorized distribution or commercial exploitation of mask works.

(b) All materials furnished must be in the English language or provided with a certified English translation.

F. Proceeding

(a) A proceeding shall be initiated by the publication of a notice in the Federal Register providing interested parties with an opportunity to submit relevant comments.
(b) Based upon comments received or a review of any petition submitted, the Commissioner, at his discretion, may hold a hearing to permit interested parties and the petitioner to present additionalinformation.
(c) The Commissioner shall review the petition, evaluate the evidence submitted, consider the results of any hearing conducted during the course of the proceeding, and issue or terminate an Order.
(d) If the Commissioner refuses to issue an Order the petitioner may, within 30 days and upon the submission of additional evidence, request reconsideration. If 30 days pass and no request for reconsideration is received, the refusal to issue an Order shall be considered final.
(e) The Commissioner may issue an Order that is valid for a period of up to three years. The Commissioner, in making a determination on the duration of the proposed Order, will be guided by the strength and weight of the evidence submitted.

G. Duration of Orders

(a) Orders shall endure for the period specified in accordance with Section F(e) above, but in no case longer than three years from the effective date of Chapter 9 of 17 U.S.C. in accordance with 17 U.S.C. 914(d)(l)(e) unless the authority of the Secretary is extended in accordance with 17 U.S.C. 914(f)(2).
(b) Orders shall be terminated if:

(1) The Commissioner finds after a proceeding under Section F above that the conditions upon which the Order was based no longer exist, or
(2) Mask works of nationals, domiciliaries, and sovereign authorities of that foreign nation or mask works first commercially exploited in that nation become eligible for protection under: (i) a Presidential proclamation issued in accordance with 17 U.S.C. 902(a)(2), or (ii) that nation's own law for the protection of such works so long as that nation is a party to a treaty protecting such works to which the United States is also a party.

H. Mailing Address

(a) Petitions, requests for reconsideration, and all correspondence submitted pursuant to these guidelines shall be addressed to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

(b) For further information contact:

Assistant Commissioner for External Affairs
703/557-3065
Mail inquiries should be directed to the same address indicated above to his attention.

SUMMARY

The initial guidelines set forth above are considered to be appropriate to implement Title 17 U.S.C. 914. They will become effective on the date of signature of H.R. 6163 by the President. They will provide appropriate guidance to mask work owners and their agents pending the issuance of regulations.

RENE D. TEGTMEYER
Nov. 1, 1984. *Acting Commissioner of Patents and Trademarks.*

[1048 O.G. 30]

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(143) **Errors in Notice of Allowance**

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due

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date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

JAMES E. DENNY,
June 12, 1985. *Deputy Assistant Commissioner for Patents.*

[1056 OG 35]

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(144) **Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120**

The Patent and Trademark Office has established initial guidelines for patent examiners to use in implementing the changes made in 35 U.S.C. 103, 116, and 120 by Public Law 98–622, the Patent Law Amendments Act of 1984. As a service to the public, those guidelines are published below. A copy of Public Law 98–622 is also being published concurrently herewith. Some of the procedural aspects of matters contained in the guidelines will be incorporated into Title 37 of the Code of Federal Regulation through the rule-making process.

RENE D. TEGTMEYER,
Dec. 11, 1984. *Assistant Commissioner for Patents.*

Initial Guidelines As To Implementation Of 35 U.S.C. 103

Public Law 98–622 added a new sentence to 35 U.S.C. 103 which reads as follows:

> "Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The significant features resulting from this amendment to §103 are the following:

(1) The only prior art which is disqualified is prior art under §102(f) or (g) where the subject matter, i.e., the prior art, and the invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." (Person includes organization.)
(2) If the subject matter (prior art) qualifies as prior art under any other section, e.g., §102(a), (b), or (e), it is still prior art and can be used.
(3) Amendment applies only to subject matter which qualifies as prior art under §103; it does not affect subject matter which qualifies as prior art under §102, i.e., anticipatory prior art.
(4) Term "another person" means any inventive entity other than the inventor and includes the inventor and any other person.
(5) Term "developed" is to be read broadly and is not limited to any particular manner of development.
(6) Subject matter derived from another under §102(f) is prior art under §103 unless the derived subject matter and the claimed invention are owned by, or subject to an obligation of assignment to, the same person at the time the claimed invention was made.
(7) The disclosure of an earlier filed patent application which issues as a patent continues to be prior art under §102(e) against a later invented and filed application of another inventor even though the patent and the later application are owned by, or subject to an obligation of assignment to, the same person.
(8) Commonly owned applications, i.e., applications owned by the same person, may be refiled as a single application to avoid one or more of them becoming prior art against another under §§102(e) and 103.
(9) The phrase "owned by the same person" requires that the same person, persons, or organization own 100% of the subject matter (prior art) and 100% of the claimed invention.
(10) The phrase "subject to an obligation of assignment to the same person" requires that a legal obligation of assignment exist and not merely a moral or unenforceable obligation.
(11) As long as the same person owns the subject matter and the invention at the time the claimed invention was made, a license to another may be made without the subject matter becoming prior art.
(12) Amended §103 requires actual ownership (or obligation to assign) be in existence at the time the claimed invention is made for the subject matter to be disqualified as prior art; acquiring one or the other later is not sufficient.
(13) Burden of establishing that subject matter is disqualified as prior art is placed on patent applicant and not on the patent examiner once the examiner establishes a prima facie case of obviousness based on the prior art.
(14) Double patenting rejections may now be made in applications based on commonly owned patents of different inventive entities and double patenting rejections of the obviousness type can be overcome by terminal disclaimers.
(15) A double patenting rejection may also be made in a later filed application where the application/patent on which the rejection is based and the later filed application are not commonly owned as long as one of the inventors is common between the later filed application and the application/patent; such a rejection cannot be overcome by terminal disclaimer in view of the lack of common ownership.
(16) The Commissioner's Notice of January 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967) is withdrawn to the extent that it does not authorize a double patenting rejection where different inventive entities are present.
(17) Inventors of subject matter not commonly owned at the time of the invention may file as joint inventors in a single application. However, the claims in such an application are not protected from a §102(f) /103 or §102(g)/103 rejection.

Implementation Steps As To Amended 35 U.S.C. 103

A. *Applications To Be Considered*
(1) Amended §103 does not "affect any final decision made by the court or the Patent and Trademark Office before the date of enactment [November 8, 1984]. . . with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired."
(2) The amendment of §103 will *not* be considered to apply to:

(a) Any application which has been abandoned prior to November 8, 1984, unless such application is revived pursuant to the provisions of 37 CFR 1.137(a) or (b) and is pending on or after November 8, 1984;

(b) Any application in which all the claims have been allowed and in which prosecution has been closed prior to November 8, 1984, e.g., by an *Ex parte Quayle* action, a Notice of allowability, or a Notice of Allowance. However, a continuing application would obtain the benefit of amended §103 if filed prior to the abandonment or issuance of the application; and
(c) Any application in which an appeal has been filed and is no longer pending or in which the time for filing an appeal has expired prior to November 8, 1984. However if the application contains allowed claims on or after November 8, 1984, the allowed claims are subject to amended §103.

(3) The amendment to §103 will be applied to any application (a) which is before the examiner for action and in which all the claims have not been allowed and the prosecution closed or (b) in which prosecution has been closed and is being reopened to reject the allowed claims on grounds other than §102(f) /103 or §102(g)/103.
(4) Applications not before the examiner for action, e.g., an application in which a response from applicant is required, will *not* be considered as to the applicability of amended §103 unless applicant takes timely action which properly requires an action on the merits by the examiner.

B. *Conflicting Co-pending Applications Of Different Inventive Entities With No Indication That They Are Commonly Owned*
(1) If the application files do not establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) assume that the applications are not commonly owned;
(b) examine the applications on all grounds other than any conflict between the applications;
(c) consider the applicability of §102(f) /103 or §102(g)/103 if one application refers to the other (if there is no cross-reference between the applications it would be inappropriate for the examiner to refer to one application in the other in view of 35 U.S.C. 122);
(d) consider interference if appropriate;
(e) suspend the later filed application if it is otherwise allowable until the earlier filed application is abandoned or issues as a patent and then reject the later filed application under §102(e)/103, if appropriate; and
(f) proceed under item C below if at any time during the examination a statement is made that the applications are commonly owned.

C. *Conflicting Co-pending Applications Of Different Inventive Entities Which Are Commonly Owned*
(1) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (a) the application files refer to assignments recorded in the PTO in accordance with 37 CFR 1.331 which convey the entire rights in the applications to the same person(s) or organization(s); or (b) copies of unrecorded assignments which convey the entire rights in the applications to the same person(s) or organization(s) are filed in each of the applications; or (c) an affidavit or declaration by the common owner is filed which states that there is common ownership and explains why the affiant believes there is common ownership; or (d) other evidence is submitted which establishes common ownership of the applications in question, e.g., a court decision determining the owner. In circumstances where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.
(2) If the application files establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) examine the applications as to all grounds except §§102(f) and (g) as they apply through §103 if the application files establish common ownership at the time the later invention was made;
(b) examine the applications for double patenting, including double patenting of the obviousness type, and make a provisional rejection, if appropriate, (see *In re Mott*, 190 USPQ 536 (CCPA 1976);
(c) examine the later filed application under §102(e) as it applies through §103 and make a provisional rejection under §102(e)/103 in the later filed application, if appropriate;
(d) permit applicant of the later filed application to file an affidavit under 37 CFR 1.131 to overcome the provisional or actual §102(e)/103 rejection, if appropriate, and a terminal disclaimer to overcome the provisional or actual rejection on double patenting of the obviousness type.

Initial Guidelines As To Implementation Of 35 U.S.C. 116

Public Law 98–622 amended 35 U.S.C. 116 to clarify that each inventor need not "sign the application" in addition to making the required oath and to add a new sentence which reads as follows:

> "Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."

The significant features resulting from these amendments to §116 are the following:

(1) The joint inventors do not have to separately "sign the application," but only need apply for the patent jointly and make the required oath by signing the same; this is a clarification, but not a change in current practice.
(2) Inventors may apply for a patent jointly even though "they did not work together or at the same time," thereby clarifying (a) that it is not necessary that the inventors physically work together on a project, and (b) that one inventor may "take a step at one time, the other an approach at different times." (*Monsanto Co.* v. *Kamp*, 154 USPQ 259 (D.D.C. 1967)).
(3) Inventors may apply for a patent jointly even though "each did not make the same type or amount of contribution," thereby clarifying the "fact that each of the inventors plays a different role and that the contribution of one may not be as great as that of another does not detract from the fact that the invention is joint, if each makes some original contribution, though partial, to the final solution of the problem." *Monsanto*, supra.
(4) Inventors may apply for a patent jointly even though "each did not make a contribution to the subject matter of every claim of the patent."
(5) Inventors may apply for a patent jointly as long as each inventor made a contribution, i.e., was an inventor or joint inventor, of the subject matter of at least one claim of the patent; there is no requirement that all the inventors be joint inventors of the subject matter of any one claim.
(6) If an application by joint inventors includes more than one independent and distinct invention, restric-

tion may be required with the possible result of a necessity to change the inventorship named in the application if the elected invention was not the invention of all the originally named inventors.

(7) The amendment to §116 increases the likelihood that different claims of an application or patent may have different dates of invention; when necessary the Office or court may inquire of the patent applicant or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Implementation Steps As To Amended 35 U.S.C. 116

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §116.

(2) Pending applications will be permitted to be amended by complying with 37 CFR 1.48 to add claims to inventions by inventors not named when the application was filed as long as such inventions were disclosed in the application as filed since 37 CFR 1.48 permits correction of inventorship where the "correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors".

(3) Under amended §116 an examiner will reject claims under §102(f) only in circumstances where a named inventor is not the inventor of at least one claim in the application; no rejection under §102(f) is appropriate if a named inventor made a contribution to the invention defined in any claim of the application.

(4) Under amended §116 considered in conjunction with amended §103, a rejection may be appropriate under §102(f)/103 where the subject matter, i.e., prior art, and the claimed invention were not owned by, or subject to an obligation of assignment to, the same person at the time the invention was made.

(5) Applicants are responsible for correcting, and will be required to correct, the inventorship in compliance with 37 CFR 1.48 when the application is amended to change the claims so that one (or more) of the named inventors is no longer an inventor of the subject matter of a claim remaining in the application.

(6) In requiring restriction in an application filed by joint inventors the examiner will remind applicants of the necessity to correct the inventorship pursuant to 37 CFR 1.48 if an invention is elected and the claims to the invention of one or more inventors are cancelled.

(7) The examiner will not inquire of the patent applicant concerning the inventors and the invention dates for the subject matter of the various claims until it becomes necessary to do so in order to properly examine the application.

(8) If an application is filed with joint inventors, the examiner will assume that the subject matter of the various claims was commonly owned at the time the inventions covered therein were made, unless there is evidence to the contrary. If inventors of subject matter, not commonly owned at the time of the later invention, file a joint application, applicants have an obligation pursuant to 37 CFR 1.56 to point out the inventor and invention dates of each claim and the lack of common ownership at the time the later invention was made in order that the examiner may consider the applicability of §102(f)/103 or § 102(g)/103. The examiner will assume, unless there is evidence to the contrary, that applicants are complying with their duty of disclosure.

Initial Guidelines As To Implementation Of 35 U.S.C. 120

Public Law 98–622 amended 35 U.S.C. 120 by striking out "by the same inventor" and inserting in its place "which is filed by an inventor or inventors named in the previously filed application."

The amended first paragraph of 35 U.S.C. 120 (the bracketed portion was deleted and the underlined portion added) reads as follows:

§120. Benefit of earlier filing date in the United States

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, [by the same inventor] *which is filed by an inventor or inventors named in the previously filed application* shall have the same effect, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application."

The significant features of these amendments to §120 are the following:

(1) A later filed application by an inventor or inventors of a previously filed co-pending application may claim the benefit of the previously filed co-pending application under §120 even though the later filed application does not name all of the same inventors as the previously filed application.

(2) In order for the later filed application to be entitled to claim the benefit of the earlier filed co-pending application under §120 the earlier filed co-pending application must
   (a) have at least one inventor in common with the later filed application; and
   (b) disclose the common inventor's invention in the manner provided by the first paragraph of 35 U.S.C. 112, i.e., fully disclose and support at least one of the common inventor's claims found in the later application.

(3) When necessary the Patent and Trademark Office or a court may inquire of the patent applicant or owner as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application.

(4) Double patenting rejections may be applicable, whether or not the applications and patents are commonly owned as long as the applications/patent(s) have at least one inventor in common.

(5) If the applications and patents are commonly owned, the rejection of the applications on the grounds of double patenting can be overcome by an appropriate terminal disclaimer as long as the identical invention is not being claimed. See *In re Robeson*, 141 USPQ 485 (CCPA 1964), and *In re Kaye*, 141 USPQ 829 (CCPA 1964).

(6) If the applications and patents are not commonly owned, the double patenting rejection is entered in the later filed application and cannot be overcome by a terminal disclaimer since the ownership of the subject matter being claimed belongs to someone other than the owner of the later application.

Implementation Steps As To Amended 35 U.S.C. 120

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §120.

(2) The examiner will examine any earlier filed co-pending application to which priority is claimed under §120 to determine if
   (a) the earlier filed co-pending application has at least one inventor in common with the later filed application;
   (b) the other requirements for claiming benefit under §120 are met; and
   (c) a rejection on the grounds of double patenting is proper.

(3) As long as the formal requirements for claiming benefit under §120 are met, the examiner will permit the claim to be made without examining the earlier filed co-pending application for disclosure and support of at least one claim of the later filed application under the first paragraph of §112 unless it becomes necessary to do so, e.g. because of an interference or an intervening reference.

(4) The examiner will not inquire of the patent applicant as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application until it becomes necessary to do so in order to properly examine the application.

(5) The examiner will examine the earlier and later filed applications and make actual or provisional rejections for double patenting where appropriate, whether or not the applications are commonly owned.

Example 1 - Single Application - Plural Inventors

Inventors A and B, both employees of Company E with obligation to assign all their inventions to E develop inventions X and Y respectively. An application for patent is properly filed listing A and B as joint inventors and with claims to both X and Y as now possible under §116 as amended by Public Law 98–622.

Situation 1.
The claims to X and Y are not patentably distinct.

Examiner's Action:

If otherwise patentable over the prior art—allows application.

Situation 2.
The claims to X and Y are patentably distinct.

Examiner's Action:

Require restriction and election of claims to either X or Y. The applicant, after election, must correct the inventorship of the application to list only the inventor of the elected invention; for example, inventor A if claims to invention X were elected. A divisional application with B as inventor and claims to Y may claim benefit of the originally filed application under 35 U.S.C. 120 as amended by Public Law 98–622.

Situation 3.
The application contains a Markush-type claim to X and Y and separate species claims to X and Y.

Examiner's Action:

(a) Examine the application to determine if the inventions X and Y are restrictable. If so, the claims to elected invention X (assume X is elected by applicants) and the X portion of the Markush claim to X and Y are examined.
   (i) if the claim to X is allowable, the entire Markush claim and the species claim to Y must also be examined.
   (ii) if the claim to X is *not* allowable, no further action on species claim Y or the Y portion of the Markush claim is required.

The inventorship of the application at the time of allowance must be corrected, if necessary, to correspond to the inventions covered by the claims allowed.

Example 2 - Multiple applications - plural inventions

Inventors A and B, both employees of Company E, with obligation to assign all their inventions to E, develop inventions X and Y with Y being developed by B after knowledge of A's development of X. A files application on X before B's development of Y and B later files application. Both applications establish they are owned by Company E.

Situation 1.
The claims to X and Y are not patentably distinct.

Examiner's Action:

(a) Examine the applications as to all grounds except §102(f) and (g) as they apply through §103;

(b) Make a provisional rejection of the later filed application on the grounds of double patenting of the obviousness type, if appropriate. If a terminal disclaimer is filed in accordance with §1.321(b), the provisional double patenting rejection of the obviousness type will be overcome;

(c) Examine the later filed application under §102(e)/103 and make a provisional rejection based on §102(e)/103, if appropriate. An affidavit under §1.131 can be filed to overcome the rejection based on §102(e)/103.

Situation 2.
After receiving the examiner's action in situation 1, A and B filed a continuation-in-part application with inventor C and claim A's invention, B's invention and an improvement they jointly developed with C. A and B abandon their prior applications.

Examiner's Action:

Examine the application in the normal manner; no double patenting and §102(e)/103 problems now exist.

Example 3 - Two copending applications with no indication in the record of common ownership

Inventor A files an application with claims to invention X. Another copending application is filed by inventor B claiming invention Y. There is no indication of common ownership.

Situation 1.
The claims in the two applications are directed to patentably distinct inventions.

Examiner's Action:

If the claims are otherwise allowable, the applications are both allowed.

Situation 2.
The claims in the two applications are *not* patentably distinct.

Examiner's Action:

The applications are prosecuted until one application is allowable. If the time difference between the two applications is too large to declare an interference, action on the later filed application is suspended until the earlier filed application issues as a patent. At that time the later filed application is rejected over the earlier filed application under §102(e)/103.

If the filing dates of the applications are sufficiently close to declare an interference, claims for an interference should be suggested. If the applications are commonly owned, the common owner must make the ownership known. When such common ownership is made known, a provisional double patenting rejection should be made in the later filed application. If the double patenting rejection is of the obviousness type, a terminal disclaimer under 37 CFR 1.321(b) may be filed. The later filed application should be examined under §102(e)/103 and a provisional rejection based on §102(e)/103 should be made in the later filed application, if appropriate. An affidavit under §1.131 can be filed to overcome a rejection based on §102(e)/103.

Example 4 - Claims in single application by different inventors.

An application for patent is filed in the Patent and Trademark Office in which the owner E sets forth the following information.

"The subject matter of claim 1 was invented by inventor A. The subject matter of claim 2 was invented by in-

ventor B. Inventor B knew of the invention of inventor A at the time he made his invention. Both A and B made their inventions while working for owner E with a duty to assign". The inventions are different but not patentably distinct.

Examiner's Action:

If the claims are patentable over the prior art, the application should be allowed.

Public Law 98–622
Signed November 8, 1984

Ninety-eighth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-third day of January, one thousand nine hundred and eighty-four

An Act

To amend title 35, United States Code, to increase the effectiveness of the patent laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I—PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

"§157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant:

"(1) meets the requirements of section 112 of this title;

"(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;

"(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and

"(4) pays application, publication, and other processing fees established by the Commissioner.

If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.

"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.

"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.

"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures.".

(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration.".

(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:

"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.".

(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.".

EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.

(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.

(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.

(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

TITLE II—PATENT AND TRADEMARK OFFICE PROCEDURES

BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Section 7 of title 35, United States Code, is amended to read as follows:

"§7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.

"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title. Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.

"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Apeals and Interferences, the Commissioner may designate any patent examiner of the primary examiner grade or higher, having the requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maximum rate of basic pay payable for grade GS-16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made."

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office.".

APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out ", thereby waiving his right" and inserting in lieu thereof ". By filing"

such an appeal the applicant waives his or her right";

(2) in the second sentence—

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof " in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case."

(b) Section 145 of title 35, United States Code, is amended—

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may,"; and

(2) in the second sentence by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent intereferences on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference".

TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended—

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" after "oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended—

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph—

(1) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended—

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interferences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

TITLE III—NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

MEMBERSHIP OF COMMISSION

SEC. 302. (a) The Commission shall be composed of —

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives apointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman.

Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limimtation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and producitivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recomendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.

DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons emloyed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS–16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated $250,000 to carry out this title.

EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985. 16 TITLE IV—MISCELLANEOUS PROVISIONS

INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: ", unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended—

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out", except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty."

(c) Section 371(c)(2) of title 35, United States Code, is amended—

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty.".

(e) Section 372(b) of title 35, United States Code, is amended—

(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and
(2) by adding at the end thereof the following:

"(3) the Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English.".

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).
(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".
(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"IV. Patent Cooperation Treaty ..... 351".

PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97–247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.
(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97–247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after August 27, 1982.

TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:
"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS–16 of the General Schedule under section 5332 of title 5."

EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.
(b) The amendments made by sections 401, 402, and of this Act shall take effect six months after the date of the enactment of this Act.

[1050 OG 316]

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(145) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket no. 41269–5018]

Final Rules for Miscellaneous Patent Provisions

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the miscellaneous patent provisions enacted into law by Public Laws 98–620 and 98–622, on Nov. 8, 1984, in which statutory invention registrations, changes in appeals to the courts, prior art and joint inventor provisions and PCT international application filing and processing procedures were established or amended. The rulemaking provides specific rules and procedures for the new and amended provisions.
Effective Date: May 8, 1985
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to establish a set of rules and procedures for the various requirements of Public Laws 98–620 and 98–622 concerning appeals to the courts, statutory invention registrations, rejections based on prior art and double patenting, and filing of international applications under the Patent Cooperation Treaty. The proposed rules were published on Jan. 25, 1985 in Volume 50 of the Federal Register, pages 3712 through 3725. A public hearing was held on the proposed rule changes on Feb. 8, 1985.
Background Information: Most of the rule changes contained herein are necessary as a result of Public Laws 98–620 or 98–622, both of which were signed by President Reagan on Nov. 8, 1984. The following is a summary of the purposes of the various statutory amendments.

Amended 35 U.S.C. 103 - Unpublished knowledge of prior art.

Public Law 98–622 changes a complex body of case law which discourages communication among members of research teams working in corporations, universities or other organizations. It amended 35 U.S.C. section 103 by adding a new sentence which provides that subject matter developed by another which qualifies as "prior art" only under subsections 102(f) or (g) of 35 U.S.C. is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. 103, provided the subject matter and the claimed invention were commonly owned at the time the invention was made.

"Prior art" is the existing body of technical information against which the patentability of an invention is judged. Publicly known information is always considered in determining whether an invention would have been obvious. However, under *In re Bass*, 474 F. 2d 1276, 177 USPQ 178 (CCPA 1973), and *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980), an earlier invention which is not public could have been treated under 35 U.S.C. 102(g), and possibly under 102(f), as prior art with respect to a later invention made by another employee of the same organization.

New technology often is developed by using background scientific or technical information known within an organization but unknown to the public. Public Law 98–622, by disqualifying such background information from prior art, encourages communication among members of research teams, and leads to more public dissemination through patents of the results of team research.

The subject matter that is disqualified as prior art under 35 U.S.C. 103 is strictly limited to subject matter that qualifies as prior art only under 35 U.S.C. 102(f) or 102(g). If the subject matter qualifies as prior art under any other subsection—e.g., subsection 102(a), 102(b) or 102(e)—it will not be disqualified as prior art under the amendment to section 103.

The contents of a patent of the same or different ownership as an application, continues to be available as prior art against the application under section 103 by virtue of section 102(e) as of the application filing date of the patent. If subject matter becomes potential prior art under section 102 (e) because a patent application is filed on such subject matter before a commonly owned claimed invention is made the subject matter of a later

application the two applications may be combined (under amended §§116 and 120) into a single application and such subject matter (with the abandonment of the two applications) would no longer constitute potential prior art under section 102(e) or under section 103 since it would not be "described in a patent granted on an application for patent by another."

It is important to recognize that the amendment to the law applies only to consideration of prior art for purposes of section 103. It does not apply to or affect subject matter which qualifies as prior art under section 102. A patent applicant urging that subject matter is disqualified has the burden of establishing that it was commonly owned at the time the claimed invention was made.

Public Law 98–622 was not intended to permit anyone other than the inventors to be named in a patent application or patent. Also, the amendment was not intended to enable appropriation of the invention of another.

The Patent and Trademark Office has withdrawn the Commissioner's Notice of Jan. 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967), to the extent that it does not authorize a double patenting rejection where different inventive entities are present. See the Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985). The Office is reinstituting, in appropriate circumstances, the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier); *In re Rogers*, 394 F.2d 566, 567 n. 4, 157 USPQ 569, 570 n. 4 (CCPA 1964). This is in accordance with existing case law and prevents an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See *In re Zickendraht*, 319 F.2d 225, 138 USPQ 22 (CCPA 1963) ("The doctrine is well established that claims in different applications need be more than merely different in form or content; and that *patentable distinction* must exist to entitle applicants to a second patent") and *In re Christensen*, 330 F.2d 652, 141 USPQ 295 (CCPA 1964) (". . . the correct procedure for double patenting cases is to analyze the claims to determine the inventions defined therein, and then decide whether such inventions, as claimed are *patentably distinct* and therefore qualified to be claimed in separate patents"). In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming, pursuant to the existing provisions of 37 CFR 1.321, the terminal portion of the term of the later patent and including in the disclaimer a provision that the patent shall be enforceable only for and during the period the patent is commonly owned with the application or patent which formed the basis for the rejection, thereby eliminating the problem of extending patent life.

Information learned from or transmitted to persons outside the organization is not disqualified as prior art.

The term "subject matter" will be construed broadly, in the same manner the term is construed in the remainder of §103. The term "another" as used in §103 means any inventive entity other than the inventor and would include the inventor and any other persons. The term "developed" is to be read broadly and is not limited by the manner in which the development occurred. The term "commonly owned" means wholly owned by the same person, persons, or organization at the time the invention was made.

Amended 35 U.S.C. 116 - Joint inventor filing

35 U.S.C. 116 as amended by Public Law 98–622 recognizes the realities of modern team research. A research project may include many inventions. Some inventions may have contributions made by individuals who are not involved in other, related inventions.

Amended 35 U.S.C. 116 allows inventors to apply for a patent jointly even though (i) they did not physically work together or at the same time, (ii) each did not make the same type or amount of contribution, or (iii) each did not make a contribution to the subject matter of every claim of the patent. Items (i) and (ii) adopt the rationale stated in decisions such as *Monsanto* v. *Kamp*, 269 F. Supp. 818, 154 USPQ 259 (D.D.C. 1967). Item (iii) adopts the rationale of cases such as *SAB Industries AB* v. *Bendix Corp.*, 199 USPQ 95 (E.D. Va. 1978).

Like other patent applications, jointly-filed applications are subject to the requirements of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application complying with 35 U.S.C. 120 would be entitled to the benefit of the earlier filing date of the original application.

It is possible that different claims of an application or patent may have different dates of invention even though the patent covers only one independent and distinct invention within the meaning of 35 U.S.C. 121. When necessary, the Patent and Trademark Office or a court may inquire of the patent application or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Amended 35 U.S.C. 120 - Benefit of prior U.S. application

35 U.S.C. 120 was amended by Public Law 98–622 to provide that an application can obtain the benefit of the filing date of an earlier application when not all inventors named in the joint application are the same as those named in the earlier application. This amendment permits greater latitude in filing "divisional" applications. For example, if the previously filed application named inventors A and B as the inventors, a later application by either A or B could be filed during the pendency of the previously filed application and claim benefit of the previously filed application. In order for a claim to be entitled to the benefit of an earlier pending application, the subject matter of the claim of the later application would have to be disclosed in the earlier application.

Similarly, if inventor A filed an application on an invention and during the pendency of that application made an improvement on the subject matter of the application as a joint inventor with inventor B, the joint application filed on behalf of inventors A and B could claim the benefit of A's previously filed sole application to the extent that the later filed joint application contained claims directed solely to A's subject matter which was disclosed in the earlier filed pending application in the manner provided by the first paragraph of section 112 of title 35, U.S.C.

Likewise, an application filed by inventors A and C could claim the benefit of an earlier filed pending application of inventors A and B, to the extent that the requirements of section 120 could be met.

Like other patent applications, jointly-filed applications will continue to be subject to the requirement of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application would be entitled to the benefit of the earlier filing date of the original application.

New 35 U.S.C. 157 - Statutory Invention Registration (SIR)

This section which is effective on May 8, 1985, establishes an optional procedure by which an inventor may secure protection which is strictly defensive in nature.

Under current law, there is no simple, practical method by which an inventor can protect his or her ability to exploit the invention without obtaining a patent. The

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new procedure confers on an inventor the same defensive rights that a patent provides to prevent others from patenting the invention. However, it does not permit the holder to exclude others from making, using or selling the invention.

Due to the fact that a SIR does not grant an exclusive right to an inventor, it is not necessary to subject a SIR to the lengthy examination process required for the granting of a patent. Such an examination is necessary if the SIR is subject to an interference proceeding to determine priority of invention. In all other instances, the Patent and Trademark Office will only review the application for adherence to formal printing and fee payment requirements and to ensure that the requirements of 35 U.S.C. 112 are satisfied.

An applicant desiring to have a SIR published will be required to file a regular complete application for a patent and to execute a request including a waiver of enforcement of patent rights. This waiver of the claimed invention will be effective at the time of publication. The original application can be abandoned in favor of a continuing application for a patent, claiming the filing date of the earlier filed application, by filing an express abandonment of the original application and a timely request or petition to withdraw the request for a SIR prior to publication of the SIR, thereby providing the applicant with flexibility during the pendency period of the application. Until the SIR is published the application remains an application for a patent. However, the holder of a SIR will not be able to file a reissue application to recapture the rights to exclusive use that were waived by the initial publication of the SIR.

The waiver of the right to receive a patent, required of all applicants electing to receive a SIR, applies to those remedies provided for the enforcement of a patent under section 183 and sections 271 through 289 of title 35, United States Code. The waiver also applies to remedies under other titles of the United States Code including sections 1337 and 1337a of title 19, section 2356 of title 22, and section 1498 of title 28. This waiver of enforcement applies only to the claimed subject matter of the SIR and not to any foreign patent arising from an application which might have served as the basis of a priority claim under the Paris Convention for the Protection of Industrial Property. Likewise, the waiver does not prevent the holder of a SIR from asserting any defenses provided in sections 271 through 289 of title 35, U.S.C. with respect to a charge of infringement of any other patent.

The Commissioner of Patents and Trademarks can refuse to accept the waiver in certain cases. For example, the waiver could not be accepted if the waiver is not a waiver of all the previously mentioned rights. The Commissioner also has discretion, which has not been exercised at this time, to set time limits on the waiver. This would allow the Commissioner to limit the ability of an inventor to keep inventions secret through a series of continuing patent applications followed by a conversion to a SIR.

The waiver of patent rights in the SIR to the subject matter claimed therein may affect the patentability of a claim in other related applications, particularly divisional applications, since the waiver of patent rights would be effective for all inventions claimed in the SIR and would be effective as a waiver of the right of the inventor to obtain a patent on the invention claimed in the same application or any other application, but not in any patent issued before the date the SIR is published. Where an application containing generic claims is published as a SIR, the waiver in that application applies to any other related applications, including divisions, continuations, and continuations-in-part, to the extent that the same invention claimed in the SIR is also claimed in the other related application.

The Patent and Trademark Office will apply standards similar to those which it applies in making determinations of "same invention" double patenting for purposes of determining whether or not a waiver by an inventor to claims in a SIR precludes patenting by the same inventor to subject matter in any other related application.

Therefore, the waiver would preclude patenting of an invention claimed by an inventor in a related application which is the same as the invention claimed by the same inventor in the SIR. When making this determination it is the claimed subject matter of the related application. Where the subject matter claimed in the related application is the same as the subject matter waived in the SIR, i.e., the "same invention" in the double patenting sense, the claims of the related application will be rejected as being precluded by the waiver in the SIR and cannot be overcome by a terminal disclaimer. The limitation of the scope of the waiver to the claimed invention would not affect the application of existing §1.658(c) should the SIR become involved in an interference. If a divisional application is filed and published as a SIR claiming only a method, publication thereof will not normally effect a waiver on an application for a patent claiming only an apparatus. The waiver in a SIR would not affect any rights in a patent which issued prior to the date of publication of the SIR, but would preclude an already issued patent from being broadened by reissue if the rights to the subject matter to which broadened claims relate have been waived by publication of the SIR. The waiver applies to any rights of the same inventor in any application pending when the SIR is published even if the inventor is a joint applicant in the pending application and was a sole applicant in the application published as a SIR. The waiver would not affect the rights of any other inventor even though those rights are commonly owned by the same person.

The holder of a SIR containing the required waiver will be left without the offensive rights associated with a patent. In other respects a SIR will be the same as a patent, including the application which is published as a SIR serving as the basis for a priority claim in a foreign application under the Paris Convention. A SIR will be treated the same as a U.S. patent for all defensive purposes. The application, and the SIR published therefrom, could become involved in an interference; the SIR would be a "constructive reduction to practice" under 35 U.S.C. 102(g); it will be "prior art" under all applicable sections of 35 U.S.C. 102 including section 102(e); and it will be classified, cross-referenced and placed in the search files, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the Patent and Trademark Office. A published SIR is intended to be a fully viable publication for defensive purposes, usable as a reference as of its filing date in the same manner as a patent. A SIR will also serve as a basis to initiate or participate in an interference or priority proceeding under 35 U.S.C. 291 in a manner similar to a patent and can be used as a reference in defense of an infringement suit.

A SIR is based on a regularly filed application for a patent. Therefore, the filing date of the application will be a sufficient basis for a priority claim in a foreign application. Article 4, section A(3) of the Paris Convention states:

> "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, whatever may be the subsequent fate of the application."

After a SIR is published, markings such as "patent pending" are improper under section 292 of title 35 of the United States Code.

The SIR will serve as a replacement for the current "defensive publication program" which was established by regulation under 37 CFR 1.139. Although publication under the "defensive publication program" was intended to provide rights similar to those of the SIR, publication under that program has been held not to be available as evidence of prior knowledge as of its filing date under section 102(a) of title 33, U.S.C. (*Ex parte Osmond*, 191 USPQ 334 (P.T.O. Bd. App. 1976)). The use of a "defensive publication" as a reference to prevent a patent from issuing on a subsequent application is therefore limited. A SIR, on the other hand, will have a clear statutory basis in title 35, U.S.C. The SIR will be "prior art" and a "constructive reduction to practice" under section 102(a) and section 102(g), respectively, as of the filing date of the application on which it is based.

A SIR will not be subject to reexamination under sections 302 to 307 of title 35, United States Code.

The Commissioner is authorized to issue SIRs for defensive purposes, but is not required to do so. The Commissioner has discretion in determining whether or not a SIR should be issued on a particular application. In circumstances where the subject matter is obviously not an invention, is too informal to print, and so forth, the Commissioner has the right to refuse to publish the SIR.

SIRs will be published sooner than patents because no substantive examination will normally be required for SIRs. To the extent that examination is required, it will be conducted in the same manner as in any other patent application. Maintenance fees will not be charged for SIRs.

Since the fees set by the Commissioner for the new SIR procedure under section 157 of title 35, U.S.C. are not established under section 41(a) or (b) of that title, they are not subject to reduction if the applicant has small entity status.

If the fee for requesting publication is not paid at the time of filing of the waiver of the right to receive a patent, the Commissioner may set a period within which the fee must be paid to prevent abandonment of the application. Such a period would be subject to petitions and fees for extensions of time. If abandonment should occur, the application may be revived.

In the final analysis, the SIR procedures set forth in the law should give inventors defensive protection more cheaply than they could get by obtaining a patent. The procedure will allow the government and the private sector to make inventions public knowledge. Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new, less expensive alternative to the traditional patenting of inventions.

Amended 35 U.S.C. 361, 366, 371, 372 and 376 - Miscellaneous provisions relating to the applications under the Patent Cooperation Treaty.

Section 361(d) of title 35, United States Code, was amended effective May 8, 1985, to provide a one-month grace period from the date of filing an international application for payment of the basic international fee and the transmittal and search fees.

Section 366 of title 35, United States Code, was amended, effective May 8, 1985, to clarify the effect of withdrawal of an international application on claims for the benefit of its filing date. The withdrawal of an international application designating the United States will not deprive an applicant of the right to claim the benefit of the filing date of such an international application in a later filed application, provided the claim for benefit is made before that international application is withdrawn. Stated otherwise, this clarifies that withdrawing the designation of the United States in an international application is comparable to abandoning a national application as far as a claim for an earlier filing date is concerned.

National Stage

As a general proposition, the amendments made to 35 U.S.C. 371 set forth a legislative scheme, effective May 8, 1985, to provide greater flexibility in the Patent and Trademark Office for the handling of international applications. In addition, by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, the amendments give international applicants benefits similar to those given national applications by section 111, 35 U.S.C. as amended by Public Law 97–247 with respect to the time for filing the national fee and oath or declaration.

Section 372(b) of title 35, United States Code, is amended, effective May 8, 1985, to authorize the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases is necessary since subsection (c)(2) of section 371 was amended to remove the requirement that the translation be verified in all cases.

Section 372(c) of title 35, United States Code, was deleted thereby discontinuing the requirement for payment of a special fee to maintain claims in an international application which were not searched by an international searching authority. This deletion was made to place international applications processed in the national stage on the same footing as purely national applications.

Section 376(a) of title 35, United States Code, was also amended by Public Law 98–622 to delete mention of the special fee in order to conform with the amendment of section 372(c).

Discussion of Specific Rules

Section 1.11 is amended as proposed to add a reference to published statutory invention registrations in paragraph (a) to indicate that they are available to the public. The portion of present §1.11(a) which deals with interferences is transferred to a new paragraph (e) and rewritten.

The amendment to paragraph (b) deletes reference to §1.139, which is being deleted in favor of the SIR, and inserts language which covers opening to the public defensive publications published under §1.139 as well as other applications laid open to the public such as the previously published abstracts and abbreviatures.

Section 1.11 is amended as proposed to delete the word "general" before public as unnecessary.

New paragraph (e) of §1.11 is added to cover the availability to the public of all interferences, including those which involved a statutory invention registration. This paragraph applies to interferences declared under the new rules which became effective on Feb. 11, 1985, 49 F.R. 48416, (Dec. 12, 1984) as well as the rules formerly in effect. The term "award of priority" is intended to refer to those decisions of the Board of Patent Interferences, or Board of Patent Appeals and Interferences, awarding priority in interferences conducted under the former rules. The term "judgment" refers to judgments entered by the Board of Patent Appeals and Interferences in interferences conducted under the new rules. The language of the proposed rule has been slightly modified for clarity in the final rule.

Section 1.14 is amended as proposed to delete reference to §1.139 since that section is being removed.

Section 1.17 paragraph (h) is amended as proposed to include the petition fee required by new §1.295.

Section 1.17 is amended to add new paragraphs (n) and (o) to establish fees for requesting publication of statutory invention registrations. Paragraph (n) establishes a $400.00 fee for requesting publication of a statutory invention registration where no first examiner's action pursuant to §1.104 has been issued in the application. The amount paid for basic filing fees under §1.16(a), (f) or (g) will be credited against this amount. For example, if a $300.00 filing fee was paid, only $100.00 additional would be required for requesting publication of a statutory invention registration.

The addition of paragraph (o) to §1.17 is similar to the addition of paragraph (n) but establishes a fee for requesting publication of applications, which have received any examiner's action pursuant to §1.104, as a statutory invention registration. The higher fee of $800.00 set in paragraph (o) is necessary in view of the expenditure of additional Office resources in examining

the application prior to the filing of the request for a statutory invention registration.

Section 1.19 is amended as proposed to provide in paragraph (a)(1) a reference to the cost of a printed copy of a statutory invention registration and in paragraph (e) to provide reference to statutory invention registrations listed by subclass.

Section 1.20 is amended as proposed to delete the requirement to pay maintenance fees in all plant patents in view of the amendment in Public Law 98–622. Paragraph 1.20(m) is amended as proposed to provide that non-timely payment of maintenance fees may be accepted in patents based on applications filed prior to Aug. 27, 1982, in accordance with Public Law 98–622.

Public Law 98–622 provides that no maintenance fees are charged for plant patents, regardless of when filed. Without this provision that no maintenance fees be charged for plant patents, plant patent owners whose applications were filed between the dates of enactment of Public Law 96–517 and Public Law 97–247 (Dec. 12, 1980 to Aug. 27, 1982) would be subject to payment of maintenance fees, while plant patent owners whose applications were filed outside those dates would not be subject to such fees. Public Law 98–622 eliminates that inconsistency.

Section 1.45 is amended as proposed to reflect the change made by Public Law 98–622 in 35 U.S.C. 116. The previously existing paragraph is designated as paragraph (a). New paragraph (b) incorporates the wording added to 35 U.S.C. 116 by Public Law 98–622. New paragraph (c) indicates that each named inventor listed in an application must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and that the application will be considered to be a joint application under 35 U.S.C. 116.

Section 1.48 is amended to add new paragraphs (b) and (c). New paragraph (b) provides for deleting the names of persons originally properly included as inventors, but whose invention is no longer being claimed in the application. Such a situation would arise where claims have been amended or deleted because they are unpatentable or as a result of a requirement for restriction of the application to one invention, or for other reasons. Public Law 98–622 and §1.48(b) change the result reached in *Ex parte Lyon*, 146 USPQ 222, 1965 Dec. Comm'r. Pat. 362 (Bd. App. 1964). The final rule has fewer requirements than the proposed rule for correction of inventorship in this situation. The proposed rule would have required, in addition to the requirements of the final rule, an oath or declaration by each actual inventor or inventors as required by §1.63 and the written consent of any assignee. The final rule requires only a petition and fee with the petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application. The amendment would have to be diligently made under paragraph (b).

The final rule adds a paragraph (c) in response to a comment to provide for the situation where an application discloses unclaimed subject matter by an inventor or inventors not named in the application as filed. In such a situation, the application may be amended pursuant to paragraph (a) of §1.48 to add claims to the subject matter and also to name the correct inventors for the application. The claims would be added by an amendment and, in addition, an amendment pursuant to paragraph (a) of §1.48 would be required to correct the inventors named in the application. Any claims added to the application must be supported by the disclosure as filed and cannot add new matter.

Section 1.60 is amended to include wording which would permit an application to be filed under this section only if it named as inventors the same or less than all the inventors who were named and signed the oath or declaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98–622, which permit continuing applications to be filed by different inventors. Under §1.60 additional inventors are not permitted to be named since the oath or declaration from the prior application is relied upon.

Section 1.61 is amended as proposed to incorporate the ability to file the translation, oath or declaration, and national fee after the 20 month deadline set forth in PCT Article 22(1) for entering the national phase in the United States Patent and Trademark Office.

Public Law 98–622 amended 35 U.S.C. 371(a) to provide greater flexibility for the PTO handling international applications. Also, 35 U.S.C. 371(a), by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, gives international applicants benefits similar to those given national applicants under 35 U.S.C. 111 by P.L. 97–247 with respect to the time for filing the national fee and oath or declaration.

Paragraph (b) of §1.61 is amended to delete the 2 month time period to conform with the decision concerning PCT Article 22(2) adopted by the Assembly of the International Patent Cooperation Union (PCT Union) on Feb. 3, 1984. The amendment to the Article took effect on Jan. 1, 1985.

PCT Article 22(2) as amended, reads as follows:

> "Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be the same as that provided in paragraph (1)."

The additional wording to paragraph (b) of §1.61 sets forth the ability to comply with the requirements for entering the national phase before the Patent and Trademark Office as a Designated Office within 22 months of the priority date. If the national fee or oath or declaration is submitted later than 20 months after the priority date, a surcharge as set in §1.445(a) (5) is required to be paid. If a required English translation of the international application is filed later than 20 months after the priority date, a processing fee as set in §1.445(a) (6) is required to be paid.

New paragraph (c) of §1.61 provides that any amendments under PCT Article 19 which are not received along with any necessary English translation by the end of 20 months from the priority date will be considered as cancelled. This change is required in view of amended §371(d) of 35 U.S.C.

Paragraph (d) is added as proposed to §1.61 in view of §372(b) of title 35, United States Code, as amended by Public Law 98–622, which authorizes the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases was necessary since subsection (c) (2) of 35 U.S.C. 371 was amended to remove the requirement that the translation be verified in all cases.

Section 1.62 is amended by revising paragraphs (a), (c), and (h) to include wording which would permit a continuing application to be filed under this section by the same or less than all the same inventors who filed and signed the oath or delcaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98–622, which permit continuing applications to be filed by different inventors. Under §1.62, additional inventors may be added only in applications in which a new oath or declaration is required because additional subject matter is being claimed. Paragraph (h) has been amended to also request applicants to furnish the title of the invention and the names of the applicants in the continuing application to permit the Office to enter this information in its records in the Application Branch.

Section 1.78 is amended to provide in paragraph (a) that the inventorship in the continuing application may be different from the inventorship in the prior copending application and that the prior application must disclose the invention claimed in at least one claim of the later filed application in the manner provided by the first

paragraph of 35 U.S.C. 112. The requirement that at least one claim be fully supported in the prior application to be entitled to priority benefit is not new, but is included to serve as a reminder that information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the later application is available as prior art where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120. See *In re Ruscetta*, 255 F. 2d 687, 118 USPQ 101 (CCPA 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 USPQ 426 (CCPA 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces Co., Inc.*, 339 F. Suppl. 859, 173 USPQ 295 (D. Del. 1972).

Paragraph (c) as amended provides for the reply to an examiner's inquiry as to first inventor of conflicting claims in commonly owned applications or an application and a patent to be either (1) a statement that the inventions were both commonly owned at the time the later invention was made or (2) an indication of the first inventor. Paragraph (c) has been changed from that proposed in response to comments to clarify that common ownership or an obligation of assignment to the same person has to exist at the time the later invention was made. New paragraph (d) provides for making a double patenting rejection where an application claims an invention which is not patentably distinct from an invention claimed in a commonly-owned patent with the same or different inventive entities. An obviousness-type double patenting rejection could be overcome by the assignee by submitting a terminal disclaimer complying with §1.321(b).

Section 1.101 is amended as proposed to delete reference to applications filed under §1.139 since this section is being removed.

Section 1.103 is amended as proposed to refer in paragraph (d) to a request "for a defensive publication" rather than a request "filed under §1.139" since §1.139 is being removed. Paragraph (d) is amended as proposed to also refer to "patent interference proceedings under Subpart E" rather than to "proceedings under §1.201(b)" since §1.201(b) has been removed.

Section 1.104 is amended as proposed to add a new paragraph (e) to specify the nature of the showing necessary before the examiner would consider co-pending applications to be owned by, or subject to an obligation of assignment to, the same person for purposes of 35 U.S.C. 102(f)/103, 102(g)/103, and paragraph (d) of §1.106. The rule permits the necessary showing to be made in different alternative ways. The necessary showing will be considered by the examiner to be present if the application files refer to assignments which are recorded in the Patent and Trademark Office in accordance with §1.331 as long as the assignments conveyed the entire rights in the applications to the same person or organization. A second alternative which can be used, if assignments have not been recorded, permits the examiner to consider copies of unrecorded assignments filed in each of the applications by the applicants as long as the unrecorded assignments convey the entire rights in the applications to the same person or organization. A third alternative permits an affidavit or declaration to be filed by the common owner stating that there is common ownership and stating facts which explain why the affiant or declarant believes there is common ownership. Under this alternative, sufficient facts will have to be presented in order to enable the examiner to conclude that a prima facie case of common ownership exists. The fourth alternative permits other evidence to be used which would establish common ownership of the applications, e.g., a court decision determining the owner. The terms "person" and "organization" in the rule would include circumstances where the ownership resided in more than one person and/or organization as long as the applications are owned jointly by the same owners. Paragraph (e) also provides that where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization who is empowered to act on behalf of the corporation or organization. A mere power of attorney to prosecute a patent application will not make an individual an official of the corporation or organization or empower the individual to act on behalf of the corporation or organization.

The wording of §1.106(d) amends the rule to reflect the change in 35 U.S.C. 103 and refers to the "entire" rights to the subject matter and the claimed invention to make it clear that the term "commonly owned" means wholly owned by the same person, persons, or organization.

If the person, persons, or organization owned less than 100 percent of the subject matter which would otherwise be prior art to the claimed invention, or less than 100 percent of the claimed invention, then common ownership would not exist. Common ownership requires that the person, persons, or organization own 100 percent of the subject matter and 100 percent of the claimed invention. As long as principal ownership rights to either the subject matter or the claimed invention reside in different persons or organizations common ownership does not exist. A license of the claimed invention to another by the owner where basic ownership rights are retained would not defeat ownership. The requirement for common ownership at the time the claimed invention was made is intended to preclude obtaining ownership of subject matter after the claimed invention was made in order to disqualify that subject matter as prior art against the claimed invention. The question of whether common ownership exists at the time the claimed invention was made is to be determined on the basis of the evidence presented and the facts of the particular case in question. Actual ownership of the subject matter and the claimed invention by the same individual or organization or a legal obligation to assign both the subject matter and the claimed invention to the same individual or organization must be in existence at the time the claimed invention was made in order for the subject matter to be disqualified as prior art. A moral or unenforceable obligation would not evidence common ownership.

The burden of establishing that subject matter is disqualified as prior art under the section is intended to be placed and reside upon the person or persons urging that the subject matter is disqualified. For example, the examiner would normally make what appears to be a proper 35 U.S.C. 102(f)/103 or 102(g)/103 rejection and the burden would be on the patent applicant to establish that subject matter is disqualified as prior art because it was commonly owned at the time the claimed invention was made. To place the burden upon the patent examiner would not be appropriate since evidence as to common ownership at the time the claimed invention was made might not be available to the patent examiner, but such evidence, if it exists, should be readily available to the patent applicant or the patentee.

The invention is made for purposes of the amendment to §103 when the conception is complete as defined in *Mergenthaler* v. *Scudder*, 11 App. D.C. 264, 1897 C.D. 724 (C.A.D.C. 1897), and in *In re Tansel*, 117 USPQ 188 (CCPA 1958).

> "The conception of the invention consists in the complete performance of the mental part of the inventive act. All that remains to be accomplished in order to perfect the act or instrument belongs to the department of construction, not invention. It is, therefore, the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice that constitutes an available conception within the meaning of the patent law."

Mergenthaler v. *Scudder*, supra, at page 731.

Paragraph (e) of §1.106 has been added in response to a comment that the rulemaking should leave no doubt as

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to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application. Paragraph (e) of §1.106 provides that the claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. Paragraph (e) of §1.106 also provides that the claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and which was the same subject matter waived in the statutory invention registration.

Section 1.108 is amended as proposed to delete the reference to filing a request under §1.139, which is being removed, and insert in its place a reference to a defensive publication.

A new section 1.110 is added as proposed to allow the examiner or other Office official to make inquiry as to the invention date, inventors and ownership at the time the invention was made when necessary for purposes of an Office proceeding.

Section 1.131 is amended to require that affidavits to overcome a rejection of a claim on a cited patent or publication be by the inventor or inventors of the subject matter of that claim. Section 1.131 has also been amended in response to a comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Section 1.139 is being removed in view of the new statutory invention registration. The proposed rules made clear the intent to remove this section which established the defensive publication program although the section per se was not published as being removed. The defensive publication program is being replaced by the ability to obtain a statutory invention registration.

Section 1.193 is amended as proposed to change from twenty days to one month the time for filing a reply brief in response to an examiner's answer which raises new points of argument. This amendment is intended to simplify the docketing of this time period and make it consistent with the time period fixed for requesting an oral hearing in §1.194(b).

Section 1.293 is added to provide who may file a request for a statutory invention registration (SIR) and the requirements of such a request in accordance with 35 U.S.C. 157 added by Public Law 98–622. Paragraph (a) of §1.293 indicates that a request for publication of a statutory invention registration in a complete pending patent application for an original patent may be filed and be signed by the applicant, and any assignee of record, or the attorney or agent of record in the application. Paragraph (b) sets forth the requirements for a request for a statutory invention registration. Such a request must include:

(1) a waiver of the applicant's right to receive a patent. This waiver will become effective upon the date of publication. Therefore, it will be possible to petition to withdraw a request for publication of a statutory invention registration until such time that publication can not be terminated;

(2) payment of the fee for requesting publication of a statutory invention registration as set forth in §1.17(n) or (o). The fee is set at two levels to reflect the amount of resources used by the Patent and Trademark Office;

(3) a statement that the application meets the disclosure requirements of 35 U.S.C. 112. This provision is considered desirable in order to prevent publication of defective and insufficient disclosures; and

(4) a statement that the application complies with the formal requirements of the rules of practice relating to printing. This provision is required in order to provide the printer with drawings and specification which are suitable for printing in substantially the same format as a patent.

A suggested format for use in filing a request for a statutory invention registration is as follows:

Request for Statutory Invention Registration

Application Serial No. or [ ] Attached hereto
Filed:
Titled:
Applicants:

A. In the above identified patent application, I hereby
1. request and authorize the Commissioner of Patents and Trademarks to publish the above identified regularly filed patent application as a Statutory Invention Registration. (35 U.S.C. 157)
2. waive the right to receive a United States patent on the same invention claimed in the above identified patent application. These rights, which are waived, include those specified in 35 U.S.C. §183 and §§271 through 289 as well as all attributes specified for patents in any other provision of law other than title 35 United States Code. The waiver includes, but is not limited to, the remedies under 19 U.S.C. 1337 and 1337a, 22 U.S.C. 2356 and 28 U.S.C. 1498. (35 U.S.C. 157(c))
3. understand that the above waiver will be effective pursuant to 37 CFR 1.293 upon publication of the Statutory Invention Registration to waive the inventor's right to receive a United States patent on the invention claimed in the Statutory Invention Registration. (37 CFR 1.293(b) (1))
4. state that, in my opinion, the disclosure and claims of the above identified patent application meet the requirements of 35 U.S.C. 112. (37 CFR 1.293(b) (3))
5. state that, in my opinion, the above identified application complies with the requirements for printing as set forth in the Rules of Practice for Patent Cases, 37 CFR Part 1. (37 CFR 1.293(b) (4))
6. enclose the fee set forth in 37 CFR 1.17(n) or (o) for requesting publication of a Statutory Invention Registration.

[ ] A first examiner's action *has not* been mailed in the above application, 37 CFR 1.17(n) — $400.00 or
[ ] A first examiner's action *has* been mailed in the above application, 37 CFR 1.17(o) — $800.00
$_____

Minus Basic Filing Fee, if previously paid

	Small entity	Large entity
Basic filing fee for utility patent application set forth in 37 CFR 1.16(a)	[ ] $150.00	[ ] $300.00
Basic filing fee for design patent application set forth in 37 CFR 1.16(f)	[ ] $62.50	[ ] $125.00
Basic filing fee for plant patent application set forth in 37 CFR 1.16(g)	[ ] $100.00	[ ] $200.00

MINUS: $_____
Amount Due $_____

[ ] Amount enclosed by check or money order
_____

[ ] Please charge Deposit Account No. _____ in the amount of _____.

[ ] If payment of any additional fee is required for publication of the Statutory Invention Registration, charge such payment to Deposit Account No. _____.

B. For printing on the Statutory Invention Registration front page list below the name(s) of not more than 3 registered patent attorneys or agents OR alternatively, the name of the firm having as a member a registered patent attorney or agent. If no name is listed below, no name will be printed. _____

_____

C. Name of assignee, if any, for printing on the Statutory Invention Registration _____

_____

Address (City and State or Country) _____
State of incorporation, if assignee is a corporation

_____

_____

(signature(s) (37 CFR 1.293(a))
[ ] applicant(s) and any assignee
[ ] attorney or agent of record

Paragraph (c) of §1.293 is added to define the effects of a waiver filed with a request for a statutory invention registration. The waiver is effective, upon publication of the SIR, to waive the inventor's right to receive a patent on the invention claimed in the SIR in any application for an original patent which is pending on, or filed after, the date of publication of the SIR. The waiver will affect pending or later applications the inventor filed as a joint inventor with others, but will not affect an application of another person, even if the application and the SIR were commonly owned. The waiver will affect a reissue application of an earlier patent of the inventor only to the extent that the reissue application seeks to enlarge the scope of the claims. Paragraph (c) of §1.293 has been modified from the proposal by inclusion of a reference to §1.106(e).

Section 1.294 is added as proposed to provide in paragraph (a) for a review of the request for publication of a statutory invention registration and the patent application to which it is directed. The request will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 are met. Under 35 U.S.C. 157, the Commissioner is authorized to publish a statutory invention registration, but is not required to do so. Thus, the Commissioner has discretion in determining whether or not a statutory invention registration should be issued on a particular patent. In circumstances where the subject matter was obviously not a patentable invention, was too informal to print, and so forth, the request to publish the statutory invention registration will be refused.

Paragraph (b) of §1.294 provides for notifying applicant of the results of the examination of the request for publication of the statutory invention registration. Paragraph (c) of §1.294 provides for the issuance of a notice of the intent to publish a statutory invention registration once the request has been examined and approved.

Section 1.295 is added to provide for the review of a final refusal to publish a statutory invention registration. The review would be by petition to the Commissioner for matters other than those arising from a rejection pursuant to 35 U.S.C. 112 and by appeal for a rejection pursuant to 35 U.S.C. 112. The language of the final rule is slightly different from that proposed to emphasize that the Board either affirms or reverses decisions rather than rejections. Paragraph (a) also differs from the proposal by including, in response to a comment, a provision for requesting return of the petition fee if the necessity for the petition resulted from an error by the Patent and Trademark Office.

Section 1.296 has been modified from the proposal to provide a specific period during which a request for a statutory invention registration may be withdrawn. Under §1.296, as modified, a request for a statutory invention registration may be withdrawn, at applicant's option, prior to the date of the notice of intent to publish a statutory invention registraiton issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. An applicant filing such a request to withdraw may also, under §1.296, request a refund of any amount paid in excess of the application filing fee and a handling fee of $100.00 which will be retained by the Office. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).

Section 1.297 is added to provide for the publication of the statutory invention registration and of the notice of its publication in the *Official Gazette*. In response to a comment, §1.297 has been modified so that the statement on the statutory invention registration will specifically state that the statutory invention registration is not a patent.

Sections 1.301, 1.302 and 1.304 are amended as proposed to delete the requirement to give reasons for appeal when filing an appeal to the Court of Appeals for the Federal Circuit in accordance with §414(a) of Public Law 98–620 which amended 35 U.S.C. 142, 143 and 144.

Section 1.378 is amended as proposed to delete from paragraph (a) the limitation that only applications filed on or after Aug. 27, 1982 may have the maintenance fee accepted after expiration of the patent. This change follows the change made by §404(b) of Public Law 98–622.

Section 1.431 is amended as proposed to provide for the later payment directly to the Receiving Office of the basic fee portion of the international fee and the transmittal and search fees within one month of the filing of an international application. The rule follows §361(d) of title 35 U.S.C. as amended by Public Law 98–622, to provide a one-month grace period from the date of filing of an international application for the payment of the basic international fee and the transmittal and search fees.

It should be noted that the designation fees continue to be required by 12 months after the priority date and that no subsequent grace period is provided in the Receiving Office for designation fees.

New paragraphs 1.431(d) and (e) incorporate into the regulations the provisions of PCT Rule 16 bis. Under these provisions the Receiving Office will charge any unpaid or insufficient fees to a deposit account maintained by the International Bureau. The applicant will then be notified by the International Bureau and be given one month to reimburse the amount charged plus a surcharge of 50%. The surcharge would not be less than 248 Swiss francs or more than 624 Swiss francs under the current fee schedule.

Section 1.445 is amended as proposed to clarify paragraph (a) (4) to clearly indicate that the national fee is credited by an amount of $250 only one time where a $500 search fee has been paid to the Patent and Trademark Office to act as an international searching authority. This is consistent with current practice. The special fee provisions in paragraph (a) (5) are being deleted in view of §402(g) of Public Law 98–622 which deleted the fee in 35 U.S.C. 376(a)(5). The wording of §1.445(a) (5) sets forth the surcharge required for filing of a national fee or oath or declaration later than 20 months from the priority date. Paragraph (a)(6) of §1.445 is added to require a fee of $20.00 for filing an English translation of an international application later than 20 months after the priority date. This makes the practice in international applications consistent with that in national applications where a fee of $20.00 is charged under §1.17(k) for processing an application filed with a specification in a non-English language.

Section 1.446 is amended as proposed to clarify the refund of a portion of the $500 search fee toward payment of the national fee.

Section 1.451 is amended as proposed to correct a rule citation in paragraph (b) and to amend paragraph (c) to provide for supplying a copy of the priority document to the Receiving Office in conformance with revised PCT Rule 17.1.

Section 1.461 is amended as proposed to delete provisions which relate to the applicant transmitting the record copy to the International Bureau. Provisions for such alternative transmittal were deleted from PCT Rule 22, effective Jan. 1, 1985. Accordingly, since the PCT rules no longer provide for such transmittal, the provisions therefor in the U.S. rules are also being deleted.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Six letters submitting written comments were received. Oral testimony was presented by four persons at the public hearing conducted on Feb. 8, 1985 and the oral testimony of two of these persons (representing the American Intellectual Property Law Association and Intellectual Property Owners, Inc.) was supplemented by written statements. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules appear below with responses thereto.

Comment:

One Comment suggested that 37 CFR 1.11 be amended to create a waiver of secrecy of an application as of the date of filing of a notice of appeal to the Court of Appeals for the Federal Circuit. The comment suggests that secrecy could be maintained upon request by the appellant in such a situation.

Reply:

The change was not published in the proposed rulemaking and is considered to be too substantial a change to be adopted without publication as a proposal to allow public comment. Further, if the suggestion were adopted appellants might simply include a request for secrecy with every notice of appeal.

Comment:

One comment suggested that the $120.00 petition fee under §1.17(h) for review of a refusal to publish a statutory invention registration under §1.295 be returned to the petitioner if the refusal to publish is found to have occurred only through an administrative error of the PTO.

Reply:

This suggestion has been adopted by an additional sentence being added to §1.295(a).

Comment:

Three comments suggested that the proposed fees for a statutory invention registration were too high. One comment suggested the elimination of the fee proposed in §1.17(o).

Reply:

Although lower fees would certainly be preferred by the public, the Office must recover its costs of processing and publishing statutory invention registrations. The two levels of fees permit an applicant whose application has not had a first Office action mailed to pay a minimum amount while those filing a request for a statutory invention registration later would share the average additional costs. The amounts proposed are the current estimates of expected costs and cannot be reduced. This will become apparent when it is realized that about $250.00 of the $400.00 fee which has been established for requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to §1.104 is the cost of printing the statutory invention registration and does not include in-house publication staff costs. The remainder of the fee is used to cover the administrative processing costs and the limited examination which is required to be given pursuant to 35 U.S.C. 157. The higher fee of $800.00 which has been established is necessary to cover the additional costs to the Office when an applicant requests publication of a statutory invention registration after the office has begun examination of the application on which the applicant is requesting publication of a statutory invention registration. Since the rules permit the request to be filed at any time during the examination process substantial additional examination costs, including possibly appeal costs, may have been incurred in a particular application prior to the date on which the request for publication is made. Accordingly, the additional $400.00 is required to cover the extra costs to the Office where the applicant belatedly requests publication of a statutory invention registration. Applicants can avoid the higher costs to themselves and the Office by requesting publication of the statutory invention registration in a timely fashion prior to the mailing of the first examiner's action pursuant to § 1.104. The possibility of reducing fees below costs to the Office does not exist since the legislative history of 35 U.S.C. 157 does not reflect any intent that other Office fees or appropriations be used to defer the costs of statutory invention registrations. Further, most of the comments received urged that the fees be set as low as possible, but not below the level necessary to recover costs.

Comment:

One comment suggested that the Patent and Trademark Office should investigate less expensive procedures for printing statutory invention registrations to reduce the costs and thereby lower the fees.

Reply:

If the registrations are not printed by a system using computer tape, the subject matter of the registrations would not be easily searchable in paper form and would not be fully available for searching under the planned automated "paperless" system. Further, the "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House stated that the statutory invention registration "would be classified and cross-referenced, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the PTO." (130 Cong. Rec. H 10526 (1984), column 3). These uses of the statutory invention registrations preclude use of any informal method of printing which would be different from the method used for the printing of patents.

Comment:

A number of comments were received concerning §1.48(b). The comments related to (1) the propriety of the fee required, (2) the incorporation of paragraph (b) into current §1.48, (3) the inclusion in the rules of a fixed and definite time period to correct inventorship, (4) the inclusion in the rules of a provision to add inventors claiming previously disclosed but unclaimed subject matter, and (5) a suggestion that the change in inventorship be simplified and possibly effected by a statement by applicant's attorney.

Reply:

Each comment will be treated separately in order. (1) The fee of $120.00 to accompany a petition for correction of inventorship is considered appropriate since the consideration of such a petition and correction of Office records takes additional resources. Such a fee should also act as a discouragement to grouping marginal inventions and loosely related inventions into the same application. (2) Whether paragraph (b) is made part of §1.48 or established as a separate rule does not appear to be a substantive matter. Paragraph (b) is being made part of §1.48 to place all rules relating to correction of inventorship in applications in a single rule. (3) No specific time period for correction of inventorship was indicated in the proposed rules. The rule requires that the correction must be made diligently. Since the examiner will not normally be aware of when inventorship correction is required, the responsibility of making such a correction diligently must rest with the applicant. The time of the correction will vary from case to case. (4) The addition of claims to previously disclosed but unclaimed subject matter of additional inventors is considered to be an error in the application and is therefore corrected under §1.48(a). A new paragraph (c) has been added to §1.48 to make this clear. Such a correction must always include a new oath or declaration. (5) The correction of inventorship has been simplified from that proposed. Final §1.48(b) does not require a new oath or declaration of each actual inventor or written consent of any assignee as originally proposed. The final rule requires a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and the fee set forth in §1.17(h). The petition could be signed by applicant's attorney who would then take full responsibility for ensuring that the inventor is not being improperly deleted from the application.

Comment:

One comment suggested that proposed §§1.60 and 1.62 should be modified to permit the filing of such continuing applications with different inventive entities from the prior application.

Reply:

The procedures under §§1.60 and 1.62 were developed to allow continuing applications to be filed without the necessity of again obtaining an inventor's signature to a declaration. The proposed rule wording has been modified in the final rule to permit inventors to be deleted in the continuing application. The addition of inventors is now permitted where a new oath or declaration would be required because of claims in the continuing application being drawn to additional subject matter.

Comment:

One comment suggested that §§1.77 and 1.78 be modified to change the placement in a patent application of the information regarding cross-reference to related applications. It was suggested to require this information to be placed immediately after the Abstract, following the claims, so that the cross-reference information could be easily removed when filing the application outside the United States.

Reply:

These changes were not included in the proposed rulemaking and therefore the public has not had an opportunity to comment on the suggestion. Accordingly, the suggestion has not been adopted.

Comment:

One comment suggested that proposed §1.78(c) be modified to permit a statement that the claimed inventions were subject to an obligation of assignment to the same person at the time the inventions were made.

Reply:

The suggestion has been adopted.

Comment:

One comment suggested that the application of double patenting rejections to applications of different inventive entities which are commonly owned as set out in proposed§1.78(d) not be made until the effective date of this rulemaking.

Reply:

The Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985), changed the practice in accordance with the intention of Congress in enacting Public Law 98–622. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier) wherein the following statement appears:

> "The Committee expects that the Patent and Trademark Office will reinstitute in appropriate circumstances the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. This will be necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming the terminal portion of the term of the later patent, thereby eliminating the problem of extending patent life."

Since the provisions of Public Law 98–622 became effective on Nov. 8, 1984, it was not appropriate to delay the change in practice.

Comment:

One comment suggested that the policy of rejecting commonly-owned applications of different inventive entities on the grounds of double patenting, as set forth in proposed §1.78(d), was unnecessary in view of 35 U.S.C. 102(e).

Reply:

The provisions of 35 U.S.C. 102(e) will not be effective to preclude double patenting in situations where the applicants of the later filed application can use the provisions of 37 CFR 1.131 to antedate the filing date of the earlier filed application or patent. Accordingly, the application of the prohibitions against double patenting is necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See 130 Cong. Rec. H 10527, supra.

Comment:

One comment suggested that proposed §1.78(c) was broader than required by statute and capable of being construed to conflict with proposed §1.106(d) by referring to common ownership at "the time the inventions were made" rather than at the time the later invention was made.

Reply:

The wording of §1.78(c) has been revised from the proposal to clarify the problem spoken to in the comment.

Comment:

One comment suggested that the proposed amendment to §1.131 not be made so that the "applicant" can make affidavits or declarations to overcome rejections. The comment suggested that the proposed rule provides no remedy in situations where the inventor is dead, insane, legally incapacitated, cannot be reached or refuses to join in the application.

Reply:

The final rule has been changed in response to the comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Comment:

Two comments suggested that the scope of the waiver in a statutory invention registration be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof. Another comment suggested that the statutory invention registration applicant should be able to waive the right to a patent on all of the subject matter disclosed in the application if he wishes to do so. One comment suggested that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application.

Reply:

A new paragraph (e) has been added to §1.106 to clarify the standard to be applied in determining the effect of a statutory invention registration waiver. The suggestion that the scope of the waiver be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof has been adopted.

Comment:

Three comments suggested that since a statutory invention registration is prior art as of its effective filing date, the time permitted between the effective filing date and the publication of the statutory invention registration should be limited. Several different approaches were suggested. One comment suggested that there was no problem in this regard. Another comment suggested that the organization is studying the question and will have recommendations in several months.

Reply:

The statute makes it clear that the Commissioner is not required to publish a statutory invention registration in response to a request therefor. The case-by-case consideration of requests for publication of a statutory invention registration should safeguard the public without unduly placing limits on patent applicants. The Office will await further recommendations on this question and will observe actual experience prior to placing any time limitations on the use of statutory invention registrations.

Comment:
Two comments suggested that §1.293 be modified to eliminate the requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112. One of these comments also suggested the elimination of the statement that the application meets formal requirements for printing. One comment suggested that if there is a requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112, there will not be a great necessity for the Office to spend a lot of time examining the application, although there has to be some examination.
Reply:
The reason for the statements in §1.293 regarding compliance with 35 U.S.C. 112 and the formal requirements for printing as a patent was to reduce the cost of statutory invention registrations to the applicants and to the Office. The level of fees which have been established assumes that applicants will include the statements required by §1.293 in their requests and that the statements will accurately reflect the condition of the applications to which the requests are directed.
Comment:
One comment suggested that the rules should include a fixed and definite time period in which an authorized party can withdraw a statutory invention registration after its approval and before its publication.
Reply:
The suggestion has been adopted. Section 1.296 has been modified to permit a request to withdraw the request for publication of a statutory invention registration to be filed at any time prior to the date of the notice of intent to publish the statutory invention registration. After the date of the notice of intent to publish the statutory invention registration, any request to withdraw the request for publication of the statutory invention registration must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).
Comment:
One comment suggested that the statement to be printed on statutory invention registrations as set out in proposed §1.297(b) be modified to be easily understood by lay people.
Reply:
The statement has been modified to specifically state that the statutory invention registration is not a patent.

Environmental, Energy, and Other Considerations: The final rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.
The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.
The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). In fact, the rule change will benefit small entities since the statutory invention registration procedures will provide a new, less expensive alternative to the traditional patenting of inventions in appropriate circumstances. Further, the ability to join multiple inventors in a single application in appropriate circumstances will be of particular benefit to small entities. Other changes, such as the elimination of the reasons for appeal, will also be beneficial to all inventors. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H.R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H 1057 (1984), column 1):

> "Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new less expensive alternative to the traditional patenting of inventions."

These rules, therefore, will have no significant adverse economic impact on small entities.
The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.
The information collection requirements contained in these rules were submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirements and has assigned OMB control number 0651–0018 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.
Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 98–620 and 98–622, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

1. Section 1.11 is amended by revising paragraphs (a) and (b) and adding new paragraph (e) to read as follows:

§1.11 Files open to the public.

(a) After a patent has been issued or a statutory invention registration has been published, the specification, drawings and all papers relating to the case in the file of the patent or statutory invention registration are open to inspection by the public, and copies may be obtained upon paying the fee therefor. See §2.27 for trademark files.
(b) All reissue applications, all applications in which the Office has accepted a request to open the complete application to inspection by the public, and related papers in the application file, are open to inspection by the public, and copies may be furnished upon paying the fee therefor. The filing of reissue applications will be announced in the *Official Gazette*. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.

• • • • •

(e) The file of any interference involving a patent, a statutory invention registration, or an application on which a patent has issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if: (1) the interference has terminated, or (2) an award of priority or judgment has been entered as to all parties and all counts.

2. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

• • • • •

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant.

• • • • •

3. Section 1.17 is amended by revising paragraphs (h) and by adding new paragraphs (n) and (o) to read as follows:

§1.17 Patent application processing fees.

• • • • •

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph		$120.00
§1.47	— for filing by other than all the inventors or a person not the inventor	
§1.48	— for correction of inventorship	
§1.182	— for decision on questions not specifically provided for	
§1.183	— to suspend the rules	
§1.295	— for review of refusal to publish a statutory invention registration	
§1.377	— for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent	
§1.378(e)	— for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent	
§1.644(e)	— for petition in an interference	
§1.644(f)	— for request for reconsideration of a decision on petition in an interference	
§1.666(c)	— for late filing of interference settlement agreement	
§§5.12, 5.13, & 5.14	— for expedited handling of foreign filing license	
§5.15	— for changing the scope of a license	
§5.25	— for retroactive license	
(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's acton pursuant to §1.104		$400.00 reduced by the amount of the application basic filing fee paid
(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to §1.104		$800.00 reduced by the amount of the application basic filing fee paid

4. Section 1.19 is amended by revising paragraphs (a) and (e) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent	$1.00

• • •

• • • • •

(e) List of patents in subclass:	
(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof	2.00
(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof	2.00

5. Section 1.20 is amended by revising paragraphs (e), (f), (g) and (m) to read as follows:

§1.20 Post-issuance fees.

• • • • •

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant	$200.00
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant	400.00
(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant	600.00

• • • • •

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable	500.00

6. Section 1.45 is revised by labeling the existing paragraph as (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.45 Joint inventors.

(a) • • • • •
(b) Inventors may apply for a patent jointly even though
(1) they did not physically work together or at the same time,
(2) each inventor did not make the same type or amount of contribution, or
(3) each inventor did not make a contribution to the subject matter of every claim of the application.
(c) If multiple inventors are named in an application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116.

7. Section 1.48 is amended by labeling the current paragraph as paragraph (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.48 Correction of inventorship.

(a) • • • • •

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(b) If the correct inventors are named in the application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:
(1) a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and
(2) the fee set forth in §1.17(h).

(c) If an application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application. [OMB Control No. 0651–0018].

8. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), naming as inventors the same or less than all the inventors named in a prior application and which discloses and claims only subject matter disclosed in the prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a), (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, and (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application.

9. Section 1.61 is amended by revising the section heading and paragraphs (a) and (b) and adding paragraphs (c) and (d) to read as follows:

§1.61 Filing of applications in the United States of America as a Designated Office.

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the U.S. Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments under PCT Article 19, unless it has been previously communicated by the International Bureau or unless it was originally filed in the U.S. Patent and Trademark Office; (2) a translation of the international application and a translation of any amendments under PCT Article 19 into the English language, if originally filed in another language; (3) the national fee (see §1.445(a)(4)); and (4) an oath or declaration of the inventor (see §1.70).

(b) If the translation of the international application, oath or declaration, and national fee have not been submitted by the applicant within twenty (20) months from the priority date, such requirements may be met within twenty-two (22) months from the priority date. The payment of the surcharge set forth in §1.445(a)(5) is required as a condition for accepting the national fee or the oath or declaration later than 20 months after the priority date. The payment of the processing fee set forth in §1.445(a)(6) is required for acceptance of an English translation later than 20 months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of §1.136 do not apply to the 22 month period of this section.

(c) If a copy of the amendments under PCT Article 19 is not communicated by the International Bureau or a copy thereof and any necessary English translation thereof is not received by the end of 20 months from the priority date, such failure will be regarded as cancellation of the amendments under PCT Article 19 in the international application.

(d) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

10. Section 1.62 is amended by revising paragraphs (a), (c) and (h) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) which is to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

* * * * *

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In those situations where a new oath or declaration is required due to additional subject matter being claimed, additional inventors may be named in the continuing application. In a continuation or divisional application which discloses and claims only subject matter dislcosed in a prior application, no additional oath or declaration is required and the application must name as inventors the same or less than all the inventors named in the prior application.

* * * * *

(h) The applicant is urged to furnish the following information relating to the prior and continuing applications to the best of his or her ability:

* * * * *

(5) The title of the invention and names of the applicants to be named in the continuing application.

* * * * *

11. Section 1.78 is amended by revising paragraphs (a) and (c) and by adding a new paragraph (d) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and dislcose the named inventor's invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application. An obviousness-type double patenting rejection may be obviated by filing a terminal disclaimer in accordance with §1.321(b).

12. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

13. Section 1.103 is amended by revising paragraph (d) to read as follows:

§1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request to publish a defensive publication will be suspended for the entire pendency of these applications except for purposes relating to patent interference proceedings under Subpart E.

14. Section 1.104 is amended by adding a new paragraph (e) immediately following the Note to paragraph (d) to read as follows:

§1.104 Nature of examination; examiner's action.

* * * * *

(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with §1.331 which convey the entire rights in the applications to the same person or organization; or (2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or (3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or (4) other evidence is submitted which establishes common ownership of the applications. In circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

15. Section 1.106 is amended by adding new paragraphs (d) and (e) to read as follows:

§1.106 Rejection of claims.

* * * * *

(d) Subject matter which is developed by another person which qualifies as prior art only under 35 U.S.C. 102 (f) or (g) may be used as prior art under 35 U.S.C. 103 against a claimed invention unless the entire rights to the subject matter and the claimed invention were commonly owned by the same person or organization or subject to an obligation of assignment to the same person or organization at the time the claimed invention was made.

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(e) The claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. The claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter (1) which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and (2) which was the same subject matter waived in the statutory invention registration.

16. Section 1.108 is revised to read as follows:

§1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references except those which have been opened to inspection by the public following a defensive publication.

17. Section 1.110 is added to read as follows:

§1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§1.78(c) and (d). [OMB Control No. 0651-0018].

18. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

* * * * *

§1.139 [removed]

19. Section 1.139 is removed.

20. Section 1.193 is amended by revising paragraph (b) to read as follows:

§1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. However, if the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may include any amendment or material appropriate to the new ground.

* * * * *

21. A new section 1.293 is added to read as follows:

§1.293 Statutory invention registration.

(a) An applicant for an original patent may request, at any time during the pendency of applicant's pending complete application, that the specification and drawings be published as a statutory invention registration. Any such request must be signed by (1) the applicant and any assignee of record or (2) an attorneyor agent of record in the application.

(b) Any request for publication of a statutory invention registration must include the following parts:
(1) a waiver of the applicant's right to receive a patent on the invention claimed effective upon the date of publication of the statutory invention registration;
(2) the required fee for filing a request for publication of a statutory invention registration as provided for in §1.17(n) or (o);
(3) a statement that, in the opinion of the requester, the application to which the request is directed meets the requirements of 35 U.S.C. 112; and
(4) a statement that, in the opinion of the requester, the application to which the request is directed complies with the formal requirements of this part for printing as a patent.

(c) A waiver filed with a request for a statutory invention registration will be effective, upon publication of the statutory invention registration, to waive the inventor's right to receive a patent on the invention claimed in the statutory invention registration, in any application for an original patent which is pending on, or filed after, the date of publication of the statutory invention registration. A waiver filed with a request for a statutory invention registration will not affect the rights of any other inventor even if the subject matter of the statutory invention registration and an application of another inventor are commonly owned. A waiver filed with a request for a statutory invention registration will not affect any rights in a patent to the inventor which issued prior to the date of publication of the statutory invention registration unless a reissue application is filed seeking to enlarge the scope of the claims of the patent. See also §1.106(e). [OMB Control No. 0651-0018].

22. A new section 1.294 is added to read as follows:

§1.294 Examination of request for publication of a statutory invention registration and patent application to which the request is directed.

(a) Any request for a statutory invention registration will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 of this part are met.

(b) Applicant will be notified of the results of the examination set forth in paragraph (a) of this section. If the requirements of §1.293 and this section are not met by the request filed, the notification to applicant will set a period of time within which to comply with the requirements in order to avoid abandonment of the application. If the application does not meet the requirements of 35 U.S.C. 112, the notification to applicant will include a rejection under the appropriate provisions of 35 U.S.C. 112. The periods for response established pursuant to this section are subject to the extension of time provisions of §1.136. After response by the applicant, the application will again be considered for publication of a statutory invention registration. If the requirements of §1.293 and this section are not timely met, the refusal to publish will be made final. If the requirements of 35 U.S.C. 112 are not met, the rejection pursuant to 35 U.S.C. 112 will be made final.

(c) If the examination pursuant to this section results in approval of the request for a statutory invention registration the applicant will be notified of the intent to publish a statutory invention registration.

23. A new section 1.295 is added to read as follows:

§1.295 Review of decision finally refusing to publish a statutory invention registration.

(a) Any requester who is dissatisfied with the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 may obtain review of the refusal to publish the statutory invention registration by filing a petition to the Commissioner accompanied by the fee set forth in §1.17(h) within one month or such other time as is set in the decision refusing publication. Any such petition should comply with the requirements of §1.181(b). The petition may include a request that the petition fee be refunded if the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 is determined to result from an error by the Patent and Trademark Office.

(b) Any requester who is dissatisfied with a decision finally rejecting claims pursuant to 35 U.S.C. 112 may obtain review of the decision by filing an appeal to the Board of Patent Appeals and Interferences pursuant to §1.191. If the decision rejecting claims pursuant to 35 U.S.C. 112 is reversed, the request for a statutory invention registration will be approved and the registration published if all of the other provisions of §1.293 and this section are met. [OMB Control No. 0651-0018].

24. A new section 1.296 is added to read as follows:

§1.296 Withdrawal of request for publication of statutory invention registration.

A request for a statutory invention registration, which has been filed, may be withdrawn prior to the date of the notice of the intent to publish a statutory invention registration issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. The request to withdraw may also include a request for a refund of any amount paid in excess of the application filing fee and a handling fee of $100 which will be retained. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish issued pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h). [OMB Control No. 0651-0018].

25. A new section 1.297 is added to read as follows:

§1.297 Publication of statutory invention registration.

(a) If the request for a statutory invention registration is approved the statutory invention registration will be published. The statutory invention registration will be mailed to the requester at the correspondence address as provided for in §1.33(a). A notice of the publication of each statutory invention registration will be published in the *Official Gazette*.

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:
A statutory invention registration published pursuant to 35 U.S.C. 157 is not a patent but it has all of the attributes specified for patents in title 35, United States Code, except those specified in 35 U.S.C. 183 and sections 271 through 289. A statutory invention registration does not have any of the attributes specified for patents in any other provision of law other than title 35, United States Code. The invention with respect to which a statutory invention registration is published is not a patented invention for purposes of the marking provisions of 35 U.S.C. 292.

26. Section 1.301 is revised to read as follows:

§1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. The certified list of documents and any original or certified copies of such documents required by the Court will be transmitted to the Court by the Patent and Trademark Office.

27. Section 1.302 is revised to read as follows:

§1.302 Notice of appeal.

(a) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof to the Commissioner within the time specified in §1.304.

(b) In interferences, the notice must be served as provided in §1.646.

28. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

29. Section 1.378 is amended by revising the section heading and paragraph (a) to read as follows:

§1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of

the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

* * * * *

30. Section 1.431 is amended by revising paragraphs (b)(3)(iii) and (c) and by adding new paragraphs (d) and (e) to read as follows:

§1.431 International application requirements.

* * * * *

(b)(3) * * *

(iii) The name of the applicant, as prescribed (note §§1.421-1.424);

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§1.445) may be made in full at the time international application papers required by paragraph (b) of this section are deposited or within one month thereafter. Failure to make full payment within one month of the deposit of the international application papers required by paragraph (b) of this section will result in the fees being charged to the International Bureau under the provisions of paragraph (d) of this section and PCT Rule 16 bis.

(d) The United States Receiving Office will charge to the International Bureau in accordance with PCT Rule 16 bis and will consider as having been timely paid:

(1) the transmittal fee, the basic fee portion of the international fee, or the search fee where these fees have not been fully paid by the applicant within one month of the date of deposit of the international application, and

(2) the destination fee, or the amount necessary to cover all the designations made in the request which have not been paid by the applicant within one year from the priority date.

(e) The International Bureau will notify applicant of any amount charged under paragraph (d) of this section and invite the applicant to pay directly to the International Bureau within one month from the date of the notification, the amount charged, augmented by a surcharge of 50%, provided the surcharge will not be less and will not be more, than the amounts indicated in the Schedule of Fees appended to the PCT Rules. If the payment needed to cover the transmittal fees, the basic fee, the search fee, one designation fee and the surcharge is not timely made to the International Bureau, the International Bureau will notify the Receiving Office which will declare the international application withdrawn under PCT Article 14(3)(a). If the applicant makes timely payment of the fees referred to in the previous sentence, but the amount paid is not sufficient to cover all the designation fees, the Receiving Office will declare any designations not paid withdrawn under PCT Article 14(3)(b) in accordance with PCT Rule 16 bis. 2(c).

31. Section 1.445 is amended by revising paragraphs (a)(4) and (5) and adding paragraph (a)(6) to read as follows:

§1.445 International application filing and processing fees.

(a) * * *

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited one time only by an amount of $250 where an international search fee of $500.00 has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single $500.00 international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date $100.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b)).. $20.00

* * * * *

32. Section 1.446 is amended by revising the section heading and paragraph (b) to read as follows:

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) Refund of a portion of the search fee toward payment of the national fee may be made one time to the extent set forth in §1.445(a)(4) if requested at the time of paying the national fee provided that a $500 search fee has been paid.

* * * * *

33. Section 1.451 is amended by revising paragraphs (b) and (c) to read as follows:

§1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office or in a separate letter filed in the Receiving Office not later than 16 months after the priority date, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Article 8 and PCT Rule 17). The fee for preparing a certified copy is stated in §1.19(a)(3) and (b)(1).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing or are not filed within 16 months of the priority date, the certified copy of the priority document must be furnished by the applicant to the International Bureau or to the United States Receiving Office within the time limit specified in PCT Rule 17.1(a).

34. Section 1.461 is amended by deleting paragraph (b) and by revising paragraph (a) to read as follows:

§1.461 Procedures for transmittal of record copy to the International Bureau.

(a) Transmittal of the record copy of the international application to the International Bureau shall be made by the United States Receiving Office.

(b) (reserved)

* * * * *

Feb. 14, 1985. DONALD J. QUIGG, *Acting Commissioner of Patents and Trademarks.*

[1053 OG 10]

(146) **Establishing Common Ownership of Patent Applications and/or Patents Owned by a Corporation or Other Organization**

This notice is intended to simplify the practice of establishing common ownership of patent applications and/or patents in circumstances where the common owner is a corporation or other organization. Under 37 CFR 1.104(c), in order to establish common ownership "[i]n circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization." A mere power of attorney to prosecute a patent application does not make an individual an official of a corporation or organization or empower the individual to act on behalf of the corporation or organization in making an affidavit or declaration averring to common ownership. However, such an affidavit could be made by a patent attorney, patent agent, or other individual if the attorney, agent, or other individual has been appointed in writing by the corporation or organization as an official of the corporation or organization specifically empowered to make affidavits or declarations on its behalf averring to common ownership. In circumstances where such a written appointment has been given to a patent attorney, patent agent, or other individual, that person could then make affidavits or declarations averring to common ownership as long as the affidavit or declaration referred to an attached copy of the written appointment and averred that the authority is still in effect. Under this practice the original signed copy of the written appointment would be retained by the affiant or declarant unless the Patent and Trademark Office specifically required it to be filed. Unless some question arose as to the authority of the individual to make the averment as to common ownership, the Patent and Trademark Office would ordinarily not need to require the original signed copy of the written appointment. While this practice should simplify the establishing of common ownership by necessitating only one original signed written appointment, corporations and other organizations must exercise care that the written appointment is only given to those persons who are in a position to know that common ownership does in fact exist and can therefore properly make affirmative representations to that effect to the Patent and Trademark Office.

May 12, 1986. DONALD J. QUIGG, *Assistant Secretary and Commissioner of Patent and Trademarks.*

[1067 OG 11]

(147) **U.S. Department of Commerce Patent and Trademark Office**

Special Status for Patent Applications Relating to Superconductivity

In his Remarks of July 28, 1987, to the Federal Conference On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that "to most of us laymen, superconductivity was a completely new term, but it wasn't long before we learned of the great promise it held out to alter our world for the better — a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 5, 1987. DONALD J. QUIGG, *Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.*

[1082 TMOG 7]

(148) **Preparation for Processing High Temperature Superconductor Technology**

In response to the President's Superconductivity Initiative announced on July 28, 1987 and with the expectation of the filing of increasing numbers of patent applications relating to higher temperature superconductors, the U.S. Patent and Trademark Office has taken a number of steps to prepare for the effective handling of applications on this subject matter.

These actions include (1) establishing a special Task Force to prepare for the processing of patent applications for higher temperature superconductor technology; (2) making patent applications relating to this technology special on request of the applicant and (3) renewing support for legislation providing for an expanded scope of protection for process patents to cover products made by the patented process.

The responsibilities of the Task Force are to (1) coordinate the development of a Patent and Trademark Office capability to examine the expected large number of patent applications in this area and (2) provide an information resource and sounding board for legal and practice questions and policy development in this area. The Task Force has been assigned a number of specific tasks, such as developing a complete search file on superconductivity technology for the use of Examiners and the public, establishing a training program for examiners on the technology and assuring a uniform and consistent application of the patent law to the technology in the U.S. Patent and Trademark Office.

Sept. 16, 1987. RENE D. TEGTMEYER, for DONALD J. QUIGG, *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1083 OG 16]

(149) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 70754-7154]

Miscellaneous Amendments of Patent Rules

Agency: Patent and Trademark Office, Commerce
Action: Notice of proposed rulemaking

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Summary: The Patent and Trademark Office proposes amendments to the rules of practice in patent cases, Parts 1 and 5 of Title 37, Code of Federal Regulations, (1) to bring the rule relating to swearing back of a reference into conformity with current interference practice; (2) to limit the length of the appellant's brief and reply brief in an *ex parte* appeal, and require that the brief contain certain specific items; (3) to reset the time period for requesting an oral hearing in *ex parte* appeals where the examiner's answer states a new ground of rejection; (4) to clarify the procedure following a final rejection after a remand to the examiner under §1.196(b)(1); (5) to give the examiner-in-chief the authority to decide certain requests for access by an interference party; (6) to clarify the rule relating to access to pending or abandoned applications; (7) to modify the rules concerning requests for interference with an application or patent; (8) to amplify the rule concerning the requirements of a motion to declare an additional interference; (9) to more clearly define the application of interference estoppel; (10) to make more comprehensive the rule concerning the filing of a reissue application by a patentee involved in an interference; and (11) to conform the rule concerning applications under secrecy order to current interference practice.

Dates: Comments and suggestions should be received by Dec. 1, 1987. A public hearing will be held on Dec. 9, 1987, beginning at 9:00 AM; requests to make oral presentations at the hearing should be received on or before Dec. 1, 1987.

Address: Address written comments to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The public hearing will be held in Rm. 11C10, Crystal Plz. Bldg. 3, 2021 Jefferson Davis Hwy., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

For Further Information Contact: Saul I. Serota by telephone at (703) 557–4072 or Ian A. Calvert by telephone at (703) 557–4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington. D.C. 20231.

Supplementary Information:

(1) Swearing Back of a Reference

The Patent and Trademark Office published its notice of final rule amending the rules of practice in patent interference cases in the Federal Register of Dec. 12, 1984 (49 Fed. Reg. 48416 through 48471) and in the Official Gazette of Jan. 29, 1985 (1050 O.G. 385 through 440). Included in the rules adopted was §1.601(n), which defines "same patentable invention."

Section 1.131(a), if amended as proposed, would insert "the same patentable invention, as defined in §1.601(n), as" before the phrase "the rejected invention". The amendment does not change the present practice where the inventor of the rejected claim, the owner of a patent under reexamination, or the person qualified under §§1.42, 1.43 or 1.47 can swear behind a domestic patent which discloses but does not claim the same invention as the rejected invention, a foreign patent or a printed publication. Rather, the amendment is necessary to define precisely the term "does not claim the rejected invention." See *In re Eickmeyer*, 602 F.2d 974, 202 USPQ 655 at 661 (CCPA 1979) where the Court stated:

> . . . we conclude that the phrase "does not claim the rejected invention" should be construed favorably to an applicant, if possible, so that unless the applicant is clearly *claiming the same invention* as the U.S. patent reference, he will not lose his rights under Rule 131. [Emphasis added.]

and also expressed its dissatisfaction with the PTO for

> . . . leaving an applicant in a position where he cannot overcome the reference claims by a 131 affidavit because the PTO has decided that the reference claims his invention, while at the same time, he is denied an interference because the PTO has decided that the claims of his application and those of the reference are not for substantially the same invention.

Possibly because of this decision, some patent practitioners seem to have been of the opinion that an affidavit under 37 CFR 1.131 can be used to overcome a rejection on a domestic patent so long as there is no verbatim correspondence between the claims of the application or the patent under reexamination rejected on that domestic patent and the claims of the domestic patent.

Such an opinion is not in accord with the law expressed in such cases as *In re Clark*, 53 CCPA 954, 457 F.2d 1004, 173 USPQ 359 (1972); *In re Hidy*, 49 CCPA 1152, 303 F.2d 954, 133 USPQ 650 (1962); *In re Teague*, 45 CCPA 877, 254 F.2d 145, 117 USPQ 284 (1958); and *In re Ward*, 43 CCPA 1007, 236 F.2d 428, 111 USPQ 101 (1956). In *In re Hidy*, supra, 133 USPQ at 652, the Court stated:

> A Rule 131 affidavit is ineffective to overcome a United States patent, not only where there is a verbatim correspondence between claims of the application and of the patent, but also where there is no patentable distinction between the respective claims. *In re Wagenhorst*, 20 CCPA 829, 62 F.2d 831, 16 USPQ 126; *In re Teague*, 45 CCPA 877, 254 F.2d 145, 117 USPQ 284.

If the application (or patent under reexamination) and the domestic patent contain claims which are identical, or which are not patentably distinct, then the application and patent are claiming the "same patentable invention," defined by §1.601(n) as follows:

> Invention "A" is the "same patentable invention" as an invention "B" when invention "A" is the same as (35 U.S.C. 102) or is obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

As provided in §1.601(i), an interference may be declared whenever an examiner is of the opinion that an application and a patent contain claims for the "same patentable invention." The purpose of the proposed amendment to §1.131(a) is to insure that an applicant who is claiming an invention which is identical to, or obvious in view of, the invention claimed in a domestic patent cannot employ an affidavit under §1.131 as a means for avoiding an interference with the patent. To allow an applicant to do so would result in the issuance of two patents to the same invention.

Section 1.131(b), if amended as proposed, would insert in the first sentence thereof the language, "prior to" before the words "said date". This amendment makes clear that the showing of facts under §1.131(b) must establish due diligence from a date prior to the effective date of the reference to affiant's subsequent reduction to practice or to the filing of his application as set forth in *In re Mulder*, 716 F.2d 1542, 219 USPQ 189 (Fed. Cir. 1983).

(2) Appellant's Brief and Reply Brief

A. Limitation on Length

Section 1.192(a), if amended as proposed, would delete the last sentence and insert the following sentence after the first sentence:

> If the brief exceeds 30 pages, in addition to the appendix required by paragraph (c)(7) of this section, it will be returned to the appellant.

Section 1.193(b), if amended as proposed, would insert the following as the third sentence:

> If the reply brief exceeds 15 pages, or the examiner determines that it is not directed only to new points of argument raised in the examiner's answer, the examiner will so notify the appellant and at the same time return the reply brief to the appellant.

The last sentence of §1.192(a) is proposed to be deleted in view of the proposed addition of paragraph (c), which would impose more specific requirements for the contents of the brief.

The sentences proposed to be added to §§1.192(a) and 1.193(b) would limit the length of an apellant's brief and reply brief in an *ex parte* appeal to 30 and 15 pages, respectively, by providing that briefs or reply briefs which exceed these limits will be returned. These numbers of pages are for pages which comply with the requirements of 37 CFR 1.52. In determining whether a brief exceeds the 30-page limit, the pages of the appendix required by proposed §1.192(c)(7) would not be counted.

While the length of the majority of briefs and reply briefs filed in *ex parte* appeals is substantially less than the 30- and 15-page limits proposed, in some instances briefs and reply briefs greatly exceed these limits. In many instances, these lengthy briefs and reply briefs are unnecessary; rather than focusing upon the issues involved in the appeal, they are verbose and repetitious, beclouding the issues and taking up an inordinate amount of the time spent by the examiner and examiners-in-chief in considering the appeal. The page limits set in proposed §§1.192(a) and 1.193(b) are intended to eliminate such lengthy briefs and reply briefs while at the same time giving appellants adequate scope to fully develop their arguments.

The proposed amendment to §1.193(b) would also provide for return of the reply brief to the appellant if the examiner determines that the reply brief did not comply with the requirement of §1.193(b) that it be limited to any new points of argument raised in the examiner's answer.

B. Contents of the Main Brief

Section 1.192, if amended as proposed, would add paragraphs (c) and (d). Paragraph (c) lists a number of items which would have to be included in the appellant's brief, while paragraph (d) would permit dismissal of the appeal for failure to include any of the items required by paragragh (c), in the order specified in paragraph (c). Paragraph (d) would also add the following sentence:

> Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

This sentence emphasizes that all arguments and authorities which an appellant wishes the Board to consider must be included in the brief. It should be noted that arguments not presented in the brief and made for the first time at oral hearing are not entitled to consideration. *In re Chiddix*, 209 USPQ 78 (Comr. 1980); *Rosenblum* v. *Hiroshima*, 220 USPQ 383 (Comr. 1983).

Proposed paragraph (c) would require that the brief contain, in order, seven specific items. This proposed requirement arose from the recommendations of a committee which was appointed by the Commissioner of Patents and Trademarks in 1986 to study and report on alternatives for reducing the backlog of *ex parte* appeals at the Board of Patent Appeals and Interferences. One of the committee's recommendations was that §1.192 be amended to require that the appellant's brief include certain items. Items (3), (4), (5) and (6) of proposed §1.192(c) are based upon the committee's recommendations. The committee indicated that the inclusion of those items in the brief would crystallize the issues involved in the appeal. By eliminating inadequate briefs, the Board of Patent Appeals and Interferences would not need to engage in what might be called "de novo" examination of a patent application, but rather could confine its activities to review of the appealed rejections.

The committee also recommended that certain items be required to be included in the examiner's answer. It is expected that the Manual of Patent Examining Procedure will be amended to require that the examiner's answer contain these and other items, substantially as indicated in Appendix A.

In addition to the committee's recommendations, some of the proposed items are supported by the evaluation of selected practices conducted as a part of the PTO's Quality Reinforcement Program. A summary of the results of that evaluation is published at 1078 Official Gazette 22 (May 19, 1987).

The specific items required by proposed §1.192(c) are:

(1) A statement of the status of all the claims in the application, or patent under reexamination, i.e., for each claim in the case, appellant should state whether it is cancelled, allowed, rejected, etc. Each claim on appeal must be identified.

(2) A statement of the status of any amendment filed subsequent to final rejection, i.e., whether or not the amendment has been acted upon by the examiner, and if so, whether it was entered, denied entry, or entered in part.

Items (1) and (2) are included in proposed §1.192(c) because in the past confusion has sometimes arisen as to which claims are on appeal, and the precise wording of those claims, particularly where the appellant has sought to amend claims after final rejection. The inclusion of items (1) and (2) in the brief would advise the examiner of what the appellant considers the status of the claims and post-final rejection amendments to be, allowing any disagreement on these questions to be resolved before the appeal was taken up for decision by the Board of Patent Appeals and Interferences.

(3) A concise explanation of the invention defined in the claims involved in the appeal. This explanation would be required to refer to the specification by page and line number, and, if there were a drawing, to the drawing by reference characters. Where applicable, it would be preferable to read the appealed claims on the specification and any drawing.

(4) A concise statement of the issues presented for review. Each stated issue would correspond to a separate ground of rejection which appellant wished the Board of Patent Appeals and Interferences to review. While the statement of the issues would have to be concise, it could not be so concise as to omit the basis of each issue. For example, the statement of an issue as "Whether claims 1 and 2 are unpatentable" would not comply with proposed §1.192(c)(4). Rather, the basis of the alleged unpatentability would have to be stated, e.g., "Whether claims 1 and 2 are unpatentable under 35 U.S.C. 103 over Smith in view of Jones", or "Whether claims 1 and 2 are unpatentable under 35 U.S.C. 112, first paragraph, as being based on a non-enabling disclosure." The statement would be limited to the issues presented, and should not include any argument concerning the merits of those issues.

(5) If an appealed ground of rejection applied to more than one claim and appellant considered the rejected claims to be separately patentable, proposed §1.192(c)(5) would require appellant to state that the claims do not stand or fall together, and the reasons why they were considered separately patentable. The absence of such a statement would be taken by the PTO as a concession by the applicant that, if the ground of rejection were sustained as to any one of the rejected claims, it would be equally applicable to all of them. Proposed §1.192(c)(5) continues the current practice of the Board of Patent Appeals and Interferences, and is consistent with the practice of the Court of Appeals for the Federal Circuit indicated in such cases as *In re Semaker*, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983), and *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

(6) The appellant's contentions with respect to each of the issues presented for review in proposed §1.192(c)(4),

and the basis for these contentions, including citations of authorities, statutes, and parts of the record relied on. Included in this proposed paragraph are five subparagraphs, (i) to (v). Subparagraphs (i) to (iv) concern the grounds of rejection most commonly involved in *ex parte* appeals, namely, 35 U.S.C. 112, first and second paragraphs, 35 U.S.C. 102, and 35 U.S.C. 103. Subparagraph (v) is a general provision concerning grounds of rejection not covered by subparagraphs (i) to (iv).

The purpose of subparagraphs (i) to (iv) is to insure that the appellant's argument concerning each appealed ground of rejection will include a discussion of the questions relevant to that ground. It is believed that compliance with the requirements of the particular subparagraphs which are pertinent to the grounds of rejection involved in an appeal would be beneficial both to the PTO and to appellants. It would not only facilitate a decision by the Board of Patent Appeals and Interferences by enabling the Board to determine more quickly and precisely the appellant's position on the relevant issues, but also would help appellants to focus their arguments on those issues.

For each rejection not falling under subparagraphs (i) to (iv), proposed subparagraph (v) provides that the argument should specify the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error. This proposed language recognizes that for some grounds of rejection, it may not be necessary to specify particular claim limitations; for example, a rejection under 35 U.S.C. 101, as in *Ex parte Hibberd*, 227 USPQ 443 (BPAI 1985), or a rejection for violation of the duty of disclosure under 37 CFR 1.56(d), as in *Ex parte Harita*, 1 USPQ2d 1887 (BPAI 1986).

(7) An appendix containing a copy of the claims involved in the appeal.

C. Contents of Reply Brief

Section 1.193(b), if amended as proposed, would insert the following as the second sentence:

> The new points of argument shall be specifically identified in the reply brief.

Since the reply brief must be limited to any new points of argument raised in the examiner's answer, compliance with the requirement of this proposed sentence would facilitate both preparation of the reply brief by appellant and consideration of the reply brief by the PTO.

The final sentence of §1.193(b), if amended as proposed, would provide that the reply may be accompanied by, rather than include, any amendment or material appropriate to the new ground of rejection. This proposed change in the rule makes clear that the amendment or other material must be presented in a separate paper, rather than in the reply itself.

(3) Time Period for Requesting an Oral Hearing

Section 1.194(b), if amended as proposed, would add the following sentence after the first sentence:

> If the examiner's answer states a new ground of rejection and if appellant files a reply as provided by §1.193(b), then the written request must be made within three months after the date of the filing of the reply.

The present rule does not provide the appellant an additional time period for requesting an oral hearing in the event that the examiner's answer states a new ground of rejection. If the answer states a new ground of rejection, §1.193(b) provides that appellant's reply may also include any amendment or material appropriate to the new ground of rejection. However, under §1.194(b) appellant must file the request for oral hearing within one month after the date of the answer whereas the reply thereto must be filed within two months from the date of the answer. Consequently, appellant must file a request for oral hearing before having the benefit of the examiner's views, if any, with respect to the reply.

Although the examiner does not normally issue a supplemental answer in response to a reply, see Manual of Patent Examining Procedure §1208.01 (5th Ed., Aug. 1983), the proposed amendment to §1.194(b) would permit the appellant to postpone filing a request for an oral hearing until three months after the date the reply is filed. This will give the appellant time to receive the examiner's response, if any, to the reply before the appellant has to decide whether to request an oral hearing.

(4) Procedure Following Final Rejection, Remand Under §1.196(b)

Section 1.196(b)(1), if amended as proposed, would add the following sentence as the penultimate sentence of the section:

> Should the examiner make the rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

Under §1.196(b), the Board of Patent Appeals and Interferences may, in its decision on an *ex parte* appeal, make a new rejection of one or more appealed claims, in which case the appellant has the option of (1) submitting an appropriate amendment of the rejected claims, and/or a showing of facts, (2) requesting reconsideration, or (3) treating the decision as a final decision. If the appellant elects option (1), the case is remanded to the examiner for consideration. If the examiner does not consider that the amendment and/or showing of facts overcome the rejection, he or she will make the rejection final.

An applicant in whose application such a final rejection has been made may mistakenly believe that he or she is entitled to review of the final rejection by the Board of Patent Appeals and Interferences by virtue of the fact that the application was previously on appeal. The proposed amendment would correct this belief by making clear that after such a final rejection, an applicant who desires further review of the matter must file a new appeal to the Board of Patent Appeals and Interferences. The language of the proposed amendment is similar to the fourth sentence of §1.196(d).

(5) Request for Access by Interference Party

Section 1.612(a), if amended as proposed, would add the following sentence as the last sentence of the section:

> A party seeking access to any abandoned or pending application referred to in the opposing party's involved application or access to any pending application referred to in the opposing party's patent must file a motion under §1.635.

The proposed amendment would require an interference party seeking access either to a pending or abandoned application referred to in an opposing party's involved application or to a pending application referred to in an opposing party's involved patent to file a motion under 37 CFR 1.635. Such a motion is decided by an examiner-in-chief (§1.640(b)).

Under the present practice, access can only be obtained by filing an *ex parte* petition to the Commissioner accompanied by the petition fee set forth in §1.17(i) and normally no decision is rendered on the petition until after the opposing party has had an opportunity to respond to the petition. The proposed amendment would expedite the interference proceeding by eliminating the delays inherent in the petition process. By requiring the party seeking access to file a motion under §1.635, that party would first have to confer with the opposing party in an effort to resolve the issue of access as required by §1.637(b). The examiner-in-chief would not have to decide the issue unless it could not be resolved by the parties.

(6) Access to Applications

Section 1.14(e) if amended as proposed, would delete the word "of" from the phrase "or of any papers relating thereto" and would add a reference to §1.612(a) by adding the following sentence as the last sentence thereof:

> See §1.612(a) for access by an interference party to a pending or an abandoned application.

Section 1.14(e) as presently worded appears to limit a request by a member of the public to copies of, but not access to, any papers relating to any pending or abandoned application. Any such limitation was unintentional. The amended language will permit a member of the public to request both access to and copies of those papers.

(7) Request for Interference with an Application or Patent

Sections 1.604(a) and 1.607(a), if amended as proposed, would provide for the situation in which a patent applicant requests an interference with another application or patent, respectively, on the basis of one or more claims which are already present in his or her application. The present rules require that when an applicant seeks an interference with another application or an unexpired patent, he or she must present a claim corresponding to the proposed count. The proposed rules would eliminate this requirement if a claim or claims corresponding to the proposed count are already in the application, and the applicant identifies them as such.

(8) Motion to Declare Additional Interference

Section 1.637(e)(1)(vi), if amended as proposed, would clearly state that a motion to declare an additional interference under 37 CFR 1.633(e)(1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference shall designate the claims of the opponent's application or patent which define the same patentable invention defined by the proposed count or if the opponent's application does not contain any such claim, the moving party shall propose a claim to be added to the opponent's application. The present section states that when the opponent is a patentee, the motion shall designate the patent claims which define the same patentable invention defined by the proposed count. The present section does not require, although such a requirement is inferred from §1.637(e)(2)(vi), that when the opponent is an applicant, the motion shall designate the application claims which define the same patentable invention defined by the proposed count or, if the opponent's application does not contain any such claim, the moving party shall propose a claim to be added to the opponent's application.

(9) Interference Estoppel

Section 1.658(c), if amended as proposed, would insert in the first sentence the language "by a motion under §1.633(e)" after the words "(3) could have been properly raised" and substitute the language "on an invention which was claimed during the pendency of the original interference either (i) in the winning party's involved application or patent or (ii) in a noninvolved application owned by a losing party" for the words "with a motion under §1.633(e)". In the second sentence, the language "who could have properly moved, but failed to move, under §§1.633 or 1.634" appearing after the words "losing party" would be deleted. Also in the second sentence, the language "that party's failure to properly move" would be deleted and the language "the issues settled by the judgment" inserted in its place. The proposed amendment incorporates into §1.658(c) the guidelines set forth in the interference rules correction notice (50 Fed. Reg. 23122, May 31, 1985, 1059 Official Gazette 27, Oct. 22, 1985) for the application of the doctrine of interference estoppel under 37 CFR 1.658(c) with respect to a losing party's failure to move under 37 CFR 1.633(e) to declare an "additional interference" between an additional application not involved in the interference and owned by the party and an opponent's application or patent involved in the interference on a separate patentable invention. The correction notice states that generally a losing party will be estopped for failure to move when the separate patentable invention (subject matter) which could have been the subject of the "additional interference" was *claimed* (during the pendency of the interference) (1) in the opponent's involved application or patent or (2) in a non-involved application owned by the party during the pendency of the interference. Should a losing party after the termination of the interference acquire an application which discloses or claims the separate patentable invention and which could have been the subject of the "additional interference", estoppel would not apply because the party did not own the application during the pendency of the interference.

The correction notice illustrates the general applicability of interference estoppel in certain situations where a losing party fails to move under §1.633(e) to declare an "additional interference" on a separate patentable invention as follows:

Losing Party's Non-Involved Application	Winning Opponent's Involved Application or Patent	Estoppel
Claimed	Claimed	Yes
Disclosed	Claimed	Yes
Claimed	Disclosed (Application)	Yes
	(Patent)	No*
Disclosed	Disclosed	No

*An invention disclosed and not claimed in a winning opponent's patent would not form the basis for a count because the patent does not contain a claim which can be designated to correspond to the count. Thus, a motion to declare an additional interference under §1.633(e) could not have been properly brought, and interference estoppel therefore would not apply.

(10) Filing of Reissue Application During Interference

Section 1.662(b), if amended as proposed, would insert a comma after "§1.633(h)" and add the language "or would not be appropriate" at the end of the last sentence. The present rule contemplates that a reissue application may be filed by a patentee involved in an interference only for one of two reasons: either for the purpose of avoiding the interference, or for some other purpose relating to the interference, e.g., to add claims corresponding to a proposed new count. In the first case, judgment would be entered against the patentee and in the second case, a motion under §1.633(h) to add the reissue application to the interference would be appropriate.

However, it has been found that a patentee involved in an interference may file a reissue application for some other reason not contemplated by the rule, and for which the entry of judgment or a motion under §1.633(h) would not be appropriate. For example, the patentee might file a reissue application for the purpose of amending claims of the patent which are directed to an invention which is patentably distinct from the issue of the interference and which is not disclosed by the opposing party. In such a situation, addition of the reissue application to the interference would be unnecessary. The proposed amendment of §1.662(b) would accommodate this third possibility by providing that, instead of filing a motion under §1.633(h) to add the reissue application to the interference, a patentee could show good cause why such a motion would not

be appropriate under the particular circumstances involved.

(11) Applications Under Secrecy Order

Section 5.3(b), if amended as proposed, would delete the language "under secrecy order copies claims from an issued patent" and insert in its place the language "is under secrecy order seeks to provoke an interference with an issued patent" to make the section's language consistent with that of §1.607(d). In addition, it is proposed to correct the reference to "§1.205(c)" to read "§1.607(d)".

Environmental, Energy and Other Considerations

The proposed rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because it is intended to expedite the disposition of appeals and to simplify by clarification and amplification certain of the rules governing the conduct of an interference. The expedited disposition of appeals will permit the small entity to make earlier business decisions which may be affected by a pending appeal. The effect of the clarification and amplification of the rules relating to interferences will be to reduce the costs associated with involvement in an interference.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below. It is proposed to amend 37 CFR, Parts 1 and 5, as follows with deletions indicated by brackets and additions by arrows.

Part 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.14 is proposed to be amended by revising paragraph (e) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or [of] any papers relating thereto, must (1) be in the form of a petition and be accompanied by the petition fee set forth in §1.17(i) or (2) include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record. ▶See § 1.612(a) for access by an interference party to a pending or abandoned application.◀

3. Section 1.131 is proposed to be revised to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim ▶the same patentable invention, as defined in §1.601(n), as◀ the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

(b) The showing of facts shall be such, in character and weight, as to establish reduction to practice prior to the effective date of the reference, or conception of the invention prior to the effective date of the reference coupled with due diligence from ▶prior to◀ said date to a subsequent reduction to practice or to the filing of the application. Original exhibits of drawings or records, or photocopies thereof, must accompany and form part of the affidavit or declaration or their absence satisfactorily explained.

4. Section 1.192 is proposed to be amended by revising paragraph (a) and adding new paragraphs (c) and (d) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate.▶If the brief exceeds 30 pages, in addition to the appendix required by paragraph (c)(7) of this section, it will be returned to the appellant.◀ The brief must be accompanied by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. [The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved.]

* * * * *

▶(c) The brief shall contain the following items under appropriate headings and in the order here indicated:

(1) *Status of Claims.* A statement of the status of all the claims, pending or cancelled, and identifying the claims appealed.

(2) *Status of Amendments.* A statement of the status of any amendment filed subsequent to final rejection.

(3) *Summary of Invention.* A concise explanation of the invention defined in the claims involved in the appeal, which shall refer to the specification by page and line number, and to the drawing, if any, by reference characters.

(4) *Issues.* A concise statement of the issues presented for review.

(5) *Grouping of Claims.* For each ground of rejection which appellant contests and which applies to more than one claim, it will be presumed that the rejected claims stand or fall together unless a statement is included that the rejected claims do not stand or fall together, accompanied by reasons as to why appellant considers the rejected claims to be separately patentable.

(6) *Argument.* The contentions of the appellant with respect to each of the issues presented for review in subparagraph (c)(4) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

(i) For each rejection under 35 U.S.C. 112, first paragraph, the argument shall specify the errors in the rejection and how the first paragraph of 35 U.S.C. 112 is complied with, including, as appropriate, how the specification and drawings, if any, (A) describe the subject matter defined by each of the rejected claims, (B) enable any person skilled in the art to make and use the subject matter defined by each of the rejected claims, and (C) set forth the best mode contemplated by the appellant of carrying out his or her invention.

(ii) For each rejection under 35 U.S.C. 112, second paragraph, the argument shall specify the errors in the rejection and how the claims particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(iii) For each rejection under 35 U.S.C. 102, the argument shall specify the errors in the rejection and why the rejected claims are patentable under 35 U.S.C. 102, including any specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection.

(iv) For each rejection under 35 U.S.C. 103, the argument shall specify the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art. If the rejection is based upon a combination of references, the argument shall explain why the references, taken as a whole, do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

(v) For any rejection other than those referred to in paragraphs (i) to (iv) of this section, the argument shall specify the errors in the rejection and the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error.

(7) *Claims appealed.* An appendix containing a copy of the claims involved in the appeal.

(d) Failure to comply with any of the requirements of paragraph (c) of this section may result in dismissal of the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.◀

Section 1.193 is proposed to be amended by revising paragraph (b) to read as follows:

1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. ▶The new points of argument shall be specifically identified in the reply brief. If the reply brief exceeds 15 pages, or the examiner determines that it is not directed only to new points of argument raised in the examiner's answer, the examiner will so notify the appellant and at the same time return the reply brief to the appellant.◀ [However, if] ▶If◀ the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may [include] ▶be accompanied by◀ any amendment or material appropriate to the new ground.

6. Section 1.194 is proposed to be amended by revising paragraph (b) to read as follows:

§1.194 Oral hearing.

* * * * *

(b) If appellant desires an oral hearing, appellant must file a written request for such hearing accompanied by the fee set forth in §1.17(g) within one month after the date of the examiner's answer. ▶ If the examiner's answer states a new ground of rejection and if appellant files a reply as provided for by §1.193(b), then the written request must be made within three months after the date of the filing of the reply.◀ If appellant requests an oral hearing and submits therewith the fee set forth in §1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.

* * * * *

7. Section 1.196(b)(1) is proposed to be revised to read as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences.

* * * * *

(b) * * *

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. ▶Should the examiner make the rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.◀ When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

* * *

* * * * *

8. Section 1.604(a) is proposed to be revised to read as follows:

§1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting [a] ▶at least one◀ claim corresponding to the proposed count ▶or identifying at least one claim in his or her application that corresponds to the proposed count◀, (2) identifying the other application and, if known, a claim in the other application

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which corresponds to the proposed count, and (3) explaining why an interference should be declared.

* * * * *

9. Section 1.607(a) is proposed to be revised to read as follows:

§1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) ▶identifying the patent, (2)◀ presenting a proposed count ▶, (3) identifying at least one claim in the patent corresponding to the proposed count, (4) presenting at least one◀ [and a] claim corresponding to the proposed count ▶or identifying at least one claim already pending in his or her application that corresponds to the proposed count,◀ and, if any claim of the patent or application ▶identified as corresponding to the proposed count◀ does not correspond exactly to the proposed count, explaining why [an interference should be declared, (2) identifying the patent and indicating which claim in the application and which claim or claims of the patent correspond to the proposed count] ▶each such claim corresponds to the proposed count◀, and [3] ▶(5)◀ applying the terms of ▶any◀ [the] application claim ▶(i) identified as◀ corresponding to the count ▶and (ii) not previously in the application◀ to the disclosure of the application.

* * * * *

10. Section 1.612(a) is proposed to be revised to read as follows:

§1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under §1.131 and any evidence and explanation under §1.608 filed separate from an amendment. ▶A party seeking access to any abandoned or pending application referred to in the opposing party's involved application or access to any pending application referred to in the opposing party's patent must file a motion under §1.635.◀

* * * * *

11. Paragraph (e)(1)(vi) of §1.637 is proposed to be revised to read as follows:

§1.637 Content of motions.

* * * * *

(e) * * *

(1) * * *

(vi) [When the opponent is a patentee, designate the claims of the patent which define the same patentable invention defined by the proposed count.] ▶Identify all claims in the opponent's application or patent which should be designated to correspond to each proposed count; if the opponent's application does not contain any such claim, the motion shall propose a claim to be added to the opponent's application.◀

* * *

* * * * *

12. Paragraph (c) of §1.658 is proposed to be revised to read as follows:

§1.658 Final decision

* * * * *

(c) A judgment in an interference settles all issues which (1) were raised and decided in the interference, (2) could have been properly raised and decided in the interference by a motion under §1.633 (a) through (d) and (f) through (j) or §1.634 and (3) could have been properly raised ▶by a motion under §1.633(e)◀ and decided in an additional interference [with a motion under §1.633(e)] ▶on an invention which was claimed during the pendency of the original interference either (i) in the winning party's involved application or patent or (ii) in a non-involved application owned by a losing party◀. A losing party [who could have properly moved, but failed to move, under §§1.633 or 1.634] shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with [that party's failure to properly move] ▶the issues settled by the judgment◀, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment.

13. Paragraph (b) of §1.662 is proposed to be revised to read as follows:

§1.662 Request for entry of adverse judgment; reissue filed by patentee.

* * * * *

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under §1.633(h) ▶,◀ or show good cause why the motion could not have been timely filed ▶or would not be appropriate◀.

* * * * *

PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

14. The authority citation for 37 CFR Part 5 would continue to read as follows:

Authority: 35 U.S.C. 6, 41, 181–188 and the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j)), 22 CFR 125.04, and 10 CFR 810.7).

15. Paragraph (b) of §5.3 is proposed to be revised to read as follows:

§5.3 Prosecution of application under secrecy orders; withholding patent.

* * * * *

(b) An interference will not be declared involving national applications under secrecy order. However, if an applicant whose application [under secrecy order copies claims from] ▶is under secrecy order seeks to provoke an interference with◀ an issued patent, a notice of that fact will be placed in the file wrapper of the patent. (See [§1.205(c)] ▶§1.607(d)◀).

* * * * *

July 16, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Appendix A

Proposed Requirements for Examiner's Answer

Chapter 1200 of the Manual of Patent Examining Procedure would be amended to require that the examiner's answer include, in the order indicated, the following items:

(1) *Status of claims.* A statement of whether the examiner agrees or disagrees with the statement of the status of claims contained in the brief and a correct statement of the status of all the claims pending or cancelled, if necessary.

(2) *Status of Amendments.* A statement of whether the examiner agrees or disagrees with the statement of the status of amendments contained in the brief, and an explanation of any disagreement.

(3) *Summary of invention.* A statement of whether the examiner agrees or disagrees with the summary of invention contained in the brief, an explanation of why the examiner disagrees, and a correct summary of invention, if necessary.

(4) *Issues.* A statement of whether the examiner agrees or disagrees with the statement of the issues in the brief and an explanation of why the examiner disagrees, including:

(i) Identification of any issues which are petitionable rather than appealable, and
(ii) Identification of any issues or grounds of rejection which the examiner no longer considers applicable.

(5) *Grouping of Claims.* A statement of whether the examiner agrees or disagrees with any statement in the brief that certain claims do not stand or fall together, and, if the examiner disagrees, an explanation as to why those claims are not separately patentable.

(6) *Claims appealed.* A statement of whether the copy of the appealed claims contained in the appendix to the brief is correct and if not, a correct copy of any incorrect claim.

(7) *References of record.* A listing of the references of record relied on, including (where appropriate, and especially in the case of non-patent references) the page or pages in each reference relied on.

(8) *New references.* A statement of whether or not any new reference is being applied and a listing of each such reference being cited for a new ground of rejection in the examiner's answer, including (where appropriate, and especially in the case of non-patent references) the page or pages in each reference relied on.

(9) *Grounds of rejection.* For each ground of rejection applicable to the appealed claims, an explanation of the ground of rejection, or reference to a final rejection or other single prior action for a clear exposition of the rejection.

(i) For each rejection under 35 U.S.C. 112, first paragraph, the examiner's answer, or the single prior action, shall explain how the first paragraph of 35 U.S.C. 112 is not complied with, including, as appropriate, how the specification and drawings, if any, (a) do not describe the subject matter defined by each of the rejected claims, (b) would not enable any person skilled in the art to make and use the subject matter defined by each of the rejected claims, and (c) do not set forth the best mode contemplated by the appellant of carrying out his or her invention.

(ii) For each rejection under 35 U.S.C. 112, second paragraph, the examiner's answer, or single prior action, shall explain how the claims do not particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(iii) For each rejection under 35 U.S.C. 102, the examiner's answer, or single prior action, shall explain why the rejected claims are anticipated or not patentable under 35 U.S.C. 102, pointing out where all of the specific limitations recited in the rejected claims are found in the prior art relied upon in the rejection.

(iv) For each rejection under 35 U.S.C. 103, the examiner's answer, or single prior action, shall state the ground of rejection and point out where each of the specific limitations recited in the rejected claims is found in the prior art relied on in the rejection, shall identify any difference between the rejected claims and the prior art relied on and shall explain how the claimed subject matter is rendered unpatentable over the prior art. If the rejection is based upon a combination of references, the examiner's answer, or single prior action, shall explain the rationale for making the combination.

(v) For each rejection under 35 U.S.C. 102 or 103 where there may be questions as to how limitations in the claims correspond to features in the prior art, the examiner, in addition to the requirements of (9)(iii) and (iv) above, should compare at least one of the rejected claims feature by feature with the prior art relied on in the rejection. The comparison shall align the language of the claim side by side with a reference to the specific page, line number, drawing reference number and quotation from the prior art, as appropriate.

(vi) For each rejection, other than those referred to in paragraphs (i) to (v) of this section, the examiner's answer, or single prior action, shall specifically explain the basis for the particular rejection.

(10) *New ground of rejection.* A statement of whether or not any new ground of rejection is being made in the examiner's answer and a complete statement and explanation of any such new ground. The requirements of section (9) shall be complied with for any new ground of rejection.

(11) Response to argument. A statement of whether the examiner agrees or disagrees with each of the contentions of appellant in the brief with respect to the issues presented and an explanation of the reasons for disagreement with any such contention. If any ground of rejection is not argued and responded to by appellant, the response shall point out each claim affected.

(12) *Period of response to new ground of rejection.* A statement setting the period for appellant to file a reply to any new ground of rejection, if necessary.

[1083 OG 19]

MISCELLANEOUS

(150) **Hearings Before the Board of Appeals**

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The

average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been successful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from the appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Mar. 20, 1975. *Commissioner of Patents and Trademarks.*

[933 O.G. 1010]

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(151) **Hearings Before the Board of Patent Appeals and Interferences**

During the past twelve months there has been an increase in the number of *ex parte* appeals pending before the Board of Patent Appeals and Interferences. In order to address the growing backlog of pending appeals, it is necessary to make the most effective use of the time of Examiners-in-Chief hearing appeals. Significant amounts of time are spent by Examiners-in-Chief preparing for the hearings. In an effort to conserve the time spent in the preparation for hearing by Examiners-in-Chief, notice is hereby given that *subsequent* to the confirmation of attendance at oral hearing, requests for postponement of the hearing will not be granted in the absence of a showing of dramatically unusual circumstances.

SAUL I. SEROTA,
June 6, 1985. *Acting Chairman Board of Patent Appeals and Interferences.*

[1056 OG 44]

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(152) **Hearings Before the Board of Patent Appeals and Interferences**

Rule 1.3 (37 CFR 1.3) provides that:

> "[a]pplicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy."

Notice is hereby given that persons attending hearings before the Board of Patent Appeals and Interferences are advised that the above provision also applies to dress. If an attendee at a hearing is not appropriately dressed, the attendee may be requested to leave the hearing room.

SAUL I. SEROTA,
June 6, 1985. *Acting Chairman Board of Patent Appeals and Interferences.*

[1056 OG 45]

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(153) **Access to Interference Settlement Agreements by Government Agencies**

Under the provisions of 35 U.S.C. §135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

Date:_____

To: Clerk, Board of Patent Interferences

Pursuant to the provisions of 35 U.S.C. 135(c), please permit .....
the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. .....
The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.

.....
Name, Title
.....
Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties or their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. §1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

LUTRELLE F. PARKER,
June 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[972 O.G. 2]

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(154) **Accessibility of Non-Final Discovery Opinions and Orders Issued by the Board of Patent Interferences**

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. §1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. §552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. §122 and 37 C.F.R. §1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. §1.287]
- 1.10 Requests and service under §1.287(a)
- 1.20 Requests under §1.287(b)
- 1.30 Motions for additional discovery under §1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under §1.287(d)(1)
- 1.50 Action under §1.287(d)(2)
- 1.60 Agreements under §1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976 *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

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(155) **Petitions in Interference Cases From Decisions of The Board on Motions for Additional Discovery Under 37 CFR 1.287(c)**

Notwithstanding the clear statement in the last sentence of 37 CFR 1.287(c), parties in interference cases continue to seek review by the Commissioner of decisions of the Board of Patent Interferences on motions for additional discovery under 37 CFR 1.287(c). Review of such a decision can be had along with judicial review of a decision on the question of priority. *Cochran* v. *Kresock*, 530 F.2d 385, 188 USPQ 553 (CCPA 1976); *Comstock* v. *Kroekel*, 200 USPQ 548 (Comm'r. Pat. 1978). Accordingly, parties in interference cases are reminded that a petition to the Commissioner should not be filed for the purpose of seeking review of an interlocutory decision of the Board granting or denying a motion for additional discovery under 37 CFR 1.287(c). See also *Fenstermacher* v. *Daugherty*, 189 USPQ 536 (Comm'r. Pat. 1975) and *Sheehan* v. *Doyle*, 202 USPQ 783 (Comm'r. Pat. 1978). The filing of such a petition only serves to delay the ultimate disposition of interferences on the merits. The filing of a paper for the mere purpose of delay is not permitted by the rules. 37 CFR 1.346. The Board of Patent Interferences will no longer grant a stay of proceedings pending disposition of a petition to the Commissioner seeking review of a decision of the Board on a motion for additional discovery under 37 CFR 1.287(c).

SIDNEY A. DIAMOND,
Apr. 17, 1980. *Commissioner of Patents and Trademarks.*

[994 O.G. 28]

(156) **Commissioner's Notice Practice under 37 CFR §1.225(b)**

When a junior party to an interference is placed under an order to show cause why judgment should not be entered pursuant to 37 CFR §1.225 and requests final hearing to contest an ancillary matter, either the junior or senior party may file a motion for permission to take testimony pursuant to 37 CFR §1.225(b) and the last sentence of 37 CFR §1.251(b). However, some uncertainty has arisen as to when the motion must be filed and what it must contain.

Motion by the Junior Party

When a junior party is placed under an order to show cause and the junior party desired a testimony period, the motion for permission to take testimony should be filed preferably before the time set for responding to the order to show cause. The motion will be considered timely, however, if filed no later than twenty (20) days after the Board of Patent Interferences enters an order setting final hearing.

There are instances where the requested testimony relates to priority. For example, the junior party may occasionally desire to take testimony to establish prior inventive acts alleged in a preliminary statement even though those acts are subsequent to the senior party's effective filing date. This situation arises when (1) the junior party's preliminary statement dates fall between the filing date of the senior party's involved application and the filing date of a prior application accorded to the senior party, (2) the junior party has unsuccessfully contended in a motion under 37 CFR §1.231 that the senior party should not be accorded benefit of the prior application, and (3) the junior party has requested final hearing to review the examiner's adverse decision on the motion.

When the requested testimony includes priority testimony, the motion to take testimony may be *pro forma, viz.*, a simple request that a testimony period be set to obtain priority evidence. Normally, however, when a junior party seeks to take testimony under 37 CFR §1.225(b), the proposed testimony relates solely to ancillary matters. When the requested testimony relates solely to ancillary matters, the motion must comply with the provisions of 37 CFR §1.225(b)—a showing of good cause must be submitted and a *pro forma* request would not be sufficient. See generally Rivise & Caesar, *Interference Law and Practice*, Vol. III, §§376–377 (1947).

Motion by the Senior Party

There are occasions when a senior party may desire a testimony period even if the junior party does not request a testimony period. See e.g., *Lorenian* v. *Winstead*, 127 USPQ 501 (Bd.Int. 1959). When a senior party desires a testimony period, the motion for permission to take testimony should be filed promptly after the Board of Patent Interferences enters an order setting final hearing, but in no event later than twenty (20) days after entry of such order. A senior party should take into account the fact that a junior party will begin preparation of a brief for final hearing after receiving notice of the briefing schedule. Therefore, a senior party should not be permitted to let a junior party expend unnecessary energy preparing a brief for final hearing if the senior party plans to move to take testimony.

As in the case of a junior party, a request to take testimony relating to priority may be *pro forma*. A request to take testimony limited to ancillary matters must comply with 37 CFR §1.225(b). See 37 CFR 1.251(b), last sentence.

RENE D. TEGTMEYER,
June 15, 1981. *Acting Commissioner of Patents and Trademarks.*

[1008 O.G. 9]

(157) **Interference Practice: Response to Order to Show Cause Under 37 CFR 1.640**

37 CFR 1.640(e) provides that when an order to show cause under 37 CFR 1.640(d) is issued against an interference party, the Board of Patent Appeals and Interferences will enter judgment against that party "unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order." In the application of this rule, some confusion has arisen as to the nature of the "paper" which the party must file when the basis of the order is 37 CFR 1.640(d)(1), i.e., where "[a] decision on a motion is entered which is dispositive of the interference against the party on any count."

Normally, the "paper" filed in response to such an order to show cause should be a simple request that final hearing (see 37 CFR 1.654) be set to review the decision on the motion which was dispositive of the interference against the party, as well as any other decision on motion which the party may wish to have reviewed by the Board.* When such a response is filed, the Examiner-in-Chief will normally set the times for filing briefs under 37 CFR 1.656. The response should be accompanied by a motion requesting a testimony period, if the party desires to take testimony. See 37 CFR 1.640(e), last sentence. Also, an opposing party may request a testimony period, even if the party responding to the order to show cause does not. Such a request should be filed promptly after the Examiner-in-Chief enters an order setting the brief times, but in no event more than twenty (20) days after entry of such order. Cf. the Commissioner's Notice of June 15, 1981, 1008 O.G. 9 (July 14, 1981).

Instead of filing a request that final hearing be set, the party under order to show cause may file a paper containing a full discussion of the reasons why judgment should not be entered. However, before deciding to file such a paper, the following should be taken into consideration:

(1) Such paper will be construed as a request for final hearing if a testimony period is requested;

(2) Such paper will be deemed a waiver of any opportunity to present oral argument concerning the matters discussed therein, and the matter will be decided by the Board based upon the content of the paper and any response thereto;

(3) An opposing party may still request final hearing and/or a testimony period within twenty (20) days of the date of service of the paper, and if either request is granted it will be necessary for the parties to file briefs under 37 CFR 1.656.

It is the policy of the Board of Patent Appeals and Interferences that when final hearing is set pursuant to a request therefor following an order to show cause issued as a result of a decision on preliminary motions under 37 CFR 1.633 or 1.634, the parties must raise at that hearing for consideration by the Board *all* matters specified in 37 CFR 1.655(b) which were decided on the merits by the Examiner-in-Chief and which they wish to have considered. In other words, once the brief times are set for such a final hearing, every matter which was decided by an Examiner-in-Chief in connection with a motion under 37 CFR 1.633 or 1.634 must be raised in the parties' main briefs if the parties wish to have those matters considered by the Board. A party cannot wait to see what the Board's decision on one such matter will be and then, if the decision is unfavorable to the party and the case continues, raise that matter or any other such matter at a subsequent final hearing.

DONALD W. PETERSON,
Dec. 8, 1986. *Deputy Commissioner of Patents and Trademarks.*

[1074 OG 4]

(158) **Interference Practice: Fraud and Inequitable Conduct Allegations**

In patent interference cases, the Board of Patent Appeals and Interferences will review every "fraud" and "inequitable conduct" issue which is properly raised at final hearing on the basis of the record as presented. Whatever basis may exist during the interlocutory stages of an interference for raising and pursuing such issues, Counsel is forewarned that when an interference approaches the final hearing stage, he or she should maturely reflect on the state of the record. Only if the record supports the fraud or inequitable conduct allegations by clear and convincing evidence should such issues be pursued at final hearing. Failure to heed this warning by pursuit of such issues at final hearing without a reasonable evidentiary basis to support each element thereof may result in the case being referred to the Office of Enrollment and Discipline for disciplinary investigation.

DONALD J. QUIGG,
Dec. 23, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1074 OG 421]

(159) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
Docket No. 40104–4151

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent interference cases. The Patent Law Amendments Act of 1984, Public Law 98–622, §§201–202, abolished the Board of Appeals and Board of Patent Interferences and created in their place a Board of Patent Appeals and Interferences which will decide *ex parte* appeals from adverse decisions of patent examiners and interference cases. The Patent and Trademark Office, through this amendment of its rules, intends to provide guidance on the procedures the Office will be following in conducting interference cases before the Board of Patent Appeals and Interferences.
Date: The effective date of these rules is: Feb. 11, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557–4025 (if no answer, message may be left at 703–557–4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. Heretofore, the determination was made by a Board of Patent Interferences. The Patent Law Amendments Act of 1984, Public Law 98–622, §§201–202 combines the Board of Appeals and the Board of Patent Interferences into a single Board of Patent Appeals and Interferences (Board) and authorizes the Board to consider priority and patentability in interference cases.

*It should be recognized that the decision of the Board following the final hearing may not terminate the interference. For example, if the order to show cause resulted from an Examiner-in-Chief's grant of a motion for judgment, and the Board after final hearing reversed the Examiner-in-Chief's decision, the case might then proceed to the taking of priority testimony. The Board's decision would however be final with regard to the basis of the motion for judgment.

In view of the discretion given the Board under 35 U.S.C. §135(a), as amended by Public Law 98–622 ("The Board . . . . may determine questions of patentability . . . ."), these new rules will apply to all interferences declared on or after Feb. 11, 1985, except in special circumstances, such as: (1) interferences which are declared as a result of a motion made in another interference which was pending before the Board before Feb. 11, 1985, (e.g., an interference declared as a result of a motion under 37 CFR §1.231 to declare an additional interference); (2) an interference related to another interference declared prior to Feb. 11, 1985 (e.g., an interference involving a method of using a compound where an interference involving the same parties and the compound was declared prior to Feb. 11, 1985); and (3) an interference reinstituted after having been dissolved under the old rules (37 CFR §§1.201–1.288)(e.g., an interference reinstituted after having been dissolved as a result of a motion under 37 CFR §1.231 to dissolve on the grounds of unpatentability where the applicant has obtained allowance of the claims held unpatentable in the decision on motions).

Through these new rules the PTO seeks to improve interference procedure so that the rights of parties in interferences are determined at an early date and the overall process of examining patent applications which become involved in interferences is simplified.

In order to obtain maximum input from the public prior to formally proposing revisions to the rules, on Aug. 1, 1983, the PTO published in the *Federal Register* an advance notice of proposed rulemaking for interference rules. 48 F.R. 34836-34855. The advance notice was not published in the *Official Gazette*. Twenty-one written comments were received. All comments are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

On Jan. 30, 1984, the PTO published in the *Federal Register* a notice of proposed rulemaking. 49 F.R. 3768-3802. The notice was also published in the *Official Gazette* on Feb. 14, 1984. 1039 O.G. 11; 1039 TMOG 11.The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 27, pp. 312–346 (Feb. 2, 1984), hereinafter 'BNA." Eighteen written comments were received in response to the notice of proposed rulemaking. The comments are analyzed herein. A hearing was held on May 15, 1984. Three individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The eighteen comments and copy of the transcript of the hearing are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

The new rules for interferences are set forth herein in §§1.601 through 1.688. The new rules replace entirely the present interference rules (37 CFR §§1.201 through 1.288). A "six hundred" number series is used for the new rules. The use of a six hundred number series for the new rules will permit interested individuals to research published decisions (e.g., F.2d, USPQ) or computerized legal research services (e.g., LEXIS) citing the new rules.

An index of the headings of §§1.601–1.688 and a table correlating 37 CFR §§1.201 through 1.288 (old rules) to §§1.601 through 1.688 (new rules) appears below.

Under the new rules, interferences are decided by the Board. The Board has jurisdiction to determine (1) priority of invention, (2) patentability of any claim corresponding to a count both as to applicants and patentees, (3) any issue of interference-in-fact as to any count, and (4) any other issue necessary to resolve the interference. The rules permit an interference to be declared on the basis of a single count defining one patentable invention in interferences involving patents as well as applications. The Board also has jurisdiction to determine whether counts are patentably distinct.

When an interference is declared, an examiner-in-chief is assigned to handle the interlocutory stages of the interference. An examiner having full signatory authority determines when one or more applications or one or more applications and a patent claim the same patentable invention. When the examiner makes such determination, the examiner will forward any involved applications or patents to the Board. The examiner will designate, at the time the involved applications or patents are sent to the Board, the claims of any application and patent which correspond to each count. The examiner-in-chief can subsequently designate additional claims to correspond to a count. The examiner-in-chief assigned to handle the interference will issue a notice to the parties declaring the interference.

The object of the interference will be to resolve all controversies as to all interfering subject matter defined by one or more counts. A final decision in the interference will determine who, if anyone, is entitled to claims which correspond to a count. Any decision adverse to an applicant by the Board will constitute a final refusal by the PTO to that applicant of the claims involved. Any decision adverse to a patentee constitutes cancellation from the patent of the claims involved.

Any decision by the Board on any issue is binding on the examiner and would govern further proceedings in the PTO.

The designation of a single examiner-in-chief to handle the interlocutory phases of an interference will permit better management of, and control over, interference proceedings. The rules provide that times be set and the examiner-in-chief exercise control over proceedings in the interference such that pendency of the interference before the Board from declaration to final decision will not normally exceed 24 months. The examiner-in-chief should be familiar with the history of the interference and will be accessible to counsel for the parties. For example, an examiner-in-chief, where appropriate, may conduct telephone conference calls to obtain agreement of the parties on the setting of schedules. The rules also permit the examiner-in-chief to hold hearings in the PTO or by conference telephone call in order to expedite or settle interlocutory issues in interferences. Any hearing can be transcribed by a court reporter under such conditions as an examiner-in-chief or the Board deems appropriate. The examiner-in-chief, where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual problems during the taking of depositions. The examiner-in-chief will also be available to rule on requests for production of documents which take place during cross-examination. Oral orders given by phone will be followed by written orders.

At the time an interference is declared, the examiner-in-chief will set a time for filing preliminary motions. The preliminary motions can include:

(1) A motion for judgment on the ground that a claim corresponding to the count is not patentable to an opponent under 35 U.S.C. §§102, 103, 112, or any other provision of law.

(2) A motion for judgment on the ground that there is no interference-in-fact between the claims of the opponents in the interference.

(3) A motion to add or to substitute new counts, to amend a claim corresponding to a count, to designate an application or patent claim to correspond to a count, to designate an application or patent claim as not corresponding to a count, or to require an applicant to present a claim to be designated to correspond to a count.

(4) A motion to substitute another application for the application involved in the interference or to add an application for reissue to the interference.

(5) A motion to declare another interference.

(6) A motion to be accorded the benefit of an earlier application or to attack the benefit of an earlier application which has been accorded to an opponent.

Other motions are permitted as necessary, such as a motion to amend the count and/or a claim corresponding to the count in response to a preliminary motion for judgment.

Oppositions to motions are permitted if filed within a time set by the examiner-in-chief. Replies are also authorized. Papers which are not authorized by the rules or requested by the examiner-in-chief can be returned unfiled.

A preliminary statement will be filed prior to or concurrently with the preliminary motions outlined above.

Motions will be decided by an examiner-in-chief, who may consult with an examiner on questions of patentability which have not previously been decided by the examiner. The examiner-in-chief may grant a motion, deny a motion, defer consideration on the merits of a motion to final hearing, or take such other action with respect to a motion as may be appropriate, e.g., dismiss an entirely inappropriate motion.

At the time preliminary motions are decided, the preliminary statements will be opened. If a decision on a motion or inspection of the preliminary statement results in entry of an order to show cause why a judgment should not be entered, the party against whom judgment might be entered can request a hearing before the examiner-in-chief and two additional examiners-in-chief. The decision will govern further proceedings. If adverse, the decision will constitute a final agency action. If favorable, the interference will proceed before the examiner-in-chief.

After preliminary motions are decided and assuming judgment does not result, a period may be set for the parties to file motions for additional discovery. The scope of the additional discovery would be the same as under current practice.

When a time period is set for filing discovery motions, or after discovery has closed, the examiner-in-chief will set a period for taking testimony. Any party wishing to take the testimony of a witness can elect to have the testimony of the witness taken by deposition or presented by affidavit. A transcript of an *ex parte* deposition can be used as an affidavit. If an affidavit is presented, the opposing party may then cross-examine on oral deposition. Any redirect will take place at the deposition. The party calling the witness is responsible for securing a court reporter and filing the transcript and record associated with cross-examination of its witness.

In the event a party needs testimony from a third-party who will not appear unless a subpoena is issued, including a hostile witness, direct and cross-examination testimony may be taken on oral deposition. The rules provide that prior authorization of an examiner-in-chief is required before a party can take testimony by issuance of a subpoena under 35 U.S.C. §24. The rule thus adopts the policy of *Sheehan* v. *Doyle*, 513 F.2d 895, 898, 185 USPQ 489, 492 (1st Cir.), *cert. denied*, 423 U.S. 874 (1975), and *Sheehan* v. *Doyle*, 529 F.2d 38, 40, 188 USPQ 545, 546 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976), and rejects the policy announced in *Brown* v. *Braddick*, 595 F.2d 961, 967, 203 USPQ 95, 101–102 (5th Cir. 1979). Testimony obtained in other proceedings, e.g., another interference or an infringement action, may be used if otherwise admissible.

Under the rules, the Federal Rules of Evidence are made applicable to interferences, except for those portions which relate to criminal actions, juries, and other matters not relevant to interferences. Those portions include:

(1) Rule 103(c).
(2) Rule 104(c), (d), and (e).
(3) The language in Rule 105 which reads "and instruct the jury accordingly."
(4) Rule 201(g).
(5) The language in Rule 403 which reads "or misleading the jury."
(6) Rule 404(a)(1) and (2).
(7) The word "charge" in Rule 405(b).
(8) The language "or criminal" and proviso (ii) in Rule 410.
(9) Rule 412.
(10) Rule 606.
(11) The language "whether by an accused" and "other" in the last sentence of Rule 607.
(12) The provisions of the first sentence of Rule 611 (c) relating to leading questions on direct examination do not apply to statements made in an affidavit authorized to be filed under the rules.
(13) The language "Except as otherwise provided in criminal proceedings by section 3500 of title 18, United States Code" and "except that in criminal cases when the prosecution elects not to comply, the order shall be one striking the testimony or, if the court in its discretion determines that the interests of justice so require, declaring a mistrial" in Rule 612.
(14) Rule 614.
(15) Rule 706.
(16) The language "excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel" and "and against the Government in criminal cases" in Rule 803(8).
(17) The language "but not including, when offered by the Government in a criminal prosecution for purposes other than impeachment, judgments against persons other than the second" in Rule 803(22).
(18) The language "prosecution for homicide or in a" in Rule 804(b)(2).
(19) The language "A statement tending to expose the declarant to criminal liability and offered to exculpate the accused is not admissible unless corroborating circumstances clearly indicate the trustworthiness of the statement" in Rule 804(b)(3).
(20) Rule 1101(a), (b), (d)(2), (d)(3), and (e).

The examiner-in-chief will set a period for filing the record and briefs. Oral hearings normally will be held before a panel consisting of the examiner-in-chief assigned to the interference and two other examiners-in-chief. The panel will render a final decision in the interference. Requests for reconsideration are permitted.

In rendering its decision, the Board will consider only that evidence which can be made available to the public under §1.11(a). Accordingly, the Board will not consider evidence which is submitted under a protective order issued by a court if release of that evidence under §1.11(a) would be inconsistent with the terms of the court's order.

A final decision of the Board is reviewable in the U. S. Court of Appeals for the Federal Circuit or an appropriate U. S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

Except as noted above, these new rules are applicable to all interferences declared on or after Feb. 11, 1985. Interferences declared prior to Feb. 11, 1985, continue to be governed by the prior rules (37 CFR §§1.201–1.288 (July 1, 1984)) and will be decided by personnel of the Board of Patent Appeals and Interferences. Actions presently taken by a patent interference examiner or examiners of interferences will be taken by an examiner-in-chief.

An anticipated time schedule for a two-party interference follows.

Sections 1.601 through 1.688 would introduce new concepts in interference practice. Some of the more significant aspects of the rules, as well as some of the new concepts, include the following.

Section 1.1 codifies a practice announced in a Commissioner's Notice of Nov. 28, 1983, "Mailing of Papers to the PTO in Patent Interference Proceedings," 1037 *Official Gazette* 25 (Dec. 27, 1983) and authorizes a party in an interference to direct mail to the PTO intended for the interference to a special box in the Mail Room for interference papers. Amendments copying claims which are filed prior to the time an interference is declared would continue to be addressed in accordance with §1.5(a).

Section 1.5 provides that when a paper filed in the PTO concerns an interference which has been declared, it should state the names of the parties (e.g., *Smith* v. *Jones*) and the number of the interference. The name of the examiner-in-chief assigned to the interference (§1.610) and the name of the party filing the paper should also appear conspicuously on the first page of the paper. Identification of the examiner-in-chief assigned to the interference and the name of the party filing the paper will greatly assist the Board in its administration of interference cases.

Section 1.8 excludes from the certificate of mailing practice any paper in an interference which an examiner-in-chief orders filed by hand or "Express Mail." Papers filed by "Express Mail" in an interference case would be addressed as set forth in §1.1(e).

Section 1.11 sets forth when the interference file would become available to the public without a petition for access.

Section 1.48 provides that when a request is filed to correct inventorship of an application involved in an interference, the request shall comply with the requirements of §1.48 and shall be accompanied by a motion under §1.634. The request will be placed in the file of the application and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.138 permits an attorney or agent to sign and file a paper abandoning an application involved in an interference.

Section 1.196 more clearly sets forth the options open to an applicant when the Board makes a new ground of rejection under §1.196(b). The last sentence of paragraph (b)(1) is intended to clarify practice in certain situations. One situation involves a case where (1) the Board affirms an examiner's rejection of a "first" claim and makes a new ground of rejection under §1.196(b) of a "second" claim, (2) the applicant elects to have further proceedings before the examiner on the new ground of rejection on the second claim, and (3) those proceedings do not result in a further appeal (i.e., the second claim is allowed or is cancelled). The last sentence of §1.196(b)(1) permits the Board to make its decision final on the first claim. By making its decision final on the first claim, the time period under §1.304 for seeking judicial review begins. Another situation involves a case where (1) the Board affirms an examiner's rejection of a claim over reference A, (2) the Board also enters a new ground of rejection of the claim over reference B, (3) the applicant elects to have further proceedings before the examiner on the new ground of rejection, and (4) those proceedings result in applicant overcoming the new ground of rejection based on reference B. The last sentence of §1.196(b)(1) permits the Board to make its decision final as to its affirmance of the rejection over reference A. Entry of an order making its decision final would start the period under §1.304 for seeking judicial review. Thus, an applicant does not forego possible judicial review by electing further prosecution before the examiner when a new ground of rejection is made by the Board. Under paragraph (d), a recommendation by the Board that an allowed claim be rejected is binding on the examiner (rather than being a mere recommendation as was previously the case) in the absence of (1) an amendment, (2) showing of facts by affidavit or other appropriate evidence, or (3) both. The last sentence of paragraph (d) is intended to clarify that the Board may enter a final decision in certain circumstances. When the Board affirms an examiner's rejection of a "first" claim and makes a recommendation under paragraph (d) as to a "second" claim, the application is remanded to the examiner and the Board's decision affirming the rejection of the first claim is not a final decision. If proceedings before the examiner on remand do not result in a further appeal (i.e., the second claim is allowed or is cancelled), the Board may then make its decision final as to the first claim. By making its decision final as to the first claim, the time period under §1.304 for seeking judicial review starts. Thus, an applicant does not forego judicial review on the first claim merely because of the remand proceedings with respect to the second claim.

Most of the current interference rules (§§1.201 through 1.247 and 1.251 through 1.288) are removed, but will continue to govern interferences declared prior to Feb. 11, 1985. Section 1.248 is retained and governs service of papers in all patent cases except interference proceedings. Section 1.646 governs service of papers in interference proceedings.

Under §1.292, it is intended to modify public use proceedings only to the extent that public use and on sale issues which arise during an interference shall be raised by a preliminary motion under §1.633(a). There is no fee for filing the motion in the interference, but a fee would continue to be necessary when a petition is filed for institution of a public use proceeding apart from an interference. When a public use proceeding is instituted apart from an interference, the Commissioner will designate an appropriate official to conduct the proceeding including the setting of times for taking testimony under §§1.671 through 1.685. There will continue to be no "additional discovery" (see §§1.687 and 1.688) in public use proceedings.

Section 1.304 makes clear that the provisions of §1.136 do not apply when judicial review is sought of a decision of the Board of Patent Appeals and Interferences in (1) a reexamination proceeding or (2) an interference. An extension of time to seek judicial review of a decision of the Board in a reexamination proceeding may be obtained under §1.550(c). An extension of time to seek judicial review of a decision of the Board in an interference proceeding may be obtained under §1.645. Section 1.304 also establishes an "excusable neglect" standard for seeking judicial review in interference cases when a notice of appeal is untimely filed or a civil action is not timely commenced. The excusable neglect standard is intended to be the same as the standard under Rule 4(a)(5) of the Federal Rules of Appellate Procedure.

Section 1.322 provides that when a request for a certificate of correction under 35 U.S.C. §254 (PTO mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of §1.322 and shall be accompanied by a motion under §1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.323 provides that when a request for a certificate of correction under 35 U.S.C. §255 (patentee's mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of §1.323 and shall be accompanied by a motion under §1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.324 provides that when a request is filed to correct inventorship of a patent involved in an interference, the request shall comply with the requirements of §1.324 and shall be accompanied by a motion under proposed §1.634. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.565 provides that when a patent is involved in an interference proceeding and a reexamination proceeding, both the interference proceeding and the reexamination proceeding *will* continue unless one of the proceedings is stayed. A stay of a reexamination proceeding will be made by the Commissioner. A stay of an interference proceeding will be made by an examiner-in-chief, subject to review by the Commissioner. Section 1.565 continues the present practice of the Commissioner determining in every instance whether to stay a reexamination proceeding when the patent involved in the reexamination proceeding is sought to be reissued or becomes involved in litigation.

Under §1.601, the rules shall be construed to secure the just, speedy, and inexpensive determination of interferences. Section 1.601 defines various terms used in Subpart E including "additional discovery," "affidavit,"

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"case-in-chief," "case-in-rebuttal," "count," "effective filing date," "filing date," "interference," "interference-in-fact," "junior party," "lead" attorney, "party," "phantom count," "same patentable invention," "separate patentable invention," "senior party," "sworn," and "United States." "Affidavits" include declarations under 35 U.S.C. §25 and 37 CFR §1.68 as well as statutory declarations under 28 U.S.C. §1746. The definition of "United States" is the same as the definition of United States in 35 U.S.C. §100(c).

The definition of "interference" permits an interference between one or more applications and one or more patents. Thus, these new rules follow the policy of *Wilson* v. *Yakel*, 1876 Dec. Comm'r. Pat. 245 (Comm'r.Pat. 1876) and, to the extent inconsistent therewith, do not follow the policy announced in *Touval* v. *Newcombe*, 194 USPQ 509 (Comm'r.Pat. 1976). However, in view of the statutory requirement for the presence of at least one application in an interference, if an applicant were to concede priority or otherwise be terminated from an interference involving only one application and more than one patent, the interference would have to be terminated for lack of subject matter jurisdiction unless one or more of the patentees filed an application for reissue which could be added to the interference under §1.633(h). A "count" defines interfering subject matter. An interference may have two counts only if the second count defines a "separate patentable invention" from the first count. The reason the second count must define a separate patentable invention is to permit the PTO to lawfully issue separate patents to different parties in an interference when a single party does not prevail as to all counts. A "separate patentable invention" is defined in §1.601(n):

> Invention (A) is a "separate patentable invention" with respect to invention (B) when invention (A) is new (35 U.S.C. §102) and non-obvious (35 U.S.C. §103) in view of invention (B) assuming invention (B) is prior art with respect to invention (A).

Section 1.602(a) continues the present PTO practice (37 CFR §1.201(c)) of not declaring or continuing an interference between (1) two or more applications owned by the same party or (2) an application and a patent owned by a single party unless good cause is shown. A corporation and its wholly-owned subsidiary are considered a "single party" within the meaning of §1.602(a). Under prior rules, when a patent and an application involved in an interference became commonly owned, the interference was not "dissolved." Rather, the PTO required that the interference be terminated with a judgment. *Chillas* v. *Weisberg*, 1928 Dec. Comm'r. Pat. 24 (Comm'r.Pat. 1928); *Malone* v. *Toth*, 202 USPQ 397 (Comm'r.Pat. 1978); and *Morehouse* v. *Armbruster*, 209 USPQ 514 (Comm'r.Pat. 1980). Under these new rules, all interferences, including those involving only applications, will be terminated with a judgment. As noted in *Chillas* v. *Weisberg*, *supra* at 25 "the common owner can allow a judgment against the junior party to be rendered by default or it can file a concession of priority from one party to the other." Paragraphs (b) and (c) of §1.602 continue the present PTO practice (37 CFR §1.201(c)) of requiring a party to notify the PTO of any real party in interest not apparent on the face of the notice declaring the interference (see §1.611) or of any change in the real party in interest after the interference is declared. The PTO needs to know the identity of any real party in interest to properly enforce §1.602(a) and to enable an examiner-in-chief to determine whether recusal is necessary or appropriate. A new requirement in paragraphs (b) and (c), not present in 37 CFR §1.201(c), is a 20-day time period for advising the PTO of the identity of, or any change in, the real party in interest.

Under §§1.601(f), 1.603, and 1.606, the interfering subject matter would be defined by one or more counts. All the claims in an application or a patent which define the same patentable invention as a count would be designated to correspond to the count. An interference would have two counts only if one count defines a separate patentable invention from another count. Under §1.606, at the time an interference is declared between a patent and an application, a count would not be narrower in scope than any patent claim which corresponds to the count. Thus, a patent claim would be presumed, subject to a motion under §1.633(c), not to embrace "separate patentable inventions." Some examples illustrate how the PTO would formulate counts and designate patent and application claims to correspond to counts.

Example 1: Application A contains patentable claim 1 (engine). Application B contains patentable claim 8 (engine). If an interference is declared, there would be one count (engine). Claim 1 of application A and claim 8 of application B would be designated to correspond to the count.

Example 2: Application C contains patentable claims 1 (engine) and 2 (6-cylinder engine). Application D contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application C and claim 8 of application D would be designated to correspond to the count.

Example 3: Application E contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application F contains patentable claims 11 (engine) and 12 (8-cylinder engine). Claims 1 and 2 of application E and claims 11 and 12 of application F define the same patentable invention. Claim 3 of application E defines a separate patentable invention from claims 1 and 2 of application E and claims 11 and 12 of application F. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application E and claims 11 and 12 of application F would be designated to correspond to the count. Claim 3 of application E would not be designated to correspond to the count.

Example 4: Application G contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application H contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H define the same patentable invention. Claim 3 of application G and claim 15 of application H define a separate patentable invention from claims 1 and 2 of application G and claim 11 of application H. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H would be designated to correspond to Count 1. Claim 3 of application G and claim 15 of application H would be designated to correspond to Count 2.

Example 5: Application J contains patentable claims 1 (engine), 2 (combination of an engine and a carburetor) and 3 (combination of an engine, a carburetor, and a catalytic converter). Application K contains patentable claims 31 (engine), 32 (combination of an engine and a carburetor), and 33 (combination of an engine, a carburetor, and an air filter). The engine, combination of an engine and carburetor, and combination of an engine, carburetor, and air filter define the same patentable invention. The combination of an engine, carburetor, and catalytic converter define a separate patentable invention from engine. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application J and claims 31, 32, and 33 of application K would be designated to correspond to the count. Claim 3 of application J would not be designated as corresponding to the count.

Example 6: The PTO will continue to follow *Waldeck* v. *Lewis*, 120 USPQ 88 (Comm'r.Pat. 1955). Application L contains patentable claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application M contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of application L and claim 11 of application M would be designated to correspond to the count.

Example 7: Application N contains patentable claim 1 (benzene). Application P contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of application N and claim 11 of application P would be designated to correspond to the count.

Example 8: Application Q contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application R contains patentable claim 33 (benzene). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application Q and claim 33 of application R would be designated to correspond to the count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be one count (benzene). Claims 1 and 2 of application Q and claim 33 of application R would be designated to correspond to the count. Claim 3 of application Q would not be designated to correspond to the count.

Example 9: Application S contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application T contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application S and claims 11, 12, and 13 of application T would be designated to correspond to the count. The PTO will continue to adhere to *Becker* v. *Patrick*, 47 USPQ 314 (Comm'r.Pat. 1939). An interference can have two counts only if one count defines a separate patentable invention from another count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be two counts: Count 1 (benzene) and Count 2 (chloroform). Claims 1 and 2 of application S and claims 11 and 12 of application T would be designated to correspond to Count 1. Claims 1 and 3 of application S and claims 11 and 13 of application T would be designated to correspond to Count 2.

Example 10: Patent A contains claim 1 (engine). Application U contains patentable claim 11 (engine). If an interference is declared, there would be one count (engine). Claim 1 of patent A and claim 11 of application U would be designated to correspond to the count.

Example 11: Patent B contains claims 1 (engine) and 2 (6-cylinder engine). Application V contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent B and claim 8 of application V would be designated to correspond to the count.

Example 12: Patent C contains claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application W contains patentable claims 11 (engine) and 12 (8 cylinder engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W define the same patentable invention. Claim 3 of patent C defines a separate patentable invention from claims 1 and 2 of patent C and claims 11 and 12 of application W. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W would be designated to correspond to the count. Claim 3 of patent C would not be designated to correspond to the count.

Example 13: Patent D contains claim 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application X contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X define the same patentable invention. Claim 3 of patent D and claim 15 of application X define a separate patentable invention from claims 1 and 2 of patent D and claim 11 of application X. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X would be designated to correspond to Count 1. Claim 3 of patent D and claim 15 of application X would be designated to correspond to Count 2.

Example 14: Patent E contains claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application Y contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of patent E and claim 11 of application Y would be designated to correspond to the count.

Example 15: In this example, the claims of patent E and application Y in Example 14 are reversed. Patent E contains claim 1 (benzene). Application Y contains patentable claims 11 (Markush group of benzene or toluene), 12 (benzene), and 13 (toluene). If an interference is declared, the count would be the same as the count in Example 14—(Markush group of benzene or toluene). Claim 1 of patent E and claims 11, 12, and 13 of application Y would be designated to correspond to the count.

Example 16: The PTO will continue to follow cases such as *Case* v. *CPC International, Inc.*, 730 F.2d 745, 221 USPQ 196 (Fed. Cir. 1984); *cert. denied*, 105 S.Ct. 233 (1984); *Aelony* v. *Arni*, 547 F.2d 566, 192 USPQ 486 (CCPA 1977); and *Nitz* v. *Ehrenriech*, 537 F.2d 539, 190 USPQ 413 (CCPA 1976), and declare interferences where interfering patent and application claims are mutually exclusive provided the claims define the same patentable inventicn. Patent F contains claim 1 (benzene). Application Z contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of patent F and claim 11 of application Z would be designated to correspond to the count.

Example 17: It will be the practice of the PTO under §1.606 to initially declare interferences with counts which are identical to or broader than patent claims which correspond to the counts. A single patent claim would be presumed, subject to a motion under §1.633(c), not to define separate patentable inventions. Patent G contains claim 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application AA contains patentable claim 33 (benzene). If an interference is declared, initially it would be presumed by the PTO, subject to a later motion under §1.633(c), that benzene and chloroform define the same patentable invention. There would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent G and claim 33 of application AA would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, that party could file a motion under §1.633(c) to redefine the count and the claims corresponding to the counts.

Example 18: Patent H contains claims 1 (Markush group of benzene or chloroform), 2, (benzene), and 3 (chloroform). Application AB contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). Benzene and chloroform initially would be presumed, subject to a motion under §1.633(c), to define the same patentable invention, because they are recited as a Markush group in a single patent claim. If an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent H and claims 11, 12, and 13 of application AB would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, the party could move under §1.633(c) to substitute a count (benzene) for (Markush group of benzene or chloroform) and to add a count (chloroform). See Example 36.

Example 19: Under §1.606, the PTO will continue to follow the practice announced in *Ex parte Card and Card*, 1904 Dec.Comm'r.Pat. 383 (Comm'r.Pat. 1904). Patent J contains claim 1 (method of mixing, grinding, and heating). Application AC contains patentable claim 8 (method of mixing and heating) and does not disclose or claim a grinding step. In the context of the inventions disclosed in patent J and application AC, a method of

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mixing, grinding, and heating is the same patentable invention as a method of mixing and heating. Under current practice, it would be said that "grinding" is an "immaterial" limitation in claim 1 of patent J. Under §1.606, the fact application AC does not disclose grinding would not preclude an interference. If an interference is declared, there would be one count (method of mixing and heating). Claim 1 of patent J and claim 8 of application AC would be designated to correspond to the count.

Under §1.605, timely filing of an amendment presenting a claim suggested by the examiner for purposes of an interference would stay *ex parte* proceedings in the application in which the claim is presented pending a determination by the examiner of whether an interference will be declared. Also under §1.605(a), when an examiner suggests a claim, the applicant will be required to copy verbatim the suggested claim. At the time the suggested claim is copied, however, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the copied claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

Under §1.607(b), when an applicant seeks an interference with a patent, e.g., by copying claims from the patent, examination of the application including any appeal would be handled with special dispatch within the PTO. "Special dispatch" would be construed to be the same as special dispatch in a reexamination proceeding. See 35 U.S.C. §305.

Under §1.608, the PTO will continue current practice (37 CFR §1.204(c)) of requiring an applicant seeking to provoke an interference with a patent to submit evidence which demonstrates that the applicant is *prima facie* entitled to a judgment relative to the patentee. Evidence would be submitted only when the earlier of the filing date or effective filing date of the application is more than three months after the earlier of the filing date or effective filing date under 35 U.S.C. §120 of the patent. The evidence may relate to patentability and need not be restricted to priority. When the evidence (1) consists of prior printed publications and patents and (2) shows that the claims of the application are not patentable, the claims in the application would be rejected and the applicant could file a request for reexamination of the patent.

Section 1.609 sets forth what an examiner shall forward to the Board when an interference is declared. For the most part, §1.609 continues current practice. However, under §1.609(b)(3), the examiner would identify all claims in an application which the examiner believes are patentable over the proposed counts. Thus, a claim in an application would either correspond to a count or would be indicated as being patentable over the count. For instance, in Example 3, *supra*, the examiner would indicate that (1) claims 1 and 2 of application E and claims 11 and 12 of application F correspond to the count and (2) claim 3 of application E defines a separate patentable invention from the count.

Under §1.610, each interference will be declared by an examiner-in-chief. The examiner-in-chief enters all interlocutory orders in the interference. As necessary, another examiner-in-chief may act in place of the examiner-in-chief assigned to the interference. At the discretion of the examiner-in-chief assigned to the interference, a panel of two or more examiners-in-chief may enter an interlocutory order. The examiner-in-chief will set times and control proceedings such that pendency of the interference normally will not exceed 24 months. Under §1.610(d), the examiner-in-chief is authorized to hold conferences. Any conference can be by a telephone conference call. Under §1.610(e), an examiner-in-chief is authorized to determine a proper course of conduct for any situation not specifically covered by the rules.

Under §1.611(a), the PTO will normally notify each party at its correspondence address (37 CFR §1.33(a)) that an interference is declared. This practice will save the PTO the administrative burden of sending multiple notices as is required by the present rules. Under §1.611(a), the PTO could, in an appropriate circumstance, also send a notice to a patentee or an assignee. An appropriate circumstance for sending an additional notice would be a situation where a patent was issued on the basis of an application filed under 37 CFR §1.47. The matters to be specified in a notice declaring an interference are set out in §1.611(c). One item to be set out is the "order of the parties," meaning the order in which the parties will take testimony. If Jones is the junior party and Smith is the senior party, the order of the parties is: *Jones* v. *Smith*. The order of the parties may change as a result of the granting of a motion under §1.633(d), (f), or (g). Under §1.611(d), the notice declaring the interference may also set dates for filing preliminary statements, notices that preliminary statements have been filed, motions under §1.633, oppositions to those motions, and replies to the oppositions. Alternatively, an examiner-in-chief may set those times in a separate order before or after consultation with counsel for the parties. Under §1.611(e), the PTO may place a notice in the *Official Gazette* each time an interference is declared involving a patent. The notice would make it easier for patent practitioners throughout the country to determine whether a given patent is or has been involved in an interference.

Under §1.612, except for affidavits under §1.131 and any evidence and explanation under §1.608(b) filed separate from an amendment, each party shall have access to the file of every other party after an interference is declared. The files of applications and patents involved in an interference will be maintained if the Service Branch of the Board of Patent Appeals and Interferences for inspection and copying. Any explanation which is filed as part of an amendment or an amendment which discusses details contained in an affidavit under §1.131 would not be sealed under §1.612(a). Thus, §1.612(a) continues the practice discussed in *Moorman* v. *Martin*, 103 USPQ 273 (Comm'r.Pat. 1950) and Calvert, *An Overview of Interference Practice*, 62 J. Pat. Off. Soc'y. 290, 293 (1980). Under§1.612(b), each party will have access to an opponent's affidavit under §1.131 or an opponent's evidence and explanation under §1.608(b) when a decision is rendered on motions under §1.633. Under §1.612(c), a party would be required to serve any evidence and explanation under §1.608(b) if an order to show cause is issued under §1.617(a) and the party responds to the order under§1.617(b). Under §1.612(d), the parties may agree to exchange copies of their respective files.

Under §1.613(a), when a party has appointed more than one attorney or agent of record, the party may be required to designate a "lead" attorney or agent. A lead attorney or agent would be a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the individual whom an examiner-in-chief can contact to set times and take other action in the interference. Section 1.613(b) continues the practice of not permitting the same attorney or agent to represent two or more parties in an interference except as permitted by Chapter 1, see e.g., §1.344. Under §1.613(c), an examiner-in-chief can make an appropriate inquiry to determine whether an attorney or agent should be disqualified from representing a party. A final decision to disqualify an attorney or agent is made by the Commissioner under 35 U.S.C. §32.

Section 1.614 specifies when the Board gains jurisdiction over an interference. The section also indicates when an interference becomes a contested case within the meaning of 35 U.S.C. §24. A remand to the examiner is authorized and may be useful in certain situations, such as, when a party moves under §1.633(c) to add a proposed count which is broader than any count in an interference. Alternatively, an examiner-in-chief would be able to obtain informal opinions from examiners during the course of an interference. Nothing in the rules, however, is intended to authorize informal conferences between an examiner-in-chief and an examiner with respect to the merits of an application before the Board in an *ex parte* appeal from an adverse decision of the examiner.

Section 1.616 permits an examiner-in-chief or the Board to impose appropriate sanctions against a party who fails to comply with the rules or with an order entered in the interference. Paragraphs (a) through (e) set forth some of the possible sanctions which can be entered. The particular sanction to be entered would depend on the facts of a given case and ordinarily would not be entered prior to giving the affected party an opportunity to present its views. An individual examiner-in-chief could not impose a sanction granting judgment inasmuch as entry of a judgment requires action by the Board. See §1.610(a). A party desiring sanctions imposed against an opponent could move under §1.635 for entry of an order imposing sanctions.

Section 1.617 retains summary judgment proceedings in those cases where a junior party applicant is required to file evidence and an explanation under §1.608(b). To avoid summary judgment, the junior party applicant must establish that it is *prima facie* entitled to judgment relative to the senior party patentee. For the most part, practice under §1.617 will be the same as the current practice under 37 CFR §1.228. The major changes would be the following: (1) A *prima facie* case could be based on patentability as well as priority. (2) A stricter standard would be imposed for presenting additional evidence after entry of an order to show cause. Under current practice (37 CFR §1.228), additional evidence may be submitted with a response to an order to show cause "when a showing in excuse of . . . [its] omission from the original" showing is made. The "good cause" showing required by §1.617(b) imposes a stricter standard than was required under the prior rules. The stricter standard is necessary to encourage applicants copying claims from a patent to better prepare their initial showings under proposed §1.608(b). Under current practice, the Board of Patent Interferences has found that substantial time is lost in issuing orders to show cause based on an inadequate initial showing only to have an adequate showing made with the response to the order to show cause. Under the "good cause" standard, ignorance by a party or counsel of the provisions of the rules or the substantive requirements of the law would not constitute good cause. (3) When an interference involves more than two parties, all opponents would be permitted to participate in summary judgment proceedings. Thus, the new rules overrule *Chan* v. *Akiba* v. *Clayton*, 189 USPQ 621 (Comm'r.Pat. 1975). (4) Currently, an applicant must file two copies of its initial showing under 37 CFR §1.204(c). Under §1.608(b), a party would file only one copy of the showing. However, any party responding to an order to show cause would be required to serve a copy of its initial showing under §1.608(b) with any response to the order to show cause. (5) A single examiner-in-chief may order an interference to proceed after issuance of an order to show cause under §1.608(b) and the filing of a response by an applicant under §1.617(b). Only the Board, however, may enter a summary judgment. See §1.617(b).

Under §1.618, the PTO has authority to return to a party any paper presented in an interference which is not authorized by, or is not in compliance with the requirements of, Subpart B. When an improper paper is filed, a party may be given an opportunity to file a proper paper under such conditions as an examiner-in-chief may deem appropriate. Two examples of improper papers are: (1) replies to replies which are not authorized by the rules and (2) papers presented which have attached thereto a paper previously filed in the interference.

Sections 1.621 through 1.629 govern preliminary statements which continue to be required in interference cases.

Under §1.621, a preliminary statement can be signed by any individual having knowledge of the facts (e.g., the inventor) or by an attorney or agent of record. Permitting an attorney or agent of record to sign a preliminary statement eliminates unnecessary mailing of papers between parties and their attorney or agent.

Under §1.622, the preliminary statement would identify the inventor who made the invention defined by each count. If the inventor identified in the preliminary statement is not an inventor named in the application or patent involved in the interference, a motion under §1.634 must be diligently filed to correct inventorship.

Sections 1.623, 1.624, and 1.625 respectively set out the allegations which should be made in, and the attachments which should accompany, a preliminary statement when (1) the invention was made in the United States, (2) the invention was made abroad and was introduced into the United States, and (3) derivation by an opponent from a party is to be an issue.

Section 1.626 permits a party to file a preliminary statement which states that the party only intends to rely on the filing date of an earlier United States or foreign application. Ordinarily, a junior party who fails to file a preliminary statement is not entitled to access to any other preliminary statement filed (see §1.631(b)). Section 1.626 would permit a junior party who only intends to rely on an earlier application to have access to any opponent's preliminary statement.

Section 1.628 sets out how an error in a preliminary statement may be corrected.

Section 1.629 sets out the effect of a preliminary statement. A party who fails to file a preliminary statement will not be permitted to prove (1) that the party made the invention defined by a count prior to the party's filing date or (2) that an opponent derived the invention from the party.

Under §1.631, preliminary statements normally will be opened for inspection when an examiner-in-chief decides preliminary motions filed under §1.633. A junior party who does not file a preliminary statement is not entitled to access to a preliminary statement of any other party. When an interference is terminated before preliminary statements are opened, any preliminary statement which has been filed will be returned unopened to the party who submitted the statement.

Under §1.632, a notice must be filed by a party who intends to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice. 35 U.S.C. §102(g). A party will not be permitted to brief (§1.656) or argue at final hearing (§1.654) that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless the notice is timely filed. A notice is timely if filed within ten (10) days of the close of the testimony-in-chief period of an opponent. While a party has the burden of proving that an opponent abandoned, suppressed, or concealed, the burden may be discharged on the basis of the opponent's evidence alone. *Shindelar* v. *Holdeman*, 628 F.2d 1337, 207 USPQ 112 (CCPA 1980). See also *Correge* v. *Murphy*, 705 F.2d 1326, 217 USPQ 753 (Fed. Cir. 1983); *Horwath* v. *Lee*, 564 F.2d 948, 195 USPQ 701 (CCPA 1977); and *Peeler* v. *Miller*, 535 F.2d 647, 190 USPQ 117 (CCPA 1976). Under current practice where notice is not required, it is possible that a party may learn for the first time that abandonment, suppression, or concealment is an issue when the party receives an opponent's brief at final hearing. See *Klug* v. *Wood*, 212 USPQ 767, 771 n. 2 (Bd.Pat.Int. 1981). At that point, it is often too late to reopen proceedings in the interference. The purpose of requiring the notice under §1.632 is to make the parties and the Board aware during the interlocutory stage of an interference that abandonment, suppression, or concealment may be an issue in the interference. Early notice will permit the parties to ask for and the examiner-in-chief to set appropriate testimony periods for a party to present evidence related to abandonment, suppression, and concealment, particularly in those cases where long unexplained delays tend to prove the allegation of suppression or concealment. Early notice will also eliminate the need for the party moving to reopen the testimony period. *Klug* v. *Wood*, *supra*.

Under §1.633, a party may file preliminary motions for judgment, to redefine the interference, to substitute a different application in the interference, to declare an additional interference, to be accorded the benefit of an

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earlier application, to attack benefit previously accorded an opponent, or to add a reissue application to the interference. The motions are called "preliminary motions" in order to distinguish the motions from other motions which might be filed during the course of an interference. The preliminary motions would replace motions currently authorized by 37 CFR §1.231.

Under §1.633(a), a motion to dissolve would be replaced with a motion for judgment. A party can file a motion for judgment on the ground that an opponent's *claim* corresponding to a count is unpatentable to the opponent. With two exceptions, unpatentability can be based on prior art (35 U.S.C. §§102, 103), insufficiency of disclosure (35 U.S.C. §112, first paragraph), indefiniteness of claims (35 U.S.C. §112, second paragraph), double patenting, estoppel, or any other ground which would support a holding that claims corresponding to a count are not patentable. The two exceptions are (1) priority of invention of the subject matter of a count by the moving party as against any opponent and (2) derivation of the subject matter of a count by the opponent from the moving party. The two exceptions are directed to issues which are traditional "priority" issues, e.g., which inventor made the invention defined by a count first or, when derivation is an issue, who made the invention. Resolution of those "priority" issues almost always requires the taking of testimony. A motion for judgment, however, would be proper when a party believed an individual not involved in the interference made the invention defined by the count prior to an opponent in the interference, but subsequent to the moving party. Thus, a patentability issue, such as that raised under 35 U.S.C. §102(g) in *Sutter Products Co.* v. *Pettibone Mulliken Corp.*, 428 F.2d 639, 166 USPQ 100 (7th Cir. 1970), properly could be raised with a motion for judgment under§1.633(a). Derivation by an opponent from an individual not involved in the interference could also be raised under §1.633(a).

Under §1.633(b), a party could move for a judgment when the party believes there is no interference-in-fact. A motion for judgment on the ground of no interference-in-fact is only proper under one of three conditions: (1) when an interference involves designs, (2) when the interference involves plant applications or a plant application and plant patent, or (3) when no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. An example illustrates when a motion under §1.636(b) is proper.

Example 20: Application AD contains patentable claim 1 (6-cylinder engine). Application AE contains patentable claim 3 (8-cylinder engine). An interference is declared with a single count (6 or 8-cylinder engine). Claim 1 of application AD and claim 3 of application AE are designated to correspond to the count. Applicant AD believes that a 6-cylinder engine is a "separate patentable invention" (see §1.601(n)) from an 8-cylinder engine. Applicant AD would file a motion under §1.633(b) for a judgment on the ground of no interference-in-fact stating why a 6-cylinder engine is patentably distinct from an 8-cylinder engine. If the Board ultimately agrees with applicant AD, a patent could issue to AD containing claim 1 of application AD and a second patent could issue to AE containing claim 3 of application AE.

Under §1.633(c), a party may move to redefine interfering subject matter. One way to redefine interfering subject matter would be to add or substitute a count. When a party seeks to add a count, the party is required to demonstrate that the proposed count to be added is directed to a "separate patentable invention" from every other count in the interference.

A motion may be filed to amend an application claim which has already been designated to correspond to a count. See §1.633(c)(2). Such a motion might be filed when a party believes an application claim designated to correspond to a count is unpatentable and the amended claim is believed to be patentable.

An applicant may move to add a claim to the applicant's application and to designate the claim to be added to correspond to a count. See §1.633(c)(2). Such a motion may be filed when the applicant discloses specific subject matter which is not claimed, would like to claim the subject matter, and wants the subject matter involved in the interference.

Another way to redefine interfering subject matter would be to designate a claim as corresponding or not corresponding to a count. See §1.633(c)(3) and (c)(4). Examples 21 and 22 illustrate this latter point.

Example 21: Application AF contains patentable claim 1 (engine). Patent K contains claims 3 (engine) and 5 (6-cylinder engine). Claim 1 of application AF and claim 3 of patent K are designated to correspond to the count. Applicant AF believes a 6-cylinder engine is the "same patentable invention" (see §1.601(n)) as engine. Applicant AF would file a motion under §1.633(c)(3) to designate claim 5 of patent K as corresponding to the count. If the motion is granted and applicant AF prevails in the interference, judgment would be entered against patentee K and both claims 3 and 5 of patent K would be cancelled under 35 U.S.C. §135(a).

Example 22: Application AG contains patentable claim 1 (engine). Patent L contains claims 3 (engine) and 5 (8-cylinder engine). An interference is declared with one count (engine). Claim 1 of application AG and claims 3 and 5 of patent L are designated to correspond to the count. Patentee L believes that an 8-cylinder engine defines a "separate patentable invention" (see §1.601(n)) from engine. Patentee L should file a motion under §1.633(c)(4) to designate claim 5 of patent L as "not corresponding" to the count. If the motion is granted and an adverse judgment is entered against patentee L, only claim 3 would be cancelled from the patent pursuant to 35 U.S.C. §135(a).

A motion to redefine the interfering subject matter may also request that an opponent who is an applicant be required to add a claim to the opponent's application and to designate the claim to correspond to a count. See §1.633(c)(5). Such a motion might be filed when a party sees that the opponent discloses, but does not claim, subject matter which the party believes should be involved in the interference.

Section 1.633(i) would continue present practice (37 CFR §1.231) of allowing a party to move to redefine the subject matter of the interference or substitute a different application when an opponent moves for judgment (see §1.633(a) and (b)) or to attack benefit (see §1.633(g)).

Paragraph (j) of §1.633 will permit an opponent to move for benefit when a party moves to add or substitute a count. Thus, when a motion to add a count is filed by a party and an opponent wants benefit of an earlier application in the event the motion to add is granted, the opponent should file a motion under §1.633(j) to be accorded benefit. The mere fact that the opponent had been accorded benefit of an earlier application when the interference was declared does not mean the opponent will be accorded benefit as to some other count which may be added on motion of some other party.

Section 1.634 authorizes a motion to correct inventorship in an application (see §1.48) or a patent (see §1.324) involved in an interference.

Section 1.635 authorizes the filing of motions other than those specified in §§1.633 or 1.634. Motions filed under §1.635 would be referred to as "miscellaneous motions" to distinguish from "preliminary motions" under §1.633. Instances where a miscellaneous motion would be filed include motions to correct an error in a preliminary statement, to extend time for taking action or to seek judicial review, to obtain permission to proceed under 35 U.S.C. §24, or to obtain additional discovery.

Section 1.636 sets out the times within which a motion would be filed.

Section 1.637 sets out the content of motions. In prior interference practice, parties and their counsel have had difficulty meeting all the "unwritten" requirements for motions under 37 CFR §1.231. Section 1.637 is quite specific in setting out the requirements for each type of motion, particularly the preliminary motions. By setting out with specificity the requirements for each type of motion, it is intended to minimize disposition of motions on technicalities. A vast majority of the comments in response to the advanced notice published in the *Federal Register* on Aug. 1, 1983, commenting on then proposed §1.637 were in favor of the requirements for motions being specifically set out in the regulations.

Section 1.638 authorizes oppositions to motions. Any opposition would have to identify any material fact in dispute. A reply to an opposition would be authorized for all motions. A reply to a reply is not authorized.

Section 1.639 sets forth the evidence which may accompany a motion, opposition, or reply. Every material fact alleged in a motion, opposition, or an reply would have to be supported by proof. Section 1.639(b) authorizes affidavits to be used as proof for any motion. The affidavit may later be used by a party during the testimony period (see §§1.671(e) and 1.672(b)). When a party believes that testimony is necessary to decide a motion under §1.633 or §1.634, the party would have to describe the nature of the testimony needed. If an examiner-in-chief agrees that testimony is needed, appropriate interlocutory relief would be granted and testimony would be ordered.

Example 23: An interference is declared with one count between application AH and application AJ. Applicant AH files a preliminary motion under §1.633(c)(1) to redefine the interference by adding a second count. In order to succeed, applicant AH must show that the proposed count to be added is directed to a "separate patentable invention" (see §1.601(n)) from the count already in the interference. In the motion, applicant AH sets forth in detail the testimony which would be required to prove that the subject matter of the proposed count is to a separate patentable invention from the subject matter of the count in the interference. Applicant AJ opposes the motion on the ground that the proposed and present counts define the "same patentable invention" (see §1.601(n)). An examiner-in-chief determines that a material fact is in dispute and that applicant AH has established testimony is needed to properly rule on the motion. Under the circumstances, the motion would be deferred to final hearing and a testimony period would be ordered. The questions of (1) whether the proposed and present counts define the same patentable invention and (2) priority would be decided at final hearing.

Under §1.640, an examiner-in-chief would decide all motions. A hearing could be held on a motion in the discretion of an examiner-in-chief. Where appropriate, an examiner-in-chief could consult with an examiner on a question of patentability which arises in the first instance in the interference. Consultation would not be necessary where the examiner had already ruled on the patentability question which comes before the examiner-in-chief or the Board. Moreover, nothing in §1.640 authorizes conferences between examiners-in-chief and examiners in *ex parte* appeals under 35 U.S.C. §134 from an adverse decision of an examiner. A party is entitled to request reconsideration of a decision on a motion by a single examiner-in-chief. An opposition to a request for reconsideration could not be filed unless ordered by an examiner-in-chief or the Board, but the decision by the single examiner-in-chief would not normally be modified unless an opposition has been requested. The request for reconsideration would be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom would normally be the examiner-in-chief who decided the motion. Several comments were received in response to the advance notice questioning why the examiner-in-chief who decided the motion would form part of the panel deciding the request for reconsideration. The decision to propose, and now adopt, a regulation which would permit the examiner-in-chief who decided the motion to participate in the decision on reconsideration was made after careful balancing of all the factors involved. It could have been proposed to permit the examiner-in-chief to individually decide the request for reconsideration. However, it is believed that parties in interference cases would feel that their requests for reconsideration are being more fully considered if more than one person considers their request. The two additional examiners-in-chief would be able to consult with the examiner-in-chief most familiar with the case, but would be able to control the decision on reconsideration by a majority vote. Use of the examiner-in-chief who decided the motion and two additional examiners-in-chief would (1) minimize delay which would occur if three new examiners-in-chief were used who were unfamiliar with the record and (2) minimize the possibility that reversible error occurred if only the examiner-in-chief who decided the motion also individually decided the request for reconsideration.

Under §1.644, petitions to the Commissioner are authorized in interference cases under certain restricted conditions. Petitions in interferences have been the source of substantial delay. Section 1.644 attempts to minimize those delays. Section 1.644 authorizes a petition to the Commissioner from a decision of an examiner-in-chief or a panel when the examiner-in-chief or the panel shall be of the opinion (1) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (2) that an immediate decision on petition would materially advance the ultimate termination of the interference. The standard is intended to be analogous to that of a district court certifying a question to a court of appeals under 28 U.S.C. §1292(b). A petition could be filed seeking to invoke the supervisory authority of the Commissioner. However, the petition could not be filed prior to entry of judgment and could not relate to the merits of priority or patentability or the admissibility of evidence under the Federal Rules of Evidence. A petition could also be filed seeking waiver of a rule. A fee of $120 would be charged for each petition and for each request for reconsideration of a decision on petition. Any petition would be decided on the record made before the examiner-in-chief or the Board and additional evidence could not be submitted with the petition. An opposition could not be filed unless ordered by the Commissioner. Where reasonably possible, service of a petition would have to be such that delivery is accomplished within one day. Service by hand or "Express Mail" would comply with this requirement.

Section 1.645 permits a party to file a motion to seek an extension of time to take action in an interference or to seek judicial review. The motion would have to be filed within sufficient time to actually reach an examiner-in-chief prior to expiration of the time for taking action. Under §1.645, a moving party would not be able to assume that a motion for an extension of time would be granted. Under §1.610(d)(6), a request for an extension of time could be made orally and an appropriate order would then be entered thus eliminating considerable paper work. The order would be the written record of the request and decision. See §1.2. Extensions of time have caused numerous delays in interference cases. Under present interference practice, some delays are caused because attorneys and agents on many occasions unexpectedly receive orders setting times. Under the new practice, attorneys and agents can expect times to be set for filing preliminary statements, preliminary motions, motions for additional discovery, testimony, and briefs after a conference call. It is expected that use of conference calls will permit an examiner-in-chief and attorneys or agents for parties to set a time schedule which is mutually satisfactory. A motion to extend time would not be granted unless a party shows good cause. The use of conference calls would allow schedules to be set before orders setting time are entered and therefore the press of other business which arises after the examiner-in-chief and attorneys and agents agree to times would not normally be considered good cause.

Under §1.647, when a party relies on a document in a foreign language, an English language translation of the

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document and an affidavit attesting to the accuracy of the translation would be required. The rule would apply to any document, including evidence submitted with motions, foreign applications for which a party seeks benefit, testimony, and exhibits introduced in evidence during testimony.

Under §1.651, after a decision is entered on preliminary motions, an examiner-in-chief would set times for filing motions for additional discovery and for taking testimony. Any motion for additional discovery would be to obtain answers to terrogatories, requests for admissions, and documents and things necessary for a party to prepare its case-in-chief.

Section 1.653 sets out what shall be in the record to be considered by the Board at final hearing. The record would continue to be printed or typed on paper 8-1/2 by 11 inches in size. Accordingly, when a party files an affidavit, the party should use 8-1/2 by 11 inches paper for the affidavit.

Section 1.654 continues the practice of holding a final hearing where oral argument may be presented by all parties. No fee would be charged for appearing at oral argument at final hearing in an interference.

Section 1.655 specifies the matters which can be considered in rendering a final decision. Patentability is an issue which may be raised. The Board can also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion, although any interlocutory order would be presumed to be correct and burden of showing error shall be on the party attacking the order. This last procedural provision permits the Board to correct any manifest error before a party seeks judicial review of an interlocutory order along with judicial review of the Board's final decision.

Section 1.656 sets forth the requirements for briefs for final hearing. In large measure, §1.656 follows the requirements of Rule 28 of the Federal Rules of Appellate Procedure. An original and three copies of a brief is required. Under §1.656(h), if a party wants the Board in rendering its final decision to rule that any evidence is inadmissible, the party must file with its opening brief an original and three copies of a motion to suppress the evidence. Any previous objection to the admissibility of evidence is waived unless the motion to suppress is filed. This procedural provision makes clear that an objection to the admissibility of evidence must be renewed at final hearing and will be considered by the Board in rendering its final decision. When a junior party fails to file a brief, an order can be issued requiring the junior party to show cause why failure to file the brief should not be taken as a concession of priority.

Under §1.658 the Board would enter a final decision. The decision can (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing claims which correspond to the count. When judgment is entered as to all counts, the decision of the Board is considered final for the purpose of judicial review. Section 1.658(c) defines the doctrine of interference estoppel as it is to be applied in the PTO after an interference is terminated. The definition of interference estoppel is designed to encourage parties in interference cases to settle as many issues as possible in one proceeding. Section 1.658(c) creates an estoppel both as to senior and junior parties unlike the present practice (37 CFR §1.257) which limits estoppel in some instances to junior parties. An estoppel would *not* apply with respect to any claims which correspond, or which properly could have corresponded, to a count as to which the party was awarded a favorable judgment. A few examples illustrate how estoppel would be applied.

Example 24: Junior party applicant AL and senior party applicant AK both disclose separate patentable inventions "A" and "B" and claim only invention A in their respective applications. An interference is declared with a single count to invention A. Neither party files a preliminary motion (see §1.633(c)(1)) to add a count to invention B. Judgment as to all of AL's claims corresponding to the sole count is awarded to junior party applicant AL. Senior party applicant AK would be estopped to thereafter obtain a patent containing claims to invention B, because applicant AK failed to move to add a count to invention B in the interference. Junior party applicant AL would not be estopped to obtain a patent containing claims to invention B.

Example 25: In this example, the facts are the same as in Example 24 except that judgment is awarded as to all AK's claims corresponding to the count to senior party applicant AK. Junior party applicant AL would be estopped to obtain a patent containing claims to invention B in the interference. Senior party applicant AK would not be estopped to obtain a patent containing claims to invention B.

Example 26: Junior party applicant AM and senior party applicant AP both disclose separate patentable inventions "C", "D", and "E" and claim inventions C and D in their respective applications. An interference is declared with two counts. Count 1 is to invention C and Count 2 is to invention D. Neither party files a preliminary motion to add a proposed Count 3 to invention E. Judgment as to all AM's claims corresponding to Counts 1 and 2 is awarded to junior party applicant AM. Senior party applicant AP would be estopped to thereafter obtain a patent containing claims to invention E, because applicant AP failed to move to add a count to invention E in the interference. Junior party applicant AM would not be estopped to obtain a patent containing claim to invention E.

Example 27: In this example, the facts are the same as in Example 26 except that judgment is awarded as to all AP's claims corresponding to Counts 1 and 2 to senior party applicant AP. Junior party applicant AM would be estopped to obtain a patent containing claims to invention E, because applicant AM failed to move to add a count to invention E in the interference. Senior party applicant AP would not be estopped to obtain a patent containing claims to invention E.

Example 28: In this example, the facts are the same as in Example 26 except that judgment is awarded on all of AM's claims corresponding to Count 1 to junior party applicant AM and judgment is awarded on all AP's claims corresponding to Count 2 to senior party applicant AP. Both parties would be estopped to obtain a patent containing claims to invention E, because neither moved to add a count to invention E during the interference. Assume that junior party AM could have properly moved under §1.633(f) to be accorded the benefit of an earlier application, but did not do so during the interference. Junior party AM would not be estopped in subsequent *ex parte* prosecution from asking for benefit of the earlier application as to the invention defined by Count 1. Accordingly, if the examiner were to reject junior party AM's claim corresponding to Count 1 on the basis of some newly discovered prior art, junior party AM could properly antedate the prior art by seeking the benefit under 35 U.S.C. §120 of the earlier application. Thus, even though junior party AM was a "losing party" as to Count 2 (an adverse judgment as to junior party AM's claims corresponding to Count 2 having been entered), junior party AM was awarded a favorable judgment (§1.658(c)) as to Count 1. Junior party AM would be estopped in subsequent *ex parte* prosecution from attempting to be accorded the benefit of the earlier application as to the invention of Count 2.

Example 29: Applicant AQ discloses and claims invention "F." Applicant AR discloses and claims separate patentable inventions "F" and "G." The assignee of applicant AQ also owns an application AS which discloses and claims invention "G." An interference is declared between applicant AQ and applicant AR. The sole count is directed to invention F. No motion is filed by applicant AQ or its assignee to declare an additional interference between applicant AR and applicant AS with a count to invention G. A judgment as to all of AR's claims corresponding to the sole count is awarded to applicant AR. Applicant AS and the assignee would be estopped to obtain a patent containing claims to invention G, because applicant AR and the assignee failed to move to declare an additional interference with a count to invention G.

Example 30: The facts in this example are the same as the facts in Example 29 except that judgment as to all of AQ's claims corresponding the sole count is awarded to applicant AQ. Applicant AS and the assignee would not be estopped, because applicant AQ was not a "losing party" (§1.658(c)).

Example 31: Applicant AT discloses a generic invention to "solvent" and a species to "benzene." Application AT contains a patentable claim 1 (solvent) and no other claims. Applicant AU discloses the generic invention to "solvent" and species to "benzene" and "toluene." Application AU contains patentable claim 3 (solvent) and no other claims. An interference is declared with a single count (solvent). Claims 1 of application AT and claim 3 cf applicatien AU are designated to correspond to the count. No preliminary motions are filed. A judgment is entered in favor of applicant AT on the claim corresponding to the sole count. Applicant AU would be estopped to obtain a patent containing a claim to benzene, because applicant AU failed to file a preliminary motion under §1.633(c)(1) seeking to add a count to benzene and benzene was disclosed in winning party AT's application. Applicant AU would also be estopped to obtain a patent containing a claim to toluene, unless "toluene" defines a "separate patentable invention" from "solvent ." A basis for interference estoppel (§1.658(c)) exists if "toluene" and "solvent" define the "same patentable invention," because a claim to "toluene" could properly have been added and designated to correspond to the count. See §1.633(c)(2).

Under §1.659, the Board would be able to make recommendations to examiners and the Commissioner, including recommendations that application claims not involved in the interference be rejected and that a patent be reexamined as to patent claims not involved in the interference.

Under §1.660, a party would be required to notify the Board when the party's patent or application becomes involved in other PTO proceedings (reexamination, reissue, or protest) or litigation.

Section 1.661 sets forth when an interference is considered terminated after a judgment is entered in the interference. For the purpose of filing copies of settlement agreements, an interference is considered terminated when the time for all appeals has expired. *Tallent* v. *Lemoine*, 204 USPQ 1058 (Comm'r.Pat. 1979). See also *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.662 provides that a party may request that an adverse judgment be entered. The section also provides that when a written disclaimer (not a statutory disclaimer), concession of priority or unpatentability, abandonment of the invention, abandonment of an application, or abandonment of the contest is filed, the disclaimer, concession, or abandonment would be treated as a request for entry of an adverse judgment. Section 1.662(b) provides that when a patentee files a reissue application and omits all claims of a patent corresponding to the counts of an interference for the purpose of avoiding the interference, judgment would be entered against the patentee. Under §1.662(c), the filing of a statutory disclaimer would not be treated as a request for entry of an adverse judgment unless all patent claims corresponding to a count are disclaimed. Under §1.662(d), if after entry of a judgment or after filing of a statutory disclaimer no interference exists, the interference would be terminated as to any party against whom judgment has not been entered and any further prosecution of any application involved in the interference would be *ex parte* before the examiner.

Section 1.666 sets out the procedure for filing settlement agreements in interference cases. The PTC is merely a repository for copies of agreements filed under 35 U.S.C. §135(c) and does not undertake to rule on whether the statute requires that a copy of any particular agreement be filed. *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.671 sets out what would be considered evidence. The Federal Rules of Evidence, with certain exceptions, are made applicable to interference cases. Under§1.671(e), a party cannot rely on a previously filed affidavit unless the affidavit is served and notice is given that the party intends to rely on the affidavit. The purpose for the notice is to permit an opponent to determine whether a deposition for cross-examination is necessary (see §§1.672(b) and 1.673(e)).

Section 1.671(e) is intended to overrule prior construction of PTO rules in *Holmes* v. *Kelly*, 586 F.2d 234, 237 n. 7, 199 USPQ 778, 782 n. 7 (CCPA 1978) and *Brecker* v. *Jennings*, 204 USPQ 663 (Bd.Pat.Int. 1978), which considered a Rule 132 affidavit in the file of an involved application to be part of the "record" in an interference. Under §1.671(e), a party intending to rely on such an affidavit must give notice and serve a copy of the affidavit on the opponent.

Under §1.671(f), the significance of documentary and other exhibits must be discussed with particularity by a witness during oral deposition or in an affidavit. Section 1.671(f) sets out in the regulations an evidentiary requirement imposed by precedent. See *Popoff* v. *Orchin*, 144 USPQ 762 (Bd.Pat.Int. 1963) (unexplained experimental data should not be considered); *Chandler* v. *Mock*, 150 F.2d 563, 66 USPQ 209 (CCPA 1945) (records standing alone were held to be meaningless), and *Smith* v. *Bousquet*, 111 F.2d 157, 45 USPQ 347 (CCPA 1940) (unexplained tests in stipulated testimony are entitled to little weight). See also *In re Borkowski*, 505 F.2d 713, 184 USPQ 29 (CCPA 1974) and *Triplett* v. *Steinmayer*, 129 F.2d 869, 54 USPQ 409 (CCPA 1942). Under §1.671(g), a party is required to obtain permission from an examiner-in-chief prior to proceeding under 35 U.S.C. §24. This requirement insures that a subpoena is necessary (e.g., a subpoena ordinarily should not be necessary where testimony of an opponent is sought) and that testimony sought through a §24 subpoena is relevant before a subpoena is issued. The motion seeking permission to proceed under §24, any opposition thereto, and the order of an examiner-in-chief authorizing the moving party to proceed under §24 will be of assistance to a federal court in the event a party is required to resort to a court to enforce the subpoena or to compel answers to questions propounded at any deposition where a witness is appearing pursuant to a subpoena. See *Sheehan* v. *Doyle*, 529 F.2d 38, 188 USPQ 545 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976).

Under §1.671(h), any evidence which is not taken or sought and filed in accordance with the regulations will not admissible.

Section 1.672 sets forth the manner in which testimony shall be taken. Testimony can be taken by deposition or affidavit at the election of the party presenting the testimony. A party presenting testimony by affidavit must file and serve the affidavit. If the party presents testimony by affidavit and an opponent elects to cross-examine the affiant, the party is required to notice a deposition for the purpose of cross-examination. Re-direct and re-cross will take place at the deposition. Where the parties agree, testimony can be presented by affidavit without opportunity for cross-examination (see §1.672(e)) or by an agreed statement of facts (see §1.672(f)).

Section 1.673 sets out how a deposition must be noticed. A deposition can be noticed for any reasonable place in the United States. The extent to which parties, witnesses, and attorneys or agents have to travel may be considered in determining whether a place is reasonable. Prior to serving a notice for a deposition, a party is required to take two procedural steps. Under §1.673(b), a party would be required to serve a copy of the documents and a list of the things in its possession, custody, and control upon which it intended to rely. Under §1.673(g), the party is required to have an oral conference (in person or by telephone) with all opponents to attempt to agree on a mutually acceptable time and

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place for taking the deposition. An examiner-in-chief may set the time and place if agreement is not reached. A single notice listing all the witnesses and the general nature of their expected testimony is then served. Under §1.673(c) and except as provided, a party can not rely on any witness not mentioned in the notice, any document not served, or any thing not listed. Under §1.673(h), a copy of any notice must be attached to the certified transcript of each deposition filed.

Section 1.674 sets out the persons before whom depositions can be taken.

Section 1.675 sets out how a deposition is to be taken.

Section 1.676 sets out how a court reporter should prepare and file a certified transcript of a deposition. Section 1.676(d) sets out how exhibits are to be marked for identification, used at depositions, and filed. Provisions similar to those of Rule 30(f) (1)(A) and (B) of the Federal Rules of Civil Procedure are applicable to interferences.

Section 1.677 sets out the form of a transcript of a deposition.

Under §1.678, a transcript of a deposition must be filed in the PTO within 45 days of the date of the deposition.

Section 1.682 sets out how a party may introduce in evidence, if otherwise admissible, official records or printed publications. When a notice is served, a party is also required to serve (but not file) copies of the official records and printed publications. Any objection to the notice or to the admissibility of any official record or publication must be filed within 15 days of the date of service of the notice.

Section 1.683 sets out how a party may use testimony from another interference or proceeding.

Section 1.684 sets out how a party may take testimony in a foreign country.

Section 1.685 sets out how objections during the taking of depositions must be raised. Under §1.685(a), an error in a notice of deposition is waived unless a motion to quash the notice is filed as soon as the error is, or could have been, discovered. Under §1.685(b), any objection to the qualifications of an officer is waived unless (1) the objection is noted on the record of the deposition before a witness begins to testify or (2) if discovered after the deposition, a motion to suppress is filed as soon as the objection is, or could have been, discovered. Under §1.685(c), any error in the manner in which testimony is transcribed, the transcript is signed by a witness, or the transcript is prepared or otherwise handled by the court reporter is waived unless a motion to suppress is filed as soon as the error is, or could have been, discovered. Under §1.685(d), any objection on the merits to the admissibility of evidence (e.g., under the Federal Rules of Evidence is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Often objections are cured by subsequent testimony. Accordingly, any objection which a party wants the Board to consider at final hearing must also be made the subject of a motion under §1.656(h).

Section 1.687 sets out how a party could seek and obtain additional discovery. "Additional discovery" is defined in §1.601(a). Section 1.687 does not change the standard ("interest of justice") for obtaining discovery.

Section 1.688 sets out how a party can introduce into evidence admissions and answers to interrogatories obtained as a result of additional discovery.

Changes in Text

Several changes have been made to the text of the proposed rules published in the *Federal Register* on Jan. 30, 1984. The changes are discussed below. Additional rationale for the changes are further discussed under the heading "Analysis of Comments."

All references to the "Board of Appeals and Interferences" have been changed to "Board of Patent Appeals and Interferences" in view of Public Law 98–622.

In §1.11(a) the language "or after termination of an interference without an award of judgment" has been deleted. This change has been made in view of changes made in paragraphs (c) and (d) of §1.662.

In response to a comment, the fee required for a petition in an interference under §1.644(e) and a request for reconsideration of a decision on petition in an interference under §1.644(f) have been set out as separate items.

Section 1.136 was changed to refer to §1.611 rather than §1.610(a).

The following sentence was inadvertently omitted as the third sentence of §1.138 in the notice of proposed rulemaking: "A registered attorney or agent acting under the provision of §1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application." This sentence presently appears in §1.138.

In §1.196(d), second sentence, "thirty days" has been changed to "one month".

In §1.197(b), "thirty days" has been changed to "one month".

In the last sentence of §1.304, "The Commissioner" has been changed to "An examiner-in-chief" and "of a decision of the Board of Patent Appeals and Interferences in an interference case" has been inserted after "time for seeking judicial review." This change is made to limit the "excusable neglect" standard to interference cases only.

In §1.601(j), the language "all the claims of a party which correspond" has been changed to read "at least one claim of a party which corresponds". The language "all the claims of an opponent which correspond" has been changed to read "at least one claim of an opponent which corresponds".

Section 1.605(a) has been changed by deleting from the third sentence the language "a claim which is the same or substantially the same as" and by adding the following sentence as the fourth sentence: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." In the second sentence, "30 days" has been changed to "one month".

In the last sentence of §1.606, the language "to define one patentable invention" has been changed to read: "not to contain separate patentable inventions."

The word "and" has been inserted in §1.607(a) before "(3)". The word "must" in the first sentence of §1.607(c) has been changed to "shall" in response to a suggestion in a comment.

Pursuant to two separate suggestions, the following is being added after the first sentence in §1.608(b): "Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm.)."

In §1.609(b)(1), the language "count or counts" has been changed to "proposed count or counts". In §1.609(b)(2), each occurrence of "the count" has been changed to "each count".

In §1.613(a), "§1.344" has been changed to "this Chapter." This change is being made to obviate the need to again amend §1.613 in the event new rules relating to practice before the PTO are issued. See the notice of proposed rulemaking published in the *Federal Register* on Aug. 24, 1984. 49 F.R. 33790, proposed §§10.62 and 10.66. The language "or members of the same firm of attorneys or agents" has been added after "agent" in §1.613(b).

In §1.615(a), second sentence, "which are" has been deleted and "in the interference" has been added after "will not be entered or considered".

Several changes have been made in §1.617. In §1.617(a), the language "the interference shall proceed before the examiner-in-chief" has been changed to read: "the interference shall proceed in the normal manner under the regulations of this part". The second sentence of §1.617(b) ("A response may include a request by the applicant for a hearing before the Board.") has been changed to read: "Any request by the applicant for a hearing before the Board shall be made in the response." This change was made to clarify when and how a hearing must be requested by the applicant. The second sentence of §1.617(d) has been changed to read: "The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." Section 1.617(e) has been re-written as follows: "Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." The language "examiner-in-chief or the" has been added after "by the applicant is timely filed, the" in the first sentence of §1.617(g). The language "Board decides that" has been deleted from the second sentence of §1.617(g). The language "If the Board decides otherwise" has been replaced with "Otherwise" in the third sentence of §1.617(g). The language "before the examiner-in-chief" in the third sentence of §1.617(g) has been changed to read: "in the normal manner under the regulations of this part." These changes will authorize either an examiner-in-chief or a Board to authorize an interference to proceed under §1.617(g). It will continue to be necessary for the Board to enter an order *granting* summary judgment. In the last sentence of §1.617(h), "patentee" has been changed to "any opponent".

The language "the name of" has been deleted from the first sentence of §1.622(a). The second sentence of §1.622(a) in the notice of proposed rulemaking ("When an inventor identified in the preliminary statement is not identical to the inventor named in the party's application or patent, the party shall file a motion . . . .") has been changed to read: "When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion . . . ." This change is being made in view of §105(a) of Public Law 98-622 which amended 35 U.S.C. §116 to permit joint inventors to be named "even though . . . (3) each did not make a contribution to the subject matter of every claim . . . ."

The following changes have been made in §1.623(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "when a drawing or written description" has been changed to "when a copy of the first drawing or first written description".

Several changes have been made to §1.624. The following has been added as a second sentence in §1.624(a)(5): "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." The following changes have been made in §1.624(c). Each occurrence of "was made" has been changed to "was introduced into the United States." In the first sentence, "copy of the drawing" has been changed to "copy of that drawing". In the second sentence, "copy of the written description" has been changed to "copy of that written description". In the third sentence, "a drawing or written description" has been changed to "a copy of the first drawing or first written description introduced in the United States".

The following changes have been made in §1.625(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "a drawing or written description" has been changed to "a first drawing or first written description".

The language of §1.628(b) which read: "because the drawing or written description is not in the party's possession, custody, or control, the party may file a motion . . . to amend its preliminary statement promptly after it secures possession, custody, or control of a copy of the drawing or written description" has been changed to read as follows: "the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion . . . to amend its preliminary statement promptly after the first drawing, first written description or drawing or written description first introduced into the United States becomes available."

The first sentence ("A preliminary statement should be carefully prepared.") has been deleted from §1.629(a).

In §1.629(b), the language "no earlier than" has been changed to "as early as".

In §1.629(d), the following has been added after "allegation": "unless the party complies with §1.628(b)."

A new §1.632 has been added to require a party to give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. A companion change has been made to §1.654.

Two changes have been made to §1.633(c). Paragraph (c)(2) has been changed by adding thereto the following language: "or adding a claim in the moving party's application to be designated to correspond to a count". In addition, in §1.633(c), the "or" before "(4)" has been deleted and the following has been added to the end of the first sentence: ", or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count."

Paragraph (j) has been added to §1.633.

In §1.636(b), "(i)" has been changed to "(i) or (j)" in view of the addition of paragraph (j) to §1.633. The language "filed as soon as practical" in §1.636(c) has been changed to "diligently filed" in order to conform §1.636 to §1.48. A party must exercise diligence in correcting inventorship. *Van Otteren* v. *Hafner*, 278 F.2d 738, 126 USPQ 151 (CCPA 1960).

Several changes have been made to §1.637. The language "Where appropriate," has been deleted from the following paragraphs of §1.637: (c)(1)(vi); (c)(2)(iv); (c)(3)(iii); (d)(4); (e)(1)(viii); (e)(2)(vii); and (h)(4). The following has been added in §1.637(c)(2) before "shall": "or adding a claim to be designated to correspond to a count". The language "amended claim" in §1.637(c)(2)(i) has been changed to read: "amended or added claim". The language "Apply the terms of each proposed claim to the disclosure of the application" in §1.637(c)(2)(ii) has been changed to read: "Show that the proposed or added claim defines the same patentable invention as the count." The language "proposed amended claim" in §1.637(c)(2)(iii) has been changed to read "amended or added claim." The language "adding the proposed claim" in §1.637(c)(2)(iii) has been changed to read: "making the amended or added claim".

The word "interferences" in §1.637(c)(4)(ii) has been corrected to read: "interference".

Subparagraph (c)(5) has been added to §1.637.

The following has been added as the last sentence to §1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met."

In paragraph §1.637(f)(3), the language "discloses an embodiment with the scope" has been changed to read: "constitutes a constructive reduction to practice".

The first sentence, originally proposed in §1.638(b) ("A reply to an opposition shall not be filed unless au-

thorized by this subpart or an examiner-in-chief or the motion was filed under §§1.633 or 1.634"), has been deleted. The language "any authorized reply" in §1.638(b) has been changed to "a reply".

The language "or a motion to correct inventorship under §1.634" has been added to the first sentence of §1.639(c) after "preliminary motion under §1.633."

The following has been added after the first sentence of §1.640(b)(1): "Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved." The fourth sentence of §1.640(c) ("A request for reconsideration will ordinarily not be granted unless an opposition has been requested by an examiner-in-chief or the Board") has been changed to read: "A decision of a single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board." In the last sentence of §1.640(c), the language "shall be decided by a panel" has been changed to read: "shall be acted on by a panel".

The word "application" in the paragraph heading and text of §1.642 has been changed to read: "application or patent".

Three changes have been made in §1.644. The following language has been added after "Commissioner" in §1.644(a)(2): "and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence". The following language has been deleted from the second sentence of §1.644(b): "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under rhe Federal Rules cf Evidence". The language "A request for reconsideration will ordinarily not be granted unless" in the second sentence of §1.644(f) has been changed to read: "The decision will not ordinarily be modified unless such".

Two changes have been made in §1.645. The word "to" has been added before "file a notice of appeal" and "commence a civil action" in the first sentence of paragraph (a). The language ", accompanied by an affidavit," has been deleted from paragraph (b).

Three changes have been made to §1.646. The word "service" has been added after "additional" in the third sentence of paragraph (b). The language "or except as otherwise provided by this part," has been added after "otherwise ordered by an examiner-in-chief," in paragraph (c). The language in paragraph (c) "paper may be made" has been changed to "paper shall be made". The word "time" has been changed to "date" in the last sentence of paragraph (e).

A new paragraph (c) has been added to §1.654 to require that a party give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. Section 1.632 specifies the time within which the notice shall be filed.

Three changes have been made in §1.658. The language "paragraph (a) of the section" in the last sentence of §1.658(b) has been changed to "paragraph (a) of this section". The "(i)" in the first sentence of §1.658(c) has been changed to "(j)" in view of the addition of §1.633(j). In the notice of proposed rulemaking, the second sentence of §1.658(c) read: "A party, other than a party awarded a favorable judgment as to all counts, who could have properly moved, but failed to move, under §§1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with the party's failure to properly move." This sentence has been changed to read: "A losing party who could have properly moved, but failed to move, under §1.633 cr 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment."

Several changes have been made in §1.662. In §1.662(a), the word "construed" has been changed to "treated". The first sentence of §1.662(c) in the notice of proposed rulemaking read: "The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will not be treated as a request for entry of an adverse judgment against the patentee, but will delete any statutorily disclaimed claims from being involved in the interference." That first sentence has been changed to read: "The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference." The second sentence of §1.662(c) in the notice of proposed rulemaking read: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." That second sentence has been changed to read: "A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count." In view of this change, proposed §1.662(d) has been deleted as unnecessary, and a change has also been made in §1.11(a) to delete any reference to a termination of an interference by any means other than judgment.

The last sentence of §1.671(g) has been changed from "The motion shall describe the general nature and show the admissibility in the interference of the testimony, document, or thing" to: "The motion shall describe the general nature and the relevance of the testimony, document, or thing."

Three changes have been made to §1.672(b). In the second sentence after "witness by affidavit shall" the following has been added: ", prior to the close of the party's relevant testimony period". The language "file an affidavit" has been changed to "file and serve an affidavit". The following has been added after the third sentence: "A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document."

Several changes have been made in §1.673(b). The introductory sentence of paragraph (b) ("Unless the parties agree otherwise, at least three days prior to the conference required by paragraph (g) of this section, a party shall serve, but not file, the following:") has been changed to read: "Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:" In §1.673(b)(1) the word "copy" has been changed to "list and copy".

In the last sentence of §1.675(d), the language "signed by the witness in the presence of any notary" has been changed to read "signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration". This change conforms §1.675(d) to §1.68.

In §1.682(a)(4), ", where appropriate," has been added prior to "be accompanied" and "(§1.671(d))" has been added after "printed publication".

The word "admissible" in §1.684(a)(4) has been changed to "relevant".

The following sentence has been deleted from §1.687(b): "If the witness refuses to produce a requested document or thing, the party may file a motion (§1.635) for additional discovery under paragraph (c) of this section."

Section 1.688 has been revised to more clearly describe how a party may introduce in evidence an answer to a request for admission or an answer to a written interrogatory.

Analysis of Comments

Eighteen written comments were received. Three individuals testified at a hearing held on May 15, 1984.

The following is an analysis of the written comments and the oral comments made at the hearing.

One comment suggested that §1.8 not be amended to exclude from the certificate of mailing practice a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail." The comment argues that "[s]ome parties might not have an attorney in the Washington area or they may live in an area not serviced by Express Mail." The suggestion is not being adopted. Experience has shown that there are situations in interferences where it is desirable to have and the parties need a prompt ruling on a written motion. It is difficult for an examiner-in-chief to render a prompt ruling if the motion and any opposition are not promptly served and filed. In those situations where a party has no Washington, D.C. metropolitan area attorney or where a party resides in an area not served by "Express Mail," it may not be possible to hand-file or use "Express Mail." The examiner-in-chief would then exercise discretion by not invoking the exception of new subparagraph (xii) of §1.8(a).

One comment suggested that it would be clearer if the fee for a petition in an interference and the fee for a request for reconsideration of a decision on petition in an interference were set out in §1.17(h) as separate items. This suggestion has been adopted and the two fees have been set out in §1.17(h) as separate items.

A suggestion was made that a reference be made in §1.136 to §1.611 rather than §1.610(a). The suggestion is being adopted, because a reference to §1.611 is believed to be more appropriate. Once an interference is declared involving an application, *ex parte* prosecution of the application is suspended and the applicant need not respond to any PTO action outstanding as of the date the interference is declared.

One comment made the following remark concerning §1.196: "I do not understand the need or desire of the PTO to start the time to appeal to a Court from a PTO *final* decision on one claim, while PTO action is continuing on a second claim." As explained in the notice of proposed rulemaking (49 F.R. 3770, columns 2–3; 1039 O.G. 20–21; 1039 TMOG 20–21), when there are further proceedings before the examiner following a decision by the Board of Patent Appeals and Interferences, judicial review is not appropriate. Hence, under §1.196, the PTO will not start a time for seeking judicial review of a PTO decision on one claim while PTO action is continuing on another claim. The last sentences of §1.196(b)(1) and §1.196(d) authorize the Board to enter an order making its decision final as to one claim when remand proceedings as to another claim result in a favorable decision for the applicant. Section 1.196 is intended to eliminate piecemeal appeals.

With respect to §1.292(c), one commentator said: "[a] party should be able to raise public use and [on] sale issues at any stage [of an interference proceeding] provided the issue is raised in a timely manner after learning of the use or sale." Public use and on sale issues are to be raised in interferences by way of a preliminary motion under §1.633(a). If a motion under §1.633(a) cannot be timely filed, a belated motion may be filed provided the moving party complies with the provisions of §1.645(b). Whether or not a belated motion will be accepted where a public use or sale is discovered after the time for filing §1.633(a) motions which has passed will manifestly depend on the facts of a given case.

One comment suggested that the language "speedy, and inexpensive" be deleted from the second sentence of the preamble of §1.601. This suggestion is not being adopted. The second sentence of the preamble of §1.601 provides that the rules "shall be construed to secure the just, speedy, and inexpensive determination of every interference." The provision is modeled in part after the second sentence of Rule 1 of the Federal Rules of Civil Procedure which states that the Federal Rules "shall be construed to secure the just, speedy, and inexpensive determination of every action." The "just, speedy, and inexpensive determination" provision of §1.601 will prove useful in construing other provisions in the rules.

Two comments were received which suggested a change in language in §1.601(j). One comment correctly noted that "[i] f even one claim of each party defines the same patentable invention, there is an interference-in-fact." The comment went on to correctly note that "[t] he remaining claims can be disposed of by a motion under§1.633(c)(4)." A second comment noted that under the definition proposed, all the claims of both parties corresponding to a count must define the same patentable invention. The comment went on to correctly note the intent of the PTO is, however, that an interference-in-fact exists if at least one of the claims of a party corresponding to a count defines the same patentable invention as one of the corresponding claims of an opponent. In view of the suggestions made in the two comments, §1.601(j) has been changed to state that an interference-in-fact exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count defines the same patentable invention.

Two comments were received which suggested that the language "earliest filing date" in §1.601(m) be changed to read "earliest effective filing date." The suggestion is not being adopted. Section 1.601(m) defines "senior party." The definition of "senior party" in §1.601(m) is consistent with current practice and is intended to codify current practice. In an interference where there are no benefit applications, the "senior party" is the party with the earliest "filing date." There are interferences where a party may be "senior" with respect to a first count based on the filing dates of the applications involved in the interference and "junior" with respect to a second count because the opponent is entitled to benefit of an earlier application as to the second count only. Under these circumstances in the past, the PTO has designated the party who is "senior" based on the filing dates of the applications involved as the "senior party." The designation of the party as "senior party" is for procedural purposes only, i.e., setting who takes testimony first, and does not affect which party has the burden of proof. Section 1.601(m) preserves this past practice.

Comments were received regarding §1.601(n) which defines "same patentable invention" and "separate patentable invention." One written comment suggested that §1.601(n) be deleted. The commentator appeared at the hearing and also urged orally that §1.601(n) be deleted. The suggestion is not being adopted. In view of the nature of the comment and the importance of the definitions in §1.601(n), the written comment is reproduced in its entirety:

Comment: The paragraph to be deleted contains an explicit definition of both "same patentable invention" and "separate patentable invention". It requires application of a two-prong test for determining "sameness" or "separateness". Two inventions are considered to be the "same patentable invention" when they are the same under 35 USC 102 or obvious variants under 35 USC 103 when one is considered as "prior art" with respect to the other. Application of this standard may lead to results which are anomalous or in conflict with statutory requirements if, as the proposed rules apparently assume, the award of priority as to counts embodying "separate patentable inventions" will inherently and finally resolve the question of entitlement to a patent as between the parties on involved claims corresponding to those counts. Three specific problems with the definition of Rule 601(n) have been identified as follows:

(1) If the standard of separate patentability as between two counts is applied on a mutual basis (i.e., Invention A must be separately patentable from Invention B considered as prior art and Invention B must be separately patentable from Invention A considered as prior art), then the conduct of interferences with separate counts directed to both a generic invention and an included specific embodiment thereof (i.e., a species) are frustrated. If, however, such mutuality is not applied (i.e., if In-

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vention A is the existing count, then a count directed to Invention B is proper so long as Invention B would be considered patentable over Invention A as prior art), then a number of irreconcilable anomalies in count modification through preliminary motions practice will be manifest.

(2) "Separate patentability" as a non-obviousness issue is in every context *except* interference practice before the PTO determined with finality only when an *affirmative* determination has been reached or the applicant *elects* to discontinue further prosecution of any applications embodying the invention or to admit obviousness. Because in the ex parte context an applicant may continue to marshall additional evidence supportive of non-obviousness until separate patentability over a prior art invention has been established, "separate patentability" is always a fluid concept where ultimate resolution can neither be predicted nor foreclosed. On certain cases interference proceedings under the proposed rules will be conducted and judgment rendered on the assumption of a lack of "separate patentability", which would ordinarily be subject to change or rebuttal as additional argument, evidence or other supportive activity of non-obviousness were marshalled. Thus, simply determining a proposed count is not yet "separately patentable" for the purposes of count formation ought not to foreclose post-interference reconsideration of separate patentability questions when the party proposing the count would not have been foreclosed on priority grounds.

(3) The underlying assumption that "separate patentability" is to be established under the proposed rules for one invention when a second invention is considered as "prior art" does not have any necessary correspondence to the *effect* of an adverse judgment in an interference on the question of priority. While a lost count in interference is not patentable to the loser, the lost count will be considered as "prior art" against the losing party only if the status of prior art for the purposes of 35 USC 103 is established by the record in the interference, (i.e., by representing a prior invention of another made in the United States, not abandoned, suppressed or concealed under 35 USC 102). A party entitled to priority for a count under the benefit provisions of 35 USC 119 creates no "prior art" under 35 USC 102(g)/103 against his opponent. Separate counts ought not to be created or denied in an interference on the basis of a rule which fails to account for whether the interference record will confirm the assumption in the definition that a lost count will become "prior art".

The following examples are provided as indicative of perceived difficulties in the application of the definition embodied in Rule 601(n):

Example A: Rule 601(n) is applied in a mutuality sense to an interference where the existing count (Invention A) is a broad genus over organic compounds. Both parties disclose a species (Invention B) which one of the parties alleges represents a "selection invention", i.e., is neither anticipated by the genus nor obvious therefrom. The party proposing to add a species count to Invention B must demonstrate that the genus was neither the same as nor obvious in view of the species, an impossibility since *disclosure of the species anticipates the genus under 35 USC 102.* In effect, no party could ever propose sub-generic or species counts included within broader generic counts. Since all potential patentability and priority questions with respect to possible sub-generic and species claims are intended to be resolved in the unified patentability/priority proceedings, loss of such a broad generic count might be construed as estopping the losing party from arguing entitlement to a patent for species and sub-genera within the lost count. Since proof of a single species is dispositive of the question of priority as to a genus, no matter how large, this is a more severe result than would appear to be proper or intended.

Example B: Under the facts of Example A, if the standard under which the propriety for including a second sub-generic or species count is merely that the *proposed* count must be non-obvious over the *existing* count considered as prior art, then, an interference could conceivably proceed with both the generic and the species count in the interference. The usual criteria for "selection inventions" could be employed. However, when an interference is declared with a species count embodying Invention A, then utilization of a test requiring that a proposed count be non-obvious over the existing count as prior art leads literally to the conclusion that a proposed count to a generic Invention B is *anticipated* by the existing species count and therefore may not be added to the interference. This artificial distinction can certainly not have been intended, and yet the rules provide no clear indication of which result is the "correct" one or whether another test will be employed, e.g., the narrower count need only be non-obvious over the broader count.

Example C: A party moves to substitute two sub-generic counts to allegedly separately patentable inventions, Invention A and Invention B, in place of a broad generic count to the "Markush" group of Invention A *and* Invention B. The party alleges Invention B has surprising and unexpected properties over Invention A and is separately patentable thereover. Because, however, a consideration of Invention B as "prior art" suggests Invention A would not be non-obvious thereover, the motion is denied. The moving party establishes priority as to Invention B, but loses the sole count of the interference to an opponent who filed a foreign application disclosing a single species from Invention A. The result is that the moving party with clear evidence of priority apparently loses the right to patent an invention on the technicality of "count formation" in interference. The result is substantially more severe than had he been simply faced with a statutory bar!

Example D: The senior party, a foreign applicant, relies on a priority application disclosing Embodiment A. Subsequently the junior party files a United States application directed to an Embodiment B. Thereafter both parties file applications in the United States disclosing a generic invention including both Embodiments A and B. An interference is declared on the generic invention and the junior party moves to substitute two counts, one count to Embodiment A and a second count to Embodiment B on the ground that they represent separate patentable inventions. Since the junior party's invention date for Embodiment B is after the senior party's priority date, the junior party will be obliged to concede priority on the sole count in the interference unless his motion to substitute counts is granted.

Accordingly, the junior party undertakes laboratory tests which indicate that both Embodiments A and B achieve substantially the same result in substantially the same manner without any significant differences in effectiveness. Without evidence of separate patentability to support the motion to substitute, the junior party is unsuccessful and priority is awarded to the senior party.

The junior party abandons his claim to the generic invention of the lost count, but persists in his assertion he is entitled to a patent on Embodiment B since the interference record indicates no actual priority for this embodiment in favor of the senior party. Ultimately, the junior party obtains evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting, while Embodiment A is substantially unsuitable for any practical use in a commercial setting.

Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? Finally, would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? All of these questions suggest that the utilization of a fluid concept such as non-obviousness as the basis for count formation will give unintended and unsupportable results in situations where the lack of separate patentability is prematurely assumed.

Example E: In the scenario of Example D, the non-entitlement to contest Embodiment B as a separate count was premised on a failure to demonstrate that Embodiment B was non-obvious over Embodiment A considered as prior art. However, an award of priority to the senior party based on the disclosure of Embodiment A in a foreign priority application does not render Embodiment A as available prior art (35 USC 102(g)/103) inasmuch as Embodiment A would not have been a prior invention of another made in the United States which had not been abandoned, suppressed or concealed. The junior party's entitlement to a patent on Embodiment B should depend, therefore, solely on his entitlement to priority with respect to Embodiment B. Priority is a necessary condition for entitlement to a patent since both parties disclose the embodiment and a sufficient condition since regardless of the party entitled to priority on Embodiment A, it should not become obviousness-generating prior art. Therefore, any standard or count formation which fails to reach the result of the junior party is entitled to contest priority and a patent on Embodiment B is contrary to current statutory requirements for entitlement to a patent.

The proposed rules attempt to rationally define counts in an interference so that the judgment in the interference settles all questions of entitlement to a patent. This not only cannot be done *prospectively*, but should not be done at all. Judgment should be made on *claims*, not counts and unpatentability determinations made against a party subject to the normal ex parte standard that additional evidence of non-obviousness, or other evidence of patentability wholly independent of priority itself, could compel a reconsideration of the judgment of unpatentability.

With respect to paragraph (1) of the comment, the standard of patentability will *not* be applied "on a mutual basis." Thus, if a species is patentable over a genus, the species is a "separate patentable invention" from the genus. Compare *In re Taub*, 348 F.2d 556, 146 USPQ 384 (CCPA 1965) (fluorine species might be patentable over genus of Markush group of hydrogen and halogen). A first count to a genus and a second count to a species which is patentable over the genus may properly appear in an interference. See e.g., Example 4. The comment suggests that if "such mutuality is not applied . . . then a number of irreconcilable anomalies . . . will be manifest." The urged "irreconcilable anomalies" are not readily apparent to the PTO.

The PTO disagrees with the concept expressed in paragraph (2) of the comment that there should be "post-interference reconsideration of separate patentability." One of the principal objects of Public Law 98–622 and these new rules is to encourage complete determination of all rights between parties in an interference and to avoid post-interference reconsideration in an *ex parte* environment of issues which were or could have been raised *inter partes* in an interference.

The commentator remarks in paragraph (3) of the comment that "[a] party entitled to priority for a count under the benefit of 35 USC 119 creates no 'prior art' under 35 USC 102(g)/103 against his opponent." *In re McKellin*, 529 F.2d 1324, 188 USPQ 428 (CCPA 1976), arguable provides support for the commentator's remark. It should be noted, however, that in defining "same patentable invention" and "separate patentable invention" in §1.601(n), the PTO is not establishing a new definition of "prior art." Rather, the PTO is providing definitions which will determine—both initially and ultimately in an interference—how *claims* in an application or patent will be designated to correspond to counts. See §§1.603 and 1.606. Examples 1-19 illustrate how the PTO proposes to initially designate claims to correspond to counts. The designation of claims to correspond (or not correspond) to a count is significant because, as noted by the plurality opinion in *McKellin*, 529 F.2d at 1327, 188 USPQ at 432: "[a] n applicant [or patentee] who has lost an interference is not entitled to claims which correspond to the subject matter of the counts of the interference." Section 1.658(c) estops a party from obtaining a claim which could have been added and which would have been designated to correspond to the lost count. The definitions of "same patentable invention" and "separate patentable invention" in §1.601(n), the availability of motions to designate or not designate claims as corresponding to a count under §1.633(c), and the estoppel provisions of §1.658(c) provide the basis for accomplishing the PTO's objective of resolving *inter partes* in a single proceeding all issues which are or could have been raised between parties in an interference.

Examples illustrate how §§1.601(n), 1.633(c) and 1.658(c) accomplish the PTO's objective.

Example 32: Application AV discloses engines in general and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). The U.S. "filing date" (§1.601(h)) of the AV application is prior to the U. S. filing date of the AW application, but the AW application claims a foreign priority date under 35 U.S.C. 119 based on an application filed in a foreign country prior to the filing date of the AV application. An interference is declared. The sole count of the interference is to "an engine." Claim 1 of the AV application and claim 3 of the AW application are designated to correspond to the count. During the interference, applicant AV does not move under §1.633(c)(2) to add a claim to a 6-cylinder engine and to designate the claim to correspond to the count. Applicant AW is awarded a judgment in the interference based on the earlier filing date of the foreign patent application. After the interference, applicant AV adds claim 2 (6-cylinder engine) to the AV application. Whether AV would be entitled to a patent containing a claim to a 6-cylinder engine will depend solely on whether a 6-cylinder engine is a "separate patentable invention" from "engine"—the subject matter of the count. If a 6-cylinder engine is a "separate patentable invention" within the meaning of §1.601(n), applicant AV could not have successfully moved under §1.633(c)(2) to add claim 2 and to designate it to correspond to the count. Therefore applicant AV could obtain a patent containing claim 2. If, on the other hand, a 6-cylinder engine is not a "separate patentable invention," claim 2 of the AV application would be rejected on the basis of interference estoppel because claim 2 could have been added by a motion under §1.633(c)(2). See §1.658(c). See also Example 37.

Example 33: This example is basically the same as Example 32, except that application AV initially contains claim 1 (engine) and claim 2 (6-cylinder engine). When the interference is declared, both claims 1 and 2 of application AV are designated to correspond to the count. During the interference, applicant AV does not move under §1.633(c)(4) to designate claim 2 as not corresponding to the count. A judgment in the interference is entered for applicant AW based on the earlier filing date of the foreign patent application. After the interference, applicant AV would not be able to obtain a patent containing claim 2, because that claim was designated to correspond to a count and entry of the judgment constitutes a final decision by the PTO refusing to grant applicant AV a patent containing claim 2.

In the written comment, Examples A through E were set out to illustrate what the commentator believed were "perceived difficulties." These examples are set out above and are analyzed below.

Analysis of Commentator's Example A

Example A does not describe any practice under these rules, because "same patentable invention" and "separate patentable invention" under §1.601(n) are not intended

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to be "applied in a mutuality sense." Where a first count is to a genus and a second count is to a species within the scope of the genus, there may be two counts if the species is separately patentable from the genus. The species is "invention A" referred to in §1.601(n); the genus is "invention B" referred to in §1.601(n).

Analysis of Commentator's Example B

Commentator's Example B suggests—incorrectly—that if an interference is declared with a count to a species that no motion under §1.633(c)(1) to add a count to a genus can ever be granted. If the species ("invention A" referred to in §1.601(n)) is not anticipated by or obvious in view of the genus ("invention B" referred to in §1.601(n)), a motion to add a separate count to the genus may be proper. The commentator uses the language "selection inventions" in both Examples A and B. Insofar as the PTO is aware, the language is not a term of art in the patent law. The PTO has not ascribed any particular meaning to the language in analyzing Examples A or B.

Analysis of Commentator's Example C

The result suggested in commentator's Example C can come to pass only if the moving party accepts as final the denial of the motion to substitute two "sub-generic counts" for the "broad generic count." Unlike practice under the rules which have been in effect, under these new rules a decision denying a motion to substitute a count is reviewable by the Board (see §1.640(c) and §1.655(a), second sentence). Additionally, the party could seek judicial review (35 U.S.C. §§141, 146) of any final decision by the Board. However, if the party accepts as final the PTO's determination that inventions A and B are the "same patentable invention," the party would be precluded from obtaining a patent to invention B. After the interference is terminated, the only conceivable way that the moving party could seek to obtain a patent containing claims to invention B would be to first successfully move to reopen the interference for the purpose of presenting additional evidence. If the motion to reopen is granted (and it would be expected that such a motion will rarely be granted), the moving party would then have to successfully establish that invention A and invention B are not the same patentable invention. The PTO will continue to follow the general guidelines of 4 Rivise & Caesar, *Interference Law and Practice*, §821 *et seq.* (Michie Co. 1948), in determining motions to reopen an interference after entry of judgment. It should be additionally noted that interferences in which a judgment has been entered by a district court in an action brought under 35 U.S.C. §146 or a mandate has been entered by the U. S. Court of Appeals for the Federal Circuit (35 U.S.C. §141 or 28 U.S.C. §1295(a)(4)(C)) will not be reopened until the district court vacates its judgment and/or the Federal Circuit withdraws its mandate.

Analysis of Commentator's Example D

Several questions asked in the commentator's Example D can be answered as follows:

Question: Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? *Answer*: No. The junior party should have presented the "evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting" during the interference. The PTO expects to resolve issues *inter partes* in the interference. If the PTO was to permit the evidence to be presented after the interference is terminated and after *ex parte* prosecution resumes, a principal purpose of the overall change to interference practice would be defeated. It may be unfortunate that the evidence was not known to the junior party. However, it may also be true that the winning party—had the evidence been presented in the interference—could have produced probative counter-evidence. Why should the winning party be put to the expense of a second interference?

Question: If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? *Answer*: The premise in the question is not correct. The junior party is not entitled to a patent to Embodiment B and therefore there will not be a second interference.

Question: Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? *Answer*: Yes, unless the junior party can successfully move to reopen the interference.

Question: Would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? *Answer*: While the question is not fully understood, it should be recognized that counts will initially be formed when an interference is declared and are subject to being changed by a motion (§1.633(c)) or by the Board (§1.640(c) and §1.655, second sentence). The correctness of the PTO's ultimate decision on what counts should be is subject to judicial review (35 U.S.C. §§141, 146).

Analysis of Commentator's Example E

The PTO, without agreeing or disagreeing with all of the commentator's statements in Example E, disagrees with any ultimate conclusion that the junior party is entitled to a patent on Embodiment B and that such a result "is contrary to current statutory requirements for entitlement to a patent." Interference estoppel precludes granting a patent claiming Embodiment B to the junior party even if Embodiment A is not prior art with respect to Embodiment B.

One comment asked whether "invention A" and "invention B" mentioned in §1.601(n) "refer to the entire scope of subject matter recited in a claim or to the disclosed embodiment(s) supporting the claim (a la *In re Vogel*, [422 F.2d 438,] 164 USPQ 619 (CCPA 1970))?" The question is somewhat difficult, if not impossible, to answer in the abstract. Whether "invention A" refers to the entire scope or to the embodiments which support a claim is not controlling under these new rules. One fundamental change being made under the new rules is that judgments will be in the form of whether an applicant or patentee is or is not entitled to a *claim*. In the past, the Board of Patent Interferences has entered an "award of priority." The use of an "award of priority" does not always accurately express the "judgment" entered in many interferences. See e.g., *Applegate* v. *Scherer*, 332 F.2d 571, 573 n. 1, 141 USPQ 796, 798 n. 1 (CCPA 1964). Whether an applicant or patentee is or is not entitled to a particular claim in any given interference will depend on many factors, some of which include the scope of the claim, the scope of the opponent's claim, and the prior art. An example illustrates the point.

Example 34: Applicant AX discloses an apparatus having fastening means. The specific means disclosed are rivets. Applicant AY discloses a similar apparatus having fastening means. The specific means disclosed are a nut and bolt. The prior art reveals that items have been fastened with numerous fastening means including both rivets and nuts and bolts. In determining whether AX's apparatus with rivet fastening means is the "same patentable invention" as AY's apparatus with nut and bolt fastening means, it would be proper to consider the specific apparatus disclosed by AX, the specific apparatus disclosed by AY, the fact that both AX and AY disclose the use of "fastening means" broadly, and the prior art which shows rivets and nuts and bolts to be known fastening means.

One comment suggested that the last sentence of §1.604(b) and the last sentence of §1.607(c) be deleted in view of a proposed rule (§10.23(c)(7); 49 F.R. 10028; 49 F.R. 33809) which defines "misconduct" as including "[k]nowingly withholding from the Office information identifying a patent or application of another from

which one or more claims have been copied." The proposed rule is still being considered. In any event, the last sentences of §§1.604(b) and 1.607(c) are instructions to examiners whereas proposed 37 CFR §10.23(c)(7) defines misconduct for those registered to practice before the PTO. Another comment suggested deletion of §1.604(b) because "existing rules [37 CFR §1.56] already provide a duty of disclosure of subject matter *material* to examination." There is no inconsistency between the rule relating to the duty of disclosure and §1.604. The comment also suggested that by identifying another application, an applicant "might be construed as having *admitted* that the claims" of the other application are directed to the same patentable invention as the claims in the applicant's application. The filing of such a paper is a statement by the applicant that the claims presented are "*known* to the applicant to define the same patentable invention" (emphasis added). If an applicant wishes to call another application to the attention of an examiner and the applicant believes that the other application does *not* claim the same patentable invention, but nevertheless may be relevant within the meaning of 37 CFR §1.56, the applicant may identify the other application and at the same time state why the invention claimed in the other application is not the same patentable invention as the invention claimed in the applicant's application. For the reasons given, the suggestions made in the two comments are not being adopted.

Three comments relating to §1.605 were received. One comment suggested that the language "or substantially the same as the suggested claim" be deleted from the third sentence of §1.605. The suggestion is being adopted to the extent that the language "a claim which is the same or substantially the same as" is being deleted. Under §1.605, when the examiner requests an applicant to copy a suggested claim, the applicant will be required to copy verbatim the claim suggested by the examiner. A second comment suggested that the second and third sentences of §1.605 be changed to read as follows:

> The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim, or shall identify in the application one or more pending claims which the applicant regards as being directed to the same or substantially the same invention as the suggested claim, within a time specified by the Examiner, not less than thirty days. Failure or refusal of an applicant to timely present a claim or to timely identify one or more claims which are directed to the same or substantially the same invention as the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim.

A third comment suggested that the second and third sentences of §1.605 fail to take into account the case where an applicant is already claiming the invention. The third comment suggested addition of the following at the end of the third sentence of §1.605(a): ", unless the application already contains claims to the same patentable invention." The suggestions made in the second and third comments are not being adopted as such. However, the following sentence is being added as the fourth sentence of §1.605: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." A major deficiency of the suggestions made in the second and third comments was the inability of the PTO to efficiently and effectively handle situations where the applicant (1) presents a claim which is "substantially the same as" the suggested claim or (2) points to a claim already in the application *and* the examiner is of the opinion that the claim is not to the same patentable invention. Under these circumstances, the examiner could not properly declare an interference. Accordingly, the applicant will be required to present verbatim the suggested claim. The applicant may, however, also present any other claim which the applicant believes is more appropriate. Alternatively, the applicant, in addition to presenting verbatim the suggested claim, may also call the examiner's attention to a claim already in the application which the applicant believes is more appropriate for interference purposes. In either case, the applicant must explain to the examiner why a claim other than the suggested claim is more appropriate for inclusion in the interference. Upon consideration of the suggested claim and the applicant's alternative claims and any explanation, the examiner is in a position to forward the application to the Board for declaration of an interference. If the applicant is dissatisfied with the claims of the application designated to correspond to the count, the applicant may file an appropriate motion under §1.633(c).

Two comments were received which suggested that the last sentence of §1.606 is not entirely clear. One comment suggested that the language in the last sentence which reads: "to define one patentable invention" be changed to read: "not to contain separate patentable invention." This suggestion is being adopted. The use of the language "*one* patentable invention" was unfortunate and rendered the actual intent of the rule unclear. Under §1.606, at the time an interference is declared a *rebuttable* presumption will exist that any patent claim designated to correspond to a count does not embrace separate patentable inventions. Moreover, at the time the interference is declared, no count will be narrower in scope than the broadest patent claim designated to correspond to that count. The presumption is *rebuttable* and may be challenged and overcome by a motion under §1.633(c). Examples 17 and 18 illustrate practice under §1.606.

Two comments were received discussing §1.607. A first comment suggested that the word "must" in the first sentence of §1.607(c) be changed to "shall". The suggestion is being adopted. Use of "shall" makes §1.607(c) consistent with §1.604(b). A second comment asked the following question:

> "If the examiner determines that the applicant's claim is patentable but that there is no interfering subject matter, and the examiner accordingly allows the claim but refuses to declare an interference, is that determination appealable [to the Board of Appeals and Interferences under 35 U.S.C. §1.134]?"

The commentator suggests that "such a determination" is appealable and rationale in support of the commentator's position appears in Gholz, *Board of Appeals Jurisdiction Over Appeals from Decisions by Primary Examiners Refusing to Institute Interferences on Modified or Phantom Counts*, 64 J. Pat. Off. Soc'y 651 (1982). At the hearing, the commentator orally urged that the rules be amended to permit an appeal to the Board when an examiner allows a claim, but refuses to declare an interference involving the allowed claim. The suggestion is not being adopted. A decision by an examiner to allow a claim, but not to declare an interference involving the allowed claim, is petitionable and not appealable. See Gholz, *supra*, at 652 n. 13. The rule being suggested would enlarge the jurisdiction of the Board. Action by Congress would be necessary to accomplish what is embodied in the suggestion.

Several written comments and one oral presentation at the hearing were made concerning §1.608. One comment suggested that §1.608 be expanded to provide for summary judgment in interferences involving applications where the earlier of the filing date or effective filing date of one application was three months earlier than the date of the other application. This suggestion is not being adopted. Ordinarily, interferences are not declared between applications having effective dates more than three months apart. Moreover, expanding summary judgment proceedings to application-application interferences would result in delay in resolving interferences. Currently in application-patent summary judgment proceedings under 37 CFR §1.204(c), very few summary

judgments are entered against applicants who are junior to a patentee by more than three months. There is no reason to expect that a significant number of summary judgments would be entered in application-application interferences. As noted in the notice of proposed rulemaking, the PTO has already declined to expand summary judgment proceedings to cases where a patentee is junior to an applicant by more than three months. See 49 F.R. 3775 (paragraph bridging columns 1 and 2); 1039 O.G. 34; 1039 TMOG 34; 27 BNA 319.

Two written comments were received which suggested that §1.608(b) should be more specific in indicating the kind of evidence which should be submitted when an applicant attempts to make out a *prima facie* case based on priority of invention. The suggestions in the comments are being adopted. The following sentence has been added to §1.608(b):

> Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent.

Similar language appears in the current rule: 37 CFR §1.204(c). The PTO agrees entirely with the following discussion made by one commentator:

> The material added to Rule 608(b) currently appears in existing 37 CFR §1.204(c). A comparison of the existing language of 37 CFR §1.204(c) with the proposed rule might be construed as suggesting that the allegations which are now expressly required where priority is an issue will be changed, specifically relaxed in some manner. Since under proposed Rule 617 this clearly is *not* the case, the proposed addition to Rule 608(b) should assist the practitioner in understanding the intent of the PTO.

The commentator has accurately pointed out that the PTO intends to apply a stricter standard for filing additional evidence in summary judgment proceedings after an order to show cause has been issued. See the notice of proposed rulemaking. 49 F.R. 3775 (column 1); 1039 O.G. 34; 1039 TMOG 1039; 27 BNA 319 (column 1).

At the hearing, it was suggested that §1.608 should encourage the use of 8-1/2 by 11 inch paper for affidavits. This suggestion is being adopted and the following sentence has been added to §1.608(b): "To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 × 11 inches (21.8 by 27.9 cm.)." The commentator at the hearing suggested that "many people submitting a Rule 608(b) showing are going to want to rely upon that showing under Rule 672(b)" in those cases where an interference is allowed to proceed. Use of 8-1/2 by 11 inch paper will facilitate preparation of the ultimate record.

Two comments were received with respect to §1.609. The first comment suggested that the language "count or counts" in §1.609(b)(1) be changed to "proposed count or counts" and that each occurrence of "the count" in §1.609(b)(2) be changed to "each count". The suggestion is being adopted. These changes are editorial in nature and are designed to enhance the clarity of the rule. A second comment indicated that it was not clear to the commentator why it was necessary under §1.609(b)(3) for the examiner to identify the claims in an application or patent which are deemed to be patentable over any count. The commentator went on to say that the examiner "could probably readily identify claims which would clearly be unpatentable over a count and perhaps this would be all that is needed. If the examiner simply said all claims are considered unpatentable over the count, what recourse does the applicant have if he disagrees?" The purpose of having the examiner identify all claims which are patentable over the count or counts is to place the parties on notice that those claims are allowable notwithstanding any decision in the interference. Thus, in an interference between Jones and Smith if the examiner indicates that claim 8 of Jones is patentable over the proposed count or counts, Smith will know that Jones may receive a patent containing claim 8 even if Smith wins the interference. This will permit Smith to move under §1.633(c) to add claim 8 as corresponding to a count if Smith believes claim 8 defines the same patentable invention as one of the counts. Contrary to the suggestion in the comment, an examiner will not indicate that a claim is unpatentable over a count; rather, the examiner will designate the claim to correspond to a count. Each claim in a patent or application which is directed to the same patentable invention as a count will be designated to correspond to the count. Under the new practice, an examiner will no longer have occasion to indicate that a claim will be rejected over a lost count. To fully answer the commentator's question, if a claim is designated to correspond to a count and the applicant believes the claim does not define the same patentable invention as the count, the applicant may move under §1.633(c) to designate the claim as *not* corresponding to the count. If the motion is granted, the examiner would be authorized to issue the applicant a patent containing the claim even if the applicant loses the interference.

Several comments were received which discuss §1.611. One comment suggested addition of a paragraph (f) to permit expanded summary judgment proceedings in application-application interferences. Since expanded summary judgment proceedings are not contemplated, the suggestion is not being adopted. See the discussion above under analysis of comments of §1.608(b). Two comments suggested that §1.611(c)(8), which provides that a notice declaring the interference shall specify among other things the "order of the parties," fails to take into account the fact one party may be "senior" as to one count and "junior" as to another count. As explained above in connection the analysis of the comments concerning §1.601(m), the "order of the parties" is a procedural tool. It indicates the "style" of the case—which practitioners are encouraged to use. If there are two counts and one party is "senior" as to one count and "junior" as to another count, the party has the burden of proof as to that count to which the party is "junior." See §1.657. Appropriate testimony periods will be set (§1.651(b)) to accommodate differing burdens of proof in cases where a party is "senior" on one count and "junior" on another count. The suggestions to change the meaning of "order of the parties" are not being adopted. Another comment suggested that §1.611(e) be changed to indicate that notice "shall" (as opposed to "may") be given in the *Official Gazette* when an interference has been declared involving a patent. No useful purpose would be served by changing "may" to "shall" inasmuch as the rights of parties involved in an interference are not affected by publication or non-publication of the fact that a patent is involved in the interference. By §1.611 the PTO intends to exercise discretion to publish in the *Official Gazette* an identification of patents which become involved in interferences; however, the PTO does not intend to undertake an absolute obligation to do so. The use of "may" better expresses the PTO's intent behind §1.611(e).

No written comments were received relating to §1.612. However, at the hearing two suggestions were made orally. The first suggestion was that where a "party" has obtained a copy of his "opponent's" affidavit under §1.131 or §1.608(b) (see §1.612(b)), the party should be required to notify the opponent. According to the suggestion, if the opponent then intends to rely on the affidavit (§1.671(e)), the opponent would have to "reserve" the affidavit on the party. This suggestion is not being adopted. When the party gains access to the affidavit under §1.612(b), the party may or may not make an accurate copy. On the other hand, the opponent knows exactly those portions of the affidavit upon which the opponent intends to rely. After careful consideration, the PTO believes on balance that it is better for the opponent to serve a copy of the evidence upon which the opponent intends to rely. Service avoids issues as to whether the party obtained under §1.612(b) a complete and/or accurate copy of the evidence upon which the opponent intends to rely.

The second suggestion concerning §1.612 made orally at the hearing was that a party should have access to an opponent's "predecessor application, even though the application may not be relied upon for 35 USC, Section 120 benefit." According to the suggestion, access to a "predecessor application" may be needed to uncover relevant evidence, including violations of 37 CFR §1.56. Specifically, the commentator called attention to *Driscoll* v. *Cebalo*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984), *rehearing denied mem.*, (Fed. Cir. July 25, 1984). The suggestion is not being adopted. The Patent Statute (35 U.S.C. §122) provides that applications for patent will be preserved in secrecy by the PTO unless special circumstances are shown. Section 1.687(c) provides for "additional discovery" when required in the interest of justice. Additional discovery is believed to provide the necessary procedural vehicle for obtaining access to an opponent's "predecessor application."

One comment was received which suggested that the language "or members of the same firm of attorneys and agents" be added after "agent" in §1.613(b). The suggestion is being adopted, because it is believed to make the rule clearer.

One comment was received which said the following with respect to §1.616: "Sanctions should not be left to the Examiner-in-Chief (EIC) or BAI [Board of Patent Appeals and Interferences] - This Rule is unnecessary and should be deleted. An alternative would be to give sanction power only to the BAI." The suggestion to delete §1.616 is not being adopted. There are cases where sanctions are warranted. See e.g., *Woods* v. *Tsuchiya*, 207 USPQ 228 (Comm'r. Pat. 1979) and *Tezel* v. *Bellantoni*, 188 USPQ 688 (Bd.Pat.Int. 1975). The PTO continues to believe that imposition of a sanction (except judgment) by a single examiner-in-chief is appropriate. In any event, a party may ask a 3-member panel of the Board to reconsider any sanction which may be imposed by a single examiner-in-chief. See §1.640(c).

Several written and oral comments were received regarding §1.617.

One oral comment made at the hearing suggested that "it should be explicitly stated in Rule 617(a) that the decision of the examiner-in-chief to permit the interference to proceed is without prejudice to the right of any other party to attack the sufficiency of the Rule 608(b) showing when offered as Rule 672 testimony." The suggestion is not being adopted. While no explicit statement to that effect will be placed in §1.617(a), it necessarily follows that any opponent may attack the sufficiency of an applicant's showing under §1.608(b) when that showing is presented as evidence under §1.672. In summary judgment proceedings, all an applicant need do is make out a *prima facie* case. If the interference is allowed to proceed in the normal manner, the applicant must prove priority by a preponderance of evidence (when the application and the patent are copending) or beyond a reasonable doubt (when the application was filed after the patent issued). Manifestly, the burden in summary judgment proceedings is not as strict as the burden in proceedings following summary judgment. *Breuer* v. *DeMarinis*, 558 F.2d 22, 28, 194 USPQ 308, 313 (CCPA 1977) and *Schwab* v. *Pittman*, 451 F.2d 637, 640, 172 USPQ 69, 71 (CCPA 1971).

Several comments suggested that an applicant should be permitted as a matter of right to file a reply to any statement filed by any opponent under §1.617(d). The suggestion that a reply be permitted is being adopted. Accordingly, §1.617(e) has been changed to read: "[w]ithin a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." Some of the comments indicated that the applicant should be able to reply to a statement by a patentee or another opponent. The language "any opponent" in §1.617(e) is intended to include both the patentee and any other opponent. The change in the last sentence of §1.617(h) of "patentee" to "any opponent" is intended to make clear that all parties may appear at a hearing if the applicant requests a hearing.

One comment suggested that the patentee (and presumably any other opponent) should be allowed to present "evidence" during summary judgment proceedings. This suggestion is not being adopted. A change in the second sentence of §1.617(d) is intended to make clear that opponents may file statements in response to an applicant's "response," but the statement "shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." The PTO does not intend to expand summary judgment proceedings into a "mini-interference." An applicant presents evidence under §1.608(b). If the examiner-in-chief finds that evidence insufficient, an order to show cause stating reasons for the insufficiency is issued. An applicant may respond and, if appropriate, file "additional evidence." The PTO intends to be rather strict in permitting the filing of new evidence. After the applicant responds (with or without additional evidence), any opponent may file a statement. In the statement, the opponent should be free to comment on all the evidence (original and additional) which the applicant presents. Compare *In re Plockinger*, 481 F.2d 1327, 179 USPQ 103 (CCPA 1973). Under §1.617(d) the opponent may not urge a rationale for summary judgment which does not appear in the order to show cause issued by the examiner-in-chief. However, it is not the PTO's intent to interpret §1.617(d) in the narrow manner the Court of Customs and Patent Appeals interpreted 37 CFR §1.204(c) in *Kahl* v. *Scoville*, 609 F.2d 991, 995–996, 203 USPQ 652, 656 [headnote 6] (CCPA 1979). An example will illustrate how the PTO intends to interpret §1.617(d).

Example 35: An applicant copies claims from a patent and is required to submit a showing under §1.608(b). Upon review of the showing under §1.608(b), the examiner-in-chief concludes that the showing fails to make out a *prima facie* case of priority, because applicant has failed to show an actual reduction to practice. Applicant files a response and includes additional evidence which purports to show an actual reduction to practice. The patentee then files a statement in which two arguments are made. *First*, patentee argues that the additional evidence has not been properly authenticated. *Second*, patentee argues that even if applicant has shown an actual reduction to practice, summary judgment is nevertheless appropriate because applicant suppressed and concealed after the actual reduction to practice. The first argument is proper, but the second argument is not. A patentee may comment on the sufficiency of the applicant's evidence. Fairness, however, dictates that summary judgment be granted only after fair notice in the order to show cause. Accordingly, summary judgment will not be based on a rationale raised by a patentee in a statement which does not correspond to the rationale used by the examiner-in-chief in the order to show cause.

A change has been made in §1.617(a) and §1.617(g) to make clear that once summary judgment proceedings have concluded, an interference will proceed "in the normal manner." The change is intended to codify the decisions in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1967) and *Ing* v. *Chiou*, 207 USPQ 321 (Comm'r.Pat. 1979). This change is further discussed in the discussion of the comments received with respect to §1.635.

One comment was received which indicated that §1.618:

> "needs qualification. It may be appropriate to resubmit certain papers (See also §1.644(d) last sentence)."

The precise "qualification" needed was not set forth in the comment. Likewise, no example of "certain papers" was set forth. Under the circumstances, the PTO declines to make any change in §1.618.

Several comments were received which discussed the rules relating to preliminary statements.

Three comments were received which suggested that §1.622(a) be amended to "take into account several court decisions holding that joint inventors need not be joint inventors of [the subject matter of] all claims." Changes have been made in §1.622(a) consistent with the amendment to 35 U.S.C. §116 made by Public Law 98–622.

One comment was critical of §§1.623(c); 1.624(c); and 1.625(c), because §1.628(b) does not cover the possibility that a drawing might not be available, e.g., a drawing destroyed in "a fire." Section 1.628(b) has been amended to permit a party to allege a date when a first drawing or first written description was made in those circumstances where the first drawing or first written description is not available. The party will be required (1) to show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party would also be required to file a motion to amend its preliminary statement promptly after the drawing or written description becomes available. It is the PTO's intent by the amendment to §1.628(b) to overrule the holding of headnote [1] of *Reddy* v. *Davis*, 187 USPQ 386, 388 (Comm'r.Pat. 1975)

Another comment was critical of the language "conceived" in §1.623(a)(4). The current rules do not require a party to allege a conception; rather, they require one to allege the date of the certain acts which, if proved, would establish conception. See 37 CFR §1.216(a)(4). According to the commentator, an allegation of conception is "unprovable and meaningless." The use of "conception" in §1.623(a)(4) is intentional and is designed to permit a party to "plead" the earliest date on which it believes conception occurred. Contrary to the suggestion in the comment, "conception" is not meaningless and may be proved during the the testimony period. See *Gould* v. *Schawlow*, 363 F.2d 908, 150 USPQ 634 (CCPA 1966); *Meitzner* v. *Corte*, 410 F.2d 433, 161 USPQ 599 (CCPA 1969); and *Mergenthaler* v. *Scudder*, 11 App.D.C. 264, 1897 C.D. 724 (D.C.Cir. 1897). There is no need to prove "conception" in the preliminary statement.

A preliminary statement serves several useful purposes in an interference: (1) it serves to limit a party's proofs as to time, (2) it serves as a vehicle for permitting the examiner-in-chief or the Board to issue orders to show cause in those cases where it would be futile to take testimony, and (3) it serves as notice to an opponent of the case which is alleged by a party. Under the rules being announced herein, the issues which will be raised and decided by the Board at final hearing are made known during the interlocutory stage through (a) the preliminary statement, (b) motions under §1.633 and decisions thereon, and (c) notices under §1.632 of a party's intent to argue abandonment, suppression, or concealment. Section 1.632(a)(4) requires a party to allege a date of conception—it does not require proof of conception. The allegation puts the opponent on notice that the party intends to prove conception as of a date no earlier than the date alleged in the preliminary statement.

One comment suggested that the rules relating to preliminary statements are deficient because they do not permit one to allege allegations concerning tapes. Specifically, the commentator said: "What about a taped transcript of an invention, a practice being followed in a number of research departments of corporations?" If making a tape is the last act of conception, a party may allege the date the tape was made as the conception date under §1.623(a)(4).

Several comments were received which suggested that a party should not have to allege derivation in a preliminary statement because the party may not know derivation occurred until the testimony period. Section 1.625 requires a party to file a preliminary statement when derivation is an issue. If derivation is not known or discovered prior to the date the preliminary statement is due, a party may move to amend the preliminary statement and allege derivation promptly after existence of derivation is discovered.

Several comments discussing §1.624 were received. One comment suggested that §1.624(a)(5) should require a party to state, where appropriate, that no actual reduction to practice of an invention made in a foreign country was introduced into the United States. This suggestion is being adopted and a second sentence has been added to §1.624(a)(5) which provides: "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." This sentence conforms §1.624(a)(5) to the allegation required in the second sentence of §1.623(a)(5). Another comment suggested that the language "in the United States" be inserted after "reasonable diligence" in §1.624(a)(6) and that all occurrences of the language "was made" in §1.624(c) be changed to "was introduced into the United States". This suggestion is being adopted. As noted in the comment, "[t] he changes . . . are necessary to clarify that for an invention made abroad the only relevant activities are those which occur in the United States." See 35 U.S.C. §104.

One comment asked "how does one introduce 'an actual reduction to practice of the invention' in the United States?" *Breuer* v. *DeMarinis*, 558 F.2d 22, 194 USPQ 308 (CCPA 1971), illustrates a case where an actual reduction to practice abroad was introduced into the United States.

One comment suggested that §1.627(a) be changed to require preliminary statements "be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks and be additionally marked Box Interference—Preliminary Statement." According to the comment, the confidentiality of preliminary statements "envisioned under the proposed rules would be further enhanced . . . ." The suggestion is not being adopted. The PTO believes it is sufficient if preliminary statements are enclosed in a sealed envelope as specified in §1.627(a). The Board will not permit access to preliminary statements which have not been ordered opened by an examiner-in-chief.

Several comments discussing §1.629 were received. One comment suggested that the first sentence ("A preliminary statement should be carefully prepared.") should not appear in §1.629(a). This suggestion is being adopted. The PTO agrees with the commentator that the sentence:

> "no longer appears necessary or appropriate in the context of rulemaking. The remainder of the paragraph makes the admonition redundant at best."

Two comments were received which suggested that the word "normally" be deleted from the last sentence of §1.629(d). The suggestions are not being adopted. A preliminary statement is a pleading. The Board does not evaluate or consider the content of a drawing or written description prior to final hearing. At final hearing, in fact, the Board will only consider the drawing or written description if a party places the drawing or written description in evidence. The word "normally" first appeared in 37 CFR §1.223(c), last sentence, in 1978 (see e.g., 973 TMOG 19 (Aug. 1, 1978)). The last sentence of 37 CFR §1.223(c) was intended to codify headnote [2] of *Reddy* v. *Davis*, 187 USPQ 386 (Comm'r.Pat. 1975). The word "normally" appears in the rule to permit the Board to exercise discretion to evaluate or consider the content of a drawing or written description in some unusual and presently unforeseen circumstance.

One comment suggested that "no earlier than" in §1.629(b) be changed to "as early as". The suggestion is being adopted inasmuch as it is believed to more clearly state the intent of the rule.

One comment suggested that §1.629(d) "is improper because it fails to take into account testimony which can show that a drawing and/or written description were actually made even though the drawing and/or written description are not now available." A change to §1.628(d) and addition of "unless the party complies with §1.628(b)" to the first sentence of §1.629(d) eliminates the problem raised by the commentator.

One comment discussing §1.631(a) was received which expressed the view that a junior party should be required to send a copy of its preliminary statement to the senior party even if the senior party does not file a preliminary statement. According to the commentator, the senior party is *prima facie* the first inventor and at some time it will have to know the earliest dates alleged by the junior party. The rules require all parties to file a preliminary statement. If a junior party does not file a preliminary statement, it will be denied access to any other preliminary statement which is filed. A senior party, however, is always entitled to access to any preliminary statement filed by a junior party. See e.g., §1.631(b). However, a junior party will only be required to serve a senior party who files a statement.

Numerous comments were received discussing §1.633.

One commentator asked: "What sort of a judgment is in order if a count is not patentable over the prior art to an opponent?" Section 1.633(a) authorizes a party to bring a motion for judgment on the ground that the opponent's *claim* corresponding to a count is not patentable. It is important to note that the motion raises the patentability of the opponent's *claim* not the count. Accordingly, by a motion under §1.633(a), a party seeks entry of a judgment that the opponent is not entitled to a patent containing a claim corresponding to a count.

Two comments questioned the nature of the judgment when a motion under §1.633(b) is granted. Section 1.633(b) authorizes the filing of a motion for judgment on the ground that there is no interference-in-fact. If a motion under §1.633(b) is granted, the judgment would provide that each party is entitled to a patent containing that party's claims corresponding to the count. Judgments in interferences under these rules will determine a party's entitlement or lack of entitlement to *claims* corresponding to a count.

One comment expressed the hope that "third party inventorship" would not be made an issue in interferences. Contrary to the hope expressed by the commentator, "third party inventorship" can be made the subject of a motion under §1.633(a). Any ground of unpatentability may be made the subject of a motion under §1.633(a) except (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. It should be noted that under past practice, third party inventorship has not been considered "ancillary" to priority. *Sheffner* v. *Gallo*, 515 F.2d 1169, 185 USPQ 726 (CCPA 1975). However, under these rules, the question of whether an issue is "ancillary" no longer arises. See 130 Cong. Rec. H10528 (daily ed. Oct. 1, 1984)(statement by Rep. Kastenmeier). Public Law 98–622 gives the Board authority to consider priority and *patentability*. Third party inventorship involves a question of patentability. 35 U.S.C. §102(f). One comment pointed out that §1.633(e) adopts the estoppel rule approved by the Court of Customs and Patent Appeals in *Avery* v. *Chase*, 101 F.2d 205, 40 USPQ 343 (CCPA 1939), *cert. denied*, 307 U.S. 638 (1939), while rejecting the rule announced by the U. S. Court of Appeals for the District of Columbia Circuit in *International Cellucotton Products Co.* v. *Coe*, 35 F.2d 869, 30 USPQ 366 (D.C. Cir. 1936). See also *American Cyanamid Co.* v. *Coe*, 106 F.2d 851, 42 USPQ 302 (D.C. Cir. 1939). The commentator is correct in noting that the rules adopt the estoppel rule approved in *Avery* v. *Chase*. The following comment by the CCPA in its opinion in *In re Shimer*, 69 F.2d 556, 558, 21 USPQ 161, 163 (CCPA 1934), accurately expresses the intent of the PTO in promulgating §§1.633(e) and 1.658(c):

> It may be stated that this rule works no hardship to him who is diligent in pursuit of his rights. When an interference is declared, the files of his contestants are open to him. He has full cognizance of their disclosures and claims. So advised, it becomes his duty to put forward every claim he has. [Rule 1.633(e)] . . . affords him this opportunity. If the rule be not enforced or enforceable, then delays and litigation are greatly increased. It is quite obvious that the doctrine of estoppel, as applied in these cases, results in the better conduct of the business of the Patent[and Trademark] Office and in the public good.

One comment suggested that the following be added to the end of §1.633(c):

> A motion to add or substitute a count shall be construed as an automatic request for the benefit of any earlier application [filing] dates accorded the existing count, and also as encompassed by a contemporaneous motion under §1.633(f) or (g), unless indicated otherwise. Any opposition thereto must be raised in a motion opposition pursuant to §1.638.

The suggestion is not being adopted. A specific reference to §1.637(c) appears in §1.633(c). The provisions of §1.637(c) spell out in detail the steps which a moving party must take in filing a motion under §1.633(c). One of those steps requires the moving party to request benefit of any earlier application. The mere fact that benefit has been accorded for a "first" count does not establish that benefit should be accorded for a "second" count. The PTO believes the burden should be on the moving party to point out where an earlier application supports a count rather than placing the burden on an opponent in the first instance to point out where an earlier application fails to support particular subject matter. There is no compelling reason to force the opponent "to prove a negative." It should be noted that the language "Where appropriate," has been deleted in every instance from §1.637 to make clear that the burden lies on the moving party to request benefit when that party files a motion under §1.633.

At the hearing, one individual commented that §1.633(a) is not clear as to whether a motion for judgment based on "fraudulent appropriation of the moving party's invention by his opponent" excluded. The "fraudulent appropriation of the moving party's invention by his opponent" is derivation. Section 1.633(a)(2) excludes both "innocent" derivation (e.g., through a third party and unknown to either party in an interference) or "fraudulent" derivation (e.g., where one party knowingly takes the invention from an opponent). In either event if derivation by an opponent of a party's invention is proved, the party will be awarded judgment.

One comment made the following statement:

> An opponent faced with a motion for judgment on the ground that a count is unpatentable may not be able to prove patentability in the short time periods. Provision should be made for extensions of time in such cases.

Provisions for extensions of time are made in §1.645.

One comment addressed Example 23 which appeared in the notice of proposed rulemaking. Example 23 also appears in a slightly modified form herein and, as modified, takes into account discussion in the comment. The commentator believed that the motion mentioned in Example 23 should be denied and that a testimony period should be set. Accordingly to the commentator, the granting of the motion would shift the burden to the opponent of the motion. The commentator's point is well taken. Actually, the motion should be deferred to final hearing and a testimony period would be set. In ruling on motions under §1.633, it will not always be possible for the examiner-in-chief to grant or deny outright a motion. When testimony is needed to rule on a motion, the proper course of action is to defer a decision on the mo-

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tion to final hearing and permit testimony. See §1.639(c). The moving party retains the burden. If testimony is taken on patentability, the parties would also have to take testimony on priority. With all testimony at its disposal, the Board would then be in a position to rule on all issues and award a judgment.

One comment asked how the claims of the parties would be designated to correspond to the counts if in Example 18 a motion to substitute Count 2 (benzene) and add Count 3 (chloroform) was granted. The following Example 36 answers the commentator's question.

Example 36: The facts in this example are the same as Example 18. Assume that applicant AB believes that benzene and chloroform define separate patentable inventions. Applicant AB would file a motion under §1.633(c)(1) to substitute Count 2 (benzene) for Count 1 (Markush group of benzene or chloroform) and add Count 3 (chloroform). If the examiner-in-chief grants the motion, the interference would be redeclared by deleting Count 1 and substituting in its place Counts 2 and 3. Claims 1 and 2 of the patent H and claims 11 and 12 of application AB would be designated to correspond to Count 2. Claims 1 and 3 of patent H and claims 11 and 13 of application AB would be designated to correspond to Count 3. If one party proves priority with respect to both benzene and chloroform, that party would be entitled to all claims in its application or patent corresponding to Counts 2 and 3. The other party would not be entitled to a patent containing any claim corresponding to Counts 2 and 3. If patentee H proves priority with respect to benzene and applicant AB proves priority with respect to chloroform (assuming there was no issue raised at final hearing with respect to the patentable distinctness of benzene and chloroform), the judgment would provide that patentee H is not entitled to a patent with claims 1 and 3, but is entitled to a patent with claim 2 and that applicant AB is not entitled to a patent with claims 11 and 12, but is entitled to a patent with claim 13. If an issue is properly raised at final hearing as to whether benzene and chloroform are the same patentable invention and the Board holds that they are the same patentable invention, the party proving the earliest priority as to either benzene or chloroform would prevail as to all claims. Thus, if patentee H invented benzene before applicant AB invented benzene or chloroform, patentee H would be entitled to a patent containing claims 1 through 3 even if applicant AB invented chloroform before patentee H invented chloroform. Applicant AB would not be entitled to a patent with claims 11 through 13.

An oral comment was received by telephone which raised the question of whether a party is, or could be, required to present in the party's application every claim which the party may ever seek to obtain in a patent based on the party's application. According to the commentator, such a requirement would prevent the party from proceeding *ex parte* after the interference on any claim on which a favorable judgment was not entered. It is not the PTO's intent to require a party who is an applicant to present at the outset all claims which the party may ever seek to obtain in a patent based on his application. Parties in interference cases should recognize, however, that the interference estoppel provisions of §1.658(c) have been expanded with the view to eliminating much of the *ex parte* maneuvering which has taken place in the past after an interference is terminated. Accordingly, a party who fails to move to place a matter in issue runs a considerable risk that the party will not be able to raise the issue *ex parte* after an interference is terminated. Nevertheless, the PTO has determined that it will not, at this time, adopt the requirement suggested by the commentator. The commentator also suggested, contingent on his earlier suggestion being rejected, that the rules provide that a party be authorized to file a motion to require an opponent who is an applicant to add a claim to the opponent's application and to designate the claim as corresponding to a count. This suggestion is being adopted by addition of §1.633(c)(5). Paragraph (c)(5) authorizes the filing of a motion to redefine the interfering subject matter by requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. A companion addition of paragraph (c)(5) to §1.637 sets out the requirements of a motion under §1.633(c)(5). Those requirements are: the moving party must (1) propose a claim to be added to the opponent's application, (2) show the patentability of the claim to the opponent and apply the terms of the claim to the disclosure of the opponent's application, (3) identify the count to which the proposed claim shall be designated to correspond, and (4) show that the proposed claim defines the same patentable invention as the count to which it will be designated to correspond. The following example illustrates how practice under §§1.633(c)(5) and 1.637(c)(5) is expected to occur.

Example 37: In this example, some of the facts set out in Example 32 will be used. Application AV discloses engines and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). Seeing that application AV specifically discloses a 6-cylinder engine and believing that a 6-cylinder engine is the same patentable invention as "engine," AW could move under §1.633(c)(5) to require applicant AV to add a claim (6-cylinder engine) and to have the claim designated to correspond to the count (engine). Applicant AV could oppose on the ground that a 6-cylinder engine is not the "same patentable invention" as "engine." If the motion is granted, applicant AV would be required to add a claim to 6-cylinder engine and the claim would be designated to correspond to the count. If applicant AV loses the interference, the judgment would preclude applicant AV from obtaining a patent with claims to "engine" or "6-cylinder engine." If the motion is denied on the basis that a 6-cylinder engine is not the same patentable invention, applicant AV would not be required to present a claim to 6-cylinder engine and would be able to pursue such a claim *ex parte* even if applicant AV loses the interference.

If an applicant is ordered by an examiner-in-chief to file an amendment to present a claim and the applicant fails or refuses to timely present the amendment, the failure or refusal will be taken without further action as a disclaimer by the applicant of the subject matter of the claim. See the second sentence of §1.640(b)(1).

At the hearing, one commentator indicated that it is not clear whether §1.635 "would permit a motion for judgment in a situation where a junior party's case-in-chief fails as a matter of law to overcome a senior party's effective filing date." Under the rules, it is not the intent of the PTO to allow a senior party to test the sufficiency of the case-in-chief of a junior party prior to final hearing. Thus, a "motion for a directed verdict" (see Rule 50(a) of the Federal Rules of Civil Procedure) at the conclusion of the junior party's case-in-chief and prior to a senior party's case-in-chief is not authorized under the rules. If a senior party believes the case-in-chief of the junior party is insufficient as a matter of law, the senior party may *elect* to proceed immediately to final hearing. If the senior party is incorrect, however, the senior party will have waived any right to present any case-in-chief or rebuttal. See e.g., *Comstock* v. *Kroekel*, 200 USPQ 548, 550 n. 4 (Comm'r.Pat. 1978); *Lorenian* v. *Winstead*, 127 USPQ 501, 508 (Bd.Pat.Int. 1959); and, more recently, *Burson* v. *Carmichael*, 731 F.2d 849, 221 USPQ 664 (Fed. Cir. 1984) ("There is no support in law for repeated bites at the apple"). This would be true even if the only evidence relied upon by the junior party is a showing under 1.608(b). In this respect, the rules codify the decision in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1970).

Two comments were received which suggested that the twenty-day period in §1.636(b) is too short. It was suggested that a longer time period be set and one comment suggested thirty (30) days. The suggestions are not being adopted. The time period set for filing oppositions will normally be set during a telephone conference call between the examiner-in-chief and the attorneys for the parties. The twenty-day period appears in the rule in the event a specific time for filing oppositions is not set by an examiner-in-chief. The twenty-day period is deemed to be sufficient in most cases. Twenty days are currently allowed to respond to a motion. See 37 CFR §1.231(b). It should be noted that the twenty-day period is longer than the minimum period allowed by the Federal Rules of Civil Procedure for responding to motions. See Rule 6(d) and (e).

Two comments were received which discussed §1.637. Both comments suggested that a sentence be added to §1.637(f) (2) to require a translation to be filed when a party moves for benefit of an earlier foreign application which is not in English. The suggestions are being adopted and the following has been added as the last sentence of §1.637(f) (2): "If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met." Section 1.647 requires a translation whenever a party relies on a document in a language other than English. One comment suggested that the language of §1.637(f)(3) ("Show that the earlier application discloses an embodiment within the scope of the each count.") may be "contrary to past decisions of the CCPA which have held a disclosure can be good without a specific embodiment." The critical issue in each benefit situation is whether the earlier application constitutes a constructive reduction to practice of the invention defined by the count. The issue is necessarily resolved on a case-by-case basis and the presence or absence of an embodiment is only one factor to be considered. Accordingly, the language of §1.647(f)(2) has been changed to read: "Show that the earlier application constitutes a constructive reduction to practice of each count." The comment also criticized the use of the word "each" in §1.647(f)(2). The term "each" is used to make clear that when there are two or more counts, the moving party must show that the earlier application constitutes a constructive reduction to practice for each count. There are cases where a disclosure in an earlier application would constitute a constructive reduction to practice for one count but not for another count.

Several changes have been made to §1.637 which were not made as a result of a comment submitted from the public. Each occurrence of the language "Where appropriate," in §1.637 has been deleted as being unnecessary and possibly confusing. Whenever a party wants or believes that it is entitled to benefit of an earlier application, the party must file a motion under §1.633(f) for benefit. The language "Where appropriate" may have given parties the mistaken impression that a motion was not necessary where benefit of the earlier application had been accorded in the papers declaring the interference. See the discussion above of the suggested change to §1.633(c) which was rejected.

The language "or adding a claim to be designated to correspond to a count" has been added to §1.637(c)(2). The change supplements a change made in §1.633(c)(2). Section 1.637(c)(2) sets out the requirements for a preliminary motion to redefine the interfering subject matter by adding a claim in the moving party's application and to designate the claim to correspond to a count.

In §1.637(c)(2)(ii), the language "Apply the terms of each proposed claim to the disclosure of the application" has been changed to "Show that the proposed or added claim defines the same patentable invention as the count". This change was made to add the requirement of showing that the new claim defines the same patentable invention as the count and to eliminate a requirement already contained in §1.637(c)(2)(iii).

Section 1.637(c)(2)(iii) was changed to refer to an "amended or added claim" and thereby conform the language of the section to the language of §1.633(c)(2).

Paragraph (c)(5) was added to set out the requirements of a motion under §1.633(c)(5) which permits a party to move to require an opponent who is an applicant to add a claim to the application and to designate the claim to correspond to a count. See Example 37.

Two comments were made concerning §1.638. One comment suggested that the twenty-day periods of paragraphs (a) and (b) were too short. The PTO has evaluated the time periods of paragraphs (a) and (b) and has decided that no change will be made to those periods. Attention is directed to the discussion above of the comments concerning §1.636(b) which also contains a twenty-day period.

Another comment made at the hearing suggested that a reply to an opposition to a motion should be permitted as a matter of course. Upon consideration of the comment, it has been decided to authorize the filing of replies to opposition to all motions. Presently, replies are permitting as a matter of course only for oppositions to motions under 37 CFR §1.231. Section 1.638(b), as changed, would permit the reply in every instance. The PTO over the years has received complaints concerning the inability of a party to file replies. The change being made in §1.638(b) will be reviewed sometime in the future to determine whether authorizing replies is helpful to the Board and/or whether undue delay in resolving interference occurs because replies are filed. Moreover, the PTO will make a judgment on whether "new issues" are being raised as a matter of course in replies. It can thus be seen that the change in authorizing replies may be considered experimental and could be changed in the future if found to be counter-productive or inconsistent with the objective of resolving interferences in a relatively prompt manner.

One comment discussing §1.639 was received. The comment states

> The requirement that proofs of alleged material facts *must* be filed may be difficult or impossible to meet in view of the shortened times. [The] rule should make provisions for timely submission of proofs within reasonable times.

To the extent that the comment suggests setting specific times in the rules, the suggestion is not being adopted. It should be noted that if affidavits cannot be timely prepared to be filed with a motion, the moving party may wish to take advantage of paragraph (c) which requires a party to specify any testimony needed to resolve a motion.

One change was made in §1.639(c) to make clear that a moving party or an opponent may describe any testimony needed to resolve a motion under either §1.633 or §1.634. Often, testimony is needed to resolve inventorship disputes. Accordingly, a party may describe testimony needed to resolve motions to correct inventorship under §1.634. It should be noted that if a party relies solely on affidavits in support of a motion (under §1.633 or §1.634) and the issue raised in the motion is to be considered at final hearing, the party must comply with §1.671(e).

Several comments were received which discussed §1.640. One comment asked: "When the final sentence speaks of a panel deciding the request for reconsideration, does this mean that the panel decides whether to reconsider or whether to modify the decision?" It was the PTO's intent that the panel make a decision on whether to modify the decision made by the single examiner-in-chief. Accordingly, the language "shall be decided by a panel" in the last sentence of §1.640(c) has been changed to read: "shall be acted on by a panel". Another change in language to the fourth sentence of §1.640(c) has been made to make clear that a decision of a single examiner-in-chief will not ordinarily be modified by a panel without an opportunity to file an opposition.

Another comment suggested that §1.640(a) be changed to "allow, even encourage, the examiner-in-chief to travel to conferences where more convenient/practical for all concerned." This suggestion is not being adopted. The use of a telephone conference call eliminates the need to adopt the suggestion. The same comment suggested that the "speedy and inexpensive" language of the second sentence of §1.640(b) be deleted. The suggestion is not being adopted. The comment fails to explain why the language should be deleted. It is obvious that a motion cannot always be

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granted or denied; other action is often appropriate, e.g., deferring consideration of a motion to final hearing. Section 1.640(b) gives the examiner-in-chief discretion to take appropriate action and the "just, speedy, and inexpensive determination" language provides some standard which an examiner-in-chief may follow in those cases where granting or denying a motion is not appropriate.

One comment was received which suggested that §1.640 be changed to provide that an examiner-in-chief hold a hearing to determine whether an interference should proceed in those cases where a junior party fails to allege a date prior to the senior party and remains in an interference only because the junior party is alleging "fraud" by the senior party. The suggestion is not being adopted. If a party believes that an opponent has committed "fraud" or has engaged in "inequitable conduct," the party may file a motion under §1.633(a) for judgment. Obviously, a motion for judgment on the basis of "fraud" or "inequitable conduct" must make out a case by clear and convincing evidence. The examiner-in-chief has sufficient authority under the rules to preclude a party from proceeding in an interference on a baseless charge of "fraud" or "inequitable conduct."

One oral comment was received which suggested that the examiner-in-chief be required to consult with an examiner prior to deciding a preliminary motion for judgment under §1.633(a) based on patentability. The oral comment suggested alternate proposals:

(1) The examiner-in-chief will normally obtain a patentability report when deciding motions involving a question of patentability.

(2) The examiner-in-chief will consult with a primary examiner prior to deciding a motion raising an issue of patentability.

The suggestion of the oral comment is not being adopted. An examiner-in-chief is a person having "competent legal knowledge and scientific ability." 35 U.S.C. §7. Examiners-in-chief review decisions of examiners on questions of patentability. Accordingly, there is no reason to *require* an examiner-in-chief to consult with an examiner on a question of patentability. The PTO recognizes that many examiners possess special expertise in particular arts. It is for this reason that §1.640(b) provides that "[a] n examiner-in-chief *may* consult with an examiner in deciding motions involving a question of patentability" (emphasis added). Thus, an examiner-in-chief is authorized to consult with an examiner on a question of patentability where the examiner-in-chief believes consultation will be beneficial.

One comment suggested that §1.642 be changed to permit an examiner-in-chief to add a newly discovered patent, as well as newly discovered applications, to an interference. Inasmuch as 35 U.S.C. §135(a) authorizes interferences between applications and patents, the suggestion is being adopted. The language "application" in §1.642 has been changed to read: "application or patent".

Several comments discussing §1.644 were received. One commentator made four suggestions, none of which are being adopted. First, the commentator suggested that there should be no fee for a petition under §1.644(a)(1). This suggestion is not being adopted. A decision on a petition is a service performed by the PTO on behalf of a petitioner. The Commissioner is authorized to charge fees for services performed. 35 U.S.C. §41(d). Second, the commentator suggested that the last sentence of §1.644(d) be deleted. This suggestion is not being adopted. In the past when parties have filed petitions, copies of documents already in the interference file have been attached to the petition. The copies tend to increase unnecessarily the size of the file of an interference. Inasmuch as the document submitted with the petition is already in the interference, there is no need to file a "second" copy of the document. Parties can expect that petitions will be returned (§1.618) if the petition is accompanied by documents which are already in the interference file. Third, the commentator argued that the "requirement of service within one (1) day is too onerous and should be deleted" from §1.644(g). No rationale was given in support of the argument. Petitions have caused considerable delay in interference cases in the past. To avoid unnecessary delay and surprise on the part of the opponent, the PTO has decided to require that service of a petition be such that delivery to the opponent is within one (1) working day. Service within one day should not ordinarily be difficult in view of "Express Mail" and numerous commercial one-day delivery services available. Lastly, the commentator suggested that §1.644(i) be changed to provide that decision on a petition would not be delegated to the examiner-in-chief handling the interference. The suggestion to change §1.644(i) is not being adopted. However, when a PTO employee is granted authority to decide a petition in an interference case, the employee would not be the examiner-in-chief handling the interference or an employee on a panel of the Board deciding the petition. It would be expected that an employee deciding a petition by delegation of authority would be one who could exercise independent judgment on the petition bearing in mind that a petition will be decided on the record made before the examiner-in-chief or the panel. In connection with this latter point, findings of fact by an examiner-in-chief or the Board will be presumed to be correct unless shown to be clearly erroneous. Discretionary action by an examiner-in-chief or the Board will not be overturned unless it is shown that an abuse of discretion occurred.

One commentator asked the following: "Is §1.644(g) intended to apply only to 'oppositions' to §1.644 petitions, or is it also applicable to §1.638 oppositions?" The provisions of §1.644(g) apply only to petitions filed under §1.644; those provisions do not apply to oppositions under §1.638.

Two comments suggested that §1.644(a)(2) be changed to include an express statement that a petition under paragraph (a)(2) could not be filed until after the Board has entered judgment and that the petition could not relate to the merits of priority of invention or patentability or a question of whether evidence is admissible under the Federal Rules of Evidence. The suggestions are being adopted and appropriate language has been added to §1.644(a)(2) after the word "Commissioner". The change was suggested by the commentators so that no reasonable person could possibly overlook the fact that a petition to exercise supervisory authority can be filed *only after entry of judgment.* It should be noted that the language "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence" has been deleted from §1.644(b) in view of the change to §1.644(a)(2).

One comment suggested that the last sentence of §1.644(f) be changed to make clear that a decision would not ordinarily be modified until the Commissioner had requested an opposition to a request for reconsideration. This suggestion has been adopted and an appropriate change has been made to the last sentence of §1.644(g).

One comment suggested that the word "shall" in the last sentence of §1.644(b) precludes the filing of an opposition beyond the 15-day period specified in the rules. According to the commentator, the opposition should also be considered timely if filed within "any appropriate extension." A party may move to extend the time for filing an opposition. See §1.645.

One comment argued that §1.644(a)(1) cannot "be squared with the statute as interpreted in *Myers* [v. *Feigelman,* 455 F.2d 596, 172 USPQ 580 (CCPA 1972)]." The rationale in support of the comment is the following:

> I presume that the limitation in subparagraph (b) that a petition under subparagraph (a)(2) "shall not relate to . . . the merits of priority of invention or patentability or . . . the admissibility of evidence" is intended to avoid conflict with *Myers* v. *Feigelman,* 172 USPQ 580 (CCPA 1972), and its progeny. However, I read *Myers* as saying that, if the board has statutory authority to make a decision (including all the myriad of ancillary decisions that the panels and/or the single examiner-in-chief will be making under the new procedure), then the Commissioner does not have authority to review the board's or the single examiner-in-chief's decision. Or, to put it the other way around, if the Commissioner reviews an examiner-in-chief's decision, he is stepping into the shoes of the examiner-in-chief, and the Commissioner's decision is in turn reviewable by the panel (which is, of course, the only entity authorized to exercise the *statutory* jurisdiction of the board—see *Knickerbacker Toy Co.* v. *Faultless Starch Co.,* 175 USPQ 417 n.8 (CCPA 1972)). Thus, I don't see how proposed section 1.644(a)(1) can possibly be squared with the statute as interpreted in *Myers.*

It is true that the CCPA has stated that, "in performing his duties, the Commissioner cannot usurp the functions or impinge upon the jurisdiction of the Board . . . established by 35 U.S.C. 135." *In re Dickinson,* 299 F.2d 954, 958, 133 USPQ 39, 43 (CCPA 1962). See also *Myers* v. *Feigelman, supra,* 455 F.2d at 599 n. 8, 172 USPQ at 583 n. 8. However, it is also true that the Commissioner "shall superintend or perform all duties required by law respecting the granting and issuing of patents . . ." 35 U.S.C. §6; *Kingsland* v. *Carter Carburetor Corp.,* 83 U.S.App.D.C. 266, 168 F.2d 565, 77 USPQ 499 (D.C.Cir. 1948); *In re Staeger,* 189 USPQ 284, 285 n. 2 (Comm'r.Pat. 1974). The Commissioner, subject to approval of the Secretary of Commerce, establishes the procedure by which the examiners-in-chief and the Board will consider interference cases. 35 U.S.C. §6. See also 35 U.S.C. §23 relating to affidavits and depositions.

Under the rules, the Commissioner will not determine on petition either "priority of invention" or "patentability." See §1.644(b). Likewise, the Commissioner will not consider whether evidence should have been admitted or excluded under the Federal Rules of Evidence. The PTO believes that the federal courts, which routinely rule on admissibility under the Federal Rules, are in a better position to determine whether the Board properly interpreted the Federal Rules of Evidence.

While the Commissioner will not decide "priority of invention" or "patentability" under 35 U.S.C. §135(a), it does not follow that the Commissioner is precluded from interpreting PTO rules on procedural matters, including procedural matters related to the admissibility of evidence on some basis other than the Federal Rules of Evidence, e.g., whether a party has complied with a PTO rule such as §1.671(e)(procedure for relying on affidavits) or §1.671(g)(permission required for obtaining evidence by subpoena).

Full consideration has been given to the comment. The PTO nevertheless believes that §1.644(a)(1) is not inconsistent with law. Several comments concerning §1.645 were received. One comment suggested that "to" be inserted in the first sentence of paragraph (a) before "file a notice of appeal" and "commence a civil action". According to the comment, "[t] he use of parallel infinitive verb forms provides greater clarity to the rule." The suggestion has been adopted.

Another commentator said the following:

> "No good reason is seen to require a notarized oath from an attorney merely to explain why a paper was filed late, if there is no claim of substantive prejudice by other parties. Attorneys and examiners-in-chief should not be spending unnecessary time and effort on merely procedural formalities. That is contrary to the intent of the new rules."

The PTO agrees with the commentator and has deleted the language "accompanied by an affidavit" from §1.645(b).

One comment suggested that a reference to §1.610(d)(6) which provides for oral requests should be inserted into §1.645 to reflect intent stated in the comments [of the notice of proposed rulemaking] on proposed §1.645." This suggestion is not being adopted. As the commentator notes, §1.610(d) authorizes an examiner-in-chief to hold a conference call to resolve issues and to enter an appropriate order following the conference call. A conference call may be used to obtain an extension of time. If the examiner-in-chief grants the request, an order may be entered—in which case a written motion is not necessary. The order provides the written record required by 37 CFR §1.2. However, it would unduly lengthen the rules to insert a reference to §1.610(d) in each rule to which it may be applicable. Section 1.645(a) specifies the procedure to be used when a written motion is filed. It should be noted that an examiner-in-chief may require a written motion notwithstanding a conference call.

One comment stated that "[t] he 'other business' may be more pressing than the Interference. In order to serve the ends of justice, the PTO should be considerate in this matter." The PTO intends to evaluate each request for an extension of time on a case-by-case basis. However, extensions of time in interference cases have become "routine." A recent survey of a file in one interference revealed the following. The interference was declared on Mar. 30, 1976. Preliminary statements were filed on May 5, 1979. A decision on motions was entered on June 28, 1982. Testimony was filed on Jan. 3, 1984. During the period between declaration and filing of testimony, sixty-four (64) requests or stipulations for extension of time were filed.

When counsel and an examiner-in-chief agree to a schedule and times are set, the parties will be expected to adhere to the schedule unless there are unusual circumstances. Apart from work that counsel may have in an interference, an examiner-in-chief will have a docket and must manage not only the interference involving counsel, but numerous other interferences. The U. S. Court of Appeals for the Federal Circuit recently said the following in *Rosemount, Inc.* v. *Beckman Instruments, Inc.,* 727 F.2d 1540, 1549-1550, 221 USPQ 1, 10 (Fed. Cir. 1984):

> The conduct of a trial, granting of continuances and the like, is not, however, solely or entirely a matter of balancing conveniences of the parties. The Federal Rules of Civil Procedure recognize another consideration—the need for the exercise of discretion by the trial court in carrying out its duty of managing the judicial process, the business of the court, and the administration of justice.

Likewise, these rules also recognize the need for the exercise of discretion by an examiner-in-chief in carrying out his or her duty of managing the interference (§1.610), the business of the PTO (§1.610), and the administration of justice (§1.601).

Several comments were received which discussed §1.646. One comment suggested that it would be clearer if "service" was inserted after "additional" in the last sentence of §1.646(b). This suggestion has been adopted.

Another comment suggested that "or except as otherwise provided in these Rules" be added to §1.646(c) after "otherwise ordered by an examiner-in-chief". The commentator pointed out that the change was needed because certain rules (§§1.644(g) and 1.658(b)) require service by "Express Mail" or by hand. The commentator accurately pointed out that adding the suggested phrase "will call attention to the fact that there are other rules which have their own requirements for service of papers." The suggestion has been adopted, except that "this part" has been used instead of "these Rules."

One comment suggested changing "time" to "date" in the last sentence of §1.646(e). The suggestion has been adopted. The change is necessary to conform with the language of the rule to actual practice and other language in the rule.

Two comments suggested that §1.646(d), which authorizes an examiner-in-chief to order service by hand or "Express Mail," be deleted. This suggestion is not being adopted. The use of "Express Mail" or delivery by hand

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is often desirable to expedite matters or to avoid unnecessary delay. One comment argued that delivery by hand may be prohibitive. Commercial couriers may be used to accomplish delivery by hand. The fee charged by most commercial couriers is not "prohibitive." The other comment argued that "there are circumstances when . . . [delivery by hand] is [not] possible." The use of §1.646(d) is discretionary on the part of an examiner-in-chief. If delivery by hand, i.e., personal delivery or delivery by commercial courier, or by "Express Mail" is impossible, it would be expected that the examiner-in-chief would exercise discretion and permit service by first class mail.

One comment suggested that the language "present case," which was said to appear in §1.651(b)(1) and §1.651(c), be changed to "prepare case." The suggestion is not being adopted because the language "present case" does not appear in §1.651. In any event, a testimony period is set for a party to present its testimony—either case-in-chief or case-in-rebuttal.

One comment was received which made two suggestions regarding §1.652. First, the comment suggested that a period longer than 15 days be set for filing a response to a paper answering an order to show cause. This suggestion is not being adopted. The fifteen-day period is believed to be adequate in most cases. If more time is needed, a party may file a motion under §1.645. Second, the comment suggested that the party placed under an order to show cause should be permitted as a matter of course to file a "reply" brief. This suggestion is not being adopted. In those instances where the Board believes a "reply" brief is desirable it may authorize the filing of a "reply."

One comment argued that §1.653(i) "fails to make provision for exhibits which are too big to file or are too dangerous to file." If an "exhibit" cannot be filed, it will not be given consideration. A party will have to rely on testimony and/or pictures or sketches for "exhibits" (e.g., a large machine in a factory) which are too large or too dangerous to be filed in the PTO.

While no comments were received concerning §1.654, it should be noted that a new paragraph (c) has been added and paragraph (c) as set out in the notice of proposed rulemaking has been redesignated as paragraph (d). New paragraph (c) provides that a party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under §1.632 was timely filed.

Two comments discussing §1.655 were received. The first comment made the following statement regarding §1.655(a):

> Last sentence—interlocutory orders are reviewed only for 'manifest error' etc. It is not clear whether this includes show cause orders under §1.640 resulting from unpatentability determined under §1.633(a). However, if so, it precludes proper review of the patentability determination.

Patentability will initially be determined by a single examiner-in-chief. See §§1.610(a) and 1.640(b). If the examiner-in-chief determines that a claim of a party is unpatentable to that party, an order to show cause why judgment should not be entered as to that claim will be issued to that party. See §1.640(d). If a response to the order to show cause is filed, a decision will be entered by the Board. See §§1.610(a) and 1.640(e). If the Board determines that the claim is not patentable to the party, a final decision and judgment will be entered holding the claim to be unpatentable. Review of the final decision and judgment is by judicial review under 35 U.S.C. §§141 or 146. It should be noted, however, that if there are other claims in the party's application or patent which are deemed to be patentable, an interlocutory order would be entered holding only that certain claims are unpatentable. A final order holding those claims unpatentable would be entered after final hearing on other issues. Such a practice will avoid piecemeal judicial review.

Another comment suggested that §1.655 be changed to preclude consideration of patentability at final hearing. Public Law 98–622 authorizes consideration of patentability assuming patentability is properly raised by a party during the interlocutory phase of an interference.

Two comments discussing §1.656 were received. One comment suggested that "[b] riefs should be letter size for consistency." The PTO has no preference for the size of briefs. Briefs may be filed on letter or legal-size paper. Inasmuch as the federal courts now require letter-size paper, parties who intend to use a PTO brief as an exhibit in a federal cour. should use letter-size paper.

Another comment suggested that §1.656 be amended to preclude a single examiner-in-chief from ruling on admissibility of evidence. The introductory remarks to the notice of proposed rulemaking (and this notice) state that "[t] he examiner-in-chief, *where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual* problems during the taking of depositions" (emphasis added). The commentator states:

> If an examiner-in-chief has ruled certain evidence inadmissible, that evidence would presumably not be before the Board at final hearing. Proposed Rule 1.656(h) provides a means for a party to obtain suppression of evidence to which he has made timely objection, but the Rule does not provide for any means for a party whose proffered evidence has been held inadmissible by the examiner-in-chief, to have that holding considered by the Board.

The change suggested by the comment will not be adopted. However, a brief explanation of how practice is expected to work is in order. The introductory remarks indicate that a single examiner-in-chief may rule on admissibility of evidence "where appropriate" and in "unusual" circumstances. There are times during interferences where a motion *in limine* can be helpful. For example, a junior party during its case-in-chief may wish to examine a witness on a document which was *not* served as required by §1.673(b)(1). The senior party objects and realizes that if the junior party is permitted to examine the witness on the document, extensive cross-examination using numerous documents would be necessary. In order to avoid wasting considerable time, the parties could contact the examiner-in-chief by phone for a determination *in limine* on whether the junior party should be able to examine the witness on the document. Under the circumstances outlined the examiner-in-chief in his or her discretion could enter an order excluding the document from evidence. The order would be subject to a request for reconsideratio... See §1.640(c). Ordinarily, however, it would be expected that parties would present evidence subject to objection. See §1.675(c), last sentence. It is not envisioned that a single examiner-in-chief will routinely rule on the admissibility of evidence.

Several comments discussing §1.658 were received. One comment suggested that the 14-day time period in §1.658(b) is too short. Section 1.658(b) provides that a party may file a request for reconsideration with 14 days of a final decision by the Board. The 14-day time period is the same period authorized for filing requests for reconsideration by the U. S. Court of Appeals for the Federal Circuit. See Rule 40(a) of the Federal Rules of Appellate Procedure.

Several individuals suggested that a less restricted "interference estoppel" be set out in §1.658(c). While full consideration has been given to the suggestions, it has been decided to retain in these rules the interference estoppel provisions of §1.658(c) essentially as proposed. "Interference estoppel" under §1.658(c) is designed to implement the PTO's intent to have as many issues resolved as possible in a single *inter partes* proceeding. Numerous examples in this notice illustrate how practice is expected to take place under §1.658(c).

The language in the second sentence of §1.658(c) has been changed to more clearly state the nature of the estoppel and the exception to estoppel. The word "counts" in the second sentence of §1.658(c) means the counts as they exist at the time a final decision is entered.

One comment was received concerning §1.658(c) which requires a specific answer. The comment made the following statement:

> You state that an estoppel would not apply against a party awarded a favorable judgment as to *all* counts. However, it seems to me that there will be occasion when it would not be appropriate to have estoppel where there was a split decision. For instance, consider an interference between applicants A and B in which A was awarded priority as to count 1 and B was awarded priority as to count 2. If I understand you correctly, A would be estopped in post-interference *ex parte* practice to present an additional claim X which was patentably indistinct from his claim corresponding to count 1 if B had support for claim X. I think this result would be unfortunate, and that A should be permitted to further refine his claim structure after the interference — that is, after he has been assured that he is entitled to claims to the basic invention recited in count 1. Under the circumstances described by the commentator, inventor A would *not* be estopped to present a claim to X because X is "patentably indistinct" (the proper terminology under the rules would be to say X is the "same patentable invention" as the subject matter of count 1) from the subject matter of count 1. Inventor A would be entitled to claim any disclosed invention which is directed to the "same patentable invention" as count 1. The change in the second sentence of §1.658(c) more clearly reflects the PTO's intent in this regard. Inventor A would *not* be entitled to claim any invention which is the "same patentable invention" as the subject matter of lost count 2. See Examples 26, 27, and 28 for illustrations of interference estoppel practice when a "split" judgment is entered.

Two comments were received discussing §1.659. One comment suggested that the first sentence of §1.659(b) should "reflect" that a reexamination may be based only on patents and printed publications. The suggestion is not being adopted. The basis upon which a reexamination may be instituted are set out elsewhere in the statute and rules. 35 U.S.C. 301-306; 37 CFR 1.501-1.570. There is no further need to set that basis out again in §1.659(b). Another comment suggested that the language "not involved in the judgment of the interference" be deleted from §1.659(b). The rationale in support of the comment was as follows:

> Besides introducing a potential ambiguity as to what claims were 'involved in the judgment,' there does not appear to be any good reasons to draw this distinction, particularly unless it is made more specific. Why should the Board be prevented from recommending reexamination of some (less relevant) patent claims and not other patent claims which are potentially even more relevant to the public, unless *all* of the *same art* has already been fully evaluated against the *same claims* in the Board's decision? (emphasis in original).

When a patent is involved in an interference, each claim of the patent will be designated to (1) correspond to a count *or* (2) not correspond to a count. All claims which are *ultimately* determined to correspond to a count will be "involved in the judgment of the interference." Inasmuch as they are involved in the judgment of the interference, there is no need to recommend reexamination of those claims. The claims involved in the interference are either patentable or unpatentable based on the final decision of the Board. Section 1.659(b) merely authorizes the Board to recommmend reexamination of patent claims which (1) are *not* involved in the judgment and (2) for one reason or another neither party saw fit to move to designate as corresponding to a count.

One comment was received which suggested that the requirements of §1.660 are unnecessary. The PTO disagrees. The requirements of §1.660 are designed to keep the PTO and a party's opponent informed of activity which is relevant to an interference. These rules attempt, to the extent possible, to eliminate procedural surprise. Inasmuch as mail delays occur and the PTO cannot react instantaneously to every paper filed in connection with every application or patent, the provisions of §1.660 are believed helpful in preventing surprise on the part of opponent's and unnecessary work by examiners-in-chief or the Board due to a lack of knowledge of relevant activity which may be taking place in the PTO.

One comment suggested that at the end of §1.661 the following be added: "and the time for any such available appeal or review has expired." The suggestion is not being adopted. Section 1.661 already provides for finality when "no appeal . . . can be taken . . . ." The language finds antecedent basis in 35 U.S.C. §135(a).

Several comments discussing §1.662 were received. Two comments suggested a change be made to provide that when a patentee files a statutory disclaimer under 35 U.S.C. §253 and deletes *all* claims corresponding to a count, the disclaimer will be treated as a request for judgment. As one of the comments pointed out, "[s] ince . . . [the filing of a statutory disclaimer disclaiming all claims corresponding to a count] by the patentee could have no other conceivable effect, the proposed rule should be changed to require judgment when all corresponding claims are disclaimed." The suggestion has been adopted and appropriate changes have been made to §1.662(c). In view of the changes, the following language in §1.662(c), as proposed, is not necessary: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." When a patentee disclaims less than all claims corresponding to a count; the claims which remain in the patent continue to be involved in the interference and any patentability or priority issues involving those remaining claims will be involved in the judgment on the merits in the interference.

Two comments suggested that the word "dissolved" in §1.662(d) be changed to "terminated". This suggestion is being adopted, because §1.662(d) has been deleted. However, all interferences will be terminated with a "judgment." A change has been made in the language of §1.11(a) to delete any reference to terminating an interference other than by judgment.

One comment suggested that the word "construed" in §1.662(a) be changed to "treated". This suggestion has been adopted and more clearly states the intent of the PTO. The filing of the various papers mentioned paragraphs (a) and (c) of §1.662 will result in certain action by the PTO. The word "treated" more appropriately describes the consequences of filing such papers.

One comment suggested that §1.662(a) "is too sweeping." According to the commentator, a patentee may file a disclaimer because it has "become aware of a statutory bar or can not afford the expense of an interference." If the patentee becomes aware of a statutory bar, the patentee should call the "bar" to the attention of the PTO or file an appropriate motion under §1.633(a) for judgment if the "bar" applies to the opponent. If a junior party patentee decides than an interference is too expensive and for that reason files a disclaimer, there is no reason why judgment should not be entered in favor of the opponent. The comment also suggested that §1.662(c) "needs revision" because a patentee may disclaim one claim corresponding to a count, but not another. Section 1.662(c), as revised, takes into account the possibility that less than all claims corresponding to a count may be disclaimed. When some of the patent claims corresponding to a count are disclaimed, the interference proceeds on the basis of the remaining claims

which correspond to the count. If all patent claims corresponding to a count are disclaimed, judgment will be entered.

One comment made the following statement regarding the third sentence of §1.662(a):

> What of abandonment in favor of a CIP [continuation-in-part application]? Would this be construed as [a] request to enter [an] adverse judgment? Language should reflect procedural moves of substituting CIP for abandoned application and/or declaring new interference.

The third sentence of §1.662(a) does not apply to an application which is *not* involved in an interference. If an applicant files a continuation-in-part application and successfully moves (§1.633(d)) to substitute the continuation-in-part for the application involved in the interference, abandonment of the application originally involved in the interference would have no bearing on the interference. Accordingly, no additional language is needed in §1.662(a).

Two comments discussing §1.663 were received. One comment suggested that an explanation of the status of patent claims involved in an adverse judgment should be stated in the rule. This suggestion is not being adopted. The status of patent claims involved in an adverse judgment is stated in 35 U.S.C. §135(a). Another comment suggested that the status of "claims which could have been counts . . . should be made of record." Unless a motion (§1.633(c)) to add claims to correspond to counts is filed, no reference will be made in a judgment as to claims "which could have been made counts."

One comment suggested that the language "then owned by either party but" be inserted after "application" in §1.665. This suggestion is not being adopted. The language "same parties" in §1.665 is intended to cover a party and any assignee. The suggested language "then owned" would narrow the scope of the rule in a manner not intended by the PTO.

An oral comment at the hearing suggested that §1.671(e) be changed so that a party would not have to serve copies of affidavits relied upon under §1.608(b) in those cases where an opponent had already obtained copies of the Rule 608(b) affidavits. This suggestion is not being adopted. See the discussion above answering comments related to §1.612(b). Another comment made at the hearing noted that the PTO is "adopting" the Federal Rules of Evidence. The Federal Rules include a "shop book" rule—Rule 803(b)(6). The commentator expressed the view that adopting of a "shop book" rule might make an important change in evidence which is admissible in interferences and suggested that "it would be helpful if the Patent and Trademark Office would publicly comment on this extremely important evidentiary rule . . . " The PTO believes that adoption of Rule 803(b)(6) of the Federal Rules of Evidence does not constitute a change in the admissibility of "shop book" evidence in interference cases. Rule 803(b)(6) is very similar to the former Federal Shop Book Rule (28 U.S.C. §1732) which it replaced. The courts have articulated a rule of law which the PTO will continue to apply in determining admissibility of laboratory note books under the "shop book" Rule 803(b)(6) of the Federal Rules of Evidence. See e.g., *Alpert* v. *Slatin*, 305 F.2d 891, 134 USPQ 296 (CCPA 1962) and *Elliott* v. *Barker*, 481 F.2d 1337, 179 USPQ 100 (CCPA 1973).

One comment suggested that §1.671(f) be eliminated on the ground that a rule should not be used to train attorneys and agents. The suggestion is not being adopted. The problem addressed by §1.671(f) is significant. By providing in the rules that documentary evidence must be explained the PTO hopes to save both parties and the Board considerable difficulty in presenting and evaluating evidence.

One comment suggested that §1.671(g) should be changed to require a party only to show the "relevancy" of expected testimony as opposed to the "admissibility" of the testimony. This suggestion is being adopted and an appropriate change has been made to §1.671(g) to require a moving party to "describe the general nature and the relevance of the testimony, document, or thing."

An oral comment was received which asked whether permission to issue a subpoena would be needed in the event a party seeks to call a witness under the control of an opponent. Ordinarily, the examiner-in-chief can order a party to produce an individual for a deposition as long as the individual is a party or is under the control of the party, e.g., an employee of an assignee. Where so-called "third parties" are concerned, however, issuance of a subpoena may be necessary, because the PTO has no authority to compel attendance of third parties. Several comments concerning §1.672 were received. One comment at the hearing pointed out that use of 8-1/2 by 11 inch paper for affidavits appears to be optional. The commentator is correct in pointing out that the use is optional. By using 8-1/2 by 11 inch paper, however, a party will save considerable time when filing a record (§1.653).

Two comments asked questions concerning §1.672(b), and in particular, the meaning of the word "party" in the phrase "a party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits . . ." Specifically, one commentator stated:

> It is the scope of the words "the party" which leave doubt as to the meaning of the passage. If "the party" refers *only* to the party proffering the affidavit testimony, then the passage is fair since such party had the opportunity to use whatever documents it deemed favorable to its position. But if "the party" also encompasses the opponent, i.e., the cross-examining party not proffering the affidavit testimony, then the passage improperly restricts the scope of cross-examination. Surely, the proponent party cannot, simply by confining the affidavit to favorable documents, insulate the witness from cross-examination on unfavorable documents.

Section 1.672(b) refers to a "party" and an "opponent." The "party" is the party filing the affidavit and not an opponent of that party. Any "opponent" conducting cross-examination of an affiant may properly rely on documents and things not referred to in the affidavit.

One comment suggested that the language "a witness whose testimony will not be compelled under 35 U.S.C. 24" should be deleted or revised. According to the commentator:

> This is often not determinable in advance. Even a "voluntary" witness may develop cold feet and require a subpoena, or demand one for his own protection. Nor will all witnesses agreeable to affidavits be agreeable to depositions.

The suggestion is not being adopted. An affidavit may be used only when a witness agrees to sign the affidavit. If an individual refuses to sign an affidavit or voluntarily appear at a deposition, the party calling the witness will have to compel attendance at a deposition by a subpoena under 35 U.S.C. §24 after receiving permission from an examiner-in-chief.

One comment asked why there is "no express provision . . . [in the rules] for simply taking appropriate testimony of an adverse party by notice . . . rather than requiring a subpoena?" In many cases, notice will be sufficient inasmuch as an examiner-in-chief or the Board may generally order an adverse party to appear and give testimony. Thus, in many cases a subpoena is not needed to require attendance at a deposition of an adverse party.

Two comments suggested that a time be set out in the rules by which an affidavit should be filed. The suggestion is being adopted and the second sentence of §1.672(b) has been changed to provide that affidavits shall be filed prior to the close of the party's relevant testimony period. The two comments also suggested that the rules specify that documents relied upon in an affidavit be filed with the affidavit. This suggestion is also being adopted by an appropriate change to §1.672(b) which will provide that a party cannot rely on any document referred to in an affidavit unless a copy of the document is filed with the affidavit. Any document filed with an affidavit must also be served (§1.646). Section 1.672(b) will also provide that a party may not rely on any "thing" mentioned in an affidavit unless the opponent is given reasonable access to the "thing." A "thing" is something other than a document. The comments had suggested that the "things" be limited to those under the possession, custody, or control of the party submitting the affidavit. This suggestion is not being adopted. If a "thing" is not under the possession, custody, or control of a party, the party should resort the use of a deposition and compel production of the "thing" by a subpoena under 35 U.S.C. §24.

Four comments were received discussing §1.673. It was suggested that the time for service under §1.673(b) be three days if service is accomplished by hand or "Express Mail" and ten days if service is accomplished by any other means. This suggestion is being adopted. An appropriate change has been made in the introductory sentence of §1.673(b). It was also suggested that the word "copy" in §1.673(b)(1) be changed to read "list and copy". In support of the suggestion, one commentator states:

> In connection with the service of documents, the amendment to the proposed rule would require that a listing of documents accompany the documents themselves. This would permit cross-checking between lists and documents to ascertain whether or not discrepancies exist and reduce the possibility for later controversy.

The suggestion is being adopted. Under §1.673(b)(1) a list of the documents would have to accompany the documents. One comment suggested that documents served should be "Bates numbered." While this suggestion is not being adopted in the sense of changing the language of a rule, it must be remembered that the party serving documents may be required to later prove exactly what was served. Using "Bates" numbers or an equivalent scheme may prove invaluable in later stages of an interference.

One comment discussing §1.682 suggested that the language "not identified on the record during the taking of testimony of a witness" be deleted. This suggestion is not being adopted. If an official record or printed publication is made an exhibit during a deposition or in an affidavit, it need not be submitted under §1.682. Section 1.682 permits a party to make an official record or printed publication part of the evidence being considered at final hearing without calling a witness. The official record or printed publication must, however, be self-authenticating. On the other hand, a party may present the official record or printed publication as an exhibit during testimony. When this latter course is followed, there is no need to take advantage of the provisions of §1.682. The comment also suggested that a change be made in §1.682(a)(4) because the requirement therein for a "certified" copy appeared to be inconsistent with §1.671(d) which provides that a record of the PTO need not be certified. The suggestion is being adopted by adding "where appropriate" at the beginning of §1.682(a)(4) and a reference to §1.671(d) at the end of §1.682(a)(4). If the official record is not a record of the PTO, it will be necessary to submit a certified copy of the official record.

Comments were received discussing §1.684. One comment suggested that language be inserted in §1.684(a) to make clear that the testimony authorized is for a case-in-chief or a case-in-rebuttal. The suggestion is not being adopted. The testimony authorized by §1.684(a) is necessarily testimony for a case-in-chief or a case-in-rebuttal. The commentator correctly notes that the use of written interrogatories under §1.684 "for cross-examination would seem neither appropriate or justified." Section 1.684 does not apply to cross-examination. If a party submits an affidavit under §1.672(b) or intends to rely on an affidavit under §1.617(e), the party must make the affiant available for cross-examination at a deposition. See §1.673(e). A deposition may be noticed only "for a reasonable time and place in the United States." See §1.673(a). Accordingly, it is not expected that §1.684(a) will be used to cross-examine affiants residing in foreign countries. The party filing the affidavit will be required to make the affiant available for cross-examination in the United States.

One comment suggested that the provisions of §1.685(d) are "harsher" than the corresponding provisions of 37 CFR §1.285(c). The comment is not fully understood. Section 1.685(d) requires an objection to be stated on the record. An objection to the admissibility of evidence must be stated on the record *and* a motion under §1.656(h) renewing the objection at final hearing must be filed. No longer will a party be permitted to attend a deposition and fail to enter an objection only to raise the objection at final hearing. The current practice permits a party to delay the objection until it is often too late to permit an opponent to correct the evidentiary basis on which the objection is bottomed.

One comment suggested that the second sentence of §1.687(b) ("If the witness refuses to produce a requested document or thing, the party may file a motion (§1.635) for additional discovery under paragraph (c) of this section.") be deleted. This suggestion is being adopted. The PTO agrees with the following remark by the commentator: "[o]mission of the sentence is recommended since it is clear from [paragraph] (c) [of §1.687] that such a motion could be made in an appropriate case."

One comment at the hearing suggested that the PTO's inability to enter protective orders makes discovery unduly complicated. The commentator suggested that under §1.687(c), as set out in the notice of proposed rulemaking, it is possible to obtain appropriate protective orders. The commentator correctly concedes that the maximum sanction which the PTO can enter upon a proven violation of a PTO entered protective order is judgment. See §1.616. The commentator suggested, however, that additional discovery may be conditioned on the issuance of a subpoena *duces tecum* under 35 U.S.C. §24. Upon issuance of the subpoena, the commentator stated that the opponent could move the district court for entry of a protective order. If a party violates a protective order entered by a district court, the party would be subject to such sanctions as the district court might deem appropriate as well as a sanction by the PTO, including entry of judgment against the party. The PTO, unlike the district court, would not be able to apply a sanction after an interference is terminated.

The commentator's suggestion is believed to be sound. No change in the language of §1.687(b) is believed to be necessary inasmuch as paragraph (b) authorizes the PTO to "specify the terms of conditions of such additional discovery." One of those terms could be requiring a party to issue a subpoena under 35 U.S.C. §24. By making a party proceed in the first instance in the PTO, appropriate PTO orders may be entered suggesting the scope of any protective order and stating the underlying basis for requiring a party to produce documents. The order could be of assistance to the district court in subsequent enforcement or contempt proceedings.

Additional discovery obtained under a protective order issued by either the PTO or a district court will not be admitted in evidence in the PTO in determining the interference. All evidence submitted in an interference must be made available to the public under the provisions of §1.11(a). Accordingly, any protective orders have to be vacated before a document could be admitted in evidence in the PTO which is subject to a protective order.

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Example 38 illustrates how the practice would work.

Example 38: An interference involves party X and party Y. During the interference, party X files a motion for additional discovery under §1.687(c) asking that party Y be required to produce certain documents. Party Y opposes on the sole ground that the documents contain trade secret and confidential information. Party Y indicates that it has no objection to producing the documents for inspection by counsel for party X, but insists that party X not be permitted to inspect the documents. Accordingly, party Y asks the examiner-in-chief to authorize the discovery subject to entry of a protective order. Party Y argues, however, that the sanctions of §1.616 are not sufficient in the event of a violation of the protective order. An examiner-in-chief concludes that additional discovery should be ordered, that a protective order is appropriate, and that the sanctions of §1.616 are not sufficient in the event of a violation of the protective order. Under the circumstances, the examiner-in-chief would enter an order directing party Y to produce the documents for inspection by counsel of party X on the condition that party X seek production of the documents by a subpoena *duces tecum* under 35 U.S.C. §24. Upon issuance of any subpoena, party Y could move the district court for entry of a protective order. If the district court enters the protective order, party Y can produce the documents to counsel for party X. If the protective order of the examiner-in-chief is violated, an appropriate sanction up to and including judgment may be entered by the Board. In addition, party Y would be in a position to seek contempt or other sanctions in the district court. The documents produced for inspection by counsel for party X could not be admitted in evidence in the interference (until the protective order is vacated), because those documents are not documents which can be made available to the public under §1.11(a).

The following is an anticipated time schedule for a two-party interference:

Event in Interference	Time from last event in the interference	Total time in interference
Interference declared (1.611)		
Filing of preliminary statements (1.621) and preliminary motions (1.633)	3 months	3 months
Filing oppositions to preliminary motions (1.638(a))	2/3 month	3-2/3 months
Filing replies to oppositions (1.638(b))	2/3 month	4-1/3 months
Decision on preliminary motions (1.640(b)(1)), open preliminary statements (1.631), set times for filing motions for discovery (1.687(c) and testimony (1.651(a))	1 month	5-1/3 months
Filing of motions for discovery (1.635, 1.651(a), 1.687(c))	1 month	6-1/3 months
Filing of opposition to motion for discovery (1.638(a))	2/3 months	7 months
Filing reply to opposition to motion for discovery (1.638(b))	2/3 months	7-2/3 months
Decision on motion for discovery	2/3 months	8-1/3 months
Time for compliance with any discovery	2/3 months	9 months
Junior party testimony (case-in-chief; 1.672(b)):		
Testimony	2 months	11 months
Senior party cross-examination of affiants if needed	1 month	12 months
Senior party testimony (case-in-chief and case-in-rebuttal, 1.672(b)):		
Testimony	2 months	13-2/3 months
Junior party cross-examination of affiants if needed	1 month	14-2/3 months
Junior party testimony (case-in-rebuttal):		
Testimony	2/3 month	16 months
Senior party cross- examination of affiants if needed	2/3 month	16-2/3 months
Filing of record (1.653(c))	1-1/3 months	18 months
Brief for junior party (1.656)	1 month	19 months
Brief for senior party (1.656)	1 month	20 months
Reply brief for junior party (1.656)	2/3 month	20-2/3 months
Final hearing (1.654)	1 month	21-2/3 months
Decision (1.658)	2 months	23-2/3 months

The following is an index for §§1.601 through 1.688:

Rule Index

§1.601 Scope of rules, definitions
§1.602 Interest in applications and patents involved in interference
§1.603 Interference between applications; subject matter of the interference
§1.604 Request for interference between applications by an applicant
§1.605 Suggestion of claim to applicant by examiner
§1.606 Interference between an application and a patent; subject matter of the interference
§1.607 Request by applicant for interference with patent
§1.608 Interference between an application and a patent; *prima facie* showing by applicant
§1.609 Preparation of interference papers by examiner
§1.610 Assignment of interference to examiner-in-chief, time period for completing interference
§1.611 Declaration of interference
§1.612 Access to applications
§1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
§1.614 Jurisdiction over interference
§1.615 Suspension of *ex parte* prosecution
§1.616 Sanctions for failure to comply with rules or order
§1.617 Summary judgment against applicant
§1.618 Return of unauthorized papers
§1.621 Preliminary statement, time for filing, notice of filing
§1.622 Preliminary statement, who made invention, where invention made
§1.623 Preliminary statement; invention made in United States
§1.624 Preliminary statement; invention made abroad
§1.625 Preliminary statement; derivation by an opponent
§1.626 Preliminary statement; earlier application
§1.627 Preliminary statement, sealing before filing, opening of statement
§1.628 Preliminary statement, correction of error
§1.629 Effect of preliminary statement
§1.630 Reliance on earlier application
§1.631 Access to preliminary statement, service of preliminary statement
§1.632 Notice of intent to argue abandonment, suppression, or concealment by opponent
§1.633 Preliminary motions
§1.634 Motion to correct inventorship
§1.635 Miscellaneous motions
§1.636 Motions, time for filing
§1.637 Content of motions
§1.638 Opposition and reply, time for filing opposition and reply
§1.639 Evidence in support of motion, opposition, or reply
§1.640 Motions, hearing and decision, redeclaration of interference, order to show cause
§1.641 Unpatentability discovered by examiner-in-chief
§1.642 Addition of application or patent to interference
§1.643 Prosecution of interference by assignee
§1.644 Petitions in interference
§1.645 Extension of time, late papers, stay of proceedings
§1.646 Service of papers, proof of service
§1.647 Translation of document in foreign language
§1.651 Setting times for discovery and taking testimony, parties entitled to take testimony
§1.652 Judgment for failure to take testimony or file record
§1.653 Record and exhibits
§1.654 Final hearing
§1.655 Matters considered in rendering a final decision
§1.656 Briefs for final hearing
§1.657 Burden of proof as to date of invention
§1.658 Final decision
§1.659 Recommendation
§1.660 Notice of reexamination, reissue, protest or litigation
§1.661 Termination of interference after judgment
§1.662 Request for entry of adverse judgment; reissue filed by patentee
§1.663 Status of claim of defeated applicant after interference
§1.664 Action after interference
§1.665 Second interference
§1.666 Filing of interference settlement agreements
§1.671 Evidence must comply with rules
§1.672 Manner of taking testimony
§1.673 Notice of examination of witness
§1.674 Persons before whom depositions may be taken
§1.675 Examination of witness, reading and signing transcript of deposition
§1.676 Certification and filing by officer, marking exhibits
§1.677 Form of a transcript of deposition
§1.678 Transcript of deposition must be filed
§1.679 Inspection of transcript
§1.682 Official records and printed publications
§1.683 Testimony in another interference, proceeding, or action
§1.684 Testimony in a foreign country
§1.685 Errors and irregularities in depositions
§1.687 Additional Discovery
§1.688 Use of discovery

The following is a table correlating the present rules (37 CFR §1.201 through §1.288) to the rules (37 CFR §§1.601 through 1.688).

Rule Correlation Table

Old	New
1.201(a)	1.601(a)
1.201(b)	1.601(b), (c)
1.201(c)	1.602
1.202	none
1.203(a)	1.603(a), (b)
1.203(b)	1.605(a)
1.203(c)	1.605(b)
new	1.604(a)
1.203(d)	1.604(b)
1.204(a)	none
1.204(b)	1.608(b)
1.204(c)	1.608(c)
1.205(a)	1.606(a), (b)
1.205(b)	1.607(a), (c)
1.205(c)	1.607(d)
new	1.608(a)
1.206(a)	1.607(b)
1.207(a)	1.609
new	1.610
1.207(b)	1.611
1.208	1.613
1.211	1.614
1.212	1.615
new	1.616
1.228	1.617
new	1.618
1.215(a)	1.621(a)
1.215(b)	1.621(b)
1.215(c)	1.629(c)
1.216(a)	1.622(a), (b)
1.216(a)(1)–(6)	1.623(a)
1.216(b)	1.623(b), 1.624(b), 1.625(b)
1.216(c)	1.666

1.217(a)	1.624(a), 1.625(a)
1.217(b)	1.623(a)
1.218	1.621(a)
1.219	1.627
1.222	1.628
1.223	1.629
1.224	1.630
1.225	1.640(d), (e), and 1.651(c)(4)
1.226	1.612
1.227	1.631
new	1.632
1.231	1.633, 1.634
1.237	1.641
1.238	1.642
1.242	1.643
1.243	1.635, 1.636, 1.637(b) 1.638 through 1.640
1.244	1.644
1.245	1.645
1.246	1.645
1.247	1.646
1.248	1.646
new	1.647
1.251	1.651
1.252	1.652
1.253	1.653
1.254	1.656
1.255	1.656(c)
1.256	1.654
1.257(a)	1.657
1.257(b)	1.658(c), (d)
1.258	1.655
1.259	1.659
new	1.660
1.262	1.662(a)
1.263	1.662(a) and (d)
1.264	1.662(b) and (c)
new	1.662(e)
1.265	1.663
1.266	1.664
1.267	1.665
1.268	1.666
1.271	1.671
new	1.671(g)
1.272(a)	1.672(a), (b)
1.272(b)	1.672(c)
1.272(c)	1.672(d), (e)
1.273(a)	1.673(a), (c), (d),
new	1.673(e)
1.273(b)	1.673(f)
1.274	1.674
1.275	1.675
1.276	1.676
1.277	1.677
1.278	1.678
1.279	1.679
1.281	1.645
1.282	1.682
1.283	1.683
1.285	1.685
1.286	eliminated
1.287(a)(1)(i),(ii)	1.673(b)
1.287(a)(1)(iii)	1.673(a)
1.287(a)(2),(3)	eliminated
1.287(b)	eliminated
1.287(c)	1.687
1.287(d)(1)	1.673(c)
1.287(d)(2)	1.616
1.287(e)	1.687(d)
1.288	1.688

Other Considerations: These rules do not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the (1) Regulatory Flexibility Act (Pub. L. 96-354), (2) Executive Order 12291, and (3) the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that these rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act; Public Law 96-354). The rules govern the conduct of interference cases which arise in the Patent and Trademark Office. In fiscal 1983, the Patent and Trademark Office received 105,704 patent applications. During the same period, 180 interferences were declared. It is expected that the overall cost will be reduced for obtaining a patent based on application which become involved in an interference. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H10528, columns 2 and 3):

> it is expected that interferences will become simpler, more expeditious, and less costly. Under the bill, all issues of patentability and priority which arise in an interference can be decided in a single proceeding rather than in a series of complicated *inter partes* and *ex parte* proceedings.

These rules, therefore, will have no significant economic impact on small entities.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers, individual industries, federal state, or local government agencies, or geographic regions. There would be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rules do not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Lawyers.

PART 1 — RULES OF PRACTICE IN PATENT CASES

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 23, 41, and 135, Part 1 of Title CFR is amended as set forth below.

1. Section 1.1 is amended by adding a new paragraph (e) to read as follows:

§1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(e) Communications relating to interferences and applications or patents involved in an interference should be additionally marked "BOX INTERFERENCE."

2. Section 1.4 is amended by revising paragraph (a)(2) and reprinting the introductory text of paragraph (a) to read as follows:

§1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises:

* * * * *

(2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§1.31 to 1.352; of international applications in Subpart C, §§1.401 to 1.482; of reexamination of patents in Subpart D, §§1.501 to 1.570; of interferences in Subpart E, §§1.601 to 1.688; and of trademark applications §§2.11 to 2.189.

* * * * *

3. Section 1.5 is amended by adding a new paragraph (e) to read as follows:

§1.5 Identification of application, patent or registration

* * * * *

(e) When a paper concerns an interference, it should state the names of the parties and the number of the interference. The name of the examiner-in-chief assigned to the interference (§1.610) and the name of the party filing the paper should appear conspicuously on the first page of the paper.

4. Section 1.8 is amended by adding to paragraph (a) a new subparagraph (xii) to read as follows:

§1.8 Certificate of mailing.

* * * * *

(xii) The filing of a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail."

* * * * *

5. Section 1.9 is amended by adding a new paragraph (g) to read as follows:

§1.9 Definitions.

* * * * *

(g) For definitions in interferences see §1.601.

6. Section 1.11 is amended by revising paragraph (a) to read as follows:

§1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After entry of a judgment in an interference by the Board of Patent Appeals and Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See §2.27 for trademark files.

* * * * *

7. Section 1.14 is amended by removing from paragraph (d) the words "Board of Patent Appeals or the Board of Patent Interferences" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

8. Section 1.17 is amended by revising paragraphs (e), (g), (h), and (l) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§1.9(f))	$ 57.50
By other than a small entity	115.00

* * * * *

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. §134:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

— §1.47 — for filing by other than all the inventors or a person not the inventor
— §1.48 — for correction of inventorship
— §1.182 — for decision on questions not specifically provided for
— §1.183 — to suspend the rules
— §1.377 — for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
— §1.378(e) — for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
— §1.644(e) — for petition in an interference
— §1.644(f) — for request for reconsideration of a decision on petition in an interference.
— §1.666(c) — for late filing of interference settlement agreement.
— §§5.12, 5.13 & 5.14 — for expedited handling of foreign filing license
— §5.15 — for changing the scope of a license
— §5.25 — for retroactive license

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph ..... $ 60.00

— §1.12 — for access to an assignment record
— §1.14 — for access to an application
— §1.55 — for entry of late priority papers
— §1.102 — to make application special
— §1.103 — to suspend action in application
— §1.177 — for divisional reissues to issue separately
— §1.312 — for amendment after payment of issue fee
— §1.313 — to withdraw an application from issue
— §1.314 — to defer issuance of a patent
— §1.334 — for patent to issue to assignee, assignment recorded late
— §1.666(b) — for access to interference settlement agreement

* * * * *

9. Section 1.36 is revised as follows:

§1.36 Revocation of power of attorney or authorization; withdrawal of attorney or agent.

A power of attorney or authorization of agent may be revoked at any stage in the proceedings of a case, and an attorney or agent may withdraw, upon application to and approval by the Commissioner. An attorney or agent, except an associate attorney or agent whose address is the same as that of the principal attorney or agent, will be notified of the revocation of the power of attorney or authorization, and the applicant or patent owner will be notified of the withdrawal of the attorney or agent. An assignment will not of itself operate as a revocation of a power or authorization previously given, but the assignee of the entire interest may revoke previous powers and be represented by an attorney or agent of the assignee's own selection. See §1.613(d) for withdrawal of an attorney or agent of record in an interference.

10. Section 1.48 is revised as follows:

§1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must

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be diligently made and must be accompanied by (a) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (b) an oath or declaration by each actual inventor or inventors as required by §1.63; (c) the fee set forth in §1.17(h); and (d) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under §1.634.

11. Section 1.55 is amended by removing from paragraph (a) "1.224" and inserting, in its place, "1.630".

12. Section 1.59 is revised as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(l)) has been paid. See §1.618 for return of unauthorized and improper papers in interferences.

13. Section 1.68 is revised as follows:

§1.68 Declaration in lieu of oath.

Any document to be filed in the Patent and Trademark Office and which is required by any law, rule, or other regulation to be under oath may be subscribed to by a written declaration. Such declaration may be used in lieu of the oath otherwise required, if, and only if, the declarant is on the same document, warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. The declarant must set forth in the body of the declaration that all statements made of the declarant's own knowledge are true and that all statements made on information and belief are believed to be true.

14. Section 1.103 is amended by revising paragraph (d) as follows:

§1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request filed under §1.139 will be suspended for the entire pendency of these applications except for purposes relating to interference proceedings under §§1.601 through 1.688.

15. Section 1.122 is amended by revising paragraph (b) as follows:

§1.122 Entry and consideration of amendments.

* * * * *

(b) Ordinarily all amendments presented in a paper filed while the application is open to amendment are entered and considered, subsequent cancellation or correction being required of improper amendments. Untimely amendatory papers may be refused entry and consideration in whole or in part. For amendments presented during an interference see §1.664.

16. Section 1.136 is amended by removing "§1.207" and inserting, in its place, "§1.611" and by removing "§1.245" and inserting, in its place, "§1.645".

17. Section 1.138 is revised as follows:

§1.138 Express Abandonment.

An application may be expresaly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of §1.34(a), or of record, may also expresaly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue.

18. Section 1.181 is amended by revising paragraph (a) as follows:

§1.181 Petition to the Commissioner.

(a) Petition may be taken to the Commissioner: (1) from any action or requirement of any examiner in the *ex parte* prosecution of an application which is not subject to appeal to the Board of Patent Appeals and Interferences or to the court; (2) in cases in which a statute or the rules specify that the matter is to be determined directly by or reviewed by the Commissioner; and (3) to invoke the supervisory authority of the Commissioner in appropriate circumstances. For petitions in interferences, see §1.644.

* * * * *

19. The center heading preceding §1.191 is revised to read "APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES".

20. Section 1.191 is amended by revising the section heading and paragraphs (a) and (c) as follows:

§1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected or who has been given a final rejection (§1.113), may, upon the payment of the fee set forth in §1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response.

* * * * *

(c) An appeal when taken must be taken from the rejection of all claims under rejection which the applicant or patent owner proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

* * * * *

21. Section 1.194 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

22. Section 1.196 is revised as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise any one of the following three options:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(2) The appellant may have the case reconsidered under §1.197(b) by the Board of Patent Appeals and Interferences upon the same record. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused.

(3) The appellant may treat the decision, including the new grounds for rejection given by the Board of Patent Appeals and Interferences, as a final decision in the case.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, appellant shall have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences. Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

23. Section 1.197 is amended by revising paragraphs (a) and (b) as follows:

§1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to the appellant's right of appeal or other review, for such further action by the appellant or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states.

* * * * *

24. Section 1.198 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

25. The center heading preceding §1.201 is removed.

26. Sections 1.201 through 1.212 are removed.

27. The center heading preceding §1.215 is removed.

28. Sections 1.215 through 1.228 are removed.

29. The center heading preceding §1.231 is removed.

30. Sections 1.231 through 1.238 are removed.

31. The center heading preceding §1.242 is removed.

32. Sections 1.242 through 1.247 are removed.

33. A center heading preceding §1.248 is added which reads "MISCELLANEOUS PROVISIONS".

34. Section 1.248 is amended by adding paragraph (c) and revising the section heading as follows:

§1.248 Service of Papers; manner of service; proof of service in cases other than interferences.

* * * * *

(c) See §1.646 for service of papers in interferences.

35. The center heading preceding §1.251 is removed.

36. Sections 1.251 through 1.259 are removed.

37. The center heading preceding §1.261 is removed.

38. Sections 1.261 through 1.268 are removed.

39. The center heading preceding §1.271 is removed.

40. Sections 1.271 through 1.288 are removed.

41. Section 1.292 is amended by revising paragraph (a) and adding paragraph (c) as follows:

§1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations and the fee set forth in §1.17(j) is filed by one having information of the pendency of an application and is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

(c) A petition for institution of public use proceedings shall not be filed by a party to an interference as to an application involved in the interference. Public use and on sale issues in an interference shall be raised by a preliminary motion under §1.633(a).

42. Section 1.301 is amended by removing the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences."

43. Section 1.302 is amended by removing from paragraph (b) "1.248" and inserting, in its place, "1.646" and by removing "and other contested cases".

44. Section 1.303 is amended by removing from paragraph (a) the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences" and by removing from paragraph (c) "1.248" and inserting, in its place, "1.646". 45. Section 1.304 is amended by revising paragraph (a) as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of

Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

46. Section 1.322 is amended by revising paragraph (a) as follows:

§1.322 Certificate of correction of Office mistake.

(a) A certificate of correction under 35 U.S.C. 254 may be issued at the request of the patentee or the patentee's assignee. Such certificate will not be issued at the request or suggestion of anyone not owning an interest in the patent, nor on motion of the Office, without first notifying the patentee (including any assignee of record) and affording the patentee an opportunity to be heard. When the request relates to a patent involved in an interference, the request shall comply with the requirements of this section and shall be accompanied by a motion under §1.635.

* * * * *

47. Section 1.323 is revised as follows:

§1.323 Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature or of minor character which was not the fault of the Office, appears in a patent and a showing is made that such mistake occurred in good faith, the Commissioner may, upon payment of the fee set forth in §1.20(a), issue a certificate, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. A request for a certificate of correction of a patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under §1.635.

48. Section 1.324 is revised as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors. A request to correct inventorship of patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under §1.634.

49. Section 1550 is amended by removing from paragraph (a) "Board of Appeals" and inserting, in its place, "Board of Patent Appeals and Interferences."

50. Section 1.565 is amended by revising paragraph (b) and adding paragraph (e) as follows:

§1.565 Concurrent office proceedings.

* * * * *

(b) If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent is filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

* * * * *

(e) If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§1.635) to stay the interference has been presented to, and denied by, an examiner-in-chief and the request is filed within ten (10) days of a decision by an examiner-in-chief denying the motion for a stay or such other time as the examiner-in-chief may set.

51. A new subpart entitled "Subpart E—Interferences" is added which reads as follows:

SUBPART E—INTERFERENCES

Sec.

1.601 Scope of rules, definitions
1.602 Interest in applications and patents involved in interference
1.603 Interference between applications; subject matter of the interference
1.604 Request for interference between applications by an applicant
1.605 Suggestion of claim to applicant by examiner
1.606 Interference between an application and a patent; subject matter of the interference
1.607 Request by applicant for interference with patent
1.608 Interference between an application and a patent; *prima facie* showing by applicant
1.609 Preparation of interference papers by examiner
1.610 Assignment of interference to examiner-in-chief, time period for completing interference
1.611 Declaration of interference
1.612 Access to applications
1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
1.614 Jurisdiction over interference
1.615 Suspension of ex parte prosecution
1.616 Sanctions for failure to comply with rules or order
1.617 Summary judgment against applicant
1.618 Return of unauthorized papers
1.621 Preliminary statement, time for filing, notice of filing
1.622 Preliminary statement, who made invention, where invention made
1.623 Preliminary statement; invention made in United States
1.624 Preliminary statement; invention made abroad
1.625 Preliminary statement; derivation by an opponent
1.626 Preliminary statement; earlier application
1.627 Preliminary statement, sealing before filing, opening of statement
1.628 Preliminary statement, correction of error
1.629 Effect of preliminary statement
1.630 Reliance on earlier application
1.631 Access to preliminary statement, service of preliminary statement
1.632 Notice of intent to argue abandonment, suppression, or concealment by opponent Preliminary motions
1.634 Motion to correct inventorship
1.635 Miscellaneous motions

1.636 Motions, time for filing
1.637 Content of motions
1.638 Opposition and reply, time for filing opposition and reply
1.639 Evidence in support of motion, opposition, or reply
1.640 Motions, hearing and decision, redeclaration of interference, order to show cause
1.641 Unpatentability discovered by examiner-in-chief
1.642 Addition of application or patent to interference
1.643 Prosecution of interference by assignee
1.644 Petitions in interference
1.645 Extension of time, late papers, stay of proceedings
1.646 Service of papers, proof of service
1.647 Translation of document in foreign language
1.651 Setting times for discovery and taking testimony, parties entitled to take testimony
1.652 Judgment for failure to take testimony or file record
1.653 Record and exhibits
1.654 Final hearing
1.655 Matters considered in rendering a final decision
1.656 Briefs for final hearing
1.657 Burden of proof as to date of invention
1.658 Final decision
1.659 Recommendation
1.660 Notice of reexamination, reissue, protest, or litigation
1.661 Termination of interference after judgment
1.662 Request for entry of adverse judgment; reissue filed by patentee
1.663 Status of claim of defeated applicant after interference
1.664 Action after interference
1.665 Second interference
1.666 Filing of interference settlement agreements
1.671 Evidence must comply with rules
1.672 Manner of taking testimony
1.673 Notice of examination of witness
1.674 Persons before whom depositions may be taken
1.675 Examination of witness, reading and signing transcript of deposition
1.676 Certification and filing by officer, marking exhibits
1.677 Form of a transcript of deposition
1.678 Transcript of deposition must be filed
1.679 Inspection of transcript
1.682 Official records and printed publications
1.683 Testimony in another interference, proceeding, or action
1.684 Testimony in a foreign country
1.685 Errors and irregularities in depositions
1.687 Additional Discovery
1.688 Use of discovery

Authority: 35 USC 6, 23, 41, and 135

SUBPART E — Interferences

§1.601 Scope of rules, definitions.

This subpart governs the procedure in patent interferences in the Patent and Trademark Office. This subpart shall be construed to secure the just, speedy, and inexpensive determination of every interference. For the meaning of terms in the Federal Rules of Evidence as applied to interferences, see §1.671(c). Unless otherwise clear from the context, the following definitions apply to this subpart:

(a) "Additional discovery" is discovery to which a party may be entitled under §1.687 in addition to discovery to which the party is entitled as a matter of right under §1.673(a) and (b).

(b) "Affidavit" means affidavit, declaration under §1.68, or statutory declaration under 28 U.S.C. §1746. A transcript of an *ex parte* deposition may be used as an affidavit.

(c) "Board" means the Board of Patent Appeals and Interferences.

(d) "Case-in-chief" means that portion of a party's case where the party has the burden of going forward with evidence.

(e) "Case-in-rebuttal" means that portion of a party's case where the party presents evidence in rebuttal to the case-in-chief of another party.

(f) A "count" defines the interfering subject matter between (1) two or more applications or (2) one or more applications and one or more patents. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent which corresponds to a count is a claim involved in the interference within the meaning of 35 U.S.C. §135(a). A claim of a patent or application which is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application which is not identical to a count, but which defines the same patentable invention as the count, is said to "correspond substantially" to the count. When a count is broader in scope than all claims which correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party.

(g) The "effective filing date" of an application or a patent is the filing date of an earlier application accorded to the application or patent under 35 U.S.C. §§119, 120, or 365.

(h) In the case of an application, "filing date" means the filing date assigned to the application. In the case of a patent, "filing date" means the filing date assigned to the application which issued as the patent.

(i) An "interference" is a proceeding instituted in the Patent and Trademark Office before the Board to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patents contain claims for the same patentable invention.

(j) An "interference-in-fact" exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count define the same patentable invention.

(k) A "lead" attorney or agent is a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the attorney or agent whom an examiner-in-chief may contact to set times and take other action in the interference.

(l) A "party" is (1) an applicant or patentee involved in the interference or (2) a legal representative or an assignee of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An "inventor" is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A "senior party" is the party with earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A "junior party" is any other party.

(n) Invention "A" is the "same patentable invention" as a invention "B" when invention "A" is the same as (35 U.S.C. §102) or is obvious (35 U.S.C. §103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a "separate patentable invention" with respect to invention "B" when invention "A" is new (35 U.S.C. §102) and nonobvious (35 U.S.C. §103) in view of invention "B"

assuming invention "B" is prior art with respect to invention "A".

(o) "Sworn" means sworn or affirmed.

(p) "United States" means the United States of America, its territories and possessions.

§1.602 Interest in applications and patents involved in an interference.

(a) Unless good cause is shown, an interference shall not be declared or continued between (1) applications owned by a single party or (2) applications and an unexpired patent owned by a single party.

(b) The parties, within 20 days after an interference is declared, shall notify the Board of any and all right, title, and interest in any application or patent involved or relied upon in the interference unless the right, title, and interest is set forth in the notice declaring the interference.

(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days of the change.

§1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined by one or more counts. Each count shall define a separate patentable invention. Each application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

§1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting a claim corresponding to the proposed count, (2) identifying the other application and, if known, a claim in the other application which corresponds to the proposed count, and (3) explaining why an interference should be declared.

(b) When an applicant presents a claim known to the applicant to define the same patentable invention claimed in a pending application of another, the applicant shall identify that pending application, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where it appears an applicant may have failed to comply with the provisions of this paragraph.

§1.605 Suggestion of claim to applicant by examiner.

(a) The examiner may suggest that an applicant present a claim in an application for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

(b) The suggestion of a claim by the examiner for the purpose of an interference will not stay the period for response to any outstanding Office action. When a suggested claim is timely presented, *ex parte* proceedings in the application will be stayed pending a determination of whether an interference will be declared.

§1.606 Interference between an application and a patent; subject matter of the interference.

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. Each count shall define a separate patentable invention. Any application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§1.611), a count shall not be narrower in scope than any patent claim which corresponds to the count and any single patent claim will be presumed, subject to a motion under §1.633(c), not to contain separate patentable inventions.

§1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) presenting a proposed count and a claim corresponding to the proposed count and, if any claim of the patent or application does not correspond exactly to the proposed count, explaining why an interference should be declared, (2) identifying the patent and indicating which claim in the application and which claim or claims of the patent correspond to the proposed count, and (3) applying the terms of the application claim corresponding to the count to the disclosure of the application.

(b) When an applicant seeks an interference with a patent, examination of the application, including any appeal to the Board, shall be conducted with special dispatch within the Patent and Trademark Office. The examiner shall determine whether there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in an interference. If the examiner determines that there is any interfering subject matter, an interference will be declared. If the examiner determines that there is no interfering subject matter, the examiner shall state the reasons why an interference is not being declared and otherwise act on the application.

(c) When an applicant presents a claim which corresponds exactly or substantially to a claim of a patent, the applicant shall identify the patent and the number of the patent claim, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where an applicant fails to identify the patent.

(d) A notice that an applicant is seeking to provoke an interference with a patent will be placed in the file of the patent and a copy of the notice will be sent to the patentee. The identity of the applicant will not be disclosed unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will be placed in the patent file and will be sent to the patentee.

§1.608 Interference between an application and a patent; *prima facie* showing by applicant.

(a) When the earlier of the filing date or effective filing date of an application is three months or less after the earlier of the filing date or effective filing date of a patent, the applicant, before an interference will be declared, shall file an affidavit alleging that there is a basis upon which applicant is entitled to a judgment relative to the patentee.

(b) When the earlier of the filing date or the effective filing date of an application is more than three months after the earlier of the filing date or the effective filing date under 35 U.S.C. §120 of a patent, the applicant, before an interference will be declared, shall file (1) evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and (2) an explanation stating with particularity the basis upon which the applicant is *prima facie* entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2× 11 inches (21.8 by 27.9 cm.). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or §1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of sufficient cause, an affidavit may be based on information and belief. If a examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the applicant would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

§1.609 Preparation of interference papers by examiner.

When the examiner determines that an interference should be declared, the examiner shall forward to the Board:

(a) All relevant application and patent files and

(b) A statement identifying:

(1) The proposed count or counts;

(2) The claims of any application or patent which correspond to each count, stating whether the claims correspond exactly or substantially to each count;

(3) The claims in any application which are deemed by the examiner to be patentable over any count; and

(4) Whether an applicant or patentee is entitled to the benefit of the filing date of an earlier application and, if so, sufficient information to identify the earlier application.

§1.610 Assignment of interference to examiner-in-chief, time period for completing interference.

(a) Each interference will be declared by an examiner-in-chief who may enter all interlocutory orders in the interference, except that only a panel consisting of at least three members of the Board shall (1) hear oral argument at final hearing, (2) enter a decision under §§1.617, 1.640(c) or (e), 1.652, 1.656(i) or 1.658 or (3) enter any other order which terminates the interference.

(b) As necessary, another examiner-in-chief may act in place of the one who declared the interference. Unless otherwise provided in this section, at the discretion of the examiner-in-chief assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the examiner-in-chief assigned to the interference. Times for taking action shall be set and the examiner-in-chief shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An examiner-in-chief may hold a conference with the parties to consider: (1) simplification of any issues, (2) the necessity or desirability of amendments to counts, (3) the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, (4) any limitations on the number of expert witnesses, (5) the time and place for conducting a deposition (§1.673(g)), and (6) any other matter as may aid in the disposition of the interference. After a conference, the examiner-in-chief may enter any order which may be appropriate.

(e) The examiner-in-chief may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

§1.611 Declaration of interference.

(a) Notice of declaration of an interference will be sent to each party.

(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an examiner-in-chief may (1) send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or (2) order publication of an appropriate notice in the *Official Gazette*.

(c) The notice of declaration shall specify:

(1) the name and residence of each party involved in the interference;

(2) the name and address of record of any attorney or agent of record in any application or patent involved in the interference;

(3) the name of any assignee of record in the Patent and Trademark Office;

(4) the identity of any application or patent involved in the interference;

(5) where a party is accorded the benefit of the filing date of an earlier application, the identity of the earlier application;

(6) the count or counts;

(7) the claim or claims of any application or any patent which correspond to each count; and

(8) the order of the parties.

(d) The notice of declaration may also specify the time for: (1) filing a preliminary statement as provided in §1.621(a); (2) serving notice that a preliminary statement has been filed as provided §1.621(b); and (3) filing preliminary motions authorized by §1.633, oppositions to the motions, and replies to the oppositions.

(e) Notice may be given in the *Official Gazette* that an interference has been declared involving a patent.

§1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under §1.131 and any evidence and explanation under §1.608(b) filed separate from an amendment.

(b) After preliminary motions under §1.633 are decided (§1.640(b)), each party shall have access to and may obtain copies of any affidavit filed under §1.131 and any evidence and explanation filed under §1.608(b) in any application set out in the notice declaring the interference.

(c) Any evidence and explanation filed under §1.608(b) in the file of any application identified in the notice declaring the interference shall be served when required by §1.617(b).

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(d) The parties at any time may agree to exchange copies of papers in the files of any application identified in the notice declaring the interference.

§1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.

(a) Each party may be required to designate one attorney or agent of record as the lead attorney or agent.

(b) The same attorney or agent or members of the same firm of attorneys or agents may not represent two or more parties in an interference except as may be permitted under this Chapter.

(c) An examiner-in-chief may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an examiner-in-chief is of the opinion that an attorney or agent should be disqualified, the examiner-in-chief shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an examiner-in-chief and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§1.635).

§1.614 Jurisdiction over interference.

(a) The Board shall assume jurisdiction over an interference when the interference is declared under §1.611.

(b) When the interference is declared the interference is a contested case within the meaning of 35 U.S.C. §24.

(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An examiner-in-chief, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

§1.615 Suspension of *ex parte* prosecution.

(a) When an interference is declared, *ex parte* prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the interference to be entered or considered in the interference without the consent of an examiner-in-chief.

(b) *Ex parte* prosecution as to specified matters may be continued concurrently with the interference with the consent of the examiner-in-chief.

§1.616 Sanctions for failure to comply with rules or order.

An examiner-in-chief or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an examiner-in-chief or the Board. An appropriate sanction may include among others entry of an order:

(a) holding certain facts to have been established in the interference;

(b) precluding a party from filing a motion or a preliminary statement;

(c) precluding a party from presenting or contesting a particular issue;

(d) precluding a party from requesting, obtaining, or opposing discovery; or

(e) granting judgment in the interference.

§1.617 Summary judgment against applicant

(a) An examiner-in-chief shall review any evidence filed by an applicant under §1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the examiner-in-chief determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the examiner-in-chief the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the examiner-in-chief shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant may file a response to the order and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under §1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under §1.608(b) and this paragraph.

(c) If a response is not timely filed by the applicant, the Board shall enter a final decision granting summary judgment against the applicant.

(d) If a response is timely filed by the applicant, all opponents may file a statement within a time set by the examiner-in-chief. The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause. Evidence shall not be filed by any opponent. An opponent may not request an oral hearing.

(e) Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent.

(f) When more than two parties are involved in an interference, all parties may participate in summary judgment proceedings under this section.

(g) If a response by the applicant is timely filed, the examiner-in-chief or the Board shall decide whether the evidence submitted under §1.608(b) and any additional evidence properly submitted under paragraph (b) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this part.

(h) Only an applicant who filed evidence under §1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The examiner-in-chief shall set a date and time for the hearing. Unless otherwise ordered by the examiner-in-chief or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

§1.618 Return of unauthorized papers.

(a) The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered by the Patent and Trademark Office in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an examiner-in-chief.

(b) When presenting a paper in an interference, a party shall not submit with the paper a copy of a paper previously filed in the interference.

§1.621 Preliminary statement, time for filing, notice of filing.

(a) Within the time set for filing preliminary motions under §1.633, each party may file a preliminary statement. The preliminary statement may be signed by any individual having knowledge of the facts recited therein or an attorney or agent of record.

(b) When a party files a preliminary statement the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by an examiner-in-chief.

§1.622 Preliminary statement, who made invention, where invention made.

(a) A party's preliminary statement must identify the inventor who made the invention defined by each count and must state on behalf of the inventor the facts required by paragraph (a) of §§1.623, 1.624, and 1.625 as may be appropriate. When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion under §1.634 to correct inventorship.

(b) The preliminary statement shall state whether the invention was made in the United States or abroad. If made abroad, the preliminary statement shall state whether the party is entitled to the benefit of the second sentence of 35 U.S.C. §104.

§1.623 Preliminary statement; invention made in United States.

(a) When the invention was made in the United States or a party is entitled to the benefit of the second sentence of 35 U.S.C. §104, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which the first drawing of the invention was made.

(2) The date on which the first written description of the invention was made.

(3) The date on which the invention was first disclosed by the inventor to another person.

(4) The date on which the invention was first conceived by the inventor.

(5) The date on which the invention was first actually reduced to practice. If the invention was not actually reduced to practice by or on behalf of the inventor prior to the party's filing date, the preliminary statement shall so state.

(6) The date after the inventor's conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with §1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a copy of the first drawing or written description cannot be filed with the preliminary statement.

§1.624 Preliminary statement; invention made abroad.

(a) When the invention was made abroad and a party intends to rely on introduction of the invention into the United States, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States.

(2) The date on which a written description of the invention was first introduced into the United States.

(3) The date on which the invention was first disclosed to another person in the United States.

(4) The date on which the inventor's conception of the invention was first introduced into the United States.

(5) The date on which an actual reduction to practice of the invention was first introduced into the United States. If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state.

(6) The date after introduction of the inventor's conception into the United States when active exercise of reasonable diligence in the United States toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with §1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States a copy of that written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a copy of the first drawing or first written description introduced in the United States cannot be filed with the preliminary statement.

§1.625 Preliminary statement; derivation by an opponent.

(a) When the invention was made in the United States or abroad and a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

(1) The name of the opponent.

(2) The date on which the first drawing of the invention was made.

(3) The date on which the first written description of the invention was made.

(4) The date on which the invention was first disclosed by the inventor to another person.

(5) The date on which the invention was first conceived by the inventor.

(6) The date on which the invention was first communicated to the opponent.

(b) If a party intends to prove priority, the preliminary statement must also comply with §1.623 or §1.624.

(c) When a party alleges under paragraph (a)(2) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(3) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a first drawing or first written description cannot be filed with the preliminary statement.

§1.626 Preliminary statement; earlier application.

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier application filed in the United States or abroad to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier application with particularity.

§1.627 Preliminary statement, sealing before filing, opening of statement.

(a) The preliminary statement and copies of any drawing or written description shall be filed in a sealed envelope bearing only the name of the party filing the statement and the style (e.g., *Jones* v. *Smith*) and number of

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the interference. The sealed envelope should contain only the preliminary statement and copies of any drawing or written description. If the preliminary statement is filed through the mail, the sealed envelope should be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks in accordance with §1.1(e).

(b) A preliminary statement may be opened only at the direction of an examiner-in-chief.

§1.628 Preliminary statement, correction of error.

(a) A material error arising through inadvertence or mistake in connection with (1) a preliminary statement or (2) drawings or a written description submitted therewith or omitted therefrom, may be corrected by a motion (§1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit and shall show that the correction is essential to the ends of justice and shall be accompanied by the corrected statement. The motion shall be filed as soon as practical after discovery of the error.

(b) When a party cannot attach a copy of a drawing or a written description to the party's preliminary statement as required by §§1.623(c), 1.624(c), or 1.625(c), the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion (§1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§1.635) for additional discovery under §1.687 or during a testimony period.

§1.629 Effect of preliminary statement.

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to (1) definiteness or sufficiency of any allegation in a preliminary statement or (2) compliance with formal requirements will be resolved against the party filing the statement by restricting the party to the earlier of its filing date or effective filing date or to the latest date of a period alleged in the preliminary statement as may be appropriate. A party may not correct a preliminary statement except as provided by §1.628.

(b) Evidence which shows that an act alleged in the preliminary statement occurred prior to the date alleged in the statement shall establish only that the act occurred as early as the date alleged in the statement.

(c) If a party does not file a preliminary statement, the party:

(1) shall be restricted to the earlier of the party's filing date or effective filing date and

(2) will not be permitted to prove that:

(i) the party made the invention prior to the party's filing date or

(ii) any opponent derived the invention from the party.

(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by §1.623(c), §1.624(c), or §1.625(c), the party will be restricted to the earlier of the party's filing date or effective filing date as to that allegation unless the party complies with §1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally be evaluated or considered by the Board.

(e) A preliminary statement shall not be used as evidence on behalf of the party filing the statement.

§1.630 Reliance on earlier application.

A party shall not be entitled to rely on the filing date of an earlier application filed in the United States or abroad unless (a) the earlier application is identified (§1.611(c)(5)) in the notice declaring the interference or (b) the party files a preliminary motion under §1.633 seeking the benefit of the filing date of the earlier application.

§1.631 Access to preliminary statement, service of preliminary statement.

(a) Unless otherwise ordered by an examiner-in-chief, concurrently with entry of a decision by the examiner-in-chief on preliminary motions filed under §1.633, any preliminary statement filed under §1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the examiner-in-chief, a party shall serve copies of its preliminary statement on every opponent who served a notice under §1.621(b).

(b) A junior party who does not file a preliminary statement shall not have access to the preliminary statement of any other party.

(c) If an interference is terminated before the preliminary statements have been opened, the preliminary statements will remain sealed and will be returned to the respective parties who submitted the statements.

§1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice shall be filed by a party who intends to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice (35 U.S.C. §102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an examiner-in-chief, a notice is timely when filed within ten (10) days of the close of the testimony-in-chief of the opponent.

§1.633 Preliminary Motions.

A party may file the following preliminary motions:

(a) A motion for judgment on the ground that an opponent's claim corresponding to a count is not patentable to the opponent. In determining a motion filed under this paragraph, a claim may be construed by reference to the prior art of record. A motion under this paragraph shall not be based on: (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. See §1.637(a)

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if: (1) the interference involves a design application or patent or a plant application or patent or (2) no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See §1.637(a)

(c) A motion to redefine the interfering subject matter by (1) adding or substituting a count, (2) amending an application claim corresponding to a count or adding a claim in the moving party's application to be designated to correspond to a count, (3) designating an application or patent claim to correspond to a count, (4) designating an application or patent claim as not corresponding to a count, or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. See §1.637(a) and (c).

(d) A motion to substitute a different application owned by a party for an application involved in the interference. See §1.637(a) and (d).

(e) A motion to declare an additional interference (1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference or (2) when an interference involves three or more parties, between less than all applications and any patent involved in the interference. See §1.637(a) and (e).

(f) A motion to be accorded the benefit of the filing date of an earlier application filed in the United States or abroad. See §1.637(a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier application filed in the United States or abroad. See §1.637(a) and (g).

(h) When a patent is involved in an interference and the patentee has on file or files an application for reissue under §1.171, a motion to add the application for reissue to the interference. See §1.637(a) and (h).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section or a motion to substitute a different application under paragraph (d) of this section.

(j) When a motion is filed under paragraph (c)(1) of this section an opponent, in addition to opposing the motion, may file a motion for benefit under paragraph (f) of this section as to the count to be added or substituted.

§1.634 Motion to correct inventorship.

A party may file a motion to (a) amend its application involved in an interference to correct inventorship as provided by §1.48 or (b) correct inventorship of its patent involved in an interference as provided in §1.324. See §1.637(a).

§1.635 Miscellaneous motions.

A party seeking entry of an order relating to any matter other than a matter which may be raised under §§1.633 or 1.634 may file a motion requesting entry of the order. See §1.637(a) and (b).

§1.636 Motions, time for filing.

(a) A preliminary motion under §1.633(a) through (h) shall be filed within a time period set by an examiner-in-chief.

(b) A preliminary motion under §1.633(i) or (j) shall be filed within 20 days of the service of the preliminary motion under §1.633(a), (b), or (g) unless otherwise ordered by an examiner-in-chief.

(c) A motion under §1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an examiner-in-chief.

(d) A motion under §1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an examiner-in-chief.

§1.637 Content of motions.

(a) Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

(b) A motion under §1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opposing parties in an effort in good faith to resolve by agreement the issues raised by the motion. A moving party shall indicate in the motion whether any other party plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§1.656(h)).

(c) A preliminary motion under §1.633(c) shall explain why the interfering subject matter should be redefined.

(1) A preliminary motion seeking to add or substitute a count shall:

(i) Propose each count to be added or substituted.

(ii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to, the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iii) Identify all claims in an opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(iv) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(v) Show that each proposed count defines a separate patentable invention from every other count in the interference.

(vi) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(2) A preliminary motion seeking to amend an application claim corresponding to a count or adding a claim to be designated to correspond to a count shall:

(i) Propose an amended or added claim.

(ii) Show that the proposed or added claim defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each amended or added claim and apply the terms of the amended or added claim to the disclosure of the application; when necessary a moving party applicant shall file with the motion an amendment making the amended or added claim to the application.

(iv) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(3) A preliminary motion seeking to designate an application or patent claim to correspond to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim defines the same patentable invention as the count.

(iii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(4) A preliminary motion seeking to designate an application or patent claim as not corresponding to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim does not define the same patentable invention as any other claim designated in the notice declaring the interference as corresponding to the count.

(5) A preliminary motion seeking to require an opponent who is an applicant to add a claim and designate the claim as corresponding to a count shall:

(i) Propose a claim to be added by the opponent.

(ii) Show the patentability to the opponent of the claim and apply the terms of the claim to the disclosure of the opponent's application.

(iii) Identify the count to which the claim shall be designated to correspond.

(iv) Show the claim defines the same patentable invention as the count to which it will be designated to correspond.

(d) A preliminary motion under §1.633(d) to substitute a different application shall:

(1) Identify the different application.

(2) Certify that a complete copy of the file of the different application, except for documents filed under §1.131 or §1.608(b), has been served on all opponents.

(3) Show the patentability to the applicant of all claims in, or proposed to be added to, the different application which correspond to each count and apply the terms of the claims to the disclosure of the differ-

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ent application; when necessary the applicant shall file with the motion an amendment adding a claim to the different application.

(4) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(e) A preliminary motion to declare an additional interference under §1.633(e) shall explain why an additional interference is necessary:

(1) When the preliminary motion seeks an additional interference under §1.633(e)(1), the motion shall:

(i) Identify the additional application.

(ii) Certify that a complete copy of the file of the additional application, except for documents filed under §§1.131 or 1.608(b), has been served on all opponents.

(iii) Propose a count for the additional interference.

(iv) Show the patentability to the applicant of all claims in, or proposed to be added to, the additional application which correspond to each proposed count for the additional interference and apply the terms of the claims to the disclosure of the additional application; when necessary the applicant shall file with the motion an amendment adding a claim to the additional application.

(v) When the opponent is an applicant, show the patentability to the opponent of any claims in, or proposed to be added to, the opponent's application which correspond to the proposed count and apply the terms of the claims to the disclosure of the opponent's application.

(vi) When the opponent is a patentee, designate the claims of the patent which define the same patentable invention defined by the proposed count.

(vii) Show that each proposed count for the additional interference defines a separate patentable invention from all counts of the interference in which the motion is filed.

(viii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(2) When the preliminary motion seeks an additional interference under §1.633(e)(2), the motion shall:

(i) Identify any application or patent to be involved in the additional interference.

(ii) Propose a count for the additional interference.

(iii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iv) Identify all claims in any opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(v) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(vi) Show that each proposed count for the additional interference defines a separate patentable invention from all counts in the interference in which the motion is filed.

(vii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(f) A preliminary motion for benefit under §1.633(f) shall:

(1) Identify the earlier application.

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under §1.131 or §1.608(b), has been served on all opponents. When the earlier application is an application filed abroad, certify that a copy of the application filed abroad has been served on all opponents. If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met.

(3) Show that the earlier application constitutes a constructive reduction to practice of each count.

(g) A preliminary motion to attack benefit under §1.633(g) shall explain, as to each count, why an opponent should not be accorded the benefit of the filing date of the earlier application.

(h) A preliminary motion to add an application for reissue under §1.633(h) shall:

(1) Identify the application for reissue.

(2) Certify that a complete copy of the file of the application for reissue has been served on all opponents.

(3) Show the patentability of all claims in, or proposed to be added to, the application for reissue which correspond to each count and apply the terms of the claims to the disclosure of the application for reissue; when necessary a moving applicant for reissue shall file with the motion an amendment adding a claim to the application for reissue.

(4) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

§1.638 Opposition and reply, time for filing opposition and reply.

(a) Unless otherwise ordered by an examiner-in-chief, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall (1) identify any material fact set forth in the motion which is in dispute and (2) include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an examiner-in-chief, a reply shall be filed within 15 days after service of the opposition. A reply shall be directed only to new points raised in the opposition.

§1.639 Evidence in support of motion, opposition, or reply.

(a) Proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, opposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits.

(c) When a party believes that testimony is necessary to support or oppose a preliminary motion under §1.633 or a motion to correct inventorship under §1.634, the party shall describe the nature of the testimony needed. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

§1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.

(a) A hearing on a motion may be held in the discretion of the examiner-in-chief. The examiner-in-chief shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the examiner-in-chief. An examiner-in-chief may direct that a hearing take place by telephone.

(b) Motions will be decided by an examiner-in-chief. An examiner-in-chief may consult with an examiner in deciding motions involving a question of patentability. An examiner-in-chief may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.

(1) When preliminary motions under §1.633 are decided, the examiner-in-chief will, when necessary, set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts involved in the interference. Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under §1.621(a). After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.

(2) After a decision is entered on preliminary motions filed under §1.633, a further motion under §1.633 will not be considered except as provided by §1.655(b).

(c) When a decision on any motion under §§1.633, 1.634, or 1.635 is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an examiner-in-chief or the Board. A decision of single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board. The request for reconsideration shall be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom will normally be the examiner-in-chief who decided the motion.

(d) An examiner-in-chief may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion is entered which is dispositive of the interference against the party as to all counts;

(2) The party is a junior party who fails to file a preliminary statement; or

(3) The party is a junior party whose preliminary statement fails to overcome the earlier of the filing date or effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter a judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 20 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party. If a party wishes to take testimony in response to an order to show cause, the party's response should be accompanied by a motion (§1.635) requesting the testimony period. See §1.651(c)(4).

§1.641 Unpatentability discovered by examiner-in-chief.

During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may notify the parties of the reason and set a time within which each party may present its views. After considering any timely filed views, the examiner-in-chief shall decide how the interference shall proceed.

§1.642 Addition of application or patent to interference.

During the pendency of an interference, if the examiner-in-chief becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the examiner-in-chief may add the application or patent to the interference on such terms as may be fair to all parties.

§1.643 Prosecution of interference by assignee.

(a) An assignee of record in the Patent and Trademark Office of the entire interest in an application or patent involved in an interference is entitled to conduct prosecution of the interference to the exclusion of the inventor.

(b) An assignee of a part interest in an application or patent involved in an interference may file a motion (§1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show (1) the inability or refusal of the inventor to prosecute the interference or (2) other cause why the ends of justice require that the assignee of a part interest be permitted to prosecute the interference. The examiner-in-chief may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

§1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an examiner-in-chief or a panel consisting of more than one examiner-in-chief. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an examiner-in-chief or a panel and the examiner-in-chief or the panel shall be of the opinion (i) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence; or

(3) The petition seeks relief under §1.183.

(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the examiner-in-chief or the panel may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to decision by the Board awarding judgment. Any petition under paragraph (a)(3) of this section shall be timely if it is made as part of, or simultaneously with, a proper motion under §§1.633, 1.634, or 1.635. Any opposition to a petition shall be filed within 15 days of the date of service of the petition.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the examiner-in-chief, the panel, or the Commissioner.

(d) Any petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested. Briefs or memoranda, if any, in support of the petition or opposition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the examiner-in-chief or the panel and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

(e) Any petition under paragraph (a) of this section shall be accompanied by the petition fee set forth in §1.17(h).

(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 15 days of the decision of the Commissioner and must be accompanied by the fee set forth in §1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or "Express Mail" complies with this paragraph.

(h) An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(i) The Commissioner may delegate to appropriate Patent and Trademark Office employees the determination of petitions under this section.

§1.645 Extension of time, late papers, stay of proceedings.

(a) A party may file a motion (§1.635) seeking an extension of time to take action in an interference, to file a notice of appeal (§§1.302, 1.304), or to commence a civil action (§§1.303, 1.304). The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action, filing the notice, or commencing the civil action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§1.635) which shows sufficient cause why the paper was not timely filed.

(c) The provisions of §1.136 do not apply to time periods in interferences.

(d) In an appropriate circumstance, an examiner-in-chief may stay proceedings in an interference.

§1.646 Service of papers, proof of service.

(a) A copy of every paper filed in the Patent and Trademark Office in an interference or an application or patent involved in the interference shall be served upon all other parties except:

(1) Preliminary statements when filed under §1.621; preliminary statements shall be served when service is ordered by an examiner-in-chief.

(2) Certified transcripts and exhibits which accompany the transcripts filed under §§1.676 or 1.684; copies of transcripts shall be served as part of a party's record under §1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An examiner-in-chief may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an examiner-in-chief, or except as otherwise provided by this part, service of a paper shall be made as follows:

(1) By handing a copy of the paper to the person served.

(2) By leaving a copy of the paper with someone employed by the person at the person's usual place of business.

(3) When the person served has no usual place of business, by leaving a copy of the paper at the person's residence with someone of suitable age and discretion then residing therein.

(4) By mailing a copy of the paper by first class mail; when service is by mail the date of mailing is regarded as the date of service.

(5) When it is shown to the satisfaction of an examiner-in-chief that none of the above methods of obtaining or serving the copy of the paper was successful, the examiner-in-chief may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An examiner-in-chief may order that a paper be served by hand or "Express Mail".

(e) Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper stating the date and manner of service will be accepted as *prima facie* proof of service.

§1.647 Translation of document in foreign language.

When a party relies on a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

§1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§1.635) for additional discovery under §1.687(c) and (2) testimony periods for taking any necessary testimony.

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) present its case-in-chief and/or case-in-rebuttal and/or

(2) cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:

(1) the examiner-in-chief orders the taking of testimony under §1.639(c);

(2) the party alleges in its preliminary statement a date of invention prior to the earlier of the filing date or effective filing date of the senior party;

(3) a testimony period has been set to permit an opponent to prove a date of invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

(4) a motion (§1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony shall be taken during the testimony periods set under paragraph (a) of this section.

§1.652 Judgment for failure to take testimony or file record.

If a junior party fails to timely take testimony authorized under §1.651, or file a record under §1.653(c), an examiner-in-chief, with or without a motion (§1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

§1.653 Record and exhibits.

(a) Testimony shall consist of affidavits under §1.672(b) and (e), transcripts of depositions under §§1.672(b) and (c), agreed statements of fact under §1.672(f), and transcripts of interrogatories, cross-interrogatories, and recorded answers under §1.684(c).

(b) An affidavit shall be filed as set forth in §1.672(b) or (e). A certified transcript of a deposition including a deposition cross-examining an affiant, shall be filed as set forth in §1.676. An original agreed statement shall be filed as set forth in §1.672(f). A transcript of interrogatories, cross-interrogatories, and recorded answers shall be filed as set forth under §1.684(c).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an examiner-in-chief each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of each witness giving the pages of the record where the direct testimony and cross-examination of each witness begins.

(2) An index of exhibits briefly describing the nature of each exhibit and giving the page of the record where each exhibit is first identified and offered into evidence.

(3) The count or counts.

(4) Each (i) affidavit, (ii) transcript, including transcripts of cross-examination of any affiant, (iii) agreed statement relied upon by the party, and (iv) transcript of interrogatories, cross-interrogatories, and recorded answers filed under paragraph (b) of this section.

(5) Each notice, official record, and publication relied upon by the party and filed under §1.682(a).

(6) Any evidence from another interference, proceeding, or action relied upon by the party under §1.683.

(7) Each request for an admission and the admission and each written interrogatory and the answer upon which a party intends to rely under §1.688.

(d) The pages of the record shall be consecutively numbered.

(e) The name of each witness shall appear at the top of each page of each affidavit or transcript.

(f) The record may be typewritten or printed.

(g) When the record is printed, it may be produced by standard typographical printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The page size shall be 8-1/2 by 11 inches (21.8 by 27.9 cm.) with type matter 6-1/2 by 9-1/2 inches (16.5 by 24.1 cm.). The record shall be bound to lie flat when open.

(h) When the record is typewritten, it must be clearly legible on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages of the record shall be bound with covers at their left edges in such manner to lie flat when open in one or more volumes of convenient size (approximately 100 pages per volume is suggested). Multigraphed or otherwise reproduced copies conforming to the standards specified in this paragraph may be accepted.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under §1.676(d), shall be filed with the record. Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., *Jones* v. *Smith*), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an examiner-in-chief may return an exhibit to the party filing the exhibit. When any exhibit is returned, the examiner-in-chief shall enter an appropriate order indicating that the exhibit has been returned.

(j) Any testimony, record, or exhibit which does not comply with this section may be returned under §1.618(a).

§1.654 Final hearing.

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An examiner-in-chief shall set a date and time for final hearing. Unless otherwise ordered by an examiner-in-chief or the Board, each party will be entitled to no more than 60 minutes of oral argument at final hearing.

(b) The opening argument of a junior party shall include a fair statement of the junior party's case and the junior party's position with respect to the case presented on behalf of any other party. A junior party may reserve a portion of its time for rebuttal.

(c) A party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under §1.632 was timely filed.

(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except under §1.658(b) or as authorized by an examiner-in-chief or the Board. No additional oral argument shall be had unless ordered by the Board.

§1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under §1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing manifest error or an abuse of discretion shall be on the party attacking the order.

(b) A party shall not be entitled to raise for consideration at final hearing a matter which properly could have been raised by a motion under §§1.633 or 1.634 unless (1) the motion was properly filed, (2) the matter was properly raised by a party in an opposition to a motion under §§1.633 or 1.634 and the motion was granted over the opposition, or (3) the party shows good cause why the issue was not timely raised by motion or opposition.

(c) To prevent manifest injustice, the Board may consider an issue even though it would not otherwise be entitled to consideration under this section.

§1.656 Briefs for final hearing.

(a) Each party shall be entitled to file briefs for final hearing. The examiner-in-chief shall determine the briefs needed and shall set the time and order for filing briefs.

(b) The opening brief of a junior party shall contain under appropriate headings and in the order indicated:

(1) A table of contents, with page references, and a table of cases (alphabetically arranged), statutes, and other authorities cited, with references to the pages of the brief where they are cited.

(2) A statement of the issues presented for decision in the interference.

(3) A statement of the facts relevant to the issues presented for decision with appropriate references to the record.

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(4) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues to be decided, and the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

(5) A short conclusion stating the precise relief requested.

(6) An appendix containing a copy of the counts.

(c) The opening brief of the senior party shall conform to the requirements of paragraph (b) of this section except:

(1) a statement of the issues and of the facts need not be made unless the party is dissatisfied with the statement in the opening brief of the junior party and

(2) an appendix containing a copy of the counts need not be included if the copy of the counts in the opening brief of the junior party is correct.

(d) Briefs may be printed or typewritten. If typewritten, legal-size paper may be used. The opening brief of each party in excess of 50 legal-size double-spaced typewritten pages or any other brief in excess of 25 legal-size double-space typewritten pages shall be printed unless a satisfactory reason be given why the brief should not be printed. Any printed brief shall comply with the requirements of §1.653(g). Any typewritten brief shall comply with the requirements of §1.653(h), except legal-size paper may be used and the binding and covers specified are not required.

(e) An original and three copies of each brief must be filed.

(f) Any brief which does not comply with the requirements of this section may be returned under §1.618(a).

(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and three copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be supported by specific references to the record. Any proposed conclusions of law shall be supported by citation of cases, statutes, or other authority. Any opposing party, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and three copies of a motion (§1.635) to suppress the evidence. The provisions of §1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of an opponent's evidence is waived unless the motion required by this paragraph is filed. An original and three copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to respond within a time period set in the order, judgment may be entered against the junior party.

§1.657 Burden of proof as to date of invention.

A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of the earlier of their filing dates or effective filing dates. The burden of proof shall be upon a party who contends otherwise.

§1.658 Final decision.

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief for further proceedings, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within 14 days after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

(c) A judgment in an interference settles all issues which (1) were raised and decided in the interference, (2) could have been properly raised and decided in the interference by a motion under §1.633 (a) through (d) and (f) through (j) or §1.634 and (3) could have been properly raised and decided in an additional interference with a motion under §1.633(e). A losing party who could have properly moved, but failed to move, under §§1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment.

§1.659 Recommendation.

(a) Should the Board have knowledge of any ground for rejecting any application claim not involved in the judgment of the interference, it may include in its decision a recommended rejection of the claim. Upon resumption of *ex parte* prosecution of the application, the examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection.

(b) Should the Board have knowledge of any ground for reexamination of a patent involved in the interference as to a patent claim not involved in the judgment of the interference, it may include in its decision a recommendation to the Commissioner that the patent be reexamined. The Commissioner will determine whether reexamination will be ordered.

(c) The Board may make any other recommendation to the examiner or the Commissioner as may be appropriate.

§1.660 Notice of reexamination, reissue, protest, or litigation.

(a) When a request for reexamination of a patent involved in an interference is filed, the patent owner shall notify the Board within 10 days of receiving notice that the request was filed.

(b) When an application for reissue is filed by a patentee involved in an interference, the patentee shall notify the Board within 10 days of the day the application for reissue is filed.

(c) When a protest under §1.291 is filed against an application involved in an interference, the applicant shall notify the Board within 10 days of receiving notice that the protest was filed.

(d) A party in an interference shall notify the Board promptly of any litigation related to any patent or application involved in an interference, including any civil action commenced under 35 U.S.C. §146.

§1.661 Termination of interference after judgment.

After a final decision is entered by the Board, an interference is considered terminated when no appeal (35 U.S.C. §141) or other review (35 U.S.C. §146) has been or can be taken or had.

§1.662 Request for entry of adverse judgment; reissue filed by patentee.

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by an applicant or patentee of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application by an applicant, other than an applicant for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under §1.633(h) or show good cause why the motion could not have been timely filed.

(c) The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference. A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count.

§1.663 Status of claim of defeated applicant after interference.

Whenever an adverse judgment is entered as to a count against an applicant from which no appeal (35 U.S.C. §141) or other review (35 U.S.C. §146) has been or can be taken or had, the claims of the application corresponding to the count stand finally disposed of without further action by the examiner. Such claims are not open to further *ex parte* prosecution.

§1.664 Action after interference.

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an examiner-in-chief, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this part provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

§1.665 Second interference.

A second interference between the same parties will not be declared upon an application not involved in an earlier interference for an invention defined by a count of the earlier interference. See §1.658(c).

§1.666 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof must be filed before the termination of the interference (§1.661) as between the parties to the agreement or understanding.

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in §1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding under paragraph (a) of this section will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commissioner may, however, upon petition accompanied by the fee set forth in §1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six month period subsequent to the termination of the interference as between the parties to the agreement or understanding.

§1.671 Evidence must comply with rules.

(a) Evidence consists of testimony and exhibits, official records and publications filed under §1.682, evidence from another interference, proceeding, or action filed under §1.683, and discovery relied upon under §1.688, and the specification (including claims) and drawings of any application or patent:

(1) Involved in the interference.

(2) To which a party has been accorded benefit in the notice declaring the interference or by a preliminary motion granted under §1.633.

(3) For which a party has sought, but has been denied, benefit by a preliminary motion under §1.633.

(4) For which benefit was rescinded by a preliminary motion granted under §1.633.

(b) Except as otherwise provided in this part, the Federal Rules of Evidence shall apply to interference proceedings. Those portions of the Federal Rules of Evidence relating to criminal actions, juries, and other matters not relevant to interferences shall not apply.

(c) Unless the context is otherwise clear, the following terms of the Federal Rules of Evidence shall be construed as follows:

(1) "Courts of the United States," "U.S. Magistrate," "court," "trial court," or "trier of fact" means examiner-in-chief or Board as may be appropriate.

(2) "Judge" means examiner-in-chief.

(3) "Judicial notice" means official notice.

(4) "Civil action," "civil proceeding," "action," or "trial," mean interference.

(5) "Appellate court" means United States Court of Appeals for the Federal Circuit or a United States district court when judicial review is under 35 U.S.C. §146.

(6) "Before the hearing" in Rule 703 means before giving testimony by oral deposition or affidavit.

(7) "The trial or hearing" in Rules 803(24) and 804(5) means the taking of testimony by oral deposition.

(d) Certification is not necessary as a condition to admissibility when the record is a record of the Patent and Trademark Office to which all parties have access.

(e) A party may not rely on an affidavit filed by that party during *ex parte* prosecution of an application, an affidavit under §1.608(b), or an affidavit under §1.639(b)

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unless (1) a copy of the affidavit is or has been served and (2) a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit. When proper notice is given under this paragraph, the affidavit shall be deemed filed under §1.672(b). A copy of the affidavit shall be included in the record (§1.653).

(f) The significance of documentary and other exhibits shall be discussed with particularity by a witness during oral deposition or in an affidavit.

(g) A party must file a motion (§1.635) seeking permission from an examiner-in-chief prior to taking testimony or seeking documents or things under 35 U.S.C. §24. The motion shall describe the general nature and the relevance of the testimony, document, or thing.

(h) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

§1.672 Manner of taking testimony.

(a) Testimony of a witness may be taken by oral deposition or affidavit in accordance with this subpart.

(b) A party wishing to take the testimony of a witness whose testimony will not be compelled under 35 U.S.C. §24 may elect to present the testimony of the witness by affidavit or deposition. A party electing to present testimony of a witness by affidavit shall, prior to the close of the party's relevant testimony period, file and serve an affidavit of the witness or, where appropriate, a notice under §1.671(e). To facilitate preparation of the record (§1.653(g) and (h)), a party should file an affidavit on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm). A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. After the affidavit is filed and within a time set by an examiner-in-chief, any opponent may file a request to cross-examine the witness on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition under §1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness whose testimony is presented by affidavit, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under §1.673(a). The party who gives notice of a deposition shall be responsible for obtaining a court reporter and for filing a certified transcript of the deposition as required by §1.676.

(c) A party wishing to take the testimony of a witness whose testimony will be compelled under 35 U.S.C. §24 must first obtain permission from an examiner-in-chief under §1.671(g). If permission is granted, the party shall notice a deposition of the witness under §1.673 and may proceed under 35 U.S.C. §24. The testimony of the witness shall be taken on oral deposition.

(d) Notwithstanding the provisions of this subpart, if the parties agree in writing, a deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.

(e) If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit of the witness shall be filed in the Patent and Trademark Office.

(f) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth (1) how a particular witness would testify if called or (2) the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See §1.653(a).

§1.673 Notice of examination of witness.

(a) A party electing to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions may be noticed for a reasonable time and place in the United States. Unless the parties agree in writing, a deposition may not be noticed for any other place without approval of an examiner-in-chief (see §1.684). The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:

(1) A list and copy of each document in the party's possession, custody, or control and upon which the party intends to rely at any deposition and

(2) A list of and a proffer of reasonable access to things in the party's possession, custody, or control and upon which the party intends to rely at any deposition.

(c) A party shall not be permitted to rely at any deposition on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section, (1) unless all opponents agree in writing or on the record to permit the party to rely on the witness, document, or thing or (2) except upon a motion (§1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows sufficient cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opposing party shall have a full opportunity to attend a deposition and cross-examine. If an opposing party attends a deposition of a witness not named in a notice and cross-examines the witness or fails to object to the taking of the deposition, the opposing party shall be deemed to have waived any right to object to the taking of the deposition for lack of proper notice.

(e) A party electing to present testimony by affidavit and who is required to notice depositions for the purpose of cross-examination under §1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

(f) The parties shall not take depositions in more than one place at the same time or so nearly at the same time that reasonable opportunity to travel from one place of deposition to another cannot be had.

(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an examiner-in-chief who shall then designate the time and place for conducting the deposition.

(h) A copy of the notice of deposition shall be attached to the certified transcript of the deposition filed under §1.676(a).

§1.674 Persons before whom depositions may be taken.

(a) Within the United States or a territory or insular possession of the United States a deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

(b) Unless the parties agree in writing, the following persons shall not be competent to serve as an officer: (1) a relative or employee of a party, (2) a relative or employee of an attorney or agent of a party, or (3) a person interested, directly or indirectly, in the interference either as counsel, attorney, agent, or otherwise.

§1.675 Examination of witness, reading and signing transcript of deposition.

(a) Each witness before giving an oral deposition shall be duly sworn according to law by the officer before whom the deposition is to be taken.

(b) The testimony shall be taken in answer to interrogatories with any questions and answers recorded in their regular order by the officer or by some other person, who shall be subject to the provisions of §1.674(b), in the presence of the officer unless the presence of the officer is waived on the record by agreement of all parties.

(c) All objections made at the time of the deposition to the qualifications of the officer taking the deposition, the manner of taking it, the evidence presented, the conduct of any party, or any other objection to the proceeding shall be noted on the record by the officer. Evidence objected to shall be taken subject to any objection.

(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall be read by the witness and then signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration.

§1.676 Certification and filing by officer, marking exhibits.

(a) The officer shall prepare a certified transcript of the deposition by attaching to a transcript of the deposition a copy of the notice of deposition, any exhibits to be annexed to the certified transcript, and a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before commencement of testimony by the witness.

(2) The transcript is a true record of the testimony given by the witness.

(3) The name of the person by whom the testimony was recorded and, if not recorded by the officer, whether the testimony was recorded in the presence of the officer.

(4) The presence or absence of any opposing party.

(5) The place where the deposition was taken and the day and hour when the deposition began and ended.

(6) The officer is not disqualified under §1.674.

(b) If the parties waived any of the requirements of paragraph (a) of this section, the certificate shall so state.

(c) The officer shall note on the certificate the circumstances under which a witness refuses to sign a transcript.

(d) Unless the parties agree otherwise in writing or on the record at the deposition, the officer shall securely seal the certified transcript in an envelope endorsed with the style of the interference (e.g., *Smith* v. *Jones*), the interference number, the name of the witness, and the date of sealing and shall promptly forward the envelope to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents and things produced for inspection during the examination of a witness, shall, upon request of a party, be marked for identification and annexed to the certified transcript, and may be inspected and copied by any party, except that if the person producing the documents and things desires to retain them, the person may (1) offer copies to be marked for identification and annexed to the certified transcript and to serve thereafter as originals if the person affords to all parties fair opportunity to verify the copies by comparison with the originals or (2) offer the originals to be marked for identification, after giving to each party an opportunity to inspect and copy them, in which event the documents and things may be used in the same manner as if annexed to the certified transcript. The exhibits shall then be filed as specified in §1.653(i). If the weight or bulk of a document or thing shall reasonably prevent the document or thing from being annexed to the certified transcript, it shall, unless waived on the record at the deposition by all parties, be authenticated by the officer and forwarded to the Commissioner in a separate package marked and addressed as provided in this paragraph.

§1.677 Form of a transcript of deposition.

(a) A transcript of a deposition must be typewritten on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages must be consecutively numbered throughout the entire record of each party (§1.653(d)) and the name of the witness must be typed at the top of each page (§1.653(e)). The questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively and each must be marked as required by §1.653(i).

§1.678 Transcript of deposition must be filed.

Unless otherwise ordered by an examiner-in-chief, a certified transcript of a deposition must be filed in the Patent and Trademark Office within 45 days from the date of the deposition. If a party refuses to file a certified transcript, the examiner-in-chief or the Board may take appropriate action under §1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

§1.679 Inspection of transcript.

A certified transcript filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office for printing (§1.653(g)) unless authorized by an examiner-in-chief upon such terms as may be appropriate.

§1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, any official record or printed publication not identified on the record during the taking of testimony of a witness, by filing a notice offering the official record or publication into evidence. If the evidence relates to the party's case-in-chief, the notice shall be filed prior to close of testimony of the party's case-in-chief. If the evidence relates to rebuttal, the notice shall be filed prior to the close of testimony of the party's case-in-rebuttal. The notice shall (1) identify the official record or printed publication, (2) identify the portion thereof to be introduced in evidence, (3) indicate generally the relevance of the portion sought to be introduced in evidence, and (4), where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§1.671(d)).

(b) A copy of the notice, official record, and publication shall be served.

(c) Unless otherwise ordered by an examiner-in-chief, any written objection to the notice or to the admissibility of the official record or printed publication shall be filed within 15 days of service of the notice. See also §1.656(h).

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§1.683 Testimony in another interference, proceeding, or action.

(a) Prior to close of a party's appropriate testimony period or within such time as may be set by an examiner-in-chief, a party may file a motion (§1.635) for leave to use in an interference testimony of a witness from another interference, proceeding, or action involving the same parties, subject to such conditions as may be deemed appropriate by an examiner-in-chief. The motion shall specify with particularity the exact testimony to be used and shall demonstrate its relevance.

(b) Any objection to the admissibility of the testimony of the witness shall be made in an opposition to the motion. See also §1.656(h).

§1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, prior to the close of the party's appropriate testimony period or within such time as may be set by an examiner-in-chief, file a motion (§1.635):

(1) Naming the witness.

(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will so testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under §1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under §1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, the moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or absence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refuses to read or sign recorded answers.

(7) The officer is not disqualified under §1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall not be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

§1.685 Errors and irregularities in depositions.

(a) An error in a notice for taking a deposition is waived unless a motion (§1.635) to quash the notice is filed as soon as the error is, or could have been, discovered.

(b) An objection to a qualification of an officer taking a deposition is waived unless:

(1) The objection is made on the record of the deposition before a witness begins to testify.

(2) If discovered after the deposition, a motion (§1.635) to suppress the deposition is filed as soon as the objection is, or could have been, discovered.

(c) An error or irregularity in the manner in which testimony is transcribed, a certified transcript is signed by a witness, or a certified transcript is prepared, signed, certified, sealed, indorsed, forwarded, filed, or otherwise handled by the officer is waived unless a motion (§1.635) to suppress the deposition is filed as soon as the error or irregularity is, or could have been, discovered.

(d) An objection to the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under §1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an examiner-in-chief or the Board.

§1.687 Additional Discovery.

(a) A party is not entitled to discovery except as authorized in this subpart.

(b) Where appropriate, a party may obtain production of documents and things during cross-examination of an opponent's witness or during the testimony period of the party's case-in-rebuttal.

(c) Upon a motion (§1.635) brought by a party within the time set by an examiner-in-chief under §1.651 or thereafter as authorized by §1.645 and upon a showing that the interest of justice so requires, an examiner-in-chief may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery.

(d) The parties may agree to discovery among themselves at any time. In the absence of an agreement, a motion for additional discovery shall not be filed except as authorized by this subpart.

§1.688 Use of discovery.

(a) If otherwise admissible a party may introduce into evidence, an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under §1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be filed prior to the close of testimony of the party's case-in-chief. If the answer relates to the party's rebuttal, the admission or answer shall be filed prior to the close of testimony of the party's case-in-rebuttal. Unless otherwise ordered by an examiner-in-chief, any written objection to the admissibility of an answer shall be filed within 15 days of service of the answer.

(b) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

Nov. 8, 1984. DONALD J. QUIGG, *Acting Commissioner of Patents and Trademarks.*

[1050 OG 385]

(160) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40104-4151]

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; correction.
Summary: This document corrects clerical errors and adds material to the Analysis of Comments in the notice of final rule amending the Patent and Trademark rules of practice in patent interference cases, which were published in the Official Gazette of Jan. 29, 1985 (1050 OG 385 through 440).
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:
Clerical Correction to the Preamble

The following corrections are made to the Official Gazette issue of Jan. 29, 1985:

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1. In the second column, line 32 (the fifth full paragraph, the second sentence) the word "an" is inserted after the word "or"

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2. In the second column, line 48 (the fifth full paragraph), after the word "agent", the following words "of record" are inserted.

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3. In the first column, line 29 (the first full paragraph, the third sentence), the words "of an interference" are removed and the words "in an interference" are inserted in their place; in line 39 (the first full paragraph, the last sentence), the words "Federal Rule" are removed and the words "Federal Rules" are inserted in their place; in line 41 (the second full paragraph, the first sentence), the word "provide" is removed and the word "provides" is inserted in its place.

4. In the second column, line 29 (the second full paragraph, the second sentence), the word "defined" is removed and the word "defines" is inserted in its place; in line 45 (the second full paragraph, the last sentence), the spelling of the word "in" is corrected; in line 48 (the last paragraph, the first sentence), the words "one of" are removed and the words "one or" are inserted in their place.

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5. In the second column, line 59 (the paragraph bridging the third column, the second sentence), quotation marks are placed around the word "lead".

6. In the third column, line 44 (the second full paragraph, the fourth sentence), the article "a" is inserted before the word "sanction".

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7. In the first column, line 12 (the second full sentence from the top of the page), the word "proposed" is removed; in line 30 (the seventh full sentence from the top of the page), the words "and applicant" are removed and the words "an applicant" are inserted in their place; in line 55 (the first full paragraph, the second sentence), the colon appearing after the word "appropriate" is deleted and a period is inserted in its place.

8. In the third column, line 5, the first letter of the word "while" is capitalized.

Page 394

9. In the second column, line 13 (the first full paragraph, the fourth sentence), the spelling of the word "Consultation" is corrected.

Page 395

10. In the first column, line 44 (the second full paragraph, the last sentence), the spelling of the word "necessary" is corrected; in line 59 (the last paragraph, the first sentence), the spelling of the word "specifies" is corrected.

11. In the second column, line 1, the word "the" is inserted after the word "and"; in line 14 (the first full paragraph, the third sentence), the words "is required" are removed and the words "are required" are inserted in their place.

Page 396

12. In the first column, line 5, the word "of" is removed.

13. In the second column, line 13 (the first full paragraph, the fourth sentence), the word "Claims" is removed and the word "Claim" inserted in its place.

Page 397

14. In the second column, line 2, the words "would be" are removed and the word "is" is inserted in its place; in line 6, the word "intended" is removed and the word "intends" is inserted in its place.

Page 399

15. In the second column, line 41 (the fifth full paragraph), the word "had" is removed and the word "has" is inserted in its place.

16. In the third column, line 37 (the third full paragraph, the last sentence), the comma after the word "language" is removed; in line 38, the comma after the word "affidavit" is removed.

Page 401

17. In the first column, line 11 (the first full paragraph, the first sentence), the words "of sale" are removed and the words "or sale" are inserted in their place.

Page 402

18. In the first column, line 4, the word "over" is removed and the word "of" is inserted in its place.

Page 403

19. In the first column, line 2, the spelling of the word "arguably" is corrected; in line 9, the spelling of the word "definitions" is corrected.

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Page 404

20. In the first column, line 18 (the second full paragraph, the fourth sentence), the words "PTO was" are removed and the words "PTO were" are inserted in their place.

21. In the second column, line 26 (the first full paragraph, the fourth sentence), the spelling of the word "under" is corrected.

Page 406

22. In the third column, line 21 (the first full paragraph, the third sentence), a closing quotation mark is placed after the word "opponents's".

Page 407

23. In the first column, line 4 (the first full paragraph, the first sentence), the spelling of the word "suggested" is corrected.

Page 409

24. In the first column, line 21 (the first full paragraph, the third sentence), the words "do not" are inserted after the word "rules".

25. In the third column, line 33 (the first full paragraph, the first sentence), the word "is" is inserted before the word "excluded".

Page 411

26. In the third column, line 26 (the third full paragraph, the third sentence), the word "permitting " is removed and the word "permitted" is inserted in its place.

Page 413

27. In the second column, line 47 (the second full paragraph, the second sentence), the reference to "1.644(b)" should read "1.644(a)(2)".

28. In the third column, line 59 (the last paragraph, the first sentence), the first letter of the word "Interference" is made lower case.

Page 416

29. In the first column, line 1, the word "opponent's" is removed and the word "opponents" is inserted in its place.

30. In the second column, line 40 (the first full paragraph, the second sentence), the reference to "1662(a)" should read "1.662(a)"; in line 45 (the first full paragraph, the third sentence), the reference to "1633(d)" should read "1.633(d)".

Page 417

31. In the second column, line 49 (the second full paragraph, the third sentence from the end), quotation marks are placed around the word "things"; in line 55 (the second full paragraph, the last sentence), the word "to" is inserted after the words "should resort".

32. In the third column, line 11 (the first full sentence from the top of the page), the colon after the word "controversy" is removed and a period is inserted in its place; in line 54 (the first full paragraph, the penultimate sentence), the spelling of the word "appropriate" is corrected.

Page 418

33. In the second column, line 16 (the first full paragraph, the first sentence), the first letter of the word "Commentator's" is made lower case.

Page 419

34. In the table correlating the old rules 37 CFR 1.201 through 1.288 to the new rules 37 CFR 1.601 through 1.688, the following corrections are made to the entries under the section, designated as new:

RULE CORRELATION TABLE

Old	New
1.201(a)	1.601(i)
1.201(b)	1.601(i)
1.203(a)	1.603
1.204(b)	1.608(a)
1.204(c)	1.608(b)
1.205(a)	1.606
1.208	1.613(b)
1.216(b)	1.623(c), 1.624(c), 1.625(c)
1.245	1.645(a)
1.246	1.645(b)
1.257(b)	1.658(c)
1.263	1.622(c)
1.264	1.662(b)
1.271	1.671(h)
1.272(b)	1.672(d)
1.272(c)	1.672(e), (f)
1.281	1.645(a)
1.287(b)	1.687(b)
1.287(c)	1.687(c)

Additional Analysis of Comments

Page 404

1. In the second column after the last full paragraph, the following paragraph is added:

An oral comment was received by telephone concerning the declaration of an interference under §§1.603 and 1.606 with applications filed under the provisions of 35 U.S.C. 157—Statutory Invention Registration (SIR). Under 35 U.S.C. 157(c), a published SIR has all of the attributes specified for patents except those specified in 35 U.S.C. 183 and 271 to 289. Consequently, interferences will be declared between an application and either an application containing a request for a SIR (37 CFR 1.293) or a published SIR. Until sufficient experience is gained by the PTO, the interference will be conducted by procedure established on a case by case basis.

Page 415

In the second column, after the first full paragraph, the following paragraph is added:

Oral comments have been received by telephone concerning the doctrine of interference estoppel under 37 CFR 1.658(c) with respect to a party's failure to move under 37 CFR 1.633(e) to declare an "additional interference" between an additional application not involved in the interference and owned by the party and an opponent's application or patent involved in the interference on a separate patentable invention. Generally a party will be estopped for failure to move when the separate patentable invention (subject matter) which could have been the subject of the "additional interference" was *claimed* (during the pendency of the interference) (1) in the opponent's involved application or patent or (2) in a non-involved application owned by the party.

The following illustrates the general applicability of interference estoppel in certain situations where a party fails to move under 37 CFR 1.633(e) to declare an "additional interference" on a separate patentable invention.

Party's non-involved application	Opponent's involved application or patent	Estoppel
Claimed	Claimed	Yes
Disclosed	.do	Yes
Claimed	Disclosed	Yes
Disclosed	.do	No

Clerical Corrections to the Rules

1. On page 420 the second column, the amendment to §1.8, amendatory instruction 4 is corrected by changing "pa ragraph (a)(xii) to read "paragraph (a)(2)(xii)".

2. On page 421, the second column, in the second sentence of §1.59, the spelling of the word "required" is corrected and the reference to "§1.21(1)" is corrected to read "§1.21(*l*)".

3. On page 423, the third column, §1.324 is corrected by inserting in the second sentence the article "a" before the word "patent".

4. On page 424, the first column, in §1.565, in the first sentence of paragraph (b), "in filed" should have read "is filed".

5. On page 425, the first column, the last sentence of §1.601(i) is corrected by removing the last occurrence of the word "patents" and inserting, in its place, the word "patent".

6. On page 425, the first column, §1.601(k) is corrected by removing the words "and interference" and inserting, in their place, the words "an interference".

7. On page 425, the second column the second sentence of §1.601(n) is corrected by removing the words "a invention" and inserting, in their place, the words "an invention".

8. On page 427, the first column, §1.611(d)(2) is corrected by inserting the word "in" after the word "provided".

9. On page 427, the second column, the reference to "1.608(b)" in the first sentence of §§1.612(a), 1.612(b) and 1.612(c) is corrected to read "1.608".

10. On page 427, the third column, the first sentence of §1.615(a) is corrected by placing in italics the words "ex parte".

11. On page 427, the third column, the second sentence of §1.616 is corrected by changing to upper case the first letter of the words "holding", "precluding" and "granting" in paragraphs (a) to (e).

12. On page 428, the first column, the first sentence of §1.617(b) is corrected by removing the first occurrence of the word "any" and inserting, in its place, the word "may".

13. On page 428, the first column, the last sentence of §1.617(b) is corrected by inserting the words "on each opponent" after the words "shall serve".

14. On page 428, the first column, the last sentence of §1.617(d) is corrected by removing the words "an oral" and inserting, in their place, the article "a".

15. On page 428, the first column, the last sentence of §1.617(g) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

16. On page 428, the second column, the second sentence of §1.621(a) is corrected by inserting the word "by" after the first occurrence of the word "or".

17. On page 428, the second column, the first sentence of §1.621(b) is corrected by inserting a comma after the first occurrence of word "statement".

18. On page 428, the third column, the first sentence of §1.624(a) is corrected by removing the semicolon appearing after the word "count" and inserting, in its place, a colon.

19. On page 430, the first column, the last sentence of §1.631(a) is corrected by removing the words "a party shall serve copies of its preliminary statement on every opponent" and inserting, in their place, the words "a party shall serve a copy of its preliminary statement on each opponent".

20. On page 430, the first column, the heading of §1.633 is corrected by changing to lower case the first letter of the word "Motions".

21. On page 430, the third column, in §1.636(b) the reference to "§1.633(a), (b), or (g)" is corrected to read "§1.633(a), (b), (c)(1), or (g)".

22. On page 431, the second column, in §§1.637(d)(2) and 1.637(e)(1)(ii) the reference to "§1.608(b)" is corrected to read "§1.608".

23. On page 431, the second column, §1.637(e)(1)(iv) is corrected by removing the words "a claim" and inserting, in their place, the words "any claim".

24. On page 431, the third column, §1.637(e)(2)(iii) is corrected by removing the first occurrence of the word "party's" and inserting, in its place, the word "party".

25. On page 431, the third column, the second sentence of §1.637(e)(2)(iv) is corrected by removing the two occurrences of the word "claims" and inserting, in their place, the word "claim".

26. On page 431, the third column, in the first sentence of §1.637(f) (2), the reference to "§1.608(b)" is corrected to read "§1.608".

27. On page 432, the first column, §1.637(h)(3) is corrected by removing the words "a claim" and inserting, in their place, the words "any proposed claim".

28. On page 432, the second column, §1.640(b)(2) is corrected by removing the words "entered or" and inserting, in their place, the words "entered on".

29. On page 432, the third column, the penultimate sentence of §1.640(c) is corrected by inserting the article "a" before the words "single examiner-in-chief".

30. On page 432, the third column, §1.640(d)(1) is corrected by removing the words "all counts" and inserting, in their place, the words "any count".

31. On page 432, the third column, the first sentence of §1.640(e) is corrected by removing the word "filed" and inserting, in its place, the word "files".

32. On page 433, the second column, §1.644(i) is corrected by removing the word "petition" and inserting, in its place, "petitions".

33. On page 433, the second column, the first sentence of §1.645(a) is corrected by inserting the word "or" after "§§1.302," and after "§§1.303,".

34. On page 433, the third column, in the first sentence of §1.646(a), the spelling of the word "every" is corrected.

35. On page 433, the third column, §1.646(c) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

36. On page 434, the third column, §1.653(c)(5) is corrected by removing the word "an" and inserting, in its place, the word "and".

37. On page 434, the third column, the last sentence of §1.653(g) is corrected by removing the word "found" and inserting, in its place, the word "bound".

38. On page 435, the first column, the penultimate sentence of §1.653(i) is corrected by removing the words "and exhibit" and inserting, in their place, the words "an exhibit".

39. On page 436, the third column, the second sentence of §1.664(a) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

40. On page 437, the first column, the last sentence of §1.666(c) is corrected by removing the word "Commission" and inserting, in its place, "Commissioner".

41. On page 437, the second column, the first sentence of §1.671(b) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

42. On page 437, the second column, in the first sentence of §1.671(e) the reference to "§1.608(b)" is corrected to read "§1.608".

43. On page 437, the third column, the third sentence of §1.672(b) is corrected by removing the words "a party shall file" and inserting, in their place, the words "a party should file".

44. On page 438, the third column, in §1.676(a), the spelling of the third occurrence of the word "transcript" is corrected.

45. On page 440, the first column, the second sentence of §1.684(c)(6) is corrected by removing the words "a witness refused to read" and inserting, in their place, the words "a witness refuses to read".

46. On page 440, the second column, §1.685(c) is corrected by inserting the word "or" after the first occurrence of the word "error," and by removing the word

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"indorsed" and inserting, in its place, the word "endorsed".

May 21, 1985. DONALD J. QUIGG, *Acting Commissioner of Patents and Trademarks.*

[FR Doc. 85-13077 Filed 5-30-85; 8:45 am]

Billing Code 3510-16-M

[1059 OG 27]

(161) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103-7058]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622.
Effective Date: May 27, 1987.
For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294-2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9-10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756-32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25-31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552-558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

Discussion of the Rule

Under §1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revise and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

. . . stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with §1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard* v. *Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.
(2) The issues to be decided by the arbitrator.
(3) A provisions that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

(1) The style (e.g., *Jones* v. *Smith*), the number of the interference and the names of the real parties in interest.
(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.
(3) The issues for decision before the arbitrator.

(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.
(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—
(a) Where the award was procured by corruption, fraud, or undue means.
(b) Where there was evident partiality or corruption in the arbitrators, or either of them.
(c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any part have been prejudiced.
(d) Where the arbitrators exceeded their powers, or so imperfectly execute them that a mutual, final, and definite award upon the subject matter submitted was not made.
(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—
(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.
(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.
(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc.* v. *Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

Example 1

Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to

arbitrate the interference in accordance with §1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice—Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under §1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with §1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to extablish vis-a-vis the public that the subject matter of the court is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examinter-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice—Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct * * * in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of §1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with §1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616.

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Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey* v. *Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Discussion of Comments

One commentor suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed §1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentor suggested, by telephone, that a provision be added to proposed §1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentor stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of §1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98–622.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New §1.690 is added to Subpart E to read as follows:

§1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thrity (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

DONALD J. QUIGG,
Mar. 16, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 87-9373 Filed 4-24-87; 8:45 am]
BILLING CODE 3510-16-M

[1080 OG 15]

(162) **Disclosure Document Program**

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program. Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

The Program

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

Content of Disclosure Document

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8 1/2 by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

Retention

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

Warning as to Limitations

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

(163) **Suspension of Action Under 37 CFR 1.103 and Under 37 CFR 1.212**

The purpose of this notice is to clarify existing Office practice with respect to suspension of action. "Suspension of action" under 37 CFR 1.103 applies only to the situation where action is to be taken *by the Examiner.* In other words, action cannot be suspended in an application which contains an outstanding Office action awaiting response by the applicant.

Under 37 CFR 1.212, upon declaration of an interference, ex parte prosecution of an application is suspended

and any outstanding Office actions are considered as withdrawn by operation of the rule. *Ex parte Peterson*, USPQ 119 (Commissioner of Patents, 1941). Upon termination of the interference, the Examiner will reinstate the action treated as withdrawn by operation of 37 CFR 1.212 and set a statutory period for response. The formats set forth in MPEP 1109.01 and MPEP 1109.02 may be followed.

Careful adherence to the distinction set forth above will prevent any question of abandonment from arising in connection with cases in which suspension of prosecution has occurred.

WILLIAM FELDMAN,
Mar. 7, 1978. *Deputy Assistant Commissioner for Patents.*

[969 O.G. 8]

(164) **POSTAL SERVICE EMERGENCY CONTINGENCY PLAN**

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.
ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.
ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.
BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.
BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.
BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.
BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.
CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.
CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 788–2151.
CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.
CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (515) 684–2944.
CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.
COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.
DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.
DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.
DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.
DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.
GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.
HARTFORD, CONN., 06103, Room 610-B, Federal Office Bldg., 450 Main St. (203) 244–3530.
HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.
HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.
INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.
KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.
LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.
MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.
MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.
MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.
MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.
NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.
NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.
NEWARK, N.J., 07102, Gateway Bldg., (4th Floor) (201) 645–6214.
PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.
PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.
PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.
PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.
RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.
RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.
ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.
SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.
SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.
SAN JUAN, P.R., 00902, Room 100, Post Office Bldg., (809) 723–4640.
SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.
SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
July 18, 1975. *Commissioner of Patents and Trademarks.*

[937 O.G. 386]

(165) **Examiner Testimony**

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: ". . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205–12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

(166) **No Change in Foreign Filing License Requirements**

It should be noted that the change to 37 CFR 5.19 deleting the requirement to obtain an export license for filing a patent application in a foreign country does not in any way alter the provisions of 35 U.S.C. 184. 35 U.S.C. 184 requires that a foreign filing license be obtained from the Patent and Trademark Office before any patent application, based on an invention made in the United States, is filed abroad unless a corresponding application has been on file in the USPTO for over six months.

Further information may be obtained by contacting Mr. T. H. Tubbesing at 703–557–2897, or Mr. Edward Drazdowsky at 703–557–2167.

WILLIAM FELDMAN,
Nov. 24, 1980. *Acting Assistant Commissioner, for Patents.*

[1001 O.G. 28]

(167) **Department of Commerce Patent and Trademark Office**

United States Adherence to the International Union for the Protection of New Varieties of Plants (UPOV)

On Nov. 12, 1980, the United States deposited its instrument of acceptance of the 1978 text of the UPOV Convention. The United States was the second State to adhere to this text, New Zealand having earlier done so.

The UPOV Convention will take effect with respect to the United States and the other adherents to the 1978 text upon a total of five adherences, three of which must be by present member States (States adhering to the text of the Convention). We expect at least three present member States to adhere shortly and the 1978 text to take effect, therefore, during 1981.

The United States deposited its instrument of acceptance on the basis of the legal protection offered for asexually reproduced plants under the plant patent law (35 U.S.C. 161–164). Accordingly, the Convention will apply only to asexually reproduced plants protected under this law. Steps are now being taken, however, by the Plant Variety Protection Office of the Department of Agriculture to conform the implementation of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to

the Convention's requirements. When this is done, the United States will notify the UPOV Secretariat that the Convention is also applicable in the United States to sexually reproduced plants protected under that Act.

Questions concerning the UPOV Convention may be directed to the Office of Legislation and International Affairs of the Patent and Trademark Office. This Office may be addressed as follows: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The Office's telephone number is (703) 557–3065.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Dec. 16, 1980.

[1002 O.G. 102]

(168) **Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants**

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on Nov. 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after Nov. 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of Nov. 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after Nov. 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and
International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557–3065.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Oct. 15, 1981.

[1011 O.G. 27]

(169) **Policy Regarding Exchange Agreements Under the Authority of 35 USC Section 6(a)**

Background

The Patent and Trademark Office (PTO), by virtue of Section 6(a) of Title 35, United States Code, is empowered to enter into exchange agreements with other organizations to further the use of patent and trademark information, and to facilitate the use and availability of that information. In recognition of these objectives, the PTO establishes the following guidelines and principles which shall apply when evaluating and entering into exchange agreements with other public, private, domestic and foreign agencies, firms and companies.

Nature of Exchange Agreements

Exchange agreements by the PTO will generally be for the purpose of (1) acquiring goods and services which will assist the PTO in accomplishing its mission and achieving its goals; (2) reducing the cost to the government of processing activities associated with the examination of applications for patent and trademark registration; (3) fostering the dissemination of information contained in patent and trademark documents; and (4) furthering the general goal of automating patent and trademark examination processes.

In exchange agreements, the PTO and the industrial or commercial concerns will share in the cost and risks of the endeavor. Terms and conditions of each agreement, including the business arrangements, are negotiable within the limits of prevailing statutes and regulations and will be commensurate with the risks, involvement, and investment of the parties to the agreements. The PTO's intent is to offer as much latitude as practical in the agreement.

Each agreement will be negotiated on a case-by-case basis. Agreements will vary in size, complexity, scope and the nature of the materials, services, and/or products being exchanged by the parties. All exchange agreements will be subject to the availability of funds.

Incentives

Incentives provided by the PTO for the purpose of entering into exchange agreements may include, but are not limited to (1) providing copies of PTO documents; (2) providing computer processable data obtained from patents, trademark applications, trademark registrations, and other data sources developed by the PTO; (3) providing government furnished equipment necessary for the other party to fulfill the agreement; and (4) entering into joint programs where each party funds its own participation.

Considerations

The factors to be considered by the PTO prior to entering into an exchange agreement or providing incentives shall include, but will not be limited to the following considerations: (1) public or social need for the product(s) of the agreement; (2) enhanced dissemination of technological information; (3) benefits accruing to the public or the U.S. Government from the endeavor; (4) the desirability of private sector involvement in PTO programs; (5) the merit of the research, development or application proposed; (6) the degree of risk and financial participation by the other party; (7) the amount of proprietary data or other information to be furnished by the concern; (8) the rights in data to be granted to the PTO and the concern as a result of their contributions; (9) the willingness and ability of the concern to market and sell any resulting new or enhanced products on a reasonable basis; and (10) the impact of PTO sponsorship upon a given industry or area of commercial endeavor.

Administration

The Administrator for Automation is delegated the authority to enter into negotiations. The Commissioner of Patents and Trademarks will approve exchange agreements on behalf of the PTO. Before proceeding into comprehensive evaluation of a joint endeavor, a preliminary assessment will be made of the merits of the offer. Exchange agreement proposals which are too sketchy or ill-defined to (1) establish the merit in the basic idea, (2) establish that the proposal is in accordance with PTO program objectives, or (3) establish that the proposing organization is willing to make significant contribution to the endeavor, will not be evaluated in depth and will be treated as correspondence or advertising. This preliminary assessment will be conducted by the Administrator for Automation or his or her designee to determine if the proposal warrants further consideration. If this determination is positive and if the parties agree to proceed with a joint endeavor, the Administrator for Automation will enter into detailed discussions and negotiations with the offeror regarding the technical and business aspects of the offer. Upon reaching a mutually satisfactory arrangement, the agreement will be submitted to the Commissioner of Patents and Trademarks for approval. Administration of the exchange agreement program will be performed by the Administrator for Automation.

Due to resource limitations and the necessity for diversity in the program, only one offer will normally be accepted for a given PTO incentive. If substantially similar offers are received within any 45-day period, they will be evaluated and/or negotiated together. The offer which provides the best total consideration for the Government will be accepted. Special consideration shall be given to small and minority businesses, as appropriate.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

May 3, 1983.

[1030 OG 49]

(170) **Policy and Plans Regarding Exchange Agreements Entered into by the Patent and Trademark Office to Competitive Procurement Contracts**

Background

Under the authority of section 6(a) of title 35, United States Code, the Patent and Trademark Office (PTO) entered into exchange agreements with non-Federal entities to further the use of patent and trademark information and to facilitate the availability of that information. Some of these agreements will be converted to procurement contracts through competitive solicitations or assistance instruments, as appropriate. Toward this objective, the PTO establishes the following guidelines that shall apply to these conversions and to any subsequent business arrangements of a similar barter or exchange nature with private firms involving ADP resources. An inventory and description of the exchange agreements is also provided. Exchange agreements that will not be converted are identified and the reason for their exclusion explained.

Guidelines

From time to time the PTO needs goods and services to accomplish its goals for which it may offer other goods and services of comparable value as consideration rather than money. Such arrangements may be considered for a particular goal that might otherwise not be reached, in gaining access to published information and/or electronic data and/or in fostering the dissemination of intellectual property information. In return for goods and services it needs, the PTO may offer any or all of the following as full or partial compensation to the provider: (1) copies of PTO documents, (2) electronic data developed by the PTO from patents, trademark applications, trademark registrations, and other data sources, (3) Government-furnished equipment, and (4) other data and information resulting from special projects that may be undertaken. The use of consideration other than money will be in accord with the objectives of the Exchange Agreement provisions of P.L. 97–247.

Regardless of the barter or exchange nature and/or provisions of such arrangements, they will be developed as procurement contracts conforming to applicable procurement statutes and Federal Acquisition Regulations or assistance instruments as described in P.L. 95–224. Services which involve the delivery of ADP services will additionally conform to the Federal Information Resource Management Regulations. Agreements which have as their primary purpose the delivery of services to the public will be processed as assistance instruments under the provisions of the Grant and Cooperative Agreements Act of 1977, P.L. 95–224.

In seeking competitive procurements to replace exchange agreements, whenever possible, solicitation documents will (1) describe PTO needs in functional terms, (2) set forth the method that will be used in evaluating proposals, and (3) indicate the factors that will be considered and their relative weight or importance. Factors and weights will be based on the needs of the PTO and the interests of the public. When solicitation documents are ready for release, announcements will be published in the *Commerce Business Daily* (CBD) to inform prospective offerors of the date of the release. The PTO will competitively acquire the services of an independent audit or accounting firm to assign a fair market value to non-monetary considerations received or provided to assist in evaluating offers.

Contracts and assistance instruments will be awarded for one year with options for additional years, if required. The number of option years will be sufficient to provide an incentive for competitors to investment in an offering, but not for such a long period that future competition would be unreasonably limited.

Exclusive licenses will not be issued to any foreign owned firm or to any subsidiary or affiliate of a foreign owned firm. When feasible, competitive procurements will be structured to favor non-exclusive licenses. In any case, an exclusive license shall not impair the ability of the public to obtain data in a form historically provided by the PTO or in some equivalent form not subject to license restrictions. Licensees will not be entitled to obtain patent or trademark information not accessable by the public.

Exchange Agreements to be Converted by Competitive Procurement

Exchange agreements now in effect that are to be converted through competitive solicitations are listed below. The tentative date for issuance of the solicitation document is shown for each.

Exchange of Trademark Data and Information with Thomson and Thomson

Under an agreement with Thomson and Thomson (T&T), of 1 Monarch Dr., North Quincy, Mass. 02171, digitized images of the figurative elements of active trademark registrations in effect in 1983 and to be registered during the subsequent 10 year period were or are to be provided to the PTO. The same figurative elements were or are to be coded for retrieval using a coding system and manual developed jointly by T&T and the PTO. The textual information contained in the trademark applications and other trademark documents for the period from 1984 to 1992 were or are to be provided. All data furnished or to be furnished by T&T were or are to be provided on magnetic tape in an agreed upon format and standard. In return for this electronic data, the PTO furnished or will furnish paper copies of registration, application, and other Office documents, copies of Trademark *Official Gazettes* (OG), certain microfilm equipment, reports from certain special studies and analyses and electronic data representing updates to the text data base of active trademark registrations for the period corresponding to the term of the agreement, from 1984 to 1992.

It is contemplated that the provisions of this exchange agreement will be ended and the substance of it will be converted by one or more competitive procurements for different types of data. The solicitations are planned to issue in Feb. or Mar., 1986.

Exchange of Patent Data and Information with Derwent

Under an agreement with Derwent, Inc., of 684 Elm St., Suite 500, McLean, Va. 22101, paper copies of copyrighted English Abstracts of Derwent's coverage of world patents and electronic data corresponding to the bibliographic data and alerting abstracts of certain Derwent files (CPI, WPI, and EPI) are provided to the PTO. In addition, a royalty credit of 300 hours connect time to Derwent data available on-line from time-sharing services is provided. The PTO furnishes Derwent paper or microfilm copies of foreign patents it receives from other patent offices, for pick-up at those offices, *OG* copies, and the following electronic U.S. patent data: patent bibliographic data with all claims, the Patent Master Classification File and the Patent Assignment Transaction Data File (backfile and updates).

This agreement, will be ended and the substance of it together with some additional data, data uses, and services will be converted by competitive procurement. The solicitation is planned to issue in Mar. or Apr., 1986.

Exchange of Services and Patent Data with Mead Data Central

Mead Data Central, of P.O. Box 933, Dayton, Ohio 54401, provides services related to the use of its on-line data systems (LEXPAT, LEXIS, NEXIS) in the amount of service credits of $77,000 annually to the PTO. In return, the PTO has or is furnishing to Mead Data Central, the following electronic data: the Patent Full Text File (backfile and updates), the Patent Assignment Transaction Data File, the Manual of Classification File, and the file of the Index to U.S. Patent Classification and paper copies of Certificates of Correction and Notices of Litigation.

This agreement will be converted by competitive replacement or, alternatively, will be terminated. If a competitive acquisition is to be undertaken, the solicitation is planned to issue approximately in Mar., 1986; if it is to be terminated, it is planned to be terminated by Oct., 1986.

Exchange of Patent Data and Information with Research Publications, Inc.

Under an exchange agreement with Research Publications, Inc., of 12 Lunar Dr., Woodbridge, Conn. 06525, the PTO receives COM-generated 16mm microfilm of its classification data files in two sequences. The magnetic tape files are provided to Research Publications every six months in the record format in which it is normally produced through the PTO maintenance program.

The PTO plans to terminate this exchange agreement in Sept. 1986.

Exceptions to Conversion by Competitive Acquisitions

Exchange agreements that are to be replaced by other than competitive procurements are listed below. The reason for the exception is given.

Exchange with Compu-Mark S.A. Related to Trademark Backfile Data

Under the exchange agreement with N.V. COMPUMARK S.A. (CM) of P.O. Box 61, B2510 Mortsel, Belgium, CM provided or will provide the PTO with electronic data on magnetic tape consisting of the text data in all trademark registrations active in 1983 and registered before 1980 and of the character data contained in the assignment index cards as of 1984. The PTO provided or is providing CM with paper copies of the active registrations found in its bound volumes, assignment index cards, and other PTO documents and electronic copies of the text data corresponding to new registrations and applications post-1979 and other trademark case data for the period from 1983 to 1992.

The PTO intends to procure data obtained from CM on a sole source basis, as previously advertised in the *CBD* on Dec. 15, 1984. To the knowledge of the PTO, CM is the only source of this collection of data that meets the specifications of the PTO. The negotiated price is expected to be less than the cost of its replacement by other, competitive means. Estimates of the replacement cost obtained from other, independent firms will be used to validate the final price, contract terms and conditions. The sole source award is planned to be completed by Jan. 1986.

Exchange of Services and Patent Data with Pergamon Infoline

Pergamon Infoline (Pergamon) of 1340 Old Chain Bridge Rd., McLean, Va. 22101, provided or is providing the PTO with the following: electronic data corresponding to the bibliographic data, including abstracts, of approximately 130,000 U.S. patents issued between 1970 and 1974 for which no other electronic data are available in the PTO, services consisting of royalty credits in an amount of $10,000 annually applied to the use of Pergamon's on-line data base, and training of 300 patent examiners in the use of the Infoline system. The PTO furnishes Pergamon the following electronic data: the full text of the patent text backfile from 1975 to 1983, annual issuances of patent assignment transaction data, annual updates of patent bibliographic data with exemplary claims, annual issuances of the Patent Master Classification File; the annual issuance of the Attorney Roster File, periodic issuances of the Special Index Term File 364–200, and periodic issuances of the Special Index Term file 364–900.

The PTO plans to terminate this exchange agreement in Sept. 1986.

Administration

The PTO Administrator for Automation has been assigned responsiblity for administering all exchange agreements, their replacement, or their termination. Any requests for additional information about the agreements now in effect should be addressed to:

J. Howard Bryant
Administrator for Automation
Department of Commerce
U.S. Patent and Trademark Office
Washington, D.C. 20231

Information on the competitive solicitations should be addressed to:

Office of Procurement
Patent and Trademark Office
Box 6
Washington, D.C. 20231

At this time the PTO is seeking expressions of interest. Interested parties should write to the procurement office identified above citing the exchange agreement(s) for which subsequent receipt of a competitive solicitation is requested. Each competitive solicitation will be separately summarized in the CBD prior to issuance.

DONALD J. QUIGG,
Dec. 2, 1985. *Assistant Secretary of and Commissioner of Patents and Trademarks.*

[1062 OG 410]

(171) **Qualifications for Admission to the Examination for Registration to Practice Before the Patent and Trademark Office**

37 CFR 1.341(c) provides in pertinent part, "No person will be admitted to practice and registered unless he shall . . . establish to the satisfaction of the Commissioner that he is of good moral character and good repute and *** possessed of the legal and scientific and technical qualifications necessary to enable him to render applicants for patents valuable service ***. In order that the Commissioner may determine whether the person *** has the qualifications specified, satisfactory proof of good moral character and repute, and of sufficient basic training in scientific and technical matters must be submitted ***."

All persons requesting application forms are routinely furnished with a circular entitled "General Requirements For Admission To The Examination For Registration To Practice Before The Patent and Trademark Office". The circular contains a list of the subjects in which a person must have a bachelor's degree or the equivalency thereof in scientific and technical training to meet registration qualifications. It is strongly recommended that persons who do not have a bachelor's degree in one of those subjects comply with the instructions in the paragraph following the list to show their scientific and technical qualifications. If it is intended to rely on courses in computer science, no more than 3 semester hours of courses in computer programming will be accepted as providing part of the required basic training in scientific and technical matters. Computer science courses oriented away from the physical sciences or engineering, e.g., toward accounting or business, will not be accepted as providing any of the requisite basic training in scientific and technical matters.

Many applications for admission to an examination are filed on or just prior to the announced closing date for doing so, and these applications are frequently disapproved because the person does not furnish a satisfactory showing of his or her qualifications. For instance, persons with a bachelor's degree in a subject other than one of those listed in the circular frequently do not follow instructions in the circular and do not furnish both their transcripts and official course descriptions. Other persons list charges brought against them requiring further showings to overcome doubts raised by the charges about their character and reputation. Still others who failed one section of the examination three times do not furnish a satisfactory showing of sufficient additional legal training to pass the examination.

The Office of Enrollment and Discipline evaluates each application for admission to the examination on an individual basis as soon as practical after receipt in that office. Thereafter, notification is promptly mailed to each person whose application has been disapproved.

The Office of Personnel Management (OPM — formerly Civil Service Commission), which administers the examination, requires that it receive correct data from the Patent and Trademark Office identifying the locale of the examination and the number of persons to be tested well ahead of the examination date. *To afford adequate time to present a satisfactory supplemental showing to gain admission to the examination for which application is being made, it is recommended that all persons file their applications early, preferably at least two months before the closing date.*

All supplemental showings of qualifications and all applications filed after the announced closing date to apply for admission to an examination will be considered only in connection with the person's admission to the next succeeding examination. Admission to an examination given on a particular date is available only to persons who have filed a completed application form, a $75.00 admission fee, and a satisfactory showing of qualifications on or before the closing date for applying for admission to the examination. Examinations are given in Apr. and Oct. each year, and the respective closing dates for applying for admission to the examinations are the preceding Jan. 31 and July 31.

WILLIAM FELDMAN,
Sept. 18, 1984. *Director of Enrollment and Discipline.*

[1047 O.G. 35]

(172) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
Docket 407 88–4161

Practice before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its rules governing practice before the PTO by attorneys and agents. These rules are needed to clarify and modernize the rules relating to admission to practice and the conduct of disciplinary cases. The rules are also needed to set out in the Code of Federal Regulations a PTO Code of Professional Responsibility. By amending the rules, the PTO believes the standards for admission to practice in patent cases will be more easily understood, that those practicing before the PTO will have ready access to a code of professional responsibility, and that procedure in disciplinary cases will be more easily understood. The PTO expects that the conduct of disciplinary proceedings under these rules will be more effective and less costly.
Dates: The effective date of these rules (except §1.21(a)(5) and (6)) is Mar. 8, 1985. Section 1.21(a)(5) and (6) is effective Apr. 8, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557–4025 (if no answer, message may be left at 703–557–4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Attorneys and agents practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31. Attorneys also practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500(b). A few agents also practice before the PTO in trademark cases under rules in force prior to Jan. 1, 1957.

A notice of proposed rulemaking for attorney and agent conduct and disciplinary procedure was published on Aug. 11, 1983 in the *Federal Register*, 48 F.R. 36478, and on Sept. 20, 1983 in the *Official Gazette*, 1034 O.G. 39, 1034 TMOG 33. A notice extending the comment period and setting a second hearing was published on Oct. 5, 1983 in the *Federal Register*, 48 F.R. 45424, and on Oct. 18, 1983, in the *Official Gazette*, 1035 O.G. 19, 1035 TMOG 17. The PTO decided to withdraw, and not adopt, the rules proposed in the *Federal Register* notice of Aug. 11, 1983. There were numerous objections to the proposed rules and the public indicated that a longer period for study and review of a code of conduct and disciplinary procedures was necessary.

An advance notice of proposed rulemaking setting out revised rules being considered for standards of conduct and disciplinary proceedings was published on Mar. 16, 1984, in the *Federal Register*, 49 F.R. 10012, and on Apr. 10, 1984, in the *Official Gazette*, 1041 O.G. 15, 1041 TMOG 13. Numerous organizations and individuals filed comments in response to the advance notice.

On Aug. 24, 1984, the PTO published in the *Federal Register* a notice of proposed rulemaking, 49 F.R. 33790. On Aug. 28, 1984, the notice was also published in the *Official Gazette*, 1045 O.G. 29; 1045 TMOG 25. The notice also appeared in the Bureau of National Affairs, *Patents, Trademark & Copyright Journal*, Vol. 28, No. 694, pp. 485–515 (Aug. 30, 1984). Twenty-two written comments were timely received in response to the notice of proposed rulemaking. The comments are analyzed here-

in. A hearing was held on Oct. 10, 1984. Five individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The twenty-two written comments and a copy of the transcript of the hearing are available for public inspection in Room 12B10, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

This notice of rulemaking sets out rules in three areas:

(1) Practice of attorneys and agents before the PTO in patent, trademark, and other non-patent cases (§§10.2 through 10.19);
(2) A PTO Code of Professional Responsibility (§§10.20 through 10.112); and
(3) Rules governing (a) investigation of possible violations of the PTO Code of Professional Responsibility and (b) disciplinary proceedings to reprimand, suspend, or exclude (disbar) individuals from practicing before the PTO who, after notice and opportunity for a hearing, are found to have violated a disciplinary rule of the PTO Code of Professional Responsibility (§§10.130 through 10.170).

Familiarity with the advance notice and notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in response to the notice of proposed rulemaking are discussed. Comments not timely received in response to the advance notice are also discussed.

Tables 1, 2, and 3 are included in this notice to assist readers in correlating present rules with the new rules and to find the principal source for the new rules. An indication in Tables 1, 2, or 3 that a section is "new" means that a corresponding section does not currently appear in Tile 37 of the Code of Federal Regulations.

Table 1 shows the principal sources of the new rules which relate to (1) admission to practice of attorneys and agents in patent cases and (2) practice in trademark and other non-patent cases.

Table 2 shows the principal sources of the rules for the new PTO Code of Professional Responsibility.

Table 3 shows the principal sources of the new rules for disciplinary proceedings.

Other sources for, and rationale in support of, the proposed rules are discussed in the Supplementary Information of the advance notice, 49 F.R. 10012–10022, and the Supplementary Information of the notice of proposed rulemaking, 49 F.R. 33790–33803.

In issuing these rules, the PTO has made every effort to minimize preemption of State control over the practice of law. Thus, in §10.1, second sentence, the new rules provide:

> Nothing in . . . [these rules] shall be construed to preempt the authority of each State to maintain control over the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives.

This provision of §10.1 is based on language in *Sperry* v. *Florida ex rel, Florida Bar,* 373 U.S. 379, 402 (1963), and makes clear the PTO's intent to regulate only conduct related or relevant to practice before the PTO.

In an effort to ascertain whether the proposed rules would have any adverse impact on the States, copies of both the advance notice of Mar. 16, 1984, and the notice of proposed rulemaking of Aug. 24, 1984, were sent to Bar Counsel in each State. The PTO received responses from Bar Counsel in Ala., Conn., Fla., Ga., Md., Miss., Nebr., Tex., and Vt. Comments were also received from the National Organization of Bar Counsel, the American Bar Association, and others.

Alaska Bar Counsel, contrary to other bar counsel filing comments, suggested that creation of a PTO Code of Professional Responsibility would be "inherently confusing" to any attorney practicing in a State and also before the PTO. The new rules, however, do not establish for the first time a PTO Code of Professional Responsibility. The current PTO code appears in 37 CFR §§1.344 and 2.12. Sections 1.344 and 2.12 merely incorporate by reference the Code of Professional Responsibility of the American Bar Association (1970). The new PTO code more appropriately sets out the standards of conduct relevant to the practice of law before the PTO. Alaska Bar Counsel also felt that it would be more appropriate if the PTO brought alleged ethics violations by attorneys to local state enforcement authorities. This view was not shared by other bar counsel who filed comments. The statute (35 U.S.C. 32) authorizes the Commissioner to administer discipline. The PTO has taken disciplinary action in instances where a State has declined to do so. Moreover, there are registered patent agents who are not subject to discipline by State enforcement agencies. Finally, Alaska Bar counsel suggested that "adjudicative agencies" are too closely involved in a disciplinary matter to be impartial. Congress has determined otherwise. 35 U.S.C. 32 and 5 U.S.C. 500(d).

Comments were received from the Statewide Grievance Committee of Connecticut in response to the advance notice. Many helpful suggestions were made in the comments. Most of the suggestions were adopted at the time the notice of proposed rulemaking was published.

The Florida Bar, through its Director of Lawyer Regulation, filed comments in response to the notice of proposed rulemaking. The Florida Bar commented on §§10.1(c) and 10.23(c) (5). The PTO's response to the comment appears later in this notice under a discussion of §10.1.

An Assistant General Counsel of the State Bar of Georgia filed a response to the advance notice. The response stated, among other things: "Although due to the press of business at the present time I am unable to provide a substantive response in this correspondence, I will respond within the appropriate time limits after having an opportunity to study the enclosed . . . [advance notice]." No further response was received.

Bar counsel for the Attorney Grievance Commission of Maryland filed a response to the advance notice. In his response Bar Counsel states in part:

> It does not appear to me that any of the proposed Rules would present any difficulty in the administration of discipline within Md.

Complaint Counsel for Miss. responded to the advance notice. He stated in part:

> I have not reviewed the proposed Code in comparison with the Code of Professional Responsiblity in great detail. In general however I can state that adoption of the proposed Code would not have an adverse effect upon the function of this office.

The General Counsel of the State Bar of Texas responded to the advance notice and did "not perceive that any problem would be created by . . . [the proposed rules] in Tex." The General Counsel did express the thought that the PTO's use of the word "practitioner" instead of "lawyer" would not prevent reciprocal discipline in Tex. based on disciplinary action by the PTO. The PTO sees no reason for disagreeing with the General Counsel. The word "practitioner" is used by the PTO to define registered attorneys, registered agents, *and* other attorneys authorized to practice in trademark and other non-patent cases before the PTO under 5 U.S.C. 500(b).

The Chairman of the Professional Conduct Board of Vermont responded to the advance notice. He states in part:

> I find nothing contained in the proposed rules which would present any difficulty in the administration of disciplinary matters within the State of Vermont. Further, I see no problems created vis-a-vis the Code of Professional Responsibility in this jurisdiction.

The President of the National Organization of Bar Counsel responded to the notice of proposed rulemaking. He expressed a concern as to whether the PTO intended to "provide for notice and information of . . . [each disciplinary violation by an attorney] to each jurisdiction where the attorney is licensed." Two provisions of the rules are designed to insure that States are notified of PTO disciplinary action. Section 10.158(b) (1) requires a disciplined attorney to notify all bars of which he or she is a member and to file a copy of the notice with the Director of Enrollment and Discipline of the PTO. Section 10.159(a) requires the Director to notify known state bars and appropriate bar associations of PTO disciplinary action. In addition, as a matter of policy, the PTO intends to notify the National Discipline Data Bank of the American Bar Association.

Comments were filed in response to the advance notice and the notice of proposed rulemaking by the Standing Committee on Professional Discipline of the American Bar Association. The comments filed in response to the advance notice were analyzed in the notice of proposed rulemaking and are not re-analyzed in this notice. In its comments responding to the notice of proposed rulemaking the Standing Committee made several helpful suggestions, some of which are being adopted. A full discussion of the PTO rationale for adopting or not adopting a particular suggestion appears under analysis of comments later in this notice. The Standing Committee urged adoption of the 1983 ABA Model Rules. The PTO is not now adopting the Model Rules *inter alia* because most States have not adopted those rules. If a significant number of states adopt the Model Rules, the PTO will consider further amendments to its Code of Professional Responsibility. The Standing Committee suggested changes to §10.23(c) (12) which are being adopted in part. The Standing Committee suggested that notice be given to a practitioner prior to any meeting of the Committee on Discipline. This suggestion is not being adopted. In most instances, a practitioner will be able to respond to a notice under 5 U.S.C. 558(c). The Committee will have the practitioner's response at the time of its deliberation. The Standing Committee urged that hearings in disciplinary matters should be open to the public. Others opposed this position. The PTO is not adopting this suggestion in view of 35 U.S.C. 122. Further rationale for not adopting the Standing Committee's suggestion appears later in the notice. The Standing Committee urged a change in §10.149 to make the burden for proving a disciplinary violation one of "clear and convincing evidence." This suggestion is being adopted. The Standing Committee urged that more discovery be permitted than was authorized by §10.152 as proposed. This suggestion is being adopted as explained further in this notice. The Standing Committee also thought §10.159 should provide for notice to the ABA National Discipline Data Bank when the PTO administers discipline. While §10.159 will not specifically mention the Data Bank, a change has been made to permit the Director to notify appropriate bar associations. The Data Bank is an appropriate bar association.

Changes in Text: Several changes have been made in the text of the new rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

In §1.8, the new subparagraph will be (xiii). Subparagraph (xii) was added when the rules relating to patent interference proceedings were amended. See 49 F.R. 48451 (Dec. 12, 1984).

In the first sentence of §1.31, the term "agent" has been changed to "registered agent" to make clear that only registered agents are intended.

Section 1.33(c) is being amended to delete a reference to former §§1.341 and 1.347 and to now refer to §§10.5 and 10.11.

Section 1.56(f) and (h) is being amended to delete a reference to former §1.346 and to now referred to §10.18.

In the second sentence of §10.1, "subpart shall" has been changed to "part shall" and "maintain control over" has been changed to "regulate." In the same sentence, "within its borders" has been deleted.

In §10.2(b) (1), "maintain the register" has been changed to "maintain the register provided for in §10.5".

In the next-to-the-last sentence of §10.7(b), "examining corps" has been changed to "patent examining corps".

The language "an alien" in §10.9(b) has been changed to read "a resident alien" to make clear that aliens registered under paragraphs (a) or (b) of §10.6 must be resident aliens.

In the first sentence of §10.14(c), "foreigner" has been changed to "foreign attorney or agent", "registered and in good standing" has been changed to "registered or in good standing", "applicants" has been changed to "parties" and "trademark applications" has been changed to "trademark cases".

In §10.18(a) (1), "the paper has been read" has been changed to "the paper has been read by the practitioner".

Several changes have been made in §10.23.

In §10.23(c) (4) (iii), "improperly" has been added before "bestowing."

In §10.23(c) (5), "on ethical grounds" has been added after the first occurrence of "attorney or agent" and "suspension or disbarment as an attorney or agent" (after "10.6(c)") has been deleted.

In §10.23(c) (7), "patent" has been added before "application of another" and the following has been added as a second sentence: "See §§1.604(b) and 1.607(c) of this Subchapter."

In §10.23(c) (8), "Failing to forward" has been changed to "Failing to inform a client or former client"; "inability to forward, to" has been changed to "inability to notify"; "client correspondence" has been changed to "client of correspondence"; "is correspondence which" has been changed to "is correspondence of which"; and "under the circumstances should be forwarded to the client or former client" has been changed to "under the circumstances the client or former client should be notified."

Section 10.23(c) (12) has been changed to read: "Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

In §10.23(c) (15), "including" has been changed to "making a" and "matter" has been changed to "statement".

In §10.36(b) (3), the language "in the locality" has been deleted.

The following language has been deleted from §10.40(c): ", and may not withdraw in other matters,".

In §10.62(b), the language "contemplated or pending litigation or" has been deleted.

In §10.63(a), the language "contemplated or pending litigation or" has been deleted. Both occurrences of "trial or" have been deleted from §10.63(a). The language "contemplated or pending litigation or" has been deleted from §10.63(b).

The following sentence has been added to §10.64(b): "A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee."

In §10.84(a) (3), "§10.85" has been changed to "this part".

The following sentence has been added to §10.87(a): "It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

Subparagraph (5) of §10.89(c) as it appeared in the notice of proposed rulemaking has been deleted. Subparagraph (6) of §10.89(c) as it appeared in the notice of proposed rulemaking has been changed to read: "(5) Engage in undignified or discourteous conduct before the

Office (see §1.3 of this Subchapter)." Subparagraph (7) of §10.89(c) has been redesignated as subparagraph (6).

In §10.112(a), the language:

maintained: (1) in the case of a practitioner whose office is located in the United States, the State in which the practitioner's office is situated or (2) in the case of a practitioner having an office in a foreign country or registered under §10.6(c) in the United States or the foreign country has been changed to read:

maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under §10.6(c), in the United States or the foreign country.

In §10.131(a), the second sentence has been deleted as being unnecessary in view of §10.132(b). The second sentence of §10.131(a) in the notice of proposed rulemaking read: "The investigation shall be such as to determine whether there is probable cause to believe that a violation of a Disciplinary Rule by a practitioner has occurred."

In the first sentence of §10.132(a), the language "that there is probable cuase to believe" has been deleted. The Committee on Discipline, not the Director, shall determine whether there is probable cause to believe that a practitioner has violated a Disciplinary Rule. See §§10.4(b) and 10.132(b).

Several changes have been made in §10.133. In the first sentence of §10.133(b), the language "§§10.132(b) and 10.134" has been replaced with "§10.134". The reference to §10.132(b) is not necessary. The language "his or her resignation by filing" in §10.133(b) has been deleted as unnecessary. The second sentence of §10.133(b) has been modified to become new paragraphs (c) and (d). Paragraph (c) indicates the content of an affidavit of resignation filed prior to the date set by the administrative law judge (ALJ) for hearing. Paragraph (d) indicates the content of an affidavit of resignation filed on or after the date set by the ALJ for hearing. Paragraph (c) has been redesignated as new paragraph (e). In addition, the language "paragraph (b)" therein has been changed to "paragraphs (b) or (c)". Paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

In §10.135(a) (2) (i), "Committee on Enrollment" has been changed to "Director".

In §10.149, "a preponderance of" has been changed in both instances to "clear and convincing".

Several changes have been made to §10.152 to expand discovery. Paragraphs (a) and (b) of §10.152 as set out in the notice of proposed rulemaking have been redesignated as paragraphs (e) and (f), respectively, and new paragraphs (a) through (d) have been added. New paragraph (a) sets forth discovery which is authorized. New paragraph (b) sets forth matter which *cannot* be discovered. Paragraph (c) sets forth factors which an ALJ can consider in determining whether to authorize discovery. Paragraph (d) requires that a motion be filed which addresses specifically and separately each particular request for discovery. In paragraph (e) (formerly paragraph (a)), a new subparagraph (3) has been added to specify that the ALJ may require the parties to set out in a pre-hearing statement information related to expert witnesses. Old subparagraphs (3) and (4) have been redesignated as new subparagraphs (4) and (5), respectively.

In §10.154(b), a new subparagraph (5) has been added which states: "(5) any extenuating circumstances."

In §10.155(a), both occurrences of "on the respondent" have been deleted.

Several changes have been made to §10.158. In §10.158(b) (1), after "all clients of the practitioner" the following has been added "for whom he or she is handling matters before the Office". In §10.158(b) (2), "client's active case files" has been changed to "client's active Office case files". In §10.158(c), changes have been made to make paragraph (c) applicable to corporate patent departments and to prohibit a suspended or excluded practitioner from meeting in person or in the presence of another practitioner with an official of the PTO in connection with the prosecution of a patent, trademark, or other case.

The following has been added to the end of §10.159(a): "and any appropriate bar associations."

Several changes have been made in §10.160(c). "A practitioner has been suspended or excluded" has been changed to "An individual who has resigned under §10.133 or who has been suspended or excluded". The language "if the Director is satisfied" has been changed to "when the individual makes a clear and convincing showing". The language "suspended or excluded practitioner" has been changed to "individual".

Response to and Analysis of Comments: Twenty-two (22) written comments where timely received in response to the notice of proposed rulemaking. The comments have been analyzed. Some suggestions made in comments have been adopted and others have been rejected. A detailed analysis of the timely received comments follows. Several comments were not timely received by July 9, 1984, in response to the advance notice of proposed rulemaking of Mar. 16, 1984. These comments have now been considered and are analyzed herein.

Several comments were received which suggested that the rules purport to regulate attorney conduct beyond that necessary or proper for administration of federal programs by the PTO. It is not, and has never been, the intention of the PTO to regulate conduct except to the extent necessary for the accomplishment of federal objectives. Thus, only that conduct which is relevant to the practice of patent, trademark, or other law *before the PTO* is what the PTO seeks to regulate. The preamble of §10.1 indicates that Subpart 10 governs solely the practice of patent, trademark, and other law before the PTO. As noted in the preamble to §10.1, "[n]othing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." See *Sperry* v. *Florida ex rel. Florida Bar*, 373 U.S. 379, 402 (1963). See also *Michigan Canners and Freezers Ass'n.* v. *Agricultural Marketing and Bargaining Board*, 104 S. Ct. 2518, 2523 (1984) (State Law is preempted when it stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress) and *Fidelity Federal Savings and Loan Ass'n.* v. *de la Cuesta*, 102 S. Ct. 3014, 3022 (1982) (federal regulations have no less preemptive effect than federal statutes).

Several comments were received concerning §10.1. The Florida Bar noted that in the notice of proposed rulemaking the PTO indicated "that failure to pay State bar dues is not a basis for suspension or exclusion before the PTO because failure to pay the dues has no relationship to the federal objectives which the PTO seeks to accomplish." 49 F.R. 33795, column 1, third full paragraph. The Florida Bar suggested that "the loss of good standing [should] be of concern to the PTO." The PTO agrees in part. Suspension from a State bar for failure to pay dues will not be viewed by the PTO as "misconduct." See §10.23(c) (5), which has been changed to define misconduct as suspension or disbarment on ethical grounds. If an attorney is suspended by his or her State bar for failure to pay bar dues, and for that reason is no longer in good standing before the State bar, that attorney is no longer an attorney within the meaning of §10.1(c). An attorney suspended from his or her State bar for failure to pay bar dues would no longer be eligible to represent individuals before the PTO in trademark and other non-patent cases.

One commentator suggested that the second sentence of §10.1 be changed to read: "Nothing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." The suggestion is being adopted. The commentator noted that as originally proposed in the notice of proposed rulemaking, the phrase "to maintain control over the practice of law within its borders" is unduly restrictive. The commentator correctly pointed out that "[c]ertainly, New York would have the authority to regulate the practice of law by a New York attorney residing in Fla."

Another commentator noted the language "federal objectives" in §10.1 and felt it would be appropriate for the PTO "to set forth what the federal objectives really are." The PTO does not believe it is appropriate to set out in the regulations specific federal objectives. The PTO engages in the examination of applications for patents, reexamination of issued patents, examination of applications for registrations of trademarks, and numerous *inter partes* patent and trademark proceedings. The federal objectives of the PTO center around these activities.

With respect to §10.2(c), one commentator argued that "it is unfair to require the payment of a fee to review a final decision of the Director." The PTO disagrees. The review provided by §10.2(c) is a service preformed by the PTO for which a fee may be charged. There is no compelling reason for not charging a fee.

Several comments were received discussing §10.4. One commentator suggested "that a provision for no discovery or testimony from a member of the Committee on Discipline is unfair and inappropriate." The PTO does not believe that a "mini-trial" should be conducted in a subsequent disciplinary proceeding of how or why the Committee on Discipline reached its decision. The commentator also argued that 10.4(c) "would be in direct conflict with the Federal Rules of Civil Procedure" in any review in the U.S. District Court for the District of Columbia. Again, the PTO disagrees. The Federal Rules of Civil Procedure do not apply to disciplinary cases in the PTO. Moreover, those rules do not apply in cases seeking judicial review of a decision of the Commissioner in a disciplinary matter. Applicable law (35 U.S.C. 32 and Local Rule 1–26 of the district court) provides for review on the record made in the PTO. See also *Camp* v. *Pitts*, 411 U.S. 138 (1973). Hence, there is no discovery in a proceeding under 35 U.S.C. 32.

Comments were received which suggest that the associate and assistant solicitors in the Office of the Solicitor cannot be isolated from the Solicitor and the Deputy Solicitor. The associate and assistant solicitors are to be isolated so that (1) the associate and assistant solicitors may act as attorney for the Director in prosecuting a disciplinary proceeding and (2) the Solicitor and Deputy Solicitor may act as legal advisor to the Commissioner in deciding a disciplinary matter. In disciplinary matters, the associate and assistant solicitors will report directly to the Director. Associate and assistant solicitors will not have occasion to discuss disciplinary matters with the Solicitor or Deputy Solicitor.

The following discussion in the *Attorney General's Manual on the Administrative Procedure Act*, pp. 57–58 (1947), commenting on original §5(c) (now 5 U.S.C. 554(d)) is believed particularly relevant to the issues raised in the comments:

> Assuming that an agency will in many cases wish to consult with certain of its staff members, it may proceed in one of two ways. It may in a particular case consult with staff members who in fact have not performed investigative or prosecuting functions in that or a factually related case. In the alternative, the agency may find it feasible so to organize its staff assignments that the staff members whom it most frequently desires to consult will be free of all investigative and prosecuting functions.
>
> * * * * *
>
> [I]f the agency so organizes its staff that the general counsel is not responsible for the investigative and prosecuting functions, he would be regularly available to the agency for consultation on the decision of cases.[5]

[5]The general counsel's participation in rule making and in court litigation would be entirely compatible with his role in advising the agency in the decision of adjudicatory cases subject to section 5(c).

Several commentators suggested that members of the public or the PTO bar should be members of the Committee on Discipline. This suggestion is not being adopted. As noted in the notice of proposed rulemaking (49 F.R. 33793, column 2, last paragraph), there are two reasons for not adopting the suggestion. Use of individuals outside the PTO is made difficult by 35 U.S.C. 122. Administrative delays would take place because it would be more difficult to schedule meetings.

One commentator suggested that the language "at least" in the phrase "at least three employees of the Office" should be deleted from the second sentence of §10.4(a). This suggestion is not being adopted. The "at least" language will permit the Commissioner to appoint alternate members to substitute for a member who may be disqualified or who may be unavailable for an extended period.

Section 10.10 provides that only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the PTO. One comment was received which noted that the rules do not address the "status" of (a) "an individual in a training program directed to the preparation and prosecution of applications for patent" or (b) "a long-time employee working within a patent organization in the area of preparation and prosecution of applications for patent, but has never become registered to practice as either a Patent Agent or Patent Attorney." The commentator suggested that the rules should state what such individuals or employees may do. The suggestion is not being adopted. Only registered practitioners (attorneys and agents) may practice patent law before the PTO. The commentator also suggested that the rules should provide that long-time corporate or government employees who have never been registered should be given limited recognition by the PTO. This suggestion is not being adopted. Limited recognition will be given only on a case-by-case basis. See §10.9.

One comment suggested that "applicants" and "trademark applications" in the first sentence of §10.14(c) rendered it unclear whether an individual authorized to practice before the PTO in trademark cases could prosecute post-registration cases, such as a cancellation proceeding. The rule has been clarified by changing "applicants" to "parties" and "trademark applications" to "trademark cases". An individual authorized to represent others under §10.14 is authorized to appear in any trademark case.

Several comments were received discussing §10.18. One comment made at the hearing suggested that the rule should specify who should read the paper being signed. The commentator stated: "I think it would be salutary if what you really mean is that the practitioner who signs it has read it." The suggestion is being adopted and the language of §10.18(a) (1) has been changed from "the paper has been read" to "the paper has been read by the practitioner".

Two individuals commented that requiring the signature of a practitioner would eliminate the "custom" of having an associate sign the name of a principal attorney on a paper which the principal authorizes the associate to file. Section 10.18 requires that the practitioner signing the paper sign his or her own name. The rule would permit associate attorney John Smith to sign on behalf of principal attorney David Jones by signing the paper as follows: "David Jones by John Smith." The rule would not permit Smith to merely sign Jones' name or to sign "David Jones by JS." The rule does not authorize a non-practitioner (e.g., a para-legal or secretary) to sign a paper on behalf of a practitioner.

One comment asked the following:

> Assume an inventor is under Final Rejection and the period for proper response is near at hand. The attorney is now instructed to "keep the case alive" until a CIP [continuation-in-part] is prepared and filed. For reasons outside the control of the attorney, the CIP cannot be

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> filed in time. Assume now the attorney files a Notice of Appeal, *never intending* to prosecute the appeal, intending only to buy time until the CIP can be filed. Would the filing of the Notice of Appeal violate Rule 10.18 and subject the attorney to PTO disciplinary action?

A notice of appeal is a proper response to a final rejection. Accordingly, it would not appear under the circumstances outlined that the notice of appeal was "interposed for delay" within the meaning of §10.18(a)(4).

Three comments were received discussing §10.22. One comment suggested that modifiers, such as "knowingly" and "willfully" be inserted in paragraphs (a) and (b) of §10.22. The suggestion is not being adopted. A "materially false statement," a failure "to disclose a material fact," or furthering the application of another "known ... to be unqualified" constitute acts which cannot be characterized as innocent. Accordingly, there is no need to insert the "modifiers" in the text of the rule. Another commentator suggested that the provisions of §10.22 are not relevant to the federal objectives of the PTO. The PTO disagrees. Practitioners who (1) fail to tell the truth, (2) fail to reveal material information or (3) knowingly further the application of an unqualified individual to a bar, demonstrate that they are "disreputable" within the meaning of 35 U.S.C. 32. A third commentator suggested that §10.22(b) is too broad because a practitioner could recommend an individual for membership in a bar and the individual might fail to pass the bar examination. Unless a practitioner has good reason to know that the individual will fail to pass a bar examination, it is not apparent how the practitioner's recommendation could amount to a violation of the PTO Code of Professional Responsibility.

Numerous comments were received discussing §10.23. One comment suggested that §10.23(c) (8) be changed to require notification of a client rather than requiring correspondence to be forwarded. This suggestion has been adopted by making appropriate changes to §10.23(c) (8).

A suggestion was made to delete the reference to $5000 in §10.23(c) (17). This suggestion is not being adopted. See the discussion in the advance notice, 49 F.R. 10016, column 1.

A suggestion was made that §10.23(c) (5) has "a built-in inequity as regards different patent attorneys in different states." According to the commentator, a practitioner suspended for an act by Ohio might not be suspended for the same act by New York. The commentator reasons it would be unfair for the Office to suspend the Ohio practitioner, but not the New York practitioner. The commentator's concern is not warranted in view of the second sentence of §10.1.

Another commentator noted that §10.23(a) (3) "points up the difficulty of superimposing . . . [a] set of rules on of the various local jurisdictions." Here again, the commentator's concern is not believed warranted in view of the second sentence of §10.1. Another commentator noted that "moral turpitude" is hard to define. It was suggested that possession of marijuana is regarded as a crime involving moral turpitude in some states where a 99-year sentence may be received. It was suggested that in other states possession of marijuana might result in "a slap on the wrist." If a practitioner is incarcerated for a crime in a state, it follows that the practitioner is not capable of representing individuals before the Office. This is true even if the same practitioner would not have been incarcerated in another state for the same act.

The Florida Bar raised a question concerning §10.23(c) (5) which is answered under the discussion above of §10.1. Section 10.23(c) (5) has been changed to make suspension or disbarment "on ethical grounds" a basis for suspension or disbarment by the Office. "Ethical grounds" would include incompetence, but would not include failure to pay State bar dues.

One comment suggested that "disreputable" and "gross misconduct" in §10.23(a) be defined. The terms "disreputable" and "gross misconduct" appear in 35 U.S.C. 32 and need no further definition in the rules. For a discussion of "disreputable," see *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84–5536 (D.D.C. June 29, 1984).

Several comments suggested that the Model Rules of Professional Conduct of the American Bar Association (1983) be adopted in place of §10.23. Adoption of the Model Rules was given consideration prior to publication of the advance notice and the notice of proposed rulemaking. The matter has been considered again. However, it has not been demonstrated to the Office that a large number of states have adopted the Model Rules. As noted in the notice of proposed rulemaking, at least Va. has rejected the Model Rules. Accordingly, the PTO will not, at this time, adopt the Model Rules. If a large number of states adopt the Model Rules in the future, the PTO would be willing to reconsider its position.

One comment suggested that "before the Office" be inserted after the word "conduct" in §10.23(b) (4), (5), and (6). This suggestion is not being adopted in view of the second sentence of §10.1.

A suggestion was received that "improperly" be inserted at the beginning of §10.23(c) (4) (iii). This suggestion has been adopted.

A suggestion was received that the word "patent" be inserted before "application" in §10.23(c) (7). This suggestion has been adopted.

A suggestion was received that §10.23(c) (15) be changed so that a trademark practitioner could present potentially scandalous subject matter in order to receive a determination on the merits of registrability. See e.g., *In re McGinley*, 660 F.2d 481, 211 USPQ 668 (CCPA 1981). Section 10.23(c) (15) has been changed to refer only "making a scandalous or indecent statement in a paper filed in the Office."

Several individuals suggested that it may be difficult to determine the identity of tunder §10.23(c)(8), particularly in corporate patent departments. The PTO will presume that practitioners know the identities of their clients and that information conveyed to the client is being conveyed in a manner acceptable to the client.

Section 10.23(c)(12) has been changed in response to comments which suggested that it would be difficult for practitioners to comply with §10.23(c)(12) on the one hand and §§10.24 and 10.131 on the other hand. The purpose of §10.23(c)(12) is to eliminate a frivolous complaint against practitioners. Accordingly, §10.23(c)(12) has been changed to define as misconduct "knowningly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

Several individuals criticized §10.24. The provisions of §10.24 are derived from DR 1–103 of the Code of Professional Responsibility of the American Bar Association (1970)—the rule currently applicable to practitioners. See 37 CFR §§1.344 and 2.13. The PTO is not aware that the current rule causes any problems. Accordingly, the numerous suggestions to delete or amend §10.24 are not being adopted.

One comment was received which suggested that charging another person with trademark infringement and requesting that the person withdraw a pending application "might be . . . interpreted as a violation" of §10.31(a). The PTO disagrees. A reasonable interpretation of the rule does not justify the unreasonable construction by the commentator.

At the hearing, an individual discussed §10.32. The individual suggested that three "practices" should be sanctioned under any PTO Code of Professional Responsibility and it was suggested that all three practices might be prohibited by §10.32. *First*, the individual suggested that "the giving of moderately priced presents . . . to established clients on appropriate occasions—Christmas, weddings of their daughters" should not constitute a violation of §10.32. The PTO agrees. The giving of a gift to an "established client" on the occasions suggested is not a gift "to a person for recommending the practitioner's services." *Second*, the individual suggested that a practitioner should not be prohibited from "paying for ordinary client entertainment." The PTO agrees. Again the "client" is not "a person recommending the practitioner's services" in return for being entertained. *Third*, the individual argued that the rules should not preclude an "exchange of cases with foreign practitioners." An "exchange" was said to occur "[w]here a foreign patent practitioner in his country sends cases to an American patent or trademark practitioner to prosecute before the PTO, and you send the foreign firm cases to prosecute before the foreign patent office, on the more or less explicit basis that it's something in the nature of a trade." According to the individual, the "exchange" ordinarily takes place without knowledge of the practitioner's client. The individual expressed the opinion that "exchanges" without knowledge of the client presently occur routinely. The PTO believes that the suggested "exchange" may ethically take place *only* when the practitioner's clients are fully advised of the exchange. Three other witnesses at the hearing expressed the view—correctly the PTO believes—that client knowledge is essential to an ethical exchange of the type contemplated. No change in §10.32 is being made.

A suggestion was received that "in matters before the Office" be inserted after "professional employment" in §10.33. The suggestion is not being adopted in view of the second sentence of §10.1. Another comment suggested that Rule 7.3 of the Model Rules of Professional Conduct (1983) be adopted in place of §10.33. The suggestion is not being adopted. Section 10.33 is based partly on Rule 7.3, but contains the additional language "under circumstances evidencing undue influence, intimidation, or overreaching." Section 10.33 is designed to prohibit so-called "ambulance chasing." In *Ohralik* v. *Ohio State Bar Ass'n.*, 436 U.S. 447 (1978), the Supreme Court held that a state could lawfully regulate ambulance chasing. In its opinion, the Supreme Court said:

> We need not discuss or evaluate each of these interests in detail as appellant has conceded that the State has a legitimate and indeed "compelling" interest in preventing those aspects of solicitation that involve fraud, undue influence, intimidation, overreaching, and other forms of 'vexatious conduct.' We agree that protection of the public from these aspects of solicitation is a legitimate and important state interest.

436 U.S. at 462. The additional language appearing in §10.33 is designed to limit the application of §10.33 to those situations in which the PTO has a legitimate interest. See also 35 U.S.C. 32 and §10.31(a).

A suggestion was received that §10.35(b) should be deleted. According to the suggestion, "[r]egulation of the practitioner's business arrangements should be left to state regulation." While the PTO is in general agreement with the rationale suggested, there exist partnerships of agents which are not subject to regulation by any state. Moreover, the commentator has not suggested or shown that §10.35(b) is inconsistent with the policy of any state. Practitioners should not be free to hold themselves out as being associated with a partnership or other organizations when an association does not in fact exist.

One comment suggested that "in the locality" be deleted from §10.36(b)(3). This suggestion is being adopted, because "in the locality" has no particular significance in the practice of patent and trademark law. Clients of patent and trademark practitioners are not necessarily located where counsel are located. Moreover, the practice is national in scope.

An individual at the hearing suggested that the PTO should delete subparagraphs (1) and (2) from §10.37(a). This suggestion is not being adopted. The individual suggested that a client need not know that "employment" has been referred to another practitioner or to a foreign practitioner. The PTO disagrees and so did three other individuals who expressed a view at the hearing. Moreover, the PTO believes that when "farming out" occurs with the consent of a client, that the fee division should be proportional to the services rendered. Under §10.37, "farming out" of work without knowledge and consent of a client will constitute a disciplinary rule violation.

One commentator suggested that §10.39 "may result in numerous claims to the effect that a practitioner brought a proceeding 'merely for the purpose of harassing or maliciously injuring another person.' " Section 10.39 continues existing policy (37 CFR §1.344 and DR 2–109 of the ABA Code (1970)). Under existing policy, the PTO has not experienced "numerous claims." Accordingly, there is no reason to expect such claims under §10.39.

A suggestion was received that the first sentence of §10.40(a) be changed to read: "A practitioner may withdraw from employment in a proceeding before the Office without permission from the Commissioner in those instances in which a substitute has been selected and is willing to serve." This suggestion is not being adopted. If "a substitute has been selected and is willing to serve," presumably with the consent of the client, a new power of attorney may be filed in the PTO. Another commentator suggested that §10.40 should not apply to corporate attorneys. This suggestion likewise is not being adopted. If a corporate atorney changes jobs, the attorney should withdraw from representing the "old" corporation *or* the old corporation should revoke any power of attorney.

One comment suggested that the PTO should be under a burden of deciding requests for permission to withdraw within thirty (30) days. This suggestion is not being adopted, but it is and will continue to be PTO policy to promptly decide requests for permission to withdraw.

One comment suggested that ", and may not withdraw in other matters," be deleted from §10.40(c). This suggestion has been adopted.

One comment asked whether a power of attorney given during prosecution of a patent application continues to be viable after the patent is issued. The answer is "yes." Communications received during reexamination proceedings are sent to the correspondence address established during prosecution of the application which matures into the patent being reexamined. See 37 CFR §1.525. Notices concerning maintenance fees likewise are mailed to the correspondence address. See 37 CFR §1.363, 49 F.R. 34725 (Aug. 31, 1984). The commentator also raised a question of who is the client when a case is filed on behalf of an individual, but the individual's assignee pays the practitioner's bills. Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client.

A comment suggested that §10.40(a) "would appear to be unreasonable" in view of the language "giving due notice to another practitioner." Such language does not appear in §10.40(a).

An oral comment was received by phone which questioned whether the use of para-legals or apprentices by a practitioner constitutes the unauthorized practice of law. If a para-legal or apprentice works under the direction of a practitioner and the practitioner does not allow the para-legal or apprentice to hold themselves out as a practitioner, there is no unauthorized practice of law problem within the meaning of §10.47.

One comment discussing §10.49 made the following statement:

> ". . . if the intent of this section is to prohibit a practitioner from forming a partnership with a lawyer who, while in good standing with his State bar, does not qualify to practice before the Office (either because he has not taken the patent examination or is not quali-

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fied to handle trademark matters), then it should be stricken."

As explained in the notice of proposed rulemaking (49 F.R. 33797, column 3), the PTO does not intend to prohibit formation of law firms by members of the Bar of any state.

One comment suggested that "in matters before the Office" should be inserted after "employment" in §10.62(a). This suggestion is not being adopted in view of the second sentence of §10.1.

Another comment suggested that §§10.62 and 10.63 be replaced with Rule 3.7(b) of the Model Rules of Professional Conduct of the ABA (1983). For reasons already discussed, the PTO is not adopting the Model Rules. The comment went on to suggest that practitioners would not be free testify concerning attorney diligence in patent interference cases. The PTO has made it plain twice that it disagrees. See the advance notice (49 F.R. 10016, column 3 (Mar. 16, 1984)) and the notice of proposed rulemaking (49 F.R. 33797, column 3, last paragraph (Aug. 24, 1984)).

A comment suggested that language in §§10.62 and 10.63 is not clear. Specifically, the commentator referred to "solely to an uncontested matter" or "solely to a matter of formality." This language occurs in the current rules and has not caused any known difficulty.

Two comments were received which suggested that §10.64(b) should permit practitioners to pay fees which rightfully should be paid by a practitioner. This suggestion is being adopted and the following sentence has been added to §10.64(b): "A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee." One of the commentators supplied the following rationale with which the PTO agrees:

> It sometimes happens that payment of a fee is necessitated by some act or omission for which the practitioner and not the client is responsible. One example is a fee for an extension of time to respond to an Office Action (see 37 C.F.R. §1.17 and §1.136), where the delay has resulted from the practitioner's workload for other clients, or from the practitioner's absence from his or her office for purposes unrelated to the client's business. Another example is a petition fee for revival of an application unintentionally abandoned through some inadvertent oversight on the practitioner's part. In these circumstances, it would seem unjust to require the client to bear the cost of the fee.

One comment suggested that §10.65 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

Another comment suggested that §10.65(a) "may limit a practitioner serving on the board of directors of a client." The commentator went on to say that practitioners serving on boards of directors is a common practice. Inasmuch as the client consents to practitioner serving on the board, it is believed that §10.65 does not limit a practitioner as suggested by the commentator.

One comment was received which suggested that §10.66(d) be changed to exclude corporate patent departments. According to the comment, "why should an entire corporate patent department have to withdraw if one of its members has to withdraw for disciplinary reasons?" In situations where it would not be appropriate for an entire firm or department to withdraw, §10.66(d) permits the Commissioner or the Director to so order. See e.g., *Sunkist Growers, Inc.* v. *The Benjamin Ansehl Co.*, 221 USPQ 1077 (Comm'r.Pat. 1984). Another comment suggested that §10.66 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment was received which suggested that §10.67 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

A comment was received which suggested that §10.68(c) might be construed to preclude a practitioner from joining a law firm where attorneys who are not registered to practice before the PTO "are in control," i.e., are the "senior" partners. The definition of practitioner (see §10.1(r)) precludes such a construction, because any attorney in good standing in any State is a practitioner. Another comment suggested that §10.68 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment was made at the hearing which suggested that modifiers, such as "knowingly, willfully, intentionally," be inserted in §10.77. This suggestion is not being adopted. The PTO believes §10.77 states clearly the prohibited conduct.

A comment was received which suggested that §§10.77, 10.78, and 10.84 be amended to indicate that they refer only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that the term "unwarranted" in §10.85(a) (2) is "too vague as to its limits." The PTO disagrees. Contrary to the suggestion by the commentator, it is believed that practitioners can readily determine whether they are advocating a position that is unwarranted under existing law.

A comment was received which suggested that §10.85(b) can place a difficult burden on patent counsel. In support of his position, the commentator gave two examples and commented on both examples as follows:

Example 1:

A client engages a patent attorney in the preparation of a patent application, and the patent attorney goes through the usual routine of advising the client of statutory bars, duty to disclose, etc. The attorney prepares and files the application, and during the course of the prosecution, the client informs the attorney of some activities that occurred a couple of years before filing the application, which activities might constitute an offer for sale. The attorney advises that this must be disclosed to the Patent Examiner, but the applicant refuses to follow this course of action and discharges the patent attorney. The client then engages another attorney to complete the prosecution, without telling the new attorney of the potentially damaging prior art.

Comment:

In accordance with my interpretation of §10.85(b), the first attorney would be required to disclose this situation to the Office, unless the term "prepetrated a fraud" as it appears in that rule does not include the deliberate failure to disclose relevant prior art. My concern is that this could make for some very poor relationships with the client who might not understand the attorney's duty of disclosure before the Office.

Example 2:

A rather poor inventor has managed to drum up enough money for the filing fee for a patent application and then proceeds to prepare and file his own patent application, without the assistance of a patent attorney. After a few months, the inventor obtains some financing from an investor, and the inventor and the investor consult the patent attorney to see if he would continue with the prosecution of the application. The attorney reviews the fact pattern and informs both the inventor and the investor that there is unquestionably some prior art, in the form of an earlier publication by the inventor, which must be disclosed before the Office. When the inventor and the investor find that the attorney intends to disclose this prior art as soon as he is engaged as their attorney, the inventor and the investor tell the attorney that they would rather engage the services of some other patent attorney, and that they will not tell the second attorney of the prior art.

Comment:

As I would interpret §10.85 (b), the first patent attorney would be obliged to inform the Office of the relevant prior art. The first patent attorney would likely have the serial number and filing date of the application, and it would appear to me that the patent attorney would have to disclose not only the prior art, but also disclose the intent of the inventor and the investor not to disclose the same. This is pretty harsh treatment, and I can see where the inventor and the investor would have some very hard feelings against the patent attorney.

The PTO agrees that under the circumstances of Example 1, a "client . . . might not understand the attorney's duty of disclosure . . . " Likewise, the PTO can understand "where the inventor and the investor [in Example 2] would have some very hard feelings against the patent attorney." Nevertheless, the commentator has correctly noted in each case that the practitioner is required to advise the PTO. The practitioner's obligation under §10.85(b) has not been changed by the rules and is mandated by *Kingsland* v. *Dorsey*, 338 U.S. 318 (1949). See also Nahstoll, *The Lawyer's Allegiance: Priorities Regarding Confidentiality*, 41 Wash. & Lee L. Rev. 421 (1984).

A comment was received which suggested that §10.85 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

Two comments were received which suggested that §10.87(a) could be construed to prohibit a practitioner from recommending that a client meet with an opposing party for settlement discussions. Both comments suggested that §10.87(a) be amended to permit a practitioner to recommend that a client engage in settlement discussions directly with an opposing party. The suggestion is being adopted and the following sentence has been added to §10.87(a): "It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

A suggestion was made that §10.87 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that §10.89(c) (5) be "eliminated on the grounds of vagueness" because one cannot "be expected to comply with apparently unpublished customs of courtesy or practice." The suggestion is being adopted. Subparagraph (6) of §10.89(c) is being redesignated as subparagraph (5) and has also been changed to read: "Engage in undignified or discourteous conduct before the Office (see §1.3 of this Subchapter)." Subparagraph (7) has been redesignated as subparagraph (6).

Another comment discussing §10.89 asked "since when must counsel cite to the Examiner in *ex parte* proceedings cases known to be directly adverse to the position being advocated?" Counsel are expected to advise patent and trademark examiners of known controlling authority which is contrary to a position being advocated. It is important for counsel to do so in *ex parte* cases because there is no *advocate* taking a position contrary to the position being taken by an applicant. See also *Southern Pacific Transportation Co.* v. *Public Utilities Commission of the State of Calif.*, 716 F.2d 1285, 1291 (9th Cir. 1983).

A commentator contended that §10.89(a) "makes no sense" because a decision of the PTO may have been overruled by the Federal Circuit. Section 10.89(a) is limited to "a decision of the Office made in the course of a proceeding." Practitioners are expected to follow interlocutory orders entered in PTO proceedings. Obviously if such an order is ultimately overruled or reversed by a court, it no longer need be followed. The same commentator suggested that §10.89(c) (3) is not appropriate. Specifically, the commentator indicated that practitioners often rely on the specification of a patent application and prior art. The specification and prior art are evidence, not the "practitioner's personal knowledge."

One commentator suggested that §§10.92 and 10.93 be amended to indicate that they relate solely to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

A commentator at the hearing suggested that §10.93 be changed to permit practitioners to discuss procedural matters with interlocutory examiners or members of the Board of Patent Interferences or the Trademark Trial and Appeal Board. In view of Public Law 98–622, November 8, 1984, the Board of Patent Interferences will cease to exist on February 8, 1985. All patent interference cases will be transfered to the Board of Patent Appeals and Interferences and will be assigned to an examiner-in-chief. Practitioners may consult an examiner-in-chief orally upon adequate notice to opposing counsel. A telephone conference call may be arranged when opposing counsel desires to participate in the oral consultation. The same is true of the interlocutory examiners or members of the Trademark Trial and Appeal Board. Questions of a purely procedural nature may be asked. However, an examiner-in-chief or the interlocutory examiner or member of the Trademark Trial and Appeal Board may nevertheless decline to answer procedural questions without opposing counsel being present or involved in a conference call.

One commentator suggested that §§10.101, 10.102, 10.103, and 10.111 be amended to indicate that they refer only to proceedings in the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that practitioners residing in the United States should be able to maintain trust funds in a bank in any State. This suggestion is being adopted and §10.112(a) has been changed to implement the suggestion. However, if a State bar requires funds to be kept in a bank within the State, a practitioner would be required to keep funds in a bank in the State in order to comply with State rules. Another comment suggested that §10.112(c)(2) is not practical. According to the commentator, "invention samples and invention disclosures and drawings usually are the client's property, but keeping them in a safe deposit box is totally impractical." The commentator overlooks that portion of §10.112(c)(2) which reads "in a safe deposit box or other place of safekeeping . . . ." A client may consent to a practitioner keeping invention samples, invention disclosures, and drawings in the practitioner's office. The practitioner, of course, should see to it that the office is maintained with appropriate security.

An individual testified at the hearing that §10.112 is not clear. According to the individual, "I think the rules should specify that if you get money up front from a client, whether it's called a retainer, pre-payment, or whatever . . . that money has to be put into a trust fund or a trust account . . . and that you can't take the money out and spend it until you have performed the services and sent a bill to the client that says X dollars has come out of your trust account in payment of Y services." The PTO believes that §10.112(b)(2) specifies "that you can't take the money out and spent it until you have performed the services" and that §10.112(c)(3) specifies that you must send "a bill to the client." Accordingly, no change to §10.112 is necessary.

One commentator testified at the hearing that the PTO rules do not address "those individuals who, due to a mental or physical defect, are not able to bring themselves in conformity with the rules of conduct . . . ." On the contrary, §10.130 specifies that any practitioner shown to be "incompetent" may be suspended or excluded. The commentator at the hearing referred to an individual "who has a drinking problem or one who is mentally incapable of representing people before the . . . Office." The statute (35 U.S.C. 32) and the rules address such an individual. As noted in the advance notice, the PTO has declined to adopt the suggestion appearing in Manson, *Helping Lawyers Who Need Help (But Won't Ask for It!)*, 25 Va. Bar News 27 (June 1977). See 49 F.R. 10017, column 1 (Mar. 16, 1984). If an individual is suspended due to a drinking problem, reinstatement (see

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§10.160) may be conditioned on a clear and convincing showing that the drinking problem has been overcome.

One individual testified at the hearing that a "statute of limitations" should be inserted in §10.131. This suggestion is not being adopted. As the individual noted during testimony, statues of limitations do not apply in disciplinary proceedings.

A suggestion was received that §10.132 be changed to expressly provide that:

> No disposition adverse to the respondent shall be recommended by the Director until the respondent shall have been afforded the opportunity to be heard.

This suggestion is not being adopted. Section 10.132(a) provides that, where necessary, the Director shall comply with 5 U.S.C. 558(c) prior to calling a meeting of the Committee on Discipline. The relevant portion of 5 U.S.C. 558(c) provides:

> Except in cases of willfulness or those in which public health, interest, or safety required otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the license has been given;
>
> (1) notice by the agency in writing of the facts or conduct which may warrant the action; and
> (2) opportunity to demonstrate or achieve compliance with all lawful requirements.

Where appropriate, a notice under §588(c) will be issued prior to the time the Director takes a case to the Committee on Discipline. Any reply to the §558 (c) notice will be reviewed by the Director and the Committee on Discipline prior to deciding whether a complaint should be filed.

Another suggestion was received which indicated that §10.132(c) should be changed so that the "accused practitioner . . . [would] have the right to select an administrative law judge from a panel of such judges, such panel including the names of at least two law judges." This suggestion is not being adopted. No rationale was given in support of the suggestion and there is no known reason to permit a respondent to select the particular administrative law judge (ALJ) to be assigned to hear the practitioner's case.

Several changes have been made in §10.133 by the PTO which are not in response to any comment or suggestion. The language "§§10.132(b) and 10.134" in the first sentence of §10.133(b) has been changed to §10.134". This change was made because a reference to §10.132(b) is not necessary. The language "his or her resignation by filing" in the first sentence of §10.133(b) has also been deleted as unnecessary. The second sentence of paragraph (b) of §10.133 has been replaced by new paragraphs (c) and (d). New paragraph (c) specifies the content of an affidavit of resignation filed prior to the date set by the ALJ for a hearing. New paragraph (d) specifies the content of an affidavit of resignation filed on or after the date set by the ALJ for a hearing. Old paragraph (c) has been redesignated as new paragraph (e) and the language "paragraph (b)" therein has been changed to read "paragraphs (b) and (c)". Old paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

New paragraph (c) of §10.133 has been added to define the conditions under which a practitioner may resign prior to the date set by the ALJ for a hearing. Experience has shown that practitioners do not readily resign prior to hearing if they are required to admit the charges against them and/or are required to admit that they could not have been defended against the charges or the subject of an investigation. Paragraph (c) does not require a practitioner to admit the charges or any lack of defense at the time of resignation. Rather, under §10.133(c)(5), any admission is operative at the time of a request for reinstatement and only for the *limited* purpose of determining the request for reinstatement. By deferring the time when the practitioner makes the admissions, it is believed that settlements are more likely. Once a hearing begins, however, there is no reason to permit a resignation without admission of the facts and a lack of defense. The admissions of paragraph (c)(5) are relevant in determining whether reinstatement should be granted and whether sufficient time has passed between resignation and any application for reinstatement.

One comment was made at the hearing which suggested that "if, in fact there is a real stalemate in a settlement discussion, that there be some avenue so that there be, in essence, binding arbitration" on the part of the respondent and the Director. This suggestion is not being adopted. There is no reason to impose binding arbitration in disciplinary matters. While settlements are to be encouraged, if the parties (the respondent and the Director) cannot reach a mutually agreeable settlement, the proper recourse is to proceed with the disciplinary proceeding.

A suggestion was received that the second sentence of §10.138 be deleted. The suggestion is not being adopted. The second sentence of §10.138 provides that evidence obtained by a subpoena under 35 U.S.C. 24 will not be admitted unless prior approval was obtained from the ALJ to proceed under §24. This provision is necessary to retain control over the proceedings in the ALJ. Moreover, an order authorizing a party to proceed under §24 can be helpful to any district court which is required to determine whether an individual should be compelled to answer counsel's questions. Additional rationale in support of the PTO's decision not to adopt the suggestion appears in the advance notice (49 F.R. 10019, columns 1 and 2) and in the notice of proposed rulemaking (49 F.R. 33800, column 1).

Two individuals testified at the hearing concerning §10.144. Section 10.144 provides that hearings in disciplinary cases will not be open to the public. One individual suggested that hearings in disciplinary matters should be opened to the public. The other individual took the opposite position and supported §10.144 as proposed. The suggestion to open hearings to the public is not being adopted at this time. The PTO believes that a practitioner should not unnecessarily be exposed to charges of alleged wrongdoing until the practitioner is found to have violated the PTO Code of Professional Responsibility. Unnecessary and premature exposure could cause a practitioner's clients to find other counsel based on mere allegations. Additionally, the PTO is required to maintain information concerning patent applications in secrecy. 35 U.S.C. 122. In most disciplinary cases information concerning a patent application is revealed at any hearing. Accordingly, the PTO will not provide for public hearings. However, the PTO intends to further study the possibility of hearings open to the public (e.g., in a disciplinary proceeding involving only trademark matters) and may, in the future, propose to modify §10.144.

Numerous comments were received which suggested that the burden of proof set forth in §10.149 should be changed from "preponderance of evidence" to "clear and convincing evidence." As announced at the hearing, this suggestion is being adopted. The "clear and convincing evidence" standard brings §10.149 in conformance with §10.158(d)(1)(ii) which also requires proof by clear and convincing evidence.

The term "clear and convincing evidence" is not succeptable to a precise definition. The PTO, therefore, deems it appropriate to set forth its views on what constitutes "clear and convincing evidence." "Clear and convincing evidence" falls somewhere between proof beyond a reasonable doubt and proof by a preponderance of evidence.

A reasonable doubt is a doubt based upon reason and common sense—the kind of doubt that would make a reasonable person hesitate to act. Proof beyond a reasonable doubt must, therefore, be proof of such a convincing character that a person would be willing to rely and act upon it unhesitatingly in the most important of his or her affairs. Devitt, *Federal Jury Practice and Instructions* §11.01 (2d ed. 1970).

To establish a fact by a preponderance of evidence means to prove that fact is more likely so than not so. A preponderance of evidence means such evidence as, when considered and compared with that opposed to it, has more convincing force, and produces in the mind of the trier of fact a belief that what is sought to be proved is more likely true than not true. Devitt, *supra* at §7.01.

Clear and convincing evidence is that measure or degree of proof which will produce in the mind of the trier of fact a firm belief or conviction as to an allegation sought to be established; it is more than a preponderance of evidence, but less than that required to establish guilt beyond a reasonable doubt. *Hobson* v. *Eaton*, 399 F.2d 781 (6th Cir. 1968). It does not mean clear and unequivocal." *Fred C. Walker Agency, Inc.* v. *Lucas*, 215 Va. 535, 540–541, 211 S.E.2d 88, 92 (1975).

Several comments were received which suggested that §10.150 be changed to make the Federal Rules of Evidence applicable to disciplinary proceedings. The suggestion is not being adopted. The PTO has explained, in both the advance notice (49 F.R. 10020, column 2) and the notice of proposed rulemaking (49 F.R. 338001, columns 1 and 2) why it cannot adopt the Federal Rules of Evidence in disciplinary cases. The "Federal Rules of Evidence . . . do not apply to administrative proceedings . . . ." Davis, *Administrative Law Treatise*, §14.01 (Supp. 1970). The controlling law is set out in 5 U.S.C. 556(d) which provides in part: "Any oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrelevant, immaterial, or unduly repetitious evidence. A sanction may not be imposed or rule or order issued except on consideration of the whole record or those parts thereof cited by a party and supported by and in accordance with the reliable, probative, and substantial evidence." It appears to be the concern of some of the comments that the Administrative Procedure Act does not articulate an appropriate standard of evidence and that hearsay may be admitted. Suffice it to say that many adjudications occur daily under the Administrative Procedure Act, including disciplinary proceedings. The following language appearing in an opinion of the Eleventh Circuit in *TRW-United Greenfield Division* v. *National Labor Relations Board*, 716 F.2d 1391, 1394 (11th Cir. 1983), may be helpful:

> At the hearing the ALJ refused to allow five additional employees to testify that other employees told them that such a statement had been made. TRW contends it was denied a full and fair hearing by the exclusion of this testimony. The general rule is that administrative tribunals are not bound by the strict rules of evidence governing jury trials. *Opp Cotton Mills, Inc.* v. *Administrator of Wage & Hour Div.*, 312 U.S. 126, 155, 61 S.Ct. 524, 537, 85 L.Ed. 624 (1971). Thus, the admission of testimony which would be deemed incompetent in judicial proceedings would not invalidate the administrative order. *Tagg Bros. & Moorhead* v. *United States*, 280 U.S. 420, 442, 50 S.Ct. 220, 225, 74 L.Ed. 524 (1930). But this assurance of a desirable flexibility in administrative procedure does not go so far as to justify orders without a basis in evidence having rational probative force. Mere uncorroborated hearsay or rumor does not constitute substantial evidence. *Consolidated Edison Co.* v. *N.L.R.B.*, 305 U.S. 197, 230, 59 S.Ct. 206, 217, 83 L.Ed. 126 (1938). Therefore, the hearsay testimony of other employees would not have amounted to substantial evidence sufficient to support a finding for the company. We find that TRW was not denied a full and fair hearing by the judge's refusal to admit hearsay testimony.

See also *Steadman* v. *Securities and Exchange Commission*, 450 U.S. 91, 98 n. 17 (1981); *Richardson* v. *Perales*, 402 U.S. 389, 410–411 (1971); *Brown* v. *Gamage*, 377 F.2d 154, 158 (D.C.Cir.), *cert. denied*, 389 U.S. 858 (1967); Annotation, *Hearsay Evidence In Proceedings Before Federal Administrative Agencies*, 6 ALR Fed 76 (1971); and Davis, *Hearsay in Administrative Proceedings*, 32 Geo. Wash. L. Rev. 689 (1964).

A suggestion was received that §10.151 be changed to make the deposition rules of the Federal Rules of Civil Procedure applicable to disciplinary proceedings. This suggestion is not being adopted. The discovery provisions of the Federal Rules of Civil Procedure are not being adopted by the PTO in disciplinary cases. Except for discovery which the parties agree to make voluntarily, all discovery under these rules will require the prior permission of the ALJ. This prior permission is designed to insure that the ALJ retains control over the proceeding. By requiring prior approval of the ALJ to take a deposition, the rules insure that the deposition will relate to evidence the ALJ deems to be relevant and will afford the ALJ the option of determining whether he or she wishes to observe the witness.

Several comments were received which suggested that §10.152 be changed to permit more discovery. Some commentators urged adoption of the discovery provisions of the Federal Rules of Civil Procedure relating to requests for admissions, interrogatories, and requests for production of documents. Other commentators felt that the discovery proposed in the notice of proposed rulemaking was not sufficient and that more discovery should be authorized. These latter commentators, however, did not urge adoption of the discovery provisions of the Federal Rules of Civil Procedure. As one commentator noted:

> Disciplinary proceedings are not in the nature of civil actions and full discovery within the scope of the Federal Rules of Civil Procedure is probably not needed or desirable.

The PTO agrees that more discovery is appropriate than would have been authorized under §10.152 as proposed. The PTO does not agree, however, that discovery should be commensurate in scope with the discovery provisions of the Federal Rules of Civil Procedure.

One commentator at the hearing who urged adoption of the discovery provisions of the Federal Rules of Civil Procedure, correctly recognized the existence of "concerns of the Patent [and Trademark] Office regarding what are alleged to be general discovery abuses." There is ample basis for the PTO's concern. See e.g., Pollack, *Discovery—Its Abuse and Correction*, 80 F.R.D. 219 (1979) (reproducing remarks made by Judge Pollack at the Fifth Circuit Judicial Conference on April 26, 1978 at New Orleans). The same commentator at the hearing went on to note, however, that if the ALJ "gets on top of a case and monitors a case very actively, then no discovery abuses will occur, and if they do, they will be dealt with swiftly and properly."

Advocates of discovery "reform" seemingly rely on two principles which are claimed to be the cure-all for discovery abuse: (1) active control by the judge and (2) sanctions. See e.g. *Second Report of the Special Committee for the Study of Discovery Abuse*, 92 F.R.D. 137 (1980). The PTO is not in a position to impose the most effective sanction—costs. However, the PTO can invest the ALJ with control over discovery. It is because the PTO can invest the ALJ with control over discovery that the suggestion for more discovery is being adopted. Section 10.152 has been changed to permit discovery which the PTO believes will be effective. The scope of the discovery, however, will not be commensurate in scope with the Federal Rules of Civil Procedure.

Paragraph (a) of §10.152 will permit *limited* discovery an answer is filed. Discovery is not authorized prior to

the filing of an answer. A party seeking discovery will have to make out a clear and convincing case to the ALJ that discovery is necessary *and* relevant. If discovery is authorized, the ALJ may set conditions he or she deems appropriate to accomplish the discovery. For example, the ALJ may set the place and time for inspection of documents which are required to be produced or the ALJ can order a party to mail copies of the documents to the other party. Under paragraph (a) of §10.152, discovery is limited to a *reasonable* number of requests for admissions, interrogatories, or requests for production of documents and things. Consideration was given to setting numerical maximums for requests for admission, interrogatories and requests for production of documents and things. See e.g., Local Rule 11.1 of the U.S. District Court for the Eastern District of Virginia. However, numerical maximums are not presently specified. Should discovery become a problem, the PTO will give further consideration to limiting the number of discovery requests which a party may file.

Paragraph (b) of §10.152 specified certain matters which *cannot* be discovered. Matter which will be used by another party solely for impeachment or cross-examination cannot be discovered. Documents which will be used as part of the Director's case-in-chief or the respondent's case-in-rebuttal or affirmative defenses are subject to discovery. Patent applications not available to a respondent under 35 U.S.C. §122 are not subject to discovery. Matter relating to disciplinary proceedings commenced prior to the effective date of these rules is not available. For the most part, the reasons for a particular length of suspension or disbarment have not been stated in the past. Accordingly, disciplinary proceedings commenced prior to these rules are not particularly relevant. See *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84–5536 (D.D.C. June 29, 1984). Prior disciplinary proceedings which resulted in public discipline being imposed will continue to be available in the Office of the Director of Enrollment and Discipline. Respondents will continue to be free to inspect the files of those proceedings. Matters relating to experts, except as may be required by the ALJ under §10.152(e), likewise are not subject to discovery. Privileged matter and attorney work product are excluded from matter which can be discovered.

Paragraph (c) sets forth some factors the ALJ can consider in determining whether to authorize discovery or to limit discovery which is authorized. The factors include delay (which is a major consideration in disciplinary matters), burden on the party required to produce discovery, availability of the discovery sought to the public (in which case, discovery may not be necessary), the extent to which the matter sought to be discovered is equally available to both parties, and the extent to which discovery is available from another source.

Paragraph (d) of §10.152 requires a party desiring discovery to file a motion which explains, in detail, how each request is relevant to an issue raised in the complaint or the answer.

Paragraph (e) of §10.152 sets out matter which the ALJ can require a party to produce in a pre-hearing statement. Subparagraph (4) states the matter the ALJ can require disclosed related to experts.

The PTO has every reason to believe that the discovery authorized by §10.152 will be useful and that sufficient authority has been given to the ALJ to effectively control discovery and prevent abuses. The PTO intends to monitor discovery closely in the future and will consider amending these rules if abuses occur.

One comment suggested that §10.154(b) be modified by adding "any extenuating circumstances" as a matter to be considered in imposing a penalty. This suggestion is being adopted. Another comment suggested that §10.154 should address "probation." This suggestion is not being adopted. Nevertheless, the PTO has authority to place a practitioner on probation for all or a portion of any suspension and to revoke the probation upon a showing of a violation. See *In re Dula*, 1030 *Official Gazette* 20 (May 17, 1983).

One comment suggested that §10.155 be modified to specify that the Director should serve a copy of any appeal "on the respondent or on the attorney for respondent." This suggestion is not being adopted. However, in view of the suggestion the language "on the respondent" (both occurrences) in §10.155(a) is being deleted. Section 10.142(a) specifies how service is made on a respondent who is represented by an attorney.

A suggestion was received that §10.157 be modified to provide that a stay would be entered in every case where a respondent seeks judicial review of a decision of the Commissioner. This suggestion was rejected at the time the notice of proposed rulemaking was published (49 F.R. 33802) and is not being adopted. There are cases where a stay is not appropriate, e.g., when the disbarred practitioner is incarcerated. There are other times when a stay may be appropriate. Accordingly, stays will be granted in the discretion of the Commissioner.

Several comments were received discussing §10.158. Some commentators suggested that §10.158 was "too lenient" and another suggested that it was "too hard" on suspended and excluded practitioners. Section 10.158 is designed to advise suspended practitioners as to what they can and cannot do during any period of suspension. The PTO believes that §10.158 strikes a reasonable balance in a difficult area. See the discussion concerning §10.158 in the advance notice (49 F.R. 10021, columns 2 and 3). One comment suggested that §10.158 should be made applicable to corporations. This suggestion is being adopted by appropriate changes in §10.158(c) to refer to client-employers. Another comment suggested that §10.158(b)(1) and (2) be changed to refer to matters before the PTO. This suggestion is also being adopted.

An oral comment was received asking whether the Director could conduct an investigation in connection with a determination under §10.158(d). The Director may conduct whatever investigation is warranted to determine whether a suspended or excluded practitioner seeking reinstatement has complied with regulations relating to suspended and excluded practitioners.

A comment was received regarding §10.159(a) which suggested that the Director notify the American Bar Association National Discipline Data Bank when a practitioner is suspended or excluded. This suggestion is not being adopted as such. However, §10.159(a) has been changed to authorize the Director to notify "any appropriate bar association." The PTO is not inclined to mention any particular bar association by name in the rules. It will be the practice of the PTO to notify the National Discipline Data Bank, among others, when a practitioner is disciplined. Another comment suggested that the entire file of a disciplinary proceeding should not be open to the public when only some, but not all, charges are sustained. This suggestion is not being adopted. In most disciplinary matters, it would be highly inconvenient to segregate the relevant from the irrelevant. Moreover, once discipline is imposed, the principal rationale for keeping the file secret no longer exists. The disciplined practitioner will suffer whatever public embarassment results from discipline apart from whether part or all of the file is open to the public.

With respect to §10.160, one commentator suggested that the burden on the suspended or excluded practitioner for reinstatment be stated in the rules. This suggestion is being adopted and a "clear and convincing showing" requirement has been added to §10.160(c). Section 10.149 sets out the burden on the Director for proof of allegations in the complaint and upon the respondent for proving affirmative defenses. The showing required by §10.158(d)(1) is by "clear and convincing evidence." One commentator suggested that the 5-year period of §10.160(b) should be changed to a 3-year period. This suggestion is not being adopted. According to the commentator, the PTO has failed to state why a 5-year period was proposed. The commentator believes a 3-year period is more appropriate, although no reason is given in support of the commentator's belief. The PTO, after considering the matter, has concluded that some period must be specified and there is no reason to change the 5-year period proposed. A commentator suggested that a practitioner suspended for less than six months should "automatically" be reinstated. This suggestion is not being adopted, because the Director, as a condition to any reinstatement, must find that the suspended practitioner complied with §10.158. Another commentator questioned whether the rules should provide for application for reinstatement during a period of probation. The PTO believes the rules need not make provision for application for reinstatement during probation. For example, if a practitioner is suspended for a period of three years and it is ordered that the practitioner be actually suspended for at least one year *and* that the last two years the practitioner be placed on probation, the practitioner would be able to apply for reinstatement after serving one year of the three year suspension.

The PTO disagrees with the following comment concerning §10.161(b). "This clause is ex post facto legislation as it seeks retroactively an increase of penalties regarding conduct which occurred prior to the legislation." No legislation is involved. Section 10.161(b) does not "increase penalties."

Table 1
Principal Source of Sections 10.2 through 10.19

Sec.	
10.1 (preamble)	35 USC 31; *Sperry* v. *Florida*, 373 U.S. 379, 402 (1963)
10.1	35 USC 25; 28 USC 1746
10.1(c)	5 USC 500(b)
10.1(q)	1 USC 1
10.1(aa)	35 USC 100(c)
10.2(a)	New
10.2(b) (1)	New, but see 37 CFR 1.341(i) (1983)
10.2(b) (2)	New, but see 37 CFR 1.348(a) (1983)
10.2(c)	New, but see 37 CFR 1.341(i) (1983)
10.3	37 CFR 1.341(i) (1983)
10.4(a)	New
10.4(b)	New, but see 37 CFR 1.348(a) (1983)
10.4(c)	New
10.5	37 CFR 1.341 (1983)
10.6(a)	37 CFR 1.341(a) (1983)
10.6(b)	37 CFR 1.341(b) (1983)
10.6(c)	37 CFR 1.341(e) (1983)
10.6(d)	37 CFR 1.341(f) (1983)
10.6(e)	37 CFR 1.341(g) (1983)
10.7(a), (b)	37 CFR 1.341(c) (1983)
10.7(c)	New
10.8	37 CFR 1.341(h) (1983)
10.9(a)	37 CFR 1.342 (1983)
10.9(b)	New
10.10	37 CFR 1.343 (1983)
10.11	37 CFR 1.347 (1983)
10.12	[reserved]
10.13	[reserved]
10.14	5 USC 500(b) and 37 CFR 2.12 (1983)
10.15	35 USC 32; 5 USC 500(d) (2); 37 CFR 1.343 (1983); and 37 CFR 2.12(f) (1983)
10.16	[reserved]
10.17	[reserved]
10.18(a)	37 CFR 1.346 (1983) and 37 CFR 2.15 (1983), see also Rule 11, FRCP
10.18(b)	35 USC 32 & Rule 11, FRCP
10.19	[reserved]

Table 2
Principle Source of Sections of 10.20 through 10.112, the PTO Code of Professional Responsibility

Abbreviations:
FRCP means Federal Rules of Civil Procedure
MCPR means Model Code of Professional Responsibility of the ABA (1980)
MRPC means Model Rules of Professional Conduct of the ABA (1983)
VCPR means the Virginia Code of Professional Responsibility (1984)

Sec.	
10.20	Preamble to MCPR (1980)
10.21	MCPR Canon 1 (1980)
10.22	MCPR DR 1–101 (1980)
10.23(a)	35 U.S.C. 32
10.23(b) (1)	35 U.S.C. 32 and MCPR DR 1–102(A) (1) (1980)
10.23(b) (2)–(6)	MCPR DR 1–102(A) (2)–(6) (1980)
10.23(c) (1)–(14)	PTO created
10.23(c) (15)	Rule 11, FRCP
10.23(c) (16)–(18)	PTO created
10.23(d)	*U.S.* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979)
10.24	MCPR 1–103 (1980)
10.25 through 10.29	(reserved)
10.30	MCPR Canon 2 (1980)
10.31(a)	35 U.S.C. 32
10.31(b)	5 U.S.C. 501
10.31(c)	37 CFR 1.345(c) (1983)
10.31(d)	Newly created
10.32	MRPC Rule 7.2 (1983)
10.33	MRPC Rule 7.3 (1983)
10.34	MRPC Rule 7.4 (1983)
10.35(a)	5 U.S.C. 501 and MRPC Rule 7.5 (1983)
10.35(b)	MRPC Rule 7.5 (1983)
10.36	MCPR DR 2–106 (1980)
10.37	MCPR DR 2–107 (1980)
10.38	MCPR DR 2–108 (1980)
10.39	MCPR DR 2–109 (1980)
10.40	MCPR DR 2–110 (1980)
10.41 through 10.45	(reserved)
10.46	MCPR Canon 3 (1980)
10.47(a), (c)	MCPR DR 3–101 (1980)
10.47(b)	New (but see e.g., *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746, 355 P.2d 490 (Cal. 1960))
10.48	MCPR DR 3–102 (1980)
10.49	MCPR DR 3–103 (1980)
10.50 through 10.55	(reserved)
10.56	MCPR Canon 4 (1980)
10.57	MCPR DR 4–101 (1980)
10.58 through 10.60	(reserved)
10.61	MCPR Canon 5 (1980)
10.62	MCPR DR 5–101 (1980)
10.63	MCPR DR 5–102 (1980)
10.64	MCPR DR 5–103 (1980)
10.65	MCPR DR 5–104 (1980)
10.66	MCPR DR 5–105 (1980)
10.67	MCPR DR 5–106 (1980)
10.68	MCPR DR 5–107 (1980)
10.69 through 10.75	(reserved)
10.76	MCPR Canon 6 (1980)
10.77	MCPR DR 6–101 (1980)
10.78	MCPR DR 6–102 (1980)
10.79 through 10.82	(reserved)
10.83	MCPR Canon 7 (1980)
10.84	MCPR DR 7–101 (1980)
10.85	MCPR DR 7–102 (1980)
10.86	(reserved)
10.87	MCPR DR 7–104 (1980)
10.88	MCPR DR 7–105 (1980)
10.89	MCPR DR 7–106 (1980)
10.90	(reserved)
10.91	(reserved)
10.92	MCPR DR 7–109 (1980)
10.93	VCPR DR 7–109 (1984)

10.94 through 10.99	(reserved)
10.100	MCPR Canon 8 (1980)
10.101(a)	MCPR DR 8–101 (1980)
10.101(b)	37 CFR 1.341(f) (1983) and 41 Cp. Att'y Gen. 21 (1949), *reprinted in* 1949 Dec. Comm'r Pat. 1
10.102	MCPR DR 8–102 (1980)
10.103	MCPR DR 8–103 (1980)
10.104 through 10.109	(reserved)
10.110	MCPR Canon 9 (1980)
10.111	MCPR DR 9–101 (1980)
10.112	MCPR DR 9–102 (1980)

Table 3

Principal Source of Sections 10.130 through 10.161

Section	*Source*
10.130	35 U.S.C. 32
10.131(a)	New, but see 37 CFR 1.348(a)
10.131(b)	MCPR DR 1–103 (1980)
10.131(c)	New
10.132(a),(c)	New
10.132(b)	New, but see 37 CFR 1.348(b) (1983)
10.133	New
10.134	37 CFR 1.348(b) (1983)
10.135(a)(1)	New
10.135(a)(2)	37 CFR 1.348(b) (1983)
10.135(a)(3)	New
10.135(b)	New
10.135(c)	New
10.135(d)	5 USC 500(f)
10.136(a)	37 CFR 1.348(c) (1983)
10.136(b)	New
10.136(c)	37 CFR 1.348(c) (1983)
10.136(d)	37 CFR 1.348(c) (1983)
10.136(e)	New
10.137	37 CFR 1.348(c) (1983)
10.138	New
10.139(a)	5 USC 3105
10.139(b)	5 USC 556(c)
10.139(c)	New
10.139(d)	New
10.139(e)	New
10.140(a)	5 USC 500(b)
10.140(b)	New
10.141	New
10.142	New
10.143	New
10.144	New
10.145	New
10.146–10.148	[reserved]
10.149	New
10.150(a)	5 USC 556(d)
10.150(b)	37 CFR 1.348 (d) (3) (1983)
10.150(c)	New
10.150(d)	New
10.150(e)	New
10.151	37 CFR 1.348(d) (3) (1983)
10.152	New, see *Silverman* v. *CFTC*, 549 F.2d 28 (7th Cir. 1977)
10.153	New, but see 5 USC 557(c)
10.154	See 5 USC 557(b) and 35 USC 32
10.155	New
10.156	New
10.157	35 USC 32, Local Rule 1–26 (D.D.C.)
10.158	New
10.159	New
10.160	New
10.161	New
10.162–10.169	[reserved]
10.170	New, but see 37 CFR 1.183

Other Considerations: The rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354) and Executive Order 12291.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The rules regulate the conduct of attorneys and agents who represent individuals and juristic entities before the Patent and Trademark Office and would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities.

The Patent and Trademark Office has determined that the rules are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information reporting requirements contained in the rules have been approved by the Office of Management and Budget, OMB Control No. 0651–0012 and OMB Control No. 0651–0017.

List of Subjects in 37 CFR Parts 1, 2 and 10.

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Trademarks, Lawyers.

For the reasons given in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 5 U.S.C. 500; 15 U.S.C. 1123; and 35 U.S.C. 6, 31, 32, and 41. Parts 1, 2, and 10 of Title 37 of the Code of Federal Regulations are amended as set forth below:

Part 1—Rules of Practice in Patent Cases

1. Section 1.8 is amended by adding to paragraph (a) (12) a new subparagraph (xiii) to read as follows:

§1.8 Certificate of mailing.

(a) * * *

(2) * * *

(xiii) Papers filed in connection with a disciplinary proceeding under Part 10 of this Subchapter.

2. Section 1.21 is amended by adding to paragraph (a) two new subparagraphs (5) and (6) to read as follows:

§1.21 Miscellaneous fees and charges.

(a) * * *

(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c) 60.00

(6) For requesting regrading of an examination under §10.7(c) 60.00

* * * * *

3. Section 1.31 is revised to read as follows:

§1.31 Applicants may be represented by a registered attorney or agent.

An applicant for patent may file and prosecute his or her own case, or he or she may be represented by a registered attorney, registered agent, or other individual authorized to practice before the Patent and Trademark Office in patent cases. See §§10.6 and 10.9 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of a registered attorney or agent.

4. Section 1.33 is amended by removing from paragraph (c) "1.341 and 1.347" and inserting in its place "10.5 and 10.11".

5. Section 1.34 is amended by revising paragraph (a) as follows:

§1.34 Recognition for representation.

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a patent case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that under the provisions of this Subchapter and the law, he or she is authorized to represent the particular party in whose behalf he or she acts. In filing such a paper, the registered attorney or agent should specify his or her registration number with his or her signature. Further proof of authority to act in a representative capacity may be required.

* * * * *

6. Section 1.56 is amended by removing from paragraphs (f) and (h) "1.346" and inserting in its place "10 18".

7. The center heading preceding §1.341 is removed.

8. Sections 1.341 through 1.348 are removed.

9. Section 1.455 is amended by removing from paragraph (a) "1.341" and inserting in its place "10.10".

Part 2—Rules of Practice in Trademark Cases

10. Section 2.11 is revised to read as follows:

§2.11 Applicants may be represented by an attorney.

The owner of a trademark may file and prosecute his or her own application for registration of such trademark, or he or she may be represented by an attorney or other individual authorized to practice in trademark cases under §10.14 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

11. Sections 2.12 through 2.16 are removed.

12. Section 2.17 is amended by revising paragraph (a) as follows:

§2.17 Recognition for representation.

(a) When an attorney as defined in §10.1(c) of this Subchapter acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a trademark case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that, under the provisions of §10.14 and the law he or she is authorized to represent the particular party in whose behalf he or she acts. Further proof of authority to act in a representative capacity may be required.

* * * * *

13. Section 2.19 is revised to read as follows:

§2.19 Revocation of power of attorney or of other authorization to represent, withdrawal.

(a) Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his or her authorization.

(b) An individual authorized to represent an applicant or party in a trademark case may withdraw upon application to and approval by the Commissioner.

14. The following Part 10 is added:

Part 10–Representation of others before the Patent and Trademark Office

Sec.	
10.1	Definitions
10.2	Director of Enrollment and Discipline
10.3	Committee on Enrollment
10.4	Committee on Discipline
	Individuals Entitled to Practice Before the Patent and Trademark Office
10.5	Register of attorneys and agents in patent cases
10.6	Registration of attorneys and agents
10.7	Requirements for registration
10.8	Oath and registration fee
10.9	Limited recognition in patent cases
10.10	Individuals not registered or recognized to practice in patent cases
10.11	Removing names from the register
10.12–10.13	[reserved]
10.14	Individuals who may practice before the Office in trademark and other non-patent cases
10.15	Refusal to recognize a practitioner
10.16–10.17	[reserved]
10.18	Signature and certificate of practitioner
10.19	[reserved]
	Patent and Trademark Office Code of Professional Responsibility
10.20	Canons and Disciplinary Rules
10.21	Canon 1
10.22	Maintaining integrity and competence of the legal profession
10.23	Misconduct
10.24	Disclosure of information to authorities
10.25–10.29	[reserved]
10.30	Canon 2
10.31	Communications concerning a practitioner's services
10.32	Advertising
10.33	Direct contact with prospective clients
10.34	Communication of fields of practice
10.35	Firm names and letterheads
10.36	Fees for legal services
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Authority: 5 U.S.C. 500: 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41

Part 10—Representation of others before the Patent and Trademark Office

§10.1 Definitions.

This part governs solely the practice of patent, trademark, and other law before the Patent and Trademark Office. Nothing in this part shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives. Unless otherwise clear from the context, the following definitions apply to this part:

(a) "Affidavit" means affidavit, declaration under 35 U.S.C. 25 (see §1.68 and §2.20 of this Subchapter), or statutory declaration under 28 U.S.C. 1746.

(b) "Application" includes an application for a design, plant, or utility patent, an application to reissue any patent, and an application to register a trademark.

(c) "Attorney" or "lawyer" means an individual who is a member in good standing of the bar of any United States court or the highest court of any State. A "non-lawyer" is a person who is not an attorney or lawyer.

(d) "Canon" is defined in §10.20(a).

(e) "Confidence" is defined in §10.57(a).

(f) "Differing interests" include every interest that may adversely affect either the judgment or the loyalty of a practitioner to a client, whether it be a conflicting, inconsistent, diverse, or other interest.

(g) "Director" means the Director of Enrollment and Discipline.

(h) "Disciplinary Rule" is defined in §10.20(b).

(i) "Employee of a tribunal" includes all employees of courts, the Office, and other adjudicatory bodies.

(j) "Giving information" within the meaning of §10.23(c)(2) includes making (1) a written statement or representation or (2) an oral statement or representation.

(k) "Law firm" includes a professional legal corporation or a partnership.

(l) "Legal counsel" means practitioner.

(m) "Legal profession" includes the individuals who are lawfully engaged in practice of patent, trademark, and other law before the Office.

(n) "Legal service" means any legal service which may lawfully be performed by a practitioner before the Office.

(o) "Legal System" includes the Office and courts and adjudicatory bodies which review matters on which the Office has acted.

(p) "Office" means Patent and Trademark Office.

(q) "Person" includes a corporation, an association, a trust, a partnership, and any other organization or legal entity.

(r) "Practitioner" means (1) an attorney or agent registered to practice before the Office in patent cases or (2) an individual authorized under 5 U.S.C. 500(b) or otherwise as provided by this Subchapter, to practice before the Office in trademark cases or other non-patent cases. A "suspended or excluded practitioner" is a practitioner who is suspended or excluded under §10.156. A "non-practitioner" is an individual who is not a practitioner.

(s) A "proceeding before the Office" includes an application, a reexamination, a protest, a public use proceeding, a patent interference, an *inter partes* trademark proceeding, or any other proceeding which is pending before the Office.

(t) "Professional legal corporation" means a corporation authorized by law to practice law for profit.

(u) "Registration" means registration to practice before the Office in patent cases.

(v) "Respondent" is defined in §10.134(a)(1).

(w) "Secret" is defined in §10.57(a).

(x) "Solicit" is defined in §10.33.

(y) "State" includes the District of Columbia, Puerto Rico, and other federal territories and possessions.

(z) "Tribunal" includes courts, the Office, and other adjudicatory bodies.

(aa) "United States" means the United States of America, its territories and possessions.

§10.2 Director of Enrollment and Discipline.

(a) *Appointment.* The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director or a vacancy in the office of the Director, the Commissioner may designate an employee of the Office to serve as acting Director of Enrollment and Discipline. The Director and any acting Director shall be an active member in good standing of the bar of a State.

(b) *Duties.* The Director shall:

(1) Receive and act upon applications for registration, prepare and grade the examination provided for in §10.7(b), maintain the register provided for in §10.5, and perform such other duties in connection with enrollment and recognition of attorneys and agents as may be necessary.

(2) Conduct investigations into possible violations by practitioners of Disciplinary Rules, with the consent of the Committee on Discipline initiate disciplinary proceedings under §10.132(b), and perform such other duties in connection with investigations and disciplinary proceedings as may be necessary.

(c) *Review of Director's decision.* Any final decision of the Director refusing to register an individual under §10.6, recognize an individual under §§10.9 or 10.14(c), or reinstate a suspended or excluded petitioner under §10.160, may be reviewed by petition to the Commissioner upon payment of the fee set forth in §1.21(a)(5). A petition filed more than 30 days after the date of the decision of the Director may be dismissed as untimely. Any petition shall contain (1) a statement of the facts involved and the points to be reviewed and (2) the action requested. Briefs or memoranda, if any, in support of the petition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the Director and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record before the Director shall not be submitted with the petition. An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(OMB Control No. 0651–0012).

§10.3 Committee on Enrollment.

(a) The Commissioner may establish a Committee on Enrollment composed of one or more employees of the Office.

(b) The Committee on Enrollment shall, as necessary, advise the Director in connection with the Director's duties under §10.2(b)(1).

§10.4 Committee on Discipline.

(a) The Commissioner shall appoint a Committee on Discipline. The Committee on Discipline shall consist of the at least three employees of the Office, none of whom reports directly or indirectly to the Director or the Solicitor. Each member of the Committee on Discipline shall be a member in good standing of the bar of a State.

(b) The Committee on Discipline shall meet at the request of the Director and after reviewing evidence presented by the Director shall, by majority vote, determine whether there is probable cause to bring charges under §10.132 against a practitioner. When charges are brought against a practitioner, no member of the Committee on Discipline, employee under the direction of the Director, or associate solicitor or assistant solicitor in the Office of the Solicitor shall participate in rendering a decision on the charges.

(c) No discovery shall be authorized of, and no member of the Committee on Discipline shall be required to testify about, deliberations of the Committee on Discipline.

Individuals Entitled to Practice Before the Patent and Trademark Office

§10.5 Register of attorneys and agents in patent cases.

A register of attorneys and agents is kept in the Office on which are entered the names of all individuals recognized as entitled to represent applicants before the Office in the preparation and prosecution of applications for patent. Registration in the Office under provisions of this part shall only entitle the individuals registered to practice before the Office in patent cases.

§10.6 Registration of attorneys and agents.

(a) *Attorneys.* Any citizen of the United States who is an attorney and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office. When appropriate, any alien who is an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registation does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

(b) *Agents.* Any citizen of the United States who is not an attorney and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office. When appropriate, any alien who is not an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States, and *further provided*: the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

Note: All individuals registered prior to Nov. 15, 1938, were registered as attorneys, whether they were attorneys or not, and such registrations have not been changed.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall file proof to the satisfaction of the Director that he or she is registered and in good standing before the patent office of the country in which he or she resides and practices and who is possessed of the qualifications stated in §10.7, may be registered as a patent agent to practice before the Office for the limited purpose of presenting and prosecuting patent applications of applicants located in such country, *provided*: the patent office of such country allows substantially reciprocal privileges to those admitted to practice before the United States Patent and Trademark Office. Registration as a patent agent under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

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(d) *Government employees.* Any officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office. If any registered attorney or agent becomes an officer or employee of the United States who is disqualified by statute from practicing as an attorney or agent in proceedings and other matters before Government departments or agencies, his or her name shall be endorsed as inactive on the register during the period of any employment by the United States. An officer or employee of the United States whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of this part may be registered to practice before the Office to the extent necessary to carry out his or her official duties. A written statement describing the official duties of the officer or employee and signed on behalf of the agency employing the officer or employee may be required by the Director.

(e) *Former Office employees.* No individual who has served in the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written statement indicating that he or she has read 18 U.S.C. 207. No individual who has served in the patent examining corps of the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another (i) assigned to such group for examination and (ii) filed within two years after the date he or she left such group, without written authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration or reinstatement is made after resignation from the Office, the applicant will not be registered or reinstated if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any patent application as indicated in this paragraph.
(OMB Control No. 0651–0012)

§10.7 Requirements for registration.

(a) No individual will be registered to practice before the Office unless he or she shall:
(1) apply to the Commissioner in writing on a form supplied by the Director and furnish all requested information and material and
(2) establish to the satisfaction of the Director that he or she is:
(i) of good moral character and repute;
(ii) possessed of the legal, scientific, and technical qualifications necessary to enable him or her to render applicants for patents valuable service; and
(iii) is otherwise competent to advise and assist applicants for patents in the presentation and prosecution of their applications before the Office.

(b) In order that the Director may determine whether an individual seeking to have his or her name placed upon the register has the qualifications specified in paragraph (a) of this section, satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters must be submitted to the Director. Except as provided in this paragraph, each applicant for registration must take and pass an examination which is held from time to time. Each application for admission to take the examination for registration must be accompanied by the fee set forth in §1.21(a)(1) of this Subchapter. The taking of an examination may be waived in the case of any individual who has actively served for at least four years in the patent examining corps of the Office. The examination will not be administered as a mere academic exercise.

(c) Within two months from the date an applicant is notified that he or she failed an examination, the applicant may request regrading of the examination upon payment of the fee set forth in §1.21(a)(6). Any applicant requesting regrading shall particularly point out the errors which the applicant believed occurred in the grading of his or her examination.
(OMB Control No. 0651–0012)

§10.8 Oath and registration fee.

Before an individual may have his or her name entered on the register of attorneys and agents, the individual must, after his or her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner and pay the registration fee set forth in §1.21(a)(2) of this Subchapter.
(OMB Control No. 0651–0012)

§10.9 Limited recognition in patent cases.

(a) Any individual not registered under §10.6 may, upon a showing of circumstances which render it necessary or justifiable, be given limited recognition by the Director to prosecute as attorney or agent a specified application or specified applications, but limited recognition under this paragraph shall not extend further than the application or applications specified.

(b) When registration of a resident alien under paragraphs (a) or (b) of §10.6 is not appropriate, the resident alien may be given limited recognition as may be appropriate under paragraph (a) of this section.

§10.10 Individuals not registered or recognized to practice in patent cases.

Only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the Office.

§10.11 Removing names from the register.

(a) Registered attorneys and agents shall notify the Director of any change of address. Any notification to the Director of any change of address shall be separate from any notice of change of address filed in individual applications.

(b) A letter may be addressed to any individual on the register, at the address of which separate notice was last received by the Director, for the purpose of ascertaining whether such individual desires to remain on the register. The name of any individual failing to reply and give any information requested by the Director within a time limit specified will be removed from the register and the names of individuals so removed will be published in the *Official Gazette.* The name of any individual so removed may be reinstated on the register as may be appropriate and upon payment of the fee set forth in §1.21(a)(3) of this Subchapter.
(OMB Control No. 0651–0012)

§§10.12–10.13 [reserved]

§10.14 Individuals who may practice before the Office in trademark and other non-patent cases.

(a) *Attorneys.* Any individual who is an attorney may represent others before the Office in trademark and other non-patent cases. An attorney is not required to apply for registration or recognition to practice before the Office in trademark and other non-patent cases.

(b) *Non-lawyers.* Individuals who are not attorneys are not recognized to practice before the Office in trademark and other non-patent cases, except that individuals not attorneys who were recognized to practice before the Office in trademark cases under this chapter prior to

Jan. 1, 1957, will be recognized as agents to continue practice before the Office in trademark cases.

(c) *Foreigners.* Any foreign attorney or agent not a resident of the United States who shall prove to the satisfaction of the Director that he or she is registered or in good standing before the patent or trademark office of the country in which he or she resides and practices, may be recognized for the limited purpose of representing parties located in such country before the Office in the presentation and prosecution of trademark cases, *provided:* the patent or trademark office of such country allows substantially reciprocal privileges to those permitted to practice in trademark cases before the United States Patent and Trademark Office. Recognition under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) Recognition of any individual under this section shall not be construed as sanctioning or authorizing the performance of any act regarded in the jurisdiction where performed as the unauthorized practice of law.

(e) No individual other than those specified in paragraphs (a), (b), and (c) of this section will be permitted to practice before the Office in trademark cases. Any individual may appear in a trademark or other non-patent case in his or her own behalf. Any individual may appear in a trademark case for (1) a firm of which he or she is a member or (2) a corporation or association of which he or she is an officer and which he or she is authorized to represent, if such firm, corporation, or association is a party to a trademark proceeding pending before the Office.

§10.15 Refusal to recognize a practitioner.

Any practitioner authorized to appear before the Office may be suspended or excluded in accordance with the provisions of this part. Any practitioner who is suspended or excluded under this subpart or removed under §10.11(b) shall not be entitled to practice before the Office.

§§10.16–10.17 [reserved]

§10.18 Signature and certificate of practitioner.

(a) Every paper filed by a practitioner representing an applicant or party to a proceeding in the Office must bear the signature of, and be personally signed by, such practitioner except those papers which are required to be signed by the applicant or party. The signature of practitioner to a paper filed by him or her, constitutes a certificate that:
(1) the paper has been read by the practitioner;
(2) the paper's filing is authorized;
(3) to the best of his or her knowledge, information, and belief, there is good ground to support the paper, including any allegations of improper conduct contained or alleged therein; and
(4) it is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See §10.23(c)(15).

§10.19 [reserved]

Patent and Trademark Office Code of Professional Responsibility

§10.20 Canons and Disciplinary Rules.

(a) Canons are set out in §§10.21, 10.30, 10.46, 10.56. 10.61, 10.76, 10.83, 10.100, and 10.110. Canons are statements of axiomatic norms, expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, with the legal system, and with the legal profession.

(b) Disciplinary Rules are set out in §§10.22–10.24, 10.31–10.40, 10.47–10.57, 10.62–10.68, 10.77, 10.78, 10.84, 10.85, 10.87–10.89, 10.92, 10.93, 10.101–103, 10.111, and 10.112. Disciplinary Rules are mandatory in character and state the minimum level of conduct below which no practitioner can fall without being subjected to disciplinary action.

§10.21 Canon 1.

A practitioner should assist in maintaining the integrity and competence of the legal profession.

§10.22 Maintaining integrity and competence of the legal profession.

(a) A practitioner is subject to discipline if the practitioner has made a materially false statement in, or if the practitioner has deliberately failed to disclose a material fact requested in connection with, the practitioner's application for registration or membership in the bar of any United States court or any State court or his or her authority to otherwise practice before the Office in trademark and other non-patent cases.

(b) A practitioner shall not further the application for registration or membership in the bar of any United States court, State court, or administrative agency of another person known by the practitioner to be unqualified in respect to character, education, or other relevant attribute.

§10.23 Misconduct.

(a) A practitioner shall not engage in disreputable or gross misconduct.

(b) A practitioner shall not:

(1) Violate a Disciplinary Rule.
(2) Circumvent a Disciplinary Rule through actions of another.
(3) Engage in illegal conduct involving moral turpitude.
(4) Engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.
(5) Engage in conduct that is prejudicial to the administration of justice.
(6) Engage in any other conduct that adversely reflects on the practitioner's fitness to practice before the Office.

(c) Conduct which constitutes a violation of paragraphs (a) and (b) of this section includes, but is not limited to:

(1) Conviction of a criminal offense involving moral turpitude, dishonesty, or breach of trust.
(2) Knowingly giving false or misleading information or knowingly participating in a material way in giving false or misleading information, to:
(i) A client in connection with any immediate, prospective, or pending business before the Office.
(ii) The Office or any employee of the Office.
(3) Misappropriation of, or failure to properly or timely remit, funds received by a practitioner or the practitioner's firm from a client to pay a fee which the client is required by law to pay to the Office.
(4) Directly or indirectly improperly influencing, attempting to improperly influence, offering or agreeing to improperly influence, or attempting to offer or agree to improperly influence an official action of any employee of the Office by:
(i) use of threats, false accusations, duress, or coercion,
(ii) an offer of any special inducement or promise of advantage, or
(iii) improperly bestowing of any gift, favor, or thing of value.
(5) Suspension or disbarment from practice as an attorney or agent on ethical grounds by any duly constituted authority of a State or the United States or, in the case of a practitioner who resides in a foreign country or is registered under §10.6(c), by any duly constituted authority of:

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(i) a State,
(ii) the United States, or
(iii) the country in which the practitioner resides.

(6) Knowingly aiding or abetting a practitioner suspended or excluded from practice before the Office in engaging in unauthorized practice before the Office under §10.158.

(7) Knowingly withholding from the Office information identifying a patent or patent application of another from which one or more claims have been copied. See §§1.604(b) and 1.607(c) of this Subchapter.

(8) Failing to inform a client or former client or failing to timely notify the Office of an inability to notify to a client or former client of correspondence received from the Office or the client's or former client's opponent in an *inter partes* proceeding before the Office when the correspondence (i) could have a significant effect on a matter pending before the Office, (ii) is received by the practitioner on behalf of a client or former client and (iii) is correspondence of which a reasonable practitioner would believe under the circumstances the client or former client should be notified.

(9) Knowingly misusing a certificate of mailing under §1.8 of this Subchapter or a certificate of "Express Mail" under §1.10 of this Subchapter.

(10) Violating the duty of candor or good faith requirements of §1.56(a) of this Subchapter.

(11) Knowingly filing, or causing to be filed, an application which is subject to being stricken under §1.56(c) of this Subchapter.

(12) Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility.

(13) Knowingly preparing or prosecuting a patent application in violation of an undertaking signed under §10.6(e).

(14) Knowingly failing to advise the Director in writing of any change which would preclude continued registration under §10.6.

(15) Knowingly signing a paper filed in the Office in violation of the provisions of §10.18 or making a scandalous or indecent statement in a paper filed in the Office.

(16) Willfully refusing to reveal or report knowledge or evidence to the Director contrary to §10.24 or paragraph (b) of §10.131.

(17) Representing before the Office in a patent case either a joint venture comprising an inventor and an invention developer or an inventor referred to the registered practitioner by an invention developer when (i) the registered practitioner knows, or has been advised by the Office, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of the pending complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the joint venture or inventor. "Invention developer" means any person, and any agent, employee, officer, partner, or independent contractor thereof, who is not a registered practitioner and who advertises invention development services in media of general circulation or who enters into contracts for invention development services with customers as a result of such advertisement. "Invention development services" means acts of invention development required or promised to be performed, or actually performed, or both, by an invention developer for a customer. "Invention development" means the evaluation, perfection, marketing, brokering, or promotion of an invention on behalf of a customer by an invention developer, including a patent search, preparation of a patent application, or any other act done by an invention developer for consideration toward the end of procuring or attempting to procure a license, buyer, or patent for an invention. "Customer" means any individual who has made an invention and who enters into a contract for invention development services with an invention developer with respect to the invention by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention). "Contract for invention development services" means a contract for invention development services with an invention developer with respect to an invention made by a customer by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention).

(18) In the absence of information sufficient to establish a reasonable belief that fraud or inequitable conduct has occurred, alleging before a tribunal that anyone has committed a fraud on the Office or engaged in inequitable conduct in a proceeding before the Office.

(d) A practitioner who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements of half-truths or concealment of material facts shall be deemed actual fraud within the meaning of this part.

§10.24 Disclosure of information to authorities.

(a) A practitioner possessing unprivileged knowledge of a violation of a Disciplinary Rule shall report such knowledge to the Director.

(b) A practitioner possessing unprivileged knowledge or evidence concerning another practitioner, employee of the Office, or a judge shall reveal fully such knowledge or evidence upon proper request of a tribunal or other authority empowered to investigate or act upon the conduct of practitioners, employees of the Office, or judges.

(OMB Control No. 0651–0017)

§§10.25–10.29 [reserved]

§10.30 Canon 2.

A practitioner should assist the legal profesion in fulfilling its duty to make legal counsel available.

§10.31 Communications concerning a practitioner's services.

(a) No practitioner shall with respect to any prospective business before the Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any prospective applicant or other person having immediate or prospective business before the Office.

(b) A practitioner may not use the name of a Member of either House of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the Office.

(c) Unless authorized under §10.14(b), a non-lawyer practitioner shall not hold himself or herself out as authorized to practice before the Office in trademark cases.

(d) Unless a practitioner is an attorney, the practitioner shall not hold himself or herself out:

(1) to be an attorney or lawyer or
(2) as authorized to practice before the Office in non-patent and trademark cases.

§10.32 Advertising.

(a) Subject to §10.31, a practitioner may advertise services through public media, including a telephone directory, legal directory, newspaper, or other periodical, radio, or television, or through written communications not involving solicitation as defined by §10.33.

(b) A practitioner shall not give anything of value to a person for recommending the practitioner's services, except that a practitioner may pay the reasonable cost of advertising or written communication permitted by this section and may pay the usual charges of a not-for-profit lawyer referreal service or other legal service organization.

(c) Any communication made pursuant to this section shall include the name of at least one practitioner responsible for its content.

§10.33 Direct contact with prospective clients.

A practitioner may not solicit professional employment from a prospective client with whom the practitioner has no family or prior professional relationship, by mail, in-person or otherwise, when a significant motive for the practitioner's doing so is the practitioner's pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching. The term "solicit" includes contact in person, by telephone or telegraph, by letter or other writing, or by other communication directed to a specific recipient, but does not include letters addressed or advertising circulars distributed generally to persons not specifically known to need legal services of the kind provided by the practitioner in a particular matter, but who are so situated that they might in general find such services useful.

§10.34 Communication of fields of practice.

A registered practitioner may state or imply that the practitioner is a specialist as follows:

(a) A registered practitioner who is an attorney may use the designation "Patents," "Patent Attorney," "Patent Lawyer," "Registered Patent Attorney," or a substantially similar designation.

(b) A registered practitioner who is not an attorney may use the designation "Patents," "Patent Agent," "Registered Patent Agent," or a substantially similar designation, except that any practitioner who was registered prior to November 15, 1938, may refer to himself or herself as a "patent attorney."

§10.35 Firm names and letterheads.

(a) A practitioner shall not use a firm name, letterhead, or other professional designation that violates §10.31. A trade name may be used by a practitioner in private practice if it does not imply a current connection with a government agency or with a public or charitable legal services organzation and is not otherwise in violation of §10.31.

(b) Practitioners may state or imply that they practice in a partnership or other organization only when that is the fact.

§10.36 Fees for legal services.

(a) A practitioner shall not enter into an agreement for, charge, or collect an illegal or clearly excessive fee.

(b) A fee is clearly excessive when, after a review of the facts, a practitioner of ordinary prudence would be left with a definite and firm conviction that the fee is in excess of a reasonable fee. Factors to be considered as guides in determining the reasonableness of a fee include the following:

(1) The time and labor required, the novelty and difficulty of the questions involved, and the skill requisite to perform the legal service properly.

(2) The likelihood, if apparent to the client, that the acceptance of the particular employment will preclude other employment by the practitioner.

(3) The fee customarily charged for similar legal services.

(4) The amount involved and the results obtained.

(5) The time limitations imposed by the client or by the circumstances.

(6) The nature and length of the professional relationship with the client.

(7) The experience, reputation, and ability of the practitioner or practitioners performing the services.

(8) Whether the fee is fixed or contingent.

§10.37 Division of fees among practitioners.

(a) A practitioner shall not divide a fee for legal services with another practitioner who is not a partner in or associate of the practitioner's law firm or law office, unless:

(1) The client consents to employment of the other practitioner after a full disclosure that a division of fees will be made.

(2) The division is made in proportion to the services performed and responsibility assumed by each.

(3) The total fee of the practitioners does not clearly exceed reasonable compensation for all legal services rendered to the client.

(b) This section does not prohibit payment to a former partner or associate pursuant to a separation or retirement agreement.

§10.38 Agreements restricting the practice of a practitioner.

(a) A practitioner shall not be a party to or participate in a partnership or employment agreement with another practitioner that restricts the right of a practitioner to practice before the Office after the termination of a relationship created by the agreement, except as a condition to payment of retirement benefits.

(b) In connection with the settlement of a controversy or suit, a practitioner shall not enter into an agreement that restricts the practitioner's right to practice before the Office.

§10.39 Acceptance of employment.

A practitioner shall not accept employment on behalf of a person if the practitioner knows or it is obvious that such person wishes to:

(a) Bring a legal action, commence a proceeding before the Office, conduct a defense, assert a position in any proceeding pending before the Office, or otherwise have steps taken for the person, merely for the purpose of harassing or maliciously injuring any other person.

(b) Present a claim or defense in litigation or any proceeding before the Office that is not warranted under existing law, unless it can be supported by good faith argument for an extension, modification, or reversal of existing law.

§10.40 Withdrawal from employment.

(a) A practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office (see §§1.36, and 2.19 of this Subchapter). In any event, a practitioner shall not withdraw from employment until the practitioner has taken reasonable steps to avoid foreseeable prejudice to the rights of the client, including giving due notice to his or her client, allowing time for employment of another practitioner, delivering to the client all papers and property to which the client is entitled, and complying with applicable laws and rules. A practitioner who withdraws from employment shall refund promptly any part of a fee paid in advance that has not been earned.

(b) Mandatory withdrawal. A practitioner representing a client before the Office shall withdraw from employment if:

(1) the practitioner knows or it is obvious that the client is bringing a legal action, commencing a proceeding before the Office, conducting a defense, or asserting a position in litigation or any proceeding pending before the Office, or is otherwise having steps taken for the cli-

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ent, merely for the purpose of harassing or maliciously injuring any person;

(2) the practitioner knows or it is obvious that the practitioner's continued employment will result in violation of a Disciplinary Rule;

(3) the practitioner's mental or physical condition renders it unreasonably difficult for the practitioner to carry out the employment effectively; or

(4) the practitioner is discharged by the client.

(c) Permissive withdrawal. If paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matters pending before the Office unless such request or such withdrawal is because:

(1) the petitioner's client:

(i) insists upon presenting a claim or defense that is not warranted under existing law and cannot be supported by good faith argument for an extension, modification, or reversal of existing law;

(ii) personally seeks to pursue an illegal course of conduct;

(iii) insists that the practitioner pursue a course of conduct that is illegal or that is prohibited under a Disciplinary Rule;

(iv) by other conduct renders it unreasonably difficult for the practitioner to carry out the employment effectively;

(v) insists, in a matter not pending before a tribunal, that the practitioner engage in conduct that is contrary to the judgment and advice of the practitioner but not prohibited under the Disciplinary Rule; or

(vi) has failed to pay one or more bills rendered by the practitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of legal services.

(2) the practitioner's continued employment is likely to result in a violation of a Disciplinary Rule;

(3) the practitioner's inability to work with co-counsel indicates that the best interests of the client likely will be served by withdrawal;

(4) the practitioner's mental or physical condition renders it difficult for the practitioner to carry out the employment effectively;

(5) the practitioner's client knowingly and freely assents to termination of the employment; or

(6) the practitioner believes in good faith, in a proceeding pending before the Office, that the Office will find the existence of other good cause for withdrawal.

§§10.41–10.45 [reserved]

§10.46 Canon 3.

A practitioner should assist in preventing the unauthorized practice of law.

§10.47 Aiding unauthorized practice of law.

(a) A practitioner shall not aid a non-practitioner in the unauthorized practice of law before the Office.

(b) A practitioner shall not aid a suspended or excluded practitioner in the practice of law before the Office.

(c) A practitioner shall not aid a non-lawyer in the unauthorized practice of law.

§10.48 Sharing legal fees.

A practitioner or a firm of practitioners shall not share legal fees with a non-practitioner except that:

(a) An agreement by a practitioner with the practitioner's firm, partner, or associate may provide for the payment of money, over a reasonable period of time after the practitioner's death, to the practitioner's estate or to one or more specified persons.

(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

(c) A practitioner or firm of practitioners may include non-practitioner employees in a compensation or retirement plan, even though the plan is based in whole or in part on a profit-sharing arrangement, providing such plan does not circumvent another Disciplinary Rule.

§10.49 Forming a partnership with a non-practitioner.

A practitioner shall not form a partnership with a non-practitioner if any of the activities of the partnership consist of the practice of patent, trademark, or other law before the Office.

§§10.50-10.55 [reserved]

§10.56 Canon 4.

A practitioner should preserve the confidences and secrets of a client.

§10.57 Preservation of confidences and secrets of a client.

(a) "Confidence" refers to information protected by the attorney-client or agent-client privilege under applicable law. "Secret" refers to other information gained in the professional relationship that the client has requested be held inviolate or the disclosure of which would be embarrassing or would be likely to be detrimental to the client.

(b) Except when permitted under paragraph (c) of this section, a practitioner shall not knowingly:

(1) Reveal a confidence or secret of a client.

(2) Use a confidence or secret of a client to the disadvantage of the client.

(3) Use a confidence or secret of a client for the advantage of the practitioner or of a third person, unless the client consents after full disclosure.

(c) A practitioner may reveal:

(1) Confidences or secrets with the consent of the client affected but only after a full disclosure to the client.

(2) Confidences or secrets when permitted under Disciplinary Rules or required by law or court order.

(3) The intention of a client to commit a crime and the information necessary to prevent the crime.

(4) Confidences or secrets necessary to establish or collect the practitioner's fee or to defend the practitioner or the practitioner's employees or associates against an accusation of wrongful conduct.

(d) A practitioner shall exercise reasonable care to prevent the practitioner's employees, associates, and others whose services are utilized by the practitioner from disclosing or using confidences or secrets of a client, except that a practitioner may reveal the information allowed by pararagraph (c) of this section through an employee.

§§10.58–10.60 [reserved]

§10.61 Canon 5.

A practitioner should exercise independent professional judgment on behalf of a client.

§10.62 Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.

(a) Except with the consent of a client after full disclosure, a practitioner shall not accept employment if the exercise of the practitioner's professional judgment on behalf of the client will be or reasonably may be affected by the practitioner's own financial, business, property, or personal interests.

(b) A practitioner shall not accept employment in a proceeding before the Office if the practitioner knows or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness, except that the practitioner may undertake the employment and the practitioner or another practitioner in the practitioner's firm may testify:

(1) If the testimony will relate solely to an uncontested matter.

(2) If the testimony will relate solely to a matter of formality and there is no reason to believe that substantial evidence will be offered in opposition to the testimony.

(3) If the testimony will relate solely to the nature and value of legal services rendered in the case by the practitioner or the practitioner's firm to the client.

(4) As to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the practitioner or the practitioner's firm as counsel in the particular case.

§10.63 Withdrawal when the practitioner becomes a witness.

(a) If, after undertaking employment in a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness on behalf of a practitioner's client, the practitioner shall withdraw from the conduct of the proceeding and the practitioner's firm, if any, shall not continue representation in the proceeding, except that the practitioner may continue the representation and the practitioner or another practitioner in the practitioner's firm may testify in the circumstances enumerated in paragraphs (1) through (4) of §10.62(b).

(b) If, after undertaking employment in a proceeding before the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm may be asked to sign an affidavit to be filed in the Office or be called as a witness other than on behalf of the practitioner's client, the practitioner may continue the representation until it is apparent that the practitioner's affidavit or testimony is or may be prejudicial to the practitioner's client.

§10.64 Avoiding acquisition of interest in litigation or proceeding before the Office.

(a) A practitioner shall not acquire a proprietary interest in the subject matter of a proceeding before the Office which the practitioner is conducting for a client, except that the practitioner may:

(1) Acquire a lien granted by law to secure the practitioner's fee or expenses; or

(2) Contract with a client for a reasonable contingent fee; or

(3) In a patent case, take an interest in the patent as part or all of his or her fee.

(b) While representing a client in connection with a contemplated or pending proceeding before the Office, a practitioner shall not advance or guarantee financial assistance to a client, except that a practitioner may advance or guarantee the expenses of going forward in a proceeding before the Office including fees required by law to be paid to the Office, expenses of investigation, expenses of medical examination, and costs of obtaining and presenting evidence, provided the client remains ultimately liable for such expenses. A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee.

§10.65 Limiting business relations with a client.

A practitioner shall not enter into a business transaction with a client if they have differing interests therein and if the client expects the practitioner to exercise professional judgment therein for the protection of the client, unless the client has consented after full disclosure.

§10.66 Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner.

(a) A practitioner shall decline proffered employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the acceptance of the proffered employment, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(b) A practitioner shall not continue multiple employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the practitioner's representation of another client, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(c) In the situations covered by paragraphs (a) and (b) of this section a practitioner may represent multiple clients if it is obvious that the practitioner can adequately represent the interest of each and if each consents to the representation after full disclosure of the possible effect of such representation on the exercise of the practitioner's independent professional judgment on behalf of each.

(d) If a practitioner is required to decline employment or to withdraw from employment under a Disciplinary Rule, no partner, or associate, or any other practitioner affiliated with the practitioner or the practitioner's firm, may accept or continue such employment unless otherwise ordered by the Director or Commissioner.

§10.67 Settling similar claims of clients.

A practitioner who represents two or more clients shall not make or participate in the making of an aggregate settlement of the claims of or against the practitioner's clients, unless each client has consented to the settlement after being advised of the existence and nature of all the claims involved in the proposed settlement, of the total amount of the settlement, and of the participation of each person in the settlement.

§10.68 Avoiding influence by others than the client.

(a) Except with the consent of the practitioner's client after full disclosure, a practitioner shall not:

(1) Accept compensation from one other than the practitioner's client for the practitioner's legal services to or for the client.

(2) Accept from one other than the practitioner's client any thing of value related to the practitioner's representation of or the practitioner's employment by the client.

(b) A practitioner shall not permit a person who recommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services.

(c) A practitioner shall not practice with or in the form of a professional corporation or association authorized to practice law for a profit, if a non-practioner has the right to direct or control the professional judgment of a practitioner.

§§10.69-10.75 [reserved]

§10.76 Canon 6.

A practitioner should represent a client competently.

§10.77 Failing to act competently.

A practitioner shall not:

(a) Handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with the practitioner another practitioner who is competent to handle it.

(b) Handle a legal matter without preparation adequate in the circumstances.
(c) Neglect a legal matter entrusted to the practitioner.

§10.78 Limiting liability to client.

A practitioner shall not attempt to exonerate himself or herself from, or limit his or her liability to, a client for his or her personal malpractice.

§§10.79-10.82 [reserved]

§10.83 Canon 7.

A practitioner should represent a client zealously within the bounds of the law.

§10.84 Representing a client zealously.

(a) A practitioner shall not intentionally:
(1) Fail to seek the lawful objectives of a client through reasonably available means permitted by law and the Disciplinary Rules, except as provided by paragraph (b) of this section. A practitioner does not violate the provisions of this section, however, by acceding to reasonable requests of opposing counsel which do not prejudice the rights of the client, by being punctual in fulfilling all professional commitments, by avoiding offensive tactics, or by treating with courtesy and consideration all persons involved in the legal process.
(2) Fail to carry out a contract of employment entered into with a client for professional services, but a practitioner may withdraw as permitted under §§10.40, 10.63, and 10.66.
(3) Prejudice or damage a client during the course of a professional relationship, except as required under this part.
(b) In representation of a client, a practitioner may:
(1) Where permissible, exercise professional judgment to waive or fail to assert a right or position of the client.
(2) Refuse to aid or participate in conduct that the practitioner believes to be unlawful, even though there is some support for an argument that the conduct is legal.

§10.85 Representing a client within the bounds of the law.

(a) In representation of a client, a practitioner shall not:
(1) Initiate or defend any proceeding before the Office, assert a position, conduct a defense, delay a trial or proceeding before the Office, or take other action on behalf of the practitioner's client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.
(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.
(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.
(4) Knowingly use perjured testimony or false evidence.
(5) Knowingly make a false statement of law or fact.
(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.
(7) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.
(8) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.
(b) A practitioner who receives information clearly establishing that:
(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal.
(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

§10.86 [reserved]

§10.87 Communicating with one of adverse interest.

During the course of representation of a client, a practitioner shall not:
(a) Communicate or cause another to communicate on the subject of the representation with a party the practitioner knows to be represented by another practitioner in that matter unless the practitioner has the prior consent of the other practitioner representing such other party or is authorized by law to do so. It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions.
(b) Give advice to a person who is not represented by a practitioner other than the advice to secure counsel, if the interests of such person are or have a reasonable possibility of being in conflict with the interests of the practitioner's client.

§10.88 Threatening criminal prosecution.

A practitioner shall not present, participate in presenting, or threaten to present criminal charges solely to obtain an advantage in any prospective or pending proceeding before the Office.

§10.89 Conduct in proceedings.

(a) A practitioner shall not disregard or advise a client to disregard any provision of this Subchapter or a decision of the Office made in the course of a proceeding before the Office, but the practitioner may take appropriate steps in good faith to test the validity of such provision or decision.
(b) In presenting a matter to the Office, a practitioner shall disclose:
(1) Controlling legal authority known to the practitioner to be directly adverse to the position of the client and which is not disclosed by opposing counsel or an employee of the Office.
(2) Unless privileged or irrelevant, the identities of the client the practitioner represents and of the persons who employed the practitioner.
(c) In appearing in a professional capacity before a tribunal, a practitioner shall not:
(1) State or allude to any matter that the practitioner has no reasonable basis to believe is relevant to the case or that will not be supported by admissible evidence.
(2) Ask any question that the practitioner has no reasonable basis to believe is relevant to the case and that is intended to degrade a witness or other person.
(3) Assert the practitioner's personal knowledge of the facts in issue, except when testifying as a witness.
(4) Assert the practitioner's personal opinion as to the justness of a cause, as to the credibility of a witness, as to the culpability of a civil litigant, or as to the guilt or innocence of an accused; but the practitioner may argue, on the practitioner's analysis of the evidence, for any position or conclusion with respect to the matters stated herein.
(5) Engage in undignified or discourteous conduct before the Office (see §1.3 of the Subchapter).
(6) Intentionally or habitually violate any provision of this Subchapter or established rule of evidence.

§10.90–10.91 [reserved]

§10.92 Contact with witnesses.

(a) A practitioner shall not suppress any evidence that the practitioner or the practitioner's client has a legal obligation to reveal or produce.

(b) A practitioner shall not advise or cause a person to be secreted or to leave the jurisdiction of a tribunal for the purpose of making the person unavailable as a witness therein.
(c) A practitioner shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of the witness' affidavit, testimony or the outcome of the case. But a practitioner may advance, guarantee, or acquiesce in the payment of:
(1) Expenses reasonably incurred by a witness in attending, testifying, or making an affidavit.
(2) Reasonable compensation to a witness for the witness' loss of time in attending, testifying, or making an affidavit.
(3) A reasonable fee for the professional services of an expert witness.

§10.93 Contact with officials.

(a) A practitioner shall not give or lend anything of value to a judge, official, or employee of a tribunal under circumstances which might give the appearance that the gift or loan is made to influence official action.
(b) In an adversary proceeding, including any *inter partes* proceeding before the Office, a practitioner shall not communicate, or cause another to communicate, as to the merits of the cause with a judge, official, or Office employee before whom the proceeding is pending, except:
(1) In the course of official proceedings in the cause.
(2) In writing if the practitioner promptly delivers a copy of the writing to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.
(3) Orally upon adequate notice to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.
(4) As otherwise authorized by law.

§§10.94–10.99 [reserved]

§10.100 Canon 8.

A practitioner should assist in improving the legal system.

§10.101 Action as a public official.

(a) A practitioner who holds public office shall not:
(1) Use the practitioner's public position to obtain, or attempt to obtain, a special advantage in legislative matters for the practitioner or for a client under circumstances where the practitioner knows or it is obvious that such action is not in the public interest.
(2) Use the practitioner's public position to influence, or attempt to influence, a tribunal to act in favor of the practitioner or of a client.
(3) Accept any thing of value from any person when the practitioner knows or it is obvious that the offer is for the purpose of influencing the practitioner's action as a public official.
(b) A practitioner who is an officer or employee of the United States shall not practice before the Office in patent cases except as provided in §10.6(d).

§10.102 Statements concerning officials.

(a) A practitioner shall not knowingly make false statements of fact concerning the qualifications of a candidate for election or appointment to a judicial office or to a position in the Office.
(b) A practitioner shall not knowingly make false accusations against a judge, other adjudicatory officer, or employee of the Office.

§10.103 Practitioner candidate for judicial office.

A practitioner who is a candidate for judicial office shall comply with applicable provisions of law.

§10.104–10.109 [reserved]

§10.110 Canon 9.

A practitioner should avoid even the appearance of professional impropriety.

§10.111 Avoiding even the appearance of impropriety.

(a) A practitioner shall not accept private employment in a matter upon the merits of which he or she has acted in a judicial capacity.
(b) A practitioner shall not accept private employment in a matter in which he or she had personal responsibility while a public employee.
(c) A practitioner shall not state or imply that the practitioner is able to influence improperly or upon irrelevant grounds any tribunal, legislative body, or public official.

§10.112 Preserving identity of funds and property of client.

(a) All funds of clients paid to a practitioner or a practitioner's firm, other than advances for costs and expenses, shall be deposited in one or more identifiable bank accounts maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under §10.6(c), in the United States or the foreign country.
(b) No funds belonging to the practitioner or the practitioner's firm shall be deposited in the bank accounts required by paragraph (a) of this section except as follows:
(1) Funds reasonably sufficient to pay bank charges may be deposited therein.
(2) Funds belonging in part to a client and in part presently or potentially to the practitioner or the practitioner's firm must be deposited therein, but the portion belonging to the practitioner or the practitioner's firm may be withdrawn when due unless the right of the practitioner or the practitioner's firm to receive it is disputed by the client, in which event the disputed portion shall not be withdrawn until the dispute is finally resolved.
(c) A practitioner shall:
(1) Promptly notify a client of the receipt of the client's funds, securities, or other properties.
(2) Identify and label securities and properties of a client promptly upon receipt and place them in a safe deposit box or other place of safekeeping as soon as practicable.
(3) Maintain complete records of all funds, securities, and other properties of a client coming into the possession of the practitioner and render appropriate accounts to the client regarding the funds, securities, or other properties.
(4) Promptly pay or deliver to the client as requested by a client the funds, securities, or other properties in the possession of the practitioner which the client is entitled to receive.
(OMB Control No. 0651–0017)

§§10.113–10.129 [reserved]

Investigations and Disciplinary Proceedings

§10.130 Reprimand, suspension or exclusion.

(a) The Commissioner may, after notice and opportunity for a hearing, (a) reprimand or (b) suspend or exclude, either generally or in any particular case, any individual, attorney, or agent shown to be incompetent or disreputable, who is guilty of gross misconduct, or who violates a Disciplinary Rule.
(b) Petitions to disqualify a practitioner in *ex parte* or *inter partes* cases in the Office are not governed by §§10.130 through 10.170 and will be handled on a case-by-case basis under such conditions as the Commissioner deems appropriate.

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§10.131 Investigations.

(a) The Director is authorized to investigate possible violations of Disciplinary Rules by practitioners. See §10.2(b) (2).

(b) Practitioners shall report and reveal to the Director any knowledge or evidence required by §10.24. A practitioner shall cooperate with the Director in connection with any investigation under paragraph (a) of this section and with officials of the Office in connection with any disciplinary proceeding instituted under §10.132(b).

(c) Any non-practitioner possessing knowledge or information concerning a violation of a Disciplinary Rule by a practitioner may report the violation to the Director. The Director may require that the report be presented in the form of an affidavit.

§10.132 Initiating a disciplinary proceeding; reference to an administrative law judge.

(a) If after conducting an investigation under §10.131(a) the Director is of the opinion that a practitioner has violated a Disciplinary Rule, the Director shall after complying where necessary with the provisions of 5 U.S.C. 558(c), call a meeting of the Committee on Discipline. The Committee on Discipline shall then determine as specified in §10.4(b) whether a disciplinary proceeding shall be instituted under paragraph (b) of this section.

(b) If the Committee on Discipline determines that probable cause exists to believe that a practitioner has violated a Disciplinary Rule, the Director shall institute a disciplinary proceeding by filing a complaint under §10.134. The complaint shall be filed in the Office of the Director. A disciplinary proceeding may result in:

(1) a reprimand or
(2) suspension or exclusion of a practitioner from practice before the Office.

(c) Upon the filing of a complaint under §10.134, the Commissioner will refer the disciplinary proceeding to an administrative law judge.

§10.133 Conference between Director and practitioner; resignation.

(a) *General.* The Director may confer with a practitioner concerning possible violations by the practitioner of a Disciplinary Rule whether or not a disciplinary proceeding has been instituted.

(b) *Resignation.* Any practitioner who is the subject of an investigation under §10.131 or against whom a complaint has been filed under §10.134 may resign from practice before the Office only by submitting with the Director an affidavit stating his or her desire to resign.

(c) If filed prior to the date set by the administrative law judge for a hearing, the affidavit shall state that:

(1) the resignation is freely and voluntarily proferred;

(2) the practitioner is not acting under duress or coersion from the Office;

(3) the practitioner is fully aware of the implications of filing the resignation;

(4) the practitioner is aware (i) of a pending investigation or (ii) of charges arising from the complaint alleging that he or she is guilty of a violation of the Patent and Trademark Office Code of Professional Responsibility, the nature of which shall be set forth by the practitioner to the satisfaction of the Director;

(5) the practitioner acknowledges that, if and when he or she applies for reinstatement under §10.160, the Director will conclusively presume, for the limited purpose of determining the application for reinstatement, that:

(i) the facts upon which the complaint is based are true and

(ii) the practitioner could not have successfully defended himself or herself against (A) charges predicated on the violation under investigation or (B) charges set out in the complaint filed against the practitioner.

(d) If filed on or after the date set by the administrative law judge for a hearing, the affidavit shall make the statements required by subparagraphs (1) through (4) of paragraph (b) of this section and shall state that:

(1) the practitioner acknowledges the facts upon which the complaint is based are true; and

(2) the resignation is being submitted because the practitioner could not successfully defend himself or herself against (i) charges predicated on the violation under investigation or (ii) charges set out in the complaint.

(e) When an affidavit under paragraph (b) or (c) of this section is received while an investigation is pending, the Commissioner shall enter an order excluding the practitioner "on consent." When an affidavit under paragraphs (b) or (c) of this section is received after a complaint under §10.134 has been filed, the Director shall notify the administrative law judge. The administrative law judge shall enter an order transferring the disciplinary proceeding to the Commissioner and the Commissioner shall enter an order excluding the practitioner "on consent."

(f) Any practitioner who resigns from practice before the Office under this section and who intends to reapply for admission to practice before the Office must comply with the provisions of §10.158.

(g) Settlement. Before or after a complaint is filed under §10.134, a settlement conference may occur between the Director and a practitioner for the purpose of settling any disciplinary matter. If an offer of settlement is made by the Director or the practitioner and is not accepted by the other, no reference to the offer of settlement or its refusal shall be admissible in evidence in the disciplinary proceeding unless both the Director and the practitioner agree in writing.

§10.134 Complaint.

(a) A complaint instituting a disciplinary proceeding shall:

(1) Name the practitioner, who may then be referred to as the "respondent."

(2) Give a plain and concise description of the alleged violations of the Disciplinary Rules by the practitioner.

(3) State the place and time for filing an answer by the respondent.

(4) State that a decision by default may be entered against the respondent if an answer is not timely filed.

(5) Be signed by the Director.

(b) A complaint will be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to adequately prepare a defense.

§10.135 Service of complaint.

(a) A complaint may be served on a respondent in any of the following methods:

(1) By handing a copy of the complaint personally to the respondent, in which case the individual handing the complaint to the respondent shall file an affidavit with the Director indicating the time and place the complaint was handed to the respondent.

(2) By mailing a copy of the complaint by "Express Mail" or first-class mail to:

(i) a registered practitioner at the address for which separate notice was last received by the Director or

(ii) a non-registered practitioner at the last address for the respondent known to the Director.

(3) By any method mutually agreeable to the Director and the respondent.

(b) If a complaint served by mail under paragraph (a) (2) of this section is returned by the U.S. Postal Service, the Director shall mail a second copy of the complaint to the respondent. If the second copy of the complaint is also returned by the U.S. Postal Service, the Director shall serve the respondent by publishing an appropriate notice in the *Official Gazette* for four consecutive weeks, in which case the time for answer shall be at least thirty days from the fourth publication of the notice.

(c) If a respondent is a registered practitioner, the Director may serve simultaneously with the complaint a letter under §10.11(b). The Director may require the respondent to answer the §10.11(b) letter within a period of not less than 15 days. An answer to the §10.11(b) letter shall constitute proof of service. If the respondent fails to answer the §10.11(b) letter, his or her name will be removed from the register as provided by §10.11(b).

(d) If the respondent is represented by an attorney under §10.140(a), a copy of the complaint shall also be served on the attorney.

§10.136 Answer to complaint.

(a) *Time for answer.* An answer to a complaint shall be filed within a time set in the complaint which shall be not less than thirty days.

(b) *With whom filed.* The answer shall be filed in writing with the administrative law judge. The time for filing an answer may be extended once for a period of no more than thirty days by the administrative law judge upon a showing of good cause provided a motion requesting an extension of time is filed within thirty days after the date the complaint is filed by the Director. A copy of the answer shall be served on the Director.

(c) *Content.* The respondent shall include in the answer a statement of the facts which constitute the grounds of defense and shall specifically admit or deny each allegation set forth in the complaint. The respondent shall not deny a material allegation in the complaint which the respondent knows to be true or state that respondent is without sufficient information to form a belief as to the truth of an allegation when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.

(d) *Failure to deny allegations in complaint.* Every allegation in the complaint which is not denied by a respondent in the answer is deemed to be admitted and may be considered proven. No further evidence in respect of that allegation need be received by the administrative law judge at any hearing. Failure to timely file an answer will constitute an admission of the allegations in the complaint.

(e) *Reply by Director.* No reply to an answer is required by the Director and any affirmative defense in the answer shall be deemed to be denied. The Director may, however, file a reply if he or she chooses or if ordered by the adminstrative law judge.

§10.137 Supplemental complaint.

False statements in an answer may be made the basis of a supplemental complaint.

§10.138 Contested case.

Upon the filing of an answer by the respondent, a disciplinary proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. 24. Evidence obtained by a subpoena issued under 35 U.S.C. 24 shall not be admitted into the record or considered unless leave to proceed under 35 U.S.C. 24 was previously authorized by the administrative law judge.

§10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays.

(a) *Appointment.* An administrative law judge, appointed under 5 U.S.C. 3105, shall conduct disciplinary proceedings as provided by this part.

(b) *Responsibilities.* The administrative law judge shall have authority to:

(1) Administer oaths and affirmations;

(2) Make rulings upon motions and other requests;

(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;

(4) Authorize the taking of a deposition of a witness in lieu of personal appearance of the witness before the adminstrative law judge;

(5) Determine the time and place of any hearing and regulate its course and conduct;

(6) Hold or provide for the holding of conferences to settle or simplify the issues;

(7) Receive and consider oral or written arguments on facts or law;

(8) Adopt procedures and modify procedures from time to time as occasion requires for the orderly disposition of proceedings;

(9) Make initial decisions under §10.154; and

(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any disciplinary proceeding.

(c) *Time for making initial decision.* The administrative law judge shall set times and exercise control over a disciplinary proceeding such that an initial decision under §10.154 is normally issued within six months of the date a complaint is filed. The administrative law judge may, however, issue an initial decision more than six months after a complaint is filed if in his or her opinion there exist unusual circumstances which preclude issuance of an initial decision within six months of the filing of the complaint.

(d) *Review of interlocutory orders.* An interlocutory order of an administrative law judge will not be reviewed by the Commissioner except:

(1) when the administrative law judge shall be of the opinion (i) that the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision by the Commissioner may materially advance the ultimate termination of the disciplinary proceeding or

(2) in an extraordinary situation where justice requires review.

(e) *Stays pending review of interlocutory order.* If the Director or a respondent seeks review of an interlocutory order of an administrative law judge under paragraph (b)(2) of this section, any time period set for taking action by the administrative law judge shall not be stayed unless ordered by the Commissioner or the administrative law judge.

§10.140 Representative for Director or respondent.

(a) A respondent may be represented before the Office in connection with an investigation or disciplinary proceeding by an attorney. The attorney shall file a written declaration that he or she is an attorney within the meaning of §10.1(c) and shall state:

(1) the address to which the attorney wants correspondence related to the investigation or disciplinary proceeding sent and

(2) a telephone number where the attorney may be reached during normal business hours.

(b) The Commissioner shall designate at least two associate solicitors in the Office of the Solicitor to act as representatives for the Director in disciplinary proceedings. In prosecuting disciplinary proceedings, the designated associate solicitors shall not involve the Solicitor or the Deputy Solicitor. The Solicitor and the Deputy Solicitor shall remain insulated from the investigation and prosecution of all disciplinary proceedings in order that they shall be available as counsel to the Commissioner in deciding disciplinary proceedings.

§10.141 Filing of papers.

(a) The provisions of §1.8 of this Subchapter do not apply to disciplinary proceedings.

(b) All papers filed after the complaint and prior to entry of an initial decision by the administrative law judge shall be filed with the administrative law judge at an address or place designated by the administrative law judge. All papers filed after entry of an initial decision by the administrative law judge shall be filed with the

Director. The Director shall promptly forward to the Commissioner any paper which requires action under this part by the Commissioner.

(c) The administrative law judge or the Director may provide for filing papers and other matter by hand or by "Express Mail."

§10.142 Service of papers.

(a) All papers other than a complaint shall be served on a respondent represented by an attorney by:

(1) delivering a copy of the paper to the office of the attorney; or

(2) mailing a copy of the paper by first-class mail or "Express Mail" to the attorney at the address provided by the attorney under §10.140(a) (1); or

(3) any other method mutually agreeable to the attorney and a representative for the Director.

(b) All papers other than a complaint shall be served on a respondent who is not represented by an attorney by:

(1) delivering a copy of the paper to the respondent; or

(2) mailing a copy of the paper by first-class mail or "Express Mail" to the respondent at the address to which a complaint may be served or such other address as may be designated in writing by the respondent; or

(3) any other method mutually agreeable to the respondent and a representative of the Director.

(c) A respondent shall serve on the representative for the Director one copy of each paper filed with the administrative law judge or the Director. A paper may be served on the representative for the Director by:

(1) delivering a copy of the paper to the representative; or

(2) mailing a copy of the paper by first-class mail or "Express Mail" to an address designated in writing by the representative; or

(3) any other method mutually agreeable to the respondent and the representative.

(d) Each paper filed in a disciplinary proceeding shall contain therein a certificate of service indicating:

(1) the date on which service was made and

(2) the method by which service was made.

(e) The administrative law judge or the Commissioner may require that a paper be served by hand or by "Express Mail."

(f) Service by mail is completed when the paper mailed in the United States is placed into the custody of the U.S. Postal Service.

§10.143 Motions.

Motions may be filed with the administrative law judge. The adminstrative law judge will determine on a case-by-case basis the time period for response to a motion and whether replies to responses will be authorized. No motion shall be filed with the administrative law judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by a motion are resolved by the parties prior to a decision on the motion by the administrative law judge, the parties shall promptly notify the administrative law judge.

§10.144 Hearings.

(a) The administrative law judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The administrative law judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director and the respondent at the expense of the Office.

(b) If the respondent to a disciplinary proceeding fails to appear at the hearing after a notice of hearing has been given by the administrative law judge, the administrative law judge may deem the respondent to have waived the right to a hearing and may proceed with the hearing in the absence of the respondent.

(c) A hearing under this section will not be open to the public except that the Director may grant a request by a respondent to open his or her hearing to the public and make the record of the disciplinary proceeding available for public inspection, *provided* agreement is reached in advance to exclude from public disclosure information which is privileged or confidential under applicable laws or regulations. If a disciplinary proceeding results in disciplinary action against a practitioner, and subject to §10.159(c), the record of the entire disciplinary proceeding, including any settlement agreement, will be available for public inspection.

§10.145 Proof; variance; amendment of pleadings.

In case of a variance between the evidence and the allegations in a complaint, answer, or reply, if any, the administrative law judge may order or authorize amendment of the complaint, answer, or reply to conform to the evidence. Any party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegations in the complaint, answer, or reply, as amended, and the administrative law judge shall make findings on any issue presented by the complaint, answer, or reply as amended.

§§10.146–10.148 [reserved]

§10.149 Burden of proof.

In a disciplinary proceeding, the Director shall have the burden of proving his or her case by clear and convincing evidence and a respondent shall have the burden of providing any affirmative defense by clear and convincing evidence.

§10.150 Evidence.

(a) *Rules of evidence.* The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the administrative law judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(b) *Depositions.* Depositions of witnesses taken pursuant to §10.151 may be admitted as evidence.

(c) *Government documents.* Official documents, records, and papers of the Office are admissible without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Office.

(d) *Exhibits.* If any document, record, or other paper is introduced in evidence as an exhibit, the administrative law judge may authorize the withdrawal of the exhibit subject to any conditions the administrative law judge deems appropriate.

(e) *Objections.* Objections to evidence will be in short form, stating the grounds of objection. Objections and rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.

§10.151 Depositions.

(a) Depositions for use at the hearing in lieu of personal appearance of a witness before the administrative law judge may be taken by respondent or the Director upon a showing of good cause and with the approval of, and under such conditions as may be deemed appropriate by, the administrative law judge. Depositions may be taken upon oral or written questions, upon not less than ten days written notice to the other party, before any officer authorized to administer an oath or affirmation in the place where the deposition is to be taken. The requirement of ten days notice may be waived by the parties and depositions may then be taken of a witness and at a time and place mutually agreed to by the parties. When a deposition is taken upon written questions, copies of the written questions will be served upon the other party with the notice and copies of any written cross-questions will be served by hand or "Express Mail" not less then five days before the date of the taking of the deposition unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken shall file a copy of a transcript of the deposition signed by a court reporter with the administrative law judge and shall serve one copy upon the opposing party. Expenses for a court reporter and preparing, serving, and filing depositions shall be borne by the party at whose instance the deposition is taken.

(b) When the Director and the respondent agree in writing, a deposition of any witness who will appear voluntarily may be taken under such terms and conditions as may be mutually agreeable to the Director and the respondent. The deposition shall not be filed with the administrative law judge and may not be admitted in evidence before the administrative law judge unless he or she orders the deposition admitted in evidence. The admissibility of the deposition shall lie within the discretion of the administrative law judge who may reject the deposition on any reasonable basis including the fact that demeanor is involved and that the witness should have been called to appear personally before the administrative law judge.

§10.152 Discovery.

Discovery shall not be authorized except as follows:

(a) After an answer is filed under §10.136 and when a party establishes in a clear and convincing manner that discovery is necessary and relevant, the administrative law judge, under such conditions as he or she deems appropriate, may order an opposing party to:

(1) answer a reasonable number of written requests for admission or interrogatories;

(2) produce for inspection and copying a reasonable number of documents; and

(3) produce for inspection a reasonable number of things other than documents.

(b) Discovery shall not be authorized under paragraph (a) of this section of any matter which:

(1) will be used by another party solely for impeachment or cross-examination;

(2) is not available to the party under 35 U.S.C. §122;

(3) relates to any disciplinary proceeding commenced in the Patent and Trademark Office prior to Mar. 8, 1985;

(4) relates to experts except as the administrative law judge may require under paragraph (e) of this section.

(5) is privileged; or

(6) relates to mental impressions, conclusions, opinions, or legal theories of any attorney or other representative of a party.

(c) the administrative law judge may deny discovery requested under paragraph (a) of this section if the discovery sought:

(1) will unduly delay the disciplinary proceeding;

(2) will place an undue burden on the party required to produce the discovery sought; or

(3) is available (i) generally to the public, (ii) equally to the parties; or (iii) to the party seeking the discovery through another source.

(d) Prior to authorizing discovery under paragraph (a) of this section, the administrative law judge shall require the party seeking discovery to file a motion (§10.143) and explain in detail for each request made how the discovery sought is necessary and relevant to an issue actually raised in the complaint or the answer.

(e) The administrative law judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains

(1) A list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,

(2) a list of proposed witnesses,

(3) as to each proposed expert witness:

(i) an identification of the field in which the individual will be qualified as an expert;

(ii) a statement as to the subject matter on which the expert is expected to testify; and

(iii) a statement of the substance of the facts and opinions to which the expert is expected to testify,

(4) the identity of government employees who have investigated the case, and

(5) copies of memoranda reflecting respondent's own statements to administrative representatives.

(f) After a witness testifies for a party, if the opposing party requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness.

§10.153 Proposed findings and conclusions; post-hearing memorandum.

Except in cases when the respondent has failed to answer the complaint, the administrative law judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.

§10.154 Initial decision of administrative law judge.

(a) The administrative law judge shall make an initial decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefore with appropriate references to the record, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension or exclusion from practice, an order of reprimand, or an order dismissing the complaint. The administrative law judge shall file the decision with the Director and shall transmit a copy to the representative of the Director and to the respondent. In the absence of an appeal to the Commissioner, the decision of the administrative law judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the administrative law judge.

(b) The initial decision of the administrative law judge shall explain the reason for any penalty of reprimand, suspension or exclusion. In determining any penalty, the following should normally be considered:

(1) the public interest;

(2) the seriousness of the violation of the Disciplinary Rule;

(3) the deterrent effects deemed necessary; and

(4) the integrity of the legal profession; and

(5) any extenuating circumstances.

§10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under §10.154, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal, the Director shall serve a copy of the appeal. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief. Upon the filing of an appeal and a reply brief, if any, the Director shall transmit the entire record to the Commissioner.

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(b) The appeal will be decided by the Commissioner on the record made before the administrative law judge.

(c) The Commissioner may order reopening of a disciplinary proceeding in accordance with the principles which govern the granting of new trials. Any request to reopen a disciplinary proceeding on the basis of newly discovered evidence must demonstrate that the newly discovered evidence could not have been discovered by due diligence.

§10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse, or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Entry of a decision by the Commissioner is a final agency action in a disciplinary proceeding. In making a final decision, the Commissioner shall review the record or those portions of the record as may be cited by the parties in order to limit the issues. The Comissioner shall tranmit a copy of the final decision to the Director and to the respondent.

(b) A final decision of the Commissioner may dismiss a disciplinary proceeding, reprimand a practitioner, or may suspend or exclude the practitioner from practice before the Office.

§10.157 Review of Commissioner's final decision.

(a) Review of the Commissioner's final decision in a disciplinary case may be had by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 1–26 of the United States District Court for the District of Columbia.

(b) The Commissioner may stay a final decision pending review of the Commissioner's final decision.

§10.158 Suspended or excluded practitioner.

(a) A practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall not engage in unauthorized practice of patent, trademark and other non-patent law before the Office.

(b) Unless otherwise ordered by the Commissioner, any practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall:

(1) Within 30 days of entry of the order of suspension or exclusion, notify all bars of which he or she is a member and all clients of the practitioner for whom he or she is handling matters before the Office in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director.

(2) Within 30 days of entry of the order of suspension or exclusion, surrender a client's active Office case files to (i) the client or (ii) another practitioner designated by the client.

(3) Not hold himself or herself out as authorized to practice law before the Office.

(4) Promptly take any necessary and appropriate steps to remove from any telephone, legal, or other directory any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice patent, trademark or other non-patent law before the Office, and within 30 days of taking those steps, file with the Director an affidavit describing the precise nature of the steps taken.

(5) Not advertise the practitioner's availability or ability to perform or render legal services for any person having immediate, prospective, or pending business before the Office.

(6) Not render legal advice or services to any person having immediate, prospective, or pending business before the Office as to that business.

(7) Promptly take steps to change any sign identifying a practitioner's or the practitioner's firm's office and the practitioner's or the practitioner's firm's stationary to delete therefrom any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice law before the Office.

(8) Within 30 days, return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

(c) A practitioner who is suspended or excluded from practice before the Office and who aides another practitioner in any way in the other practitioner's practice of law before the Office, may, under the direct supervision of the other practitioner, act as a para-legal for the other practitioner or perform other services for the other practitioner which are normally performed by lay-persons, *provided:*

(1) the practitioner who is suspended or excluded is:
(i) a salaried employee of:

(A) the other practitioner;
(B) the other practitioner's law firm; or
(C) a client-employer who employs the other practitioner as a salaried employee;

(2) the other practitioner assumes full professional responsibility to any client and the Office for any work performed by the suspended or excluded practitioner for the other practitioner;

(3) the suspended or excluded practitioner, in connection with any immediate, prospective, or pending business before the Office, does not:

(i) communicate directly in writing, orally, or otherwise with a client of the other practitioner;

(ii) render any legal services to a client of the other practitioner; or

(iii) meet in person or in the presence of the other practitioner with:

(A) any Office official in connection with the prosecution of any patent, trademark, or other case;

(B) any client of the other practitioner, the other practioner's law firm, or the client-employer of the other practitioner;

(C) any witness or potential witness which the other practitioner, the other practitioner's law firm, or the other practitioner's client-employer may or intends to call as a witness in any proceeding before the Office. The term "witness" includes individuals who will testify orally in a proceeding before, or sign an affidavit or any other document to be filed in, the Office.

(d) When a suspended or excluded practitioner acts as a para-legal or performs services under paragraph (c) of this section, the suspended or excluded practitioner shall not thereafter be reinstated to practice before the Office unless:

(1) the suspended or excluded practitioner shall have filed with the Director an affidavit which (i) explains in detail the precise nature of all para-legal or other services performed by the suspended or excluded practitioner and (ii) shows by clear and convincing evidence that the suspended or excluded practitioner has complied with the provisions of this section and all Disciplinary Rules, and

(2) the other practitioner shall have filed with the Director a written statement which (i) shows that the other practitioner has read the affidavit required by subparagraph (d) (1) of this section and that the other practitioner believes every statement in the affidavit to be true and (ii) states why the other practitioner believes that the suspended or excluded practitioner has complied with paragraph (c) of this section.

§10.159 Notice of suspension or exclusion.

(a) Upon issuance of a final decision reprimanding a practitioner or suspending or excluding a practitioner from practice before the Office, the Director shall give notice of the final decision to appropriate employees of the Office and to interested departments, agencies, and courts of the United States. The Director shall also give notice to appropriate authorities of any State in which a practitioner is known to be a member of the bar and any appropriate bar association.

(b) The Director shall cause to be published in the *Official Gazette* the name of any practitioner suspended or excluded from practice. Unless otherwise ordered by the Commissioner, the Director shall publish in the *Official Gazette* the name of any practitioner reprimanded by the Commissioner.

(c) The Director shall maintain records, which shall be available for public inspection, of every disciplinary proceeding where a practitioner is reprimanded, suspended, or excluded unless the Commissioner orders that the proceeding be kept confidential.

§10.160 Petition for reinstatement.

(a) A petition for reinstatement of a practitioner suspended for a period of less than five years will not be considered until the period of suspension has passed.

(b) A petition for reinstatement of a practitioner excluded from practice will not be considered until five years after the effective date of the exclusion.

(c) An individual who has resigned under §10.133 or who has been suspended or excluded may file a petition for reinstatement. The Director may grant a petition for reinstatement when the individual makes a clear and convincing showing that the individual will conduct himself or herself in accordance with the regulations of this part and that granting a petition for reinstatement is not contrary to the public interest. As a condition to reinstatement, the Director may require the individual to:

(1) meet the requirements of §10.7, including taking and passing an examination under §10.7(b) and

(2) pay all or a portion of the costs and expenses, not to exceed $1,500, of the disciplinary proceeding which lead to suspension or exclusion.

(d) Any suspended or excluded practitioner who has violated the provisions of §10.158 during his or her period of suspension or exclusion shall not be entitled to reinstatement until such time as the Director is satisfied that a period of suspension equal in time to that ordered by the Commissioner or exclusion for five years has passed during which the suspended or excluded practitioner has complied with the provisions of §10.158.

(e) Proceedings on any petition for reinstatement shall be open to the public. Before reinstating any suspended or excluded practitioner, the Director shall publish in the *Official Gazette* a notice of the suspended or excluded practitioner's petition for reinstatement and shall permit the public a reasonable opportunity to comment or submit evidence with respect to the petition for reinstatement.

§10.161 Savings clause.

(a) A disciplinary proceeding based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of this part.

(b) No practitioner shall be subject to a disciplinary proceeding under this part based on conduct engaged in before the effective date hereof if such conduct would not have been subject to disciplinary action before such effective date.

§10.162–10.169 [reserved]

§10.170 Suspension of rules.

(a) In an extraordinary situation, when justice requires, any requirement of the regulations of this part which is not a requirement of the statutes may be suspended or waived by the Commissioner or the Commissioner's designee, *sua sponte,* or on petition of any party, including the Director or the Director's representative, subject to such other requirements as may be imposed.

(b) Any petition under this section will not stay a disciplinary proceeding unless ordered by the Commissioner or an administrative law judge.

GERALD J. MOSSINGHOFF
Dec. 21, 1984. *Commissioner of Patents and Trademarks*

[1052 OG 4]

(173) **Patent Cooperation Treaty (PCT) Update**
Accession to the Patent Cooperation Treaty (PCT) by Benin

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Benin deposited its instrument of accession to the PCT on 26 Nov. 1986. Therefore, according to PCT Article 63(2), Benin may be designated in international applications filed on and after 26 Feb. 1987.

It should be noted that since Benin is a member of the African Intellectual Property Organization (OAPI), any designation of Benin has the effect of a designation of that country for the purposes of a regional patent issued by OAPI in Yaounde, Cameroon.

See listing of PCT Member Countries on next page.

Listing of PCT Member Countries

	Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1)	Central African Republic*	Accession	15 September 1971	01 June 1978
(2)	Senegal*	Ratification	08 March 1972	01 June 1978
(3)	Madagascar	Ratification	27 March 1972	01 June 1978
(4)	Malawi	Accession	16 May 1972	01 June 1978
(5)	Cameroon*	Accession	15 March 1973	01 June 1978
(6)	Chad*	Accession	12 February 1974	01 June 1978
(7)	Togo*	Ratification	28 January 1975	01 June 1978
(8)	Gabon*	Accession	06 March 1975	01 June 1978
(9)	United States of America	Ratification	26 November 1975	01 June 1978
(10)	Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)	Congo*	Accession	08 August 1977	01 June 1978
(12)	Switzerland**	Ratification	14 September 1977	01 June 1978
(13)	United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)	France**	Ratification	25 November 1977	01 June 1978
(15)	Soviet Union	Ratification	29 December 1977	01 June 1978
(16)	Brazil	Ratification	09 January 1978	01 June 1978
(17)	Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)	Sweden**	Ratification	17 February 1978	01 June 1978
(19)	Japan	Ratification	01 July 1978	01 October 1978
(20)	Denmark	Ratification	01 September 1978	01 December 1978

(21)	Austria**	Ratification	23	January 1979	23	April 1979
(22)	Monaco	Ratification	22	March 1979	22	June 1979
(23)	Netherlands**	Ratification	10	April 1979	10	July 1979
(24)	Romania	Accession	23	April 1979	23	July 1979
(25)	Norway	Ratification	01	October 1979	01	January 1980
(26)	Liechtenstein**	Accession	19	December 1979	19	March 1980
(27)	Australia	Accession	31	December 1979	31	March 1980
(28)	Hungary	Ratification	27	March 1980	27	June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08	April 1980	08	July 1980
(30)	Finland	Ratification	01	July 1980	01	October 1980
(31)	Belgium**	Ratification	14	September 1981	14	December 1981
(32)	Sri Lanka	Accession	26	November 1981	26	February 1982
(33)	Mauritania*	Accession	13	January 1983	13	April 1983
(34)	Sudan	Accession	16	January 1984	16	April 1984
(35)	Bulgaria	Accession	21	February 1984	21	May 1984
(36)	Republic of Korea (South Korea)	Accession	10	May 1984	10	August 1984
(37)	Mali*	Accession	19	July 1984	19	October 1984
(38)	Barbados	Accession	12	December 1984	12	March 1985
(39)	Italy**	Ratification	28	December 1984	28	March 1985
(40)	Benin*	Accession	26	November 1986	26	February 1987

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

Feb. 4, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1076 OG 3]

(174) Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 30 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 31 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00

International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00

U.S. National Stage fees	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

Nov. 17, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1085 OG 38]

(175) Minimum Requirements for Acceptance of Applications Under 35 U.S.C. 371 (the National Stage of PCT)

The Patent and Trademark Office is continuing to receive application papers which do not clearly identify whether the papers (1) are being submitted to enter the national stage of the Patent Cooperation Treaty (PCT) under 35 U.S.C. 371 or (2) are being filed as a regular national application under 35 U.S.C. 111.

Attention is directed to the notice in the *Official Gazette* at 1070 O.G. 11 titled "Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371" wherein at item eight it is stated

> "(8) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111."

To clearly indicate an international application is being filed under 35 U.S.C. 371 the applicant should use the "Transmittal Letter for United States Designated Office" (Form PTO–1390) as the transmittal letter.

Alternatively, one of the following indications may be used:

> 1) the applicant shall clearly state in the transmittal or cover letter that he or she is filing under 35 U.S.C. 371 or entering the national stage under the PCT; or
>
> 2) the applicant clearly identifies in the oath or declaration the specification to which it is directed by referring to a particular international application by PCT Serial Number and International Filing Date and that he or she is executing the declaration as, and seeking a U.S. Patent as, the inventor of the invention described in the identified international application.

Applicants are cautioned that the identification of the international application, in the oath or declaration or otherwise, as a prior filed application for priority purposes is *not* considered to be an indication of an intention to file under 35 U.S.C. 371.

If there are any conflicting instructions as to which section of the statute (371 or 111) is intended the application will be accepted under 35 U.S.C. 111. It is strongly recommended that applicant use the Form PTO–1390 in all cases where a filing under 35 U.S.C. 371 is intended.

Mar. 16, 1987. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1077 OG 13]

(176) Patent Cooperation Treaty: Implementing Legislation and Withdrawal of the Reservation to Chapter II.

On Oct. 9, 1986, the U.S. Senate gave its advice and consent to withdrawal by the United States of its declaration not to be bound by chapter II of the Patent Cooperation Treaty (PCT). Public Law 99–616, that amends title 35, United States Code, to implement U.S. adherence to PCT chapter II was enacted on Nov. 6, 1986.

On Apr. 1, 1987, the President notified the Director General of the World Intellectual Property Organization of the withdrawal of the declaration by the United States. As the withdrawal takes effect three months after the date of notification, the United States will be bound by the provisions of PCT chapter II on July 1, 1987.

A notice of proposed rulemaking concerning PCT chapter II was published in the *Federal Register* on Mar. 4, 1987 (52 Fed. Reg. 6696) and was reprinted in the *Official Gazette* on Mar. 17, 1987, (1076 OG 29). The text of the President's notification and of Public Law 99–616 are reprinted below.

Apr. 13, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

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NOTIFICATION

RONALD REAGAN

PRESIDENT OF THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

CONSIDERING THAT:

The Patent Cooperation Treaty, with Regulations, done at Washington June 19, 1970, was signed by the United States on that date and ratified by the United States on November 27, 1973, subject to three declarations, in pursuance of the advice and consent of the Senate;

The United States deposited its instrument of ratification with the Director General of the World Intellectual Property Organization on November 26, 1975, and the Treaty entered into force for the United States on January 24, 1978;

At the request of the President, the Senate of the United States of America by its resolution of October 9, 1986, two-thirds of the Senators present concurring therein, gave its advice and consent to withdraw one of the declarations made when the United States deposited its instrument of ratification, to wit, under Article 64(1)(a), the United States would not be bound by the provisions of Chapter II of the Treaty;

NOW, THEREFORE, I, Ronald Reagan, President of the United States of America, hereby give notice and confirm the withdrawal of the declaration by the United States regarding Chapter II of the said Treaty.

IN TESTIMONY WHEREOF, I have signed this instrument withdrawing the said declaration and caused the seal of the United States of America to be affixed.

DONE at the city of Washington this twenty-seventh day of March in the year of our Lord one thousand nine hundred eighty-seven and of the Independence of the United States of America the two hundred eleventh.

By the President: Ronald Reagan

George P. Shultz
Secretary of State

Public Law 99–616
99th Congress

An Act

To amend the patent laws implementing the Patent Cooperation Treaty.

Nov. 6, 1986
[S. 1138]
35 USC 351 note.

28 UST 7645.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Act to authorize
the United States to participate in chapter II of the Patent Cooperation Treaty".

SEC. 2. (a) Section 351(a) of title 35, United States Code, is amended by striking out ", excluding chapter II thereof".

(b) Section 351(b) of title 35, United States Code, is amended by striking out "excluding part C thereof".

(c) Section 351(g) of title 35, United States Code, is amended by—

(1) striking out "term" and inserting in lieu thereof "terms";

(2) inserting "and 'International Preliminary Examining Authority' " after "Authority"; and

(3) striking out "means" and inserting in lieu thereof "mean".

(d) Section 361(d) of title 35, United States Code, is amended to read as follows:

"(d) The international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall either be paid on filing of an international application or within such later time as may be fixed by the Commissioner.".

SEC. 3. The item relating to section 362 in the analysis for chapter 36 of title 35, United States Code, is amended to read as follows:

"362. International Searching Authority and International Preliminary Examining Authority.".

SEC. 4. Section 362 of title 35, United States Code, is amended to read as follows:

"§362. International Searching Authority and International Preliminary Examining Authority

"(a) The Patent and Trademark Office may act as an International Searching Authority and International Preliminary Examining Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau, and may discharge all duties required of such Authorities, including the collection of handling fees and their transmittal to the International Bureau.

"(b) The handling fee, preliminary examination fee, and any additional fees due for international preliminary examination shall be paid within such time as may be fixed by the Commissioner.".

SEC. 5. Section 364(a) of title 35, United States Code, is amended by—

(a) striking out "or", first occurrence and inserting in lieu thereof ",";

(b) inserting "International Preliminary Examining Authority" after "Authority, or"; and

(c) striking out "both".

SEC. 6 Section 368(c) of title 35, United States Code, is amended by—

(a) striking out the second occurrence of "or" and inserting in lieu thereof ",", and

(b) striking out "both" and inserting in lieu thereof "International Preliminary Examining Authority".

SEC. 7. (a) Section 371(a) of title 35, United States Code, is amended to read as follows:

"(a) Receipt from the International Bureau of copies of international applications with any amendments to the claims, international search reports, and international preliminary examination reports including any annexes thereto may be required in the case of international applications designating or electing the United States."

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2), or under article 39(1)(a) of the treaty".

(c) Section 371(c)(4) of title 35, United States Code, is amended by striking the "." and inserting in lieu thereof ";".

(d) Section 371(c) of title 35, United States Code, is amended by adding at the end thereof the following new paragraph (5):

"(5) a translation into the English language of any annexes to the international preliminary examination report, if such annexes were made in another language.".

(e) Section 371(d) of title 35, United States Code, is amended by adding at the end thereof the following sentence: "The requirement of subsection (c)(5) shall be complied with at such time as may be fixed by the Commissioner and failure to do so shall be regarded as cancellation of the amendments made under article 34(2)(b) of the treaty"

(f) Section 371(e) of title 35, United States Code, is amended by inserting "or article 41" after "28"

SEC. 8. (a) Section 376(a) of title 35, United States Code, is amended by—

(1) inserting "and the handling fee" after the first occurrence of "fee";

(2) striking "amount is" and inserting in lieu thereof "amounts are",

(3) redesignating paragraph (5) as paragraph (6); and
(4) inserting the following new paragraph (5):
"(5) A preliminary examination fee and any additional fees (see section 362(b))."
(b) Section 376(b) of title 35, United States Code, is amended by—
(1) inserting "and the handling fee" after the first occurrence of "fee' in the first sentence; and
(2) inserting "the preliminary examination fee and any additional fees," after "fee," in the third sentence.

Effective date.
35 USC note.
28 UST 7645.

SEC. 9. Sections 2 through 8 of this Act shall come into force on the same day as the effective date of entry into force of chapter II of the Patent Cooperation Treaty with respect to the United States, by virtue of the withdrawal of the declaration under article 64(1)(a) of the Patent Cooperation Treaty. It shall apply to all international applications pending before or after its effective date.

Approved Nov. 6, 1986.

LEGISLATIVE HISTORY—S. 1230:

SENATE REPORTS: No. 99–275 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 132 (1986):
Oct. 16, considered and passed Senate.
Oct. 17, considered and passed House.

[1078 OG 10–13]

(177) **Implementation of Chapter II of the Patent Cooperation Treaty**

This notice is intended to be a summary of various notices published to implement Chapter II of the Patent Cooperation Treaty (PCT) on July 1, 1987.

1. *Withdrawal of reservation and implementing legislation.*

A copy of the withdrawal of the reservation as to Chapter II of the PCT under PCT Article 64(6)(b) and a copy of Public Law 99–616 implementing Chapter II of the PCT were published in the Official Gazette of May 12, 1987 at 1078 O.G. 10–13.

The proposed rule change relating to the implementation of Chapter II of the PCT was published on Mar. 4, 1987 in the Federal Register at 52 F.R. 6696–6707 and on Mar. 17, 1987 in the Official Gazette at 1076 O.G. 29–40. The final rules were published on May 28, 1987 in the Federal Register 52 F.R. 20038–20052 and on June 16, 1987 in the Official Gazette at 1079 O.G. 32.

A listing of all current member countries of the PCT was published on Mar. 3, 1987 at 1076 O.G. 3. After July 1, 1987 only Denmark, Norway, Liechtenstein, Switzerland and the Republic of Korea (South Korea) retain reservations as to Chapter II of the PCT.

A listing of the level of PCT fees effective July 1, 1987, both because of rulemaking and a change in the exchange rate was published on June 23, 1987 in the Official Gazette at 1079 O.G. 50.

A notice clarifying the requirements for entering the national stage in the United States under 35 U.S.C. 371 was published on Apr. 14, 1987 at 1077 O.G. 13.

2. *International Preliminary Examining Authorities*

The United States has informed the Director General of the World Intellectual Property Organization (WIPO) that the United States Patent and Trademark Office (USPTO) will serve as an International Preliminary Examining Authority for any international application filed in the United States Receiving Office and for any international application for which the USPTO has served as the International Searching Authority.

Applicants who have filed their international applications in the USPTO as a Receiving Office may choose to have the European Patent Office (EPO) serve as their International Preliminary Examining Authority *if* (1) the EPO has served as the International Searching Authority for the international application and (2) the demand filed with the EPO is one of the first 500 demands filed by applicants who have filed their international applications in the United States Receiving Office in one of the 3 years beginning July 1, 1987.

The attention of applicants desiring to use the EPO as an International Preliminary Examining Authority is also directed to the notice titled "Information for PCT applicants concerning the procedure before the EPO as an International Preliminary Examining Authority under Chapter II of the PCT" published in the Official Journal of the European Patent Office in volume 12/1986 at pages 441–445.

A copy of the "Memorandum of Understanding" to monitor the number of demands filed in the EPO by U.S. applicants between the USPTO and EPO appears below.

DONALD J. QUIGG,
June 11, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks United States Patent and Trademark Office.*

Memorandum of Understanding

Procedures for monitoring and processing demands submitted to the European Patent Office by U.S. applicants who filed their international applications with the United States Receiving Office.

Purpose

The purpose of this memorandum is to set forth the procedures to be used to monitor the number of demands for international preliminary examination filed by U.S. applicants in the European Patent Office (EPO) in respect of international applications filed with the United States Receiving Office (hereinafter referred to as "demands filed in the EPO by U.S. applicants"). Such monitoring is important in view of the limit of 500 international preliminary examination reports which the EPO has agreed to establish during each of the first three years that PCT Chapter II is in effect as to the United States of America. The memorandum also sets forth the processing procedures for any demands filed in excess of the agreed to-amount.

Monitoring of Number of Demands

It is essential that U.S. applicants be informed as to the number of demands which have already been filed in the EPO by U.S. applicants, especially where the number of demands filed in the EPO is approaching 500.

In order to provide such numerical information to the U.S. applicants, the EPO will provide to the USPTO, each month during the first three years by telex, the cumulative number of demands filed in the EPO by U.S. applicants during that particular year. The USPTO will then publish a notice which indicates the number of demands filed in the EPO by U.S. applicants as of a particular date, in its Official Gazette. The number of demands filed, based upon the latest known information, will also be supplied by telephone or telex to interested persons by both the EPO and USPTO.

Processing of Demands in Excess of 500

Since the EPO will only accept 500 demands a year from U.S. applicants, the USPTO will accept any demands beyond the 500 limit filed in the EPO by U.S. applicants.

Upon receipt by the EPO of the 501st and subsequent demands from a U.S. applicant, the EPO will promptly notify the applicant that it is not competent under PCT Rule 59.1 to receive the demand. The EPO will also immediately telex or telephone the USPTO and inform it of the international application serial number so that the USPTO may make immediate contact with the applicant.

The EPO will refund any fees paid by the applicant to the EPO and indicate that only the USPTO is competent to receive the demand and establish the international preliminary examination report, and that the demand is being forwarded to the USPTO. The EPO will indicate the date of receipt of the demand on the demand and promptly forward it to the USPTO for further processing. The EPO will be considered to be the agent of the USPTO for purposes of receiving and dating demands. The USPTO will correspond with the applicant concerning the demand and require the payment of fees to the USPTO under PCT Rules 57.4 and 58.2.

For purposes of this procedure, the contact person in the USPTO is Louis O. Maassel (telephone 703–557–3070) and the contact person in the EPO is Mr. Colin Philpott (telephone 2399–2479) for substantive and organizational matters, or Mrs. M. Houyez-Stevens (telephone 2399–2423) for numerical information.

PAUL BRAENDLI
President,
European Patent Office.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks United States Patent and Trademark Office.

[1080 OG 2]

(178) **Patent Cooperation Treaty (PCT) Update**

Translation of the International Preliminary Examination Report (IPER) into Russian no longer required, Withdrawal by Japan of the reservation concerning filing a translation of the international application by 20 months and Number of Demands received by the IPEA/EP from U.S. applicants.

Translation of the IPER into Russian no longer required

The following information was released by the World Intellectual Property Organization (WIPO) on July 17, 1987.

Pursuant to PCT Rule 72.1 the USSR State Committee for Inventions and Discoveries has informed the International Bureau of a change in the languages into which it requires a translation of the International Preliminary Examination Report (IPER) by the International Bureau.

> As from July 8, 1987, a translation of the IPER into Russian will no longer be required if the IPER has been established in English . . . .

Consequently, as of July 8, 1987, the payment of a multiple of the handling fee under PCT Rule 57.2(a) for a translation into Russian is no longer required if the Soviet Union is elected in demand for International Preliminary Examination filed in English. Nor will the supplement to the handling fee under PCT Rules 57.1(b) and 57.2(b) apply if the Soviet Union is elected in a later election under PCT Rule 56 filed with the International Bureau on or after July 8, 1987.

Withdrawal by Japan of the reservation concerning filing a translation of the International application by 20 months from the priority date

On Sept. 16, 1987, WIPO announced that on Sept. 8, 1987, the Government of Japan notified the withdrawal of the declaration made by it under PCT Article 64(2)(a) concerning the time limit applicable under Chapter II of the PCT for the furnishing of a translation of the international application. Thus, Japan will become bound by the provisions of PCT Chapter II without any reservations on Dec. 8, 1987.

Pursuant to the said declaration, the translation of an international application into Japanese must at present be furnished to the Japanese Patent Office in all cases within 20 months from the priority date.

The withdrawal of the said declaration has the effect that, as from Dec. 8, 1987, the provisions of PCT Article 39 (1)(a) (under which a translation of the international application into Japanese must be furnished within 30 months from the priority date) will apply in respect of the Japanese Patent Office as elected Office.

This 30 month time limit applies also to international applications which have been filed before Dec. 8, 1987, provided that Japan has been elected in a demand for international preliminary examination or in a later election prior to the expiration of the 19th month from the priority date *and* that on Dec. 8, 1987, 20 months from the priority date have not expired.

Number of demands for International Preliminary Examination filed by U.S. applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of Oct. 31, 1987

Pursuant to the Memorandum of Understanding between the European Patent Office (EPO) and the USPTO concerning monitoring Demands submitted to the IPEA/EP by U.S. applicants, published at 1080 O.G. 2 on July 7, 1987, the number of Demands filed by U.S. applicants (who filed their international applications with the United States Receiving Office) with the IPEA/EP as of Oct. 31, 1987 was 70.

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1085 OG 30]

(179) **Helpful Hints**

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1. APPEALS

a. *Appeal Fees in Patent Cases*

Appeal fees deficiencies are frequent, causing necessity for extension fees to cover the additional time consumed in making up the appeal fee deficiency. Ensuring proper payment at time of filing the appeal will save money and time.

b. *Notices of Appeal to the United States Court of Appeals for the Federal Circuit*

Notices of appeal to the United States Court of Appeals for the Federal Circuit should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Improperly addressing such communications, e.g. to the examining groups, may delay delivery to the Solicitor.

2. APPLICATION FILES

a. *Requests for Allowed Patent Application Files*

Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is especially directed to out-of-town requesters who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance.

Inquiries and requests should be directed to the Correspondence Section at (703) 557-6397 or (703) 557-6398 between the hours of 8:30 AM through 5:00 PM on weekdays.

b. *Returning Files to the File Information Unit (FIU)*

Customers are reminded that file histories obtained through the FIU are official government records which must not be removed from the confines of the Patent Search Room at any time. Such files must be returned to the File Information Unit by 7:45 pm on the same day they are obtained.

FIU personnel will continue to periodically monitor this problem. Should individual patterns of abuse be discerned, administrative sanctions up to termination of access privileges may be applied.

3. APPLICATION PAPERS — IDENTIFICATION

a. *Disclosure Statements*

If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.

b. *Improving Accuracy and Speed of Routing of Patent Application Related Papers*

To improve the accuracy and speed of routing patent application-related papers, all papers must contain, at a minimum, the serial number of the application. Additionally, the word "Patent" should be in the upper right hand corner and the filing date, inventor's names and title of the invention should be included on the paper.

Responses to Notices of Incomplete Application and Notices to File Missing Parts must be accompanied by a copy of the Notice form. Otherwise, the response may not be matched to the appropriate application in a timely manner.

c. *Information to be Included for Proper Routing of Application Papers*

A great deal of delay and wasted time results in trying to match papers bearing incorrect or incomplete data with applications. Because some trademark papers are not clearly identified as pertaining to trademark applications, they are frequently misrouted to a patent examining group.

On all papers related to *patent* applications, type the word "Patents" in the upper right-hand corner of the document. Also, please include the correct 8-digit serial number, filing date, inventor's name, and title of the invention. Additionally include the examiner's name and group art unit number found on the most recent letter from the PTO.

For all papers related to *trademark* applications, type the word "Trademark" in the upper right-hand corner of the document. Also, please set forth the applicant's name, correct serial number (including series number which currently is "73"), filing date, law office, examining attorney, and mark.

d. *Papers Filed Prior to Receipt of Serial Number*

After a patent or trademark application is filed, please avoid filing additional papers (other than those required by the Office) until the Filing Receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.

e. *Papers With No Particular Time Requirement*

File patent and trademark documents which have no particular time or sequence requirement with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority in patent applications, changes of Power of Attorney, or changes in Mailing Address following first action.

f. *Response to Final Rejection In Patent Applications– Expediting Processing*

See section under Mail.

g. *Separation of Various Application Papers*

In *patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel [CFR 1.4(c)]. However, please include a statement in the amendment/response describing the paper being filed.

h. *Supplemental or Preliminary Amendments*

Where a supplemental or preliminary amendment is found necessary in patent or trademark applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.

i. *Transmittal Letters for Deposit Account Charges*

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

4. **ASSIGNMENTS**

a. *Ensuring Correct Printing on Trademark Registration*

To ensure the correct printing of ownership information on a Trademark Registration at issue date, provide the trademark examining attorney with the reel and frame number of the appropriate assignment document as soon as you are notified of it.

b. *Expediting Recording*

When requesting correction or updating of a previously recorded patent or trademark assignment document, providing the reel and frame number of that document to the Assignment Branch will greatly expedite the recording process.

c. *Return Addresses*

Assignment documents should be filed with accompanying transmittal letters bearing current return addresses to assure prompt processing.

d. *Return of Original Assignment Documents*

Some assignment documents are being filed with applications for patents without a transmittal letter attached to the assignments. Therefore, no address is available for return of the original assignment document by the Assignment Branch.

A transmittal letter that contains the firm's name and address must be attached to each assignment document filed to ensure accurate return of assignment documents.

5. **CERTIFICATES OF CORRECTION**

a. *Accurate Requests*

Many requests for "Certificate of Correction" result from a perfunctory comparison of the issued patent with the attorney's application file, without investigating whether the recitation in the issued patent is correct. In many instances, change to the PTO file wrapper has been caused by the examiner prior to printing of the patent in order to make appropriate corrections to the file.

6. **CERTIFICATION SERVICES**

a. *Expedited Service for Patent Applications-As-Filed*

If there is a need for special service, for example to meet a priority date within a short period of time, the order must be marked "RUSH" with the date/time needed and reason for the need. The order should be hand-delivered to the Examination Services Division at CP2-7D19. Orders may also be mailed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, clearly marked to the attention of the Manager, Examination Services Division. However, because mail orders must be initially handled by the Mail Room, requesters are cautioned that turnaround time will be several days longer than for hand-delivered orders. Every effort will be made to fill all "RUSH" orders timely, to the extent resources are available.

b. *Methods of Ordering*

Mail Orders — The address for mail orders is:

Box 10
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Hand-carried Orders — Hand-carried requests for certification service should be taken to the Public Service Window in the North Stacks of the Patent Search Room where they can be placed in the Certification Order Receipt Box or given to the attendant. For security reasons, the public is not permitted access to the Certification Branch itself.

c. *Processing Time*

The current goal for furnishing certified copies of applications-as-filed is 17 days from receipt in the Mail Room of the Patent and Trademark Office to mailing of the completed order by the Certification Branch. The 17 days includes 4 work days for Mail Room and Finance processing, 9 work days in the Certification Branch and 4 weekend days that accrue over the 13 work days.

The 17-day goal applies to those orders for which microfiche of applications-as-filed are available in the Certification Branch. The microfiche for a small percentage of the total orders for certified copies of applications-as-filed must be retrieved from a remote location, or be replaced due to damage or correction. The 17-day goal does not apply to these orders.

d. *PTO vs Public-Supplied Copies for Certification*

Requests for all certified copies of applications-as-filed and file wrapper/contents of pending patent and trademark applications will be filled with PTO supplied copies of original source documents. No public supplied copies will be accepted.

The public may submit copies of Registered Trademarks, Registered Trademark Files, Patented Files, and Patents for certification by the Certification Branch.

e. *Questions Frequently Asked*

Q. What does "certified" mean?
A. Authentication of copies by ribbon and seal of the PTO with the signature of an officer authorized by the Commissioner of Patents and Trademarks.

Q. What does an application consist of?
A. (1) Specification (2) Claims (3) Oath or Declaration (4) Drawings, when necessary, and (5) Filing Fee.

Q. What does a file wrapper and contents (file history) consist of?
A. The original application papers plus all correspondence between the applicant/attorney of record/assignee and the PTO.

Q. Why are certified copies of applications-as-filed required?
A. Since the rights granted by a U.S. patent extend only throughout the territory of the U.S. and have no affect in a foreign county, an inventor who wishes patent protection in other countries must apply for a patent in that country by filing a certified copy of his or her U.S. application.

Q. What regulations govern the filing of a U.S. application in a foreign country?
A. There is a treaty relating to patents which involves 92 countries and is known as the Paris Convention for the Protection of Industrial Property. It provides that each country guarantees to the citizens of other countries the same patent rights that it gives to its own citizens.

Q. Can anyone request a copy of a pending application?
A. No. Pending applications are preserved in secrecy. No information or copies may be obtained without written authority of the applicant, attorney of record, or the assignee, if any. Such written consent must accompany the request for copies.

Q. Can orders for copies be placed by phone?
A. No. All orders must be in writing.

Q. May office copies of my application be sent to the PTO for certification?
A. No. We do not certify copies prepared outside the PTO.

Q. Will the PTO mail certified copies ordered directly to a foreign country?
A. No. With respect to the exportation of technical data, the PTO discontinued the practice of forwarding direct to any foreign country certified copies of U.S. applications ordered by residents of the United States.

Q. Are cited references in a file automatically furnished when a file wrapper and contents is requested?
A. No. Cited references are not included as papers comprising the file history. References cited are furnished only if specifically requested.

Q. Can cited references, when requested, be certified with the file wrapper and contents under one certificate?
A. No. Each reference must be certified separately.

Q. Are there instances when references are included in a file wrapper and contents?
A. Yes. If the references are submitted as attachments to a response from the applicant and if such response is entered and made a part of the file.

Q. Exclusive of applications-as-filed and file wrappers and contents of patented files, what other types of copies may be obtained from the Certification Branch?
A. The following items may be obtained:

a. Certified copies of issued U.S. patents and designs.
b. Certified copies of foreign patents.
c. Certified copies of publications from the Scientific Library.
d. Certified copies of Office letters.
e. Certified duplicate filing receipts.
f. Certified copies of an assignment and application-as-filed, under one certificate.
g. Copies of disclosure documents.
h. Copies of the following files:

- Defensive publication files.
- Reexamination files.
- Interference files.
- Trademark files.
- Opposition files.
- Concurrent use proceedings files.
- Statutory Invention Request
- Certified copies of assignment documents.
- Abstract of title.

f. Status Requests or Problems

For status inquiries, call the Input and Records Control Unit of the Certification Branch at 557-1587. For problem situations call the Manager of the Certification Branch, at 557-1552.

7. **DRAWINGS FOR PATENT APPLICATIONS**

a. *Proper Identification of Formal or Substitute Drawings*

When the Office receives formal or substitute drawings, a cover letter identifying the application by serial number should accompany them. It is extremely difficult to associate the drawings with the files when this information is missing. The application serial number should be placed on the sheet of drawing in accordance with 37 CFR 1.84(1).

According to 37 CFR 1.84(1), identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2½ inches may be placed in a

centered location between the side edges within three-fourths inch of the top edge. Either this marking technique on the front of the drawing or the placement of this information on the back of the drawing is acceptable. However, for identification of the serial number, the PTO prefers that it be placed on the front.

b. *Proper Identification of New Application Drawings*

During pre-examination processing, drawings are temporarily separated from the rest of the application papers. To facilitate the matching of drawings with the application, it would be helpful if the applicant's name, docket number, and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels.

c. *Submission of Copies of Drawings Rather than Originals*

For your convenience and for more effective handling of any drawing corrections which may be necessary, please DO NOT SUBMIT ORIGINAL DRAWINGS WITH PATENT APPLICATIONS. DO SUBMIT THREE HIGH QUALITY COPIES. If the copies submitted pass the formality review and patent examination, no substitute drawings will be necessary. If corrections are necessary, they should be made to the original drawings. Either one good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

d. *Timeliness of Submission of Corrected Drawings in Allowed Cases*

When drawings need to be corrected in an allowed patent application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

8. **EXTENSIONS OF TIME IN PATENT CASES**

a. *Appropriateness*

In essence, where applicants' approval is not needed to amend the claims, no extension of time is required. However, if applicants' approval is required and applicants did not file their response within two months of the Final Rejection, the appropriate extension of time must be purchased.

Also, it should be noted that extensions of time may be requested under 37 CFR 1.136(a) for extending the time required to pay for the request for an oral hearing before the Board of Patent Appeals and Interferences.[MPEP §1209(1)]. The time for a request and fee for an oral hearing is one month from the date of the Examiner's Answer or any supplemental Examiner's Answer.

Extensions of time by fee payment under 37 CFR 1.136 (a) are appropriate for filing of the Brief on Appeal in regular applications. No more than four months may be granted under 37 CFR 1.136 (a). Beyond those four months, any further request must show sufficient cause under 37 CFR 1.136 (b), and no additional extension fee is required.

An extension of time is not required in order to hold an interview with the examiner. However, after the period for response has ended, an extension is required for the purpose of filing a follow-up amendment by applicant and/or for the entry of an Examiner's Amendment requiring approval of the applicant.

Extensions of time are appropriate for the purpose of achieving continuity between parent and continuing applications. A separate paper requesting the extension of time must be filed in the *parent* application. It would be useful to file a *copy* of that request or petition with the papers constituting the filing of the continuing application.

b. *Instances Not Permitted*

An extension of time under 37 CFR 1.136(a) is not permitted in the following instances:

(1) Where an applicant is so notified in a Office action as, for example, in a Reissue application involving a litigated patent.
(2) Where the application is involved in an interference declared pursuant to 37 CFR 1.611. See 37 CFR 1.645 for provisions governing extensions of time in interference proceedings.
(3) In reexamination proceedings. See 37 CFR 1.550(c) for extensions of time in reexamination proceedings.
(4) In PCT international applications. Under PCT Rule 26.2, extensions are permitted for correction of PCT Article 14 defects in international applications before the Receiving Office.

c. *Insufficient Fees*

Many requests for extension of time are being filed with insufficient fees. In those instances where there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning papers to the PTO Finance Branch in order to apply these charges prior to action on the cases.

Please note that effective Oct. 5, 1985, the extension fees in patent cases are as follows:

	Small Entity	*Non-Small Entity*
One Month Extension	$$$	556
Two Month Extension	85	170
Three Month Extension	195	390
Four Month Extension	305	610

If applicants have a deposit account, it is recommended that applicants file, in an individual application, a general authorization to

charge any of the fees set forth in 37 CFR §§1.16 to 1.18 to a deposit account for the entire pendency of the application.

d. *Policy*

Where an extension of time is required to file a response in a timely manner, the response is not considered complete until the response, fee, and request or petition for an extension of time are received. The fee and request or petition must be filed before the expiration of the extended period requested. The fee cannot be paid outside the statutory six-month limit for the period of response.

e. *Requirement for Request or Petition for Extension*

Submission of the appropriate extension fee under 37 CFR 1.136(a) is to no avail unless a request for petition for extension is filed. Frequently, the request is omitted, which then requires an additional extension fee to cover the period to the date of the request. Occasionally, the application is held abandoned because the six month maximum statutory period has expired before detection of the omission of the request for extension. It is critical that a paper specifically requesting the extension be filed with late responses. It is also wise to use the Certificate of Mailing practice under 37 CFR 1.8 when requesting extensions.

f. *Response to Final Rejection — Avoiding Extension Fees*

In patent applications wherein a three month Shortened Statutory Period (SSP) is set for response to a Final Rejection, the response would best be filed within two months of the date of the Office Action. If filed within two months, any Advisory Action mailed after the SSP expires will reset the SSP to expire on the date of the Advisory Action for extension fee purposes, but never more than six months from the date of the Final Rejection.

g. *Supplemental Amendments*

If a timely and complete response has been filed after a *Non-Final* Office Action, an extension of time *is not required* to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a *Final* Office Action, an extension of time *is required* to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run.

9. **INTERVIEWS WITH PATENT EXAMINERS**

a. *Appropriateness*

Prior to filing, no interview is permitted; only search assistance may be given to the attorney, searcher or inventor.

Prior to first action, an interview is ordinarily granted only in continuing or substitute applications; a request for an interview is untimely and will not be granted prior to first action in all other applications.

After final rejection, an interview will not be denied merely because final Office action has been rendered. Normally, one interview after a final rejection is permitted if the examiner is convinced that disposal or clarification for appeal may be accomplished with only nominal further consideration. In requesting an interview after final rejection, the intended purpose and content of the interview must be presented briefly, either orally or in writing. Interviews merely to restate arguments of record or to discuss new limitations which would require more than nominal reconsideration or new search will be denied.

After a case is sent to issue, it is technically no longer under the jurisdiction of the primary examiner (37 CFR 1.312). Requests for interviews on cases already passed to issue should be granted only with specific approval of the Group Director upon a showing in writing of extraordinary circumstances.

The ideal time for personal interviews, during which time an interview is clearly available, is the "Conference Period", which is the time between the filing of applicant's thorough first response to the examiner's first action on the merits and a concluding action by the examiner.

In reexamination proceedings, an interview with the owner is permitted after first action. Requests that reexamination requesters be permitted to participate in or attend interviews will be denied.

When an interference has been declared, all questions involved are to be determined *inter partes* and will not be discussed *ex parte*.

Following the grant of a United States Patent, an examiner must refuse to express any opinion or view as to the invalidity of the patent, except on the record in the course of examining a reissue application or a reexamination proceeding. Even in the case of search assistance on an invention, if an examiner is aware that the invention has been patented in the United States, the searcher will be referred to the prosecution file history, and the examiner will make no comment on the appropriateness of the search conducted or the references cited.

Should any examiner fail to comply with the above guidelines, the matter would best be brought to the attention of the examiner's Group Director.

Direct questions to:

Al Lawrence Smith
Director, Group 350
(703) 557-3414

b. *Prohibitions*

No interview will be conducted with an attorney who is not registered or who has been suspended or excluded from practice regarding an application unless the attorney is the applicant in the application.

Protestors are not permitted to participate in interviews in applications where the protest was filed after Dec. 8, 1981, and the examiner will not communicate in any manner with such protesters.

10. **FILES**

a. *Official Searches*

The PTO has had an unusually large number of official search status letters returned

by the Postal Service due to insufficient/incomplete addresses. When requesting an official search for a lost patent or trademark file, please ensure that all pertinent information is completely filled out on the PTO Form 1216. In the case of an individual working for a particular firm, the firm's name should be included in block number 5 of the form along with the name of the requestor. If you have any questions in this matter please call the Chief, Support Services Branch on (703) 557-3560.

b. *Requests for Reconstruction*

To request the reconstruction of a file, submit a written request along with a notice from the PTO Official Search unit stating that the file cannot be located.

11. MAIL

a. *Certificate of Mailing AND Return Post Card*

Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if desposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is *not* received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

b. *Correspondence with Certificate of Mailing Delivered by Commercial Carrier*

The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand-carried or delivered to the PTO via commercial mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than the U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

c. *Express Mail*

Due to a failure of following proper procedures, many applicants are losing the advantage of receiving the date a paper or fee was deposited at the Post Office when "Express Mail" is used. According to 37 CFR §1.10, any such paper or fee must include a certificate of mailing by "Express Mail," signed by the person mailing the paper or fee.

To ensure papers and fees sent by "Express Mail" are accorded the proper certificate date, the following suggestions and reminders are offered:

(1) Each document must have a certificate of mailing typed on or affixed to the document. The certificate should be placed on the first page of the document or the covering letter to ensure easy accessibility.

Often, the certificate is missing, illegible, inaccurate, incomplete, or difficult to locate. As a result, the paper or fee is considered to have been filed on the date of receipt in the PTO.

(2) The certificate should be legible.

(3) The Express Mail number must be placed on the certificate.

(4) Dates on the certificate must correspond to dates on the Express Mail label.

The PTO continues to receive correspondence filed under the provisions of 37 CFR 1.10 in which the certificate of mailing by "Express Mail" certifies that the correspondence is being mailed on one date while the "Express Mail" label shows a "Date-In" on a different date. This usually occurs when the "Express Mail" package is deposited in a remote "Express Mail" receptacle or mailbox after the last pickup, and accordingly is not being picked-up and processed by the Postal Service until the next business day. The question as to the treatment of such a situation was covered in the final rulemaking published on Jan. 20, 1983, at 48 FR 2696–2714 and on Feb. 10, 1983, at 1027 O.G. 9. The following comments appear therein.

> "Comment: One person questions what treatment will be accorded a paper placed in an 'Express Mail' box receptacle after the box has been cleared for the last time on a given day."
> "Reply: The paper will be considered to be deposited as of the date of receipt indicated on the 'Express Mail' mailing label by the Postal Service clerk".

It is recommended that where the filing date of a paper or fee is critical, e.g., the filing of a patent application, and particularly when the deposit by "Express Mail" is being made late in the business day, the correspondence should be personally delivered to a Post Office. There the date of receipt of the "Express Mail" package can be immediately indicated by the Postal Service Clerk.

(5) Each certificate must have an original signature of the person *actually mailing* the paper or fee; i.e., the person who actually deposits the paper or fee with the U.S. Postal Service.

The PTO has encountered instances in which the certificate of mailing by "Express Mail" was signed by an attorney and the deposit was made by the attorney's secretary or another member of the attorney's staff. This is improper under the provisions of 37 CFR 1.10. This section differs in that regard from 37 CFR 1.8.

(6) The preferred wording and information to be included on the certificate is as follows:

> "Express Mail" Mailing Label No. (*insert B no. from Express Mail label*)
> Date of Deposit (*insert date from Express Mail Label*)
>
> I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
>
> (*Typed or printed name of person mailing paper or fee*)
> (*Signature of person mailing paper or fee*)

By following these procedures, problems concerning filing dates should be minimized.

d. *Response to Final Rejections In Patent Applications — Expediting Processing and Reply by PTO*

In order to ensure the quickest reply to an amendment or response after Final Rejection in patent applications, the paper must be marked in the upper right portion:

> RESPONSE UNDER 37 CFR 1.116
> EXPEDITED PROCEDURE
> EXAMINING GROUP (Insert Group Number)

The marking on the paper preferably should be written in, highlighted by, or encircled with, a bright color felt-point marker.

The envelope in which the response is submitted must include only submissions under 37 CFR 1.116. The envelope must be marked "Box AF" in the lower left corner and must be addressed to:

> BOX AF
> COMMISSIONER OF PATENTS AND TRADEMARKS
> WASHINGTON, D.C. 20231

If the paper is being hand-carried to the Examining Group (instead of mailing to Box AF), the envelope, if any, and the response should both be marked:

> RESPONSE UNDER 37 CFR 1.116
> EXPEDITED PROCEDURE
> EXAMINING GROUP (Insert Group Number)

Use of this procedure should avoid the necessity for extensions of time and the filing of unnecessary notices of appeal in many cases.

e. *Return Post Card*

If a receipt for any paper filed in the Patent and Trademark Office is desired, it may be obtained by enclosing with the paper a self-addressed post card identifying the paper. The Patent and Trademark Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to clearly identify the paper for which receipt is requested. For example, the card should identify the applicant name(s), serial number, filing date, interference number, etc. Also, the paper(s) should be identified by specifying the type thereof, namely affidavit, amendment, appeal, itemized components of applications, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

A post card receipt which itemizes and properly identifies the papers which are being filed serves as prima facie evidence of receipt in the PTO of all the items listed thereon on the date stamped thereon by the PTO unless the post card receipt has been annotated by the PTO to indicate that one or more items were not received. A post card receipt will *not* serve as prima facie evidence of receipt in the PTO if the papers are not itemized in a detailed manner, e.g., number of pages of specification and number of sheets of drawings, or if the post card receipt has been annotated to indicate that one or more items was not received.

When papers for more than one document are filed under a single cover, a return addressed post card should be attached to the paper for each document for which a receipt is desired.

f. *Secrecy — Related Papers (37 CFR 5)*

All correspondence in connection with 37 CFR 5 should be addressed to:

> Commissioner of Patents and Trademarks
> (Attention Licensing and Review)
> Washington, D.C. 20231

Improperly addressing such correspondence may delay delivery and could result in violations of 37 CFR 5. See 37 CFR 5.33 regarding correspondence.

g. *Special Boxes for Mail*

As suggested by a patent attorney, we are republishing this notice regarding the use of special boxes for PTO mail. Henceforth, this notice will appear regularly in the Official Gazette. Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purposes. Address mail as follows:

> Box _____
> Commissioner of Patents and Trademarks
> Washington, D.C. 20231
>
> Box 3 — Mail for the Office of Personnel from NFC.
> Box 4 — Mail for the Office of Legislation and International Affairs.
> Box 5 — "No fee" mail related to trademarks (e.g.) amendments to applications and requests for extensions of time to file an opposition).
> Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".

Box 6 — Mail for the Office of Procurement.
Box 7 — Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8 — All papers for the Office of the Solicitor.
Box 9 — Coupon orders for U.S. patent and trademark copies.
Box 10 — Orders for certified copies of patent and trademark applications.
Box 11 — Electronic Ordering Service (EOS).
Box 12 — Contributions to the Examiner Education Program.
Box AF — Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.
Box FWC — Mail related to File Wrapper and Continuations.
Box Interference — Communications relating to interferences and applications and patents involved in interferences.
Box M. Fee — Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext. — Applications for patent term extension.
Box PCT — Mail related to applications filed under the Patent Cooperation Treaty
Box Reexam — Mail related to reexamination applications.

12. MAINTENANCE FEES

a. *Correspondence Address and/or Fee Address on Maintenance Fees*

Practitioners are reminded that when no separate "fee address" under 37 CFR 1.363 has been supplied, the "correspondence address" of record under 37 CFR 1.33 will be used for correspondence relating to maintenance fees. A similar reminder appears on the Issue Fee Transmittal Form (PTOL-85 (b)).

Practitioners should maintain a current "correspondence address" and, if desired, a separate current "fee address" during the enforceable life of the patent in order to ensure receipt of correspondence regarding maintenance fee.

In the case where a practitioner does not intend to continue representing the patentee, a request for permission to withdraw pursuant to 37 CFR 1.36 must be approved by the Commissioner.

Practitioners are reminded that they should inform a client or former client (or timely notify the Office of an inability to notify a client or former client) of any maintenance fee correspondence received from the PTO. See 37 CFR 10.23 (c) (8). This is similar to the practice with respect to interferences and reexamination proceedings.

b. *Delayed Payment of Maintenance Fees*

Payment of any maintenance fee due on a patent after expiration of the patent may be accepted if the conditions set forth in 37 CFR 1.378 are satisfied.

In the past, petitions under 37 CFR 1.378 to accept delayed payment of the maintenance fee in an expired patent have been filed which allege, as a basis for unavoidable delay: (1) lack of knowledge that a maintenance fee was due and/or (2) failure to receive a Maintenance Fee Reminder notice from the PTO.

Practitioners are reminded that a patentee's lack of knowledge of a requirement to pay a maintenance fee does not constitute a showing of unavoidable delay; see 49 F.R. 34716 at page 34720, and 1046 O.G. 28 at page 32.

Maintenance Fee Reminder notices are mailed only as a courtesy after the "grace period" has begun; see 37 CFR 1.362(e). Patentees are expected to maintain their own docket systems to ensure timely payment of maintenance fees, preferably during the "window period"; see 37 CFR 1.362(d). Since patentees are expected to maintain their own docket systems for timely payment of maintenance fees, proof that a Maintenance Fee Reminder notice was not received from the PTO does not constitute a showing of unavoidable delay; see 49 F.R. 34716–34726, and 1046 O.G. 28–37.

Practitioners are cautioned that any petition to accept delayed payment of a maintenance fee under CFR 1.378 must include an enumeration of the steps taken to ensure timely payment of the maintenance fee. In this regard, the petition should include a detailed explanation of the docket system employed to ensure such timely payment. Any petition filed more than six months after the expiration of a patent will also be required to show that the failure to timely pay the maintenance fee was due entirely to circumstances outside the control of the patentee and those acting on behalf of the patentee.

c. *Fee Address and Payer Number*

Effective November 1, 1984, 37 CFR 1.363 provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The fee address is in addition to the "correspondence address" under 37 CFR 1.33 which will continue to be used for all reexamination and interference purposes. If no separate fee address is specified, the correspondence address will also be used for maintenance fee correspondence.

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payer number" will be assigned to each fee address when a fee address is presented to the Office in a patent or earlier upon request. A request for a payer number before a maintenance fee is paid or due will permit a patent owner to request that the fee address and payer number be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenace fees will be sent to the fee address.

The Patent and Trademark Office has established a procedure for assigning a payer number upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments.

Under the procedure, a patent owner or other party may request a payer number for a particular fee address by writing to:

Commissioner of Patent and Trademarks
Box M. Fee
Washington, D.C. 20231

Each request for a payer number should include the:

- fee address to be used by the Office, and
- telephone number of the fee addressee to be used to resolve problems.

After receipt of a payer number, it may be used to indicate to the Patent and Trademark Office the fee address to be used in particular patents on which maintenance fees will become due and in applications in which issue fees have been or are being paid. Any request for entry of a payer number or fee address in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a payer number has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a payer number has not been previously entered in the Office records for a particular patent, the mere indication of a payer number at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the payer number of record in the Office for that patent.

The problems which most often arise in connection with attempts to establish a fee address in a particular patent or group of patents is that the request is being signed by an attorney who is not of record in each of the patents. This results in the request being entered only in part.

Also, when the request is signed by an owner of the patent, the records of the Assignment Branch do not always reflect such ownership. Where the assignment was recorded prior to Dec. 1980, it would help the Office if the PTO reel and frame number of the assignment recordation were presented in the paper requesting that a fee address be entered, and if the person signing the request would indicate his or her title.

Lastly, as fees are now being submitted for payment in patents that issued a few years ago, if a fee address has not been established, please be sure that the current correspondence address has been made of record.

d. *Maintenance Fee Transmittal Form Notice*

Where maintenance fee payments are to be made by authorization to charge a deposit account, the Maintenance Fee Transmittal Form, should reflect *both* the Payer's Name *and* signature in the bottom left corner thereof.

e. *Mandatory Identifiers when Submitting Maintenance Fees*

Practitioners are reminded that a patent maintenance fee payment and any surcharge payment submitted must identify the patent to which it relates by at least *two mandatory identifiers* [see 37 CFR 1.366(c)]:

1. The patent number; and
2. The serial number of the United States application for the patent on which the maintenance fee is being paid.

Reissue patent maintenance fee due dates are based on the issue date of the original, rather than the reissue patent. The payment must identify the reissue patent by reissue patent number and reissue application serial number as the two mandatory identifiers and should also include the original patent number, the original patent issue date and the original United States application filing date. See 37 CFR 1.366(d).

The two mandatory identifiers are required as a minimum to enable a cross-check to be made to avoid errors in crediting payment of maintenance fees.

It is suggested that the payment identify the fee being paid for each patent as to whether it is the 3½, 7½ or 11½ year fee; whether small entity status is being changed or claimed; the amount of the maintenance fee and any surcharge being paid; any assigned payer number; the patent issue date; and the United States application filing date. See 37 CFR 1.366(d).

Failure to provide at least the two above-named mandatory identifiers will likely result in the non-acceptance of the maintenance fee payment. The date the two mandatory identifiers and the required fee are submitted is the date the maintenance fee payment is credited as being made.

f. *Public Availability of Maintenance Fee Petitions/Decisions*

Maintenance fee petitions and decisions thereon are public records. Copies thereof can be obtained by submitting a written request to the Certification Branch. The request should state the patent number and serial number. The charge for the copies is currently $.50 per page.

Direct questions on these maintenance fee notices to:

Al Lawrence Smith
Director, Group 350
(703) 557-3414

13. NEW PATENT APPLICATIONS

a. *Attorney Docket Number on Missing Part/Incomplete Notices*

In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an "attorney docket number". This number will be entered by the PTO under the Title of Invention on the Notices.

If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response,

but no change will be made by the Office until the Filing Receipt is issued.

If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corp.

b. *Continuation or Divisional — Retaining Original Claim*

When filing under Rule 1.60, retain at least one original claim from the patent application to assure a complete application. Only amendments reducing the number of claims or adding a reference to the prior application [(Rule 1.78 (a)] will be entered, upon request, before calculating the filing fee and granting the filing date. *Reminder*: Applicant cannot file a CIP (continuation-in-part) under Rule 1.60.

c. *Continuation or Divisional – Problems*

Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

Most often, the problems that arise in this area can be characterized as the following:

(1) Applicants continue to fail to comply with the requirements of 37 CFR 1.60 with regard to what must be submitted upon filing under the rule. This is true even after the clarifying amendments (effective April 1, 1984) were made to the rule.
(2) A true copy of the prior application must be filed including the specification (with claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application.
(3) Applicants are using transmittal forms which request filings under one rule when, in fact, they wish to file under another rule. For example, a transmittal form requesting filing under 37 CFR 1.62 may be filed when it was really desired to file a divisional application under 37 CFR 1.60 and not to abandon the parent application.

d. *Expediting Patent Applications*

We are trying to expedite and improve preliminary processing of patent applications. Please help by putting patent applications and associated papers (e.g., assignments) in separate envelopes apart from all other mail. Identify on the outside of the envelope "PATENT APPLICATIONS ONLY."

e. *File Wrapper Continuation — Preliminary Amendment*

Many continuation applications filed under 37 CFR 1.62 contain no preliminary amendment to the claims which were finally rejected in the parent application. The result is a first action final rejection of these claims. Applicants should file any desired amendments at the time the application is filed under 37 CFR 1.62, since the Office is treating these applications as "Special" and an action on the merits will be rendered quite promptly.

To expedite processing under Rule 1.62, make certain that the parent serial number cited in the transmittal letter is the correct serial number.

f. *File Wrapper Continuation - Problems*

Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

Most often, the problems that arise in this area can be characterized as the following:

(1) Applications have been filed with a transmittal form requesting filing under 37 CFR 160 when it was intended to file under 37 CFR 1.62. The confusion in the record of such applications must be clarified by a decision on petition before the applications can be processed for examination.
(2) Some applicants fail to realize that the parent application is abandoned by the filing of a continuing application under 37 CFR 1.62. Paragraph (g) of 37 CFR 1.62 states:

> The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.

Correction after such a mistaken filing under 37 CFR 1.62 usually requires a revival of the parent application under 37 CFR 1.137(a) or (b) which expends resources of both the applicant and the PTO.

(3) Some applicants are attempting to file continuing applications under 37 CFR 1.62 after payment of the issue fee in the parent application. Such applications are improper and are not entitled to a filing date. Additionally, such filings will not affect the prior application; i.e., the parent application may issue as a patent. Paragraph (a) of 37 CFR 1.62 specifies that continuing applications may be filed under 37 CFR 1.62 "before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application"
(4) Some applicants are attempting to file continuation-in-part applications under 37 CFR 1.62 with a new specification rather than with the changes made by amendment to the prior application. As stated in 37 CFR 1.62(a), filings under 37 CFR 1.62 use the specification of the prior application.

Paragraph (c) of 37 CFR 1.62 also states:

> "In the case of a continuation-in-part application which *adds and claims additional disclosure by amendment*, an oath or declaration as required by §1.63 must also be filed . . ." (emphasis added)

g. *Information Disclosure Citation - Form PTO 1449*

The Public is encouraged to use Form PTO 1449, "Information Disclosure Citation," when preparing a statement under 37 CFR 1.97–1.99 (see MPEP §609). This form provides the Office with a uniform way of listing the citations and a vehicle from which the information thereon can be printed on the issued patent.

Some citations are being presented on various forms prepared by the public rather than on Form PTO 1449. As a result, delays are cropping up in the printing process because the printer has difficulty in following the various formats and is having to query the examiner each time a non-PTO 1449 form is used.

Note that listing citations on Form PTO 1449 does not raise an irrebuttable presumption that the citation is prior art. A holding by an examiner that any citation on Form PTO 1449 is prior art to claimed subject matter can be rebutted by procedures commonly used to rebut the prior art status of an examiner's citations on Form PTO 1449, "Notice of References Cited".

Among the information that should be provided on Form PTO 1449 is the date of the citation. In addition, it is helpful if the class and subclass of each citation is provided. It is appreciated that classification information may not be known at the time Form PTO 1449 is prepared. When classification information is not known, draw a line in the boxes under the class and subclass heading adjacent to the citation for which classification information is not known.

h. *Petition for License*

Rule 5.12 states that "filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 USC 184 for the subject of the application. The filing receipt will indicate a license is granted. There is no need to request a corrected filing receipt deleting the words "License Granted." Its intent is to provide the necessary acknowledgement for those filing abroad.

i. *Processing and Retention Fees for Abandoned Applications*

An application, which has become abandoned pursuant to 37 CFR 1.53(d) for failure to pay the filing fee, will be disposed of unless the processing and retention fee set forth in §1.21(l) is paid within the 1-year period referred to in §1.53(d). Moreover, the processing and retention fee must be timely paid in order to obtain certified copies of the application (e.g., for convention priority purposes) or to establish in a later filed application the filing date benefit of an earlier copending application under 35 USC 120 and 37 CFR 1.78(a) (3). Therefore, an application which has become abandoned for the reasons set forth above should be immediately reviewed in order to timely determine the advisability of submitting a processing and retention fee payment.

j. *Surcharge for Filing a Patent Application*

Filing dates are accorded to applications filed without the basic filing fee and without the oath or declaration. In such cases, a notice is mailed by Application Branch requiring at least the basic filing fee and the oath or declaration, accompanied by a surcharge [37 CFR 1.16(e)]. In numerous instances, applicants fail to submit the surcharge causing the application to become abandoned. See 37 CFR 1.53(d) and MPEP §506.

14. PATENT COOPERATION TREATY APPLICATIONS

a. *Responses Filed in International Applications*

The 18 month publication deadline for international applications filed under the Patent Cooperation Treaty (PCT) is critical. Therefore, it is in applicant's interest to respond timely to an invitation to correct a PCT Article 14 defect. An untimely response can result in the withdrawal of the international application under Article 14 and PCT Rule 26. If an extension to respond is needed, call the person who signed the invitation before the expiration of the time limit. The PTO will strictly comply with PCT Article 14 and Rule 26 in holding international applications withdrawn when responses are untimely or not filed.

b. *Early Notification of Receipt of PCT Designated Office Cases*

If you would like to have early notification that the PTO has received requirements under 35 U.S.C. 371 to enter the Designated Office phase, you should send two self-addressed, stamped postcards with those requirements. The first postcard will be date stamped and returned to you upon receipt of the requirements by the PCT staff. The second postcard will be sent to you when the case is released to the Mail Room to join the regular flow of national applications. The second postcard will be stamped with the U.S. serial number. If only one postcard is sent, it will be marked with the U.S. serial number but will remain with the application until requirements are completed and the case is released.

When corrections of PCT Rule 91 obvious errors in the description, claims or abstract are submitted together with corrections of deficits under PCT Article 14, the transmittal letter should clearly note the Rule 91 corrections. This is necessary because, under PCT Rule 91.1(e), the Receiving Office can authorize the rectification of obvious errors only in the Request (Form PCT/RO/101), while Searching Authority authorization is needed for obvious errors in the description, claims or abstract. When the transmittal letter clearly notes the Rule 91 corrections, Searching Authority authorization of any obvious errors in the description, claims or abstract can be expedited.

Call Jane Corrigan on 557-2003 if you have questions concerning responses filed during the international stage for international applications under the PCT.

15. PATENT COPIES

a. *Price of Patent Copies*

The price of a patent copy increased from $1.00 to $1.50 on Oct. 5, 1985. The new $1.50 coupons are available, but we will accept the old ones and provide a $.50 coupon refund as appropriate.

b. *Subscription Services*

When submitting changes to subscription accounts, allow approximately two months from the date mailed to the Patent and

Trademark Office for changes to become effective. The reason for the two month delay is to allow for changes to be recorded, data entered, and the automated system to be updated.

16. **PETITIONS TO REVIVE**

a. *Request and Fee for Extension Not Required*

Frequently, a petition to revive an abandoned application is accompanied by an unnecessary request and fee for extension of time. Our policy is set forth in MPEP 711.03(c). Specifically, a response does not require a request and fee for extension of time as a condition of revival.

b. *Terminal Disclaimer*

A petition to revive an abandoned application is often accompanied by an unnecessary terminal disclaimer. A terminal disclaimer is required only when a grantable petition based on unavoidable delay is not filed within six months of .the date of abandonment [CFR 1.137(a) and 1.137(c)]. It follows that a terminal disclaimer should not accompany a petition based on unintentional abandonment [(37 CFR 1.137(b)]. In these respects, analogous reasoning applies to petitions to accept late payment of the issue fee under 37 CFR 1.155 or 1.316.

When a terminal disclaimer is a necessary component of the petition, the period to be disclaimed must equal the number of months between the date of abandonment and the date a grantable petition is filed. The date of abandonment is the date the period for response has expired [see MPEP 711.04(a)]. This is normally the end of the three month shortened statutory period. Moreover, the terminal disclaimer should employ the format shown in Figure 1.

FIGURE 1 — Terminal Disclaimer

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
(NAME)
Serial No.
Filed:
For:

TERMINAL DISCLAIMER

TO THE COMMISIONER OF PATENTS AND TRADEMARKS:

Your petitioner, _____, residing at _____, represents that he is the owner of the entire interest in the above-identified application (by virtue of an assignment recorded at Reel _____, and Frame _____, filed on the _____day of _____, 19 _____).

Your petitioner, _____, hereby disclaims the terminal _____ months of any patent granted on the above-identified application or on any application which is entitled to the benefit of the filing date of this application under 35 USC 120. This agreement is to run with any patent so granted and to be binding upon the grantee, its successors or assigns.

IN WITNESS WHEREOF, I here unto set my and and seal this _____day of _____, 19_____.

_____
(Signature)

17. **POWER TO INSPECT**

a. *Power of Attorney*

The Office receives letters granting power to inspect patent applications. These may only be granted by the attorney of record or inventor. Sometimes the person signing the power is not authorized to do so, causing delay until proper authorization is received. Copies of completed applications cannot be made during the pre-examination process. They can be inspected, but not pulled from the work flow to have copies made.

b. *Withdrawal of Attorney*

To expedite the handling of requests for permission to withdraw as attorney under 37 CFR §1.36, submit the request in triplicate (original and two copies) and indicate thereon the present mailing addresses of the attorney who is withdrawing and of the applicant. The examining group number should also appear on all such requests. Because the Office does not recognize law firms, each attorney of record must sign the notice of withdrawal, or the notice of withdrawal must contain a clear indication of one attorney signing on behalf of another.

A request to withdraw is effective when approved rather than when received. This is particularly important when such requests are submitted toward the end of the period for response. There should be at least thirty days between approval of withdrawal and the expiration date of a time response period so that the applicant will have sufficient time to obtain other representation or take other action. If less than thirty days remains in a running response period, a request to withdraw is normally disapproved.

It would be helpful if a request and fee, preferably an authorization to charge a deposit account, were included with a request to withdraw. Such would permit the Office to make sure, in most instances, that sufficient time remains in the period for response.

18. **REISSUES**

a. *Amendments*

In order to avoid unnecessary delays in the issuance of reissue applications, applicants and their attorneys are reminded to exercise caution and give sufficient attention to 37 CFR 1.121(a) and (e) in presenting reissue amendments to the PTO. The practices and procedures vary somewhat from regular utility application amendments, and this frequently causes clerical problems and editorial revisions.

MPEP Sec. 1455 provides guidance for proper entry of amendments and claim numbering. Publication of the reissue application(s) may be needlessly postponed while formal irregularities are corrected.

b. *Oaths and/or Declarations*

Since standard oath and declaration forms are not used in reissue applications, applicants are commonly neglecting to include averments required by 37 CFR 1.63 per 37 CFR 1.175(a). The most frequent omissions involve the "duty of disclosure" acknowledgment, and the "reviewed and understands" statement. Such omissions usually necessitate additional handling and correspondence, and cause undue time delays, which result in postponement of publication of the reissue patent.

A frequent problem in reissue practice is the failure of applicants to satisfactorily comply with 37 CFR 1.175 regarding the description of all errors of the original patent in the reissue oath or declaration. Applicants are required to specify errors in the original reissue oath or declaration at the time of filing the reissue application. They must also specify, in a supplemental oath or declaration, any errors brought to their attention during the prosecution, as well as the circumstances surrounding the occurrence or discovery of these errors. Every departure from the original patent represents an "error" and must be particularly and distinctly specified and supported in the original, or a supplemental, reissue oath or declaration under 37 CFR 1.175. See MPEP Sec. 1414 and 1444. Postponement of publication of the reissue patent may result if these requirements are not met at the time of allowance.

19. **SMALL ENTITY STATUS**

a. *Small Entity Statements*

Verified statements claiming small entity status, where appropriate, would best be signed and submitted at the time the application oath or declaration is signed to permit filing of the statement with the application. This would reduce correspondence between attorney and client, reduce paper handling by the PTO support staff and the PTO Finance Branch, and greatly simplify the processing of subsequent papers involving fees. If small entity status is being claimed for the first time at the time of payment of the issue fee, a verified statement claiming small entity status should be submitted with the fee. See MPEP §509.03.

20. **TRADEMARKS**

a. *Application Drawings*

To avoid delays in processing new trademark applications, the drawing should have the following information in the upper left hand corner:

- Drawing title.
- Applicant's name and address.
- First use date.
- First use in interstate commerce date.
- Goods, services or both.

b. *File Histories*

When requesting trademark file histories, the "status date" (i.e., date abandoned) must be provided to fill the order if the file is abandoned. If not known, this information can be obtained from TRAM. The request will be returned unfilled if this date is not provided.

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TRADEMARK APPLICATION EXAMINATION AND CONTENT

(180) Interviews Involving Trademark Application

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner of Patents.*

This supersedes the notice of Feb. 10, 1958. (728 O.G. TM 1)

[804 O.G. TM 147]

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(181) Trademark Examining Procedure for Amended Applications; Reporting Oldest Dates of Amended Trademark Applications

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the *Official Gazette* (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

RENE D. TEGTMEYER,
July 15, 1971. *Assistant Commissioner.*

[889 O.G. TM 6]

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(182) Trademark Office Actions

Effective immediately Applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

ROBERT GOTTSCHALK,
Feb. 7, 1972. *Commissioner of Patents.*

[895 O.G. TM 238]

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(183) Petition to Make Trademark Applications Special

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lewry,* 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren,* 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. TM 2]

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(184) Title 37—Patents, Trademarks, and Copyrights

Chapter I—Patent Office, Department of Commerce

Parts 2 and 6—Rules of Practice in Trademark Cases

International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise §6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new §6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act of all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the *Official Gazette,* which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the *Official Gazette* when the List is available from local sources of the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C
Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

* * * * *

ROBERT GOTTSCHALK,
May 14, 1973. *Commissioner of Patents.*

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210]

(Note: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice; prior U.S. schedule of classes was redesignated as Rule 6.2.)

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(185) Wording In Verification or Declaration of Trademark Application

Applicants and attorneys are requested to use the following wording in the part of the verification or decla-

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ration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance. Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

Mar. 25, 1974. RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[921 O.G. TM 186]

(186) **Standardized Disclaimers**

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use ——, apart from the mark as shown.

Aug. 30, 1982. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1022 TMOG 44]

(187) **Trademark "Revivals" and "Reinstatements"**

It would be of great assistance to the Office if the heading or caption of "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications carried the following identifying data:

1. Address Paper to the Attention of:
   Office of Director, Trademark Examining Operation
2. Serial Number
3. Mark
4. Applicant's Name
5. A title indicating the nature of the paper

Use of this heading for "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications will help ensure that the papers are promptly routed to the proper Office, which will prevent needless delay in its consideration.

Aug. 13, 1984. MARK M. NEWMAN,
Director, Trademark Examining Operation.

[1046 TMOG 13]

(188) **T-Search Printouts as Section 2(d) References**

As part of its ongoing automation program, the PTO is pleased to announce that on or about July 1, 1986, Trademark Examining Attorneys will use the automated Trademark search system (T-Search) exclusively for searching word marks. The Examining Attorneys will use computer printouts to advise applicants about Section 2(d) references. The printouts will include computer-generated facsimiles of the drawing where appropriate. The printouts will be used for word marks, whether the word is depicted in a typed drawing or in stylized form. Photocopies of certificates of registration will continue to be used for design marks.

The Patent and Trademark Office, in consultation with the Public Advisory Committee for Trademark Affairs, has established accuracy standards for the computerized data. Data elements which are not essential for examiner searching are being systematically checked and corrected. The following data elements which are essential for examiner searching purposes are essentially complete:

1. MARK
2. SERIAL NUMBER
3. REGISTRATION NUMBER
4. FILING DATE
5. REGISTRATION DATE
6. GOODS AND SERVICES
7. INTERNATIONAL CLASS
8. U.S. CLASS

Subject to the above caveat, the printouts will contain all the information that appears on the certificate of registration with one exception. If an application for registration was based on Section 44, 15 U.S.C. 1126, the printout will indicate that the registration or application was filed under the provisions of Section 44 (using the notation "SECT 44"). The printout will also show the priority date if the application was filed under the provisions of Section 44(d). However, it will not indicate the country or certificate number of the foreign registration on which the U.S. registration was based.

The printouts will also contain additional registration information which was not provided under the non-automated system, as follows:

A. Change in registration—This will indicate that a registration was changed after registration, such as by an amendment of the mark or identification of goods/services. The current information will be displayed in the printout.

B. Affidavits—This indicates that a Section 8 affidavit of continued use was accepted, that a Section 15 affidavit of incontestability was acknowledged, or that a mark was republished under the provisions of Section 12(c).

C. Renewals—Applicable renewal information, such as "1st Renewal" or "2nd Renewal" will be shown.

D. Owner—In addition to listing the original registrant, the last known owner, as the change of ownership is acknowledged by the Office by virtue of examining an affidavit or renewal, will be included.

The following provides an explanation of the terms/symbols used in the printout:

1. Goods or services appearing in double parentheses "(( ))" were not included in a Section 15 affidavit.
2. Goods or services appearing in brackets "[ ]" were deleted after registration by amendment, correction, restriction or at the time of renewal.
3. Dates will appear as year, month and day. For example, June 20, 1983 will appear as 1983.06.20.
4. Goods and services will be indicated with the international class (IC), the prior U.S. classification (US), the identification, date of first use and date of first use in commerce.
5. Registrants (OWNER) will be listed showing the owner's name, entity designation (e.g., individual, partnership, corporation), country of citizenship or state or country of incorporation, and address.
6. Pseudo mark—This material is merely a search aid and has no bearing on the registration information.
7. Design search code—This is also merely an aid for computerized searching of design marks, by which a number is assigned to describe a particular design element. It has no bearing on the registration information.
8. Mark drawing code—This indicates the appearance of the mark, and again is not part of the registration data. There are six mark drawing codes.

   1—typed drawing
   2—design only
   3—words, letters and/or numbers and design
   4—words, letters and/or number in block form (block letters; not typed drawing)
   5—words, letters and/or numbers in a stylized form
   6—sound marks

An example of a computer printout and a facsimile of a stylized word mark follow.

June 23, 1986. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

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Document 1 of 1 for SS 1: FD 1351766/RN,SN
WORD MARK                 LINEA ADRIANO
TRANSLATION               THE WORDS "LINEA ADRIANO" IN THE MARK MAY BE
                          TRANSLATED INTO ENGLISH AS "LINE HADRIAN"
GOODS AND SERVICES        IC 025; US 039; G & S: ARTICLES OF CLOTHING
                          FOR MEN, NAMELY JACKETS, COATS, SUITS,
                          TROUSERS, JUMPERS, SHIRTS AND TIES
MARK DRAWING CODE         (5) WORDS, LETTERS, AND/OR NUMBERS IN
                          STYLIZED FORM
SERIAL NUMBER             73-446850
FILING DATE               1983.10.06
CHANGE IN REGISTRATION    CHANGE IN REGISTRATION HAS OCCURRED
REGISTRATION NUMBER       1351766
REGISTRATION DATE         1985.07.30
OWNER NAME AND ADDRESS    (REGISTRANT) RITEX AG KLEIDERFABRIK ZOFINGEN
                          CORPORATION SWITZERLAND FUNKENSTRASSE 10
                          ZOFINGEN AARGAU SWITZERLAND
SECTION 44 INDICATOR      SECT 44
FOREIGN PRIORITY DATES    1983.06.20
DISCLAIMER                NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO
                          USE "LINEA" APART FROM THE MARK AS SHOWN
TYPE OF MARK              TRADEMARK
REGISTER                  PRINCIPAL
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Linea Adriano

[1068 TMOG 7]

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TRADEMARK POST REGISTRATION

(189) Trademark Rule 2.165 Requirement Where A Section 8 Affidavit Or Declaration Is Held Insufficient

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least respond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (*b*) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Dec. 12, 1977.

[966 TMOG 80]

(190) Late-Filed Renewal Fees

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§1095 and 1113) require that an additional five dollar ($5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ 154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payment. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Feb. 20, 1981.

[1004 O.G. 29]

(191) Renewal Applications and Section 8 Affidavits

There has been a noticeable increase in the number of petitions requesting provisional acceptance of defectively executed Section 8 Affidavits and Renewal Applications under 35 U.S.C. §26, the most common problem being a lack of notarization or a Rule 2.20 declaration. Often, such petitions are necessitated by the failure of registration owners to file the documents early enough to leave time in which to correct should they prove defective.

Section 8 Affidavits may be filed beginning with the fifth anniversary of the registration. The period for filing expires on the sixth anniversary of the registration. The period for filing Renewal Applications begins six months before the twentieth anniversary of the registration and extends three months beyond the expiration of the twenty year term. While the Post Registration Division may allow up to six months to respond to a notice of defect, it may not allow corrective action beyond the period for filing established by the Trademark Act. It is therefore in the registrant's best interest to file such documents as close to the opening date as possible to allow time for correction, if necessary. Provisional acceptance under 35 U.S.C. §26 has been, and will continue to be, given narrow application. Registrants should not rely on 35 U.S.C. §26 as a means of acquiring an extension of time.

We have also become aware of many delays caused by defects in the chain of title. Registrants are encouraged to keep Patent and Trademark Office assignment records current with regard to ownership of registrations.

The filing of Post Registration documents at the earliest date and maintenance of assignment records will help to avoid the cancellation or expiration of registrations of trademarks currently in use, and will result in a savings of time and expense for both the registrant and the Patent and Trademark Office.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Apr. 19, 1983.

[1030 TMOG 37]

(192) Trademark Examining Operation

Effective Dec. 1, 1983, all requests presented to the Patent and Trademark Office under the provisions of Section 7 of the trademark statute (15 U.S.C. 1057) will be considered by the Post Registration Section of the Trademark Examining Operation.

Necessary telephone inquiries concerning procedure or status should be directed to 703–557–1986.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Dec. 2, 1983.

[1038 TMOG 256]

(193) Expedited Service for Certified Copies of Trademark Registrations

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registrations will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crystal Plz. 2–4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2–4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Plz. 2–3C06
(703) 557–3268

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Aug. 19, 1986.

[1070 TMOG 4]

TRADEMARK INFORMATION AND CORRESPONDENCE

(194) Powers of Attorney in Registered Trademark Files

On and after Feb. 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C.M. WENDT,
Director.

Jan. 30, 1967.

[835 TMOG 95]

(195) Initial Processing of Application

On Feb. 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

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Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.
2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.
3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.
4. When an application is accompanied by a petition to the Commissioner under §2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective Feb. 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 F.R. 942; Jan. 21, 1972

[895 O.G. TM 193]

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(196) **Mail Delays and Petitions to Revive (Trademarks)**

Since applications that become abandoned unintentionally present burdens to both the Patent office and the applicant, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure (which is similar to the procedure adopted for patent applications at 910 O.G. 402 and 910 O.G. TM 76) provides for an automatic petition to revive.

When a trademark communication which falls within the circumstances enumerated below is mailed to the Patent Office more than three full days prior to the due date, a conditional petition may be attached to the communication. If the communication is received in the Patent Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were either placed in the United States mail as first class or air mail or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office by the due date, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places the application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

A suggested declaration form for the petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited in ( ) the United States mail as first class or air mail, or ( ) the mail outside the United States as air mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on _____; which date is more than three full days prior to the due date, at _____, by _____.
(Location) (Name of individual)

In the event that such communication is not timely filed in the Patent Office, it is requested that this paper be treated as a petition to revive and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. _____ in the name of _____.

The undersigned declares further that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: (Signature of applicant or applicant's attorney)
And
Date: (Signature of person mailing, if other than the above)

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

RENE D. TEGTMEYER,
Mar. 21, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 126]

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(197) **Dissemination Of Trademark Information**

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703–557–3268.

BERNARD A. MEANY,
Feb. 15, 1978. *Assistant Commissioner for Trademarks.*

[968 TMOG 9]

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(198) **Requests for Information on Status of Trademark Registrations**

The purpose of this notice is to explain the circumstances in which the Trademark Examining Operation can respond to written and telephone requests for information about the status of trademark registrations. Only limited information can be provided by telephone.

I. Orders for "Status" Copies

The most reliable means of obtaining status information concerning a registration is a written order for a "status" copy of the registration. Status copies show whether affidavits have been filed under Sections 8 and 15, whether the registration has been renewed or cancelled, and whether certain other actions have been taken with respect to the registration. The charge for copies of registrations showing status and/or title, if not certified, is $6.50, effective Oct. 1, 1982. The charge for a certified copy showing status and/or title is $10.00 effective the same date.

II. Telephone Information Available from the Search Library

If the caller has the registration number, he or she may leave a request for status information on an automatic answering machine in the Trademark Search Library (Search Room) at 703–557–3282. The Search Library staff will call back with the information requested within one working day. Callers are asked to limit their requests to two registration numbers per day.

The Search Library staff is not permitted to make "searches" to determine if particular marks are in the Office's search files. Neither is the staff able to supply information as to the ownership or assignment of registrations, or to read over the telephone lengthy passages of a registration, such as the identification of goods or services.

III. Telephone Information on Receipt of Section 8 and 15 Affidavits and Renewal Applications

The Post Registration Section can be reached by calling 703–557–2923. The staff of this section can advise only on whether an affidavit or a renewal application has or has not been received. Inquiries as to whether affidavits and renewals have been accepted should be directed to the Search Library.

MARGARET M. LAURENCE,
Sept. 15, 1982. *Assistant Commissioner for Trademarks.*

[1023 TMOG 15]

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(199) **Transmittals for Use of Deposit Accounts**

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

THERESA A. BRELSFORD,
Nov. 21, 1983. Assistant Commissioner for Administration.

[1037 TMOG 15]

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(200) **Helpful Hints From The PTO**

- *Data To Be Included on Patent and Trademark Papers Filed In The PTO In Response To Office Actions*—Perhaps the greatest cause of delay and wasted time in the support sections of the PTO is in trying to match papers bearing incorrect or incomplete data with applications. Because some Trademark Papers are not clearly identified as pertaining to Trademark applications, they are frequently misrouted to the Patent Examining Groups.

On all papers related to *Patent* applications, type the word "PATENT" in the upper right-hand corner of the document. Also, please include the correct serial number, filing date, inventor's name, and title of the invention. Additionally, include the examiner's name, and group art unit number or other identifying data found on the most recent letter from the PTO. (37 CFR 1.1(a)).

However, please note that an organizational restructuring of the Patent Examining Corps has resulted in many applications being reassigned to new Groups and Art Units. Your attention is directed to the NOTICE OF CHANGES IN THE PATENT EXAMINING CORPS that appeared in the OFFICIAL GAZETTE on June 26, 1984, (1043 OG 23), which identifies the Group Art Unit of each examiner (1043 OG 40 through 1043 OG 67). Letters mailed from the Groups after Apr. 15, 1984, should reflect the current identifying data.

For all papers related to *Trademark* applications, type the word "TRADEMARK" in the upper right-hand corner of the document. Also, please set forth the applicatant's name, correct serial number (including the series number which currently is "73"), filing date, law office, examining attorney and mark.

Documents for which no fee is required at the time of filing (e.g., amendments to applications and requests for extensions of time to file an opposition) continue to be addressed:

Box 5
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Mail directed to the Trademark Trial and Appeal Board should have mark "Attention: TTAB" on the envelope in additon to "Box 5."

- *Mailing Responses To The PTO*—In general, it would eliminate or greatly reduce processing steps by the PTO support staff, and will avoid interruption of the examiner's work, if a few simple, general rules were followed in regard to mailing of the responses to the PTO:

1. After a Patent or Trademark application is filed, please avoid filing additional papers (other than those requesting a filing receipt or those required by the Office) until the filing receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.
2. In *Patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *Trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel (37 CFR 1.4(c)). However, please include a statement in the amendment/response describing the paper being filed.
3. Where a supplemental or preliminary amendment is found necessary in *Patent* or *Trademark* applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.
4. File *Patent* and *Trademark* documents which have no particular time or sequence requirement, with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority and formal drawings in Patent applications or changes in Power of Attorney or Mailing Address following first action.
5. If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners

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are taking up new applications before an information statement is matched with the application.

THERESA A. BRELSFORD,
July 10, 1984. *Assistant Commissioner for Administration.*

[1044 TMOG 44]

(201) **Published Trademark Applications**

Papers which are filed in the Patent and Trademark Office in connection with published trademark application files should be captioned to the attention of the Trademark Quality Review Clerk and addressed as follows:

Commissioner of Patents and Trademarks
Attention: Box 5, Trademark Quality Review Clerk
Washington, D.C. 20231

This mailing should be used only for papers filed after publication but before issuance of the registration. This could include corrections to information which appears to have been inadvertently or incorrectly published in the Trademark Official Gazette, as well as changes of attorney or address papers or notification of filing an assignment. Corrections to information published in the TMOG must be received in the Office before the registration is issued.

Use of this mailing address for corrections will help ensure that such papers are properly routed within the Office. Telephone inquiries concerning corrections or other matters in relation to published trademark applications should be directed to (703) 557–4249.

MARGARET M. LAURENCE
Dec. 10, 1984. *Assistant Commissioner for Trademarks.*

[1050 TMOG 316]

(202) **Notices of Abandonment**

The Trademark Operation has begun notifying trademark applicants when their pending applications have been abandoned by the Office. Under this new procedure, a computer-generated post card bearing the notice, serial number, applicant name and abandonment date will be sent to the correspondence address designated by the applicant. The post cards will be mailed within 2 to 4 weeks after the application is declared abandoned.

MARGARET M. LAURENCE
Jan. 13, 1986. *Assistant Commissioner for Trademarks.*

[1063 TMOG 4]

(203) **Change of Correspondence Address in Trademark Applications**

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record, correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates *in writing* that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing the address or revoking the prior power of attorney. See TMEP Section 603.

MARGARET M. LAURENCE,
May 15, 1986. *Assistant Commissioner for Trademarks.*

[1067 TMOG 7]

(204) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557–3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557–3227.

THERESA A. BRELSFORD,
June 23, 1986. *Assistant Commissioner, for Administration.*

[1068 TMOG 4]

(205) **New Trademark Fees**

Effective Oct. 4, 1986, the trademark fee schedule (Rule 2.6, 37 CFR §2.6), is as follows:

(a)	For filing an application, per class	$200.00
(b)	For filing an appliclation for renewal of a registration, per class	300.00
(c)	For filing to publish a mark under section 12(c), per class	100.00
(d)	For issuing a new certificate of registration upon request of assignee	100.00
(e)	For a certificate of correction of registrant's error	100.00
(f)	For filing a disclaimer to a registration	100.00
(g)	For filing an amendment to a registration	100.00
(h)	For filing an affidavit under §8 of the Act, per class	100.00
(i)	For filing an affidavit under §15 of the Act, per class	100.00
(j)	For filing a combined affidavit under §§8 and 15 of the Act, per class	200.00
(k)	For petitions to the Commissioner	100.00
(l)	For filing petition to cancel or notice of opposition, per class	200.00
(m)	For ex parte appeal to the Trademark Trial and Appeal Board, per class	100.00
(n)	For printed copy of registered mark	
	Copy only	1.50
	Copy showing title and/or status	6.50
(o)	For certifying trademark records, per certificate	3.50
	For expedited handling of such certification, per record requested	25.00
(p)	For photocopies or other reproductions of records, drawing, or printed material, per page of the material copied	0.30
(q)	For recording trademark assignments and agreements or other papers relating to the property in a registration or application, per document	100.00
	For each mark in addition to one assigned in the same document	20.00
(r)	For abstracts of title to each registration or application, including the search	12.00
(s)	For special service handling of late filed fees in connection with a renewal	100.00
(t)	For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service	actual cost.

MARGARET M. LAURENCE,
Aug. 15, 1986. *Assistant Commissioner, for Trademarks.*

[1070 TMOG 10]

(206) **Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks**

1. *Service of court papers*

This notice supersedes the Solicitor's Notice of Sept. 10, 1982 [1023 *Official Gazette* 3 (Oct. 5, 1982)].

Court papers may be served on the Solicitor in the following manner:

A. By hand between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor located in Crystal Plz., Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Fl., Rm. 5–C–15, Arlington, Va.

B. By mail in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215.

Court papers mailed to an address other than the Solicitor's service address above, or hand-delivered to the Office of the Solicitor, are deemed to be served when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the Patent and Trademark Office in connection with an application or other proceeding pending in the Office should not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be filed in the Office and will be returned. No exceptions will be made to this policy.

2. *Filing of a notice of appeal to the Federal Circuit*

A notice of appeal from a decision of the Board of Patent Appeals and Interferences in an *ex parte* or *inter partes* patent matter or a decision of the Trademark Trial and Appeal Board in an *ex parte* or *inter partes* trademark matter must be timely filed.

A certificate of mailing under 37 CFR §1.8 *cannot* be used for the purpose of effecting "filing" of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit. *In re Thrifty*, 231 USPQ 560 (Comm'r. Pat. 1986), *mandamus denied mem.*, Misc. No. 137 (Fed. Cir. Nov. 21, 1986) (unpublished). Thus, a notice of appeal which reaches the Patent and Trademark Office after the due date, is not considered to be timely filed, even though mailed prior to the due date with a certificate of mailing under 37 CFR §1.8.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any of the following ways:

A. By mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service *only*) under 37 CFR §1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand to the Office of the Solicitor.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit should *not* be mailed to the Solicitor's mail service address.

JOSEPH F. NAKAMURA,
June 8, 1987. *Solicitor.*

[1079 TMOG 5]

(207) **HELPFUL HINTS**

• *Correspondence with Certificate of Mailing Delivered by Commerical Carrier* — The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand carried or delivered to the PTO via commerical mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS'," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

[1080 TMOG 6]

(208) **Appeals to CAFC**

In every case of an appeal to the CAFC from a decision of the Board of Patent Appeals and Interferences or the Trademark Trial and Appeal Board, a copy of the notice of appeal should be separately transmitted to the Office of the Solicitor at the time the original notice is filed with the Commissioner. The Solicitor's copy should be sent in an envelope addressed as follows:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attn: Office of the Solicitor

In lieu of mailing, the copy for the Solicitor may be hand-delivered to the Office of the Solicitor. Sending a copy of the notice of appeal to the Solicitor's Office will prevent or reduce delays in docketing appeals in the CAFC.

DONALD W. PETERSON,
July 17, 1987. *Deputy Commissioner of Patents and Trademarks.*

[1081 TMOG 5]

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(209) **HELPFUL HINTS**

• *Certificate of Mailing AND Return Post Card* — Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is *not* received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

[1082 TMOG 8]

(210) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

DONALD W. PETERSON,
Oct. 5, 1987. *Deputy Commissioner.*

[1083 TMOG 7]

TRADEMARK PUBLICATIONS

(211) **Separation of the Patent and Trademark Sections of the Official Gazette**

Effective February 2, 1971, the *Official Gazette* will be separated into two parts to be known as the *Patent Official Gazette and the Trademark Official Gazette.*

* * * * *

Orders for subscriptions should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the *Official Gazette* will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the *Official Gazette* will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the *Patent Official Gazette* and the *Trademark Official Gazette* will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

WILLIAM E. SCHUYLER, JR.,
Dec. 29, 1970. *Commissioner of Patents.*

[882 O.G. TM 33]

(212) **Changes in Format for Publishing Trademarks for Opposition**

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see *Official Gazette* of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the *Official Gazette* of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the *Official Gazette* entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see *Official Gazette* of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
>
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Orders are now being accepted by the Superintendent of Documents. The stock number is 003–004–00606–4. Direct inquiries to:

Superintendent of Documents
U.S. Goverment Printing Office
Washington, D.C. 20402

Checks for orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
June 29, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 3]

(217) **USTA Publications of Looseleaf Rules of Practice**

The United States Trademark Association has published *US Trademark Law; Rules of Practice, Forms and Federal Statutes.* The book, in looseleaf format to allow for supplements, includes the trademark Rules of Practice, sample forms, the Lanham Act and applicable provisions and cites of other statutes that deal with trademarks and the Patent and Trademark Office. In content and format, the USTA publication generally replaces the Government Printing Office looseleaf edition of the Rules of Practice which has been discontinued.

Information on ordering copies of *US Trademark Law: Rules of Practice, Forms and Federal Statutes* may be obtained from:

The United States Trademark Association
6 East 45th St.
New York, N.Y. 10017
(212) 986–5880

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, every July. Effective July 1, 1983, however, the CFR edition no longer includes forms.

MARGARET M. LAURENCE,
Apr. 30, 1984. *Assistant Commissioner for Trademark.*

[1042 TMOG 58]

(218) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. if a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

THERESA A. BRELSFORD,
Aug. 3, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 24]

(219) **Notification of Errors in Trademark Official Gazette**

In view of the establishment of in-house photocomposition of the Trademark Official Gazette, it is important that errors noted by the public be directed to a single office within the Trademark Examining Operation for verification and correction.

Written notification of errors in the publication of marks in the Trademark Official Gazette should include the correspondent's telephone number and should be addressed to the Paralegal Specialist, Office of the Deputy Assistant Commissioner for Trademarks, United States Department of Commerce, Patent and Trademark Office, Washington, D.C. 20231. Error notification may also be done by telephone to the Paralegal Specialist in the Office of the Deputy Assistant Commissioner for Trademarks, at 202–557–3268.

Applicants may use this procedure to notify the Office of errors in relation to marks published in the Official Gazette if the error is purely clerical (e.g. typographical error, drawing printed upside down, or incorrectly stated data). This procedure should not be used to dispute information that is actually of record in the application file. The Paralegal Specialist will review the notification of error and verify the existence of the clerical error, determine whether the error can be corrected without jurisdiction being restored to the Examining Attorney or republication being required, and coordinate the appropriate correction procedure.

Notification must be received by the Office within one week after the Official Gazette publication date to permit processing by the Office.

MARGARET M. LAURENCE
Apr. 11, 1985. *Assistant Commissioner for Trademarks.*

[1054 TMOG 4]

(220) **Subscription Pricing Information**

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section	
First-class domesitc mailing	$384.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	18.00
Single copies each foreign	22.00
Title: Official Gazette, Trademark Section	
First-class domestic mailing	246.00
Surface mailing, foreign	307.50
Single copies each, domestic	7.00
Single copies, foreign	8.75

This change is effective with Government periodicals and Subscription Services Price List 36, dated Summer, 1986.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

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Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order. Subscriptions can also be charged to your Master Charge or VISA, include your Account Number and expiration date.

This notice supersedes the notice published June 10, 1986, at 1067 OG 12, and 1067 TMOG 13.

June 25, 1986. THERESA A. BRELSFORD,
Assistant Commissioner,
for Administration.

[1068 TMOG 5]

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(221) **Printing of Use in Another Form Claims**

Effective immediately, all claims of prior use of the subject mark in another form contained in applications for Trademark registrations will be printed in the *Official Gazette* and on the registration certificates according to the following formats:

First used in another form on _____
First used in commerce in another form on _____

July 15, 1986. MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

[1069 TMOG 4]

TRADEMARK MISCELLANEOUS

(222) **Recording of Documents Affecting Title**

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

June 16, 1971. WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2]

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(223) **International Protection of Government Emblems and Seals**

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one department seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of Dec. 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by Sept. 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1 1/2 inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 18, 1976. C. MARSHALL DANN,
Commissioner of Patents
and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114]

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(224) **Recording of "Territorial Assignments" in the Assignment Division of the Patent and Trademark Office**

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

Oct. 7, 1977. BERNARD A. MEANY,
Assistant Commissioner
for Trademarks.

[964 TMOG 8]

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(225) **Flexible Working Hours**

On Jan. 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

Dec. 13, 1978. DONALD W. BANNER,
Commissioner of Patents
and Trademarks.

[978 TMOG 141]

(226) **THE RETENTION SCHEDULE FOR TRADEMARK RECORDS**

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks, and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.	PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years.
Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.
Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Indes. Index to trademark registration that are renewed.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
B. Serial Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings., Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.
Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from *Official Gazette.*	
a. Those which have been opposed.	*Retain in agency until no longer needed for reference.*
b. All others.	*Destroy when mark is registered.*
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	*PERMANENT.* Offer to National Archives when no longer needed for regerence.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	*PERMANENT.* Offer to National Archives when no longer needed for reference.

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Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

Section 1. International classification—Application in more than one class
Section 2. International classification—Application in one class
Section 3. Prior United States classification—Application in more than one class
Section 4. Prior United States classification—Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

RENE D. TEGTMEYER,
Mar. 22, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 122]

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(213) **Change in Official Gazette Entry to Show Cancellation of Fewer Than All Classes in a Multiple Class Registration**

Effective with the *Official Gazette* issue of December 16, 1980, there will be a change in the *Official Gazette* listing entitled "Trademark Registrations Cancelled." Beginning with that issue, "Trademark Registrations Cancelled" will list:

(1) single class registrations cancelled;
(2) multiple class registrations cancelled in all classes;
(3) multiple class registrations cancelled in fewer than all classes.

For every entry in the listing, the specific classes cancelled will be included in parentheses, next to the registration number and mark.

For a single class registration and for a multiple class registration in which every class has been cancelled, the class number(s) shown in parentheses will represent every class to which the registration applied.

For a multiple class registration in which fewer than all classes have been cancelled, the *Official Gazette* entry will include the word "only" following the notation of classes in parentheses, for example: (Int. Cls. 12 and 20, only). In this example, the addition of the word "only" would indicate that there are classes in the registration in addition to Classes 12 and 20, but only Classes 12 and 20 have been cancelled.

MARGARET M. LAURENCE,
Oct. 29, 1980. *Assistant Commissioner, for Trademarks.*

[1000 TM 21]

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(214) **Single Copies of the Trademark Official Gazette**

Members of the public ordering single copies of the Trademark Official Gazette from the Superintendent of Documents are reminded they must specify the date of the issue being ordered.

The date of the issue in which a mark will be published for opposition is shown on The Notice of Publication form mailed to applicants approximately two weeks before the publication date. This date must be included on each single copy order.

Orders received without an issue date may be filled from current weekly stock. The Superintendent of Documents cannot check on whether a particular mark is published in the issue then in stock. If the stock is exhausted at the time the order is received, the order will be returned unfilled.

MARGARET M. LAURENCE,
Mar. 3, 1981. *Assistant Commissioner for Trademarks.*

[1004 O.G. 36]

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(215) **Inadvertently Issued Registration Numbers**

Effective Jan. 3, 1984, a new sub-section identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Canceled" section of the *Official Gazette.*

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

MARGARET M. LAURENCE,
Nov. 15, 1983. *Assistant Commissioner for Trademarks.*

[1037 TMOG 16]

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(216) **Availability of Patents and Trademarks Style Manual**

The latest edition of Patents and Trademarks Style Manual will be available to the patent and trademark community soon. This edition will be published as a separate supplement to the GPO Style Manual. It is the first revision since 1973, and will be available in looseleaf form. The cover of this supplement is illustrated below:

PATENTS AND TRADEMARKS STYLE MANUAL



A Supplement to the
UNITED STATES GOVERNMENT PRINTING OFFICE
Style Manual

1984

UNITED STATES PATENT AND TRADEMARK OFFICE

Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	*PERMANENT.* Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.
b. papers and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark practice and Procedure Files. Record set of training materials used in training trademark examiners.	*PERMANENT.* Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.
Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	
a. Records that supplement the International Property Activities Case Files (Item 103).	*PERMANENT.* Transfer to office responsible for international affairs after case is closed.
b. Other materials.	Destroy 5 years after close of case or sooner if no longer needed.
International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state:	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

1. That they be made of material suitable for being placed inside a manila file wrapper.
2. That they be capable of being arranged flat, such as being folded.
3. That they be of a size not to exceed 8 1/2 inches wide by 13 inches long. (Rule 2.56)

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 × 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979.

SAUL LEFKOWITZ,
Acting Assistant Commissioner for Trademarks.

[980 TMOG 16]

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(227) **Public Advisory Committee for Trademark Affairs**

Reestablishment

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of Mar. 1974, and after consultation with GSA, it has been determined that the reestablishment of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in Sept., 1970, and its present charter expired on Jan. 10, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five per cent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Association. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office; Washington, D.C. 20231; telephone (703) 557–3881.

Mar. 15, 1979. GUY W. CHAMBERLIN,
Assistant Secretary for Administration.

[FR Doc. 79–8929; Filed 3–22–79; 8:45 am]

[982 TMOG 14]

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(228) **Certified Copies of Trademark Applications/Registrations**

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

Jan. 17, 1984. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1039 TMOG 140]

(229) **TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872–1990**

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

Calendar Table of Official Gazette Volume Numbers
Month-by-Month Volume Numbers: Jan. 1872 to Present

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1872°	1	1	1	1	1	1	2	2	2	2	2	2
1873	3	3	3	3	3	3	4	4	4	4	4	4
1874	5	5	5	5	5	5	6	6	6	6	6	6
1875	7	7	7	7	7	7	7	8	8	8	8	8
1876	9	9	9	9	9	9	10	10	10	10	10	10
1877	11	11	11	11	11	11	12	12	12	12	12	12
1878	13	13	13	13	13	13	14	14	14	14	14	14
1879	15	15	15	15	15	15	16	16	16	16	16	16
1880	17	17	17	17	17	17	18	18	18	18	18	18
1881	19	19	19	19	19	19	20	20	20	20	20	20
1882	21	21	21	21	21	21	22	22	22	22	22	22
1883°	23	23	23	23	23	23	24	24	24	25	25	25
1884	26	26	26	27	27	27	28	28	28	29	29	29
1885	30	30	30	31	31	31	32	32	32	33	33	33
1886	34	34	34	35	35	35	36	36	36	37	37	37
1887	38	38	38	39	39	39	40	40	40	41	41	41
1888	42	42	42	43	43	43	44	44	44	45	45	45
1889	46	46	46	47	47	47	48	48	48	49	49	49
1890	50	50	50	51	51	51	52	52	52	53	53	53
1891	54	54	54	55	55	55	56	56	56	57	57	57
1892	58	58	58	59	59	59	60	60	60	61	61	61
1893	62	62	62	63	63	63	64	64	64	65	65	65
1894	66	66	66	67	67	67	68	68	68	69	69	69
1895	70	70	70	71	71	71	72	72	72	73	73	73
1896	74	74	74	75	75	75	76	76	76	77	77	77
1897	78	78	78	79	79	79	80	80	80	81	81	81
1898	82	82	82	83	83	83	84	84	84	85	85	85
1899	86	86	86	87	87	87	88	88	88	89	89	89
1900	90	90	90	91	91	91	92	92	92	93	93	93
1901	94	94	94	95	95	95	96	96	96	97	97	97
1902	98	98	98	99	99	99	100	100	100	101	101	101
1903°	102	102	103	103	104	104	105	105	106	106	107	108
1904	108	108	109	109	110	110	111	111	112	112	113	113
1905	114	114	115	115	116	116	117	117	118	118	119	119
1906	120	120	121	121	122	122	123	123	124	124	125	125
1907	126	126	127	127	128	128	129	129	130	130	313	131
1908	132	132	133	133	134	134	135	135	136	136	137	137
1909°	138	139	140	141	142	143	144	145	146	147	148	149
1910	150	151	152	153	154	155	156	157	158	159	160	161
1911	162	163	164	165	166	167	168	169	170	171	172	173
1912	174	175	176	177	178	179	180	181	182	183	184	185
1913	186	187	188	189	190	191	192	193	194	195	196	197
1914	198	199	200	201	202	203	204	205	206	207	208	209
1915	210	211	212	213	214	215	216	217	218	219	220	221
1916	222	223	224	225	226	227	228	229	230	231	232	233
1917	234	235	236	237	238	239	240	241	242	243	244	245
1918	246	247	248	249	250	251	252	253	254	255	256	257
1919	258	259	260	261	262	263	264	265	266	267	268	269
1920	270	271	272	273	274	275	276	277	278	279	280	281
1921	282	283	284	285	286	287	288	289	290	291	292	293
1922	294	295	296	297	298	299	300	301	302	303	304	305
1923	306	307	308	309	310	311	312	313	314	315	316	317
1924	318	319	320	321	322	323	324	325	326	327	328	329
1925	330	331	332	333	334	335	336	337	338	339	340	341

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Calendar Table of Official Gazette Volume Numbers
Month-by-Month Volume Numbers: Jan. 1872 to Present—Continued

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1926	342	343	344	345	346	347	348	349	350	351	352	353
1927	354	355	356	357	358	359	360	361	362	363	364	365
1928	366	367	368	369	370	371	372	373	374	375	376	377
1929	378	379	380	381	382	383	384	385	386	387	388	389
1930	390	391	392	393	394	395	396	397	398	399	400	401
1931	402	403	404	405	406	407	408	409	410	411	412	413
1932	414	415	416	417	418	419	420	421	422	423	424	425
1933	426	427	428	429	430	431	432	433	434	435	436	437
1934	438	439	440	441	442	443	444	445	446	447	448	449
1935	450	451	452	453	454	455	456	457	458	459	460	461
1936	462	463	464	465	466	467	468	469	470	471	472	473
1937	474	475	476	477	478	479	480	481	482	483	484	485
1938	486	487	488	489	490	491	492	493	494	495	496	497
1939	498	499	500	501	502	503	504	505	506	507	508	509
1940	510	511	512	513	514	515	516	517	518	519	520	521
1941	522	523	524	525	526	527	528	529	530	531	532	533
1942	534	535	536	537	538	539	540	541	542	543	544	545
1943	546	547	548	549	550	551	552	553	554	555	556	557
1944	558	559	560	561	562	563	564	565	566	567	568	569
1945	570	571	572	573	574	575	576	577	578	579	580	581
1946	582	583	584	585	586	587	588	589	590	591	592	593
1947	594	595	596	597	598	599	600	601	602	603	604	605
1948	606	607	608	609	610	611	612	613	614	615	616	617
1949	618	619	620	621	622	623	624	625	626	627	628	629
1950	630	631	632	633	634	635	636	637	638	639	640	641
1951	642	643	644	645	646	647	648	649	650	651	652	653
1952	654	655	656	657	658	659	660	661	662	663	664	665
1953	666	667	668	669	670	671	672	673	674	675	676	677
1954	678	679	680	681	682	683	684	685	686	687	688	689
1955	690	691	692	693	694	695	696	697	698	699	700	701
1956	702	703	704	705	706	707	708	709	710	711	712	713
1957	714	715	716	717	718	719	720	721	722	723	724	725
1958	726	727	728	729	730	731	732	733	734	735	736	737
1959	738	739	740	741	742	743	744	745	746	747	748	749
1960	750	751	752	753	754	755	756	757	587	759	760	761
1961	762	763	764	765	766	767	768	769	770	771	772	773
1962	774	775	776	777	778	779	780	781	782	783	784	785
1963	786	787	788	789	790	791	792	793	794	795	796	797
1964	798	799	800	801	802	803	804	805	806	807	808	809
1965	810	811	812	813	814	815	816	817	818	819	820	821
1966	822	823	824	825	826	827	828	829	830	831	832	833
1967	834	835	836	837	838	839	840	841	842	843	844	845
1968	846	847	848	849	850	851	852	853	854	855	856	857
1969	858	859	860	861	862	863	864	865	866	867	868	869
1970	870	871	872	873	874	875	876	877	878	879	880	881
1971	882	893	884	885	886	887	888	889	890	891	892	893
1972	894	895	896	897	898	899	900	901	902	903	904	905
1973	906	907	908	909	910	911	912	913	914	915	916	917
1974	918	919	920	921	922	923	924	925	926	927	928	929
1975	930	931	932	933	934	935	936	937	938	939	940	941
1976	942	943	944	945	946	947	948	949	950	951	952	953
1977	954	955	956	957	958	959	960	961	962	963	964	965
1978	966	967	968	969	970	971	972	973	974	975	976	977
1979	978	979	980	981	982	983	984	985	986	987	988	989
1980	990	991	992	993	994	995	996	997	998	999	1000	1001
1981	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013
1982	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
1983	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
1984	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
1985	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061
1986	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073
1987	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085
1988	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097
1989	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109
1990	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121

* SUMMARY OF CHANGES IN VOLUME NUMBERING.

Semi-annual:	*Jan. 1872 through Jun. 1883*
Quarterly:	*Jul. 1883 through Dec. 1902*
Bi-monthly:	*Jan. 1903 through Dec. 1908*
Monthly:	*Jan. 1909 to the present*

The *Official Gazette* was published on successive Wednesdays from 3 Jan. 1872 through 17 Jan. 1872. From 23 Jan. 1872 to the present, it has been published weekly on Tuesday.

(230) Proposed Records Control Schedule

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557–0183. Written comments should be mailed to:

John Hassett, Director
Patent and Trademark Office
Crystal Plz. 1, Lobby
Washington, D.C. 20231

June 17, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Commissioner's and Deputy Commissioner's Records

1. *Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Tradmark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
2. *Reports to the Commissioner.* Reports received by the Commissioner from the Patent and Trademark Office staff and maintained as separate series.
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
3. *Index to Commissioner's Correspondence and Subject Files.* Card index to records described under Item 1.
   PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.
4. *Deputy Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
5. *Policy Documentation Files.* Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars, manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.
   PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.
6. *Work-Flow Control and/or Statistical Reports Files.* Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.
   Destroy when 5 years old or sooner if no longer needed.
7. *Production and Pendency Reports Files.* Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.
   a. Office of Assistant Commissioners or equivalent.
   Transfer to FRC when 5 years old. Destroy when 10 years.
   b. Other Offices.
   Destroy when updated report is received.
8. *Special Studies Files.* Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.
   PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
9. *Narrative and Statistical Reports Files.* Annual or other periodic narrative and statistical reports.
   a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.
   PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.
   b. Other Offices.
   Destroy when 5 years old.
10. *Internal Administrative Files.* Administrative operations files of organizational offices, consisting of:
    a. Correspondence concerning routine or temporary internal administrative matters.
    Destroy when 2 years old.
    b. Office personnel files.
    Destroy after separation of employee.
    c. Completed requisitions for services, supplies and equipment, and travel documents.
    Destroy 1 year after action is completed.
    d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.
    Destroy on completion of program.
    e. Hand receipt files.
    Destroy when property is accounted for.
    f. Suspense files.
    Destroy when purpose is served.
    g. Chronological files.
    Destroy when 2 years old.
11. *Program Planning and Evaluation Files.* Files showing the overall development of Patent and Trademark Office plans and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
12. *Surplus Property Case Files.* Case files on disposal of surplus real and related personal property.
    Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.
13. *Excess Real Property Reports.* Reports of real property with related papers.
    Destroy when 10 years old.
14. *Budget Policy and Procedure Correspondence Files.* Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
15. *Budget Estimates Files.* File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.
    PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.
16. *Records Disposition Files.* Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating t o revisions.
    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.
17. *Forms Files.* One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.

PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

18. *Systems Development Program Files.* Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.
    PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.
19. *Systems Development Task Force, Committee, and Board Files.* Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.
    PERMANENT. Transfer to FRC 5 years after close of file. Offer to National Archives 20 years later or after 25 years old, whichever is sooner.
20. *Technical Report Files.* One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.
    PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.
21. *Systems Development Project Case Files.* Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.
    PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

ADP Records
(also in GRS 20)

22. *ADP Planning Documents Files.* Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.
    PERMANENT. When no longer needed or used offer to National Archives with related materials.
23. *ADP Program Management Files.* Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.
    PERMANENT. Offer to National Archives with related materials.
24. *ADP Standardizations Files.* Standardization files consisting of data elements and codes, standardization requests, and jusification for all data systems developed by or for the Patent Office.
    PERMANENT. Offer to National Archives with related materials.
25. *ADP Data Systems Planning Files.* Documents containing defin ition of the system.
    PERMANENT. Offer to National Archives with related materials.
26. *ADP Information Retrieval System Master Reference File.* Magnetic media containing an index to patents and trademarks and publications.
    PERMANENT. Offer to National Archives on termination of Patent and Trademark Office.
27. *Publication Tape File.* Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
    PERMANENT. Offer to National Archives when publication needs cease.

Patent Records

28. *Advertising Files.* Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
    Destroy when 25 years old.
29. *Complaint Files.* Case files relating to complaints made against attorneys registered to practice before the Patent Office.
    Destroy on death of attorney.
30. *Board of Appeals Decisions Files.* Copies of Board of Appeals decisions with related background materials.
    a. Cases patented.
    Destroy 10 years after patent issued.
    b. All others.
    Destroy 10 years after appeal is decided.
31. *Indexes to Appeal Cases.* Indexes, arranged in various ways, to the appeal cases.
    Destroy 30 years after date of appeal.
32. *Declaration of Assistance Received Files.* Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL–284).
33. *Academy Lecture Files.* Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
    a. Historical Sample
    PERMANENT. Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
    b. All other copies.
    Destroy when obsolete.
34. *Academy Training Sessions Files.* Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
    PERMANENT. Offer to National Archives when 25 years old.
35. *Academy Examinations Files.* Completed examinations of persons attending the Academy.
    Destroy when 1 year old.
36. *Academy Application Files.* Applications for training in the Academy, including memoranda of agreement and personal history statements.
    Destroy when 2 years old.
37. *Academy Correspondence File.* Correspondence relating to the courses offered by the Patent Office Academy.
    Destroy when 5 years old.
38. *Disclosure Document File.* Documents submitted by inventors as evidence of the date of conception of an invention.
    a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
    Dispose of with related patent application.
    b. Disclosure Documents *not* referred to.
    Destroy when 2 years old.
39. *Disclosure Documents Index.* Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
    Destroy with related DD's.
40. *Index to Patents Available for License or Sale.* Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
    Destroy when no longer needed for reference.
41. *General Correspondence File.* Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
    Destroy when 3 years old.
42. *Foreign Filing Licensing Documents.* Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
    Destroy 25 years after date of issue.

43. *Indexes to Foreign Filing Licensing Documents.* Indexes to licensing documents described in Item 43.
    Destroy 25 years after issue.
44. *Transmittals to Other Agencies Files.* Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
    Destroy when 1 year old.
45. *D-1 Files.* Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
    Destroy 35 years after date of receipt for review.
46. *Drawing Correction Slips.* Index arranged by serial number of application and used to locate orders for correction of drawings.
    Destroy when 2 years old.
47. *Inventor's Index to Patent Applications.* Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name and address of the attorney, application serial number and the filing date of the application.
    PERMANENT. Offer to National Archives when no longer needed for reference.
48. *Numerical (serial) Index to Patent Applications.* Index arranged by the serial number assigned to the application.
    PERMANENT. Offer to National Archives when no longer needed for reference.
49. *Assignment Document Files and Index.* Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
    PERMANENT. Offer to the National Archives when no longer needed for current business.
50. *Indexes to Government Interests.* Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
    a. Government Agency Index.
    PERMANENT. Offer to National Archives when no longer needed for reference.
    b. Patent Number Index.
    Destroy when no longer needed for reference.
    c. Assignor Index.
    Destroy when no longer needed for reference.
51. *Petitions to the Commissioner.* Petitions to the Commissioner concerning patent applications.
    a. Original petitions in patent case file.
    Dispose of with related case file.
    b. Other copies.
    Destroy when 2 years old.
52. *Patent Protest Letters.* Protest to the grant of a patent (Rule 291).
    a. Letters filed in patent case file.
    Dispose of with related case file.
    b. Others.
    Destroy when 5 years old.
53. *Patent Docket Cards.* Cards used to control patent applications.
    Destroy when 6 months old.
54. *Classifications Definitions Files.* One copy of each issuance of *Classifications Definitions,* with related background papers.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
55. *Canceled Drawings.* Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
    Destroy 5 years after filing date.
56. *Abandoned Patent Application Files.* Patent applications that did not result in a patent.
    a. Those that are retained because they are referred to in another application that may have become patented.
    Dispose of with patent file in which cited.
    b. All others.
    Destroy when 20 years old.
57. *Patent Files.* Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
    a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
    PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
    b. All others.
    Destroy when 35 years old.
58. *Patent File Charge-out Records.* Record showing name of person charging out a patent file.
    Destroy after file is returned and all papers are determined to be in file.
59. *Statistical Reports on Patents to Printers Files.* Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
    a. Original Report.
    Destroy when 5 years old.
    b. Operating Unit Copy.
    Destroy when 2 years old.
60. *Quality Review of Sample of Allowed Applications.* Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
    Destroy 1 year after ultimate disposition of related case.
61. *Sample Pull-Rate Files.* Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
    Destroy when 1 year old.
62. *Printer-Waiting Register Files.* Register showing status of Query Disposition Records return to a group for reply.
    Destroy when 1 year old.
63. *Query Disposition Record Files.* Form used to return printer-waiting cases to a group for answer to a specific query.
    Destroy 6 months after query is returned.
64. *Batch Control Sheet for Allowed Cases Files.* Form uses as input to PALM System showing routing control and batch contents, such as PTO Form 1238–1.
    Destroy when 1 year old.
65. *Checklist for Applications Allowed by Examiner File.* Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
    Destroy when 1 year old.
66. *Patent Interference Files.* Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
    a. Cases that reach the hearing stage.
    PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
    b. Cases that are abandoned before reaching a hearing.
    Destroy when 40 years old.

67. *Board of Interference Decisions.* Copies of Board of Interference Decisions.
PERMANENT. Offer to the National Archives when 40 years old.
68. *Index to Patent Interferences.* Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.
PERMANENT. Offer to National Archives when 40 years old.
69. *Index to Interference Exhibits.* Describes exhibits in each interference.
Destroy when 40 years old.
70. *Proceedings Under AEC and NASA Acts.* Separate series of interference files relating to the SEC and NASA Acts.
Dispose of with related patent files.
71. *Settlement Agreements.* Files relating to the settlement agreed to by parties in the interference.
Dispose of with related interference case file.
72. *Court Cases.* Proceedings in cases where the Commissioner is a party of a civil suit.
a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.
PERMANENT. Offer to the National Archives when 30 years old.
b. All other cases.
Destroy when 30 years old.
73. *Index to Court Cases.* Card index to cases described under Item 72.
Retain in agency until no longer needed for reference.
74. *Roster of Registered Patent Attorneys and Agents.* Printout listing registered patent attorneys and agents.
Destroy after undated listing is received.
75. *Case Folders of Registered Attorneys and Agents.* Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.
Destroy on death of attorney or agent.
76. *Unsuccessful Application for Registration to Practice before the Patent and Trademark Office.* Application folders of those applicants who failed to be registered.
Destroy 5 years after date of examination.
77. *Examination Papers of Applicants for Registration.* Examination answer papers to applications for registration to practice before the Patent and Trademark Office.
Destroy after grades are recorded.

Trademark Records

78. *Trademark Examiners Work Reports.* Records showing amount of work processed by examiners in a given time. Used to evaluate examiners work and progress.
Destroy when 5 years old.
79. *Trademark Adversary Proceedings Files.* Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.
Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.
80. *Canceled Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after the date of cancellation.
81. *Expired Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after expiration of registration.
82. *Abandoned Trademark Application Files.* Consists of original application and all related correspondence.
Destroy 2 years after date of abandonment.
83. *Trademark Renewal Index.* Index to trademark registrations that are renewed.
PERMANENT. Offer to National Archives when no longer needed for reference.
84. *Indexes to Trademark Applications.* Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.
a. Applicant's Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Serial Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
85. *Proceedings Index to Trademark Adversary Proceedings.* Index in the Trademark Public Search Library arranged by type of proceeding.
Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.
86. *Trademark Adversary Proceedings Records.* Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.
PERMANENT. Offer to National Archives when no longer needed for reference.
87. *Trademark Registrant's Index.* Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.
PERMANENT. Offer to National Archives when no longer needed for reference.
88. *Index to Trademark Trial and Appeal Board Ex Parte Cases.* Record of Trademark Trial and Appeal Board cases in ex parte appeals.
PERMANENT. Offer to National Archives when no longer needed for references.
89. *Public Advisory Committee for Trademark Affairs Files.* Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.
Destroy when 10 years old or no longer needed for reference.
90. *Trademark Petitions Files.* Petitions and decisions to the Commissioner relating to trademarks, with related materials.
a. Original Petitions in trademark case file.
Dispose of with related case file.
b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.
PERMANENT. Offer to the National Archives when no longer needed for references.
c. Other copies.
Destroy when 2 years old.
91. *Trademark Protest Letters.* Letters of protest to the Commissioner related to trademarks.
Destroy when no longer needed or when three years old, whichever is earlier.

Public Information and Service Records

92. *International Intellectual Property Activities Case Files.* Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.
PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
93. *Proposed Intellectual Property Legislation Files.* Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.
PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
94. *Printed Articles Files.* Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.
Destroy when 10 years old.
95. *Public Affairs Report.* Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.
Destroy when 6 months old.
96. *Speakers Files.* Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.
Destroy when 3 years old.
97. *Exhibit Files.* Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
98. *Photograph Files.* Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.
PERMANENT. Offer for transfer to the National Archives when 20 years old.
99. *Publications Files.* Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
100. *Speech Files.* Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
101. *News Release Files.* Official records copy of each new release.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.
102. *Patents Received and Files Register.* Register showing date and number of patent cases received in search room and date filed.
Destroy 2 years after date of last entry in volume.
103. *Reports on Search Room Activities Files.* Weekly, monthly and other periodic reports showing production and general activities of the public search room, with related background papers.
a. Original Report.
Destroy when 1 year old.
b. Operating Office Copy.
Destroy when 2 years old.
104. *Patent and Trademark Reproduction Copy Files.* The master copy of patents and trademarks used for the photoreproduction of sales copies, includes original drawings and specifications.
Transfer to FRC when 10 years old. Destroy when 20 years old.
105. *Reprint Requisition File.* Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.
Destroy when 1 year old.
106. *Sales Journal.* Shows statistical information on sales of copies of patents and trademarks.
Destroy when 5 years old.
107. *Correspondence and Sale Control Records.* Records used to control the flow of correspondence and sale of printed materials.
Destroy when 1 year old.
108. *Requests for Publications.* Correspondence requesting copies of certain publications and other printed materials.
Return requests with ordered materials.
109. *Microform Files.* Microform copies of applications as filed, printed patent files and printed trademark files.
a. Master microfilm files. (Certified as processed under 41 CFR 101–11.504)
PERMANENT. Transfer to classified site. Offer to National Archives when 25 years old.
b. All other microform copies
Non-Records
110. *Charged-Out Slips File.* Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.
Destroy when records are returned.
111. *Binding Instructions.* Cards showing instructions on how the various publications received by the library are to be bound.
Destroy when no longer needed.
112. *Charge-out Files of Library Materials.* Sets of 3" × 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.
Destroy when obsolete or on return of book.
113. *Interlibrary Loans Files.* Records of books borrowed from other libraries.
Destroy 2 years after return of book.
114. *Library Serial Order Cards.* 3" × 5" cards used to record purchase of journals, magazines, etc.
Destroy when no longer needed for reference.
115. *Library Book Order Cards.* 3" × 5" cards showing book purchases.
Destroy when no longer needed for reference.
116. *Foreign Patent Accession Register.* Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.
Destroy when no longer needed for reference.
117. *Inventor's Index.* Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.
PERMANENT. Offer to National Archives when no longer needed for reference.
118. *PTO Procurement Files.* Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).
a. Procurement or purchase organization copy, and related papers.
1. Transactions of more than $10,000 and all construction contracts exceeding $2,000.
Destroy 6 years and 3 months after final payment.
2. Transactions of $10,000 or less and construction contracts under $2,000.
Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal years's files for destruction therewith.)
b. Obligation copy.
Destroy when funds are obligated.
c. Other copies of record described above used by component elements of a procurement office for administrative purposes.
Destroy upon termination or completion.
119. *Solicited and Unsolicited Bids and Proposals Files.*
a. Successful bids and proposals.
Destroy with related contract case files (see item 118 of this schedule.)

b. Solicited and unsolicited unsuccessful bids and proposals.
1. When filed separately from contract case files.
Destroy when related contract is completed.
2. When filed with contract case files.
Destroy with related contract case files (see item 118 of this schedule.)
c. Cancelled Solicitations Files.
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.
Destroy 5 years after date of cancellation.
2. Unopened Bids.
Return to bidder.
d. Lists or Card Files of Acceptable Bidders.
Destroy when superseded or obsolete.

120. *Public Printer Files.* Records relating to requisitions on the Printer, and all supporting papers.
a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.
Destroy 3 years after completion or cancellation of requisition.
b. Accounting copy of requisition.
Destroy 3 years after period covered by related account.

Non Record Materials

The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.

121. *Foreign Patents.* Copies of patents issued by foreign countries.
122. *Translation of Foreign Patents and Publications and Related Indexes.* Typewritten copies of translations and related indexes.
123. *Card Catalogs.* 3" × 5" cards used as finding aids to the library.
124. *Patent Examiner's Search Files.* Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class or subclass.
125. *Printed Trademark Registrations Reference Files.* Digest of Registered marks consisting of a set of registered work marks arranged alphabetically and secondarily by trademark registration number; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.
126. *Numerical Index to Patent Classification.* Arranged numerically by patent number and shows the class and subclass assignment of each patent.
127. *Shelf List of Classified Patents.* Listing of all U.S. Patent numbers comprising, respectively, the "original" and "cross reference" classification of patents according to the official classification of the Patent and Trademark Office.
128. *Public Search Files of U.S. Patents.* Printed or microfilm copies of U.S. Patents arranged in two series: 1) numerically by class and subclass assignment, and secondarily by patent number and 2) numerically by patent number.
129. *Legislative History Files.* Consist mainly of copies of published materials relating to legislation that is of interest to the Patent and Trademark Office. Includes copies of bills, public laws, Federal Register, Congressional Record, and similar materials.

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[1068 TMOG 5]

(231) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded in view of Public Law 98–144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC §6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:
New Year's Day, Jan. 1
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May
Independence Day, July 4
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

DONALD J. QUIGG,
July 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1069 TMOG 5]

(232) **Advisory Committee for Patents and Trademarks; Establishment**

In accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2.) and General Services Administration Interim Rule on Federal Advisory Committee Management, 41 CFR Part 101–6, as amended, and after consultation with GSA, the Secretary of Commerce has determined that the establishment of the Advisory Committee for Patents and Trademarks is in the public interest in connection with the performance of duties imposed on the Department by law.

1. The Committee will advise the Patent and Trademark Office on broad policy issues involving both patents and trademarks, and the overall operation of the Office including matters concerning office-wide Automation programs.

2. The Committee will consist of at least 10 but no more than 18 members to be appointed by the Assistant Secretary and Commissioner of Patents and Trademarks to assure a balanced representation among patent and trademark attorneys, corporate executives, technical research directors, inventors, the judiciary, professional patent and trademark searchers, information specialists and publishers, automation experts, consumer groups, entrepreneurs, and educators. The Committee will function solely as an advisory body and in compliance with the provisions of the Federal Advisory Committee Act. Its charter will be filed under the Act, 15 days from the date of the publication of this notice.

Interested persons are invited to submit comments regarding the establishment of the Advisory Committee for Patents and Trademarks. Such comments, as well as any inquiries, may be addressed to the Executive Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce, Washington, D.C. 20231, phone: 703–557–3071, or the Department's Committee Management Analyst, phone: 202–377–4217.

DONALD J. QUIGG,
Nov. 14, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 86–26451 Filed 11–21–86; 8:45 am]
BILLING CODE 3510–16–M

[1073 TMOG 5]

(233) **Closing of Patent and Trademark Office on Monday, Jan. 26, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Jan. 26, 1987, the Patent and Trademark Office will consider Jan. 26, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purpose of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Jan. 27, 1987.

DONALD W. PETERSON,
Jan. 28, 1987. *Acting Assistant Secretary and Commissioner of Patents and Trademarks.*

[1075 TMOG 4]

(234) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated Jan. 6, 1987**

Copies of the Trademark Official Gazette dated Jan. 6, 1987 were not mailed until Jan. 14, 1987. Therefore, for marks published in the Trademrk Official Gazette dated Jan. 6, 1987, Notices of Opposition filed by Feb. 13, 1987 will be considered timely.

MARGARET M. LAURENCE,
Feb. 4, 1987. *Assistant Commissioner for Trademarks.*

[1076 TMOG 8]

(235) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated Jan. 20, 1987**

Copies of the Trademark Official Gazette dated Jan. 20, 1987 were not mailed until Jan. 27, 1987. Therefore, for marks published in the Trademark Official Gazette dated Jan. 20, 1987, Notices of Opposition filed by Feb. 26, 1987 will be considered timely.

MARGARET M. LAURENCE,
Feb. 4, 1987. *Assistant Commissioner for Trademarks.*

[1076 TMOG 8]

(236) **Filing of Papers Daring Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

DONALD W. PETERSON,
Feb. 11, 1987. *Acting Assistant Secretary and Commissioner of Patents and Trademarks.*

[1076 TMOG 6]

(237) **Closing of Patent and Trademark Office on Monday, Feb. 23, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Feb. 23, 1987, the Patent and Trademark Office will consider Feb. 23, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Feb. 24, 1987.

DONALD J. QUIGG,
Feb. 27, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1076 TMOG 4]

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SPECIAL GRANT COVERS COMMEMORATING THE BICENNTENNIAL OF THE UNITED STATES CONSTITUTION

The Patent and Trademark Office will use special grant covers depicting a United States Constitution motif on patents issued and trademarks registered beginning June 2, 1987, and continuing through the last seven months of 1987.

The patent covers will be printed in black and blue on off-white paper with a shadow print of the U.S. Constitution document, sealed with a red ribbon and gold seal.

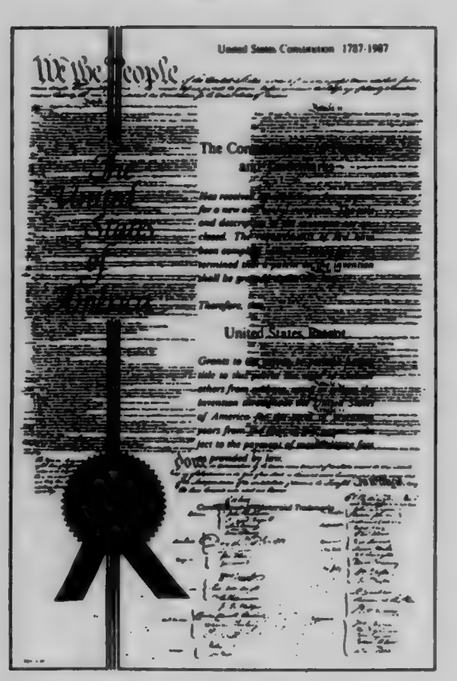
The trademark certificate of registration on the Principal Register covers will be printed in black on off-white paper with a gold eagle and gold seal, and with a shadow print of the U.S. Constitution document. The trademark certificate of registration on the Supplemental Register will be printed in black on yellow paper with a red eagle and red seal, and with a shadow print of the U.S. Constitution document. The trademark certificate of renewal will not be changed.

Reduced size samples of these special covers are illustrated below.

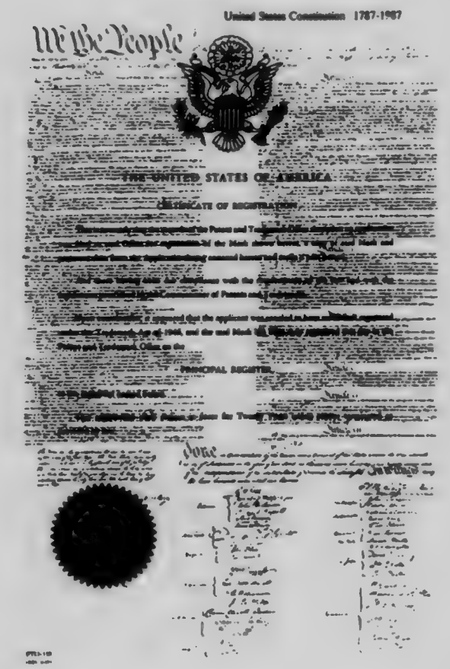
May 13, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commission of Patents and Trademarks.

(patent cover)



(trademark cover)



(239) **Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities and Enforcement Procedures**

Agency: Patent and Trademark Office, Department of Commerce
Action : Notice
Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.
Effective Date: July 1, 1987
For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557–2290.
Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR 101–20.109–10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101–20.3 (41 CFR §§101–20.300 through 101–20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101–20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of $2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

1. User Passes
   a. Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.
   b. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of $5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.
   c. Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.
   d. Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

2. Use of Search Areas
   a. The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:

Patent Public Search Rm., Mezzanine and Microfilm Center	8:00 a.m.—8:00 p.m.*
Trademark Public Search Rm.	8:00 a.m.—5:30 p.m.*
Assignment Search Rm., Public Service Center, and Scientific Library	8:30 a.m.—5:00 p.m.*
Patent Examining Organizations, Trademark Examining Law Offices and all other public access areas of the PTO	8:30 a.m.—5:00 p.m.*

* Clearing of these areas would begin prior to this time to ensure all visitors are out of the building by the time designated.

   b. Materials available for search purposes in the Patent and Assignment Search Rooms and patent application file histories shall not be removed from those areas.
   c. Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.
   d. Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.
   e. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.
   f. Visitors to a Patent Examining Group Search Area must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.
   g. Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

3. PROHIBITIONS

The following are prohibited:

   a. Conduct which is rude or abusive to PTO employees or others.
   b. Smoking and consumption of food or beverages in other than designated areas.
   c. Loud talking or any conduct which may be disruptive to others.
   d. Use of radios, televisions, typewriters, photographic equipment, dictation equipment and

other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.

e. Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.
f. Reserving seats or work areas.
g. Affixing messages to walls, telephone booths or other government property, except designated message boards.
h. Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.
i. Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.
j. Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in th Patent Public Search Room for public use.
k. Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.
l. Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

[1079 TMOG 7]

(240) Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101–20.3, and appropriate sections of Department Organization Orders 10–14 and 30–3 of the Department of Commerce, the procedures appearing below are established.

1. Violations involving unauthorized removal of PTO files, documents, records or government property.
   a. Each observed or reported violation will be investigated.
   b. Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.
   c. Each incident involving unauthorized possession of PTO material or government property shall be immediately reported by telephone or in person to the Office or Group Director of the area from which the material or property was taken.
   d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.
   e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.
   f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.
   g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.

2. Other violations of public use regulations.
   a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.
   b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.
   c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.
   d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.
   e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.
   f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.

3. Factors to be Considered in Assessing Penalties.
   a. Penalties will be determined on a case by case basis.
   b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.
   c. Penalties may be assessed as follows, depending on circumstances:

      (1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.
      (2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.
      (3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.
      (4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as *any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.*

4. Record of Penalties Imposed.
A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

5. Use of Public Facilities During Suspension or After Revocation of User Pass.
No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

6. Absence of Assistant Commissioner for Administration.
In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

7. Absence of Designated PTO Officials.
In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

8. Assistance.
PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1. and 2.

9. Appeals.
Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

May 11, 1987.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1079 TMOG 8]

(241) IMPROVEMENTS TO SERVICES

• *Trademark Drawings* — Effective July 1, 1987, the rule requiring that trademark drawings be limited in size to 4 inches by 4 inches will not be insisted upon for the purpose of assigning a filing date. This change is being made based on a recommendation by the Public Advisory Committee for Trademark Affairs and after consideration of the effect on Office practice.

Drawings must still meet the other requirements of CFR §2.52 to receive a filing date. Further, the size limitation to 4 inches by 4 inches of CFR §2.52(c) must be met before the application may be approved for publication or, if the application is on the Supplemental Register, for registration. It is strongly recommended that applicants attempt to comply with the size requirements at the time of filing to expedite the examination and registration process.

[1079 TMOG 12]

(242) IMPROVEMENTS TO SERVICES

Until recently, trademark assignments containing more than 99 properties were pulled from the normal processing pipeline and handled separately. This was being done since the automatic typewriters used to record the information must be reset to accommodate for more than 99 properties. However, this procedure has resulted in delays in recording such assignments, and in their being processed well after other assignments with earlier receipt dates. This backlog is now being addressed and will be processed by the end of July. All trademark assignments, regardless of the number of properties, are now being processed in date order.

[1080 TMOG 6]

(243) IMPROVEMENTS TO SERVICES

Until June 1987, trademark assignments containing more than 99 properties were pulled from the normal processing pipeline and handled separately. This was being done since the automatic typewriters used to record the information must be reset to accommodate for more than 99 properties. However, this procedure had resulted in delays in recording such assignments, and in their being processed well after other assignments with earlier receipt dates. An intensive effort has been underway to record all those assignments and the backlog has now been completed. All trademark assignments, regardless of the number of properties, are now being processed in date order and we are planning to be back on schedule by the end of Sept.

Similarly, patent assignments involving several properties had also been delayed. The increase in the days to process assignments reflects the working off of this backlog. It is expected to be completed by the end of Sept. and all patent assignments should be back on target in Oct.

[1082 TMOG 8]

(244) Animals — Patentability

A decision by the Board of Patent Appeals and Interferences in *Ex parte Allen*, 2 USPQ2D 1425 (Bd. App. & Int., Apr. 3, 1987), held that claimed polyploid oysters are nonnaturally occurring manufactures or compositions of matter within the meaning of 35 U.S.C. 101. The Board relied upon the opinion of the Supreme Court in *Diamond* v. *Chakrabarty*, 447 U.S. 303, 208 USPQ 193 (1980) as it had done in *Ex parte Hibbard*, 227 USPQ 443 (Bd. App. & Int., 1985), as controlling authority that Congress intended statutory subject matter to "include anything under the sun that is made by man." The Patent and Trademark Office now considers nonnaturally occurring non-human multicellular living organisms, including animals, to be patentable subject matter within the scope of 35 U.S.C. 101.

The Board's decision does not affect the principle and practice that products found in nature will not be considered to be patentable subject matter under 35 U.S.C. 101 and/or 102. An article of manufacture or composition of matter occurring in nature will not be considered patentable unless given a new form, quality, properties or combination not present in the original article existing in nature in accordance with existing law. See e.g. *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 76 USPQ 280 (1948); *American Fruit Growers* v. *Brogdex*, 283 U.S. 1, 8 USPQ 131 (1931); *Ex Parte Grayson*, 51 USPQ 413 (Bd. App. 1941).

A claim directed to or including within its scope a human being will not be considered to be patentable subject matter under 35 U.S.C. 101. The grant of a limited, but exclusive property right in a human being is prohibited by the Constitution. Accordingly, it is suggested that any claim directed to a non-plant multicellular organism which would include a human being within its scope include the limitation "non-human" to avoid this ground of rejection. The use of a negative limitation to

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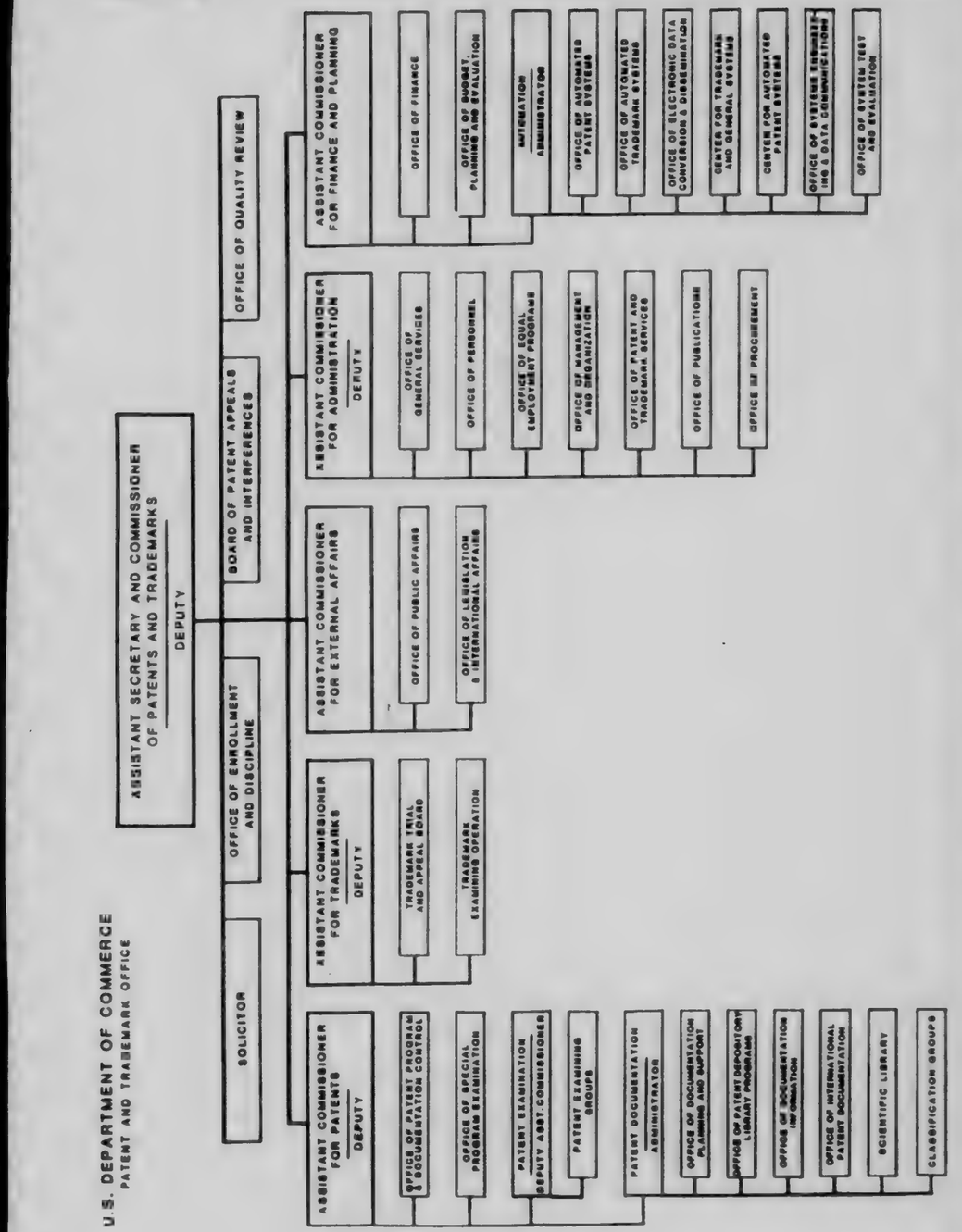
define the metes and bounds of the claimed subject matter is a permissible form of expression, *In re Wakefield*, 422 F.2d 897, 164 USPQ 636 (CCPA 1970).

Accordingly, the Patent and Trademark Office is now examining claims directed to multicellular living organisms, including animals. To the extent that the claimed subject matter is directed to a non-human "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*), such claims will not be rejected under 35 U.S.C. 101 as being directed to nonstatutory subject matter.

Apr. 7, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1077 OG 24]



TELEPHONE DIRECTORY

General Information ..... (703) 557-3080

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 30 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected uner PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 31 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 1, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,490,855 through 4,491,984
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, of 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 18, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
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4,409,700	06/274,038	10/18/83
4,409,703	06/232,556	10/18/83
4,409,709	06/336,039	10/18/83
4,409,717	06/255,858	10/18/83
4,409,727	06/425,770	10/18/83
4,409,732	06/222,384	10/18/83
4,409,733	06/228,603	10/18/83
4,409,740	06/316,558	10/18/83
4,409,744	06/271,549	10/18/83
4,409,750	06/293,902	10/18/83
4,409,751	06/297,243	10/18/83
4,409,752	06/257,796	10/18/83
4,409,753	06/373,423	10/18/83
4,409,763	06/246,612	10/18/83
4,409,768	06/239,324	10/18/83
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4,409,781	06/289,308	10/18/83
4,409,793	06/369,775	10/18/83
4,409,795	06/271,288	10/18/83
4,409,798	06/297,263	10/18/83
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4,409,815	06/314,529	10/18/83
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4,409,819	06/378,162	10/18/83
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4,410,011	06/250,886	10/18/83	4,410,481	06/314,935	10/18/83
4,410,016	06/310,763	10/18/83	4,410,490	06/397,053	10/18/83
4,410,018	06/296,647	10/18/83	4,410,502	06/321,258	10/18/83
4,410,031	06/282,936	10/18/83	4,410,509	06/242,315	10/18/83
4,410,032	06/329,426	10/18/83	4,410,519	06/243,267	10/18/83
4,410,058	06/329,219	10/18/83	4,410,530	06/266,546	10/18/83
4,410,065	06/254,491	10/18/83	4,410,533	06/345,485	10/18/83
4,410,068	06/292,459	10/18/83	4,410,538	06/287,684	10/18/83
4,410,069	06/278,527	10/18/83	4,410,539	06/313,121	10/18/83
4,410,074	06/250,314	10/18/83	4,410,548	06/277,610	10/18/83
4,410,079	06/322,817	10/18/83	4,410,551	06/450,843	10/18/83
4,410,081	06/314,770	10/18/83	4,410,567	06/368,510	10/18/83
4,410,088	06/290,205	10/18/83	4,410,613	06/301,968	10/18/83
4,410,093	06/264,579	10/18/83	4,410,630	06/330,020	10/18/83
4,410,096	06/306,550	10/18/83	4,410,634	06/320,919	10/18/83
4,410,097	06/389,724	10/18/83	4,410,646	06/380,009	10/18/83
4,410,100	06/317,164	10/18/83	4,410,657	06/320,019	10/18/83
4,410,101	06/224,004	10/18/83	4,410,681	06/360,711	10/18/83
4,410,103	06/241,510	10/18/83	4,410,688	06/329,780	10/18/83
4,410,108	06/310,227	10/18/83	4,410,696	06/305,347	10/18/83
4,410,110	06/259,159	10/18/83	4,410,702	06/306,847	10/18/83
4,410,113	06/252,255	10/18/83	4,410,704	06/254,544	10/18/83
4,410,115	06/271,286	10/18/83	4,410,715	06/398,086	10/18/83
4,410,117	06/396,034	10/18/83	4,410,717	06/374,840	10/18/83
4,410,127	06/236,359	10/18/83	4,410,749	06/310,553	10/18/83
4,410,140	06/259,071	10/18/83	4,410,751	06/357,461	10/18/83
4,410,155	06/282,632	10/18/83	4,410,753	06/242,300	10/18/83
4,410,166	06/329,250	10/18/83	4,410,757	06/360,790	10/18/83
4,410,168	06/290,890	10/18/83	4,410,759	06/271,242	10/18/83
4,410,174	06/362,110	10/18/83	4,410,765	06/270,385	10/18/83
4,410,177	06/311,526	10/18/83	4,410,771	06/246,001	10/18/83
4,410,183	06/416,864	10/18/83	4,410,776	06/244,021	10/18/83
4,410,191	06/235,962	10/18/83	4,410,784	06/230,070	10/18/83
4,410,199	06/216,968	10/18/83	4,410,788	06/269,733	10/18/83
4,410,200	06/299,542	10/18/83	4,410,803	06/313,277	10/18/83
4,410,213	06/271,228	10/18/83	4,410,806	06/298,990	10/18/83
4,410,216	06/267,469	10/18/83	4,410,820	06/286,505	10/18/83
4,410,224	06/295,539	10/18/83	4,410,824	06/404,785	10/18/83
4,410,227	06/262,945	10/18/83	4,410,838	06/279,774	10/18/83
4,410,230	06/475,467	10/18/83	4,410,839	06/279,775	10/18/83
4,410,248	06/369,097	10/18/83	4,410,843	06/362,038	10/18/83
4,410,254	06/341,833	10/18/83	4,410,853	06/328,622	10/18/83
4,410,282	06/262,704	10/18/83	4,410,856	06/217,235	10/18/83
4,410,293	06/293,780	10/18/83	4,410,859	06/316,633	10/18/83
4,410,310	06/256,980	10/18/83	4,410,863	06/246,499	10/18/83
4,410,351	06/341,433	10/18/83	4,410,885	06/345,245	10/18/83
4,410,352	06/341,435	10/18/83	4,410,888	06/267,022	10/18/83
4,410,353	06/284,304	10/18/83	4,410,890	06/260,867	10/18/83
4,410,377	06/361,638	10/18/83	4,410,891	06/292,101	10/18/83
4,410,382	06/316,563	10/18/83	4,410,928	06/259,730	10/18/83
4,410,393	06/391,793	10/18/83	4,410,953	06/217,124	10/18/83
4,410,401	06/216,779	10/18/83	4,410,963	06/308,296	10/18/83
4,410,404	06/277,906	10/18/83	4,410,971	06/255,926	10/18/83
4,410,409	06/335,019	10/18/83	4,410,997	06/267,564	10/18/83
4,410,412	06/317,189	10/18/83	4,410,999	06/280,122	10/18/83
4,410,413	06/308,520	10/18/83	4,411,003	06/285,244	10/18/83
4,410,414	06/314,471	10/18/83	4,411,006	06/300,701	10/18/83
4,410,423	06/360,829	10/18/83	4,411,012	06/234,412	10/18/83
4,410,429	06/254,779	10/18/83	4,411,015	06/265,107	10/18/83
4,410,439	06/398,428	10/18/83	4,411,022	06/343,034	10/18/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,364,600	06/278,909	12/21/82	2/3/81	12/9/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,415,438, Re. S.N. 081,716, Filed Aug. 4, 1987, Cl. 502/255, METHOD FOR CATALYTICALLY CONVERTING RESIDUAL OILS, Robert R. Dean, et al., Owner of Record: *Inventor,* Attorney or Agent: David E. Boone, Ex. Gp.: 116

4,485,864, Re. S.N. 937,018, Filed Dec. 2, 1987, Cl. 165/11R, OCCUPANCY RESPONSIVE TEMPERATURE CONTROL SYSTEM, Edwin A. Carrell, et al., Owner of Record: *Flair-Emsco Corp., Hauppauge, N.Y.,* Attorney or Agent: Mark S. Bicks, et al., Ex. Gp.: 340

4,552,544, Re. S.N. 119,759, Filed Nov. 12, 1987, Cl. 464/162, DRIVE LINE SLIP JOINT ASSEMBLY, David Sills, et al., Owner of Record: *Dana Corp., Toledo, Ohio,* Attorney or Agent: Robert M. Leonardi, et al., Ex. Gp.: 245

4,554,076, Re. S.N. 120,599, Filed Nov. 13, 1987, Cl. 210/639, MATERIALS HAVING IMPROVED NONFOULING CHARACTERISTICS AND METHOD OF MAKING SAME, Lois M. Speaker, Owner of Record: *Georgia Tech Research, Atlanta, Ga.,* Attorney or Agent: Vern L. Oldham, et al., Ex. Gp.: 210

4,577,182, Re. S.N. 122,440, Filed Nov. 19, 1987, Cl. 340/539, ALARM SYSTEM, James W. Millsap, et al., Owner of Record: *Said Assignor to Peter Miller, Chicago, Ill.,* Attorney or Agent: George H. Gerstman, Ex. Gp.: 268

4,600,078, Re. S.N. 120,579, Filed Nov. 16, 1987, Cl. 181/286, SOUND BARRIER, Leslie S. Wirt, Owner of Record: *Lockheed Corp., Burbank, Calif.,* Attorney or Agent: Frederic P. Smith, Ex. Gp.: 211

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,053,313, Reexam. No. 90/001,388, Requested: Dec. 3, 1987, Cl. 430/270, PROCESS FOR IMAGE REPRODUCTION USING MULTILAYER PHOTOSENSITIVE SOLVENT PROCESSABLE ELEMENTS, Roxy N. Fan, Owner of Record: *E. I. duPont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Annette L. Richter, Ex. Gp.: 150, Requester: Owner

4,260,890, Reexam. No. 90/001,384, Requested: Nov. 30, 1987, Cl. 250/373, FLUORESCENT GAS ANALYZER, Steven A. Wright, Owner of Record: *Monitor Labs. Inc., San Diego, Calif.,* Attorney or Agent: Carl R. Brown, Ex. Gp.: 250, Requester: Dasibi Environment Corp., Glendale, Calif.

4,323,071, Reexam. No. 90/001,386, Requested: Dec. 1, 1987, Cl. 128/343, VASCULAR GUIDING CATHETER ASSEMBLY AND VASCULAR DILATING CATHETER ASSEMBLY AND A COMBINATION THEREOF AND METHODS OF MAKING THE SAME, John B. Simpson, et al., Owner of Record: *Advanced Catheter Systems Inc., Santa Clara, Calif.,* Attorney or Agent: Flehr, Hohbach, et al., Ex. Gp.: 330, Requester: Donald Jacobson, Burnsville, Minn.

4,384,821, Reexam. No. 90/001,389, Requested: Dec. 3, 1987, Cl. 415/136, FREE FLOATING DIVIDER WALL TURBINE HOUSING, Arthur H. Mains, et al., Owner of Record: *Wallace Murray Corp., New York, N.Y.,* Attorney or Agent: Thomas J. Greer, Ex. Gp.: 240, Requester: Ishiawajma-Harima Heavy Ind., Co., Tokyo, Japan

4,436,233, Reexam. No. 90/001,387, Requested: Nov. 27, 1987, Cl. 224/159, BABY CARRIER, James B. & Sally Hill, Owner of Record: *Inventors, Denver, Colo.,* Attorney or Agent: Robert E. Purcell, Ex. Gp.: 240, Requester: Nanette Reding, Tulsa, Okla.

4,517,099, Reexam. No. 90/001,390, Requested: Dec. 4, 1987, Cl. 210/741, APPARATUS AND METHOD FOR HANDLING SOLIDS IN LIQUID, Raymond A. Breckner, Owner of Record: *Innovac Technology Inc., Vancouver B.C., Canada,* Attorney or Agent: Henry C. Bunsow, Ex. Gp.: 130, Requester: Owner

4,684,404, Reexam. No. 90/001,385, Requested: Dec. 1, 1987, Cl. 75/118, DISSOLUTION OF NOBLE METALS, Guy I. Z. Kalocsai, Owner of Record: *Kaljas Pty Ltd., New South Wales, Australia,* Attorney or Agent: Arthur R. Crawford, Ex. Gp.: 130, Requester: Owner

Erratum

"All reference to Patent No. 4,711,588 to Gene R. Clement of Mich. for 'SEQUENTIAL DRAWER SLIDE' appearing in the Official Gazette of Dec. 8, 1987 should be deleted since no patent was granted."

Requests for Comments on the Desirability of Permitting More Participation by Non-Patent Owner Requesters During Reexamination

The Patent and Trademark Office has received indications and suggestions that reexamination requesters who are not the patent owner be permitted to participate more fully during reexamination proceedings than is now permitted under the present statute (35 USC 302-307) and rules (37 CFR 1.510-1.570). The purpose of this notice is to solicit public comment on draft legislation permitting more participation by non-patent owner requesters during reexamination proceedings. The draft legislation follows this notice.

The draft amendments to the reexamination statute permit increased requester participation throughout the reexamination proceeding including appeal to the Court of Appeals for the Federal Circuit and permit rejection of patent claims in reexamination for lack of compliance of the claims or the specification of the patent with the requirements of 35 USC 112. The amendments being proposed to sections 303, 305, and 306 are intended to increase the value of the reexamination proceeding to the public, and particularly the person requesting reexamination of another's patent, by providing well-defined, but limited, opportunities for the requester to participate in the examination process after it has begun. At present, the person requesting reexamination, if not the patent owner, is not able to participate in, or comment upon, the examination process after it has begun. The intent of these draft amendments is to provide well-defined, but limited, opportunities for the reexamination requester to comment upon, and participate in, each stage of the examination after it has begun, but to do so in such a manner that the requirement of section 305 of this title that reexamination proceedings "be conducted with special dispatch within the Office" is met.

Presently, issues under 35 USC 112 may only be raised during reexamination with respect to new claims or the amendatory subject matter of original claims. The draft amendment provides for the raising of issues under

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35 USC 112 with respect to any claim – new, amended, or original.

Although not specifically provided for in the draft amendments to the statute, this increased requester participation contemplates the Commissioner, under appropriate guidelines, permitting the requester to attend, as an observer, interviews between the examiner and the patent owner. For example, the requester might not be permitted to participate in any manner. The requester might, however, be permitted to file into the reexamination record a summary of the interview or comments on the patent owners or examiner's summary.

The amendment provides a person requesting reexamination, who is not the patent owner, with the opportunity, within the times and conditions established by the Commissioner, to effectively respond to the positions taken by the patent owner during the reexamination proceeding. The amendment provides that a fee or fees for increased requester participation may be established. This could be done, for example, by an increase in the initial reexamination filing fee for all reexaminations, by requiring an individual fee for the right to further participation for each paper filed, or by a combination of such fees.

The amendment also provides the requester with the opportunity, under appropriate conditions, to appeal decisions which are favorable to patentability to the Board of Patent Appeals and Interferences and to the United States Court of Appeals for the Federal Circuit. The amendment is intended to assist the public, including patent owners and alleged or potential infringers, and the Federal courts, by providing a more expeditious and less costly alternative to patent litigation to determine questions of patentability based on patents and printed publications. These amendments will provide the public and the Federal courts with the opportunity in appropriate cases, to obtain a decision as to the patentability of subject matter which may be given preclusive effect. These amendments therefore will make patent litigation less costly and reexamination more attractive and effective.

Dates: Comments and suggestions should be received by March 1, 1988. A public hearing will be held on March 8, 1988, beginning at 9:30 a.m. in Room 11C10 on the 11th floor of Building 3, located at Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Requests to make oral presentations at the hearing should be received on or before March 1, 1988.

Addresses: Address written comments and requests to make oral presentation to the Commissioner of Patent and Trademarks, Washington, D.C 20231 to the attention of R. Franklin Burnett, Crystal Plaza 3-11A13. For further information contact R. Franklin Burnett by telephone at (703) 557-3054.

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Proposed Amendments to Sections 303, 305, and 306 of title 35, United States Code (New language is italic)

(1) Amend 35 U.S.C. §303(c) to read as follows:

(c) *The Commissioner may refund a portion of the reexamination fee required under section 302 of this title upon a final determination that no substantial new question of patentability has been raised unless an appeal under the provisions of section 306 of this title is filed.*

(2) Amend 35 U.S.C. §305 to read as follows:

§305 Conduct of reexamination proceedings

After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. *The examination will include issues under section 112 of this title relating to the patent undergoing reexamination and to proposed amendments to the patent. The person requesting reexamination may file a single set of comments on each notice of examination pursuant to section 132 of this title or the patent owner's response to each notice of examination pursuant to section 132 of this title, within such time and conditions, and upon payment of such fee or fees, as the Commissioner shall establish. The Commissioner may establish the fee or fees as a part of the reexamination fee under section 302 of this title or require the fee or fees to be paid at another time by the requester.* In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Patent Appeals and Interferences will be conducted with special dispatch within the Office.

(3) Amend 35 U.S.C. §306 to read as follows:

306 Appeal

The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and under the provisions of sections 141 to *144* of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent. *Any person requesting reexamination, who is not the patent owner, may appeal to the Board of Patent Appeals and Interferences within such time and conditions and upon the payment of such fee as the Commissioner shall establish, with respect to any decision favorable to patentability or a final order denying reexamination because no substantial new question of patentability has been raised. Any person requesting reexamination, who is not the patent owner, may appeal, under the provisions of sections 141 to 144 of this title, with respect to any decision of the Board of Patent Appeals and Interferences favorable to patentability, or any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised.*

Purpose of the Amendments To Sections 303, 305, and 306

The amendments being proposed to sections 303, 305, and 306 are intended to increase the value of the reexamination proceeding to the public, and particularly to the person requesting reexamination of another's patent, by providing well-defined, but limited, opportunities to participate in the examination process after it has begun. At present, the person requesting reexamination, if not the patent owner, is not able to participate in, or comment upon, the examination process after it has begun. Some members of the public view this total lack of the ability to participate in, or comment upon, the examination process after it has begun as a serious drawback to the effectiveness of reexamination. The intent of these amendments is to respond to this criticism by providing well-defined, but limited, opportunities for the reexamination requester to comment upon, and participate in, each stage of the examination after it has begun, but to do so in such a manner that the requirement of section 305 of this title that reexamination proceedings "be conducted with special dispatch within the Office" is met. This amendment achieves its objectives by providing a person requesting reexamination, who is not the patent owner, with the opportunity, within the times and conditions established by the Commissioner, to effectively respond to the positions taken by the patent owner during the reexamination proceeding. Such a person is also provided with the opportunity, under appropriate conditions, to appeal decisions which are favorable to patentability to the Board of Patent Appeals and Interferences and to the United States Court of Appeals for the Federal Circuit. This amendment is intended to assist the public, including patent owners and alleged or potential infringers, and the Federal courts, by providing a more expeditious and less costly alternative to patent litigation to determine questions of patentability based on patents and printed publications. These amendments will provide the public and the Federal courts with the opportunity in appropriate cases, to obtain a decision as to the patentability of subject matter which can be given preclusive effect. These amendments therefore will make patent litigation less costly and reexamination more attractive and effective.

Section Analysis

Section (1) of this bill amends paragraph (c) of section 303 of title 35 to authorize the Commissioner to refund a portion of the reexamination fee required under section 302 of title 35 upon a final determination that no substantial new question of patentability has been raised unless an appeal under the provisions of the amendment to §306 is filed. If an appeal to the Board of Patent Appeals and Interferences is filed, no refund is proper since the additional expense to the Office makes a refund inappropriate. Further, the refusal to refund a portion of the reexamination fee when an appeal is filed will discourage frivolous appeals.

Section (2) of this bill amends section 305 of title 35, United States Code, by adding to the section a new sentence including examination under section 112 of this title of all claims in a reexamination including those in the patent and those in proposed amendments to the patent. This will allow issues under section 112 with regard to the patent claims to be resolved in the reexamination along with such issues as are now being considered as to new claims or amendments to the claims of the patent under reexamination. It is not intended to extend reexamination to other issues such as whether the invention was on public use or sale or whether there was inequitable conduct in obtaining the patent. Such issues may be decided in the courts in view of the evidence presented after discovery and testimony. A new sentence is also added to the section permitting a person requesting reexamination to file either comments on each notice of examination pursuant to section 132 of this title or a reply to the patent owner's response to each notice of examination pursuant to section 132 of this title, within such time and conditions, and upon payment of such fee or fees, as the Commissioner shall establish. This amendment would permit the person requesting reexamination to have one opportunity to comment upon each notice of examination pursuant to section 132 of this title. If the person requesting reexamination is the patent owner, the patent owner's comments under this section would be expected to be incorporated into the patent owner's response to each notice of examination and the Commissioner could so require. If the person requesting reexamination is not the patent owner, this amendment would permit the requester to file a single set of comments on each notice of examination under section 132, i.e., each of the patent examiner's official actions, or the patent owner's response to each of the examiner's actions. Under this amendment, although a requester could file a set of comments on an official action by the examiner without waiting for the patent owner's response, it is not anticipated that most requesters will do so. A requester would file a set of comments on the examiner's official action, however, in situations where no response is expected by the patent owner.

The amendment authorizes the Commissioner to establish appropriate times and conditions for the filing of the comments or reply such that the requirement of this section that reexamination proceedings "be conducted with special dispatch within the Office" will be met. The Commissioner may limit the content and/or length of the comments or reply, if appropriate, to ensure that the procedure is orderly and conducted with special dispatch. The Commissioner may also, in the Commissioner's discretion, permit the requester to reply to any petitions or other submissions of the patent owner which the Commissioner may authorize to be filed during the reexamination proceeding. It is contemplated that the Commissioner will set strict times for the filing of the comments or reply in order to ensure that the reexamination proceedings are conducted expeditiously. Further, the Commissioner may, in the Commissioner's discretion, return any unauthorized or untimely comments or replies. The requester may be permitted to be present during interviews with the patent owner, subject to guidelines established by the Commissioner.

The amendment authorizes the Commissioner to establish a fee or fees for the increased requester participation. The Commissioner could do so by establishing the fee or fees as part of the reexamination fee under section 302 of this title or requiring the fee or fees to be paid at another time, e.g., upon filing the first or each comment or reply.

Section (3) of this bill amends section 306 of title 35, United States Code, by providing for an appeal to the Court of Appeals for the Federal Circuit by a patent owner from a decision adverse to patentability rather than providing alternative routes of review under both sections 141 and 145. Section (3) also amends section 306 to provide that any person requesting reexamination, who is not the patent owner, may appeal to the Board of Patent Appeals and Interferences within such time and conditions and upon the payment of such fee as the Commissioner shall establish, with respect to any decision favorable to patentability or a final order denying reexamination because no substantial new question of patentability has been raised. Section (3) also amends section 306 to provide that any person requesting reexamination, who is not the patent owner, may appeal to the Court of Appeals for the Federal Circuit with respect to any decision of the Board of Patent Appeals and Interferences favorable to patentability, or any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised.

The amendments to section 306 to require that appeals by either the patent owner or the requester, who is not the patent owner, be directed to the Court of Appeals for the Federal Circuit are designed to eliminate the limited de novo consideration in the District Court which does not appear necessary and to prevent the anomalous situation which would result if the patent owner and the requester, who is not the patent owner, could appeal or seek review in different courts. These amendments will not adversely affect the rights of either the patent owner or the requester, who is not the patent owner, since reexamination proceedings involve decisions based on patents and printed publications or admissions and previous determinations on any grounds by the courts or the Patent and Trademark Office and are suited for consideration by the Court based on the record before the Patent and Trademark Office.

The amendment to section 306 is intended to permit an appeal to the Board of Patent Appeals and Interferences of a final order denying reexamination because no substantial new question of patentability has been raised only in those circumstances where the request is found to contain no substantial new question of patentability and an order for reexamination is denied. If the reexamination request is granted on any basis, this amendment would not permit an appeal on other grounds upon which reexamination was not ordered. In such circumstances where reexamination has been ordered, any appeal would be on the basis that the decision of the examiner was favorable to patentability and not on the basis of an order denying reexamination. This amendment to section 306, provides a route of appeal to the Court of

Appeals for the Federal Circuit for any person requesting reexamination, who is not the patent owner, of any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised. If reexamination of the patent is ordered as a result of the request for any reason, this route of appeal does not exist. The amendment does not provide for participation by the patent owner in any appeal of a final order denying reexamination because no substantial new question of patentability has been raised since the patent owner will fully participate if reexamination is ordered as a result of the appeal. In this respect, the amendment is consistent with the reexamination procedures in effect prior to the amendment which do not permit participation by the patent owner prior to the determination on the request for reexamination. The amendment also contemplates that precluding the patent owner from participating in any appeal of a final order denying reexamination will be less expensive to the patent owner and will simplify and expedite the appeal. The patent owner will not lose any rights by not having to participate until reexamination is ordered.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Feb. 8, 1987.

Foster, Glenn B., 1719 Preston Rd., Alexandria, Va. 22302
Jiles, Henry R., 1770 Redwood Ter., NW., Washington, D.C. 20012
Prezlock, Cynthia A., 6649 Briarleigh Way, Alexandria, Va. 22310
Rowland, James L., 7622 Arlen St., Annandale, Va. 22003
Szereszewski, Juliuscz, Canadian Pats. & Dev. Ltd., 275 Slater St., Ottawa, Canada K1A 0R3
Westphal, David W., 4106 E. Providence Rd., Charlotte, N.C. 28211

Dec. 7, 1987.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Complimentary Dining Club, Inc., Buffalo, N.Y. Reg. No. 1,401,747, for the mark "COMPLIMENTARY DINING CLUB", Canc. No. 16,143.

Schaak Electronics, Inc., St. Paul, Minn., Reg. No. 1,268,804, for the mark "WHIZ KIDS", Canc. No. 16,261.

ERMA S. BROWN
Administratot of the Trademark Trial and Appeal Board.
For JEFFERY M. SAMUELS,
Assistant Commissioner for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 5, 1988

D. 288,437	4,658,354	4,675,873	4,684,624
4,308,554	4,659,528	4,675,958	4,684,633
4,505,979	4,660,556	4,677,042	4,684,930
4,510,941	4,660,567	4,677,145	4,685,029
4,528,197	4,660,576	4,677,299	4,685,359
4,535,417	4,660,883	4,677,617	4,685,724
4,537,386	4,660,891	4,677,662	4,686,279
4,567,001	4,661,147	4,677,679	4,686,418
4,600,216	4,663,546	4,678,468	4,686,538
4,607,305	4,666,501	4,678,655	4,687,252
4,607,389	4,666,814	4,680,129	4,687,968
4,612,973	4,666,815	4,680,245	4,688,309
4,614,149	4,667,044	4,680,263	4,688,693
4,615,404	4,667,079	4,680,284	4,688,861
4,628,900	4,667,360	4,680,328	4,690,150
4,629,155	4,667,395	4,680,743	4,690,496
4,629,525	4,669,042	4,680,862	4,690,745
4,632,274	4,669,154	4,680,945	4,691,175
4,632,971	4,669,339	4,680,995	4,691,497
4,634,402	4,669,355	4,681,115	4,691,801
4,636,224	4,671,032	4,681,395	4,691,829
4,636,255	4,671,284	4,681,736	4,691,866
4,636,686	4,671,386	4,681,823	4,691,903
4,643,451	4,671,442	4,682,051	4,692,672
4,643,889	4,672,096	4,682,366	4,694,133
4,645,553	4,672,793	4,682,528	4,694,160
4,645,730	4,672,947	4,682,597	4,694,273
4,645,739	4,673,416	4,682,987	4,694,434
4,647,658	4,673,658	4,683,205	4,695,047
4,647,733	4,674,085	4,683,482	4,695,321
4,648,038	4,674,196	4,683,660	4,695,328
4,651,926	4,674,229	4,683,835	4,696,619
4,652,287	4,674,883	4,684,054	4,697,388
4,652,498	4,675,232	4,684,124	4,706,499
4,652,641	4,675,555	4,684,372	
4,653,790	4,675,707	4,684,512	
4,657,665	4,675,835	4,684,589	

Disclaimers

4,513,356.—*James A. Mikola,* Livonia, Mich. REPLACEABLE LAMP ASSEMBLY AND LOCKING MECHANISM FOR A SEALABLE REFLECTOR HOUSING. Patent dated Apr. 23, 1985. Disclaimer filed Oct. 7, 1987, by the assignee, *Ford Motor Co.*

The term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

4,559,935.—*David E. Young,* Watlington; *David H. Boyes,* Childwall, England. FRACTURE CAST BRACES. Patent dated Dec. 24, 1985. Disclaimer filed Oct. 28, 1987, by the assignee, *Protectair Limited.*

Hereby enters this disclaimer to claims 1–8 of said patent.

4,570,739.—*DuWayne E. Kramer,* Mission, Kans. PERSONAL MOBILITY VEHICLE. Patent dated Feb. 18, 1986. Disclaimer filed Oct. 19, 1987, by the assignee, *Burke, Inc.*

Hereby enters this disclaimer to claims 15, 16, and 17 of said patent.

4,590,321.—*Chin-Chiun Chu,* North Brunswick, N.J. AROMATIZATION REACTIONS WITH ZEOLITES CONTAINING PHOSPHORUS OXIDE. Patent dated May 20, 1986. Disclaimer filed Oct. 5, 1987, by the assignee, *Mobil Oil Corp.*

Hereby enters this disclaimer to claims 1–7 of said patent.

4,650,994.—*Torgny Brogardh* and *Christer Ovren,* Vasteras, Sweden. FIBEROPTIC MEASURING APPARATUS USING LUMINESCENT MATERIAL. Patent dated Mar. 17, 1987. Disclaimer filed Oct. 20, 1987, by the assignee, *ASEA Aktiebolag.*

The term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

4,667,052.—*Robert J. Theissen,* Bridgewater, N.J. 2-NITRO-5-(SUBSTITUTED PHENOXY) BENZOATE ESTERS OF HYDROXYALKANOIC ACIDS AND DERIVATIVES THEREOF AS HERBICIDES. Patent dated May 19, 1987. Disclaimer filed Sept. 21, 1987, by the assignee, *Rhone-Poulenc Inc.*

The term of this patent subsequent to July 8, 2003, has been disclaimed.

197-782 O.G.-87-15

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	Denver Public Library	(303) 571-2347
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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 5, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-12-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during December 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,543,308 to 3,551,900, inclusive
Plant Patents ..... Numbers 3,008 to 3,010 inclusive

REEXAMINATIONS

JANUARY 5, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,611,549 (805th)
METHOD FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS
George F. Pope, Burlington, N.C., assignor to Scoggins Mfg. Inc., Burlington, N.C.
Reexamination Request No. 90/000,929, Dec. 31, 1985.
Reexamination Certificate for Patent No. 3,611,549, issued Oct. 12, 1971, Ser. No. 838,270, Jul. 1, 1969.
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—433



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 10 are determined to be patentable as amended.

Claims 2–9, dependent on an amended claim, are determined to be patentable.

1. A method of installing a pliable line from an area outside of the confines of a hollow wall in and through the wall and at least one structural obstruction therein; said method comprising moving a drill having a [spring-like shaft with a drill bit secured to the leading end thereof] *rigid, relatively short helical drill bit secured to a spring steel, readily flexible, straight shaft of much greater length and smaller cross-section* through an access opening in one face of the wall while bowing the shaft to direct the drill bit along a path corresponding to the desired run of the pliable line, rotating the drill while applying a longitudinal force thereto to cause the drill bit to drill a hole through the structural wall obstruction in its path, ceasing rotation of the drill after the drill bit has reached an accessible area, connecting a pliable line to one end of the drill, and passing the drill through the drilled hole in a direction away from the pliable line to an area outside of the confines of the hollow wall to remove the drill from the wall while pulling the pliable line therewith to position a length of the pliable line extending through the hollow wall.

10. A method of providing successive holes through a series of spaced apart wooden structural members in a common plane, such as in a wall or floor structure of a building, for the purpose of positioning conductor lines or pipes therethrough; said method comprising bowing [an elongate spring-like] *the* shaft of a drill having a *rigid, relatively short helical* drill bit secured to one end of [the] *a spring steel, readily flexible straight* shaft *of much greater length and smaller cross-section* to position the drill bit within the common plane of the structural members and in contact with the first one of the series of structural members while positioning the other end of the shaft outside of the common plane of the structural members, rotating the drill while applying a longitudinal force thereto to cause the drill bit to successively drill holes through all of the structural members in the series, ceasing rotation of the drill following the drilling of holes through the series of structural members, connecting a pliable line to one end of the drill, and removing the drill by moving the same in a direction away from the pliable line to pull the line therewith through the previously drilled holes while leaving a length of the pliable line positioned in the drilled holes.

B1 4,442,325 (806th)
SWITCHABLE INCREMENTAL ATTENUATION FOR TELEPHONE LINE INTERFACE
Noel C. McDermott, Santa Cruz, Calif., assignor to Larus Corporation, Santa Clara, Calif.
Reexamination Request No. 90/001,097, Sep. 30, 1986.
Reexamination Certificate for Patent No. 4,442,325, issued Apr. 10, 1984, Ser. No. 528,668, Sep. 2, 1983.
Continuation of Ser. No. 326,490, Dec. 2, 1981, abandoned.
Int. Cl.[4] H04M *1/76*
U.S. Cl. 379—398



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–16 are cancelled.

New claims 17–20 are added and determined to be patentable.

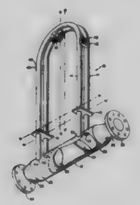
17. A device for providing selectively incremental attenuation in a telephone circuit using discrete resistive values, comprising:
a plurality of serially coupled individually switchable attenuation sections, each of said attenuation sections including switching means for selectively determining the attenuation value of each section, permitting the selection of the total attenuation value of said device by integral multiples of a selected incremental base unit, within a range generally of 0–41.75 db, wherein the plurality of individually switchable attenuation sections includes eight sections of thick film resistor networks divided into two banks, the first bank of four sections includes sections having attenuation values of said incremental base unit, two base units, four base units and eight base units, respectively, while the second of said banks includes sections having attenuation values of ten base units, twenty base units, forty base units and eighty base units, respectively, and said plurality of individually switchable attenuation sections further includes a section comprising a set of discrete matched network resistors having an attenuation value of one-hundred sixty base units;
a circuit board to which said serially coupled attenuation sections are physically attached and electrically connected;
frame including mounting means for slideably receiving and supporting said circuit board;
connecting means for connecting said circuit board to said telephone circuit;
whereby incremental attenuation in said telephone circuit is provided.

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B1 4,491,025 (807th)
PARALLEL PATH CORIOLIS MASS FLOW RATE METER

James E. Smith, Boulder, and Donald R. Cage, Longmont, both of Colo., assignors to Micro Motion, Inc., Boulder, Colo.

Reexamination Request No. 90/001,173, Feb. 20, 1987.
Reexamination Certificate for Patent No. 4,491,025, issued Jan. 1, 1985, Ser. No. 439,035, Nov. 3, 1982.
Int. Cl.⁴ G01F *1/84*
U.S. Cl. 73—861.38



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-10 is confirmed.

9. A method for measuring the mass flow rate of a fluid by generating Coriolis forces, comprising:

(A) flowing said fluid through an inlet plenum, and in a parallel fashion flowing essentially equal amounts of said fluid through two resilient U-shaped flow tubes, said U-shaped flow tubes being fixedly mounted at their open ends to an inlet plenum and an outlet plenum respectively so that both U-shaped flow tubes have essentially equal resonant frequencies of oscillation about their respective bending axes which are located near said fixedly attached ends and in the same plane as and perpendicular to the side legs of said U-shaped flow tubes:

(B) sinusoidally driving said U-shaped flow tubes at said resonant frequency about said bending axes, said resonant frequency being different from the resonant frequency of said U-shaped flow tubes about torsion axes located in the same plane as said U-shaped flow tubes but perpendicular to said bending axes and essentially parallel to and midway between the side legs of said U-shaped flow tubes;

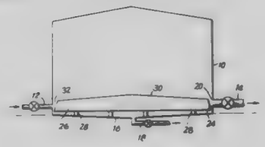
(C) measuring the time interval between the passage of the first side legs of each of said U-shaped flow tubes through the respective mid-planes of oscillation, and the passage of the second side legs, caused by Coriolis forced deflection about said torsion axes, to pass through the respective mid-planes of oscillation at a later time;

whereby the mass flow rate of said fluid is a direct function of the measured time interval.

B1 4,537,211 (808th)
APPARATUS FOR IMPROVING OIL STORAGE TANKS

Robert Almeida, 29 Overhill Rd., Scarsdale, N.Y. 10583

Reexamination Request No. 90/000,984, Apr. 14, 1986.
Reexamination Certificate for Patent No. 4,537,211, issued Aug. 27, 1985, Ser. No. 495,247, May 17, 1983.
Int. Cl.⁴ F17D *1/00*
U.S. Cl. 137—1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5, 6 and 12-16 is confirmed.

Claim 4 is cancelled.

Claims 1 and 7 are determined to be patentable as amended.

Claims 2, 3 and 8-11, dependent on an amended claim, are determined to be patentable.

1. Apparatus for decreasing a quantity of oil held as deadstock in an oil storage tank having a top, bottom, and sides, an oil inlet pipe, and an oil delivery pipe located above the level of the bottom of the tank, the apparatus comprising:

positive volume displacement means *arranged inside said tank and being free of attachment to said tank top* for displacing a predetermined volume of oil including a tray having a solid, substantially flat bottom and upraised sides for retaining therein a quantity of material substantially inert to oil;

means for arranging said tray adjacent said bottom *and for affixing said tray thereto* at a location determined by a lowermost edge and an uppermost edge of said oil delivery pipe; and

liquid impervious means for preventing occlusion of said oil delivery pipe and for maintaining a quantity of oil at least above an uppermost edge of said oil delivery pipe *and being arranged in spaced-apart relationship with said oil delivery pipe.*

STATUTORY INVENTION REGISTRATIONS

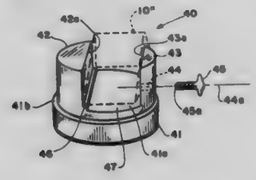
PUBLISHED JANUARY 5, 1988

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H396
PRISM HOLDER

Robert J. Spry, Tipp City, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 747,743
Int. Cl.⁴ G02B *7/18*
U.S. Cl. 350—287 **5 Claims**



1. A device for holding in preselected orientation an optical prism having an internally reflective surface, comprising:

a. a base having a substantially flat first surface thereon;

b. first and second upstanding side members on said base at opposite edges of said first surface and defining said first surface therebetween, said side members further defining respective substantially flat and parallel confronting second and third surfaces defining an opening therebetween of preselected width for receiving said optical prism, each of said second and third surfaces being substantially perpendicular to said first surface;

c. a shoulder of preselected height and width on said first surface adjacent said first upstanding member and said second surface for supporting said prism thereon with said reflective surface in spaced relationship to said first surface, the height of said shoulder preselected to define a space between said reflective surface of said prism and said first surface to prevent optical coupling of evanescent waves between said first surface and said prism;

d. a tapped hole through said second member and intersecting said third surface, the centerline of said tapped hole being substantially perpendicular to said third surface; and

e. a set screw, received by said tapped hole, for holding said prism in preselected orientation between said second and third surfaces.

H397
MODIFIED BUBBLE INTURN MASK PERIPHERY

David C. Stark, Sierra Vista, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1986, Ser. No. 874,742
Int. Cl.⁴ A62B *7/00*
U.S. Cl. 128—206.24 **5 Claims**

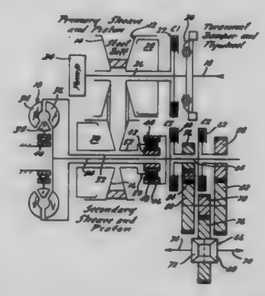


1. In a protective face mask having a face piece with an inner surface for facing inwardly of a wearer and an outer surface for facing outwardly of the wearer, the face piece having a periphery, the improvement comprising an inturn connected to and extending inwardly from the inner surface of the face piece at a location spaced from the periphery, the inturn extending away from the periphery and having a flat portion connected directly to the inner surface of the face piece and extending substantially tangentially to the inner surface of the face piece, and a curved bubble portion connected to the flat portion and concave with respect to the inner surface of the face piece so as to curve outwardly into engagement with a wearer's face.

H398
CONTINUOUSLY VARIABLE TRANSMISSION WITH SPLIT TORQUE HYDROKINETIC UNIT

George E. Lemieux, 36316 Dardanella, Livonia, Mich. 48152, and Alan R. Fisher, 1320 Porter, Apt. 81, Dearborn, Mich. 48124

Filed Sep. 2, 1986, Ser. No. 902,983
Int. Cl.⁴ F16H *37/00, 47/08*
U.S. Cl. 74—689 **1 Claim**



1. A hydromechanical, infinitely variable transmission mechanism comprising:

an input shaft on a first axis adapted to be connected to an engine, a countershaft axis parallel to the first axis;

a first adjustable sheave assembly mounted on said first axis, a second adjustable sheave assembly mounted on said countershaft axis;

a friction belt drive member connecting drivably the first adjustable sheave assembly with the second adjustable sheave assembly;

a split torque gear unit comprising a sun gear, a ring gear and a planet carrier on the torque flow downstream side of said second adjustable sheave assembly on the countershaft axis, a torque input element of said torque split gear unit being connected to the torque output side of said second adjustable sheave assembly;

a hydrokinetic unit having a turbine and an impeller in fluid flow relationship, said impeller being connected drivably to the first torque output element of said split torque gear unit, the turbine of said hydrokinetic unit being connected to a second torque output element of said split torque gear unit;

a torque output shaft; and

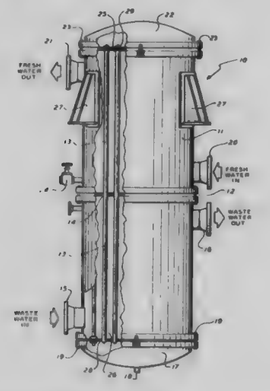
final drive gear means for connecting said second torque output element of said split torque gear unit to said torque output shaft.

VOL 1086 ISS 1 JAN 5 1988 UMI

H399
WATER-TO-WATER HEAT PIPE EXCHANGER

Charles H. Johnson, Blacksburg, and Estel E. Ogle, Christiansburg, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1986, Ser. No. 920,019
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—47 11 Claims

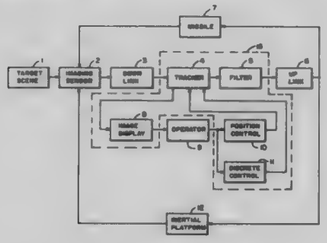


1. A heat exchanger comprising:
a vessel;
at least one partition dividing the interior of said vessel into at least two compartments, at least one of said compartments being a waste water compartment and having a waste water input means and a waste water output means, and a different compartment being a fresh process water compartment and having a fresh water input means and a fresh water output means; and a plurality of heat exchange pipe for transferring heat between said compartments, each of said heat exchange pipes having a first end and a second end.

H400
AIMPOINT BIAS FOR TERMINAL HOMING GUIDANCE

Ricky K. Hammon, Decatur; Monte K. Helton, Madison; Ray H. Farmer, Huntsville, and James F. Meadows, Jr., Hartselle, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1987, Ser. No. 34,364
Int. Cl.[4] F41G *7/00*
U.S. Cl. 244—3.11 4 Claims

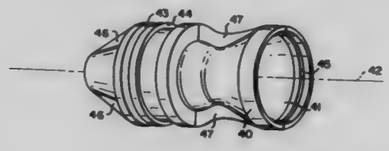


1. In a terminal homing guidance system using imaging sensors and auto-trackers the improvement comprising the addition of monitor display having a first set of crosshairs indicating the aimpoint of the auto-trackers, a second set of crosshairs whose position is under the control of an operator for selecting a different aimpoint, and discrete control means for selectively transferring the aimpoint of said auto-trackers from said first set of crosshairs to said second set of crosshairs.

H401
PENETRATOR MUNITION

David R. Ibach, Anoka, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1987, Ser. No. 42,488
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—356 2 Claims

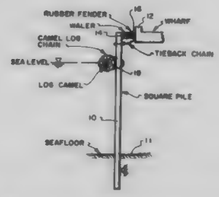


1. The method of manufacture in metal which comprises the steps of upsetting a workpiece, having a longitudinal axis, by axial force in a first die, to constitute a first preform having a desired uneven mass distribution along said axis, and hot forging the preform, by transverse force in a second die, to constitute a second preform having a desired unsymmetrical mass distribution transverse to said axis.

H402
HIGH ENERGY ABSORBING PRESTRESSED CONCRETE FENDER PILES AND FENDERING SYSTEM

Robert W. Julian, Oxnard, Calif.; Robert F. Mast, Auburn; Joseph R. Schlechten, Puyallup, both of Wash.; George E. Warren, Oxnard, Calif., and Manfred H. Zinserling, Renton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1987, Ser. No. 43,272
Int. Cl.[4] E02D *3/22*
U.S. Cl. 405—212 21 Claims

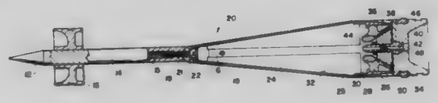


1. A high-energy-absorbing prestressed concrete fender pile, comprising:
(a) a plurality of parallel prestressed metallic longitudinal strands arranged such that a perpendicular cross section thereof forms a geometrical pattern;
(b) a spiral wire reinforcement wrapped about said arrangement of parallel prestressed longitudinal strands along the entire length thereof;
(c) said metallic longitudinal strands being partially prestressed at a low initial stress to provide high remaining material strength for use in absorbing high energy impact prior to reaching the yield strength of said longitudinal strands;
(d) said plurality of prestressed metallic longitudinal strands with spiral wire reinforcement being filled with and encased in high strength concrete to form a high-energy-absorbing prestressed concrete pile having high moment capacity.

H403
GUN LAUNCHED KINETIC ENERGY PENETRATOR

Alan Glasser, Bala Cynwyd, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 7, 1987, Ser. No. 52,507
Int. Cl.[4] F42B *15/00*
U.S. Cl. 102—374 12 Claims



1. A kinetic energy penetrator assembly adapted to be launched from a gun barrel bore, comprising:
a motor casing defining a space and having an aft opening and a forward end;
an ignitable propellant in said casing space ignitable to generate expanding gases;
a nozzle connected to said casing and closing said aft opening thereof, said nozzle having a nozzle opening for directing expanding gases out of the casing to produce a forward thrust for the casing;
a pusher plate engaged with an aft end of the motor casing and adapted for transmitting the thrust of expanding gases at an aft end of the pusher plate to the motor casing;
a nozzle plug connected to the pusher plate and engaged with the nozzle opening for closing the nozzle opening;
delay ignition means connected to the nozzle plug and pusher plate for igniting upon exposure to expanding gases and burning for a selected period of time after which said delay ignition means ignite said propellant in said motor casing;
a penetrator rod having a smaller outer diameter than a maximum outer diameter of said motor casing and connected to said forward end of said motor casing; and
a sabot engaged around said penetrator rod and having an outer diameter substantially equal to an outer diameter of said pusher plate;
whereby the kinetic energy penetrator assembly can be launched from a barrel bore by expanding gases in the barrel bore aft of the pusher plate, and the propellant charge can be ignited after the penetrator assembly leaves the gun barrel.

H404
DISPOSAL OF INORGANIC CHEMICAL WASTES

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

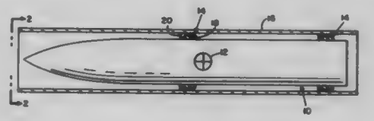
Filed Jun. 12, 1987, Ser. No. 60,797
Int. Cl.[4] B09B *1/00*; G21F *9/00*
U.S. Cl. 405—128 3 Claims

1. A method of disposal of waste inorganic chemical material containing insoluble inorganic salts of toxic metals, said method comprising:
(i) treating said inorganic chemical waste material in the form of a slurry while being agitated with an excess of a stoichiometric amount of a compound selected from the compounds consisting of methanesulfonic acid and methanedisulfonic acid to convert said insoluble inorganic salts of toxic metals into metal mesylates;
(ii) solublizing said metal mesylates in an aqueous or a polar organic solvent system; and,
(iii) recovering said metal mesylates which contain toxic metals leached from said inorganic chemical waste material.

H405
ROCKET/LAUNCHER INTERFACE

James H. Covey, Snohomish, Wash., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1987, Ser. No. 90,826
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.816 4 Claims

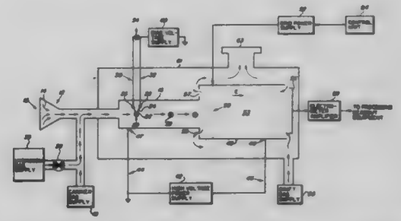


1. A sabot arrangement for supporting a rocket inside a rocket launch tube, said sabot arrangement including two sabot adaptors spaced along the outer periphery of the rocket with one of said sabot adaptors being located forward of the center of gravity of said rocket and the other of said sabots being located near the rear of the rocket, each said sabot adaptor including an inner segmented ring shaped structure that has a radially outer tapered surface and an outer segmented ring shaped structure with an inner tapered surface that mates with the tapered surface of said inner segmented ring shaped structure, and said outer segmented ring shaped structure having an outer surface for engaging the inner surface of the launch tube.

H406
ORGANOPHOSPHORUS SELECTIVE ION MOBILITY SPECTROMETER

Henry Wohltjen, Burke, Va., assignor to United States of America, Washington, D.C.

Filed Feb. 17, 1984, Ser. No. 581,398
Int. Cl.[4] C12P *7/32*
U.S. Cl. 436—153 17 Claims

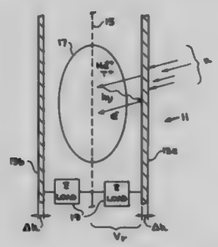


1. An ion mobility spectrometer for analyzing a sample gas of the type having an ion source for ionizing the sample gas, thereby producing ions, and means for gating ions by a shutter along a pathway into a drift region having an electric field parallel to the ion pathway, the improvement wherein:
said ion source comprises a body immersed in a mixture of air and hydrogen, said body comprising a thermally stable material having an alkali metal compound on its surface, and wherein said spectrometer further comprises a heating means for heating the surface of said body to a temperature of from 200°–1000° C.; and
a means for introducing the sample gas to the surface of said body; whereby only phosphorus and nitrogen containing molecules of the sample gas are ionized upon contact with the surface of said body.

H407
ELECTRICITY AND SHORT WAVELENGTH RADIATION GENERATOR

E. Victor George, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 26, 1985, Ser. No. 769,518
Int. Cl.[4] G21D 7/00
U.S. Cl. 376—147 7 Claims

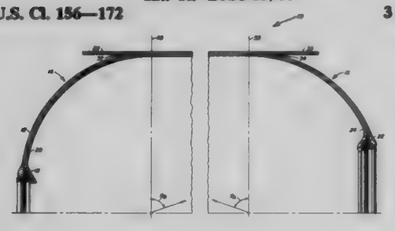


1. Apparatus for production of an electrical voltage, the apparatus comprising:
- a hollow, closed electrically conducting sphere of inner radius substantially greater than one meter, the sphere having a spherical region at the sphere center removed to allow positioning of a laser fusion target at the sphere center, and the sphere wall material having an associated electron work function of substantially 1.6 eV;
- one or more thin, electrically conducting anode plates positioned in the sphere interior adjacent to and spaced apart from and substantially parallel to the adjacent sphere wall, each such plate having an associated electron work function that is $>>1.6$ eV;
- an impedance or other electrical load connecting each anode plate and the adjacent sphere wall;
- an inert gas, capable of forming excimers and maintained at a pressure of substantially 100 atmospheres, contained in the interior of the hollow sphere;
- a fusion target positioned substantially at the center of the sphere; and
- a laser beam, focused on the last fusion target.

H408
GRAPHITE CHAMBER MANUFACTURING PROCESS

Steven J. Sargent, and Anthony L. Stephenson, both of Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1986, Ser. No. 856,261
Int. Cl.[4] B31C 13/00
U.S. Cl. 156—172 3 Claims

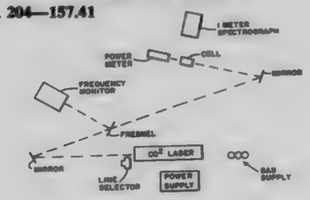


1. A method of manufacturing a chamber pressure vessel wherein a chamber having a forward end, an aft end, forward insulation and aft insulation, is wrapped with graphite-epoxy composite material, alternating circular and helical winding configurations, beginning and ending with said helical configuration.

H409
SYNTHESIS OF CADMIUM SULFIDE USING THE LASER-INDUCED REACTION OF DIALKYLCADMIUM AND ORGANOSULFUR COMPOUNDS

Ann E. Stanley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1987, Ser. No. 67,770
Int. Cl.[4] B01J 27/04
U.S. Cl. 204—157.41 5 Claims



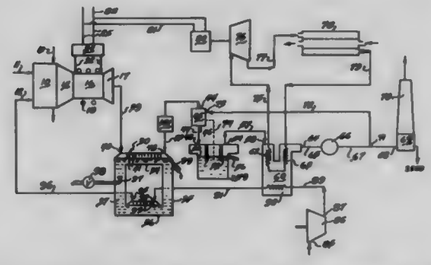
1. A method for the synthesis of cadmium sulfide by the laser-induced chemical reaction between a first reactant selected from a dialkylcadmium compound and a second reactant selected from a dialkylsulfide compound, said method comprising:
- (i) providing a stainless steel reaction cell adapted for use with vacuum line techniques and equipped with O-ring seals for securing ZrSe windows onto said reaction cell for transmitting laser radiation and for securing potassium chloride windows onto said reaction cell to achieve monitoring of said laser-induced chemical reaction including the reaction products formed;
- (ii) metering said first reactant of said dialkylcadmium compound and said second reactant of said dialkylsulfide into said reaction cell to form a reaction mixture of said dialkycadmium compound in the range from about 14 to about 32 torr and of said dialkylsulfide compound in the range from about 30 to about 279 torr;
- (iii) irradiating said reaction mixture with infrared laser radiation in the range of 10.4 or 9.4 micrometers as provided by a continuous-wave CO_2 laser operating in a predetermined single line operation with an output power between about 10 and 150 watts per centimeter square (W/cm^2) to form reaction products including a solid compound; and,
- (iv) recovering said solid compound which is high purity thermodynamically stable cadmium sulfide.

H410
OPEN-CYCLE MAGNETOHYDRODYNAMIC POWER PLANT BASED UPON DIRECT-CONTACT CLOSED-LOOP HIGH-TEMPERATURE HEAT EXCHANGER

Gregory F. Berry, Naperville; Vladimir Minkov, Skokie, and Michael Petrick, Joliet, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,701
Int. Cl.[4] H02K 44/00
U.S. Cl. 310—11 13 Claims

1. In an MHD power generating system wherein fuel and oxidizer means are burned in a combustor and seed is added to enhance the electroconductivity of the combustion gases that in turn are passed through an MHD channel to generate a primary electrical output, the combination therewith of energy conversion means for the combustion gases discharged from the MHD channel that are yet at high energy levels, comprising heat exchanger means defining a closed loop having separate horizontally disposed upper and lower channels interconnected by respective separate vertically disposed columns and heat transfer liquid within the loop and completely filling each of the columns and each of the channels across the bottoms thereof to and between the liquid in the columns, said heat transfer liquid being in the liquid phase in the temperature range between approximately 1300° C. and 1800° C., the loop channels being at different elevations thereby providing a head pressure differential in the heat transfer liquid as between the upper and lower channels corresponding to the column head of the liquid between the liquid surfaces in the channels, spaced inlet and outlet means to each channel, means for continuously directing the combustion gases via the appropriate inlet means into the upper loop channel and for thermally admixing the

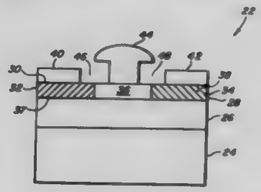


combustion gases with the heat transfer liquid therein and for recovering the combustion gases therefrom via the outlet means, means for continuously directing air under pressure via the appropriate inlet means into the lower loop channel and for thermally admixing the air with the heat transfer liquid therein and for recovering the air therefrom via the outlet means, the pressures of the combustion gases and the air being generally comparable respectively to the pressures of the heat transfer liquid in the upper and lower loop channels, means for circulating the heat transfer liquid unidirectionally around the loop, whereby the combustion gases are continuously cooled by the heat transfer liquid which in turn continuously heats the air, and means for admitting the heated pressurized air recovered from the lower loop channel into the combustor to serve thereby as the oxidizer means.

H411
QUASI-ACCUMULATION MODE FET

Max N. Yoder, Falls Church, Va., assignor to United States of America, Washington, D.C.

Filed Aug. 28, 1985, Ser. No. 770,166
Int. Cl.[4] H01L 29/80, 29/161, 29/167
U.S. Cl. 357—22 9 Claims

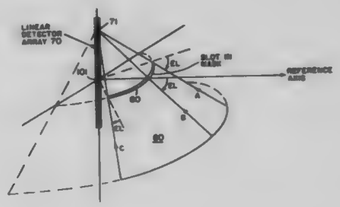


3. A method of forming a quasi accumulation mode field effect transistor, comprising the steps of:
- providing a semi-insulating substrate layer;
- disposing an active channel layer of doped n-type semi-conductor material on said semi-insulating substrate layer;
- disposing a first heteroepitaxial semi-insulating layer of a semi-conductor material on said active channel layer, said first heteroepitaxial layer material having a bandgap greater than the bandgap of the active channel layer material, said first heteroepitaxial layer having a top surface, a designated first region, a designated second region, and a middle region therebetween wherein the first region and the second region of said first heteroepitaxial layer are implanted with donor impurities and activated;
- disposing a source contact on the top surface of the first heteroepitaxial layer above said first region;
- disposing a drain contact on the top surface of the first heteroepitaxial layer above said second region; and
- disposing a gate control contact on the first heteroepitaxial layer, said gate control contact positioned on the middle section between the source contact and the drain contact, said gate control contact being physically separated from the source and drain contacts.

H412
COORDINATE POSITION DETECTOR

Walter E. Miller, Jr.; Robert R. Mitchell, both of Huntsville, and Michael M. Jones, Arab, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1986, Ser. No. 900,879
Int. Cl.[4] G01J 1/20; F24J 2/38
U.S. Cl. 250—203 R 3 Claims

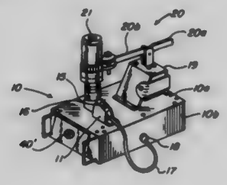


1. A system for determining at least one coordinate of an arrival angle of electromagnetic energy eminating from distant source comprising a plurality of electromagnetic energy detectors arranged in a line, a first means which is opaque to electromagnetic energy which is positioned spatially from said electomagnetic detectors and between said source and said detectors, said first means having a slot for allowing electromagnetic energy from said source to pass through said first means and to impinge upon selective ones of said plurality of detectors in accordance with the angle of the arrival of the electromagnetic energy from said source; said first means is at least part of a cylindrical surface located from said detectors such that the line of the detectors is located on its cylindrical axis, said slot in said first means being perpendicular to said axis such that it will project a straight line onto the detectors which is perpendicular to the line of the detectors, and said detectors being located in a vertical plane and said slot being located in a horizontal plane such that the detector illuminated by incoming electromagnetic energy can be calibrated such that it represents an elevation coordinate of said incoming electromagnetic energy.

H413
MICROPHONE OUTPUT-LEVEL TESTER

Arthur S. Lelie, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1987, Ser. No. 10,255
Int. Cl.[4] H04R *29/00*
U.S. Cl. 381—58 4 Claims

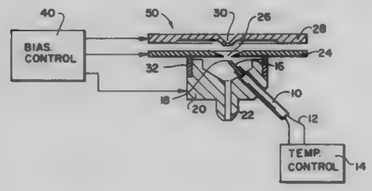


1. An apparatus for testing the output level of a microphone comprising:
means for holding the microphone in place;
means for generating frequencies in the audio range;
means for securely positioning the microphone at a predetermined location with respect to the generating means; and
means coupled to the microphone for monitoring the output level intensity at the frequencies in the audio range.

H414
SURFACE IONIZATION SOURCE

Steven E. Young, Mountain View, and Sidney E. Buttrill, Jr., Palo Alto, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 20, 1987, Ser. No. 28,168
Int. Cl.[4] H01J *27/00, 7/24*
U.S. Cl. 250—423 R 5 Claims

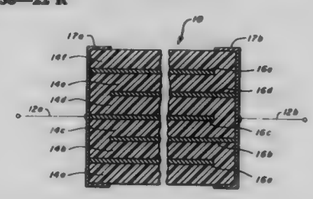


1. A surface ionization source comprising:
a source housing defining an ion space;
a support wire extending into said space;
temperature control means connected to said wire for heating said wire;
an alkali metal glass bead connected to said wire to be heated to form ions of molecules in said space;
an ion extraction plate engaged to said housing and insulated from said housing, said extraction plate closing said space and having a beam orifice therein for the passage therethrough of an ion beam from said space; and
biasing means connected to said housing and said extraction plate for forming a beam on a beam axis extending through said orifice.

H415
MULTILAYER PTCR THERMISTOR

Robert E. Newnham, State College, Pa., and Basavaraj V. Hiremath, Lawrenceville, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1987, Ser. No. 44,398
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—22 R 7 Claims

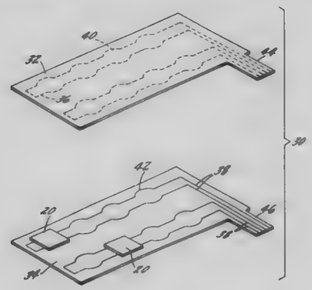


1. A thermistor, comprising:
a plurality of layers, each layer exhibiting a positive temperature coefficient of resistance;
a plurality of electrodes, each electrode being contiguously positioned between adjacent ones of said layers; and
a pair of conductors, each being electrically connected to alternate electrodes forming thereby parallel resistance paths across each of said layers.

H416
HIGH CAPACITANCE FLEXIBLE CIRCUIT

Kevin W. Colvin, Corona, Calif., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 297,987, Aug. 31, 1981, abandoned.
This application May 19, 1986, Ser. No. 864,821
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—398 9 Claims



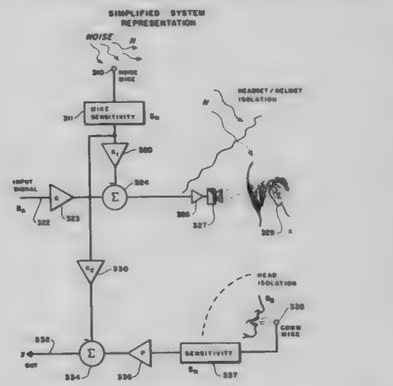
1. A high capacitance flexible circuit comprising:
a first flexible circuit sheet, said first flexible circuit sheet having first and second sides, said second side having a defined electrically conductive pathway means disposed thereon;
a second flexible circuit sheet, said second flexible circuit sheet having first and second sides, said first side having a defined electrically conductive pathway means disposed thereon, said first side facing but not in contact with said second side of said first flexible circuit sheet; and
at least one capacitor chip, said capacitor chip comprising a generally rectangular flat wafer of dielectric material disposed between a pair of oppositely disposed planar conductive outer surfaces, said capacitor being positioned between said first and second flexible circuit sheets, said conductive outer surfaces of said capacitor chip being in electrical contact with appropriate sections of said electrically conductive pathway means on said first and second flexible circuit sheets.

H417
HEADSET FOR AMBIENT NOISE SUPPRESSION

Michael W. Miles, Huber Heights, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 5, 1987, Ser. No. 21,926
Int. Cl.[4] H04B *15/00*
U.S. Cl. 381—94 2 Claims

1. A headgear system for noise cancellation which utilizes the theory that unique sound waves can be added or subtracted without loss of information, comprising a directional noise microphone mounted on headgear, isolated from both voice and earphone output, a receiving destructive interference unit and a separate sending destructive interference unit, each of which includes signal conditioning means in tandem with phase inverting means, the receiving destructive interference unit having an input coupled to the noise microphone and an output coupled to receiving summing means, the sending destructive interference unit having an input coupled to the noise microphone and an output coupled to a sending summing means, with each signal conditioning means comprising level-setting and frequency tailoring circuits, the receiving summing means having another input coupled to a line for receiving voice signals and an output coupled to earphone means of the headgear, the sending summing means having another input coupled to a communication microphone of the headgear and an output to a line for sending voice signals.



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REISSUES

JANUARY 5, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

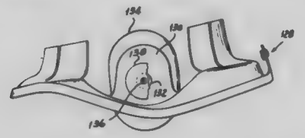
Re. 32,569
PROTECTIVE HELMET

Jackson A. Alleo, Carbondale, and Leonard P. Frieder, Jr., Dalton, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.

Original No. 3,897,596, dated Aug. 5, 1975, Ser. No. 500,547, Aug. 26, 1974. Application for reissue Jul. 20, 1983, Ser. No. 515,217

Int. Cl.[4] A42B *3/00*

U.S. Cl. 2—416 49 Claims



1. In a protective helmet an assembly including a hard body having a peripheral edge *with an outwardly directed portion*, a suspension frame *of relatively rigid material*, [means on] said frame [forming] *being formed with* an upwardly opening peripheral channel adapted to receive said edge, *said channel having an inwardly directed portion adapted to receive said outwardly directed portion of said edge, at least one of said portions being of such limited circumferential extent as to permit said body to be assembled on said frame without substantial deformation of said channel by inserting said edge portion in said channel portion and then swinging said body to a position at which the remainder of said edge is received in the remainder of said channel*, and means for [assembling] *retaining* said body [on] *in assembled relationship with* said frame.

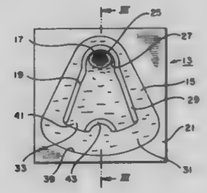
Re. 32,570
TILT DETECTOR

Worth R. Coun, Garland, Tex., assignor to Detectors, Inc., Graham, Tex.

Original No. 4,438,720, dated Mar. 27, 1984, Ser. No. 346,559, Feb. 8, 1982. Application for reissue Mar. 13, 1986, Ser. No. 841,105

Int. Cl.[4] G01C *9/10*

U.S. Cl. 116—215 17 Claims



12. A tilt detector for accompanying goods to be transported to determine whether said goods have been transported in a recommended position without being inclined beyond a predetermined angle comprising:

a. a thin container having front and back walls and defining a chamber;

b. a first fluid of a first density substantially filling said chamber;

c. a second mass of a second density different from said first density so as to respond to gravitational force when allowed to do so;

d. a horseshoe-shaped baffle extending between and engaging said front and back wall so as to hold said second mass within a trapping end in the form of an inner apex for trapping said second mass under the force of gravity when in a vertical position with its open end in the opposite direction such that at least part of said second mass is free to move out of said baffle when tilted beyond a pre-determined angle of tilt, the degree of the sides of said baffle being related to said predetermined angle;

said thin container having at least a transparent window for viewing at least said trapping end of said horseshoe-shaped baffle for ascertaining if said second mass has been freed by being tilted too much such that said tilt detector can be affixed to goods, containers and the like to tell if they have been tilted too much during transportation and the like; said tilt detector being resettable by inverting to replace said second mass within said horseshoe-shaped baffle.

Re. 32,571
METHOD OF MANUFACTURING CORROSION-RESISTANT MEASURING PROBES

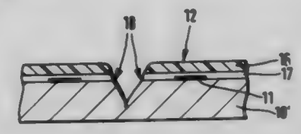
Kurt Burger, Friolzheim, and Heinz Friedrich, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,539,059, dated Sep. 3, 1985, Ser. No. 513,975, Jul. 14, 1983. Application for reissue Mar. 27, 1986, Ser. No. 845,709

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231345

Int. Cl.[4] B32B *31/00*; B29C *19/02*; C09J *5/02*; B23K *9/00*

U.S. Cl. 156—251 3 Claims



1. A method of manufacturing a measuring probe of the type having a rigid support, a system of measuring layers arranged on the support, and a protective foil sealingly covering the measuring layers to protect the same against aggressive environment, comprising the steps of arranging a plurality of measuring layer systems on a large-area support; providing a large-area protective foil with a lower layer of thermoplastic material; then coating the layer systems, with the protective foil; then *attaching the foil to the support by a heat-sealing process during which the foil is subject simultaneously both to heat and pressure; and subsequently* cutting with a laser beam a thus-formed multi-layer structure including the support, the measuring layer systems arranged on the support, and the protective foil, so that the laser beam simultaneously separates the individual measuring probes from one another and hermetically seals the edges of the separated protective foil portions to the upper surface of the support [; and subsequently attaching the foil portions to the support by a heat-sealing process during which the foil portions are subject simultaneously both to heat and pressure].

Re. 32,572

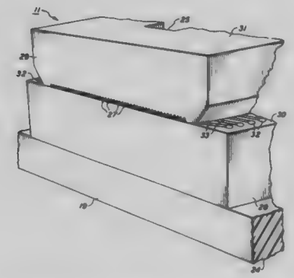
THERMAL INK JET PRINTHEAD AND PROCESS THEREFOR

William G. Hawkins, Webster; Donald J. Drake, Rochester, and Michael R. Campanelli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,601,777, dated Jul. 22, 1986, Ser. No. 719,410, Apr. 3, 1985. Application for reissue Dec. 29, 1986, Ser. No. 947,020

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—626 **30 Claims**



21. A method for fabricating a printhead for use in an ink jet printing device, comprising the steps of:

(a) cleaning a silicon substrate and a second substrate, each having first and second parallel surfaces, the silicon substrate surfaces being {100} planes;

(b) depositing a layer of etch resistant material on the surfaces of the silicon substrate;

(c) forming an equally spaced, linear array of resistive material on the first surface of the second substrate for use as heating elements and forming a pattern of electrodes on the same second substrate surface for enabling individual addressing of each heating element with current pulses;

(d) patterning the etch resistant material on the first surface of the silicon substrate to produce at least one via therein for orientation dependent etching of at least one recess in silicon substrate bounded by {111} plane side walls;

(e) forming a plurality of equally spaced, parallel grooves in the first surface of the silicon substrate, one end of the grooves communicate with the recess and the other ends of the grooves are open; and

(f) aligning and bonding the silicon substrate and the second substrate with their first surfaces confronting and contacting each other, so that each groove contains a heating element therein spaced a predetermined distance from the groove open end, whereby the recess serves as an ink supplying manifold, the grooves serve as capillary filled channels, and the groove open ends serve as the printhead nozzles.

Re. 32,573

PROCESS FOR PRODUCING A FERROFLUID, AND A COMPOSITION THEREOF

Kyozaburo Furumura, Ninomiya, and Shigeki Matsunaga, Tokyo, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Original No. 4,485,024, dated Nov. 27, 1984, Ser. No. 478,876, Mar. 25, 1983. Application for reissue Oct. 16, 1986, Ser. No. 920,226

Claims priority, application Japan, Apr. 7, 1982, 57-56654; Dec. 8, 1982, 57-214015

Int. Cl.[4] H01F *1/25;* **C10M** *3/00*

U.S. Cl. 252—62.52 **13 Claims**

13. A process for producing an improved ferrofluid, which comprises:

(a) adding a first surface-active agent and an organic solvent having a low boiling point to ferromagnetic fine particles to coat each surface of said fine particles with said first surface-active agent;

(b) dispersing said thus coated fine particles in said organic solvent to form an intermediate particulate material;

(c) separating some ferrogmagnetic fine particles of bad dispersion from said intermediate particulate material;

[(d) adding a poly-α-olefin oil to said intermediate particulate material;]

[(e)] (*d*) heating said intermediate particulate material to evaporate organic solvent; and

[(f)] (*e*) adding a poly-α-olefin oil, a saturated fatty acid as a second surface-active agent having more than 18 carbon atoms and an oxidation inhibitor to the produce of step [(e)] (*d*).

Re. 32,574

METHOD AND APPARATUS FOR INFORMATION RETRIEVAL FROM AN OPTICALLY READABLE STORAGE MEDIUM

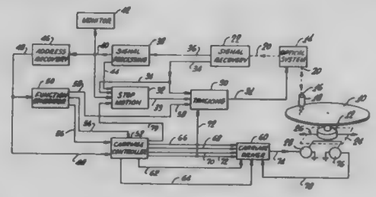
Ludwig Ceshkovsky, Fountain Valley, and Wayne R. Dakin, Huntington Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Original No. 4,506,355, dated Mar. 19, 1985, Ser. No. 449,061, Dec. 13, 1982. Continuation of Ser. No. 295,629, Aug. 24, 1981, which is a continuation of Ser. No. 920,777, Jun. 30, 1978, abandoned. Application for reissue Sep. 9, 1985, Ser. No. 773,770

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.[4] G11B *7/00, 17/00*

U.S. Cl. 369—32 **7 Claims**



7. In an apparatus for selectively retrieving information from a plurality of optically readable information tracks formed in an information storage medium, wherein the information includes location identification data identifying the location of different segments of said information, said apparatus further including means for impinging an incident beam of radiation upon the storage medium, and information recovery means for recovering information from a modulated beam of radiation produced thereby, the combination comprising:

carriage means for moving the storage medium and the incident beam of radiation relative to one another to cause the incident beam to move across said tracks in a search mode of operation and in a direction toward a desirable information segment on said storage medium;

[carriage driver means for producing a drive signal to be applied to said carriage means to effect said relative movement of said incident beam in said direction, in said search mode of operation toward said desirable information segment to be recovered by said recovery means,]

said means for recovering information including means for detecting location identification data from the recovered information and intermittently redetermining the incident beam position, from location identification data in the information recorded, during said [relative movement of said incident beam toward said desirable information segment in said] search mode [and in said direction toward said desirable information segment]; and

control means, responsive to said information recovering means detecting the location identification data for [controlling said carriage driver means to alter said drive signal and thereby cause] *causing* said carriage means to cease its search mode movement [when] *in response to* said incident beam [is at] *reaching* said desirable information segment without reversing the direction of [said relative] movement *of said carriage means.*

PLANT PATENTS

GRANTED JANUARY 5, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,075

ASIAN PEAR TREE NAMED DAISUI LI

Ben T. Iwakiri, Sacramento, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 27, 1985, Ser. No. 814,113

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of Asian pear tree, substantially as illustrated and described, characteristically including—in comparison to other Asian pear varieties—the regular and productive bearing of large to very large fruit which becomes picking and eating ripe after the Bartlett and the Shinko; the fruit, of excellent quality, being smooth and clean in appearance, and the flesh being white, firm, tender, crispy, juicy, sweet with a faint trace of tartness, and refreshingly mild; the storage life of the fruit being five to six months at 32° F.

6,076

ASIAN PEAR TREE NAMED "SHIN LI"

Ben T. Iwakiri, Sacramento, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 27, 1985, Ser. No. 814,248

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of Asian pear tree, substantially as illustrated and described, characteristically including — in comparison to other Asian pear varieties — more vigorous growth on the rootstock; blooming slightly after the Tsu Li and Ya Li and more nearly with the Chojuro; and the early, regular and productive bearing of large to medium size, round-oblate fruit having light green to yellowish green skin at maturity, and white fleah which is firm, tender, crispy, juicy, and sweet with a faint trace of tartness; the fruit having a storage life of five to six months at 32° F. while maintaining its flavor and firmness.

6,077

PLUM TREE, "ANNA SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to Metzler Investments and Metropolitan Life Insurance Company, Del Rey, Calif.

Filed Oct. 1, 1985, Ser. No. 782,469

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, which is somewhat similar to the Kelsey Plum Tree (unpatented), with which it bears fruit which is similar in physical characteristics, but from which it is distinguished by bearing fruit which is mature for harvesting approximately three weeks later than the Kelsey Plum Tree, and has a Medium Green skin color with a yellow flesh, and is generally freestone in nature.

6,078

NECTARINE TREE (JUNE BRITE)

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Nov. 16, 1984, Ser. No. 671,904

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, of large size, vigorous, upright growth and being a regular and productive bearer of large, early ripening, yellow flesh, clingstone fruit, ripening approximately 2 to 3 days before Zee Gold Nectarine (U.S. Plant Pat. No. 3,087); the fruit is further characterized by its uniform size, and attractive red skin color, its good eating, storage and shipping qualities.

6,079

CHRYSANTHEMUM NAMED 'YELLOW REPIN'

Martinus Van Der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association NV, Netherlands Antilles

Continuation of Ser. No. 623,096, Jun. 21, 1984. This application Sep. 3, 1985, Ser. No. 772,185

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive variety of Chrysanthemum named 'Yellow Repin', as described and illustrated in the foregoing specification and accompanying drawings.

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PATENTS

GRANTED JAN. 5, 1988

ERRATA

For CLASS	See PATENT NO.
165-142	4,716,958
184-006	4,717,000
439-083	4,717,217
439-059	4,717,218
439-082	4,717,219
428-628	4,717,413
437-228	4,717,443
437-195	4,717,449
428-701	4,717,457
512-011	4,717,506
437-081	4,717,597
148-033	4,717,631
424-447	4,717,735
530-387	4,717,766
318-568	4,718,078
382-017	4,718,089
382-026	4,718,090
382-041	4,718,091

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GRANTED JANUARY 5, 1988

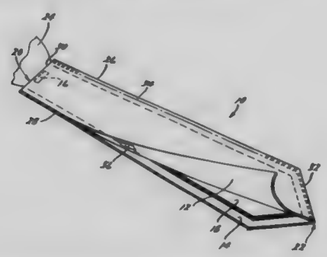
GENERAL AND MECHANICAL

4,716,594
PROTECTIVE GARMENT FOR PROTECTION AGAINST MOSQUITOES AND OTHER INSECTS
Keith Shannon, Rte. 2, Box 223X, Hopkins, S.C. 29061
Filed Apr. 14, 1987, Ser. No. 38,043
Int. Cl.[4] A41B *13/00*; A42B *3/00*
U.S. Cl. 2—4 **12 Claims**



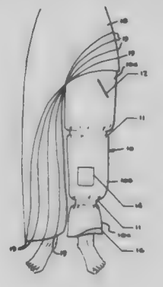
1. A protective garment adapted to be worn by hunters and other outdoor people to provide protection against mosquitoes and other types of insects, said garment comprising a plurality of fabric components, said fabric components being multilayered and comprising inner and outer layers of fabric, and stitching forming seams securing the fabric components together and interconnecting the inner and outer layers of fabric to form the garment, the outer layer of fabric having a construction so as to prevent passage of mosquitoes and other insects therethrough, the inner layer of fabric being a coarse mesh fabric with relatively large openings therein and being many times thicker than the thickness of the outer layer of fabric so as to serve as a spacer layer to space the skin of the wearer of the garment at such a distance from the outer surface of the garment that mosquitoes, even in the event of sticking their heads between yarns forming the outer fabric layer, cannot span the distance to the skin of the wearer so as to bite the wearer.

4,716,595
NECKTIE PROTECTOR
Dana L. Camphous, 41535 Clair Pointe, Mt. Clemens, Mich. 48045
Filed Aug. 11, 1986, Ser. No. 895,291
Int. Cl.[4] A41D *27/12*
U.S. Cl. 2—46 **1 Claim**



1. A necktie protector comprising:
a pair of elongated substantially identical and flat sheet members, said sheet members formed from a transparent untreated polyethylene material having a low linear density, a reduced static build-up and a thickness of from about 50 to 75 gage, each of said sheet members having a pair of longitudinal sides and a pair of lateral sides, said lateral sides positioned adjacent to and between said longitudinal sides, said sheet members having a shape substantially corresponding to a necktie with a non-bonded first end and a second end, each of said ends having one of said lateral sides, said lateral side on said second end having an overall V-shape, each leg of said "V" being adjacent to one of said longitudinal sides,
said sheet members being orientated with respect to one another such that said sheet members are imposed on one another, said sheet members being bonded together along only one of its longitudinal sides and only the adjacent leg of said second end V-shaped lateral side such that a necktie may be inserted into said protector through said non-bonded longitudinal and lateral sides;
a first releasable pressure sensitive adhesive means positioned adjacent to said non-bonded longitudinal side and between said lateral sides such that said first releasable adhesive means is at a substantially equal distance from said bonded lateral side and said non-bonded lateral side, said first releasable adhesive member adhering said first and second sheet members to one another to secure said tie within said tie protector; and
a second releasable pressure sensitive adhesive means positioned adjacent to said first end non-bonded lateral side for securing said first and second sheet members to said tie to prevent axial movement of said tie protector along said tie.

4,716,596
GARMENTS
Velimir Hofman, Slangenburg 10, 1082 JW Amsterdam, Netherlands
Continuation-in-part of Ser. No. 248,254, Mar. 30, 1981, abandoned. This application Apr. 4, 1984, Ser. No. 596,866
Claims priority, application United Kingdom, Apr. 25, 1980, 8013710
Int. Cl.[4] A41D *17/02, 1/22*
U.S. Cl. 2—69 **3 Claims**



1. Article of dress for use as a decorative leg covering of a single leg, said article being tubing of decorative light weight material and capable of being worn as a single unit covering only one leg,
(a) said article extending when worn by a wearer from above the knee to below the knee;
(b) said article having upper and lower terminal edges and supporting means spaced therefrom comprising at least first and second spaced apart tight fitting attachment

portions for engaging a part of the leg of the wearer for supporting the article thereon;

(c) said article having a first loose fitting portion at said upper edge adjacent said first tight fitting attachment portion, said first loose fitting portion extending between said first tight fitting portion and said upper edge and being positioned above said tight fitting attachment portion when worn by the wearer, whereby to allow ambient air to engage at least a portion of the leg of the wearer above the knee;

(d) said article having a second loose fitting portion at said lower edge adjacent said second tight fitting attachment portion, said second loose fitting portion extending between said second tight fitting portion and said lower edge, whereby to allow ambient air to engage at least a portion of the leg of the wearer below the knee; and

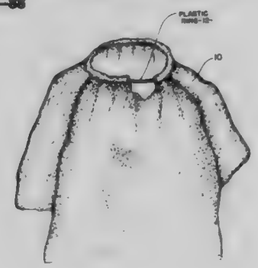
(e) said article having a third loose fitting portion extending between said first and second tight fitting attachment portions, whereby to allow ambient air to engage at least a portion of the leg of the wearer between said first and second tight fitting attachment portions.

4,716,597

NURSING GARMENT

Karen M. Griggs, 10440 Magnolia Blvd., North Hollywood, Calif. 91601

Filed Jan. 14, 1983, Ser. No. 457,926
Int. Cl.[4] A41D *1/22, 3/08*
U.S. Cl. 2—88 1 Claim



1. A nursing garment comprising: a fabric formed as a loose fitting poncho covering at least the upper part of the body of the wearer, said poncho having a circular opening at the upper end thereof to receive the head of the wearer, and an annular rigid neckpiece secured to the poncho and extending around said opening and surrounding the neck of the wearer in a loose fitting relationship and having sufficient diameter to enable the poncho and the neckpiece to be drawn down over the head of the wearer, and said neckpiece having sufficient diameter to permit the wearer to look down into the interior of the garment.

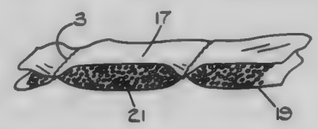
4,716,598

HEAT-INSULATING FABRIC ARTICLES

Jane K. Bertram, Grimston, Melton Mowbray, Leicestershire LE14 3BZ, England

Filed Oct. 2, 1984, Ser. No. 656,983
Claims priority, application United Kingdom, Oct. 12, 1983, 8327334
Int. Cl.[4] A41D *1/02, 1/00*
U.S. Cl. 2—108 7 Claims

1. A heat-insulating fabric article comprising at least two layers of flexible fabric secured together by a plurality of spaced-apart seams arranged in a network across the fabric to form columns or rows of pockets, wherein said pockets are each substantially filled with closed particles of polystyrene the amount of polystyrene filling in each pocket being sufficient to occupy the space therein to permit movement of the



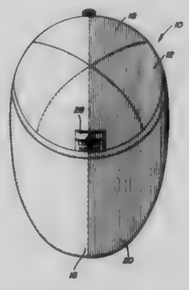
particles one against the other but to resist migration thereof to other regions of the pocket.

4,716,599

REVERSIBLE CAP USED AS NAVIGATIONAL AID

Richard S. Bell, Gloucester, Mass., assignor to Mighty-Mac, Inc., Gloucester, Mass.

Filed Dec. 28, 1981, Ser. No. 335,324
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—195 11 Claims



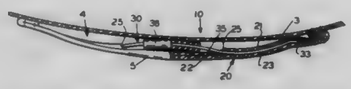
1. A hat for assisting in navigation by indicating the side of the vessel on which red and black buoys are to be passed, said hat including a flexible invertible crown portion, a head encircling band portion extending about the open side of the crown portion and a visor portion supported and projecting forwardly from the front marginal portion of the head encircling band portion, said visor portion including upper and lower surfaces, said upper and lower surfaces each including first and second opposite side portions, the upper and lower surfaces of the first side portion of said visor portion being red in color and the upper and lower surfaces of the second side portion of said visor portion being black in color.

4,716,600

POCKET LOSS PREVENTION GUARD

Gys J. van Beek, Rte. 9, Box 71, Caldwell, Id. 83605

Filed Feb. 9, 1987, Ser. No. 12,622
Int. Cl.[4] A41D *27/20*
U.S. Cl. 2—250 11 Claims



1. A loss prevention guard for clothing of the type having one or more pockets, said guard comprising:

insert retention means located at the mouth of a pocket; and

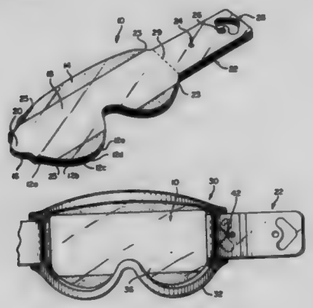
an insert held in place by said retention means, said insert including two end portions and a central resilient bowed portion therebetween for holding the pocket in a closed position with the bowed portion biased toward the clothing to which the pocket is affixed to prevent loss of articles within the pocket.

4,716,601

TEAR-OFF LENS SYSTEM AND METHOD FOR GOGGLES

Joseph R. McNeal, Hailey, Id., assignor to Scott USA Limited Partnership, a Washington Limited partnership, Sun Valley, Id.

Filed Aug. 5, 1986, Ser. No. 893,508
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—434 25 Claims



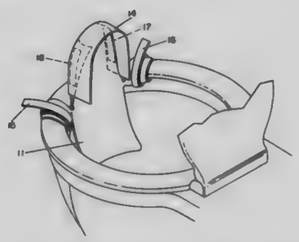
1. A stack of tear-off lenses adapted for mounting to a goggle having a main goggle lens, said stack comprising: a plurality of flexible, transparent lenses adhesively bonded together by adhesive means only along upper and lower peripheral portions of each of said lenses, said lenses being manually serially removable from said stack, wherein each of said lenses has a viewing portion and an elongated removal tab at one end of said lens, wherein each of said lenses has a securing and orienting tab at the end of said lens opposite the end having the elongated removal tab, and said bottom tear-off lens including adhesive securing means for removalby securing said stack to said main goggle lens.

4,716,602

URINATION DEFLECTOR

Todd Brickhouse, 8 Joan La., Massapequa Park, N.Y. 11762

Filed Sep. 20, 1985, Ser. No. 778,141
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—237 3 Claims



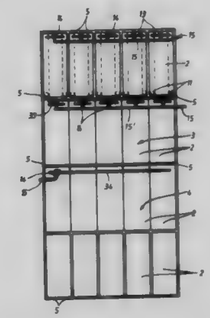
1. Apparatus for being fastened to a toilet seat for containing urinary discharges to the associated tolet bowl comprising a relatively flexible sheet having top and bottom surfaces and which in its unflexed state comprises a main central portion, a pair of side portions and a top portion, the side portions and the top portion being adapted to be bent away from the plane of the main portion to form a flexed functional position, said side portions having upper and lower extensions arranged to wrap around the sides of a toilet seat and having separate flexible straps associated with each side portion for surroundig said side portion extensions and a portion of the toilet seat, thereby fastening the sheet to the toilet seat and forming said main central portion into a cylindrical surface, and a pair of hook and loop fastener sets, one half of each being supported on the top portion and one half on the main portion, so disposed that when the top portion is flexed to its functional position the separate halves are mated and the sheet is locked in its functional position.

4,716,603

SWIMMING POOL COVER

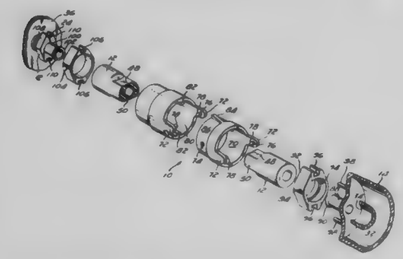
Heinz Sernetz, Jungberg 3, Gleisdorf A-8200, Austria

Filed Jul. 7, 1981, Ser. No. 281,292
Claims priority, application Austria, Jul. 9, 1980, 3581/80
Int. Cl.[4] E04H *3/19*
U.S. Cl. 4—501 17 Claims



1. A flat, elongated cover for a pool having a bottom and side walls, the pool containing a liquid, the cover being substantially rigid and having a side facing the liquid and an opposite side facing away from the liquid when the cover is in a floating position on the liquid, and the cover defining at least one elongated cavity extending in the direction of elongation of the cover, each cavity having a single flooding opening facing, and in free communication with, the liquid, the flooding opening being arranged in the region of one end of the cavity for flooding the cavity, a venting port arranged in the region of an end of the cavity opposite to the one end, a vent valve for closing and opening the venting port, and a connection to a source of a gas under pressure leading to the cavity for selectively supplying the gas under pressure to the cavity, the mass of the cover in addition to that of the liquid flooding the cavity exceeding the mass of the liquid to be displaced whereby the cover will gradually sink to the bottom when the liquid floods the cavity through the single flooding opening at the one end after the vent valve has been opened to permit the gas under pressure to escape through the venting port at the opposite end, the cover assuming an oblique position while it sinks as the liquid gradually floods the cavity from the one to the opposite end, and the cover gradually rising in a like manner when the gas under pressure is supplied to the cavity and gradually displaces the liquid in the cavity through the opening at the one end.

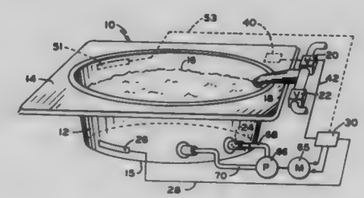
4,716,604
SPA WITH MOVING JETS
Jonathan Watkins, San Marcos, Calif., assignor to Watkins Manufacturing Co., Carlsbad, Calif.
Filed Sep. 18, 1985, Ser. No. 777,435
The portion of the term of this patent subsequent to Jan. 18, 2002, has been disclaimed.
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 15 Claims



2. The improvement in a spa or the like, comprising:
(a) a tank containing water for body immersion and a flexible tube directed to exhaust water into said tank from a side thereof and a source of pressurized water connected to said tube, said tube having a free end adapted to whip by reaction of water exhausting therefrom for massage of users, said tube having a fixed end secured relative to said tank with said free end extending inwardly therefrom towards the inside of said tank, and
(b) a harness formed by a number of separate articulated sleeves pivotally connected together in series by journals and bearings and closely encircling said tube and guiding said tube in whipping motion by limiting flexing of said tube substantially to the flexing limitations of said harness and said harness being restricted in articulated movement substantially to a vertical plane that extends through said tank, said sleeves being pivotally connected to pivot about parallel axes at right angles to said plane, so that said sleeves can only pivot in said plane and whereby said tube can only whip in said plane, said sleeves pivoting without appreciable resistance in said plane.

4,716,605
LIQUID SENSOR AND TOUCH CONTROL FOR HYDROTHERAPY BATHS
Philip E. Shepherd, 5608 Melody Lake Dr., Edina, Minn. 55436, and Gregory R. Johnson, 4940 173rd Ave. NE., Ham Lake, Minn. 55304
Filed Aug. 29, 1986, Ser. No. 901,554
Int. Cl.[4] E03C *1/05*
U.S. Cl. 4—544 6 Claims

1. A hydrotherapy apparatus comprising a hydrotherapy tub,
a water pump having inlet and outlet ducts connected to the tub and a drive motor connected to operate the pump,
at least a pair of electrical proximity sensor terminals comprising two non-moveable electrodes supported in fixed positions at two different elevations and being mounted in the vicinity of the tub including a first terminal mounted at a relatively low level in the vicinity of the tub to sense the presence of water in the tub,
the second terminal mounted in the vicinity of the tub for sensing the presence of the human body, but not being actuated by water in the tub,

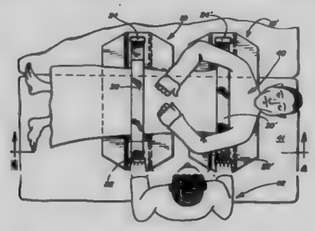


circuit means operatively connected between the terminals and the motor to energize the motor only when the first terminal is actuated by the presence of water in the tub and the second terminal is actuated by the presence of the human body in proximity or contact therewith whereby the motor will operate only when both terminals are actuated, the first terminal by the water and the second terminal by the human body.

4,716,606
Patent Not Issued For This Number

4,716,607
PATIENT TRANSFER MAT
Paul J. Johansson, 1416 Grant Rd., Northbrook, Ill. 60062
Filed Feb. 18, 1986, Ser. No. 830,261
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R 12 Claims

1. A patient transfer mat comprising:
an elongated body portion having a substantially elongated rectangular shape adapted to be placed transversely under a selected portion of the torso of a patient to facilite moving at least said torso portion of the patient, said body portion having a length substantially less than the length of the patient but greater than the width of said torso portion and having a width substantially less than said length;
said body portion being formed from a flexible but substantially rigid lightweight material and including means to at least partially conform with the contour of a portion of the



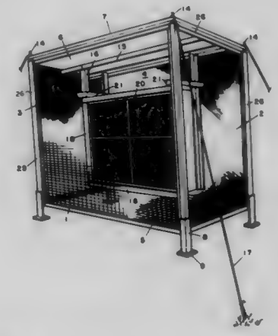
patient's body, said means to conform including a center section and a wing section hingedly attached to each side of said center section, which wings bend at an angle to said center section to provide said conformation and a sufficient sliding surface for moving said patient; and
openings in each end of said body portion adapted to be grasped by an attendant to move said patient.

4,716,608
MATTRESS COVER HOLDER
John H. Whitfield, P.O. Box 54, Laytonville, Calif. 95454
Filed Jul. 14, 1986, Ser. No. 884,932
Int. Cl.[4] A47C *21/02*
U.S. Cl. 5—451 10 Claims



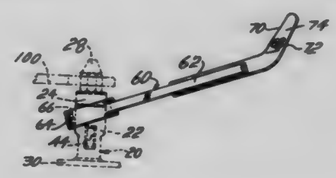
1. Apparatus for releasably securing bedclothes to a mattress having a sleeping surface, a bottom surface, and an outer periphery defined by end surfaces and side surfaces, said apparatus comprising:
a generally rectangular anchoring device adapted to contact the mattress below the sleeping surface and along the outer periphery of the mattress, said anchoring device having a pair of end portions in parallel, spaced-apart relation and adapted to contact the end surfaces of the mattress and a pair of side portions connecting said end portions in parallel, spaced-apart relation and adapted to contact the side surfaces of the mattress, said end portions and said side portions defining an inner periphery smaller than the outer periphery of the mattress, whereby said anchoring device is adapted to engage the sides of the mattress to be anchored thereon; and
a plurality of fastening members, located on said anchoring device and adapted to connect said anchoring device to bedclothes in stretched-out relation over the mattress.

4,716,609
DOMICILE FOR LEAF CUTTER BEES
Frederick A. Norman, 21 Greensview Road, Banksia Park, S.A., Australia
Filed Feb. 26, 1986, Ser. No. 832,784
Int. Cl.[4] A01K *47/00*
U.S. Cl. 6—1 17 Claims



1. A domicile for leaf cutter bees, the domicile comprising:
a supporting frame having a plurality of struts defining an enclosure, the enclosure having a top, a base and sides;
mesh means connected to the struts for defining porous surfaces for the enclosure through which surfaces the leaf cutter bees can enter the enclosure,
a solid panel means having an impermeable surface disposed at least over the top of the enclosure to shield the enclosure from rain and sun; the panel means cooperating with the mesh means to completely surround the enclosure;
a nest holder within the enclosure for supporting a nest for the bees, and
hanger means for suspending the nest holder from the top of the enclosure in spaced relation to the top, base and sides of the enclosure.

4,716,610
HAND TOOL
Albert J. Therkildsen, Kent, Wash., and Ronald A. Kvinge, 619 N. Summit Ave., Kent, Wash. (98031), assignors to Ronald A. Kvinge, Edmonds, Wash.
Filed Nov. 5, 1984, Ser. No. 668,414
Int. Cl.[4] B25B *13/50*
U.S. Cl. 7—138 12 Claims



1. A combination of a thermostatic expansion valve and a hand tool:
a. said thermostatic expansion valve comprising:
I. a valve housing;
II. a first outwardly projecting tube connecting with said valve housing;
III. a second outwardly projecting tube connecting with said valve housing;
IV. a third outwardly projecting tube connecting with said second outwardly projecting tube;

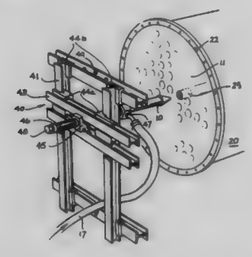
V. the longitudinal axis of said valve housing and the longitudinal axis of said third outwardly projecting tube being substantially parallel;
VI. said valve housing having a first means for receiving a cap;
b. said hand tool comprising:
VII. a shank;
VIII. said shank having a first end and a second end;
IX. a passageway in said first end;
X. said second end being a finger; and,
c. said hand tool being positioned on said thermostatic expansion valve to brace said thermostatic expansion valve to allow working on said thermostatic valve.

4,716,611

APPARATUS FOR CLEANING PIPES, TUBES, AND THE LIKE BY LAUNCHING PIGS

Peter L. Barry, Narre Warren, Australia, assignor to Lacroes Nominees Pty., Ltd., Camberwell, Australia

Continuation of Ser. No. 527,269, Aug. 29, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 785,089
Claims priority, application Australia, Mar. 11, 1983, 12422/83
Int. Cl.[4] B08B 9/04
U.S. Cl. 15—3.51 **4 Claims**



1. Apparatus for cleaning one or more tubes which comprises in combination a source of high pressure liquid and quick-operating valve means connected via a pressure outlet or outlets to one or more launchers for launching pigs, wherein each launcher comprises a high pressure connecting means and a launcher tip, which launcher tip has a frustoconical nozzle section for sealingly engaging the end of a tube to be cleaned, said one or more launchers being mounted upon movable location and support means, which means comprises an X-Y frame for maintaining said one or more launchers in position with respect to the ends of said one or more tubes, whereby said one or more tubes may be cleaned sequentially or simultaneously.

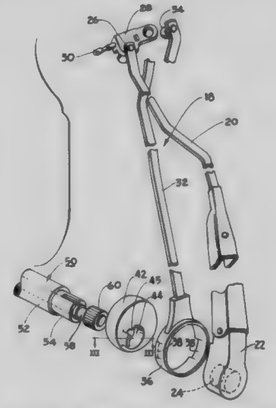
4,716,612

WIPER ARM ASSEMBLY

Anthony R. D'Alba, Amherst, N.Y., assignor to Trico Products Corp., Buffalo, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,859
Int. Cl.[4] B60S 1/34
U.S. Cl. 15—250.23 **5 Claims**

1. In a windshield wiper arm assembly comprising a pivot block, a primary arm pivotally secured to said pivot block at one end on an axis perpendicular to the major plane of the pivot block, means at its other end for securement to a driven oscillatory pivot shaft for pivotal movement about its central axis, said pivot shaft being journalled within a bearing housing, a drag link secured for universal movement at one end to said pivot block and spaced from said axis, said drag link having anchoring means at its other end for connecting said drag link at said pivot shaft for universal movement and means for connecting a wiper blade to said pivot block for movement therewith; wherein said anchoring means comprises a disk of greater diameter than said pivot shaft having a convex sperical periphery and an eccentrically positioned axially extending opening of greater radial extent than said pivot shaft, said opening encircling said pivot shaft and said bearing housing and being frictionally engageable with said bearing housing, readily releasable engaging means for fixing the angular position of said disk relative to said housing, the central axis of said disk being displaced from the central axis of said pivot shaft, a



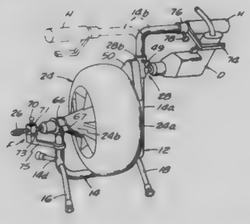
bearing ring of rigid material having an internal spherical concave surface complementary to said covex spherical periphery fixed to the other end of said drag link and engaging said convex spherical periphery for free, unobstructed univeral movement, whereby said central axis of said disk may lie close to or within the radial extent of said pivot shaft and avoid interference between said pivot shaft and said drag link during movement in any direction.

4,716,613

PIPE CLEANING MACHINE

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342

Filed Mar. 25, 1986, Ser. No. 843,654
Int. Cl.[4] B08B 9/02
U.S. Cl. 15—104.33 **6 Claims**



1. A pipe cleaning machine which can be powdered either by hand or by a standard type of electric hand drill having a drill bit holding chuck, the machine being of the type characterized by having an elongated flexible plumbers' snake or spring formed by helically wound spring wire which is stored within the machine in a coiled configuration and can be withdrawn forwardly of the machine for inserting into the pipe to be cleaned, comprising:
(a) a frame;
(b) a first shaft rotatably carried by said frame;

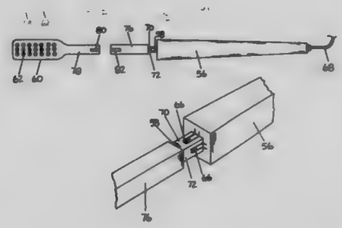
(c) a driven member carried by said first shaft for rotation therewith;
(d) a spring housing for housing the snake, said spring housing having an opening formed therein for receiving at least a portion of said driven member to impart rotation to said spring housing upon rotation of said first shaft;
(e) a hand crank detachably interconnected with said first shaft for imparting rotation thereto;
(f) a second shaft rotatably carried by said frame at a spaced apart location from said first shaft, said second shaft being receivable within the drill bit holding chuck for rotation by the hand drill;
(g) a driving member carried by said second shaft for rotation therewith;
(h) interconneciton means for interconnecting said driving member and said driven member, whereby rotational movement of said driving member will impart rotational movement to said driven member; and
(i) feed means mounted on said frame forwardly of said spring housing for releasably gripping said spring to urge axial movement thereof upon rotation of said spring housing.

4,716,614

DEVICE FOR MONITORING THE PROCESS OF TOOTHBRUSHING

Arthur R. Jones, 272 Ferndale Place, Waterloo, Ontario, Canada N2J 3X9, and John D. Jones, R.R. #1, Dorchester, Ontario, Canada N0L 1G0

Filed Apr. 16, 1986, Ser. No. 852,564
Claims priority, application Canada, Nov. 7, 1985, 494795
Int. Cl.[4] A46B 9/04
U.S. Cl. 15—105 **28 Claims**



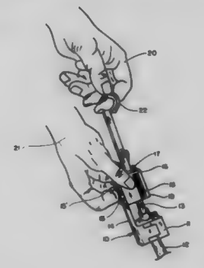
1. A device for monitoring the process of toothbrushing, said device comprising a toothbrush having a handle with a neck and a removable and replaceable head, said neck being located between said head and a remainder of said handle, said neck having means to consecutively receive various heads so that when pressure is exerted on said head it will be transmitted to said neck, said head having numerous bristles thereon and said bristles having a free end, said handle having at least two sets of sensing means affixed thereto in an area of said neck to linearly measure a bending moment of the area to which each set of sensing means is attached, said handle having two non-parallel planes with one set of sensing means on each plane, each plane being parallel to a longitudinal axis of said handle, each set of sensing means being electrically connected to different signalling means so that a two dimensional signal can be activated as pressure is exerted on said bristles.

4,716,615

WIPER ASSEMBLY

Charles L. Whitehead, 7224 Briarview, St. Louis, Mo. 63123, and Leawood C. Colvin, 5816 Nottingham Ave., St. Louis, Mo. 63109

Filed May 21, 1986, Ser. No. 865,300
Int. Cl.[4] G01F 23/04; F01M 11/12
U.S. Cl. 15—210 B **18 Claims**



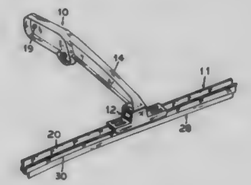
1. A wiper assembly comprising a frame member, said frame member including a central portion and connected side frame portions, a wiping pad disposed within said frame member with portions within each of said side frame portions, said side frame portions being pivotally engaged to said central portion and pivotal between an open position and a closed position wherein said wiping pad portions in said side frame portions substantially abut, mounting means including a mounting clip adaptable for engagement with a dip stick tube, said mounting means including shaft means adjustably engaged to said frame member whereby said wiping pad portions are positioned substantially adjacent to an open end of a dip stick tube and when said side frame portions are in said closed position said wiping pads contact and wipe a dip stick as the dip stick is withdrawn from the dip stick tube.

4,716,616

FLEXIBLE SQUEEGEE DEVICE

Patrick Poon, 441 Eans Park Drive, Unit 8, Markham, Ontario, Canada L3R 1H7

Filed Mar. 18, 1987, Ser. No. 27,316
Int. Cl.[4] A47L 13/11
U.S. Cl. 15—245 **10 Claims**



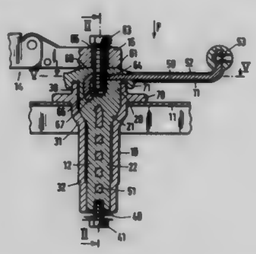
1. A squeegee device comprising,
an elongated flexible frame member,
an elongated resilient strip element mounted to one lateral edge of said frame member,
a bracket member coupled to said frame member in a second lateral edge therein opposite to said one lateral edge, said bracket member having a substantially rectangular mounting housing portion provided with an opened side, and a slotted top cover having an opened end at said opened side,
a handle member having a substantially square head portion formed in a free end therein, said mounting head portion being operatively engageable with said mounting housing

portion of said bracket member for mounting said handle member and said bracket member selectively in at least two positions wherein in one position said handle member is substantially perpendicular to said bracket member, and in a second position said handle member is substantially parallel to said bracket member.

4,716,617
WINDSHIELD WIPER BEARING

Klauspeter Noack, Obersulm, and Hans Prokaska, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,246
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501331
Int. Cl.[4] B60S *1/02*
U.S. Cl. 15—250.34 **19 Claims**



1. A wiper system for motor vehicles, said system comprising: a wiper shaft, a wiper arm fixed to one end of said wiper shaft, a crank for-driving said wiper shaft and a plastic bearing bushing adapted to be fastened on the body of a motor vehicle, said bearing bushing having an axial bore encompassed by an axial wall having a substantially constant thickness over substantially all of its axial length, said wiper shaft being rotatably received in said bore, said bore having a conical bearing surface portion and said wiper shaft having a conical bearing surface portion complementary to and seated on the conical bearing surface portion complementary to bore, said wiper shaft having three portions with three different diameters and said bearing bushing having three portions with three different diameters, said bushing diameters accommodating the three different diameters of said wiper shaft.

4,716,618
WIPER BLADE RUBBER

Takemasa Yasukawa, Inazawa; Hiroshi Sugita; Tadanobu Iwasa, both of Ichinomiya, and Masanori Aritake, Nishikasugai, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Nov. 18, 1986, Ser. No. 932,142
Claims priority, application Japan, Nov. 19, 1985, 60-259402
Int. Cl.[4] B60S *1/38*
U.S. Cl. 15—250.36 **5 Claims**

1. A wiper blade rubber of an elongated configuration comprising a base portion of large thickness, a swinging portion substantially of a trigonal cross section, a neck portion connecting said base portion and said swinging portion, and a thin plate-like lip portion disposed at the top end of said swinging portion, said base portion having a surface opposed to said swinging portion, and said swinging portion having a surface opposed to said base portion, wherein

the basic material forming most part of said base portion, said neck portion, said swinging portion and said lip portion is a soft and flexible rubber mainly composed of vulcanized ethylene-propylene rubber, and at least the surface of said lip portion is disposed with a surface layer formed with a blended rubber composed of acrylonitrile-

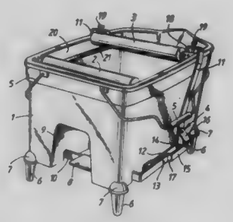


butadiene rubber and polyvinyl chloride resin and said surface layer has a chlorinated surface layer.

4,716,619
MOPPING UNIT

Ronald A. Young, London, United Kingdom, assignor to Scot Young Service Systems Limited, Lye, England

Filed Jun. 2, 1986, Ser. No. 869,572
Claims priority, application United Kingdom, Jun. 6, 1985, 8514271
Int. Cl.[4] A47L *13/60*
U.S. Cl. 15—262 **11 Claims**



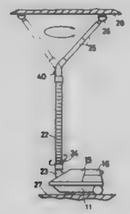
1. A mopping unit comprising:

a bucket, a wringer with two squeeze rollers mounted at the top of the bucket, an operating mechanism having a foot pedal mounted at a lower level on the bucket and operative, of depression of the foot pedal, to produce relative closing movement of the squeeze rollers, one of said two rollers being mounted adjacent a front side of said bucket for rotation about an axis disposed laterally of the bucket and which remains fixed in position during said relative closing movement, and two operating arms which are respectively pivotally mounted on opposite sides of said bucket with the other of said two rollers rotatably mounted between upper ends of said arms, said operating mechanism including two similar toggle linkages each of which is operatively connected between a corresponding one of said arms and said foot pedal and which at the end of said closing movement both go over-center to lock the rollers at a predetermined spacing in an operative mop-wringing position.

4,716,620
VACUUM CLEANER

Seizo Hayashi, Oumi Hachiman; Hidesori Kitamura, Youkaichi, and Yuichi Shimizu, Oumi Hachiman, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 20, 1987, Ser. No. 4,398
Claims priority, application Japan, Jan. 17, 1986, 61-5503[U]; Jan. 20, 1986, 61-6102[U]
Int. Cl.[4] A47L *5/36*
U.S. Cl. 15—327 F **10 Claims**



1. A vacuum cleaner comprising:

a cleaner housing accommodating a motor-driven air blower and having a dust collection chamber defined in a front end thereof;

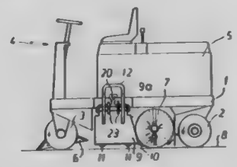
an upper cover detachably hinged at an end to said cleaner housing for closing an upper portion of said dust collection chamber and having a slanted surface inclined downwardly toward said front end, said upper cover having an inlet hole defined in said slanted surface for communication with said dust collection chamber when the upper portion of said dust collection chamber is closed by said upper cover; and

a connector pipe connected at one end to an intake hose and having an opposite end rotatably coupled to said inlet hole, said connector pipe being bent at such an angle as to be directed substantially vertically when said hose is directed upwardly.

4,716,621
FLOOR AND BOUNDED SURFACE SWEEPER MACHINE

Sergio Zoni, Parma, Italy, assignor to Dulevo S.p.A., Sanguinaro di Fontanellato, Italy

Filed Jul. 16, 1986, Ser. No. 886,269
Claims priority, application Italy, Jul. 26, 1985, 34889/85[U]
Int. Cl.[4] A47L *11/24*
U.S. Cl. 15—349 **8 Claims**

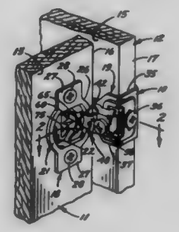


1. A floor and bounded surface sweeper machine, of the type which comprises at least one supporting frame (1), wheels (2,3) supporting said frame (1), a cylindrical brush (7) parallel to a surface (8) to be swept clean and being supported on said frame at a position across the longitudinal axis of the machine, and a storage container (9) for the swept trash engaged releasably with said frame (1) and having a loading mouth (9a) adjacent said cylindrical brush (7), characterized in that it comprises, for engaging said container (9) with said frame (1), pivotally mounted guides (14) located in a central portion of said frame (1) and extending in a transverse direction to a longitudinal axis of the machine, swivel members (18) engaging pivotally said guides (14) with said frame (1) and defining a pivot axis connecting and transverse to said guides (14) and parallel to said longitudinal axis, hook-up elements (19–22) provided between said frame (1) and said guides (14) set apart from said swivel members (18) and adapted to hold said guides (14) at a raised position close against said frame (1), and spring members (23) projecting from said frame (1) and acting by spring bias on said container (9) in a substantially parallel direction to said guides (14) when said container has at least a major portion inserted on said guides (14) and said guides (14) are at least close to the raised position.

4,716,622
CONCEALED SELF-CLOSING HINGE

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Feb. 27, 1986, Ser. No. 833,168
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—297 **1 Claim**



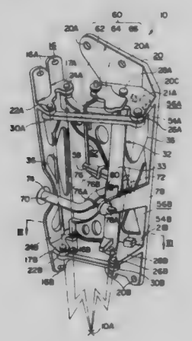
1. A concealed self-closing hinge for mounting a door for swinging on a fixed frame, said hinge comprising a door member having a cup defined by an end wall and by an annular wall formed integrally with and projecting inwardly from said end wall, said end wall having inner and outer sides, means formed integrally with said cup for mounting said door member on said door, a hinge pin supported by said cup adjacent said annular wall and having at least a portion located inwardly of the end wall of the cup, said hinge further comprising a frame member having a wing for mounting said frame member on said frame, an arm having one end attached to the wing of said frame member and extending into said cup, a curl on the opposite end of said arm and wrapped around said hinge pin to connect said door and frame members pivotally to one another, and a spring for urging said door member to and releasably holding said door member in a closed position with respect to said frame member, said spring comprising a single piece of resiliently yieldable material formed separately of said cup and having a generally flat plate portion secured to and lying along the outer side of the end wall of said cup, an opening formed through said end wall adjacent said hinge pin, and said spring further comprising a tongue portion formed integrally with and bent inwardly from said plate portion and extending inwardly through said opening and into said cup to bear against and ride on said curl.

4,716,623

SIDE DOOR HINGE MECHANISM IN MOTOR VEHICLE

Eiichi Kinaga, Toyota, and Daiichi Shiraishi, Seto, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 31, 1985, Ser. No. 793,152
Claims priority, application Japan, Nov. 2, 1984, 59-167002[U]; Nov. 2, 1984, 59-167004[U]; Nov. 2, 1984, 59-167010[U]
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] E05D *11/06*
U.S. Cl. 16—371 18 Claims



1. A side door hinge mechanism for a motor vehicle, comprising:
- a first pair of top rotary center shafts spaced apart from each other in a generally horizontal direction and supported of a rocking proximal end portion of a side door at a top portion thereof;
- a second pair of top rotary center shafts spaced apart from each other in a generally horizontal direction and supported on a vehicle body and disposed adjacent said rocking proximal end portion;
- a first pair of bottom rotary center shafts located below and aligned with said first pair of top rotary center shafts on a portion of said side door;
- a second pair of bottom rotary center shafts located below and aligned with said second pair of top rotary center shafts on said vehicle body;
- a top control arm having first and second ends, said first end being rotatably connected to a first one of said first pair of top rotary center shafts and said second end being rotatbly connected to a first one of said second pair of top rotary center shafts;
- a bottom control arm having first and second ends, said first end being rotatably connected to a first one of said first pair of bottom rotary center shafts and said second end being rotatably connected to a first one of said second pair of bottom rotary center shafts; and
- a main arm formed integrally in the vertical direction, said main arm comprising a large diameter pipe portion elongated in the vertical direction, a top arm having a generally triangular shape extending laterally of said main arm, and a bottom arm having a generally triangular shape extending laterally of said main arm;

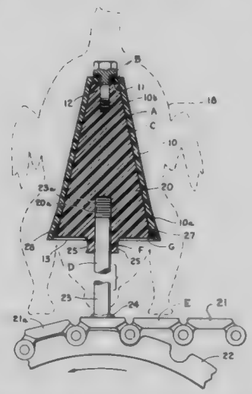
wherein said large diameter pipe portion includes a first end supported by a second one of said second pair of top rotary center shafts and a second end supported by a second one of said second pair of bottom rotary center shafts, said top arm includes a first end connected to said first end of said large diameter pipe portion and a second end connected to a second one of said first pair of top rotary center shafts, and said bottom arm includes a first end connected to said second end of said large diameter pipe portion and a second end connected to a second one of said first pair of bottom rotary center shafts.

4,716,624

POULTRY CUTTING SUPPORT

George W. Massey, Jr., Box 774, Starr, S.C. 29684

Filed Apr. 10, 1987, Ser. No. 37,213
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 7 Claims



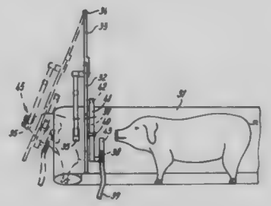
1. A cutting support for use in deboning poultry comprising:
- a molded plastic cutting shell having,
- a generally conical wall open at a bottom thereof, and sealing means carried by an upper portion of said conical wall,
- a fixture receiving said shell thereon; and
- means removably mounting said fixture in upright position wherein said shell extends into a body cavity positioning poultry so as to be accessible to an operator for manual deboning.

4,716,625

PROCESS AND DEVICE FOR STUNNING SLAUGHTER ANIMALS, IN PARTICULAR FOR STUNNING AND SUBSEQUENTLY STICKING SLAUGHTER ANIMALS

Gerrit J. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G. J. Nijhuis B.V., Netherlands

Filed Jan. 16, 1986, Ser. No. 819,373
Claims priority, application Netherlands, Jan. 21, 1985, 8500147
Int. Cl.[4] A22B *3/00*
U.S. Cl. 17—45 24 Claims



1. A process for electrically stunning and subsequently sticking slaughter animals, by means of two electrodes which are placed on either side of the head of the animal to be stunned, while the animal is in the passage of a conveyor having two endless conveyor belts which are placed opposite each other and which grip the sides of the animal to convey it, comprising the steps of:
- stunning an animal with an electric impulse given by means of two electrodes shaped so that the electrodes partially enclose the animal's head when the electrodes are placed round the head of the animal;
- pulling the animal's head up by the electrodes in such a way that the neck is stretched;
- sticking the animal in the carotid artery while the head of the animal is being maintained in a position where the neck is stretched due to the pulling by the electrodes and while the animal is still in the conveyor.

7. Apparatus for the automatic stunning of slaughter animals, comprising:
- a conveyor with two endless belts which are placed in such a way that there is a passage between the belts and which can grip an animal to be stunned and move it forwards;
- two electrodes in the passage of the conveyor and adapted to grip both sides of the head of the animal to be stunned, the electrodes being hingedly attached to carriers in such a way that the electrodes can be moved in a direction which is transverse to the direction of conveyance, towards each other or away from each other;
- an operating mechanism connected to the electrodes, the operating mechanism being operable to move the electrodes towards each other in such a way that the head of the animal to be stunned can be subjected to clamping; and,

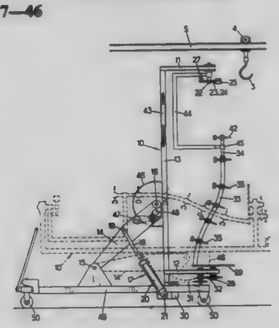
means for moving the electrodes apart.

4,716,626

METHOD FOR PROCESSING A CARCASS OR HALFCARCASS OF MEAT AND DEVICE FOR IMPLEMENTING SUCH A METHOD

Gabriel Chiron; Marcel Soullard, both of Cholet, and Maurice Fradin, Saint Jean de Moats, all of France, assignors to Bocaviande Chiron, Cholet, France

PCT No. PCT/FR84/00084, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/03816, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 29, 1984, Ser. No. 687,419
Claims priority, application France, Mar. 30, 1983, 83 05243
Int. Cl.[4] A22C *17/04*
U.S. Cl. 17—46 13 Claims



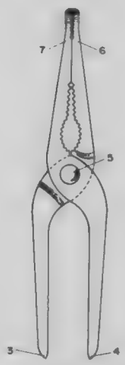
1. A method for processing carcasses or half-carcasses of bovine animal or other quadrupeds, comprising the steps of:
- vertically suspending the carcass or half-carcass;
- transferring the carcass or half-carcass from its vertical suspended position into a substantially horizontal suspended position;
- exerting a stretching force on the carcass or half-carcass so as to hold it in position and keep it taut;
- manitaining said carcass or half-carcass in said horizontal suspended position while maintaining said stretching force and supporting the carcass or half-carcass by its skeleton;
- manually separating the muscles and meat from the bones without performing a substantial intermediate deboning operation while said carcass or half-carcass is maintained in said horizontal suspended position; and
- continuing said manual separtion until at the end of processing the substantially entire skeleton of the carcass or half-carcass has been separated from the entire meat and muscles, said skeleton remaining held in said horizontal suspended position.

4,716,627

CRAB CRACKER

Winston C. Scott, Jr., Rte. Box 730 WS, Manderville, La. 70448

Filed Nov. 10, 1986, Ser. No. 902,669
Int. Cl.[4] A22C *29/00*
U.S. Cl. 17—73 1 Claim



1. A crab cracking, opening and picking tool comprising a first handle having a concaved portion with notches therein and a curved needle nose portion with fine notches thereon, said needle nose portion being tapered and having a flattened end,
- a second handle having a concaved portion with notches therein and a curved needle nose portion with fine notches thereon, said needle nose portion being tapered and having a flattened end,

said first and second handles being hingedly joined together to define a plier-like tool, said concaved portions of each defining, when the needle nose portions are in the substantially closed position, a crab claw-like concavity adapted to grip a crab or crab part to crack the shell thereof and the flatten ends being adapted to pick the exposed meat therefrom.

4,716,628

DEVICE FOR PRODUCING SUPERPOSED WEBS

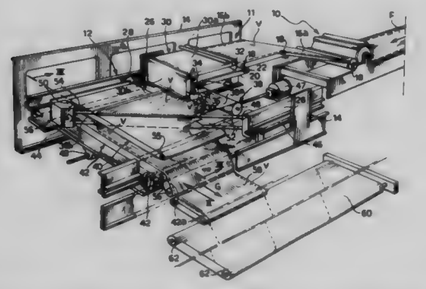
Giovanni Bacchio, Mongrando, Italy, assignor to Fonderie Officine Riunite F.O.R. Ing. Graziano di L. Graziano & C. S.a.s., Biella, Italy

Filed Dec. 3, 1986, Ser. No. 937,352
Claims priority, application Italy, Dec. 11, 1985, 68039 A/85
Int. Cl.[4] B65H *45/103*
U.S. Cl. 19—106 R 4 Claims

1. Device for producing superposed webs of non-woven fabric on the exit of an end comber of a carding machine from which a web is discharged along a direction of arrival, comprising an adjusting unit including a series of conveyor belts movable parallel to the direction of arrival of the web from the end comber 10 of the carding machine, and a traversing unit feed by the adjusting unit and including a feeder belt having a

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first section movable parallel to the conveying direction of the said adjusting unit, a second section movable at right angles to the conveying direction of the said adjusting unit, and deviating means for deviating the said feeder belt between the said first and second sections, a delivery belt parallel to the second section of the feeder belt, and a layering end belt movable



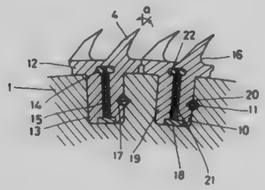
parallel to the said delivery belt; the said traversing unit being capable of performing an alternating rectilinear movement in a direction of displacement parallel to the conveying direction of the adjusting unit, in synchronism with the latter, in order to feed the web to the said layering end belt, which belt has a width corresponding substantially to the distance traversed by the said traversing unit.

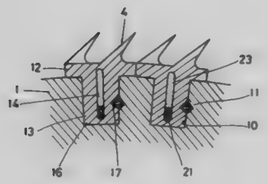
4,716,629

COMBINING CYLINDER OF A COMBER IN SPINNING MACHINERY

Kunio Iwata, Itami, and Kesaya Hagimoto, Amagasaki, both of Japan, assignors to Kanai Juyo Kogyo Co., Ltd., Hyogo, Japan

Filed Aug. 15, 1985, Ser. No. 765,955
Int. Cl.[4] D01G *15/84*
U.S. Cl. 19—114 8 Claims





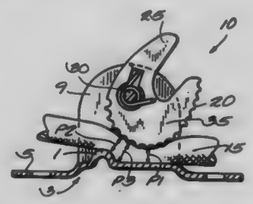
1. A combing cylinder comprising:
a cylindrical body having a plurality of needle plate member grooves in the outer circumference thereof extending in an axial direction of said cylindrical body, and a respective small groove extending in said cylindrical body in said axial direction at a side of each of said needle plate member grooves and open thereto;
a laminated needle plate member in each of said plurality of needle plate member grooves, said laminated needle plate member comprising a plurality of needle plates,
each of said plurality of needle plates having a base part and a needle head extending from said base part outward from said cylindrical body, a needle inserting part extending from said base part opposite said needle head into a respective needle plate member groove, said needle inserting part having a recess therein open to said small groove at the side of said respective needle plate member groove, and each of said plurality of needle plates having a hole having a substantially I-shaped cross-section extending therethrough in said axial direction;
a connecting member extending through each of said holes of said plurality of said needle plate members and secured to each of said plurality of said needle plate members for fixing each of said plurality of needle plate member relative to one another; and
an anti-slip member extending in said axial direction in each said small groove and each recess of said plurality of needle plates open to said each small groove for attaching each of said needle plate members to said cylindrical body.

4,716,630

CAM LOCK WITH POSITIVE RELEASE

Helmut K. Skyba, Rte. 2, Box 330, Wild Rose, Wis. 54984

Filed Jan. 20, 1987, Ser. No. 4,561
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—134 R 1 Claim



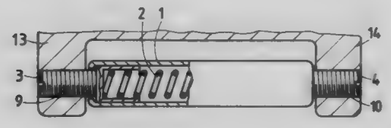
1. A cam lock mechanism for a flexible strap or rope or the like comprising a cam wheel having a curved periphery with an eccentric portion thereon, an aperture eccentrically located with respect to the curved periphery, a bracket including a flat base generally all of the cam wheel and two upstanding legs having aligned apertures, a pin extending through the leg apertures and the aperture in the cam wheel to rotatably support the cam wheel, and a raised ridge positioned on and spanning the base between the legs of said bracket opposite the side of said pin that the eccentric portion of said cam wheel is located when said cam wheel is in a rope engaged position, the raised ridge being adapted to cooperate with the cam wheel to clamp the rope between the raised ridge and the cam wheel, wherein said cam lock provides a two pressure point contact between the base and the rope to compress the rope at two spaced points, one pressure point is located between the cam wheel and the flat base lying thereunder; and the other pressure point is located between the cam wheel and the raised ridge.

4,716,631

PIN FOR WRIST-WATCH

Jacques H. Gay, Geneva, Switzerland, assignor to Gay Freres S.A., Switzerland

Filed May 15, 1985, Ser. No. 734,452
Claims priority, application Switzerland, May 25, 1984, 2580/84
Int. Cl.[4] A44C *5/14*
U.S. Cl. 24—265 B 3 Claims



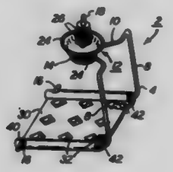
1. Pin for a wrist-watch comprising:
a cylindrical body having two cylindrical components at its ends,
said cylindrical components are moveable axially in the cylindrical body so as to engage in lug holes such as between the cheeks or lugs of said wrist-watch,
said cylindrical components have a threaded portion which is intended to ensure axial locking of the pin by rotation of the cylindrical components relative to said body,
said cylindrical components having outer ends being shaped so as to receive a screwdriver for said rotation,
said cylindrical components are mounted so as to slide and are held apart by a compression spring, wherein the portion of the cylindrical components situated outside the tubular body is threaded over at least a portion of its length.

4,716,632

PANEL MOUNTING FASTENER SYSTEM

Uwe W. Perl, Union Lake, Mich., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Mar. 3, 1987, Ser. No. 21,127
Int. Cl.[4] B60R *13/02*
U.S. Cl. 24—289 23 Claims



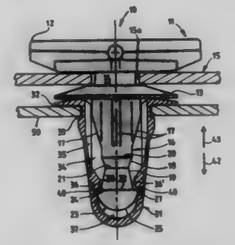
1. A fastener system for attachment between a supporting structure and a supported panel member, said fastener system including:
a. a base plate for attachment to the backside of said panel member;
b. a resilient mounting bracket, said mounting bracket having:
(1) a pair of generally parallel feet adapted for connection with said base plate, each of said feet terminating at a tip that is angled away from said foot, said tips adapted for snap engagement with said base plate,
(2) a pair of generally parallel legs, one extending upward from each of said feet, and
(3) a yoke joining said legs and extending in a generally transverse plane over said feet, said yoke defining a collar intermediate said legs and spaced from said base; and
c. a fastener mounted on said mounting bracket, said fastener including a flanged neck portion for snap engagement within said collar and an upwardly extending body portion for engagement with said supporting structure.

4,716,633

FIXING DEVICE, ESPECIALLY FOR PANELS

Léandre Rizo, St-Ouen l'Aumone, France, assignor to ITW de France, Beauchamp, France

Filed Feb. 20, 1987, Ser. No. 17,083
Claims priority, application France, Feb. 17, 1986, 86 02075
Int. Cl.[4] A44B *21/00*; F16B *13/06*
U.S. Cl. 24—453 5 Claims



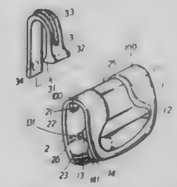
1. Fixing device comprising a male part having a mounting head, a pressure head axially spaced from said mounting head, a retaining head having a retaining surface directed towards said mounting head, a snap-fastener surface, a retaining edge defined by the intersection of said retaining surface with said snap-fastener surface, an elongate cylindrical body between said pressure head and said retaining head, at least three axially extending ribs integrally formed on said elongate body directly below said pressure head, said ribs extending radially in an equal spaced arrangement about the center of said cylindrical body and a female part having a receptacle for said body, the interior wall portion adjacent the opening for said receptacle defining a circular opening having a diameter of substantially the same size as the diameter defined by an imaginary circle drawn through the outer marginal surface of said ribs to thereby provide axial centering and entrainment of said elongate body relative to said receptacle, and at least one circumferential sector for retaining said retaining head axially, wherein said retaining edge is adapted to penetrate said at least one retaining sector to provide an axial abutment opposing withdrawal of said male part from said receptacle.

4,716,634

TWO-PIECE REINFORCED CLOTHES PEG

Wen-Yuan Fan, No. 6, Lane 37, Jih Hsin Street, Tu Chen Hsiang, Taipei Hsien, Taiwan

Filed May 5, 1987, Ser. No. 46,901
Int. Cl.[4] A41D *27/22*
U.S. Cl. 24—545 1 Claim



1. A two-piece reinforced clothes peg comprising:
a right jaw member 1, arcuately configured at the top portion, and in the internal surface thereof being provided with two-parallel belt-like projections 13, 14 on which

respectively are planted projecting wavy stripes 131, 141 for effecting the purpose of firm clamping of a piece of hanged clothes; on the external surface a niche 11 having an oval-shaped bottom portion 12 being defined, for receiving therein one leg of a clamping member when the same is in registry with the clothes peg; and a pair of connecting portions 100 being disposed along the top edge of said right jaw member;

a left jaw member 2, coupled to said right jaw member 1 by means of said connecting portions 100, being configured to have a straight back portion terminating with an arcuate-shaped top end, and a niche 25 being defined in correspondence to said niche 11 of said right jaw member 2; and a restraint slat 24 being provided near the top of said niche 25 for the purpose of locating said clamping member 3 in place; in order to secure the present clothes peg to the transverse rod of a clothes horse 41, a pair of openings 21, each having a J-shaped hook 22 defined therein, being provided; and in the internal surface, a plurality of projecting wavy stripes 23 and projecting grains 24 being planted;

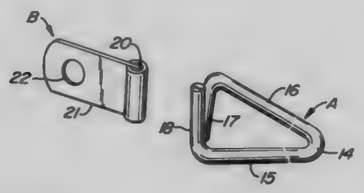
a J-shaped clamping member 3 made of plastic steel material having a pair of legs, one short and one long, and a wedge-shaped projection 34 being disposed, facing outward, on said long leg for securing the same to said jaw members by means of said restraint slat 24 planted on said left jaw member, and the short leg terminating with an enlarged end, having two-symmetrically-defined flanges 31, 32, the former being adopted to be able to be in secure engagement with the oval-shaped bottom portion 12 of said niche 11 so that said clamping member 3 is able to be fixed firmly in place in use, and the latter being set for ready puch operation of said clamping member 3; said long and short legs being slidably moved in said niches 25 and 11 respectively in operation, and a reinforcing ridge 33 being planted along the central line on the external surface of said clamping member 3; by means of above said components, the reinforced clothes peg being structured in such a manner that when in use, said clamping member 3 is pushed downward with its long leg and short leg moving in said niches 25, 11 of said left and right jaw members 2, 1 respectively, and said flange 31 of said short leg coming into engagement within said oval-shaped bottom portion 12 so that said clamping member 3 can be instantly in locking engagement with said jaw members, thereby forcing the jaw members to press against each other so to produce a clamping effect; by pushing upward said clamping member 3 to disengage said flange 31 from said oval-shaped bottom position 12, said left and right jaw members 2, 1 being free of a clamping state.

4,716,635

MECHANICAL FUSE

Andrew J. Flocchini, 7050 Lakeville Hwy., Petaluma, Calif. 94952

Filed Jun. 11, 1982, Ser. No. 387,383
Int. Cl.[4] A44B *19/00*
U.S. Cl. 24—588 6 Claims



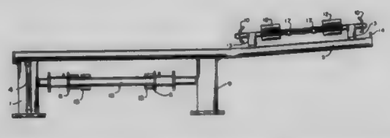
1. A two part mechanical fuse for placement as a tensive link for transmitting tension up to a fuse parting force and permitting tension to part the fuse, said fuse comprising: a first wire fuse member, said wire fuse member bent to a triangular configuration with the first and second sides of said wire fuse member joined at an apex and the closing side of said wire fuse member formed of juxtaposed side-by-side ovelapping sections of said wire; said side-by-side overlapping sections of said wire urge one towards one another by the spring force of the wire; a second fuse member including a bar and a tongue extending radially from the axis of said bar, said bar having a length less than the length of said closing side, said tongue passing through said side-by-side sections with said bar toward the interior of the triangle formed by said wire fuse member whereby upon excessive force being drawn to said mechanical fuse said side-by-side sections part disengaging said fuse.

4,716,636

BURIAL VAULT LOWERING DEVICES

John C. Schneider, 404 E. 1st St., Huxley, Iowa 50124

Filed Apr. 2, 1984, Ser. No. 596,092
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.
Int. Cl.[4] A61G *19/00*
U.S. Cl. 27—32 1 Claim



1. An improvement in a burial vault and a vault lid handling apparatus having a supporting frame, a vault lid having a first end, a second end opposite said first end, a first elongated side and a second elongated side opposite said first elongated side, a pair of holding means extending transversely around said first end and said second opposite end of said vault lid, a pair of wheels on each of said pair of said holding means, a first guide rail located at said first opposite end of said vault lid, a second guide rail located at said second opposite end of said vault lid, one of said pair of wheels engaging said first guide rail; one of said pair of wheels engaging said second guide rail; said first and second guide rails resting on said supporting frame, said improvement comprising:

each of said first and second guide rails comprising a first portion and second portion, said first portions being placed over said supporting frame, said second portions extending from said first portions so that each of said second portions of said guide rails extend parallel to each other in the same direction; and

said second portions being angled upwardly from said first portions at an angle less than 180° whereby said vault lid can be rotatably guided along said guide rails from said second portions to said first portions and said vault lid placed over said vault and whereby viewing of said vault lid while at said angle is facilitated.

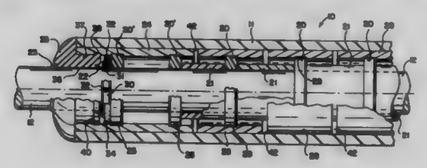
4,716,637

SPREADER ROLL

Billy R. McIntosh, Salisbury, and Thor R. Thiase, Linwood, both of N.C., assignors to The B. F. Goodrich Company, Okron, Ohio

Filed Jul. 29, 1982, Ser. No. 403,177
Int. Cl.[4] B30B *3/00*
U.S. Cl. 29—129 4 Claims

1. In a bow roll for use in supporting flexible sheet material along its transverse length for transport wherein said roll has an elongated rigid shaft supported at its respective ends, as plurality of axially spaced thermoplastic annular rings supported on said shaft for rotation thereon, a plurality of laterally spaced thermoplastic sleeves having grooves on their inner periphery for captively securing said rings, thermoplastic annular spacers mounted on said shaft between said annular rings and operative to maintain a predetermined clearance space between said sleeves, a cyindrical rubber roller circumferentially encompassing all of said sleeves for rotation therewith and supported thereby for frictional contact with such



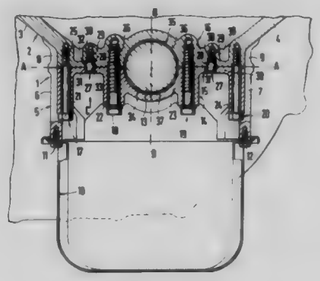
sheet material for support and conveyance thereof, said rubber roller having annular ends, and elastomeric end caps with a central bore frictionally journaled on the respective ends of said shaft and abuttingly engages said annular ends of said cylindrical roller and certain ones of said sleeves to seal the ends thereof.

4,716,638

METHOD FOR ALIGNING BEARING COVERS AT BEARING SECTIONS OF A CRANKCASE

Herbert Ampferer, Sachsenheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed Dec. 18, 1986, Ser. No. 943,059
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545722
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R 3 Claims



1. A method for aligning bearing covers at bearing sections of a crankcase and for machining crankshaft bearings formed by the bearing covers and bearing sections, in which the bearing covers cooperate with the bearing sections by way of fitting pins and fastening bolts attached on both sides of the crankshaft, comprising the steps of

securing the bearing cover without crankshaft at the bearing sections by means of fastening bolts;

machining bores for the fitting pins into the bearing covers and into the bearing sections;

installing the fitting pins;

machining the bearing bores for the crankshaft which are formed by the bearing covers and the bearing sections;

disassembling the bearing cover; and

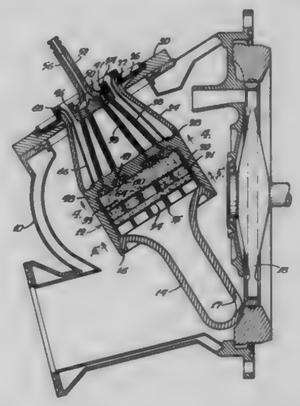
assembling the crankshaft and the bearing cover in such a manner that the bearing covers are at first aligned by way of the fitting pins and are then secured by means of the fastening bolts.

4,716,639

METHOD OF MAKING A HYDRAZINE FUEL INJECTOR

John Readman, Rockford, and Brian G. Johnson, Cherry Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 651,624, Sep. 17, 1984, Pat. No. 4,578,946.
This application Feb. 18, 1986, Ser. No. 830,454
Int. Cl.[4] B21D *53/00*; B23P *13/04*
U.S. Cl. 29—157 C 5 Claims



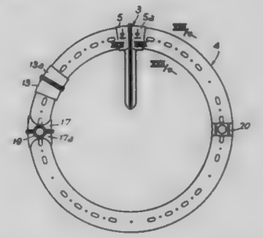
1. The method of making a hydrazine fuel injector comprising, shaping a piece of high temperature alloy to a frusto-conical shape, making a series of machining cuts in different planes radially of said piece, said cuts in certain radial planes being completely through said piece and cuts in other radial planes being of variable depth to form a series of integral feed tubes arranged in two radially spaced-apart circular arrays.

4,716,640

METHOD FOR MANUFACTURING A BURNER RING FOR A TURBOJET ENGINE

Gerard E. A. Jourdain, Saintry sur Seine, and Francois, M. B. Marlin, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation-S.N.E.C.-M.A., Paris, France

Filed Sep. 15, 1986, Ser. No. 907,098
Claims priority, application France, Sep. 18, 1985, 85 13794
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 C 15 Claims

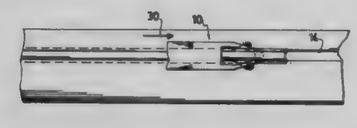


1. A method of manufacturing an annular burner ring for a turbojet engine, the burner ring having a gutter-shaped cross-section, comprising the steps of:

(a) forming a burner ring body by winding a refractory material about the exposed surface of a toroidal form;

(b) stopping the winding when a predetermined thickness of refractory material has been reached;
(c) attaching at least one burner ring element to the refractory material of the burner ring body wound on the toroidal form;
(d) winding additional refractory material about the toroidal form until final thickness of the burner ring body is reached;
(e) subjecting the refractory material to a heat treating process;
(f) cutting the refractory material in half along a plane extending generally perpendicular to a central axis of the toroidal form; and,
(g) separating the toroidal form from the refractory material so as to form the burner ring body in an annular shape having a gutter-shaped cross section.

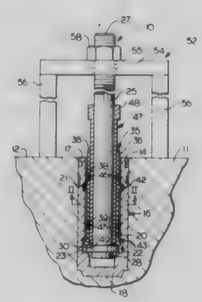
4,716,641
TRUCK WINDSHIELD MOULDING INSERTION TOOL
Shrimpton, Ronald J., 15 Walker Crescent, Saskatoon, Saskatchewan, Canada (S4L 4H7)
Filed Oct. 20, 1986, Ser. No. 920,729
Claims priority, application Canada, Jun. 19, 1986, 511969
Int. Cl.⁴ B23P *19/02*
U.S. Cl. 29—235 **2 Claims**



1. A tool for engaging an insert moulding within the channel of a truck windshield sealing moulding comprising a flattened elongated metal strip, the sides of said strip at one end thereof converging substantially to a point, and a V-shaped aperture formed clear through said strip from one face to the other with the apex of the V-shaped aperture being adjacent said pointed one end, said aperture lying symmetrically along the longitudinal axis of said strip with the sides of the aperture being substantially spaced and parallel to the sides of the said one end of said strip, said sides of the aperture widening gradually from the apex thereof to the rear end of the aperture, said rear end of the aperture being perpendicular to the longitudinal axis of said strip, said aperture including rear side wall portions extending from the rear ends of said V-shaped aperture, said rear side wall portions being spaced and parallel to one another and terminating at said rear end of said aperture thereby defining, when in plan, a front, V-shaped aperture portion and a rear, substantially rectangular aperture portion as a continuation of said V-shaped aperture portion.

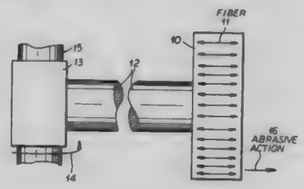
4,716,642
EXTRACTOR TOOL
James M. Bill, Sr.; Earl R. Schmidgall; Edward G. Schmidgall, and Frank C. Schmidgall, all of Peoria, Ill., assignors to Technological Products, Inc., Dunlap, Ill.
Filed Sep. 16, 1986, Ser. No. 907,815
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—265 **6 Claims**

1. An extractor tool, for removing a hydraulic valve lifter body from an engine block or head with the lifter body having a bore provided with at least a pair of relatively widely axially spaced internal annular grooves, comprising:
an elongated puller rod having a head end insertable into said bore of such a lifter body;
a plurality of expandable arcuate segments loosely disposed in edgewardly abutting circumscribing relation on said head end of the pullar rod when in a collapsed retracted position and having a pair of relatively widely axially spaced external grooves circumscribing the segments;
a pair of garter springs individually mounted in said external grooves expandably holding said segments in said retracted position during insertion into said bore of the lifter body;
actuator means slideably mounted on said puller rod for movement into a position disposed between said rod and said expandable segments;



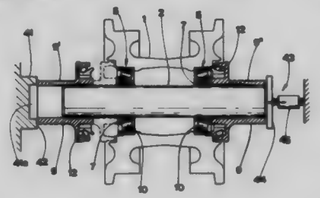
and a pair of relatively widely axially spaced body gripping rings radially outwardly extended from the segments in substantially continuous circumscribing relation thereabout with the rings being individually alignable with and expandable into said annular grooves in said lifter body.

4,716,643
METHOD OF MAKING A MACHINE PART FOR ABRASIVE APPLICATIONS
Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany
Filed Apr. 30, 1986, Ser. No. 858,936
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—434 **2 Claims**



1. A method of making a machine part of a given configuration adapted to engage an abrasive material in a certain orientation of said machine part upon movement of a machine element relative to said material, said method comprising the steps of:
casting a carbon steel body from a steel composition consisting essentially of:
1.0 to 2.2% by weight carbon,
0.1 to 0.4% by weight silicon,
0.15 to 0.45% by weight manganese,
11.0 to 12.0% by weight chromium, the balance iron and the usual and unavoidable accompanying elements;
forging said body into said configuration with a fiber structure running parallel to the direction with which said machine part would engage said material if oriented in said orientation to form the machine part; and
affixing the forged machine part to said element in said orientation whereby the machine part affixed to said element engages said material so that at least a principal direction of abrasive attack upon said machine part is parallel to said fiber structure.

4,716,644
UNIT COMPRISING A SHAFT AND ROTATABLE BODY IN ROLLING CONTACT, SERVING AS ROLLER OR WHEEL IN EARTH-MOVING VEHICLES, AND RELATIVE METHOD OF ASSEMBLY
Aldo Crotti, Castelnuovo Rangone, Italy, assignor to Italtractor ITM S.p.A., Potenza, Italy
Filed Nov. 26, 1985, Ser. No. 801,855
Claims priority, application Italy, Nov. 30, 1984, 40112 A/84
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—525 **10 Claims**



1. A method of assembly for units having a shaft and a rotatable body in rolling contact, said units serving as a roller or wheel in earth-moving vehicles and being of a type comprising a pair of limiting means fixed integrally with the shaft or with the rotatable body and being disposed singly at two sides of the rotatable body, said limiting means being designed to check axial movement of the rotatable body, steps of which include:
compaction of the rotatable body and limiting means interconnected in an assembly thereof with said shaft by applying an amount of thrust sufficient to draw at least a first of the limiting means toward its counterpart along the axial direction of said shaft, to the point where a reaction produced by said assembly of said rotatable body and interconnected limiting means is equal to said thrust, wherein said first limiting means consists of a check element pressed either orto the shaft or into the the axial bore of the rotatable body such that an interference fit is created of strength sufficient to withstand an amount of external thrust for which said unit is designed, and wherein the thrust applied during such compaction exceeds a force created by the interference fit between said check element and shaft, or between said check element and rotatable body; and
subsequent spread of said limiting means from each other in said axial direction by a calculated infinitesimal amount, thus lengthening the distance therebetween provided by said step of compaction, wherein sufficient further thrust is applied to cause at least one of the limiting means to slide with respect to the other in said axial direction

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4,716,645
METHOD OF MAKING BUILDING PANELS AND THE LIKE
Raymond H. Pittman, Batavia, and William J. Schultz, St. Charles, both of Ill., assignors to Masonite Corporation, Chicago, Ill.
Division of Ser. No. 629,625, Jul. 11, 1984, Pat. No. 4,617,774.
This application Jun. 23, 1986, Ser. No. 877,190
Int. Cl.⁴ B26F *1/00, 3/00*
U.S. Cl. 29—527.1 **14 Claims**

1. A method of forming a nail slot in a molded hardboard building panel having an outer face and a back face, comprising the steps of:
molding a depression in said outer face during the initial consolidation of a relatively thick mat of wood fibres into a relatively thin sheet of molded hardboard material forming said panel and resulting in a mold-formed projection opposite said depression protruding outwardly on said back face;
curing said molded hardboard material into relatively rigid form after said initial formation; and



removing said projection from said back face to form an opening between said faces comprising said nail slot.

4,716,646
APPARATUS FOR AUTOMATIZED HANDLING OF TUBULAR SLEEVES
Karl A. B. Jarreby, Falkenberg, Sweden, assignor to Skandinaviska Apparatindustri AB Saiap, Falkenberg, Sweden
Filed Dec. 12, 1986, Ser. No. 940,563
Claims priority, application Sweden, Dec. 20, 1985, 8503125
Int. Cl.⁴ B23Q *7/08;* **B65G** *25/00*
U.S. Cl. 29—564.1 **5 Claims**



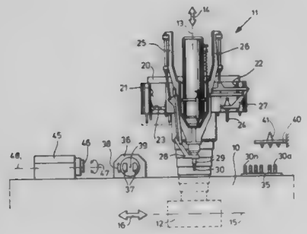
1. An improved apparatus for automatic treatment and machining of tubular sleeves of the kind which are used as the cores onto which are wound the paper web in the production of paper, said apparatus comprising a number of stations for performing various treatment and machining operations on said tubular sleeves, each station equipped with a tool adequate for performing the treatment or machining operation associated with said station, holder means in each station for retaining said tubular sleeve during the performance of said treatment or machining operation in the associated station, and at least one actuating means in each station to release said tubular sleeve from said holder means and move said sleeve away from said station, the improvement comprising
at least one carriage in each station, said carriage arranged for displacement in the longitudinal direction of said station for setting the spacing between said holder means for adjustment of said spacing to the length of the tubular sleeve to be treated, and wherein
said means arranged to release and move said tubular sleeve from said holder means consists of at least one pivotally mounted arm, said arm arranged to be pivoted between an upper and a lower position, so that in said upper position said arm lifts said tubular sleeve off said holder means and forms a guide means to guide said tubular sleeve from said station.

4,716,647

MACHINE TOOL

Hans-Henning Winkler, Tuttlingen, and Eugen Rötschle, Mühlheim, both of Fed. Rep. of Germany, assignors to Chiron-Werke GmbH, Tuttlingen, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,315
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533088; Jun. 18, 1986, 3620343
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 15 Claims



1. A machine tool comprising:

(a) A spindle stock having spindle means for receiving either a toolholder, or a gripping element, said spindle having drive means for rotation about predetermined angles about a rotating axis;

(b) a working table disposed proximate said spindle stock, said working table being subdivided into a working area and a mounting area;

(c) means for displacing said spindle stock along three coordinate directions relative to said working table;

(d) a first toolholder magazine attached fixedly to said spindle stock for joint displacement therewith and being provided with a predetermined number of said toolholders having standard coupling means for being inserted into and clamped in said spindle, said toolholder magazine further having conveying means for transporting said toolholders into transfer positions on two sides of said spindle stock;

(e) a gripping element having first jaw means for grasping workpieces, said gripping element comprising said standard coupling means and first coupling means for cooperating with second coupling means, disposed in said spindle, for feeding energy from said spindle to said gripping element for actuating said first jaw means;

(f) two gripper arm means, disposed on either side of said spindle stock for alternately transferring said toolholders or said gripping element from one of several transfer positions into said spindle and vice versa;

(g) workpiece holding means fixed on said working area of said working table and having second jaw means for holding and rotating said workpieces for subsequent machining; and,

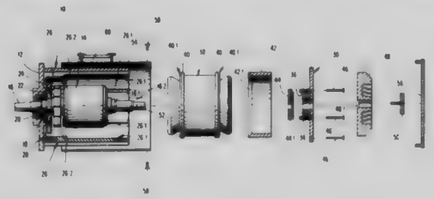
(h) a workpiece magazine fixed on said mounting area of said working table at a distance from said workpiece holding means and having a predetermined number of storage cells means for receiving unmachined and machine workpieces.

4,716,648

METHODS OF SECURING A STATOR IN AN ELECTRICAL MACHINE

Gert Nel, Kloofendal, South Africa, assignor to Eastway Holdings Limited, Hayes, England

Continuation-in-part of Ser. No. 589,002, Mar. 13, 1984, Pat. No. 4,564,780. This application Nov. 14, 1985, Ser. No. 797,975
Claims priority, application South Africa, Mar. 14, 1983, 83/1722
Int. Cl.[4] H01R *15/14*
U.S. Cl. 29—596 4 Claims



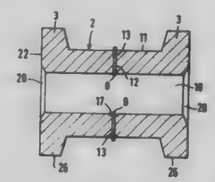
1. A method of securing a stator in an electrical machine including a casing, at least one end plate adapted for securement to an end of the casing, a rotor mounted within the casing and a stator which is axially slidable with respect to the casing and adapted for mounting co-axially about the rotor, the method comprising the steps of arranging annularly extending, outwardly facing contact surfaces on the stator and annularly extending inwardly facing locating surfaces within the casing in an axially spaced relationship, sandwiching the contact surfaces between the locating surfaces and clamping the stator in position by securing the end plate to the end of the casing axially to clamp the contact surfaces and locating surfaces together, the end plate being releasable to allow for unclamping of the locating and contact surfaces and axial removal of the stator from the casing.

4,716,649

METHOD OF MAKING A SENSOR FOR A MAGNETIC INDUCTIVE FLOWMETER

Franz Bittner, Moers, Fed. Rep. of Germany; Boudewijn J. Poortman, Dordrecht, Netherlands; Kristian Rademacher-Dubbick, Duisburg, Fed. Rep. of Germany; Abram K. Roekam, Sleeuwijk, Netherlands; Udo Stevens, Duisburg, Fed. Rep. of Germany, and Wouter T. Tromp, Sliedrecht, Netherlands, Walter Beisler, Bensheim, Siegfried Bock, Mannheim; Hermann Bertsch, Mannheim; all of Fed. Rep. of Germany, assignors to Rheometron AG, Basel, Switzerland

Division of Ser. No. 454,156, Dec. 29, 1982, Pat. No. 4,507,975, and a continuation-in-part of Ser. No. 432,955, Sep. 28, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 590,780
Claims priority, application European Pat. Off., Nov. 27, 1981, 81/201316.7; PCT Int'l Appl., May 10, 1982, PCT/EP82/0097
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—602 R 3 Claims



1. A method of fastening a measuring electrode and other current-conducting components to a ceramic measuring tube of a measured-value sensor for a magnetic-inductive flowmeter by the securing of a shaft of the measuring electrode in a position leading radially through the wall of said measuring tube, comprising the steps of:

radially arranging the shaft of each measuring electrode in an unburnt molded body consisting of ceramic raw materials;

sintering said shafts in place in said body by a ceramic burning of the molded body;

subsequently applying onto the resulting ceramically sintered measuring tube a metal powder paste in the form of conductive paths; and

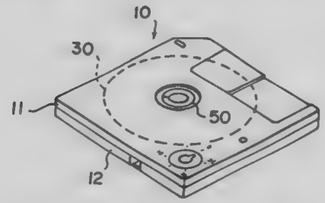
burning on said paths by a new firing of the measuring tube.

4,716,650

METHOD OF ASSEMBLING MAGNETIC RECORDING DISK CARTRIDGE

Masaaki Utsui; Makoto Shimizu; Noriyuki Hoshina; Nobuyuki Adachi; Takashi Kurihara, and Tatsuo Shino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1987, Ser. No. 34,240
Claims priority, application Japan, Apr. 4, 1986, 61-77595
Int. Cl.[4] B21D *39/03;* B23P *11/00*
U.S. Cl. 29—430 1 Claim



1. A method of assembling a magnetic recording disk cartridge having a magnetic disk unit rotatably accommodated in a casing, comprising

a first conveying step of conveying a lower half of the casing by a first conveyor,

a second conveying step of conveying an upper half of the casing by a second conveyor,

a disk assembling step of receiving a magnetic disk sheet and a core part and securing the magnetic disk sheet to the core part to form a magnetic disk unit,

a disk unit placing step of placing the magnetic disk unit on the lower half of the casing on the first conveyor,

and a casing assembling step of transferring both the upper half of the casing on the second conveyor and the lower half of the casing with the magnetic disk unit on the first conveyor to an assembly table, receiving mechanical parts, incorporating the mechanical parts in the lower half on the assembly table, subsequently connecting the upper and lower halves and transferring the integrated casing to a third conveyor, said disk unit placing step being carried out by the intermittent-stop-and-wait system.

4,716,651

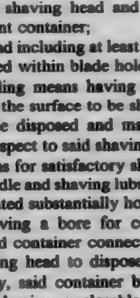
APPARATUS FOR REMOVING INSULATION AND CONNECTING ELECTRICAL CABLES

Eberhard Klaiber, and Dieter Gerke, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,403
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3522131
Int. Cl.[4] H02G *1/00, 1/12*
U.S. Cl. 29—750 5 Claims

1. An apparatus for attaching a cable, having an insulating sheath surrounding a cable core, to a cutting-clamping terminal, comprising:

a base having a cable flute and a precutting device formed with a lever having a U-shaped cross-section with opposite side walls defining a channel therebetween, said lever being pivotally-mounted to the base so that, upon pivotal closure of the lever, the channel aligns with the cable flute,



a pair of arcuate knives which are mounted to the side walls and are so disposed opposite each other as to define between themselves a space having a width that at least matches the diameter of the cable core to at least partially cut away the insulating sheath of a cable which has been inserted into the cable flute.

4,716,652

DISPOSABLE SHAVER

John Cataudella, 6142 Gage, Apt. 3B, Rosemont, Ill. 60018

Continuation-in-part of Ser. No. 539,092, Oct. 5, 1983. This application Dec. 18, 1985, Ser. No. 810,210
Int. Cl.[4] B26B *19/44*
U.S. Cl. 30—41 11 Claims



1. A disposable shaver comprising:

in combination a shaving head and a unified handle and shaving lubricant container;

said shaving head including at least one razor blade operatively disposed within blade holding means;

said blade holding means having a shaving surface for contact with the surface to be shaved during shaving;

said razor blade disposed and maintained at a selected angle with respect to said shaving surface of said blade holding means for satisfactory shaving;

said unified handle and shaving lubricant container including an elongated substantially hollow shaving lubricant container having a bore for containing the shaving lubricant, said container connected at one end thereof to said shaving head to dispose said shaving head in shaving array, said container being defined by walls thereof and having a closable opening at one end thereof;

one of said shaving lubricant container walls having an

exterior surface including a designated contour and containing a slot therein closed by a relatively thin and rupturable membrane;

said slot disposed within and extending longitudinally on said exterior surface of said wall of said shaving lubricant container;

said unified handle and shaving lubricant container further including membrane rupturing means slidably disposed within said slot and initially disposed in a first position at one end of said slot;

said membrane rupturing means including shaving lubricant pushing means disposed within and substantially matching in cross-sectional shape said bore of said unified handle and shaving lubricant container; and

said membrane rupturing means including manual engagement means disposed exteriorly of said exterior surface containing said slot, whereby the user may push upon and move said manual engagement means longitudinally and exteriorly with respect to said unified handle and shaving lubricant container to rupture said membrane, to transport said shaving lubricant pushing means longitudinally within said bore, to force the shaving lubricant to expel from the opposite end of said unified handle and shaving lubricant container through said closable opening therein.

4,716,653

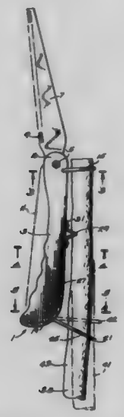
TREE SAW WITH EXTENSION ATTACHMENT

Helmut K. Skyba, Rte. 2, Box 330, Wild Rose, Wis. 54984

Filed Sep. 25, 1986, Ser. No. 911,525

Int. Cl.⁴ B26B *27/00*

U.S. Cl. 30—296 R **11 Claims**



1. A tree saw for pruning tree branches comprising:

a. a handle having two ends;

b. a toothed blade connected to one end of the handle;

c. a first ring mounted to the handle near the connection thereof with the blade;

d. a second ring swingably mounting to the handle near the other end thereof; and

e. a fulcrum secured to and upstanding from the handle between the first and second rings, the fulcrum and rings cooperating to grip and hold an elastic handle extension rigidly to the fulcrum with the handle extension pressed against the fulcrum,

so that the tree saw is capable of pulling branches beyond a person's normal reach.

4,716,654

DEVICK FOR BRAKING THE SAW CHAIN OF A PORTABLE POWER SAW

Kenneth Wallmark, Flottiljvagen 19, S-392 77 Kalmar, Sweden

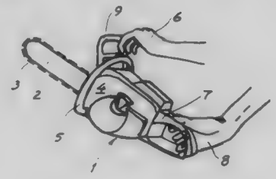
PCT No. PCT/SE85/00460, § 371 Date Sep. 24, 1986, § 102(e) Date Sep. 24, 1986, PCT Pub. No. WO86/04294, PCT Pub. Date Jul. 31, 1986

PCT Filed Nov. 18, 1985, Ser. No. 913,664

Claims priority, application Sweden, Jan. 29, 1985, 8500400

Int. Cl.⁴ B23D *57/02, 59/00*

U.S. Cl. 30—383 **3 Claims**



1. A device for braking a saw chain of a portable power saw, the saw having a front handle (5) to be gripped by a front hand of a saw operator, and a rear handle (7) to be gripped by a rear hand of the saw operator, the device having a brake means (11) which brakes the saw chain, said brake means being actuated by means of an actuating member (12), arranged to be operated by the saw operator, characterized in that the actuating member (12) comprises an elongated lever, one end of which is connected by a kickback guard to the brake means, the other end of which is located adjacent to the rear handle so that it is operated by the rear hand (8) of the saw operator to actuate said brake means as a result of a wrenching movement of the rear hand relative to the rear arm of the operator when kickback of the power saw occurs.

4,716,655

ORNAMENTAL COMPASS

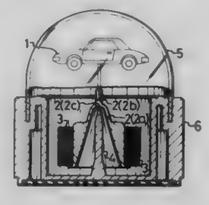
Tadashi Sakuma, c/o Jio Goods Development Institute Kabushiki Kaisha, Suite 201 Villa-Nogizaka, 15-22, Minami-aoyama 1-chome, Minato-ku, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,681

Claims priority, application Japan, Mar. 13, 1985, 60-34749[U]

Int. Cl.⁴ G01C *17/10*

U.S. Cl. 33—355 R **3 Claims**



1. An ornamental compass, comprising:

a housing having a hollow interior and an opening through an upper portion of said housing and a compass rose around said opening;

support means formed integrally with a lower portion of said housing, said support means extending towards said opening and having a tip end of reduced cross-section below said opening;

a direction-adjustable means being disposed within said housing and supported on said support means for rotation in any direction, said direction-adjustable means having a conical recess extending upwardly from a bottom surface

thereof, said tip end of said support means contacting an upper surface of said recess formed in said direction-adjustable means whereby said direction-adjustable means may pivot freely on said support means;

an annular one-piece magnet supported on and extending completely around a radially outer periphery of said direction-adjustable means;

an ornament disposed above the housing;

connection means extending through said opening and connecting said ornament to said direction-adjustable means for supporting said ornament above said housing and allowing said ornament to easily tilt in any direction and for cooperating with said compass rose; and

covering means fixed to said housing and enclosing said ornament for maintaining said ornament in a dry condition and for allowing viewing of the direction and fluctuating movement of said ornament.

4,716,656

POSITION - SENSING PROBE

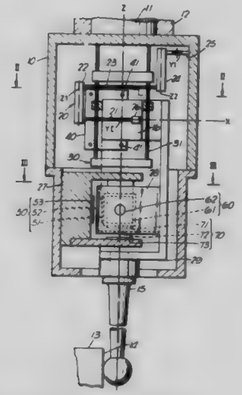
Neil A. Maddock, Wotton-Under-Edge, and David K. Thomas, Dursley, both of England, assignors to Renishaw plc, Wotton-Under-Edge, England

Filed Mar. 24, 1987, Ser. No. 29,767

Claims priority, application United Kingdom, Mar. 24, 1986, 8607199

Int. Cl.⁴ G01B *7/03*

U.S. Cl. 33—503 **9 Claims**



1. A position-sensing probe comprising

a fixed member,

a movable member, which is translatable relative to the fixed member on each of three orthogonal axes,

three connecting units connecting the movable member to the fixed member, each restraining rotation of the movable member about a respective orthogonal axis,

each connecting unit comprising

an intermediate member,

a pair of parallel first links connecting the intermediate member to the movable member,

a pair of parallel second links connecting the intermediate member to the fixed member,

wherein the intermediate member is universally rigid,

each link is rigid in tension and compression but has at least a portion which is universally flexible in bending,

and wherein the plane of the second links of each unit lies parallel to the plane of the first links, when the links are in their normal, undeflected positions.

6. A position-sensing probe comprising

a fixed member

a movable member which is translatable relative to the fixed member on each of three orthogonal axes, and a transducer arrangement for measuring the translation of the moveable member of each of the orthogonal axes, the transducer arrangement comprising three transducer plates on one said member, the plates being arranged on three orthogonal planes defining three sides of a cube; and three pairs of transducer elements on the other said member, the elements of each pair confronting a respective said plate on opposite sides thereof and acting differentially therewith.

4,716,657

MACHINE HAVING A SELF POWERED TOOL OR MEASURING PROBE

David Collingwood, Stonehouse, Great Britain, assignor to Renishaw plc, Gloucestershire, Great Britain

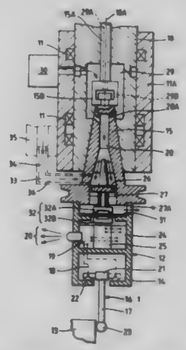
PCT No. PCT/GB86/00068, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04535, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 10, 1986, Ser. No. 915,010

Claims priority, application United Kingdom, Feb. 9, 1985, 8503355

Int. Cl.⁴ G01B *7/02*; B23B *51/00*

U.S. Cl. 33—561 **14 Claims**



1. A machine having a movable member (10) capable of supporting a tool for performing an operation on a workpiece and having a supply (29A,30,35,49) of pressurized fluid, a tool (12,48) including an electric circuit (18,45), and means (15) for releasably connecting the tool to the movable member, characterized in that the tool comprises a drive means (26,47) which is arranged to be driven, in operation, by pressurized fluid supplied from the machine, and an electricity generator (25,43) drivingly connected to the drive means for providing power to the electric circuit.

4,716,658

HEAT LAMP ASSEMBLY

Cecil T. Jacobi, Jr., Marshall, Mo., assignor to Amjo Infra Red Dryers, Inc., Marshall, Mo.

Filed Dec. 11, 1986, Ser. No. 940,426

Int. Cl.⁴ F26B *23/04*

U.S. Cl. 34—4 **20 Claims**

1. In combination with a printing press having a downstream delivery area for receiving sheets of printed material from an upstream area of said printing press and a structure overhanging said delivery area, the improvement of a heat lamp assembly, which comprises:

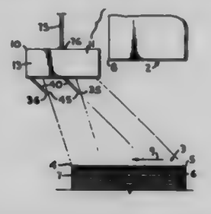
(a) a housing including:

1. front and back sides located on upstream and downstream sides of said housing respectively;

2. opposite ends; and

3. a pair of tube mounting brackets each located at a respective housing end;

(b) reflector means mounted in said housing and including an upper portion and an extension leg, said extension leg being connected to said upper portion and extending downwardly and in an upstream direction therefrom;
(c) a heat lamp including opposite ends each mounted in a respective tube mounting bracket, said heat lamp being positioned between said reflector upper portion and said



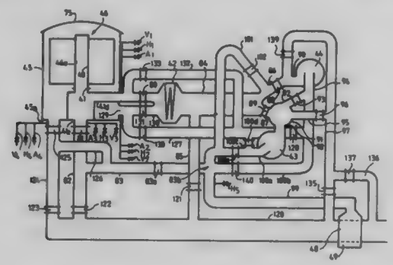
extension leg whereby radiation therefrom is reflected in a downward and upstream direction; and
(d) mounting means for mounting said heat lamp assembly on said printing press adjacent to said overhanging structure with said extension leg projecting downwardly and in an upstream direction whereby radiation emitted by said heat lamp is reflected under said overhanging structure.

4,716,659

METHOD AND INSTALLATION FOR REMOVING WATER FROM, DRYING AND/OR CONDITIONING FIBROUS, POROUS OR FILAMENT MATERIALS

Bernard Barriquand; Francois Villard, and Charles Delenge, all of Roanne, France, assignors to Barriquand, Roanne, France

Filed Apr. 4, 1986, Ser. No. 848,142
Claims priority, application France, Apr. 5, 1985, 85 05266
Int. Cl.[4] F26B *3/06*
U.S. Cl. 34—15 22 Claims



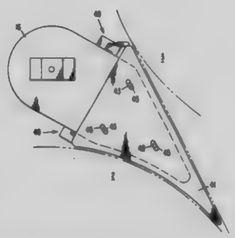
1. A method of using a single enclosure to treat fibrous, porous or filament materials contained therein with a flow of gaseous fluid, said method comprising the steps of:
providing a single enclosure adapted to contain material to be treated;
introducing material to be treated into the enclosure;
making a first determination of whether it is desired to treat the materials during a drying phase under a reduced pressure condition of the flowing gaseous fluid or under an over pressure condition of the gaseous fluid;
making a second determination of whether it is desired to cause the gaseous fluid to flow through the material in a direction from an inside portion of the material toward an outside portion of the material or in a direction from an outside portion of the material toward an inside portion of the material or in a vertical direction through the material;
making a third determination of whether or not is is desired for the gaseous fluid to be in a heated thermal condition or in a non-heated thermal condition during said drying phase;
making a fourth determination of a desired humidity condition of the gaseous fluid during said drying phase by determining whether or not it is desired to introduce humidity into the gaseous fluid during said drying phase;
making a fifth determination of a desired composition of the gaseous fluid by determining whether or not it is desired to introduce a finishing product into the gaseous fluid for deposition on the material in the enclosure;
conducting said drying phase by causing a stream of gaseous fluid to flow through the material in the enclosure and, during said flow, establishing a pressure condition of the flow in accordance with said first determination, establishing a flow direction through the material in the enclosure in accordance with said second determination, establishing a thermal condition of the flow in accordance with said third determination, establishing a humidity condition of the flow in accordance with said fourth determination, and establishing a composition of the gaseous flow in accordance with said fifth determination;
making a sixth determination of whether or not it is desired to follow the drying phase with a reconditioning phase;
if said sixth determination is positive, making a seventh determination of whether it is desired to conduct said reconditioning phase under a reduced pressure condition or under an over pressure condition;
if said sixth determination is positive, making an eighth determination of a desired humidity condition by determining whether or not it is desired to introduce humidity during said reconditioning phase;
if said sixth determination is positive, causing a stream of fresh ambient air to flow through the material in the enclosure and, during said flow, establishing said pressure condition and said humidity condition in accordance with said seventh and eighth determinations, respectively.

4,716,660

UNIFELT AIR SUCTION SYSTEM

Eric W. Thiele, Freemont, Wis., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 3, 1986, Ser. No. 847,671
Int. Cl.[4] F26B *13/08*
U.S. Cl. 34—114 18 Claims



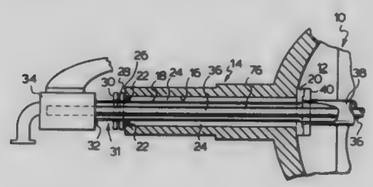
1. In a unifelt system for the drying of paper wherein banks of upper and lower drying cylinders are arranged in alternating sequence and the paper to be dried is conveyed from the paper press and then around the cylinders in the alternating sequence of upper and lower cylinders and wherein a support sheet is conveyed around at least some of the cylinders in supporting contact with the paper, the improvement being at least one suction nozzle being located in the pocket formed between the upstreammost lower cylinder and the support sheet in the vicinity where the support sheet makes contact with said upstreammost lower cylinder, said nozzle having an arcuate surface disposed adjacent and parallel to the outer arcuate surface of said upstreammost lower cylinder, said nozzle having a planar surface diverging away from said arcuate surface for being disposed adjacent and parallel to the support sheet, a plurality of perforations throughout the length of said arcuate surface and of said planar surface of said nozzle for permitting a suction to be applied to said pocket to prevent the trapping of air in said pocket and for applying a suction to the paper and support sheet throughout their lengths corresponding to said arcuate surface; and said planar surface, and a adjustable seals on said nozzle adjustably mounted at said arcuate surface and said planar surface for selectively moving toward said lower cylinder and toward said support sheet at the open end of the pocket for forming the pocket into a generally closed chamber.

4,716,661

DRYER JOURNAL PROTECTION

Glen D. Asmus, Port Alberni, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Mar. 9, 1987, Ser. No. 23,618
Int. Cl.[4] F26B *13/18*
U.S. Cl. 34—125 6 Claims



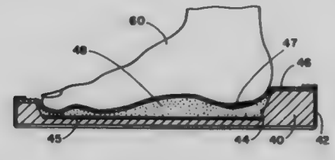
1. A dryer construction comprising a head for a dryer drum, a hollow journal projecting from said head and terminating at a free outer end, said hollow journal having an axially extending passage having an inside wall, a tube concentrically positioned within said hollow journal and spaced from said inside wall to define an annular insulating space between said tube and said inside wall, radial flange means extending from said tube means, securing means securing said flange to said head to secure said tube in centered concentric relationship in said journal and seal the end of said space remote from said free end, spacer means spacing and centering said tube relative to said inner wall at the end of said space remote from said flange and adjacent said free end, said space extending substantially the full axial length of said journal and being sealed with the exception of a venting passage means continuously venting said space to atmosphere.

4,716,662

INSOLE AND METHOD FOR PRODUCING SAME

Aharon Bar, 8 Tel-Mane Street, Haifa 34363, Israel

Filed Apr. 22, 1985, Ser. No. 725,581
Claims priority, application Israel, Apr. 22, 1984, 71616; Feb. 11, 1985, 74294
Int. Cl.[4] A43B *13/40*; B29C *67/22*
U.S. Cl. 36—44 7 Claims



1. A method for casting in situ an insole on a foot comprising the steps of:
providing a mold defining an open top recess, arranged to permit visual inspection of the position and orientation of the foot in the mold;
providing in said open top recess a bottom reinforcing layer of reinforcing material;
providing a hardenable, foamable material in a liquid state onto said bottom layer in the recess;
placing a layer of flexible material over the foamable material;
placing the foot within said recess such that the plantar surface of the foot lies in engagement with said layer of flexible material and over said bottom layer at a predetermined angle and position relative to the mold;
permitting the foamable material to foam and expand whereby the lower surface of the foamable material conforms to the recess and the upper surface of the foamable material conforms to the shape of the planter surface of the foot;
permitting excess foamable material to overflow from said recess through gaps between the layer of flexible material and the bottom layer, whereby undue pressure is prevented from building up underneath or around the sides of the foot which could cause the foot to change its orientation with respect to the mold or its shape during casting;
permitting the foamable material to harden;
trimming the periphery of the reinforcing layer beyond the recess and excess foamable material, thereby producing a completed composite insole wherein the layer of flexible material and the bottom layer are joined by the hardened foamable material the bottom layer defining the bottom of the insole.
7. An insole cast according to the method of claim 1.

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CLIMBING SHOE

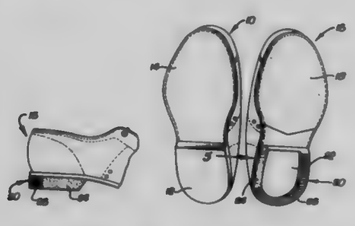
Oli Steinhauser, 79 Rockinghorse Rd., Rancho Palos Verdes, Calif. 90274

Filed Apr. 14, 1987, Ser. No. 38,044
Int. Cl.[4] A43C *15/00*
U.S. Cl. 36—113 16 Claims



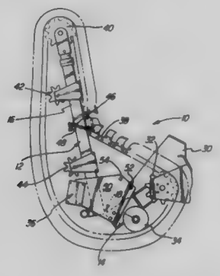
1. A climbing shoe comprising:
a shoe upper formed of non-friction material, said shoe upper having a medial center line and having lacing edges facing said medial center line, said shoe being one of a pair of shoes for human wear, said shoe having an inside facing the inside of the other shoe of the pair of shoes and an outside facing away from the other shoe of the pair of shoes when the pair of shoes is positioned for wearing;
a sole and a welt joining said upper and extending partway up said upper to leave a portion of said non-friction material exposed, said sole and said upper being made of thin, flexible, rubberlike, high-friction material; and
an engagement panel positioned and secured to said upper on the forward portion of said upper extending from said welt to said lacing edge on at least one of said inside and outside of said shoe.

4,716,664
BOWLING SHOES AND IMPROVED HEEL CONSTRUCTION THEREFOR
Wilson G. Taylor, P.O. Box 146, San Gabriel, Calif. 91776
Filed Apr. 23, 1982, Ser. No. 371,273
Int. Cl.[4] A43B *5/00, 21/18*
U.S. Cl. 36—114 11 Claims



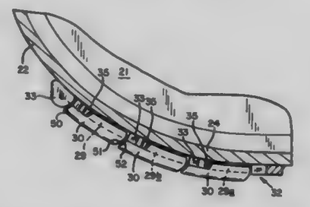
1. A pair of bowling shoes comprising:
a first shoe to be worn on a bowler's non-sliding foot having a relatively high friction sole; and
a second shoe to be worn on said bowler's sliding foot having a relatively low friction sole as compared to said first shoe, said second shoe having a heel that presents an outer bottom surface on the side thereof farthest from said non-sliding foot when so worn and an inner bottom surface on the side thereof nearest form said non-sliding foot when so worn, said outer bottom surface having a relatively high coefficient of friction as compared to said inner bottom surface, whereby said heel tends to center said second shoe with respect to the center of gravity of said bowler and align said second shoe with respect to the forward motion of said bowler, leading to a more square body position as a ball is thrown.

4,716,665
FOLDING TRENCHER BOOM
Richard S. Johnson, Wichita, and Stephen A. Youngers, Clearwater, both of Kans., assignors to J. I. Case Company, Racine, Wis.
Filed Jan. 20, 1987, Ser. No. 5,499
Int. Cl.[4] E02F *5/06*
U.S. Cl. 37—86 3 Claims



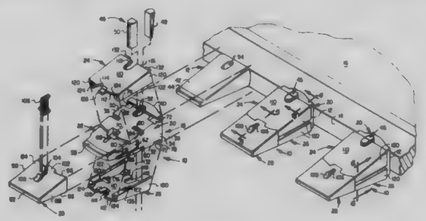
1. A digging boom assembly comprising:
a first boom portion pivotally connected to a second boom portion by a hinge means, said hinge means including a first leg, a second leg, and a hinge pin connecting said first and second legs, and releasable fastening means for securing one of said legs to one of said boom portions such that said boom portions may be moved from a first position wherein the boom portions are colinearly aligned and said fastening means are engaged to a second position wherein said fastening means are released and the boom portions are folded relative to each other;

4,716,666
WEAR RUNNER FOR EXCAVATING BUCKET
James T. Potter, Salem, Oreg., assignor to ESCO Corporation, Portland, Oreg.
Filed Sep. 29, 1986, Ser. No. 912,269
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—135 12 Claims



11. A replaceable wear runner element for a dragline bucket or the like comprising unitary relatively elongated plate-like body having forward and rear ends and an undersurface adapted to engage the ground, said body having an upper surface adapted to be positioned in confronting relation to the underside of a bucket, said upper surface at its forward end being equipped with laterally spaced integral upstanding portions providing confronting interior walls, said walls being arranged in two longitudinally spaced pairs separated by a notch in each wall, said walls being rearwardly divergent at an angle of about 30°, each wall being downwardly and outwardly sloped at an angle of about 30° to the vertical, parts of the walls in one pair being longitudinally aligned with corresponding parts of the walls in the other pair, said upstanding portions terminating a spaced distance from said body rear end.

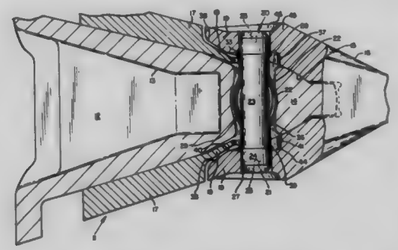
4,716,667
EXCAVATING TOOTH AND WEAR CAP ASSEMBLY
Wesley E. Martin, Carrollton, Tex., assignor to GH Hensley Industries, Inc., Dallas, Tex.
Filed Sep. 25, 1986, Ser. No. 912,330
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 R 14 Claims



1. An excavating tooth and wear cap assembly comprising:
an adapter having a forwardly disposed nose portion and a rearwardly disposed base portion;
a tooth point having a pocket formed therein and receiving said nose portion of said adapter;
pin means extending through and releasably intersecuring said tooth point and said nose of said adapter;
wear cap means removably carried by said base portion of said adapter adjacent said tooth point for shielding an external surface portion of said base portion of said adapter from abrasion;

interlocking means on said wear cap means and said base portion of said adapter for preventing said wear cap means from being driven against said tooth point and thereby deforming said pin means;
lipped groove means formed on a rear portion of said base portion of said adapter;
tab means formed on a rear portion of said wear cap means, said tab means being received in said lipped groove means and pivotally connecting said wear cap means to said base portion of said adapter; and
tab means formed on a forward portion of said wear cap means and cooperating with said tooth point to prevent appreciable pivotal motion of said wear cap means relative to said adapter.

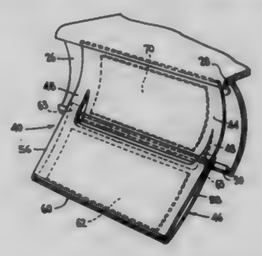
4,716,668
EXCAVATING TOOTH POINT FOR USE WITH BASKET SPRING RETAINER
Frederick C. Hahn, Aloha, Oreg., assignor to ESCO Corporation, Portland, Oreg.
Continuation-in-part of Ser. No. 791,117, Oct. 24, 1985. This application Jan. 8, 1987, Ser. No. 1,401
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 A 7 Claims



1. An excavating tooth point adapted to be received on an adapter equipped with a vertical cylindrical pin and a flanged basket spring thereabout, said point being equipped with a rearwardly facing socket for receipt of an adapter nose, said socket being defined top and bottom by forwardly convergent surfaces, said point being equipped with vertically aligned cylindrical openings adjacent to but spaced from the rear of said point for the receipt of said pin,
said socket being equipped with a recess adjacent each opening in each convergent surface and defined by a horizontal wall extending forwardly from adjacent the rear of said point and extending 360° about its associated opening, said horizontal wall extending forwardly from its associated opening approximately the same distance as said horizontal wall extends rearwardly of said associated opening,
said recess being further defined by a vertical wall merging into said horizontal wall and extending forwardly from adjacent the rear of said point on both sides of said associated opening and forwardly around said associated opening whereby said recess provides a 360° clearance for said spring flange and said point can be installed and removed from said adapter without spring interference and whereby said point is adapted to accommodate ball joint action under impact relative to said spring and adapter.

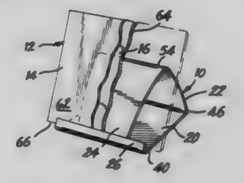
4,716,669
PRICE CHANNEL FLAG & POCKET
Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317
Filed Jul. 18, 1985, Ser. No. 756,235
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—16.2 6 Claims

1. A price channel flag comprising a card of resilient sheet material having at least a rectangular price channel-engaging portion with an upper edge and a lower edge and a transverse bend line extending across the entire width of the price-channel-engaging portion adjacent one of the said edges, the distance between the bend line and the other of said edges conforming to the size of the regular oversize price channel flag adapted to be flexed into concave form so as to be retained in a substantially conforming concave price channel of nominal width, said bend line defining a flag portion between the bend line and said one edge for flexing about the bend line so as to make the flag adjustable in height for retention in price channels somewhat wider than the nominal width, wherein the flag



includes a depending portion, a channel shaped slit defining the lower edge of the price channel-engaging portion and limbs at opposite ends of the slit connecting said portions, wherein the depending portion comprises a two-panel sheet with a fold line between the respective panels for forming the depending portion into a pocket-like configuration, and wherein the lower edge of the depending portion is formed with a cutout which is substantially a mirror image of the channel shaped slit and defines respective tabs at the ends thereof for supporting the depending portion against a price channel when folded into the pocket-like configuration.

4,716,670
DISPLAY STAND
Alfred Coda, 48 Wyandemere Dr., Woodcliff Lake, N.J. 07675
Filed Jun. 27, 1986, Ser. No. 879,579
Int. Cl.[4] G09F *1/06, 21/04*
U.S. Cl. 40—152.1 20 Claims



1. A display stand capable of being erected from a substantially flat storage and shipping configuration to a display configuration for displaying a card-like item, such as a photograph, the display stand comprising:
a substantially flat sheet member extending longitudinally between a first end and a second end, and laterally between opposite side edges;
an altitudinal shoulder on the sheet member adjacent the first end thereof, said shoulder extending laterally across the sheet member and extending altitudinally upwardly between the side edges;
bend means providing a bend portion in the sheet member extending laterally across the sheet member intermediate the first and second ends and establishing a basal area between the first end and the bend portion; and
resilient flexure means providing a resilient flexure portion in the sheet member extending laterally across the sheet

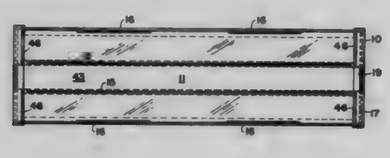
member intermediate the bend portion and the second end and establishing a rear wall area between the bend portion and the resilient flexure portion and a front wall area between the resilient flexure portion and the second end; said bend means enabling bending of the sheet member along the bend portion such that the rear wall area will extend altitudinally upwardly from the basal area toward the resilient flexure portion, and said resilient flexure means enabling flexure of the sheet member along the resilient flexure portion such that the front wall area will extend altitudinally downwardly from the resilient flexure portion toward the basal area and bring the second end adjacent the first end, with a confronting portion of the front wall area adjacent the second end confronting and biased resiliently toward said shoulder so that upon juxtaposition of said item with the shoulder and with said confronting portion of the front wall area the item will be gripped between the shoulder and said confronting portion by said resilient bias and held in place for display.

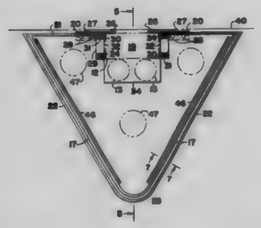
4,716,671

ADVERTISING COVER FOR FLUORESCENT LIGHTING

Jan S. Gross, 315 Garden La., Atlantic Beach, Fla. 32233

Filed May 19, 1986, Ser. No. 864,548
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—558 **14 Claims**





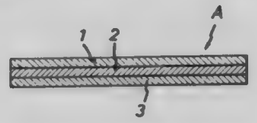
1. An advertising cover for a fluorescent strip lighting fixture including a raceway and one or more tubular fluorescent light lamps comprising a pair of triangular end caps and a flexible transparent sheet of plastic, each said end caps and a flexible transparent sheet of plastic, each said end cap having an inside and an outside, a top edge and two side edges each joined to opposite ends of said top edge and to each other in a smoothly rounded corner, a generally rectangular cutout portion extending from middle of the top edge toward said rounded corner, said two side edges and said top edge having a right angle flange portion extending inwardly from said inside surface, a channel recess adjacent said flange portion along said side edges and said rounded corner, a pair of extendable-retractable fingers mounted opposite to each other adjacent said top edge and adapted to extend said fingers toward each other along the top edge of said cutout portion, a pair of extendable-retractable magnets mounted on opposite vertical sides of said cutout portion and adapted to be magnetically attractively attachable to opposite sides of said fluorescent lighting raceway; said flexible transparent plastic sheet having an inside surface and an outside surface and being of a size to slide in said channel recess of each of said end caps, a pair of parallel sheet receiving elongated clips extending across the inside surface of said plastic sheet from one end cap to the other end cap adjacent said rounded corner and said side edges, a plurality of spaced sheet receiving clip sections extending in an interrupted line across the inside surface of said plastic sheet adjacent said top edge, and a pair of sheet receiving clip sections attached to said end cap adjacent said channel recess, said clips being positioned to receive four sides of each of two sheets of translucent film containing advertising material; and four lengths of decorative opaque tape attached to said outside surface of said transparent plastic sheet so as to hide from view said clips attached to said transparent plastic sheet.

4,716,672

ORNAMENTAL BODY

Shinichiro Arakawa, c/o Wid Co., Ltd., 5-46-5, Asakusa, Taito-Ku, Tokyo 111, Japan

Filed Feb. 6, 1986, Ser. No. 826,768
Claims priority, application Japan, Mar. 20, 1985, 60-54347
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—615 **4 Claims**



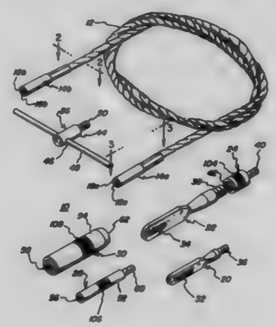
1. An ornamental body comprising a transparent layer and a metal foil laminated with said transparent layer the transparent layer and the metal foil each having an outer surface and an inner laminated surface, a visible image such as a scenery or the like being formed upon the laminated surface of one of said transparent layer and said metal foil by photographic means, printing means or the like wherein said metal foil is an aluminum foil and said laminated surface of said foil is a non-glossy surface having a diffused reflection property.

4,716,673

GUN BARREL CLEANER AND CONTAINER THEREFOR

Gerald Williams, and Doreen Williams, both of 227 Higby Rd., Utica, N.Y. 13501

Filed Jul. 9, 1986, Ser. No. 883,588
Int. Cl.[4] F41C *31/00*; B65D *57/00*
U.S. Cl. 42—95 **29 Claims**



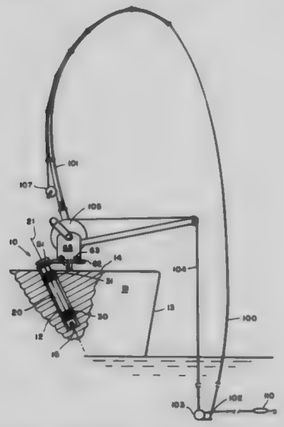
1. A gun barrel cleaner comprising:
a shaft substantially unyielding in an axial direction or barrel cleaning and laterally bendable for compact coiling, said shaft having a wire interior comprising a plurality of wire bundles coiled about a single wire bundle such that a multitude of interstices exist within said wire interior, said shaft also having a flexible exterior coating surrounding said wire interior, a portion of said flexible exterior coating at each end of said shaft being removed to expose said wire interior;
two universal brass couplings, each coupling having a substantially identical threaded internal bore, said universal couplings being cold welded onto said exposed portions of wire interior at opposite ends of said shaft such that brass from said couplings resides within the interstices of said exposed wire interior at said shaft ends, said universal couplings and said exposed portions of wire interior being dimensioned such that said exposed portions of wire interior and sections of said shaft adjacent thereto are covered by said couplings when said couplings are cold welded onto said shaft; and
at least two different cleaning tips, each of said tips having a threaded stem at one end for threadable and detachable engagement with said threaded internal bore within either of said universal couplings, one of said at least two different tips comprising a first cleaning tip having an obstruction remover at one end and said threaded stem at its other end, said obstruction remover including a cylindrical body portion having a concave end face so that when dislodging a bullet obstruction from a gun barrel bore said concave end face will center said obstruction remover about said bullet to facilitate the safe removal of said obstruction, whereby said shaft with said couplings secured thereto is capable of consistently withstanding high pulling pressure without said couplings breaking away from said shaft and said cleaning tips are selectively attachable to and detachable from said universal couplings at either end of said shaft thereby facilitating cleaning of a gun barrel.

4,716,674

ROD HOLDER ADAPTER

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Filed Dec. 16, 1986, Ser. No. 942,216
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—27.4 **10 Claims**



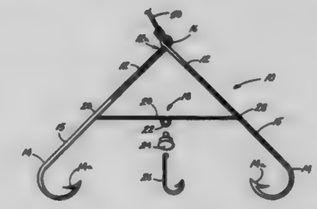
1. A rod holder adapter for mounting fishing accessories on a boat in a flush mounted rod holder comprising:
an elongate sleeve for insertion axially in the rod holder, said elongate sleeve having a distal end and a proximate end disposed within the rod holder;
a distal end plug slidably received in the distal end of said elongate sleeve, wherein said distal end plug is provided with cross slots for engaging a radially extending pin disposed in the bottom of the rod holder;
a first elastomeric ring disposed adjacent said distal end of said sleeve;
a second elastomeric ring disposed adjacent said proximate end of said sleeve;
a device mount connected adjacent said proximate end of said sleeve and extending over the rod holder for receiving a fishing accessory; and
means for axially compressing said first and second elastomeric rings to cause said rings to swell in a radial direction and firmly engage the rod holder.

4,716,675

EXTERNALLY ENGAGING SWALLOW-RESISTANT FISHHOOKS

Charley R. Knight, Rte. 1, Box 135-D, Oroville, Wash. 98844

Filed Jan. 12, 1987, Ser. No. 2,103
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—37 **2 Claims**



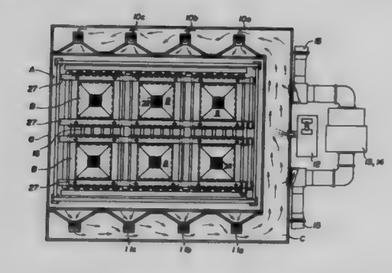
1. A fishook apparatus for hooking fish and the like, comprising:
three elongate members having distal and proximate ends, the elongate members being connected to at least one other elongate member at proximate ends thereof; each of said elongate members being provided with at least one external hook means connected to at least one of the elongate members near the distal end thereof, said external hook means being inwardly directed;
contraction linkage means connected to and extending between at least two of the elongate members for causing inward contraction of the elongate members and associated external hook means toward one another upon engagement of the linkage means by a fish striking at the fishook apparatus, the contraction linkage means being adapted for connecting in appropriate fish bait thereto; wherein the contraction linkage means comprises three link members, each being metallurgically connected to an elongate member at a point intermediate ends of the elongate member, the three link members being joined at a juncture positioned between the elongate members, said juncture being adapted to connect an appropriate fish bait thereto; and
biasing means for biasing the external hook means into extended positions wherein the external hook means are spaced apart.

4,716,676

INSECT KILLING SYSTEM

Masumi Imagawa, c/o Sassyu Sangyo Kabushiki Kaisha, Minami-oakae, Kagoshima-shi, Kagoshima-ken, Japan

Continuation-in-part of Ser. No. 647,030, Sep. 4, 1984, Pat. No. 4,620,388. This application Mar. 31, 1986, Ser. No. 846,908
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] A01M *19/00*
U.S. Cl. 43—130 8 Claims



1. An insect killing system for killing insect pests such as orange flies and melon flies, comprising:

a circulation chamber in which steam is allowed to circulate;

a plurality of differential insect killing cells with each cell having an open upper top portion and an open bottom portion, and wherein said differential insect killing cell comprises a hood adapted to be moved vertically by winding means, and a differential fan disposed in an upper opening of said hood, and a cover member for covering the outer sidewalls of a plurality of harvest boxes each of which is open on its top surface side, is formed with a vent hole in the bottom thereof, and is further formed in the sidewalls thereof with a large number of ventilating holes, in which said steam is forced to flow therethrough, said plurality of differential insect killing cells accomodating a large number of raw fruits with said inscet pest attached thereto and being arranged within said circulation chamber;

first blower means for circulating said steam in said circulating chamber; and

second blower means for forcing said steam to flow through each of said plurality of differential insect killing cells,

whereby said steam is applied to each of said raw fruits and kills out said insect pests attached to said raw fruits,

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4,716,677

MANUAL DEVICES AND METHODS FOR SELECTIVE APPLICATION OF CHEMICAL SUBSTANCES TO PLANTS

James E. Moore, 555 Riviera Dr., Naples, Fla. 33940

Filed Mar. 26, 1986, Ser. No. 844,119
Int. Cl.[4] A01N *5/00*
U.S. Cl. 47—1.5 9 Claims



1. A hand-operated applicator assembly for applying a chemical substance to selected portions of plants, said applicator assembly comprising

at least one holder for grasping by a human hand,

an absorbent applicator pad mounted to a distal portion of said holder, and

a shield connected to said holder and disposed adjacent to said applicator pad,

wherein said pad is disposed between said shield and said distal portion of said holder, and said shield is moveable with respect to said pad to permit variation in the spacing between said shield and said pad to define an application zone between said shield and pad for accepting said selected portions of plants,

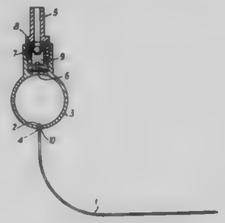
said applicator assembly further comprising a solid form of said chemical substance which is carried so as to be capable of contacting said applicator pad, so that said applicator assembly is operable for applying a portion of said chemical substance to said selected portions of plants when a liquid solvent for said said form of said chemical substance is applied to said applicator pad so that said chemical substance is capable of being transferred to said applicator pad and then applied to said selected portions of the plants.

4,716,678

ARRANGEMENT FOR TREATMENT OF CULTURE BY MOISTENING

Patrick Balla, Reims, France, assignor to Tecnoma S.A., Epernay, France

Continuation-in-part of Ser. No. 603,433, Apr. 24, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 888,347
Claims priority, application France, May 4, 1983, 83 400898
Int. Cl.[4] A01G *15/00*
U.S. Cl. 47—1.5 3 Claims



1. A device for applying controlled quantities of chemicals to selected plants while substantially avoiding accidental delivery of the chemicals to an environment of said plants, said device comprising

a chamber for receiving the controlled quantities of liquid chemicals defined by at least inside surface of the walls;

wick means extending from the lower portion of the chamber and having a length with first and second ends, said wick means delivering said chemicals to the plants by a capillary flow through a body of said wick means from the first end to the second end, the second end of the wick means being distal to said chamber and extending out of said chamber for rest contact with said plants;

the first end of said wick means being positioned within the interior of the chamber;

means for delivering said liquid chemicals into the chamber in a pressurized condition in a mist form to be spread out evenly within an interior of the chamber, whereby the chemicals being partially condensed on the inside surface of the walls and on the first end of said wick means positioned within the chamber to ensure the controlled flow of the chemicals equal throughout the entire width of said wick means to the selected plants;

at least one aperture is provided within the wall of the lower portion of the chamber for providing decompression of the tank end ensuring regularity of the capillary flow;

means for pressurizing said chemicals prior to delivery thereof into said chamber;

intermittent means for receiving said pressurized chemicals and for providing a controlled and discontinuous flow of said chemicals into said chamber, the mass inflow rate of said chemicals into said chamber being substantially equal to the rate at which said wick means can deliver said chemicals to the plants by capillary action so that accumulation of said chemicals in said chamber is essentially avoided; and

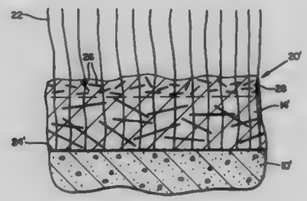
said delivery means defined by atomizing means for receiving said discontinuous liquid flow of chemicals comprising an opening adapted for delivering said chemicals into said chamber in the mist form.

4,716,679

PRE-GROWN LAWN TURF PRODUCT AND METHOD OF GROWING

Richard A. Heard, 2330 Dairy Loop Rd., Roseburg, Oreg. 97470

Continuation of Ser. No. 906,628, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 691,222, Jan. 14, 1985, abandoned. This application Aug. 4, 1987, Ser. No. 82,952
Int. Cl.[4] A01C *1/04*
U.S. Cl. 47—56 4 Claims



1. A pre-grown lawn turf capable of being transplanted to a permanent site and consisting essentially of

a layer of straw having an upper portion and being at least ½ inch thick on a water and root impervious surface to form a growing base for turf on said impervious surface, and

germinated grass seed which in the formation of the turf was distributed on said upper portion of the straw layer in a slurry of water and which when grown has its roots extending downward through the thickness of the straw layer and bunched up into a mat against the impervious surface, forming an integrated turf capable of being lifted off said impervious surface and transplanted at a permanent site.

4,716,680

PLANT GROWTH CONTAINER AND METHOD

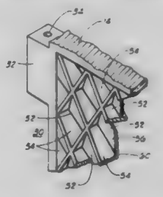
Carl E. Whitcomb, Rte. 5, Box 174, Stillwater, Okla. 74074, and Harold Stephens, P.O. Box 506, Jenks, Okla. 74037

Filed Apr. 28, 1986, Ser. No. 856,653
Int. Cl.[4] A01G *23/02*
U.S. Cl. 47—73 20 Claims

1. A container for a plant intended to be transplanted, comprising:

a set of upwardly extending side panels each having an interior surface and an exterior surface, and each having vertically extending edge joints adapted so that said side panels can be joined together to form a container with an open top and further adapted so that said joined side panels can be disconnected and moved laterally outwardly apart; and

said interior surface of each of said side panels having a lattice of root trapping recesses therein, each of said recesses including a wall that extends from the interior to the exterior of said side panel and a laterally extending which connects with said wall forming growing therein downwardly and outwardly so as to be trapped therein.

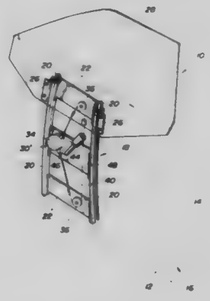


4,716,681

WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

Satoru Ugawa, Hadano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 4, 1985, Ser. No. 794,843
Claims priority, application Japan, Nov. 24, 1984, 59-248332
Int. Cl.[4] E05F *15/16*
U.S. Cl. 49—349 7 Claims



1. A window regulator for raising and lowering a window pane in an automotive vehicle door having an inner panel, comprising:

a preassembled integral unit guide rail assembly fixedly attached to the inner panel and comprising a pair of parallel guide rails spaced from each other, said guide rails disposed nearly vertically and having upper end portions and lower end portions, a pair of first and second beams disposed nearly horizontally to respectively interconnect said upper end portions and said lower end portions, each of said first and second beams having a pulley rotatably mounted thereon, and a third beam interconnecting portions of said guide rails intermediate between said upper end portions and said lower end portions;

a pair of guide rollers rotatably mounted on said window pane and movably engaged with said guide rails, respectively; and

a wire type drive unit engaging said pulleys for driving the window pane;

said wire type drive unit comprising a drum base attached to said third beam, a winding drum rotatably mounted on said drum base, pulleys rotatably mounted on said first and second beams, respectively, a movable bracket attached to said window pane to move together therewith, a wire having a portion fixedly attached to said movable bracket and placed around said pulleys and said winding drum in such a manner as to have opposite end portions which are respectively wound around said winding drum in the

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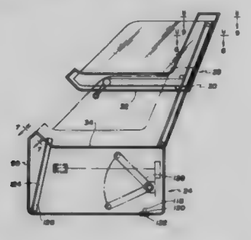
reverse directions, and means for driving said winding drum to rotate.

4,716,682

MODULAR DOOR STRUCTURE

Delbert D. De Reus, Romeo, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Aug. 6, 1986, Ser. No. 893,791
Int. Cl.[4] E05K *11/44*
U.S. Cl. 49—352 **22 Claims**



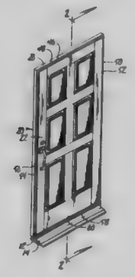
1. A vehicle door for closure of a vehicle door opening comprising:
- a lower housing defining an open-topped cavity and having a peripheral outline substantially corresponding to the shape of a first portion of the door opening along the sides and bottom of the door opening, and having a top edge;
- an upper housing having a lower edge adapted to matingly engage the top edge of said lower housing;
- a glass panel;
- guide means carried by said upper housing for displaceably supporting said glass panel with respect to said upper housing at and between a raised position in which said glass panel encloses a second portion of said door opening above said first portion of the door opening, and a lowered position retracted from said second portion of said door opening at which at least a portion of said panel extends into said cavity;
- means for regulating displacement of said glass panel to and between said raised and lowered positions, said regulating means being wholly carried by said upper housing; and
- means for coupling said upper housing to said lower housing.

4,716,683

DOOR WEATHERSTRIPPING ASSEMBLY

Mearl J. Minter, Oskaloosa, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed May 13, 1985, Ser. No. 732,949
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—479 **3 Claims**



1. An improved door weatherstripping assembly for use in a door frame including a header, opposite side jams, a sill and a door stop member extending around the interior perimeter of said door frame, said door stop member having a vertical stop surface an an entry surface disposed perpendicularly to said stop surface, said assembly comprising:
- a door hingedly mounted on one side of said side jambs for closing toward said stop member and having a vertical front surface, a back surface and a primary peripheral edge extending between said front and back surfaces, and
- a first compressible weatherstripping member mounted on and extending continuously around said door for compressive sealing engagement between said vertical front surface of said door and said vertical stop surface of said stop member upon closure of said door within said frame so as to provide a substantially air-tight seal therebetween;
- a second flexible weatherstripping member mounted on and extending around said door forwardly of said first weatherstripping member for providing a rain screen effect upon closure of said door within said frame;
- said second weatherstripping member including separate first, second, third and fourth elongated sections extending along the length of the top portion, one side portion, the other side portion, and the bottom portion of said door, respectively;
- at least said first, second and third sections of said second weatherstripping member each including a flexible leaf element for frictionally engaging said respective entry surfaces and said stop member upon closure of said door within said frame and thereby provide a substantially water-tight seal between said stop member and said door;
- said fourth section of said second weatherstripping member further including an extruded element mounted on said door and having a lip extending forwardly of said front surface of said door, said lip being angled downwardly with respect to said front surface of said door such that water running down said front surface is directed away from said door and said first weatherstripping member by said lip;
- said door having a perimeter notch in said primary peripheral edge extending to said front surface of said door so as to form a secondary peripheral edge adjacent said front surface of said door and a vertical stop surface extending between said primary and secondary peripheral edges, said first weatherstripping member being positioned adjacent said vertical stop surface of said door;
- said first second and third sections of said second weatherstripping member each including a base portion integrally formed with said leaf element and engaging said secondary peripheral edge of said door and an integrally formed flange extending from said base portion and operatively fitting into a second slot in said secondary peripheral edge for securing the respective section to said door.

4,716,684

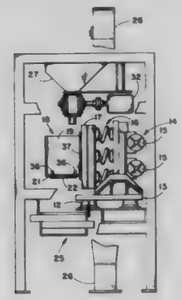
CLEANING AND DEBURRING OF MACHINED OR CAST PARTS

Larry A. Roach, 920 N. Jefferson, Mason City, Iowa 50401

Filed Jul. 28, 1986, Ser. No. 891,266
Int. Cl.[4] B24B *31/06*
U.S. Cl. 51—7 **10 Claims**

6. A method for abrasively cleaning and deburring cast or machined pieces and the like, comprising the steps of:
- (a) attaching pieces to be cleaned securely to the interior of a container having an open top, closed side walls and a bottom wall;
- (b) then inserting abrasive cleaning material into the container through the open top and vibrating the container;
- (c) providing an opening in the container at or near its bottom to allow only a restricted amount of abrasive material to leave the container while it is being vibrated; and

- (d) then feeding abrasive material into the container through the open top while the container is being vibrated to



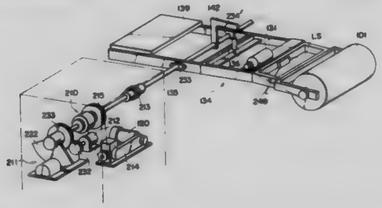
replace the material which leaves through the bottom opening.

4,716,685

APPARATUS FOR ABRASIVELY TREATING THE SURFACES OF AUTOMOBILE BODIES

Yoshiaki Kuramoto, Tokyo, Japan, assignor to Nippon Flakt K.K., Japan

Continuation-in-part of Ser. No. 635,909, Jul. 30, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,482
Int. Cl.[4] B24B *19/26*
U.S. Cl. 51—74 R **1 Claim**



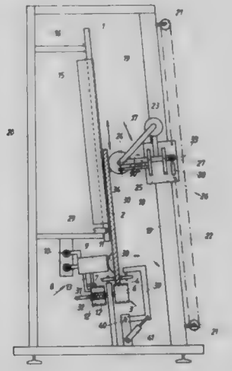
1. An apparatus for abrasively treating the surfaces of a series of automobile bodies being longitudinally conveyed along a line by bringing the surfaces of each automobile body in contact with a plurality of abrasive brushes rotating with their axes of rotation perpendicular to the direction of conveyance of the automobile bodies, the improvement which comprises a plurality of abrading units for processing different areas of the upper surfaces of each automobile body successively disposed in predetermined spaced relation along the line of conveyance of the automobile bodies, each of said units comprising:
- a support structure adjacent the line of conveyance of the automobile bodies;
- at least one cylindrical abrasive brush rotatable with its axis of rotation perpendicular to the direction of conveyance of the automobile bodies for processing a particular area of the upper surfaces of each automobile body, said brush having an effective abrasive width less than a half of the width of the upper surface of the automobile body;
- an electric motor for rotating the axis of said brush;
- a swing arm for rotatably mounting said brush and fixedly securing said motor;
- a shaft for rotatably supporting said swing arm at such a position that said shaft can be an axis of any swing motion of the brush mounted on said swing arm;
- a member for transmitting the rotating motion of said shaft around its axis to said swing arm, fixed at one end to said shaft and at the other other end to said swing arm and having a double acting piston means interposed between said ends;
- a brake motor for rotating said shaft and braking the rotation of said shaft;
- a means for displacing the piston of said double action piston means so that said brush may be forced against the surface of the automobile body to be processed without rotation of said shaft when said brush has come in contact with said surface, and for maintaining a pressure differential so established in said double acting piston means during the processing of said surface;
- a clutch means interposed between said brake motor and said shaft;
- a brake means for braking the rotation of said shaft only for a moment when said brush has come in contact with a surface of the automobile body to be processed; and
- an encoder connected to said shaft for detecting the amount of rotation of said shaft and dispatching a signal representative of the amount of rotation of said shaft which has been detected for automatic control of the operation of at least said brake motor and double acting piston means.

4,716,686

DEVICE FOR TREATING THE EDGE ZONES OF PLATE-SHAPED ELEMENTS

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Jun. 14, 1985, Ser. No. 744,753
Claims priority, application Austria, Jun. 14, 1984, A1945184
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—76 R **16 Claims**



1. In a device for the treatment of the edge zones of surfaces of plate-shaped elements, comprising an upright lateral supporting wall (1) for the elements, which lateral are arranged substantially upright, conveying means (3) for the elements at the bottom edge of the supporting wall (1), a treatment tool (17) guided to be displaceable upward and downward along a substantially vertical guide rail (19) connected to a stand (20) of the device; there being a substantially vertical slot (14) in the supporting wall (1) opposite the treatment tool (17), and a bracing roll (15) rotatable about a substantially vertical axis (16) and at least partly penetrating said slot (14) in the supporting wall (1); said wall extending on both sides of said slot, and the bracing roll being opposite the treatment tool so that the pressure exerted by the treatment tool on a said element is absorbed by the bracing roll; the improvement comprising a carrier unit (8) for the plate-shaped element (2), said carrier unit being disposed between the lower end of the supporting wall (1) and the conveying means (3) and on the side of the plate-shaped element which is opposite the treatment tool (17),

the carrier unit (8) being guided in parallel overlapping relationship to the conveying means (3), whereby said plate shaped element (2) is supported by both said carrier unit (8) and said conveying means (3), and means for at least intermittently moving the carrier unit in synchronism with the conveying means (3).

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METHOD AND APPARATUS FOR GRINDING A ROTARY BODY

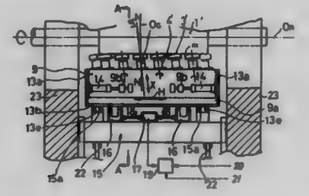
Hidehiko Tsukamoto; Kanji Hayashi; Tsunetaka Sumomogi; Masashi Oya; Junichi Ibushi; Katsuaki Takasaki; Masao Arikawa; Tatso Tsujimoto; Kunio Yamamoto; Kanehisa Miyagaichi; Yoshiki Mito, and Tameaari Doho, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,265

Claims priority, application Japan, Feb. 22, 1985, 60-34007; Apr. 12, 1985, 60-76648

Int. Cl.⁴ B24B *5/04*

U.S. Cl. 51—131.1 **6 Claims**



1. A method for on-line grinding of a work roll that is rotatably supported about a rotational axis thereof in a rolling mill, said method comprising:

positioning a rotatably supported grindstone having an axis of rotation against the outer circumferential surface of the work roll such that the axis of rotation of the grindstone extends in a direction that does not intersect the rotational axis of the work roll, and such that the axis of rotation of the grindstone intersects a plane extending perpendicular to the rotational axis of the work roll at a predetermined angle;

rotating the work roll about the rotational axis thereof; and

continuously urging the grindstone toward the outer circumferential surface of the work roll as the work roll is rotated and causing a relative slip between the rotating work roll and the grindstone to occur at a contact point therebetween thereby causing said grindstone to grind the work roll continuously as the grindstone wears and the work roll is ground.

4,716,688

FIXTURE FOR HOLDING A HOLE-CUTTING TOOL HAVING CUTTING EDGES TO BE GROUND

Karl Reiling, and Reinhold Reiling, both of Reuchlinger Strasse 4, D-7535 Königsbach-Stein, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 855,092

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517034

Int. Cl.⁴ B24B *3/26*

U.S. Cl. 51—219 R **13 Claims**

1. In a fixture for holding an elongate hole-cutting tool having a longitudinal axis and a cutting tip formed with at least two cutting edges to be ground by a grinding wheel, which fixture comprises:

a stand;

a mounting pin carried by said stand, and

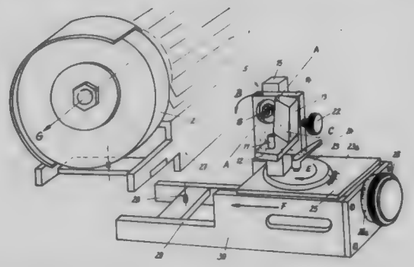
a gripping unit detachably mounted on said mounting pin in one predetermined position for grinding one of said cutting edges and adapted to be detachably mounted on said mounting pin in another predetermined position for grinding another of said cutting edges, said gripping unit comprising two gripping jaws for gripping said tool so that said cutting tip protrudes from said jaws,

the improvement residing in that

said fixture comprises an angle bracket having a base and a vertical back structure rising from said base,

said mounting pin is carried by and rises from said base,

said back structure is pivoted to said stand on a horizontal pivotal axis which is disposed above said base and extends at right angles to said mounting pin, and



said gripping jaws are adapted to grip said tool so that said cutting tip protrudes from said jaws adjacent to said pivotal axis and said longitudinal axis crosses said pivotal axis,

wherein said gripping jaws are adapted to grip said tool so that said cutting tip protrudes from said jaws adjacent to said pivotal axis and said longitudinal axis is oblique to said pivotal axis, and

wherein said back structure comprises a generally vertical tapered surface which faces said mounting pin and is in snug contact with said gripping unit and is horizontally tapered toward said pivotal axis.

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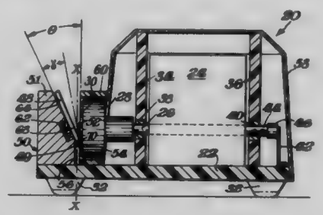
METHODS AND APPARATUS FOR KNIFE AND BLADE SHARPENING

Daniel D. Friel, Winward Rd., Greenville, Del. 19807

Continuation-in-part of Ser. No. 588,794, Mar. 12, 1984, Pat. No. 4,627,194, and Ser. No. 588,795, Mar. 12, 1984, abandoned. This application Apr. 23, 1986, Ser. No. 855,147

Int. Cl.⁴ B24B *3/36*

U.S. Cl. 51—285 **9 Claims**



1. A method of sharpening a knife having a face terminating at a cutting edge facet comprising providing a magnetic guide member having a magnetic guide surface juxtaposed an abrasive surface with the guide surface being in a plane disposed at a predetermined angle to and intersecting the abrasive surface to form a line of intersection therewith and with the magnetic guide surface having a pair of magnetic poles comprising a north pole and a south pole oriented such that each lies along a line which is substantially parallel to the line of intersection, locating the magnetic guide surface with one of the north and the south magnetic poles being disposed contiguous to the abrasive surface and having the other of the north and the south magnetic poles being disposed remote from the abrasive surface, imparting a motion to the abrasive surface, placing the knife against the magnetic guide member, and utilizing the magnetic field created by the magnetic poles to provide a thrust which moves the cutting edge facet into contact with the abrasive surface and a force to hold the cutting edge facet in contact with the abrasive surface while the abrasive surface is in motion.

4,716,690

APPARATUS AND METHOD FOR CLEANING STONE AND METAL SURFACES

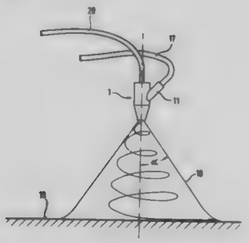
Johan Szücs, Hornstrasse 9, 8000 München 40, Fed. Rep. of Germany

Continuation of Ser. No. 765,469, Aug. 14, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,617

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1984, 34109681

Int. Cl.⁴ B24C *1/08*

U.S. Cl. 51—321 **14 Claims**



1. Method for cleaning stone and metal surfaces, in particular such surfaces contaminated and corroded by atmospheric influences, by applying to such surfaces a jet containing air, water and a fine grain mineral blast material having a grain size of up to 1 mm, said jet being produced by:

supplying water at a pressure in the range from about 70 to 130 bar through a vaporizing entry nozzle into a mixing chamber at a side opposite an exit nozzle in the direction toward said exit nozzle, and directing pressurized air entraining said blast material into said mixing chamber from the side obliquely forwardly against the water flow direction in such a manner that the center axis of the air flow and the center axis of the vaporized water flow extend in spaced relationship to each other thereby generating violent circular motion while mixing said air, water and blast material and further vaporizing the water,

the pressure of the air in which said blast material is entrained being about 3 to 8% of the water pressure,

the proportion of air by volume being many times the proportion of water,

upon leaving said exit nozzle, said jet rotating about its axis and expanding greatly to form a rotating conical stream due to expansion of the air contained therein under pressure and the violent circular motion induced in the mixing chamber whereby said blast material follows a helically and plane-spirally extending curve.

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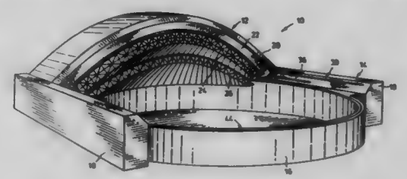
STADIUM BUILDING

Christopher M. Allen, 18 Birchview Road, Ottawa, Ontario, Canada (K2G 3G4), and Roderick G. Robbie, 16 Cornish Road, Toronto, Ontario, Canada (M4T 2E2)

Continuation-in-part of Ser. No. 857,971, May 1, 1986, Pat. No. 4,676,033. This application Feb. 24, 1987, Ser. No. 17,601

Int. Cl.⁴ E04H *3/10*; E06B *3/32*; E04B *1/32, 7/16*

U.S. Cl. 52—6 **10 Claims**



1. In a stadium building, a retractable roof comprising a central arch separating a pair of ungular end segments, one end segment being movable into nesting relationship with the other end segment, and the central arch being movable to rest above the nesting end segments, the nesting end segments and the above nesting central arch being movable laterally whereby the interior of the stadium is more fully exposed.

4,716,692

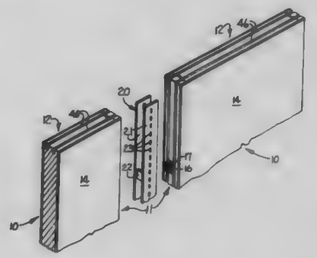
LOCKING SYSTEM FOR INTERCONNECTING PANELS

Thomas Harper, Archdale; James Langham, High Point, and Francis J. Idol, Kernersville, all of N.C., assignors to Alma Desk Company, High Point, N.C.

Filed Dec. 30, 1986, Ser. No. 947,596

Int. Cl.⁴ E04B *2/78*

U.S. Cl. 52—36 **21 Claims**



1. An arrangement for interconnecting wall panels of corresponding construction with one another to form walls of predetermined size and orientation, said wall panels being generally rectangular in overall shape and having opposing vertical sides, opposing horizontal ends and opposing vertical faces, said arrangement comprising:

a plurality of spaced apart parallel channels extending inwardly from the respective vertical sides of each of said wall panels;

a plurality of outwardly and upwardly extending fingers positioned along each vertical side of each of said wall panels and between said spaced apart parallel channels, each of said fingers defining an upwardly facing slot between said finger and said respective vertical side;

a columnar vertical standard for being received between the respective vertical sides of adjoining wall panels and adapted to selectively interconnect said adjoining wall panels, said columnar standard having a plurality of spaced apart parallel vertical flanges connected to one

another and a plurality of parallel sets of short vertical web members positioned between said flanges;

said flanges being spaced apart a distance substantially similar to the distance between said channels in said vertical sides and each flange having a width substantially similar to the widths of said channels in said vertical sides for being engagingly received therein; and

said parallel sets of vertical web members being positioned at locations along said columnar standard which correspond to the locations of said upwardly facing slots defined by said fingers along each vertical side of adjoining wall panels, said vertical web members being restingly received in said slots so that one vertical member from each set is received in a respective slot on respective adjoining panels, whereby the engagement of the flanges of the columnar standard with the channels on adjacent wall panels stabilizes the adjoining wall panels against torsional movement therebetween and the engagement of said fingers and slots with said vertical web members interconnects said adjoining wall panels and stabilizes said adjoining wall panels against movement apart from one another in a direction parallel to their vertical faces.

4,716,693

STRUCTURE HAVING A MOVABLE PANEL

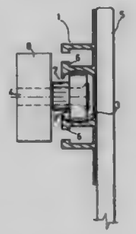
James A. Webster, London, Great Britain, assignor to Click Systems Limited, Milton Keynes, Great Britain

Filed Apr. 22, 1986, Ser. No. 855,097

Claims priority, application United Kingdom, Apr. 22, 1985, 8510235; Dec. 3, 1985, 8529728

Int. Cl.[4] E04B *1/346*

U.S. Cl. 52—64 23 Claims



1. A structure comprising support means, a support frame having a front portion and two side portions, said two side portions being slidably mounted on said support means to allow sliding movement of said frame between a retracted and and extended position relative to said support means, a movable panel mounted on said front portion of said frame, and interengaging track means mounting said movable panel on said front portion of said frame and comprising arcuate members operable for allowing a first tilting of said movable panel between a flush-fitting plane and an inclined plane on sliding movement of said frame from said retracted position to said extended position thereof and for allowing a second tilting of said movable panel between said inclined plane and a non-flush plane substantially parallel to said flush-fitting plane, said arcuate members of said interengaging track means being further operable to permit said movable panel to move laterally along said front portion of said frame when said movable panel is in said non-flush plane.

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WEAR RESISTANT PANEL ARRANGEMENT

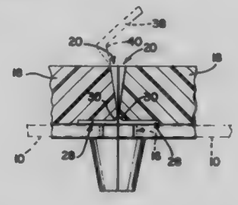
Manfred F. A. Freisle, Johannesburg, South Africa, assignor to Screenex Wire Weaving Manufactures (Proprietary) Limited, Alrode, South Africa

Filed Nov. 24, 1986, Ser. No. 934,621

Claims priority, application South Africa, May 23, 1986, 86/3864

Int. Cl.[4] E04B *1/38*

U.S. Cl. 52—127.6 2 Claims



1. A wear resistant panel having a nonworking rear surface, protrusions of a resiliently deformable material located in the vicinity of a peripheral region of the panel by means of which the panel can be removably secured to a support structure, said panel defining a first recess in the peripheral region thereof into which recess a release tool can be forced to exert pressure to facilitate the removal of the panel from the support structure and said panel further defining a second recess on the rear, nonworking panel surface immediately below said first recess.

4,716,695

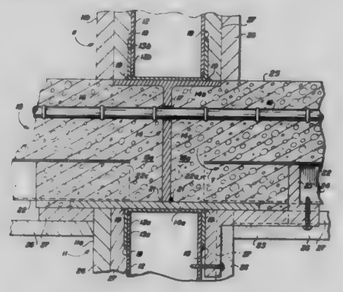
STEEL FRAMING SYSTEM FOR MULTI-STORY BUILDINGS

Theodore G. Alexander, 5136 N. 31st Pl., #644, Phoenix, Ariz. 85016; Claude V. Baker, 512 W. Stella La., Phoenix, Ariz. 85013, and Robert Jepson, 6737 W. Union Hills Dr., Peoria, Ariz. 85345

Filed Jul. 8, 1985, Ser. No. 752,815

Int. Cl.[4] E02H *9/02*

U.S. Cl. 52—167 1 Claim



1. In a multi-story building structure having a lower floor and at least one upper floor, including

poured steel-reinforced concrete floors, and

load bearing walls, including upper walls, including steel studs, supporting the upper floors and transmitting seismic and bearing loads therebetween,

the improved framing system for transmitting the entire seismic loads and the entire bearing loads of the upper walls and floors by steel structural elements of the walls therebelow, said steel structural elements comprising, in combination:

(a) horizontally spaced steel studs, having upper and lower ends, forming said walls;

(b) vertically spaced steel channel members running along the entire length of said walls at floor and ceiling level, shaped and dimensioned to receive and locate the upper and lower ends of said steel studs to directly transmit said loads from said studs to a hybrid wide-flange steel beam, each of said channel members having a U-shaped cross-section, including a horizontal web in steel-to-steel contact with said beam and continuous side flange portions extending perpendicular to said beam;

(c) the hybrid wide-flange steel beam running along the length of said walls at floor level between said spaced channel members, said hybrid beam including

(i) a lower horizontal flange extending laterally a distance sufficient to support outer edges of said steel-reinforced concrete floor which abuts the side walls between said channel members,

(ii) an upper horizontal flange to support said channel member thereabove, and

(iii) a web connecting said upper and lower flanges; and

(d) means for securing said steel structural elements together with steel-to-steel contact and for joining said secured steel elements and said concrete floors to form a unitary building structure in which the entire seismic loads and bearing loads of the upper walls and floors are transmitted by said steel structural elements of the walls therebelow.

4,716,696

RESILIENT PIER AND FOOTING ARRANGEMENT

Joseph Yacoboni, P.O. Box 1606, Lake Placid, Fla. 33852

Continuation-in-part of Ser. No. 731,475, May 7, 1985, Pat. No. 4,663,898, which is a continuation-in-part of Ser. No. 199,957, Oct. 25, 1980, abandoned. This application Jun. 10, 1986, Ser. No. 872,487

Int. Cl.[4] E02D *27/32, 27/34*

U.S. Cl. 52—169.9 2 Claims

1. As an article of manufacture, a prefabricated concrete structural pier, which, when placed in a pre-dug aperture in the ground, of proper size and shape will support at least a portion of a structure, said pier comprising in combination:

(a) a base plate (14) with a defined center, said plate being designed to rest in a horizontal position at the bottom of a pre-dug aperture in the ground;

(b) a vertical pipe (18), connected to said plate center, with an internally threaded bolt (20) welded to the upper end thereof;

(c) a vertical steel rod (22), threaded at its lower end and threadedly engaged to said bolt (20) so that the rotation of the rod will adjust the heighth of said rod, said rod having a hook upper end;

(d) a vertical concrete-filled sleeve (26), serving to define the pier main body, a central support rod (30) extending horizontally across said vertical sleeve (26) at about its widest part, said support rod (30) being engaged by said hook upper end so that the rotation of said rod determines the vertical location of the vertical concrete-filled sleeve (26);

(e) an anchor plate (38) embedded at the top of the pier having a defined central section, with appropriate outer apertures, also with downwardly extending threaded anchor rods (40) held in said apertures, inwardly bent outer ends on said anchor rods;

(f) a substantially hemisphere-shaped actuator (48) with a round portion and a flat portion, the round portion thereof being fastened to the anchor plate central section, the flat portion having apertures therein to receive fastening means for a structural beam; and,

(g) a plurality of vertical bars (28) with outwardly bent ends extending out of the bottom of the sleeve to hold the sleeve firmly in concrete to be poured around the pier.

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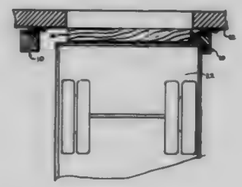
MOVABLE DOOR SEAL

Robert G. Snyder, 10204 Rosalsted Way West, Raleigh, N.C. 27612

Filed Aug. 11, 1986, Ser. No. 895,903

Int. Cl.[4] E06B *1/00, 7/16, 5/00*

U.S. Cl. 52—173 DS 6 Claims



1. A movable door seal for attachment to a building adjacent to a truck loading dock door opening comprising a sealing bumper mounted on a backing board which is mounted on a double-acting hinge attached to the building adjacent to the opening to move the bumper and backing board laterally between a first position for sealing against a truck positioned at the door opening and a second nonsealing position.

4,716,698

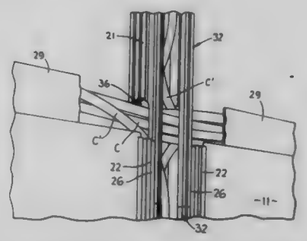
WALL SYSTEM WITH SPLIT POLE FOR LAY-IN WIRING

Harold Wilson; Bin Lim, both of Holland, and Brian Gingrich, Wyoming, all of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Jun. 6, 1986, Ser. No. 871,658

Int. Cl.[4] E04F *19/06*

U.S. Cl. 52—239 3 Claims



1. In a space-dividing wall system supported on a floor and spaced downwardly a substantial distance from a ceiling, said wall system having at least first and second upright wall panels horizontally serially connected and supported in an upright position on the floor, said panels having a height less than floor-to-ceiling height so that the panels have horizontally-extending upper edges which are spaces downwardly a substantial distance from the ceiling, each of said first and second panels having an interior cable-receiving top channel formed therein and extending horizontally longitudinally thereaing

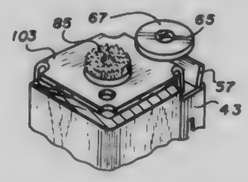
VOL 1086 ISS 1 JAN 5 1988 UMI

adjacent the respective upper edge thereof, each of said first and second panels also having a horizontally elongated top rail which is removably associated with the panel and closes off said top channel, and a vertically-extending pole arrangement extending from the ceiling downwardly to a location adjacent the floor, said pole arrangement being positioned between adjacent and opposed end rails of said first and second panels, said pole arrangement defining a hollow channel within the interior thereof and projecting longitudinally therealong for permitting cables to extend vertically therein, at least one side wall of said pole arrangement having an elongated slotlike opening extending longitudinally thereof and closed by a removable cover for permitting cables to be laid into said hollow channel, and vertically elongated key means coupled between the end rail of each of said first and second panels and an opposed end wall of said pole arrangement for horizontally fixedly coupling the first and second panels to said pole arrangement, comprising the improvement wherein said pole arrangement includes upper and lower vertically-elongated pole members disposed in vertically aligned relationship, said upper and lower pole members being of substantially identical cross section, said lower pole member having a vertical height which is less than the height of said panels so that said lower pole member projects upwardly from a location adjacent the lower edges of said panels so as to terminate in a free upper end disposed at a location close to but spaced downwardly from the upper edges of said panels, said lower pole member being secured to the end rails of said panels by said vertically elongated key means, said key means projecting vertically upwardly through at least a limited extent beyond free upper end of said lower pole member, and said upper pole member having a free lower end disposed substantially in abutting engagement with said lower pole member when in a use position, said upper pole member when in said use position having a lower vertically-elongated part thereo disposed between the first and second panels and vertically slidabley engaged with upper portions of said key means for horizontally fixedly connecting said upper pole member between said first and second panels, said upper pole member projecting upwardly from said free lower end to a point at least equal to the height of said ceiling, said key means permitting said upper pole member to be freely slidably displaced upwardly relative to said panels so as to be moved out of engagement with said key means, said upper pole member having vertically elongated slots formed in the end walls thereof in aligned relationship with one another, said slots opening upwardly from the lower free end of said upper pole member and projecting upwardly so that he slots define upper closed ends which are approximately horizontally aligned with said top channels when the upper pole member is in said use position so as to permit cables to extend from the top channel of the first panel through the slots and directly into the top channel of the second panel, and the upper and lower pole members defining therein respective upper an lower channels which extend longitudinally therethrough in open communication with one another and define said hollow channel so that cables can extend from one of said top channels through one said slot and then be bent to extend downwardly through said lower channel or upwardly through said upper channel.

4,716,699
WALL PANELS WITH SINGLE LOAD-BEARING CONNECTOR POSTS

Philip E. Crossman, Holland, and Terry L. Mitchell, Jenison, both of Mich., assignors to Rostec Industries, San Jose, Calif.
Continuation-in-part of Ser. No. 820,408, Jan. 17, 1986, abandoned. This application Sep. 23, 1986, Ser. No. 910,458
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 **15 Claims**

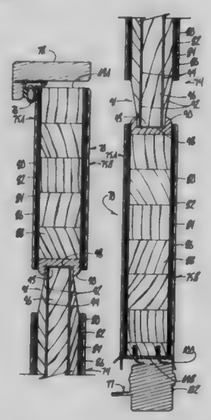
1. A modular wall panel system comprising,
a plurality of upright load-bearing connector posts in contact with a support surface, each post having opposed side walls and opposed front and back walls, a plurality of vertically extending bracket slots defined in at least one of the front and back walls and at least one panel registration slot defined in each of the opposed lateral walls,
a plurality of rectangular panels having opposed lateral edges, each of said edges having post engaging means extending therefrom for gaining support for each panel between side walls of two connector posts at a height clearing said support surface, said post engaging means including at least one cantilevered flange extending from the associated lateral edge for engagement with a panel registration slot of a connector post, said opposed lateral edges of each panel wrapping around almost half of said connector posts, except for said vertically extending



bracket slots, thereby substantially concealing said bracket slots, some of said post engaging means cooperatively entering panel registration slots in said connector posts, whereby each panel is elevated and supported between two adjacent posts, and
a plurality of wall panel modular fixtures having cantilever brackets, each cantilever bracket having hooks engaging said vertically extending bracket slots, supporting said fixtures from said connector posts in cantilever fashion, the width of each hook being less than half the slot width so that two adjacent hooks may fit in one slot for side-by-side support of wall panel modular fixtures.

4,716,700
DOOR

Bruce A. Hagemeyer, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa
Continuation-in-part of Ser. No. 732,950, May 13, 1985, Pat. No. 4,630,420. This application Dec. 23, 1986, Ser. No. 946,443
Int. Cl.[4] E06B *3/70*
U.S. Cl. 52—456 **8 Claims**

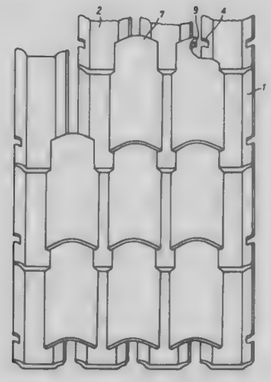


1. A thermal and moisture resistance door having perimeter edges and interior and exterior sides, comprising: a framework defining the perimeter edges of said door, said framework

including parallel opposite elongated stiles extending vertically and horizontally extended rails interconnecting said stiles;
a series of panels secured within said framework to said stiles and rails;
each of said panels comprising a wood core, an intermediate wood layer operatively attached to said core, a wood cross-banding layer attached to said intermediate wood layer, a vapor-barrier layer attached to said cross-banding layer, a second wood cross-banding layer attached to said vapor-barrier layer and an outer wood veneer layer attached to said second cross-banding layer, the wood grain of said intermediate layer and the wood grain of said veneer layer running substantially parallel to one another and the wood grain of at least one of said cross-banding layers running substantially perpendicular to the wood grain of said veneer layer;
said stiles and rails consisting of a wood core, a wood cross-band layer attached to said core; a vapor-barrier layer attached to said cross-band layer, a second wood cross-band layer attached to said vapor-barrier layer and an outer wood veneer layer attached to said second cross-band layer;
said core of each of said panels being elongated and said intermediate wood layer being elongated and tapered to extend beyond the other of said layers of said panel in order to form an end; said stiles and rails including wood receiving blocks to adaptingly receive said end of one of said panels;
wherein the layers of lamination of said panels, stiles and rails provide strength to the said door to prevent warping of the door due to temperature differences across the door and said vapor-barrier layers in said panels, stiles and rails prevent warping of said door due to moisture absorption thereby.

4,716,701
ROOF SYSTEM BASED ON TWO TILE ELEMENTS HAVING MEANS OF ATTACHMENT

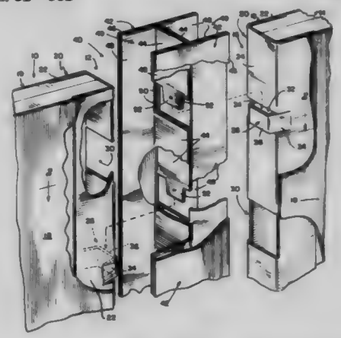
Michel Talbot, 127, Rue d'Estiennes d'Orves, Verrieres-le-Buisson, France (91370)
Filed Jul. 29, 1985, Ser. No. 760,301
Claims priority, application France, Jul. 30, 1984, 84 12052
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—536 **7 Claims**



1. A tile system for use on sloped roofs comprising
at least two running tiles adjacent to each other, each said running tile having a substantially rectangular shape and including a substantially flat bottom with longitudinal edges raised obliquely and substantially outwardly and upwardly from the substantially flat bottom, said edges having a curved convex configuration, the substantially flat bottom of the running tile having a lower face and a locking spur formed on its lower face, at least one covering tile of a substantially arc configuration, the covering tile being adapted to rest on the bottoms of said two running tiles juxtaposed and superposed in the direction of roof slope, the raised edges of the running tile having near an end of the running tile at least two notches spaced equally from the end, the covering tile having near an end thereof a substantially vertical partition for cooperating with said notches and permitting a spacing adjustment between the running tiles by relative sliding of the said notches along the partition, said substantially vertical partition substantially extending from one edge of the covering tile to the other edge, said partition is adapted to engage the notch of the running tile in any position on the full length of the partition, the combined length of projections of said two longitudinal edges of the running tile on the roof is substantially smaller than a cord of the arc of the covering tile so that in an assembled condition of the tile system a substantial gap is provided between said two adjacent running tiles providing a possibility of lateral movement between said running and covering tiles and allowing adjustment of the relative positions of the running tile and the covering tile.

4,716,702
EDGE-TO-EDGE PANEL CONNECTION

J. Douglas Dickson, Columbus, Ohio, assignor to American Metal Door Company, Inc., Richmond, Ind.
Continuation of Ser. No. 306,002, Sep. 28, 1987, abandoned. This application Jan. 5, 1984, Ser. No. 568,285
Int. Cl.[4] E04C *1/30*
U.S. Cl. 52—582 **14 Claims**



1. An edge-to-edge panel connection comprising two panels having abutting edges in adjacent edge-to-edge relationship, means providing a series of protuberances spaced apart along the edges of the panels, each protuberance including an aperture normal to the edges, and locking means movable between the edges for engaging the apertures to interlock the panels, the locking means including two side sections and a web section therebetween forming two channels opening outwardly to receive the edges of the panels, and a series of windows in the web section providing gateways for the protuberances, each window including a gate movable into engagement with the aperture of the protuberance received in the gateway.

4,716,703

METHOD FOR MOUNTING A ROOF, FLOOR OR SIMILAR STRUCTURE AND A STRUCTURE ADAPTED TO BE MOUNTED ACCORDING TO THE METHOD

Axel B. R. Ericsson, Holmsund, Sweden, assignor to Profoment Utvecklings AB, Umea, Sweden

Division of Ser. No. 448,991, Nov. 16, 1982, Pat. No. 4,628,647.
This application Aug. 13, 1986, Ser. No. 895,943
Int. Cl.[4] E04B 1/74, 7/00
U.S. Cl. 52—743 7 Claims



1. A method of constructing a roof or floor, said method comprising the steps of:

connecting a plurality of girders to a flexible sheet at spaced locations along said flexible sheet according to a predetermined spacing;

forming stowage spaces between adjacent pairs of girders by bringing the connected girders together into side-by-side relationship;

stowing each portion of the flexible sheet between adjacent pairs of girders in the stowage space formed between the respective pair of adjacent girders, whereby a compact unit is formed;

said girders being connected to the flexible sheet at lower edges of said girders; and

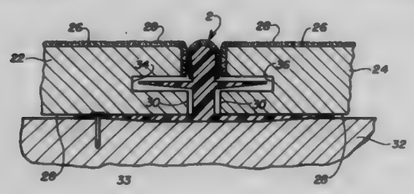
said connecting and forming steps being performed at a first site, said method further comprising the steps of moving the compact unit from said first site to a building being constructed, positioning the compact unit on a portion of the building and moving the girders apart so that the flexible sheet spaces the girders along said building according to said predetermined spacing.

4,716,704

FABRIC COVERED SPLINE ASSEMBLY

Henry F. Murr, Mountville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Dec. 29, 1986, Ser. No. 946,767
Int. Cl.[4] E04C 2/00
U.S. Cl. 52—779 5 Claims



1. A spline structure for use with at least two wallboard structures comprising:

(a) a narrow vertical web member,

(b) horizontal long flanges extending perpendicularly an equal distance either side of the base of the web member,

(c) horizontal short flanges extending perpendicularly an equal distance either side of the web member in the vicinity of the midpoint of the vertical web; and

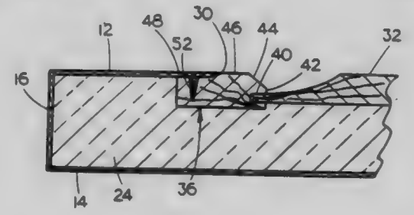
(d) a fabric material covering the sides and end of the narrow vertical web in the area from the short flanges to the end of the web opposite from the end of the web having the long flanges.

4,716,705

NATURAL WOOD SURFACE TREATMENT FOR AN INSULATED DOOR

James L. Formanek, Box 35, and Larry J. Formanek, Rte. 2, Box 126, both of Lindsay, Nebr. 68644

Filed Jun. 30, 1986, Ser. No. 880,198
Int. Cl.[4] E06B 3/72
U.S. Cl. 52—785 8 Claims



1. In a door including a rear panel of a nonwood material, side walls protruding forwardly from the peripheral side edges of the rear panel and thermal insulation material on the front surface of the said rear panel, the improvement comprising,

a plurality of raised panel inserts,

a plurality of natural wood boards, each having interior and exterior edges, and a groove formed in the interior edge thereof adapted for receiving one edge of a raised panel insert, said boards arranged around said panels with the edges of said panels received in the grooves in said boards,

means for securing said boards relative to one another to define a peripheral framework for supporting said raised panel inserts,

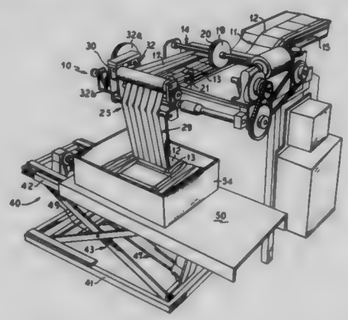
means for securing said boards to said door in spaced relation forwardly of said rear panel such that said boards and raised panel inserts define at least a portion of a front panel for said door, and insulation material between said rear panel and said boards and raised panel inserts.

4,716,706

BAG FOLDING AND PACKAGING APPARATUS

Hugo Boeckmann, Arlington Heights, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation of Ser. No. 552,157, Nov. 15, 1983, abandoned.
This application Aug. 21, 1986, Ser. No. 898,877
Int. Cl.[4] B65B 63/04
U.S. Cl. 53—117 3 Claims



1. An apparatus for stacking a chain of flexible bags in a rectangular carton having a bottom wall, an upstanding laterally opposed pair of sidewalls, and an upstanding longitudinally opposed pair of endwalls, in which each bag is formed in a rectangular shape having an upper edge, a lower edge, and opposite lateral edges with zipper-locking profiles running laterally along such bag near its upper edge to define a reclosable mouth and wherein said bags are connected in the chain one after another at a trailing lateral edge of one and a leading lateral edge of another, comprising, in combination:

a feed conveyor means for continuously laterally conducting said chain to a downstream end thereof,

a discharge conveyor means for continuously receiving said chain from said feed conveyor means and passing said chain generally downward through a guideway, said guideway having a discharge end and being disposed for continuous back and forth pivotal movement by an oscillating means,

said guideway comprising a pair of plates facing across a fixed space from one another, said chain passing along the face of one said plate formed with ridges such that said zipper-locking profiles are guided between adjacent ridges thereof, and said discharge conveyor means comprising movable belt means passing along the face of the other said plate,

a vertically movable support table means having a platform on which said carton is disposed for back and forth reciprocation in the longitudinal direction of said carton underlying said guideway discharge end, a first drive means for raising and lowering said platform, and a second drive means for reciprocating said platform in continuous back and forth motion,

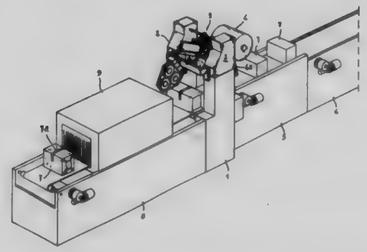
whereby said carton is filled with said chain from said guideway discharge end without any prolonged filling against said carton endwalls, such that said bags are disposed in successive vertical layers of series of laterally directed rows of bags longitudinally offset from one another and the zipper-locking profiles of said bags do not lie directly on top of one another.

4,716,707

APPARATUS FOR SHRINK-WRAPPING ARTICLES WITH HANDLES

Mario Gambetti, Crevalcore, Italy, assignor to "Beumer di Mario Gambetti", Castelfranco Emilia, Italy

Filed Jul. 1, 1986, Ser. No. 881,009
Claims priority, application Italy, Jul. 10, 1985, 3497 A/85
Int. Cl.[4] B65B 6/14
U.S. Cl. 53—134 7 Claims



1. An apparatus for wrapping an article, comprising:

means defining a transport path for a succession of articles to be wrapped;

supply means along said path for feeding a web of heat-shrinkable material into contact with each of said articles at a wrapping station for wrapping said articles with said web so that said web upon wrapping around said article forms an outer surface of a wrapping on each article;

a wheel assembly at said station adjacent to and above said path and tangential to a side of said web forming said outer surface for applying handle lengths to said web so that each length forms a handle for a respective wrapped article;

means for feeding a continuous strip of an adhesive tape to a periphery of said wheel assembly;

means on said wheel assembly for retaining said strip of adhesive tape adjacent said periphery with an adhesive side of said strip of adhesive tape turned outwardly;

means adjacent said wheel assembly for applying to said adhesive side of said strip of adhesive tape on said periphery a masking strip covering said adhesive side at a location spaced from a free end of said strip of adhesive tape so as to form a handle portion on said strip;

means adjacent said wheel assembly for cutting said strip of adhesive tape on said periphery at a location spaced from said handle portion so as to cover a respective handle length from said strip of adhesive tape so that the severed length has adhesive regions on opposite ends thereof and to form a new free end of said continuous strip of adhesive tape on said periphery of said wheel assembly;

means for pressing said web against said wheel assembly so as to bond said adhesive regions to said side of said web and thereby affix each handle length thereto; and

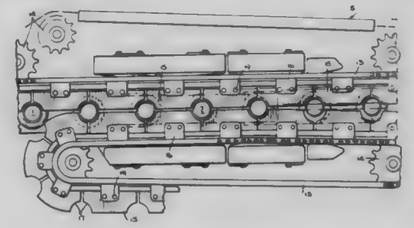
a tunnel furnace along said path downstream of said wheel assembly for shrinking the web wrapping each article therearound.

4,716,708

MEANS FOR SEALING CONTAINERS

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 14, 1986, Ser. No. 852,037
Int. Cl.[4] B65B 7/28
U.S. Cl. 53—314 12 Claims



1. In a straight line sealing plastic machine for sealing jars with caps and having a jar conveyor for carrying jars successively past cap applying and cap sealing means, the improvement comprising:

side belt means with a plurality of pocket means mounted thereon and having cavities adapted for forming interior openings with a shape complimentary to the outside shape of the jars being sealed for substantially fully encapsulating the jars during their sealing.

4,716,709

APPARATUS AND METHOD FOR ROLL WRAPPING WITH POLY-COATED PAPER

Vernon L. Lamb, Sr., and Stanley A. Helmer, both of Sparta, Mich., assignors to Howard City Paper Company, Howard City, Mich.

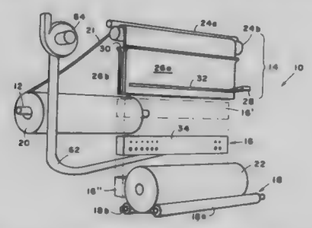
Filed Oct. 6, 1986, Ser. No. 915,730
Int. Cl.[4] B65B 11/04
U.S. Cl. 53—399 9 Claims

1. A method of wrapping a paper roll comprising:

providing a continuous web of roll wrapping material having a thermoplastic coating on one side thereof;

adhering a leading edge portion of said continuous web to the paper roll by grasping the leading edge portion with a heatable bar, heating the thermoplastic above its softening point in the leading edge portion, transporting the grasped leading edge portion into contact with the paper roll, and contacting the softened thermoplastic to the paper roll;

rotating the paper roll to draw the continuous web about the roll;
cutting a roll wrapper from the continuous web, the roll wrapper having a length greater than the circumference of the roll;
adhering a trailing edge portion of the roll wrapper to the



roll wrapper drawn about the paper roll by grasping the trailing edge portion with a heatable bar, heating the thermoplastic above its softening point in the trailing edge portion, transporting the grasped trailing edge portion into contact with the paper roll, and contacting the softened adhesive to the roll wrapper to complete securement of the roll wrapper about the roll.

4,716,710

PROCESS FOR THE PREPARATION IN A SERIES OF SELF-INJECTABLE SYRINGES IN A SEALED CONTAINER, FOR LYOPHILIZED MEDICATIONS, AND DEVICE FOR THE IMPLEMENTATION OF SAID PROCESS

Michel Galy, Pontchara sur Turdine, and Alain Genet, Ecully, both of France, assignors to Institut-Merieux, Lyons, France

Filed Jul. 1, 1986, Ser. No. 880,823
Claims priority, application France, Jul. 1, 1985, 85 10009
Int. Cl.⁴ B65B *31/00*; B67B *3/24*
U.S. Cl. 53—432 **7 Claims**



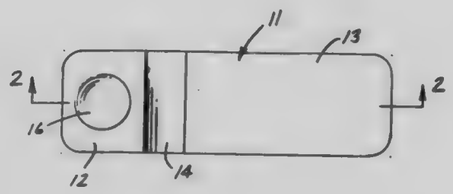
1. Process for the preparation in a series of self-injectable syringes for lyophilized medications, arranged in a sealed tube, each of said syringes comprising a tubular body whose lower end is adapted to accommodate an injection needle and a plunger comprising a shaft, whose lower end is provided with a part having an enlarged section capable of sliding with friction inside said tubular body and whose upper end comprises an enlarged end forming a pusher, said process comprising:
sealing the lower ends of said tubular bodies using movable seal means;
vertically disposing multiple seal tubes on an appropriate support, which holds them so that their upper open ends are essentially at the same level, the said seal tubes being large enough so that they can contain the syringe-plunger assembly;
vertically disposing a syringe body in each seal tube;
maintaining the said syringe body in a manner such that the seal tube and the syringe body which it contains are arranged in an essentially coaxial manner;
introducing a single dose of the medication in solution in a solvent in each tubular body thus arranged;
disposing a plunger suspended by its pusher in each seal tube, above the syringe body, in a movable manner, at the lower end of a stopper which can adapt to said seal tube, so that said plunger is essentially in the axis of the syringe body and the lower end of said plunger is located above the upper end of the syringe body, with said stopper being held in a position so that said seal tube is not blocked or is not entirely blocked, so as to obtain an assembly comprising an open system in which the internal space, in the seal tubes and above said solution in the syringe bodies, communicates with the outside of the system;
introducing said system into a lyophilized device;
effecting a lyophilization operation;
introducing an inert gas into the lyophilization device at a predetermined pressure which is lower than atmospheric pressure;
applying a downward vertical pressure to said stoppers, so that said stoppers completely block the seal tubes while said plungers fastened to said stoppers, are introduced into said tubular bodies until a predetermined maximum insertion position is reached; and subsequently, introducing said inert gas into the lyophilized device until the pressure reaches atmospheric pressure.

4,716,711

APPARATUS FOR CORRELATING WALLETS WITH PROCESSING ENVELOPES IN PHOTOGRAPHIC LABORATORIES

Roberto Signoretto, Venezia, Italy, assignor to Photo Engineering International S.r.l, Italy

Filed Nov. 5, 1986, Ser. No. 927,085
Claims priority, application Italy, Nov. 11, 1985, 84155 A/85
Int. Cl.⁴ B65B *25/14*
U.S. Cl. 53—460 **10 Claims**



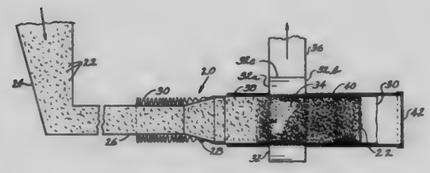
1. A method for correlating wallets with processing envelopes in photographic laboratories, characterised by:
identifying from the number (6) present on each processing envelope (4) the customer from which said envelope originates,
withdrawing from a dispenser (9) a wallet (11) personalised for the customer thus identified,
creating a batch of wallets (11) disposed in the same sequence as the processing envelopes (4) of that batch, and in the finishing station (21), inserting the photographic material (28,29) correesponding to a determined processing envelope (4) into the wallet (11) associated with that processing envelope.

4,716,712

APPARATUS FOR PACKAGING LOOSE FIBROUS MATERIAL

Gurdev S. Gill, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 707,623, Mar. 4, 1985, Pat. No. 4,640,082. This application Nov. 26, 1986, Ser. No. 935,361
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.⁴ B65B *1/20*
U.S. Cl. 53—523 **2 Claims**



1. Apparatus for vacuum-compacting and packaging loose fibrous material within a sleeve of porous material, said apparatus comprising a suction housing having a pair of opposite end walls and an enclosing sidewall, said end walls having a pair of aligned openings respectively therein, a perforated duct extending through the suction housing in spaced relationship to the enclosing sidewall, having inlet and outlet openings aligned respectively with the openings in said end walls, and being formed of material having perforations therein, the perforations being of a size normally preventing passage of fibrous material while allowing passage of air therethrough, means for transitionally disposing a sleeve of porous material in said perforated duct substantially in engagement therewith adjacent said inlet opening, supply means upstream of said inlet opening for supplying loose fibrous material into said sleeve of porous material and accommodating the passage of air to the inlet opening of said perforated duct, and an air exhaust duct communicating with said housing.

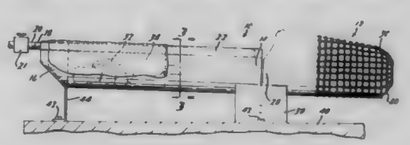
4,716,713

METHOD AND APPARATUS FOR FORMING NETTED MEAT PRODUCTS WRAPPED IN AN EDIBLE COLLAGEN FILM

Gary A. Crevasse, Rochester Hills; David L. Gammon, Rochester, and Michael J. Sullivan, Rochester Hills, all of Mich., assignors to Naturin-Werk Becker & Co., Fed. Rep. of Germany

Division of Ser. No. 724,817, Apr. 18, 1985, Pat. No. 4,621,482. This application Aug. 20, 1986, Ser. No. 898,424
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.⁴ B65B *13/20*
U.S. Cl. 53—530 **20 Claims**

1. An apparatus for netting meat products wrapped in an edible collagen film comprising:
receiving means including an open ended trough portion having at least two upright side walls and a bottom, the side walls being spaced apart a distance less than the width of a sheet of said edible collagen film of sufficient dimension to wrap said meat products deposited in said trough on said sheet, with said trough being of sufficient dimension so that said film can subsequently be wrapped about said meat products in part by placing the sheet across the walls and putting the meat products on the sheet and allowing the weight of the meat products to fall to the trough bottom thereby partially enveloping the meat products with the sheet;
an extrusion means having a first end with a bottom connected to the bottom of said receiving means, and said



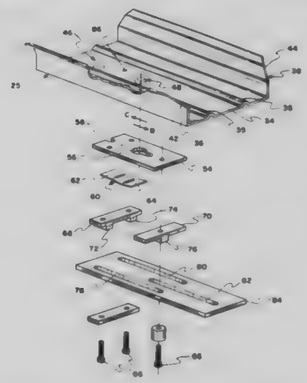
extrusion means further including a second end for receiving said netting into which said wrapped meat products may be extruded; and
lubrication means on upper portions of the trough side walls for lubricating surfaces of said receiving means and said extruding means which contact said sheet during movement of said wrapped meat products into said netting.

4,716,714

APPARATUS WITH REPLACEABLE TRAYS ON AUTOMATIC PACKAGING MACHINES

Steven Tisma, Chicago, Ill., assignor to Tisma Machine Corporation, Chicago, Ill.

Filed Sep. 9, 1986, Ser. No. 905,708
Int. Cl.⁴ B65B *9/00, 47/00*
U.S. Cl. 53—575 **6 Claims**



1. A mandrel for an automatic packaging machine, said mandrel comprising a carriage plate having guide slots formed thereon for enabling a limited longitudinal motion, a support plate mounted on said carriage plate for movement along said guide slots, a tray having physical dimensions corresponding the physical dimensions of an object to be carried by said tray, interconnector means for joining said tray to said support plate in response to a sliding motion, leaf spring means for locking said tray to said support plate at the end of said sliding motion, and means formed in said tray for moving said leaf spring to unlock said tray from said carriage plate.

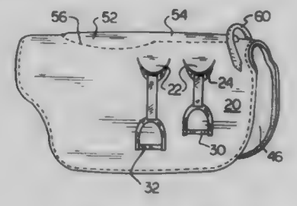
VOL 1086 ISS 1 JA 5 1988 UMI

4,716,715

TEACHING SADDLE

Naomi H. Johnson, Rte. 3, Box 143-A, Raeford, N.C. 28376

Filed Sep. 2, 1986, Ser. No. 902,494
Int. Cl.[4] B68C *1/02*
U.S. Cl. 54—44 **5 Claims**



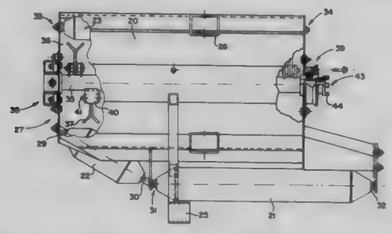
1. An extra-long treeless saddle designed for two persons riding in tandem; said saddle including:
(a) a rear primary seat portion and a forward auxiliary seat portion;
(b) a first pair of stirrups associated with the sides of said auxiliary seat portion and a second pair of stirrups associated with said primary seat portion, i.e., forward rider uses first pair of stirrups and rear rider uses second pair of stirrups;
(c) a layered construction having a first, underlayer forming support pad of prescribed thickness, and a second, outer layer forming a skirt; and
(d) an inner cushion member secured between said skirt and said underlayer, and underlying said primary and auxiliary seat portions; said cushion member being formed of a material having thickness and resilience sufficient to cushion and protect the riders;
whereby a parent and child, instructor and student, handicapped rider and back-rider, or any combination of two riders may ride in tandem in comfort and safety without use of seats secondarily attached to a conventional saddle.

4,716,716

WORK HEAD

Kevin A. Favier, and Allan G. Favier, both of 11 Mountain View Dr., Atherton, both of Australia (QLD 4883)

PCT No. PCT/AU85/00290, § 371 Date Aug. 25, 1986, § 102(e) Date Aug. 25, 1986, PCT Pub. No. WO86/03090, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 25, 1985, Ser. No. 912,604
Claims priority, application Australia, Nov. 23, 1984, PG8271
Int. Cl.[4] A01D *34/86, 34/43*
U.S. Cl. 56—10.7 **8 Claims**



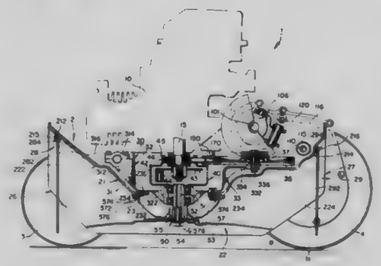
1. A work head for mounting on a boom (15) comprising a supporting housing (20) having bracket means (24, 26) thereon for attachment to the boom (15), forward roller means (21) for rolling movement in operation over the ground beneath, said forward roller means (21) being disposed on a horizontal axis extending perpendicularly of the line of forward motion of said work head extending along the leading edge of said work head, rearward roller means (23) for rolling movement in operation over the ground beneath being disposed on a horizontal axis extending perpendicularly of the line of forward motion of said work head extending along the trailing edge of said work head, and an outer roller means (22) for rolling movement in operation over the ground beneath being disposed on a horizontal axis outwardly of the supporting housing the sense of the boom side being oriented inwardly, said axis being angularly disposed relative to the axes of the forward (21) and trailing (23) roller means, said forward roller means (21) and said outer roller means (22) being disposed end to end across the leading edge of the work head, each of said forward (21), trailing (23) and outer (22) roller means being cylindrical bodies with conically shaped end pieces leading to shafts providing for their axial rolling support.

4,716,717

POWER LAWN MOWER

Takeo Ogano; Yoshihiro Toda; Masato Mukainakano, and Mikio Shoji, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 828,232
Claims priority, application Japan, Feb. 8, 1985, 60-16919[U]; Feb. 8, 1985, 60-23120
Int. Cl.[4] A01D *69/08*
U.S. Cl. 56—255 **3 Claims**



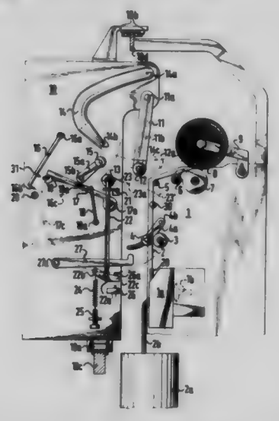
1. A power lawn mower for mowing lawns and cutting vegetation comprising:
a carriage having a top deck and side walls;
a pair of front wheels;
a pair of rear wheels having a corresponding pair of wheel axle shafts;
a cutting mechanism having a rotary cutting element;
a prime mover mounted on the top deck of said carriage and having an output shaft drivingly connected to said cutting element to rotate the same; and
a rear wheel drive mechanism for transmitting driving power of said prime mover to said rear wheels and including at least one drive shaft;
said carriage including front and rear openings;
said front wheels being independently supported on the front portion of said carriage;
said rear wheels being independently supported on the rear portion of said carriage;
said drive shaft being located above and forwardly of said wheel axle shafts; and
said side walls of the carriage have forwardly and upwardly inclined ends and rearwardly and upwardly inclined ends respectively and said top deck has a forwardly and upwardly inclined portion and a rearwardly and upwardly inclined portion.

4,716,718

OPEN-END ROTOR SPINNING MACHINE

Heinz-Dieter Göbels, Moenchengladbach; Manfred Lassmann, Nettetal; Hans Raasch, and Norbert Schippers, both of Moenchengladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,394
Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515765
Int. Cl.[4] D01H *15/02, 13/16*
U.S. Cl. 57—263 **6 Claims**



1. Open-end rotor spinning machine, comprising a plurality of spinning stations each including a first thread monitor monitoring a thread course and a rotor spinning device receiving a fiber supply and having a spinning element; an automatic thread joining device for joining a thread to be conducted to the rotor element, and a second thread monitor disposed on said automatic thread joining device for monitoring the thread course without placing a load on the thread when said first thread monitor is inoperative and said automatic thread joining device is operative, said automatic device including means for delivering said second thread monitor and a thread to a location directly adjacent said spinning element, and said second thread monitor including means for immediately interrupting fiber supply to said rotor spinning device if said second third monitor detects the absence of the thread.

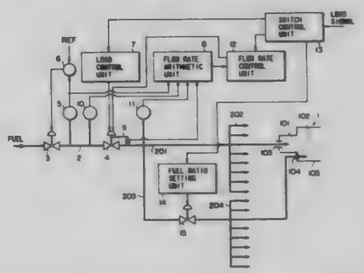
4,716,719

METHOD OF AND APPARATUS FOR CONTROLLING FUEL OF GAS TURBINE

Koji Takahashi; Tsunemasa Nishijima, and Seisaku Takibana, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,820
Claims priority, application Japan, Apr. 17, 1985, 60-80186
Int. Cl.[4] F02C *9/28*
U.S. Cl. 60—39.06 **11 Claims**

10. A method of controlling fuel gas fed to a gas turbine provided with a two stage combustion type combustor having a primary fuel nozzle for supplying a fuel gas to a primary combustion zone of said combustor, a secondary fuel nozzle for supplying a fuel gas into a secondary combustion zone of said combustor, and a fuel control valve provided on a fuel line from which primary and secondary fuel lines branch off downstream of said fuel control valve, said primary fuel line leading to said primary fuel nozzles and said second fuel line to said secondary fuel nozzles, the method comprising the steps of:
supplying a fuel gas into said combustor only through said primary fuel nozzle through said fuel control valve while controlling said fuel control valve in accordance with a load control signal so as to operate said gas turbine under a load schedule during a low load operation;
measuring a flow rate of the fuel gas to the combustor through said fuel control valve to generate a signal related to the measured flow rate value;
generating switching instruction signals when said turbine reaches a predetermined load;
controlling the flow rate of the fuel gas to said combustor by taking, as a reference flow rate, a measured flow rate at a time when the predetermined load is reached, comparing successively measured fuel flow rates in the measuring step with the reference flow rate and actuating said fuel control valve so that a difference between the reference



flow rate and the successively measured fuel flow rates is a scheduled value;
switching fuel supply to said combustor from only through said primary fuel nozzle to both said primary and secondary fuel nozzles by controlling a switching valve provided on said secondary fuel line so that a ratio between a flow rate of fuel gas in said primary fuel line and a flow rate of fuel gas in said secondary fuel line will be a predetermined value while controlling said fuel control valve based on said measured flow rate; and
controlling the flow rate of the fuel gas to said combustor according to the low control signal after a termination of the fuel supply switching so as to operate said turbine on the load schedule.

4,716,720

COMBUSTION ENGINE WITH EXTERIOR COMBUSTION CHAMBER

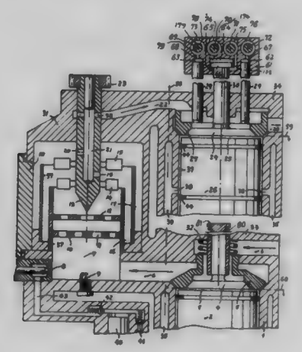
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 522,999, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 184,687, Sep. 8, 1980, abandoned. This application Feb. 10, 1986, Ser. No. 828,116
Int. Cl.[4] F02G *3/02*
U.S. Cl. 60—39.6 **12 Claims**

1. A combustion engine, comprising, in combination,
a compression chamber having inlet means, a combustion chamber provided with with fuel supply means and ignition means, an expansion chamber with inlet and outlet means, at least one passage from said compression chamber to said combustion chamber and from said combustion chamber to said expansion chamber, movable members in said compression and expansion chambers which expand and reduce the volumes of said chambers in periodic cycles, said expansion chamber provided with at least two valves with said two valves having extensions which individually extend outwards from said valves through a respective chamber head wherein they are guided, said valves controlled by respective control devices in suitable timed relation respective to the respective expansion and exhaust of said expansion chamber and thereby in relation to the movements and positions of said moveable member in said expansion chamber, said inlet means of said com-

pression chamber provided by an inlet valve and said compression chamber provided with an outlet valve between said compression chamber and said passage from said compression chamber to said combustion chamber, said valves of said compression chamber having coinciding longitudinal medial axes for reciprocal movements along said coinciding axes, said fuel supply means connected to said combustion chamber, said valves of said expansion chamber having coinciding axes and individual valve stems, said extensions subjected to actions of said control device, said valve stems including at least two valve stems with parallel axes which are laterally distanced from said coinciding axes, and the inlet valve of said expansion chamber located radially inside of the outlet valve of said expansion chamber at times when said valves of said expansion chamber are closed while said outlet valve of said expansion chamber has a seat on said expansion chamber and said inlet valve of said expansion chamber has a seat in said outlet valve of said expansion chamber,

wherein said at least two valve stems are provided on said outlet valve of said combustion chamber and subjected temporarily at said periodic cycles to a thrusting arrangement to press said outlet valve onto said seat on said expansion chamber, and,



wherein the stem of said inlet valve of said expansion chamber is provided with a stem head which has an inner and an outer face with said faces subjected to oppositely directed forces of said control means at respective times of said periodic cycles to alternatingly press said inlet valve into said seat in said outlet valve of said expansion chamber and to press said inlet valve away from said seat in said outlet valve to open the inlet of said expansion chamber, said outlet valve of said expansion chamber leaves said seat of said expansion chamber and opens the outlet of said expansion chamber when said thrusting arrangement prevents pressing of said outlet valve against said valve seat in said expansion chamber.

10. The engine of claim 1,

wherein control valve means are provided to control the inlets, outlets and passages of said expansion chambers in a proper relation to provide, that at constant pressure combustion in said combustion chamber the delivery volume of said compression chamber to said combustion chamber remains considerably less than the expansion volume of said expansion chamber taken from said combustion chamber,

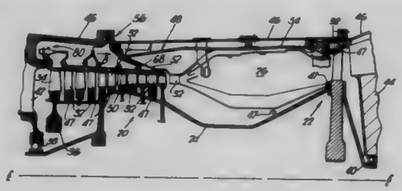
whereby said expansion chamber provides a higher power than said compression chamber consumes at a respective cycle and time.

4,716,721

IMPROVEMENTS IN OR RELATING TO GAS TURBINE ENGINES

George Pask, and Peter A. Shaw, both of Derby, England, assignors to Rolls-Royce plc, London, England

Filed Nov. 13, 1985, Ser. No. 797,805
Claims priority, application United Kingdom, Dec. 8, 1984, 8431059
Int. Cl.[4] F02C 7/20; F02G 3/00
U.S. Cl. 60—39.32 12 Claims



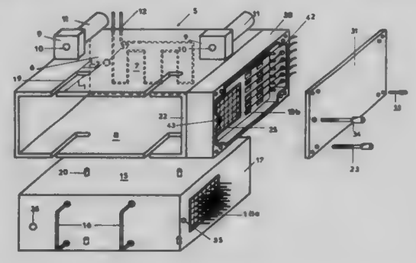
1 A gas turbine engine having an outer casing, and an inner casing containing at least in part an arrangement of stator vanes and rotor blades, the stator vanes being attached to the inner casing, and the rotor blades attached to a shaft mounted in bearings, the inner casing being mounted within the outer casing by means of load transmitting and isolating structure including a mounting means adjacent each end of the inner casing, the mounting means locating the inner and outer casings concentrically with one another and allowing relative axial movement with one another, said mounting means comprising torque reacting means located between the inner and outer casings to allow torque to be transmitted to the outer casing, and thrust reacting means positioned between the ends of the inner casing to allow thrust induced on the inner casing to be transmitted to the outer casing with the load-transmitting and isolating structure minimizing the transmission of loads from the outer casing to the inner casing, said mounting means at at least one end of the inner casing comprising a cylindrical sleeve attached to the outer casing and a cylindrical surface of the inner casing engaging with the sleeve of the outer casing, allowing relative axial movement between the inner and outer casings.

4,716,722

AIRCRAFT TURBO-JET ENGINE COMPUTER CARRIER

Daniel Rambach, Paris, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, France

Filed Aug. 12, 1986, Ser. No. 895,867
Claims priority, application France, Aug. 14, 1985, 85 12367
Int. Cl.[4] F02C 7/00, 7/12
U.S. Cl. 60—39.83 12 Claims



1. In an assembly of an electronic computer apparatus and a carrier therefor

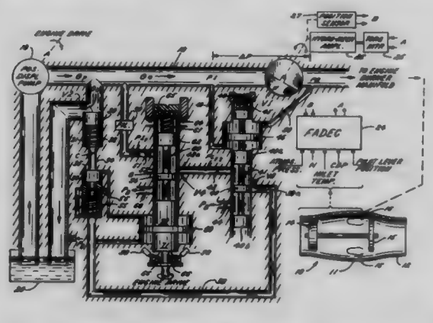
a computer apparatus casing comprising
at least one side wall
a front wall,
a rear wall,
an upper wall and,
a lower wall
electrical connector means mounted on said side wall,
coupling means by which the carrier can be coupled to the computer apparatus,
said carrier comprising
a rear wall,
at least one side wall,
an upper wall,
a lower wall,
electrical connector means mounted on said side wall corresponding to the side wall of the computer apparatus on which the corresponding connector means is mounted, and
coupling means carried by one of said upper wall and one of said lower wall and said rear wall and arranged to couple the carrier and the computer apparatus, the coupling means of the carrier including
a first part enabling coupling motion of the computer apparatus to the carrier in a direction from the front to the rear of the carrier until the connector means of the computer apparatus are aligned with the connector means of the carrier, and
a second part enabling coupling motion of the computer apparatus in a direction orthogonal to the motion permitted by the first part until the connector means of the computer apparatus and of the carrier are in operative relationship.

4,716,723

FUEL CONTROLS FOR GAS TURBINE ENGINES

Russell B. Ralston, Loves Park, and Daniel J. McLevige, Davis, both of Ill., assignors to Woodward Governor Company, Rockford, Ill.

Filed Sep. 5, 1986, Ser. No. 904,720
Int. Cl.[4] F02C 9/28
U.S. Cl. 60—39.281 5 Claims



1. In a system for controlling the rate of fuel fed to the burners of a gas turbine engine, the combination comprising
(a) a positive displacement pump driven by the engine and supplying fuel from a source to a main conduit,
(b) a main valve disposed between said main conduit and the burners of the engine,
(c) a variable opening area bypass valve connected between said main conduit and said source to return fuel to the latter,
(d) hydraulic actuator means responsive to the admission of pressurized fluid, or the venting of fluid, for respectively closing and opening said bypass valve,
(e) a first valve having a controlled port connected to said hydraulic actuator means (d) to provide a path for the admission of pressure fluid through an input line or the venting of fluid,
(f) a second valve having a controlled port to supply pressure fluid to or vent fluid from said input line of said first valve,
(g) means for causing said first valve (i) to connect its controlled port to said input line when the pressure drop ΔP across said main valve is less than a set point value ΔP_d, and (ii) to connect its controlled port to a low pressure sump when said pressure drop ΔP is greater than the set point ΔP_d,
(h) means for causing said second valve (i) to connect its controlled port to a fluid pressure source when the engine speed N is less than a set point value N_{co}, and (ii) to connect its controlled port to a low pressure sump when said speed N is greater than the set point N_{co},

whereby said bypass valve is moved in an opening sense to decrease fuel flow to the burners for a given position of said main valve when

$$\Delta P > \Delta P_d \quad (1)$$

or

$$\Delta P \leq \Delta P_d \text{ and } N > N_{co} \quad (2)$$

and said bypass valve is moved in a closing sense to increase fuel flow to the burners for a given position of said main valve when

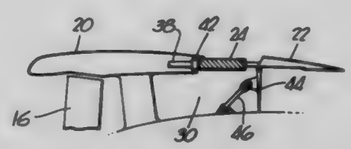
$$\Delta P < \Delta P_d \text{ and } N < N_{co}.$$

4,716,724

GAS TURBINE ENGINE POWERPLANT WITH FLOW CONTROL DEVICES

Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 3, 1987, Ser. No. 10,493
Claims priority, application United Kingdom, Apr. 25, 1986, 8610180
Int. Cl.[4] F02K 3/02
U.S. Cl. 60—226.2 3 Claims



1. A gas turbine engine powerplant including a streamlined casing, a portion of which is translatable axially of the powerplant and the fixed remainder of which contains translatable reverser cascade means and common means for moving both the translatable portion through a first predetermined distance to open a gap of a selected axial dimension in the streamlined casing without moving said translatable reverser cascades and for moving both said portion and said translatable cascades through a second selected distance so as to enlarge said gap, said common means comprising ram mechanisms which are equi-angularly spaced around the interior of said streamlined casing, and connected via rods in series with said translatable cascades and said translatable portion and including lost motion means so as to initially enable translation of said portion without translating said cascades as said portion is moved through said first distance to open said gap, said lost motion means comprising ram rods passing through said cascades in close sliding relationship, said ram rods having free ends fixed to the upstream end of said translatable portion, each said ram

rod having a fixed collar thereon in spaced relationship with and upstream of a respective cascade a distance equal to said selected first distance.

4,716,725

APPARATUS FOR BURNING SOLID PARTICLES IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

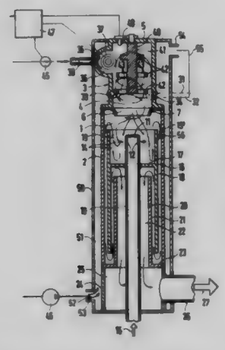
Hubert Dettling, Weilbingen; Rolf Leonhard, Schwieberdingen, and Ulrich Projahn, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 30,191

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621914

Int. Cl.⁴ F01N *3/26*

U.S. Cl. 60—303 **23 Claims**



1. An apparatus for burning solid particles, in particular soot particles, in an exhaust gas of internal combustion engines, which comprises: a cylindrical jacket (2), an ignition burner (3) in axial alignment with said cylindrical jacket, a first combustion chamber (1) in said cylindrical jacket, a plunger tube (10) associated with a second combustion chamber (19) and through which an exhaust gas flow (15) laden with soot particles (14) arranged to be introduced into said second combustion chamber and from which a product of combustion (27) is diverted, a fuel mixture preparation chamber (4) in said ignition burner (3), an overflow opening (6) extending from said preparation chamber (4) to said first combustion chamber, an axially aligned rotationally symmetrical glow element (40) and an ignition device (37) in said ignition burner, a fuel supply line (30) for supplying liquid fuel into said ignition burner, and air supply lines 31 and 32 for supplying combustion air into the preparation chamber to form fuel-air mixture, said ignition device being off-set eccentrically and separately from said axially aligned glow element disposed in said preparation chamber, said glow element having surface faces that orient said fuel-air mixture and a flame formed by said ignition device toward said overflow opening and into said first and second combustion chambers.

4,716,726

ADJUSTABLE ROTARY VANE PUMP

David J. Nowaczyk, 3024 W. 40 Pl., Chicago, Ill. 60632

Filed Mar. 12, 1986, Ser. No. 838,774

Int. Cl.⁴ F16D *39/00*

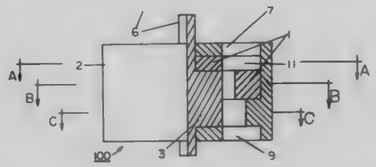
U.S. Cl. 60—487 **5 Claims**

1. An adjustable rotary vane pump or motor device for changing the direction and rate of fluid flow therethrough, said device comprising, in combination:

a first pump housing having a first chamber therein extending along a central axis of said housing said first housing having an inlet and an outlet respectively opening into said chamber;

a second pump housing mounted adjacent said first housing and having a second chamber therein extending along said axis and being generally coaxial with said first chamber;

an insert member received within and slidably mounted in said second chamber for rotational movement about said axis, said insert member having an aperture therein and extending therethrough along said axis and wherein the cross section of said aperture is of a predetermined irregular shape;



a rotor coaxially mounted in said housings and extending through said aperture and said first chamber;

a first plurality of vanes mounted on the portion of said rotor extending through said first chamber and extending radially away from said axis for engaging the wall portions of said first chamber; and

a second plurality of vanes mounted on the portion of said rotor which extends through said aperture for engaging the wall portions of said aperture.

4,716,727

HYDRAULIC DEVICE

Wolfgang Kötter, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

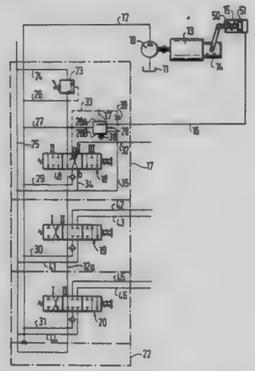
PCT No. PCT/DE85/00419, § 371 Date Apr. 7, 1986, § 102(e) Date Apr. 7, 1986, PCT Pub. No. WO86/03264, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 28, 1985, Ser. No. 882,922

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443354

Int. Cl.⁴ F15B *11/16*

U.S. Cl. 60—423 **5 Claims**



1. A hydraulic device, comprising a pump (10); a motor (13) arranged to drive said pump; a regulator (14) arranged to set a speed of said motor; a pressure medium actuated adjusting cylinder-piston unit (15) arranged to adjust said regulator (14); a line (16) through which said adjusting cylinder-piston unit adjusts said regulator; a plurality of wayvalves (18, 19, 20) through which a plurality of consumers are supplied by said pump (10), said adjusting cylinder-piston unit being arranged to adjust said regulator (14) so that a speed of said motor (13) and thereby an amount fed by said pump (10) is just as large as required by the consumers which are supplied by said pump (10) through said wayvalves (18, 19, 20); and a pressure control valve (28) which generates a pressure in said line (16), said pressure control valve being formed so that during actuating a customary one of said wayvalves (19, 20) for one consumer said pressure control valve (28) generates a constant pressure, and during actuating of a particular one of said wayvalves (18) for another consumer, the particular wayvalve (18) provided with an adjustable throttle edge (48), said pressure control valve (28) generates an increasing pressure which is proportional to a slide deflection.

4,716,728

HYDRAULIC DRIVE SYSTEM FOR COUNTERWEIGHT DOLLY IN COUNTERBALANCE TYPE CRANE

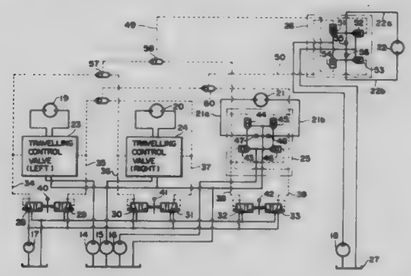
Mitsuo Kakeya, Hyogo, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 7, 1986, Ser. No. 927,863

Claims priority, application Japan, Feb. 3, 1986, 61-14170[U]

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—426 **5 Claims**



1. A hydraulic drive system for a counterweight dolly, having a plurality of wheels, in a counterbalance type crane having a crane body provided with a lower travelling structure and an upper swivelling structure wherein the counterweight dolly is connected to the rear portion of the upper swivelling structure through a connecting member, comprising:

a swivelling hydraulic motor for swivelling the upper swivelling structure of the crane body;

a swivelling control valve in communication with said swivelling hydraulic motor for controlling the pressure of hydraulic oil to be fed to said swivelling hydraulic motor;

a hydraulic circuit in communication with said swivelling control valve for swivelling operation which controls the amount of operation of said swivelling control valve;

a hydraulic motor connected to said counterweight dolly which drives each of said plurality of wheels of the dolly;

a dolly control valve in communication with said hydraulic motor for controlling the pressure of hydraulic oil to be fed to said hydraulic motor for the countereweight dolly; and

a control circuit in communication with said dolly control valve for actuating said dolly control valve in accordance with an operational pressure of said hydraulic circuit for swivelling operation and for controlling a driving pressure for said hydraulic motor for the dolly under a pressure proportional to the driving pressure for said swivelling hydraulic motor.

4,716,729

HYDRAULIC DRIVE SYSTEM FOR A COUNTERWEIGHT DOLLY IN COUNTERBALANCE TYPE CRANE

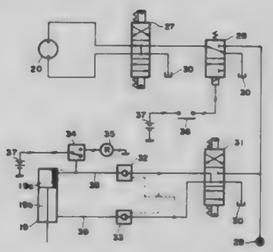
Mitsuo Kakeya, Hyogo, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 7, 1986, Ser. No. 928,032

Claims priority, application Japan, Jan. 27, 1986, 61-15480; Jan. 27, 1986, 61-15481

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—426 **5 Claims**



1. A hydraulic drive system for a counterweight dolly in a counterbalance type crane, including:

dolly driving wheels vertically movably supported through wheel supporting hydraulic cylinders at the lower portion of the counterweight dolly which is connected to the rear portion of a crane body;

a wheel driving hydraulic motor connected to each of said wheels;

support pressure detecting means for detecting a support pressure of each of said wheel supporting hydraulic cylinders, said support pressure detecting means being provided in a drive circuit for the cylinders; and

means for controlling the driving pressure for said wheel driving hydraulic motor in accordance with a detected value generated from said detecting means.

4,716,730

HYDROSTATIC DRIVE

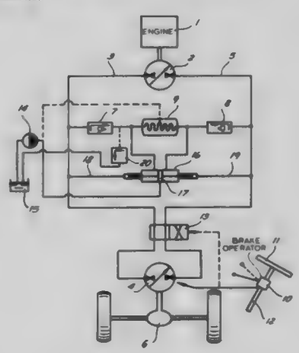
Faust Hagin, Munich; Stefan Martini, Ulm, and Hans J. Drewitz, Munich, all of Fed. Rep. of Germany, assignors to M A N Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,243

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1955, 3508886; Nov. 7, 1985, 3539561

Int. Cl.⁴ F16D *1/02, 39/00*

U.S. Cl. 60—456 **4 Claims**



1. A hydrostatic drive comprising:

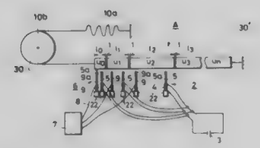
a first hydrostatic machine having two ports and being capable of operating as a pump,
a second hydrostatic machine having two ports and being capable of operating as a motor or as a pump,
a first duct interconnecting one port of the first hydrostatic machine to one port of the second hydrostatic machine,
a second duct interconnecting the other port of the first machine to the other port of the second machine,
a cooler having two ports,
a first threshold pressure valve between the first duct and one port of the cooler,
a second threshold pressure valve between the second duct and the other port of the cooler,
each threshold pressure valve allowing free flow of fluid from the cooler to its respective duct, but permitting flow of liquid from its respective duct to the cooler only when the pressure differential across the valve exceeds a predetermined value,
a brake operating device,
means responsive to actuation of the brake operating device to cause the second hydrostatic machine to operate as a pump for braking,
a fluid supply, and
a feed pump for delivering fluid from the supply to a point between the two threshold pressure valves.

4,716,731

ACTUATOR OF SHAPE MEMORY EFFECT MATERIAL

Toshikazu Saka, Kawasaki, and Makoto Higomura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,698
Claims priority, application Japan, Aug. 16, 1985, 60-179263
Int. Cl.⁴ F03G *7/06*
U.S. Cl. 60—527 **16 Claims**



1. An actuator, comprising:
a plurality of materials having a shape memory effect;
a heat insulator member; and
heating means for providing said plurality of materials with heat, wherein said plurality of materials having a shape memory effect disposed with said heat insulator member interposed therebetween, and said plurality of materials and said insulator member are joined together.

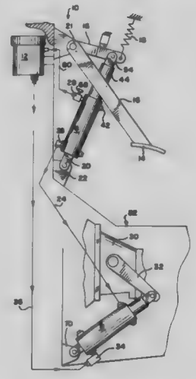
4,716,732

VEHICLE HYDRAULIC ACTUATING SYSTEM

Robert L. Tordoff, Huntertown, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed May 10, 1985, Ser. No. 733,561
Int. Cl.⁴ B60T *11/30*
U.S. Cl. 60—584 **8 Claims**

1. A hydraulic actuating system for a mechanical element comprising:
a single-acting master cylinder having a ram and at least one cylinder port at a first elevation, said master cylinder ram being biased in a first direction;
acturator means for moving said master cylinder ram in a second direction opposite said first direction and generating fluid pressure in said master cylinder;
a single-acting slave cylinder with at least one cylinder port at a second lower elevation, said slave cylinder having fluid communication with said master cylinder and said slave cylinder controlling said mechanical element; and
a fluid reservoir having selective fluid communication with said cylinder port of said first elevation for bleeding said hydraulic actuating system, said reservoir having automatic fluid communication with said cylinder port of said second lower elevation when the fluid pressure within said cylinder port of said second lower elevation is at least



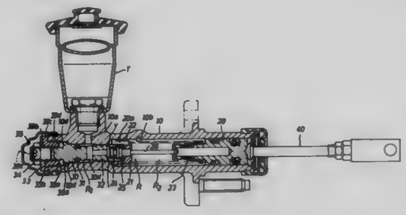
zero but below a predetermined value and no fluid communication when the fluid pressure within said cylinder port of said second lower elevation is greater than said predetermined value and further comprising a spring biased check valve disposed between said cylinder port of said second lower elevation and said reservoir and disposed to prevent flow from said slave cylinder ot said reservoir upon said slave cylinder being pressurized while being biased to permit flow when said slave cylinder is unpressurized.

4,716,733

CLUTCH MASTER CYLINDER

Masami Sugihara; Osamu Ogura, both of Kariya; Hajime Arai, and Satoru Maruyamano, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,313
Claims priority, application Japan, Jul. 27, 1984, 59-115411[U]
Int. Cl.⁴ B60T *11/28*
U.S. Cl. 60—589 **6 Claims**



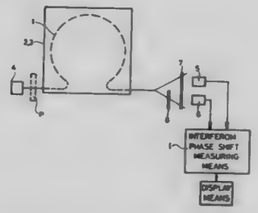
1. A clutch master cylinder for use in a clutch release mechanism, comprising:
a master cylinder body provided thereon with a fluid reservoir tank and therein with an inlet port in communication with said reservoir tank and an outlet port for connection to a slave cylinder in said clutch release mechanism;
a piston axially slidably disposed within said cylinder body and arranged to be moved inward by a push-rod;
a valve seat arranged between said inlet and outlet ports within said cylinder body to permit fluid flow passing therethrough;
a valve body associated with said piston to cooperate with said valve seat in response to inward movement of said piston so as to interrupt the communication between said inlet and outlet ports; and
an adjusting plug disposed within said cylinder body to adjust an axial space between said valve seat and said valve body and being fastened in its adjusted position to maintain the axial space in an adjusted amount;
wherein a fixed plug is mounted on said cylinder body to support an outer end portion of said adjusting plug, and wherein the outer end portion of said adjusting plug is adjustably threaded into said fixed plug and fastened in place by a lock nut threaded thereon, said adjusting plug being provided at an intermediate portion thereof with an annular flange engageable with the inner end of said fixed plug to restrict outward movement of said adjusting plug and engageable with an inner wall of said cylinder body to restrict inward movement of said adjusting plug.

4,716,734

INTERNAL COMBUSTION ENGINE EQUIPPED WITH A SUPERCHARGER AND AN IDLING SPEED CONTROL SYSTEM

Masami Nakao, Hiroshima; Masato Iwaki, Higashihiroshima; Hiroshi Kinoshita, and Ikuo Okamoto, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Aki, Japan

Filed May 30, 1986, Ser. No. 868,600
Claims priority, application Japan, Jun. 1, 1985, 60-83303[U]
Int. Cl.⁴ F02B *33/44*
U.S. Cl. 60—599 **12 Claims**



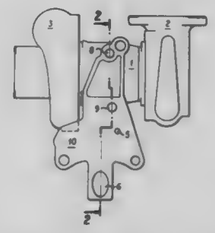
1. An internal combustion engine equipped with a supercharger and an idling speed control system comprising,
a combustion chamber formed in an engine body and provided with an exhaust passage elongating therefrom,
an inlet passage for guiding intake air to said combustion chamber, said inlet passage being provided with the supercharger for compressing the intake air therein,
a throttle valve provided at a downstream portion of said inlet passage compared with said supercharger for controlling intake air mass flow supplied to said combustion chamber,
an intercooler provided at the downstream portion of said inlet passage compared with said supercharger for cooling the intake air compressed by said supercharger,
a bypass passage provided to said inlet passage for detouring said throttle valve, said bypass passage having one end thereof connected with a portion of said inlet passage between said supercharger and said intercooler and the other end thereof connected with another portion of said inlet passage downstream from said intercooler, and
an air flow control valve for adjusting intake air mass flow supplied through said bypass passage to said combustion chamber
start detecting means for detecting a start of the engine by detecting a cranking condition of the engine, and
valve control means for controlling said air flow control valve to supply a predetermined air mass flow to the combustion chamber when the start of the engine is detected by said start detecting means.

4,716,735

EXHAUST GAS TURBO-SUPERCHARGER FOR A VEHICLE ENGINE

Max Ruf, Oberelsenheim, and Erwin Korosteuski, Ostheim, both of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,616
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532695
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—605.3 **3 Claims**



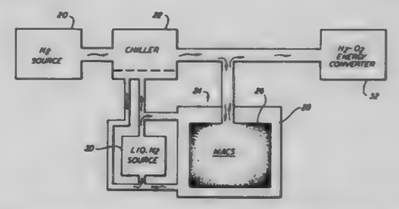
1. A motor vehicle driven by an internal combustion engine with an exhaust supercharger, said engine being connected via engine mountings to a vehicle chassis and including lubricant and coolant circuits, said supercharger comprising:
an exhaust gas turbine mounted in a turbine housing;
a compressor mounted in a compressor housing and driven by said turbine through a shaft; and
a bearing housing between and connected to said turbine and compressor housings supporting said shaft and comprising lubricant and coolant passage means, wherein said bearing housing is connected on one side to the vehicle chassis and on another side to the engine and has an abutment surface abutting against a surface of the engine, said lubricant and coolant passage means opening onto the abutment surface for communication with the lubricant and coolant circuits of the engine.

4,716,736

METAL ASSISTED CARBON COLD STORAGE OF HYDROGEN

James A. Schwarz, Fayetteville, N.Y., assignor to Syracuse University, Syracuse, N.Y.

Filed Jan. 17, 1986, Ser. No. 819,844
Int. Cl.⁴ F17C *11/00*
U.S. Cl. 62—48 **29 Claims**



1. A method of storing hydrogen by sorption on a composite

formed of carbon and a transition metal, comprising the steps of

contacting gaseous hydrogen with a storage medium formed of high surface area activated carbon combined with an active transition metal in elemental form capable of dissociating the hydrogen,

physisorbing the hydrogen on the storage medium, and

storing the sorbed hydrogen by maintaining the pressure at or above one bar and maintaining the temperature of the medium in a cold temperature range below 293 K.

4,716,737

APPARATUS AND PROCESS FOR VAPORIZING A LIQUIFIED HYDROCARBON

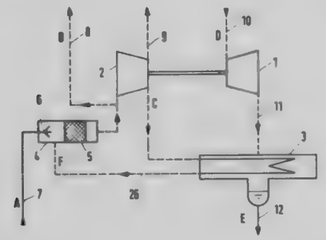
Charles Maudrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 17, 1987, Ser. No. 26,665

Claims priority, application Switzerland, Mar. 20, 1986, 01115/86

Int. Cl.⁴ F17C *7/02*

U.S. Cl. 62—52 **19 Claims**



1. An apparatus for vaporizing a liquified hydrocarbon, said apparatus comprising

a first heat exchanger;

a conduit for delivering a flow of liquified hydrocarbon into said heat exchanger;

first means for delivering a vaporized flow of the hydrocarbon into said heat exchanger;

second means in said heat exchanger for mixing the delivered flows of liquified hydrocarbon and vaporized hydrocarbon to vaporize the liquified hydrocarbon;

a compressor connected to said heat exchanger to receive and compress a vaporized flow of hydrocarbon therefrom; and

heating means connected to and between said compressor and said first heat exchanger for heating a flow of compressed hydrocarbon from said compressor for recycling to said first heat exchanger.

4,716,738

APPARATUS AND METHOD FOR DELIVERING CRYOGENIC LIQUID FROM A SUPPLY VESSEL TO RECEIVER VESSELS

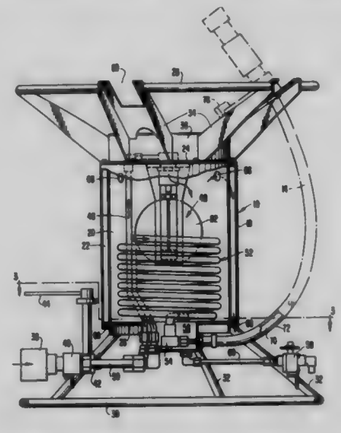
Robert J. Tatge, Palos Verdes Estates, and Thomas E. Pfenning, Newport Beach, both of Calif., assignors to CV International, Inc., Torrance, Calif.

Filed Aug. 4, 1986, Ser. No. 892,853

Int. Cl.⁴ F17C *7/02*

U.S. Cl. 62—55 **11 Claims**

1. Apparatus for transferring cryogenic liquid from a supply vessel to a receiver vessel, comprising a double-wall tank defining an inner chamber surrounded by an annular space, inlet means for receiving cryogenic liquid from said supply vessel, means connected to said inlet means for transferring cryogen to said chamber, said annular space communicating with said chamber at an upper region and communicating with the atmosphere at a lower region, whereby cryogenic vapor may vent continuously from said chamber through said annular space to the atmosphere, a heat exchanger disposed in said chamber to transfer heat to cryogenic liquid in said chamber, means connected to said inlet means for transferring cryogenic liquid to said heat exchanger, and at least one delivery hose



having one end connected to said heat exchanger for receiving cooled cryogenic liquid therefrom and having a coupling at an opposite end for deliverying the cooled liquid to the receiver vessel.

4,716,739

CARRIAGE OF COMESTIBLES AND IN PARTICULAR TO CONTAINERS AND RELATED MEANS AND METHODS SUITABLE FOR SUCH PURPOSES

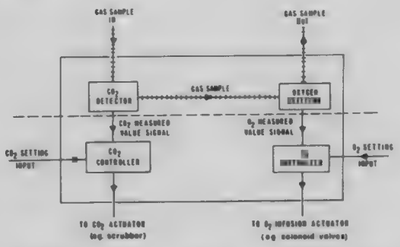
Samuel Harris, Takapuna, and John R. Lovegrove, Remuera, both of New Zealand, assignors to The 501 Shipping Corporation of New Zealand, New Zealand

Division of Ser. No. 811,704, Dec. 20, 1985, Pat. No. 4,642,996, which is a continuation of Ser. No. 641,537, Aug. 16, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,632

Claims priority, application New Zealand, Sep. 1, 1983, 205453; Aug. 13, 1984, 205453

Int. Cl.⁴ F24F *3/16*

U.S. Cl. 62—78 **7 Claims**



1. A shipping container adapted for having a quantity of respiring comestibles selected from plants, fruit and vegetables disposed and sealed therein sufficient to insure that less oxygen from the ambient air can diffuse into the container than is required for respiration by said quantity and sufficient to insure a production of carbon dioxide by said quantity than can diffuse from the container,

means to monitor the temperature of the environment within said container,

means to monitor oxygen content within said container,

means to monitor carbon dioxide content within said container,

means responsive to the means to monitor the temperature of the environment within said container to adjust at least downwardly the temperature of the environment towards a predetermined value,

means responsive to the means to monitor the oxygen content within the environment of said container to cause a positive infusion of ambient air into said container should the oxygen level within the environment fall below a predetermined value, and

means responsive to the means to monitor the carbon dioxide within the environment to cause the passage of gas within the envorinment through means to scrub at least some carbon dioxide from the atmosphere of the environment should it rise above a predetermined value.

4,716,740

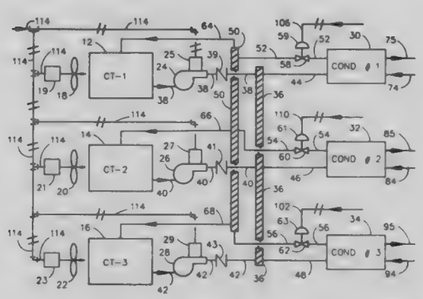
CONTROLLER APPARATUS AND METHOD FOR HEAT EXCHANGE SYSTEM

John H. Hayes, 560 N. Hart Blvd., Orlando, Fla. 32818

Filed Apr. 14, 1986, Ser. No. 851,516

Int. Cl.⁴ F25B *39/04*

U.S. Cl. 62—99 **17 Claims**



1. A controller for use with two or more heat exchange systems in which each system includes first and second heat exchangers, a working fluid circuit between the heat exchangers of each system and a working fluid in said circuit, said controller comprising:

(a) means manifolding together the outputs of said working fluid circuits for all of the first heat exchangers for all of the heat exchange systems and providing an input from said manifolding means to all of the second heat exchangers for all of the heat exchange systems; and

(b) means for controlling the flow of said working fluid from each of the first heat exchangers dependent upon the average energy demand for all of the second heat exchangers.

4,716,741

AIR-CONDITIONING INSTALLATION FOR MOTOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

Henryk Bednarek, Landsberg, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

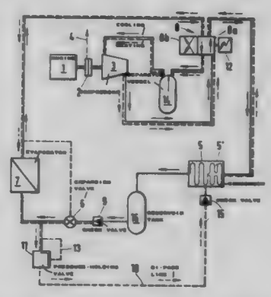
Filed Apr. 15, 1986, Ser. No. 852,216

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514781

Int. Cl.⁴ F25B *41/00, 13/00*

U.S. Cl. 62—197 **16 Claims**

1. An air-conditioning installation for motor vehicles, comprising a circulatory means switchable from cooling to heating of a vehicle passenger space by way of a switching means; compressor means; condenser means having a single flow section connected to a multi-line parallel flow-section through a bifurcation means; an expansion valve means; and an evaporator means; the cooling medium successively flowing through; the compressor means, the condenser means, the expansion valve means and the evaporator means back to the compressor means for purposes of cooling; a by-pass line including a pressure-holding valve means and by-passing the expansion valve means in the opposite flow direction for purposes of heating; the condenser means, which during heating serves as heating-evaporator means, being of multi-line parallel flow section toward the inlet of the condenser means during cooling or toward the outlet of the condenser means during heating; and wherein the by-pass line terminates in the condenser means in the flow direction during heating within the single flow section ahead of the bifurcation means or within the area of the bifurcation means.



4,716,742

CRYOGENIC SYSTEM FOR RADIATION DETECTORS

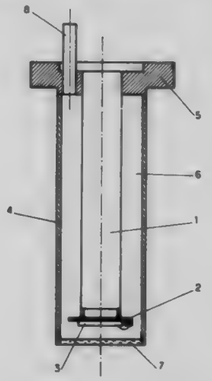
Michel M. E. Germain-Lacour, Fontaine Le Comte, and Joseph M. A. Loiseau, Saint Maurice, both of France, assignors to SAT (Societe Anonyme de Telecommunications), Paris, France

Filed Sep. 26, 1985, Ser. No. 780,340

Claims priority, application France, Oct. 2, 1984, 84 15085

Int. Cl.⁴ F25B *19/00*

U.S. Cl. 62—514 R **3 Claims**



1. A cryogenic device for radiation detector comprising:

a finger cooled to a low temperature and adapted for supporting and cooling said detector,

a wall surrounding said finger having, opposite said detector, a window transparent to the radiation to be detected and in which the enclosure defined by said finger and said wall

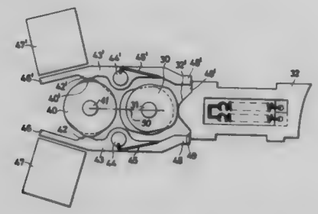
is closed and filled with at least a gas, said gas, as well as its pressure in the enclosure, being chosen so that said gas has a low thermal conductivity and so that its liquefaction or solidification temperature is higher than that reached by said finger.

4,716,743

DEVICE FOR NEEDLE SELECTION IN A CIRCULAR KNITTING MACHINE

Fernando Caselli, Pontassieve, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Feb. 5, 1986, Ser. No. 826,248
Claims priority, application Italy, Feb. 8, 1985, 19449 A/85
Int. Cl.⁴ D04B *15/78*
U.S. Cl. 66—219 **8 Claims**



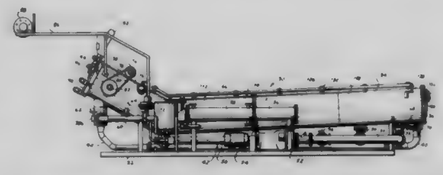
1. An apparatus for needle selection in a circular knitting machine having jacks with selection butts projecting from the peripheral surface of the cylinder comprising a series of parallel slides capable of rectilinear reciprocating movement in planes orthogonal to the axis of the cylinder, a series of rotatable approach cams coplanar with said slides and contactible therewith, said approach cams being rotatable at an angular velocity coherent with the angular velocity of the cylinder to bring said slides to a position of approach to the peripheral surface of the cylinder, and electromagnetically operated devices to selectively retain those slides which are to interact in a particular revolution of the cylinder with the butts of the needle pushers or jacks, said interacting slides being brought to a position of approach to the peripheral surface of the cylinder in the half-revolution in which the surface of the cylinder is free from selection butts to perform the selection starting from the subsequent half-revolution, said series of cams being divided into two rotating cam groups in which a high-contour cam part effecting the approach of the cylinder is offset in open group by 180° from a corresponding part in the other group, said electromagnetically operated devices for selectively retaining the slides in the approached position being constituted by a plurality of electromagnets, oscillation cams, oscillation levers and springs on said oscillation levers, said oscillation cams being rotatable about a pivot having an axis parallel to the axis of the approach cams and being rotatable at the same angular velocity as the approach cams, said oscillation levers being biased by said springs to contact said oscillation cams, said oscillation levers being oscillatable in the same planes as the slides, said oscillation cams producing in said oscillation levers an oscillation which causes one of the two opposite ends of each lever to engage the coplanar slide to retain it in the approached position to the cylinder, and the other end to approach an electromagnet which when energised retains said oscillation lever magnetically locked to said electromagnet, said locking action maintaining the coplanar slide in an approached position to the cylinder and no longer in adherence to the approach cam, and maintaining the oscillating lever fixed and no longer in adherence to the oscillation cam.

4,716,744

APPARATUS FOR WET TREATMENT OF CLOTH IN ENDLESS ROPE FORM

James K. Turner, Lincolnton; William C. Starkey, Charlotte, and Charles R. Horabuckle, Lincolnton, all of N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Jun. 27, 1983, Ser. No. 508,383
Int. Cl.⁴ D06B *3/28*
U.S. Cl. 68—62 **28 Claims**



1. Apparatus for wet treatment of endless cloth rope comprising a generally horizontally extending cloth treating chamber for containing treating liquid and through which chamber said cloth rope progresses in a plug of generally vertical folds from an entry end to an exit end for treatment by said liquid, a cloth return tube extending between said exit and entry ends and through which said cloth rope progresses in generally unfolded extension from said exit end of said treating chamber to said entry end for return into said treating chamber, treating liquid circulating means operable to withdraw treating liquid from said treating chamber and to direct treating liquid through said cloth return tube in a direction for discharge into said treating chamber at said entry end thereof such that said circulating treating liquid transports said cloth rope through said cloth return tube back into said treating chamber, means for causing said cloth rope to entrain air therein and form into said plug as it enters said treating chamber, said liquid circulating means maintaining the treating liquid in said treating chamber at a predetermined level lower than said plug height so that a portion of the cloth plug is exposed above the treating liquid level for continued entrainment of air therein, and said liquid circulating means including spray means for directing a portion of the treating liquid into said treating chamber at a plurality of openings spaced along the length of said chamber intermediate its ends and above said cloth plug to apply treating liquid to the exposed portion of said cloth plug at a plurality of locations as it progresses through said chamber, said openings being disposed and shaped for distribution of said treating liquid across substantially the full width of said cloth rope plug and along substantially the full length thereof for treating of said exposed plug portion and for progressively adding to the treating liquid in the chamber to facilitate treating of the plug as it progresses through said chamber, a vortex chamber mounted exteriorly on said treatment chamber above each opening, each vortex chamber converging conically from an enlarged upper portion to said opening and having an entry opening in said upper portion, and a supply conduit connected to the upper portion of each said vortex chamber and extending generally tangentially with respect thereto for introduction therethrough of treating liquid tangentially into said vortex chamber to cause said treating liquid to form a vortex as it flows downwardly through said vortex chamber and spray opening to form a dispersing spray in said treating chamber.

4,716,745

VIDEO CASSETTE SECURITY DEVICE

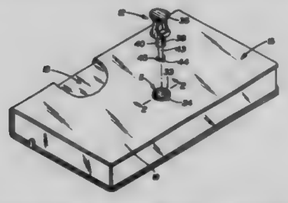
Bruce A. Hehn, Canton, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio

Filed Aug. 21, 1986, Ser. No. 898,615
Int. Cl.⁴ E05B *73/00*
U.S. Cl. 70—58 **19 Claims**

1. A security device for a cassette of the type having a

channel extending at least partially therethrough and having an opening in a sidewall of said channel, said device including:

a. a locking member, said locking member capable of engaging said alignment channel, said locking member having at least one tab formed thereon biased in a radially outward direction and being capable of extending into said channel



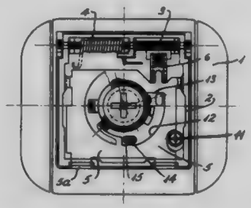
sidewall opening and securing said locking member in said cassette channel, said locking member further having an outwardly extending annular flange located at an upper portion of said member, and a V-shaped guide notch formed in said upper portion and extending downwardly from said flange.

4,716,746

KEY OPERATED LOCK MECHANISM LOCKABLE IN THE ABSENCE OF A KEY

Maurice A. Journee, Reilly, France, assignor to Paul Journee, S.A., Courbevoie, France

Filed Dec. 2, 1985, Ser. No. 803,192
Claims priority, application France, Dec. 12, 1984, 84 18969
Int. Cl.⁴ B65D *55/14*
U.S. Cl. 70—161 **2 Claims**



1. A locking mechanism which is selectively operable by use of a separate key comprising

a. a body portion having abutment means formed thereon,

b. a flap portion pivotally mounted on said body portion between a closed position and an open position, means for biassing said flap portion to said open position, said flap portion being formed with a substantially cylindrical boss having a pair of opposing grooves therein and which boss defines a cylindrical bore,

c. a slidable locking bolt on said flap portion engageable with said abutment means,

d. spring return means arranged between said flap portion and said locking bolt to urge said locking bolt towards a locking position, said locking bolt having a shoulder formed thereon,

e. a lock cylinder having a plurality of locking elements normally seated within said opposing grooves to thereby lock said lock cylinder relative to said flap portion in a first position, said lock cylinder being rotatable within said cylindrical bore of said cylindrical boss, upon the insertion of the key therein, between said first position and a second position where said locking pin elements are remote from said opposing grooves to thereby retain said lock cylinder unlocked within said cylindrical boss under conditions wherein the key is selectively removed from said lock cylinder, said lock cylinder also being rotatable between said second position and a third position, which third position is beyond the rotational range between said first and second positions,

f. a cam plate connected with said lock cylinder to rotate therewith, and

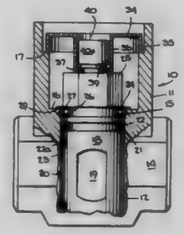
g. a stud mounted on said cam plate capable of engaging said shoulder upon rotation said lock cylinder to said third position to effect a sliding motion of said locking bolt against said return means to thereby disengage said locking bolt from said abutment means, said stud permitting movement of said locking bolt when said lock cylinder is in said second position and effecting locking of said locking bolt when said lock cylinder is in said first position.

4,716,747

TOP LOCKING PLUG VALVE

Onofrio N. Russo, Middle Village, N.Y., assignor to Gas Energy, Inc., Brooklyn, N.Y.

Filed Jul. 24, 1986, Ser. No. 888,718
Int. Cl.⁴ B60R *25/02*
U.S. Cl. 70—179 **13 Claims**



1. A rotary plug valve comprising:

a body formed with an upstanding skirt and having a seat and a flow passageway therethrough intercepted by said seat;

a valve member having a flow passage therethrough and being rotatable relative to said seat formed in said body between a selected open position in which its flow passage registers with the flow passageway in said body and a selected closed position in which its flow passage does not register with the flow passageway in said body;

said valve member having an operator extending into said skirt formed in said body, rotation of said operator effecting rotation of said valve member relative to said seat;

removable means lockable extending across the area defined by said skirt to prevent access to said operator; and

means associated with said body and said valve member to prevent axial displacement of said valve member relative to said body.

4,716,748

STEERING LOCK DEVICE

Yoshio Watanuki, Ebina; Haruo Mochida, Kanagawa, and Hidekazu Satou, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd. and Kokusan Kinzoku Kogyo Kabushiki Kaisha, both of, Japan

Filed Jun. 23, 1986, Ser. No. 877,508
Claims priority, application Japan, Jun. 24, 1985, 60-135898
Int. Cl.⁴ B60R *25/02*; E05B *65/12*
U.S. Cl. 70—252 **9 Claims**

1. A steering lock device having a locking bar which is lockably engageable with a steering shaft, comprising:

a hollow body;

a cylindrical case rotatably received in said hollow body and having a locking hole;

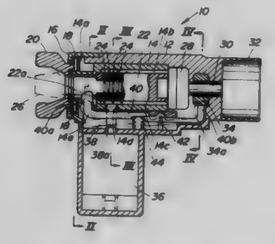
a knob connected to said cylindrical case to rotate therewith;

a rotor rotatably received in said cylindrical case and having

a plurality of tumblers which are projectable therefrom into grooves formed in said cylindrical case;

a check lever pivotally mounted in said hollow body, said check lever having one end projectable into said rotor and the other end engageable with a given portion of said locking bar to hold the same in a steering shaft unlocking condition;

biasing means for biasing said check lever in a direction to project said one end into said rotor;



an actuator having a locking plunger which is projectable into said locking hole of said cylindrical case to lock the same relative to said hollow body; and

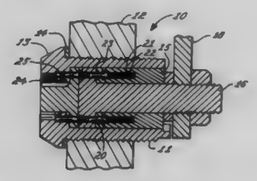
coupling means for coupling said check lever and said locking plunger in a manner to move said one end of said check lever away from said rotor when said locking plunger is moved away from said locking hole of the cylindrical case.

4,716,749

HIGH SECURITY PIN TUMBLER LOCK

Gale Johnson, Northbrook, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Jan. 16, 1987, Ser. No. 3,813
Int. Cl.[4] E05B *27/08*
U.S. Cl. 70—363 **6 Claims**



1. In a tubular lock construction comprising an outer barrel having forward and rear ends, a stationary tumbler sleeve telescoped into the rear end portion of said barrel, a locking spindle extending through and rotatably mounted in said stationary tumbler sleeve, a rotatable driver sleeve fixed to said spindle and disposed within said barrel in face-to-face relation with the forward end of said stationary tumbler sleeve and driver and tumbler pins slidably mounted in axially extending and angularly spaced holes defined in said stationary tumbler sleeve and said rotatable driver sleeve and normally operable to prevent rotation of said spindle with respect to said stationary tumbler sleeve, the improvement comprising

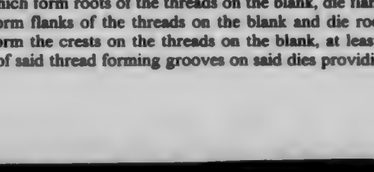
annular undercuts provided in at least one of said tumbler sleeve and said driver sleeve so as to define annular discontinuities in the axially extending bores disposed therein, said tumbler sleeve and said driver sleeve each includes a uniformly cylindrical section and a substantially cylindrical section which includes a stepped section which defines said annular bore discontinuity when said sections are rigidly fixed together, and annular grooves defined on selected ones of said driver pins and said tumbler pins at their end proximate to the face-to-face junction of said tumbler sleeve and said driver sleeve, whereby said pin grooves interact with said annular sleeve undercuts to create a false impression of the existence of said face-to-face junction, as the pins are axially slided along said bores.

4,716,750

PROCESS FOR OBTAINING COMPOSITE HOLLOW MEMBERS FROM VARIEGATED LONGITUDINAL STRIPS, EMBODIED WITH OR WITHOUT A REMOVABLE CORE

Valtiero Tizzi, Via Clementini, 2, 47037 Rimini (Forli), Italy

Filed Mar. 26, 1986, Ser. No. 844,126
Claims priority, application Italy, Apr. 2, 1985, 3389 A/85
Int. Cl.[4] B21G *39/02*; B23P *15/00*
U.S. Cl. 72—52 **9 Claims**



1. A process for producing composite hollow members from variegated longitudinal strips comprising the steps of:

preparing a number of longitudinal moldings by drawing or pressing said moldings so as to provide folded lips along the edges of said moldings, said folded lips being capable of being interlocked and flattened, wherein at least one of said moldings is a destructible molding formed from a chemically-destructible metallic material;

arranging said moldings adjacent to each other so that said folded lips become interlocked lips;

lodging solder between said interlocked lips;

flattening said interlocked lips under pressure so as to join said moldings into a tubular-shaped hollow member with a tubular wall and so as to create a variegated surface;

reducing the thickness of said tubular wall to a predetermined annular cross section

threading a core member into said hollow member such that discrete lengths of said hollow member can be formed into links, said core member being formed from a chemically-destructible metallic member;

fusing the ends of said links following concatenation by floating said solder in order to form chains or necklaces; and

removing said destructible molding and said core member by chemically treating said links.

4,716,751

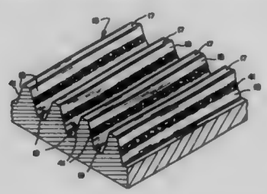
NON-SLIP THREAD ROLLING DIES

Edmund T. Wozniak, Bay Village, Ohio, assignor to Colt Industries Operating Corp., Cleveland, Ohio

Filed May 22, 1986, Ser. No. 865,756
Int. Cl.[4] B21H *3/06*
U.S. Cl. 72—88 **9 Claims**

1. A pair of thread rolling dies each comprising a body of metal providing a working face, thread forming grooves formed in said working face operable with the other die of the pair of dies to progressively form threads on a blank as such blank rolls between said dies from a start end to a finish end of said working faces, said thread forming grooves providing die crests which form roots of the threads on the blank, die flanks which form flanks of the threads on the blank and die roots which form the crests on the threads on the blank, at least a portion of said thread forming grooves on said dies providing

a rough slip-resistant surface along longitudinal bands extending on said die flanks said rough slip-resistant surface has been defined by surface irregularities, said portion of said grooves



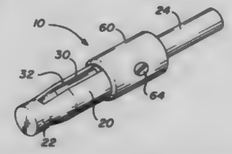
providing surfaces on each side of each band which are substantially smoother than each band, said roughened band causing said blanks to roll along said band without significant slippage.

4,716,752

TUBE EXPANDING AND FLARING TOOL

Charles E. Diller, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1986, Ser. No. 862,776
Int. Cl.[4] B21D *39/12*
U.S. Cl. 72—118 **9 Claims**



1. A tube expanding and flaring tool comprising:

a. A rotatable cage having a nose guide sized to be recieved in a tube end that is to be expanded and flared and said cage having a tail shaft in axial alignment with said nose guide by which said cage is to be rotated;

b. at least two substantially identical rollers carried by said cage equally spaced circumferentially about said cage and extending paritally through said cage for rolling engagement with the interior surface of said tube;

c. a nose surface, on said at least two rollers, with a portion thereof tapering from a first diameter to second relatively larger diameter;

d. a truncated conical tail surface, on said at least two rollers, expanding at a predetermined angle from said second diameter to a third relatively larger diameter; and

e. means for supporting said at least two rollers in rolling engagement with the interior surface of said tube end with sufficient force to expand said tube to a diameter relatively larger than its original diameter and to flare said tube end at said predetermined angle of said truncated conical tail surface of said roller.

4,716,753

FLEXIBLE TUBE EXPANDER EXTENSION ASSEMBLY

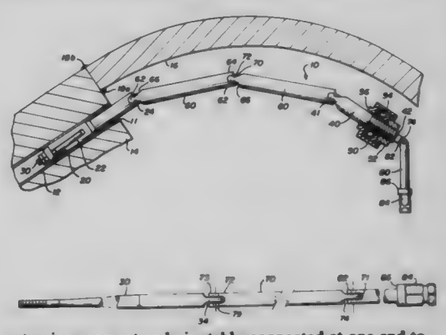
Paul W. Martin, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 10, 1986, Ser. No. 880,728
Int. Cl.[4] B21D *41/02*
U.S. Cl. 72—122 **6 Claims**

1. A flexible extension assembly for use with a tube expander of the type having an expanding head which has internal tube expanding means driven for tube expansion by a drive means connected coaxially thereto with spacer means for locating said expanding head at a predetermined distance from the end of the tube to be expanded, said flexible extension assembly comprising:

a. at least one rigid hollow extension segment pivotably connected at one end to said expanding head and pivotably connected at the other end to said spacer means so that said extension segment is pivotable into and out of coaxial alignment with said expanding head; and

b. at least one extension link slidably carried in said hollow



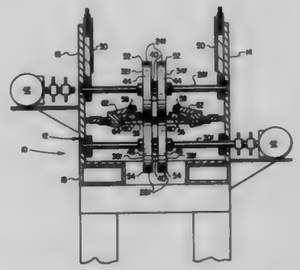
extension segment and pivotably connected at one end to said internal tube expanding means and pivotably connected at its other end to said drive means so that said extension link is pivotable with said extension segment into and out of coaxial alignment with said expanding head.

4,716,754

ROLL FORMING MACHINE

Wilbur R. Youngs, Scroggins, Tex., assignor to Collier Metal Specialties, Inc., Garland, Tex.

Filed Apr. 21, 1986, Ser. No. 854,170
Int. Cl.[4] B21D *5/08*
U.S. Cl. 72—178 **10 Claims**



1. A roll forming machine, which comprises:

a frame including spaced apart substantially parallel side walls;

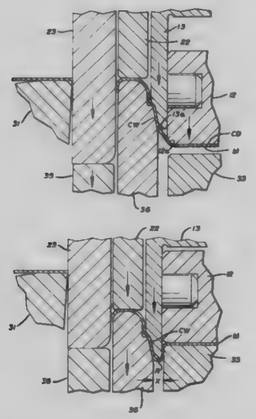
a plurality of sets of drive rollers supported on said frame at spaced apart points along a predetermined path, each of said sets of drive rollers including an upper and a lower opposed drive roller rotatable about parallel axles, and axes of each set define a plane, at least one of said upper and lower drive rollrs being rotatably driven;

a plurality of pairs of support rails supported between said side walls substantially parallel to said axes of said drive roller axles, each drive roller set having associated therewith a pair of support rails with each of said support rails of a pair being spaced apart from each other on opposite sides of said plane defined by said axes of said set of drive roller axles, the ends of said support rails being spaced apart from said side walls and positioned on transverse bars connected between said side walls;

a plurality of support blocks, each of said support blocks

being slidingly mounted on and between one of said pairs of support rails;
shim means for adjustably positioning said support blocks at selected positions along said support rails;
and a plurality of forming rollers, each of said forming rollers being supported by one of said support blocks on axles having an axis lying in said defined plane each forming roller oriented to successively deflect sheet material transverse to its movement through the machine.

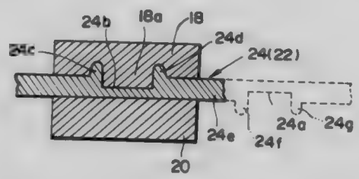
4,716,755
METHOD AND APPARATUS FOR FORMING CONTAINER END PANELS
Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio
Filed Jul. 28, 1986, Ser. No. 889,945
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—349 6 Claims



1. A method of forming a container end piece from a sheet of material in a press having a fixed base and a movable platen comprising the steps of:
(a) blanking a workpiece from the sheet of material;
(b) forming an inverted cup from said workpiece by wiping its peripheral edge over a die core ring supported on the fixed platen;
(c) reversing said inverted cup by advancing a punch core and a punch core ring to form a cup having a flange area, a central body area, and a preliminary chuckwall interconnecting the flange area and the central bottom area by radiused areas with said chuckwall and chuckwall angle being formed between said punch core ring and said die core ring; and
(d) maintaining engagement between said die core ring, said chuckwall and said punch core ring and advancing said punch core ring ahead of said punch core to shorten said chuckwall and reduce the radius between said chuckwall and said central bottom portion while maintaining said chuckwall angle.

6. Apparatus for forming a container end piece from a workpiece in a double acting press having a fixed base and inner and outer slides movable toward and away from the base, comprising:
(a) a die core fixed to the base;
(b) a die core ring fluidly supported on the base in concentric, spaced relationship with said die core;
(c) a lower pressure sleeve fluidly supported on the base in concentric relationship with said die core ring;
(d) a punch core carried by inner slide for fluidly actuated movement with respect thereto and disposed in opposed relationship with said die core;
(e) a punch core ring carried by the inner slide in concentric relationship with said punch core;
(f) an upper pressure sleeve carried by the outer slide in concentric relationship with said punch core ring and opposed relationship with said die core ring;
(g) a punch shell carried by the outer slide in concentric relationship with said upper pressure sleeve and opposed relationship with said lower pressure sleeve;
(h) said upper pressure sleeve being movable toward the base to hold the workpiece against said die core ring;
(i) said punch shell being movable toward the base to form an inverted cup by bending the periphery of the workpiece about said die core ring;
(j) said punch core and said punch core ring being movable toward the base to reverse said inverted cup and form an end piece having a preliminary chuckwall, a chuckwall angle, a central bottom panel and a radiused area between said chuckwall and said central bottom panel thereof;
(k) said punch core ring being further movable toward said base after said punch core bottoms on said die core to shorten said chuckwall while maintaining engagement therewith to maintain said chuckwall angle and reduce said radius.

4,716,756
CLUTCH DRUM
Kazuyoshi Fujioka, Sagamihara, and Toshiro Tani, Fujinomiya, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Yamakawa Industrial Co., Ltd., Fuji, both of, Japan
Continuation of Ser. No. 837,573, Mar. 4, 1986, abandoned, which is a continuation of Ser. No. 550,304, Nov. 10, 1983, abandoned. This application Nov. 25, 1986, Ser. No. 935,149
Claims priority, application Japan, Nov. 11, 1982, 57-196777
Int. Cl.[4] B21K *21/16*
U.S. Cl. 72—353 1 Claim



1. A method of producing a clutch drum of an automatic transmission, said method comprising the steps of:
a. placing a cylindrical hollow body between a plurality of die pairs, each of said die pairs comprising a first die member having a substantially flat die surface, and a second die member having a projection extending from a die surface of said second die member and grooves formed in said die surface of said second die member at the root of said projection, said plurality of die pairs being arranged in a ring such that said first and second die members of each die pair are inverted with respect to an adjacent die pair;
b. pressing said first and second die members of said plurality of die pairs together, such that material from said cylindrical hollow body flows into said grooves of said die surface of said second die member in a direction opposite to the direction in which said projection is moved, thereby forming a first and second series of splines respectively projecting inwardly and outwardly from inner and outer surfaces of said cylindrical hollow body to provide an engaging surface for said clutch drum; and
c. releasing said first and second die members of said plurality of die pairs so that said cylindrical hollow body may be removed.

4,716,757
GUIDE WIRE TIP SHAPING TOOL AND METHOD
Jean E. McGregor, Sunnyvale; Wilfred J. Samson, Saratoga, and Craig E. Mar, Fremont, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.
Filed Aug. 25, 1986, Ser. No. 900,046
Int. Cl.[4] B21F *1/00*
U.S. Cl. 72—387 13 Claims

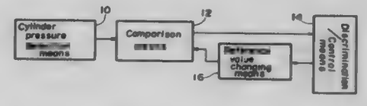
11. In a method of bending the tip of an angioplasty guide wire with a tool having a pair of body sections joined together by a hinge and a flexible tube having an axial opening extending between the body sections, the steps of: inserting the tip of the guide wire into the axial opening of the flexible tube so that the guide wire extends across the hinge, and folding the body sections together about the hinge to bend the flexible tube and the tip of the wire inserted therein.

4,716,758
METHOD OF PREDICTING AND MONITORING THE IMPERVIOUSNESS OF AN UNDERGROUND CAVERN
Eric Amantini, Courbevoie, France, assignor to Societe Francaise de Stockage Geologique - GEOSTOCK, Paris, France
Filed Nov. 21, 1986, Ser. No. 933,512
Claims priority, application France, Nov. 21, 1985, 85 17230
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 5 Claims

1. A method of predicting and monitoring the imperviousness of an underground cavern formed in a water-impregnated rock formation, the method comprising the steps of:
(a) disposing at least two pressure sensors in the formation around the cavern at different distances therefrom and spaced from each other;
(b) progressively raising the pressure inside the cavern; and
(c) monitoring the gradient of the hydraulic pressure potential ϕ in the rock formation during the pressure increase to confirm that said gradient is not inverted.

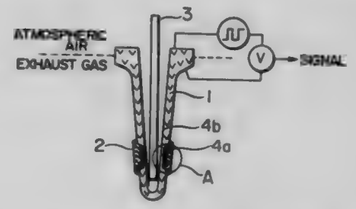
4,716,759
METHOD OF DETECTING CYLINDER PRESSURE AND CYLINDER PRESSURE DETECTION DEVICE IN INTERNAL COMBUSTION ENGINE
Akira Tanaka, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 937,153
Claims priority, application Japan, Dec. 2, 1985, 60-271120; Dec. 2, 1985, 60-271121; Dec. 2, 1985, 60-271122
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—115 9 Claims

1. In a method of detecting cylinder pressure in an internal combustion engine wherein the output of a cylinder pressure sensor is compared with a reference value, the result of the comparison is discriminated, the reference value is changed on the basis of the discrimination to approximate it to the maximum output value of the sensor, and the approximated reference value is deemed to represent the maximum pressure value, the improvement comprising the steps of:
a. setting two initial reference values of differing magnitudes,
b. confirming whether the maximum output value of the sensor falls between the two reference values and if it does



not, changing at least one of the two reference values so that it does,
c. changing at least one of the reference values so that one of the reference values approximates the maximum output value of the sensor, and
d. deeming the one reference value approximated to the maximum output value of the sensor to represent the maximum cylinder pressure.

4,716,760
AIR-FUEL RATIO DETECTION SYSTEM
Minoru Osuga, and Yoshishige Oyama, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 26, 1986, Ser. No. 833,032
Claims priority, application Japan, Feb. 28, 1985, 60-40190; Apr. 9, 1985, 60-74909
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 36 Claims



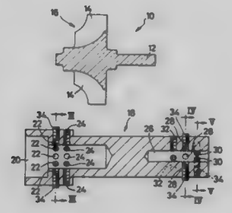
1. In an air-fuel ratio detection system comprising a solid eletrolyte in contact with a diffusion resistor on one side and the atmosphere on the other side thereof, the oxygen concentration in said diffusion resistor being related to the oxygen concentration in the exhaust gas, the improvement comprising means for applying an electric current to said solid electrolyte to supply oxygen in the atmosphere into said diffusion resistor for at least a period of time until the amount of the oxygen introduced into said diffusion resistor through said solid electrolyte is balanced with the amount of the oxygen diffused into the exhaust gas through said diffusion resistor, means for subsequently applying a predetermined current of opposite polarity to said solid electrolyte thereby to draw oxygen out of said diffusion resistor, and means for detecting the air-fuel ratio on the basis of the time required for the voltage drop across the solid electrolyte to reach a predetermined value while drawing the oxygen out of the diffusion resistor.

4,716,761

METHOD AND JIG FOR DYNAMICALLY BALANCING AN ASSEMBLY OF THE JIG AND ROTOR

Shigenori Ito, Kasugai, and Minoru Machida, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 781,727
Claims priority, application Japan, Oct. 3, 1984, 59-207731
Int. Cl.[4] G01M *1/36, 13/00*; F01D *5/10*; F16F *15/32*
U.S. Cl. 73—118.1 11 Claims



7. A jig having a generally cylindrical shape for rotating a ceramic rotor in a dynamically balanced condition on a spin tester, comprising:

a first axial end portion having a fixing hole into which a shaft portion of the ceramic rotor is inserted and fixed to; and

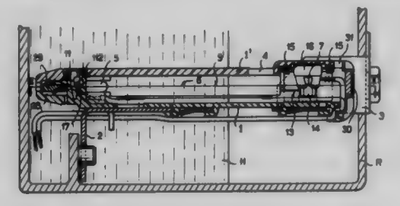
balancing portions comprising a plurality of balancing holes which are formed in said first axial end portion and in a second opposite axial end portion of the jig, said plurality of balancing holes being open to an outer surface of the jig, said balancing holes being adapted to retain therein at least one balancing piece, said second axial end portion having a mounting hole for attachment to the spin tester.

4,716,762

LEVEL SENSOR FOR USE WITH AN ELECTRICALLY INSULATING LIQUID

Denis H. Eynard, Paris, France, assignor to Jaeger, France

Filed Jul. 14, 1986, Ser. No. 885,236
Claims priority, application France, Jul. 15, 1985, 85 10810
Int. Cl.[4] G01F *23/24*
U.S. Cl. 73—295 9 Claims



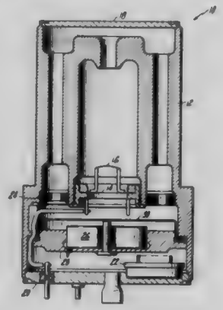
1. A sensor for sensing the level of an electrically insulating liquid, the sensor comprising an elongate housing fixed substantially vertically in a casing containing the liquid whose level is to be sensed, said housing having a top opening and a bottom opening and containing a longtiudinally extending heat sensitive V-shaped resistive wire having its end situated at the top of the housing, said wire being arranged for form two substantially parallel branches along a major portion of their longitudinal length, the sensor including the improvement of means for positioning the and fixedly holding the respective end of the heat sensitive wire to ensure a substantially constant gap between the ends of the wire and the two branches thereof over a major portion of their length, said branches of said wire lying in and defining a plane so that the plane defined by the branches of the wire has a position which is stable relative to the elongate housing, said positioning means comprising, at the top of said housing, side slots receiving respective connection members associated with each branch of the heat sensitive wire and each connection member including respective center portions for providing said electrical connections to the corresponding ends of said wire, and, at the bottom of said housing, a transverse column fixed to the housing, said column ensuring both the desired separation between the two branches of the wire and for providing support means for a resilient fastening member for fastening to the point of the V-shape, said fastneing means being disposed behind said column in a direction furthest away from the top of said housing, said fastening member urging said V-shape point of said wire in a direction away from said top of said housing.

4,716,763

JET FLOW IN AN ANGULAR VELOCITY SENSOR

E. Marston Moffatt, Glastonbury, and Richard E. Swarts, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,519
Int. Cl.[4] G01P *3/26, 3/44*
U.S. Cl. 73—505 14 Claims



1. Angular velocity sensor means, comprising:

a nozzle block for enclosing a jet chamber having a reference jet chamber with a reference jet axis and having nozzle means disposed at one end of said chamber for discharging a fluid jet along said reference jet axis;

a sensor plug having at least one pair of sensing elements mounted thereon, said plug disposed at an opposite end of said chamber such that said sensing elements are disposed symmetrically about said reference jet axis in a plane perpendicular thereto, each pair of sensing elements being cooled differentially in response to deflection of said fluid jet from said reference jet axis in the presence of sensor rotation about a rotation axis perpendicular to said reference jet axis, said deflection being in proportion to the angular velocity of said sensor, each of said sensing elements having resistance values which vary according to the amount of cooling received by each, said plug having a single passage for discharging fluid from said jet chamber, said passage disposed symmetrically with respect to said chamber and said sensing elements for reducing flow disturbances;

an impulse pump having a diaphragm of a selected material for delivering a fluid under pressure to said nozzle means to form said fluid jet; and

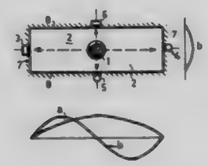
detector circuit means, responsive to said sensing elements resistance values for providing signals indicative of said angular velocity.

4,716,764

METHOD AND DEVICE FOR DETERMINING THE CROSS-SECTION OF ELONGATED OBJECTS USING A SOUND FIELD

Ernst Felix, Uster, Switzerland, assignor to Zellweger Uster., Ltd., Switzerland

Filed Sep. 17, 1985, Ser. No. 776,880
Claims priority, application Switzerland, Oct. 26, 1984, 5160/84
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—571 1 Claim



1. A device for at least approximately determining the cross-section of elongated objects such as yarns, rovings and slivers in the textile industry, and cables or filaments comprising:

a sonic chamber enclosed laterally on all sides and having apertures in opposing walls to permit passage of an elongated test object through said chamber;

two sonic emitters positioned respectively on first and second walls of said chamber for radiating sonic energy from said first and second walls of said chamber into said chamber to create standing waves therein;

two sonic receivers positioned respectively on third and fourth walls of said chamber for detecting sonic energy within said chamber; and

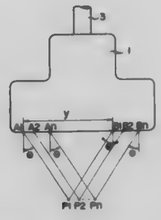
evaluation means connected to said sonic receivers for determining the cross-section of an elongated test object passing through said chamber on the basis of the influence of said test object on the standing waves within said chamber.

4,716,765

ULTRASONIC MEASURING APPARATUS

Makoto Hirama, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 1, 1986, Ser. No. 891,891
Claims priority, application Japan, Aug. 9, 1985, 60-176113
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 8 Claims



1. An ultrasonic measuring apparatus for measuring the sound velocity of an ultrasonic wave propagating through tissue of a subject being examined, said apparatus comprising:

ultrasonic transducer means having an array of transducer elements and having an ultrasonic transmission section comprised of a predetermined number of said elements for emitting a plurality of ultrasonic transmission beams at a predetermined angle with respect to a perpendicular projected from the surface of said array to a plurality of target areas of the subject, and an ultrasonic reception section comprised of a predetermined number of others of said elements of said array separated from said transmission section by a predetermined distance, for receiving echo beams at said predetermined angle reflected from the target areas of said subject and directed to said ultrasonic reception section and for generating echo signals in accordance with said echoes,;

scanning means for driving said ultrasonic transducer means, to scan the subject with the transmission beams and for maintaining said predetermined distance between said ultrasonic transmission and reception sections and said predetermined angle of said transmission beams and echo beams;

signal-processing means for combining a plurality of the echo signals generated by said ultrasonic transducer means;

means for calculating the time which said ultrasonic transmission and echo beams require to propagate through the subject in accordance with the combination of the echo signals which have been obtained by said signal-processing means; and

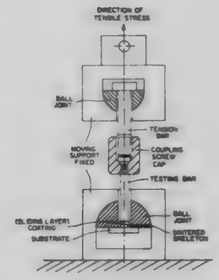
means for calculating the sound velocity of the ultrasonic beams in accordance with the propagation time calculated by said time calculating means.

4,716,766

METHOD OF EVALUATING THE PEEL STRENGTH OF THE PLASTIC SLIDING LAYER OF A LAMINATE FOR SLIDING SURFACE BEARINGS

Hans-Paul Baureis, Diefheim-Horrenberg, Fed. Rep. of Germany, assignor to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,881
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525068
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—827 7 Claims



1. A method of evaluating the pell strength of a plastic sliding layer of a laminate for sliding surface bearings, which comprises a metallic backing layer, a sintered or sprayed-on porous bronze layer having a thickness of 0.1 to 1.0 mm and containing a rolled-in pore filler and on said bronze layer a sliding layer having a thickness of 0.005 to 1.0 mm and made of perfluoro polymers, which may contain one or more first additives for improving the emergency running properties, said first additives selected from the group consisting of lead, graphite and molybdenum disulfide, individually or in combination, and, if desired, also one or more second additives for improving the wear resistance and the load-carrying capacity, said second additives selected from the group consisting of glass fibers, carbon fibers and glass beads, individually or in combination, the method comprising the steps of: first mechanically and then, chemically activating with a solution the surface of the sliding layer of a sample punched from the laminate

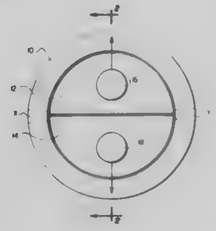
for sliding surface bearings; subsequently drying the sample; adhesively joining the sample to a mechanically roughened end face of a testing steel cylinder of a testing apparatus in accordance with ISO Standard 4624; and when the adhesive has cured, severing the sliding layer at the outside periphery of the testing cylinder as far as to the bronze layer, and determining the ultimate tensile stress of a joint comprising the sliding layer in accordance with ISO Standard 4624.

4,716,767

RUPTURE TESTING APPARATUS FOR BOILER TUBES

Myron Krawchuk, Newton, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Apr. 7, 1986, Ser. No. 848,617
Int. Cl.[4] G01N *3/54*
U.S. Cl. 73—834 **2 Claims**



1. A rupture testing apparatus for a tube section, said apparatus comprising two segments each having a semi-circular cross section, said segments together forming a disc having an outer diameter slightly less than the inner diameter of said tube section for insertion into said tube section, and two spaced parallel dowels extending through said two segments, respectively, and projecting from the opposed faces of said segments, respectively,and means operatively engaging the projecting portion of said dowels for applying oppositely directed tensile forces to said respective segments to simulate the hoop stress applied to said tube due to internal pressure.

4,716,768

PROCESS AND APPARATUS FOR DETERMINING AND INFLUENCING THE FLOW PROPERTIES OF SOLID GRANULAR MATERIAL

Ágoston Dávid; János Pogány, and László Rónkös, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Continuation-in-part of Ser. No. 818,080, Jan. 13, 1986, abandoned, which is a continuation of Ser. No. 755,204, Jul. 12, 1985, abandoned, which is a continuation of Ser. No. 549,204, Nov. 4, 1983, abandoned. This application Oct. 23, 1986, Ser. No. 922,783
Claims priority, application Hungary, Nov. 4, 1982, 3545/82
Int. Cl.[4] G01G *11/00*
U.S. Cl. 73—861 **5 Claims**

1. A process for determining flow properties of solid granular materials, comprising the steps of:

(a) selectively positioning a funnel-shaped sample holder with selected geometry at least in terms of a selected height in a position to receive a sample of solid granular material;

(b) selectively disposing an aperture of selected flow cross-section below said sample holder;

(c) opening a passage for said sample holder through said aperture;

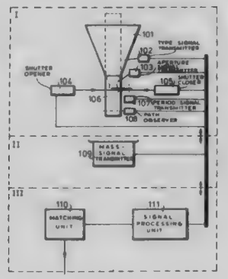
(d) collecting the sample traversing said aperture in a balance;

(e) generating a type signal representing the selected geometry of said sample holder;

(f) generating an aperture signal representing the cross section of the selected aperture;

(g) generating a flow-initialing signal upon the opening of communication through said aperture;

(h) selecting between a first measuring mode in which a mass-proportional measurement is made and a second measuring mode in which a time-proportional measurement is made so that:



(h_1) upon selection of said first measuring mode a signal proportional to the mass flow of said sample is generated at said balance, and

(h_2) upon selection of said second mode a signal is generated upon termination of flow through said aperture;

(i) applying said signals to a signal processing unit and automatically determining therein from the signals applied thereto a value Q and a value Q/A where

$$Q = \frac{m}{t} = k_1 \frac{\rho_s}{d_s} (d_o - D_m)^n \cdot (d_o^n - k_2 d_o + k_3)$$

and

$$Q/A = \rho_s \cdot j \cdot \frac{d_o^2}{d_s} + G \cdot g \cdot \left(1 - \frac{\rho_s - \rho}{\rho_{s\rho}}\right)$$

wherein Q is a measured flow rate of said sample through said aperture, m is the measured mass of said sample, t is the time during which flow occurred, k_1, k_2 and k_3 are empirically derived constants relevant to said material and determined by passage of a material with given properties through said aperture and changing said aperture for successive tests, D_m is a minimum aperture size such that $D_m \cong 3d_s$, d_s is the average grain size, d_o is a measure of aperture diameter, ρ_s is the density of the solid granular material, A is a known cross section of a particular aperture, g is the gravitational acceleration constant, j is a coefficient of rolling-sliding substance, G is a coefficient of material quality representing granule shape and ρ is the virtual density of the aggregated material, coefficients j and G being determined by passage of a material with given properties through said aperture changing said aperture for successive tests; and

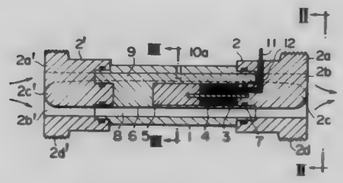
(j) outputting at least one result signal representing at least one of flow properties of said sample by the processing of the signals applied to said unit in accordance with at least one of the relationships for Q and Q/A, respectively.

4,716,769

RADIAL FIELD ELECTROMAGNETIC FLOW METER

Teruo Yamada, Nagoya, Japan, assignor to Aichi Tokei Denki Co., Ltd., Aichi, Japan

Filed Dec. 9, 1985, Ser. No. 806,997
Claims priority, application Japan, Dec. 26, 1984, 59-197195
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 **2 Claims**



1. A radial field electromagnetic flow meter comprising:

a tubular outer member (1) made of a ferromagnetic material having an inner electrically insulated wall;

a radial magnetic field generating device disposed inside said outer member (1), having an outer electrically insulated wall;

said radial magnetic field generating device including:

an electromagnet having a core (3) made of a ferromagnetic material and a coil (4) wound thereon, an inner cylindrical ferromagnetic member (5) receiving one end of said core (3), and a connecting ferromagnetic member (2) for receiving an opposite end of said core (3), and interconnecting said magnetic field generating device with said outer member (1), said inner magnetic member (5) and said connecting member (2) being coaxial with said core;

an annular passage for a flow of the fluid to be measured formed between said inner wall of said outer member and said outer wall of said field generating device;

means for energizing said coil to produce said radial magnetic field;

means for measuring said fluid flow by detecting the voltage induced by said radial magnetic field passing through said fluid in said annular passage between said inner and outer members.

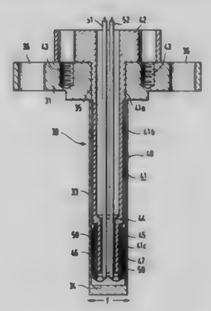
4,716,770

VORTEX FLOW METER

Michael Herzog, Witterswil, Switzerland, assignor to Flowtec AG, Switzerland

Filed Dec. 11, 1986, Ser. No. 940,581
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544198
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **3 Claims**

1. Vortex flow meter for measuring the flow velocity of a fluid in a conduit, the vortex flow meter comprising a Karman vortex generating bluff body arranged in the flow passage of the conduit, a cavity formed in the bluff body, the cavity being in communication with the flow passage via passages formed in the bluff body, a vortex sensor which is disposed in the cavity and responds to the pressure fluctuations generated by the Karman vortex train, the vortex sensor having a capacitive transducer including two oscillating bodies, the first oscillating body being a sensor sleeve which is disposed in the cavity so as to be deflectable by the vortex pressure fluctuations, the interior of the sensor sleeve being sealed with respect to the flow passage, and the second oscillating body being an electrode holder which is disposed within the sensor sleeve so as to be uncoupled from the vortex pressure fluctuations and which carries at least one capacitor electrode, each of which lies opposite an electrode portion of the sensor sleeve in such a manner that it forms therewith a measured capacitance which is variable in response to deflection of the sensor sleeve caused by the vortex pressure fluctuations, an evaluation circuit which includes a capacitance measuring circuit which is connected to the at least one capacitor electrode by means of a shielded cable and which in response to changes of the at least one measured capacitance generates an electrical signal characteristic of the frequency of the vortex pressure fluctuations and thus of the flow velocity in the conduit, the capacitance measuring circuit including for each measured capacitance a switchover means which alternately and periodically with a predetermined switchover frequency connects the measured



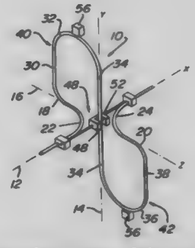
capacitance for charging to a constant voltage and for discharging to a storage capacitor whose capacitance is large compared with the measured capacitance and whose terminal voltage is held substantially at a constant reference potential by a controlled discharge current, the magnitude of the discharge current being proportional to the measured capacitance and representing the measured value, and a further switchover means which with the switchover frequency periodically and alternately connects the cable shield to the constant voltage and to the reference potential, respectively.

4,716,771

SYMMETRICAL MASS FLOW METER

Martin Kane, Atlantic City, N.J., assignor to K-Flow Division of Kane Steel Co., Inc., Millville, N.J.

Filed Feb. 11, 1986, Ser. No. 809,659
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **19 Claims**



1. In a Coriolis mass flow meter of the type imparting an oscillation transverse to the direction of flow therein and having sensors located symmetrically with respect to and on opposite sides of the impartation of the oscillation and means for determining mass flow from the sensor signals due to the reaction of the flow in response to the imparted oscillation, comprising: a conduit having an inlet and an outlet rigidly fixed with respect to one another and a continuous flexible flow tube communicating with the inlet and the outlet at respective ends thereof, said flow tube formed symmetrically about a substan-

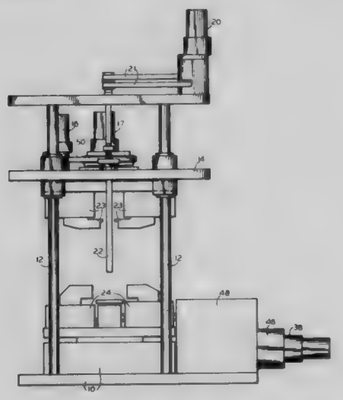
tially straight line between the inlet and the outlet and substantially free of restrictions or constraints along its length offset from said straight line the flow tube having two successive loops, the first and second loop communicating with one another and adapted to direct the flow through the flow tube at the communication between said loops so as to cross the line between the inlet and the outlet substantially perpendicular thereto, the flow tube adjacent the inlet end having an inlet connecting portion adapted for deflecting the flow from the inlet to a position spaced from the line between the inlet and and the outlet end directing the flow into the first loop, and an outlet connecting portion adapted to direct the flow from the second loop from a position spaced from the line between the inlet and the outlet and directing the flow into the outlet of the conduit.

4,716,772

CHILD-RESISTANT CAP TORQUE EVALUATOR

Kenneth B. Bubeck, 23 Dorchester Ave., Selkirk, N.Y. 12158, and Lawrence E. Ruff, P.O. Box 966, Coeymans, N.Y. 12045

Filed Apr. 14, 1986, Ser. No. 851,546
Int. Cl.⁴ G01L *5/00, 5/16*
U.S. Cl. 73—862.23 **8 Claims**



1. A method for loading and conducting testing on a container which is sealed with a child resistant cover, so as to subject said container to cover-opening testing, comprising the following steps:

securing said container about its cover by a first clamping means thereby orienting and posturing said container for subjecting it to cover-opening tests;

securing said container by a second clamping means the radial force center of which is coaxial with said first clamping means;

translating said first and second clamping means towards each other along their common axis while rotating said clamping means relative to each other about said common axis; and

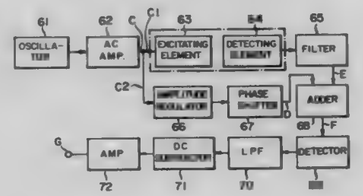
recording the forces and combinations thereof resulting from said translating while rotating step, whereby said first and second securing steps comprise the laoding of said container, and said translating while rotating and said recording steps comprise its testing.

4,716,773

STRESS DETECTOR

Yutaka Nonomura; Jun Sugiyama; Hirofumi Komatsubara, and Masaharu Takeuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 31, 1985, Ser. No. 815,252
Claims priority, application Japan, Jan. 11, 1985, 60-3688
Int. Cl.⁴ G01L *3/10;* **G01B** *7/24*
U.S. Cl. 73—862.36 **14 Claims**



1. A stress detector comprising:

an AC power source for generating an AC symmetrical wave form voltage;

an exciting coil driven by said AC power source for alternatingly magnetizing at least a portion of a ferromagnetic material to be measured in a predetermined direction;

a detecting coil for detecting a magnetic flux generated due to said alternating magnetization;

an adder means for taking out a part of a voltage applied to said exciting coil, setting an amplitude and a phase of a wave form of the taken-out part of the voltage to preset values, adding the voltage thus obtained to a voltage induced in said detecting coil, and giving an output signal representative of a value of stress in said ferromagnetic material as a variation either in amplitude or phase depending on the preset phase; and

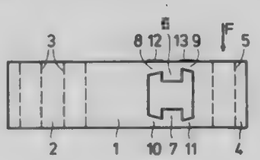
a wave detecting means which outputs a linear voltage signal representative of the stress fluctuation of said ferromagnetic material by detecting said signal outputted from said adder means.

4,716,774

FORCE MEASURING CELL WITH A FORCE SENSOR IN THE FORM OF A BENDABLE SUPPORT

David C. Bull, Hinwil, and Juerg Hasler, Winterthur, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed May 30, 1986, Ser. No. 868,597
Claims priority, application Switzerland, Jul. 5, 1985, 2902/85
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 73—862.65 **6 Claims**



1. A force measuring cell for measuring a force due to a load, comprising a force sensor in the form of a bendable support, wherein one end of the support is in the form of a base part which is rigid with respect to bending, and the outer end of the support is in the form of a load-receiving element adapted to receive a load; said other end of said support being rigid with respect to bending, the load-receiving element being connected to the base part by a plurality of elastically bendable

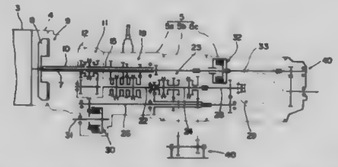
link members, each link member having two bendable segments, one of said bendable segments being disposed closer to the base part than the other bendable segment, said bendable segments having relatively smaller cross sections than other parts of the elastically bendable link member; expansion-measuring strips disposed on the bendable segments on at least one of the link members, for generating an electric signal in accordance with the force being measured; the mean material thickness of said one bendable segment of each link member being greater than that of the other bendable segment thereof, and the ratio of said thicknesses being such that stresses of equal magnitude are applied to all the bendable segments when under the load.

4,716,775

TRANSMISSION HAVING CASSETTE TYPE SUPPLEMENTARY CHANGE SPEED APPARATUS

Yasuyuki Horii; Takao Nishikawa, both of Sakai; Isamu Yamanishi, Takatsuki, and Tomeo Umemoto, Osaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 16, 1986, Ser. No. 852,764
Claims priority, application Japan, Aug. 20, 1985, 60-127384[U]; Nov. 20, 1985, 60-260445; Nov. 20, 1985, 60-260446
Int. Cl.⁴ F16H *37/00*
U.S. Cl. 74—15.86 **4 Claims**



1. A transmission for an agricultural tractor comprising:

a transmission housing including a front case, an intermediate case, and a rear case;

main change speed means housed in said front transmission case and having a first transmission shaft means;

rear differential means housed in said rear transmission case;

auxiliary change speed means housed in said intermediate transmission case so as to be mounted between said main change speed means and said rear differential means, said auxiliary change speed means including

second transmission shaft means disposed coaxially with said first transmission shaft means of said main change speed means,

first gear means fixedly coupled to said first transmission shaft means,

second gear means rotatably mounted on said second transmission shaft means and having an auxiliary gear means intigrially coupled thereto,

third gear means and fourth gear means rotatably mounted within said intermediate transmission case so as to rotate in unison, said third gear means being meshed with said first gear means and said fourth gear means being meshed with said second gear means,

means for selectively coupling said first gear means and said second gear means,

input gear means rotatably mounted on said second transmission shaft means, and

claw clutch means for connecting said input gear means to said second transmission shaft means; and

a cassette type supplementary change speed means including

a supplementary change speed case removably mounted in an opening defined in said intermediate transmission case,

first and second supplementary change speed transmission shaft means supported by said supplementary change speed case,

first supplementary change speed gear means mounted on said first supplementary change speed transmission shaft means and meshed with said auxiliary gear of said auxiliary change speed means,

second supplementary change speed gear means mounted on said first supplementary change speed transmission shaft means for transmitting power to said auxiliary change speed means,

third supplementary change speed gear means mounted on said first supplementary change speed transmission shaft means to be rotatable with said first supplementary change speed gear means,

fourth supplementary change speed gear means mounted on said second supplementary change speed transmission shaft means and meshed with said third supplementary change speed gear means,

fifth supplementary change speed gear means mounted on said second supplementary change speed transmission shaft means so as to be rotatable with said fourth supplementary change speed gear means,

sixth supplementary change speed gear means rotatably mounted on said first supplementary change speed transmission shaft means and meshed with said fifth supplementary change speed gear means, and

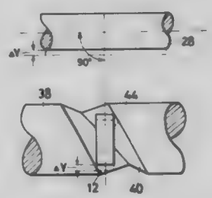
supplementary change speed switching means for selectively connecting said second and third supplementary change speed gear means and said second and sixth supplementary change speed gear means.

4,716,776

ROTARY TO LINEAR CONVERTER WITH LEAD SCREW

Takahiro Sakaguchi, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 829,426
Claims priority, application Japan, Feb. 19, 1985, 60-31023
Int. Cl.⁴ F16H *1/20*
U.S. Cl. 74—89.15 **3 Claims**



1. A rotary to linear converter, particularly well suited for use in transporting a transducer head from track to track on a disk-like record medium in apparatus for data transfer therewith, comprising:

(a) a drive motor;

(b) a lead screw coupled to the drive motor thereby to be rotated, the lead screw having a helical groove cut therein;

(c) guide means including a guide rod extending parallel to the lead screw with a preassigned spacing therebetween;

(d) a carriage reciprocably movable along the guide rod; and

(e) a pin mounted to the carriage for joint movement therewith along the guide rod and slidably engaged in the helical groove in the lead screw for translating the rotation of the lead screw into the linear travel of the carriage along the guide rod;

(f) the pin extending substantially at right angles with the lead screw for a minimal displacement of the pin in the axial direction of the lead screw in spite of possible variations in the preassigned spacing between the lead screw and the guide rod, wherein the pin is a straight member having opposite end portion, the straight member being

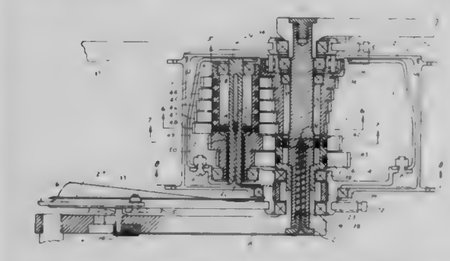
sufficiently long to have the opposite end portions out of contact with the lead screw.

4,716,777

MULTIPLE SPEED TRANSMISSION FOR PEDAL POWERED VEHICLES

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Filed May 8, 1986, Ser. No. 860,981
Int. Cl.⁴ F16H *3/08*
U.S. Cl. 74—369 **11 Claims**



1. In a pedal powered vehicle including a frame, a driving wheel with a central hub, a pedal drive shaft on the axis of said wheel and mounted in bearings for concentric rotation with said hub, an improved multiple speed transmission located within said hub and comprising:

a gear case having a closing plate fixed to said frame;

a drive-gear-carrier fixed on said pedal drive shaft for rotation therewith;

multiple drive gears rotatably mounted on said drive-gear-carrier;

drive gear locking means operative for selectively locking any one of said multiple drive gears to said drive-gear-carrier;

multiple idler shafts rotatably mounted in said gear case, positioned parallel to and equally spaced around said pedal drive shaft;

gears fixed on each of said multiple idler shafts in mesh with each of said multiple drive gears;

multiple idler gears rotatably mounted on each of said multiple idler shafts;

idler gear locking means operative for selectively locking any one of said multiple idler gears to its respective idler shaft, simultaneously with corresponding ones of said multiple idler gears on the others of said multiple idler shafts; and

free-wheel means having multiple gears in mesh with said multiple idler gears, respectively, and supported for concentric rotation about said pedal drive shaft; and

free-wheel ratchet means coupling said free-wheel means with said hub for driving said hub.

4,716,778

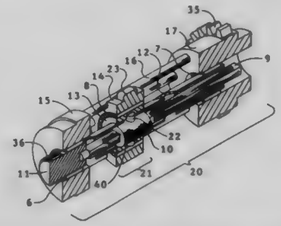
MANUAL, MULTI-RATIO TRANSMISSION

Christopher Scarpino, R.D. No. 3, Box 201, Leventry Rd., Johnstown, Pa. 15904

Continuation-in-part of Ser. No. 694,331, Jan. 24, 1985, abandoned. This application May 20, 1986, Ser. No. 872,000
Int. Cl.⁴ F16H *3/08*
U.S. Cl. 74—371 **1 Claim**

1. A variable speed transmission comprising:

first and second convergent conical gear trains, wherein said convergent gear trains simultaneously increase in circumference, said first conical gear train serving as a power output member and is an integral conical shells comprising a plurality of stepped gear platforms having internally cut gear teeth arranged conically from the smallest to the largest diameters, said second conical gear train serving as an input member and comprising a plurality of stepped gear platforms having externally cut gear teeth arranged conically from the smallest to the largest diameter, being in meshing engagement with a corresponding gear platform of the first conical gear train, and being eccentrically located within the first conical gear train, wherein a shifting means comprising a shifting control slide is mounted coaxially within the second conical gear train and is tracked to a fixed stabilizing shaft disposed within a hollow helical control drum, whereby said stabilizing shaft prevents inadvertent rotational motion of said slide, such



that two carriage indexing pins, integral with said shifting control slide engage double lead helical slots formed in said helical control drum, and being so driven by rotation of said double lead helical slots, aligns the carriage surrounding said helical control drum such that movement in said carriage directs a power engagement mechanism via the carriage indexing pins for selectively engaging one of the gears of the second conical gear train, whereby, the parallel expansion of said convergent cones produces a corresponding efficiency increase such that an increase in circumference is directly proportional to an increase in efficiency.

4,716,779

GEAR-SHIFT DEVICE

Karl-Fritz Heinzelmann, Meckenbeuren, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP85/00677, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/03858, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 5, 1985, Ser. No. 902,408
Claims priority, application European Pat. Off., Dec. 22, 1984, 84/00429 LU
Int. Cl.⁴ G05G *9/12*
U.S. Cl. 74—473 R **5 Claims**

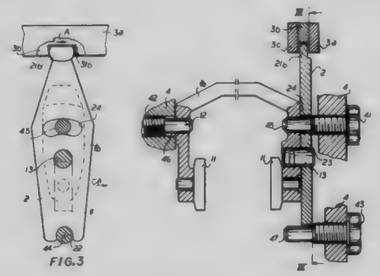


FIG.3

1. Gear-shift device for variable speed transmission comprising:

a transmission housing;

shifting means including at least one shift finger mounted in said transmission housing;

a plurality of shift rails disposed in said transmission housing and selectively engageable by said shifting means for displacing a respective rail within given limits;

a respective shift-rocker arm engaged with each shift rail;

a respective slide crank connected to each shift-rocker arm and engageable in a clutch sleeve of a respective shifting coupling for speed selection upon displacement of the respective rail; and

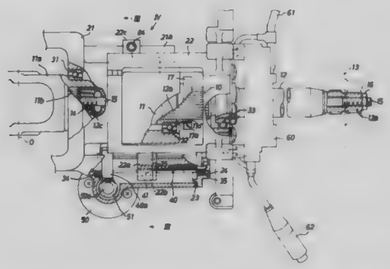
a reversing lever connected between one of said rocker arms and the respective one of said rails for reversing the direction of actuation of the respective shifting coupling with respect to the direction of actuation of others of said shifting couplings whereby said one of said rails and the respective clutch sleeve are both displaced in the same direction.

4,716,780

TELESCOPIC STEERING MECHANISM FOR AUTOMOTIVE VEHICLE

Masumi Nishikawa, Toyoake; Masanobu Ishikawa, Nagoya; Yuji Yokoya, and Sumio Takizawa, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 3, 1986, Ser. No. 914,993
Claims priority, application Japan, Oct. 4, 1985, 60-222421
Int. Cl.⁴ B62D *1/18*
U.S. Cl. 74—493 **4 Claims**



1. A telescopic steering mechanism for automotive vehicles including first and second support members telescopically coupled with each other for relative movement, a first shaft rotatably carried by said first support member, a second shaft rotatably carried by said second support member and telescopically coupled with said first shaft for rotation therewith, a feed screw shaft arranged in parallel with said first and second shafts and rotatably carried by said first support shaft, and a feed nut fixedly mounted on said second support member and threadedly coupled over said feed screw shaft for effecting relative movement of said first and second support members in accordance with rotation of said feed screw shaft,

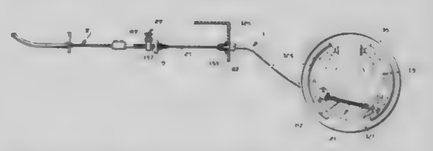
wherein one of said support members is integrally formed thereon with an elongated guide lug which is arranged in parallel with said first and second shafts, and the other support member is integrally formed thereon with a support portion which is axially movably coupled over said elongated guide lug, one of said support members being provided with means for resiliently engaging said elongated guide lug with said support portion of the other support member, and wherein said feed screw shaft is assembled to be slightly displaceable in a radial direction on said first support member.

4,716,781

UNIVERSAL EMERGENCY BRAKE FOR VEHICLE

Jean-Paul Dussault, 29 Notre-Dame de Fatima Street, Lorettville Quebec, Canada G2A 2E8

Filed Jan. 21, 1982, Ser. No. 341,527
Int. Cl.⁴ F16C *1/10*
U.S. Cl. 74—501 R **2 Claims**



1. An emergency brake replacement cable system for mounting on a wheeled vehicle having a support element formed with a through hole of predetermined diameter and having a wheel including a wheel cover formed with a hole of predetermined diameter, comprising:

(a) a cable;

(b) first connection means fixed at one end of said cable for connection of said cable to a brake actuation member of the vehicle;

(c) a coil spring loosely wound over said cable at said one end of said cable;

(d) a protection sleeve loosely mounted over said cable extending from one end of said spring away from said first connection means;

(e) a first connector at one end of said sleeve, said first connector comprising:

(1) a tubular housing loosely mounted over said sleeve at said one end thereof and having an outer diameter such that, in use, said housing may be slid through said cover hole;

(2) means at one end of said housing clamping said housing onto said sleeve and including an abutment member abutting, in use, one face of said wheel cover, and

(3) wherein said housing is formed with a plurality of outwardly bending spring lock fingers extending in the direction of said clamping means, said fingers having tips engaging, in use, the other face of said wheel cover whereby said first connector is secured, in use, on said wheel cover by the dual action of said abutment member and said bending lock fingers;

(f) a second connector at the other end of said sleeve;

(g) said second connector being formed with means detachably connecting said second connector to said sleeve, said second connector comprising:

(1) a body formed with a bore through which said cable freely extends, first and second cylindrical outer portions separated by a radial abutment surface, and further formed with a circumferential groove next to said first portion on the side thereof away from said radial abutment surface, said first portion having a diameter such that, in use, said second connector may be slid through said hole with said radial abutment surface on one side of said support element and said groove on the other side thereof, and

(2) a spring clip engageable around said groove and resiliently biased, in use, against said support element to mount said second connector thereon;

(h) second connection means detachably mounted on said cable at the other end thereof;

(i) wherein said cable, said sleeve and said spring have predetermined operative lengths at least as great as the distances between the relevant parts of the vehicle on which said replacement cable system is to be mounted;

(j) whereby, prior to use, said second connection means is released and removed from said cable, said sleeve with said connectors mounted thereon and said spring are slid off of said cable; said second connector is removed from

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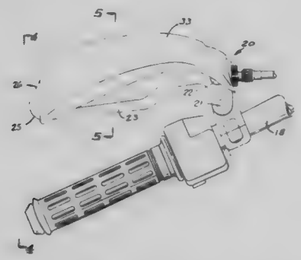
said sleeve, and said cable, sleeve and spring are cut to said distance between the relevant parts of the vehicle.

4,716,782

PULL LOOP SAFETY HANDLE FOR MOTORCYCLES

J. D. Jones, 1211 Kwis Ave., Hacienda Heights, Calif. 91745

Filed Jun. 27, 1986, Ser. No. 879,349
Int. Cl.⁴ F16C *1/10*; B62K *23/06*
U.S. Cl. 74—501 R **4 Claims**



1. A pull loop safety handle and a handlebar for handlebar controlled vehicles, said pull loop safety handle being of the type including a body having a pivot point pivotably connected to the handlebar of the handlebar controlled vehicle, a cable connection fitting positioned on said body handle near its pivot point and an elongated arm extending from the pivot point wherein the improvement comprises:

a continuation of the arm by means of an integral front arm into a closed loop having an inner opening sufficiently large for the user's fingers to extend therein and including the elongated arm for operating said pool loop safety handle and the integral front arm extending from said elongated arm and continuing to a point of connection with the body of said pool loop safety handle; and

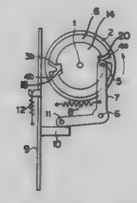
shield means affixed to the front arm of said handle.

4,716,783

INTERMITTENT GEAR LOCK MECHANISM

Hideki Hayashi, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,249
Claims priority, application Japan, Apr. 18, 1985, 60-81460
Int. Cl.⁴ F16D *43/26*
U.S. Cl. 74—527 **3 Claims**



1. A lock mechanism for an intermittently driven wheel of a tape player comprising:

at least one trapping region having a major engaging portion and a secondary engaging portion provided on one surface of said wheel, said major engaging portion being located rearward of said secondary engaging portion with respect to the rotational direction of said wheel by a predetermined distance, said both engaging portions also being radially spaced by a predetermined distance to establish a generally confronting partial overlap therebetween and a generally radially disposed passage therebetween;

a lock member having a locking portion configured to enter said radial passage between said both engaging portions and movable radially of said wheel to selectively engage either of said engaging portions to lock said wheel;

a first spring for biasing said lock member portion to confront said major engaging portion;

restricting means for restricting the movement of said lock portion between a first position for engaging said major engaging portion and a second position for engaging said secondary engaging portion;

an unlock lever movable back and ahead, said unlock lever being coupled to push said lock member through said passage and out of confrontation with said major engaging portion to subsequently rotationally confront said secondary engaging portion and against the energy of said first spring when said unlock lever is moved ahead so as to unlock said wheel; and

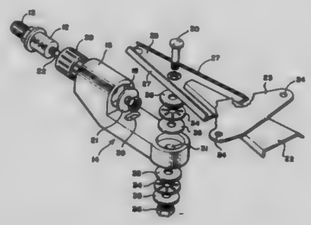
a second spring for biasing said lock lever in a back position.

4,716,784

BICYCLE PEDAL FOR RELEASABLY CONNECTING THE SHOE OF THE CYCLIST THERETO

Joseph C. Schlotterer, 1016 Mallory Way, Carson City, Nev. 89701

Filed Mar. 10, 1986, Ser. No. 837,735
Int. Cl.⁴ G05G *1/14*
U.S. Cl. 74—594.6 **33 Claims**



1. A pedal for a crank of a crank driven apparatus, wherein the pedal is capable of having a sole of a shoe of an operator of the apparatus readily connected thereto and disconnected therefrom, said pedal comprising:

a spindle having first and second ends, with an axial length relatively short as compared to a respective axial length of the pedal;

connecting means at the first end of the spindle for connecting said spindle to the crank of the crank driven apparatus;

a substantially L-shaped treadle member comprising a shorter leg and a longer leg, wherein the shorter leg has first and second ends, with the first end being integrally attached to a first end of the longer leg;

means for rotatively mounting the second end of the shorter leg of said treadle member to the second end of said spindle for rotation of said treadle member about a longitudinal axis of said spindle so that the longer leg of said treadle member lies lengthwise offset from and generally alongside the longitudinal axis of said spindle and swings in axial rotational movement about the longitudinal axis of said spindle; and

shoe connecting and disconnecting means mounted on a side of the longer leg of said treadle member that faces the longitudinal axis of said spindle, said shoe connecting and disconnecting means comprising;

pedal connector plate having a shape of a quadrilateral having two continuous opposite ends and two continuous longer opposite sides which interconnect between the opposite ends and converge toward each other, said pedal connector plate being mounted to an upper side of the longer leg of said treadle member such that one of the opposite ends of the pedal connector plate is positioned adjacent to an end portion of said longer leg which is affixed to the shorter leg, whereby the pedal connector plate extends substantially along the upper side of the longer leg and away from the spindle and shorter leg;

interlocking means formed along respective entire lengths of said two longer sides of said pedal connector plate;

a shoe connector plate having a shape of a quadrilateral having two continuous opposite ends and two continuous longer opposite sides which interconnect between the opposite ends and converge toward each other, said shoe connector plate being adapted to be secured to the sole of a shoe;

connector means formed along respective entire lengths of said two longer sides of said shoe connector plate;

wherein the connector means on the shoe connector plate is mutually interengageable and interlockable with the interlocking means on the pedal connector plate such that firm engagement is achieved along the entire length of the opposite sides of the mutually respective shoe connector plate and the pedal connector plate.

20. A pedal for a crank of a crank driven apparatus, wherein the pedal is capable of having a sole of a shoe of an operator of the apparatus readily connected thereto and disconnected therefrom, said pedal comprising:

a treadle member which is adapted to be rotatively connected at one of its longitudinal ends to the crank;

a pedal connector plate mounted on said treadle member, said pedal connector plate having a shape of a quadrilateral having two continuous opposite ends and two continuous longer opposite sides which interconnect between the opposite ends and converge toward each other, said pedal connector plate being mounted to said treadle member such that one of the opposite ends of the pedal connector plate is positioned adjacent to an end portion of said treadle member which is connected to the crank, whereby the pedal connector plate extends substantially along said treadle member and away from the crank, with side edges of said two opposite longer sides of said pedal connector plate being bent upwardly to form interlocking means extending along respective entire lengths of said two longer sides of said pedal connector plate, and

a shoe connector plate adapted to be secured to the sole of the shoe, said shoe connector plate having a shape of a quadrilateral having two continuous opposite ends and two continuous longer opposite sides which interconnect between said two opposite ends and converge toward each other, with side edges of respective entire lengths of said two opposite longer sides of said shoe connector plate being bent downwardly to form connector means for interengaging along the entire length of the respective longer sides of said shoe connector plate with the interlocking means along the entire length of the longer sides of said pedal connector plate for quickly and easily connecting and disconnecting the shoe of the operator and the pedal.

4,716,785

PLAYBACK INDUSTRIAL ROBOT PROVIDED WITH A DRIVING DEVICE HAVING AN ELECTRIC MOTOR

Hiroshi Godai, Tokyo; Yukio Otani, Kawasaki, and Noriyuki Utsumi, Yokohama, all of Japan, assignors to Tokico Ltd., Japan

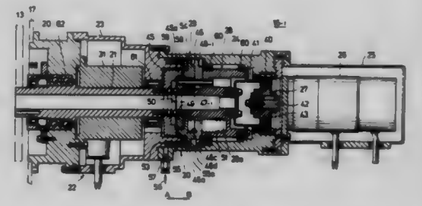
Filed Aug. 18, 1986, Ser. No. 897,614
Claims priority, application Japan, Aug. 20, 1985, 60-126739[U]; Sep. 11, 1985, 60-200781[U]
Int. Cl.⁴ F16H *33/00, 35/00, 37/00*
U.S. Cl. 74—640 **4 Claims**

1. A playback industrial robot comprising:

at least one driving device; and

an electric motor provided in said driving device and having a motor shaft;

said driving device comprising a reduction gear mechanism for reducing a rotational speed of the motor shaft of said electric motor; a rotatable output shaft for operating the playback industrial robot; a clutch mechanism which is in a disengaged state when said output shaft rotates in a teaching mode so that said reduction gear mechanism does not act as a load; a clutch engaging and disengaging mechanism for putting said clutch mechanism is an engaged state depending on supply and cutting off of the supply of compressed fluid when the teaching mode is started; a case for accommodating said electric motor, said reduction gear mechanism, said output shaft, said clutch mechanism, said clutch engaging and disengaging mechanism; and a rotary position detector for detecting a rotary position of said output shaft,



said case including a port through which protecting gas is supplied to the inside of said case, and passages for said protecting gas on the inside of said case,

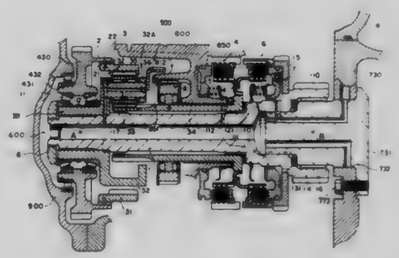
said clutch mechanism comprising a movable clutch member applied with a rotary force depending on forward and backward rotations of said electric motor and guide members arranged in parallel to said output shaft at positions separated from a center of said output shaft toward an outer peripheral direction of said output shaft, said movable clutch member being provided on said guide members so as to be non-rotatable but movable in an axial direction of said output shaft.

4,716,786

AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Shiro Sakakibara, Toyokawa, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Continuation of Ser. No. 786,728, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 476,804, Mar. 18, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 873,832
Int. Cl.⁴ F16H *37/08, 47/08, 57/10*
U.S. Cl. 74—695 **3 Claims**



1. An automatic transmission for motor vehicles comprising:

a first shaft rotatably supported by an automatic transmission case and having an input shaft coupled with an engine output shaft, an output shaft disposed coaxially in series with the input shaft and mounting a first output gear;

a second shaft having a long shaft supported by the transmission case, a short shaft rotatably mounted on the long shaft

through a tapered roller bearing, said short shaft having an input gear connected to the first output gear, said long shaft being provided with a second output gear mounted thereon;

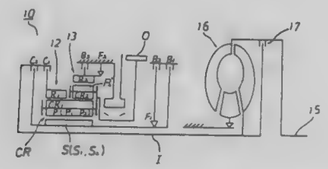
a differential gear having a large drive gear connected to the second output gear; and speed-changing planetary gear mechanism provided in the proximity of the input gear to connect the short shaft to the long shaft.

4,716,787

AUTOMATIC TRANSMISSION MECHANISM

Masakatsu Miura, Kariya, and Hideyuki Aoki, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Feb. 26, 1986, Ser. No. 833,378
Claims priority, application Japan, Oct. 16, 1985, 60-230809; Dec. 16, 1985, 60-282583
Int. Cl.⁴ F16H *57/10*; F16D *25/10*
U.S. Cl. 74—761 **6 Claims**



4. An automatic transmission mechanism comprising:

a single planetary gear unit;

a dual planetary gear unit;

carriers of both of the planetary gear units that are connected to one another;

carrier pinions of both of the planetary gear units that are connected to one another;

sun gears of both of the planetary gear units that are connected to one another, said sun gears that are connected to one another meshing with said carrier pinions that are connected to one another;

an output member to which said carriers are connected;

a ring gear of the single planetary gear unit that meshes with said carrier pinions that are connected to one another;

an input member for inputting engine torque to the gear units operatively connected to said ring gear of the single planetary gear unit through a first clutch means, the first clutch means being engaged to connect the input member and said ring gear of the single planetary gear unit whenever the transmission mechanism is in a forward travelling mode including when the transmissionn is in first speed, the input member also being operatively connected to said sun gears that are connected to one another through a second clutch means;

first retaining means for restricting rotation of said sun gears;

a ring gear of the dual planetary gear unit meshing with another carrier pinion of the dual planetary gear unit that is not connected with the carrier pinion of said single planetary gear unit;

an end portion at which said first and said second clutch means are disposed;

a flange portion fixed to said input member and connected to said first clutch means for defining a cylinder of a hydraulic actuator for actuating said first clutch means;

a movable member movably mounted to said flange portion for moving therealong in a direction toward and away from said first clutch means, said direction corresponding to an axial direction extending along an axis of the transmission mechanism, the movable member being a piston of the hydraulic actuator for actuating the first clutch means, and the movable member connected to said second clutch means for defining a cylinder of a hydraulic actuator for actuating said second clutch means;

a piston member movably mounted to said movable member for moving therealong in said axial direction toward and away from said second clutch means, the piston member being a piston of the hydraulic actuator for actuating said second clutch means; and

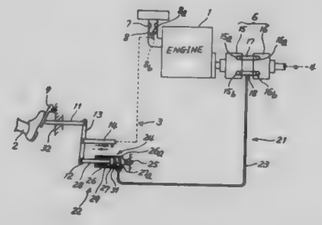
a return spring engaged with said piston member for biasing said piston member and said movable member to a return position.

4,716,788

ACCELERATION CONTROL SYSTEM FOR AUTOMOBILES

Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Corporation, Japan

Filed Oct. 28, 1985, Ser. No. 792,294
Claims priority, application Japan, Oct. 29, 1984, 59-228798
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—858 **8 Claims**



1. In an acceleration control system for an automobile having drive wheels, said control system being provided with:

an engine having an output and an operating means for controlling said engine;

the output of said engine varying in response to said operating means;

a first transmitting line connected to said operating means and being responsive to a position of an accelerator element and an acceleration linkage means;

a second transmitting line for transmitting the output of said engine to the drive wheels of said automobile; and said second transmitting line including

a continuously variable transmission having a high and low pressure side and having a reduction ratio which can be rendered infinite when said automobile is started;

and said acceleration control system having a torque detecting means including a pilot pipe means for detecting an output torque of said continuously variable transmission, said pilot pipe means having a first end connected to a high pressure side of an oil circuit in said continuously variable transmission so that a pressure in said pilot pipe means is substantially equal to the pressure of the working oil in said high pressure side of said oil circuit, said high pressure corresponding to the output torque of said continuously variable transmission; and

means for correcting an amount of input to be applied by said acceleration element to said operating means through said first transmitting line in such a manner that when said torque detecting means detects the output torque of said engine having exceeded a predetermined allowable maximum level, said engine output is reduced so as to offset the excessive amount of torque;

the improvement comprising:

said first transmitting line having a linkage means including:

a lever having a support point and adapted to be pivoted about said support point by an input from said accelerator element; and

means connected to said lever for transmitting a movement of said lever to said operating means;

and wherein said correcting means comprises:

a hydraulic cylinder having a chamber;

a piston slidable in said chamber;

a piston rod extending outside said chamber and providing the support point for said lever;

said pilot pipe having a second end communicating with said chamber at one side of said piston opposite said piston rod so as to introduce the high pressure of said working oil of said continuously variable transmission into said chamber at said one side of said piston so as to urge said piston and piston rod in a direction of the force of the working oil of said continuously variable transmission thereby displacing said support point of said lever; and

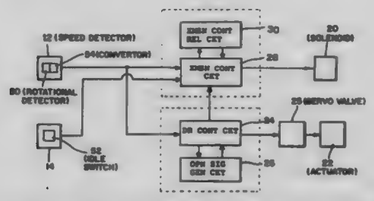
a spring disposed in said chamber at the opposite side of said piston so as to counteract the force exerted on said piston by said working oil from said continuously variable transmission.

4,716,789

DRIVE CONTROL DEVICE FOR VEHICLES

Yutaka Suzuki, Zama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jun. 15, 1984, Ser. No. 621,185
Claims priority, application Japan, Jun. 17, 1983, 58-109062
Int. Cl.⁴ B60K *41/04*
U.S. Cl. 74—866 **13 Claims**



1. A drive control device including an electronic automatic transmission and an automatic drive system, comprising:

a first detecting means for detecting a vehicle speed and generating a vehicle speed signal;

a second detecting means for detecting an extent of a throttle opening and for generating a throttle opening extent signal;

an actuator for opening and closing a throttle valve;

a drive controlling circuit for controlling said actuator according to the vehicle speed signal from said vehicle speed detector to maintain a predetermined chosen vehicle speed without operating an accelerator pedal;

an operation signal generating circuit for outputting an operation signal indicating that said drive controlling circuit is in operation;

a transmission control circuit for controlling the transmission according to a predetermined normal speed change schedule upon receipt of both said vehicle speed signal from said vehicle speed detector and said throttle opening extent signal; and

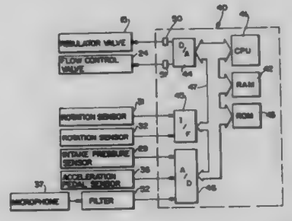
a transmission control releasing circuit for releasing normal transmission control of said transmission control circuit upon receipt of the operation signal from said operation signal generating circuit.

4,716,790

CONTINUOUSLY VARIABLE TRANSMISSION CONTROL SYSTEM RESPONSIVE TO PASSENGER COMPARTMENT NOISE OR VIBRATION

Daisaku Sawada, Gotenba; Takashi Shigemata, and Setsuo Tokoro, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 541,249, Oct. 12, 1983, Pat. No. 4,593,582. This application Feb. 12, 1986, Ser. No. 828,710
Claims priority, application Japan, Oct. 15, 1982, 57-179062
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—866 **15 Claims**



1. A continuously variable transmission means for controlling a speed of an engine installed in a vehicle, comprising:

a driving pulley including a fixed member and a movable member, said movable member being actuated by an hydraulic cylinder to form a V-shaped opening between the fixed and movable member;

a driven pulley with another fixed member and another movable member, said another movable member being actuated by another hydraulic cylinder to form another V-shaped opening between said another fixed member and said another movable member;

a flexible endless belt member spanning the pulleys such that the diameter of the pulleys can be varied relative to each other to result in different transmitting ratios;

a first detecting means for detecting vibrations of a vehicle body in accordance with an operating condition of the engine, the first detecting means outputting a first output signal, said first output signal corresponding to a first detected value;

a storing means for storing a basic value;

a comparison means for comparing the detected vibration with the stored basic value, the comparison means receiving said first output signal from the first detecting means and outputting a second output signal in accordance with a result of said comparing, the second output signal corresponding to a first compensation value;

a second detecting means for detecting an amount of displacement of an acceleration pedal, the second detecting means outputting a third output signal;

a first determining means for determining a revolution speed in accordance with said third output signal, the first determining means outputting a fourth output signal;

a calculating means for calculating a desired revolution speed, the calculating means receiving the fourth output signal from the first determining means and the second output signal from the comparision means, the calculating means outputting a fifth output signal, the fifth output signal corresponding to a calculated desired revolution speed; and

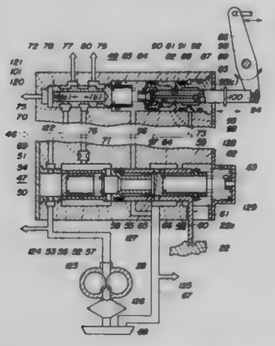
a control means for controlling the engine speed in accordance with said calculated desired revolution speed outputted from the calculating means and thereafter changing the transmitting ratio between the driving and driven pulleys.

4,716,791

INFINITELY VARIABLE TRANSMISSION UTILIZING HYDRAULIC FLUID PRESSURE TO VARY VELOCITY RATIO BETWEEN DRIVING AND DRIVEN PULLEYS

Kohei Ohnono, Fujisai; Mitsuru Saito, Koganei, and Kiyotaka Hayashi, Urawa, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,366
Claims priority, application Japan, Mar. 12, 1985, 60-047374; Mar. 13, 1985, 60-0934700[U]; May 2, 1985, 60-093852; May 2, 1985, 60-093850
Int. Cl.[4] B60K *41/12, 41/16*
U.S. Cl. 74—867 12 Claims



1. In an infinitely variable transmission of the type including a driving shaft, a driven shaft, a driving pulley composed of a first stationary pulley element and a first movable pulley element both provided on the driving shaft, a driven pulley composed of a second stationary pulley element and a second movable pulley element both provided on the driven shaft, an endless belt wound around the driving pulley and the driven pulley for connecting between the driving shaft and the driven shaft for transmitting power from the former to the latter, and a hydraulic fluid supply source for supplying a hydraulic fluid to the first and second movable pulley elements, wherein the first and second movable pulley elements are axially displaceable relative to respective ones of the first and second stationary pulley elements by means of the hydraulic fluid from the hydraulic fluid supply source, to vary the distances between the first and second movable pulley elements and the respective ones of the stationary pulley elements and accordingly the velocity ratio between the driving shaft and the driven shaft, the improvement comprising:

control means operatively connected between the first and second movable pulley elements and the hydraulic fluid supply source, the control means comprising

pressure creating means for creating a lower pressure fluid and a higher pressure fluid from the hydraulic fluid from the hydraulic fluid supply source, with a constant pressure difference between the lower pressure fluid and the higher pressure fluid,

modulating means for varying pressure values of the lower pressure fluid and the higher pressure fluid created by the pressure creating means while maintaining said constant pressure difference in response to a velocity ratio between the driving shaft and the driven shaft, and

selective supply means for selectively supplying the lower pressure fluid created by the pressure creating means and varied by the modulating means and the higher pressure fluid created by the pressure creating means to the first movable pulley element and the second movable pulley element.

4,716,792

TIRE REPAIR TOOL MEANS

Dwight H. Hector, 123 E. Dewey Dr., Ellettsville, Ind. 47429

Filed Nov. 7, 1986, Ser. No. 928,017
Int. Cl.[4] B60C *25/16*
U.S. Cl. 81—15.7 6 Claims



1. A tire repair tool means for repairing a puncture or other hole in a tire casing, comprising, in combination:

a tubular carrier member having a tubular exterior wall and a hollow bore extending rearwardly a substantial distance from the forward end thereof, the distance being sufficient at least to fully receive a plug member body as specified below, and of an outer diameter greater than that of the casing hole,

a plug member body formed of operatively pliable material of a nature for sealing against the walls of the casing hole,

the plug member body being of slender form whose cross-sectional size and shape is such as to be receivable within the carrier member's bore, but large enough relative to the bore as to be yieldingly retained therein, and of a length to operatively be retained in the casing wall when caused as specified below to be disposed in a direction generally perpendicular to the portion of the tire casing having the hole therein to be repaired,

the forward end of the plug member body being provided with a rigid pointed member of hard material, and the plug member body and the pointed member being fixedly retained, and together providing a plug member,

the pointed member in the region of its first abutment specified below being of a sufficiently large size relative to the size of the carrier member as to provide plug member retention by the tire casing as specified below during outward pull of the carrier member without any other axial force being applied to the plug member body to hold the plug member in the casing during such outward pull of the carrier member,

the pointed member having a first abutment facing the plug member body, and

the carrier member having a forwardly facing second abutment,

the arrangement providing that if the plug member body is inserted into the bore of the tubular carrier member, the said first abutment then facing rearwardly, and with the point of the pointed member entering the casing hole, a force imparted to the carrier member is transmitted, through the abutting contact of the said first and second abutments, to the pointed member which upon continuation of such force is caused to travel inwardly of the tire casing and pull the plug member body correspondingly into the hole of the tire casing, the plug member body during its said movement being shielded from the holding effect of the casing walls adjacent the casing hole by the carrier member's tubular wall,

and then rearward force applied to the carrier member will cause it to move outwardly of the tire casing, and the features mentioned above then causing or permitting all of the following:

(a) the plug member body, due to its retention in the tubular carrier member, is caused to correspondingly move outwardly, for an initial portion of outward movement of the tubular carrier member,

(b) the shielding effect of the tubular carrier member blocks the resilience of the tire casing from causing the tire casing to embrace the plug member body during the said initial portion of outward movement, and thus prevents the tire casing from blocking that initial outward movement of the plug member body,

(c) the retention of the pointed member and plug member body correspondingly causes the pointed member to also be moved outwardly as the plug member body is moving outwardly in correspondence to the initial portion of the outward movement of the tubular carrier member,

(d) the yieldability of the retention of the plug member body in the tubular carrier member permits the tubular carrier member to move outwardly relative to the plug member body when the plug member body is caused to stop its outward movement as specified below,

(e) the merely-abutting nature of axial contact between the said first and second abutments permits separation of the pointed member and the carrier member during outward movement of the carrier member, even though during inward movement of the carrier member they are operatively connected to achieve the casing-penetrating thrust operativity mentioned above,

(f) the outward movement of the pointed member, as it is being pulled outwardly by the plug member body, and the pointed member being inwardly of any shielding effect of the tubular carrier member, provides that during the outward movement of the pointed member, the pointed member encounters the tire casing,

(g) the tubular carrier member's size having caused the casing walls to be resiliently deformed, provides that the casing portions adjacent the casing hole move toward the casing hole as the carrier member is moved outwardly; and thus by some portion of the tire casing engaging the pointed member, the pointed member is operatively held from further outward movement,

(h) the retention of the pointed member and the plug member body causes the said holding of the pointed member by the casing to also hold the plug member body against outward movement during subsequent outward movement of the carrier member once the plug body member has moved outwardly far enough for the casing to hold the pointed member,

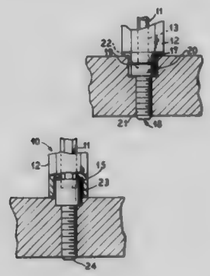
(i) and thus the plug member body is left disposed in the casing hole and held therein as the carrier member is then further pulled outwardly of the tire casing to be free from both the casing and the plug member body.

4,716,793

POLYGONAL TOOL FOR REMOVAL OF STRIPPED HEX HEAD FASTENERS

Michael Tauber, Park Ridge, Ill., assignor to Safety Socket Screw Corporation, Chicago, Ill.

Continuation of Ser. No. 811,354, Dec. 20, 1985, abandoned.
This application Jun. 10, 1987, Ser. No. 60,958
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—53.2 1 Claim



1. In combination a tool for rotatably removing fixed fasteners having heads that provide a normally straight sided tool receiving socket that has become stripped and is non-receptive to a noramlly straight sided removal tool, including;

(a) an elongated broach polygonal in cross section and having an outer dimension slightly larger than the socket of the fixed fastener, so as to have its either end forcefully projected therein,

(b) a sleeve having a diameter greater than said broach, and a center bore of a configuration corresponding to that of said broach, so as to be slidable and reversible upon, yet non-rotatable about said broach,

(c) a projection on one end of said sleeve having an outer diameter of a size less than said sleeve and greater than said broach and having a coaxially aligned center bore of a configuration corresponding to that of said broach so as to be projected longitudinally from one end of said sleeve for placement in juxtaposition to a countersunk flat surface of a recessed head of a fastener so as to align said broach with the socket in the head while being forcefully projected therein so that said fixed fastener may be removed by rotation of the tool, and

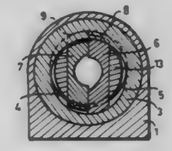
(d) a recessed receptacle formed in the opposite end of said sleeve about said center bore thereof for receiving a raised exposed head of a fastener so as to align said broach with the socket in the head while being forcefully projected therein so that said fixed fastener may be removed by the rotation of the tool.

4,716,794

OPENING DEVICE FOR AN EXTENSION ROD DRILLING EQUIPMENT

Jarmo Leppänen, Ylöjärvi, Finland, assignor to OY Tampella AB, Tampere, Finland

Filed Sep. 26, 1986, Ser. No. 911,810
Claims priority, application Finland, Oct. 22, 1985, 854119
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.18 3 Claims



1. An opening device for extension rod drilling equipment, comprising:

a frame;

a support sleeve having a central opening defining an axis and rotatably carried by said frame, said sleeve being adapted to receive a drill rod in said central opening;

gripping means carried by said sleeve for movement in a direction generally normal to said axis and having gripping surfaces for gripping the drill rod in the opening, said gripping means including a pair of jaws having substantially flat planar surfaces maintained in permanent slidable engagement with one another by the support sleeve, said gripping surfaces being defined by recesses in said planar surfaces;

means for rotating said sleeve about said axis;

said support sleeve having a pair of arcuate cam surfaces and said gripping means having a pair of cam follower surfaces for following engagement with said arcuate cam surfaces, respectively, said arcuate cam surfaces having discrete axes extending parallel to the axis of said central opening and positioned on opposite sides of said axis, respectively, whereby the axes of said arcuate cam surfaces are radially offset one from the other and from the axis of the central opening;

said cam surfaces engaging corresponding cam follower

surfaces at diametrically opposite sides of said sleeve whereby rotation of said sleeve relative to said gripping means and in opposite directions moves said gripping surfaces respectively toward and away from positions wherein said gripping surfaces are aligned one with the other to grip the rod and misaligned one with the other to release the rod.

4,716,795

MULTI-OBJECT HAND HELD IMPLEMENT

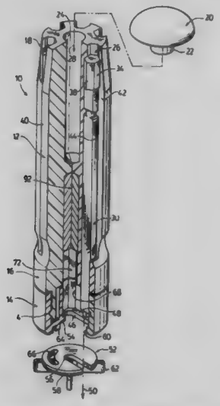
Antonio Corona, and Franco O. Corona, both of 175 Cumberland Street, Ste. 1805, Toronto, Ontario, Canada (M5R 3M9)

Continuation-in-part of Ser. No. 796,635, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 700,830, Feb. 12, 1985, Pat. No. 4,552,044. This application Mar. 28, 1986, Ser. No. 845,930

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] B25G *1/08*

U.S. Cl. 81—177.4 15 Claims



12. A hand held multi-object implement having a handle with a central longitudinal axis, an object selector cup rotatably mounted at an end of said handle to rotate about said central axis, a plurality of elongate objects provided peripherally of said handle in a circular pattern about said handle axis, each object being provided in said handle to extend essentially parallel to said handle's axis, a chuck provided at said end of said handle, said chuck being aligned with said handle axis for receiving an object end and securing it against rotation, said cup having a continuous side wall with an interior surface spaced radially outwardly of the radial location of said circular pattern of objects and a closed cup end, an elongate slot extending from a central portion of said cup and radially outwardly to the location of said objects in said handle, said cup being rotatable to position said slot in register with any desired object in said handle, said slot in said cup being of sufficient width and length to permit outward withdrawal of an object shaft from said handle in a direction generally parallel with said handle axis, means for retaining a selected object end in said cup, said object end being movable along said slot towards said cup central portion into alignment with said chuck for insertion of said object end into said chuck, characterized in that said object end has outwardly projecting portions for cooperation with said chuck, said handle having a plurality of channels for receiving said objects, each said channel having recessed portions extending along its length to receive said object end outwardly projecting portions, a circular flange depending from said handle end and having a plurality of slots extending therethrough, each of said slots being radially aligned with a respective said recessed portion in one of said channels, said slot in said flange receiving one of said outwardly projecting portions upon withdrawal of said object end from a corresponding channel for insertion into said chuck.

4,716,796

MULTIBIT HAND TOOL WITH IMPROVED CHUCK ARRANGEMENT

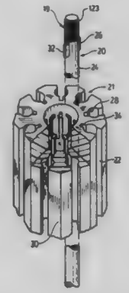
Antonio Corona, and Franco O. Corona, both of 175 Cumberland Street, Suite 1805, Toronto, Ontario, Canada (M5R 3M9)

Continuation-in-part of Ser. No. 796,633, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 681,886, Dec. 14, 1984, Pat. No. 4,552,043. This application Mar. 28, 1986, Ser. No. 845,931

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] B25G *1/08*

U.S. Cl. 81—177.4 10 Claims



1. A hand held multi-object implement having a handle with a central longitudinal axis, an object selector cup rotatably mounted at an end of said handle to rotate about said central axis, a plurality of elongate objects provided peripherally of said handle in a circular pattern about said handle axis, each object being provided in said handle to extend essentially parallel to said handle's axis, a chuck provided at said end of said handle, said chuck being aligned with said handle axis for receiving an object end and securing it against rotation, said cup having a continuous side wall with an interior surface spaced radially outwardly of the radial location of said circular pattern of objects and a closed cup end, an elongate slot extending from a central portion of said cup and radially outwardly to the location of said objects in said handle, said cup being rotatable to position said slot in register with any desired object in said handle, said slot in said cup being of sufficient width and length to permit outward withdrawal of an object shaft from said handle in a direction generally parallel with said handle axis, means for retaining a selected object end in said cup, said object end being movable along said slot towards said cup center into alignment with said chuck for insertion of said object end into said chuck, said chuck having a bore formed within said handle, said bore presenting a plurality of internal operative faces for engaging corresponding external operative faces provided on said object end, the number of said operative faces being equal to or a multiple of the number of objects provided in said handle to facilitate thereby the insertion of a selected object end into said chuck bore.

4,716,797

SCREWDRIVER WITH CONCAVE BLADE

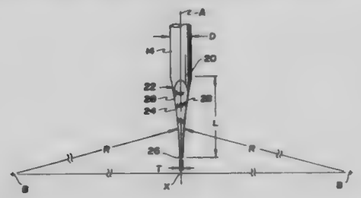
David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018

Filed Aug. 20, 1986, Ser. No. 898,207

Int. Cl.[4] B25B *15/00*

U.S. Cl. 81—436 6 Claims

2. A screwdriver comprising: a handle; an elongated shaft having a central axis and also having a first end connected to the handle as well as a second end spaced from the handle; said elongated shaft having a transverse thickness D; a blade unitary with the shaft extending from the second end thereof away from the handle along the central axis for a length in the range of about 3.5 D to 6.5 D; said blade including a main portion and a tip connected to the main portion; the blade having oppositely facing continuously curved concave surfaces tapering toward each other from the thickness D at the



second end of the shaft to the tip; each oppositely facing concave surface being defined by a circular arc having a radius of a length in the range of about 40 D to 120 D; each circular arc having a center positioned along a perpendicular to the central axis with the perpendicular having a junction with the central axis at a location between the tip and a distance 4 D from the tip in a direction away from the handle; and the tip having a thickness between the oppositely facing concave surfaces in the range of about 0.15 D to 0.25 D.

4,716,798

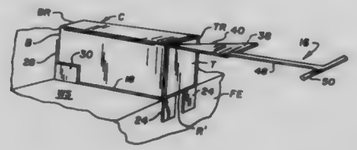
CAN HOLDER AND OPENER

William L. Flint, 400 Crescent Ave., Colonial Heights, Va. 23834

Filed Apr. 14, 1986, Ser. No. 851,932

Int. Cl.[4] B26D *1/00*

U.S. Cl. 83—13 8 Claims



1. A method for opening a can which has a perimetrical sidewall of generally rounded-corner rectangular transverse cross-sectional shape, extending between two opposite end walls,

said method comprising:

(a) providing a generally horizontal, upwardly-facing elevated work surface with a front edge;

(b) providing at least one bracket with a front flange which engages said front edge, a body which extends rearwards along said work surface and a rear flange which projects upwards at a site spaced rearwardly of said front edge;

(c) disposing the can which is to be opened, on its perimetrical sidewall with its one end wall in engagement with said rear flange and its opposite end wall facing forwards and located nearer said front edge of said work surface; and

(d) thrusting a cutter horizontally, rearwardly into said can about the outer perimeter of said opposite end wall.

4,716,799

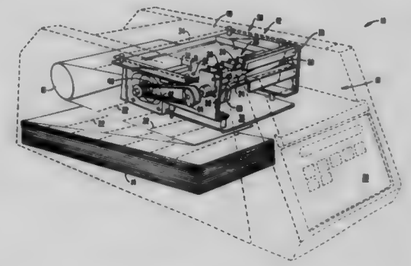
TICKET DISPENSING MACHINE AND METHOD

Donald Hartmann, Reno, Nev., assignor to Syntech International, Inc., Reno, Nev.

Filed Aug. 12, 1986, Ser. No. 895,768

Int. Cl.[4] B26D *3/00*

U.S. Cl. 83—42 15 Claims



1. A method for dispensing tickets from a strip of tickets having perforated joints, comprising the steps of:

advancing said strip of tickets past an optical sensor;

sensing a plurality of perforations with said optical sensor;

measuring the distance said strip of tickets is advanced between sensed perforations;

calculating an average ticket length from the measured distances between perforations;

indicating a desired number of tickets to be issued; and

advancing said strip of tickets a distance equal to said average ticket length multiplied by said desired number of tickets.

4,716,800

INSTALLATION FOR CORRECTLY STACKING BLANKS

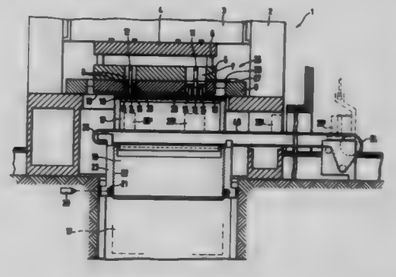
Alfred Bareis, Uhingen; Karl Dangelmaier, and Horst Pfisterer, both of Goeppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 889,841

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527018

Int. Cl.[4] B26D *7/32;* B30B *15/32*

U.S. Cl. 83—91 8 Claims



1. An arrangement for sectionally correctly stacking blanks made by multiple press tool methods, comprising:

a press table;

cutting tool means having cutting tool upper and lower parts;

a plurality of stacking channels having one stacking spindle means per stacking channel;

a conveyor means having a conveying plane and extending at least to underneath the stacking spindle means;

means for intermediate stack formation in an intermediate

area between said cutting tool means and said conveyor means;

support installation for raising and lowering said stacking spindle means between a position extending through the press table from below into the lower part of the cutting tool means and a position below said conveying plane;

each stacking spindle means including a spindle tip means which remains within the intermediate area when the stacking spindle means is lowered toward said conveying plane, and support means which extend in the direction of the stacking spindle means and spindle tip means for supporting the lowermost blank stacked on the spindle tip means;

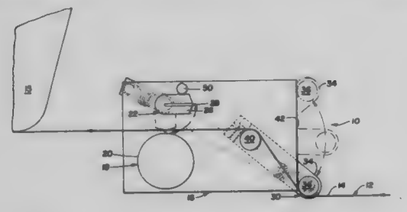
a diameter of the stacking spindle means being smaller than a diameter of the associated spindle tip means and said support means and said stacking spindle means being interchangeably and adjustably secured to the support installation as to be interchanged and adjustable in position for a new cutting tool means.

4,716,801

RAPID CUT-OFF APPARATUS FOR HIGH SPEED MOVING YARN

Albert E. Spaller, Jr., Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1986, Ser. No. 896,692
Int. Cl.[4] B26D *1/62*
U.S. Cl. 83—286 **4 Claims**



1. Cut-off apparatus for rapidly cutting a yarn moving along a path therepast at high speed toward a yarn processing station when tension upon the yarn exceeds a predetermined tension, said cut-off apparatus comprising:

a support means positioned to one side of the path of the high speed moving yarn;

anvil means connected to said support means and projecting therefrom across said path and spaced from said yarn to provide a cutting surface in alignment with the yarn moving along said path;

cut-off blade means having a cutting edge projecting therefrom across said path on the opposite side of said path from the cutting surface of said anvil means, said cut-off blade means being movably connected to said support means between an inoperative position spaced from said yarn and an operative cut-off position in engagement of said cutting edge against said cutting surface of said anvil means, said cutting edge frictionally engaging said yarn and forcing it against said cutting surface of said anvil means to sever it in the course of moving from said inoperative position toward said operative cut-off position;

yarn guide means movably connected to said support means between an operative position extending across said path of said yarn for engaging and guiding said yarn toward said yarn processing station and to an inoperative non-yarn guiding position away from said path of said yarn, said yarn guide means being located upstream of said path of said yarn from said anvil means and said cut-off blade means; and

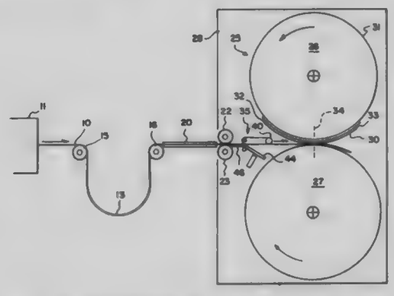
over-the-center spring means having a predetermined tension and connected at one end to said cut-off blade means and connected at its other end to said yarn guide means, said spring means being shiftable between (a) a first position for holding said cut-off blade means in said inoperative position and said yarn guide means in said operative position and (b) a second position for moving said cut-off blade means to said operative cut-off position, said yarn guide means being forced by said yarn in engagement therewith to said inoperative nonyarn guiding position upon tension on the yarn exceeding the predetermined tension of said spring means and thereby shifting said over-the-center spring means to said second position in the course of its movement to said inoperative non-yarn guiding position.

4,716,802

SCRAP REDUCTION SYSTEM FOR ROTARY DIE CUTTER

Barry J. O'Connor, Anderson, Ind., and Robert B. Vigder, Dayton, Ohio, assignors to Corfine Inc., Muncie, Ind.

Continuation of Ser. No. 817,720, Jan. 20, 1986, abandoned. This application May 5, 1987, Ser. No. 51,262
Int. Cl.[4] B26D *1/62, 5/00*; B65H *20/32*
U.S. Cl. 83—313 **9 Claims**



1. In a die cutter system for cutting succesive blanks from advancing web material, said system including a pair of die and anvil rolls mounted in a frame in nip-defining relation which cooperate to grip and pull a leading end portion of the web forward while cutting a blank therefrom and which release the cut reading end of the web during a portion of each complete revolution, and said system also including means for feeding the web to said rolls, and means for maintaining a slack loop of web between said feeding means and said rolls whereby said rolls grip and pull the web from said slack loop, apparatus for minimizing the scrap web material between successive blanks, comprising:

(a) one-way means at a position spaced upstream from the nip defined by said rolls and downstream from said loop maintaining means for holding the web against backward movement into said slack loop,

(b) means positioned between said holding means and said nip for retracting the cut leading end of the web through a predetermined distance with respect to said nip in response to release of the web by said rolls, and

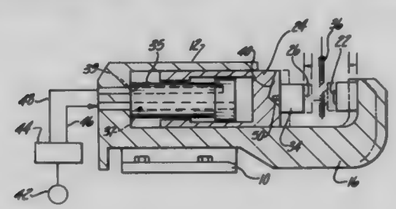
(c) means for controlling said retracting means to limit said retracting action thereof such that the cut leading end of the web will lie just beyond the angular position on said anvil roll where said die roll will engage said anvil roll at the start of the next cutting cycle and will thereby engage and draw the web through said nip.

4,716,803

SELF-EQUALIZING PIERCING MACHINE

Edward J. Waltonen, Southfield, Mich., assignor to REO Hydraulic Pierce & Form, Inc., Detroit, Mich.

Filed Sep. 29, 1982, Ser. No. 427,048
Int. Cl.[4] B26D *5/12, 7/26*
U.S. Cl. 83—529 **6 Claims**



1. Apparatus for performing an operation such as piercing of a workpiece in an equalized force mode so a to prevent distortion thereof comprising:

a base;

a yoke having a proximal portion mounted on the base for bidirectional movement along a work axis, and a distal portion for supporting one side of the workpiece during said operation;

integral piston and ram means slideably mounted within the proximal portion of the yoke for bidirectional movement relative to the yoke along the work axis to provide force on the other side of the workpiece during said operation;

means for supplying hydraulic fluid pressure to said integral piston and ram means to cause complemental movement of the piston means and yoke during work and return strokes;

said integral piston and ram means comprising a hollow cylindrical piston body defining first and second axially opposite fluid pressure reaction surfaces and having an exposed end which is proximate the distal end of the yoke and which defines with said distal end a work gap; and

said apparatus further including an internal core mechanically fixed to the yoke, said piston body being arranged on the internal core for sliding movement thereover, said reaction surfaces and said core responding to fluid pressure to produce axial movement of said integral piston and ram means relative to said yoke when supplied with fluid pressure.

4,716,804

INTERACTIVE MUSIC PERFORMANCE SYSTEM

Joel Chadabe, P.O. Box 8748, Albany, N.Y. 12208

Division of Ser. No. 421,900, Sep. 23, 1982, Pat. No. 4,526,078. This application Jul. 1, 1985, Ser. No. 750,915
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**

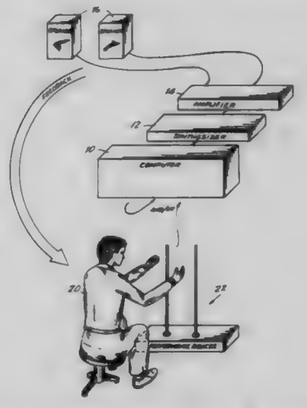
1. Apparatus for interactive generation of music adapted or use with a synthesizer, a programmable computer, and at least one performance device, said synthesizer, computer, and device operating together as a real-time composing and sound-producing system operative with a human performer, said apparatus comprising:

means for automatically generating composition control data in said computer, which composition control data determine in real time the course of an ongoing musical composition such that aspects of the music are non-predeterminable;

means for applying these composition control data to the synthesizer to affect the synthesizer's operations such that the synthesizer may generate sound in accordance with the composition control data applied to it;

means for generating performance control data to the synthesizer from the performance device in response to control gestures of the performer with the device; and

means for applying said performance control data to the synthesizer in conjunction with the composition control data that are automatically generated in the computer,



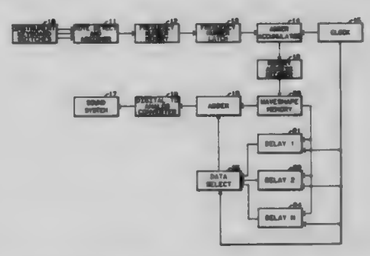
such that the performer can influence the course of the ongoing musical composition by selecting his or her next performance gesture in response to the aspects of the generated music determined by the composition control data automatically generated by the computer.

4,716,805

ENSEMBLE EFFECT FOR A MUSICAL TONE GENERATOR USING STORED WAVEFORMS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Sep. 8, 1986, Ser. No. 904,314
Int. Cl.[4] G10H *1/02, 7/00*
U.S. Cl. 84—1.24 **10 Claims**



1. In combination with a keyboard operated musical instrument having an array of keyswitches apparatus for producing a musical tone having ensemble effect comprising;

an assignor means whereby a detect data word is generated in response to each actuated keyswitch in said array of keyswitches and whereby one of a plurality of tone generators is assigned to each said actuated keyswitch,

a frequency number generator means whereby a frequency number is generated in response to each said detect data word and whereby said frequency number is provided to an associated one of said plurality of tone generators;

said plurality of tone generators each of which comprises;

a waveshape memory for storing a preselected set of waveshape data words,

a clock for providing timing signals,

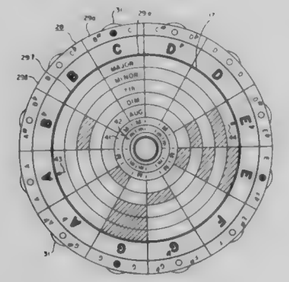
a memory addressing means, responsive to said timing signals, whereby said preselected set of waveshape data words are read out sequentially from said waveshape memory at a memory address advance rate responsive to said frequency number provided to said assigned tone generator,
a plurality of delay means each of which delays the data words read out of from said waveshape memory by a preselected number of said timing signals,
a data select means for selecting output data from one of said plurality of delay means in response to a delay control signal,
a combining means for combining the output data selected by said data select means with the data words read out of said waveshape memory to form a sequence of composite data words, and
a means for producing said musical tone having an ensemble effect responsive to said sequence of composite data words.

4,716,805

MUSICAL INDICATING APPARATUS

Frank D. Forrest, 2625 Brooks Ave., El Cerrito, Calif. 94530

Filed Jun. 30, 1986, Ser. No. 880,296
Int. Cl.[4] G09B *15/02*
U.S. Cl. 84—474 **6 Claims**



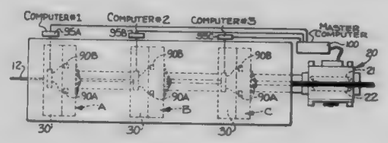
1. Musical indicating apparatus comprising:
a disk-like base having first and second faces;
an outer ring fixed on said first face said ring having in sequence, in twelve sectors, indicia of the twelve notes of the chromatic scale, each sector including bi-stable indicator means for selectively indicating the three notes of a triad which is to be identified;
a rotatable disk mounted on said one face within said outer ring and having radial indicia dividing its face into twelve pie-shaped sectors each sector corresponding in any one of twelve positions of rotation to any one of said notes and corresponding sector of said outer ring, said rotatable disk being subdivided into a plurality of rings crossing each sector, a root sector being marked with a plurality of kinds of triad chords, including at least one major triad and a minor triad, respectively in each of said rings, with the same ring in at least two other sectors being marked to indicate the remaining notes of a particular kind of triad; whereby the user by observing the written notes of a triad on a piece of sheet music may mark said notes by said bi-stable indicator means and rotate said rotatable disk so that three especially marked indicia will coincide with said marked notes of said outer ring, said predetermined root sector thus indicating the kind of triad.

4,716,807

SPEED CONTROL APPARATUS AND METHOD FOR BRAIDING MACHINE

Thomas A. Fischer, Orangeburg, S.C., assignor to Mayer Wildman Industries, Inc., Orangeburg, S.C.

Filed Dec. 17, 1986, Ser. No. 942,676
Int. Cl.[4] D04C *3/06, 1/00, 3/12, 3/40*
U.S. Cl. 87—20 **13 Claims**



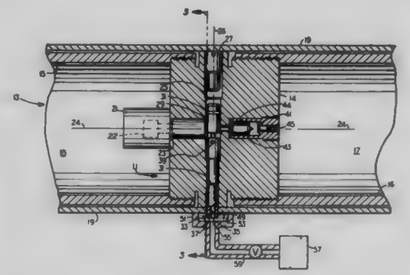
1. In a braiding machine having first and second sets of strand supply carrier shuttles, a strand supply carrier mounted on each of said shuttles and containing strand material wound thereon and adapted to be unwound therefrom during the braiding operation, a set of drive rotors rotatably supported in a circular arrangement around a central braiding location and supporting said first and second sets of strand supply carrier shuttles thereon, and drive means for imparting rotation to adjacent ones of said drive rotors in opposite directions and for imparting movement to said first and second sets of strand supply carrier shuttles in serpentine intersecting paths of travel and in opposite directions around the central braiding location, the combination therewith of
speed control means for progressively increasing the speed of travel of said first and second sets of strand supply carrier shuttles in response to the amount of strand material wound on said supply carriers being decreased and to thereby increase the efficiency of said braiding machine.

4,716,808

MECHANICAL LAUNCH SEQUENCER FOR A MISSILE

Robert L. Hoch, Merritt Island; James J. Keasler, Titusville, and Thomas J. Long, Maitland, all of Fla., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 12, 1985, Ser. No. 797,226
Int. Cl.[4] F41F *3/052*
U.S. Cl. 89—1.812 **15 Claims**



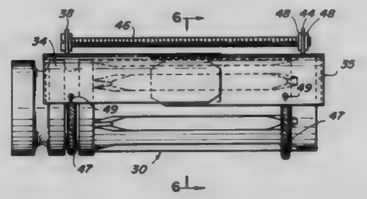
1. Apparatus for sequencing events necessary to arm and launch a missile comprising:
a missile launcher;
a missile including a warhead fuze and a rocket motor;
a block located in said missile;
a passageway situated in said block;
an actuator piston slidably positioned in said passageway;
said actuator piston and said missile launcher being engaged;
said actuator piston having a hollow core, a port communicating with said hollow core, a closed end and an open end;
gas means for introducing a gas into said hollow core through said open end so that said actuator piston travels in said passageway;
a fuze safety lock preventing the arming of said warhead fuze when locked;
said block containing means for igniting said rocket motor;
said travel of said actuator piston in said passageway disengages said missile from said missile launcher, unlocks said fuze safety lock, and permits said gas to communicate with said ignition means through said port and thereby actuate said ignition means.

4,716,809

DEBRIS SHIELD/FLASH REDUCER

Anthony A'Costa, P.O. Box 5806, 710 W. 4th St., Pueblo, Colo. 81002

Filed Dec. 5, 1985, Ser. No. 804,891
Int. Cl.[4] F41F *17/12*
U.S. Cl. 89—14.3 **8 Claims**



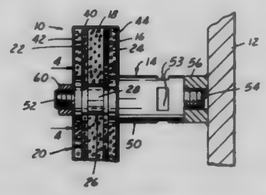
1. A debris shield/flash reducer for use in conjunction with attachments mounted on the muzzle end of a firearm barrel comprising a body member having a partial cylindrical configuration, a length adapted to extend along the attachments and a radius slightly greater than the radius of the attachment; radially inwardly directed flanges integrally formed with said body member at each end thereof for positioning said debris shield on the attachment and terminating radially outwardly of the bore of said attachment, and attachment encircling means secured to said body member for securing said debris shield on the attachment.

4,716,810

SELF-CONTAINED ARMOR ASSEMBLY

Emmett W. DeGuvera, Grosse Pointe Woods, Mich., assignor to Detroit Punch & Retainer Corporation, Fraser, Mich.

Filed Feb. 24, 1986, Ser. No. 832,440
Int. Cl.[4] F41H *5/04*
U.S. Cl. 89—36.02 **3 Claims**



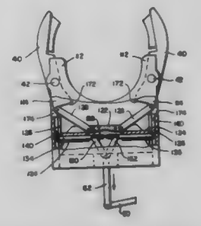
1. A self-contained armor assembly comprising a panel unit including a pair of armor plates each having opposite sides and peripheral edges, means for clamping said armor plates together in spaced, generally parallel relation, a casing in which said panel unit is housed, said armor plates being spaced from said casing along their opposite sides and peripheral edges, a foamed resinous plastic material in said casing filling the space between said armor plates and said casing and in which said armor plates are completely embedded and encapsulated, said means for clamping said armor plates together comprising a plurality of space retainers, said space retainers extending through openings in said armor plates and each having an enlarged central body portion and reduced end portions, and means on said reduced end portions to clamp said armor plates against said central body portion.

4,716,811

DOUBLE TOGGLE GRIPPING APPARATUS

Bruce S. Johnson, Dallastown, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Jan. 24, 1985, Ser. No. 694,246
Int. Cl.[4] F41F *3/18*
U.S. Cl. 89—40.12 **17 Claims**



1. Gripping apparatus comprising gripping means pivotally mounted on a structure to open and close; a carriage movable on the structure with respect to the gripping means; toggle linkage means comprising a pair of toggle links connected to the carriage and to the gripping means for opening and closing the gripping means upon movement of the carriage; means for moving the carriage; and locking means carried by the carriage for lockign the carriage at a predetermined location on the structure at which the gripping mens is closed and the pair of toggle links are in substantially a straight line relationship, said locking means comprising locking members slidably carried on the carriage, and wherein the structure has means for receiving the locking members upon the carriage being moved to said predetermined location, and said locking means further comprising another pair of toggle links connected to the locking members and to the moving mans such that the other pair of toggle links assume an over-center position to hold the lock members in the receiving means.

4,716,812

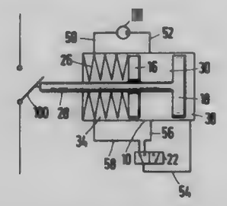
HYDRAULIC DRIVE

Gerhard Koerner, Schriesheim; Horst Plettner, Hanau; Edelwald Lutz, Rodgau; Egon Orth, Hanau, and Rudi Weingaertner, Hasselroth, all of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Mar. 11, 1985, Ser. No. 710,036
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408905
Int. Cl.[4] F15B *15/17*
U.S. Cl. 91—417 R **16 Claims**

1. Hydraulic drive, comprising a pressure housing having a blind axial recess formed therein with a wall and a bottom, an accumulator piston with first and second opposite ends disposed in said recess, an energy accumulator in the form of springs disposed symmetrical to the central axis of said accumulator piston for continuously engaging said accumulator piston braced against said springs, a working piston in the form of a differential piston guided in said recess having a piston rod passing through said accumulator piston and disposed centrally in said pressure housing, a high-pressure pump communicating with said accumulator space for filling said accumulator

space, a hydraulic control unit for controlling motion of said working piston, said piston rod, said pressure housing and said accumulator piston defining said wall of said recess, said piston rod, said pressure housing, said first end of said accumulator piston and said working piston defining an accumulator space



in the form of a hydraulic accumulator providing pressure energy for the hydraulic drive, said second end of said accumulator piston and said wall and said bottom of said recess defining a plenum for receiving spent hydraulic fluid at low pressure, and said accumulator piston separating said accumulator space from said plenum.

4,716,813

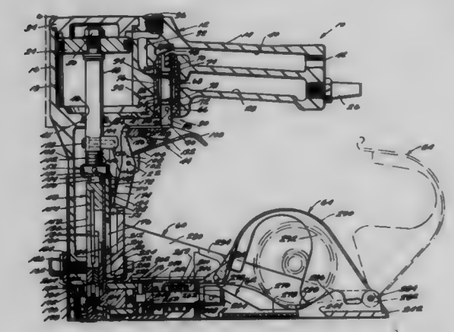
PNEUMATICALLY OPERATED STAPLER WITH IMPROVED ACTUATING AND CLINCHING MECHANISM

Canlas S. Pradenclo, North Kingstown, R.I., assignor to Stanley-Bostitch, Inc., East Greenwich, R.I.

Filed May 6, 1985, Ser. No. 730,571

Int. Cl.⁴ F15B *11/15*

U.S. Cl. 91—355 **12 Claims**



1. A pneumatically actuated fastener driving device comprising

a housing defining a pressure chamber and a drive track,

a piston mounted in said pressure chamber for movement through a pressure actuated drive stroke and a return stroke,

a fastener driving element mounted in said drive track and operatively connected with said piston for movement therewith through a drive stroke and a return stroke,

a valve member mounted on said housing for movement from a normal position into a firing position for enabling said piston to be moved through a pressure activated drive stroke and from its firing position into its normal position for enabling said piston to be moved through a return stroke,

a trigger member mounted on said housing for pivotal movement between a normal position and a cocked position,

an actuating member mounted on said trigger member for movement therewith and for controlled movement with respect to said trigger member,

a control member mounted on said housing for movement between a control position and a release position,

first interengaging means acting between said control member and said actuating member for enabling said control member (1) when in its control position to control the relative movement of said actuating member with respect to said trigger member so that the actuating member will be moved with the trigger member through a valve actuating movement in response to the movement of said trigger from said normal position into said cocked position and (2) when moved into its release position to control the relative movement of said actuating member with respect to said trigger member so that said actuating member will be enabled to move through a valve releasing movement following its valve actuating movement, while said trigger member is maintained in said cocked position,

second interengaging means acting between said actuating member and said valve member for enabling said valve member (1) to move from its normal position into its firing position in response to the valve actuating movement of said actuating member and (2) from its firing position into its normal position in response to the valve releasing movement of said actuating member, and

means for moving said control member from its control position to its release position in response to the movement of said fastener driving element through the end portion of its drive stroke.

4,716,814

MUFFLER FOR BRAKE BOOSTER SYSTEM

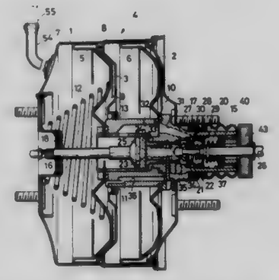
Mutsuro Yamakoshi, Sakado, Japan, assignor to Jidosha Kiki Co., Ltd., Japan

Filed Feb. 7, 1985, Ser. No. 699,017

Claims priority, application Japan, Feb. 9, 1984, 59-17197[U]

Int. Cl.⁴ F15B *9/10*; F01N *1/24*

U.S. Cl. 91—376 R **7 Claims**



1. A muffler device in combination with a brake booster system comprising: an axis, a power piston disposed slidably in reciprocating motion in the interior of an enclosed housing having a front wall and a rear wall, the power piston being at its front end connected to an output rod mounted slidably along the axis of the system and extending through the front wall of the housing; an integrally mounted cylindrical portion slidably mounted at a rear end along the axis of the system and extending through the rear wall of the housing; a constant-pressure chamber defined by the housing into which a predetermined negative pressure is normally introduced; a variable pressure chamber communicating selectively with the constant pressure chamber or the atmosphere by way of a valve mechanism disposed in the cylindrical portion of the power piston an input rod, adapted to control the valve mechanism in its valving function, positioned in the interior of the cylindrical portion of the power piston, the valve mechanism being constructed so that when the power piston moves in a forward stroke, toward the front wall, atmospheric air is sucked into the variable pressure chamber by way of a rear opening of the cylindrical portion through the valve mechanism; muffler means, positioned between the inner circumferential surface of said cylindrical portion and the outer circumferential surface of the input rod, for re-directing atmospheric air substantially ninety degrees from an input direction, and for re-directing the re-directed atmospheric air substantially ninety-degrees from the re-directed direction so as to bend the air twice at right angles in order to shield from noise the exterior of the housing.

4,716,815

FLUID-PRESSURE-OPERATED ACTUATORS

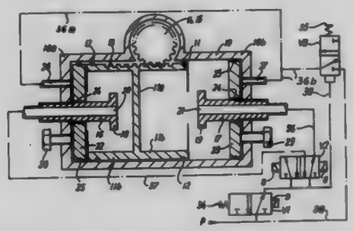
Duncan R. Stewart, Newent, England, assignor to Hytork Actuators Limited, Gloucester, England

Filed Apr. 18, 1984, Ser. No. 601,447

Claims priority, application United Kingdom, Apr. 23, 1983, 8311117

Int. Cl.⁴ F15B *11/08*

U.S. Cl. 91—464 **20 Claims**



1. A fluid-pressure operated actuator comprising a cylinder, a piston having hollow axial end chambers and a transverse web intermediate said chambers, said piston movable in the cylinder, a first inlet for supplying fluid pressure to the cylinder interior and the piston end chamber on one side of the piston web to move the piston in one sense, a second inlet for supplying fluid pressure to the cylinder interior and the piston end chamber on the other side of the piston web to move the piston in the opposite sense, and means cooperable with the piston to set the piston in a selected one or other of three axially spaced predetermined positions, said last mentioned means including first and second elements axially movable in said cylinder respectively on opposite sides of the web, an intermediate one of the three positions being defined by engagement of said piston with said first and second elements, and means limiting the inward movement of at least one of said first and second elements to establish said intermediate position.

4,716,816

HYDRAULIC MOTOR

Vilho Filt, Ilmimi, Finland, assignor to Oy Partek Ab, Pargnen, Finland

PCT No. PCT/FI86/00026, § 371 Date Nov. 13, 1986, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO86/05554, PCT Pub. Date Sep. 25, 1986

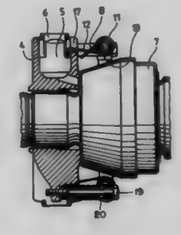
PCT Filed Mar. 19, 1986, Ser. No. 934,448

Claims priority, application Finland, Mar. 20, 1985, 851107

Int. Cl.⁴ F01B *13/06, 31/00*

U.S. Cl. 91—491 **4 Claims**

1. Hydraulic motor, in which a rotating motion is generated by a combined effect of a cam ring (2) and roller means (6) connected to the pistons (5) of a cylinder group (3) and in which in connection with each piston (5) in the cylinder group (3) is arranged a spiral spring (11; 14) leaning against the cylinder group (3) to disengage the piston (5) with its roller means (6) from the cam ring (2) when the pressure ducts of the motor are connected to a space without pressure, characterized in that one end (12; 15) of the spiral spring (11; 14) mounted to lean against a support (8, 9, 10) is arranged to influence the piston (5) through a passage (17) formed in the wall of the



cylinder (4) and the other end (13; 16) is arranged to lean against the support (8), while the spring (11; 14) thus acts as torsion spring.

4,716,817

PISTON, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES

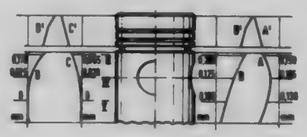
Emil Ripberger, Remseck, and Eberhard Buberk, Fellbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 887,437

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527032

Int. Cl.⁴ F16J *1/00*

U.S. Cl. 92—177 **4 Claims**



1. A piston, particularly for internal combustion engines, comprising a head and a skirt having annular grooves therein to receive piston rings and gudgeon pin bores the bearing surfaces of which skirt come into contact with the bore of the cylinder in which it reciprocates lie on a generated surface which has an essentially circular or elliptical outer contour in all cross-sections vertical to the longitudinal axis of the piston, and in the longitudinal axis of the piston straight or curved generating lines, the improvement being that two opposite lines, extending at least over a considerable common part of the axial length of the piston, do not run symmetrically in the connecting rod reciprocating plane passing through the longitudinal axis of an enclosing cylinder placed without clearance around the piston.

4,716,818

AIR DISTRIBUTION DEVICE

Carlton E. Brown, Tucson, Ariz., assignor to Air Concepts, Inc., Tucson, Ariz.

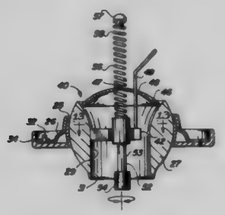
Filed Mar. 3, 1986, Ser. No. 835,169

Int. Cl.⁴ F24F *13/10*

U.S. Cl. 98—40.02 **9 Claims**

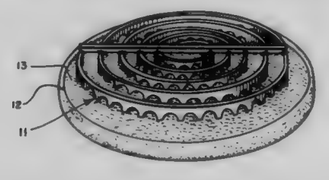
1. An air outlet comprising a face plate having a first circular aperture defined therethrough and a plurality of shaft members extending orthogonally therefrom; a rear plate having a plurality of openings defined therethrough in registry with said shaft members for receiving said shaft members in registered passage therethrough to attach said rear plate to said face plate, said rear plate having a second circular aperture defined therethrough; a plurality of shaft retainer means, each operatively

securable about a different one of said shaft members to secure said rear plate to said face plate; a valve member having a spherical body portion having a diameter larger than the diameter of either said first and said second circular aperture and operatively interposed between said face plate and said rear plate for engagement therewith and rotation relative thereto, said valve member having a cylindrical passageway defined centrally therethrough between a tapered entrance and an exit, said tapered entrance having a transverse area which is greater than the transverse area of said exit; a torsion free centering assembly mounted within the centrally disposed cylindrical



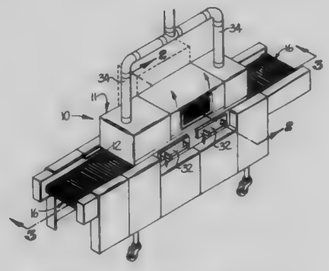
passageway of said valve member; an axially extending damper actuator means mounted through said centering assembly and having an adjusting means at one end thereof and a flexible spring member at the other end thereof; a dome-shaped damper circumscribed about said spring member and axially mobile in response to the rotation thereof; and damper guide means extending through said damper into seated engagement upon said centering assembly for directing said damper between totally obstructive engagement within said nozzle entrance to a totally non-obstructive position relative to said central passageway as said damper migrates upon said spring member in response to the rotation of said adjusting means.

4,716,819
HEAT TRANSFER DEVICE FOR USE IN COOKING PIZZAS
John D. Beltz, Wichita, Kans., assignor to Pizza Hut, Inc., Wichita, Kans.
Division of Ser. No. 729,521, May 1, 1985, abandoned. This application May 4, 1987, Ser. No. 46,666
Int. Cl.⁴ A47J *37/04*
U.S. Cl. 99—419 **22 Claims**



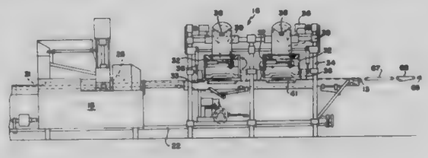
12. A device for use in cooking a pizza which comprises a one-piece heat conducting means which is formed generally in a spiral with at least two revolutions and which means comprises a heat absorbing band portion with tapered heat transferring pins for inserting into the pizza extending from the heat absorbing band portion in a direction generally perpendicular to the spiral, the heat transferring pins having a length such that when the pins are inserted into the pizza a portion of each pin remains outside of the pizza thereby preventing the heat absorbing band portion from contacting the pizza, the device further comprising a supporting bar which is attached to the heat conducting means.

4,716,820
BAKED GOODS COOKING APPARATUS
Robert M. Stuck, 1 Thornwood Rd., Clover, S.C. 29710
Filed May 15, 1981, Ser. No. 264,113
Int. Cl.⁴ A23L *3/00*
U.S. Cl. 99—443 C **8 Claims**



1. A cooking apparatus comprising:
housing means for enclosing a cooking zone,
endless foodstuff chain conveyor means mounted to extend through said cooking zone and for movement along a closed path of travel having upper and lower runs,
heating means mounted in said housing means for heating said cooking zone by emission of infrared radiation and by convective heating of air and for cooking foodstuff conveyed therethrough along said upper run of said conveyor means, and
tempering means mounted in said housing means and extending into said cooking zone for stroboscopically interrupting reflection within said housing means of infrared radiation from said heating means and for agitating air in said cooking zone so as to facilitate more uniform cooking of foodstuff conveyed through said cooking zone along said upper run of said conveyor means.

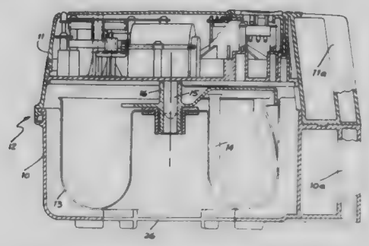
4,716,821
LINE FOR ASSEMBLING STUFFED PROTEINACEOUS PATTIES
Timothy G. Mally, Oregon; John A. Jonovic, Fitchburg, and Alvin Borsuk, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Feb. 13, 1986, Ser. No. 829,582
Int. Cl.⁴ A21C *9/04*; A23G *5/00*
U.S. Cl. 99—450.1 **14 Claims**



1. An apparatus for assembling a product including proteinaceous patties having a filling therebetween, comprising:
A generally horizontal conveyor assembly and a drive assembly therefor;
means for supplying first proteinaceous patties onto an upstream portion of the conveyor assembly;
means for depositing edible filling materials onto the first proteinaceous patties while same are conveyed by the conveyor assembly downstream, said depositing means being downstream of said first proteinaceous patty supply means and being for forming a combined first patty and filling intermediate assembly;

pass-through proteinaceous patty supplying means downstream of said depositing means, said pass-through proteinaceous patty supply means including a generally horizontal longitudinal opening therethrough, and said conveyor assembly traverses a path through said longitudinal opening of the pass-through proteinaceous patty supplying means, said pass-through proteinaceous patty supplying means being for positioning second proteinaceous patties onto the combined first patty and filling intermediate assemblies while same are conveyed by the conveyor assembly; and
knitting means downstream of said pass-through proteinaceous patty supply means, said knitting means being for knitting together said first patties and of said second patties while same are conveyed by the conveyor assembly.

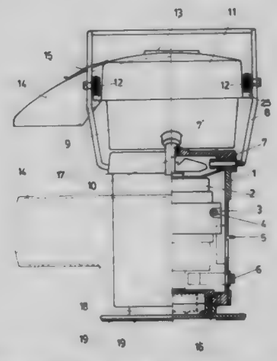
4,716,822
ICE-CREAM MAKER
William J. O'Brien, Vaucluse, Australia, assignor to Breville R & D Pty. Ltd., Pyrmont, Australia
Filed Aug. 6, 1986, Ser. No. 893,863
Claims priority, application Australia, Oct. 17, 1985, PH2953; Nov. 7, 1985, PH03298; Nov. 28, 1985, PH03618; May 26, 1986, PH06097
Int. Cl.⁴ A23C *3/04*; A23G *9/00*
U.S. Cl. 99—455 **7 Claims**



1. A domestic ice-cream maker for insertion in a freezer, comprising:
a container in the form of an annular trough having an axis;
a mixing blade arranged in said trough for rotation around said axis;
first electric motor means drivingly connected to said mixing blade for producing rotation of said blade;
means for producing a stream of air directed downwardly onto to a surface of an ice-cream mix in said container; and
means for directing air leaving said surface of said ice-cream mix around said container and through an outlet below said container.

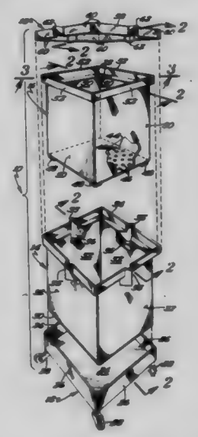
4,716,823
JUICE EXTRACTOR FOR INDUSTRIAL USE
Guillermo Capdevila, Fucaterrabia, Italy, assignor to Sanamic, S.A., San Sebastian, Spain
Filed Jun. 6, 1986, Ser. No. 871,260
Int. Cl.⁴ A23N *1/00*
U.S. Cl. 99—510 **5 Claims**

1. An improved juice extractor for industrial use, comprising in combination, a basic shell which is cylindrical in shape forming an upright tubular component for housing an electric motor, a motor supporting ring at one end of the shell, a potentiometer for changing the motor speed, a master safety switch for controlling the supply of electrical power to the motor, an upper head section on said shell, said head section including a basin in which products are placed to be liquidized for obtaining the juice and including a lid overlying the basin, a closure part for said shell, a generally U-shaped handle having a central portion and two ends, the ends being pivoted to the shell and the central portion adapted to overlie the lid, the handle including fittings for engaging the lid when closed, a microswitch mounted inside the shell, and internally projecting



actuating means carried by the handle to actuate the microswitch for starting the motor by pivoting said handle to overlie and engage the lid when the lid is closed.

4,716,824
FOOD MARINATOR
George E. Hand, Excelsior, and Roman A. Kramer, Bloomington, both of Minn., assignors to Interplastic Corporation, Minneapolis, Minn.
Filed Aug. 23, 1985, Ser. No. 768,744
Int. Cl.⁴ A23B *4/00*; B01D *23/06*
U.S. Cl. 99—516 **6 Claims**



1. A marinator for marinating food comprising:
a food holding container of non-circular cross section having a bottom wall, side walls extending upwardly from each side of the bottom wall in adjoining relation and a plurality of bottom corners, the bottom wall having a plurality of openings for marinade passage; and
a marinade holding container of non-circular cross section having a bottom wall and side walls extending upwardly from each side of the bottom wall in adjoining relation and defining a chamber for holding a predetermined level of marinade, the side walls of the marinade holding container being further arranged to alternatively support the food

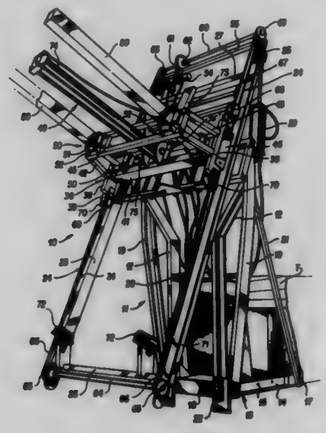
holding container in a nested marinating position within the marinade holding chamber and a non-nested draining position above the predetermined level of marinade and substantially out of said chamber and including a plurality of support surfaces each of which project away from said chamber, said support surfaces being arranged to engage a bottom corner of the food holding container when in the drawing position, the food holding container and the marinade holding container being aligned in different angular orientations with respect to each other when in the marinating and in the draining positions.

4,716,825

VEHICLE MOUNTED COMPACTION IMPLEMENT

Chester Lemmond, Rte. 4, Box 74, Decatur, Ala. 35603

Filed Jan. 30, 1987, Ser. No. 9,221
Int. Cl.[4] B30B *15/04*
U.S. Cl. 100—226 18 Claims



1. A compaction implement for use with conventional farm type vehicles including tractors comprising a compaction ram assembly, a mounting frame assembly for selectively securing said compaction ram assembly to the vehicle, said mounting frame assembly having first means for engaging the vehicle and vertical support means extending upwardly therefrom, carriage support frame means pivotally mounted to said vertical support means of said mounting frame means, a carriage means movably supported on said carriage support frame means, carriage drive means mounted to said carriage support frame means for adjusting said carriage means along the length of said carriage support frame means, means for mounting said compaction ram assembly to said carriage means, said compaction ram assembly having an extendable rod means and a compaction plate means mounted to said rod means for vertical movement with respect to said carriage means.

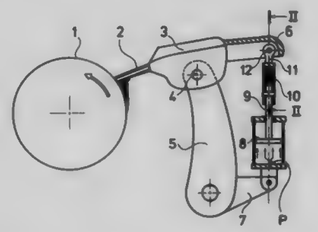
4,716,826

INSTANTANEOUS ADJUSTMENT DEVICE FOR A DOTORING BLADE ASSEMBLY OPERATIVELY LINKED TO A CYLINDER IN A PRINTING PRESS

Gianfranco Gibellino, Trino Vercellese, and Mario Forno, Casale Monferrato, both of Italy, assignors to Officine Meccaniche Giovanni Cerutti S.p.A., Casale Monferrato, Italy

Filed Jul. 26, 1985, Ser. No. 759,140
Int. Cl.[4] B41F *1/00*
U.S. Cl. 101—169 13 Claims

1. An instantaneously adjusted doctoring blade assembly operatively linked to a cylinder in a printing press, comprising:
- a rotatably mounted holder assembly;
- a doctoring blade held in the holder assembly and juxtaposed to the circumferential periphery of such printing-press cylinder;
- a fluid-operated cylinder-and-piston unit which, during printing-press operation using the doctoring blade, continuously biases the holder assembly in a direction that causes the doctoring blade to be pressed against the periphery of the printing-press cylinder, said cylinder-and-piston unit being subject to objectionable static friction between its piston and cylinder, and further being subject to objectionable inertial delays in motion of the piston; and



interposed between the cylinder-and-piston unit and the holder assembly for the doctoring blade, mechanical means, such as a spring, for storing up a force and for applying the force to directly and continuously bias the holder assembly in the same direction as does the cylinder-and-piston unit but with substantially negligible static friction and with substantially negligible inertial delays in motion;

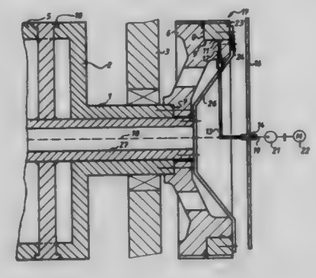
whereby the mechanical means provide relatively rapid corrective adjustment of the blade position relative to the printing-press cylinder, as compared with the cylinder-and-piston unit acting alone.

4,716,827

COUPLING FOR A SHEET FED ROTARY PRINTING PRESS

Erich G. Wieland, and Wolfgang C. J. Spiess, both of Würzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 903,530
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534486
Int. Cl.[4] B41F *13/12, 21/00*
U.S. Cl. 101—216 2 Claims



1. A sheet transfer drum assembly interposed between first and second toothed drive trains for a sheet fed rotary printing machine, said sheet transfer drum including first and second relatively rotatable sheet transport assemblies which are selectively rotatably joined to each other through a coupling, said coupling comprising:

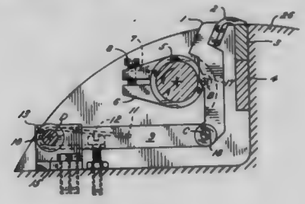
- a toothed wheel secured to a first of said relatively rotatable sheet transport assemblies of said sheet transfer drum, said toothed wheel having an outer peripheral surface, a first portion of said outer peripheral surface carrying teeth and a second portion of said outer peripheral surface of said toothed wheel carrying an adjacent reduced diameter support surface;
- a toothed ring carried on said support surface and secured to a second of said relatively rotatable sheet transport assemblies of said sheet transfer drum, said toothed wheel and said toothed ring being selectively rotatable with respect to each other and being selectively connectable to each other by a pressure oil injection interference fit; and
- a switchable pressure oil source adapted to selectively supply and remove oil under pressure to said reduced diameter support surface, said toothed wheel and said toothed ring being rotatable with respect to each other when said oil under pressure is supplied to said support surface and being connected to each other when said oil is removed from said support surface.

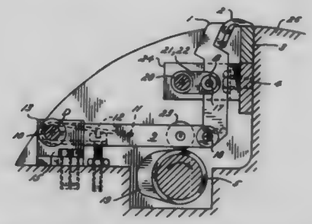
4,716,828

RESILIENT SHEET GRIPPER FOR A SHEET-FED ROTARY PRINTING PRESS

Winfried Hartung, Offenbach am Main, and Valentin Gensheimer, Mühlheim/Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,487
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529594
Int. Cl.[4] B41F *1/30*
U.S. Cl. 101—415.1 9 Claims





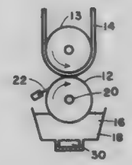
1. A resilient sheet gripper for use in the recess of a rotatable cylinder of a sheet-fed rotary printing press comprising, in combination,
- a gripper support surface on said rotatable cylinder adjacent the edge of said recess,
- a first shaft and a second shaft disposed in said recess,
- a gripper finger disposed in said recess substantially radially with respect to said cylinder and having a gripper tip engageable with said gripper support for holding the edge of a sheet,
- an asymmetical four pivot mechanism including a short link, a long link and said gripper finger as an intermediate link, said short link pivotally connected at one end to a radially outer portion of said gripper finger and at the other end to said first shaft for movement around said first shaft
- said long link pivotally connected at one end to a radially inner end of said gripper finger and at the other end to said second shaft for movement around said second shaft
- spring means for biasing said gripper finger radially inwardly toward its closed position with said gripper tip engaging said gripper support,
- means interconnecting said first shaft and said four-pivot mechanism for swinging said gripper finger radially outwardly on the end of said long link against the bias of said spring means to raise said gripper tip substantially radially off of said gripper support,
- and said short pivot link causing said gripper finger to rotate on the end of said long link so as to swing said gripper tip substantially circumferentially away from said gripper support to release the sheet edge.

4,716,829

METHOD FOR REMOVING SOLIDS FROM SUBSTRATES AND PREVENTING SOLIDS BUILD-UF THEREON

Ronald E. Wenzel, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 700,279, Feb. 11, 1985, abandoned.
This application Jan. 5, 1987, Ser. No. 4,799
Int. Cl.[4] B05D *3/12*
U.S. Cl. 101—426 25 Claims



1. A process for removing a particular solid phase material from a selected portion of a substrate, said process comprising the steps of:
- (a) preparing, as a liquid medium useful for depositing a layer of material on a substrate, a liquid composition comprising (i) a solvent for said particular solid phase material and (ii) a resinous portion capable of forming a solid phase material;
- (b) bringing said particular solid phase material and said liquid composition together in a liquid reservoir; and
- (c) applying, to said liquid, an effective amount of ultrasonic energy while maintaining a relatively constant amount of said liquid composition in said reservoir,

whereby said solid phase material is removed from said selected portion of said substrate, as a solid phase material.

4,716,830

INERTIA SAFETY AND ARMING DEVICE

Willard F. Davis, Brigham City, and Douglas G. Ballard, Ogden, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Jul. 29, 1985, Ser. No. 760,227
Int. Cl.[4] F42C *9/02, 15/40*
U.S. Cl. 102—248 3 Claims

1. An inertial safety and arming device comprising,
- casing means forming a first chamber and a second chamber each of which have a first end and a second end, said casing means further including a cylindrical passage connecting the first ends of said first and second chambers, said cylindrical passage having a flame tube hole in the wall thereof,
- piston means in said cylindrical passage and normally in a first position blocking the flame tube hole but movable to

a second position to unblock the flame tube hole, wherein in the second position thereof said piston means extends partially into said first chamber.

cylindrical shaft means having a first end and a second end and having a zig-zag channel disposed longitudinally along a portion of the periphery thereof,

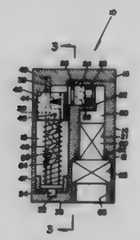
means for supporting said cylindrical shaft means within said first chamber with said cylindrical shaft means extending between the first end and the second end of said first chamber,

sleeve means having a heavy wall and forming an inertial mass positioned in surrounding relation with said cylindrical shaft means and having a slide pin attached thereto that is constrained to slide in said zig-zag channel as said sleeve is moved along the length of said cylindrical shaft means,

first stop means in said first chamber positioned adjacent the first end thereof,

wherein said cylindrical shaft means, at the first end thereof, has a portion of the length thereof opposite the cylindrical passage cut away to allow further movement of said piston means into the first chamber, said cylindrical shaft means at said cut away portion providing a second stop means, said second stop means limiting the extent of movement of said piston means into the first chamber.

spring means normally biasing said inertial sleeve against said first stop means,



squib means contained in said second chamber adjacent the second end thereof,

electrical contact means disposed in said first chamber adjacent the second end thereof and adapted to be engaged by said sleeve means, said electrical contact means being operative when so engaged to enable an electric circuit for the firing of said squib means by a firing command signal,

the zig-zag in the channel on said shaft cooperating with said spring means to prevent said sleeve means from moving the full distance from the first end to the second end of said first chamber when the inertial safety and arming device is subjected to sharp shock but allowing said sleeve means to move such full distance in response to sustained acceleration thereof to engage said electrical contact means, and

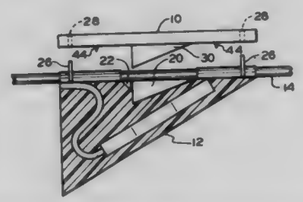
means for locking said sleeve means in place when moved such full distance into engagement with said electrical contact means,

whereby upon the application of a firing command signal to said squib means through said electric contact means the resulting pressure of hot gases in said second chamber forces said piston means to move from the first position thereof to the second position thereof thereby to unblock the flame tube hole for the passage therethrough of hot gases.

4,716,831
DETONATING CORD CONNECTOR

Stephen W. Bartholomew, Granby, Conn.; Daniel C. Rontey, Lebanon, N.J., and William J. Necker, Collinsville, Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Nov. 3, 1986, Ser. No. 926,395
Int. Cl.[4] F42B *3/16*; C06C *5/00*
U.S. Cl. 102—275.3 17 Claims



1. A detonating cord signal delay connector comprising:

a housing;

means on said housing for engaging a first detonating cord end and for engaging a second detonating cord end;

barrier means on said housing to prevent detonating signal transmission directly between said first and second detonating cord ends.

a signal delay assembly in said housing for connection between said first detonating cord end and said second detonating cord end, said signal delay assembly being operable to delay a detonating signal between said first detonating cord end and said second detonating cord end;

said signal delay assembly including linear signal transmission means in said housing having a first end and a second end, said first transmission means end being adapted for signal receiving connection with said first detonating cord end;

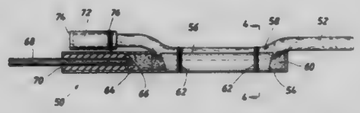
a delay explosive train mounted in said housing with its signal input end being connected to said signal transmission means second end and its signal output end being adapted for signal transmission connection with said second detonating cord end,

and gripping means for securing said detonating cord first and second ends in said housing to prevent removal of said ends.

4,716,832
HIGH TEMPERATURE HIGH PRESSURE DETONATOR

Cyril R. Sumner, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 18, 1986, Ser. No. 908,742
Int. Cl.[4] C06C *7/00*
U.S. Cl. 102—275.6 8 Claims

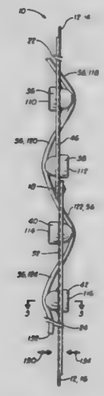


1. For use in a perforating gun assembly having a detonating cord therein and subject to use in deep well conditions, an apparatus comprising an elongate housing member having at least one external focussing cavity shaped therein, said housing member being hollow and shaped such that said detonating cord is received into said external focussing cavity; said hollow portion of said housing member being interior to and adjacent to and extending along said at least one focussing cavity and shaped for receiving a cooperative ignitor means and an explosive mixture in said hollow portion of said housing member and coupled to said ignitor for providing ignition of said explosive mixture.

4,716,833
METHOD OF ASSEMBLING A TANGED CHARGE HOLDER

John A. Regalbuto, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Division of Ser. No. 816,172, Jan. 3, 1986, Pat. No. 4,681,037.
This application Apr. 7, 1987, Ser. No. 35,570
Int. Cl.[4] F42B *1/02, 3/00*
U.S. Cl. 102—320 6 Claims



1. A method of assembling a shaped charge carrier assembly, comprising:

(a) providing an elongated carrier having a plurality of charge receiving openings disposed therethrough, at least every second one of said openings having first and second elongated cord receiving slots communicated therewith and extending therefrom in substantially opposite directions;

(b) inserting an integral intermediate portion of a detonating cord in a first direction through one of said openings and through first and second cord receiving slots communicated with said one opening without passing a free end of said detonating cord through said one opening or its associated cord receiving slots;

(c) after said cord has been inserted through said one opening, inserting a shaped charge through said one opening; and

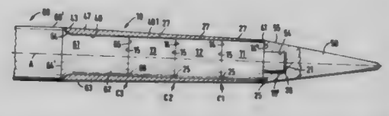
(d) engaging said detonating cord with said shaped charge.

4,716,834
INERTIAL PENETRATOR PROJECTILE

Peter Wallow, Duesseldorf, and Bernhard Bieping, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 949,067, Sep. 5, 1978, abandoned, and a continuation-in-part of Ser. No. 252,366, Mar. 25, 1981, abandoned. This application Aug. 14, 1985, Ser. No. 765,609
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011760
Int. Cl.[4] F42B *11/14*
U.S. Cl. 102—519 17 Claims

1. An improved inertial armor-piercing subcaliber penetrator projectile, having a relatively large length to diameter ratio, and including a front pre-penetrator having a nose and a tail, and having a main penetrator operatively connected to said tail of said pre-penetrator, said pre-penetrator comprising a stack of predetermined mass of a predetermined number of partial cores, each partial core being of predetermined length and having an essentially circular cross-section of uniform corresponding diameter, a front end surface, and an aft end surface, each partial core being separable from the stack of partial cores and being exchangeable for an other partial core of different mass, each partial core having at least one sharp edge on its front region, the front end surface of each partial core abutting the aft end surface of the immediately adjacent partial core to thereby form a predetermined number of butt zones, the major portion of each of two corresponding abutting surfaces of each butt zone defining a plane which is normal

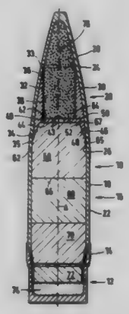


with respect to the central longitudinal axis of said penetrator, each butt zone comprising centering means to fixedly connect adjacent partial cores to each other, said centering means provide a predetermined fracturing or separation upon the application of a predetermined load, each butt zone forming an individual preset fracturing area, the predetermined load to be applied to achieve said fracturing or separation in said area stepwisely increasing from the front-most butt zone to the one next rearwardly disposed up to the front end of said main penetrator.

4,716,835
DISINTEGRATING PROJECTILE FOR CARTRIDGED MANEUVER AMMUNITION

Johan S. Leemans, Roosaken, Netherlands, assignor to NWM de Kruithoorn B.V., Poeldonkweg, 'sHertogenbosch, Netherlands

Filed May 20, 1987, Ser. No. 51,632
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617460
Int. Cl.[4] F42B *9/20*
U.S. Cl. 102—529 6 Claims



1. In a disintegrating projectile for cartridged maneuver ammunition for an automatic weapon, the projectile including: a thin-walled and closed body of plastic-like material including a cup-shaped bottom section and a main section connected with the bottom section, the main section including a circularly cylindrical section having a frontal region and which changes into a tapering hollow tip in such frontal region, the main section tightly enclosing a given number of axially successively arranged, rotationally symmetrical pressed bodies of metal powder; and a rotationally symmetrical stiffening insert made of plastic, disposed in the frontal region of the main section and composed of two cup sections each open at one end, the insert presenting a circular disc member with a rearwardly directed

face oriented transverse to the longitudinal axis of the projectile, one of the two cup sections having a side wall with an inner face, wherein such inner face and the rearwardly directed face of the insert are in immediate contact with metal powder of one of the pressed bodies, the improvement wherein:

said insert is made of one piece and extends longitudinally of said projectile between a rear circular delimitation and a front circular delimitation, each said delimitation essentially corresponding to a respective circularly cylindrical region of said main section, said circular disc member of said insert having opposite faces oriented transverse to the longitudinal axis of the projectile and forming a common bottom of said two cups which are arranged one behind the other in the longitudinal direction of said projectile and constitute a front cup and a rear cup, respectively;

said rear cup has a side wall thickness that constantly increases from the rear circular delimitation to the face of said circular disc member adjacent to said rear circular delimitation;

said front cup has a side wall thickness that constantly increases from the front circular delimitation to the face of said circular disc member adjacent to said front circular delimitation;

the upper pressed body has a frontal face and the inner surface of said rear cup lies against the frontal face of said upper pressed body; and

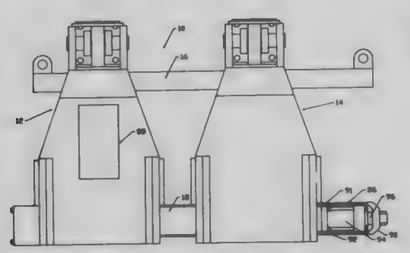
said main section has an inner wall area in its frontal region adjacent to the inner surface of said front cup, and said projectile includes a hard elastic foam filling the area delimited by the inner surface of said front cup and said adjacent inner wall area of said main section.

4,716,836

SUSPENDED RAIL WELDER

Robert C. Hardt, Country Club Hills, Ill., assignor to H. A. Schlatter AG, Switzerland

Filed Jul. 14, 1986, Ser. No. 885,270
Int. Cl.[4] E01B *11/44*
U.S. Cl. 104—15 **10 Claims**



1. A suspended rail welder for welding railroad rails together end-to-end to form a continuous rail comprising:

a first and a second clamping unit carried by a beam which is adapted to be raised and lowered by a boom or the like to vertically position said first and second clamping units with respect to the rails to be welded together, said first and second clamping units each comprising a pair of clamping arms which are pivotally and rotatably operable to clamp therebetween the web portion of a rail;

a first upset tube assembly extending between and disposed within one of said pair of clamping arms of each of said first and second clamping units;

a second upset tube assembly extending between and disposed within the other one of said pair of clamping arms of said first and second clamping units;

said first and second upset tube assemblies each comprising a hollow rectangular tube, said hollow rectangular tubes of said first and second upset tube assemblies being clamped against lateral and vertical movement within said second clamping unit and functioning as upset rods for axially reciprocating said second clamping unit with respect to said first clamping unit; and

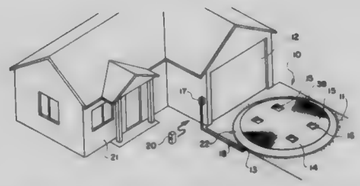
an upset cylinder assembly affixed to the respective ones of said pair of clamping arms of said second clamping unit and to said rectangular tube of said upset tube assembly disposed therein for axially reciprocating said second clamping unit on said rectangular tubes of said upset tube assemblies with respect to said first clamping unit.

4,716,837

AUTOMOBILE TURNTABLE

Alfred E. Valencia, 2635 S. 10th Ave., Arcadia, Calif. 91006

Filed Sep. 19, 1986, Ser. No. 910,235
Int. Cl.[4] B60S *13/02*
U.S. Cl. 104—38 **5 Claims**



1. In a portable vehicle turntable apparatus, the combination of a circular platform having an upper surface characterized as roughened surface elevated above a pavement surface of a driveway;

said platform further having a downward sloping surface carried on a circular skirt carried about the periphery of said platform wherein said sloping surface interfaces said pavement surface of said driveway with said elevated roughened surface of said platform so that a vehicle may travel therebetween;

a base means removably located on a selected portion of said driveway pavement for rotatably supporting said platform whereby said vehicle positioned thereon may be turned about into an opposite direction;

said platform have an undersurface with a pair of coaxial, spaced apart angular tracks wherein the angular disposition of said angular tracks are substantially opposite with respect to each other;

elongated rollers operably carried on said base means in a pair of circular paths immediately under and in registry with said pair of spaced apart tracks whereby said platform is movably supported on said rollers for revolving about said base means above and elevated from said driveway pavement surface;

drive means mounted on said base means operably coupled to a selected one of said rollers for imparting a driving force to said selected roller to move said platform on the remaining ones of said rollers; and

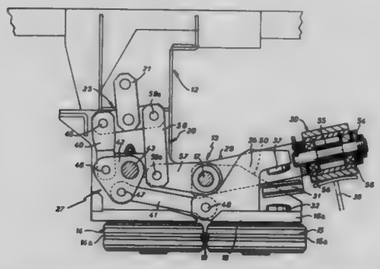
combined local and remote control means for selectively operating said drive means whereby control may be effected from said vehicle, at the turntable site or from within nearby structures.

4,716,838

TRANSPORT INSTALLATION COMPRISING A GUIDE TRACK AND A CAR PROVIDED WITH GRIPPING MEANS COOPERATING WITH A DRIVE CABLE

Jean Huon De Kermadec, Le Chesnay, and Guy M. C. M. Thomas, Bagneres De Bigorre, both of France, assignors to Soule, Bagneres De Bigorre, France

Filed Dec. 12, 1986, Ser. No. 941,144
Claims priority, application France, Dec. 18, 1985, 85 18788
Int. Cl.[4] B61B *9/00*
U.S. Cl. 104—173.1 **13 Claims**



1. Transport installation comprising a guide track, at least one car adapted to move on said track, a circulating cable near said track, gripping means on said at least one car adapted to grip said cable and comprising two gripping members movable relative to each other and adapted to be urged into a closed position by a closing force developed within said at least one car, a force distributor mechanism disposed between at least one of said gripping members and a point at which said closing force is applied, two transmission branches coupled to said force distributor mechanism and each adapted to transmit part of said closing force, a first pivoting support to which the second branch is articulated, a second pivoting support engagement means on said second pivoting support, an abutment member on said second pivoting support, a first bearing surface on said first pivoting support with which said abutment member is adapted to come into contact when acted on by the part of said closing force aplied to it via said second branch so as to urge said first pivoting support in the same direction as said first branch, and at least one ramp member disposed in a fixed position along a predetermined section of said track, said engagement means being adapted to co-operate with said at least one ramp member so as to move apart said first and second pivoting supports.

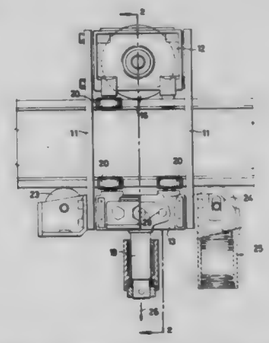
4,716,839

TROLLEY FOR THE OVERHEAD TRANSPORTATION OF LOADS ON MONORAIL

Nicola Catena, Leumana, Italy, assignor to Fata European Group S.p.A., Torino, Italy

Filed Apr. 29, 1986, Ser. No. 857,185
Claims priority, application Italy, May 23, 1985, 21923/85[U]
Int. Cl.[4] B61B *3/02*
U.S. Cl. 105—153 **1 Claim**

1. A trolley for the overhead transportation of loads on a monorail, characterized in that it consists of a framework comprising, in combination: a pair of sides (11) which are rigidly interconnected in their upper portion by a pair of spaced flanges (12) and, in their lower portion, by a bracket (13) carrying a means (19) for suspending a load, a pivot (15) mounted between said flanges (12), a drive wheel (16) mounted on said pivot (15) servable to translate the trolley on a monorail, wheels (20) pivotally mounted on said flanges (12) and the bracket (13) cooperatable with said monorail so as to achieve a stable guidance of the trolley on said monorail, a first supporting wheel (23) fixedly mounted on said bracket (13) cooperatable with the bottom of said monorail, a second supporting wheel (24) floatably mounted on said bracket and cooperatable with the bottom of said monorail, a pressure unit (25) mounted on said bracket to force and maintain said second supporting wheel against the bottom of said monorail so as to assure a



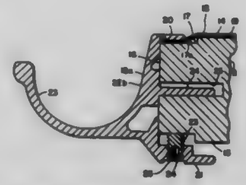
stable trim of the trolley moving on said monorail, and a geared motor (22) attached to one of said flanges (12) and operationally connected to said pivot (15) to move said drive wheel (16).

4,716,840

DRAFTING BOARD WITH REPLACEABLE SURFACE LAYER

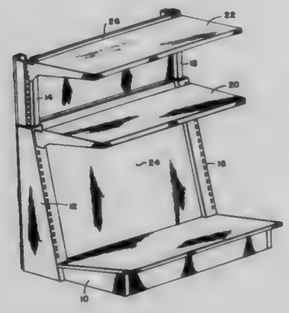
Richard C. Tringali, Manitowoc, and David C. Pflieger, Two Rivers, both of Wis., assignors to Hamilton Industries, Two Rivers, Wis.

Filed Jan. 21, 1987, Ser. No. 6,387
Int. Cl.[4] A47B *17/00*
U.S. Cl. 108—27 **10 Claims**



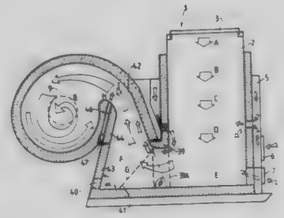
1. A drafting board comprising a rigid rectangular panel having a planar top surface and having a peripheral depression defining an upwardly-facing border surface extending along a plane spaced below said top surface; said panel also having bottom and side surfaces; a cover sheet extending over said top surface and said border surface and being strippably secured to said top surface by a layer of pressure-sensitive adhesive; said cover sheet being formed of resilient, flexible material having a durometer within the range of 50 to 90 on the Shore C scale; and a peripheral retaining rim extending about said panel; said rim having a planar upper portion extending over said cover sheet within said depression; means extending through said rim and engaging said panel for securing said rim to said panel and for retaining the periphery of said cover sheet within said depression; said planar upper portion of said rim and said cover sheet having a combined thickness substantially less than the distance between the planes of said top surface and said border surface; said planar upper portion of said rim also having a width substantially less than the width of said depression and having an inner edge spaced from the outer limits of said top surface a distance no less than the distance between the planes of said top surface and said border surface.

4,716,841
SHELVING UNIT
James M. Sattler, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.
Filed Sep. 7, 1982, Ser. No. 415,483
Int. Cl.[4] A47B *57/30*
U.S. Cl. 109—108 2 Claims



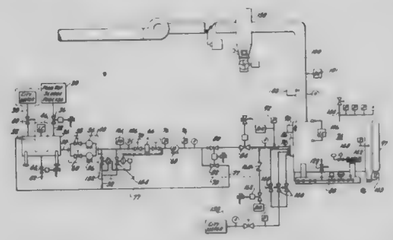
1. A shelving unit comprising a base, at least one upright, and a plurality of shelves mountable thereon:
in which each shelf has at least one bracket with rearwardly extending tabs for engagement with shelf-retaining slots in the upright;
in which the upright comprises a lower vertically elongated member extending upwardly from the base, and an upper vertically elongated member in telescoping relationship with the lower member, at least part of the upper member extending upwardly from the upper end of the lower member, means for preventing relative horizontal movement of the upper and lower members, and means for selectably supporting the upper member in each of a plurality of heights on the lower member;
in which the lower member comprises an elongated, oblique sheet metal web having a face side and a back side and a first series of shelf-retaining slots, each slot extending through the web from the face side to the back side, said first series extending in a line downwardly along said oblique sheet metal web from a location adjacent to the upper end thereof;
in which the upper member comprises an elongated vertical sheet metal web constituting the front side thereof, the web having a face side and a back side the face side having a first planar surface and a second planar surface, the second planar surface being spaced rearwardly and located to one side of the first planar surface, and having a second series of shelf-retaining slots each slot extending from the face side of the second planar surface to the back side of the web, the second series of slots being arranged in a vertical line positioned directly to the rear of the line of said first series of slots; and
in which, at least at the upper end of the lower member, the back side of the elongated sheet metal web of the lower member is in such close proximity to the face side of the sheet metal web of the upper member that if one of said shelves is positioned at the uppermost end of the lower member, with a tab extending through the uppermost shelf-retaining slot in the lower member, the tab extends through the plane of said first planar surface, and the spacing between the planes of the first and second planar surfaces being such that said tab does not reach said second planar surface.

4,716,842
EXTRACTION ZONE FOR SOLID FUEL BURNER
Paul D. Williams, 2 Parkhill Road, Hauraoana, New Zealand
Filed Nov. 14, 1985, Ser. No. 797,885
Claims priority, application New Zealand, Nov. 19, 1984, 210243
Int. Cl.[4] F23B *5/00, 7/00*
U.S. Cl. 110—211 6 Claims



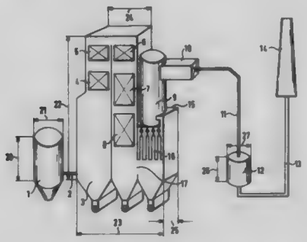
1. A burner having a substantially vertical primary combustion chamber for receiving at its upper end a combustible fuel to be gasified and connected at its bottom end with a secondary combustion chamber to receive the gasified fuel from the primary combustion chamber and in which secondary combustion chamber the gasified fuel is further combusted, a substantially conical and vertical extraction zone providing a convergent gas flow path between said bottom end of said primary combustion chamber and said secondary combustion chamber, an apex region of said extraction zone being substantially open and leading into said secondary combustion chamber, an exit for hot gas being provided for said secondary combustion chamber, means for providing a substantially lateral and low velocity gas flow through said fuel at said bottom end of said primary combustion chamber and into said extraction zone where said gas rises substantially vertically in said extraction zone so that the low velocity of said gas combined with gravity separates out and holds back particulate matter entrained in said gas, said convergent gas flow path increasing said gas velocity at said apex region as said gas enters into said secondary chamber.

4,716,843
WASTE FUEL COMBUSTION SYSTEM
Philip R. Coerper, Jr., West Allis, and Mark G. Parish, Brown Deer, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.
Filed Nov. 3, 1986, Ser. No. 926,094
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 25 Claims



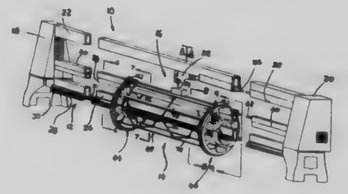
1. A fire tube boiler for generating steam, said boiler comprising:
a front head;
a rear head;
a furnace tube extending between said front and rear heads for nearly the entire length therebetween, the entire length of said furnace tube being a combustion chamber and the entire length of said furnace tube being insulated with refractory material so as to maintain a preselected temperature range and extended linear flow path for materials being combusted; and
wherein said front head includes
means for delivering a preselected amount of a waste material having high ash content, water content in excess of 50% and up to 99% and large particles of solid combustible material to said combustion chamber;
means for delivering combustion air to said combustion chamber;
means for delivering a primary combustion fuel to said combustion chamber;
means for mixing the waste, combustion air and the fuel in proper proportions for complete combustion throughout the firing rate of said boiler; and
wherein said furnace tube is capable of maintaining sufficient velocity of said ash content and said large particles of said waste so as to keep said ash and particles entrained within combustion gases of said furnace tube.

4,716,844
PROCESS AND DEVICE FOR THE NITRIC OXIDE-FREE GENERATION OF STEAM WITH FOSSIL FUELS
Christian Koch, Mühlweg 13, 8570 Pegnitz, Fed. Rep. of Germany
PCT No. PCT/EP85/00722, § 371 Date Apr. 14, 1986, § 102(e) Date Apr. 14, 1986, PCT Pub. No. WO86/03821, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 19, 1985, Ser. No. 865,721
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447147
Int. Cl.[4] F23B *7/00*; F23G *5/00*
U.S. Cl. 110—341 3 Claims



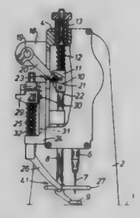
1. In a process for the nitric oxide-poor reaction of fossil fuels with ash contents in a two-stage combustion process consisting of a first gasification stage with partial oxidation for producing fuel gas, and a second stage for the combustion of the fuel gas produced in the first stage, the improvement comprising:
reacting the fossil fuels in a ceramically insulated first stage gasification chamber with air preheated to 300° to 700° C.
cooling the resulting gasification gases first to 900° to 1000° C. in a radiation zone with fin-type tubes connected following the gasification chamber and then to low temperatures in a subsequently connected heat exchanger system and removing solids and hydrogen sulfide components carried along by said gases; and
mixing said gases with the remaining combustion air and completely burning substantially free from nitric oxide at below 1300° C. in a second stage ceramic combustion unit consisting of structured ceramic layers having a length from 10 to 100 times their bore diameter, said second stage including a combustion catalyst which contains as an active substance 50 to 95% lanthanum and 5 to 50% cerium.

4,716,845
SEWING MACHINE HAVING ROTATABLE AND AXIALLY MOVABLE FRAME
Richard N. Codos, Warren, N.J., assignor to Pathe Computer Control Systems, Inc., Irvington, N.J.
Filed Jul. 3, 1986, Ser. No. 881,846
Int. Cl.[4] D05B *11/00*
U.S. Cl. 112—118 17 Claims



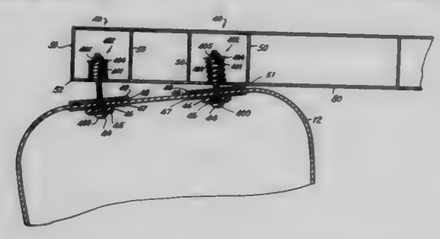
1. A quilting machine comprising:
(a) a base;
(b) a substantially cylindrically shaped frame slidably and rotatably mounted on said base, said frame including:
(i) a first end assembly;
(ii) a second end assembly;
(iii) each end assembly having a support member slidably mounted on said base and a ring rotatably mounted on the respective support member, each ring having a plurality of gear teeth spaced therearound;
(iv) said first and second end assemblies spaced from each other on said base;
(v) a plurality of first telescoping rods secured to said first end assembly and extending toward said second end assembly;
(vi) a plurality of second telescoping rods secured to said second end assembly and extending toward said first end assembly;
(vii) each first telescoping rod telescopically receiving a respective second telescoping rod;
(viii) at least one first telescoping rod screw-threadedly receiving at least one respective second telescoping rod;
(ix) at least one first and second telescoping rod rotatably fixed and axially movable with respect to each other; and
(x) a gear on each of said first and second rotatably fixed and axially movable telescoping rods in mating engagement with said gear teeth of said rings;
(c) rotation means for rotating said rings with respect to said support members and including first rod rotation means for rotating said first and second rotatably fixed and axially movable telescoping rods;
(d) elongation means for changing the length of said frame, including second rod rotation means for rotating at least one screw-threaded rod; and
(e) frame moving means for axially moving the frame along said base, said frame moving means including a rack having gear teeth mounted on said base, a gear rotatably mounted on said frame in meshing engagement with the teeth of said rack, and control means for controlling rotation of said gear to move said frame along said base.

4,716,846
SEWING MACHINE WITH WORKPIECE HOLDER FOR SECURING INITIAL SEAM STITCHES
Franz Schneider; Herbert Wenz, and Günter Link, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany
Filed Oct. 29, 1986, Ser. No. 924,860
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543133
Int. Cl.[4] D05B 29/02
U.S. Cl. 112—239 10 Claims



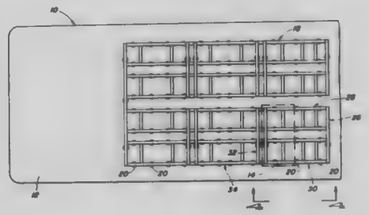
1. A sewing machine comprising, a needle shaft for carrying a sewing needle, needle drive means for moving the needle shaft up and down to form stitches in a material at a stitching location, a presser foot for holding the material near the stitching location, presser foot drive means for periodically raising and lowering the presser foot to hold the material in synchronism with the formation of stitches and to release the material to permit manual movement of the material, and holding means associated with said sewing machine for engaging the material near the stitching location to continuously hold the material stationary during the formation of a selected plurality of initial stitches.

4,716,847
MULTIPLE-HULLED MARINE VESSEL
Earl B. Wilson, Jr., 20655 Bowery La., Bend, Oreg. 97701
Continuation of Ser. No. 763,667, Aug. 8, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,934
Int. Cl.[4] B63B 35/52
U.S. Cl. 114—61 4 Claims



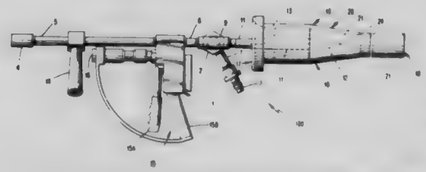
1. A catamaran comprising
a pair of similar hulls having parallel longitudinal axes and being spaced apart side by side in a direction perpendicular to said longitudinal axes;
a plurality of spaced apart beams lying across said hulls in a direction perpendicular to the longitudinal axes of the hulls, each of said beams having a generally flat horizontal lower flange resting upon and in direct contact with each of said hulls;
each of said hulls and said flanges containing a plurality of openings, each opening in a hull being axially aligned with and juxtapositioned beneath a corresponding opening in one of the flanges;
a plurality of bolts, each bolt having a head too large to pass through the aligned openings in the hulls and flanges, the shank of said bolt passing vertically through said aligned openings, said shank having an end opposite said head; and
a plurality of coil springs having opposite ends, each spring encircling the shank of one of the bolts passing through said aligned openings and having one of said spring fastened to the end of the bolt opposite the bolt's head,
whereby the coil springs are in their non-tensioned state when said hulls and beams are in their nominal positions with the beams resting upon and in contact with said hulls, and at least one of said springs associated with each hull is compressed in response to forces tending to separate the respective hull from its associated beam.

4,716,848
CLOSE TOLERANCE PIN CONNECTION
Lancing G. Smith; Lonnie R. Walker, and William J. Denison, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Jul. 19, 1985, Ser. No. 757,116
Int. Cl.[4] B63B 25/08
U.S. Cl. 114—75 18 Claims



1. A close tolerance structural pin connection system, comprising:
a first cylindrical connecting pin;
a first structure having a first pin receiving hole means disposed therethrough for closely receiving said connecting pin, said first structure including:
first and second substantially parallel side walls and third and forth substantially parellel side walls fixedly joined to and extending between said first and second side walls;
said first pin receiving hole means including aligned first and second pin receiving bores disposed through said first and second side walls, respectively, for clearly receiving said cylindrical pin therein; and
said first structure having a width defined parallel to said third and fourth side walls;
a second structure having a second pin receiving hole means disposed therethrough for loosely receiving said connecting pin, wherein:
said second structure includes a pair of substantially parallel mounting plates spaced apart a distance sufficient to receive said first structure therebetween, said width of said first structure defined parallel to said third and fourth side walls thereof being less than said distance by which said mounting plates of said second structure are spaced apart;
and
said second pin receiving hole means includes first and second aligned openings, one in each of said parallel mounting plates;
a first weld washer having a third pin receiving hole means disposed therethrough for closely receiving said connecting pin, said first weld washer being adapted to be located adjacent and engage said second structure;
and
said connecting pin being received in said first, second and third pin receiving hole means and said weld washer being welded to said second structure so that said first and second structures are connected by said connecting pin, with said connecting pin being closely received in said first hole means of said first structure and also being closely received in said third hole means which is fixed relative to said second structure.

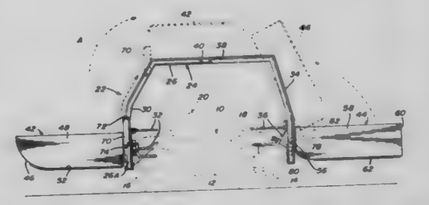
4,716,849
EROSIVE-JET DIVER TOOL
Andrew F. Conn, Baltimore, and Virgil E. Johnson, Jr., Gaithersburg, both of Md., assignors to Tracor Hydronautics, Inc., Laurel, Md.
Filed May 31, 1985, Ser. No. 739,535
Int. Cl.[4] B63B 59/00
U.S. Cl. 114—222 40 Claims



1. An erosive fluid jet tool for underwater operation, comprising:
(a) means for receiving a fluid under elevated pressure for providing hydraulic power to the tool;
(b) erosive fluid jet nozzle means connected to the fluid receiving means for providing the working output jet of the tool; and
(c) means for providing a counterthrusting force for balancing the thrust on the tool produced by the erosive fluid jet, the counterthrusting means including a counterthrusting fluid jet nozzle connected to the fluid receiving means and facing oppositely to the erosive nozzle means for providing a counterthrusting jet and open ended shroud means coaxially surrounding the counterthrusting jet nozzle, said shroud means including a mixing tube for substantially coaxially surrounding said counterthrusting jet, wherein the value of the ratio r_f/r_j, the effective cross-sectional radius of said mixing tube, r_f, to the effective cross-sectional radius of said counterthrusting jet nozzle, r_j, is sufficiently large to permit the pressure within said mixing tube at the upstream end of said counterthrusting jet to remain above the vapor pressure during operation, said value being at least about $1.62/\sqrt{\Sigma_o}$, where Σ_o is the operating cavitation number, whereby, during operation, water surrounding the submerged tool is entrained through the shroud means for providing additional counterthrusting force during operation of the counterthrusting means, the erosive fluid jet nozzle means and the counterthrusting means being constructed so that in excess of 50% of the hydraulic power provided to the tool is provided to the erosive fluid jet nozzle means and whereby, during operation, cavitation is substantially prevented from occurring in the entrained flow around said counterthrusting jet within said mixing tube.

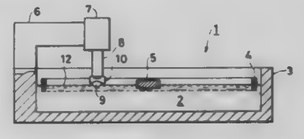
4,716,850
FLOATATION ASSEMBLY FOR OFF-ROAD VEHICLE
André Lachance, 1140 des Pivoines Street, Alma, Canada (G8B 7W8)
Filed Dec. 24, 1986, Ser. No. 947,561
Int. Cl.[4] B63B 35/86
U.S. Cl. 114—270 6 Claims

1. A floatation assembly to render an off-road vehicle amphibious, said vehicle having a vehicle frame and wheels, said assembly comprising a pair of spaced rails, each of inverted U-shape defining front and rear legs, and a bight portion, said front and rear legs adapted to be secured to the front and rear of said vehicle frame with the bight portion of each rail above a vehicle driver seated in said vehicle, front and back floatation members two pairs of vertically-spaced hook members carried by each floatation member and releasably hooked onto said rails and displaceable therealong, the lower hook members of said pairs, when released from said rails, permitting upward pivoting of the floatation member relative to said rails about the uper hook members of said pairs, whereby both floatation



members are shiftable relative to said rails between an operative position, to permit the vehicle to be water borne, and an inoperative position to permit the vehicle to travel on the ground, said floatation members, when in operative position, extending forwardly and rearwardly of the vehicle, repectively, at the level of said vehicle, and when in inoperative position, said front floatation member is supported on the bight portions of both rails and said rear floatation member is pivoted upwardly against said rear legs.

4,716,851
CURVED SURFACE SHAPING APPARATUS AND CURVED SURFACE SHAPING METHOD USING THE SAME
Kenji Saito, Tokyo; Noritaka Mochizuki, Yokohama, and Yukuo Nishimura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 30, 1985, Ser. No. 760,549
Claims priority, application Japan, Aug. 6, 1984, 59-163854; Aug. 6, 1984, 59-163855; Aug. 6, 1984, 59-163856; Aug. 6, 1984, 59-163857; Aug. 6, 1984, 59-163858
Int. Cl.[4] B05C 3/12
U.S. Cl. 118—402 5 Claims



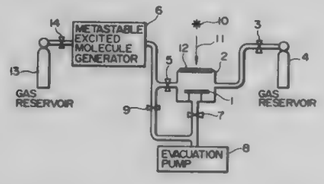
1. A curved surface shaping apparatus comprising:
a liquid tank for developing a monomolecular film on a surface of a liquid contained therein;
means for holding a base member to be shaped; and
moving means for linearly reciprocally moving said base member and simultaneously rotating said base member about an axis of said base member in such a manner that a curved surface of said base member to be shaped intersects said liquid surface.

4,716,852

APPARATUS FOR THIN FILM FORMATION USING PHOTO-INDUCED CHEMICAL REACTION

Kanji Tsuji, Nishitama; Yusuke Yajima, Musashino, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,485
Claims priority, application Japan, Apr. 8, 1985, 60-72682
Int. Cl.⁴ C23C *16/48*
U.S. Cl. 118—720 **16 Claims**



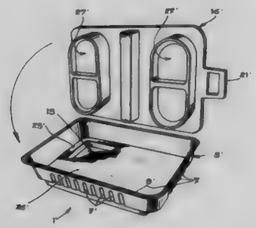
1. An apparatus for thin film formation using a photo-induced chemical reaction comprising a reaction chamber in which a substrate can be set, means to introduce a reactive gas into said reaction chamber for the purpose of causing a surface of the substrate to adsorb the reactive gas, means to evacuate said reaction chamber, means to irradiate the substrate surface having adsorbed the reactive gas with photon energy for the purpose of forming a nucleus required for growing a film on the substrate surface, means to generate metastable excited molecules which can react with the reactive gas to decompose it, said means to generate metastable excited molecules being located outside said reaction chamber, and means to introduce the reactive gas and the metastable excited molecules into said reaction chamber for the purpose of growing the film on the substrate formed with the nucleus and on the basis of the nucleus.

4,716,853

DISPOSABLE LITTER FOR CATS OR OTHER DOMESTIC ANIMALS

René S. d'Aniello, 1049, Petit Bernier, St-Jean (Quebec), Canada (J3B 6Y8)

Filed Mar. 24, 1986, Ser. No. 842,897
Claims priority, application Canada, Apr. 19, 1985, 479602
Int. Cl.⁴ A01K *23/00*
U.S. Cl. 119—1 **6 Claims**



1. A disposible litter for cats or the like domestic animals, comprising:

a generally rectangular, open-top shallow container made of a low cost material selected from the group consisting of semi rigid plastic materials and cardboards of medium thichness waterproofed on at least one face thereof, said conatiner comprising a flat bottom surrounded by lateral walls provided with a plurality of folds and ribs to ensure adequate stiffness, said lateral walls forming, all around said flat bottom, a slight rabbet defining an annular shoulder of small height, said shoulder having an upper surface extending over all of the periphery of said flat bottom;

a layer of absorbent material disposed at the bottom of the container up to essentially tne height of the sholder, said absorbent material being selected from the group consisting of sawdust, woodchips, paper pellets, sand, cork granules and other similar material; and

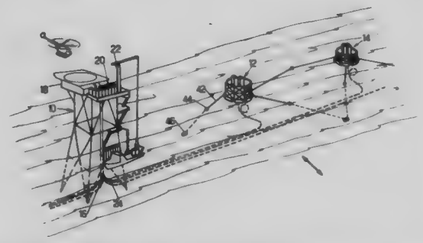
a membrane of paper or plastic material secured directly onto the upper surface of the annular shoulder of the container all around the same, for holding the layer of absorbent material in position at the bottom of said container as long as desired, said membrane, once removed, giving access to said layer of absorbent material and transforming said layer of absorbent material and said container into which it is disposed, into a litter that may be discarded once the layer of absorbent material is soiled.

4,716,854

SEA AQUACULTURE INSTALLATION

André Bourdon, 65, rue Gambetta, 76200 Dieppe, France

Filed May 24, 1985, Ser. No. 737,660
Claims priority, application France, May 28, 1984, 84 08319
Int. Cl.⁴ A01K *61/00*
U.S. Cl. 119—3 **14 Claims**



1. An aquaculture installation comprising:

a plurality of cage modules, each having a framework sufficiently strong to withstand open sea currents, each module having an open cage structure over at least a portion of its surface area, and each cage having a weight and air reservoir structure which causes the module to float in an open sea environment with at least a lower portion of its cage structure submerged below the surface,

said plurality of modules being located in an open sea having currents in surface layers, which currents are essentially unconfined by sea boundry structures,

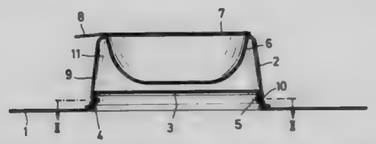
each module containing therein the fish life which creates fish pollution, primarily fish dejecta, which is carried away by the said currents in the surface layer, the pollution carried away by the said currents being located in a zone of action, which zone extends substantially parallel to and in the direction of said current from each cage, downstream therefrom, and a certain width transverse to the direction of said currents, the modules of the plurality thereof being spaced apart in a direction transverse to the mean direction of said currents a sufficient distance that the zones of action of two adjacent modules are free from overlap with each other.

4,716,855

FOOD CONTAINER POT ASSEMBLY

Günter Andersson; Uwe D. Holz, and Frank J. Margieclok, all of Mannesmannufer 8, 4000 Duesseldorf 1, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,690
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530853
Int. Cl.⁴ A01K *1/10*
U.S. Cl. 119—61 **6 Claims**



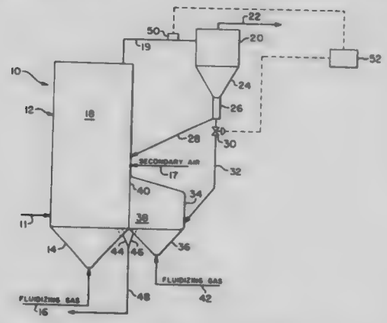
1. In a food container pot assembly comprising at least one food container pot, the improvement comprising a supporting base, said supporting base including pot holder means, said at least one food container pot being fittable to said pot holder means, and said at least one food container pot includes a bottom, means defining a recess in said bottom, an upwardly extending protrusion on said supporting base, said protrusion fitting in said recess of said at least one food container pot, and further comprising depending skirt means extending around said at least one food container pot, said skirt means surrounding said recess, at least two inward projections on said skirt means, shoulder means extending around said protrusion and at least two recess means in said shoulder, said at least two recess means receiving said at least two inward projections.

4,716,856

INTEGRAL FLUIDIZED BED HEAT EXCHANGER IN AN ENERGY PRODUCING PLANT

Hans Beisswenger, Montvale, N.J.; Wolfgang P. Frank, Eschborn, Fed. Rep. of Germany, and Alexander T. Wechsler, Riverdale, N.Y., assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 744,118, Jun. 12, 1985, abandoned.
This application Aug. 18, 1986, Ser. No. 898,789
Int. Cl.⁴ F22B *1/00*
U.S. Cl. 122—4 D **24 Claims**



1. An energy producing plant comprising:

a circulating fluidized bed system including a fluidized bed reactor having a chamber with heat transfer means comprising at least one reactor water wall, at least one solids separator and recycle leg, said reactor having a first inlet means for introducing a first fluidizing gas therein and at least one second inlet means for introducing a secondary gas containing oxygen enabling a staged and near stoichiometric combustion of a fuel;

means adapted to transfer at least a portion of the solids removed in the solids separator into a second chamber positioned above said first inlet means, said second chamber having a common wall with the fluidized bed reactor between first and second inlet means of the reactor and forming an integral unit with said reactor, said second chamber having gas inlet means and a means for maintaining a gas therein at a pressure so that gas passes into the reactor with solids from said second chamber, said second chamber having at least one water wall, said least one water wall being in fluid communication with said least one water wall of the reactor;

means to control the relative amount of solids fed into the second chamber; and

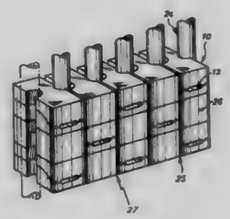
means adapted to transfer the remaining portion of the solids removed in the separator directly into said reactor.

4,716,857

FURNACE WALL COMPRISING FEED NOZZLES MOLDED IN TWO COMPLEMENTARY PARTS

André Moreau, Paris, France, assignor to Electricite de France, Paris, France

PCT No. PCT/FR85/00369, § 371 Date Jun. 26, 1986, § 102(e) Date Jun. 26, 1986, PCT Pub. No. WO86/03824, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 17, 1985, Ser. No. 885,840
Claims priority, application France, Dec. 17, 1984, 84 19251
Int. Cl.⁴ F22B *37/00*
U.S. Cl. 122—6 A **8 Claims**



1. A furnace wall, in particular an incinerator furnace wall, of the kind constructed of elements (10, 26) assembled in the manner of bricks some of said elements (10) being hollow nozzle-forming elements for feeding secondary air into the furnace, said elements being disposed around pipes (24) adapted to convey a cooling fluid, the pipes being disposed in bundles and constituting a metal framework for the wall, characterized in that each of said nozzle-forming elements is in two parts (11, 12), each of the parts having a longitudinal recess mating with the other of the parts along a substantially horizontal jointing surface (17), and each of each nozzle-forming elements having a discharge into the furnace through a generally plane face of the element (10) contiguous with the corresponding faces of the adjacent ones of said elements (26).

4,716,858

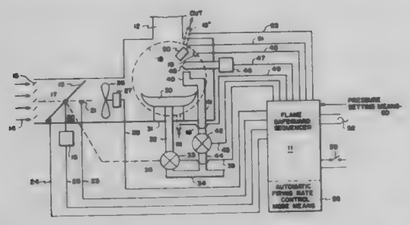
AUTOMATIC FIRING RATE CONTROL MODE MEANS FOR A BOILER

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1986, Ser. No. 943,094
Int. Cl.⁴ F22B *37/42*; F22D *5/00*
U.S. Cl. 122—448 R **5 Claims**

1. A flame safeguard sequencer for control of a fuel burner for heating a boiler upon the operation of controller means with said fuel burner having damper means, ignition means, fuel supply means, and flame sensor means, including: a flame

safeguard sequencer connected to said damper means, said ignition means, said fuel supply means, and said flame sensor means to sequentially operate said means to properly purge, ignite, and operate said fuel burner in a predetermined sequence upon operation of said controller means to heat said boiler; said flame sensor means energized by said sequencer to monitor said burner for the presence or absence of flame upon said controller means operating to initiate the operation of said fuel burner; means for setting a pressure for said boiler; pressure sensor means for said boiler with said pressure sensor means supplying said sequencer with an electrical signal related to a pressure in said boiler; said flame safeguard sequencer further including automatic firing rate control mode means responsive to said pressure related signal in said boiler;



said automatic firing rate control mode means providing at least three functions to cause said boiler to be heated in a safe and efficient manner; a first of said functions including a proportional control function which is proportional to a difference in a set pressure for said boiler to an actual pressure in said boiler; said proportional control function being squared while preserving the mathematical sign of said function; a second of said functions including an integration of a load history of said boiler operating for a previous period of time; and a third of said functions including a further constant times the rate of change of pressure within said boiler with respect to time to allow said automatic firing rate control mode means to correct any errors in heating of said boiler before said error becomes large thereby providing a highly responsive control of said operation of said boiler.

4,716,859

PROCESS FOR TREATMENT OF LIQUIDS CONSISTING PRIMARILY OF METHANOL

Axel König; Kurt Korbel, both of Wolfsburg; Karl-Werner Ellinger, Rötgesbüttel; Michael Schneider, Ottobrunn-Riemerling; Karel Kochloefl, Moosburg, and Ortwin Bock, Landshut-Kumhausen, all of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg and Süd-Chemie AG, Munich, both of, Fed. Rep. of Germany

Filed Apr. 30, 1986, Ser. No. 858,062

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516562

Int. Cl.[4] F02B *43/08*

U.S. Cl. 123—3 **39 Claims**

1. Process for the treatment ofa liquid consisting of methanol, which comprises the steps of:

A. directing a first portion of said liquid to a reaction chamber and converting said first portion into conversion products comprising H_2 and the oxides of carbon;

B. directing a second portion of said liquid to a fuel metering device;

C. mixing said conversion products from said first portion and said liquid from said second portion in said metering device and forming a fuel mixture;

D. supplying said fuel mixture in timed sequence to the combustion chambers of a combustion engine;

E. preheating and vaporizing said first portion of said liquid to a temperature of about 200° to 600° C.;

F. passing said vaporized liquid into a reaction chamber containing a noble metal supported catalyst comprising a noble metal component of Group VIII of the Periodic

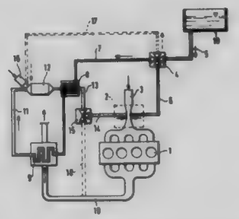


Table on a carrier material which comprises TiO_2 and/or CeO_2.

4,716,860

ARRANGEMENT FOR INLET OF COOLING AND COMBUSTION AIR

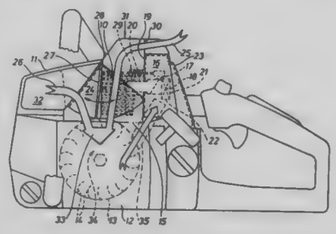
Sören N. Henriksson, Kållered, and Lars-Olof Kärreman, Lerum, both of Sweden, assignors to AB Electrolux, Sweden

Filed Feb. 10, 1986, Ser. No. 829,831

Claims priority, application Sweden, Feb. 13, 1985, 8500666

Int. Cl.[4] F01P *7/02*

U.S. Cl. 123—41.05 **6 Claims**



1. An arrangement for the inlet of cooling and combustion air in a motor saw having a fan system, a cylinder and a carburetor, said arrangement comprising an external air inlet for admitting outdoor air to the saw, said external inlet comprising an opening in the top surface of the saw, said arrangement further comprising an internal air distributor for recirculating cooling air in said system, said distributor being positioned to receive outdoor air from said external inlet and air preheated by circulation about said cylinder and to supply mixed, preheated air to the input of the fan system, said fan system directing air received thereby either along one path to said carburetor or along another path to circulate about said cylinder.

4,716,861

4-CYCLE ENGINE

Tetsuzo Fujikawa, Kobe; Shinichi Tamba, Kakogawa, and Noriyuki Ueki, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed May 1, 1986, Ser. No. 858,048

Claims priority, application Japan, May 1, 1985, 60-94744

Int. Cl.[4] F01L *1/10, 1/26*

U.S. Cl. 123—90.2 **2 Claims**

1. A 4-cycle engine comprising:

a crank-case;

a cylinder formed integrally with said crank-case to provide a unitary structure;

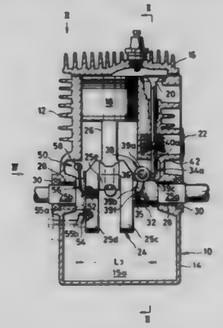
a piston fitted in said cylinder for reciprocatory movement;

a crank-shaft connected to said piston and supported at opposite ends in said crank-case for rotation, said crank-

shaft including two output shaft sections oriented in opposite directions;

a guide groove formed at one of said two output shaft sections, said guide groove extending twice around the one output shaft section peripherally along an outer peripheral surface of said output shaft section in the form of an only single endless loop with a cross point;

a plurality of followers engaged in said guide groove, said plurality of followers being located in positions substantially on opposite sides of said one output shaft section in



positions having a phase difference of substantially 180 degrees;

a plurality of linkages each connected to one of said plurality of followers through a bell crank, one of said linkages being linked to an exhaust valve and the other linkage being linked to a suction valve to transmit the movements of the followers to the respective valves to open and close same; and

governor means mounted on the other output shaft section innerside of a bearing portion thereof.

4,716,862

OLEODYNAMIC DISTRIBUTION SYSTEM, WITH SEPARATE CONTROL OF THE SUCTION AND EXHAUST VALVES, WITH CONTINUOUS TIMING SETTING WITH RUNNING ENGINE, FOR ALL FOUR-STROKE CYCLE ENGINES

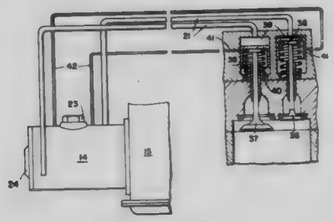
Gastone Sauro, Vicolo delle Ville, 8, 34123 Trieste, Italy

Filed Sep. 26, 1985, Ser. No. 780,679

Claims priority, application Italy, Jan. 23, 1985, 82801 A/85

Int. Cl.[4] F01L *9/02*

U.S. Cl. 123—90.12 **18 Claims**



1. Oleodynamic distribution system, with separate control of suction and exhaust valves, for continuous time setting of a running four-stroke-cycle engine, characterized in that

the opening and closing of the valves are determined and controlled by presure pulses which are periodically generated and maintained by two interengaging pumping elements, in a fluid with appropriate fluid characteristics, said time setting being adjustable for various operating conditions,

wherein said pumping means consists of:

a casing (1), having a longitudinal axis and being angularly rotatable about the first axis to set the timing to accommodate the various speeds of the engine, said casing having an internal surface including a plurality of alternating protruding parts (5) and notches (6),

a core (2) assembled inside said casing (1) with its longitudinal axis parallel and eccentric to said casing longitudinal axis, said core having an external surface including a plurality of alternating protruding parts (8) and notches (9) so that said core notches (9) can receive said casing protruding parts (5) and said core protruding parts (8) can engage into said casing notches (6), said core movement along its axis producing a backward rotating movement; and

a closing cover (3), and a setting cover (4) having a fluid intake orifice (12) and a pressure releasing orifice (13), said closing cover and said setting cover closing said assembled casing (1) and core (2) longitudinally.

4,716,863

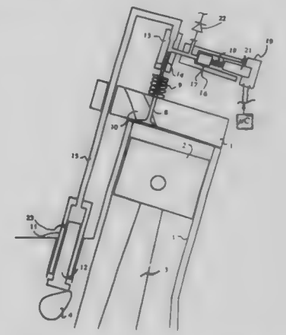
INTERNAL COMBUSTION ENGINE VALVE ACTUATION SYSTEM

Daniel A. Pruzna, 845A Taughannock Blvd., Ithaca, N.Y. 14850

Filed Nov. 15, 1985, Ser. No. 798,465

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.15 **3 Claims**



1. A valve actuation system for an internal combustion engine comprising:

(a) means coupled to a cam on the camshaft on the engine for controlling the position of an associated intake valve,

(b) means for dynamically varying said position independently of any other valve in a predetermined manner depending on a selectable lift and duration pattern, comprised of a linkage having a variable stroke betwen said cam and said intake valve, the linkage being comprised of a master cylinder containing a master piston coupled as a lifter to said cam, a slave cylinder containing slave piston coupled to said valve for controlling its position, a hydraulic line coupling said cylinders, a control cylinder coupled to the hydraulic line containing a control piston, a stop for the control piston, means for controlling the position of said stop, the position of the control piston being variable up to the stop depending on the retraction position of said master piston, following which the position of the slave piston is varible depending on further retraction of the master piston whereby the displacement of the intake valve is varied with displacement of the master piston,

(c) the intake valve including a valve closure spring,

(d) a control piston spring which is weaker than the valve

closure spring interfacing between the control piston and the stop, and

(e) a check valve coupled to the control cylinder for introducing fluid to said hydraulic line, and being coupled to an oiling system of the engine, and an oil spill port in said master cylinder coupled to said oiling system and being uncovered when the master piston is in its fully extended position, whereby fresh oil can be cyclically recirculated from said oil system through the check valve, the hydraulic line and the oil spill port for return to the oiling system.

4,716,864

CAMSHAFT DRIVE FOR AN INTERNAL COMBUSTION ENGINE

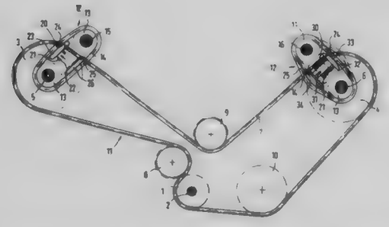
Robert Binder, Schwieberdingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 742,111, Jun. 6, 1985, abandoned. This application Jul. 15, 1986, Ser. No. 884,657

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1984, 3421028

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.31 **25 Claims**



1. A camshaft drive for a internal combustion engine having a cylinder head with first, second, third and fourth camshafts and a crankshaft, comprising:

first flexible drive menas directly connecting said first camshaft and said third camshaft with said crankshaft for driving said first camshaft and said third camshaft,

second flexible drive means connecting said first camshaft with said second camshaft for driving said second camshaft, and

third flexible drive means connecting said third camshaft with said fourth camshaft for driving said fourth camshaft, said flexible drive means being all disposed at one axial end of the engine.

3. A method of driving camshafts of an internal obustion engine having first second, third and fourth camshafts and a crankshaft comprising:

directly driving said first camshaft and said camshaft witha first flexible drive connecting said first camshaft and said third camshaft with said crankshaft,

driving said second camshaft with a second flexible drive connecting said first canshaft and said second camshaft,

driving said fourth camshaft with a third flexible drive connecting said third camshaft and said fourth camshaft, and

said flexible drives being all disposed at one axial end of the engine.

4,716,865

INNER ELEMENT FOR A HYDRAULIC COMPENSATION ELEMENT

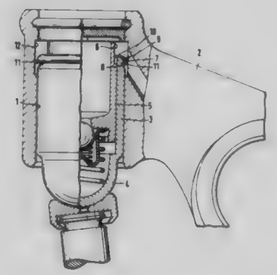
Georg Schaeffler, Herzogenaurach, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Maschinen- und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Filed Feb. 10, 1987, Ser. No. 13,001

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605645

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **1 Claim**



1. An inner element for a hydraulic valve clearance compensation element for an internal combustion engine comprising a cylindrical element (3) closed on one end and a piston element (5) guided therein for longitudinal displacement and protruding beyond the open end of cylindrical element (3), the piston element (5) having a reduced outer diameter (6) in its protruding portion engaging a radial flange (10) of a restraining element (9) held by a cylindrical collar (13) on the open end of cylindrical element (3), the open end of element (3) having also a reduced outer diameter (7) with an additional diameter reduction in the form of a peripheral groove (8) engaging positively the collar (13) of the restraining element (9) at at least some peripheral points, the restraining element (9) having one projection (11) at at least one peripheral point radially protruding beyond the outer diameter of cylindrical element (3), characterized in that the lengthwise region of collar (13) containing projections (11) engaging radially over the outer diameter of cylindrical element (3) and the lengthwise region of collar (13) engaging peripheral groove (8) of cylindrical element (3) lie axially behind one another without a mutual overlap.

4,716,866

INNER ELEMENT FOR A HYDRAULIC VALVE COMPENSATION ELEMENT

Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to Motomak Motorenbau Maschinen- und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Filed Feb. 18, 1987, Ser. No. 16,075

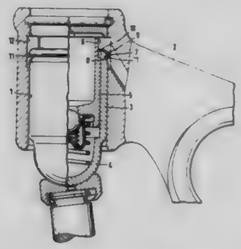
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606537

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **1 Claim**

1. An inner element for a hydraulic valve clearance compensation element for an internal combustion engine comprising a cylindrical element (3) closed on one end and a piston element (5) guided therein for longitudinal displacement and protruding beyond the open end of cylindrical element (3), the piston element (5) having a reduced outer diameter (6) in its protruding portion engaging a radial flange (10) of a restraining element (9) held by a cylindrical collar (13) on the open end of cylindrical element (3), the open end of element (3) having also a reduced outer diameter (7) with an additional diameter reduction in the form of peripheral groove (8) engaging positively the collar (13) of the restraining element (9), at at least

some peripheral points, the restraining element (9) having a projection (11) at at least one peripheral point radially protruding beyond the outer diameter of cylindrical element (3), characterized in that the collar (13) of restraining element (9) is provided in its initial stage so that its cylindrical external contour does not exceed the outer diameter of cylindrical element



(3) and in the area of the collar (13) indentations are provided at at least two positions about the circumference at which the restraining element material is shaped into the peripheral groove (8) of the cylindrical element (3) whereby collar (13) displays an enlarged diameter at the circumference portions situated between the indentations so that it exceeds there the outer diameter of the cylindrical element (3).

4,716,867

INNER ELEMENT FOR A HYDRAULIC VALUE COMPENSATION ELEMENT

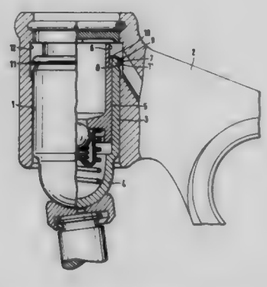
Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Maschinen- und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 17,761

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606536

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **1 Claim**



1. An inner element for the hydraulic valve clearance compensation element for an internal combustion engine comprising a cylindrical element (3) closed on one end and a piston element (5) guided therein for longitudinal displacement and protruding beyond the open end of cylindrical element (3), the piston element (5) having a reduced outer diameter (6) in its protruding portion engaging a radial flange (10) of a restraining element (9) held by a collar (11) on the open end of cylindrical element (3), the open end of element (3) having also a reduced outer diameter (7) with an additional diameter reduction in the form of peripheral groove (8) engaging positively the collar (11) of the restraining element (9), at at least some peripheral points, the restraining element (9) having one projection (13) at at least one peripheral point radially protruding beyond the outer diameter of cylindrical element (3), characterized in that the collar (11) of restraining element (9) is provided in its initial stage at its end opposite to the radial flange (10) with an outer diameter (13) greater than the outer diameter of cylindrical element (3) in which area at least two indentations spaced about the circumference are provided at which the restraining element material is shaped into the peripheral groove (8) of the cylindrical element (3).

4,716,868

HAND STARTER CRANK WITH INTEGRATED SAFETY DEVICE

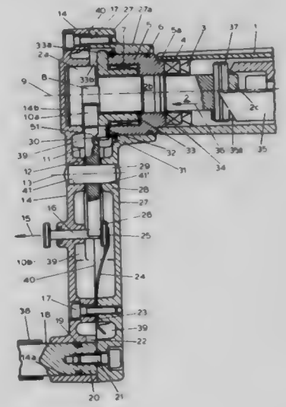
Harald Reuter, Cologne, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

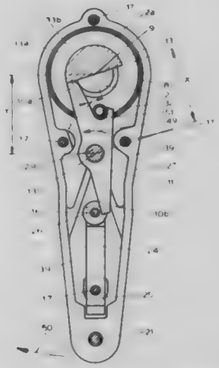
Filed Sep. 17, 1986, Ser. No. 908,267

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533685

Int. Cl.[4] F02N *1/02*

U.S. Cl. 123—185 S **16 Claims**





1. A manual starter crank with an integrated safety device to guard against backfiring during starting of an internal combustion engine having a starter shaft which drivingly engages the free end of a cam shaft of the internal combustion engine when rotated in the starting direction and presenting an abutment surface by which starting torque may be transmitted thereto, said safety device including a ratchet pivotal about a pivot axis substantially parallel to the axis of the starter shaft from a disengaged position to an engaged position in which a free end of said ratchet is in torque transmitting engagement with said

abutment surface of said starter shaft, whereby the manual starter crank when turned in said starting direction is drivingly connected for rotating said cam shaft, said safety device further including a bearing support adapted to be held nonrotatable relative to the engine, a disengaging bushing rotatably mounted on said starter shaft, a one-way clutch operatively disposed within said bearing support and between said bearing support and said disengaging bushing allowing rotation of said bushing relative to said bearing support in said starting direction and preventing relative rotation therebetween in the opposite direction and a disengaging pin on said disengaging bushing in the path of pivotal movement of said ratchet and engageable therewith during backfiring of said engine to move said ratchet out of its engaged position and to its disengaged position.

4,716,869

VALVE GUIDE FOR AN INTERNAL COMBUSTION ENGINE

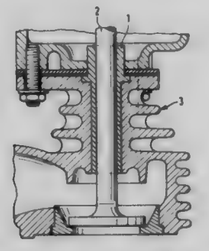
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Duesseldorf, Germany

Continuation-in-part of Ser. No. 803,502, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 571,479, Jan. 17, 1984, abandoned. This application Aug. 1, 1986, Ser. No. 892,582

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301912

Int. Cl.[4] F01L *3/00*

U.S. Cl. 123—188 GC **22 Claims**



1. In an internal combustion engine wherein a tubularly formed valve guide is formed with a bore for a metal valve shank said valve guide being encircled by a component embracing it in at least an area where it is exposed to exhaust gases, the improvement which comprises the valve guide being a sintered body consisting of partially stabilized zirconium oxide having a porosity less than 3%, and composed of up to 80 wt. % cubic modification, between 20 and 60 wt. % tetragonal modification, and up to 6 wt. % monoclinic modification, the sum of the amount of the various modifications being 100 wt. %, wherein the partially stabilized zirconium oxide has a homogenous structure and is formed by grains in the cubic modifications in which tetragonal precipitations are present.

4,716,870

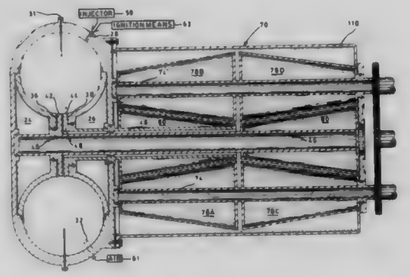
ROTARY INTERNAL COMBUSTION ENGINE

Clifford E. Wilson, 128 College St., Madisonville, Tenn. 37354

Filed Jun. 25, 1986, Ser. No. 878,350

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—245 **17 Claims**



1. An internal combustion engine comprising:

wall means defining at least one toroidal cylinder;

at least one pair of flywheels mounted for rotation with respect to said cylinder around a central axis thereof and with respect to each other;

piston means within said cylinder including a first pair of pistons mounted on one of said flywheels at selected locations, and a further pair of pistons mounted on another of said flywheels at selected locations, said pistons cooperating to define with said cylinder compressing/expanding chambers during rotation of said flywheels and said pistons attached thereto;

means for injecting fuel and inserting air into said compressing chamber through said wall means of said cylinder;

means for igniting fuel injected within said cylinder at predetermined times such that said ignited fuel acts against said piston means and causes said piston means to revolve within said cylinder; and

means for controlling the mode of operation of said piston means and said flywheels whereby said first and further pairs of pistons revolve in the same direction within said cylinder at varying angular velocities during cycles of said engine, said means for controlling said mode including

a. a first rotating shaft carrying said one of said flywheels,

b. a second rotating shaft carrying said another of said flywheels,

c. at least one first gear member carried on said first rotating shaft, said first gear member defining a substantially conically configured surface with a first end of a first selected diameter and a second end of a second selected larger diameter, said surface provided with first gear engagement means of a selected configuration,

d. at least one second gear member disposed proximate said first gear member having a conically configured surface with a first end of one selected diameter proximate said second end of said first gear member and a second end of a selected larger diameter proximate said first end of said first gear member, said surface of said second gear member provided with further gear engagement means of a selected configuration operatively associated with said gear engagement means on said surface of said first gear means whereby said second gear means is rotatable in a direction opposite said first gear means, said configuration of said first and further gear engagement means of said first and said second gear members selected whereby intermeshing between said first and said second gear members reciprocates between ends of said gear members whereby said second gear member is rotated at said varying angular velocities with respect to said first rotating shaft, and

e. gear coupling means connected between said second gear means and said second rotating shaft to rotate said second rotating shaft at said varying angular velocities with respect to said first rotating shaft to thereby cause said pistons to define said compressing/expanding chambers within said cylinder during an engine cycle.

4,716,871

INTAKE SYSTEM FOR ENGINE

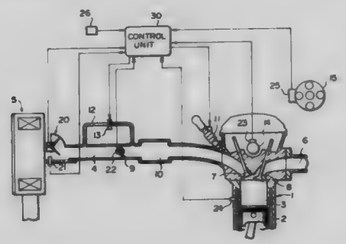
Katsuhiko Sakamoto; Tetsushi Hosokai, and Hideo Shiraishi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Aug. 1, 1986, Ser. No. 892,041

Claims priority, application Japan, Aug. 2, 1985, 60-171464

Int. Cl.[4] F02M *3/12*

U.S. Cl. 123—339 **13 Claims**



1. An intake system for an internal combustion engine comprising an intake passage provided with a throttle valve, a bypass passage for feeding auxiliary air to the engine bypassing the throttle valve, a control valve provided in the bypass passage to control airflow through the bypass passage, an operating condition detecting means for detecting the engine operating condition, an auxiliary air requirement calculating means which receives the output of the operating condition detecting means and determines an auxiliary air requirement according to the engine operating condition, a target idling speed determining means which receives the output of the operating condition detecting means and determines a target idling speed, an engine speed detecting means, a feedback correction amount determining means which compares the target idling speed with the actual engine speed detected by the engine speed detecting means and determines a feedback correction amount of auxiliary air according to the difference therebetween, a flow rate determining means which determines the flow rate of auxiliary air on the basis of the sum of the auxiliary air requirement and the feedback correction amount of auxiliary air, a converting means for converting the flow rate into a control amount of the control valve based on the output characteristics of the control valve, and a driving means for controlling the control valve on the basis of the control amount.

4,716,872

ECONOMIC SPEED INDICATOR

Alexander T. Pol, 5801 SW. 47 St., Miami, Fla. 33155

Filed Sep. 17, 1985, Ser. No. 776,872

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—352 **7 Claims**

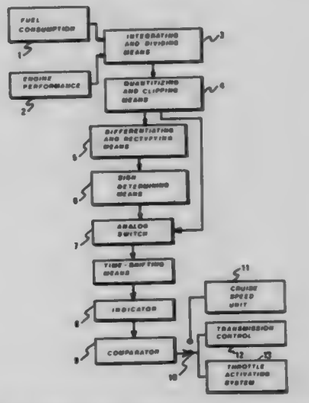
1. A method of finding and holding the most economical speed of an engine or vehicle, comprising the steps of:

continuously monitoring the ratio of instantaneous fuel consumption rate to engine torque or vehicle speed;

generating impulses in accordance with said ratio;

obtaining a derivative of said impulses;

determining the point of the most economic speed based on the value of said impulses; and



controlling the speed of the engine or vehicle according to the determined point of the most economic speed.

4,716,873

ENGINE CONTROL SYSTEM

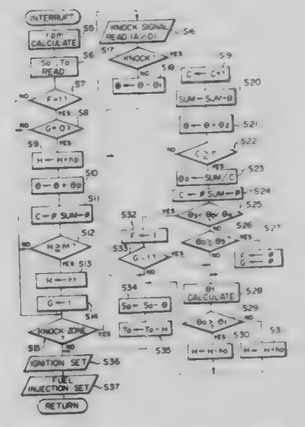
Tetsuro Takabe; Tomotsugu Rikitake; Yoshitaka Tabaru, and Manabu Arima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 3, 1986, Ser. No. 903,286

Claims priority, application Japan, Sep. 5, 1985, 60-196774

Int. Cl.[4] F02P *5/14*

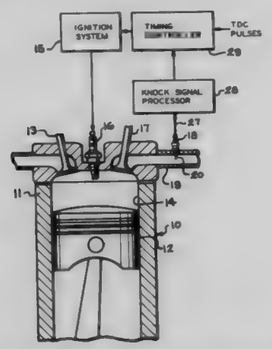
U.S. Cl. 123—425 **5 Claims**



1. An engine control system comprising a knock detecting means for detecting knock of an engine, an ignition timing correcting means which receives the output of the knock detecting means and retards the ignition timing when knock occurs and advances the ignition timing when knock does not occur, a setting means which sets an optimal ignition timing on which the ignition timing is to be converged to a latest ignition timing to which the ignition time can be retarded without raising the exhaust gas temperature higher than a predetermined value at the actual air-fuel ratio at that time, a comparator means which compares the actual ignition timing corrected

by the ignition timing correcting means with the optimal ignition timing set by the setting means, and an air-fuel ratio control means which receives the output of the comparator means, and corrects the air-fuel ratio toward the lean side when the actual ignition timing is on the advance side of the optimal ignition timing and toward the rich side when the former is on the retard side of the latter.

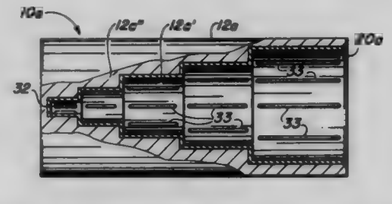
4,716,874
CONTROL FOR SPARK IGNITED INTERNAL COMBUSTION ENGINE
John C. Hilliard, and Anthony K. F. Chan, both of Ann Arbor, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Sep. 27, 1985, Ser. No. 780,781
Int. Cl.[4] F02P 5/15
U.S. Cl. 123—425 **15 Claims**



1. A control for a spark ignited internal combustion engine having at least one combustion chamber having a combustion cycle, means for producing timing pulses having a predetermined relationship to the engine cycle, a spark plug mounted for igniting an air-fuel mixture within said chamber, an ignition system responsive to a timed signal from said control for supplying an ignition voltage to said spark plug and a port for exhausting combustion gases from said chamber, said control comprising detector means for producing an electric signal proportional to the degree of the electrical conductivity of exhaust gases passing through said port, means for averaging such detector means signal over a predetermined number of ignition cycles to generate an averaged detector means signal, and means responsive to such averaged detector means signal in successive ignition cycles and to such timing pulses for applying a timed signal to said ignition system to produce ignition timing near maximum engine efficiency without knock.

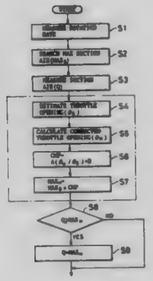
4,716,875
SAFETY PLUG DEVICE FOR FUEL LINES
Fernando Troncoso, Jr., 14090-6100 Rd., Montrose, Colo. 81401
Filed Aug. 18, 1986, Ser. No. 897,267
Int. Cl.[4] F02M 55/02
U.S. Cl. 123—469 **3 Claims**

1. An improved safety plug device for internal combustion engine fluid fuel lines, said device comprising, in combination:
a. a plug body kit having separate and independent first and second fuel line plugging portions, said first portion comprising a solid core having means for plugging insertion into fuel lines of various internal bore diameters comprising a multiple stepped outer surface, said second portion comprising an outer sheath with a central cavity in which said core is stored and releasably removed therefrom, said cavity being defined by multi-stepped inner surfaces of said sheath mating with said multiple stepped outer surface of said core, said sheath having an open end and a closed end and having means to internally receive and



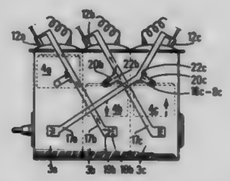
plug fuel lines of various outer diameters in said cavity through said open end by virtue of said multi-stepped inner surfaces when said core is out of said sheath.

4,716,876
FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE
Setsuhiro Shimomura, and Yukinobu Nishimura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1986, Ser. No. 921,515
Claims priority, application Japan, Oct. 22, 1985, 60-238126
Int. Cl.[4] F02P 3/00
U.S. Cl. 123—480 **5 Claims**



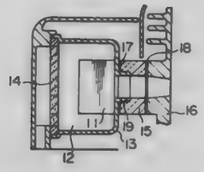
1. A fuel injection control system comprising:
(a) an air-flow sensor (3) for detecting a quantity of suction air supplied to an internal combustion engine;
(b) an injector (2) for injecting fuel into said engine;
(c) a controller (8) for controlling a quantity of said injected fuel in response to an output of said air-flow sensor;
(d) a throttle valve (5) for regulating a quantity of said suction air;
(e) throttle valve opening detecting means for detecting an opening of said throttle valve;
(f) rotational frequency detecting means (9) for detecting a rotational frequency of said engine;
(g) means for limiting one of said quantity of said injected fuel or said output of said air-flow sensor to a maximum value; and
(h) means for determining said maximum value in response to said output of said air-flow sensor and to outputs of said throttle valve opening detecting means and said rotational frequency detecting means, wherein said maximum value determining means includes:
(i) searching means for finding a first maximum value of said one of said quantity of said injected fuel or said output of said air-flow sensor in response to said output of said rotational frequency detecting means; and
correcting means for correcting said first maximum value in response to said outputs of said air-flow sensor, said throttle valve opening detecting means and said rotational frequency detecting means.

4,716,877
DEVICE AND METHOD FOR INJECTING FUEL INTO AN ENGINE, ASSISTED BY COMPRESSED AIR OR GAS
Pierre Duret, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison; Automobiles Peugeot, Paris and Automobiles, Citroen, Seine, all of, France
Filed Dec. 30, 1985, Ser. No. 814,767
Int. Cl.[4] F02M 23/00
U.S. Cl. 123—531 **6 Claims**



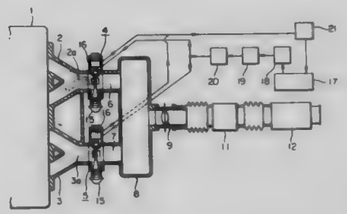
1. An internal combustion engine comprising at least one pneumatic fuel injection member, at least one exhaust pipe including at least one auxiliary duct having a first end connected to said exhaust pipe and a second end connected to said injection member, and wherein said auxiliary duct comprises a third aperture opening to a gas source and an obstruction member disposed in said aperture, said obstruction member including one of a stop valve or check valve.

4,716,878
DEVICE FOR MOUNTING A CARBURETOR HAVING A BODY MADE OF SYNTHETIC RESIN
Mitsuo Shimada, Tokyo; Yoetsu Yokocho, Ome, and Yoshiki Nakayama, Akishima, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Apr. 14, 1986, Ser. No. 851,796
Claims priority, application Japan, May 2, 1985, 60-65192[U]; May 14, 1985, 60-70099[U]
Int. Cl.[4] F02M 31/20
U.S. Cl. 123—540 **2 Claims**



1. Device for mounting a carburetor having a body made of synthetic resin having a heat insulating member for intercepting heat transmission from a cylinder of an engine to said carburetor, characterized by a temperature adjusting metallic member interposed between said heat insulating member and said carburetor, and in the said metallic member is constructed as a metallic case forming a receptacle for said carburetor.

4,716,879
FUEL INJECTION SUPPLY SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE
Teruo Takayama, and Teruo Yamauchi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 26, 1986, Ser. No. 844,342
Int. Cl.[4] F02M 29/00
U.S. Cl. 123—590 **7 Claims**

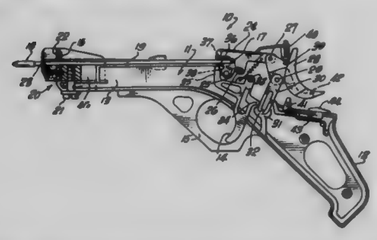


1. A fuel injection supply system for an internal combustion engine having an even number of more than four cylinders, an intake throttling valve means disposed in an intake passage substantially midway between each combustion chamber intake port and air cleaner outlet, a first intake manifold connected to a first cylinder group comprising one half of all of the cylinders, a second intake manifold connected to a second cylinder group comprising the other half of said cylinder, a passage collector means for collecting the intake passages so as to communicate the intake ports of said first and second manifolds with each other, a first fuel supply means disposed at a converging portion of the first intake manifold and a second fuel supply means disposed at a converging portion of the second manifold, wherein said of said first and second fuel supply means comprises a fuel injection valve, a fuel atomizing means including a tubular hollow vibrating piece, a vibrating driver means and a horn means for connecting said vibrating piece with said vibrating driver means, a cylindrical intake pipe member forming a part of said intake passage and having a hole for accommodating said horn member, a cylindrical housing extending radially outwardly of said cylindrical intake pipe member for receiving said fuel injection valve means, said cylindrical housing having a fuel injection aperture at the bottom thereof for enabling a passing of fuel into said cylindrical pipe member, and fuel passage means for respectively supply fuel thereto and returning fuel therefrom, said vibrating driver means being mounted on an outer surface of said pipe member for locating said vibrating piece at a central portion of said pipe member opposite to said fuel injection aperture.

4,716,880
HAND HELD CROSSBOW
Glenn H. Adkins, 12026 Fidel Ave., Whittier, Calif. 90605
Filed Sep. 4, 1986, Ser. No. 903,520
Int. Cl.[4] F41B 5/00
U.S. Cl. 124—25 **17 Claims**

1. A cross bow for propelling an arrow, said cross bow comprising:
a cross bow frame including a handle portion and a barrel portion, said barrel portion having a front and a rear and a top surface including a top surface area;
a bow frame having two tips, said bow frame affixed to the cross bow frame near the front of the barrel portion thereof, said bow frame having a bow string affixed between the tips thereof;
an arrow gripper arm held by said cross bow frame near the rear of the barrel portion, said arrow gripper arm including a gripping surface, said arrow gripper arm having sufficient gripping force to hold an arrow in place in the cross bow when the cross bow is cocked, and the bow

string is a cocked bow string, without any holding of the bow string other than by an arrow; and



pullable trigger means held by said cross bow frame adjacent the handle portion thereof, said trigger means being linked to said arrow gripper means so that the pulling of the trigger means releases said gripper means.

4,716,881

BLADE MOUNT FOR INNER DIAMETER SAW BLADE

Robert E. Steere, Parsippany, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Oct. 1, 1986, Ser. No. 913,966
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **20 Claims**



1. A blade mount for an inner diameter saw blade comprising
a pair of clamping rings for securing an inner diameter saw blade therebetween;
means disposed within one of said clamping rings for tensioning the saw blade; and
a stabilizer blade mount adjustably secured to one of said clamping rings for imposing an axial force on the saw blade.

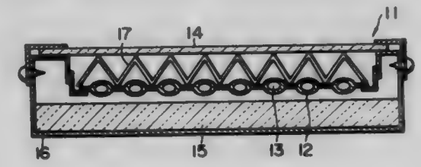
4,716,882

SOLAR HEAT COLLECTOR

Masaharu Ishida, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 311,278, Oct. 14, 1981, abandoned. This application Jun. 4, 1986, Ser. No. 870,455
Int. Cl.[4] F24J *2/04*
U.S. Cl. 126—441 **4 Claims**

1. A solar heat collector comprising:
an outer box opened at an upper portion thereof for receiving solar rays;
a heat insulating material disposed in a bottom of said outer box over an entire length and width of the bottom for preventing heat loss from said bottom to an outside;
an absorber plate provided insaid outer box for converting the solar rays into thermal energy to transmit the thermal energy to a heat transfer medium, said absorber plate being formed in a manner to connect a plurality of tubes being flat in cross section to plate means, and said absorber plate being applied to a surface thereof with a selective absorption surface treatment;
a transparent sheet secured to the opened upper portion of said outer box for preventing a convection heat loss through said absorber plate and protecting said absorber



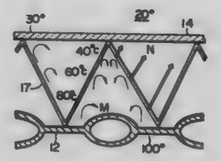


plate against contaminatio and damages caused by external factors; and
a transparent heat trap being transparent for infrared rays as well as the solar rays and formed of an ethylene fluoride series resin film having a film thickness of 1 to 100 μm and having a degree of crystallinity of 35 to 55%, said transparent heat trap being formed into continuous V-shapes in cross section at a substantially regular pitch and disposed between said transparent sheet and said absorber plate and extending across the absorber plate, whereby three forms of heat losses due to convection, radiation and conduction are suppreased simultaneously, thereby enabling to secure a high heat collecting efficiency.

4,716,883

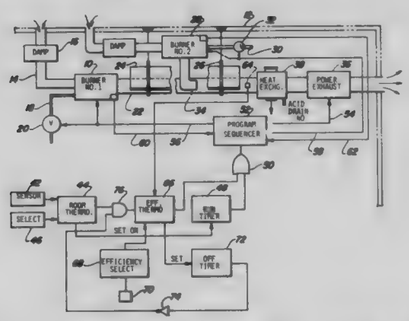
HIGH EFFICIENCY INFRARED RADIANT ENERGY HEATING SYSTEM AND METHOD OF OPERATION THEREOF

Arthur C. W. Johnson, 2611 Lake Charnwood, Troy, Mich. 48084

Filed May 8, 1986, Ser. No. 860,902
Int. Cl.[4] F24H *3/00*
U.S. Cl. 126—116 A **18 Claims**

1. A method of heating an enclosure with a heating apparatus of the type having an infrared emitter within the enclosure and in the form of a tubular conduit for hot gaseous effluent and a burner connected to the conduit to charge the conduit with hot gaseous effluent when activated comprising the steps of:
(a) monitoring the temperature of the enclosure;
(b) activating the burner to charge the tubular emitter when the enclosure temperature is below a reference temperature;
(c) monitoring the temperature of the effluent at the exhaust end of the conduit; and
(d) deactivating the burner when the exhaust temperature reaches a predetermined set value.

12. In a radiant energy heating system of the type having a burner, an elongate tubular infrared emitter of metallic construction receiving effluent from the burner, and a thermostatic control system for turning the burner off and on according to heat demands, the improvement which comprises a minimum



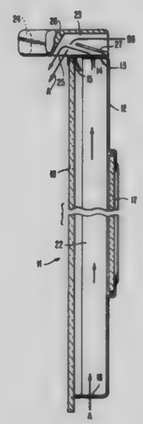
burner run timer connected to said burner to maintain the burner in an "on" condition until a predetermined effluent exhaust temperature sufficient to maintain corrosive substances in a gaseous state is reached regardless of heat demand signals from said control system.

4,716,884

OVEN DOOR OF THE VENTILATED TYPE

Luigi Bonaccorsi; Piero Armanni, and Giuliano Zanetti, all of Forlì, Italy, assignors to Zanussi Elettrodomestici S.p.A., Pordenone, Italy

Filed Jul. 15, 1986, Ser. No. 886,641
Claims priority, application Italy, Jul. 15, 1985, 45725 A/85
Int. Cl.[4] F23M *7/00*
U.S. Cl. 126—198 **4 Claims**



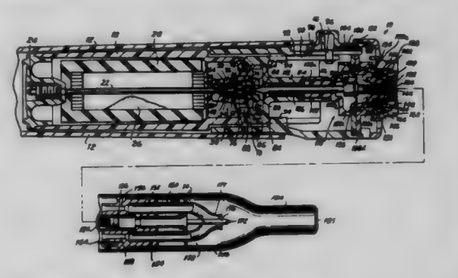
1. An oven door of the ventilated type and comprising:
a peripheral frame;
an inner transparent pane secured to said frame to face an oven chamber when said door is mounted on an oven;
an outer transparent pane releasably mounted on said frame at a position spaced outwardly from said inner pane with respect to the oven chamber;
said frame having lower and upper rims formed with openings for the circulation of cooling air upwardly through an interspace between said inner and outer panes;
a profile member secured to said upper rim of said frame and having a handle;
said profile member having an internal cavity to receive a flow of air forced around the oven chamber by a fan and which is heated at an upper portion of the oven chamber, said internal cavity communicating through said openings in said upper rim with said interspace;
first deflector means within said internal cavity for directing a first portion of the flow of heated air away from said handle and into said interspace;
said profile member having front outlet openings extending from said internal cavity to the exterior of the door, such that a second portion of the flow of heated air passes through said internal cavity and is discharged directly through said front outlet openings; and
second deflector means within said internal cavity forming venturi passages for said second portion of said flow of heated air and thereby for promoting the flow of said cooling air through said interspace and the escape of said cooling air flow and said first portion of said heated air flow from said interspace through said front outlet openings.

4,716,885

DUAL INPUT TO SINGLE BURNER SOLDER IRON

Thaddeus Zaborowski, Pembroke, Mass., assignor to The Schawbel Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 781,262, Sep. 27, 1985. This application Apr. 18, 1987, Ser. No. 37,941
Int. Cl.[4] B23K *3/02*
U.S. Cl. 126—413 **25 Claims**



1. A portable heating appliance comprising:
a hollow barrel having a tapered free end;
burner means including a burner having separate, independently controlled gas supply paths, said supply paths including first and second tubes, each tube having a free end;
single junction tube means for joining together the free ends of said first and second tubes, said junction tube means having a free end adjacent said tapered free end for heating the same;
fuel supply means for supplying fuel to said junction tube means through said first and second tubes; and
ignition means for igniting said fuel escaping from the free end of said junction tube means.

4,716,886

UMBILICAL CORD CLAMP AND CUTTERS

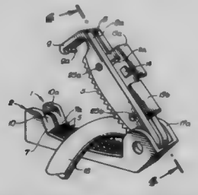
Norman M. Schulman, Los Angeles, and Donald Raible, Irvine, both of Calif., assignors to Norman Schulman, Los Angeles, Calif.

Filed May 1, 1986, Ser. No. 858,397
Int. Cl.[4] A61B *17/08*
U.S. Cl. 128—305 **21 Claims**

1. A double-clamp device for the clamping and severing of a tubular body, each severed end thereof being retained in a clamp, comprising:

a pair of clamps, each clamp comprising a pair of arms hingably connected at one end and further having latching means for securing said pair of arms in a clamped position about said tubular body wherein said latching means secures said pair of arms in a clamped position prior to severing the tubular body;

breakable connecting means disposed between said pair of clamps for selectively connecting and maintaining said pair of clamps in a side-by-side abutting relation; and



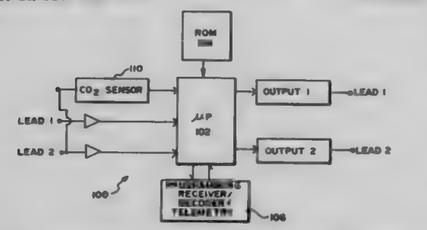
a cutting blade for breaking said connecting means and severing said tubular body, located between said clamps and adjacent said breakable connecting means, said cutting blade integrally connected to one of said arms and movable relative thereto, whereby clamping and severing of said tubular body is done substantially in a single motion with each end of said severed tubular body remaining clamped.

4,716,887

APPARATUS AND METHOD FOR ADJUSTING HEART/PACER RATE RELATIVE TO CARDIAC PCO_2 TO OBTAIN A REQUIRED CARDIAC OUTPUT

Gerrit Koning, Vries, Netherlands, and Edward A. Schroeppel, Miamar, Fla., assignors to Telectronics N.V., Curacao, Netherlands Antilles

Filed Apr. 11, 1985, Ser. No. 722,575
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **22 Claims**



1. An implantable apparatus for pacing a heart in accordance with the heart/pacer rate needed to produce a required cardiac output relative to the partial pressure of carbon dioxide in blood, pCO_2, while the person having the apparatus implanted within his body is exercising comprising:

a demand pacer for implantation in the human body and having a pulse generator and control circuitry mounted therein and operable to sense, through a pacing lead, when a heart is not naturally paced;

a pacing lead for implantation in a heart and coupled to said pacer, said pacing lead having a tip electrode for engaging and supplying pacing pulses to a ventricle of a heart and having an opening therein which is located in a portion of the lead which is received in a heart chamber when the lead is implanted in a heart;

pCO_2 sensing means mounted in said opening for sensing the partial pressure (tension) of CO_2 dissolved in the blood and generating signals related to the pCO_2 sensed; and

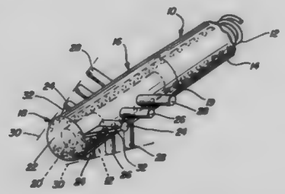
said control circuitry comprising a microprocessor including means for relating a signal from the pCO_2 sensing means to the partial pressure of carbon dioxide, pCO_2, in the blood, means for determining changes in the partial pressure of carbon dioxide, $\Delta pTCO_2$, and relating such changes to a corresponding change in pacing rate, ΔR_T, between a maximum rate increase allowed, $\Delta R_{Max.1}$, and a maximum rate decrease allowed, $\Delta R_{Max.2}$, means for adjusting the pacing rate, ΔR_{T-1}, by adding ΔR_T to the present pacing rate, R_{T-1}, to obtain a new pacing rate, R_T, between a minimum programmed pacing rate, $R_{Min.}$ and a maximum programmed pacing rate, $R_{Max.}$, needed to supply a required cardiac output relative to the pCO_2 measured, and means for causing the pacer to pace the heart at the newly calculated required rate when the heart is not naturally paced while the person is exercising.

4,716,888

TINED LEADS

Walter H. Wesner, Plantation, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 744,949, Jun. 17, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 918,669
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—785 **9 Claims**



1. A body-implanatable lead which comprises:

an elongated electrical conductor encased in an elongated tube comprising inert insulating material, said lead terminating at one end with an exposed electrode tip;

a first set of discrete extending projections which extend outwardly from said elongated tube;

a second set of discrete extending projections which extend outwardly from said elongated tube;

the space between said first set and said second set being free from all transverse material that is capable of contacting the trabeculae;

said first set of discrete extending projections having a length that is less than the length of said second set of discrete extending projections; and

said second set of discrete extending projections being positioned more remote from said electrode tip than said first set of discrete extending projections.

4,716,889

DEVICE FOR IMPARTING CONTINUOUS PASSIVE MOTION TO HUMAN JOINTS

John H. Saringer, Toronto, Canada, assignor to Toronto Medical Corp., Scarborough, Canada

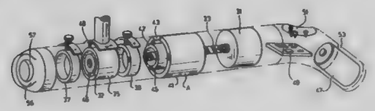
Continuation of Ser. No. 660,704, Oct. 15, 1984, Pat. No. 4,537,083, which is a division of Ser. No. 362,896, Mar. 29, 1982, Pat. No. 4,487,199. This application Aug. 22, 1985, Ser. No. 768,518
Claims priority, application Canada, Oct. 23, 1981, 388659
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **2 Claims**

1. A continuous passive motion apparatus for mobilizing a human joint, comprising,

an elongated support,

traveller means on the support for reciprocating linear movement relative thereto, and means connected to the traveller means for operatively engaging a limb of the body adjacent to a joint to be mobilized,

motor means for driving the traveller means back and forth through a reciprocating linear stroke in a slow rhythmic cycle; and,



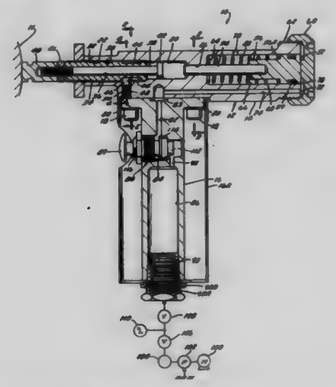
for reversing the direction of travel of the traveller means at any point in its path of travel in response to a predetermined load.

4,716,890

CHIROPRACTIC THRUSTER

Ronald A. Bichel, 3141 Hwy. K South, Hartford, Wis. 53027

Filed Jan. 29, 1986, Ser. No. 823,771
Int. Cl.[4] A61F *5/00*; A61H *23/04*
U.S. Cl. 128—55 **6 Claims**



1. A chiropractic thruster comprising:

a supporting structure;

a punch mounted for sliding reciprocable movement in said structure and having an outer end extending from said structure and an inner end within said structure:

a gas cylinder on said structure and having a gas inlet port near one end and a gas exhaust port near its other end;

a piston slideably mounted for reciprocable movement in said cylinder between an initial position at one end of said gas cylinder and another position near the other end of said gas cylinder;

biasing means for resiliently biasing said piston toward said one end of said cylinder to said initial position;

a piston rod connected at one end to said piston and having a free end extending from said cylinder, said free end of said piston rod being spaced apart a predetermined distance from said inner end of said punch when said piston is biased to said one end of said cylinder;

a compressed gas reservoir on said structure and having a gas inlet port and a gas outlet port, said reservoir having a larger volume than the maximum volume of that portion of said gas cylinder located between said gas inlet port and said piston;

a poppet valve mounted on said structure and having a valve gas inlet port, a normally-closed valve gas outlet port and a normally open valve exhaust port, said valve inlet port and said valve outlet port being connected in series betwen said gas outlet port of said reservoir and said gas inlet port of said cylinder, said valve gas exhaust port being connected to said gas inlet port of said cylinder; and

a trigger mounted on said structure for operating said valve and movable between a trigger-released position wherein said valve gas outlet port is closed and said valve gas exhaust port is open, and a trigger-actuated position wherein said valve gas outlet port is open and said valve gas exhaust port is closed;

said valve gas outlet port when open operating to admit air from said reservoir to said cylinder whereby said piston advances toward said other position and imparts a single blow to said inner end of said punch,

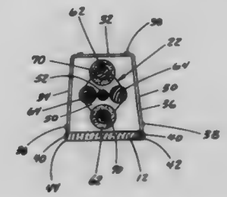
said valve gas outlet port when closed operating to bleed air from said cylinder to atmosphere to permit said piston to be biased to said initial position.

4,716,891

INTERSEGMENTAL TRACTION APPARATUS FOR THE CERVICAL SPINE

Kenneth J. Yorgan, 901 S. Green Bay Rd., Racine, Wis. 53406

Filed May 12, 1986, Ser. No. 861,866
Int. Cl.[4] A61H *15/00*
U.S. Cl. 128—57 **4 Claims**



1. In a device for applying intersegmental traction to a patient's cervical spine of the type having an array of elongated parallel rollers rotatable about a main axis which is substantially parallel to that of the rollers, the improvement comprising:

two lifting rollers spaced about 180 degrees apart about the main axis and having centerlines spaced apart by no more than the length of the adult cervical spine such that the entire array of rollers fits immediately adjacent to the cervical spine, said lifting rollers having first outermost peripheral portions at a first radial distance from the main axis;

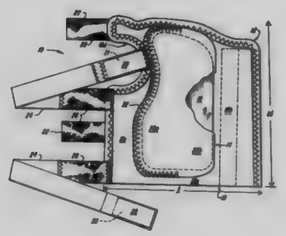
two intervening rollers each spaced substantially equally between and on either side of each of the lifting rollers and having second outermost peripheral portions at a second radial distance from the main axis,

the first radial distance being substantially greater than the second radial distance to the extent that when a lifting roller is centered on the cervical spine it is the only roller in supporting contact therewith, and;

said second outermost peripheral portion of each intervening roller extending beyond the common tangent line of the lifting rollers so that when the two lifting rollers are equidistant from the center of the cervical spine both of them and an intervening roller are in concurrent supporting contact with the patient's neck along the natural posterior concavity of the cervical spine,

whereby repetitive intersegmental traction may readily be applied to improve cervical curvature without intervening periods of unsupported curvature collapse.

4,716,891
ORTHOPEDIC SUPPORT APPARATUS WITH A BRACE-RECEIVING POCKET
Sumner Brunswick, 858 Huntington Ave., Boston, Mass. 02115
Filed Dec. 19, 1986, Ser. No. 944,461
Int. Cl.[4] A61F *5/04, 5/02*
U.S. Cl. 128—77 7 Claims



1. Orthopedic support apparatus for a body portion which extends along a first axis, said support apparatus having a pliable wrap with an inner surface, a length dimension and a width dimension, and which includes compliant web means resiliently elastic at least along said length dimension, said wrap further having adjustable strap means extending along said length dimension and adapted for securing said web means at least partially encircling the body portion about said axis with the length dimension extending circumferentially of the body portion and with said inner surface facing toward the body portion, said apparatus having the improvement comprising

A. compliant pocket panel means on said wrap overlying said inner surface of said web means and having selected thermal insulation, said pocket panel means

(1) having a first dimension longitudinal with said length dimension and a second dimension longitudinal with said width dimension,

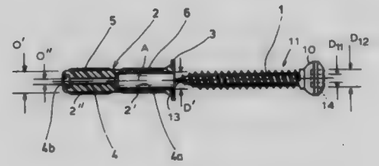
(2) having a seating portion secured to said web means along a first path to form with said web means a re-entrant pocket having a pocket bottom distal along said length dimension from a pocket opening, said first path extending along at least part of said second dimension and along only a portion of said first dimension, and

(3) having an overlap portion extending at least in said length dimension from said seating portion away from said pocket bottom for the remainder of said first dimension, and

B. a thermo-formable bracing element removably and replaceably received in said pocket between said pocket panel means and said web means and having a portion thereof seated by said seating portion and having the remaining portion thereof covered by said overlap portion,

C. and wherein said web means is free of securage to said pocket panel means at said overlap portion so that said web means is free to stretch at least along said length direction without restraint by pocket-forming securage to said overlap portion.

4,716,893
BONE FASTENER
Artur Fischer, Weinhalde 34, D-7244 Tumlingen/Waldachtal, and Wolfgang Kramer, Oberjettingen, both of Fed. Rep. of Germany, assignors to Artur Fischer, Tumlingen, Fed. Rep. of Germany
Filed Dec. 23, 1985, Ser. No. 813,221
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508567
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YF 7 Claims



1. A fastener for anchoring in a bore in a spongy interior of a bone, the fastener comprising:

a screw extending along an axis and having a substantially cylindrical outer surface formed with a helical screwthread, the screw having at the screwthread a thread diameter and between the turns of the thread at the surface a root diameter smaller than the thread diameter;

an anchor sleeve normally fitted in the bore and having an outside diameter corresponding generally to the diameter of the bore, the sleeve having

an outer end formed with a laterally projecting rim normally lying against the bone around the bore,

an outer portion with an inside diameter greater than the root diameter but smaller than the thread diameter, and

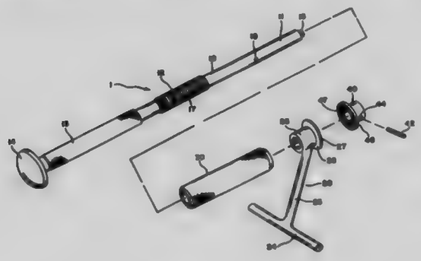
an inner portion with an inside diameter smaller than the root diameter, said sleeve thereby being formed so that when the screw is threaded into the sleeve its thread cuts into the outer portion without substantially deforming and spreading same and into the inner portion with substantial outward deformation and spreading of same, said inner portion being formed resilient to deflect inward when said screw is unthreaded out of said inner portion thereby enabling said sleeve to be entirely withdrawn out of the bore when pulling out the screw;

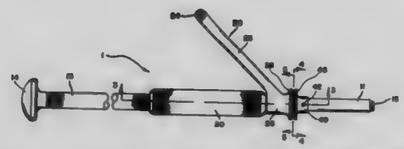
a rib projecting and extending generally longitudinally on said inner end portion so that said rib is forced into radial contact with a spongy interior of the bone when said inner end portion deforms outward and spreads by said screw threading into said inner end portion; and

means for preventing said sleeve from splitting when said screw passes through said sleeve and including an inner end of said sleeve being formed with an inside diameter generally corresponding to said inside diameter of said outer end portion, said inner end being arranged so that said inner portion lies between said inner end and said outer portion.

4,716,894
ACETABULAR CUP INSERTING INSTRUMENT
Mark A. Lazzeri, and John E. Hamm, both of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Aug. 27, 1986, Ser. No. 900,869
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 V 15 Claims

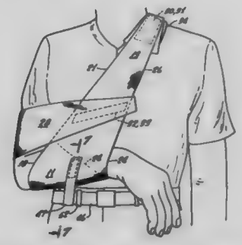
1. An acetabular cup inserting instrument comprising a first elongated handle and a second elongated handle extending from the first handle, the second handle being selectively rotatable about the first handle and selectively lockable in a desired position with respect to the first handle, and wherein





the first elongated handle includes a proximal end, a distal end and an interconnecting intermediate section therebetween.

4,716,895
ARM SLING
Jean S. Marques, 10341 Jackson Hole Rd., Palo Cedro, Calif. 96073, and Ernesto D. Marques, 23841 Kara Bay, Laguna Niguel, Calif. 92677
Filed Jun. 11, 1984, Ser. No. 619,206
Int. Cl.[4] A61F *5/40*
U.S. Cl. 128—94 21 Claims



6. An arm sling for supporting a forearm, said sling comprising:

(a) an elongated element formed of flexible material and having substantial width throughout at least the great majority of its length, said elongated element lying in a single plane prior to mounting on the patient, and not having any pockets or cavities therein adapted to receive a part of the patient's arm, said width of said elongated element being, at least in the vicinity the supported forearm when the arm sling is in mounted condition on a patient, at least as wide as a large portion of the length of the supported forearm,

said elongated element, when mounted on the patient, passing from above one shoulder of the patient, then down across the patient's back, then forwardly and the forearm of that arm which is not connected to said one shoulder, and then upwardly across the patient's chest to above said one shoulder,

said elongated element not receiving the upper arm of said arm when said elongated element is mounted on the patient,

the edge of said elongated element that is lowermost when passing across the back of the patient extending around the side of the patient and then inclining downwardly and in a direction toward the wrist on said forearm of the patient, at a region between said forearm and the patient's body, and then passing forwardly below said wrist and upwardly to said one shoulder at a region spaced from the patient's neck, being that edge most remote from the patient's neck in comparison to the remainder of the element, and

(b) means to removably secure to each other the end portions of said elongated element.

4,716,896
BRONCHIAL CATHETER
Bernard Ackerman, Metuchen, N.J., assignor to Ackrad Laboratories, Cranford, N.J.
Filed Aug. 1, 1986, Ser. No. 892,792
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.26 2 Claims



1. A bronchial catheter system for insertion of a catherter through an endotracheal tube positioned in the main tracheal passage of a patient and then into the left bronchial passage, comprising, in combination,

a preformed endotracheal tube adapted to be positioned in the tracheal passage and having an open external end located outside the patient and an open internal end located in the trachea proximal to the left and right bronchial passages of the patient,

tube means adapted to be positioned in the endotracheal tube and in the bronchial passage, said tube means having a proximal end adapted to be located outside the patient and a distal end adapted to be located in the left bronchial passage of the patient, said tube means defining a first tube section extending from said proximal end to a first joining portion extending from said proximal end; a second tube section joined to said first joining portion and extending to a second joining portion; and a third tube section extending from said second joining portion to said distal end, said tube means being for passing fluids between the left bronchus and said proximal end, said distal end having aperture means for passing the fluids between the left bronchus and said tube means,

first positioning means associated with said first tube section for positioning said endotracheal tube in the trachea of the patient, said first tube section being precurved to extend from said proximal end to a first joining portion in a first plane, said first plane being aligned with the left-right bisecting plane of the body of the patient and having forward and rearward portions and upper and lower

portions relative the body of the patient, said proximal end being positioned forwardly and upwardly and said joining portion being positioned at an area downwardly and generally between said forward and rearward portions, said first section forming a front to back tracheal curve between said proximal end and said first joining portion so as to accommodate to the tracheal curve of the treacheal passage of the body;

second positioning means associated with said second tube section for positioning said endotracheal tube in the left bronchus of the patient, said second tube portion being precurved to extend in a second plane oriented at a downward obtuse angle relative to said first plane extending from a transverse planar conjuction between said first and second planes so as to pass into the left tracheal passage upon insertion, said second tube section also simultaneously extending forwardly in said second plane so as to accommodate the bronchial curce of the bronchial passage, and

third positioning means associated with said tube means for pressing against the top inner surface of the bronchial wall during insertion of the catherer into the left bronchial passage of the patient, said third tube section being precurved to extend in a third plane generally parallel to said first plane and forwardly relative to said second joining area.

4,716,897

ELECTROSURGICAL APPARATUS

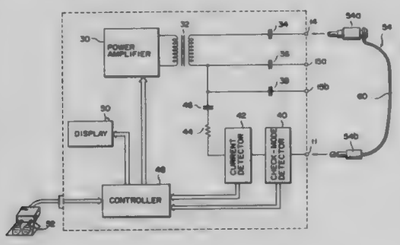
Toshiaki Nogaschi, Tokyo; Seiichi Hosoda, Shirakawa, and Ichiro Nakamura, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1986, Ser. No. 881,646

Claims priority, application Japan, Jul. 15, 1985, 60-155527; Jul. 31, 1985, 60-168980

Int. Cl.⁴ A61B *17/39*

U.S. Cl. 128—303.15 **4 Claims**



1. An electrosurgical apparatus, comprising:

a housing;

a dummy load arranged in said housing of said electrosurgical apparatus;

radio frequency (RF) output means for outputting a predetermined RF signal;

terminal means on said housing for enabling a connection between said dummy load and said RF output means, including a first terminal connected to said dummy load and a second terminal connected to said RF output means;

means for detecting an actual RF signal flowing through said dummy load; and

means for comparing a predetermined RF signal from said RF output means with an actual RF signal detected by said detecting means when said dummy load is connected to said RF output means, and for producing a fault alarm signal when the actual detected RF signal deviates excessively from said predetermined RF signal;

wherein said connecting means comprises a connection cord arranged outside said housing for connecting said first terminal connected to said dummy load to said second terminal connected to said RF output means.

4,716,898

STIMULATION DEVICE FOR ACUPUNCTURE POINTS

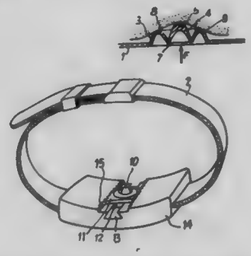
Jean-Yves Chauve, 11 Allée des Camélias, 44350 Guerande; Jean M. Leguin, 52 Avenue de Gaulle; Jacques Loquet, 31 Avenue de Gaulle, both of 44380 Pornichet, and Leroux Eugene, Rue du Bel Air, 50470 La Glasserie, all of France

Filed Sep. 19, 1986, Ser. No. 909,299

Claims priority, application France, Mar. 6, 1986, 86 04331

Int. Cl.⁴ A61H *11/00*

U.S. Cl. 128—329 A **7 Claims**



1. A stimulation device for an acupressure point comprising a member acting by pressure and means for maintaining said member pressed on the body where the acupressure point is located, said member comprising a hollow semi-dome portion made of a resiliently deformable material, and a hollow-finger portion extending from the top of said semi-dome portion and extending centrally inward of said maintaining means, said finger portion having thicker walls than said semi-dome portion, said semi-dome portion partially collapsing in a partially everted manner when pressure is applied to said finger portion, said partially everted semi-dome portion forming an annular ridge, surrounding said finger portion, all of which bear against the body to stimulate the affected area.

4,716,899

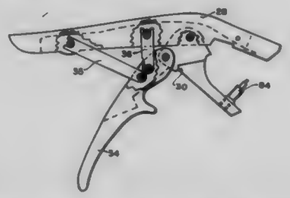
DEVICE FOR ATTACHING AN IDENTIFICATION TAG TO AN EAR OR THE LIKE OF AN ANIMAL

Joseph M. Huenefeld, and James R. Haas, both of Fort Thomas, Ky., assignors to Hasco International, Inc., Dayton, Ky.

Filed Jan. 13, 1986, Ser. No. 874,023

Int. Cl.⁴ G09F *3/00*

U.S. Cl. 128—330 **3 Claims**



1. A tool for applying an identification tag body and a tag retainer to an ear of an animal which includes a main handle member, means for mounting the tag body on the main handle member, a swinging bracket pivotally mounted on the main handle member, means for mounting the tag retainer on the swinging bracket, a second handle member pivotally connected to the swinging bracket, a first sliding link member pivotally connected to the second handle member, a second sliding link member pivotally connected to the second handle member, a first support pin mounted on the main handle member, a second support pin mounted on the main handle member, support means on each of the sliding link members engageable with one of the support pins when the handle members are urged together, means on each of the sliding link members for guiding same when the support means thereof is free of the associated support pin, the first support pin engaging the support means of the associated sliding link member when the handle members are between an open position and a transition position, both support pins engaging support means of associated sliding link members when the handles are in the transition position, the second support pin engaging the support means of the associated sliding link member when the handle members are between the transition position and a closed position, the swinging bracket moving in retainer inserting direction as the handle members are urged together.

4,716,900

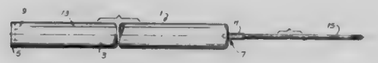
INTRAINTESTINAL BYPASS GRAFT

Biagio Ravo, Garden City, N.Y.; Thomas E. Sloane, Jr., West Redding, Conn., and Christine L. Regan, Port Washington, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed May 9, 1986, Ser. No. 861,692

Int. Cl.⁴ A61B *17/12*

U.S. Cl. 128—334 R **7 Claims**



1. A bypass graft suitable for attachment in the lumen of a resectioned intestine or duct upstream of the anastomosis thereof comprising

an elongated tube having proximal and distal ends and formed of a thin water-impervious wall material having sufficient flexibility to conform to the natural movements of the intestine or duct surrounding it, and

reinforcing means extending around the proximal end of said tube for rendering said end stronger than said thin wall material but still sufficiently flexible to conform to said natural movements,

with said elongated tube abruptly terminating at its distal end in a relatively short nipple of substantially reduced cross-section.

4,716,901

SURGICAL APPLIANCE FOR FORMING AN OPENING THROUGH THE SKIN

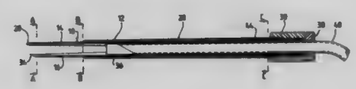
Joseph F. Jackson, Halifax, and Steven S. Gill, Knebworth, both of England, assignors to Pratt Burnerd International Limited, United Kingdom, a part interest

Filed Sep. 25, 1985, Ser. No. 779,810

Claims priority, application United Kingdom, Sep. 27, 1984, 8424436

Int. Cl.⁴ A61M *29/00*

U.S. Cl. 128—343 **11 Claims**



4. A surgical appliance for forming an opening through the skin comprising: a trocar having a distal end which is adapted to penetrate the skin, and a proximal end; said trocar comprising two components formed with at least one cutting edge which is adapted to make an incision in the skin when said distal end of the trocar is forced through the skin; said at least one cutting edge extending across substantially the full width of said distal end; means whereby said two components are adapted to move relatively to each other, between a closed condition and an open condition; the arrangement of said components being such that in said open condition, there is no significant increase in the cross section of said trocar towards said distal end; a distendable tube fitted around the parts of said trocar components which do not penetrate the skin in use and having an internal diameter such that it provides at least part of preloading urging said two components towards said closed condition; and an expander which can be inserted into said trocar from said proximal end towards said distal end, said insertion of said expander causing movement of said trocar components to said open condition.

4,716,902

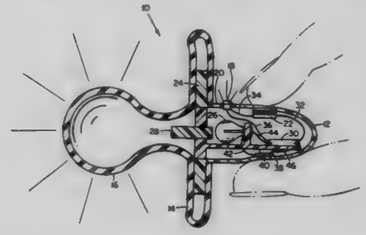
ILLUMINATED PACIFIER

Barry E. Swartz, 8070 Pimlico La., Boerne, Tex. 78006

Filed Aug. 20, 1986, Ser. No. 898,188

Int. Cl.⁴ A61J *17/00*

U.S. Cl. 128—360 **3 Claims**



1. An illuminated pacifier comprising:

a nipple;

handle means attached to said nipple;

a low power light emitting diode attached to said handle means;

first switch means for selectively engaging said light emitting diode;

an incandescent light bulb located inside said handle means, directed toward said nipple;

second switch means for selectively engaging said incandescent light bulb, said second switch means actuatable by squeezing said handle means; and

battery means for powering said light emitting diode and said incandescent light bulb, whereby said pacifier may be located in the dark and whereby said nipple may be illuminated by squeezing said handle means.

4,716,903

STORAGE IN A PACEMAKER MEMORY

James C. Hansen, Deaver; Tibor A. Nappholz, Englewood, and Robert H. Whigham, Aurora, all of Colo., assignors to Telectronics N.V., Curacao, Netherlands Antilles

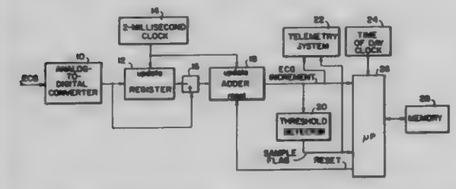
Filed Oct. 6, 1986, Ser. No. 915,696

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—419 PG **10 Claims**

1. In an implantable pacemaker having means for sensing a cardiac signal, a system for storing a representation of said signal from which the signal subsequently may be reconstructed comprising means for monitoring said signal and determining each time at which the signal has changed by at least a threshold value since the preceding time at which the

signal similarly changed, memory means, and means for storing in said memory means data indicative of the intervals



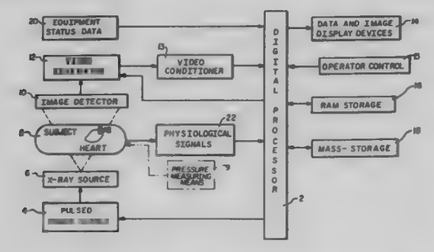
between successive times at which said signal changed by at least said threshold value.

4,716,904

HEART OUTPUT AND CIRCULATORY IMPEDANCE MEASURING METHOD AND APPARATUS

Frank Mono, Pittsburgh, Pa., assignor to University of Pittsburgh of The Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Jun. 23, 1986, Ser. No. 877,149
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—654 **15 Claims**



1. A method of measuring heart output comprising
pulsing X-ray beams through a heart chamber containing a contrast medium and blood,
detecting the portion of said X-rays not absorbed by said heart and chest,
converting said detected X-rays into electrical signals,
effecting subtraction of said signals detected at one time from those of another time, and summing the resulting pixel values, whereby said signals relating to heart displacement will be cancelled and said electrical signals relating to heart contraction will remain, and
converting said heart contraction signals into a corresponding volume of blood pumped by said heart in a predetermined time interval.

4,716,905

METHOD OF RETROGRADE FLUORESCENT LABELING OF NEURONS

Laurence C. Schmued, Irvine, Calif., assignor to Fluorochrome, Inc., Englewood, Colo.

Filed Sep. 25, 1985, Ser. No. 780,100
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—654 **7 Claims**

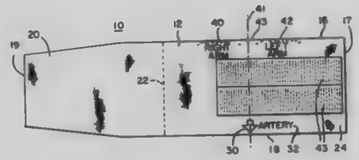
1. The method of retrograde axonal tracing by the fluorescent labeling of neurons via axonal pathways to parent cell bodies in living tissue comprising injecting into live brain tissue to be labeled, the compound 2-hydroxy-4,4'-diamidinostilbene isethionate as a RAT in a concentration of between 1 and about 10% in the solvent selected from the group consisting of distilled water, 0.9% saline solution and a pH=7.4 phosphate buffer and waiting for a period of time after injection sufficient to label cells for subsequent examination under a fluorescene microscope.

4,716,906

BLOOD PRESSURE CUFF

Gray E. Ruff, Hillsboro, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Jun. 30, 1986, Ser. No. 880,249
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—686 **6 Claims**



1. A blood pressure cuff adapted to be positioned on a limb of a body comprising:
an elongated flexible band having first and second ends, said band having a body side ace intended for engagement with the limb and an outward face, said band having a compartment therein which is partially open to ambient atmosphere through a pair of openings in said band;
an inflatable bladder having a centerline, said bladder being removably confined within said compartment in either a first position or a second position rotated 180° from said first position with the centerline substantially aligned with an artery in said limb in either said first or second position when said band is properly positioned on said limb, said bladder having a portion protruding out from said compartment through one of said pair of openings which are spaced apart from one another on either side of said centerline, said protruding portion protruding through a first one of said openings when said bladder is in said first positin and a second one of said openings when said bladder is in said second position.

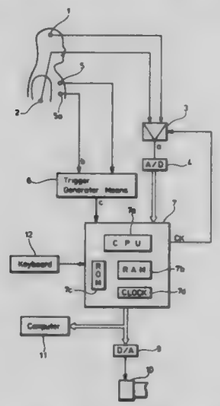
4,716,907

APPARATUS FOR DETECTING ELECTROENCEPHALOGRAM AND EVOKED RESPONSE WITH MONOPOLAR DERIVATION METHOD

Masatoshi Nakamura, 12-30, Oaimaru-cho; Hiroshi Shibasaki, No. 625 Idai-shukusha, 3-10 Yaemizo, both of Saga-shi, Saga-ken, and Shigeto Nishida, Saga, all of Japan, assignors to Hiroshi Shibasaki and Masatoshi Nakamura, both of Saga, Japan

Filed Aug. 21, 1986, Ser. No. 898,698
Claims priority, application Japan, Aug. 23, 1985, 60-186441; Aug. 23, 1985, 60-186442
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—731 **9 Claims**

1. An apparatus for detecting an electroencephalogram comprising:
(a) an electrode to be attached to the scalp;
(b) an electrode to be attached to a patient body location other than the scalp;
(c) an amplifier having input terminals connected with said electrodes for outputting an electroencephalogram (EEG) signal derived between said electrodes;
(d) trigger generator means for generating a trigger on the basis of R waves involved in an electrocardiogram (EKG) signal;
(e) averager means for dividing said EEG signal into segments, each corresponding to a period of said EKG signal and starting from a time going back to the past by predetermined time from a time of generating said trigger, and averaging the resultant segmented EEG signals; and



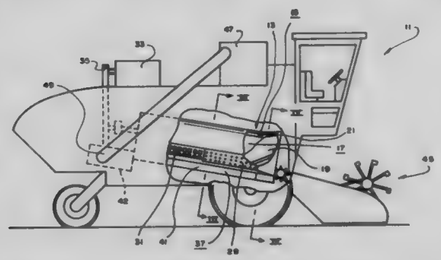
(f) subtractor means for subtracting an output signal of said averager means from said EEG signal and for thereby generating an actual EEG signal.

4,716,908

COMBINE

Jimmy D. Helmes, Rt. 2 (P.O. Box 953), Batesville, Miss. 38606

Filed Jan. 21, 1986, Ser. No. 820,725
Int. Cl.[4] A01F *12/20*
U.S. Cl. 130—27 T **2 Claims**



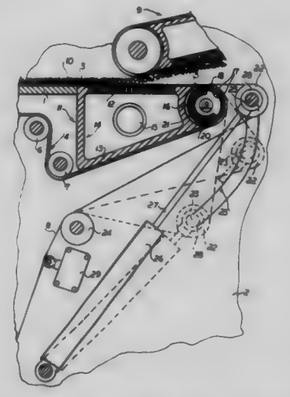
1. An improved axial flow seed combine of the type including a threshing/separating unit having a stationary cylinder, having a rotor mounted axially within said cylinder with an impeller attached to the front end thereof, and having a stationary transport cone attached to the front end of said cylinder over said impeller; and including an auger/auger pan unit located beneath said threshing/separating unit for catching threshed and separated seeds from said threshing/separating unit; wherein the improvement comprises:
(a) extending at least a portion of said auger/auger pan unit to a point beneath said transport cone; and
(b) providing a plurality of apertures through a section of said transport cone for allowing threshed and separated seeds to fall through said transport cone onto the extended portion of said auger/auger pan unit.

4,716,909

PAPER STRIP GUIDE DEVICE, FOR A CIGARETTE MAKING MACHINE

Bruno Belvederi, San Martino di Monte San Pietro, and Armando Neri, Bologna, both of Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Mar. 5, 1986, Ser. No. 836,291
Claims priority, application Italy, Mar. 19, 1985, 3370 A/85
Int. Cl.[4] A24C *5/14, 5/20*
U.S. Cl. 131—84.1 **4 Claims**



1. A strip guide device, particularly for a cigarette making machine, for the automatic feed of at least one paper strip to form at least one continuous cigarette roll, said device comprising:
at least one air-permeable belt, each belt having an upper branch;
a horizontal bench being bounded at a top thereof by said upper branch;
a device for supply of a continuous carpet of tobacco;
a suction pulley at an end of said upper branch and tangential to said top of said bench;
an idler wheel for return of the paper strip above the bench and mounted on a rotational axle, said idler wheel being adjacent said suction pulley; and
means for moving said rotational axle along a predetermined path between a position in which the idler wheel is substantially tangential to the plane in which the bench lies and a position which is disengaged with respect to this plane.

4,716,910

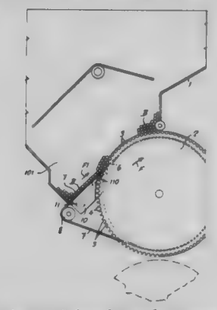
FLUTED DRUM DEVICE FOR WITHDRAWING ROD-LIKE ARTICLES FROM A FEEDING HOPPER

Gian L. Gherardi, Medicina, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Jul. 16, 1986, Ser. No. 886,103
Claims priority, application Italy, Jul. 24, 1985, 12546 A/85
Int. Cl.[4] A24C *5/52*
U.S. Cl. 131—94 **12 Claims**

1. A device for withdrawing rod-like articles (B), particularly filter plugs for the manufacture of filter-tipped cigarettes, from a feeding hopper (1) with a fluted rotary drum (2) forming a portion of its bottom and being designed for receiving one rod-like article (B) into each one of its flutes (3) at the time of its passing by the feeding hopper (1), while a portion of the hopper bottom which is adjacent to the fluted drum (2), is formed by at least one endless conveyor belt (7) with its upper branch running toward the said fluted drum (2) for entraining articles to the flutes, characterized in that the conveyor belt (7) has a width which is sensibly smaller than the length of the

rod-like articles (B) and the length of the fluted drum (2), and the upper branch of the said conveyor belt (7) gets into and



through a respective peripheral annular groove (6) in the said fluted drum (2), the groove having a depth which is at least equal to the depth of the bottoms of the drum flutes (3).

4,716,911

METHOD FOR PROTEIN REMOVAL FROM TOBACCO

A. J. Poulose, San Bruno, and Stanley E. Mainzer, Burlingame, both of Calif., assignors to Genencor, Inc., South San Francisco, Calif.

Filed Apr. 8, 1986, Ser. No. 849,575
Int. Cl.[4] A24B *15/20*
U.S. Cl. 131—297 **24 Claims**

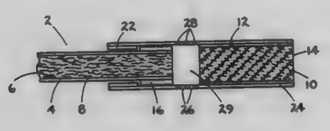
1. In the process for treatment of tobacco comprising the steps of subjecting cured tobacco to treatment with aqueous medium whereby insoluble nitrogen-containing components are solubilized and separated from the tobacco residue, the improvement which comprises utilizing as said aqueous medium an aqueous medium containing hydroxide ion equivalent to 0.5–1.5% potassium hydroxide.

4,716,912

FILTER CIGARETTE HAVING ADJUSTABLE AIR DILUTION

Gerard E. Leonard, Kernersville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 14, 1986, Ser. No. 829,341
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 **3 Claims**



1. A filter cigarette comprising in combination a rod of smokable material, an axially aligned filter plug adjacent one end of the rod, and tipping material circumscribing and being fixedly attached to the filter plug and circumscribing a portion of the rod in the region adjacent the filter plug; said cigarette further comprising first and second bands in an end-to-end relationship, said bands circumscribing the rod in the region adjacent the filter plug and being disposed in and substantially filling the transverse region between the outer surface of the rod and the inner surface of the tipping material;

the first band being fixedly attached to the rod in the region adjacent the filter plug;

the second band being positioned adjacent the first band towards the fire end of the cigarette and the outer surface thereof is fixedly attached to the inner surface of the tipping material which overlies said band;

the tipping material comprising an air permeable region in the region therein which overlies and air impermeable region of the first band when the filter plug is positioned as to substantially abut the rod;

wherein the first and second bands are positioned in a spaced apart relationship when the filter plug is positioned so as to substantially abut the rod;

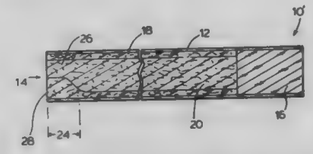
wherein movement of the filter plug away from the rod along the longitudinal axis of the cigarette in order that the filter plug does not abut the rod provides exposure of the airspace formed between the filter plug and the rod through the air permeable region of the tipping material and thereby providing air dilution capabilities to the cigarette.

4,716,913

COMPOSITE CIGARETTES

Warren A. Brackmann, Mississauga, Canada, assignor to Rothmans of Pall Mall Limited, Toronto, Ontario, Canada

Filed May 13, 1986, Ser. No. 862,702
Claims priority, application United Kingdom, May 15, 1985, 8512292; Dec. 4, 1985, 8529852
Int. Cl.[4] A24D *1/00*; A24C *5/18*
U.S. Cl. 131—364 **11 Claims**



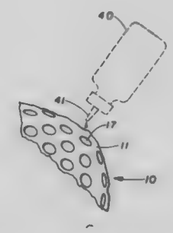
1. A composite cigarette having a lighting end and a smoking end and comprising a rod of tobacco material consisting wholly of tobacco material and having a core of particulate tobacco material having a lower smoking quality and an annulus of particulate tobacco material having a higher smoking quality enclosed in a paper wrapper, said tobacco material rod having a higher proportion of said annulus material at said lighting end.

4,716,914

HAIR STYLING BONNET

Laura Green, 8242 Old Ranch Rd., Citrus Heights, Calif. 95610

Filed May 12, 1986, Ser. No. 862,465
Int. Cl.[4] A45D *8/40*
U.S. Cl. 132—9 **3 Claims**



1. In the process of permanently waving the hair of a human wherein a waving solution is applied to the hair, which comprises the steps of

a. placing the hair in curling rods,

b. placing a flexible perforated bonnet having perforations of about ¼ inch in diameter, said perforations being spaced about the bonnet, over substantially all of the hair of the wearer to aid in the retention of the hair within the curling rods,

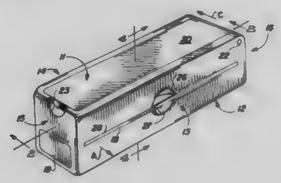
c. rinsing the hair with the perforated bonnet in place over the curl rods.

4,716,915

COSMETIC DEVICE

Wm. Robert Burns, 4520 N. Central, Phoenix, Ariz. 85021

Filed Jul. 22, 1985, Ser. No. 757,248
Int. Cl.[4] A45D *40/00*
U.S. Cl. 132—79 R **6 Claims**



1. A cosmetic device including

(a) a hand held case having first and second side surfaces and planar rectangular top, bottom, front and back surfaces and shaped and dimensioned to be concealed on the person, each of said top, bottom, front and back surfaces generally being parallel to one other of said top, bottom, front and back surfaces;

(b) a first mirror mounted in said case;

(c) an elongate generally symmetrical channel extending through said case intermediate and generally parallel said top and bottom surfaces and opening at each of said side surfaces;

(d) a chemical solution reservoir shaped to slidably conform to said channel and having

(i) a top,

(ii) a bottom surface, and

(iii) manually operated valve-nozzle means attached to said top for delivering under pressure from said reservoir chemical solution stored therein on the hair of an individual,

said reservoir normally being concealably stored in said channel such that said bottom surface of said reservoir comprises in part one of said side surfaces, said valve-nozzle means being positioned for manual operation by pressing said bottom surface of said reservoir to slidably displace said bottom surface of said reservoir into said channel and displace said valve-nozzle means through said channel to an operative position outside of said case;

(e) a hair brush pivotally mounted in said case and including a backing and bristles extending therefrom, said backing having an outer surface, said brush being pivotally movable between two positions,

(i) a first storage position with said brush concealing said mirror, with said outer surface of said backing generally comprising said top surface of said case, and with said bristles concealed inside case adjacent said mirror, and

(ii) a second position with said backing and bristles extending away from said case, with said outer surface generally parallel to said mirror, and with said mirror exposed to view such that when said case is held in either hand of a user with said bottom surface of said case contacting the palm of the hand, said bristles extend outwardly away from the palm and the user can,

utilize the brush on the user's hair,

operate with the fingers of the hand said valve-nozzle means when said valve-nozzle means is slidably displaced to said operative position outside of said case, and

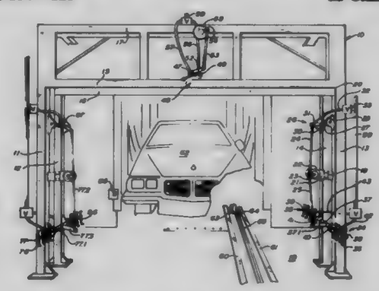
view the user's head in said mirror by holding said hand in front of the user's face with the palm of the hand turned toward and opposing the face.

4,716,916

VEHICLE CLEANSING

Robert J. Hodge, Colorado Springs, Colo., assignor to Grace-Lee Products, Inc., Minneapolis, Minn.

Filed Dec. 23, 1985, Ser. No. 812,740
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—123 **12 Claims**



5. In a system employing water for cleansing exterior surfaces of vehicles, the features comprising:

(a) a horizontal manifold on which is mounted a horizontal array of a plurality of zero degree solid stream nozzles in spaced relationship to each other along the linear length of the horizontal array, said zero degree nozzles being at an angular orientation with respect to the linear length of said array, said zero degree nozzles and said angular orientation thereof being such that solid streams are emitted from said zero degree nozzles and said solid streams are from 40° up to about 80° from said linear length of said horizontal array,

(b) means including a motor for oscillating said array in a direction transverse to the linear length thereof at a rate in excess of 150 cycles per minute, and

(c) mechanical means for effecting during oscillation of said array a relative linear motion lengthwise between a vehicle undergoing treatment and said horizontal oscillatable array, with said array laterally parallel to a side of the vehicle, whereby an end of a vehicle as well as a side thereof can be cleaned with angularly impacting solid streams from said array during said relative linear motion even though said array is parallel to the length of the vehicle,

(d) wherein said zero degree nozzles are grouped in pairs, with the nozzles of each pair spaced from each other in a direction transverse to the linear length of the horizontal array so as to form two essentially linear lines of spaced zero degree nozzles in the horizontal array, anc wherein the angular orientation for each zero degree nozzle in a said linear line is essentially the same, and the angular orientation in one said linear line is different from the angular orientation in the other said linear line but not by more than about 2°.

4,716,917

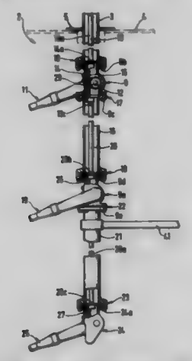
TANK WASHING SYSTEM

Ernst L. Schmidt, Wetstraat 112, Antwerpen, Belgium (B-2000)

Filed Jul. 2, 1986, Ser. No. 881,275
Claims priority, application Sweden, Jul. 8, 1985, 8503383
Int. Cl.[4] B08B *3/02*, *9/08*
U.S. Cl. 134—167 R **3 Claims**

1. A washing system for washing tanks or the like, preferably ship's tanks (2), having at least one substantially horizontally extending stringer (2*a*–2*c*), said washing system (1) being provided with washing nozzles which while rotating about a substantially vertical axis are at the same time rotatable about

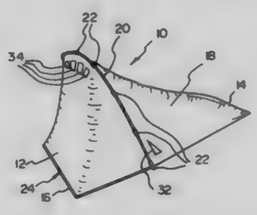
substantially horizontal axes, characterized in that the washing system (1) comprises nozzle holders (9, 24 or 9, 9a, 24) arranged at at least two different elevations, each of said nozzle holders having at least one washing nozzle (11, 25 or 11, 19, 25), that an upper nozzle holder (9) at an upper elevation is detachably disposed by means of a pivot bearing (10) on a standpipe (3) connected to the tank (2), that at least one extension pipe (21 or 16, 21) is detachably and non-rotatably coupled to the upper nozzle holder (9) via a coupling (17), that the upper nozzle holder (9) is tubular to conduct washing liquid from the standpipe (3) to the extension pipe (21 or 16, 21), that a lower nozzle holder (24) at a lower elevation is detachably and non-rotatably coupled to the extension pipe (21 or 16, 21) via a coupling (23,) that a rotary and vertically reciprocable drive member (13) is adapted, on the one hand, to rotate the



upper nozzle holder (9) and the extension pipe (21 or 16, 21) non-rotatably mounted on said holder (9) about a substantially vertical axis and, on the other hand, simultaneously to rotate the washing nozzles (11, 25 or 11, 19, 25) in synchronism about substantially horizontal axes in relation to the nozzle holders (9, 24 or 9, 9a, 24), that the drive member (13) has an upper portion (13a) extending through the standpipe (3) on which portion a drive member extension (20a or 20, 20a) is detachably mounted to at least the upper nozzle holder (9), the washing nozzle (25) of the lower nozzle holder (24) being located in the vicinity of the bottom of the tank (2) in order primarily to wash said bottom and the lower portions of the tank (2), while the upper washing nozzle (11) is located on an essentially higher level of the tank (2) in order primarily to wash the upper portions of the tank (2) and possibly such portions as are concealed to washing with the lower washing nozzle (24).

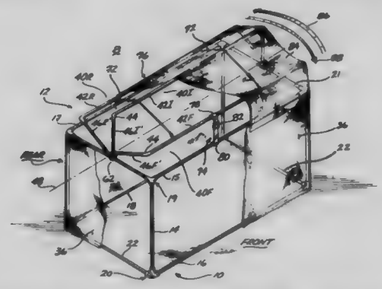
4,716,918
TENT
John P. Hayashida, and Roger P. Bowman, both of Waterloo, Canada, assignors to Her Majesty the Queen in right of Canada, Canada
Filed Jun. 20, 1986, Ser. No. 876,397
Claims priority, application Canada, Feb. 10, 1986, 501510
Int. Cl.[4] E04H *15/14, 15/36, 15/56*
U.S. Cl. 135—93 **14 Claims**

1. A tent comprising:
a shell including a floor and a canopy secured together, the floor and canopy being separably joined along substantially U-shaped perimeter sections thereof and;
a frame comprising an arch extending laterally of the tent and having its ends supported adjacent the ends of the U-shaped perimeter sections and supporting the canopy above the floor, and two longitudinally oriented bowed supports supporting the canopy above the floor, the arch being pivotable from a closed condition of the tent in which the floor and canopy meet along their U-shaped perimeter sections and an open position in which the perimeter section of the canopy is drawn up and away



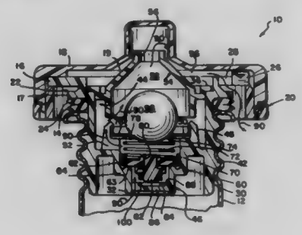
from the perimeter section of the floor to permit access to the tent.

4,716,919
PORTABLE BLIND WITH AUTOMATIC OPENING TOP
Dennis M. Griffin, 2310 SW. 304th St., Federal Way, Wash. 98023
Filed Jan. 27, 1986, Ser. No. 822,802
Int. Cl.[4] E04H *15/06, 15/00, 15/48*
U.S. Cl. 135—106 **21 Claims**



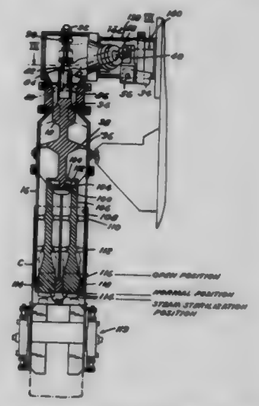
1. A portable, automatically and bidirectionally opening top for mounting a fabric or other type of covering material to overlie the opening of a pit, blind or similar structure, comprising:
(a) a frame extending along at least a portion of the perimeter of the top, said frame including a plurality of disassemblable, tubular, elongated members;
(b) a plurality of generally U-shaped, tubular rafter assemblies;
(c) means for pivotally connecting said rafter assemblies to said frame about a common axis of rotation; and,
(d) means for in concert automatically pivoting said rafter assemblies about their common axis of rotation in the same selected rotational direction from a closed position of the top wherein said rafter assemblies are spaced apart relative to each other across the opening covered by the top, to an open position of the top whereby said rafter assemblies are positioned along one side of said frame, said automatic pivoting means comprising:
elongate, extendible, resilient means transversely spanning said rafter assemblies, said resilient means interconnected with the two furthermost spaced rafter assemblies and being in extended, biased condition when said top is in closed position; and,
quick release means rotatably connecting said two furthermost spaced rafter assemblies to adjacent portions of said frame to nominally maintain said rafter assemblies in spaced-apart relationship across the opening being covered by the top when said top is in closed position, whereby upon release of said quick release means, said biased resilient means contracting to automatically pivot said rafter assemblies about their common pivot axis under the influence of said contracting resilient means in the direction away from said released quick release means to automatically shift said top into open position.

4,716,920
ROLL OVER FUEL CAP
Billy G. Crute, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.
Filed Jan. 8, 1987, Ser. No. 1,362
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—39 **10 Claims**



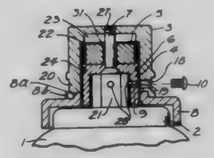
1. A pressure-vacuum cap for a vehicle fuel tank having a normally upwardly extending filler neck formed with a peripherally and radially extending sealing surface concentric with the longitudinal axis of said neck, the cap comprising
a cover;
a valve housing providing a passageway extending axially therethrough and including means for connecting said housing to said filler neck, the axially upper portion of said passageway formed to include a valve seat, said valve housing formed to include a peripherally and radially outwardly extending shoulder having at least one opening formed therethrough, said valve housing also formed to include a radially inwardly extending, axially upwardly facing sealing surface disposed around the lower portion of said passageway,
a first valve member disposed within said passageway above said sealing surface, said first valve member formed to include an aperture therethrough,
first spring means to yieldably urge said first valve member axially downwardly against said sealing surface to normally close said passageway, said first spring means being calibrated to provide for movement of said first valve member axially upwardly away from said sealing surface to open said passageway when the pressure in said filler neck reaches a predetermined superatmospheric level,
a second valve member disposed below said first valve member and concentric with said aperture in said first valve member,
second spring means to yieldably urge said second valve member axially upwardly to normally close said aperture in said first valve member, said second spring means being calibrated to provide for movement of said second valve member axially downwardly away from said first valve member to open said aperture in said first valve member to vent said filler neck and fuel tank through said passageway when the pressure in said filler neck reaches a predetermined subatmospheric level; and
sealing means disposed within said passageway above said first valve member and formed to be received in said valve seat in the upper portion of said passageway when said filler neck is tilted to a substantially inverted orientation to close off said passageway.

4,716,921
FILLER STERILIZATION SYSTEM
Badruddin K. Rangwala, Farmington Hills, and Kenneth P. McDonald, Livonia, both of Mich., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.
Filed Apr. 14, 1986, Ser. No. 851,173
Int. Cl.[4] F16K *3/36*
U.S. Cl. 137—241 **8 Claims**



1. A combined liquid filling and steam sterilization system comprising fluid conduit means having an inlet valve, a main liquid flow control valve, in series, respectively, an outlet valve, and a linkage means for (1) opening said inlet valve to receive a liquid product and closing said main and outlet valves in a first position, (2) closing said inlet valve and opening said main and outlet valves to discharge said liquid product in a second position, and (3) opening said inlet and main valves and closing said outlet valve so as to receive steam into the system in a third position from an external source, said outlet valve including bleed-off means for providing a predetermined back pressure via bleeding off of said steam in a controlled manner for sterilization purposes.

4,716,922
MAGNETIC FIRE HYDRANT GUARD
John P. Camp, 8717 Hopewell Dr., El Paso, Tex. 79925
Filed Jun. 5, 1987, Ser. No. 58,514
Int. Cl.[4] F16K *31/08, 35/16*
U.S. Cl. 137—296 **9 Claims**



1. In combination with a fire hydrant having a stand pipe on which a bonnet is mounted, and having a valve operating stem extending rotatably through the bonnet and terminating in a nut end above the bonnet, a protective device for the nut end comprising a cylindrically shaped core piece completely encasing the operating nut end and directly and engagably supported by the nut end, and fixedly secured to the nut end by means of set screws threaded through the core piece and seated into shallow holes drilled into the vertical, flat faces of the nut end, and with a square recess built into the center of the flat top

of the core piece wherein loosely rests a square steel locking block of a length equal to the depth of the recess in which it rests, said core piece and locking block being surrounded and covered by a sleeve having an inside diameter slightly larger than the outside diameter of the core piece, thereby allowing the sleeve to rotate freely around the core piece; an square recess is built into the center of the underside of the top of the sleeve, said recess having the same outside dimensions as the recess built into the top of the core piece, but only half as deep as the recess in the top of the core piece; an assembly bolt being engagably and directly supported by the top portion of the nut end, said bolt assembly passes upwardly through a first opening in the center of the core piece and through a second opening in the locking block, and is threadedly secured to the center of the underside of the top of the sleeve, thus assembling the parts of the device into a single unit, and wherein the set screws are secured to the nut end by means of an allen wrench inserted through an access hole in the sleeve after which the access hole is closed by driving a self-threading drive screw into the access hole, thus permanently plugging the access hole preventing further access to the set screws;

said protective device requires a new access hole to be drilled through the wall of the sleeve at any point centered in a pre-groove cut around the circumference of the sleeve through which an allen wrench can again be inserted to loosen the set screws from the nut end, allowing easy removal of the protective device from the hydrant and preventing unauthorized use of the fire hydrant;

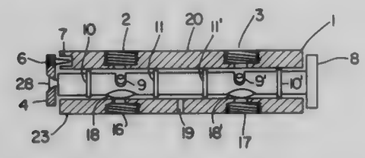
a self-contained magnetic operating wrench for rotating the hydrant operating stem, the locking block lies completely within the recess in the top of the core piece leaving the sleeve free to rotate around the core piece without turning the hydrant operating stem prior to the mating of the operating wrench with the sleeve, when the self contained magnetic wrench is mated with the formed top of the sleeve, magnetic attraction draws the locking block up into the square recess in the underside of the top of the sleeve slidably along the assembly bolt, a distance of half its length, leaving the remaining half of the locking block within the recess in the top of the core piece, wherein any turning action of the magnetic operating wrench imparts a similar turning action to the sleeve, locking block, core piece, nut end and operating stem which activates the flow control valve upon removal of the magnetic wrench the locking block will gravitationally drop back into its original position within the recess in the top of the core piece slidably along the assembly bolt, thereby leaving the hydrant inoperable until the magnetic wrench is reapplied.

4,716,923

APPARATUS FOR MANIPULATING PARALLEL FLUID FLOW CIRCUITS

Robert E. West, 9700 Academy Rd., NW., Albuquerque, N. Mex. 87114

Filed Jun. 27, 1986, Ser. No. 879,411
Int. Cl.[4] F16K *11/06*
U.S. Cl. 137—312 **6 Claims**



1. An apparatus for manipulating parallel fluid flow circuits, said apparatus comprising:

(a) a manifold comprising at least one set of radial system ports consisting of an inlet port and at least two additional ports which correspond to the inlet port and which are positioned radially adjacent to the inlet port, and at least one set of radial system ports consisting of an outlet port and at least two additional ports which correspond to the outlet port and which are positioned radially adjacent to the outlet port;

(b) a valve stem assembly, positioned in the interior of said manifold and able to rotate within said manifold, comprising a value relief for each set of radial system ports for allowing fluid, when provided, to flow among at least two radially adjacent ports;

(c) a resilient valve sealing means, for each set of radial system of ports, which is attached to said valve stem assembly and which extends outwardly from the circumference of the valve stem assembly, for blocking off at least one port in each set of radial system ports;

(d) axial sealing mens between each set of radial system ports for preventing leakage from said valve reliefs;

(e) a leak detection and venting port between each set of radial system ports for venting and detecting leakage past the axial sealing means;

(f) switching means, attached to said valve stem assembly, for rotating said valve stem assembly such that said valve reliefs and valve sealing means may be rotated to different radially adjacent ports; and

(g) attachment means for attaching said switching means to said valve stem assembly;

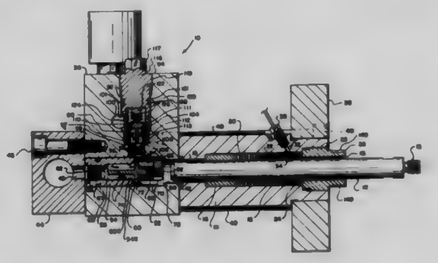
whereby during operation of said apparatus, said switching means rotates said valve stem assembly, said resilient valve sealing means are thereby positioned such that fluid is prevented from flowing through at least one additional port which is radially adjacent to said system inlet port and through at least one additional port which is radially adjacent to said system outlet port, and said valve reliefs are thereby positioned to allow fluid to flow into said system inlet port and through at least one of the remaining additional ports which is radially adjacent to said system inlet port and to flow from at least one of the remaining additional ports which is radially adjacent to said system outlet port into said system outlet port.

4,716,924

VALVE ASSEMBLY FOR RECIPROCATING PLUNGER PUMP

Amos Pacht, Houston, Tex., assignor to Partek Corporation of Houston, Houston, Tex.

Division of Ser. No. 218,129, Dec. 19, 1980, Pat. No. 4,432,386, which is a division of Ser. No. 853,113, Nov. 21, 1977, Pat. No. 4,277,279. This application Sep. 28, 1983, Ser. No. 536,698
The portion of the term of this patent subsequent to Nov. 5, 2003, has been disclaimed.
Int. Cl.[4] F16K *15/06*
U.S. Cl. 137—327 **3 Claims**



1. A replaceable discharge valve assembly for a reciprocating high pressure plunger pump having a cylinder block forming a generally cylindrical valve chamber, said valve chamber including a first chamber portion of a first diameter intersecting and opening into a cylinder bore in said block, a second chamber portion of a second diameter larger than said first diameter extending from a transverse endwall between said first and second chamber portions toward an outer wall of said block, and a third chamber portion having a wall of a diameter larger than the diameter of said second chamber portion and disposed between said second chamber portion and said outer wall, and a discharge port opening into said valve chamber, said valve assembly comprising:

a cylindrical tubular valve seat member including a first portion of a first diameter for insertion in said first chamber portion, a second portion of a second diameter for insertion in said second chamber portion, said seat member being slidably insertable into said valve chamber in close fitting relationship thereto and with a surface of said seat member abutting said endwall;

a seal ring disposed around the outer circumference of one of said portions of said seat member for sealing engagement with only the bore wall forming one of said first and second chamber portions;

a seating surface formed on one end of said seat member and an inner cylindrical surface defining a flow passage extending from the other end of said seat member and delimiting said first portion of said seat member;

a valve member slidably disposed in said seat member for movement relative to said seat member and engageable with said seating surface; and

a generally cylindrical discharge valve cover having means on one end engageable with said seat member for retaining said seat member in said valve chamber in abutting engagement with said endwall, said valve cover including a cylindrical portion dimensioned to be disposed in said third chamber portion in close fitting relationship to said block in said third chamber portion, a seal ring disposed around said cylindrical portion of said cover and engageable with said wall of said third chamber portion, an exit formed in a sidewall of said cover and opening to the outer surface of said cylindrical portion of said cover between said seal rings for conducting pressure fluid from said valve chamber to said discharge port, a recess formed in one end of said cover for receiving said valve member during movement of said valve member relative to said seat member, said recess forming a chamber for conducting fluid from said flow passage in said seat member to said exit, and a threaded portion between said cylindrical portion of said cover and an end of said cover opposite said one end and engageable with a cooperating threaded portion formed in said valve chamber between said third chamber portion and said outer wall for retaining said cover in said valve chamber and sealed from exposure to fluids in said valve chamber.

4,716,925

REVERSIBLE WASHING MACHINE BOX

Charles R. Prather, Germantown, Tenn., assignor to Industrial Polychemical Service, Inc., Gardena, Calif.

Filed Jun. 23, 1987, Ser. No. 65,594
Int. Cl.[4] F16L *5/00*
U.S. Cl. 137—360 **17 Claims**

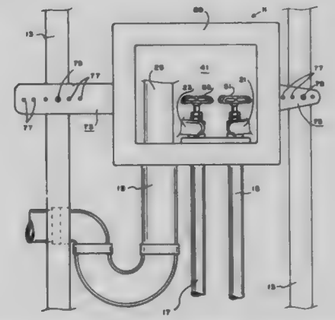
1. A reversible side outlet washing machine box for being mounted between two adjacent studs in a wall and for allowing first and second water supply lines and a drain line to be coupled to the first and second water hoses and drain hose, respectively, of a washing machine; said box comprising:

(a) a first side wall;

(b) a second side wall; and

(c) a base member having a first end and a second end;

said base member extending between said first and second side walls and being reversible to allow either said first or second end thereof to be attached to either said first or second side wall; said first water supply line and said first water hose being attachable to said base member adjacent said first end thereof, said second water supply line and said second water hose being attachable to said base member intermediate said first and second ends thereof, said drain line and said drain hose being



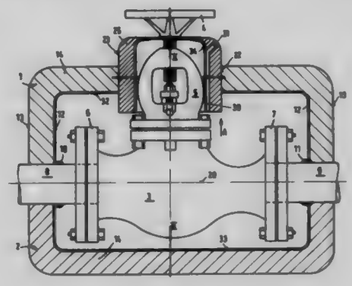
attachable to said base member adjacent said second end thereof.

4,716,926

HOUSING FOR HEAT INSULATING ARMATURES AND/OR FLANGE CONNECTORS

Ludwig Jacobs, Lagesche Strasse 8, D-4790 Paderborn, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,985
Int. Cl.[4] F16L *59/16*
U.S. Cl. 137—375 **9 Claims**



1. Housing for heat insulating of a flanged pipe fitting member provided with flange connections at respective ends thereof, the housing including:

two box-like housing portions and two openings for shaped pipe lines to be connected to said flange connections,

a further opening for accommodating an actuating device for actuating the flanged pipe fitting member, said actuating device being located exteriorly of the housing, each of said housing parts including at least one flange adapted to be joined along a separating plane,

means disposed adjacent the separating plane and extending through circumferential segments of the housing parts for detachably connecting the housing parts to each other,

centering means provided in said housing parts for defining a centering installation position of the housing parts with respect to each other and which are connected in one piece with the housing parts, said centering means including a tongue and groove joint extending at least over portions of the circumference of said housing parts,

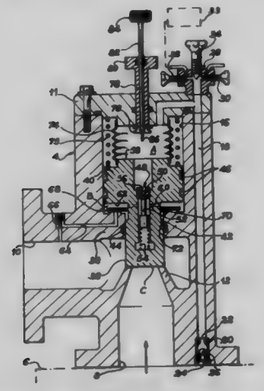
an adjuster means which is axially adjustably mounted in said further opening for compensating the axial length of the actuating device, said adjuster means capable of being held at a desired location, and including a discharge groove for discharging of fluid.

4,716,927

INTEGRATED CONTROL SAFETY VALVE MEANS

Jean Vayre, Meyreuil, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 8, 1986, Ser. No. 939,116
Claims priority, application France, Dec. 16, 1985, 85 18614
Int. Cl.[4] G05D *16/00*; F16K *31/122*
U.S. Cl. 137—490 10 Claims



1. An integrated control safety valve means for an enclosure containing a pressurized fluid, the valve means comprising a valve body provided with an inlet and an outlet for the fluid, the inlet communicating with the pressurized enclosure and the outlet being linked with the atmosphere, a seat located between the inlet and the outlet, the body defining a cylindrical chamber, a piston slidingly mounted in the cylindrical chamber, a main valve having a face C directed towards said enclosure, said face C having a surface S_c, said main valve being fixed beneath the piston and able to close said seat, elastic means for applying the main valve to the seat, a channel axially traversing the valve means, a control valve located in said piston, elastic means for applying the control valve to its seat, the piston defining with the cylindrical chamber a pressure chamber A for closing the main valve, a pressure chamber B for opening the main valve, said chamber A being linked with the enclosure by a channel, the piston having a surface face S_b directed towards pressure chamber B and a surface face S_a directed towards pressure chamber A, surface S_a exceeding suface S_c of face C of the main valve and being less than the sum of the surfaces S_b of the face of the piston and S_c of the face C of the main valve, wherein a valve is located in the channel connecting the closing pressure chamber A of the main valve to the enclosure, said valve having an upper passage orifice and a lower passage orifice, as well as a ball movable within a cavity between said upper and lower orifices, said ball being able to close the upper orifice in the case of a sudden overpressure occurring within the enclosure.

4,716,928

PRESSURE-RELIEF VALVE DEVICES

Willy Kassel, Werne, and Walter Weirich, Dortmund, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia GmbH, Lunen, Fed. Rep. of Germany

Filed Jun. 23, 1986, Ser. No. 877,584
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523548
Int. Cl.[4] F16K *15/06, 17/04*
U.S. Cl. 137—494 4 Claims

1. A valve device for pressure relief of hydraulic ressure fluid used with mining equipment, said device comprising:

(a) a hollow sleeve (2) providing a main housing closed at one end and open at another, opposite end,

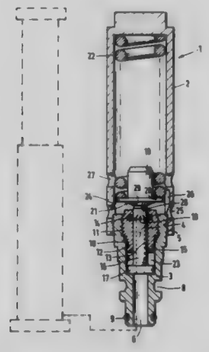
(b) pressure fluid outlet means (25, 27) leading from the interior of the housing,

(c) a guide (10) having an axial through bore (13),

(d) a valve member (15) having a cylindrical stem slidably received in the axial bore in the guide, an abutment face at an upper end of the stem having an area substantially similar to the cross-sectional area of the stem, an enlarged portion forming a piston (17) at the lower end of the valve member, an axial blind bore (16) in the stem which is open at the lower end of the valve member remote from the abutment face to form pressure fluid inlet means, and radial bores (18) leading to the periphery of the stem and communicating with the axial bore therein,

(e) sealing means (14) disposed between the periphery of the stem of the valve member and the axial bore in the guide, said sealing means cooperating with the radial bores to establish therewith a valve between the fluid inlet and outlet means.

(f) a hollow connector part (3) with a stepped internal bore, said connector part being in screw-threaded engagement (4, 5) with the housing and with the guide to locate the guide within the open end of the housing in an axially adjustable manner, the connector part being provided with means (8, 9) for mounting the device to other equip-



ment and providing a pressure fluid flow path between such equipment and the inlet means,

(g) stop means formed by the stepped bore in the connector part which cooperates with the piston of the valve member to define a closed position for the valve,

(h) a pressure member (19) located in the housing, the pressure member having a flange (20) with a peripheral surface in guiding relation to an internal surface of the housing, a frustoconical projecting portion (29) with a central region forming a further abutment face which engages on the abutment face of the stem of the valve member, and a concave face (21) merging the abutment face with the flange, and

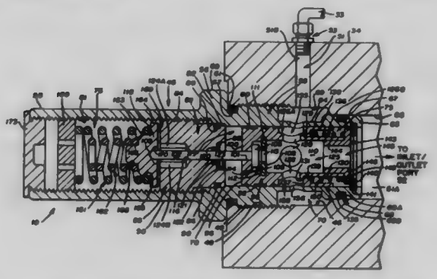
(i) a spring (22) located in the housing to apply force to the flange of the pressure member to urge the abutment faces of the pressure member and the stem together to bias the valve member against the stop means to maintain the valve closed unless the pressure acting on the valve member via the inlet means rises above a predetermined value, whereupon the valve member is displaced to compress the spring and open the valve to permit pressure relief via the outlet means of the housing with the pressure fluid being progressively guided to the outlet means by the concave face of the pressure member.

4,716,929

FLOW CONTROL VALVE

Lewis P. Tomer, Mentor, Ohio, assignor to B. W. Rogers Company, Akron, Ohio

Filed May 4, 1987, Ser. No. 45,286
Int. Cl.[4] G05D *16/10*
U.S. Cl. 137—505.13 24 Claims



1. A pressure compensated flow control valve comprising:

a housing;

at least one cavity within said housing;

said housing cavity being bounded by a smooth interior surface;

a spool;

said spool having a piston portion and a skirt portion extending outwardly of said piston portion;

said piston portion of said spool slidingly engaging the smooth interior surface of said housing cavity for reciprocation within said cavity;

a distribution chamber located radially inwardly of the smooth interior surface within said housing and radially outwardly of said skirt portion;

entrance port means to provide communication between said distribution chamber and the exterior of said housing;

a flow chamber disposed interiorly of said skirt means;

passage means to provide continuous communication between said flow chamber and the exterior of said housing;

communicating port means penetrating said skirt portion to provide communication between said distribution chamber and said flow chamber;

a flow control sleeve slidingly mounted on said skirt portion and slidingly engaging the interior of said housing cavity progressively to open and close said communicating port means; and,

means to resist axial translation of said spool in said housing cavity, said means acting in opposition to hydraulic pressure in said flow chamber.

4,716,930

PNEUMATIC TIME DELAY VALVE

Martin R. Richmond, Lexington, Mass., and Mark A. Hayner, Manchester, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 597,943, Apr. 9, 1984, Pat. No. 4,646,644.
This application Jul. 18, 1986, Ser. No. 889,971
Int. Cl.[4] F16K *21/10*
U.S. Cl. 137—514.5 1 Claim

1. A pneumatic time delay valve for insertion in a pneumatic line between a source of pressurized gas and a device to be activated thereby, comprising:

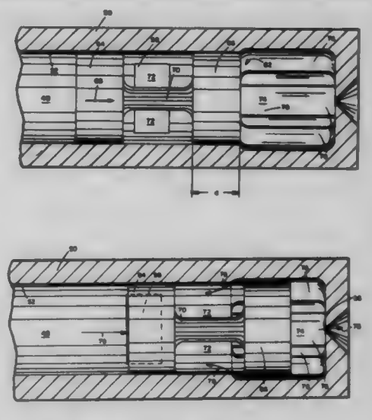
(a) a body member having an elongated cylinder bore therein, an inlet opening to said cylinder bore on one end thereof adapted for connection to the source of pressurized gas, an orifice communicating with said cylinder bore on the other end thereof, and an outlet port disposed between said inlet opening and said orifice and communicating between said cylinder bore and the device to be activated;

(b) a piston member disposed within said cylinder bore and having first and second ends sized and shaped for sealed longitudinal sliding movement within said cylinder bore and having a middle segment of reduced diameter between said ends providing space between said piston member and the side walls of said cylinder bore, said piston member being initially disposed in a starting position with said first end adjacent said inlet opening, said second end spaced from said orifice opening to provide a chamber within said cylinder bore between said orifice opening and said second end, and said outlet port disposed between said first and second ends adjacent said middle segment;

(c) an incompressible metering fluid disposed within said chamber; and wherein,

(d) the side walls of said cylinder bore defining said chamber have longitudinal grooves therein; and additionally,

(e) said above-described components are sized and positioned such that when the pressurized gas is applied to said



inlet opening, the pressure thereof tends to urge said piston member longitudinally within said cylinder bore towards said orifice forcing said metering fluid out of said chamber through said orifice at a rate which determines the time delay of the valve, when the delay is complete the piston member will have reached a point where communication between said inlet end and said outlet port is still blocked by said first end and said second end is adjacent the inner ends of said longitudinal grooves whereby further movement of said piston member causes said grooves to be placed into communication with said middle segment and said metering fluid can move rapidly through said grooves into said middle segment instead of through said orifice thus allowing said piston member to move rapidly through the remaining distance of its travel so that said outlet port is put suddenly in total communication with said inlet end applying the pressurized gas to the device to be activated at the end of the time delay period.

4,716,931

INTERNAL PARTS FIXING STRUCTURE FOR TANK

Yutaka Shibamoto, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

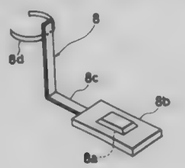
Filed Oct. 20, 1986, Ser. No. 920,664
Claims priority, application Japan, Oct. 23, 1985, 60-237094
Int. Cl.[4] F16M *11/00*
U.S. Cl. 137—558 6 Claims

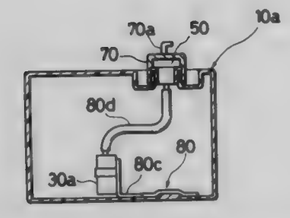
1. A structure for supporting a member in a tank made of resin and having an opening in the upper wall thereof, comprising:

a fixing bracket having a base portion and a support portion,

VOL 1086 ISS 1 JA 5 1988 UMI

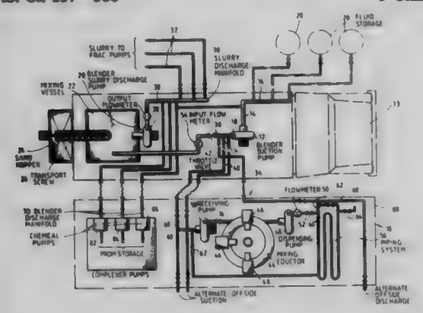
said base portion being made of resin and secured to a bottom wall of the tank generally just below the opening of the tank, said base portion having a recessed portion





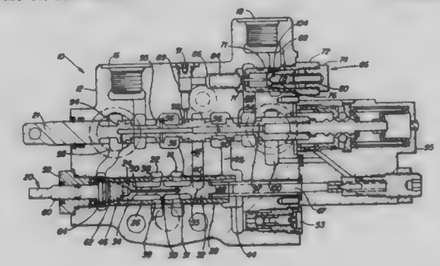
fitted onto a projection in the bottom wall of the tank, and said support portion extending from said base portion and adapted to support the member in a position offset from the opening of the tank.

4,716,932
CONTINUOUS WELL STIMULATION FLUID BLENDING APPARATUS
Harmon L. Adams, Jr., 15006 Carols Way, Houston, Tex. 77070
Filed Feb. 27, 1987, Ser. No. 19,740
Int. Cl.[4] E21B *43/267*
U.S. Cl. 137—566 **9 Claims**



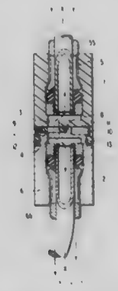
1. A well stimulation fluid blending apparatus comprising,
a blender pump having a suction intake adapted to be connected to a supply of frac fluid and having a discharge outlet,
a throttle valve connected to the discharge outlet of the blender pump,
an input flow meter connected to the discharge outlet downstream of the throttle valve,
a particle mixing vat connected to the discharge outlet downstream of the flow meter,
a gelling unit having an inlet and an outlet, the inlet of the gelling unit connected to the discharge outlet of the blender pump, the output of the gelling unit connected to the discharge side of the blender pump and downstream of the inlet of the gelling unit,
said gelling unit including a mixing eductor positioned between the inlet and outlet of the gelling unit,
at least one dry chemical gel feeder connected to the eductor for feeding gel into the eductor for mixing with the incoming frac fluid,
a dispensing pump connected between the mixing eductor and the gelling unit outlet, said dispensing pump having a higher outlet pressure than the discharge pressure of the blender pump, and
a flow meter and valve connected to the outlet of the dispensing pump for measuring and controlling the flow rate through the gelling unit.

4,716,933
VALVE UNIT
Guy T. Stoever, Rock Island, and David W. Swaim, Coal Valley, both of Ill., assignors to J. I. Case Company, Racine, Wis.
Filed Oct. 16, 1986, Ser. No. 919,533
Int. Cl.[4] F15B *13/02*
U.S. Cl. 137—596.2 **6 Claims**



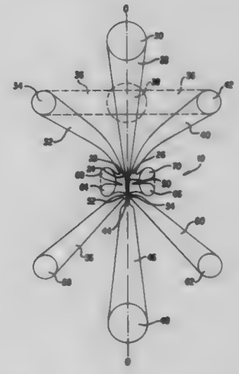
1. A valve unit for a load sensing system, said valve unit comprising:
a valve body having an inlet port connected to a fluid pump for receiving the fluid output of the pump and cylinder ports connected to a fluid cylinder;
a flow control valve within the body connected to the inlet port for controlling the flow of fluid to the cylinder ports;
a manually positionable main control spool slideably mounted within a first bore in the body interconnecting the flow control valve and the cylinder ports for selective operation of the cylinder; and
a lock check valve having a main poppet slideably mounted within a sleeve positioned within the valve body between the main control spool and at least one of the cylinder ports, a biased pilot poppet slideably mounted within the main poppet to bias the main poppet toward a seated position to close off flow to the cylinder port and a pilot piston slideably mounted within a second bore coaxially aligned with the sleeve;
upon selective movement of the main spool, fluid pressure from the inlet port communicating with the second bore containing the pilot piston for causing the pilot piston to engage the pilot poppet to force the pilot poppet against the bias for unseating the main poppet and opening the port for passage of fluid to a reservoir;
upon further movement of the main spool, fluid pressure from the inlet port acting directly against the main poppet causing the main poppet to unseat for passage of fluid into the cylinder port; and
upon further selective movement of the main spool, said pilot poppet engaging said main poppet forcing said main poppet to a seated position to reduce leakage from the cylinder port; and
wherein the flow control valve includes a rotatable sleeve having a first orifice communicating the inlet port with the interior of the rotatable sleeve, an opening in the rotatable sleeve communicating the interior of the rotatable sleeve with a passage which is selectively in communication with the cylinder ports, and a second orifice communicating the interior of the rotatable sleeve with an outlet port; and
a spool slideably mounted within the rotatable sleeve for directing fluid from the interior to the opening and the second orifice as required, said opening being adjustable upon turning said rotatable sleeve to determine the amount of priority flow between the opening and the second orifice.

4,716,934
CONNECTORS USED IN FLUID TECHNIQUES
Yves Levenez, Vaune le Penil, France, assignor to Legris, Rennes, France
Filed Apr. 14, 1986, Ser. No. 851,612
Int. Cl.[4] F16K *11/06*
U.S. Cl. 137—625.21 **6 Claims**



1. A rotary switching connector for conveying a gaseous fluid to an installation and venting thereof, characterized in that it comprises two elements, one an outlet element (1), the other an inlet element (2) coupling means for assembling said elements coaxially so as to be able to rotate with respect to each other through a muscular force about a common rotational axis (X); and wherein each external orifice of at least one set of elements is equipped with a connector (66) allowing axial rotation of said connector 66 without torsional stress of the pipe which extends therefrom; the external orifices (5, 6) of each element (1, 2) open in their adjacent faces through bores (3, 4) offcentered by the same radial value (X-Y) with respect to the common rotational axis (X) of the elements; the bores (4) opening into the junction face of the inlet element (2) are capped by a resilient material O-seal embedded in a cup (7) shallower than the thickness of said seal which seal is slightly crushed against the adjacent smooth face (II) of the outlet element (I) during assembly; and wherein in one angular position of one element with respect to the other, at least one inlet orifice (6) is in sealed communication, through the seal (8), with an outlet orifice (5) and that in a different position in which said inlet orifice (6) is closed by the application of its seal (8) to a zone without bore of the smooth face (II) of the outlet element (1), said outlet orifice (5), is in communication with the atmopshere through the space created by the play existing between the adjacent faces of the two elements outside the surface occupied by the O-seal(s) (8) and wherein said coupling means comprises a female skirt of one element enveloping a male end of said other element, and one of said skirt and said male end having a hooked shaped profile snap engaging a facing groove within the other of said skirt and male end.

4,716,935
FLUIDIC RECTIFIER
Nassy Srour, Silver Spring, and Tadeusz M. Drzewiecki, Rockville, both of Md., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 27, 1987, Ser. No. 19,847
Int. Cl.[4] F15C *1/04*
U.S. Cl. 137—825 **4 Claims**

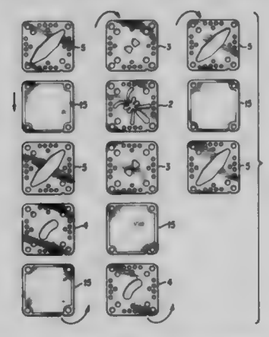


1. A full wave fluidic rectifier for providing at a rectifier output a direct fluidic output signal having a level that increases as the amplitude of an alternating fluidic input signal increases, comprising:
an input end and an output end disposed on an axis extending therebetween;
a null venting outlet which is symmetrically disposed on the axis at the rectifier output end;
first and second signal outlets symmetrically disposed on opposite sides of the null outlet at the rectifier output end;
first and second channels, having equal fluid resistances, for respectively connecting the first and second signal outlets to a common rectifier output channel forming the rectifier output;
a nozzle, which is disposed at the rectifier input end and connected to a source of pressurized fluid, for directing a stream of fluid along the axis into the null outlet; and
stream control means for applying the alternating input signal to the stream, deflecting the stream alternatively toward the first and second signal outlets in proportion to the amplitude of the alternating input signal.

4,716,936
FLUIDIC SYSTEM WITH NOISE FILTER FOR INCREASING OPERATING RANGE
George Mon, Potomac, and James W. Joyce, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 22, 1986, Ser. No. 946,479
Int. Cl.[4] F15C *1/06, 1/08*
U.S. Cl. 137—833 **6 Claims**

1. A fluidic system comprising:
a first laminate having an active element formed therein;
a second laminate superimposed on a first side of said first laminate having a vent element formed therein for extracting vent flow from said active element;
a third laminate superimposed adjacent said second laminate having an exhaust element formed therein for transferring vent flow away from said second laminate (plate);
filter means positioned between the vent element of said

second laminate and the exhaust element of said third laminate for breaking up eddies passing between said



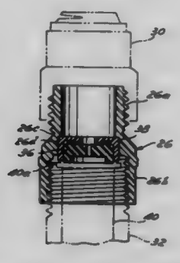
second third laminates, whereby the range of laminar flow of said fluidic systems is extended.

4,716,937

FLOW LIMITING ASSEMBLY HAVING BREAKAWAY FEATURES

Donald W. Hendrickson, P.O. Box 999, Corona, Calif. 91718

Filed Mar. 25, 1987, Ser. No. 30,143
Int. Cl.[4] F16D *1/02*
U.S. Cl. 138—45 18 Claims



1. A flow limiting assembly comprising conduit means having a flow control device therein adapted to provide an output at a relatively uniform flow rate when subjected to a range of input fluid pressures; said conduit means having a weakened section downstream of said flow control device, said section being weaker than the adjacent portions of said conduit means so that if the conduit means is subjected to a blow generally lateral to the conduit means, it will break at the weakened section rather than at some other location along the length of the conduit means.

4,716,938

PRESSURE-TIGHT PLUG COUPLING

Erwin Weh, and Wolfgang Weh, both of Siemensstrasse 5, D-7918 Illertissen, Fed. Rep. of Germany

Filed May 14, 1986, Ser. No. 862,936
Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518019; Oct. 16, 1985, 3536916
Int. Cl.[4] F16L *37/28*
U.S. Cl. 138—93 25 Claims

1. A plug coupling for providing a pressure-sealed connection to a device provided with threaded connecting means having a front face surface comprising:

a cylindrical housing provided at an open front side, with a surface corresponding to that of said connecting means, and having a rear side closed by closure member;

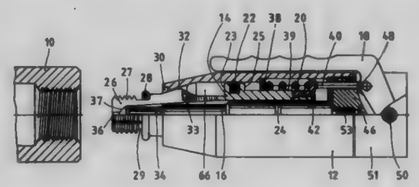
a core element axially extending in said housing having a rear end fixed to said closure member and having a front end extending into the region of the face surface of the housing;

a piston means within said housing slidably mounted on the core element for axial movement;

elongated clamping jaws having first ends linked to a front portion of said piston, and extending in a generally axial direction, said clamping jaws being concentrically arranged around a longitudinal axis of said housing and having free second ends radially displaceable;

ramp means for rocking said clamping jaws about joints between said first ends of said clamping jaws and said front portion of said piston upon an axial movement of said piston;

means for applying pressure to said piston for moving it in said axial direction of said housing thereby pressing said clamping jaws radially inwards by means of a ramp arrangment and axial movement thereof toward said front end of said housing for displacing said free ends of said



clamping jaws by an engagement thereof with said ramp means into a radial position permitting a threading provided at said free ends of said clamping jaws to be placed in radial jaxtaposition to a threading of said threaded connecting means;

a spring means biasing said piston against the pressure of said pressure means and moving said piston toward said rear end of said housing upon release of the pressure of said pressure means;

a means for positively engaging said threading of said free ends of said clamping jaws into said threaded connecting means and positively maintaining an engagement of said clamping jaws with said threading of said connecting means upon movement of said piston toward said rear end of said housing; and sealing means provided for engagement with said face surface of said front end of said housing and for pressure-tight sealing engagement to said face surface of said threaded connecting means upon movement of said piston toward said rear end of said housing.

4,716,939

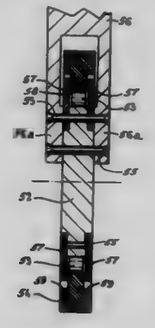
LEVER WITH DOUBLE ROLLERS FOR POSITIVE CAM MECHANISMS FOR CONTROLLING THE HEDDLE FRAMES OF WEAVING LOOMS

Joseph Palau, Saint Jorioz, France, assignor to S.A. des Etablissements Staubli (France), Faverges, France

Filed Nov. 5, 1986, Ser. No. 927,073
Claims priority, application France, Dec. 4, 1985, 85 18149
Int. Cl.[4] D03C *5/00*
U.S. Cl. 139—79 6 Claims

1. In a lever assembly for interacting the cam mechanisms used for controlling the movement of a heddle frame of a weaving loom with the heddle frame wherein the lever assemblies include two spaced roller assemblies which follow the tracks created by two axial offset cam members revolving about a common rotating shaft, the improvement comprising each of said roller assemblies including a rotating ring having inner and outer surfaces and a width dimension, said inner surface of said ring being moveably supported on a plurality of roller bearing means, means for retaining said roller bearing means in general alignment with said ring, extension means

carried by the lever assemblies for supporting said rings in contact with the cam members, and said extension means,



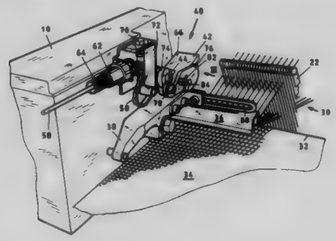
roller bearing means and said means for retaining said roller bearing means having a combined width dimension which does not exceed said width dimension of said rings.

4,716,940

SAFEGUARD DEVICE FOR A WEAVING MACHINE

Heinz Baumann, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jan. 27, 1987, Ser. No. 7,368
Claims priority, application Switzerland, Jan. 27, 1986, 00303/86
Int. Cl.[4] D03D *51/18*
U.S. Cl. 139—336 16 Claims



1. In a weaving machine, the combination of

a reed;

a pair of temples spaced from said reed to define a temple zone between said reed and said temples;

a light beam emitter on one temple for directing a light beam to the other temple;

a light beam receiver on said other templer to receive the light beam from said emitter;

a lever having said emitter thereon and pivotally mounted between an operative position and a retracted position; and

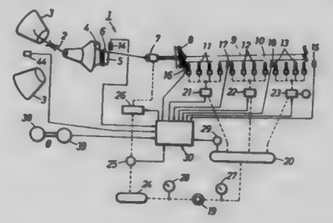
a plate pivotally mounted relative to said lever for masking said emitter in said retracted position of said lever and having a recess for exposing said emitter in said operative position of said lever.

4,716,941

FAULTY PICKING DIAGNOSING SYSTEM FOR A FLUID JET LOOM

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Dec. 8, 1986, Ser. No. 939,211
Claims priority, application Japan, Jan. 13, 1986, 61-5850
Int. Cl.[4] D03D *51/18*
U.S. Cl. 139—336 5 Claims



1. A faulty picking diagnosing system for a fluid jet loom which measures and stores a weft yarn (2) by winding the weft yarn (2) around a stationary drum (5) through the rotary motion of a rotary yarn guide (4), releases the weft yarn (2) wound on the drum (5) by retracting a restraining pin (6), and jets a picking fluid with a main picking nozzle (7) and auxiliary nozzles (11, 12, 13) to pick the weft yarn (2), which comprises:

an unwinding detector (14) disposed adjacent to a weft yarn unwinding position to detect a time when each of the coils of the weft yarn (2) is unwound;

weft yarn arrival detectors (15, 16, 17, 18) distributed in the path (10) of travel of the picked weft yarn (2) to detect the time of arrival of the free end of the picked weft yarn (2) at the corresponding positions; and

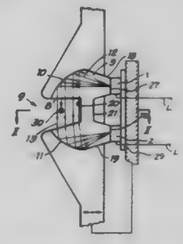
an arithmetic and logic unit (30) which determines the causes of a faulty picking operation from the difference between actual unwind time when the coils of the weft yarn (2) are unwound actually and the corresponding target values, and the difference between actual weft yarn arrival times and the corresponding target weft yarn arrival times.

4,716,942

OPTICAL WEFT STOP MOTION FOR LOOMS WITH A U-SHAPED REED

Borge R. Jensen, Brussels, and Willy M. D. Sierens, Tervuren, both of Belgium, assignors to Picanol N.V., Belgium

Filed Aug. 19, 1986, Ser. No. 898,044
Claims priority, application Belgium, Aug. 26, 1985, 60769
Int. Cl.[4] D03D *51/34*
U.S. Cl. 139—370.2 14 Claims



1. An optical weft stop motion for a weaving loom including a reed having lamellae with U-shaped weft guide channels, comprising

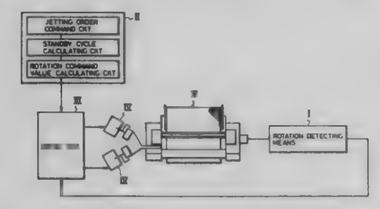
an optical emitter, an optical receiver and a unitary optically conductive plate optically connected together for transmitting a light signal from the emitter to the receiver through the plate, said emitter, receiver and plate secured to the reed for motion therewith with the plate disposed between a pair of reed lamellae; said plate including a recess substantially congruent with the weft guide channels of the reed lamellae and a bridging portion extending between the light emitter and light receiving sides of the plate, and light reflective sidewalls arranged to transmit light from the emitter across the recess in the plate and to the receiver through said plate.

4,716,943

DEVICE FOR CONTROLLING WEFT YARN STORING UNITS FOR JET LOOMS

Kazunori Yoshida, Nagoya; Fujio Suzuki; Hidehiko Tanaka, both of Toyota, and Susumu Kawabata, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 21, 1986, Ser. No. 831,992
Claims priority, application Japan, Feb. 21, 1985, 60-33024
Int. Cl.[4] D03D *47/36, 47/38;* B65H *51/20*
U.S. Cl. 139—452 **11 Claims**



1. A control device for controlling the storage amount of a selected weft yarn in a storage device for a jet loom having a plurality of weft yarn storing units wherein a plurality of weft yarns are stored in respective weft yarn storing units according to weaving pattern command signals produced by a command means, and in the weft insertion cycle of each weft yarn storing unit, the weft yarn stored therein is jetted to the loom to perform a weft insertion, comprising:

rotation detecting means for detecting a rotational condition of the driving shaft of a loom body, to output a driving shaft rotation signal;

a rotation control circuit which, according to a weft yarn jetting order command signal, calculates the numbers of standby cycles between weft insertion cycles of said weft yarn storing units, and calculates the speeds of rotation of weft yarn storing sections in said weft yarn storing units to store weft yarns for weft insertion in advance according to the numbers of standby cycles thus calculated, to produce rotation command signals;

a driving circuit for receiving the driving shaft rotation signal from said rotation detecting means and the rotation command signals from said rotation control circuit, to produce drive signals to determine the speeds of rotation of said weft yarn storing units; and

drive means provided for said weft yarn storing units, respectively, each drive means receiving the drive signal from said drive circuit to drive a respective weft yarn storing unit at a speed of rotation corresponding to said drive signal thus received,

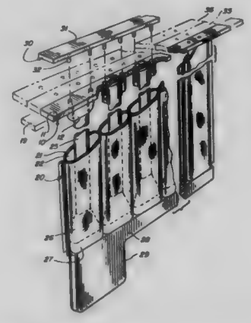
a weft yarn having a length corresponding to a predetermined weft insertion length being stored in said weft yarn storing units in weft insertion cycles selected according to said weft yarn jetting order command signal.

4,716,944

TUBULAR PLATE ELECTRODE SLURRY FILLING PROCESS AND APPARATUS FOR LEAD-ACID CELLS

Mark L. Eggers, Schaumburg, Ill., assignor to KW Battery Company, Skokie, Ill.

Division of Ser. No. 804,496, Dec. 4, 1985, Pat. No. 4,678,730.
This application Feb. 25, 1987, Ser. No. 18,447
Int. Cl.[4] B65B *3/04;* H01M *4/16*
U.S. Cl. 141—1 **20 Claims**



1. A process for filling a tubular plate electrode assembly with a lead oxide particulate slurry comprising lead oxide particulates suspended in fluid, said electrode assembly comprising a plurality of substantially lead spines with a porous tubular sheath enveloping and extending for the length of each said spine, forming an annular space between each said spine and each said tubular sheath, said annular spaces accessible from a first end and sealed at a second end, said process comprising the steps of:

installing a tubular plate electrode foot partially sealing said first end of said annular spaces and having at least one slurry access port penetrating to each said annular space;

dispensing said lead oxide particulate slurry onto an upper, exposed surface of said tubular plate electrode foot;

introducing said lead oxide particulate slurry into said annular spaces through said slurry access ports in said foot and confining said lead oxide particulates within said porous tubular sheaths; and

draining excess fluid through said porous tubular sheaths, thereby depositing wetted lead oxide particulates in said annular spaces between said spines and said porous tubular sheaths.

4,716,945

RECORDING INSTRUMENT INK-PATH TREATMENT PROCESS

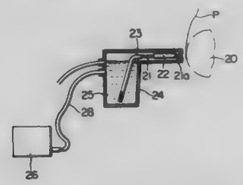
Seiichi Aoki; Tadayoshi Inamoto, both of Machida, and Masami Kasamoto, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 617,926, Jun. 6, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 835,424
Int. Cl.[4] B65B *31/02;* G01D *15/16*
U.S. Cl. 141—1 **16 Claims**

1. A method of making a recording instrument, comprising the steps of:

providing a recording instrument including recording means for recording with ink, ink storage means and an ink supplying system for supplying ink from said ink storage means to said recording means, said ink supplying system having an ink contracting surface; and

exposing said ink contacting surface to an aqueous solution of at least one of the components in a dye or to an aqueous solution of a compound having at least one hydrophilic group, such component or compound having the ability to be retained on said ink contacting surface by absorption thereon or penetration thereinto, wherein said exposing step includes bringing said ink contacting surface into contact with the solution at an elevated temperature.

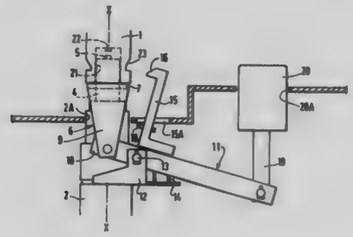


4,716,946

CRYOGENIC FLUID TRANSFERRING DEVICE

Philippe Grigoletto, Villeparis, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 20, 1986, Ser. No. 920,053
Claims priority, application France, Oct. 18, 1985, 85 15460
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—269 **11 Claims**



1. A device for transferring a cryogenic fluid comprising two end members each being a part of a respective container and the end members being cooperative by a simple pushing of one end member into the other end member, a locking element having an active position for locking together the two end members and an unlocking position for releasing the two end members from each other, an element for separating from each other the two end members combined with the locking element so that, when the locking element is in said active position, the separating element is retracted and when the locking element is in said unlocking position the separating element is active for separating the two end members, and a common mechanism for actuating the separating element and the locking element.

4,716,947

ALL WEATHER SOFT-SIDED CARRIER SYSTEM

Sharon K. Haddock, 2554 S. Eagle St., Aurora, Colo. 80014

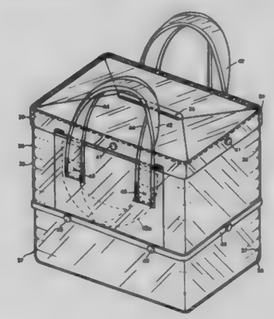
Filed Jan. 6, 1986, Ser. No. 816,427
Int. Cl.[4] A45C *3/08, 13/10, 13/12*
U.S. Cl. 150—106 **19 Claims**

1. A carrier system comprising a non-waterproof bag and a plurality of waterproof accessories forming a cover for said bag; the waterproof accessories comprising:

a bottom container adapted to encloae the bottom and a minor portion of the sides of said bag and for attachment thereto;

a cap adapted to fit over the top and a minor portion of the sides of said bag and for attachment to at least one of the said bag, the bottom container, and a sheath;

said sheath adapted to fit around a major portion of the sides of said bag and adapted for attachment to said bottom container and said cap to form a weather resistant cover for said bag; and



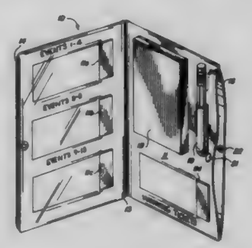
said bag including means for attaching it to at least one of the bottom container, the sheath and the cap.

4,716,948

PARI-MUTUEL BETTOR'S ORGANIZING WALLET

Ronald A. Brissette, 6048 Kenwood La., Apt. B, Fort Myers, Fla. 33907

Filed Jul. 10, 1986, Ser. No. 884,054
Int. Cl.[4] A45C *1/06, 11/18*
U.S. Cl. 150—132 **5 Claims**



1. A pari-mutuel bettor's wallet comprising an outer layer of opaque flexible material and an inner layer of transparent flexible material joined together along two of their opposite edges and also joined together along the centerline of their two joined edges to form two identical pockets each sized to contain a quantity of unfolded U.S. paper currency,

the inner layer of transparent flexible material on one side of its joined centerline containing three identical slots arranged one above the other each sized to receive several two by four inch pari-mutuel tickets, and

said inner layer on the opposite side of its joined centerline containing a fourth slot sized to receive pari-mutuel tickets, a fifth slot sized to receive the back of a pad of note paper, and a sleeve for holding a pen or pencil.

4,716,949

ANTISKID TRACTION DEVICE

Suk R. Lee, 9126 N. Keating Ave., Skokie, Ill. 60077

Continuation-in-part of Ser. No. 741,527, Jun. 5, 1985, Pat. No. 4,662,417. This application Dec. 27, 1985, Ser. No. 813,683
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] B60C *27/20*
U.S. Cl. 152—216 **8 Claims**

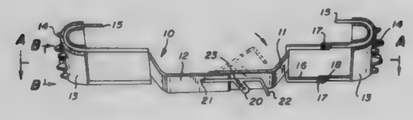
1. An antiskid traction device adapted to be attached to

vehicle tires for use in adverse driving conditions which comprises:

a right side frame member having a locking pin,

a left side frame member having a pivotal locking member with multiple locking positions for engagement with said locking pin whereby the combined length of the right and left side frame members can be varied,

at least two antiskid members disposed at each of the radial



outer end portions of the right and left side frame members, said antiskid members being provided with a plurality of studs thereon for improving the traction thereof, said studs disposed at the middle of the antiskid member being longer than those disposed above the side thereof, and

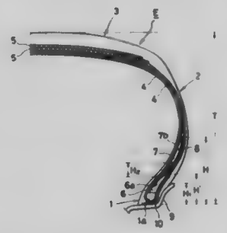
means for separately and additionally adjusting the length of said right side frame member whereby the device can be further adjusted for all tire sizes.

4,716,950

RADIAL TIRE FOR PASSENGER CAR

Tuneo Morikawa, Hadano, and Tetsuya Kuze, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,429
Int. Cl.[4] B60C *9/20, 9/08, 15/06*
U.S. Cl. 152—526 5 Claims



1. In a radial tire for a passenger car of the type which consists of a pair of right and left bead portions, a pair of right and left side wall portions continuing said bead portions, respectively, and a tread portion interposed between said side wall portions, and in which a carcass layer having a cord angle in the range of 70° to 90° to a tire circumferential direction is fitted between said bead portions, and a plurality of belt layers which have a cord angle in the range of 10° to 35° to the tire circumferential direction and in which the cords of one of said belt layers cross those of the other belt layers are disposed on said carcass layer at said tread portion;

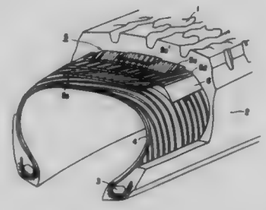
the improvement wherein an upper filler is disposed on a tread portion side of a bead filler positioned on a bead wire buried in each of said bead portions, and a single steel reinforcing layer is interposed between said upper filler and said bead filler in such a fashion that said steel reinforcing layer extends from the outside of said upper filler to the inside of said bead filler, and its height H from a bead heel does not exceed 50% of a sectional height T of said tire.

4,716,951

PNEUMATIC TIRE

Tatsuo Suzuki, Kanagawa; Ken Takahashi, Chigasaki; Kazuyuki Kabe, Hiratsuka, and Yukio Kaga, Atsugi, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 561,239, Dec. 14, 1983, abandoned. This application Aug. 12, 1986, Ser. No. 895,571
Int. Cl.[4] B60C *9/04, 9/18*
U.S. Cl. 152—535 3 Claims



1. A pneumatic tire having a thread comprising a carcass cord layer containing reinforcing cords and a belt-reinforcing layer overlaid and interposed between the tread of the tire and the carcass cord layer, said belt reinforcing layer including a transient-reinforcing layer having reinforcing cords positioned in contact with said carcass cord layer with the reinforcing cords therein disposed at an angle of between 40° to 75° with respect to the circumferential direction of the tire, and at least two belt tension-resistant layers having reinforcing cords, the lower one thereof being laid over said transient-reinforcing layer with the reinforcing cords therein disposed at an angle of between 15° to 30° with respect to the circumferential direction of the tire and the upper one with the reinforcing cords therein disposed at an angle of between 150° to 165° thereto, said cords of said carcass cord layer, said transient-reinforcing layer and said lower tension-resistant layer being oriented in the same direction and said carcass cord layer being a single layer, in which the reinforcing cords therein have an elasticity of at least 5×10^3 Kg/mm^2 and are disposed at an angle of between 75° to 85° with respect to the circumferential direction of the tire, all angles being measured from the same side of the tire, the side being the side on which the angle of the reinforcing cords in the transient-reinforcing layer is an acute angle with respect to the circumferential direction of the tire.

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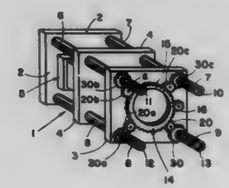
MEANS FOR SQUARING TIE BARS FOR DIE CASTING MACHINES

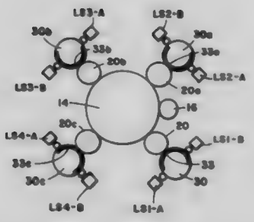
Robert W. Hegel, and William V. Appledorn, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jun. 12, 1986, Ser. No. 873,808
Int. Cl.[4] B22D *17/26*
U.S. Cl. 164—154 31 Claims

1. In a die casting machine having front and rear end plates, a plurality of tie bars extending between said end plates, a traveling plate slidably mounted on said tie bars for movement between said end plates; means for moving said traveling plate toward said front plate for clamping molds therebetween during the casting operation and thereby exerting a strain on said tie bars; adjustable means at the ends of said tie bars adjacent said rear end plate for individually adjusting the tension exerted in each of said tie bars; separate strain detector means for each of said tie bars for individually detecting the tension on each of said tie bars; the improvement comprising:

position detector means at each of said adjustment means for separately and individually detecting the relative positions of the rear ends of each of said tie bars to said rear end plate; said detector means including an actuating means and at least two detectors spacedly mounted about said tie bar and arranged to both be simultaneously actuated by said actuating means when a desired tension is in said tie bar, one of said actuating means and said detectors being mounted on said adjustment means and the other of said detectors or actuating means being mounted stationary with respect to said adjustment means; whereby when the machine is originally squared by adjusting the adjustable





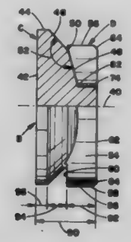
means to cause a desired tension in each tie bar, the detectors are actuated and the orignal squared positions of said tie bars can be obeerved and after operation of said machine it can be resquared by adjusting said adjustable means to adjust said tie bars back to the said original squared positions.

4,716,953

VENT PLUG

John E. Prunty, II, Des Moines, Iowa, and Jeffrey D. Eagens, Rocky River, Ohio, assignors to Brunswick Industrial Supply Co., Lakewood, Ohio

Filed May 13, 1986, Ser. No. 862,763
Int. Cl.[4] B22C *15/22, 23/00*
U.S. Cl. 164—200 33 Claims



1. A vent plug comprising:

a substantially circular head having a central axis, a substantially flat front face, an outer peripheral surface and a rear portion;

said rear portion including mounting means for mounting said vent plug in a vent hole while providing air flow past said outer peripheral surface; and,

said rear portion including sloping rear surface means which slopes toward said axis in a direction away from said front face.

33. A plate for a chamber in which sand molds are blown, a stepped circular hole through said plate and including a large diameter bore intersecting an inner face of said plate, an intermediate diameter bore extending concentrically from said large diameter bore, and a small diameter bore extending concentrically from said intermediate diameter bore and intersecting an outer face of said plate, a vent plug having mounting means mounted in said intermediate diameter bore, and

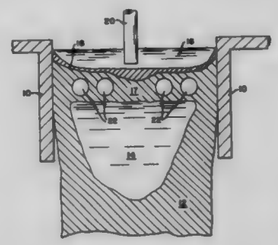
said vent plug including a substantially circular head which is smaller in diameter than said large diameter bore, an outer peripheral surface, and a rear portion including said mounting means, and said vent plug being mounted by said mounting means so the outer peripheral surface of said head is spaced radially inward from said large diameter bore for allowing air flow pass said outer peripheral surface.

4,716,954

METHOD AND APPARATUS FOR SEQUENTIALLY CONTINUOUS CASTING DIFFERENT COMPOSITION GRADES OF STEEL

Victor P. Arditi, Lower Burrell, and James R. Riedl, Freeport, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1986, Ser. No. 922,579
Int. Cl.[4] B22D *11/04, 11/16*
U.S. Cl. 164—461 14 Claims



1. A method of sequentially continuous casting molten steels of different composition grades, the method comprising:

(a) stopping the pouring of a first grade of molten steel into a continuous casting mold;

(b) immersing a plurality of discrete chill units into the first grade of molten steel below the surface thereof to about the same depth below a casting nozzle providing molten metal to the mold without moving the nozzle, said units having a geometric solid shape selected from the group of spheroids, ellipsoids, and polyhedra;

(c) allowing the molten metal to solidify around said chill units and adjacent the interior walls of the mold to form a solidifying layer of steel; and

(d) pouring a second grade of molten steel into the mold after the chill units are frozen into place in the solidifying metal; and drawing from the mold solidifying steel of the first grade and then of the second grade.

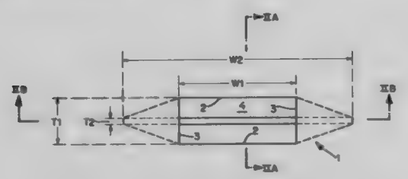
7. An apparatus for sequentially continuous casting molten steel slabs of different composition grades, the apparatus comprising;

(a) a continuous casting chill mold;

(b) a plurality of discrete chill units having a geometric solid shape selected from the group of spheroids, ellipsoids, and polyhedra; and

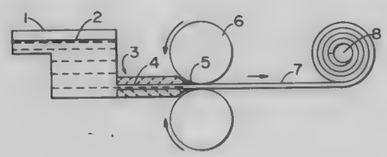
(c) means for lowering and immersing the plurality of chill units into a first grade of molten steel below the surface thereof to about the same depth of immersion below a casting nozzle providing molten metal to the mold without moving the nozzle.

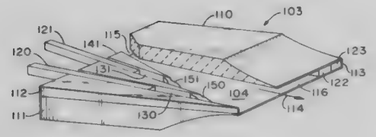
4,716,955
CONTINUOUS CASTING METHOD
Herbert P. Fastert, Franklin Lakes, N.J., assignor to SMS Concast Inc., Montvale, N.J.
Filed Jun. 11, 1986, Ser. No. 872,956
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—475 **20 Claims**



1. A continuous casting method, comprising the steps of continuously admitting a stream of molten metal into a casting passage; partially solidifying said molten metal in said casting passage to form a continuously cast strand; continuously drawing said strand through said casting passage; reducing the cross-sectional area of said strand between upstream and downstream locations of said casting passage by an amount exceeding the reduction in cross-sectional area due to shrinkage; and decreasing the perimeter of said strand during the reducing step by an amount substantially equalling the reduction in perimeter due to shrinkage.

4,716,956
ROLL CASTER FEED TIP AND METHOD
William H. Hoffman, Palmyra, and Thomas W. Ebright, Lebanon, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Dec. 3, 1986, Ser. No. 937,564
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—480 **27 Claims**

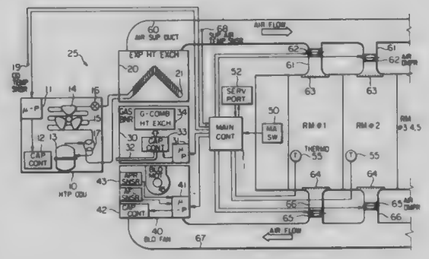




24. A method for adjusting the outlet width of a roll caster feed tip during casting of a molten metal, said feed tip including a top member, a bottom member, and a pair of fixed side members positioned between the top and bottom members to define a molten metal passageway having at least one inlet, said method comprising:

slidably extending at least one spacer through the inlet of the feed tip, to the outlet and adjacent one side member.

4,716,957
DUCT TYPE MULTIZONE AIR CONDITIONING SYSTEM
Peter Thompson; Nobuo Otsuka; Kisuke Yamazaki, and Hideo Igarashi, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Mar. 26, 1986, Ser. No. 844,182
Claims priority, application Japan, Mar. 29, 1985, 60-65378; Mar. 29, 1985, 60-65379; May 9, 1985, 60-96702; May 27, 1985, 60-112132
Int. Cl.[4] G05D *23/00*; F24F *3/044*; F25B *29/00*
U.S. Cl. 165—12 **6 Claims**



1. A duct type multizone air conditioning system having a cooling and heating heat pump, a heating gas burner, a supply air duct for supplying air to a plurality of zones to be air conditioned, and a blower fan for forcibly circulating conditioned air through the duct to the plurality of zones to be air conditioned comprising:

a plurality of temperature detecting means, respectively disposed in corresponding ones of the zones to be air conditioned, each temperature detecting means detecting a present temperature of the corresponding one of the zones;

a plurality of air damper means, respectively disposed in corresponding ones of the zones, for controlling the supply air to the corresponding zones to be air conditioned;

a plurality of zone temperature setting means, respectively disposed in corresponding ones of the zones, each temperature setting means setting a present set temperature for the corresponding one of the zones;

means for controlling the opening and closing of the air damper means so that the present temperatures detected by each of said temperature detecting means become said present set temperatures set by said zone temperature setting means;

means for automatically determining the number of the zones to be air conditioned;

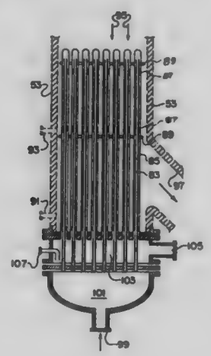
mean sfor automatically determining the presence of an air damper means and corresponding temperature detecting means in each zone;

means for automatically determining the presence of a heating gas burner and the presence of a heat pump within the air conditioning system;

means for automatically determining the presence of a damper means and corresponding temperature setting means in the same zone; and

means for receiving heat pump cost and heating gas burner cost information so as to ensure cost-effective use of the heat pump and heating gas burner.

4,716,958
METHOD AND APPARATUS FOR COOLING FLUID SOLID PARTICLES USED IN A REGENERATION SYSTEM
Paul W. Walters; Lloyd E. Busch, and Oliver J. Zandona, all of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky. Division of Ser. No. 617,764, Jun. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 532,253, Sep. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 355,661, Mar. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 304,992, Sep. 1, 1981, Pat. No. 4,434,044. This application
Apr. 18, 1985, Ser. No. 724,699
Int. Cl.[4] B01J *21/20*
U.S. Cl. 165—142 **2 Claims**



1. An arrangement of apparatus for transferring heat between solid particle material of fluidizable particle size and a heat exchange fluid, comprising the combination of:

(a) a cylindrical chamber open in the upper cross sectional area thereof for charging heated solid particles thereto,

(b) a bottom portion of said cylindrical chamber separated into upper and lower header chambers,

(c) a plurality of open ended first conduits in parallel arrangement extending upwardly from said lowermost header chamber to an upper part of said cylindrical chamber,

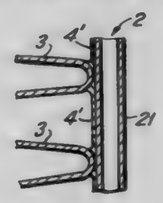
(d) a plurality of separate second conduit means, each with a closed upper end and a larger diameter than said first open ended conduits and separately encasing one of said first conduits to define an annular space therewith and in open communication at the bottom annular end thereof with said upper header chamber,

(e) means for charging a heat exchange fluid to one of said header chambers and means for withdrawing heated fluid from the other of said header chambers,

(f) opening means in said cylindrical chamber above said upper header chamber for withdrawing solid particles passed downwardly through said heat exchange cylindrical chamber in indirect heat exchange.

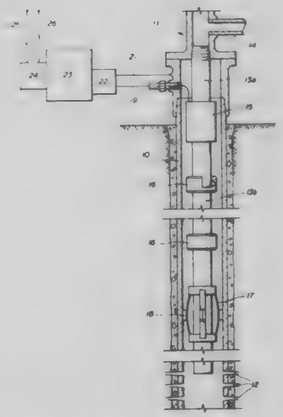
4,716,959
ALUMINUM HEAT EXCHANGERS AND METHOD FOR PRODUCING THE SAME
Hisao Aoki, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Aug. 27, 1984, Ser. No. 644,816
Int. Cl.[4] F28D *1/02*
U.S. Cl. 165—152 **7 Claims**

1. In an aluminum heat exchanger comprising a flat aluminum metal tube which is provided with at least one refrigerant passageway therein and having a serpentine-anfractuous shape in a longitudinal direction of the tube characterized by a plurality of parallel portions spaced apart from one another, each of said parallel portions having interposed therebetween a fin unit of aluminum metal of corrugated configuration, each of said fin units of corrugated shape being brazed to each of said parallel portions of said flat tube, the improvement wherein each of said fin units is made of a first aluminum alloy having a high aluminum content of at least 99 wt. %, the surface of each of said aluminum fin units being exposed and substantially free of



brazing alloy, and wherein said flat tube is made of a second aluminum alloy which has a corrosion potential at least equal or more noble than the first aluminum alloy, only the surface of each of said parallel portions being covered by separate aluminum brazing alloy-sheet to thereby end braze each of said fin units onto said flat tube.

4,716,960
METHOD AND SYSTEM FOR INTRODUCING ELECTRIC CURRENT INTO A WELL
Bernard J. Eastlund, Spring; Kenneth J. Schmitt, The Woodlands; Ronald M. Bass, and John M. Harrison, both of Houston, all of Tex., assignors to Production Technologies International, Inc., Houston, Tex.
Filed Jul. 14, 1986, Ser. No. 884,963
Int. Cl.[4] E21B *36/00*; H01R *4/64*
U.S. Cl. 166—60 **12 Claims**



1. A system of inhibiting formation of solids in a petroleum well comprising:

a grounded wellhead of electrically conducting material,

a tubing of electrically conducting material attached to said wellhead,

a sucker rod for a pump in said tubing,

said sucker rod having a tubular rod section of non-conducting material insulating said rod from said wellhead,

said sucker rod below said section formed of electrically conducting material,

connecting means below said section electrically connecting said sucker rod and said tubing,

vertically spaced insulators on said sucker rod insulating said sucker rod from said tubing between said section and said connecting means, and

a source of current having a first connection to said wellhead and a second connection to said sucker rod below said section, said second connection between said source of current and said sucker rod including a conduit extending through said tubular rod section and connected to said sucker rod below said section.

6. A tubing collar comprising:

inner and outer tubular connectors of electrically conducting material concentrically arranged with one end of the inner connector positioned intermediate the ends of the outer connector and provided with threads for making up with the tubing above and below the collar,

a plurality of circumferentially extending interlocking shelves carried by the inner and outer connectors,

insulating material between the inner and outer connectors,

said insulating material additionally extending from said one end of the inner connector along the inner surface through the outer connector and away from the inner connector a selected distance to minimize shorting between the tubular connectors by a mixture of conducting and non-conducting liquid flowing through the collar, and

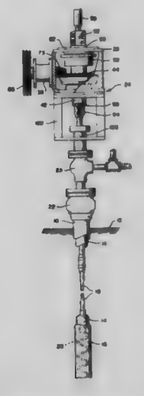
one of said connectors including means for connecting an electrical conduit to said one connector.

4,716,961

ROTARY DRIVE APPARATUS FOR DOWNHOLE PUMP

James E. Makins, Jr., and James E. Thompson, both of Dallas County, Tex., assignors to USX Engineers & Consultants, Inc., Pittsburgh, Pa.

Filed Feb. 6, 1987, Ser. No. 11,576
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—68.5 **4 Claims**



1. A rotary drive apparatus adapted for connection to a rotary drive string extending downwardly in a well to a rotary downhole pump, said rotary drive apparatus comprising:

a housing having top and bottom surfaces with mateably aligned openings therein;

a drive spindle in said housing having an oversize passage for receiving the rotary drive string axially and in a freely slidable manner therein; said drive spindle having a slot at the lower end thereof;

an axial load bearing spindle rotatably mounted in said housing above and separately from the drive spindle, said axial load bearing spindle also having an oversize passage for receiving said rotary drive string axially therein;

bearing means for rotatably mounting the axial load bearing and drive spindles in said housing;

first and second clamp type connector means for connection of said rotary drive string to said axial load bearing spindle and said drive spindle, respectively;

said second connector means being a segmented clamp for lockingly engaging said slot in the lower end of the drive spindle, said segmented clamp when released being freely slidable axially on said drive spindle so that substantially all of the weight of the rotary drive string is borne by the axial load bearing spindle;

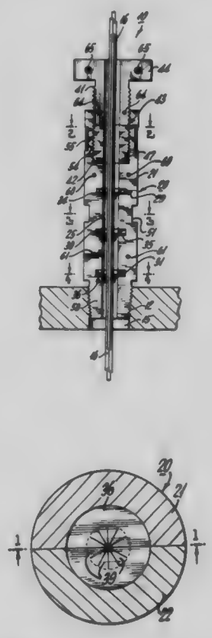
a frame for support of said rotary drive apparatus and a stop means mounted in said frame and located beneath the second connector means, said stop means being adapted to prevent loss of the rotary drive string down the well upon release or slippage of said first connector means and to provide support for the rotary drive string upon release of said first connector so that the axial load bearing spindle may be repaired or replaced without removal of the rotary drive string from said rotary drive apparatus.

4,716,962

STRIPPING GLAND

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 29, 1985, Ser. No. 803,263
Int. Cl.[4] E21B *33/08*
U.S. Cl. 166—84 **5 Claims**



1. A stripping gland comprising:

housing means having an axial passage therethrough for accommodating an object having an irregular surface, and

a plurality of means located in said housing means for forming seals within said passage beteen the housing means and the irregular surface of the object,

wherein the housing means and seal means are separable into the two sections to facilitate utilization with the object, and said stripping gland further comprises means for clamping the two sections of housing and seal means together,

means located within the housing for providing sealing between the housing and the object when compressed, the compressible sealing means being separated in two sections, a section of compressible sealing means is located in each section of the housing, and

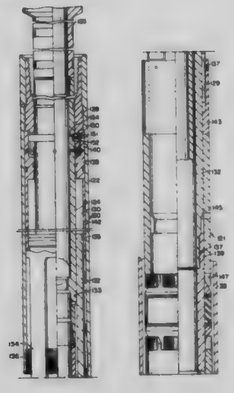
means for compressing the compressible sealing means after the two sections of the housing are clamped together.

4,716,963

APPARATUS FOR WELL COMPLETION OPERATIONS

Flint R. George, Katy; Bennie C. Gill, Missouri City, and David M. Haugen, Houston, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 770,502, Aug. 27, 1985, abandoned. This application Oct. 20, 1986, Ser. No. 921,802
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—123 **9 Claims**



1. An apparatus for hydraulically setting a hydraulically set packer within a well bore and for controlling the flow of well fluids into said apparatus, said apparatus attached to one end of a tubing string in said well and adapted to selectively sealingly engage the interior of said hydraulically set packer, said apparatus comprising:

a seal assembly having one end thereof connected to said tubing string and having seals thereon, a bore therethrough and a annular recess therein; and

a hydraulic setting tool assembly connected to said hydraulically set packer for setting said hydraulically set packer in said well, said hydraulic setting tool assembly including:

a concentric sleeve having said hydraulically set packer therein;

a packer actuating sleeve slidably with respect to the concentric sleeve and releasably secured thereto, the packer actuating sleeve having a portion thereof engaging a portion of said hydraulically set packer on the concentric sleeve;

a housing releasably secured to the concentric sleeve and having a portion thereof abutting the packer actuating sleeve;

an inner mandrel slidable within the housing and engaging a portion of said seal assembly, the inner mandrel having ports therein in fluid communication with the bore in the said seal assembly;

a piston slidably within the annular space between the housing and the inner mandrel, the piston having a portion thereof connected to a portion of the packer actuating sleeve, and capable of being actuated by fluid pressure communicated to the piston thereon by the bore in said seal assembly and the ports in the inner mandrel; and

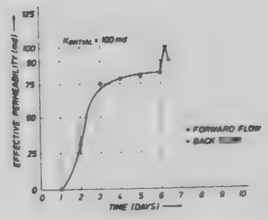
a cap secured to a portion of the housing and a portion of the inner mandrel closing the annular space located between the housing and the inner mandrel located above the piston.

4,716,964

USE OF DEGRADABLE BALL SEALERS TO SEAL CASING PERFORATIONS IN WELL TREATMENT FLUID DIVERSION

Steven R. Erbstoesser, Missouri City; Claude E. Cooke, Jr., Houston, both of Tex.; Richard G. Sinclair, and Michael M. Epstein, both of Columbus, Ohio, assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 712,045, Mar. 15, 1985, abandoned, which is a division of Ser. No. 464,084, Feb. 4, 1983, Pat. No. 4,526,695, which is a division of Ser. No. 291,200, Aug. 10, 1981, Pat. No. 4,387,769. This application Dec. 10, 1986, Ser. No. 940,193
Int. Cl.[4] E21B *33/10, 43/25, 43/26*
U.S. Cl. 166—284 **5 Claims**



1. A method of plugging the perforations in a casing which has been set in a wellbore which penetrates a subterranean formation comprising:

(a) flowing down said casing a wellbore fluid having dispersed therein a plurality of ball sealers, said ball sealers being sized to seal said perforations and being comprised of a polyester polymer which is substantially insoluble in said wellbore fluid and degradable in the presence of water at the formation temperature to oligomers which are at least partially soluble in a formation fluid, and

(b) continuing the flow of said wellbore fluid until at least a portion of said perforations are sealed by said ball sealers.

4,716,965

INSTALLING CASING WITH IMPROVED CASING/CEMENT BONDING

Gerardus M. Bol; Franciscus H. Meijs; Fredericus C. Schouten; Robert B. Stewart, and Petrus C. De Reo, all of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

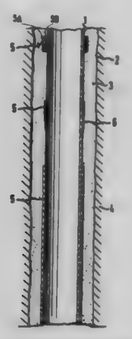
Filed Apr. 8, 1986, Ser. No. 849,339
Claims priority, application United Kingdom, Apr. 11, 1985, 8509320
Int. Cl.[4] E21B *33/14*
U.S. Cl. 166—292 **7 Claims**

1. In a cementing process in which a casing is suspended within a well and a slurry of cement is flowed into the space between the casing and the borehole wall and allowed to harden, an improvement for preventing fluid migration between the casing and cement, comprising:

surrounding at least one portion of the outer surface of the casing with a self supporting sheath of an elastomeric foam comprising alternately arranged layers of a closed cell polyurethane foam and a closed cell polyethylene foam which, together, are capable of remaining resilient and retaining the structural integrity of the sheath after compression by the hydrostatic pressure of a slurry of cement;

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inflowing the cement slurry into the borehole around the casing and sheath; and



allowing the cement to harden with the resilient tendency toward expansion of the elastomeric foam ensuring good adhesion of the sheath to both the casing and cement.

4,716,966

AMINO RESIN MODIFIED XANTHAN POLYMER GELS FOR PERMEABILITY PROFILE CONTROL

Paul Shu, Princeton Junction, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 24, 1986, Ser. No. 922,916
Int. Cl.⁴ E21B *33/138, 43/12*
U.S. Cl. 166—295 **23 Claims**

1. A process for closing pores in a hydrocarbonaceous fluid bearing formation to obtain improved sweep efficiency during a water flood oil recovery operation wherein the process comprises injecting into the formation a gellable composition comprising:

(a) water;

(b) about 0.2 to about 5.0 wt. percent of a cross linkable polysaccharide biopolymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group;

(c) about 0.02 to about 5.0 wt. percent of an aminoplast resin which reinforces said biopolymer; and

(d) sufficient transitional metal ions to form a gel of a size and strength sufficient to close one or more permeable zones in said formation under substantially all pH conditions.

4,716,967

STIMULATING SUBTERRANEAN FORMATIONS IN THE OPEN HOLE

Henry H. Mohaupt, 1151 Estrella Dr., Santa Barbara, Calif. 93110

Filed May 13, 1985, Ser. No. 732,967
Int. Cl.⁴ E21B *43/25, 43/26, 43/263*
U.S. Cl. 166—305.1 **18 Claims**

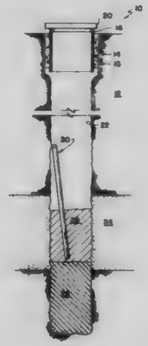
1. A method of increasing the productivity of a subterranean formation penetrated by an uncased bore hole of a well, therebeing a quantity of formation liquid in the bore hole adjacent the formation, comprising

positioning a thermal ignitor in the uncased bore hole of the well;

delivering a quantity of flowable material into the liquid in the uncased bore hole and creating a charge of fuel and oxidizer around the ignitor;

actuating the ignitor to heat the fuel above its ignition temperature thereby initiating combustion of the fuel in the uncased hole;

propogating a combustion front through the quantity of flowable material by progressively raising the temperature through the flowable material above its ignition temperature; and



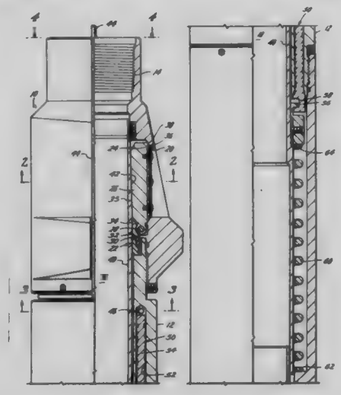
delivering high pressure combustion products from the charge into the formation.

4,716,968

DOUBLE SEATED WELL VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jan. 12, 1987, Ser. No. 2,350
Int. Cl.⁴ E21B *34/10*
U.S. Cl. 166—319 **8 Claims**



1. A subsurface double seated well valve for use in a well conduit for controlling fluid flow through the conduit and between the inside and outside of the conduit comprising,

a tubular housing adapted to be connected in a well conduit, said housing having a bore therethrough,

a first valve seat in the bore and a second valve seat in the housing in communication between the inside and the outside of the housing,

a valve closure member in the housing movable between and into contact with the first and second valve seats for alternately closing and opening fluid flow through the bore and between the inside and outside of the housing,

a flow tube telescopically movable in the housing for controlling the movement of the valve closure member,

a piston and cylinder assembly positioned in the housing and engaging the flow tube, one side of the assembly adapted to be in communication with a fluid control passageway to the well surface, and

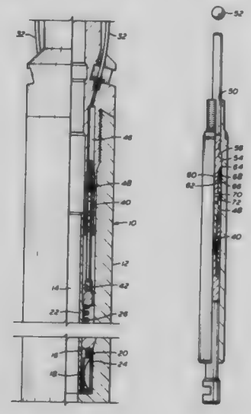
biasing means in the housing acting in a direction to move the valve closure member onto the second valve seat.

4,716,969

HYDRAULIC VALVE ACTUATING MEANS FOR SUBSURFACE SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jan. 12, 1987, Ser. No. 2,323
Int. Cl.⁴ E21B *34/10*
U.S. Cl. 166—321 **5 Claims**



1. In a subsurface well safety valve for controlling the fluid flow through a well conduit and including a housing having a bore and a valve closure member moving between open and closed positions for controlling the fluid flow through the bore, a tubular member telescopically moving in the housing for controlling the movement of the valve closure member, and biasing means for moving the tubular member in a direction to close the valve, the improvement in fluid actuating means for actuating the valve closure member comprising,

a cylinder in the housing,

a piston in and movable relative to the cylinder in response to fluid pressure in the cylinder, one of said cylinder and piston engaging and moving the tubular member,

said cylinder on one side of the piston adapted to be in communication with a fluid control passageway, and said cylinder on the second side of the piston adapted to be in communication with a biasing fluid,

first and second flow sealing valves, each of said valves are positioned on said one side of the piston and opened and closed in response to movement of the piston relative to the cylinder,

said first valve positioned to shut off fluid flow from the fluid control passageway to the cylinder when the safety valve is in said open position, and the second valve positioned to shut off fluid flow from the cylinder to the fluid control passageway when the safety valve is in the closed position,

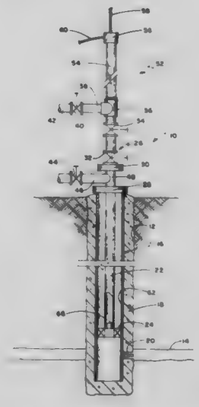
said piston includes first and second portions movable relative to each other and a metal O-ring seal positioned between the two portions of the piston, each of the two portions of the piston including a tapered safe surface facing each other for engaging the metal seal for compressing the seal outwardly into a greater sealing relationship with the cylinder when the piston is actuated.

4,716,970

OIL OR GAS WELL WORKOVER TECHNIQUE

Freddie L. Henning, P.O. Box 434, Goliad, Tex. 77963

Filed Sep. 22, 1986, Ser. No. 909,919
Int. Cl.⁴ E21B *43/00*
U.S. Cl. 166—372 **7 Claims**



1. A method of working over a well producing from a subterranean formation and having a casing string cemented in a well bore penetrating the formation, a tubing string inside the casing string and a packer sealing between the tubing string and the casing string, comprising

running into the tubing string a perforating mechanism and creating a passageway across the tubing string into the inside of the casing string by driving a member through the tubing string, the member having a passage therethrough having a check valve therein and comprising the steps of preventing fluid flow from the inside of the tubing string into the annulus between the tubing string and the casing string and allowing fluid flow into the tubing string from the annulus and then removing the perforating mechanism from the tubing string;

running into the tubing string, on a wire line, a jet pump assembly having a lower suction inlet, an upper discharge outlet and a power fluid inlet between the suction inlet and the discharge outlet, first seal means above the power fluid inlet and second seal means below the power fluid inlet;

manipulating the wire line and activating the first and second seal means for sealing against the inside of the tubing string above and below the passageway; and

placing the well back on production by injecting a power fluid downwardly into the well, passing the power fluid through the passageway across the tubing string into the power fluid inlet and delivering liquids from the formation upwardly through the well.

4,716,971

TILLAGE IMPLEMENT

Roy J. Lanham, Cygnet, Ohio, assignor to D. S. Brown Company, North Baltimore, Ohio

Filed May 5, 1986, Ser. No. 859,812
Int. Cl.⁴ A01B *23/06, 71/08*
U.S. Cl. 172—39 **10 Claims**

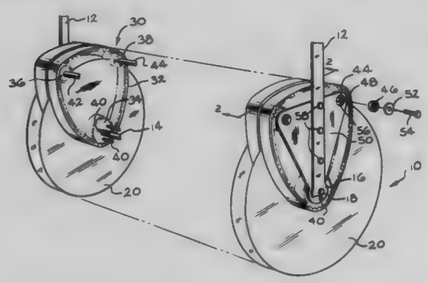
1. A tillage implement for breaking up soil in-situ, said implement comprising, in combination,

a frame having a forward portion and rearward portion,

a first shaft supported in said frame,

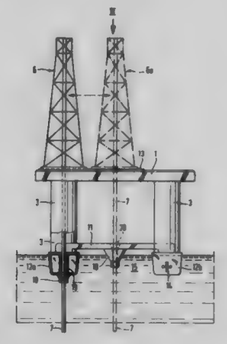
a plurality of discs or coulters mounted for rotation about the axis of said first shaft, said discs or coulters being mounted in substantially parallel, speced apart relationship,

a plurality of first belt support wheels, one mounted between each adjacent pair of said discs or coulters and around said first shaft for rotation about the axis of said first shaft,
a second shaft mounted on the rearward portion of said frame and adjacent to said discs or coulters,
a plurality of second belt support wheels mounted for rotation about the axis of said second shaft,
a plurality of belts, one mounted between each adjacent pair



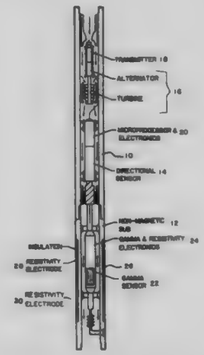
of said discs or coulters and around a first and second belt support wheel, and
drive means connected to said first or second belt support wheels and operable to cause rotation of said belts when the implement is moved in a forward direction,
wherein, as said implement is moved in a forward direction over the ground, said belts dislodge soil and debris from between said coulters or discs so that the soil and debris fall to the ground at the rear of said implement.

4,716,972
FLOATING DRILLING PLATFORM
Eero Mäkinen, Espoo, and Torsten Heideman, Kaunialaen, both of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland
Continuation of Ser. No. 503,326, Jun. 10, 1983, Pat. No. 4,596,291. This application Dec. 23, 1985, Ser. No. 812,282
Claims priority, application Finland, Jun. 15, 1982, 822159
Int. Cl.[4] B63B *35/44*
U.S. Cl. 175—8 **13 Claims**



1. A floating semisubmersible off-shore drilling platform comprising a lower pontoon portion, an upper working portion, a plurality of columns supporting the working portion above the pontoon portion, said columns being exposed to the ambient water when the pontoon portion is submerged below the level of the water surface, a drill for drilling the sea bottom, said drill extending downwards in use from the working portion of the platform, and an ice shield surrounding the drill at the level of the pontoon portion to protect the drill from floating ice when the pontoon portion is at the level of the water surface.

4,716,973
METHOD FOR EVALUATION OF FORMATION INVASION AND FORMATION PERMEABILITY
Martin E. Cobern, Cheshire, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.
Continuation of Ser. No. 745,691, Jun. 14, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,390
Int. Cl.[4] E21B *49/00*
U.S. Cl. 175—50 **27 Claims**

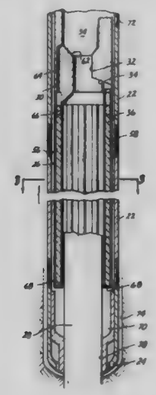


9. A method for determining an invasion parameter of a formation including the steps of:
taking a first resistivity measurement of a zone of a formation within a short and known time after drilling of a borehole in the zone has occurred and prior to any significant invasion of that zone by the drilling fluid or the liquid portion thereof;
taking a plurality of resistivity measurements of the zone at known times subsequent to said first measurement, at least some of said subsequent measurements being taken prior to the zone being flushed, and at least one of said subsequent measurements, $R(\infty)$, being taken after the zone is completely flushed by the drilling fluid; and
determining an invasion parameter, F(t), which is proportional to the difference between the resistivity measured at a time t after drilling, R(t), and the resistivity measured after the zone is completely flushed, $R(\infty)$,said invasion parameter, F(t), being determined from the said measurements of R(t) and R(x).

4,716,974
METHOD AND APPARATUS FOR CORING WITH AN IN SITU CORE BARREL SPONGE
Steven R. Radford, West Jordan, and J. Stanley Davis, Sandy, both of Utah, assignors to Eastman Christensen Co, Salt Lake City, Utah
Filed Jul. 21, 1986, Ser. No. 887,352
Int. Cl.[4] E21B *25/06*
U.S. Cl. 175—59 **20 Claims**

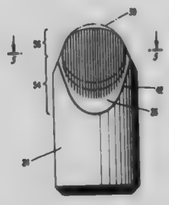
1. A method for recovering of subterranean fluid from a core at a well surface comprising the steps of:
cutting a core downhole under pressure;
disposing said core within an inner tube without the presence of any absorbent material in contact with said core;
generating a foam in liquid form downhole;
disposing said foam in liquid form into contact with said core downhole;
curing said liquid foam downhole to create a sponge-like solid in contact with said core disposed within said inner tube; and
retrieving said inner tube, sponge-like solid and core to the well surface,
whereby a subterranean core is taken, retrieved to the well surface, and depressurized during such retrieval, and wherein subterranean fluid contained within said core is retained within said sponge-like solid in the proximity of said core from which said subterranean fluid originated.

8. An apparatus for recovery of subterranean fluids at a well surface comprising:



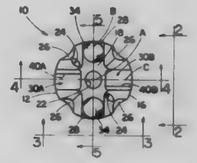
means for cutting a core downhole containing said subterranean fluids;
inner tube means associated with said means for cutting, said inner tube means for receiving said core downhole; and
means for forming an absorbent member about said core downhole after said core has been cut and disposed in said inner tube means,
whereby said absorbent member absorbs and stores said subterranean fluid for later retrieval at said well surface after said core has been cut, and whereby said absorbent member is not present within said inner tube when said core is disposed within said inner tube means.

4,716,975
CUTTING ELEMENT HAVING A STUD AND CUTTING DISK BONDED THERETO
Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.
Filed Feb. 3, 1987, Ser. No. 10,320
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **10 Claims**



1. A cutting element for use in rotary drill bits which cut in subterranean formations, comprising a generally cylindrical stud having a supporting surface disposed at a front end thereof, and a cutting disk including a substrate having a first surface bonded to said supporting surface and a second surface disposed parallel to said supporting surface and carrying a diamond substance, said supporting surface intersecting a cylindrical side surface of said stud to form an edge surrounding said supporting surface, said supporting surface including a plurality of alternating projections and grooves extending in a generally front-to-rear direction of said supporting surface, said projections and grooves including rear ends terminating short of a region of said edge situated longitudinally rearwardly of a longitudinal front half of said substrate, said first surface of said substrate including a plurality of alternating projections and grooves intermeshing with said grooves and projections of said supporting surface, with a bonding material sandwiched therebetween.

4,716,976
ROTARY PERCUSSION DRILL BIT
Edmund Isakov, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Oct. 28, 1986, Ser. No. 924,528
Int. Cl.[4] E21B *10/36, 10/38*
U.S. Cl. 175—410 **10 Claims**



5. In a rock drill bit, the combination comprising:
(a) a body having a rearward shank portion, a forward boring head with a front face and a longitudinal central axis;
(b) a plurality of cylindrical crushing inserts secured in said forward boring head portion and having noncutting rock crushing hemispherical shaped ends exposed at said front face thereof; and
(c) a plurality of cutting inserts secured in said forward head portion and having roof-shaped ends exposed at said front face thereof with a peak of each said roof-shaped ends defining a rock cutting edge;
(d) said crushing and cutting inserts being arranged on said head portion with their respective hemispherical and roof-shaped ends in a symmetrical cross-like pattern;
(e) wherein said crushing and cutting inserts are aligned along planes disposed in orthogonal relation to one another and intersecting at said central axis;
(f) and wherein said cutting edge of each of said cutting inserts extends generally parallel to and offset from said plane along which said each cutting insert is aligned.

4,716,977
SPECIALLY SHAPED CUTTING ELEMENT FOR EARTH BORING APPARATUS
Alan D. Huffstutler, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 857,701, Apr. 29, 1986, abandoned. This application Dec. 22, 1986, Ser. No. 944,773
Int. Cl.[4] E21B *10/16, 10/52*
U.S. Cl. 175—410 **12 Claims**

1. A shaped cutting element for an earth boring rock bit comprising:
(a) means defining a base;
(b) a cutting tip having back-to-back double faced flanks joined extending outward from said base to a distal end

defining a single wedgelike crest of predetermined apex angle and substantially uniform width; said cutting tip including:

(1) first and second contiguously intersecting substantially pyramidal portions successively extending longitudinally continuous from said base to said apex;

(2) said first pyramidal portion being joined to said base and having a greater number of faces than the number



of faces on said second pyramidal portion extending to said crest; and

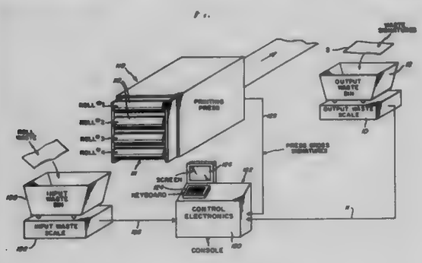
(3) said pyramidal portions being defined in a cross sectional plane taken therethrough substantially transverse to the longitudinal axis of said cutting tip as having said flanks arranged symmetrically with each flank being formed by a pair of merged planar faces angled obtusely relative to each other.

4,716,978

PAPER MONITORING SYSTEM

R. Langdon Wales, Lincoln, and H. W. Crowley, Newton, both of Mass., assignors to Automation, Inc., Needham, Mass.

Filed Dec. 11, 1985, Ser. No. 807,541
Int. Cl.[4] G01G 23/22
U.S. Cl. 177—25 30 Claims



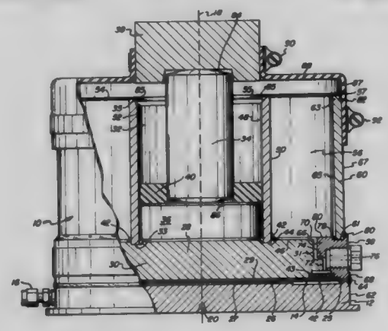
1. A system for monitoring paper consumption in association with a web printing press having the capability of monitoring paper delivery to the press from multiple rolls, said system comprising, an input waste scale, an input waste bin adapted to be disposed on the input waste scale, said input waste scale providing for the continuous registration of waste in sequence from the multiple rolls and having an output signal continuously representative of waste weight, separate means each responsive to said scale signal for sensing increments in scale weight for each respective roll to provide a total of waste weight per roll, and control means including means operator initiated for enabling only one of said separate means for sensing so as to accumulate waste weight only associated with a selected roll.

4,716,979

LOAD CELL WITH WELDED COMPONENTS

Chester D. Bradley, Darien, and Detlef Olzog, Norwalk, both of Conn., assignors to The A. H. Emery Company, New Canaan, Conn.

Filed Apr. 30, 1985, Ser. No. 728,795
Int. Cl.[4] G01G 5/04, 21/24
U.S. Cl. 177—208 10 Claims



1. A hydraulic load cell for use in measuring a loading force, the cell comprising:

(a) a base having means forming a chamber therein;

(b) a diaphragm overlying said chamber in alignment therewith;

(c) a piston overlying said diaphragm, said piston comprising:

(i) a bottom piston member positioned adjacent to and aligned with the chamber, said bottom member abutting and substantially coextensive with the diaphragm; and

(ii) a top piston member comprising a piston tube joining the bottom piston member at a first end of said piston tube by a continuous weld placed around the periphery of the piston tube;

(d) a cylinder encasing the piston, the cylinder comprising:

(i) a ring in alignment with and joined to the outer periphery of the base by a continuous weld placed around the periphery of the ring, whereby the chamber is sealed;

(ii) a cylinder casing member comprising a cylinder tube, said cylinder tube joining said ring at a first end of said cylinder tube by a continuous weld placed around the periphery of the cylinder tube;

(e) piston stabilizing means retaining said piston inside said cylinder and spacing said piston from said cylinder, said piston stabilizing means comprising a relatively thin, flexible member having an inner and an outer perimeter, said stabilizing member being joined along its inner perimeter to the piston tube along a second end thereof by a continuous weld placed around the inner perimeter of the stabilizing member, said stabilizing member also being joined along its outer perimeter to the cylinder tube along a second end thereof by a continuous weld placed around the perimeter of the annular member, whereby the piston is mounted inside the cylinder for movement therein with respect thereto in response to the loading force, whereby the continuous welds inhibit passage of moisture into said load cell; and

(f) a column having a first bearing surface for receiving the loading force and a second bearing surface for transmitting the loading force to the piston, the column being placed inside the piston tube and having a predetermined length sufficient to extend the first bearing surface through the open end of the top piston member, the column having a length D and the first and second bearing surfaces are portions of the surface of a sphere, each bearing surface having radii R1 and R2 associated therewith respectively, and R1=R2, where R1 and R2 given by

$$R = \frac{D/2}{\left(1-\cos\frac{360PM}{2\pi D}\right)+\sin\frac{360PM}{2\pi D}\left[\frac{\tan\left(90-\frac{360PM}{2\pi D}\right)-PR/P}{1+\frac{PR}{P}\tan\left(90-\frac{360PM}{2\pi D}\right)}\right]}$$

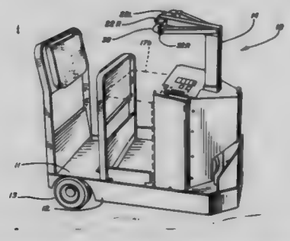
where PM is the maximum allowable lateral displacement of the loading head and PR/P is the ratio of a lateral restoring force PR to the loading force P, whereby the loading force can be applied to the piston through the column.

4,716,980

CONTROL SYSTEM FOR RIDER VEHICLES

Robert W. Butler, Rural Letts, Iowa, assignor to The Prime Mover Company, Muscatine, Iowa

Filed Feb. 14, 1986, Ser. No. 830,520
Int. Cl.[4] B62D 51/04
U.S. Cl. 180—19.2 20 Claims



1. An electric rider vehicle comprising: electrical propulsion means for propelling said vehicle, means for supporting a person in an operator's position on said vehicle, first control means disposed on said vehicle in said operator's position for manipulation by a person at said position for effecting operation of said propelling means in forward and reverse directions in a first mode of propulsive operation, second control means disposed on said vehicle in a position wherein it is accessible for manipulation by a person walking beside said vehicle for effecting operation of said propelling means in forward and reverse directions in a second mode of propulsive operation which is different from said first mode, and means for selecting between operation of said propelling means by said first control means in said first mode or said second control means in said second mode and precluding operation of said propelling means by the non-selected control means in the respective non-selected mode.

4,716,981

APPARATUS FOR STEERING FRONT AND REAR WHEELS OF A MOTOR VEHICLE

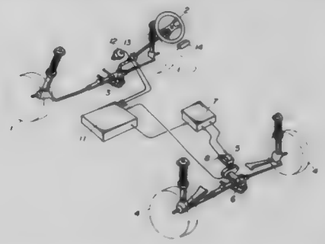
Eiji Murao, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 12,846
Claims priority, application Japan, Feb. 12, 1986, 61-29544; Feb. 12, 1986, 61-29546; Feb. 12, 1986, 61-29547; Feb. 12, 1986, 61-29548
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—79.1 8 Claims

1. An apparatus for steering the front and rear wheels of a motor vehicle, comprising:

detecting means for detecting an effect of operation by a driver of the motor vehicle on the behavior of the motor vehicle; and

a rear wheel steering control device for returning the rear wheels to a neutral steering position when a rate of change



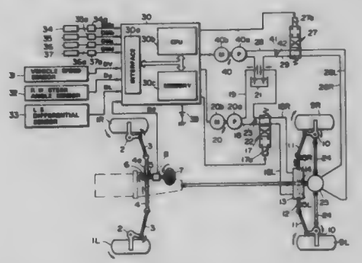
of a detected output from said detecting means is in excess of a prescribed value.

4,716,982

FOUR WHEEL STEER CONTROL SYSTEM CONNECTED WITH LIMITED SLIP DIFFERENTIAL

Katsumi Ishii, Sagamihara; Kazue Hirayama, Yamato; Yoshio Matsuoka, Tokyo, and Kotoi Takahashi, Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 12, 1986, Ser. No. 929,276
Claims priority, application Japan, Nov. 13, 1985, 60-254698
Int. Cl.[4] B62D 5/06
U.S. Cl. 180—140 6 Claims



1. A vehicle comprising;

a four wheel steer system for varying a rear wheel steer angle in response to a control signal,

a differential disposed between right and left drive wheels of said vehicle,

slip limiting means for limiting a differential action of said differential,

means for sensing a slip limiting amount of said slip limiting means, and

controlling means for producing said control signal and controlling a ratio of the rear wheel steer angle to a steering wheel angle in accordance with said slip limiting amount sensed by slip limiting amount sensing means.

4,716,983

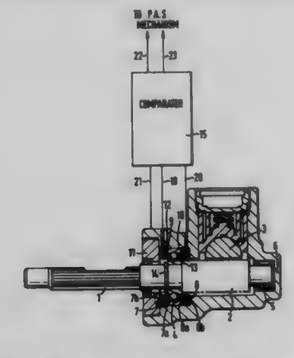
TORQUE SENSING VEHICLE STEERING SYSTEM

Frederick J. Adams, Clevedon, and Kenneth Chandler, Bristol, both of Great Britain, assignors to TRW Cam Gears Limited, Hitchin, Great Britain

Filed Jan. 27, 1986, Ser. No. 822,829
Claims priority, application United Kingdom, Jan. 30, 1985, 8502276
Int. Cl.[4] B62D 5/00
U.S. Cl. 180—142 13 Claims

5. A vehicle steering system comprising a thrust component,

means for generating an axial load on said thrust component proportional to an input steering torque applied to the system during a steering manoeuvre, two axially opposed thrust faces on said thrust component each of which respectively opposes one of two restraining faces on a housing part, one restraining faces and the thrust face which opposes it forming one pair of faces which restrain said thrust component from axial displacement in one direction, and the other restraining face and the thrust face which opposes it forming a second pair of faces which restrain said thrust component from axial displacement in the direction opposite to said one direction, two pressure responsive electrical components each located between the respective opposed faces of said pairs to provide variations in electrical signals proportional to the thrust developed thereon



by pressure from the respectively opposed thrust faces in restraining axial displacement of said thrust component, and a comparator to which said signals are applied, said comparator comparing said signals with a neutral and emitting a control signal when said signals deviate from a predetermined comparative condition for controlling operation of power assist means that provides power assist to operation of said steering system, said pressure responsive electrical components being preloaded so that continuous electrical signals results, said signals being applied to said comparator to determine a comparative condition, said steering system further including means comprising a cap screw threadedly secured to the housing for preloading said pressure responsive electrical components, the preload being adjusted by the amount of torque applied to the cap screw during assembly of the steering system.

4,716,984

AUTOMOTIVE VEHICLE POWER TRAIN

Takefumi Hiramatsu, and Noboru Ashikawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,700
Claims priority, application Japan, Mar. 27, 1985, 60-62351
Int. Cl.[4] B60K *5/04*
U.S. Cl. 180—297 **5 Claims**

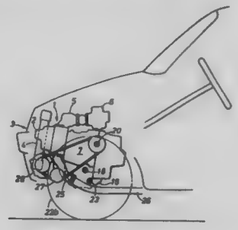
1. A power train for an automotive vehicle comprising a body with an engine compartment, comprising:

(a) an engine comprising a crank shaft and at least one cylinder, mounted within said engine compartment with said crank shaft extending transversely to the longitudinal direction of the vehicle body and with said cylinder extending generally horizontally;

(b) a transmission device comprising a power input shaft, coupled to said engine with said power input shaft coaxially with and rotationally driven from said engine crank shaft;

(c) a differential device, driven from said transmission device, with an axial center line which is located generally below the center line of said crank shaft, and

(d) said vehicle having two wheels driven from said differential device and arranged on a driven axle means, wherein, in the longitudinal direction of the vehicle, the axis of the



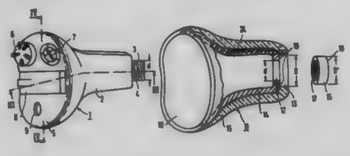
two driven wheels is located generally between said center line of said crank shaft and said axial center line of said differential device.

4,716,985

IN-THE-EAR HEARING AID

Christof Haerti, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 44,727
Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616558; May 16, 1986, 3616557
Int. Cl.[4] H04R *25/02*
U.S. Cl. 181—130 **17 Claims**



1. An in-the-ear hearing aid, including a pear-shaped housing that encompasses a distal, bead-like head part having a planar face on which a face plate is seated and encompasses a proximal, thinner tail part, whereby a longitudinal axis of the tail part is angled off relative to a normal line of the planar face of the head part in two mutually perpendicular longitudinal sectional planes of the housing, comprising the improvement wherein an angle α between the normal line of the planar face and the longitudinal axis of the tail part lies in the range of 135°–142° in one of said longitudinal planes.

4,716,986

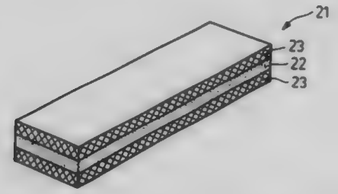
VIBRATION DAMPING SYSTEM

Tadahiro Umemoto, and Hiroe Kobayashi, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,161
Int. Cl.[4] F16F *7/00*
U.S. Cl. 181—207 **21 Claims**

1. A vibration damping system comprising: vibration damper means interposed between an equipment to be vibration-damped and a support for supporting said equipment, said vibration damper means consisting of first bar or plate means made of a metal having a degree of plastic deformation stress,

and second bar or plate means unitarily joined to said first bar or plate means and made of a metal having a degree of plastic



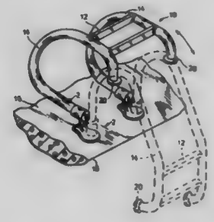
deformation stress different from that of said first bar or plate means.

4,716,987

SWIMMING POOL LADDER SECUREMENT DEVICE

Albert W. Lindberg, Jr., 125 W. 6th St., Bayonne, N.J. 07002

Continuation-in-part of Ser. No. 891,482, Aug. 1, 1986, abandoned. This application Apr. 16, 1987, Ser. No. 39,308
Int. Cl.[4] E06C *7/50, 9/06*
U.S. Cl. 182—97 **6 Claims**



1. A releasable securement device for a swimming pool ladder having a tubular ladder rail hingedly connected to an anchor mounted in the swimming pool deck, comprising:

a hollow cup-like cylindrical ferrule having an open end and a generally closed end, said ferrule conformed to slidably and coaxially receive the tubular ladder rail through the open end of said ferrule, the closed end having a hole therethrough located approximately coaxially to the longitudinal axis of said ferrule;

means for hingedly attaching said ferrule to the anchor;

clamping bolt means passing through said hole in the closed end of said ferrule and disposed generally coaxially with the longitudinal axis of said ferrule;

a cap shaped spacer with a central opening in the closed end thereof disposed within said ferrule so as to receive said clamping bolt means through said opening, said spacer being arranged so that the closed end thereof is spaced from the closed end of said ferrule;

a compression disc threadably engaged with said clamping bolt means, said compression disc being coaxially positioned within the tubular ladder rail to be secured and having a diameter slightly smaller than the inside diameter of the tubular ladder rail;

a cylindrically shaped resilient member with first and second ends and having an outside diameter in the relaxed state slightly smaller than the inside diameter of the ladder rail, said member being positioned within the ladder rail between said compression disc and the closed end of said spacer, so that when said bolt means is tightened, said copression disc retracts towards the closed end of said spacer, forcing the sidewall of the cylindrically shaped resilient member to expand radially outward to lockingly engage the inner surface of the ladder rail so as to prevent said member from moving within the rail; and

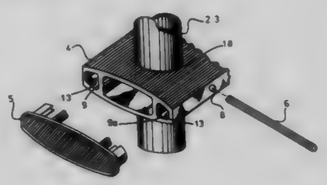
means for releasably engaging said compression disc with the first end of said resilient member so that said disc does not turn during the threading of said bolt in said disc.

4,716,988

LADDER STEP CONSTRUCTION FOR USE WITH RECREATIONAL VEHICLES AND BOATS

Thomas F. Graffy, Los Angeles, Calif., assignor to Top Line Manufacturing Inc., Paramount, Calif.

Filed Aug. 6, 1986, Ser. No. 893,737
Int. Cl.[4] E06C *7/08*
U.S. Cl. 182—228 **1 Claim**



1. An end cap wherein: said end cap is molded from a plastic material, said end cap shape comprising a cap base, two interference fingers, four posts and two stiffeners; said interference finger being comprised of a relatively stiff pillar to which are joined two flat flexible flaps which are angled outward in order to apply pressure against the inner wall of a ladder step end cavity extrusion, forcing the stiff pillar against the outer wall surface of said step; said posts being cylindrical columns, arranged so as to aid in the alignment of said end cap in said ladder step end cavity extrusion; said stiffeners being employed to join said posts at their bases, providing support and stiffening to said end cap; said cap base providing the means for attaching and supporting said interference fingers remaining in interference contact with said ladder step end cavity extrusion throughout a wide range of temperature experienced.

4,716,989

ELEVATOR COMPENSATING CABLE

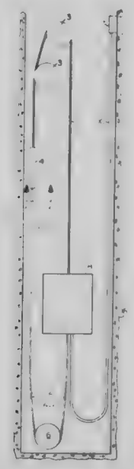
John D. Coleman, and Donald L. Obet, both of Hickory, N.C., assignors to Slecor Corporation, Hickory, N.C.

Filed Aug. 4, 1982, Ser. No. 405,147
Int. Cl.[4] B66B *9/00*
U.S. Cl. 187—1 R **23 Claims**

1. An elongated member comprising:

(a) an elongated sheath;

(b) at least one elongated strength member disposed in said sheath; and,



(c) the volume of said sheath not otherwise occupied by said elongated strength member substantially occupied by a mixture of metal particles and plastic.

4,716,990

HYDRAULIC DRIVING CIRCUIT FOR A FORKLIFT TRUCK

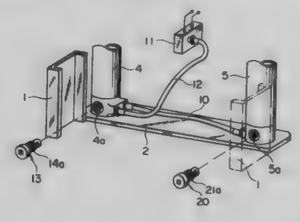
Toshiyuki Takeuchi, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 6, 1985, Ser. No. 795,517

Claims priority, application Japan, Dec. 1, 1984, 59-183042[U]

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 E 3 Claims



1. An hydraulic driving circuit on a forklift truck, comprising:

a substantially horizontal tie beam on said truck;

respectively parallel and substantially vertical first and second hydraulic lift cylinders, having respective bottom ends, mounting on said tie beam;

a substantially vertical inner mast mounted for vertical movement on said truck, and means connecting said inner mast to said first and second hydraulic lift cylinders for said vertical movement of the inner mast responsive to hydraulic actuation of said cylinders;

means defining respective bottom chambers within each of said hydraulic lift cylinders adjacent to their said respective bottom ends;

an hydraulic fluid piping connection between said respective bottom chambers of said hydraulic lift cylinders;

hydraulic fluid pump means on said truck, including a changeover valve means switchable between a cylinder-ascent position and a cylinder-descent position, and an hydraulic fluid piping connection between said pump means and said bottom chamber of said first hydraulic lift cylinder;

means defining respective valve-receiving apertures in each of said first and second hydraulic lift cylinders, each said valve-receiving aperture extending radially inwardly into said bottom chamber of its said associated lift cylinder from the exterior thereof;

a fluid flow control valve removably mounted in said valve-receiving aperture of said first hydraulic lift cylinder; and

a safety descent valve removably mounted in said valve-receiving aperture of said second hydraulic lift cylinder,

whereby said flow control valve and said safety descent valve are each removable from an accessible location on the periphery of said hydraulic lift cylinder on which it is mounted.

4,716,991

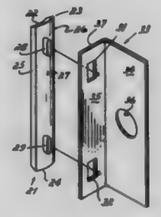
ELEVATOR GUIDE SHOE

Carl Riechers, 7820 Gleabrook Court, Cincinnati, Ohio 45224

Filed Jul. 21, 1986, Ser. No. 887,384

Int. Cl.[4] B66B *7/04*

U.S. Cl. 187—95 7 Claims



1. An elevator guid shoe and bracket therefor adapted to ride on a generally cylindrical rail between the rail and a guide shoe bracket comprising:

a concave rail-engaging surface;

an opposed convex bracket-engaging surface, including means to engage said guide shoe bracket;

and means permitting side to side movement of said guide shoe relative to said bracket.

4,716,992

OPERATING PANEL DEVICE FOR AN ELEVATOR SYSTEM

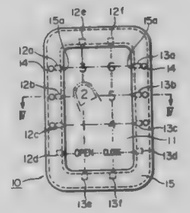
Kazushi Kunii, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 8, 1986, Ser. No. 904,283

Claims priority, application Japan, Sep. 9, 1985, 60-199235

Int. Cl.[4] B66B *3/00*; G08B *5/36*

U.S. Cl. 187—121 17 Claims



1. An operating panel device for an elevator system comprising:

an indicator panel having a plurality of indication marks described thereon;

a first light-emitting means for emitting light signals which pass along a surface of said indicator panel across said indication marks;

a light-receiving means for receiving the light signals from said first light-emitting means whereby when at least one of the light signals emitted from said first light-emitting means passing across a specific one of said indication marks on said indicator panel is selectively interrupted, said light-receiving means detects such a selective interruption of the at least one of the light signals to send out an operation command signal corresponding to the specific indication mark; and

a second light-emitting means mounted on said indicator panel near each of and corresponding to the indication marks and connected to be activated to emit light in response to an operation command signal to indicate that the corresponding specific indicator mark is selectively interrupted.

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DISC BRAKE

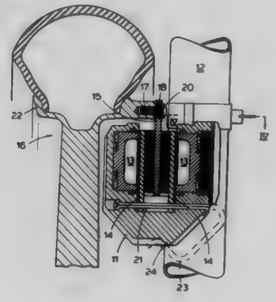
Richard A. Bass, Warwick, England, assignor to Automotive Products plc, Leamington Spa, England

Continuation of Ser. No. 571,724, Jan. 18, 1984, abandoned. This application Feb. 4, 1986, Ser. No. 825,697

Claims priority, application United Kingdom, Aug. 29, 1981, 8126424; Mar. 18, 1982, 8207952

Int. Cl.[4] B60T *1/06, 11/00*; F16D *55/00*; A63C *17/12*

U.S. Cl. 188—18 A 17 Claims



1. A disc brake for a motorcycle wheel which is supported by a pair of fork legs for rotation about an axis, the disc brake comprising an annular disc having opposite sides and an outer peripheral portion, fastening means securing said outer peripheral portion to said wheel, said fastening means allowing said disc limited axial play relative to said wheel, a brake caliper mounted on one of said fork legs, in operative position said caliper being stationary relative to said one of said fork legs, said caliper having a bridge portion which straddles an inner periphery of said disc and leg portions extending from the bridge adjacent said opposite sides of said disc, each said leg portion carrying at least one hydraulically actuated piston, said pistons being operable to press friction pads against the opposite sides of the disc, said fastening means comprising members which locate in said wheel, said peripheral portion defining openings each extending through said disc in a direction axially of the disc, a respective said member passing through each said opening, each said opening being elongated in the radial direction so as to provide elongate spaced edges and so as to define a radial clearance between said opening and said member therein, and each said opening extending radially inwardly to form a radial slot to facilitate radial thermal expansion of the disc and to facilitate assembly of the disc onto the wheel.

10. A disc brake for a motorcycle wheel, said wheel being supported by a pair of fork legs for rotation about an axis, the disc brake comprising an annular disc having opposite sides and an outer peripheral portion, fastening means securing said outer peripheral portion to said wheel, said fastening means allowing said disc limited axial play relative to said wheel, a brake caliper mounted on one of said fork legs, said caliper having first and second arms, a bridge portion which straddles an inner periphery of said disc and leg portions extending from said bridge adjacent said opposite sides of said disc, one of said arms extending from one of the leg portions and the other of said arms extending from said bridge portion, the said arms being secured to the said one of said fork legs to prevent axial movement of the caliper relative thereto, and the caliper being removable from one of said fork legs upon release of said arms in an operative position, said caliper being stationary relative to said fork legs, each said leg portion carrying at least one hydraulically actuated piston, said pistons being operable to press friction pads against the opposite sides of the disc, said fastening means comprising members which locate in said wheel, said peripheral portion defining openings extending through said disc in a direction axially of the disc, a respective said member passing through each said opening, each said opening being elongated in the radial direction so as to provide elongate spaced edges and so as to define a radial clearance between said opening and said member therein, each said opening extending radially inwardly to form a radial slot to facilitate radial thermal expansion of the disc and to facilitate assembly of the disc onto the wheel.

4,716,994

DISC BRAKE

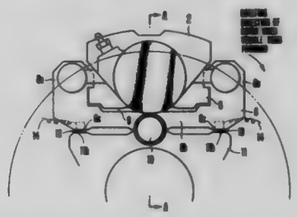
Tadashi Iwamoto, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed Aug. 12, 1986, Ser. No. 896,139

Claims priority, application Japan, Aug. 16, 1985, 60-180246; Nov. 5, 1985, 60-247792

Int. Cl.[4] F16D *55/46*

U.S. Cl. 188—72.2 6 Claims



1. A disk brake comprising a rotor having an axis, a pair of oppositely facing revolving faces facing in the axial direction of said rotor and a radially outer circumferential periphery, a caliper straddling a portion of the outer circumferential periphery of said rotor and including therein a piston-cylinder device, a pair of friction pads mounted on said caliper each on an opposite side of said rotor facing one of said revolving faces, with said piston-cylinder device arranged to cause said pair of friction pads to frictionally engage the revolving faces of said rotor, and a support member supporting said caliper so that said caliper is slidable in the axial direction of said rotor and said support member receives a braking torque developed by said friction pads one of directly and through said caliper, comprising:

a fixed support, said support member supported on said fixed support, a pin member having an axis parallel with the axis of said rotor connects said support member to said fixed support so that said support member is turnable about the axis of said pin member, said fixed support includes anchor parts spaced transversely of the axial direction of said pin

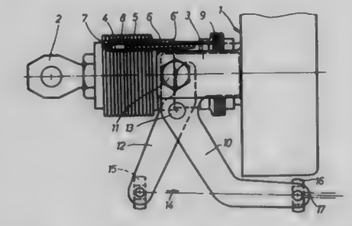
member outwardly from said pin member, said anchor parts engage said support member for limiting the degree said support member is turned on said pin member; and turning force detecting means located on at least one of said anchor parts for detecting the turning force of said support member, and said turning force detecting means includes a transducer for detecting the magnitude of the turning force as an electrical signal.

4,716,995

PARKING BRAKE ARRANGEMENT FOR A RAIL VEHICLE BRAKE UNIT

Bo S. A. Nilsson, Eslöv, and Krister E. Ljung, Bjärred, both of Sweden, assignors to SAB Nife AB, Landskrona, Sweden

Filed Nov. 18, 1985, Ser. No. 799,170
Claims priority, application Sweden, Nov. 19, 1984, 8405792
Int. Cl.⁴ F16D *65/52*
U.S. Cl. 188—197 **5 Claims**



1. A parking brake arrangement for a rail vehicle brake unit, comprising: a brake unit housing; a push rod extending outwardly from the brake unit housing and movable axially; service brake actuation means connected witht he push rod to selectively engage and disengage a service brake; a tubular housing extending from the brake unit housing; slack adjuster means movable relative to the tubular housing along the push rod axis in a brake force applying direction; parking brake sleeve means surrounding the tubular housing and slidable relative thereto, the parking brake sleeve means provided with a shoulder and in abutting relationship with the slack adjuster means and connected with the push rod; and at least one parking brake lever pivotally carried by the brake unit housing and abutting the shoulder of the parking brake sleeve means to move the parking brake sleeve means and the push rod to selectively engage the brake unit independently of the service brake actuation means.

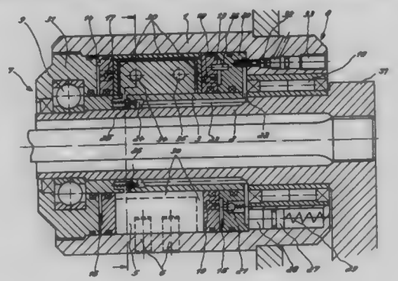
4,716,996

HYDRAULIC ROTATION DAMPER

Kurt M. Hummel, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 886,573
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525965
Int. Cl.⁴ F16F *9/14*
U.S. Cl. 188—306 **8 Claims**

1. An hydraulic rotation damper comprising: a bearing housing with inwardly-extending angularly-spaced stator vanes, a carrier arm journal mounted in spaced-apart bearings in the bearing housing, a rotor with outwardly-extending angularly-spaced rotor vanes arranged to be interspersed with respect to the stator vanes so that each rotor vane is flanked by stator vanes, the rotor being shaped to seat on the carrier arm journal, a plurality of working chambers defined by the stator vanes and the rotor vanes and by spaced-apart end walls in the bearing housing, a pair of annular gaps arranged one near each end of the working chambers but separated therefrom by the end walls of the working chambers, at least one passage extending between the working chambers and each annular gap for feeding working medium at a pressure corresponding to the pressure present in the working chambers to those annular gaps, one-way valves arranged in the end walls of the working chambers and adapted to open in one direction only for the supply of working medium through the said passages to the



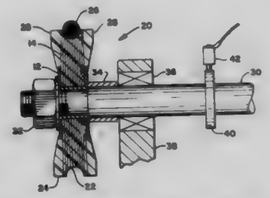
annular gaps, and a passage containing a damping valve connecting at least one of the annular gaps with an annular space in communication with the working chambers for the transfer of working medium from pressure-loaded working chambers into unloaded working chambers during operation of the damper.

4,716,997

CONDUCTIVE IDLER SHEAVE

William H. Gibson, Aurora, Colo., assignor to Otis Elevator Company, Farmington, Conn.

Filed Feb. 18, 1986, Ser. No. 830,405
Int. Cl.⁴ B60L *5/06*
U.S. Cl. 191—63 **1 Claim**



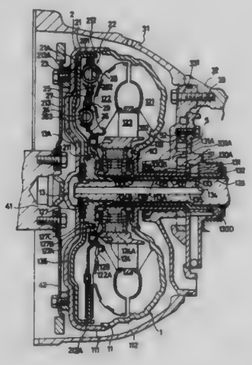
1. An idler sheave for contacting a moving cable, comprising:
- a wire wheel brush having metal bristles emanating radially from a metal hub; and
- plastic material molded in the form of a sheave coaxially onto the wire wheel brush and interspersed between the bristles, wherein the bristles extend to the outer surface of the sheave; for applying a voltage to said moving cable;
- a metal hub comprising two radially extending spaced apart plates joined by an axial tubular section, said bristles contacting said tubular section and said plates being in contact with opposite radial surfaces of said sheave.

4,716,998

DIRECT COUPLING CLUTCH WITH A DAMPER DEVICE FOR A FLUID COUPLING

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Koji Maeda, both of Anjo; Kazuaki Watanabe, Toyota, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Apr. 28, 1986, Ser. No. 856,815
Claims priority, application Japan, Apr. 30, 1985, 60-93454; Apr. 30, 1985, 60-93456; Apr. 30, 1985, 60-93457
Int. Cl.⁴ F16H *45/02*; F16D *3/66*
U.S. Cl. 192—3.3 **3 Claims**



1. A direct coupling clutch with a damper device for a fluid coupling including an input shaft, an output shaft, a fluid casing concentrically secured with said input shaft, a pump impeller mounted on said fluid casing and a turbine runner connected to said output shaft through a turbine hub comprising:

said direct coupling clutch including a piston axially slidably disposed about one of said output shaft and turbine hub and adapted to engage with and disengage from a portion of said fluid casing, and a fluid passage for supplying pressurized fluid to a chamber defined between an inside surface of said fluid casing and an opposed surface of said piston; and

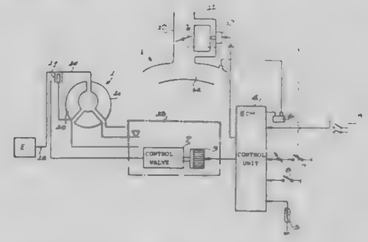
said damper device disposed between said turbine hub and piston and drivingly connecting said hub and piston, said damper device further including a driven plate consisting of first and second annular guide plates secured concentrically with each other, first and second rows of toroidal spaces arranged between said first and second guide plates along a first and a second concentric circles in equally spaced apart layout in circumferential directions, respectively, an annular drive plate slidably interposed with respect to and between said guide plates and having a row of windows along a circle having a diameter similar to that of the first circle arranged in equally spaced apart layout in circumferential direction and a row of projections projecting radially inwardly from an inner edge of said drive plate along a circle having a diameter similar to that of the second circle and smaller than that of the first circle arranged in equally spaced apart layout in circumferential direction, a first group of resilient members, each of which is placed in each of said toroidal spaces of the first row formed in said driven plate and within said window formed in said driven plate and a second group of resilient members, each of which is greater in spring constant and smaller in compression stroke length than those of each resilient member of the first group and is placed in each of said toroidal spaces of the second row formed in said driven plate and between adjacent projections formed in said drive plate and adapted to be compressed after each resilient member of the first group has been compressed to a predetermined state.

4,716,999

SYSTEM FOR CONTROLLING A LOCK-UP SYSTEM OF AN AUTOMATIC TRANSMISSION FOR A MOTOR VEHICLE

Kazunari Terada, Asaka, and Mitsuo Nakamura, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1986, Ser. No. 816,098
Claims priority, application Japan, Jan. 10, 1985, 60-2922
Int. Cl.⁴ F16D *47/02*; B60K *41/02*
U.S. Cl. 192—3.29 **2 Claims**



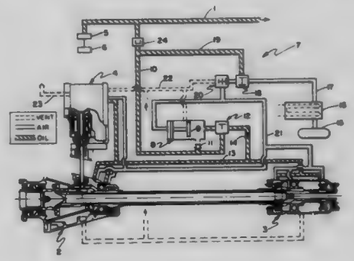
1. A system for controlling a lock-up system of an automatic transmission for an engine powered vehicle having a torque converter, comprising:
- a fluid operated lock-up clutch for locking the torque converter;
- sensing means for sensing driving conditions of the motor vehicle and for producing a driving condition signal;
- control means responsive to the driving condition signal for producing an output signal in a lock-up condition state;
- a solenoid operated control valve responsive to the output signal for applying fluid to the lock-up clutch to engage the lock-up clutch; and
- valve means responsive to the output signal for reducing the amount of intake air of an engine of the vehicle in lock-up state so as to prevent changing of engine torque.

4,717,000

INTEGRATED EMERGENCY LUBRICATION SYSTEM

Clive Waddington, Stratford; Normand L. Lagasse, Milford, and George T. Milo, Stratford, all of Conn., assignors to Avco Corporation, Providence, R.I.

Filed Aug. 5, 1986, Ser. No. 893,176
Int. Cl.⁴ F01M *1/18, 11/10, 9/10*; F16C *35/00*
U.S. Cl. 184—61 **16 Claims**



1. An integrated emergency lubricating system for lubricat-

ing the bearings of a gas turbine engine when its normal lubrication system fails comprising:

an oil accumulator for storing an emergency oil supply derived from the normal lubrication system when the gas turbine engine is operating normally;

a source of compressed air; and

oil pressure sensitive valve means responsive to the normal pressure of oil in the normal lubrication system for blocking the flow of oil from said accumulator to said bearings during normal operation, and responsive to a drop in the normal oil pressure in the normal lubricating system for permitting air to flow from said source to said oil accumulator when the normal lubrication system fails whereby oil in said oil accumulator is displaced by the air and supplied to the bearings requiring emergency lubrication.

4,717,001

FRICTION CLUTCH

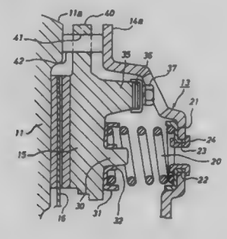
Kazuhiko Yoneda, Katano, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jul. 30, 1985, Ser. No. 760,424

Claims priority, application Japan, Jul. 31, 1984, 59-118858[U]

Int. Cl.⁴ F16D *13/71*

U.S. Cl. 192—30 V **12 Claims**



1. A friction clutch having a clutch disk and a pressure plate for pressing said clutch disk toward an engine-side flywheel, both said clutch disk and said pressure plate being concentrically arranged in a space defined by and between said flywheel and a clutch cover fixed to said flywheel, said friction clutch comprising:

holes bored in outwardly projecting tongues integrally formed on said pressure plate, each hole extending in a parallel relation to a center line of said clutch,

a roll pin extending in a parallel relation to said center line and slidably press fitted in each of said holes, said roll pin being axially held between said flywheel and said clutch cover in a pressure contact at opposite ends with said flywheel and said clutch cover wherein vibration of said pressure plates is absorbed by friction between said holes and said roll pin.

4,717,002

UNIVERSAL POWER ASSIST ARRANGEMENT FOR USE WITH A VEHICLE TRANSMISSION CLUTCH LINKAGE

Ross Sasamura, Fremont, Calif., assignor to Paccar, Inc., Bellevue, Wash.

Filed Dec. 2, 1985, Ser. No. 803,434

Int. Cl.⁴ F16D *23/12*; F16K *31/44*

U.S. Cl. 192—99 S **1 Claim**

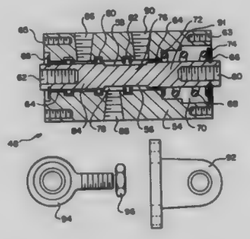
1. In a vehicle of the type having a manual transmission which includes a clutch, a clutch pedal and a linkage assembly interconnecting the clutch with the pedal and which requires that the drive depress the clutch pedal in order to disengage the clutch, a valve assembly forming part of an overall arrangement including a power device and source of power to assist the driver in disengaging said clutch when the clutch pedal is depressed, said valve assembly comprising:

(a) a valve including first and second members movable relative to one another between a first opened condition and a second closed condition.

(b) means for operationally connecting said valve between said power device and source of power so as to connect said source of power with said power device when the valve is in its opened condition; and

(c) valve mounting means for interconnecting said valve with said linkage assembly such that the manual depression of said pedal by said driver acts on said valve to cause its members to move from said closed condition to said opened condition;

(d) said valve and valve mounting components being configured such that they form part of said overall arrangement whether said linkage assembly interconnecting the vehicle's clutch with its pedal is placed in tension or compression.



4,717,003

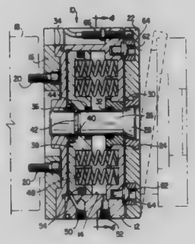
BREAKAWAY CLUTCH FOR ROBOT END-OF-ARM TOOLING

Peter E. McCormick, and Walter D. Autry, Jr., both of Dallas, Tex., assignors to EOA Systems, Dallas, Tex.

Filed Apr. 21, 1986, Ser. No. 854,172

Int. Cl.⁴ B25J *17/00, 19/00*

U.S. Cl. 192—56 F **17 Claims**



1. A breakaway clutch for robot end-of-arm tooling comprising:

a housing having a piston cavity;

a piston confined within the piston cavity, said piston capable of lateral movement within said cavity;

a tool plate;

securing means for connecting the tool plate to the piston;

biasing means for biasing the piston away from the tool plate, said biasing means being adjustable to vary the bias;

locating means for positioning the tool plate in a normal position in relation to the housing; and

proximity sensing means for sensing relative movement between the tool plate and the housing.

4,717,004

SELF-ADJUSTING CLUTCH MECHANISM

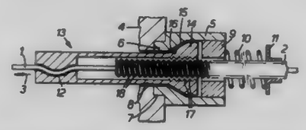
Edgar Hoyle, 193 The Street, Boughton, Faversham, Kent ME13 9BH, United Kingdom

Continuation of Ser. No. 610,987, May 11, 1984, abandoned. This application Oct. 16, 1986, Ser. No. 920,894

Claims priority, application United Kingdom, Sep. 14, 1982, 8226107

Int. Cl.⁴ F16D *13/75*

U.S. Cl. 192—111 A **8 Claims**



1. An engine clutch control mechanism incorporating a flexible remote control cable comprising a conduit (2, 51); a core (1, 50) longitudinally displaceable with said conduit (2, 51); an abutment (5, 29, 52) which is located adjacent the cable control near one end of the conduit (2, 27, 51) and vin which axial load on the conduit can be transmitted to a fixture (4, 53), and a conduit-anchoring device (13, 13', 55) which anchors the conduit against axial displacement relative to said abutment during each operative (clutch-disengaging) stroke of the core (1, 26, 50) but automatically releases the conduit as the core approaches the end of its return (clutch-engaging) stroke thereby to allow change in the effective length of the cable control to take place under any residual loading of the cable by the clutch-return spring; said conduit-anchoring device (13, 13', 55) being a one-piece (or "unitary") component having a first part comprising toothed jaws (14, 54) each having a wedging surface which, on axial displacement of said component in a certain direction, cooperate wedge-fashion with a wedging surface on said abutment (5, 29, 52) and thereby become radially inwardly displaced so that the jaw teeth intermesh with a series of teeth (18) which is provided along at least part of the conduit so as to provide a series of adjustment positions, and a second part (13*a*) having a bore through which the core (1, 26, 50) passes and through which it is slidable against a frictional resistance which thereby forms a friction coupling between said component and the core, which coupling serves during an initial part of each clutch-disengaging stroke of the core to transmit force from the core to the said component (13, 13', 55) thereby to cause its said axial displacement and toothed engagement with the conduit whereafter said coupling allows such clutch-disengaging stroke to continue to completion while said toothed engagement is maintained.

2. An engine clutch control mechanism according to claim 1, wherein said friction coupling is formed by a spring which is mounted in said first portion (13'*a*) of the collet (13') and bears against the core (1).

4,717,005

COIN OPERATED WATERCRAFT WINCHES/CAPSTANS

Frederick L. Jones, 1777 SE. 15th St., Fort Lauderdale, Fla. 33316

Filed Jul. 7, 1986, Ser. No. 882,469

Int. Cl.⁴ G07F *7/00, 17/00*; B66D *1/06*

U.S. Cl. 194—208 **24 Claims**

1. An electrically powered winch system for improved launching and hauling out of watercraft for installation at a site where land meets water including beaches, boat ramps and the like, comprising:

a. electric motor means;

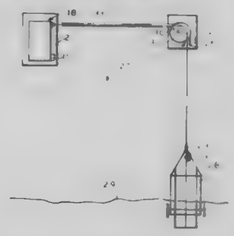
b. speed reduction means having an input connected to said motor means and an output driven by said input that provides a lower rotational speed and higher torque than said motor means;

c. cable spool means rotatable about a horizontal axis, said spool means connected to, and driven, by said output of said reduction means;

d. spool support means journalled to rotatably support said spool means in bearing means, said support means including means for permanent installation at the surface of said land to resist pulling forces generated in said hauling out;

e. electric supply means connected to said electric motor means for supplying electric power to drive said motor means;

f. electric control means connected between said electric supply means and said motor means to control the flow of electric current to said motor means;



g. time interval means operationally connected to said control means to cause said control means to make available a flow of electric current to said motor means continuously throughout a predetermined time interval when actuated by an outside signal; and

h. token receiving means connected to said time interval means to provide said outside signal upon receipt of a specific token.

4,717,006

COIN DISCRIMINATING APPARATUS USING COIL PULSES OF DIFFERENT LENGTHS

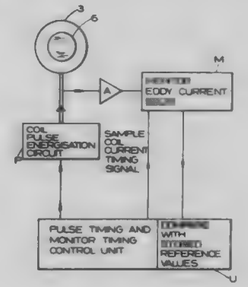
Colin K. L. Chapman, Oswestry, and Geoffrey Howells, Cosham, both of England, assignors to Cash & Security Equipment Limited, London, England

Continuation of Ser. No. 577,670, Feb. 7, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 768,016

Claims priority, application United Kingdom, Feb. 9, 1983, 8303587

Int. Cl.⁴ G07F *3/02*; G01N *27/72*; G01R *33/12*

U.S. Cl. 194—318 **4 Claims**



1. A coin discriminating apparatus comprising means defining a coin path along which coins presented to said apparatus are caused to pass, coil means positioned adjacent to said coin path for inducing eddy currents in a coin proceeding along said coin path, pulsing means connected to said coil means for selectively pulsing said coil means with voltage pulses of shorter and longer durations, damping means permanently associated with said coil means and of a magnitude which prevents repeated oscillations of current in said coil means, eddy current detection means positioned adjacent to said coin path and responsive to decaying eddy currents in a coin proceeding along said coin path to produce an output signal,

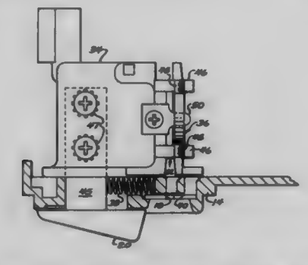
monitoring means responsive to said output signal of said eddy current detection means for monitoring the decays of said eddy currents in said coin produced by said pulses of shorter and longer durations for producing measurement values of said decays corresponding respectively to said pulses of shorter and longer durations, a reference value store for storing reference values, and means for identifying a concordance between both said measurement values and respective ones of said reference values for providing an identification signal only on detection of a concordance between both said measurement values and said reference values.

4,717,007

NON-TRAPPING COIN SHUTTLE FOR ELECTRONIC PARKING METER

John W. Van Horn, Harrison, Ark., assignor to Qonsar Corporation, Rolling Meadows, Ill.

Filed Apr. 17, 1986, Ser. No. 853,007
Int. Cl.[4] G07F *1/04, 1/00*
U.S. Cl. 194—343 **6 Claims**



1. Coin shuttle apparatus for electronic parking meters or other coin acceptance apparatus including frame means; a shuttle body; means for retaining the body on the frame means for slidable movement thereon between a first coin receiving position and a second coin transfer position; handle means rigidly connected to the body for manually moving the shuttle body from the first coin receiving position to the second coin transfer position; a shuttle gate, means for pivotally mounting the gate on the body in spaced relationship thereto whereby the space between the body and gate defines a shuttle coin recess; slot means on the frame means, the slot means being adjacent the shuttle coin recess whereby coins may be inserted through the slot means into the coin recess when the body is in the first coin receiving position; means for maintaining coins in the shuttle recess, said maintaining means having an aperture therein through which coins may pass when the shuttle body is in the second coin transfer position whereby coins will pass from the shuttle.

4,717,008

AUTOMATIC COIN FEEDER WITH WINDING MECHANISM

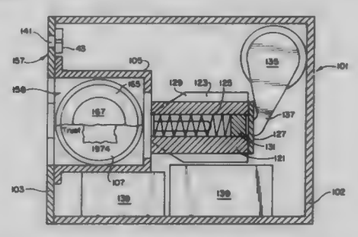
Frank M. Ellison, 1376 Nottingham Rd., Charleston, W. Va. 25314; Hasan T. Gencsoy, and Nelson S. Smith, Jr., both of Morgantown, W. Va., assignors to Frank M. Ellison, Charleston, W. Va.

Filed Mar. 11, 1985, Ser. No. 710,440
Int. Cl.[4] G07F *17/24*
U.S. Cl. 194—343 **19 Claims**

3. In combination:

a parking meter having timing means to show that the time paid for has expired,

said parking meter including a coin receiving opening, and coin feeding means for detachable connection to said parking meter,



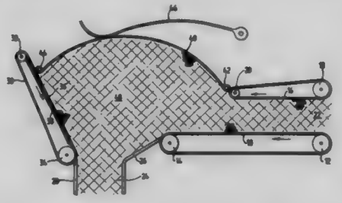
said coin feeding means including means responsive to said timing means for feeding a coin into said opening.

4,717,009

CONVEYOR ARRANGEMENT FOR ROD-LIKE ARTICLES

David C. M. Carter, Coventry; Ian Dunckley, High Wycombe; Kerry Hierons, High Wycombe, and Robert J. C. S. Mitchell, High Wycombe, all of England, assignors to Molins Machine Co. Inc., Bucks, United Kingdom

Filed Aug. 27, 1985, Ser. No. 769,973
Claims priority, application United Kingdom, Aug. 30, 1984, 8421940
Int. Cl.[4] B65G *1/00*
U.S. Cl. 198—347 **19 Claims**



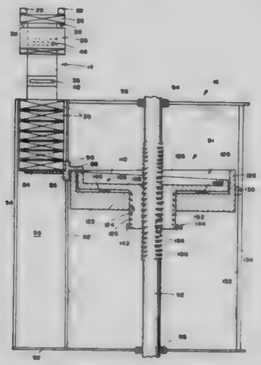
1. A conveyor arrangement for rod-like articles, comprising conveyor means for conveying rod-like articles in a direction transverse to their lengths, means defining a variable capacity region for receiving articles from said conveyor means and having an exit for said articles, said region being arranged so that articles may move in said region in a direction other than towards said exit, with the result that a boundary layer of articles received in said region may move towards or away from the exit as the number of articles in the region varies, further conveyor means including at least one endless band forming part of a boundary wall of the region and extending in a direction transverse to said conveyor means and the adjacent portion of said boundary layer for conveying articles in said region, movable means for confining said boundary layer of articles in said region, and drive means connected to said further conveyor means for driving said further conveyor means so that articles are urged towards said exit whenever said drive means is operated, said drive means being arranged to operate simultaneously with drive means for said conveyor means, said conveyor means and said further conveyor means being arranged to convey articles in said variable capacity region in directions generally towards each other and towards said exit, whereby replacement of articles within said region is promoted to discourage extended periods of occupation of said region by any individual article and to encourage movement of articles from said region.

4,717,010

CIGARETTE PACK ACCUMULATOR ASSEMBLY

Philip A. Deal, Winston-Salem, and Gerard E. Leonard, Kernersville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 28, 1986, Ser. No. 856,309
Int. Cl.[4] B65G *47/52*
U.S. Cl. 198—347 **15 Claims**



1. A cigarette pack accumulator assembly for receiving and discharging packs of cigarettes traveling along a cigarette pack conveying means, said cigarette pack accumulating assembly comprising

(a) a rotatable cigarette pack accumulating drum having a plurality of spaced pack support columns and being rotatable about a generally vertical axis of rotation;

(b) a cigarette pack support pedestal movably carried within each pack support column;

(c) means carried by said pack accumulating drum to move said support pedestals collectively within said support columns and including:

(i) a rotatable lead screw mounted in said cigarette pack accumulating drum and rotatable with respect to the drum,

(ii) spaced concentric inner and outer pedestal support cups with each of said cups having a base and an upstanding rim, the inner pedestal support cup base having a central hub with a central threaded bore for receiving said rotatable lead screw and the outer pedestal support cup base having a central splined bore that is slidably positioned about an outer splined portion of the central hub of said inner pedestal support cup and

(iii) means for moving said inner pedestal support cup in a telescopic manner with respect to said outer pedestal support cup; and

(d) means for transferring said packs of cigarettes between said cigarette pack conveying means and said cigarette pack accumulating drum.

4,717,011

SORTING CONVEYOR WITH CROSS-OVER

Thomas C. Yu, and Robert K. Vogt, both of Cincinnati, Ohio, assignors to The E.W. Buschman Company, Cincinnati, Ohio

Filed Apr. 30, 1986, Ser. No. 857,915
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **8 Claims**

1. A carton conveyor system including a frame defining a main line and at least one pair of substantially directly opposed branch lines leading from opposite sides of said main line, comprising:

(a) an endless apron supported for movement on said frame to define a top conveying run and a bottom return run,

(b) means for driving said apron,

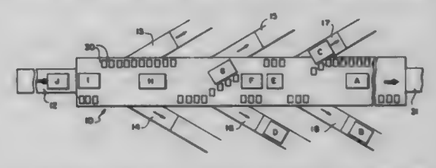
(c) a plurality of pusher elements mounted for sliding movement on said apron from one side thereof to the other,

(d) each said pusher element having a guide member depending therefrom,

(e) means for selectively causing each of said elements to be aligned along one or the other of the side edges of said apron at the upstream end of said top run thereof,

(f) diverting means mounted adjacent each side of said frame upstream from each said branch outlet for shifting movement between a retracted position and an advanced position wherein it cooperates with successive said guide members to divert successive said pusher elements away from the adjacent edge of said apron,

(g) a pair of guide tracks extending in cross-defining relation across said frame below said apron at a position between



each said pair of branch outlets for cooperation with said guide members on successive said diverted pusher elements to guide said diverted pusher elements across said apron and thereby to push a carton from said apron to one of said pair of outlets,

(h) each of said guide tracks having a gap therein at the center of said frame,

(i) selectively operable switching means mounted on said frame for movement between alternative limit positions wherein a portion thereof fills in said gap in one or the other of said guide tracks while leaving the other said gap open for passage of said guide members,

(j) said switching means comprising a a swivel member mounted for pivotal movement below said gap between said limit positions,

(k) said swivel member having mounted on the upper side thereof a pair of non-parallel spaced block members, and

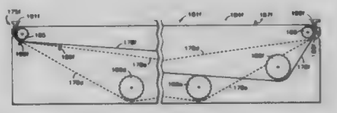
(l) each of said block members being proportioned to fill in said gap in one of said guide tracks in each of said limit positions of said swivel member.

4,717,012

BUFFER APPARATUS FOR AN INTEGRATED CIRCUIT HANDLER

Mavin C. Swapp, and Milo W. Frisbie, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1986, Ser. No. 816,027
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—425 **11 Claims**



1. A buffer apparatus for an integrated circuit handler comprising:

at least two track means for slidably containing integrated circuits, each said track means having an input end and an output end, each said at least two track means further comprising:

stop means adjacent said output end of said track means for engaging an integrated circuit thereon and for preventing further movement of integrated circuits toward said output end;

pusher means spaced from said stop means for engaging an integrated circuit on said track means and for urging integrated circuits thereon toward said output end thereof;

rail means for supporting a body portion of said integrated circuit; and

guide means for engaging said body portion of said integrated circuits and for maintaining said integrated circuits on said rail means; and

a belt running parallel to each said track means, said stop means and said pusher means being attached to said belt.

4,717,013

APPARATUS FOR TRANSPORTING LAYERS OF PAPER SHEETS TO PROCESSING MACHINES

Klaus Reismann, and Friedhelm Herrig, both of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

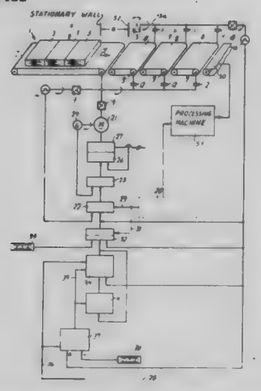
Division of Ser. No. 613,961, May 24, 1984, Pat. No. 4,629,058. This application Aug. 21, 1986, Ser. No. 898,958

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319247

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[4] B65G *47/31*

U.S. Cl. 198—461 **8 Claims**



1. A method of delivering stacks of superimposed sheets to a processing machine, comprising the steps of advancing successive groups of normally abutting stacks by an intermittently driven first conveyor longitudinally along a first path in a predetermined direction and into a second path; conveying successive groups in said direction longitudinally along the second path by a plurality of continuously driven second conveyors; monitoring the speed of groups in each of the first and second paths and generating first and second signals respectively denoting the distance covered by the groups in the corresponding paths per unit of time; comparing the first and second signals and generating third signals denoting the differences between the first and second signals; and utilizing the third signals to drive the first conveyor so that the distance between the rearmost stack of the group in the second path and the foremost stack of the group in the first path is zero or a whole multiple of the length of a stack in said direction.

4,717,014

SCREW CONVEYOR

Ake Ekelund, Helsingborg, Sweden, assignor to AB Siwertell, Bjuv, Sweden

PCT No. PCT/SE86/00022, § 371 Date Sep. 26, 1986, § 102(e) Date Sep. 26, 1986, PCT Pub. No. WO86/04566, PCT Pub. Date Aug. 14, 1986

PCT Filed Jan. 23, 1986, Ser. No. 931,441

Claims priority, application Sweden, Feb. 7, 1985, 8500570

Int. Cl.[4] B65G *65/16*

U.S. Cl. 198—518 **4 Claims**

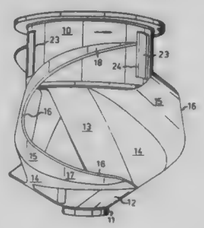
1. A screw conveyor for taking up bulk material, especially from ships, comprising

a conveyor screw rotatable within a housing extending along said screw conveyor and having, at its intake end,

a feeder device adapted to promote the transport of material to the conveyor screw, said conveyor screw and said feeder device being adapted to rotate in opposite directions, and said conveyor screw projecting into said feeder device, and

said feeder device having spokes on which blades are mounted for conveying the material inwardly towards said conveyor screw,

wherein said blades (14, 15) have upwardly and downwardly



extending portions (18 and 17, respectively), and are curved in a trawl-like manner for drawing the material into the feeder device, a lower part (17) of said blades being adapted to raise the material and move it inwardly towards the feeder device, and an upper part (18) of said blades being adapted to draw the material downwardly and inwardly into said feeder device.

4,717,015

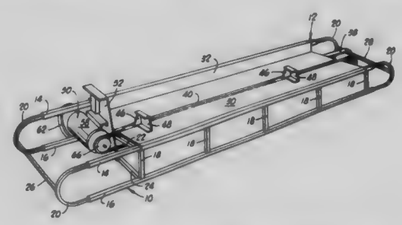
CARPENTER'S ELEVATOR AND CONVEYOR

Kenneth C. Waller, P.O. Box 26472, Oklahoma City, Okla. 73126

Filed Nov. 5, 1981, Ser. No. 318,395

Int. Cl.[4] B65G *19/18*

U.S. Cl. 198—733 **2 Claims**



1. A carpenter's elevator and conveyor comprising:

a pair of elongated, horizontally spaced framework elements, each of substantially monoplanar configuration and each having arcuate, parallel rounded end portions of substantially semi-circular configuration at opposite ends thereof;

transverse braces interconnecting said framework elements intermediate the rounded end portions of said framework;

a flat, elongated material supporting plate extending between the framework elements over, and supported by, said braches;

an elongated guidance plate having a first longitudinal edge secured to a longitudinal edge of said material supporting plate and a second longitudinal edge secured to one of said framework elements;

an elongated conveyor channel positioned centrally in the material supporting plate and extending substantially parallel to said guidance plate and disposed at a location below the upper surface of said material supporting plate;

an endless flexible conveyor including an endless chain having an upper reach lying in the conveyor channel and carrying a plurality of spaced flights:

a motor drivingly connected to the conveyor chain and

mounted between the spaced framework elements at a location horizontally spaced from one end of the material supporting plate, and offset to one side of said elongated conveyor channel;

a motor switch plate mounted between the motor and the material supporting plate, and projecting to a location spaced further vertically from the material supporting plate than the upper side of the motor for protecting the motor from contact with material supported on the material supporting plate;

a motor guard extending between, and transverse to, the arcuate parallel rounded portions of one end of the framework elements and located on the opposite side of the motor from the switch plate and the material supporting plate; and

a guard ring of semi-circular configuration secured to one of said framework elements at the opposite side thereof from said motor and in substantially transverse alignment with the motor to prevent inadvertant contact with the motor;

each of said flights of said endless flexible conveyor comprising:

an elongated U-shaped channel member secured to one side of said chain so that the web portion of said U-shaped channel member extends across and lies over the upper side of said upper reach of said chain, and the side flanges of said U-shaped channel member extend downwardly along the sides of said chain to leave the bottom of said chain open for driving sprocket engagement;

a channel-shaped material pushing paddle secured across said U-shaped channel by securement of a flange of said channels-shaped paddle to the web portion of said U-shaped chanel, said channel-shaped paddle opening toward said motor switch plate, and disposed on the opposite side of said conveyor channel from said motor switch plate so that said channel-shaped paddle can pass by and clear said motor switch plate during operation of the flexible conveyor; and

a gusset plate secured to the upper surface of the web portion of said U-shaped channel and to said channel-shaped material pusher paddle between the opposed flanges thereof for strengthening said paddle.

4,717,016

PACKAGE FOR INGREDIENTS

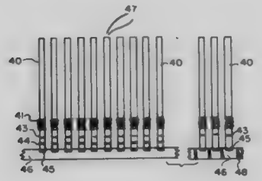
James M. Dalgleish, 124 Myton Rd., Warwick, CV34 6PR, United Kingdom

Filed May 29, 1986, Ser. No. 868,008

Int. Cl.[4] A47J *31/18*; B65B *29/04*

U.S. Cl. 206—0.5 **13 Claims**





1. A package comprising a tube of resilient material, the tube having at least one sealed end and including a corrugated portion along at least a part of its length, outer edges of said corrugated portion including a plurality of apertures, the apertures being adapted to be held in a closed position by the resilience of the material and to move from said closed position to an open position upon application of longitudinal stressing force to the tube which tends to effect straightening of the corrugations, the internal faces of the corrugations sealing said plurality of apertures in said closed position.

4,717,017

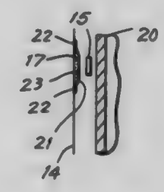
PACKAGE WITH MEANS FOR RELEASING AROMATIC SUBSTANCE ON OPENING

Francis M. Sprinkel, Jr., Glen Allen, and Reginald W. Newsome, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 23, 1987, Ser. No. 29,210

Int. Cl.[4] A24F *15/00*; B65D *85/10, 85/12*

U.S. Cl. 206—264 **21 Claims**



1. A cigarette pack for releasing a volatile material upon being opened, said cigarette pack comprising:

a cigarette container;

a sealing film circumscribing said cigarette container for preserving, prior to said cigarette pack being opened, the freshness of cigarettes contained in said cigarette container;

film slitting means interposed between said cigarette container and said sealing film and protruding from said sealing film for allowing a smoker to slit said sealing film to open said cigarette pack; and

receptacle means overlying said film slitting means for containing volatile material, such that said film slitting means ruptures said receptacle means while slitting said sealing film, releasing said volatile material.

4,717,018

CONTAINER FOR LONGITUDINALLY EXTENDING DIAGNOSTIC TEST STRIPS

Klaus D. Sacherer, Kirchheim/Weinstr.; Erich Weiss, Mannheim; Jochen Koehn, and Ulrich Brach, both of Zell/Mosel, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 744,116, Jun. 12, 1985, Pat. No. 4,615,462. This application Jul. 28, 1986, Ser. No. 890,867

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423851; Dec. 22, 1984, 3447223; Feb. 16, 1985, 3505454

Int. Cl.[4] B65D *43/24, 81/26, 85/38*

U.S. Cl. 206—305 **13 Claims**

1. Container (210) for longitudinally extending diagnostic test carriers (212) comprising:

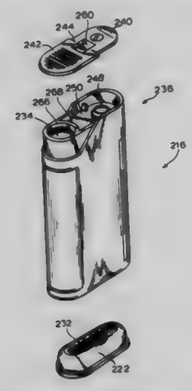
a longitudinally extending container body (216) for receiving the test carrier (212), whose inner space length is larger than the length of the test carrier (212) with a removal end (236) at which the removal opening (234) is disposed and with a container bottom (220) at the end facing away from the removal end (236) of the container body (216), and

a locking means (218) for locking the container body (216) in a moisture proof manner, wherein

the container body (216) and the locking means (218) are injection molded parts,

the container body (216) has a flattened cross section in a

plane transverse to its longitudinal direction deviating from the circular shape,
a locking element (252) having a protrusion is mounted on a locking shank (242) which is pivotably mounted at the removal end (236) of said container body (216) by means of a hinge (244),
the locking shank carries the protruding locking element (252) having a sealing face (254) adapted to seal with a sealing edge (256) of the removal opening (234),



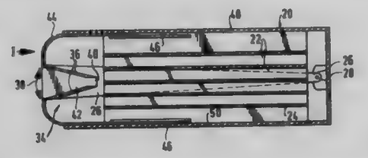
the cross section of said removal opening (234) is considerably smaller than the cross section of the container body (216),
the container bottom (220) encompasses a bottom element (222) being separate from the remainder of the container body (216) and moisture proof connected therewith, and
the container body (216) encompasses a chamber for receiving a drying substance.

4,717,019

DISC CONTAINER

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

PCT No. PCT/EP85/00410, § 371 Date Apr. 17, 1986, § 102(e) Date Apr. 17, 1986, PCT Pub. No. WO86/01328, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 10, 1985, Ser. No. 865,748
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, P3424403
Int. Cl.⁴ B65D *85/57, 85/672*
U.S. Cl. 206—307 **31 Claims**



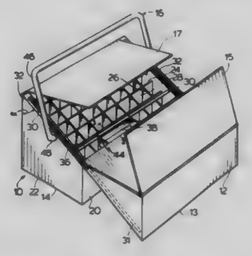
1. A container for use in the storage of flat recording media comprising:
a housing;
a storage assembly supported within said housing, the storage assembly defining a plurality of closely-spaced adjacent storage areas for receiving and supporting said recording media;
guide means for directing the motion of an individual recording media during the transfer thereof between said storage assembly and the exterior of said housing and during the return thereof to said storage assembly, said guide means being positioned in said housing and including guide members which define a media guide channel, said guide channel having surfaces which converge from the exterior of the housing toward said storage assembly, said guide channel having a maximum width at a first end thereof which is greater than the width of one of said storage assembly defined storage areas measured in the direction of the recording media thickness; and
means for producing relative motion between said guide means and said storage assembly whereby alignment may be selectively established between one of said storage areas and the path of the said recording media motion directed by said guide means.

4,717,020

VERTICAL STORAGE TOOLBOX

Elmet Vilra, 110 Duvernet Avenue, Toronto, Ontario M4E 1V4, Canada

Filed Apr. 14, 1987, Ser. No. 38,063
Int. Cl.⁴ B65D *25/04, 43/12;* **B25H** *3/02*
U.S. Cl. 206—372 **5 Claims**



1. A receptacle comprising:
a bottom section and a top wedge-shaped section,
said bottom section having a floor, back wall, front wall of lesser height than said back wall, a pair of sidewalls of generally quadrilateral shape, each sidewall of said pair having a top face, with the top angle of the quadrilateral sidewalls being smaller than any of the other three angles,
a plurality of compartments in said bottom section, at least some of which extend in a vertical fashion,
said top wedge-shaped section having a floor and being adapted to slide along the bottom section via slide means provided in said bottom section,
said top wedge-shaped section being provided with at least one compartment,
said slide means comprising a pair of elongated slots in parallel, spaced apart relationship, each slot being formed in a said top face of a said sidewall of said pair, and slide members mounted on said floor of said top section and slidingly received in said slots, and
said slide means further including a second pair of elongated slots in parallel spaced apart relationship, each slot of said second pair being formed in said floor of said top section, and second slide members mounted on the top faces of said sidewalls and slidingly received in said second pair of slots.

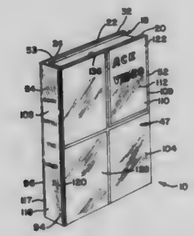
4,717,021

VIDEO CASSETTE CONTAINER DISPLAY

Albert Ditzig, 1155 Mayfield, Hoffman Estates, Ill. 60195

Filed Aug. 13, 1986, Ser. No. 896,108
Int. Cl.⁴ B65D *85/67, 73/00*
U.S. Cl. 206—387 **11 Claims**

1. A video tape cassette assembly, comprising:
a video tape box for enclosing a video tape cassette selected from the group consisting of a Beta video tape cassette, a VHS video tape cassette, an 8 mm video tape cassette, a ¾ inch video tape cassette, and a European style video tape cassette, said video tape box having an exterior front surface, side surface, and back surface;
a web of material selected from the group consisting of plastic, paper, and paperboard, said web comprising a display label having a viewable front surface with indicia printed thereon;



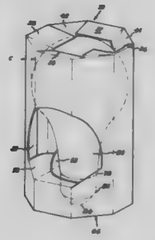
a protective casing for covering substantial portions of at least one of said surfaces of said video tape box, said protective casing having connecting means for connecting said protective casing to at least one of said surfaces of said video tape box and having a substantially transparent flexible multi-window portion with an array of separate windows for containing, covering, and permitting viewing of said display label.

4,717,022

OCTAGONAL-SHAPED SHIPPING CONTAINER

Kenneth Combs, Warrensville Hts., Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 685,664, Dec. 24, 1984, abandoned.
This application Jul. 3, 1986, Ser. No. 882,209
Int. Cl.⁴ B65D *85/42*
U.S. Cl. 206—418 **8 Claims**



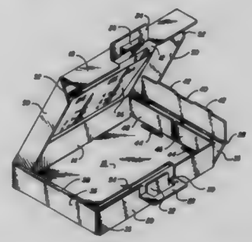
1. A self locking carton for a fragile article such as a lamp or electric light bulb which prevents movement of said bulb within said carton comprising:
an octagonally shaped tubular sleeve having a predetermined length having four pairs of side panels disposed diametrically opposite each other comprising artiulated segments of said tubular sleeve:
first and second intermediate support means located at a predetermined position relative to a first end of said tubular sleeve disposed diametrically opposite from each other and each articulated from a plurality of said articulated segments for rigidly supporting said article at an intermediate position along the axial length of said sleeve; and
self-locking end closure means comprising a plurality of generally rectangularly shaped end closure panel means articulated from the second end of alternate ones of said side panels and having respective free edges for engaging the end surface of said fragile article at a first predetermined position within said carton relative to said second end of said sleeve, a plurality of generally trapezoidaly shaped article locking panel means articulated from the second end of the remaining alternate ones of said side panels for engaging said article at a second position further from said second end of said tubular sleeve than said first position, and a plurality of triangularly shaped bellows panel means each having a respective one of said end closure panel means attached to and articulated from one edge thereof and a respective one of said article locking panel means attached to and articulated from another edge thereof for connecting a respective one of said end closure panel means to a respective adjacent one of said article locking panel means, wherein said end closure means are folded to form a self locking interference fit around said fragile article and wherein said locking panels extend further axially from said second end of said tubular sleeve than do said end closure panels when said end closure means are folded.

4,717,023

CONVENTION BOX

George Oprean, 26 Chili Ave., Box 76, Scottsville, N.Y. 14546

Filed Aug. 22, 1986, Ser. No. 899,007
Int. Cl.⁴ B65D *69/00*
U.S. Cl. 206—459 **16 Claims**



1. Convention box to be folded from a single flat sheet of rigid material of a predetermined thickness and handed out to convention or meeting attendees or the like for storage and carriage of literature materials at the convention or meeting, the convention box being generally rectangular and of a predetermined overall height, width, and depth, and comprising:
a rectangular back panel of said width and height,
a first top panel of said width and depth and joined at a fold line to a top edge of said back panel, said first top panel including retangular tabs extending out from said edges thereof at fold lines a distance substantially half said height, and of a width smaller than said depth by substantially twice the predetermined thickness of said sheet;
a bottom panel forming the base of said box and of said width and depth and joined at a fold line to a bottom edge of said back panel, said bottom panel including a pair of rectangular tabs extending out from side edges thereof at fold lines a distance substantially half said height, and of a width smaller than said depth by substantially twice the predetermined thickness of said sheet;
a pair of side panel groups disposed at opposite side edges of said back panel, each said group having a height smaller than said box height by substantially twice the sheet thickness, and including a first panel member of said depth and joined at a fold line to the respective side edge of said back panel, a second panel member of a width substantially one to three times the sheet thickness and joined at a fold line to the respective side edge of said back panel, a second panel member of a width substantially three times the sheet thickness and joined at a fold line to a side edge of said first panel member, a third panel member joined at a fold line to a side edge of second panel member and of substantially said depth, and means on an outer side edge

of said third panel member cooperating with engaging means at the corresponding side edge of said back panel for holding each said group and associated ones of said top and bottom panel tabs, such that said groups and tabs form substantially rigid, reinforced sides of said convention box;

a rectangular front panel having a bottom edge joined at a fold line to said bottom panel and having a width smaller than said box width by several thicknesses of said sheet, and a height smaller than said box height by approximately said sheet thickness;

side tabs joined at fold lines to said edges of said front panel and of substantially said depth, and including means to facilitate opening and closing of the box,

a handle formed in at least one of said first and second top panels and folding out from the respective top panel, and permitting said box to close with the front panel side tabs inside the sides of said convention box and with the second top panel disposes inside of said first top panel,

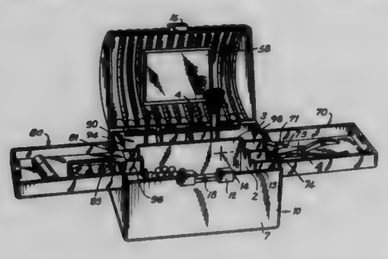
wherein one of said rectangular back panel and said rectangular front panel has a slot extending in the width direction thereof for a distance of substantially the length of a standard sheet of paper, for permitting convention or meeting literature to be inserted through it into the box without need to open the box.

4,717,024

HOME AND TRAVEL ORGANIZER

Vasa Djezovic, 527 W. 48th St., New York, N.Y. 10036

Filed Apr. 3, 1986, Ser. No. 847,948
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—581 5 Claims



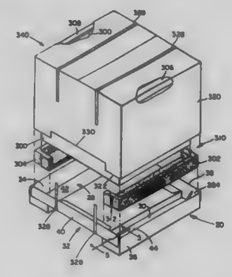
1. A portable organizer comprising: a lid, a receptacle onto which is hinged said lid; at least one mirror mounted on said lid; two removable trays held within but unattached to said receptacle, each of said trays having a mounting bracket for attaching said tray to an outer wall of said receptacle, one tray stackable upon another and stored in a compartment of said receptacle, said mounting bracket comprising a claw positioned perpendicular to and overlapping said outer wall, said claw formed as a pair of digits separated by a gap, said receptacle being divided by one or more partition walls into a series of compartments, one of said partition walls being aligned at right angles to an inner surface of said outer wall, said digits each adapted to straddle a different side of said partition wall when said tray is attached to said outer wall, said series of compartments comprising at least one deep compartment and one squat compartment, said deep compartment extending the full depth of said receptacle, two or more ledges protruding from said outer wall, said ledges being no higher than half the height of said partition wall and said trays supported on said ledges.

4,717,025

SHIPPING PACKAGE ADAPTED FOR MECHANICAL HANDLING AND STACKING

Donald J. Maurer, Cedar Rapids, Iowa, assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 31, 1986, Ser. No. 948,383
Int. Cl.[4] B65D *19/04*
U.S. Cl. 206—599 9 Claims



1. A shipping package comprising:

a horizontal panel having a first pair of opposing parallel edges and a second pair of opposing parallel edges;

a pair of rectangular upwardly facing channels, each one of said channels disposed adjacent a corresponding one of the first pair of edges;

a pair of rails, each one of said rails disposed adjacent a corresponding one of the second pair of edges;

means disposed between at least one of said channels and at least one of said rails for transferring shear stress;

said at least one of said rails comprising an outer panel disposed adjacent and integrally connected to the corresponding one of the second pair of edges and an inner panel disposed near the corresponding one of the second pair of edges and parallel to and spaced apart from said outer panel, said inner panel being disposed close to a central portion of said horizontal panel than said outer panel; and

said inner panel having a pair of positioning tabs on opposing ends, said positioning tabs respectively extending into said pair of channels.

3. A shipping package formed from a unitary sheet of material, for supporting and protecting an item to be shipped, and for elevating the item to provide an entry slot for use by mechanical material handling equipment, comprising:

a horizontally oriented rectangular panel having a first pair of opposing parallel horizontal edges and a second pair of opposing parallel horizontal edges, the first pair of opposing edges disposed perpendicular to the second pair of opposing edges;

a pair of rectangular vertical channels, disposed along and integrally connected to the first pair of opposing parallel edges, said entry slot being defined by a space below said horizontal panel and between said channels, each one of said channels including an interior vertical panel, a horizontal foot panel, and a vertical slow panel, the vertical side panel being greater in height than the interior panel, the interior panel integrally connected to a corresponding one of the first pair of edges and the foot panel, and the side panel also integrally connected to the foot panel;

a pair of vertical rails, disposed along and integrally connected to the second pair of opposing parallel edges, each one of said rails including a vertical outer panel, a horizontal ridge panel, and a vertical inner panel, the outer panel integrally connected to a corresponding one of the second pair of edges and the ridge panel, the inner panel spaced apart from the outer panel and integrally connected to the ridge panel, and the outer and inner panels defining a rail flap slot at ends of the vertical rails; and

four side panel flaps, each flap disposed along and integrally connected to a corresponding end of one of the vertical side panels formed in said pair of channels, each flap juxtaposed so as to engage a corresponding one of the rail flap slots formed in said pair of rails.

9. A method of packaging an item to be shipped comprising the steps of:

providing a horizontal panel having a first pair of opposing parallel edges and a second pair of opposing parallel edges;

providing a pair of rectangular upwardly facing channels, each one of the channels disposed adjacent a corresponding one of the first pair of edges;

providing a pair of rails, each one of said rails disposed adjacent a corresponding one of the second pair of edges;

said rails comprising an outer panel disposed adjacent and integrally connected to the corresponding one of the second pair of edges and an inner panel, disposed near the corresponding one of the second pair of edges and parallel to and spaced apart from the outer panel, the inner panel disposed closer to a central portion of the horizontal panel than the outer panel;

providing means disposed between at least one of the channels and at least one of the rails for transferring shear stress;

providing a pair of positioning tabs formed near opposing edges of the inner panel; and

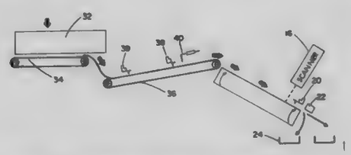
providing a shipping pad adapted to be disposed within one of the upwardly facing channels and also adapted to engage the pair of positioning tabs.

4,717,026

CONTAINER SCANNING AND ACCOUNTING DEVICE

Gregory J. Fischer, Wheat Ridge, and Larry Hopkins, Lakewood, both of Colo., assignors to Golden Aluminum Company, Lakewood, Colo.

Filed Apr. 3, 1986, Ser. No. 847,503
Int. Cl.[4] B07C *5/02*; G06M *7/02*
U.S. Cl. 209—539 19 Claims



1. A container scanning device comprising:

(a) first and second parallel rollers, each of said rollers having one end elevated above the other end of the rollers, and with the roller diameters and spacing between rollers fixed to form a trough between the rollers sufficiently narrow to support containers between the rollers;

(b) feeder means for singly feeding a stream of containers in an end-to-end orientation into the trough between the rollers at the elevated ends of the rollers, wherein each of said containers contacts both of said rollers along at least a predetermined portion of the length of said trough;

(c) drive means to rotate both rollers in the same direction, said drive means rotating said first roller at a first rotational speed and rotating said second roller at a second rotational speed, wherein each of said containers travels along the length of said trough; and

(d) a number of scanners located to view containers along the trough between the rollers, said scanners scanning said predetermined portion of the length of said trough.

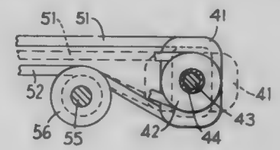
5. The container scanning device of claim 1, further comprising ejector means at the lower ends of the rollers for rejecting containers that have not been successfully scanned.

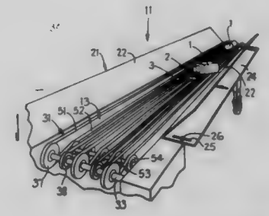
4,717,027

VIBRATORY BELT SEPARATOR FOR BLOW-MOLDED PARTS

George R. Laure, and Brett M. Caster, both of Kalamazoo, Mich., assignors to LaRos Equipment Company, Inc., Portage, Mich.

Filed Mar. 28, 1986, Ser. No. 845,905
Int. Cl.[4] B07C *5/04*
U.S. Cl. 209—620 15 Claims





1. A separator apparatus for effecting separation of a mixture of parts, such as blow-molded plastic parts, comprising:

a housing means;

elongated separator belt means movably mounted on said housing means for effecting separation of a mixture of parts by permitting first parts to fall therethrough while supporting second parts and transporting them to a discharge location;

said separator means including at least two narrow endless belts movably supported on the housing means, said belts having elongated upper belt reaches which extend approximately horizontally along the length of the housing means, said upper belt reaches extending in approximately parallel and adjacent side-by-side relationship and being provided with a small predetermined clearance space therebetween through which said first parts can pass;

drive means for moving said belts relative to said housing means, said drive means including drive pulley means engaging said belts adjacent one end thereof;

end idler pulleys rotatably supported adjacent and disposed in supportive engagement with said belts adjacent the other end thereof; and

means for effecting cyclic vertical vibration of the upper reach of at least one said belt relative to an adjacent said belt, said last-mentioned means including a said end idler pulley which is disposed in supportive engagement with said one belt, said one end idler pulley having a noncircular peripheral profile relative to its axis of rotation for effecting cyclic vertical vibration of the upper reach of said one belt.

4,717,028

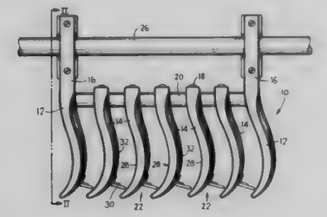
HANGER

Gary Gochanour, 3108 Baker Rd., Dexter, Mich. 48130

Filed Sep. 16, 1986, Ser. No. 908,425
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—113 16 Claims

1. A garment hanger adapted to be connected to a closet rod, comprising at least a pair of similarly curved paddle-shaped

dividers in fixed parallel spaced-apart relation to one another, said dividers having opposed upright surfaces defining a downwardly opening garment-receiving space therebetween, one of said surfaces being concave and the other of said surfaces being correspondingly convex and substantially parallel with said concave surface, a pivotable garment engaging flap extending between each pair of dividers, means for rigidly holding said dividers in said spaced-apart relation, said holding means comprising a member extending between said dividers and to which said dividers are rigidly connected, and means for rigidly fixing said garment hanger to a closet rod, said fixing means comprising a member projecting from at least one of said dividers and adapted for engaging a closet rod, each of said curved paddle-shaped dividers having a said concave surface and a said convex surface on opposite sides thereof,



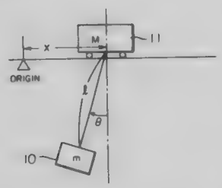
said dividers being disposed so that said concave surfaces on all of said dividers face a single linear direction and said convex sufaces on all of said dividers face the opposite linear direction, each flap being pivotedly mounted at one end thereof on the convex surface of its associated pair of dividers close to the lower end thereof and extending across the space between its associated pair of dividers toward the concave surface of its associated pair of dividers so that the opposite end of said flap is normally disposed close to said concave surface at a loation close to the lower end thereof to engage and support a garment against the concave surface of its associated pair of dividers, said flap being pivotable upwardly in said garment-receiving space so that the spacing between said opposite end of said flap and said concave surface progressively increases in an upward direction as said flap is pivoted upwardly in said space.

4,717,029

CRANE CONTROL METHOD

Seiji Yasunobu, Yokohama, and Shoji Miyamoto, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,303
Claims priority, application Japan, Aug. 16, 1985, 60-180249
Int. Cl.[4] B66C *19/00*
U.S. Cl. 212—132 **4 Claims**



1. A method of controlling a crane in which a parcel suspended by a rope is laterally transported by a trolley, comprising the steps of:

obtaining an accelerating time of the trolley on the basis of a mass of trolley, mass of suspended parcel including a suspending device, and a length of rope upon starting of the trolley;

obtaining an accelerating force of trolley necessary for allowing velocities of said trolley and suspended parcel to reach objective velocities for said accelerating time;

applying said accelerating force to the trolley for said accelerating time;

allowing the trolley to uniformly run at said objective velocity after said accelerating time has elapsed; and

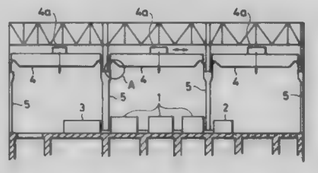
winding up the rope while measuring the rope length and in which when said rope length becomes a first objective value, said trolley is started, and after the trolley was made operative, the rope is continuously wound up until the rope length becomes a second objective value.

4,717,030

TURBINE BUILDING EQUIPPED WITH OVERHEAD TRAVELING CRANES

Sakae Ebata, Hitachi, and Seiichi Inoue, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,606
Claims priority, application Japan, Nov. 29, 1985, 60-267163
Int. Cl.[4] B66C *17/00*
U.S. Cl. 212—205 **2 Claims**



1. A turbine building equipped with overhead traveling cranes comprising:

a floor on which a turbine and a generator mechanically connected to and in alignment with each other are mounted, said floor having a space for placing disassembled parts of said turbine and said generator thereon during an inspection period of said turbine and said generator, said floor is substantially rectangular and includes short sides and long sides;

a plurality of overhead traveling cranes arranged above the level of said turbine and said generator so as to travel in a direction perpendicular to the axis of said turbine and generator, one of said cranes is arranged above said generator and the other of said cranes is arranged above said turbine so that said overhead traveling cranes can travel in parallel with each other;

crane rails for mounting said overhead travelling cranes, said crane rails each extending in a direction perpendicular to the axis of said turbine and generator; and

means for supporting said crane rails comprising a plurality of posts arranged in rows, each of said posts extending in a direction perpendicular to the axis of said turbine and generator, said rows of said posts supporting said crane rails extending in parallel with said short sides of said substantially rectangular floor.

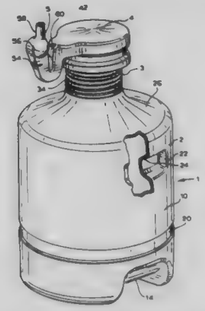
4,717,031

FERMENTATION VESSEL

C. Bruce Hewson, Horseshoe Bay, Canada, assignor to Brewmaster Systems Ltd., Canada

Filed Apr. 28, 1986, Ser. No. 856,742
Int. Cl.[4] B65D *1/06*
U.S. Cl. 215—1 C **18 Claims**

1. A unitary, molded fermentation vessel comprising: a container for receiving liquid, and including a neck portion at its upper end; and a closure member, which includes an air lock means and a connection portion continuous with the neck portion, and which closure member is removable in use, the



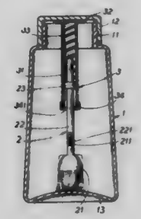
closure member being adapted, in use, after separation from the connection portion, for forming a seal with the neck portion.

4,717,032

BOTTLE WITH SELF-CONTAINED PICKUP TOOL

Chyi-Yiing Wu, P.O. Box 10160, Taipei, Taiwan

Filed Feb. 17, 1987, Ser. No. 16,186
Int. Cl.[4] B65D *51/24*
U.S. Cl. 215—228 **5 Claims**



1. A bottle with self-contained pickup tool compising:

a bottle body having a bottle neck operatively sealed by a top cover fixed thereon, said bottle adapted for filling with seasoning, preserving or medical materials therein;

a detachable pickup tool having a detachable tool detachably fixed under a tool rod having a plunger formed on the upper portion of the rod; and a tool holder including a longitudinal cylinder having a top flange fixed under said top cover of said bottle body, a restoring spring inserted in said cylinder to resiliently retain said plunger of said rod to protrude said tool downwards, and a bottom cap fixed on the lower end of said cylinder having a packing ring formed therein for reciprocatively passing said tool rod therethrough, said detachable tool resiliently depressed downwards to normally poke onto a bottom portion of said bottle body.

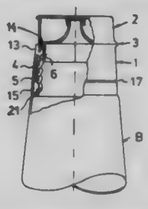
4,717,033

PLASTIC CLOSURE WITH SAFETY BAND

Werner F. Dubach, Hubrain, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed Aug. 18, 1986, Ser. No. 897,318
Claims priority, application Switzerland, Aug. 19, 1985, 3563/85
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—245 **17 Claims**

1. A container closure made of plastic material attachable to a container neck, said closure provided with means for adjusting it between an upper safety position and a lower access position relative to said container neck, said closure maintained in said safety position by means of a removable safety band (15), said closure comprising a base (1) with a spout opening (7), a sealing cap (2) connected to said base by a hinge (3), said closure adjustable between an open position wherein said spout opening is uncovered, and a closed position wherein said cap



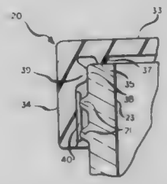
seals and covers said spout opening; said cap provided with at least one locking means (11, 12) which, when the closure is in said safety position, engages underneath a projection (14) in an aperture (13) in said base (1) of the closure, and when said closure is in said access position, said locking means is released from engagement with said projection by contact with an upper edge of said container neck.

4,717,034

ONE-PIECE THERMOPLASTIC CLOSURE HAVING PRESS-ON SCREW OFF STRUCTURE INCLUDING SPACED VERTICAL RIBS IN THE SKIRT OF THE CLOSURE

George V. Mumford, Ventura, Calif., assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jul. 6, 1982, Ser. No. 395,397
Int. Cl.[4] B65D *41/16*
U.S. Cl. 215—318 **2 Claims**



1. A closure for a container having generally helical threads on the neck finish, the closure comprising a one-piece molded cap shell of non-heat shrunk thermoplastic including a top wall and a peripheral skirt, the skirt having means thereon for engaging threads of the neck of a container, the means including a plurality of spaced, flexible generally vertical non-heat shrunk thermoplastic ribs integral with the skirt, each rib being so constructed and arranged that it has sufficient resistance to coald flow that the rib only slightly bends around the thread to form a slight indentation on the rib when the rib is forced into contact with the thread, the slight indentation being sufficient to provide purchase on the threads for removing the closure, there being a resilient deformable gasket liner inside the cap shell for a top seal, the liner located between the top cap wall and the top of the finish of the container, the cap shell being made of high density polyethylene and the gasket of foamed polyvinyl chloride.

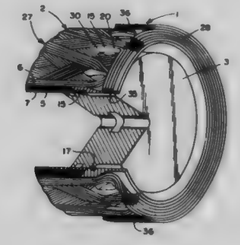
VOL 1086 ISS 1 JA 5 1988 UMI

4,717,035

END CLOSURE FOR COMPOSITE PRESSURE VESSELS

William Dirkin, and Charles Lund, both of Portage, Mich., assignors to Pneumo Abex Corporation, Boston, Mass.

Filed Nov. 28, 1986, Ser. No. 935,745
Int. Cl.[4] B65D 7/44
U.S. Cl. 220—3 17 Claims



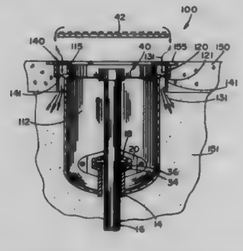
1. A composite pressure vessel comprising a side wall structure of composite material and end closures at opposite ends of said side wall structure, said side wall structure including generally longitudinal tension windings extending back and forth between opposite ends of said side wall structure, and connecting means for transferring axial loads between said end closures and said longitudinal tension windings, said connecting means including a retaining ring on at least one of said end closures, said retaining ring having a generally cylindrical outer surface, a plurality of circumferentially spaced tabs extending axially outwardly from said outer surface, said tabs having axial outer ends extending generally radially inwardly of said outer surface, and ramp surfaces between said tabs for providing a transition for said longitudinal tension windings from said outer surface to said axial outer ends of said tabs, said longitudinal tension windings including portions laying on said ramp surfaces and extending in a generally circumferential direction around the axial outer ends of a plurality of said tabs radially inwardly of said outer surface for imposing a circumferential compression force to said retaining ring.

4,717,036

LIQUID TANK SPILLAGE CONTROL SYSTEM

Richard E. Dundas, Rockford, and Gerald H. Visser, Grand Rapids, both of Mich., assignors to Plymouth Tank of West Michigan, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 862,050, May 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 738,592, May 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 610,265, May 14, 1984, Pat. No. 4,527,708. This application Oct. 6, 1986, Ser. No. 915,627
Int. Cl.[4] B65D 25/00
U.S. Cl. 220—18 20 Claims



1. A spill control device for underground liquid storage tanks used in the storage of toxic or flammable materials, comprising:

a liquid impermeable spill collecting tank having a top and a bottom, said top having an access opening thereat that provides sufficient clearance for the passage of a fill hose therethrough, said tank having a pipe aperture through said bottom of a dimension sufficient to provide the close reception of a liquid storage tank fill pipe therethrough;

means for sealing said tank bottom about a liquid storage tank fill pipe received through said pipe aperture to prevent fluid passage through said pipe aperture, whereby said tank forms a liquid impermeable container about the upper end of a liquid storage tank fill pipe when assembled thereon to prevent liquid contaminants from entering the ground surrounding said pipe;

a substantially liquid impermeable cover adapted for extending over and substantially covering said access opening; and

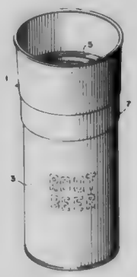
a first basin at least partially surrounding said spill collecting tank and said liquid impermeable cover for channeling liquids impinging said cover away from said spill collecting tank.

4,717,037

BEVERAGE CAN DRINKING ATTACHMENT

Leendert van der Meulen, 1804 Bayshore Raod, S.W., Calgary, Alberta, Canada T2V 3M1

Continuation-in-part of Ser. No. 834,771, Feb. 28, 1986. This application Oct. 14, 1986, Ser. No. 918,079
Claims priority, application Netherlands, Mar. 1, 1985, 8500574
Int. Cl.[4] B65D 25/48
U.S. Cl. 220—90.6 24 Claims



1. A beverage can drinking attachment comprising:

(a) a substantially cylindrical body having clamping means for obtaining a liquid tight connection between the beverage can attachment and a can top positioned at a lower end of said body;

(b) a disk extending substantially transverse across said body dividing said body into a drinking portion and a clamping portion, said disk having means for engaging the can top;

(c) an aperture in said disk which when said can attachment is placed on the can top said aperture is alignable with a can lid opening; and

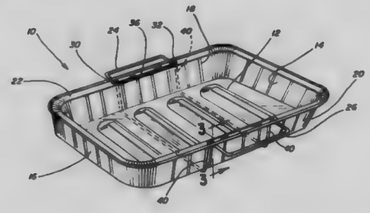
(d) means located on said disk for receiving a can lid opening device, the can lid opening device remaining attached to the can top after the can is opened; said receiving means comprising a raised section for accepting the can lid opening device bent into a generally flat position when the can lid opening device is in a post-open position.

4,717,038

DISPOSABLE PAN

Gary P. Anders, Highland Park, Ill., assignor to Industrial Precision Products Company, Schaumburg, Ill.

Filed Feb. 5, 1987, Ser. No. 11,036
Int. Cl.[4] B65D 5/46
U.S. Cl. 220—94 R 16 Claims



13. An oven pan, which comprises:

a disposable stamped aluminum pan structure having a bottom, side walls and a rim at the periphery of the side walls, said stamped aluminum having a thickness of between 0.003 inch and 0.005 inch;

a first handle having a generally U-shape and fastened to the rim at a first location thereof;

first means fastening said first handle at the ends of the U to two spaced points on the rim;

first stabilizing means bridging said two spaced points; a second handle having a generally U-shape fastened to the rim at a second location thereof, opposed to said first location;

second means fastening said second second handle at the ends of the U to two spaced points on the rim;

second stabilizing means bridging said last-mentioned two spaced points;

said first and second stabilizing means each comprising an elongated bar;

said support means attached to the elongated bars and extending from said first handle to said second handle and underlying the bottom of said pan, said support means comprising a pair of wires formed to extend adjacent the outside of the side walls and under and adjacent the bottom of the pan; and

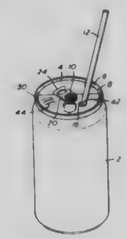
said handles and said stabilizing means being formed of steel.

4,717,039

CONTAINER RECLOSING DEVICE

Lusy Ayyoubi, P.O. Box 8636, The Woodlands, Tex. 77387-8636

Filed Nov. 3, 1986, Ser. No. 926,914
Int. Cl.[4] B65D 51/18
U.S. Cl. 220—253 9 Claims



1. An apparatus for reclosing a container having a top with an opening therethrough, a circumferential channel disposed radially outward from the opening, and a central post, said apparatus comprising:

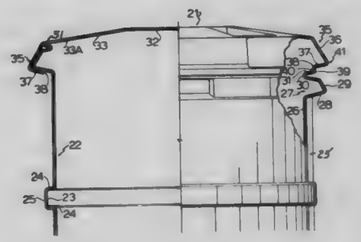
a plate having a rim disposed on the periphery thereof for engaging the channel when said plate is rotatably attached to the central post, a sealing region of said plate being adapted for slidably, alternately covering and uncovering the opening, said sealing region including a seal depression formed in said plate for protruding through the opening.

4,717,040

ROTATIONALLY MOULDED SEPTIC TANK SLEEVES

William H. Stanton, Winnipeg, Canada, assignor to Equinox Industries Ltd., Winnipeg, Canada

Filed Apr. 15, 1987, Ser. No. 38,758
Int. Cl.[4] B65D 41/16, 41/18
U.S. Cl. 220—306 17 Claims



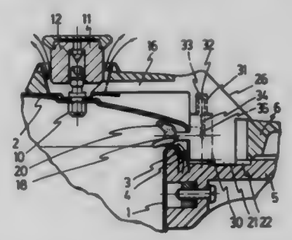
1. An access sleeve for septic tanks and the like comprising in combination a rotationally moulded cylindrical sleeve, a cover portion moulded integrally upon at least one end of said sleeve, an annular parting-off line formed between said cover portion and said one end of said sleeve whereby said cover can be removed after moulding, and means on said one end of said sleeve cooperating with means on said cover for detachably securing said cover to said one end in sealing relationship therewith after said cover has been parted off from said sleeve.

4,717,041

PRESSURE COOKER WITH BAYONET CLOSURE AND WEIGHT VALVE

Manuel A. Elexpuru, Guipuzcoa, Spain, assignor to Radar, S. Coop., Escoriaza Guipuzcoa, Spain

Filed Nov. 10, 1986, Ser. No. 929,679
Claims priority, application Spain, Nov. 12, 1985, 290269
Int. Cl.[4] B65D 45/00
U.S. Cl. 220—316 4 Claims



1. Pressure cooker with bayonet closure and weight valve, of the type including a pair of handles related to body and lid, respectively, which in the closed position are arranged one over the other and adopt a radial disposition with respect to the arms of the cooker, essentially characterised in that a housing is established in the upper handle for a mobile element

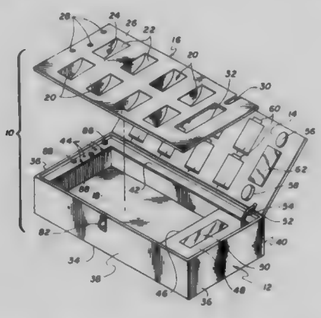
which projects partially outwards from said handle through a window operatively made in said handle, such that the projecting sector of said element constitutes a knob for manual actuation thereof, it having been foreseen that said mobile element includes an arm which, when suitably guided along a track provided within the upper handle, in the sector thereof which overrides the lid, reaches the area of the weight valve, affecting same and causing aperture thereof in a certain position of the knob, said mobile element further including a lower flange which crosses an aperture operatively made in the perimentral overhang of the lid and affects the sealing gasket between body and lid, thus establishing another point for pressure release, it having been further foreseen that the mobile element includes a lower extension which fits into a depression provided in the lower handle, said depression having a side opening so that said element may likewise act as a locking element for the two handles, in a certain position thereof, but allowing said handles to unlock in a different position where the said extension operatively faces the side outlet of the depression.

4,717,042

MEDICINE DISPENSER FOR HOME HEALTH CARE

John T. McLaughlin, Glendale, Calif., assignor to Pyxis Corporation, Salina Beach, Calif.

Filed May 28, 1986, Ser. No. 868,660
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—3 **17 Claims**



14. A medicine dispenser, comprising:

a container having a lid which can be shut to completely enclose the interior of the container, the container providing means for supporting a tray or the like immediately beneath the lid when closed, the lid having a plurality of apertures therethrough;

means for manually encoding the tray supporting means to prevent the accidental positioning of an unintended tray within the container;

a medicine tray dimensioned for placement within the container, the medicine tray including a plurality of compartments for holding medicine, and means encoded into the tray, which encoded means interacts with the means for manually encoding the tray supporting means to permit the tray to be positioned and held securely immediately beneath the lid when closed; and

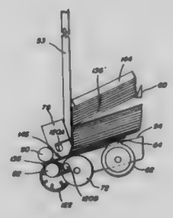
a plurality of compartment covers attached to the lid adjacent respective ones of the plurality of lid apertures, each of the compartment covers capable of being shut and opened with respect to the lid to selectively permit access to respective ones of the compartments, wherein each lid aperture is dimensioned and positioned to directly overlay a respective one of the tray compartments when the lid is closed.

4,717,043

VENDOR COUPON DISPENSER

Phillip B. Groover, Marietta; Jose Batlle, Dunwoody, both of Ga.; Saburo Tatsuke, Gyoda; Masaaki Kozukue, and Yukio Endo, both of Fukinge, Japan, assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 623,012, Jun. 21, 1984, abandoned. This application Sep. 23, 1986, Ser. No. 910,835
Int. Cl.[4] B65H *1/06, 7/14*
U.S. Cl. 221—7 **13 Claims**



8. Sheet dispensing apparatus comprising:

storage means for storing a plurality of sheets;

advancing means for propelling one of said plurality of sheets from said storage means to a ready position;

dispensing means for propelling said sheet from said ready position to a dispense position whereat said sheet partially extends from said apparatus;

means for detaining said sheet in said ready position intermediate that of said storage means and said dispense position;

first sensor means for generating a first signal indicating that said sheet is at said ready position;

second sensor means for generating a second signal indicating that said sheet is at said dispense position;

third sensor means for generating a third signal indicating that said sheet has been totally removed from said apparatus; and

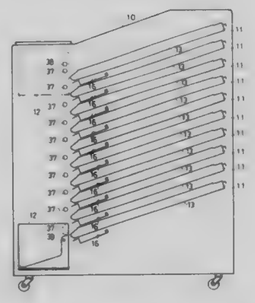
means for enabling said advancing means in response to said third signal.

4,717,044

APPARATUS FOR DISPENSING COIN PACKAGES

Morio Suzuki, Koshigaya, and Kenzi Okada, Noda, both of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,369
Claims priority, application Japan, Sep. 12, 1985, 60-139884[U]
Int. Cl.[4] G07F *11/28*
U.S. Cl. 221—130 **2 Claims**



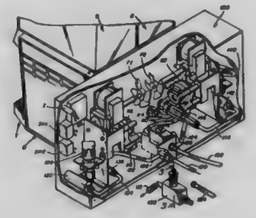
1. An apparatus for dispensing coin packages comprising a plurality of cassette cases each for accommodating a number of coin packages arranged in series, the cassette cases being aligned in a plurality of vertical layers within a body of the dispensing apparatus in a manner whereby they can be freely mounted and removed, the cassette cases each having a front end, an elevator mounted adjacent the front ends of the cassette cases for up and down movement adjacent the front ends of the cassette cases, each of the cassette cases including a bottom plate inclined downwardly toward the front end, a front plate for preventing coin packages from rolling off the front end, and a notch in the bottom plate adjacent the front plate, the apparatus further comprising a plurality of discharge plates pivotally mounted in the body for discharging packages from the respective cassettes, each discharge plate being positioned below the notch of a respective cassette and having a portion adapted to project through the respective notch and raise a coin package above the respective front plate upon upward pivoting movement of the respective discharge plate, and a discharge cam on the elevator, the cam having a protruding portion for operating a selected discharge plate when the elevator is moved to position the cam in juxtaposition to the selected discharge plate in such a manner to upwardly pivot the selected discharge plate and raise a coin package above the front plate of the respective cassette case, the cam further having a recessed portion which may be disposed facing the discharge plate such as to space the cam apart from the discharge plates allowing the elevator to be moved as between the respective cassette cases.

4,717,045

SYRUP SENSOR FOR DISPENSING MACHINE

Peter J. Coppola, Burlington, Mass., assignor to Jet Spray Corp., Norwood, Mass.

Continuation of Ser. No. 590,994, Mar. 19, 1984, Pat. No. 4,645,095. This application Jun. 11, 1986, Ser. No. 873,178
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—64 **37 Claims**



1. A sensor apparatus for sensing an out-of-syrup condition in a dispensing machine having a storage reservoir for the syrup and fluid lines coupling from the storage reservoir to the beverage tank of the dispenser, said sensor apparatus disposed in said fluid line and comprising; a housing having a through passage from one side to the other thereof, said passage intercoupling with said fluid line, means defining a hole in said housing, a probe, a means supporting said probe in said hole extending at least in part into said through passage and disposed substantially transversely to said through passage, a gap being defined between said probe and a wall of said through passage whereby syrup breaks from the probe providing a gap between the probe and syrup, said probe being disposed substantially vertically so that the syrup may break therefrom by gravity, said probe having an end the extremity of which extends partially into said through passage, means for securing a conductor to the probe, a circuit means and means connecting said circuit means to at least said probe, said circuit means adapted to sense the conductivity at the probe between the probe and syrup, said housing having means defining a same compartment disposed about said probe and over said through passage, pump means connected to said fluid line downstream of said housing to maintain at least a partial vacuum in said small compartment about said probe, said circuit means further comprising means for sensing an increase in resistance at the probe gap.

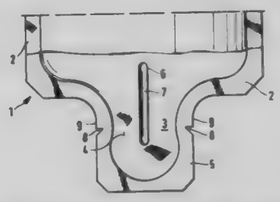
37. A sensor apparatus for sensing an out-of-syrup condition in a fluid line coupling a storage reservoir to a beverage tank in a dispensing machine, said sensor apparatus comprising a housing having a through passage from one side to the other thereof for intercoupling with the fluid line, and circuit means responsive to the conductivity of syrup in the sensor characterized by an electrically conductive probe, means supporting the probe in a hole in the housing so as to extend at least in part into said through passage and disposed transversely thereto, a gap being defined between a wall of said through passage and the end of said probe, said probe being so arranged that when disposed substantially vertically the syrup may break therefrom by gravity, and means coupling said circuit means to the probe to sense syrup conductivity, said probe having a pointed end, said means for supporting the probe comprising a cap disposed in the hole, the depth of said hole being greater than the length that the cap extends into the hole so as to form between the cap and the through passage a compartment having a liquid vacant space, said probe having a pointed end with the pointed end being disposed in the through passages and a portion of the pointed end extending into said compartment thereabove.

4,717,046

SQUEEZABLE CONTAINER PARTICULARLY FOR LIQUID MATERIALS

Werner F. Brogli, Im oberen Letten, CH-4202, Duggingen, Switzerland

Filed Jul. 21, 1986, Ser. No. 888,528
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1985, 3526112
Int. Cl.[4] B65D *35/08*
U.S. Cl. 222—107 **9 Claims**



1. Squeezable container, in particular for liquid filling goods, made from a single stiff, but flexible blank of coated carton material shaped by inwardly bulging or shaping of a center section of the initially flat blank, and by simultaneously raising and outwardly bulging two side sections, and superimposing and joining in tight connection of the opposite side edges and flanges of the side sections, whereby at least at one location the superimposed flanges form a discharge opening with limiting side walls separable from each other by the squeezing pressure exerted on the side sections, and ending in a separable tongue which is closed before use and which on separation defines a dispensing outlet characterized in that:

a. the discharge opening is provided with at least one preformed groove in at least one of the limiting side walls, and

b. said preformed groove extends in the discharge direction of the container and defines at least one guiding conduit communicating with the dispensing outlet formed on the separable tongue to control the direction of and provide a uniform stream of the liquid being discharged.

4,717,047

DISPOSABLE COFFEE CONCENTRATE STORING AND TRANSPORTING APPARATUS

Gerardus J. J. van Overbruggen, Vianen; Richard A. van Beaumont, Harmelen, and Henricus A. C. Thijssen, Son, all of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel B.V., Joure, Netherlands

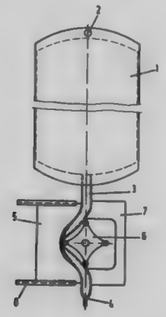
Continuation of Ser. No. 337,670, Jan. 7, 1982, abandoned, which is a continuation of Ser. No. 196,564, Oct. 14, 1980, Pat. No. 4,334,640, which is a continuation of Ser. No. 930,538, Aug. 2, 1978, abandoned. This application Aug. 23, 1985, Ser. No. 768,924

Claims priority, application Netherlands, Aug. 8, 1977, 7708746; Oct. 6, 1977, 7710961

The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—207 5 Claims



1. Disposable apparatus for storing and transporting coffee concentrate and for dispensing increments of the concentrate when installed in a coffee vending machine, said apparatus comprising:

a reservoir containing coffee concentrate, having a rigid neck with an open end defining an outlet, and means on the open end forming a first non-return valve;

a dispensing tube integral with the reservoir, forming with the reservoir an exchangeable single unit handled, changed and disposed of as such and having one end integral with and in communication with the reservoir via said first non-return valve opening into said tube, said tube having an opposite, free, dispensing end formed by a second non-return valve which has a normally closed dispensing outlet, said tube having a longitudinal resiliently flexible portion adapted to be squeezed by a squeezing device in said coffee vending machine, said squeezing device without disassemblage receiving the dispensing tube by simple insertion without distortion of said tube, said squeezing device squeezing said flexible dispensing tube by means of an omnilaterally pressure exerting fluid so as to bring about a substantially total collapse of said resilient flexible dispensing tube, and to dispense concentrate through said second non-return valve, said disposable apparatus being removable from said squeezing device, and said dispensing tube being separated from the pressure exerting fluid by a tube fitting loosely about said dispensing tube and being readily deformable by the fluid pressure whereby on squeezing an increment of coffee concentrate will be dispensed from said apparatus through said dispensing outlet;

the resiliency of the resiliently flexible portion of the dispensing tube being such that it is squeezed and collapsed when exposed to an omnilateral pressure in the range of 1–6 atmospheres, such that said increment does not vary in volume with further increase in the pressure of squeezing applied.

4,717,048

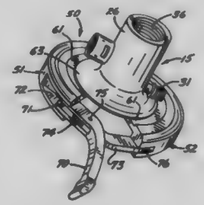
BEVERAGE TAP

Donald R. Stenger, Roscoe, Ill., assignor to Johnson Enterprises, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 729,304, May 1, 1985, abandoned. This application Mar. 18, 1986, Ser. No. 840,759

Int. Cl.[4] B65D *83/00*

U.S. Cl. 222—400.8 13 Claims



1. A tap for a container having an upstanding tubular neck with a radially outwardly projecting peripheral lip at its upper end, the inside of said neck having normally closed valve means which may be opened to permit pressurized fluid to be introduced into said conatiner and to permit liquid to flow out of said container, said tap comprising a body initially spaced upwardly from said lip and having lower probe means sized for downward insertion into said neck and adapted to open said valve means as an incident to being inserted fully into said neck, said probe means being fixed relative to said body, passages in said body for introducing pressurized fluid into the container and for delivering liquid out of the container when said valve means are open, and means for releasably fastening said tap to said neck, said tap being characterized in that said fastening means comprise an expandable collar on said body and having angularly spaced and generally radially inwardly projecting cam lug means, and means for contracting and expanding said collar between a locked position in which said lug means lock beneath said lip to keep said probe means in said neck and a released position in which said lug means are spaced outwardly from said lip to permit said probe means to be pulled out of said neck, said lug means being shaped to cam against the lower side of said lip and draw said tap body downwardly toward said neck sufficiently far to cause said probe means to be fully inserted into said neck and open said valve means as said collar is contracted to said locked position and without need of rotating said tap body relative to said neck.

4,717,049

DROPLET GENERATING APPARATUS

Gary J. Green, Yardley, Pa.; Frederick L. Dryer, Pennington, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 596,990, Apr. 5, 1984, abandoned. This application Oct. 9, 1986, Ser. No. 917,288

Int. Cl.[4] B65D *47/18*

U.S. Cl. 222—420 10 Claims

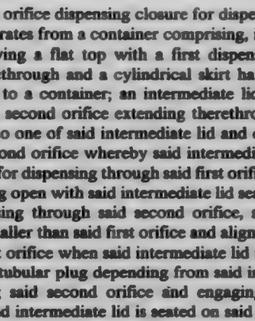
1. Apparatus for producing uniform droplets of a liquid comprising:

a capillary tube having a liquid receiving end and an open tip;

means for supplying and controlling the flow of said liquid to said receiving end;

an outer concentric tube having a converging-diverging venturi nozzle at the bottom thereof, the tip of said capillary tube being positioned in the throat of said venturi;

a source of gas supplied to said outer tube; and



means for regulating the flow of gas through said venturi nozzle to control the formation of droplets from the tip of said capillary tube.

4,717,050

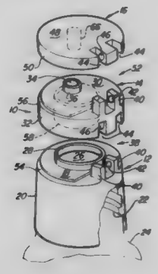
MULTIPLE ORIFICE DISPENSING CLOSURE

David M. Wright, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed May 19, 1986, Ser. No. 864,332

Int. Cl.[4] B67D *3/00*; B65D *47/00*

U.S. Cl. 222—482 16 Claims



1. A multiple orifice dispensing closure for dispensing product at different rates from a container comprising, in combination: a cap having a flat top with a first dispensing orifice extending therethrough and a cylindrical skirt having means for attachment to a container; an intermediate lid hinged to said cap with a second orifice extending therethrough; and a top lid hinged to one of said intermediate lid and cap for closure of said second orifice whereby said intermediate lid may be swung open for dispensing through said first orifice, said top lid can be swung open with said intermediate lid seated on said cap for dispensing through said second orifice, said second orifice being smaller than said first orifice and aligned with the area of said first orifice when said intermediate lid is seated on said cap; and a tubular plug depending from said intermediate lid surrounding said second orifice and engaging said first orifice when said intermediate lid is seated on said cap so that the dispensing from said second orifice occurs by flow from said container, through said first orifice, and out of said second orifice, and both of said orifices being closed when said intermediate lid is seated on said cap and said top lid is seated on said intermediate lid with said plug in engagement with said first orifice.

4,717,051

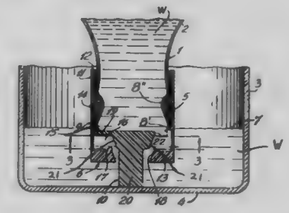
CHECK VALVE FOR WATER DISPENSER BOTTLE

Guy Leclerc, 900 de Nemours Street, Charlesbourg, Canada (G1H 7B3)

Filed Sep. 2, 1986, Ser. No. 902,619

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—545 3 Claims



1. A check valve for removably fitting the mouth of an invertible water bottle to be placed on a water dispenser and for closing said mouth during water-bottle inversion until said check valve contacts an element of said water dispenser when said bottle is resting on said water dispenser in inverted position, said water bottle made of semi-resilient material and having a mouth formed with an external circular rib, said check valve formed of a valve seat part and of a separate valve member part, said valve seat part consisting of a body having a cylindrical wall open at one end, a closure wall at the other end of said cylindrical wall and having a central circular opening of decreasing diameter towards the outside of said body, and forming a female valve seat, means to releasably retain said body over said mouth by engagement with said bottle external circular rib, said valve member part having a disc-like head disposed within said body and of greater diameter than that of said central opening, a stem secured to said head, freely extending through said central opening and protruding from said closure wall, and a tapered male valve seat portion formed around said stem adjacent said head and conforming with said female valve seat, said stem of smaller cross-sectional area than the minimum diameter of said central opening, said valve member part axially movable towards the inside of said body from a valve-closing position in which said male valve seat portion contacts said female valve seat to a valve-opening position wherein said male valve seat portion is spaced inwardly from said female valve seat, and said head is spaced inwardly from said closure wall; further including a first internal circular rib, protruding from said cylindrical wall and constituting a stop for the mouth of said water bottle to limit insertion thereof into said body, so that it be spaced from said closure wall, said head having a slide fit with said cylindrical wall and provided with peripheral notches, said first internal circular rib serving as a stop engageable with said head to provide an inward limit position of said valve member part within said body.

4,717,052

MOLTEN METAL CONDUIT

John M. Urbanic, Churchill Borough, and Jan H. Van Linden, Allison Park, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 11, 1986, Ser. No. 884,434

Int. Cl.[4] B22D *39/00*; F16L *11/02*

U.S. Cl. 222—590 32 Claims

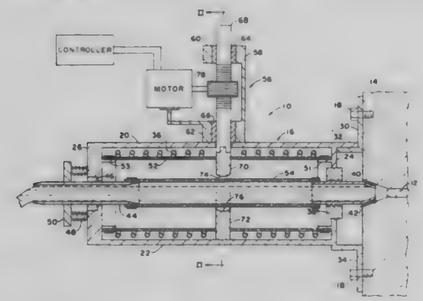
1. A valve for controlling the flow of molten metal, comprising:

a flexible tube of a material compatible for contact with a molten metal to be flowed therethrough; and

means for selectively applying and releasing an external force against the tube which reduces or enlarges the cross-sectional area of the opening through the tube and thereby

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enables varying the volume of metal which can flow therethrough.



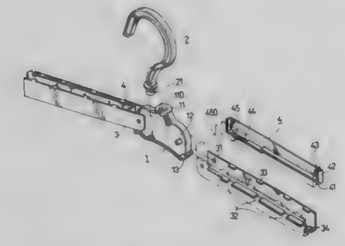
22. A method for transporting molten metal comprising providing an elongated flexible tube having relatively thin sidewalls made from a fabric woven with ceramic fibers and containing molten metal as it is flowed therethrough.

4,717,053

EXTENDIBLE AND FOLDABLE GARMENT HANGER

Kuo-Ru Wang, No. 31, Nan-An Tsun, An-Ting Hsiang, Tainan Hsien, Taiwan

Filed Apr. 1, 1987, Ser. No. 33,510
Claims priority, application Taiwan, Feb. 19, 1987, 76201453
Int. Cl.[4] A47G *25/40*
U.S. Cl. 223—94 4 Claims



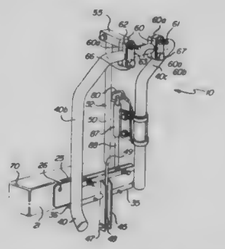
1. An extendible and foldable garment hanger comprising:
a base having an upper end and opposed sides with a pair of support rods respectively projecting from said base near the opposed sides of said base;
a hook rotatably connected to the upper end of said base;
a pair of opposed main arms, respectively pivotally connected to the opposed sides of said base in such a manner that the two pivot points thereof are located above said support rods and closer to the center of said base than said support rods, supported on and above said support rods so that the orientation of the main arms relative to said base is fixed, each of said main arms having a channel provided lengthwise therein having side walls and a bottom wall and a plurality of engagement recesses provided in the upward surface of the bottom wall of said main arm along said channel, each of said channels being open upwardly and open at the free end thereof;
a pair of extension arms, an extension arm respectively received within said channel of one of said main arms and slidable partially out of the open end of said channel at the free end of said main arm, each of said extension arms including a groove provided in the upper surface thereof and a resilient strip integral with said extension arm, each of said resilient strips including an engagement bump integral therewith for being engaged in selected ones of said engagement recesses;
whereby, as desired, the distance between the outer ends of said extension arms can be varied by engagement of said bumps of said extension arms with selected ones of said recesses of said main arms depending on the size of the garment to be hung; when the garment hanger is idle, said main arms can be rotated at the pivot points so that each of said grooves of said extension arms catch at least a portion of said hook therein while permitting said extension arms to retract back to the inside of said main arms;
each of said main arms including a plurality of block sheets horizontally inwardly projecting from the upper ends of the side walls thereof so as to prevent said extension arm received in said main arm from upward movement out of said channel of said main arm;
each of said extension arms having a bottom surface with a slot extending from an intermediate portion of said bottom surface to the outer end of said bottom surface, and wherein each of said main arms has a limit stop projecting upwardly from the outer end of the upward surface of the bottom wall of said main arm and received within said slot for preventing said extension arm received therein from outward movement out of said channel of said main arm.

4,717,054

TIRE CARRIER WITH PIVOTABLE TIRE MOUNT AND VARIABLE COUNTERFORCE DEVICE

Teddy L. Vanzant, 3060 Kips Korner, Norco, Calif. 91760

Filed Jan. 22, 1986, Ser. No. 821,270
Int. Cl.[4] B60R *3/00*
U.S. Cl. 224—42.21 26 Claims



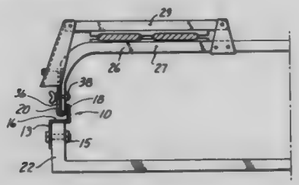
1. A normally vertically-located upright tire carrier of the type adapted to manually swing downwardly and away from a vehicle and having a counterforce applying device and a hinged support plate with a horizontal pivot axis for pivotably securing the carrier to the vehicle, said carrier comprising:
an upright tire carrier frame located in a near vertical plane and pivotably connected at said pivot axis on said hinged support plate;
a vertically-oriented counterforce device arranged to pivot from a near vertical position when said carrier frame is upright to a near horizontal position when said carrier frame is lowered;
means fastening an upper end of said counterforce device at an upper location of said frame;
means fastening the lower end of said counterforce device at an off-pivot location lying in a near vertical plane and positioned below said pivot axis of said hinged support plate; and
said off-pivot location and connection of said counterforce device providing a means for producing a variably increasing counterforce as said tire carrier frame is swung downwardly and away from said normally upright vertical location.

4,717,055

BRACKET FOR TRUCK MOUNTING SKI OR SURFBOARD RACK

Alex San Juan, 2414 W. Avenue 32, Los Angeles, Calif. 90065

Filed May 21, 1986, Ser. No. 866,236
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—42.45 R 9 Claims



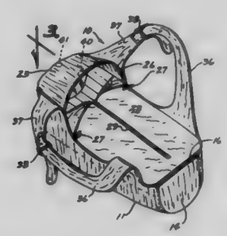
1. Bracket for mounting to the side walls of a truck bed, a ski, surfboard, or like rack having a rigid central portion and terminal portions defining tongue and keeper anchoring structures by which the rack is normally securable to a vehicle roof gutter, said bracket comprising a base plate having base portion adapted to be fastened to said truck bed side wall, an offset portion parallel to said base portion, and a flange therebetween at right angles to said base portion and said offset portion, and a gutter-shaped section parallel to said flange and supported on said offset portion offset by said flange and cantilevered over said flange in rack tongue and keeper structure anchoring relation.

4,717,056

INFANT CARRYING APPARATUS

Sandra Carmichael, R.R.-Box 5689C, Spirit Lake, Iowa 51360

Filed Jun. 9, 1986, Ser. No. 872,023
Int. Cl.[4] H61G *1/00*
U.S. Cl. 224—158 12 Claims



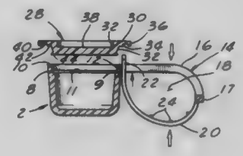
1. An infant carrier comprising:
a shell formed of heavy cloth having a front portion, a rear portion, side portions and a bottom portion, said bottom portion being curved downwardly, said shell having an inside and an outside;
a plate means of substantially the same shape as said front portion being attached adjacent to said front portion for reinforcing said front portion;
foam support means for substantially lining the inside of said shell along the entire bottom and side portions thereof, the top of the side edges of the foam support means being compressed by taut sewing thereof to the shell to help prevent buckling of the foam support under the weight of an infant in the carrier;
adjustable hood means attached to the top of the front portion and to parts of each side portion adjacent the front thereof for covering the head of a baby disposed in said shell and on said foam support means; and
carrier strap means disposed on each side of said shell, each strap means extending from the top front of each side portion to the top rear of each side portion of the shell and forming an opening between a top intermediate part of the side portions of the shell and an intermediate portion of each carrier strap means whereby a person's arm can extend through said openings so that the intermediate portions of the carrier strap means can rest on such person's shoulder to support the weight of an infant in the carrier.

4,717,057

DENTAL PASTE CUP WITH INTEGRATED FINGER MOUNT

Don D. Porteous, 2794 Moraga Dr., Los Angeles, Calif. 90024

Filed Jan. 16, 1987, Ser. No. 4,543
Int. Cl.[4] B65D *25/10, 41/16*
U.S. Cl. 224—217 10 Claims



1. A Dental Paste Cup comprising:
a cup having an open mouth defined by a rim that includes an inner surface, a top surface and an outer surface;
a removable closure overlying said open mouth and engaging said rim, said removable closure having a substantially rigid construction and including a laterally disposed peripheral flange that overlies the top surface of said rim and extends outwardly therefrom to thereby define an outer extension; and
a finger mount extending circumferentially in an outward and downward direction from the rim of said cup and terminating in an open end proximate to said rim to thereby provide a slide-resistant grip on a support finger, said finger mount being defined by first and second portions, with said first portion projecting from the rim of the cup and having an aperture therethrough that extends outwardly from said rim, and said second portion terminates in said open end that passes through the aperture of said first portion and into alignment with the underside of the outer extension of the peripheral flange of said closure, whereby the application of a vertical squeezing force to said finger mount disengages said closure from said cup.

4,717,058

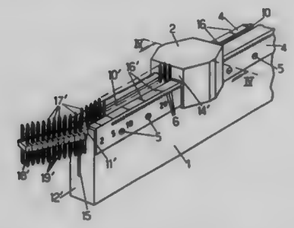
CUTTING TOOL FOR CUTTING DIVISIBLE STRIPS OF CONTACT ELEMENTS

Bernard Gobert, Montmorency, France, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jun. 30, 1986, Ser. No. 880,385
Claims priority, application France, Aug. 2, 1985, 85 11877
Int. Cl.[4] B26F *3/00*
U.S. Cl. 225—93 6 Claims

1. A cutting tool for cutting divisible strips into a given number of elements, these strips being formed form an insulating base (18, 18') made from a frangible material carrying contact elements (17, 17') separated by pre-break lines (19, 19') on the base situated at unit spacings of substantially constant pitch, comprising: a linear support (1); a slider (2) adapted for moving in both directions on the support; locking means (6 to 9) for resiliently locking the slider (2) in given discrete positions on the support (1), the pitch of these positions being approximately the same as that of said pre-break lines; at least one longitudinal slide (10) one end of which opens into a first front end face (12) of the support (1) and the other end of

which is limited by a stop (13) integral with said slider (2), this slide (10) having a cross section of a shape such to receive said strips by sliding with clearance; and a graduation extending along said slide (10), formed of marks (16) for giving an indication of the whole number of unit spacings between said first front end face (12) of the support (1) and said stop (13) integral



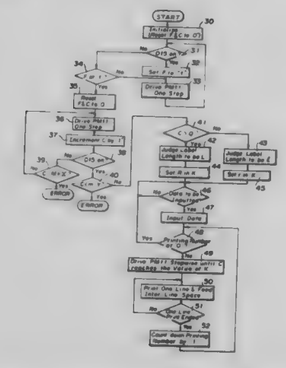
with the slider (2), for each discrete locking position thereof on the support (1), said support (1) comprising a second longitudinal slide (10'), having a cross section of a shape different from that of the first slide (10), for receiving another type of strip, said second slide (10') extending substantially in the extension of the first slide (10), and opening into a second front face (12'), opposite the first face (12), of said support (1).

4,717,059

LABEL POSITIONING METHOD AND LABEL FEEDER FOR CONTINUOUS LABEL PRINTER

Mitsuharu Takahashi, Fujisawa, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Feb. 23, 1984, Ser. No. 582,840
Claims priority, application Japan, Feb. 28, 1983, 58-30746
Int. Cl.⁴ B65H *23/192*
U.S. Cl. 226—2 **23 Claims**



1. A method for automatically positioning, relative to a print head, labels which are longitudinally ordered on a web, the labels having a label length which equals one of a plurality of predetermined label lengths, each label further having a detectable indicia thereon, the method comprising the steps of:

storing in a memory values representative of the plurality of predetermined label lengths;

storing in the memory at least one value representative of a begin-printing location on the labels where information may be printed;

automatically feeding the web past a detector capable of detecting the detectable indicia and detecting a first one of the detectable indicia located on a leading one of the labels;

detecting a next one of the detectable indicia which is spaced from the detectable indicia at a distance which provides a measure of label length;

automatically calculating the label length on the basis of the distance between the detected indicia;

comparing the calculated label length to at least one reference value stored in the memory and, on the basis of the comparison, selecting one of the stored label lengths as a label length value for the labels being fed; and

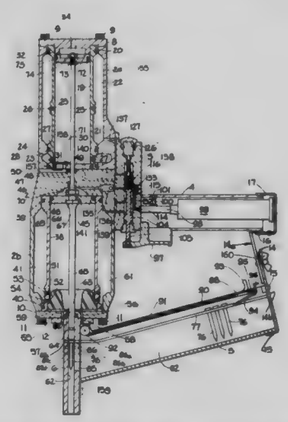
advancing the web by a distance which is determined by the at least one value representative of the begin printing location, on the basis of the selected label length value to place the web in a printing position.

4,717,060

SELF-CONTAINED INTERNAL COMBUSTION FASTENER DRIVING TOOL

Gilbert A. Cotta, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jul. 2, 1986, Ser. No. 881,339
Int. Cl.⁴ B25C *1/08*
U.S. Cl. 227—10 **34 Claims**



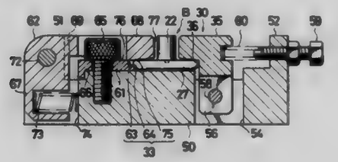
1. A fastener driving tool comprising a tool body, upper and lower coaxial cylinders located within said tool body, each of said cylinders having upper and lower ends, upper and lower pistons located in said upper and lower cylinders respectively and fixedly mounted on a common driver forming a piston/-driver assembly, said piston-driver assembly being shiftable between a normal retracted position and an extended fastener driving position, the upper end of said lower cylinder and said lower piston defining a combustion chamber, ignition means within said combustion chamber, a chamber in said tool body containing pressurized combustion air, at least one chamber in said body containing return air under pressure, a source of gaseous fuel under pressure within said body, and control means to introduce into said combustion chamber a measured air/fuel mixture from said combustion air chamber and said gaseous fuel source, to actuate said ignition means to combust said air/fuel mixture and thereby shift said piston-driver assembly from said normal retracted position to said extended fastener driving position, to introduce air from said at least one return air chamber to said upper cylinder beneath said upper piston to shift said piston/driver assembly from said extended fastener driving position to said normal retracted position and to exhaust spent products of combustion from said combustion chamber and lower cylinder, and means to replenish air under pressure in said combustion air chamber and said at least one return air chamber during shifting of said piston/driver assembly.

4,717,061

BUTTON FEEDER FOR BUTTON APPLICATOR

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 925,077
Claims priority, application Japan, Oct. 31, 1985, 60-166701[U]
Int. Cl.⁴ A41H *37/10*
U.S. Cl. 227—119 **5 Claims**



1. A button feeder, for feeding a button having a circular head to a button applicator, comprising:

a feed guide including a base, a first side guide member mounted on said base and having a substantially wedge-shaped groove, and a second side guide member mounted on said base and having a wall confronting said wedge-shaped groove, said base, said wedge-shaped groove, and said wall jointly defining a button feed path;

said first side guide member including a first guide element fixed to said base and a second guide element linearly movably mounted on said first guide element for movement toward and away from said first guide element, said wedge-shaped groove being defined between said first and second guide elements;

resilient means comprising a leaf spring acting between said second guide element resiliently toward said first guide element; and

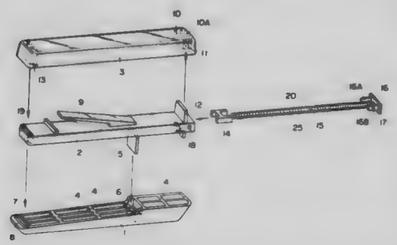
a pusher unit coupled to said feed guide for delivering the button into said button feed path.

4,717,062

STAPLER

Yoshiyaki Ebihara, 22-7, Igusa 3-chome, Suginami-ku, Tokyo, Japan

Filed Apr. 25, 1986, Ser. No. 856,598
Claims priority, application Japan, Sep. 20, 1985, 60-207839
Int. Cl.⁴ B25C *5/02*
U.S. Cl. 227—120 **1 Claim**



1. A staple feeder for a disposable hand-held stapler of the type including an elongate tubular cartridge formed from an injection moldable material, a serially arranged collection of staples positioned within and slidable axially within said elongate tubular cartridge, and means for dispensing said staples serially from said cartridge, said elongate tubular cartridge including:

an end-closure member for said elongate tubular cartridge;

a support rod formed integrally with said end closure member and extending longitudinally within said cartridge;

a feeder element slidable on said support rod and for biasing the staples towards a dispensing position, said end closure member, said support rod and said feeder element each being formed from an injection moldable material; and

a coiled compression spring surrounding said support rod and reacting between said end closure member and said feeder element for biasing said staples towards a dispensing position: the improvement comprising,

lugs formed integrally with said end closure member and received within said elongate tubular cartridge, said lugs engaging inner surfaces of said elongate tubular cartridge and providing guide members for accurately positioning said end closure member and its associated support rod with respect to said elongate tubular cartridge; and

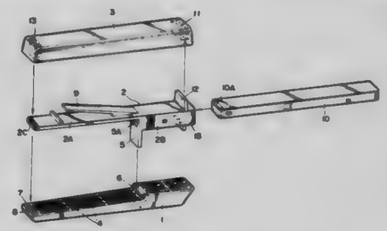
oppositely directed locking members formed on said lugs and engaged within apertures formed in said elongate tubular cartridge to prevent removal of said end closure member and its associated support rod and feeder element from within said elongate tubular cartridge.

4,717,063

STAPLER ANVIL

Yoshiyaki Ebihara, Tokyo, Japan, assignor to Etona Company, Limited, Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,678
Claims priority, application Japan, Dec. 16, 1985, 60-280969
Int. Cl.⁴ B25C *5/02*
U.S. Cl. 227—155 **3 Claims**



1. A stapler comprising a base, a frame, and a handle with each having a forward end portion, an intermediate portion and a rearward end portion, the frame being pivotally mounted on said base at substantially the intermediate portion of said base, the handle being pivotally mounted on said frame at the rearward end portion thereof, at least said base being made of a plastic material, said base having a surface facing said frame at the forward end portion thereof, said base having a recess formed in said surface, said recess being defined by plural walls, and a metallic anvil element being pressed into said recess on said base, said anvil element having at least one side wall and having at least one pointed projection extending outwardly from said side wall of said anvil element, said pointed projection biting into the material of said base at a corresponding side wall of said recess to hold said anvil element within said recess.

4,717,064

WAVE SOLDER FINGER SHIELD APPARATUS

Edward J. Popielarski, Laguna Hills, and Kenneth D. Thomas, Anaheim, both of Calif., assignors to Unisys Corporation, Detroit, Mich.

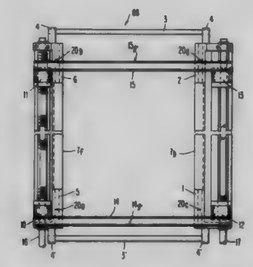
Filed Aug. 15, 1986, Ser. No. 896,703
Int. Cl.⁴ B23K *1/08, 37/06*
U.S. Cl. 228—39 **17 Claims**

1. An auxiliary attachment apparatus, for placement over a

molten solder bath of a wave solder machine, which conveys the underside of a printed circuit board across said solder bath, said printed circuit board having a designated edge area, which is to be isolated from solder contact and a terminal area to be wetted by solder, the apparatus comprising:

(a) support means for holding first and second guide bars for placement at the opposite edges of said underside of said printed circuit board;

(b) said first and second guide bars placed parallel to the direction of motion of said printed circuit board and spaced to a distance slightly greater than the width of said printed circuit board;



(c) prevention means, on said first and second guide bars for isolating designated underside edge areas, of said printed circuit board, from any contact with molten solder, said prevention means including:

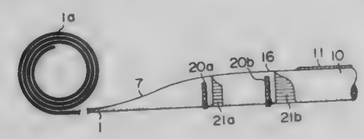
(c1) a rigid, cup-shaped, solder-repellant, metallic unit having an angular finger shield on one side thereof which rises 30° from the horizontal base to contact and repel said molten solder from said designated underside edge areas of said printed circuit board, said finger shield having a horizontal finger edge which is adjustably positioned to 50 mils plus or minus 20 mils below said underside of said printed circuit board, and parallel to said underside.

4,717,065

METHOD FOR MANUFACTURING WELDED PIPES

Shigetomo Matsui, Higashiosaka, and Hisao Hasegawa, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 498,596, May 26, 1983, abandoned. This application Jul. 11, 1985, Ser. No. 754,202
Int. Cl.[4] B23K *31/06*
U.S. Cl. 228—147 3 Claims



1. In a method for the manufacture of welded pipes in which a strip is fed through shaping rolls which gradually bring together the longitudinal edges of the strip in opposed abutting relation to bend the same into tubular form, and then the thus opposed edges of the bent tubular section are welded together, the improvement comprising preventing buckling or waving of said longitudinal edges by the steps of:

during at least one of the process of bending said strip into tubular form and the period during which said edges are abutted against each other, subjecting said edges and a longitudinal central portion of said strip to tensile stress while subjecting the remainder of said strip to compressive stress, by heating said remainder of said strip while maintaining said edges and said central portion free of such heating; and

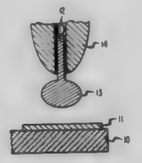
then welding said edges together under such conditions.

4,717,066

METHOD OF BONDING CONDUCTORS TO SEMICONDUCTOR DEVICES

Tsvi Goldenberg; Lawreace A. Greenberg, both of Allentown, and Kenneth P. Moll, Philipsburg, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 24, 1986, Ser. No. 831,814
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—179 8 Claims



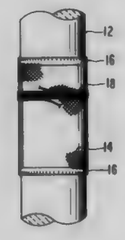
1. A method of forming a contact portion on a metal pad comprising the steps of forming a ball on one end of a conductive wire, bonding the ball to the metal pad and severing the wire from the ball, characterized in that the wire material comprises 97–99 percent gold and 1–3 percent palladium.

4,717,067

DIFFUSION BONDED STRUCTURE AND METHOD OF MAKING

Sebastian W. Kessler, Jr., San Mateo, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 11, 1985, Ser. No. 807,576
Int. Cl.[4] B23K *20/00, 35/12*
U.S. Cl. 228—193 4 Claims



1. A method of diffusion bonding of a first workpiece to a second workpiece, comprising the steps of:

contacting a first workpiece to a second workpiece to form a composite structure;

wrapping said composite structure in carbon yarn to form a wrapped structure; and

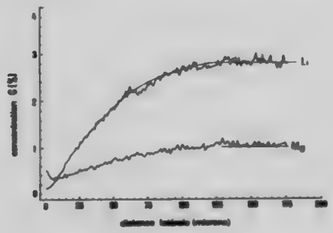
heating said wrapped structure to a temperature sufficient to cause diffusion bonding between said first workpiece and said second workpiece.

4,717,068

PROCESS FOR PLATING AL ALLOYS CONTAINING LI, BY HOT CO-ROLLING

Philippe Meyer, Voiron, France, assignor to Cegedur Societe de Transformation, Paris, France

Filed Feb. 17, 1987, Ser. No. 15,629
Claims priority, application France, Feb. 19, 1986, 86 02764
Int. Cl.[4] B23K *20/24*
U.S. Cl. 228—203 10 Claims



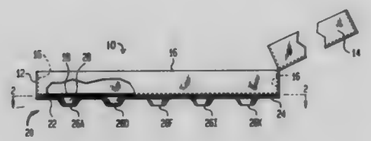
1. In a process for plating by hot co-rolling of a core Al alloy containing Li with a sheath of commercially pure Al or an Al alloy which is free of Li, by reheating and hot co-rolling the core and sheath, the improvement comprising, prior to reheating, subjecting the core alloy to an oxidation operation at a temperature of between 450° C. and 550° C., such that the Li content is reduced in a zone having a depth of between 50 and 700 μm, and chemically and/or mechanically treating the core alloy so as to eliminate the products of the oxidation operation, with a surface loss of alloy in the course of said chemical and/or mechanical treatment of at most 30 μm.

4,717,069

HOT FOOD CARTON HAVING INSULATED BOTTOM WALL STRUCTURE

Donald E. Pizzolato, 125 Fleming St., Piscataway, N.J. 08854

Filed Jun. 3, 1987, Ser. No. 57,485
Int. Cl.[4] B65D *5/70;* A45C *11/20*
U.S. Cl. 229—104 14 Claims



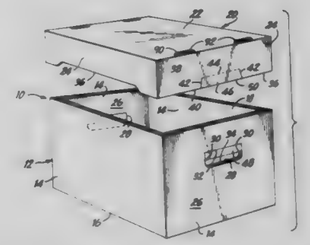
1. In a carton for maintaining a heated food product warm while the carton rests on a cool surface, the carton including a bottom portion having side walls and a bottom wall, and a top portion covering the bottom portion, the improvement wherein said bottom wall comprises a multi-layer insulated wall structure, including a lower layer having a plurality of depressions formed therein and an upper, generally flat, layer closely abutting said lower layer and forming therewith a plurality of void spaces surrounded by said depressions and said upper layer, the depressed portions of said lower layer being adapted to rest on said cool surface and support the remainder of said structure in spaced relation to said cool surface thereby to retard the flow of heat from the interior of said carton to said cool surface.

4,717,070

STORAGE BOX WITH LOCKING COVER

Clifford Taub, 52 Brighton Ter., Wayne, N.J. 07470

Filed Mar. 30, 1987, Ser. No. 31,869
Int. Cl.[4] B65D *43/02*
U.S. Cl. 229—125.28 5 Claims

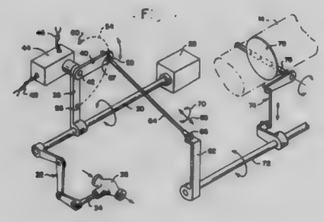


1. In a storage and transportation box of the type having a container body with side walls extending upwardly from a closed bottom to an open top and at least one handhold aperture located in a side wall, adjacent to and spaced downwardly from the open top, the handhold aperture having laterally spaced apart opposite end boundaries defining opposite ends and laterally extending upper and lower boundaries, and a cover for placement over the open top of the container body so as to close the top, the cover including a top wall and depending skirts integral with the top wall for juxtaposition with corresponding side walls of the container body in a generally telescoping relationship, the skirts having lowermost edges spaced downwardly from the top wall, the improvement wherein:

the lowermost edge of at least the skirt corresponding to the side wall with the handhold aperture is spaced downwardly relative to the downward spacing of the handhold aperture to locate said lowermost edge in a position extending laterally across the handhold aperture, between the upper and lower boundaries thereof, a slit in the skirt extending upwardly from the lowermost edge toward the top wall adjacent each end of the handhold aperture, and a fold-line extending laterally between the slits, adacent the uppermost boundary of the handhold aperture, such that the slits and the fold-line defined a locking tab receivable within the handhold aperture, upon folding of the locking tab inwardly along the fold-line and through the handhold aperture, to secure the cover against upward movement relative to the container body; and

the cover is erected from a blank of foldable material, such as corrugated paper board, the blank including a top section having laterally space apart opposite sides and longitudinally spaced apart opposite ends for forming the top wall, side sections at each side of the top section for forming opposite side skirts, and end sections at each of the opposite ends for forming opposite end skirts, the end sections each having two skirt portions and a laterally extending lowermost edge fold-line located between the two skirt portions and extending between the opposite sides, said laterally extending lowermost edge fold-line defining the lowermoset edge of the end skirt when the end skirt portions are folded into juxtaposition with one another along the lowermost edge fold-line, said slits extending transverse to the lowermost edge fold-line in opposite directions away from the lowermost edge fold-line such that the locking tab includes a locking tab portion in each of the end skirt portions, the locking tab portions being folded into juxtaposition with one another when the end skirt portions are folded into juxtaposition with one another.

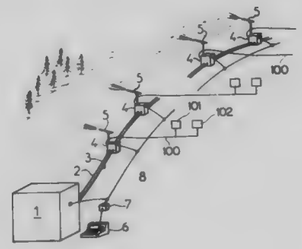
4,717,071
COMBUSTION TRIM CONTROL APPARATUS
David M. Capone, Oakmont, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed Jun. 16, 1986, Ser. No. 874,583
Int. Cl.[4] F23N 5/00
U.S. Cl. 236—15 E 12 Claims

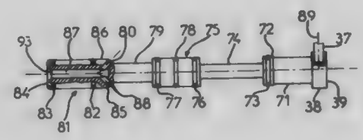


1. A trim control apparatus for regulating fuel and oxygen-containing gas flow to a combustion system comprising:
first rotatable shaft means for regulating the rate of fuel flow to said system;
second rotatable shaft means for regulating the rate of oxygen-containing gas flow to said system;
first radial arm means having a radially inward portion mounted on said first rotatable shaft means for rotating therewith and a radially outward portion;
second radial arm means having a radially inward portion mounted on said second rotatable shaft means for rotating therewith and a radially outward portion;
third radial arm means having a radially inward portion mounted on said radially outward portion of said first radial arm means and having a radially outward portion;
third rotatable shaft means connected with said radially inward portion of said third radial arm means for rotating said third radial arm means;
said third radial arm means rotatable with said first radial arm means and also independently rotatable about said outward portion of said first radial arm means; and
linking means connecting said outward portion of said third radial arm means with said outward portion of said second radial arm means.

4,717,072
SEQUENTIAL VALVE AND DRAIN FOR SNOW GUN
Pierre Girardin, Saint Herblain, France, assignor to Le Froid Industriel York, Carquefou Cedex, France
Filed Nov. 26, 1985, Ser. No. 802,043
Claims priority, application France, Nov. 27, 1984, 84 18236
Int. Cl.[4] E03B 7/20
U.S. Cl. 239—75 9 Claims

1. A feed device for a snow gun, comprising:
(a) an elongated body, said body further comprising:
(i) a water inlet port adapted to be connected to a source of water under pressure;
(ii) an air inlet port adapted to be connected to a source of air under pressure;
(iii) a water outlet port; and
(iv) an air outlet port,
wherein all of said ports have their longitudinal axes lying in a common plane passing through the longitudinal axis of said elongated body;
(b) a longitudinal passage in said elongated body with each of said ports being in communication with said longitudinal passage, said longitudinal passage further comprising:
(i) a first cylindrical flow section lying between said air inlet and said air outlet; and
(ii) a second cylindrical flow section lying between said water inlet and said water outlet;
(c) a drain orifice at one end of said longitudinal passage;
(d) an elongated cylindrical slide mounted in said longitudinal passage for axial movement therein from a closed position to an open position and return;
(e) valve elements on said slide for selectively controlling the flow of water and air through said device and for opening and closing said drain orifice, said valve elements further comprising:
(i) a first valve element having a first sealing member thereon positioned to open and close said first flow section;
(ii) a second valve element having a second sealing member thereon positioned to open and close said second flow section, said second valve element being configured so as to gradually increase the head of water flowing through said second flow section through substantially one-third of the length of travel of said slide between the closed and open positions,
wherein said first sealing member is positioned to open said first flow section to the flow of air therethrough prior to the

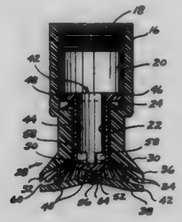




opening of said second flow section to the flow of water therethrough; and
(f) operating means connected to said slide to selectively open and close said inlet and outlet ports and said drain orifice, and to bleed fluid from said passage when said slide is in a closed position, said operating means being responsive to a remote control system acting to automatically control the operation of said feed device in response to atmospheric temperature and humidity inputs without manual intervention, wherein said operating means is mounted at one end of said elongated body with said air inlet and air outlet ports located at the end of said elongated body adjacent said operating means and said water inlet and water outlets ports located adjacent the opposite end of said elongated body, whereby fluid will be drained from said passage through said drain orifice when said elongated body is mounted at a vertically inclined angle with said drain orifice lowermost.

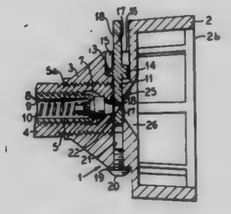
4,717,073
SPRAYER HEAD
Robert P. Bielka, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed May 2, 1986, Ser. No. 859,013
Int. Cl.[4] B05B 15/02
U.S. Cl. 239—107 17 Claims

1. A sprayer head comprising:
(a) a hollow elongate casing connectable at one end to a source of presaurized liquid, the other end of the casing being an outlet end;
(b) a plunger mounted for sliding reciprocal movement within the casing, the plunger having ports formed therein;
(c) elastic means for urging the plunger into a first position within the casing when no pressurized liquid is being introduced into the casing, the plunger being configured and arranged so that when pressurized liquid is introduced into the casing, the plunger moves in opposition to the urging of the elastic means into a second position; and
(d) a flexible disc connected to the outlet end of the casing to



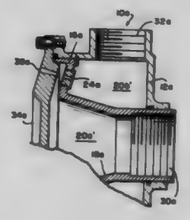
define an outlet gap between the outlet end of the casing and the outermost edge of the disc, the disc being connected for movement between a flush position wherein the gap has a maximum width and a spray position wherein the gap has a minimum width, the disc being configured and arranged to be moved out of the flush position and into the spray position by the plunger when the plunger moves into its second position, the ports and the plunger being configured to direct the introduced pressurized liquid through the gap, the plunger and disc being arranged so that the plunger moves a portion of the distance between the first and second positions before the disc is moved out of the flush position.

4,717,074
ADJUSTABLE ORIFICE FOR A SPRAYER UNIT
Rudolph Kartiner, Minnetonka, Minn., and Guido Zimmermann, Friedrichshafen, Fed. Rep. of Germany, assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.
Continuation-in-part of Ser. No. 623,967, Jun. 25, 1984, abandoned. This application May 21, 1985, Ser. No. 736,539
Int. Cl.[4] B05B 1/28
U.S. Cl. 239—288 22 Claims



1. An adjustable orifice assembly for use with a liquid sprayer unit having a nozzle for discharging liquid in an axial direction, said assembly comprising:
a nozzle guard and means for tightening said nozzle guard on said sprayer unit surrounding said nozzle, said nozzle guard having a first slot extending radially through said nozzle guard and a second slot extending radially in said nozzle guard disposed on one side of said first slot;
an orifice plate disposed in said first slot and having a plurality of differently sized orifices therein radially disposed near a periphery of said orifice plate, said orifice plate further having a centrally disposed pivot pin received in said second slot of said nozzle guard for permitting rotation of said orifice plate thereabout to a selected one of a plurality of positions for aligning one of said orifices in front of said nozzle, said pivot pin and said second slot being disposed such that a portion of said periphery of said orifice plate is at all times exposed for access by a user of said liquid sprayer to rotate said orifice plate;
a retainer means connected to said nozzle guard and engaging said orifice plate for holding said orifice plate in said selected position; and
a seal means for providing an axial seal between said sprayer unit and said orifice plate when said nozzle guard is tightened on said sprayer unit.

4,717,075
PARTICULATE DISPERSION APPARATUS
Anthony F. Carter, Newton Highlands; Calvin Rushforth, Andover; Walter L. Brassert, Belmont, and Arnold M. Heitmann, Swampscott, all of Mass., assignors to Northern Research & Engineering Corp., Woburn, Mass.
Filed Jul. 18, 1986, Ser. No. 886,908
Int. Cl.[4] B05B 7/14
U.S. Cl. 239—398 9 Claims

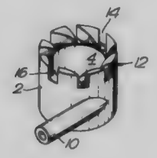


1. Particulate dispersion apparatus, comprising:
a housing;
means for admitting both an energized gas, and particulate, into said housing;
means for discharging such housing-admitted gas, and dispersing such housing-admitted particulate, from said housing; wherein
said gas discharging and particulate dispersing means comprises an array of ejector nozzles and an array of diffuser nozzles; wherein
said ejector nozzles of said array thereof are each in collinear alignment along a given axis with one of said diffuser nozzles of said array thereof;
said ejector nozzles are of converging, diverging configuration;
each said ejector nozzle is spaced apart, along its given alignment axis, from the diffuser nozzle with which it is aligned;
said discharging and dispersing means further comprises means defining a cavity interposed between said array of ejector nozzles and said array of diffuser nozzles; and
each of said nozzles has an end which opens onto said cavity.

4,717,076
SPRINKLER DEVICE
Yosef Notkin, Kibbutz Gvat, Israel, assignor to Plastro Gvat, Kibbutz Gvat, Israel
Filed Aug. 5, 1986, Ser. No. 893,258
Claims priority, application Israel, Aug. 9, 1985, 76052
Int. Cl.[4] B05B 1/34
U.S. Cl. 239—467 11 Claims

1. A vortex sprinkler comprising:
a vortex chamber delimited in the downward direction by a

bottom surface and in the upward direction by a rimmed opening leading to the atmosphere;
at least one liquid inlet leading substantially tangentially into said vortex chamber,



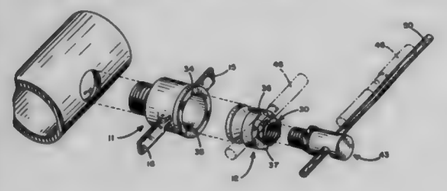
a plurality of slots cut across the rim of said opening, wherein said slots are cut in a direction substantially tangential with respect to said vortex chamber, and
wherein said slots are angularly spaced in such a way that adjacent slots intersect.

4,717,077

SELF-ALIGNING COUPLER FOR FLUID TRANSMITTING CONDUITS

Harry H. Takata, Minneapolis, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Continuation of Ser. No. 569,744, Jan. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 411,633, Aug. 26, 1982, abandoned. This application Mar. 24, 1986, Ser. No. 843,283
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—548 **3 Claims**



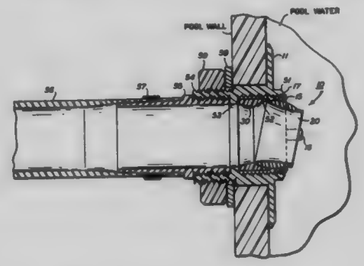
1. In a fluid supply system having a plurality of detachable fluid transmitting conduits and including a female coupler portion and a male adaptor portion to be releasably received and retained within said female coupler portion, said supply system being further characterized in that:
(a) said female coupler portion comprises a body portion having a male threaded end for coupling to a supply manifold and a bore formed therein with a generally horizontally disposed flow axis extending therethrough, and with said bore having a pair of diametrically opposed elongated alignment slots formed generally parallel to the flow axis thereof, a pair of clamping members pivotally secured to the walls of said female coupling portion and arranged in generally diametrically opposed relationship along said bore and with each clamping member being disposed generally at right angles to one of said alignment slots;
(b) said pivotal clamping members each having a cam locking ear portion adapted to extend from said body portion radially inwardly into said bore and with said cam locking ear portions having a generally arcuate locking surface;
(c) said male adaptor portion comprising a generally tubular body with a proximal end and a distal end and having a bore formed therethrough, said bore being in communication with one of said plurality of detachable transmitting conduits and with said bore being in alignment with and generally coaxial with the bore of said female coupling portion, a pair of locking lugs extending generally radially of said bore adjacent the proximal end of said male adaptor portion and arranged to mate with said alignment slots, and an elongated annular groove formed adjacent said proximal end, said annular groove being adapted to receive the camming ears of said pivotal clamping members therewithin; and
(d) a flat peripheral reference alignment surface arranged along the distal end and normal to said flow axis and generally normal to a line extending along the diameter of said male adaptor bore and between said locking lugs for accommodating level indicating devices disposed in flat surface-to-surface contact therewith.

4,717,078

EYEBALL FITTING FOR INCREASING FLOW OF RETURN WATER TO SWIMMING POOL

George F. Arp, 27 Terrace Villa Cir., Fairport, N.Y. 14450

Continuation-in-part of Ser. No. 642,575, Aug. 20, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 911,334
Int. Cl.[4] B05B *15/08;* **F16L** *27/06*
U.S. Cl. 239—550 **11 Claims**



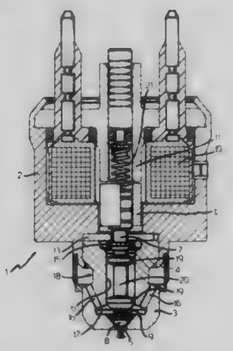
1. An eyeball fitting for increasing the flow of return water into a swimming pool, said eyeball fitting being arranged in a fixture at the discharge end of a return line and including an eyeball having a spherically shaped outside surface allowing said eyeball to be set at variable angular orientations held in a spherical seat by a retainer, opposite entrance and discharge sides of said eyeball having respective concentric entrance and discharge openings connected by an inside surface through which return water flows to be discharged through said discharge opening into said swimming pool, said eyeball fitting comprising:
a. said spherical seat being formed in a ring that is removably positioned within said fixture to surround full water flow from said return line flowing through said ring and into said eyeball set within said spherical seat;
b. said ring fitting loosely inside of internal threads within said fixture and resting against an internal abutment within said fixture;
c. said entrance opening of said eyeball having a diameter approximately equal to the inside diameter of said return line supplying said return water to said eyeball fittng, and said discharge opening of said eyeball having a diameter less than said entrance opening diameter;
d. said inside surface of said eyeball being continuously curved from said entrance opening to said discharge opening;
e. the curvature of said inside surface having a radius that continuously increases as said inside surface proceeds from said entrance opening to said discharge opening; and
f. said retainer being threaded into said internal threads of said fixture so that an inside surface of said retainer engages said eyeball and presses said eyeball into said spherical seat in said ring, which in turn presses against said internal abutment.

4,717,079

FUEL METERING VALVE FOR INTERNAL COMBUSTION ENGINE SUPPLY DEVICE

Roberto de Concini, Zola Predosa, Italy, assignor to Weber S.p.A., Turin, Italy

Filed May 30, 1986, Ser. No. 868,526
Claims priority, application Italy, Jun. 11, 1985, 67542 A/85
Int. Cl.[4] F02M *51/06*
U.S. Cl. 239—585 **11 Claims**



1. A fuel metering valve for internal combustion engines and the like, comprising:
(a) a cap fitted to the valve casing;
(b) said cap having an axial bore extending through at least a portion thereof, said axial bore forming a substantially continuous cylindrical surface in the interior of said cap;
(c) a plug slideably positioned in said axial bore;
(d) said plug having a plurality of projections, said projections having a cylindrical surface operably associated with said axial bore;
(e) an annular groove formed in the outer surface of said cap;
(f) an annular chamber communicating with said axial bore;
(g) a fuel injection outlet communicating with said annular chamber;
(h) a plurality of passageways communicating at a first end with said annular groove and at a second end with said annular chamber, said passageways forming an acute angle with said axial bore;
(i) said first end of said passageways being positioned inwardly from the outer periphery of said cap; and
(j) said annular groove being positioned substantially entirely above said first ends of said plurality of passageways and in a plane that is generally perpendicular to the axis of said cap for minimizing the resistance to fuel flow.

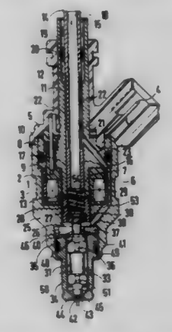
4,717,080

ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVE

Rudolf Sauer, Benningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,495
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502410
Int. Cl.[4] F02M *51/06*
U.S. Cl. 239—585 **6 Claims**

1. An electromagnetically actuatable fuel injection valve for fuel injection systems of internal combustion engines, comprising a valve housing (1) having a longitudinal axis and a step (25), a magnetic coil (3) in an interior (6) of said valve housing, said magnetic coil arranged to surround a core (7) of ferromagnetic material, a valve needle (31), a cylindrical armature (27) in proximity to said core adapted to actuate said valve needle counter to the force of a compression spring (29), said valve needle arranged to cooperate with a fixed valve seat (43); first and second coaxial pipe means (11,14) disposed relative to said longitudinal axis, said first and second pipe means adapted to permit an inlet fuel flow and a return fuel flow, said armature comprising an annular body and a bore (28) and includes an end remote from said core which protrudes with little play into a through bore (26) of said step in said housing, said armature further adapted to extend below said magnetic coil adjacent to a fuel chamber (46), a nozzle body (34), a guide bore (33) in said nozzle body, said valve needle extending in said guide



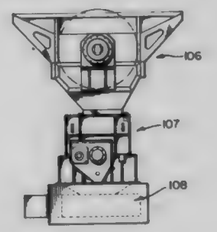
bore and having a terminus (30) affixed to said armature and provided with a flow connection (54), said flow connection in said valve needle terminus being in communication with said fuel chamber and said second pipe means, and said first pipe means being adapted to supply fuel through said housing and around said magnetic coil to said valve needle via a connecting line (53) which is embodied in said valve housing (1) and which discharges downstream of said armature (27) and communicates with said interior (6) which receives said magnetic coil.

4,717,081

TREE RESIDUE PROCESSOR

Douglas D. Hamilton, Montreal, Canada, assignor to Canadian Patents and Development Limited, Canada

Filed Sep. 6, 1984, Ser. No. 647,794
Claims priority, application Canada, Sep. 8, 1983, 436297
Int. Cl.[4] B02C *13/30, 18/24*
U.S. Cl. 241—60 **2 Claims**



1. Apparatus for processing residue such as branches, tree tops or the like resulting from tree harvesting operations comprising:
(a) a first residue reduction unit having a hopper thereon for receiving the residue to be processed, said first reduction unit including a power driven horizontally disposed shaft having a plurality of arms mounted thereon, said arms having a leading edge curved in the direction of rotation and spaced apart from one another circumferentially around the longitudinally along the shaft, said curved arms cooperating with fixed knives to reduce the residue to smaller pieces:

(b) a second residue reduction unit comprising a hammer mill also having a horizontally disposed power driven shaft; and

(c) conveyor means comprising a power driven fan, mounted on a shaft that rotates about a vertical axis, for receiving the broken up residue from the second residue reduction unit and blowing the same to a residue collector, said first residue reduction unit, said second residue reduction unit and said power driven fan being mounted vertically one on top of the other with the fan at the bottom such that feed of material from one to the other is assisted by gravity;

means for metering residue from the first residue reduction unit to the second residue reduction unit, said means comprising first and second hydraulic motors driving respectively said first and second residue reduction units; and

means for diverting hydraulic fluid flow from one motor to the other interrelating power requirement of the motors for the respective reduction units in response to the demands thereon varying the speed of drive of the first and second residue reduction units relative to one another in such a manner as to avoid overloading of the second reduction unit by controlling the amount of residue being fed thereto by the first reduction unit.

4,717,082

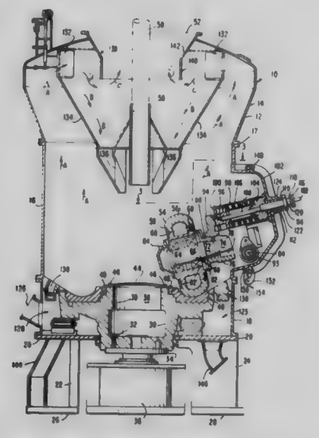
FIXED ROLLER PULVERIZING MILL

Paul V. Guido, Cedar Grove; Chester J. Romanowski, Carteret, and William D. Stevens, North Caldwell, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

Continuation of Ser. No. 208,010, Nov. 18, 1980, abandoned, which is a continuation of Ser. No. 973,987, Dec. 28, 1978, abandoned. This application Oct. 24, 1985, Ser. No. 544,806

Int. Cl.⁴ B02C *15/04*

U.S. Cl. 241—121 **6 Claims**



1. A coal pulverizing mill comprising:

an outer shell;

a horizontal table rotatably mounted within said shell, having an annular recess in the upper surface thereof, said recess being concave over the width thereof;

means to rotate said table;

means to place coal on said table;

a plurality of rollers above said table having a tread portion convex over the width thereof bearing on said table within said recess;

a plurality of supports, each of said rollers being rotatably mounted on one of said supports, each of said supports being pivotally mounted on said outer shell for upward and downward movement;

a plurality of spring means, each of said spring means being connected with said shell to exert a spring force only on one of the supports to urge the one of said rollers associated with said one support down against said table, each of said spring means comprising two springs, said two springs being spaced apart along the direction perpendicular to the axis of the associated roller, engaging their associated support on opposite sides of a vertical plane extending through the axis of rotation of the associated roller, and exerting a force on their associated support in a direction parallel to said axis of rotation;

whereby, when one of said rollers moves vertically, said movement has no effect on the others of said plurality of rollers and all of the rollers are biased to roll straight in the annular recess in the horizontal table.

4,717,083

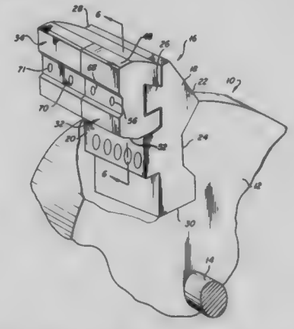
HAMMER ASSEMBLY FOR A ROTARY MATERIAL CRUSHER

Roger H. Quast, 7040 Lake Ellenor Dr., Suite 117, Orlando, Fla. 32809, and Axel W. Orphall, 200 King Richard Dr., McMurray, Pa. 15317

Continuation of Ser. No. 574,699, Jan. 27, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 23,995

Int. Cl.⁴ B02C *13/28*

U.S. Cl. 241—197 **7 Claims**



1. A hammer assembly for attachment to the rotor of a rotary material crusher, said rotor being rotatable about an axis of rotation, said hammer assembly comprising in combination: a hammer member for rigid connection to the rotor of said material crusher, said hammer member having an extension, said extension having a longitudinal axis parallel with and spaced from said axis of rotation of said rotor when said hammer member is mounted on said rotor, said extension having a uniform crosssectional configuration along the length of said extension, a plurality of first bores, each of said first bores extending through said extension and having a longitudinal axis extending substantially perpendicular to said extension within said extension, a cap means removably mounted on said extension for impacting and crushing material on rotation of said rotor, said cap means having an undercut portion which cooperates with a dove tail on said extension for locking said cap means on said extension, a plurality of second bores through said cap means transverse to said cap means, each of said second bores having a longitudinal axis substantially parallel to said first bores when said cap means is mounted on said extension, said second bores being aligned with third bores extending through said dove tail of said extension, first and second hard faces on said cap means with an undercut portion between said hard faces; and fastening means extending through each of said second and third bores for fastening said cap means to said extension, said undercut portion, said dove tail, said first and second hard faces and said fastening means being symmetrical and enabling said cap means to be removed from and relocated on said extension in a reversed position for selectively positioning said first and said second hard faces of said cap means on said extension for crushing material upon use of said hammer assembly on a rotor of a rotary material crusher.

4,717,084

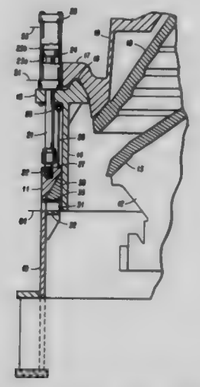
HYDRAULIC SYSTEM FOR REMOTE OPERABLE CONE CRUSHERS

John C. Vendelin, Springfield, and David F. Peaks, Eugene, both of Oreg., assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Dec. 22, 1986, Ser. No. 944,020

Int. Cl.⁴ B02L *2/00*

U.S. Cl. 241—207 **9 Claims**



1. In a cone crusher having a frame, a gyratory head carried by the frame and surmounted by a mantle, a bowl carried by the frame and submounted by a bowl liner above and in spaced crushing relation to the mantle, the bowl and liner being vertically adjustable by hydraulic means effective to move the bowl and liner rectilinearly of the frame in order to adjust said spacing between the mantle and the liner, and means effective to clamp the bowl relative to the frame in a selected adjusted position, the clamping means including one or more clamping members movable into and out of clamping relation with respect to the frame and bowl, a plurality of hydraulic clamp cylinders effective when pressurized to impel the clamping members into said clamping relation, and a hydraulic pump for supply of hydraulic fluid at a first pressure to the clamp cylinders, the improvement including hydraulic intensifier means disposed between the pump and the clamp cylinders and fluid connected to each, the hydraulic intensifier means supplying fluid to the clamp cylinders at a second pressure greater than the first pressure, and first hydraulic clamp valve means between the pump and the intensifier means for controlling supply of hydraulic fluid to and from the intensifier means to activate and deactivate the same.

4,717,085

DOCUMENT SHREDDING MACHINES

Denis P. Crane, Olton, United Kingdom, assignor to Ofrex Group Holdings Plc, West Drayton, United Kingdom

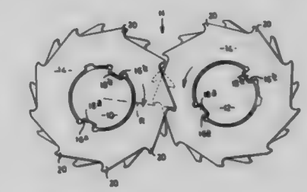
Filed Dec. 18, 1985, Ser. No. 810,418

Claims priority, application United Kingdom, Dec. 21, 1984, 8432545

Int. Cl.⁴ B02C *18/22, 18/44*

U.S. Cl. 241—236 **4 Claims**

1. In a document shredding machine, a cutting mechanism comprising two shafts mounted for rotation about parallel axes, cutting discs at spaced intervals on each shaft with the discs on one shaft intermeshing with the discs of the other shaft, means for rotating the shafts in opposite directions so as to provide a downwardly-accessible nip into which documentary material may be fed, the discs being provided with transverse cutting edges to subject the material to a transverse severance, the cutting discs on each shaft being arranged in a plurality of sets with the cutting edges of the discs of each set being located on helices corresponding in number to the cutting edges of each



disc and extending longitudinally of the shaft and circumferentially intermediate the adjacent helices on which the cutting edges of the discs of adjacent sets are located, and the discs of each set alternating longitudinally with the discs of each adjacent set.

4,717,086

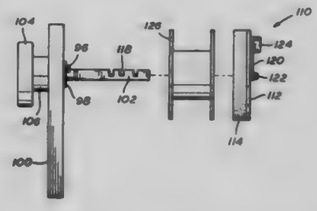
SPOOL REWINDER

John Q. Crow, 1609 W. 8th St., Texarkana, Tex. 75501

Continuation-in-part of Ser. No. 901,379, Aug. 28, 1986. This application Apr. 21, 1987, Ser. No. 40,817

Int. Cl.⁴ B65H *54/00, 54/74*

U.S. Cl. 242—47 **19 Claims**



1. A spool rewinder comprising:

(a) a plate;

(b) a shaft rotatably mounted through said plate;

(c) a means for hand rotation of said shaft mounted to one end thereof;

(d) a plurality of notches located along the portion of said shaft distal to said means for hand rotation and separated therefrom by said plate; and

(e) a member removably mounted on said shaft comprising a disc, a means on said disc to engage with a notch on said shaft whereby said member rotates with said shaft and a resilient compressible member attached to said disc on a surface thereof opposed to said plate.

4,717,087

APPARATUS FOR CONTINUOUSLY SUPPLYING A WEB OF SHEET MATERIAL

John F. Keene, Roscoe; Bengt L. Keller, Rockford, and Robert G. Kennecter, Rockton, all of Ill., assignors to Enkel Corporation, Rockford, Ill.

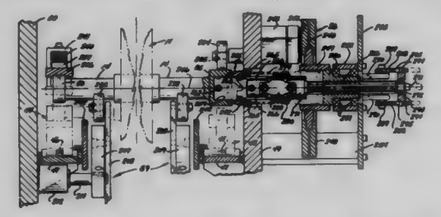
Division of Ser. No. 874,612, Jun. 16, 1986, Pat. No. 4,673,142, which is a division of Ser. No. 799,477, Nov. 19, 1985, Pat. No. 4,614,313, which is a division of Ser. No. 555,823, Nov. 28, 1983, Pat. No. 4,564,150. This application Mar. 16, 1987, Ser. No. 26,813

Int. Cl.⁴ B65H *23/06*

U.S. Cl. 242—75.4 **2 Claims**

1. In an apparatus for drawing a web of sheet material from a roll wound on a core, the combination of, means supporting

the core to rotate freely about its axis as the web is drawn off the roll, a shaft rotatable about said axis independently of the core, a brake having a movable element connected to said shaft, first and second coaxial members mounted on said shaft to turn with the latter, each of said members being mounted to move axially toward and away from the core with at least said second member being movable independently of said first



member, means for moving said first member axially into frictional engagement with said core whereby the core turns said shaft and means operable when said shaft is turning in unison with said core to move said second member into engagement with the core, said core and said second member having parts which interlock upon engagement to mechanically connect the core and said shaft.

4,717,088

BELT WEBBING CLAMPING DEVICE

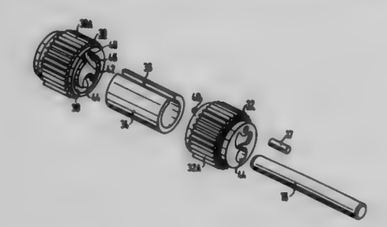
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,583

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1985, 3546227

Int. Cl.⁴ B60R *22/42;* **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **10 Claims**



1. A safety belt restraint system comprising a drum on which seat belt webbing is wound and from which the seat belt webbing is unwound, a belt webbing clamping device located downstream of said drum, said belt webbing clamping device comprising a stationary clamping surface, a clamping roller, and an eccentric metal shaft for supporting said clamping roller for pivotal movement toward said clamping surface for clamping the belt webbing therebetween, said clamping roller comprising at least one molded plastic member and a reinforcing member, said plastic member having a recess formed therein for receiving said reinforcing member and a throughbore extending parallel to the axis of said clamping roller and adjacent to said recess for receiving said eccentric metal shaft, said eccentric metal shaft and said reinforcing member bearing on each other at least under stress along a zone parallel to the axis of said clamping roller.

4,717,089

WEBBING RETRACTOR FOR VEHICLE

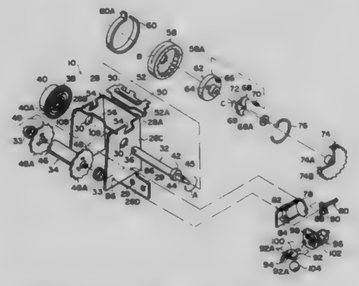
Keiichi Tamura, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jul. 8, 1986, Ser. No. 883,338

Claims priority, application Japan, Jul. 10, 1985, 60-104923[U]

Int. Cl.⁴ B65H *75/48*

U.S. Cl. 242—107.4 A **18 Claims**



1. A webbing retractor for a vehicle, which comprises:
(a) a take-up shaft adapted to retain one end of a webbing and biased in a direction in which said webbing is wound up thereon by a biasing means;
(b) lock means activated when an emergency situation of the vehicle occurs so as to prevent said take-up shaft from rotating in a direction in which said webbing is unwound;
(c) acceleration detecting means for detecting an emergency situation of the vehicle;
(d) a lock wheel adapted such that, when the vehicle is in a normal state, said lock wheel rotates in unison with the rotation of said take-up shaft, but when an emergency situation of the vehicle occurs, said acceleration detecting means engages said lock wheel so that the rotation of said lock wheel is delayed relative to the rotation of said take-up shaft;
(e) engaging means including a pawl and a receiving member, wherein said pawl is activated to engage the receiving member when the rotation of said lock wheel is delayed, thereby actuating said lock means;
(f) first slip means disposed between said lock wheel and said pawl to connect them together by means of a first predetermined frictional force; and
(g) second slip means disposed between said lock means and said receiving member to connect them together by means of a second predetermined frictional force,
so that said first and second slip means prevent the transmission of potentially damaging forces between said lock wheel and pawl and said lock means and receiving member, respectively, when said webbing is unwound after an emergency vehicular situation even when said lock wheel and said acceleration detecting means are still forcefully engaged with each other as a result of said emergency situation.

4,717,090

DEVICE FOR RESTORING AND REMOVING A TAPE LEADER BLOCK TO AND FROM A TAPE CASSETTE

David E. Smith, Lafayette, and Dennis R. Olmsted, Longmont, both of Colo., assignors to Aspen Peripherals, Longmont, Colo.

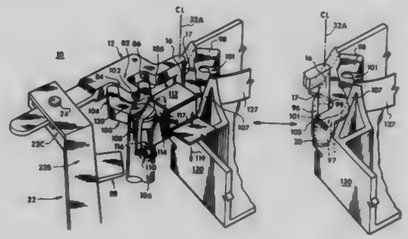
Filed Jun. 11, 1986, Ser. No. 872,951

Int. Cl.⁴ G11B *15/66, 15/32*

U.S. Cl. 242—197 **4 Claims**

1. A device for restoring and removing a leader block to and from a leader block housing in a tape cassette, said device comprising:

a threader arm;
a leader block carrier pivotally mounted to the threader arm and which further comprises a first gear means;
a threader pin attached to the underside of the leader block carrier;



a yoke having (1) a second gear means for engaging the first gear means of the leader block carrier (2) a stem pivotally mounted upon a base and (3) a cam follower which extends from the stem; and
a cam device having (4) a camming surface for engaging the cam follower and (5) means for receiving forces capable of operating said cam device.

4,717,091

TAPE CASSETTE, IN PARTICULAR A VIDEO TAPE CASSETTE, AND A PRESSURE SPRING THEREFOR

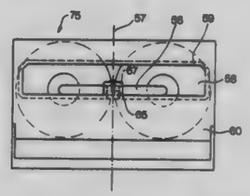
Klaus Schoettle, Heidelberg; Paul Deigner, Kehl; Herbert Dietze, Berghaupten; Volker Frank, Heidelberg, and Oswald Waidele, Mahlberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,164

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 8335294[U]

Int. Cl.⁴ G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—199 **9 Claims**



1. A tape cassette having a housing with a top and a bottom, a pair of tape reels and a reel pressure spring attachable to said top for urging said reels in the direction of the bottom of the housing,
said reel pressure spring having two arms extending from a central portion of the spring, which portion projects away from the plane of the spring arms and is in the shape of a U having a bite portion parallel to said plane and two upstanding leg portions, and the top of said housing comprising
a holding means for said reel pressure spring, said holding means being in the form of a transparent window member and having a longitudinal edge with two transversely extending slits therein, said slits having a mutual spacing the same as that of the legs of the U-shaped central portion of the spring,
so that said central portion of the reel pressure spring, which forms a locating means, may be transversely inserted into the longitudinal edge of said transparent window member, said window member and the spring upon insertion therein forming a subassembly.

4,717,092

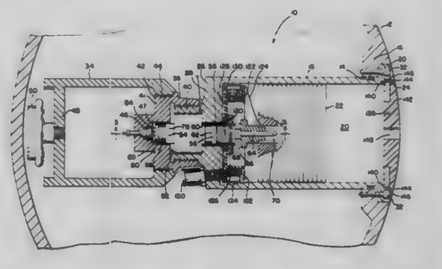
TORPEDO RECOVERY DEVICE

Robert W. Cameron, 7724 115th Pl. NE., Kirkland, Wash. 98033

Continuation-in-part of Ser. No. 792,543, Oct. 29, 1985. This application Jan. 3, 1986, Ser. No. 815,915

Int. Cl.⁴ B64B *1/50*

U.S. Cl. 244—33 **13 Claims**



1. A torpedo recovery unit positionable within a torpedo casing having a circular opening with an annular externally recessed lip for receiving the unit, comprising:
a substantially cylindrical body with an interior cavity substantially diametrically mountable within the torpedo casing, said body having an open end and a distal end closed by an end wall, said body being insertable into the circular opening in the torpedo casing with said body open end at the casing opening and attachable by a flange at said open end to the annular recessed lip of the casing opening to rigidly support the unit within the torpedo casing and to permit access to said interior body cavity, said flange being sized to provide a substantially nonprotruding exterior mounting;
a non-rigid, gas inflatable airfoil foldable within said interior body cavity for deployment therefrom upon inflation, said airfoil having an inflation block;
a substantially cylindrical bottle, containing pressurized gas, and positioned generally coaxial with said body and rigidly and removably attached to an exterior side of said body closed end wall, said bottle having a release valve at an end located toward said body closed end wall for release of the preasurized gas in said bottle upon depression of said release valve;
an elongated valve member positioned generally coaxial with said body and rigidly attached thereto, said valve member having a first end portion extending through a fluid sealed aperture in said body closed end wall and projecting into said interior body cavity, said first end portion having an inflation needle insertable into said inflation block of said airfoil for inflation thereof, said valve member further having a second end portion positioned outside of said body and extending toward said gas bottle and operatively and sealably engaging said release valve when said bottle is attached to said body, said valve member having an interior gas passage extending between said second end portion and said inflation needle at said first end portion with gas flow through said passage being controlled by a solenoid operated valve, said passage to the bottle side being charged with pressurized gas from said bottle upon attachment of said bottle to said body, said solenoid valve being selectively operable to open said passage to allow flow of pressurized gas to said inflation needle for inflation of said airfoil;
a reel positioned within said interior body cavity between said body closed end wall and said airfoil and coaxially mounted on said valve member first end portion, said reel having a tether line wrapped thereabout with one end

attached to said airfoil, said reel being substantially free to play out said tether line upon deployment of said airfoil from said interior body cavity under the pulling force applied to said tether line by said airfoil when inflated;

a fully removable lid positioned at said body open end and releasably engaging said body with a substantially flush mounting with the torpedo casing exterior, said lid being outwardly releasable under the force applied to an inward side thereof by said airfoil during inflation, said lid having a water opening to allow exterior water to freely enter said interior body cavity; and

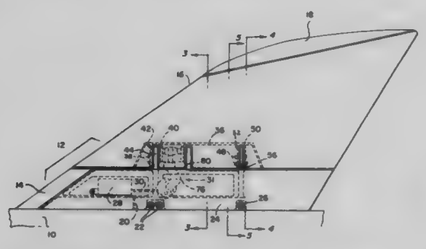
a selectively operable flood port valve in said body closed end wall for release of water in said interior body cavity into the interior of the torpedo casing for selective flooding of the torpedo casing.

4,717,093

PENGUIN MISSILE FOLDING WING CONFIGURATION

Mark A. Rosenberger, East Farmingdale, and John J. Ettinger, Bay Shore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 12, 1985, Ser. No. 764,457
Int. Cl.⁴ B64C *3/56*
U.S. Cl. 244—49 **2 Claims**



1. A foldable wing structure comprising:

a fixed wing section adapted for mounting to a fuselage;

a foldable wing section pivotally connected to the fixed wing section and normally assuming a stored condition;

pyrotechnic actuating means located in one of the wing sections;

a non-reversible over-center mechanism connected between the actuating means and the other wing section for rapidly deploying the foldable wing section to an extended position upon firing of the actuating mechanism;

whereby the over-center mechanism includes a plurality of linkages having sufficient dimensional tolerance therebetween for preventing reversible movement of the foldable wing to a stored condition.

4,717,094

AIRCRAFT ENGINE MOUNT SYSTEM WITH VIBRATION ISOLATORS

Wan T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

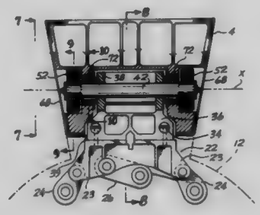
Filed May 19, 1986, Ser. No. 864,486
Int. Cl.⁴ B64D *27/26*
U.S. Cl. 244—54 **31 Claims**

1. In an aircraft of the type having an engine support structure, a system for mounting a jet engine on said structure and dampening engine vibrations, said system comprising;

an engine mount having a first end portion attached to the engine, and an opposite second end portion;

connecting means for pivotably connecting said second end portion to said structure; said connecting means defining a laterally extending pivot axis; and

first and second isolator means for dampening vertical and lateral vibrations, respectively; said first and second isolator means being independent of each other, and positioned between said second end portion and said structure and around said pivot axis; and each of said isolator means including elastomeric elements;



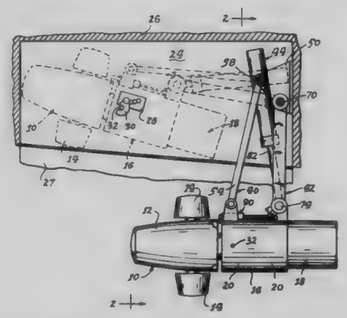
said engine mount being dimensioned and said first and second isolator means being positioned to locate said elastomeric elements of each isolator means far enough away from the engine to prevent heat from the engine from impairing the functioning of the isolator means.

4,717,095

RAM AIR TURBINE INDEXING MECHANISM

Mordeky Cohen, Rockford, and David A. Kezar, Loves Park, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 10, 1985, Ser. No. 743,087
Int. Cl.⁴ B64D *41/00*
U.S. Cl. 244—58 **11 Claims**



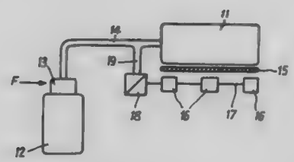
1. In a deployment mechanism for a ram air turbine movable between stowed and deployed positions relative to a mounting base associated with an aircraft, with a plurality of links pivotally connected at pivot joints at one of their ends to said base and pivotally connected at their other ends at pivot joints to the ram air turbine, the ram air turbine including a rotatable turbine hub and blades, and indexing mechanism comprising means coupled to the ram air turbine for releasably holding the rotatable turbine hub and blades in a particular rotative position when stowed, and means coupled to one of said links adjacent the pivot joint thereof at the ram air turbine and responsive to pivotal movement of the link relative to the ram air turbine for coacting with said holding means to release the turbine hub and blade.

4,717,096

PROCESS AND DEVICE FOR OPENING AN INFLATABLE STRUCTURE CONTAINER, ESPECIALLY SUCH AS A CHUTE FOR CLEARING A PLANE

Michel Laberre, Vincennes; Gilles Debray, Paris, and Jean Castelaube, Les Clayes-sous-Bois, all of France, assignors to Aerazur EFA S.A., Issy-les-Moulineaux, France

Filed Jun. 16, 1986, Ser. No. 874,998
Claims priority, application France, Jun. 17, 1985, 85 09149
Int. Cl.⁴ B64D *25/14*
U.S. Cl. 244—137.2 **7 Claims**



1. A process for opening a container for an inflatable member such as a chute for unloading a plane wherein the chute is connected to a source of fluid under pressure through valve means and is housed in a container having a movable door and breakable retaining means holding the door in a closed position, the retaining means being associated with an explosive means actuatable to break the retaining means, comprising the steps of

(a) opening the valve means to pass fluid under pressure through a relay to explode the explosive means and thereby break the retaining means, and

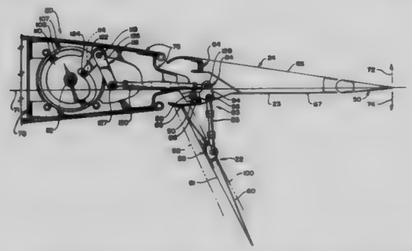
(b) inflating the inflatable member with the fluid under pressure.

4,717,097

AIRCRAFT WINGS WITH AILERON-SUPPORTED GROUND SPEED SPOILERS AND TRAILING EDGE FLAPS

James L. Sepstrup, King County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 3, 1986, Ser. No. 835,804
Int. Cl.⁴ B64C *9/34*
U.S. Cl. 244—217 **11 Claims**



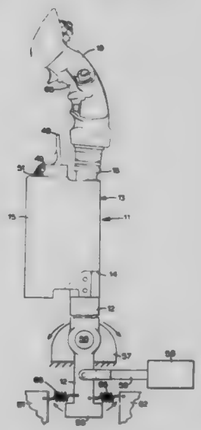
1. The combination of: an aircraft wing; an aileron extending along said wing at the rear edge thereof; stationary aileron support means fixed to said wing; pivot means fixing said aileron to said support means for pivotable movement about an axis extending spanwise of said wing; an aerodynamic lifting or braking means adapted to be displaced from a stowed position in which said lifting or braking means is butted against said aileron to an extended position in which the lifting or braking means is oriented at an angle relative to the chord plane of said wing to increase the lift or drag on the aircraft in which said wing is incorporated; means operable to position said aerodynamic lifting or braking means relative to said aileron support means for pivotable movement about the same axis extending spanwise of said wing as said aileron whereby, when the lifting or braking means is in its stowed position, said lifting or braking means and said aileron pivot together about said axis and said lifting or braking means thereby remains in its stowed position against said aileron as said aileron is displaced about said pivot axis; and an actuating mechanism for displacing said lifting or braking means as aforesaid from its stowed position to its extended position, said actuating mechanism for said lifting or braking means comprising: a two-armed crank, a second pivot means supporting said crank by the end of one arm thereof for pivotable movement about an axis extending parallel to the pivot axis provided by the first-mentioned pivot means, a push-pull actuator, means pivotably connecting one end of said actuator to the crank at the end of the second arm thereof, a link between said crank and said aerodynamic lifting or braking means, means pivotably connecting one end of said link to said lifting or braking means, and means pivotably connecting the opposite end of said link to said crank at a location intermediate the ends of the crank arms, the distance from the pivot axis between the crank and the aileron support means being such that the pivot axis between said crank and said link is essentially coincidental with the pivot axis between said aileron and the aileron support means when said aerodynamic lifting or braking means is in its stowed position.

4,717,098

ACTUATOR FOR A G-LIMITER OVERRIDE

Laurence A. Walker, Glencoe, and William F. Stoudt, Florissant, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 19, 1986, Ser. No. 864,454
Int. Cl.⁴ B64C *13/04*
U.S. Cl. 244—223 **18 Claims**



1. An apparatus for overriding a control stick limiter comprising:

a control stick having its travel restricted by a stop;

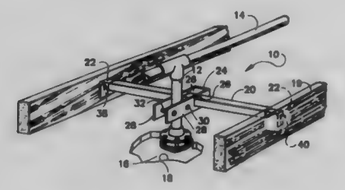
an arm attached to said control stick and rotating relative to said control stick when said control stick is restrained by said stop;

means for overriding said control stick limiter, said override means being actuated upon the rotation of said arm from an initial position through a predetermined angle with respect to said control stick; and

means attached to said arm for resisting the rotation of said arm relative to said control stick, said resisting means preventing the rotation of said arm relative to said control stick until a break-out force is applied to said arm, whereupon said resistance is decreased; whereby

the application of said break-out force to said arm causes the sudden rotation of said arm through said angle and signals the actuation of said override means.

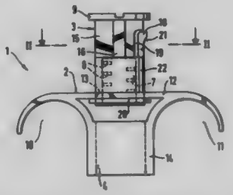
4,717,099
FIRE SPRINKLER ALIGNMENT BRACKET
George R. Hubbard, 13342 Camulto Carmel, Del Mar, Calif. 92014
Filed May 15, 1986, Ser. No. 863,367
Int. Cl.[4] F16C *5/00*
U.S. Cl. 248—57 8 Claims



1. An alignment bracket for holding and aligning a pipe relative to a pair of building support members, comprising:
a central elongate tubular member of square cross-section;
a pipe holder slidably mounted on the central member comprising a U-shaped bracket having opposed straight arms and clamping means for urging the arms towards one another and securing their free ends together for releasably clamping the arms around a pipe extending transversely through the arms, the bracket having aligned square openings in its arms adjacent the closed end of the U-shape for slidably engaging over the central member, each arm having a plurality of spaced openings at different distances from its free end which are aligned with corresponding openings in the other arm, and the clamping means comprising screw means for engaging through a selected pair of aligned openings adjacent the free ends of the arms to draw the arms towards one another, the spaced openings allowing the bracket to be clamped around different diameter pipes; and
a pair of elongate, channel section slide members telescopically engaged in respective opposite ends of the central member, the slide members being of part square cross section corresponding to that of the central member so that they are a close sliding fit in opposite ends of that member, each slide member having attachment means at its outer free end for securing it to a respective one of a pair of spaced building members;
the central member being of a deformable metal and the slide members being of a harder metal, the central member being deformable relative to the slide members to grip against opposing surfaces of the slide members to prevent relative sliding movement when the assembly has been adjusted to the desired length.

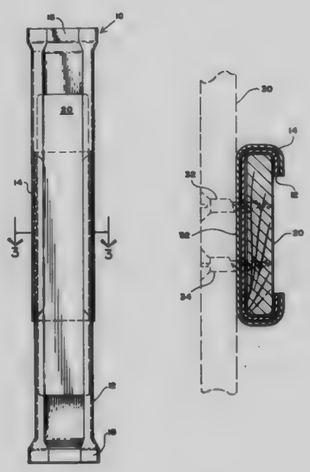
4,717,100
FASTENER ASSEMBLY
Jean-Luc R. G. Klein, Bouxwiller, France, assignor to TRW Carr France S.A., Ingwiller, France
Filed Jul. 11, 1986, Ser. No. 884,393
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—73 9 Claims

1. In a fastener assembly including a securing element having a base part formed with a first axially elongated cylindrical aperture extending therethrough and receiving a generally cylindrical bearing part having a central axially extending opening pressable in an axial direction on to a screw-threaded stud to retain the securing element thereon, the improvement wherein means are provided for retaining the bearing part in the aperture in the base part in a manner to prevent relative axial movement between the base part and the bearing part while permitting rotation of the bearing part in the base part, said means including an abutment and at least one resilient



tongue member adapted to engage with said abutment when said bearing part is received in said first cylindrical opening, said abutment and said tongue each positioned to be entirely within said base part when said bearing part is retained therein.

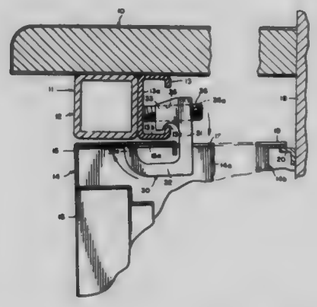
4,717,101
ADJUSTABLE BACKING BOARD BRACKET
Andrew S. Harrod, Rte. 2, Box 209, Zolfo Springs, Fla. 33890
Continuation-in-part of Ser. No. 827,470, Feb. 10, 1986, abandoned. This application Dec. 9, 1986, Ser. No. 939,799
Int. Cl.[4] A47F *5/08*
U.S. Cl. 248—200.1 5 Claims



1. An adjustable backing board bracket to support an item to

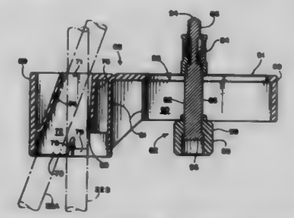
be suspended thereon using interlocking connecting means comprising:
an elongated second member, substantially rectangular in configuration, and having exterior dimensions compatible with dimensions of the interior channel of the first member, the second member being insertable into and slidable with respect to the interior channel of the first member, the first and second members each having planar sides in close physical contact with each other when the second member is inserted into the interior channel of the first member to provide a mounting surface for attachment of the item to be suspended; and
a fiber member disposed within and in close physical contact with the elongated second member, said fiber member adapted to be drawn into intimate mutually reinforcing relationshp with the elongated second member by the interlocking connecting means which comprises at least one screw that pierces at least one elongated member and is imbedded in the fiber member.

4,717,102
PIVOTAL CLAMP FOR CONNECTING MODULAR FURNITURE COMPONENTS
David C. Pflieger, Two Rivers, Wis., assignor to Hamilton Industries, Two Rivers, Wis.
Filed Jun. 5, 1986, Ser. No. 870,889
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—228 12 Claims



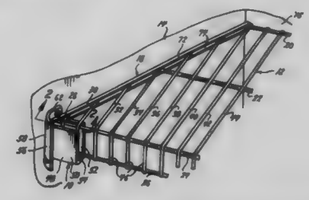
1. A clamp for securing a cabinet to a supporting rail which has a front wall portion, a rearwardly-extending wall portion, and a flange projecting from said rearwardly-extending wall portion and spaced behind said front wall portion; wherein said clamp is generally J-shaped with an upstanding stem portion, an upper arm portion, and a lower arm portion; said upper arm portion being disposed above said lower arm portion and terminating in a rib that projects towards said lower arm portion; said upper arm portion also having a threaded bore extending therethrough in a direction generally parallel with said lower arm portion and spaced above said rib; and a screw threadedly received in said bore; whereby when said lower arm portion is hooked beneath a top frame of a cabinet to be suspended from such rail, with said rib hooked over the flange of the rail, the tightening of said screw against such rail will cause said clamp to pivot and thereby lift said cabinet into tight engagement with the rail.

4,717,103
CLAMP DEVICE FOR POST MEMBERS
Eugene A. Kester, Los Gatos; Scott P. Reeves, Campbell, and Danny Zemanek, Sunnyvale, all of Calif., assignors to Photoflex Products, Campbell, Calif.
Division of Ser. No. 855,755, Apr. 23, 1986. This application Oct. 27, 1986, Ser. No. 924,254
Int. Cl.[4] F16B *2/18*
U.S. Cl. 248—231.3 3 Claims



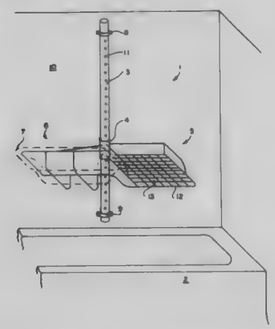
1. A clamp device for supporting objects along a post member, comprising:
a frame member including an arm portion to support the objects and a post receiving portion having a post channel formed therein, with said post channel being angled to be wider at a bottom end and narrower at a top end with stop means being provided in the central portion of said bottom end, said stop means dividing a slide position from a secure position, said slide position being adjacent to said secure position; and
said post channel being bounded by an angled guiding partition intersecting a pair of opposing frame walls which extend to intersect a restraining partition, said slide position being adjacent to said guiding partition and said secure position being adjacent to said restraining partition.

4,717,104
WALL BRACKET WITH ADJUSTABLE MOUNTING FACE
E. Desmond Lee, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Feb. 7, 1986, Ser. No. 827,365
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—235 11 Claims



7. A wall bracket for mounting a shelf in a generally horizontal position within an area defined by two intersecting walls wherein the shelf has a downwardly extending front edge and wherein the angle of intersection between the two intersecting walls may deviate from ninety degrees by an amount not predetermined, the wall bracket comprising a cradle extending from a mounting plate, the cradle having a bottom and generally vertical side walls for receiving a side margin of the front edge therewithin, the mounting plate being generally convex about a generally vertical axis to define a generally convex surface and a generally concave surface, the cradle projecting outwardly from the concave surface to allow rotation of the wall bracket about said axis to compensate for said angle deviation, and means to mount the mounting plate to one of the walls.

4,717,105
SWADDLING TABLE
Samuel Stefani, Leitenweg 21, D-8071 Wettstetten, Fed. Rep. of Germany
Continuation of Ser. No. 696,163, Jan. 29, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,291
Int. Cl.[4] A47F *1/10*
U.S. Cl. 248—295.1 1 Claim



1. A swaddling table for swaddling babies having a horizontal swaddling plate which can be moved from a lower working position upwards to a position of rest, comprising:

(a) a guide rail perpendicualr to the swaddling plate, said guide rail being round;

(b) a sliding bushing surrounding the guiding rail and fixedly connected to the swaddling plate, said bushing carrying the swaddling plate, and said bushing being vertically displaceable on the guide rail;

(c) retention means fixedly attached to said swaddling plate for movement therewith and received within a portion of said bushing for securing the swaddling plate in said working and in said rest positions, said retention means releasing automatically upon a substantially vertical upward force being applied to the swaddling plate to allow substantially non-tilting upward movement of the swaddling plate with respect to said guide rail, said retention means automatically re-securing the swaddling plate upon the swaddling plate being moved upwards a predetermined distance along said guide rail, said retention means including:

(i) at least two engagement recesses in the guide rail in the region of the height of said working position and rest position, each of said at least two engagement recesses having a lower engagement surface;

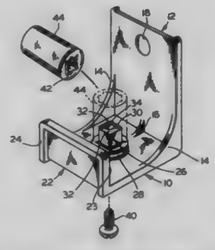
(ii) a horizontal axle connected to the bushing;

(iii) a lever mounted to pivot about said horizontal axle;

(iv) an extension carried by said lever, said extension pointing towards said engagement recesses and being mounted to engage into said recesses, said extension having a run-in slope towards the top and an approximately horizontal surface towards the bottom, said approximately horizontal surface being for engaging said lower surface of one of said at least two engagement recesses for substantially supporting the swaddling plate on said lower surface through contact therewith; and

(v) spring means for pre-stressing the lever towards the engagement recesses, whereby, when the extension is engaged in a recess, upward movement of the swaddling plate will force the extension out of engagement with the recess, and the action of the spring means will force the extension into the next recess thereby securing the swaddling plate in the next position as desired.

4,717,106
DISPLAY BRACKET FOR SOCKETS AND PACKAGE EMPLOYING SAME
Sylvester W. Bies, Bloomfield; Martin V. Fazio, Cheshire, and George Matyczyk, Southington, all of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Apr. 19, 1982, Ser. No. 369,405
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—309.2 5 Claims



1. A bracket for mounting and displaying a wrench socket or the like, comprised of a generally L-shaped, self-supporting rigid body integrally formed as a single piece from a synthetic resinous material, said body including a generally planar base wall, an upstanding, generally planar back wall extending along the rear of, and being of substantially the same width as, said base wall, and a mounting post projecting upwardly from said base wall inwardly of the periphery thereof in spaced relationship to said back wall and parallel to the plane thereof, said post being dimensioned and configured to snugly seat within the tool-engaging recess of the socket, said post including a plurality of resiliently deflectable elements, said elements being capable of lateral movement to vary the effective peripheral dimensions of said post, a member for spreading said elements, said elements cooperatively defining an opening receiving said spreading member therebetween, and said member being dimensioned and configured to spread said elements and thereby increase the normal peripheral dimensions of said post when inserted into said opening, said post and said spreading member comprising retaining means on said bracket, and said back wall having means at its upper end portion to permit hanging of said bracket on a hook or the like, whereby the socket can be mounted for display and storage in an upright position, protectively sheltered within the confines of said base wall and said back wall as defined respectively by the upward and forward projections thereof.

4,717,107
CLOTHESLINE LOCKING POLE
Robert Servadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213
Filed Apr. 17, 1987, Ser. No. 39,173
Int. Cl.[4] E04G *25/00*
U.S. Cl. 248—353 3 Claims



1. An article of the character described for the support and locking of a clothesline, said article comprising a clothesline pole, having two diametrically opposed rectangular openings near its top end, said rectangular openings allowing the insertion and operation of line engaging means, two- U-shaped groooves located at the top of said pole in opposite relationship and being at right angles of said rectangular openings, said grooves allowing the passage of said clothesline through the top of said pole so as to be engaged by said line engaging means, said line engaging means comprising an alligator type clamp pivotally connected to said pole at right angles to said rectangular openings and comprising two upper, opposing jaw elements operationally connected to two lower squeezable hand elements, said handle elements being squeezable through said rectangular openings from outside thereof which causes said jaws to open for engagement of said clotheslines, said handle elements having a return spring therebetween so as to return said jaws to the closed position when pressure on said handles is released, said spring being of sufficient strength as to keep said jaws firmly closed for locking of said clothesline to said pole.

4,717,108
TEMPORARY ELECTRICAL SERVICE SUPPORT SYSTEM INCLUDING NOVEL SELF-CONTAINED BRACKET MEMBER
William O. Liedle, 2809 E. 27th St., Vancouver, Wash. 98661
Filed Nov. 6, 1986, Ser. No. 927,455
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—432 22 Claims



1. A self-contained bracket member for supporting a plurality of leg members having a rectangular cross-sectional configuration in an upright position, without requiring supplemental support means, to form a temporary electrical service support system, which comprises:

a. plate means;

b. a plurality of rectangularly shaped slots located within, and disposed about the periphery of, said plate means for receiving and securing a plurality of said leg members therewithin; and

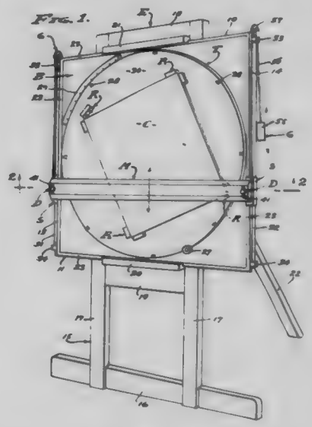
c. stabilizing block means centrally located, joined to, and extending from said plate means which engages the inner side of each said leg member for maintaining said system in an upright position at the point of engagement between the respective sides of said block means and the inner side of each leg member.

4,717,109
ADJUSTABLE TRAVELING MAHL AND MAGNETIC SUPPORT FOR MOUNTING ARTIST'S CANVASES
Walter G. Johnston, 10618 Rountree Rd., Los Angeles, Calif. 90064
Filed Oct. 28, 1985, Ser. No. 791,727
Int. Cl.[4] A47B *19/00*
U.S. Cl. 248—441.1 16 Claims

1. A traveling mahl and support for an artist's canvas comprised of a frame over which a canvas is stretched, and including;

a planar base with a flat artist's canvas supporting surface and having parallel opposite side edges extending between top and bottom edges,

slide means for movement at and along each opposite side edge of the base and comprised of a member coextensive with each opposite side edge of the base and a carriage slideably engaged on each member and to which opposite ends of the mahl are attached by height adjustment means comprised of a manually adjustable jack between each carriage and the opposite end of the mahl, there being guide pins standing between each carriage and the opposite ends of the mahl for rigid transverse positioning and selective placement of the mahl over the base,



the mahl being in the form of a rigid member carried by and extending transversely between the slide means at opposite side edges of the base and carried thereby to travel in spaced relation over the supporting surface of the base and the artist's canvas thereon,

and releasable brake means at and securing the slide means at each opposite side edge of the base for positioning the mahl between the top and bottom edges of the base.

4,717,110
ADJUSTABLE SIGNAGE SYSTEM
Scott R. Fohrman, 1123 Linden, Wilmette, Ill. 60091
Filed Dec. 15, 1986, Ser. No. 941,600
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—545 11 Claims

1. An all plastic signage system capable of supporting and displaying at least one variably-sized sign comprising:

a flat base having mounting means;

a support adapter constructed and arranged to engage said mounting means;

an elongate, vertically-projecting support stem which releasably engages said support adapter;

a fixed crossbar integrally joined to the top of said support stem to form a 'T', said crossbar having integrally formed upper sign clamping means;

a sliding inverted crossbar having integrally formed lower sign clamping means and constructed and arranged to slide vertically with a friction fit on said support stem to securely hold signs of a variety of sizes against said fixed crossbar;

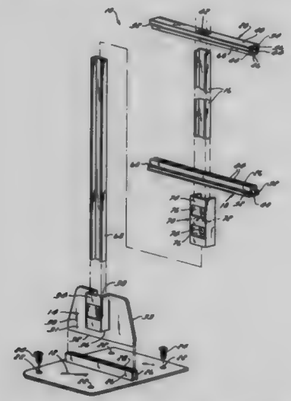
said upper and lower sign clamping means extending the full length of the respective crossbars;

said fixed and inverted crossbars each including:

a flat base member having a length and a width, oriented parallel to the plane of said flat base, and having a central aperture which engages said support stem;

a pair of flanges projecting vertically from and integrally

joined to said base member in parallel orientation, one on each side of said support stem and coextensive with the length of said base member;



said sign clamping means joined to said base member so as to clamp said sign against at least one of said flanges; and including a spring clip coextensive with said base member and integrally joined thereto.

4,717,111

FLUID-FILLED RESILIENT ENGINE MOUNT

Siro Saito, Kani, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Sep. 12, 1986, Ser. No. 906,536
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—562 **14 Claims**



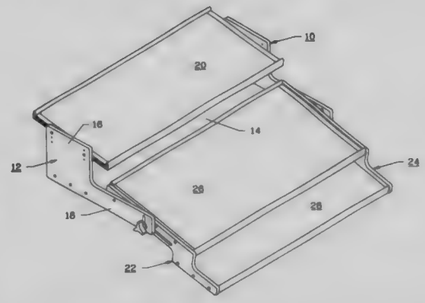
1. A fluid-filled resilient engine mount comprising:
an inner sleeve;
an outer sleeve located radially outwardly of said inner sleeve and having an axis parallel to that of said inner sleeve;
a generally annular resilient member interposed between said inner and outer sleeves, said resilient member having a plurality of voids which are spaced from each other in a circumferential direction of said resilient member and are open in an outer surface of said resilient member, said outer sleeve closing said voids and thereby cooperating with said resilient member to define a plurality of fluid chambers corresponding to said voids, said fluid chambers being filled with a fluid;
means for defining at least one orifice through which said plurality of fluid chambers communicate with each other;
a stopper block of an elastic material positioned adjacent to an opening of each of said plurality of voids and fixed relative to said outer sleeve and said resilient member, said stopper block having an abutting portion which protrudes in the corresponding fluid chamber toward said inner sleeve, said abutting portion being spaced from a bottom of the corresponding void, and abuttable on said bottom, thereby preventing an excessive amount of elastic deformation of said resilient member; and
a rigid member fitted on the outer surface of said resilient member, said rigid member having a plurality of apertures aligned with said plurality of voids in said resilient member, said outer sleeve being fitted on an outer surface of said rigid member, thereby holding said resilient member via said rigid member.

4,717,112

COMPUTER WORKSTATION

Fred L. Pirkle, P.O. Box 27, Orrland, Pa. 19075

Filed Nov. 4, 1986, Ser. No. 927,242
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—639 **7 Claims**



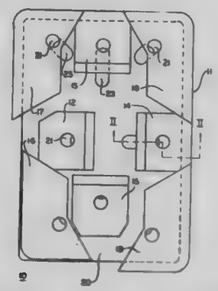
1. A computer workstation for computer-aided design using a computer, a monitor, a keyboard and a digitizer pad comprising:
a main support frame;
a monitor supporting means;
means for connecting the monitor supporting means to the main support frame and allowing and limiting adjustment of the position of the monitor supporting means relative to the main support frame in fore and aft directions;
digitizer pad supporting means having a pad supporting surface;
keyboard supporting means having a keyboard supporting surface; and
secondary frame means for connecting said digitizer pad supporting means and said keyboard supporting means together with the keyboard supporting surface below the level of the lowermost part of the pad supporting surface;
in which the main support frame comprises two side panels arranged in opposed, parallel, spaced relationship to each other, said side panels having base means adapted to rest on a horizontal support surface;
in which the secondary frame means comprises two side panels, one of the side panels of the secondary frame means being situated parallel and adjacent to one of the side panels of the main support frame and the other of the side panels of the secondary frame means being situated parallel and adjacent to the other of the side panels of the main support frame;
each of said side panels of the secondary frame having an elongated slot; and
each of the side panels of the main support frame having a least one vertically elongated slot;
locking pin means, extending through said vertically elongated slots of the side panels of the main support frame and through the elongated slots of the side panels of the secondary frame means, for locking said panels in fixed relationships to each other, said pin means being movable to positions in said vertically elongated slots at a height allowing the keyboard supporting surface to be located below the level of the bottom of the base means, and said pin means being movable to positions in said vertically elongated slots at a height allowing the slots of the side panels of the secondary frame means to slide on the pin means in said fore and aft directions with the keyboard supporting means being located entirely above the level of the bottom of the base means and with the elongated slot in each side panel of the secondary frame being substantially horizontal.

4,717,113

SEGMENTED INJECTION MOLD SYSTEM

Harold B. Martin, West Caldwell, N.J., assignor to EEE Co., Inc., Port Washington, N.Y. and Martin Design, West Caldwell, N.J., a part interest

Continuation of Ser. No. 745,891, Jun. 18, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 11,459
Int. Cl.[4] B29C *45/40*
U.S. Cl. 249—63 **14 Claims**



1. A mold system which forms a substantially sealed holow volume for receiving a molding material in a molten state, the mold system comprising:
a first mold portion for forming a portion of the hollow volume, said first mold portion forming an outermost surface of the substantially sealed hollow volume, said outermost surface being closed onto itself,
a second mold portion for communicating with said first mold portion and forming the substantially sealed hollow volume, said second mold portion being formed of a plurality of mold segments each having an outer volume-facing portion and a inner portion and being displaceable between respective first and second positions whereby when said mold segments are each in their respective first positions, said outer volume-facing portions form at least one substantially continuous innermost surface which faces into and substantially seals the substantially sealed hollow volume for communicating with the molten material and said inner portions define therebetween a free interior space devoid of any means therein in actuating engagement with said plurality of mold segments of said second mold portion, and when said mold segments are in their respective second positions, the substantially sealed hollow volume is unsealed for facilitating removal of the molten material in a solidified state and said inner portions are located within the confines of said otherwise free interior space; and
actuator means coupled to each of said mold segments for displacing the mold segments between their respective first and second positions.

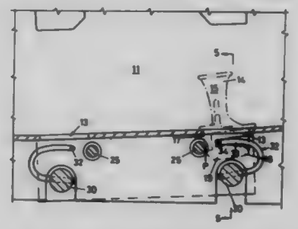
11. An injection molding arrangement comprising:
a continuous outer wall for defining an outermost extent of an article to be molded; and
a plurality of wall segments which are displaceable substantially radially outward for forming an inner wall and substantially sealably engaging with said outer wall for forming an enclosed region having a configuration corresponding to an article to be molded, said wall segments being displaceable substantially radially inwardly in an otherwise free space of an interior hollow chamber for collapsing said inner wall and permitting access to said enclosed region, said free space being devoid of any means in actuating engagement with said wall segments.

4,717,114

CONCRETE SLEEPER MOULD

Robert L. Bratchell, Brighton, Australia, assignor to Monier Limited, Brighton, Australia

Filed Jul. 8, 1986, Ser. No. 883,070
Claims priority, application Australia, Jul. 10, 1985, PH01409
Int. Cl.[4] B28B *7/26, 23/00*
U.S. Cl. 249—86 **7 Claims**



1. In a bank of sleeper moulds for the moulding of sleepers side by side, wherein said sleeper moulds contain shoulder receiving apertures in which respective shoulders are located during concrete pour, each of said shoulder positioned in said mould such that said shoulder comprises two outwardly projecting side wings each of which contains a respective inwardly directed clip retaining recess,
the improvement comprising a rocker shaft located below the moulds and extending across the moulds, bearing surfaces journalling the rocker shaft for rotation about its longitudinal axis, a plurality of retaining members carried on the rocker shaft,
locating pins located below the moulds and so positioned as to locate said shoulders with respect to the moulds when the retaining member urge the shoulders into engagement with the locating pins, the shape, size and location of each said retaining member being such that said retaining member enters said clip retaining recesses of said wings of a respective said shoulder and urges that shoulder into firm engagement with a said locating pin when its said rocker shaft is rotated in its bearing surfaces, and retention means releasably retaining that said rocker shaft in its said shoulder engagement position,
each of said locating pins extending across the bank of moulds but beneath the moulds and being withdrawable from a side of said bank.

4,717,115

ADJUSTABLE MOLD FOR FABRICATING BONE REPLACEMENTS

John P. Schmitz, Columbia, and Jeffrey O. Hollinger, Glenwood, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 14, 1986, Ser. No. 919,945
Int. Cl.[4] B29C *33/20, 33/68*
U.S. Cl. 249—112 **2 Claims**

1. An adjustable mold comprising:
(a) five wall members rigidly attached to each other to form a container structure being open on one side, said wall member opposite said open side having a plurality of through holes;
(b) a lid member having a plurality of through holes, said lid

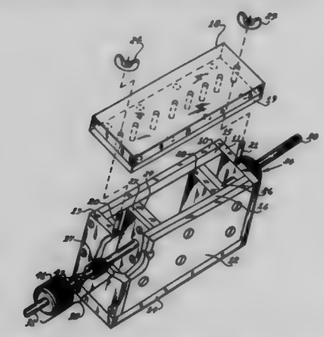
member being adapted to fit sealing over said open side of said container structure;

(c) means for releasably attaching said lid member to said container structure;

(d) at least one plate which is movable transversely between a nonintersecting pair of said wall members said plate sealingly contacting said pair of wall members and said wall member which is opposite said open side of said container structure;

(e) a rod attached to the side of said plate opposite the side in contact with a composition placed in said adjustable mold, said rod extending through a hole in one of said wall members, which is parallel with said plate, to the exterior of said adjustable mold;

(f) a hollow threaded member with a conical interior, which is in threaded engagement with said hole in said wall member through which said rod extends, said rod thereby also extending through said threaded member;



(g) a hollow cone member slidably received onto said rod and into the conical interior of said hollow threaded member, said cone member having longitudinal openings around the circumference and open to a narrow end of the cone member, thereby permitting the narrow end of said cone member to be tightly compressed around said rod when said cone member is forced into the conical interior of said hollow threaded member; and

(h) an interiorly threaded nut which is closed at one end except for a hole having about the same diameter as that of said rod which permits said rod to extend therethrough and which when slid onto said rod and is threadably engaged with said threaded member forcing said cone member into said threaded member thereby compressing said cone member tightly around said rod thereby preventing movement thereof.

4,717,116

PILOT MODE TWO-PORT SOLENOID VALVE

Tsuneo Ishigaki, Soka, Japan, assignor to SMC Corporation, Tokyo, Japan

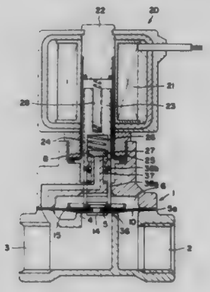
Filed Aug. 15, 1986, Ser. No. 896,963

Claims priority, application Japan, Aug. 15, 1985, 60-179918

Int. Cl.⁴ F16K *31/40*

U.S. Cl. 251—30.02 **4 Claims**

1. In a pilot mode two-port solenoid valve comprising a valve housing, a valve seat to which a main valve comes in and out of contact positioned in a passage between an inlet port and an outlet port provided in said valve housing, a pressure chamber at the back of the main valve, the pressure chamber being brought into communication with the inlet and outlet ports through a pilot supply hole and a pilot discharge passage, a pilot valve actuated by the armature of a solenoid to open and close the pilot discharge passage and thereby bring the main valve in and out of contact with the valve seat, the main valve being connected to the armature by means of a lifting spring, the improvement that the pilot discharge passage is immovably provided in the valve housing, the pilot valve coming in and out of contact with a pilot valve seat at one end of the pilot discharge passage is attached to the armature while being



spring-urged in the closing direction, and a holding rim is provided to the armature so that the pilot valve is caught thereby toward the end of the attraction stroke in which the armature is drawn to the stationary core.

4,717,117

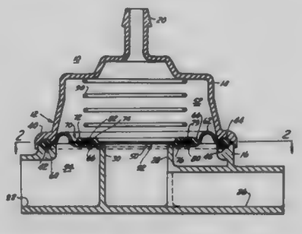
VACUUM VALVE USING IMPROVED DIAPHRAGM

John E. Cook, Chatham, Canada, assignor to Bendix Electronics Limited, Chatham, Canada

Filed Dec. 8, 1986, Ser. No. 938,911

Int. Cl.⁴ F16K *31/145*

U.S. Cl. 251—61.1 **4 Claims**



1. A valve comprising:

a plurality of passages (22,24) formed in a housing, and an annular sealing area formed about one of said passages;

a circular diaphragm, received within and supported by the housing and movably relative to said sealing area in response to a force differential applied thereacross; including a thin, planar, flexible, non-metallic membrane centrally disposed therein for sealably engaging said sealing area,

means, disposed adjacent to the outer edge of the membrane, for stiffening such outer edge, comprising an increased thickness portion including an annular groove formed therein and a metal ring received into and secured within such groove,

a flexible convolute disposed about said portion;

a spring received upon said ring for biasing the membrane into engagement with the sealing area.

4,717,118

ELECTROMAGNETICALLY OPERABLE VALVE

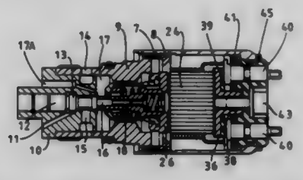
James C. Potter, London, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed May 27, 1987, Ser. No. 54,531

Claims priority, application United Kingdom, Jun. 6, 1986, 8613666

Int. Cl.⁴ F16K *31/06*

U.S. Cl. 251—129.02 **11 Claims**



1. An electromagnetically operable valve comprising a housing, a valve body mounted in the housing and a valve member axially slidable in the valve body between open and closed positions, an armature of plate-like generally rectangular form connected to the valve member, the armature extending generally tranversely to the axis of movement of the valve member, a magnetic "E" core having an inner and a pair of outer limbs each defining a pole face respectively presented to the armature, a stop plate engaged by the outer limbs of the core, and a spacer positioned between the stop plate and the housing, retaining screws securing the core, the stop plate and the spacer to the housing, said stop plate having a central aperture through which a part of the armature can pass, a pair of opposite edges of the armature being recessed so as to form stop surfaces lying behind the face of the armature presented to the core, said stop surfaces in use, engaging with said stop plate to determine the extent of movement of the armature toward the core, the movement of the armature away from the core being limited by the abutment of portions of the armature with the spacer,

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4,717,119

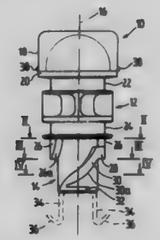
DEVICE FOR BLEEDING OR FOR DRAINING A HEAT EXCHANGER, SUCH AS A RADIATOR FOR A MOTOR VEHICLE

Pierre Trin, Maurepas, France, assignor to Valeo, Paris, France

Filed Feb. 11, 1987, Ser. No. 13,589

Int. Cl.⁴ F16K *31/524*; B65D *41/02*

U.S. Cl. 251—144 **12 Claims**



1. A device for bleeding or draining a heat exchanger, such as radiator for a motor vehicle, the device comprising a removable stopper suitable for closing in sealed manner an orifice formed in the wall of the heat exchanger water box, the stopper comprising means defining a limit stop for a closed or open position, an operating head, and a tail formed with diametrically opposite radial ribs, said ribs following limited angular sectors and comprising a first portion parallel to the axis of the stopper tail and a second portion perpendicular to said axis, the radially inside edge of the orifice being formed with diametrically opposite radial notches defining plane projections therebetween suitable for co-operating with the radial ribs on the stopper tail in order to hold it in its orifice closure position, the device including the improvement whereby each radial rib on the stopper tail includes a third portion extending obliquely or helically around the axis towards the free end of the stopper tail from said second portion of the rib, and constituting a sloping ramp suitable for co-operating with a radial side of a projection from the edge of the orifice in order to displace the stopper in translation along its axis when it is rotated about said axis from its position in which it closes the orifice in sealed manner and means directly extending from the third portion for retaining association of said stopper with said heat exchanger and for controlling the bleeding or draining of the heat exchanger.

4,717,120

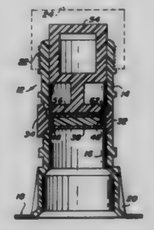
DISCHARGE VALVE FOR BULK CONTAINERS

W. Douglas Fremow, Jeffersontown; Franklin E. Russell, Sr., Prospect, both of Ky., and Roger H. Ellert, San Clemente, Calif., assignors to Boise Cascade Corporation, Boise, Id.

Filed May 12, 1987, Ser. No. 48,779

Int. Cl.⁴ F16K *51/00*

U.S. Cl. 251—144 **15 Claims**



1. In a bulk liquid container including an outer shell and an inner liner formed of flexible synthetic plastic material, a valve assembly for discharging liquid from the container, comprising

(a) a longitudinal tubular housing defining a generally cylindrical chamber open at its opposite ends, said housing including an annular flange extending radially outwardly from one end thereof, said flange being connected with the container liner adjacent a liner opening, thereby to permit fluid communication between the interior of the container liner and said chamber; and

(b) butterfly valve means connected with said housing for rotation between open and closed positions relative to said chamber to control the flow of liquid therethrough, said valve means including

(1) a valve shaft including end portions rotatably connected with said housing on opposite sides of said chamber, respectively, and a generally cylindrical body portion extending transversely across said chamber, said body portion containing a slot extending between said shaft end portions;

(2) a generally circular disc arranged in said slot and connected with said shaft, said disc having a maximum diameter corresponding with the diameter of said chamber and having flattened peripheral portions adjacent said shaft end portions, respectively, said disc having a minimum diameter corresponding with the length of said slot; and

(3) an O-ring connected with the outer edge of said circular disc, said O-ring being compressed between said slot and said disc, whereby when said valve means is rotated to the open position, said disc is arranged longitudinally of said chamber to permit the flow of liquid from the container through said housing, and when said valve

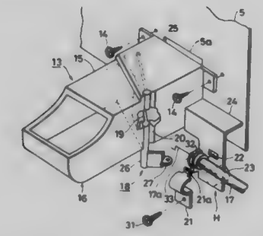
means is rotated to the closed position, said disc is arranged transversely of said chamber to prevent liquid from flowing therethrough.

4,717,121

DAMPER SYSTEM FOR AIR CONDITIONER

Yasuhiko Hashimoto, and Kaneo Katayama, both of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,174
Claims priority, application Japan, Jun. 5, 1985, 60-84787[U]; Jun. 5, 1985, 60-84788[U]
Int. Cl.⁴ F16K *31/46*
U.S. Cl. 251—294 3 Claims



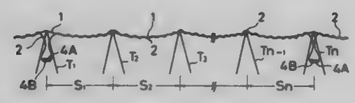
1. A damper system for an air conditioner, comprising:
(a) a duct (16) for connecting an outside air intake aperture (5*a*) to an air blower suction inlet (9*a*),
(b) a pivotal damper (18) mounted in the duct for opening and closing the duct,
(c) a control cable (17) for the damper including an outer sheath and a control wire (17*a*) slidably disposed within the sheath and having one end coupled to the damper,
(d) first anchor means (33, 34) fixed to the sheath at one end thereof proximate said one end of the control wire,
(e) a support bracket (24) integral with the duct,
(f) a cable clamp (21) mountable to the support bracket for clamping said one end of the sheath therebetween,
(g) second anchor means (32, 35) fixed to one of the support bracket and the cable clamp for engaging the first anchor means to prevent any longitudinal movement of said one end of the sheath when the clamp is mounted to the bracket, and wherein the first anchor means comprises a pair of spaced, outwardly extending rings (33) defining an annular groove (34) therebetween, and the second anchor means comprises a tab (35) integral with the clamp and seated in the groove.

4,717,122

METHOD OF LAYING OPTICAL CABLE IN AERIAL LINE

Takao Ikeya, and Norio Katsuoka, both of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1986, Ser. No. 908,012
Claims priority, application Japan, Sep. 20, 1985, 60-206689
Int. Cl.⁴ B65H *59/00*
U.S. Cl. 254—134.3 R 3 Claims



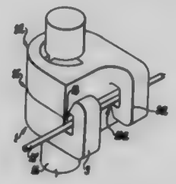
1. A method of laying an optical cable on an aerial line between supports defining a laying zone comprising the steps of:
(a) winding the optical cable measured in a necessary length for a laying zone on a reel,
(b) mounting optical connectors at both ends of the reels,
(c) laying the optical cable by winding at the aerial line by mounting the reel on a winding machine on the aerial line already installed,
(d) disposing optical connectors on the supports at both ends of the laying zone,
(e) laying optical cable at an adjacent laying zone by repeating steps a, b and c, and
(f) connecting the optical cables of the adjacent zones on the support.

4,717,123

SECURING AGENT

Andrew N. Wrigley, Auckland, New Zealand, assignor to ITW New Zealand Limited, Auckland, New Zealand

Filed Feb. 18, 1987, Ser. No. 15,901
Claims priority, application New Zealand, Feb. 21, 1986, 215246
Int. Cl.⁴ B21F *27/00*; E04H *17/02*
U.S. Cl. 256—48 4 Claims



1. A clip assembly is adapted to be formed by joining together two identical clip members, each of said clip members comprising a body portion having a bore formed therethrough, a pair of protrusions integrally formed on one end of said body portion and extending away from said one end in direct alignment with said bore, and a book portion integrally formed with said body portion, a plurality of teeth formed lengthwise on each of said protrusions, whereby upon said two identical clip members being brought together by positioning said pair of protrusions of said two identical clip members in opposed mating relation such that said plurality of teeth of said pair of protrusions ratchet together with said plurality of teeth of said opposed pair of protrusions as said two identical clip members are squeezed together.

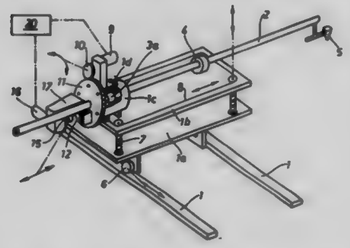
4,717,124

STEERING MECHANISM FOR AUTOGENOUS CUTTING TORCH

Leo Larikka, Takkatie 7 a, 00370 Helsinki, Finland

PCT No. PCT/FI86/00001, § 371 Date Aug. 13, 1986, § 102(e) Date Aug. 13, 1986, PCT Pub. No. WO86/04003, PCT Pub. Date Jul. 17, 1986
PCT Filed Jan. 7, 1986, Ser. No. 897,756
Claims priority, application Finland, Jan. 7, 1985, 850057
Int. Cl.⁴ B23K *7/02*
U.S. Cl. 266—54 7 Claims

1. A steering mechanism for an autogenous cutting torch, comprising:
a base;
a steering arm comprising an elongated shaft having one end supporting said torch;
means for supporting said steering arm on said base for movement along a longitudinal axis of said arm and for rotary movement around said axis;
drive means for moving said arm along said axis and for rotating said arm around said axis, said drive means including a rotary power source drivingly connected to a rotatable drive element around said shaft, which shaft is extended through said drive element and drivingly engaged therewith so that said shaft is rotated with said drive element;
digital control means for activating said drive means to rotate said shaft and to move said shaft longitudinally along said axis during rotation or alternatively in cycles of desired duration of rotation and longitudinal movement;



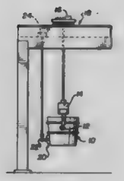
said drive means including an elongated toothed rack mounted within a cylindrical surface of said steering arm for moving said arm along said longitudinal axis; and
a slide bearing for supporting said arm on said base for movement along said longitudinal axis, said arm passing through said slide bearing and extending outwardly from opposite sides thereof a substantial distance during all operating conditions of said arm.

4,717,125

METALLURGICAL LADLE WITH IMPROVED TILTING LUG

John D. Ficke, Union, Mo., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1986, Ser. No. 838,497
Int. Cl.⁴ C21B *3/00*
U.S. Cl. 266—143 8 Claims



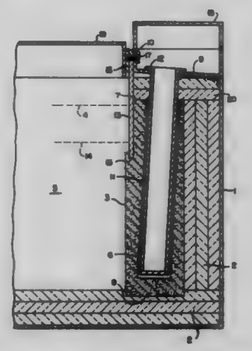
1. In a metallurgical ladle having a bottom, an upwardly extending sidewall, trunion means for supporting the ladle for tilting movement about a horizontal trunion axis, and ladle tilting lug means mounted on the ladle sidewall in position to be engaged and lifted by a crane hook for tilting the ladle about its trunion axis, the improvement wherein said tilting lug means comprises,
elongated hooking link means having one end portion permanently mounted on said sidewall for limited pivotal movement about a fixed pivot axis,
support bracket means rigidly mounted on said sidewall near said bottom and at a circumferential location substantially 90° from said trunion axis, said support bracket means including pivot means engaging and pivotally mounting said one end of said hooking link means for limited pivotal movement about said pivot axis, said pivot axis extending generally horizontally and in generally parallel relation to said trunion axis,
said hooking link means having an open hooking eye at its other end for engagement by a crane hook to apply a tilting force through said hooking link and pivot means to tilt the ladle about said trunion axis,
biasing means normally retaining said hooking link in a substantially horizontal position whereby said hooking eye is normally maintained at a position spaced outwardly from said sidewall for engagement by a crane hook,
said hooking link being freely pivotable about said pivot axis in an upward direction upon application thereto of an upwardly directed force and being pivotable about said pivot axis downward from said generally horizontal position against said biasing means upon application thereto of a downward force.

4,717,126

APPARATUS FOR HOLDING AND REFINING OF MOLTEN ALUMINUM

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 28, 1986, Ser. No. 834,922
Int. Cl.⁴ C22B *4/08*
U.S. Cl. 266—200 10 Claims



1. In a vessel for the holding, with or without refining, of molten aluminum and comprising (1) an insulated shell having bottom and side walls impervious to molten aluminum; (2) graphite block lining on at least one interior side wall of said shell, said graphite block extending above the design operating melt level within the vessel, said graphite block being positioned so as to come into contact with the molten aluminum within the vessel, and having an opening therein extending from the upper end thereof in the direction of, but not reaching, the bottom of said block; (3) an electrical resistance heating element disposed within the opening in said graphite block, said heating element being supported therein without electrical contact with said graphite block, the improvement comprising:
(a) support plate means attached to said shell and extending inwardly into the vessel over the graphite block at a position above said graphite block;
(b) a metal heating element container positioned within said opening in the graphite block, said container extending upward above said graphite block and being secured and sealed to said support plate means;

(c) a refractory sheet positioned on the inner surface of said graphite block and extending vertically so as to protect said graphite block from contact with oxygen in the gas phase above the level of melt within the vessel, said refractory sheet extending horizontally substantially to both sides of the shell, the upper end of said refractory sheet being secured to said support plate to protect the top of said graphite block from contact with oxygen from said gas phase, thereby totally protecting said graphite block from oxidation,

whereby said refractory sheet and support plate means, in conjunction with said shell and said metal heating element container, serve to preclude the oxidation of the graphite block from the side or top down to below the level of melt in the vessel, with subsequent flow of molten aluminum into the opening in said graphite block, said metal container serving to protect the heating element from attack by liquid or vapor state chlorides capable of passing through the interconnected pores of said graphite block.

4,717,127

PIVOT ASSEMBLY FOR CONNECTING A COVER MEMBER TO A HOUSING OF A SLIDING CLOSURE UNIT

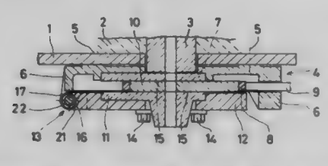
Beat Troxler, Hildisrieden, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Oct. 8, 1986, Ser. No. 916,739

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 8530966[U]

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 266—287 **16 Claims**



1. In a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel and of the type including a housing to be fixed to the metallurgical vessel, at least one stationary refractory plate positioned within said housing, a movable refractory plate mounted within said housing for movement relative to said stationary refractory plate, a cover member for pressing together said refractory plates to urge respective abutting sliding surfaces thereof into sealing contact, and a pivot shaft pivotally connecting said cover member to said housing, the improvement of means for ensuring that said sliding surfaces are free of binding and are maintained in substantially uniform surface-to-surface contact under the influence of said pressing by said cover member and for preventing displacement of said cover member relative to said housing due to friction between said sliding surfaces upon movement of said movable refractory plate, said means comprising:

said housing having at least one boss, said pivot shaft extending through said boss and thus being supported thereby;

means connecting said cover member to said pivot shaft with play therebetween, said connecting means comprising a hinge portion of said cover member having therethrough an opening, said pivot shaft extending through said opening with clearance between said pivot shaft and said hinge portion, said clearance between said pivot shaft and said hinge portion being greater than clearance between said pivot shaft and said boss;

auxiliary pivot means on said cover member defining a pivot axis parallel to the axis of said pivot shaft; and

control means connecting said pivot shaft and said auxiliary pivot means for maintaining a constant spacing between said pivot axis and said axis of said pivot shaft.

4,717,128

REFRACTORY PLATE ASSEMBLY INCLUDING WEAR AND EROSION RESISTANT INSERT SURROUNDED BY PLURAL COMPONENT BASE STRUCTURE

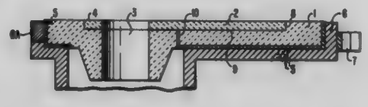
Raimund Brückner, Engenhahn; Jürgen Plath, Wiesbaden-Biebrich, and Ernst Lührsen, Bad Schwalbach, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,212

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538499

Int. Cl.⁴ B22D *37/00*

U.S. Cl. 266—287 **19 Claims**



1. In a refractory plate assembly for use in a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said assembly including a refractory base structure having therein a recess and a refractory wear and erosion resistant insert positioned within said recess, said base structure and said insert together defining a planar sliding surface to be abutted with a planar sliding surface of another refractory plate of the sliding closure unit during relative movement therebetween, said insert and said base structure having therethrough a discharge opening, and said insert having a dimension along said sliding surface thereof at least equal to the range of relative movment, the improvement of means for elastically supporting said insert within said base structure and for enabling removal and replacement of said insert with respect to said base structure, said means comprising:

said base structure being formed of at least two components divided along at least one joint extending transverse to said planar sliding surface, each said component defining a respective portion of said recess and surrounding a respective portion of the circumference of said insert;

a frame supporting said base structure and surrounding the outer periphery thereof;

a first said component being stationarily positioned within said frame and at least a second said component being movably positioned within said frame; and

elastically yieldable clamping means, the clamping force of which is adjustable, for urging said insert toward said first component.

4,717,129

TUBE WITH WELDED BOTTOM DESIGN IN PARTICULAR FOR MAKING HIGH-PRESSURE GAS SPRINGS

André Jaillet, Auxon Dessus, France, assignor to Airax, Montferrand-Le-Chateau, France

Continuation-in-part of Ser. No. 682,317, Dec. 17, 1984, abandoned. This application Dec. 19, 1986, Ser. No. 945,237

Claims priority, application France, Dec. 16, 1983, 83 20187

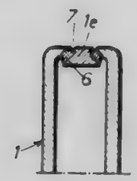
Int. Cl.⁴ F16F *9/32*

U.S. Cl. 267—113 **5 Claims**

1. A tube having a welded bottom impermeable to gases under pressure, the tube comprising:

(a) a tube body having end with an inner peripheral edge folded-over toward the interior of the tube body for forming an opening of reduced diameter; and

(b) an end piece for forming the welded bottom of the tube, the end piece including a metal disk with an outer diameter substantially smaller than the inner diameter of the tube body and substantially greater than the reduced diameter of the opening of the inner peripheral folded-over edge of said tube end, said disk having at the center thereof a cylindrical outwardly directed projection, said projecting having a diameter slightly smaller than the reduced diameter of the opening of the peripheral folded-over edge of said tube end, wherein said end piece is located inside the tube body and joined to said folded-over edge by a welded zone having a metallographical structure of melted or softened metal, said welding zone having an exposed surface in the bottom of a narrow groove formed between said folded-over edge and said projection, and a protective substance is provided in said groove formed between said folded-over edge and said projection.



4,717,130

POWER UNIT SUSPENSION SYSTEM

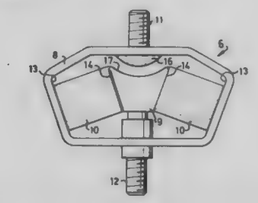
Ralf I. Barkhage, Lerum, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden

Filed Jun. 24, 1986, Ser. No. 877,757

Claims priority, application Sweden, Jun. 26, 1985, 8503176

Int. Cl.⁴ F16F *7/00*

U.S. Cl. 267—141 **4 Claims**



1. In a power unit (1) for an inboard-outboard drive for boats having an engine bed (2), the power unit (1) including an engine (3) and a power transmission (4) connected to the engine for driving a propeller (5), and a suspension system for the engine (3) on the engine bed (2), said suspension system comprising suspension elements (6, 7), therebeing a said suspension element (7) supporting a rear portion of the engine (3) in compression between the engine and the engine bed (2) and a forward suspension element (6) between a forward portion of the engine (3) and the engine bed (2) which is in compression between the engine (3) and the engine bed (2) when the engine (3) is not operating but is in tension between the engine (3) and the engine bed (2) under the thrust of the propeller (5) when the engine (3) is operating; the improvement in which in said forward suspension element (6) comprises two fastener means (8, 9) one connected to the engine (3) and the other to the engine bed (2), mutually parallel abutment surfaces (13, 14) on the two fastener means (8, 9), said abutment surfaces being substantially flat and symmetrically arranged at an angle to a plane which is disposed parallel to the direction in which the engine (3) tensions the forward suspension element (6), and damping means (10) between said abutment surfaces (13, 14), said fastener means (8, 9) being so connected to said engine bed (2) and said engine (3) as to move said abutment surfaces (13, 14) toward each other to compress said damping means (10) when said engine (3) subjects said forward suspension element (6) to tension.

4,717,131

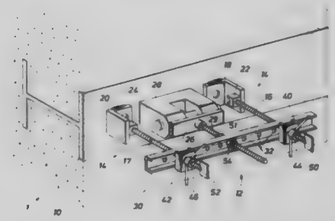
WELDING CLAMP

David Dugas, 1603 Helena Ave., Nederland, Tex. 77627

Filed Sep. 3, 1986, Ser. No. 903,512

Int. Cl.⁴ B25B *1/20*

U.S. Cl. 269—41 **9 Claims**



1. A welding clamp comprising:

(a) mounting bracket means having a pair of base elements each adapted to establish restraining relation with a structural member on which an attachment is to be welded, said base elements each forming an internally threaded opening, said mounting bracket means further having longitudinal rod means extending therefrom and having threaded connections with said internally threaded opening;

(b) a brace having a longitudinal shaft extending therefrom;

(c) an axial beam forming openings, receiving said rod means and said longitudinal shaft;

(d) a pair of blocks surrounding each of said bolts and a pair of nuts to threadably engage each of said bolts, said blocks being positioned between said beam and said nuts and being urged by said nuts for positioning said beam on said rod means; and

(e) means securing said brace to said beam and being adjustable for positioning said brace relative to said beam.

4,717,132

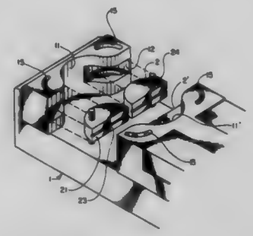
VISE WITH SLIDING MOVABLE CLAMP SURFACE

Tai-Her Yang, 5-1, Tai-Pin Street, Kuang-Hwa Li, Si-Hu Jeau, Chang-Hwa Hsien, Taiwan

Filed Sep. 25, 1986, Ser. No. 872,270

Int. Cl.⁴ B25B *1/20*

U.S. Cl. 269—261 **2 Claims**



1. In a vise assembly including a substantially planar base having an end portion, an upwardly-extending portion formed integrally with the end portion of the planar base and perpendicularly thereof, a first vise member mounted on the base and disposed against the upwardly-extending portion of the base, and a second vise member mounted on the base for movement towards and away from the first vise member in a direction substantially longitudinally of the base, the improvement which comprises, in combination, each of the vise members having a pair of convex vise faces separated by a concavely

curved notch therebetween, each of the convex vise faces having a substantially semi-circular blind channel formed therein and opening into the concavely curved notch, each of the channels being defined within a pair of planes which are substantially parallel to each other and to the planar base, a movable clamp member within each of the channels and extending partially into the concavely curved notch, each of the clamp members being substantially semi-circular in plan outline, a fixed pin carried by each of the clamp members and extending therefrom perpendicularly thereof, each of the convex vise faces having an arcuate slot formed therein to receive a respective pin, each of the arcuate slots extending substantially of its respective vise face, each of the clamp members being adapted to move independently of the other clamp members and about a respective rotational axis eccentrically of its respective pin, each of the clamp members having a planar clamping face, wherein a total of four clamp members are provided and are arranged in two pairs, one pair for each vise member, wherein the clamp members in each vise member are co-planar and are arranged laterally of each other, each clamp member having a given radius, and the rotational centers of an adjacent pair of clamp members being separated by a maximum of two given radii plus sliding clearance, whereby a cylindrical workpiece whose diameter is only slightly larger than the sliding clearance may be gripped upright by the four clamp members substantially perpendicularly of the planar base of the vise assembly.

4,717,133

LEG HOLDING AND POSITIONING DEVICE

Michael J. Walsh, and Alexander E. Churches, both of Sydney, Australia, assignors to Unisearch Limited, Kensington, Australia

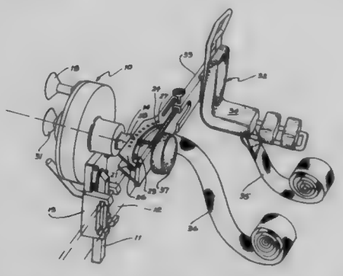
PCT No. PCT/AU85/00154, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00521, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 15, 1985, Ser. No. 848,399

Claims priority, application Australia, Jul. 13, 1984, PG6000; May 13, 1985, PH00532

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **5 Claims**



1. A leg holding and positioning device for use in surgical operative procedures, the device comprising a housing assembly, a member extending downwardly from the housing assembly with means for adjustably attaching to a side rail of a surgical operating table for movement upwardly and downwardly and along said rail, a part of said housing assembly being rotatable relative to said member about an axis lying in a plane substantially parallel to a top surface of an operating table to which the device is attached, means within the housing assembly for controlling rotation of said rotatable part and for fixing same in any one of a plurality of positions of rotation, a second member attached to said part extending substantially radially from the axis of rotation of said part so as to permit limited rotation in relation thereto through an arc about an axis at right angles to the axis thereof, the attachment being such that pivoting occurs about a virtual center at a point constituting the approximate center of a hip joint of the operative leg and having means to releasably secure said second member in any one of a plurality of positions of rotation through said arc and positioned to extend alongside an operative leg of a person on the operating table, and means on the second member for securely but releasably attaching the thigh of said operative leg thereto the arrangement permitting controlled movement of the operative leg in flexion—extension and abduction—adduction about the hip joint.

4,717,134

SHEET FOLDING APPARATUS

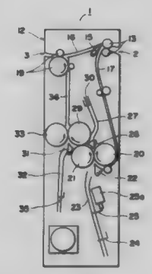
Noriyoshi Iida, Ichikawa; Nobutaka Uto, Yokohama; Masakazu Hirot, Tokyo, and Akimitsu Hoshi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,605

Claims priority, application Japan, Mar. 15, 1985, 60-052055; Mar. 20, 1985, 60-057140; Apr. 19, 1985, 60-085089

Int. Cl.[4] B41L *1/32*

U.S. Cl. 270—39 **8 Claims**



1. A sheet folding apparatus, comprising:
an inlet for receiving a sheet material from outside of the sheet folding apparatus;
an outlet for discharging the sheet material to outside of the sheet folding apparatus;
a sheet material processing station for processing the sheet material, the processing station being disposed along a path of sheet material movement between said inlet and said outlet and including a plurality of sheet processing units each having a couple of folding rollers, a deflector and a folding position controlling passage;
a first passage for communicatng said inlet with said sheet processing station;
a second passage for communicating said sheet processing station with said outlet;
a third passage for directly communicating said inlet and said outlet; and
an inlet deflector for selectively directing the sheet material received by said inlet to said first passage or to said third passage.

4,717,135

APPARATUS AND PROCESS FOR AUTOMATICALLY INTERFOLDING SHEETS AND SEPARATING THEM INTO BUNDLES

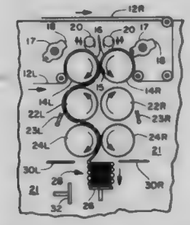
John M. Hathaway, Green Bay, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 12, 1986, Ser. No. 895,778

Int. Cl.[4] B41L *1/32*

U.S. Cl. 270—39 **11 Claims**

1. A process for interfolding sheets and separating said sheets into bundles comprising the steps of:
(a) carrying first and second webs of sheet material through a first line of convergence on a first pair of vacuum cylinders and carrying said webs away from said first line of convergence on a first one of said pair of cylinders by engaging vacuum in the lower portion of said first cylinder which is toward said first line of convergence, said webs having discontinuous transverse cuts thereacross defining individual sheets in said webs, said cuts in said first web being displaced from said cuts in said second web;
(b) transferring said webs from said one cylinder of said first pair of cylinders to a first one of a second pair of intermediate web-directing vacuum cylinders;
(c) transferring said webs from said first one of said second pair of cylinders to a first one of a third pair of folding cylinders;
(d) folding said webs to form a first interfolded bundle; and
(e) completely cutting selected ones of said discontinuous transverse cuts in said first and second webs before said selected cuts leave said first line of convergence, thereby creating a first web set having trailing sheets in each said web ahead of said selected severed cuts and creating the beginning of a second web set having leading sheets in each said web behind said selected cuts;



wherein said leading sheet in said second web of said second web set leads said leading sheet in said first web of said second web set, and including carrying said leading sheets of said second web set away from said first line of convergence on said second one of said first pair of cylinders by engaging vacuum in the lower portion of said second cylinder which is toward said first line of convergence and disengaging vacuum in the lower portion of said first cylinder, transferring said second web set from said second cylinder of said first pair to said second cylinder of said second pair of intermediate, web-directing vacuum cylinders, said second web set being arranged on said second web-directing cylinder in layered configuration, said first web being adjacent, and in surface-to-surface contact with, said second web-directing cylinder, said second web being adjacent, and in surface-to-surface contact with, said first web, that leading portion of said leading sheet, on said second web, which is ahead of said leading sheet on said first web, being held, by vacuum, in surface-to-surface contact with said second web-directing cylinder.

4,717,136

PROCESS AND APPARATUS FOR FEEDING IN OF RECORDING CARRIERS TO THE WRITING ROLLER OF AN OFFICE MACHINE

Albert Rutishauser, Rütlibefstrasse 38-40, 8713 Uerikon, Switzerland

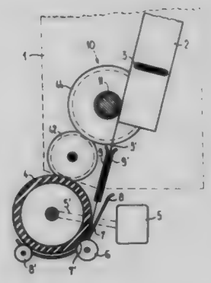
Filed Nov. 1, 1985, Ser. No. 793,897

Claims priority, application European Pat. Off., Nov. 2, 1984, 84113191; Nov. 2, 1984, 84113192

Int. Cl.[4] B65H *3/44*

U.S. Cl. 271—9 **6 Claims**

1. A process for the discontinuous feeding and positioning of individual sheets to a nip defined by two adjacent rollers of an office machine where each sheet has a forward region including a leading edge and a following region and, when a sheet is to be fed, a force is applied to the following region to move the sheet toward the nip, comprising the steps of, during the moving of a sheet toward said nip, rotating the rollers in a paper feed forward direction to engage the leading edge of the sheet



in the nip and rotating the rollers in the reverse direction at least until the leading edge of the sheet is moved out of the nip.

4,717,137

APPARATUS AND A METHOD FOR SEPARATING SHEET MATERIAL

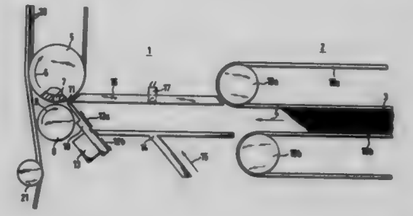
Karl-Heinz Leuthold, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 810,765, Dec. 19, 1985, abandoned. This application Mar. 20, 1987, Ser. No. 28,042

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446262

Int. Cl.[4] B65H *3/14*

U.S. Cl. 271—97 **18 Claims**



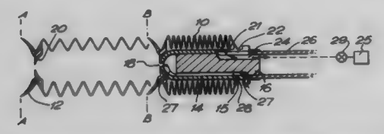
1. An apparatus for separating individual sheets of flat sheet material such as flat vouchers, bank notes or similar articles from a stack of said sheets, which material is transported in a stack of said flat sheets by a stack transporting system, said separating apparatus comprising a stacking table, means for retaining said sheets on said stacking table, and means for withdrawing individual sheets from said stack, wherein a separating gap of a predetermined size is located between said withdrawing means and said retaining means, said withdrawing means being positioned at least partially behind said separating gap and comprising means for feeding said individual sheets to a sheet transporting system, said apparatus further comprising means for reducing the size of said separating gap before each stack of sheet material is conveyed to said separating apparatus, means for increasing said predetermined gap size after each stack is conveyed, means for maintaining said increased size of said separating gap while said individual sheets are being separated from said stack of sheet material, said retaining means including a substantially stationary member having a movable member positioned thereon, wherein said movable member is controlled by said means for reducing the size of said separating gap, said gap size reducing means comprising driving means for controlling said movable member.

4,717,138

VALVE MECHANISM

Christopher R. Watkins, Biggleswade, England, assignor to Watkins Automation Limited, Bedfordshire, England

PCT No. PCT/GB85/00394, § 371 Date May 2, 1986, § 102(e) Date May 2, 1986, PCT Pub. No. WO86/01493, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 4, 1985, Ser. No. 866,196
Claims priority, application United Kingdom, Sep. 4, 1984, 8422338
Int. Cl.[4] B65H 3/08
U.S. Cl. 271—103 10 Claims



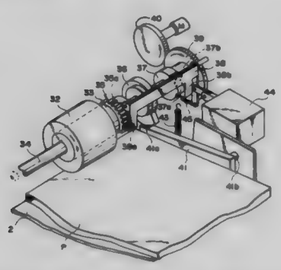
1. A pneumatic valve mechanism comprising a mouthpiece which defines an air intake; an extensible and retractable sleeve, normally biased at an extended position, coupled to the mouthpiece to cause the mouthpiece to move therewith; passage means to connect the interior of the sleeves to suction means such that when the sleeve is not fully retracted suction is created at the air intake; wherein, when the air intake is closed, the sleeve is retracted by the effect of the suction; a seal between the mouthpiece and a valve body within the sleeve which is effective when the sleeve is fully retracted, following closure of the air intake, to seal the air intake from the suction means; venting means permitting air to enter the mouthpiece in the retracted position of the sleeve without breaking the seal, whereby the sleeve is maintained in its retracted position by the effect of said suction; and actuating means arranged upon operation to break the seal and thereby permit the biased sleeve to return towards its extended position.

4,717,139

SHEET FEEDING APPARATUS

Sumitoshi Sootome, Yachiyo; Mototada Toriumi, Tokyo; Sohei Tanaka, Yokohama, and Shinichi Sasaki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,689
Claims priority, application Japan, Mar. 29, 1985, 60-65462
Int. Cl.[4] B65H 3/06
U.S. Cl. 271—116 17 Claims



12. A sheet feeding apparatus for feeding a sheet material, comprising:

(a) a sheet supporting member for supporting thereon a sheet material;

(b) a feeding roller for feeding the sheet material supported on said sheet supporting member;

(c) means, coaxial with said feeding roller, for causing said feeding roller and the sheet material to engage or disengage with respect to each other;

(d) driving source for driving said feeding roller and said causing means;

(e) transmitting means, coaxial with said feeding roller, for transmitting driving force from said driving source to said feeding roller;

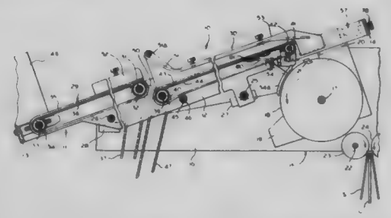
(g) stop means movable between a position wherein said transmitting means is allowed to transmit the driving force and a position wherein said transmitting means is prevented from transmitting the driving force.

4,717,140

STREAM FEEDER APPARATUS FOR PRINTED SHEETS

Jorg Schuiter, Glenview, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Jun. 2, 1986, Ser. No. 869,304
Int. Cl.[4] B65H 3/56
U.S. Cl. 271—168 16 Claims



1. In a stream feeder that has a frame, driven endless means on said frame for moving a shingled stream of signatures forwardly to maintain a small upright stack of signatures at a packer box of a bindery line collator that has means for separating signatures seriatim from the bottom of said small upright stack and feeding them into an endless gathering chain that moves along the forward ends of a line of such packer boxes, and a line of transversely spaced inpaling pins in said stream feeder to assist in separating said signatures, the improvement comprising, in combination:

a transversely extending impaling pin bar movably mounted on a forward end portion of the stream feeder frame immediately adjacent said small upright stack;

a line of impaling pins individually adjustably mounted in said pin bar, said pins having free ends projecting into the path of movement into the packer box of signatures in said small upright stack;

means for moving said pin bar to adjust the extent of projection of all said pins simultaneously, said means including a manually movable adjustment control member mounted at a position spaced from said pin bar where it is readily accessible to an operator who is attending the bindery line; and

means for adjusting the angular position of all said pins simultaneously, said means providing angular position adjustment about a phantom axis at the tips of the pins.

4,717,141

SHEET BRAKE AND DELIVERY ASSEMBLY

Albrecht J. Germann, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,271
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543026
Int. Cl.[4] B65H 29/68
U.S. Cl. 271—183 6 Claims

1. A sheet brake and delivery assembly for receiving a printed sheet from a sheet fed rotary printing press and for delivering the sheet to a sheet receiving means while reducing the speed of the sheet from a higher sheet transport speed to a lower sheet delivery speed, said assembly comprising:

a controllable sheet brake roller, said sheet brake roller being rotatable at the higher sheet transport speed during receipt of the printed sheet from the sheet fed rotary printing press and decelerating to rotate at the lower sheet delivery speed during delivery of the printed sheet to the sheet receiving means, said sheet brake roller having a



non-shouldered cylindrical body with a peripheral surface which is printing ink repellent;

a dampening unit cooperating with said peripheral surface of said sheet brake roller; and

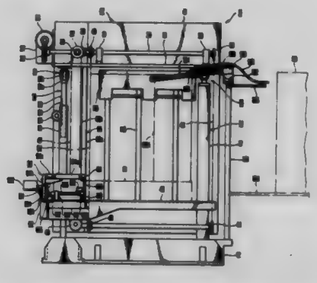
means to retain the printed sheet on said peripheral surface of said sheet brake roller during deceleration of the printed sheet.

4,717,142

SHEETS ALIGNER FOR USE IN A PRINTING PRESS

Nobuaki Saito, and Fumio Osawa, both of Iberaki, Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Dec. 8, 1986, Ser. No. 938,803
Int. Cl.[4] B65H 31/10
U.S. Cl. 271—217 4 Claims



1. A sheets aligner for use in a printing press comprising:

a frame body which has vertical surfaces perpendicular to each other and is capable of selectively taking either an upright posture or an inclined posture, one of said vertical surfaces of the frame body which is positioned in a direction perpendicular to a feed direction of sheets to the printing press is provided with an opening;

a vertically movable table supported for moving upwardly and downwardly within said frame body;

a pallet which is mounted on said vertically movable table and loaded with the sheets, an end portion of said pallet is permitted to protrude through said opening of said vertical surface of said frame body from the inside to the outside of said frame body;

a plurality of front lays which extend vertically along said respective vertical surfaces to allow edges of said sheets to be in contact collectively therewith, said front lays being moved upwardly and downwardly with said vertically movable table;

a pallet stopping means disposed at the outside of said opening of said frame body for stopping said pallet which is extruding from inside to outside of said frame body at a predetermined position according to a size of the sheet; and

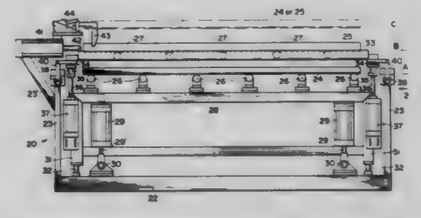
a gap closing means for closing a gap between each of lower ends of said front lays and an upper surface of said pallet in accordance with a detection of the end of said pallet.

4,717,143

SYSTEM FOR TRANSPORTING LIMP, FLAT SHEET MATERIAL

Ernst M. Spengler, Hessenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R+S, Frankfurt, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,395
Int. Cl.[4] B65H 5/12
U.S. Cl. 271—267 9 Claims



1. An apparatus for transporting pieces of flat sheet material into a processing station, comprising a machine frame, a pair of tentering frames for holding pieces of sheet material, means operatively mounted in said machine frame for carrying said tentering frames in any one of three vertically aligned positions in said machine frame, first vertical lifting and lowering means operatively arranged in said machine frame for moving said carrying means for said tentering frames vertically up and down to any one of said three vertically aligned positions, second horizontal operating means operatively arranged for moving said tentering frames, one at a time, substantially horizontally back and forth between said processing station and one of said three vertically aligned positions for transporting a tentering frame holding a piece of sheet material into said processing station and for returning an empty tentering frame for receiving another piece of sheet material, said first vertical lifting and lowering means for moving comprising position variable means operatively arranged for permitting the vertical movement of one of said tentering frames in one position of said position variable means and for supporting said tentering frame in another position of said position variable means, whereby an empty tentering frame is presented in an uppermost position of said three vertically aligned positions for filling, and a filled tentering frame is presented in a horizontal transport position of said three vertically aligned positions so that horizontal transporting always takes place at the same level.

4,717,144

ARRANGEMENT FOR COLLECTING SEQUENTIALLY TRANSPORTED SHEET-LIKE OBJECTS

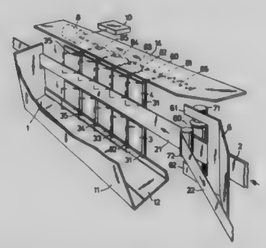
Rolf Rosengren, Skarholmen, Sweden, assignor to Inter Innovation AB, Stockholm, Sweden

Filed Sep. 4, 1986, Ser. No. 903,612
Claims priority, application Sweden, Nov. 13, 1985, 8505366
Int. Cl.[4] B65H 29/54
U.S. Cl. 271—307 9 Claims

1. An apparatus for collecting sequentially transported sheet-like objects, comprising: a collecting chamber (1), transport means (2) arranged to transport the objects to said collecting chamber one at a time and including two mutually coacting members (21, 22), a first plurality of substantially planar flaps (41–44) sequentially disposed in a direction of transport of said objects and substantially parallel thereto adjacent the collecting chamber and the transport means, means (31–35) individually mounting the flaps for rotation about axes perpendicular to said direction of transport, and drive means (8,

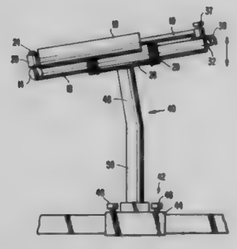
VOL 1086 ISS 1 JAN 5 1988 UMI

80–86) coupled to the flaps for briefly and simultaneously rotatably swinging the flaps about said axes in a direction toward the collecting chamber to individually displace con-



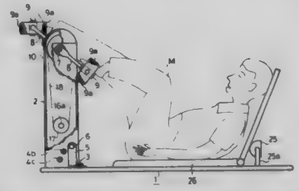
veyed objects from the transport means into the collecting chamber and to thereafter return the flaps to a rest position whereat they are parallel to the direction of transport.

4,717,145
KAYAK EXERCISER DEVICE
Steve P. Chinnis, Opelika, Ala., assignor to Diversified Products Corp., Opelika, Ala.
Filed Jan. 15, 1986, Ser. No. 819,014
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 3 Claims



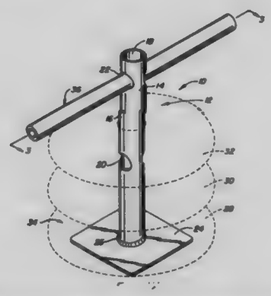
1. An exercise device for performing rowing-type excercises comprising:
a support member;
a user-engageable handle spaced from said support member;
a pivot rod fixed at one end thereof to said support member and at the other end thereof to said handle;
a guide tube fixed about said pivot rod, said pivot rod longitudinally slidable within said guide tube;
resistance means for providing exercise resistance pivotally fixed at one end thereof to said support member and pivotally fixed at the other end thereof to a coupling bracket fixed to said handle, said resistance means positioned on each side of said pivot rod, said coupling bracket having coupling openings for selectively coupling said resistance means to one of a plurality of longitudinally spaced positions on said bracket to thereby vary the exercise resistance provided by said cylinders; and
a mounting arm fixed at one end thereof to said guide tube and adapted to be fixed at the other end thereof to a base member, said mounting arm comprising a guide tube portion adjacent said guide tube and a base portion, and wherein said guide tube portion is angled with respect to said base portion, so that said user-engageable handle is fixed in position above said support member thereby permitting said user-engageable handle to move inwardly and downwardly thus more accurately simulating a single oar rowing type exercise.

4,717,146
ROTARY HEALTH PROMOTING EXERCISE APPARATUS
Hatsue Nohara, Gifu, Japan, assignor to G O Giken Co., Ltd., Gifu, Japan
PCT No. PCT/JP84/00459, § 371 Date May 21, 1985, § 102(e) Date May 21, 1985, PCT Pub. No. WO85/01447, PCT Pub. Date Apr. 11, 1985
PCT Filed Sep. 26, 1984, Ser. No. 743,999
Int. Cl.[4] A63B *21/00*; A61H *1/02*
U.S. Cl. 272—73 10 Claims



1. A rotary health promoting exercise apparatus comprising a base (1), a support housing (2) thereon, a shaft supported rotatebly on said housing, a pair of pedal levers (8) attached to said shaft, an electric motor (11) operationally connected to said shaft by a rotation transmitting means for driving said shaft at a predetermined rotating speed, and a repose means (26, 27 and 60) provided on said base (1) to enable the user (M) of the apparatus to stay in posture of repose when exercising by rotating of said pedal levers (8), said rotation transmitting means including a torque limiter (15) which is slippable when said pedal levers are rotated at a speed higher or lower than said predetermined rotating speed controlled by said motor.

4,717,147
WEIGHT LIFTING DEVICE
Richard D. Rochelle, 2337 Redwood Dr., Antioch, Calif. 94509
Filed Oct. 4, 1985, Ser. No. 784,610
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—117 5 Claims



1. A retaining and lifting device for weights comprising:
a. a post, said post including a flange and means for confining the weight to a surrounding relationship with the post, said flange contacting the weight; and
b. a bar rotatably and removably attached to the post, said bar extending beyond the perimeter of and extending substantially equal distances to opposite sides of said post, said bar serving as grips on opposite sides of said post, said post depending downwardly from said bar and being positioned in substantially orthogonal relationship with said bar, said post being rotatable in relation to said bar when said post is moved, said grips extending substantially

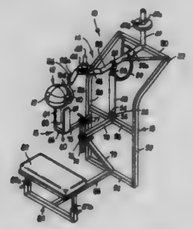
equal distances to opposite sides of said post being usable during rotation of said bar relative to said post.

4,717,148
THERAPEUTIC EXERCISE APPARATUS
Clifford E. Brewer, Lucky Stars, 10 Lagoon Rd., Lilliput, Poole, Dorset, BH14 8JT, England
Filed Jul. 29, 1986, Ser. No. 890,388
Claims priority, application United Kingdom, Aug. 7, 1985, 8519823
Int. Cl.[4] A61H *1/02*
U.S. Cl. 272—145 10 Claims



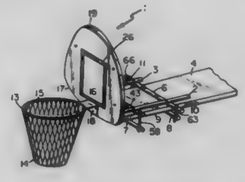
1. Therapeutic exercise apparatus, comprising: a frame, a bed device which is pivotally mounted with respect to the frame and which is pivotable between an upwardly inclined position for enabling a person to get on and off the bed device and a downwardly inclined position for enabling the person to hang with their head lower than their feet, a saddle mounted on the bed device, and rowing means comprising an elongate body having a first end portion which is pivotally connected to the bed device and a second end portion which is provided with a hand grip arrangement so that a person seated on the saddle can simulate a rowing action by gripping the hand grip arrangement and pivoting the elongate body backwards and forwards.

4,717,149
FREE THROW SHOOTING PRACTICE DEVICE
Mark J. Juhl, P.O. Box 185, Bendena, Kans. 66008
Continuation of Ser. No. 853,186, Apr. 17, 1986, Pat. No. 4,623,148. This application Aug. 25, 1986, Ser. No. 899,591
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] A63B *69/00, 23/00*
U.S. Cl. 273—1.5 A 6 Claims



1. A basketball shooting practice device, comprising:
a basketball;
means for supporting said basketball in an elevated position, and for mounting the ball for translational movement of the ball upwardly and away from an initial rest position;
arm-engaging means oriented for receiving the elbow region of a shooter's arm in the initial shooting position of the shooter's arm; and
means mounting said arm-engaging means for maintaining the arm-engaging means stationary during upward shooting movement of the shooter's arm during use of the device, with the shooter's arm being freed from contact with said arm-engaging means during said upward shooting movement of the shooter's arm.

4,717,150
DIVING BOARD BASKETBALL HOOP
Roger J. Pribaow, 8821 61st Ave. N., New Hope, Minn. 55428
Filed Aug. 13, 1986, Ser. No. 896,614
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 R 9 Claims

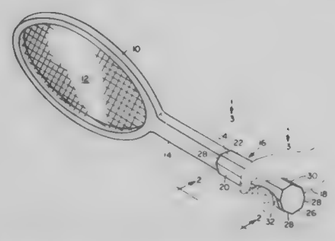


1. A basketball hoop mounting apparatus, comprising:
(a) a backstop;
(b) a bracket, the bracket having a first planar area and a second planar area, the first planar area being substantially perpendicular to the second planar area;
(c) first fastening means, the first fastening means rigidly affixing the bracket to the backstop such that the first planar area is substantially coplanar to the backstop;
(d) second fastening means, the second fastening means rigidly affixing the second planar area of the bracket to the basketball hoop;
(e) a net, the net being formed as a flexible cylindrical mesh permitting a spherical object to pass through the hoop and the net;
(f) an attachment assembly, the attachment assembly further comprising:
(i) a first upright member, the first upright member having a vertical portion and a horizontal portion, the horizontal portion having an end zone, the vertical portion being formed integrally with the horizontal portion by means of a radiused bend, the radiused bend occurring near a centrally located portion of the first member;
(ii) a second upright member, the second upright member having a vertical portion and a horizontal portion, the horizontal portion having an end zone, the vertical portion being formed integrally with the horizontal portion by means of a radiused bend, the radiused bend occurring near a centrally located portion of the first member;
(iii) a first horizontal member, the first horizontal member having a first end region and a second end region, the first end region being rigidly attached to the horizontal portion of the first upright member at a point adjacent to the radiused bend of the first upright member, the second end region being rigidly attached to the horizontal portion of the second upright member at a point adjacent to the radiused bend of the second upright member;
(iv) a second horizontal member, the second horizontal member having a first end region and a second end region, the first end region being rigidly attached to the horizontal portion of the first upright member at a point residing within the end zone of the horizontal portion of the first upright member, the second end being rigidly attached to the horizontal portion of the second upright

member at a point residing within the end zone of the horizonal portion of the second upright member;

(v) a third horizontal member, the third horizontal member residing in a first plane, the first plane being defined as a place containing both the first horizontal member and the third horizontal member, a substantially planar diving board being interspersed between the first horizontal member and the third horizontal member, the third horizontal member being urged toward the first horizontal member such that the diving board is gripped between the first horizontal member and the third horizontal member.

4,717,151
GRIP FOR GAME RACQUETS
Craig R. DuBois, 601 E. San Antonio, Suite 203, Victoria, Tex. 77901
Filed Aug. 7, 1986, Ser. No. 893,983
Int. Cl.[4] A63B 49/00
U.S. Cl. 273—75 1 Claim



1. A tennis racquet handle for accommodating anatomically related size differentiations in a human hand while hitting a tennis ball with strings in the tennis racquet comprising:

a grip portion being generally octagonal in shape and terminating in a generally perpendicular end;

first and second sides of said grip portion being spaced apart and parallel to each other and parallel to said strings;

third and fourth sides of said grip portion being spread apart and parallel to each other and perpendicular to said strings, said first, second, third, and fourth sides being joined by corner sides to form said generally octagonal shape;

a first concavity being formed in said second side near said perpendicular end to receive the hypothenar eminence of said hand;

a second concavity being formed in said first side near said perpendicular end to receive at least both the terminal digit and the fourth digit of said hand therein, said second concavity being slightly smaller than said first concavity;

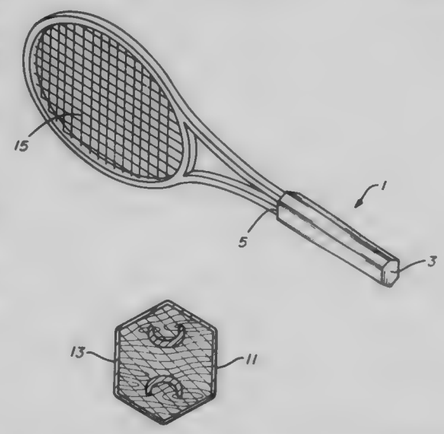
a third concavity being formed in said fourth side near said perpendicular end to receive the proximal phalanx of the terminal digit of said human hand; and

a fourth concavity being formed in said fourth side to receive the proximal phalanx of the index finger of said human hand, said fourth concavity being spaced away from said perpendicular end toward said strings, said fourth concavity being less prominent than said third concavity;

said first, second, third, and fourth concavities having generally smooth tapers thereby allowing for (a) fine adjustments related to said differentiations in said human hand and (b) a comfortable shift of said human hand from a forehand grip to a backhand grip as well as other modified grip developed by that particular user;

said grip having no concavities other than said first, second, third, and fourth concavities.

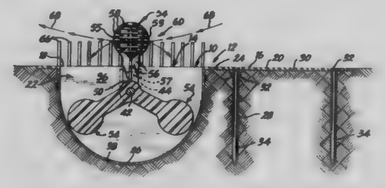
4,717,152
RACKET GRIP
Fred B. Kessler, 12 Shadow Lawn, Houston, Tex. 77085
Filed Mar. 5, 1986, Ser. No. 836,422
Int. Cl.[4] A63B 49/08
U.S. Cl. 273—75 5 Claims



4. In a racket having a head residing in a plane which is characterized by an axis bisecting the head, the improvement comprising:

a grip extending from the head and having a free end, said grip further including a longitudinal axis which is colinear with the axis bisecting the head, said grip being hexagonal in cross-sections perpendicular to the longitudinal axis, the cross-sectional area of said grip decreasing from a point proximate the head to a point proximate the free end so as to define a tapering configuration, the hexagonal cross-section being characterized by a plurality of opposing vertices in which two of said opposing vertices lie in a plane that is coplanar with the plane of the head of the racket.

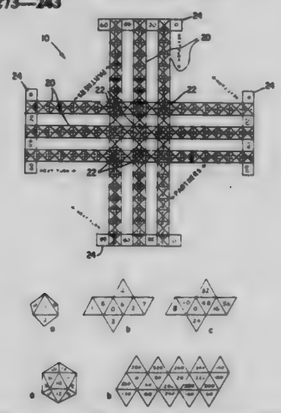
4,717,153
GOLF PRACTICE DEVICE
Joseph G. Breen, 575 Echo Glen Ave., River Vale, N.J. 07675
Filed Jun. 30, 1986, Ser. No. 880,672
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—197 A 13 Claims



11. In a golf practice device for enabling practice in striking a golf ball with the head of a golf club, when the golf ball is at a prescribed location relative to a ground surface, the improvement comprising:

a rotor having at least one simulated golf ball target and capable of being mounted for rotation relative to a predetermined ground surface level such that the target is movable through a striking position located above said ground surface level and corresponding to said prescribed location, the rotor including a hub and an arm extending radially from the hub and corresponding to the target, the arm carrying the target at the radially outer extremity of the arm, the target including a web extending radially along the arm and having a radially outermost portion including a golf ball-like profile configuration at the outer extremity, and a plurality of flanges extending transverse to the web and spaced radially along the outermost portion of the web, each flange having a golf ball-like profile configuration such that the combined web and flanges present a simulated golf ball configuration at the outer extremity.

4,717,154
DICE GAME
David F. Miller, 2351 Edith Avenue, Burlington, Ontario L7R 1N4, Canada
Filed Feb. 18, 1986, Ser. No. 830,360
Claims priority, application Canada, Feb. 28, 1985, 475361
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—243 9 Claims



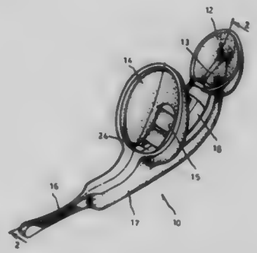
1. A game apparatus for combining chance play with mathematical operation comprising:

a game board having a playing surface laid out with a sequence of numbered playing spaces;

a set of markers for use in marking positions within the said sequence of playing spaces; and

at least two dice each said die marked on the sides thereof with a different series of numbers, all said series together forming a group of series beginning with a first lowest series and increasing to a final highest series, the numbers in said group of series forming a number set, and each series in the set chosen such that (a) the first number in the first series is zero or one, (b) if the first number in the first series is zero, then one number in each other said series may be zero and otherwise (i) no two numbers are the same within the set, and (ii) each number in each series after said first series is higher than all numbers in all lower said series; and (c) if the first number in the first series is one, then one number in each other said series may be zero, one number of the second series may be the same as the highest number of the first series, and otherwise (i) no two numbers are the same within the set, and (ii) each number in each series after said first series is higher than all numbers in all lower said series.

4,717,155
LADLE-BALL RACKET
Hsu Chu-Hwa, 6th Fl., No. 424 Cheng Teh Road, Taipei, Taiwan
Filed Jul. 28, 1986, Ser. No. 890,158
Int. Cl.[4] A63B 59/00
U.S. Cl. 273—322 3 Claims



1. A racket in the form substantially like a ladle, said racket comprising:

(a) a grip at the lower terminus;

(b) a serving ladle at the upper terminus; and

(c) a receiving ladle below said serving ladle at a position in the middle between the grip terminus and the serving ladle terminus, said receiving ladle including a plurality of spaced belts to form a bottom; and

(d) a walled ball passage formation extending between said serving ladle and said receiving ladle.

4,717,156
TOSSING GAME
John C. Wright, 7 Cypress Cir., Newport, Ark. 72112
Filed May 23, 1986, Ser. No. 866,457
Int. Cl.[4] A63B 67/00
U.S. Cl. 273—401 4 Claims



3. A tossing game comprising:

(a) first and second base means for placement on a substantially horizontal support surface spaced apart from one another, each of said base means having a cavity with an upwardly opened mouth and being in the shape of a truncated right circular cone;

(b) first and second target means for fitting substantially submerged into said cavities of said first and second base means respectively, each of said target means having a cavity with an upwardly opened, flared outwardly mouth; and

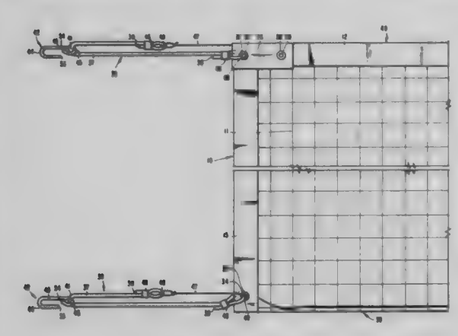
(c) a plurality of cylindrical projectile components for being tossed at said opened mouth of said first or second target means, each of said projectile components having a first end and a second end, said first end of each of said projectile components being heavier than said second end thereof.

4,717,157

SELF-TENSIONING GAME NET

Max D. Smith, Evansville, Ind., assignor to Indian Industries, Inc., Evansville, Ind.

Filed Oct. 31, 1985, Ser. No. 793,200
Int. Cl.[4] A63B *67/00, 61/00*
U.S. Cl. 273—411 7 Claims



1. A self-tensioning volleyball net for attachment to external net supports comprising:

an elongated rectangular net, said net having a top edge and a bottom edge defined by its elongated sides and a first side edge and a second side edge defined by its non-elongated sides, said net further having four corners; and,

a plurality of tensioning attachment means, extending through said net at said corners, for providing tensioned attachment of the corners to external supports, said attachment means including:

an elastic stretch cord permanently attached to said net, said elastic stretch cord having a first end and a second end as well as a first effective end and a second effective end, said first effective end being permanently received in said net, wherein said first end of said cord is fixedly attached to said cord at a location distant from said second end of said cord and said second end of said cord is fixedly attached to said cord at a location distant from said first end of said cord, a third effective end to said elastic stretch cord being defined by a loop formed by the attachment of said second end of said cord at a location distant from said first end of said cord;

an inextensible drawstring extending along an elongated side of said net, said drawstring being attached to said third effective ends of a plurality of tensioning attachment means; and,

hooking means for hooking said net to an external net support, said hooking means attached to said second effective end of said elastic stretch cord.

4,717,158

GAME FOOTBAG

Anthony J. Pennisi, 50 Barber, San Anselmo, Calif. 94960

Filed Jun. 26, 1986, Ser. No. 878,937
Int. Cl.[4] A63B *37/02, 37/12*
U.S. Cl. 273—58 A 6 Claims

1. An improved game footbag, comprising:

a hollow sphere molded from a soft plastic compound formed by polymerization and defining a plurality of air holes located uniformly throughout the surface of said sphere permitting the passage of air from the interior to the exterior of said sphere, said soft plastic compound having sufficient rigidity to maintain the shape of said sphere except under compression; and



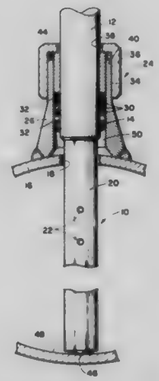
fluid, particulate pellets of filler material disposed within said sphere, said pellets having a diameter greater than a diameter of said air holes.

4,717,159

METHOD AND APPARATUS FOR SEATING AND SEALING A PITOT TUBE TYPE FLOW METER IN A PIPE

Norman A. Alston, Boulder, and Horst W. Kalin, Longmont, both of Colo., assignors to Dieterich Standard Corp., Boulder, Colo.

Filed Jun. 6, 1986, Ser. No. 871,366
Int. Cl.[4] F16J *15/10, 15/18;* F16L *41/08*
U.S. Cl. 277—1 15 Claims



1. An apparatus for use in both seating a remote end of a pilot tube type flow meter probe against the opposite wall of a pipe in which it is being installed and also for sealing same within a tubular guideway that borders a side-opening probe-entry port in the pipe as it encircles a similarly-shaped section of the probe body in spaced relation thereto to form a seal-receiving annulus therebetween, the pipe being subject to size variations which can cause the diameter of the pipe to be oversized or undersized with respect to a design standard, which comprises: control means for ensuring that said probe remote end is seated against the opposite wall of the pipe before the probe is sealed within the tubular guideway, said control means including a fixed abutment movable with the prove body and sized for insertion into the seal-receiving annulus said fixed abutment being located on said probe body to define a gap between the sidewall of the pipe adjacent to said probe-entry port and said fixed abutment, said fixed abutment being positioned on said probe body with respect to the remote end of the probe so that the size of the gap exceeds a maximum oversize variation in the diameter of the pipe and so that no stop-forming obstruction is located between said fixed abutment and the pipe sidewall adjacent to said probe entry port so that when the probe remote end is seated against the opposite wall of the pipe and after sealing there is no compressive force applied to said fixed abutment by the pipe sidewall adjacent to said probe-entry port; sealing means for sealing the probe body within the tubular guideway comprising compressible packing material movable along said body within the seal-receiving annulus into abutting relation with the fixed abutment on the side of said fixed abutment opposite to the remote probe end, said compressible packing material being adapted to expand into contact with the guideway when compressed and being movable axially of the guideway before being compressed; and, a movable abutment movably positioned on the probe body at a location spaced from said fixed abutment and being movable into position to push the packing material against the fixed abutment and force the fixed abutment along with the probe forwardly toward the opposite pipe wall until the remote end of the probe seats against the opposite pipe wall, and said movable abutment upon further movement toward said probe remote end being operative to narrow the space between it and the fixed abutment thereby compressing and expanding the packing material into contact with the guideway to form a continuous annular fluid tight seal around the probe body.

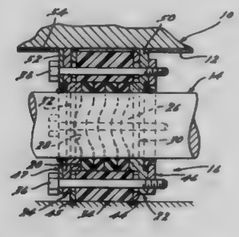
11. The method for seating the remote end of a pitot tube type flow meter probe against the opposite wall of a pipe into which it is being installed and thereafter sealing and holding same in fixed axial position within a tubular guideway through which it enters a side-opening port in said pipe which comprises the steps of: mounting compressible packing material on the probe and spacing that compressible packing material from the tubular guideway to define an annular space between the compressible packing material and the tubular guideway with the packing material being axially movable in that space with respect to that guideway; using a movable abutment to push against the compressible packing material and force that compressible packing material against a fixed abutment carried by said probe body thereby forcing the latter inward until it bottoms-out on the opposite pipe wall and thereafter continuing to advance the movable abutment to narrow the gap between it and the fixed abutment so as to compress the packing between the two until it expands into contact with the tubular guideway to fill the annular space and form a fluid-tight seal around said probe body while simultaneously holding same in bottomed-out position within the pipe.

4,717,160

HIGH PRESSURE ROTARY SHAFT SEAL

Gordon T. Zitting, Sandy, and Jay T. Duke, West Valley City, both of Utah, assignors to Microdot Inc., Darien, Conn.

Filed Apr. 21, 1986, Ser. No. 853,879
Int. Cl.[4] F16J *15/24, 15/54;* F16L *19/06, 21/04*
U.S. Cl. 277—105 4 Claims



1. A seal assembly for a shaft extending through a bore in a housing, said seal assembly comprising

an axially compressible, radially expandable annular shaft sealing means having an initial internal diameter equal to or larger than the diameter of said shaft,

a pair of annular relatively hard inflexible backup rings disposed on opposite sides of said shaft sealing means, said backup rings having opposed axially extending undulations therein undulating along the circumference of the rings from one portion of the circumference to another for effecting axial deformation and radial expansion of said shaft sealing means upon advancement of said backup rings toward one another, and

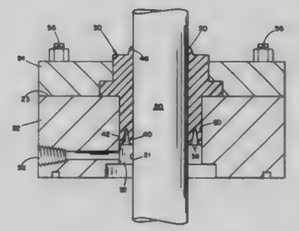
means connecting said backup rings to effect movement thereof toward one another.

4,717,161

MULTIPLE-LIP SEAL FOR CYLINDER ROD AND THE LIKE

Mark W. Stremeckus, Maynard, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.

Filed Apr. 27, 1987, Ser. No. 43,156
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—105 3 Claims



1. An integral sealing system for a cylinder or piston rod and the like, for bearing, sealing and wiping a piston rod during reciprocating motion, comprising, in a molded, polymeric unit:

a body defining an inner bearing surface dimensioned to engage in bearing relationship about a piston rod surface,

said body having an interior end portion sized to fit within a cylinder end cap stuffing box, and an exterior end portion having a radially outwardly extending annular flange and configured for mating relationship with a gland retaining plate,

said interior end portion terminating in a divergent pair of generally axially-extending, annular tapered, peripheral lips, the outer surfaces of said pair of lips defining inner and outer sealing surfaces adapted, under pressure in the cylinder stuffing box, to engage respectively opposed surfaces of a cylinder rod and a cylinder end cap in sealing relationship, and

said bearing surface, in said exterior end portion, tapering radially inwardly, said tapering inner surface adapted to wipe the surface of said piston rod to exclude foreign matter from entering between said bearing surface and the opposed surface of the piston rod.

4,717,162

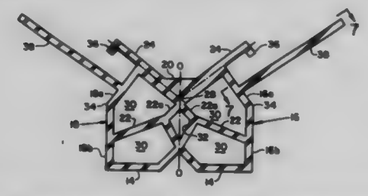
SEALING STRIP FOR BRIDGING AN EXPANSION JOINT

Mario Trieste, and James J. Whelan, II, both of 23 Oakdale Pl., Massapequa Park, N.Y. 11762

Filed May 19, 1987, Ser. No. 51,452
Int. Cl.[4] F16J *15/10;* E01C *11/10*
U.S. Cl. 277—205 6 Claims

1. A bridge seal for bridging the groove or space between structural flooring elements, comprising a pair of spaced apart side walls, each having an upper lever portion extending inwardly from each other at a fulcrum point intermediate its ends, an upper wall connected to be supported on the upper ends of the lever portions having an initial V shaped configuration with outer arm portions extending outwardly of the lever portion and inner portions extending inwardly thereof, connected to each other at a midpoint between the side walls, and an inverted V shaped pair of internal walls connected from the side walls to the midpoint connection adapted when the seal is

compressed on the side walls to be moved toward each other to urge the mid point in an ascending direction whereby the

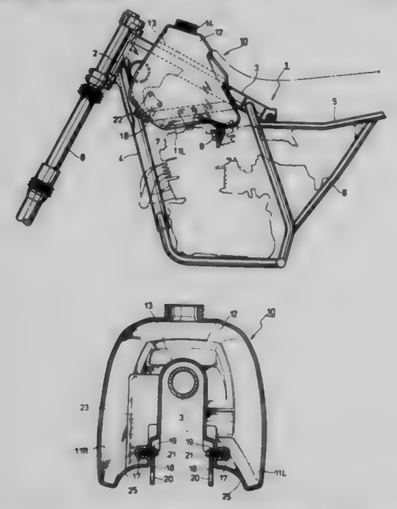


inner portions rotate in and the outer portions rotate down to provide a flat configuration to said upper wall.

4,717,163
FUEL TANK FOR STRADDLED TYPE VEHICLES

Kousuke Tsukiji, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 776,287, Sep. 16, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 27,052
Claims priority, application Japan, Sep. 17, 1984, 59-192460
Int. Cl.[4] B60K *15/06*
U.S. Cl. 280—5 H 5 Claims



1. A fuel tank for straddle type vehicles which is formed to have an inverse U-shaped transverse cross-section with downwardly extending legs of said U-shaped section bifurcated into left and right branch portions and straddling a main pipe of said straddle type vehicle, said tank having a top surface and front, rear and bottom surfaces; at least a portion of the bottom surface at one end portion of the surface of one of said downwardly extending legs of said fuel tank slants upwardly forming a slanted fuel guide surface toward a corresponding top surface of said fuel tank and rear and front portions of the bottom surface of the other of said downwardly extending legs is substantially flat.

4,717,164
ROAD VEHICLE INCLUDING BANKING, STEERING, BRAKING AND OTHER CONTROLS

Shmuel Levavi, Keren Kayemet Leyisrael St. 18, Givatayim, Israel

Filed May 27, 1986, Ser. No. 867,020
Int. Cl.[4] B60G *21/00*
U.S. Cl. 280—112 A 30 Claims

1. A road vehicle including:
a chassis supported by at least three wheels, at least one of which is a steered wheel and at least one of which is a non-steered wheel;
said chassis including a fixed chassis section and a rotatable chassis section rotatable with respect to said fixed section about a horizontal axis parallel to the longitudinal axis of the vehicle;
said steered wheel being carried by said fixed chassis section and turnably mounted about a substantially vertical axis thereof;
said non-steered wheel being carried by said rotatable chassis section;

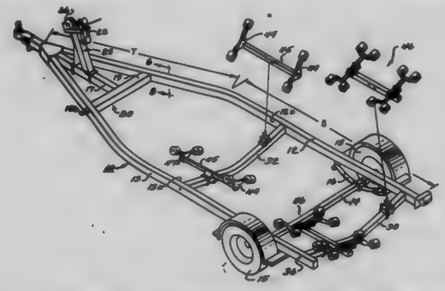


steering control means for turning said steered wheel about said substantially vertical axis in order to steer the vehicle;
and banking means controlled by said steering control means for automatically rotating said rotatable chassis section, and the non-steered wheel carried thereby, with respect to said fixed chassis section in a predetermined direction about said horizontal axis whenever the steered wheel is turned to steer the vehicle.

4,717,165
BOAT TRAILER

Lawrence N. Johnson, W. 130 Highdrive, Spokane, Wash. 99203

Filed Jul. 22, 1986, Ser. No. 888,757
Int. Cl.[4] B60P *3/10*
U.S. Cl. 280—414.1 9 Claims

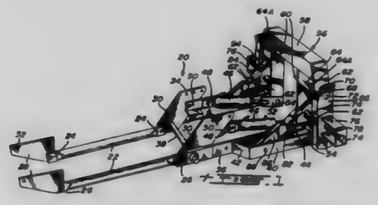


1. In a boat trailer comprising two elongated side frame members positioned adjacent to each other and supported on a spring-connected wheel bearing axle for movement over a roadway surface, said trailer having a cross bar member extending transversely between the two side frame members and pivotally connected thereto for facilitating movement of a boat on to and off from the trailer, and said pivotally connected cross bar member carrying boat-hull-engaging support means, the improvement comprising:
an end plate connected to each end of the cross bar member and having a hole formed therein for receiving a pivot bolt therethrough to extend within the adjacent end of the cross bar member,
a pivot bolt receiving hole formed in each of said side frame members at a position adjacent to the hole formed in the end plates of the cross bar member for receiving a pivot bolt therethrough, and
a pivot bolt extending within the end of the cross bar member and through said hole formed in each of said end plates and said adjacent pivot bolt receiving hole formed in said side frame members for forming a pivotal connection between the cross bar member and the trailer side frame members.

4,717,166
HOOK TYPE QUICK COUPLING FOR TRACTOR IMPLEMENT

Bertrand Vachon, 2815, chemin de l'aéroport, Thetford Mines, Canada G6G 5R7

Filed Mar. 2, 1987, Ser. No. 20,385
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—481 9 Claims



1. A quick coupling assembly for coupling a working implement to the front of a vehicle, comprising: a front push-frame having means to attach the same to the chassis of said vehicle in a position with the front end portion of said push-frame projecting forwardly of said vehicle, said front end portion including two upright legs disposed transversely of said push-frame, a transverse stud carried by each leg, a transverse retractable locking pin carried by each leg below said stud, a hook frame, means to attach said hook frame to the back of a working implement, said hook frame including a pair of transversely-spaced upright hook plates, each having an upper downwardly-turned hook member and a hole below said hook member, said hook members capable of hooking engagement with said studs and said locking pins capable of engaging said holes for coupling said working implement to said vehicle.

4,717,167
CROSS-COUNTRY SKI

Guenter Adam, Strasbling, Fed. Rep. of Germany, assignor to PUMA AG Rudolf Dassler Sport

Filed Feb. 19, 1986, Ser. No. 830,876
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505666
Int. Cl.[4] A63C *5/00*
U.S. Cl. 280—604 35 Claims

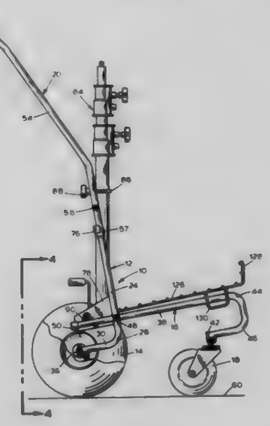


1. A cross-country ski with a body having a movable centre section installed in a centre part of the ski between laterally adjoining side sections, said movable section being provided with a running surface for providing a frictional connection between the ski body and a surface of snow, being movable outwardly relative to a sliding surface of the ski body, being retractable into the ski body into a retracted position wherein its running surface is above the sliding surface; wherein:
(a) the movable centre section of the ski body is configured in a manner causing it to function as a resiliently deflectable spring part that is connected to the remainder of the ski body at at least one end and is held angled upwardly from said one end by foot-responsive means for raising the movable centre section in relation to a top surface of the remainder of the ski body in a glide position wherein the skier's weight is on the heel and ball of the foot;
(b) a ski binding for securing a shoe tip to the ski body is connected to the movable centre section and is arranged in an elevated position relative to the top surface of said adjoining side portions of the remainder of the ski body by said movable centre section, at least when the movable centre section is retracted; and
(c) the configuring and relative positioning of the movable centre section and ski binding are operable in conjunction with said foot-responsive means for enabling a skier wearing a shoe attached to said binding to produce said outward movement of the movable section through resilient deflection thereof, from said retracted position, by shifting the skier's weight from the heel and ball of the foot in said glide position onto only the ball of the foot in a push-off position.

4,717,168
UTILITY CART

James R. Moon, Sr., R.R. 1, Box 79C, Waukee, Iowa 50263

Filed Sep. 10, 1986, Ser. No. 905,636
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—641 14 Claims



12. A utility cart, comprising:
an upstanding inverted U-shaped tubular frame defining a closed top end and spaced depending legs,
each of said legs having a first bend at a corresponding lower portion to extend rearwardly and parallel to each other on a horizontal plane to a second bend and then extending away from each other in respective opposite directions to define respective integral axles,
a wheel with a balloon tire operably journalled on each axle,
a respective bracket rigidly secured to each leg above said first bend to extend rearwardly in parallel relationship adjacent a respective wheel,
a bar secured to and between said brackets to support a tripod and the like in operable position,
an elongated inverted U-shaped tubular handle defining a closed top end and spaced depending legs disposed to embrace the closed end of said frame adjacent a respective frame leg,
first respective spring loaded slidable lock pins mounted to said respective frame legs in operable engagement with an adjacent handle leg for releasably lockably engaging said handle,
means for simultaneously disengaging said lock pins from said handle,
means on the closed end of said frame for securing a tripod and the like in operable position,
respective slidable rods mounted to said respective brackets and adapted to engage a respective tire in braking relationship,

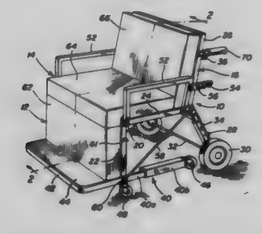
means for selectively simultaneously engaging and disengaging said rods from said tires,
an equipment support platform having a rear and forward end,
means pivotally securing said rear end to said frame,
second respective spring loaded slidable lock pins mounted to said respective brackets in operable engagement with an adjacent rear end portion of said platform to hold it against pivotal movement, and
means for simultaneously releasing said second lock pins from engagement with said platform.

4,717,169

CONVERTIBLE BED AND WHEELCHAIR UNIT

Willis G. Shaffer, Westminster, Colo., assignor to Michael J. Salazar, Westminster, Colo., a part interest

Filed May 9, 1986, Ser. No. 861,407
Int. Cl.[4] A47C *13/00*; A61G *5/00*
U.S. Cl. 280—648 **12 Claims**



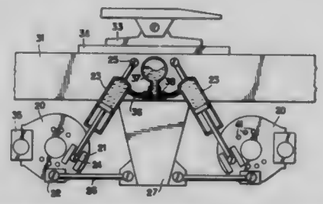
1. A convertible bed/wheelchair unit comprising a three-part pivotally interconnected frame including a first part constituting a foot section of the unit, a second part constituting a central or seat section of the unit, and a third part constituting a head section of the unit, the foot and head sections being pivotally interconnected about respective transverse axes to the seat section at front and back ends of the seat section, respectively, the seat section including first wheeled leg means depending therefrom toward the back end of the seat section, the head section being pivotally movable between a bed forming position of the unit wherein it forms a horizontal extension at the back of the seat section and a wheelchair forming position of the unit wherein it extends upwardly from the back end of the seat section, the unit including first releasable brace means for connection between the first wheeled leg means on the seat section and the head section for retaining the heat section in the bed forming position, and second releasable brace means for connection between the seat section and the head section for retaining the head section in the wheelchair forming position, the foot section being pivotally movable between the bed forming position of the unit wherein it forms a horizontal extension at the front of the seat section and the wheelchair forming position wherein the foot section extends downwardly from the front end of the seat section, wheel means depending from the lower back end of the foot section and engaging the ground when the unit is in the wheelchair forming position wherein the foot section forms a substantially vertically oriented support for the front end of the seat section and second wheeled leg means mounted on and depending from the front end of the foot section when in the bed forming position said second wheeled leg means extending beneath the seat section when the unit is in wheelchair forming position, and the unit further including third releasable brace means for supporting connection between the foot section and the seat section in both the wheelchair and bed forming positions of the unit.

4,717,170

AXLE-CHASSIS CONNECTING DEVICE

Francois Mounier-Poulat; Marcel Savoie, both of Heyrieux, and Patrick Berthon, Saint-Priest, all of France, assignors to Renault Vehicules Industriels, Lyons, France

Filed Oct. 17, 1986, Ser. No. 920,191
Claims priority, application France, Oct. 29, 1985, 85 16029
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—683 **5 Claims**



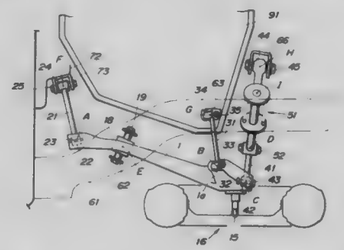
1. An axle-chassis connecting device in a vehicle having a chassis, tandem axles with axle tanks, and wheels including brakes connected to ends of said axles, said device comprising:
a multifunction part fixed to each of said axle tanks adjacent one of said wheels;
vertical force support means directly connected between said chassis and each said multifunction part for transferring vertical forces from said chassis to said wheels;
longitudinal support means connected between said chassis and each said multifunction part for transferring longitudinal loads from said chassis to said wheels; and
braking support means mounted on each said multifunction part for supporting a stationary portion of a wheel brake, whereby loads on said axle tanks are minimized.

4,717,171

WHEEL SUSPENSION FOR ROAD VEHICLES

Yozo Kami; Keinosuke Taki, and Toshifumi Yamamoto, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1986, Ser. No. 881,775
Claims priority, application Japan, Jul. 3, 1985, 60-146321; Jul. 3, 1985, 60-146322; Jul. 3, 1985, 60-146323; Jul. 3, 1985, 60-146330; Jul. 3, 1985, 60-146331; Jul. 3, 1985, 60-146332; Jul. 4, 1985, 60-146969
Int. Cl.[4] B60G *1/00, 3/00*
U.S. Cl. 280—688 **8 Claims**



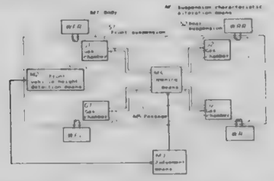
1. A wheel suspension in a road vehicle having a frame, comprising:
a longitudinal arm extending substantially in a longitudinal direction of the vehicle and having a front end, a rear end, and an intermediate portion, said longitudinal arm also having, on said rear end, means for supporting the wheel and, on said intermediate portion, means for pivotally coupling the longitudinal arm to said frame;
guide means for controlling movement of said longitudinal arm in a transverse direction of the vehicle while allowing said rear end of the longitudinal arm to move substantially in a vertical direction; and
said guide means comprising a first lateral link having a first end coupled to said frame and a second end coupled to said front end of the longitudinal arm, said first lateral link extending substantially in the transverse direction of the vehicle, and link means coupling said frame and said longitudinal arm to each other and cooperating with said first lateral link.

4,717,172

SUSPENSION CONTROLLER

Ken Asami, Nagoya; Kaoru Ohashi, Okazaki; Toshio Onuma, Susono, and Shunichi Buma, Toyota, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Jan. 30, 1986, Ser. No. 824,262
Claims priority, application Japan, Feb. 4, 1985, 60-20671; Feb. 4, 1985, 60-20672
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 **8 Claims**



1. A suspension controller for a vehicle having suspensions which comprise gas chambers for gas suspensions between the body and front and rear wheels respectively comprising:
(a) front vehicle height detection means by which a distance between the front wheel and the body of the vehicle is detected to generate a front vehicle height signal;
(b) judgment means by which said front vehicle height signal is compared with a predetermined reference signal to generate a judgment result signal when the front vehicle height signal is greater than the predetermined reference signal; and
(c) suspension characteristic alteration means which comprise a passage connecting the gas chambers of the front and rear suspensions, and opening means that open the passage responsive to the generation of the judgment result signal.

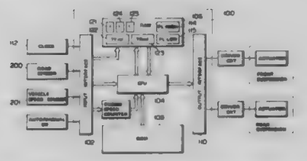
4,717,173

SUSPENSION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE SUSPENSION SUPPRESSING BOUNCING

Fukashi Sugasawa; Junsuke Kuroki, and Yohsuke Akatsu, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 744,379, Jun. 13, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,923
Claims priority, application Japan, Jun. 14, 1984, 59-122828
Int. Cl.[4] B60G *17/08*
U.S. Cl. 280—707 **24 Claims**

16. A system for a vehicle, comprising:
a vehicle wheel;
a suspension system for suspending said vehicle wheel, said suspension system being variable in damping rate at least between a first softer damping characteristic mode and a second harder damping characteristic mode;
a road sensor for monitoring roughness of a road surface on which said vehicle is travelling and producing a road condition indicative signal;
a vehicle speed sensor for monitoring vehicle speed and producing a speed sensor signal having a value representative of the speed of the vehicle; and
a controller for normally outputting a first control signal to said suspension system for causing said suspension system to operate in said softer damping characteristic mode, said controller being connected to receive said road condition indicative signal and determining the presence of an irregularity on said road surface based on said road condition indicative signal, and for outputting a second control signal to said suspension system at a first timing to cause said suspension system to operate in said harder damping characteristic mode when the presence of said irregularity is determined, said first timing being determined such that said suspension system is operated in said harder damping characteristic mode at least after said wheel has passed over said irregularity, and said controller sending said first control signal to said suspension system at a second timing for causing said suspension system to operate in said softer damping characteristic mode, said second timing being determined such that said suspension is maintained in said harder damping characteristic mode for a certain period of time after said wheel has passed over said irregularity.



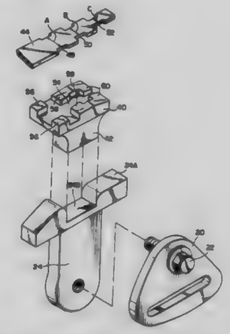
17. A system as called for in claim 16, wherein said controller determines said first timing based on said vehicle speed signal and a known positional relationship between said road sensor and said vehicle wheel.

4,717,174

DRIVING FORCE TRANSMITTING STRUCTURE FOR AUTOMATIC SEATBELT SYSTEM

Yuji Nishimura, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Oct. 21, 1986, Ser. No. 921,115
Claims priority, application Japan, Oct. 25, 1985, 60-163985[U]
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—804 **24 Claims**



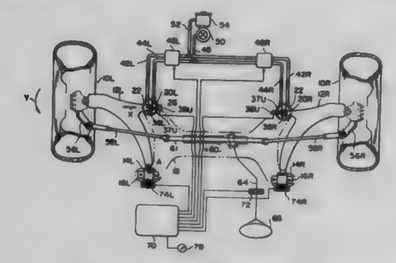
1. An automatic seatbelt system for a vehicle designed to automatically fasten a webbing to the body of an occupant, comprising:
(a) a slider movable in the longitudinal direction of the vehicle and retaining one end of said webbing;
(b) driving means secured to the vehicle body;
(c) a flexible continuous member connected to said slider at an end and to said driving means at the other end, which is subjected to tensile and compressive forces from said driving means so as to move said slider; and
(d) driving force transmitting means including a plurality of neck portions defined by notches oppositely formed along both longitudinal sides of an end of said continuous mem-

ber in such a member as to be spaced apart from each other in the longitudinal direction thereof, and projecting members oppositely longitudinally provided adjacent to each side on an upper face of said slider for engaging with said neck portions, respectively, to uniformly transmit substantially the same amount of driving force through each of said neck portions of said continuous member to each of said projecting members of said slider.

4,717,175
STEER ANGLE ADJUSTING APPARATUS FOR VEHICLE

Noritoshi Arai, and Chiharu Tamura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1986, Ser. No. 927,965
Claims priority, application Japan, Nov. 8, 1985, 60-250278; Jan. 9, 1986, 61-1324
Int. Cl.[4] B62D *7/16*
U.S. Cl. 280—96.1 20 Claims

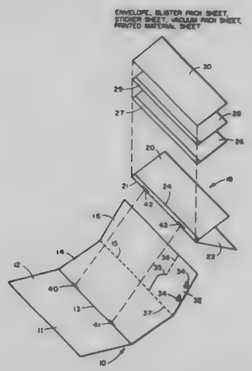


1. A steer angle adjusting apparatus for a vehicle, comprising:
steer angle adjusting means capable of independently adjusting the respective steer angles of right and left wheels of the vehicle in addition to steering operation of both the wheels by a steering wheel;
running condition detecting means for detecting a running condition of the vehicle; and
control means for controlling said steer angle adjusting means in accordance with the detected running condition.

4,717,176
BOOKLET

Lowell Matthews, 11188 Western Ave., Stanton, Calif. 90680

Filed Sep. 17, 1985, Ser. No. 776,832
Int. Cl.[4] B42D *5/00, 1/00, 3/12*; B65D *27/08*
U.S. Cl. 281—15 R 25 Claims

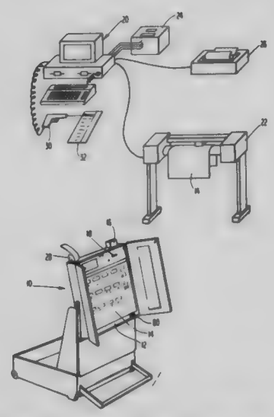


1. A booklet comprising: a cover having inside and outside surfaces and having at least one cover fold to define a plurality of cover portions separated by said at least one cover fold; at least one insert having inside and outside surfaces and having at least one insert fold to define a plurality of insert portions separated by said at least one insert fold; insert attachment means for attaching at least one of said at least one insert fold to said cover at at least one of said at least one cover fold with at least a portion of said insert outer surface facing said cover inner surface; and at least one leaf having an edge and being attached at said edge to one of said insert portions proximate one of said attached insert folds.

4,717,177
ABSENTEE BALLOTING SYSTEM

Robert J. Boram, Quakertown, Pa., assignor to R. F. Shoup Corporation, Bryn Mawr, Pa.

Continuation of Ser. No. 608,158, May 8, 1984, abandoned. This application Aug. 27, 1985, Ser. No. 770,053
Int. Cl.[4] B42D *15/00*; G09F *3/00*
U.S. Cl. 283—5 6 Claims



1. An absentee balloting system comprising a printed ballot having first and second halves, the halves being separable from one another along a score line, a first one of said halves containing pre-printed adhesive-backed labels indicative of candidates for a given one of a plurality of offices and the second of said halves containing spaces corresponding to said offices, said labels being detachable from said first half of said ballot and affixable to said second half of said ballot so as to effectuate a vote for a given candidate, wherein the adhesive backing said labels is formed to adhere to said second half of said ballot, upon affixation by an absentee voter, in a manner causing detactable damage to said second half of said ballot upon the occurrence of an attempted removal of one or more of the previously affixed labels therefrom.

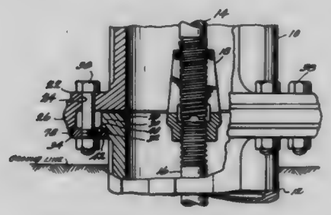
4,717,178
FRANGIBLE COUPLING FOR BARREL SECTIONS OF A FIRE HYDRANT

Joseph L. Daghe; Gary L. Boue, and Carl E. Floren, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Jun. 3, 1986, Ser. No. 869,987
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—4 20 Claims

1. A frangible ring for securing together the adjacent ends of the upper and lower barrel sections of a fire hydrant, said ends having peripheral flanges of a different diameters comprising:
a generally flat circular coupling member having a coaxial annular array of bolt holes adjacent its outer periphery,

alignable with corresponding bolt holes in the flange of larger diameter;
a first annular coaxial weakening groove in one face of said coupling member spaced radially inward of said bolt holes; and

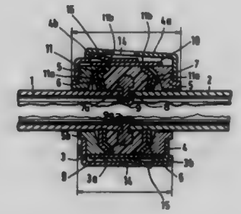


a second annular weakening groove in the other face of said coupling member coaxial with said first groove, spaced radially inward of said bolt holes and radially overlapping said first groove.

4,717,179
PIPE UNION FOR END TO END PIPES WITH DEFORMABLE CLAMPING DISKS SURROUNDING A SEAL

Rolf Haberstock, Kuessabert 1-Kadelburg; Heinrich Trissler, Donaueschingen; Nikolay Vlaykowski, and Hans P. Maier, both of VS-Schwenningen, all of Fed. Rep. of Germany, assignors to Agintec AG, Pfaeffikon, Switzerland

Filed Mar. 10, 1986, Ser. No. 837,825
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508296
Int. Cl.[4] F16L *19/08*
U.S. Cl. 285—112 21 Claims

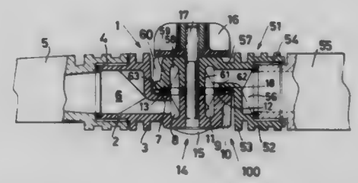


1. A pipe union for joining end portions of two pipes in an end-to-end relationship, comprising:
(a) a seal adapted to be fitted about opposing pipe end portions, said seal including:
(1) an outer elastomeric ring having a central annular groove, outer and inner peripheral surfaces, and side surfaces, said inner peripheral surface adapted to contact said pipe end portions;
(2) an inner ring received in said central annular groove and including a portion extending radially inward of said groove for being received between said pipe end portions;
(b) separate clamping disks abutting each of said side surfaces of said outer elastomeric ring, each of said clamping disks having a curved cross-sectional profile and including:
(1) a radially inward clamping rim forming an inside diameter for receiving an outer perimeter of a respective pipe end portion; and
(2) a radially outward clamping rim forming an outside diameter;
(c) separate flanges adapted to be positioned on each of said pipe end portions, said flanges being received over a respective one of said clamping disks, said flanges located opposite said disks from said shaped seal; and
(d) means for changing said curved cross-sectional profiles of said clamping disks, thereby increasing said outside diameters and decreasing said inside diameters so as to clamp said pipe end portions, said means for changing said curved profiles of said clamping disks including:
(1) a pipe segment fitted over said flanges, said pipe segment having an inner surface which forms a clamping face for said clamping disks; and
(2) means for exerting an axial force on said flanges.

4,717,180
WATERTIGHT JOINT FOR RIGID PIPING, IN PARTICULAR FOR THE ARTICULATION OF A WASHING BRUSH FED WITH WATER

Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Italy

Filed Oct. 20, 1986, Ser. No. 921,604
Claims priority, application Italy, Nov. 14, 1985, 23828/85[U]
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—175 3 Claims

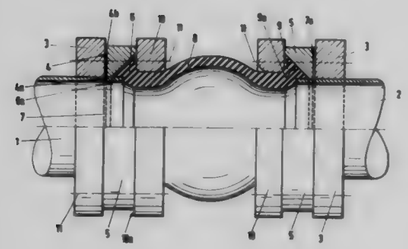


1. Watertight joint for rigid pipes in particular for the articulation of a water-fed washing brush, comprising:
two joint parts coupled with a variable angle, each of which has a first tubular portion fixable to a rigid pipe and traversed by an axial passage and a second tubular portion coupled at a variable angle to a corresponding second tubular portion of the other of said two joint parts and traversed by an annular passage communicating with said axial passage of the first portion and perpendicular thereto, said second tubular portion being formed of a cylindrical side wall which defines said annular passage and terminates in a transversal surface for coupling said two joint parts, the transversal surface being traversed by said annular passage and having a peripheral crown of teeth engageable with corresponding teeth of the corresponding transversal surface of the other of said two joint parts, and there being provided a rotation pin passing axially through central hubs of the second tubular portions of the two joint parts, a lock nut screwable on a threaded end of said rotation pin to clamp said transversal surfaces against each other with the respective teeth thereof mutually engaged to thereby orient at a desired angular position the two joint parts, and a seal with two concentric rings placed between said transversal surfaces at said central hubs and at said side walls, the two concentric rings being connected by radial spokes, an outer one of the two concentric rings being disposed radially inside the peripheral crown of teeth.

4,717,181
ELASTIC PIPE CONNECTOR

Hans P. Maier, Zurich, Switzerland, assignor to Agintec AG, Zurich, Switzerland

Filed Aug. 27, 1986, Ser. No. 901,181
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3530972
Int. Cl.[4] F16L 51/02
U.S. Cl. 285—229 8 Claims

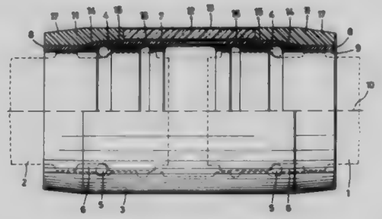


1. A compensator which forms an elastic connection between the ends of two pipes separated by a gap, comprising:
a bellows body connecting said pipes across the gap;
a flange positioned on each pipe adjacent a respective pipe end;
a respective counter-flange positioned over said bellows body adjacent each said pipe end and having an end face facing a respective said flange;
means for forming an annular sealing chamber between said flange and said counter-flange on each said pipe including an annular chamber part positioned over each said pipe between a respective said flange and counter-flange, each said annular chamber part also forming a radial clamping chamber with a respective said flange, said clamping chamber including a radially outward clamping face and having a first conical annular surface opening in the direction of said end face of said counter-flange, said flanges and said annular chamber parts being loosely positioned onto said respective pipe ends; and
a torus formed at each respective end of said bellows body adjacent said ends of said pipes, a respective torus being received in each said sealing chamber and fitted over an outer circumference of the respective pipe;
means for applying a compression load to said tori, including clamping each said flange to a respective said counter-flange, and supporting said annular chamber parts on said respective flanges and an annular clamping disk positioned in each respective clamping chamber and fitted over a respective said pipe, each said clamping disk having an outer diameter which increases under said compression load and an inner diameter which decreases under said compression load and engages said outer circumference of a respective said pipe such that each said torus fills a respective said annular sealing chamber and bears against said conical annular surface, said end face of said counter-flange and said outer circumference of a respective said pipe, thereby fluidly sealing said compensator against said pipes and providing sealed fluid communiction between said pipes.

4,717,182
PLASTIC COUPLING SLEEVE FOR PIPES

Uwe Behrens, Frechen, and Willi Keul, Kerpen-Brüggen, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,061
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516814
Int. Cl.[4] F16L 49/00
U.S. Cl. 285—230 13 Claims



1. A substantially cylindrical coupling sleeve said carrier body portion being a tubular member having first and second end regions and being of smaller diameter at at least one of said end regions than in the other part of said tubular member, of plastic material, for producing a connection between first and second pipes which is adapted to carry compression and tensile forces in the longitudinal direction of said pipes, said sleeve having at least one internal peripheral groove adapted to cooperate with an external peripheral groove provided on an end portion of a respective said pipe, to form a passage for accommodating a flexible elongate coupling member, and a passage means communicating with said at least one internal peripheral groove and extending outwardly through the sleeve in at least substantially tangential relationship therewith, for the introduction of said flexible coupling member into said passage, characterized by the fact that the sleeve comprises a carrier body portion of glass fiber roving cloth embedded in synthetic resin and whose greatest tensile strength is oriented in the longitudinal direction of the sleeve, and, wound around said carrier body portion on the outside thereof, at least in the region of said at least one internal peripheral groove, glass fiber roving material embedded in synthetic resin and whose greatest tensile strength is oriented in the peripheral direction of the sleeve.

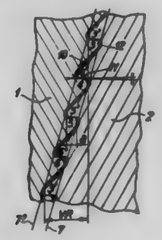
4,717,183
CONICAL THREAD CONFIGURATION FOR RAPID MAKE-UP CONNECTION

Philippe C. Nobileau, Biot, France, assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Continuation of Ser. No. 511,204, Jul. 6, 1983, abandoned, and Ser. No. 535,621, Sep. 26, 1983, abandoned. This application May 29, 1985, Ser. No. 739,122
Claims priority, application France, Jul. 7, 1982, 82 11939; Jul. 20, 1982, 82 13381
Int. Cl.[4] F16L 17/02
U.S. Cl. 285—334 44 Claims

1. Apparatus for making a connection between two tubular elements comprising:
mateable male and female members respectively for said elements,
each said member including at one open end a plurality of threads having corresponding points forming an axially extending frusto-conical surface of revolution,
the threads of one member being complementary to the threads of the other member,
said plurality of threads on each member including a plural number n of threads having a difference VR in radial dimension for one turn of each of said n threads,

each said thread having a first side, which faces away from said one open end of the respective member and having a second inclining side which faces toward said open end of the respective member, there being a groove between said sides of each thread which defines the thread root,
said first sides of opposing threads of the members when

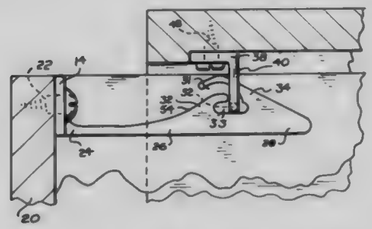


fully mated being in contact and overlapping a given amount,
there being a predetermined radial distance including said given overlapping amount and extending along each of those contacting sides,
said predetermined radial distance being smaller than approximately one-half VR.

4,717,184
SAFETY LATCH FOR DRAWERS AND THE LIKE

Phil Boyce, 2133 Research Dr., Livermore, Calif. 94550

Filed Jun. 10, 1985, Ser. No. 743,068
Int. Cl.[4] E05C 17/14
U.S. Cl. 292—87 9 Claims

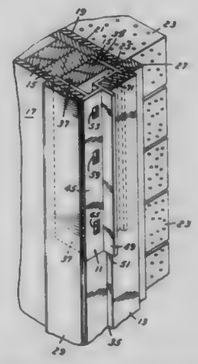


1. A safety latch for securing movable members associated with enclosure housings, said latch comprising,
catch means adapted for attachment to an enclosure housing for selectively securing a movable member,
hook means including a foot portion adapted for attachment to said movable member and having a head portion having a latching slot, said latching slot having a leading slot portion and a rest slot portion, said leading slot portion having an entrance facing said foot portion and having a termination intersecting said rest slot portion, said rest slot portion being elongate, whereby moving said movable member from a closed position to an ajar position may engage said catch means first with said leading slot portion and subsequently with said rest slot portion for securement of said movable member in said ajar position such that the movable member can neither open nor close, said rest slot portion having a first section and a second section, said first section extending toward said foot portion from said intersection of said leading slot portion and said rest slot portion, said second section extending from said intersection and away from said foot portion, said hook means having a flexible bar portion coupling said head portion to said foot portion such that said hook means can be disengaged from said catch means by flexing said bar portion.

4,717,185
SECURITY STRIKER PLATE

Richard A. Hartley, 25834 Continental Cir., Taylor, Mich. 48180

Filed Jul. 28, 1986, Ser. No. 890,253
Int. Cl.[4] E05C 21/02
U.S. Cl. 292—340 10 Claims



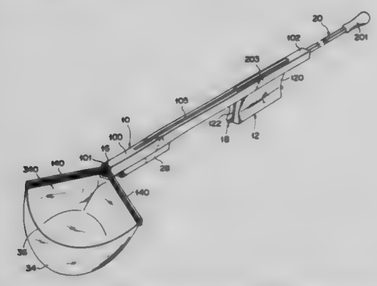
1. A security striker plate for a locking means upon an exterior door hinged within a door jamb, including an upright rail, a peripheral door stop and interior upright framing studs, said security striker plate comprising:
said body including a pair of spaced opposed upright inner and outer mount plates of equal width and height adapted to be snugly positioned over and along opposite sides of the framing studs;
each of said mount plates having longitudinally spaced nail apertures therethrough arranged in a row adapted to receive nails for securing the mount plates to the studs;
an elongated apertured strike plate extending from and at a right angle to said inner mount plate and adapted to face the door when closed;
an elongated door stop lip having first and second portions, said first portion extending from and at a right angle to one side of said strike plate adapted to be inserted within and in registry with and reinforcing the door stop and door jamb;
an elongated anchor plate inset from and projecting from said door stop lip at right angles thereto and adapted for snug retaining registry with an interior portion of the door jamb and retained thereby, one end of said anchor plate extending to and connected with said outer mount plate;
the second portion of said door stop lip extending from the other side of said strike plate to said anchor plate;
a door jamb anchor flange projecting from said outer mount plate and said anchor plate parallel to said door stop lip and adapted for retained interlock with the overlying door jamb; and
an upright end flange located upon and extending along said strike plate perpendicular to said inner mount plate;
said elongated strike plate, door stop lip, anchor plate, door jamb anchor flange and upright end flange being integral parts of said elongated unit body and having generally the same height as said inner and outer mount plates.

4,717,186

IMPLEMENT FOR DISPOSING OF DUNG OF A PET ANIMAL

Mashayuki Yoshioka, 3-31, 2-chome Higashiyurigaoka, Aso-ku, Kawasaki, Kanagawa, Japan

Filed Apr. 10, 1987, Ser. No. 36,884
Claims priority, application Japan, Nov. 5, 1986, 61-170436[U]
Int. Cl.[4] A01K *29/00*
U.S. Cl. 294—1.5 15 Claims



1. An implement for disposing of dung of a pet animal comprising:

tubular means consisting of an elongated tubular body which has first and second ends and a pair of pins removably fitted through upper and lower walls of said first end to project in a longitudinal bore of said tubular body;

storage means being mounted on said tubular body of said tubular means and for carrying vertically stacked cartridges therein;

a movable plate being movably supported with respect to said storage means and for moving said cartridges within said storage means one by one in said longitudinal bore of said tubular body;

a pushing rod being movably inserted at one end thereof from said second end of said tubular body in said longitudinal bore and for pushing a cartridge having been located in said longitudinal bore of said tubular body by said movable plate towards said first end along said longitudinal bore of said tubular body; and

each of said cartridges includes a pair a casing members each having a substantially U-shape in vertical section and being pivotally connected at one end thereof to each other in a manner to be faced at an opened side thereof to each other; a vinyl sack having an opening for receiving dung of a pet animal therein and having a resilient wire provided along a margin of said opening of said vinyl sack, said vinyl sack being supported through said resilient wire between the faced sides of said casing members in a manner to be folded up; and two tape pieces applied across onto upper and lower surfaces of said casing members to cause said casing members to be closed toward each other against an elastic force of said resilient wire in a manner to permit a space to be left between said casing members, said space being enough to receive tip ends of said pins of said tubular body therein when said cartridge is moved to said first end of said tubular body by means of said pushing rod.

4,717,187

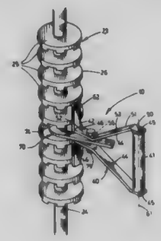
APPARATUS FOR IMPARTING ROTATIONAL MOVEMENT TO A WORK OBJECT AND THE LIKE

Daniel Delgado, Jr., Hanford, Calif., assignor to Dennis M. Scumardo, Hanford, Calif.

Filed Dec. 29, 1986, Ser. No. 946,833
Int. Cl.[4] B25B *13/50*; B65G *7/12*
U.S. Cl. 294—17 5 Claims

5. Apparatus for imparting rotational movement to a doffer assembly or the like rotatably mounted on an axle and mounting a plurality of substantially equidistantly spaced doffer plates which have peripheral edges, the apparatus comprising:

a force transmitting member having a longitudinal axis and mounting a transversely disposed pressure plate having a length dimension that is substantially equal to or greater than the distance between two adjoining doffer plates, the pressure plate operable to be supported on the peripheral edges of at least two adjoining doffer plates; and



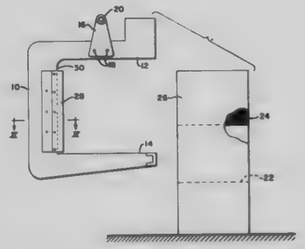
an adjustable capture assembly releasably mounted on the force transmitting member and having a main body with a length dimension that is greater than the radius dimensions of the doffer plates, and a substantially arcuately shaped cradle is formed in the main body, the cradle dimensioned to receive the axle whereby the apparatus is operable to transmit force to the peripheral edges of the doffer plates to which it is applied to impart rotational movement to the doffer assembly.

4,717,188

COIL PROTECTOR FOR "C" HOOKS

Richard H. Johnston, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1986, Ser. No. 947,000
Int. Cl.[4] B66C *1/54*
U.S. Cl. 294—67.2 5 Claims



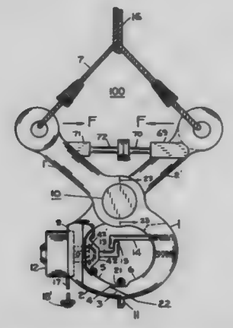
1. An attachment for the vertical leg of a "C" hook to prevent damage to coiled strip as the lower leg of the hook is being inserted into the central opening of a coil; said attachment comprising a coil protector including a face plate adapted to cover by extending around the forward face of the vertical portion of the "C" hook and along its opposite side faces to protect the coil from slamming against the forward face and side faces of the hook, a pair of mounting plates secured to the inner surface of said face plate and adapted to substantially abut the opposite side faces of said vertical leg, and means on said mounting plates for releasably securing the mounting plates and the face plate carried thereby at a predetermined fixed position to said vertical leg.

4,717,189

TONG-LIKE, CABLE-SCOOPING, HOIST-CABLE COUPLING DEVICE FOR SUSPENDED LOADS

Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756

Filed Mar. 31, 1986, Ser. No. 846,228
Int. Cl.[4] B66C *1/38*
U.S. Cl. 294—82.32 11 Claims



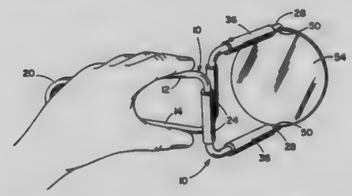
1. A hoist cable coupling device with cable-scooping capability for quickly loading and unloading cargo remotely, comprising a forceps-like part A, having two elongated members with sharply-curved lower portions and straight upper portions, pivoted near said members' mid-section with a pivot pin, and having a solenoid with a shaft extension, for use with hoist and load cables, both said cables being adapted for attachment to said part A, said lower portions having complementary-shaped ends which overlap when in contact with each other; one of said lower portions having a rotary solenoid fastened firmly to a shallow cylindrical cavity on its side, having said shaft extension extending toward the inside of said lower portions and the end of said shaft extension having a right-angle bend, to engage a rod with a right-angle bend, extending toward the inside from the other of said lower portions, the two right angle bends engaging with each other to keep said ends of said lower portions in overlapping contact as a safety precautionary measure, when said solenoid is de-energized and said cargo is in suspension; and when desiring to unload said cargo, said solenoid is energized, causing said rod and said shaft extension to disengage and to allow said lower portions to separate in order to permit said load cable to detach itself from one of said lower portions.

4,717,190

WAFER HANDLING AND PLACEMENT TOOL

Linda L. Witherspoon, 22 Cottonwood La. Los Lunas, N. Mex. 87031

Filed Oct. 30, 1986, Ser. No. 925,241
Int. Cl.[4] B25B *9/02*; H01L *21/68*
U.S. Cl. 294—99.2 11 Claims



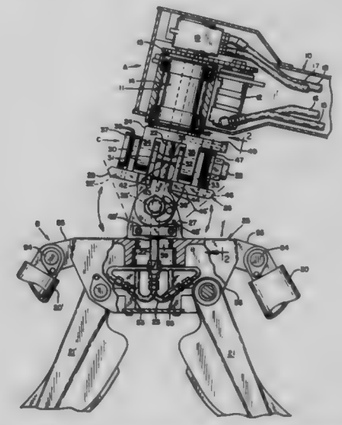
9. A wafer handling and placement tool, said tool including a pair of elongated generally parallel arms having base and spaced apart free ends, connecting means connecting said base ends together for relative swinging of said arms in generally parallel planes for movement of said free ends toward and away from each other, the free ends of said arms including elongated jaw elements supported from and projecting lengthwise outwardly from said arm free ends and including outer terminal ends, said terminal ends including laterally opening transverse notches formed therein opposing each other, said jaw elements being tubular and said notches opening into the interiors of said tubular jaw elements.

4,717,191

SWIVEL HEAD FOR GRAPPLE

Stanley Farmer, Corbett, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Aug. 27, 1986, Ser. No. 900,798
Int. Cl.[4] B66C *1/00*
U.S. Cl. 294—119.4 10 Claims



1. A linkage for connecting the depending clevis of a boom to the upstanding clevis of the head of a hydraulic cylinder actuated grapple comprising:

a unitary body having a plate-like middle portion, said middle portion having a central opening extending therethrough for the passage of hydraulic cylinder hose means,

a first plurality of spaced apart lugs upstanding from said middle portion and integral therewith, said first lugs having aligned openings for the receipt of a first shaft to releasably receive and engage the depending clevis of said boom,

a first shaft in said first lugs aligned openings, said first shaft centrally of the length thereof being of restricted diameter to accommodate passage thereby of said hydraulic cylinder hose means,

a second plurality of spaced apart lugs depending from said middle portion and integral therewith, said second lugs having aligned openings for the receipt of a second shaft to releasably receive and engage the upstanding clevis of said head,

a second shaft in said second lugs aligned openings, said second shaft centrally of the length thereof being of restricted diameter to accommodate passage thereby of said hydraulic cylinder hose means,

said first and second shafts being arranged perpendicularly of each other to provide for rotation of said grapple in two mutually perpendicular vertical arcs,

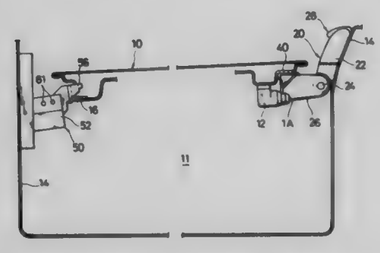
each shaft extending at both ends beyond its associated lugs and equipped with snubber means in the extended portions.

4,717,192

UNIT FOR STORING DEMOUNTABLE ROOF PANEL

Tooru Iwamura, and Hirokazu Yoshikawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 9, 1986, Ser. No. 883,537
Claims priority, application Japan, Jul. 12, 1985, 60-106631; Jul. 12, 1985, 60-106633; Jul. 12, 1985, 60-106634
Int. Cl.[4] B60J 7/20, 7/11
U.S. Cl. 296—37.1 20 Claims



1. A unit for storing a demountable roof panel, wherein movement of said demountable roof panel is controlled by a roof panel fixing device, with which one end edge of said demountable roof panel is engaged, and a roof panel holding device, with which another end edge of said demountable roof panel is engaged, to thereby store said demountable roof panel in a storing space of a motor vehicle, said roof panel fixing device including:

a support mounted to an inner peripheral wall of the storing space;

a stay pivoted on a rotary shaft to be rotatable about the rotary shaft horizontally provided on the support from a retracted position wherein said stay is substantially parallel to the inner peripheral wall of the storing space, to a position where said stay projects into the storing space and is engageable with a mounting bracket provided at one end edge of said demountable roof panel; and

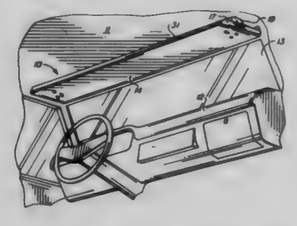
stay fixing means including a movable member carried by said support and engageable with said stay for fixing the stay in the projected position so that the mounting bracket is engageable with said stay, said stay fixing means being releasable, whereby upon release said stay falls under the force of gravity to said retracted position.

4,717,193

SHELF FOR VEHICLE CAB

Ernest Noriega, 8608 E. Coronado, Scottsdale, Ariz. 85022

Continuation-in-part of Ser. No. 574,137, Jan. 26, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 852,734
Int. Cl.[4] B60R 5/00
U.S. Cl. 296—37.7 15 Claims



1. A vehicle shelf for mounting near the roof of a vehicle adjacent the windshield of the vehicle, said shelf including in combination:

an elongate shelf member having a predetermined length corresponding substantially to the width of the vehicle roof, said shelf member having a front edge, a rear edge, and first and second up-turned ends extending slightly inwardly toward each other, an up-turned rear lip on the rear edge thereof for location adjacent a vehicle windshield, wherein said lip extends upward from said shelf member and inwardly at a predetermined angle to overlie said shelf member, and an upturned front lip on the front edge of said shelf member to prevent articles placed on said shelf member from falling off;

first and second mounting brackets adapted to be attached to the first and second ends respectively of said shelf member, each of said mounting brackets having a first portion attached to a respective up-turned end and extending upwardly from the respective end of said shelf member to which such bracket is attached and having a second portion thereon for attachment to the sunvisor mounting holes in a vehicle roof and extending at an angle to said first portion and further inwardly toward the corresponding second portion of the other of said mounting brackets to overlie said shelf member and to suspend said shelf member a short distance downwardly from the evhicle roof substantially concealing said mounting brackets from view when said shelf member is mounted in place in a vehicle, the distance between said second portions of said mounting brackets being less than said predetermined length;

means for attachment said first and second mounting brackets to the first and second ends respectively of said shelf member; and

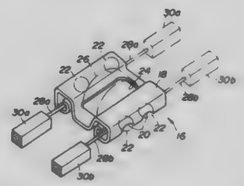
means for facilitating the attachment of said second portion of said mounting brackets to the sunvisor mounting holes.

4,717,194

SEAT SLIDE DEVICE

Toshihiko Ota, and Chiyokatsu Yokokura, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Nov. 25, 1986, Ser. No. 934,712
Claims priority, application Japan, Jan. 29, 1986, 61-17295
Int. Cl.[4] B60N 1/08
U.S. Cl. 296—65 R 9 Claims



1. A seat slide device for sliding a seat relative to a floor, comprising:

a stationary rail secured to said floor;

a movable rail secured to said seat, said movable rail being interlocked with said stationary rail in a manner to permit relative movement between said movable rail and said stationary rail in first and second opposite directions;

a plurality of slide assisting units operatively disposed between said stationary rail and said movable rail, said slide assisting units smoothing relative displacement between said movable and stationary rails; and

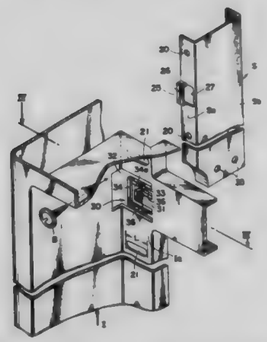
a projected structure operatively connected with a terminal one of said slide assisting units, said projected structure extending in said first direction beyond said terminal slide assisting unit and sandwiched between said movable and stationary rails so that when said movable rail is subjected to a force which acts in a direction essentially normal to said first and second directions, said projected structure interconnects said movable and stationary rails in a manner to reduce the length of the movable rail over which said force can act to produce a moment of force which tends to bend said movable rail away from said stationary rail.

4,717,195

INSTRUMENT PANEL CONSTRUCTION WITH STAY

Hiroo Okuyama, Isehara, and Katsuya Tsunoda, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 10, 1984, Ser. No. 639,346
Claims priority, application Japan, Aug. 20, 1983, 58-150950
Int. Cl.[4] B62D 25/14; A44B 17/00
U.S. Cl. 296—72 4 Claims



1. An instrument panel construction comprising:

an instrument panel;

a stay serving as a reinforcement of said instrument panel; and

means for slidably holding said stay relative to said instrument panel;

said slidable holding means including a hook formed on one of said instrument panel and said stay and a temporary latch formed on the other of said instrument panel and said stay;

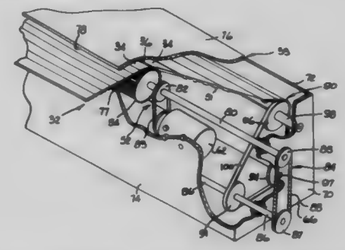
said hook including a wall formed with a cutout and a projecting bridge portion extending across said cutout near an open end of said cutout, and said temporary latch including a resilient bias rib having formed therethrough an opening and a guide rib formed with a claw at an end positioned within said opening, said projecting bridge portion slidably receiving said guide rib positioned within said opening, said projecting bridge portion being formed with a channel for slidably receiving said guide rib such that said claw thereof is disposed in said cutout, said resilient bias rib slidably engaging said wall, whereby said hook is slidably movable relative to said temporary latch with said wall engaging said resilient rib and said bridge portion engaging said guide rib, said hook being movable between a first position where further movement is limited by said claw abuttingly engaging said wall and a second position where further movement is limited by said bridge portion abuttingly engaging said bias rib.

4,717,196

PICK-UP TRUCK BED COVER

James P. Adams, Greeley, Colo., assignor to Adelco, Inc., Greeley, Colo.

Filed Jul. 11, 1986, Ser. No. 884,490
Int. Cl.[4] B60J 7/10
U.S. Cl. 296—98 5 Claims



1. A cover system for a pickup truck bed defined by a substantially rectilinear floor having a front end, a rear end, and a pair of spaced apart side edges; a front wall extending from and substantially normal to said floor at the said front end of said floor, and a pair of substantially parallel, spaced apart side walls extending from and substantially normal to said floor at the said side edges of said floor, said side walls each having a top edge; a pair of tracks, each said track mounted longitudinally adjacent said top edge of each said side wall; and a substantially rectilinear, rollable cover means for said pickup truck bed, said cover means having a front edge, a rear edge, a bottom surface, a top surface, and a pair of spaced apart side edges, said side edges of said cover means being supported by and riding along and connecting said cover portion to said tracks, wherein the improvement includes, in combination:

a drive system for said cover means comprising an electric motor means and one or more cylindrical drum drive roller means connected to said motor means, each drive roller means having a substantially cylindrical elongated peripperal surface and being transversely mounted for rotation intermediate the side walls of the truck bed and located in inwardly spaced relationship to said tracks;

said cover means comprising a plurality of pivotally connected elongated flat rigid rectangular panel members, each of said panel members having a bottom surface and end portions slidably engageable with said tracks;

first tooth means on an intermediate central portion of each of said panel members and second tooth means on said substantially cylindrical surface of each drive roller means for continuous driving engagement therebetween at a location intermediate and between said side panel member and said tracks and for causing movement of said cover means between a retracted open position and an extended closed position relative to the truck bed, said first and second tooth means being continuously engaged to positively connect with one another, so that rotation of said drive roller means will cause immediate and controlled longitudinal movement of said cover means along the tracks mounted on the side walls;

said first toothed drive means comprising a series of ribs and grooves on said bottom surface of the panel members which are dimensioned and located so that they will positively mate with said second tooth means on said cylindrical drum drive roller means;

separate flexible hinge means extending between each adjacent pair of panel members for pivotally connecting adjacent panel members and providing a water-proof seal between adjacent panel members and extending the entire length of said panel members between the end portions thereof, whereby said cover means, when fully extended,

will render the top of said pickup truck bed closed and substantially watertight;

rotatable reel means for winding and unwinding of said cover means thereon and having a non-circular peripheral surface with at least two straight line surface segments and said reel means; and

reel drive means for connecting said motor means directly to said reel means for causing rotation of said reel means in synchronization with said cylindrical drum drive roller means.

4,717,197

AUTOMOBILE BODY SIDE STRUCTURE

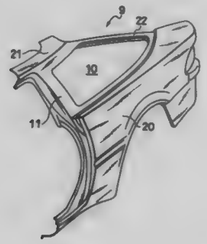
Haystmgu Harasaki, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

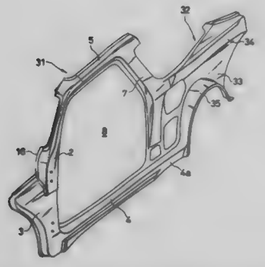
Filed Mar. 27, 1986, Ser. No. 844,975

Claims priority, application Japan, Mar. 30, 1985, 60-68056; Mar. 30, 1985, 60-68057

Int. Cl.⁴ B62D *2/04*

U.S. Cl. 296—187 **6 Claims**





1. An automobile body side panel assembly comprising:

a front side outer panel and a rear side outer panel, said front and rear side outer panels being formed separately from each other,

said front side outer panel including a front pillar outer panel section having an upper end contiguous with a front end of a roof rail outer panel section and a lower end contiguous with an upper end of a front door hinge panel section, a side sill outer panel section having a front end contiguous with a lower end of said front door hinge pillar panel section, said roof rail outer panel section and said side sill outer panel section having rear ends contiguous with a rear pillar reinforcement panel section extending substantially vertically to define a rear end of a side door opening,

said rear side outer panel including a rear fender outer panel section having a front end portion contiguous with a substantially vertically extending rear pillar outer panel section which extends along the rear end of said side door opening and defines a front end of a rear window opening, said rear pillar outer panel section being located outside said rear pillar reinforcement panel section, and

a rear side inner panel including a rear pillar inner panel and a frame defining said rear window opening located rearwardly of said rear pillar inner panel, said rear pillar inner panel being connected at front and rear edge portions to said rear pillar outer panel section and said rear pillar reinforcement panel section, respectively, to form a rear pillar of a closed cross-section, and said rear pillar reinforcement panel section being located so that it divides the closed cross-section of the rear pillar into two closed spaces.

4,717,198

FRONT STRUCTURE OF VEHICLE BODY

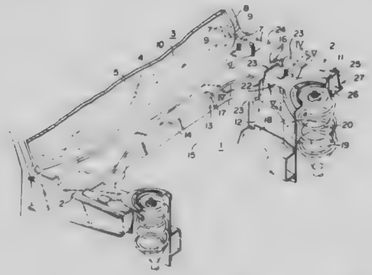
Nobuhiro Komatsu, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Sep. 26, 1986, Ser. No. 912,066

Claims priority, application Japan, Sep. 30, 1985, 60-150744[U]

Int. Cl.⁴ B62D *25/08*

U.S. Cl. 296—192 **16 Claims**



1. An open cowl type front structure for a vehicle body comprising a dashboard upper panel, the dashboard upper panel including an upwardly open channel member, the dashboard upper panel and a cowl panel being connected together so that an opening is formed to open upward in front of the cowl panel, the dashboard upper panel being provided on the front end thereof with a vertically extending front wall portion which defines, together with an upper portion of the dashboard lower panel separating an engine room and a passenger compartment, a closed cross-section portion extending in the transverse direction of the vehicle body, and the closed cross-section portion being connected to right and left wheel aprons at opposite ends thereof, the right and left wheel aprons defining the right and left side walls of the engine room.

4,717,199

MOTOR VEHICLE ROOF WITH IMPROVED HEADLINING MOUNTING ARRANGEMENT

Georg Kohlpaintner, Martinsried, and Horst Bienert, Gauting, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

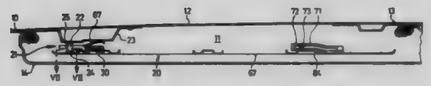
Filed Aug. 14, 1986, Ser. No. 896,245

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532083

Int. Cl.⁴ B60J *7/05;* **B60R** *13/02*

U.S. Cl. 296—214 **21 Claims**

1. Motor vehicle roof with a roof opening and a cover by which the roof opening may be opened and closed, and an underside of the cover being covered by a headlining which, close to a front edge of the cover, is joined to the cover by at least one mounting device which allows a height adjustment of the cover relative to the headlining, wherein the mounting device comprises a vertically oriented mounting pin and a catch clip, said catch clip being engageable with the mounting pin by a relative movement between the catch clip and mounting pin in essentially only a horizontal direction, and wherein the catch clip, when engaged with the mounting pin, forms means for biasing said headlining in a downward direction relative to the cover and is movable a limited distance with respect to the mounting pin in an axial direction of the mounting pin and is tiltable a limited angle with respect to the mounting pin.



4,717,200

SLIDING LINER FOR A SLIDING ROOF FOR AUTOMOBILES

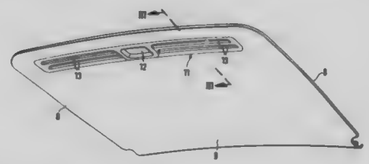
Peter Krüger, Hermann-Ehlerstrasse 100, 6450 Hanau 7, Fed. Rep. of Germany

Filed Jan. 20, 1986, Ser. No. 876,564

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527839

Int. Cl.⁴ B60J *7/10*

U.S. Cl. 296—214 **3 Claims**



1. In a sliding roof for an automobile having a rigid sliding lid and a sliding lever that improvement consisting of:

a ventilation strip including a groove, detachably secured at its forward end to said sliding liner by means of detent means;

said sliding liner having an elongated opening along its forward edge into which said ventilation strip is inserted; said detent means comprising a flange along the opening to engage the groove of the ventilation strip;

said ventilation strip having a plurality of channel in the upper face thereof;

said liner having a plurality of ribs extending across said elongated opening at a plurality of positions corresponding to the positions of said channels to engage said channels when said ventilation strip is secured to said liner;

said ventilation strip being formed substantially over its entire length as a continuous depression in which ventilation openings are provided;

grip means provided at about the center of said ventilation strip;

said ventilation openings in said ventilation strip being located on both sides of said grip means; and

the underside of said ventilation strip being substantially flush with the underside of said sliding liner.

4,717,201

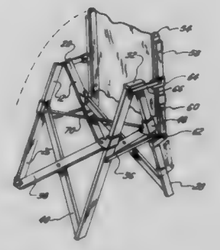
FOLDING CHAIR

Lee J. Barras, P.O. Box 73, Gretna, La. 70053

Filed Jan. 13, 1986, Ser. No. 818,213

Int. Cl.⁴ A47C *4/00*

U.S. Cl. 297—16 **2 Claims**



1. A folding chair comprising:

a. left and right side "A" frames, each comprising front and rear legs which are substantially equal in length and which are connected together at their upper end portios with a pivotal connection;

b. collapsing brace means associated with each side frame for supporting the legs in an unfolded operative position;

c. fore and aft, folding cross braces, each forming connections respectively between the front legs of each side frame and the rear legs of each side frame, the cross brace being pivotally attached to the side frames at the lower end of the cross braces and slidably affixed to the side frames at the upper end of the cross braces so that at the chair folds the cross braces and legs align;

d. a seat supported at its edges upon the side frames when the chair is in an unfolded operative sitting position, the seat being connected to the front and rear legs of the left and right side frames at a point below the pivotal connection of the side frames and above the front and rear cross braces;

e. a back pivotally attached at its side portions to the rear of the seat;

f. sleeve means forming a sliding connection between the bottom edge portions of the back and each rear leg for retaining the lower side portions of the back in two separate, spaced apart positions with respect to the rear legs, including a higher position when the chair is in the unfolded operation position and a lower position near the bottom to the rear legs when the chair is in a folded inoperative storage position; and

g. link means connecting the side frames and back for preventing the back from pivoting rearwardly when the chair is in the unfolded operative sitting position, wherein:

the seat and back include foldable fabric material,

the legs, back, and seat can collapse into a bundle wherein the legs, cross braces, seat edges, and back side portions are generally aligned parallelt of one another, and

the bundle has a length substantially equal to the length of the legs.

4,717,202

OUTDOOR COURTESY BENCH

Joseph H. Batchelder, III, and John M. Parks, both of Peoria, Ill., assignors to The Batchelder Company, Peoria, Ill.

Filed Oct. 6, 1986, Ser. No. 915,579

Int. Cl.⁴ A47C *7/62*

U.S. Cl. 297—191 **6 Claims**

1. An outdoor courtesy bench of three-piece modular construction, comprising;

a first segment providing a base having an integral upstanding rear panel support member;

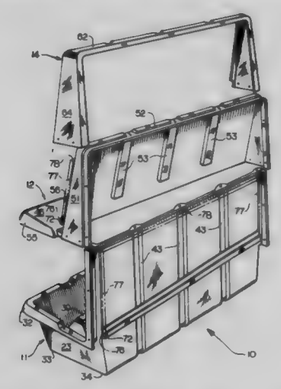
a second segment providing a seat mountable on the base

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and having an integral upstanding front panel support member providing a horizontal upper edge portion disposed in overlapping relation to said rear panel support member;

a plurality of fasteners extended downwardly through said upper edge portion releaseably connecting said front and rear panel support members;

a pair of interchangeable front and rear advertising panels individually initially loosely disposed against said panel mounting portions of said first and second segments;



and a third segment releaseably secured to said first and second segments providing cap means disposed on said upper edge portion in masking relation to said fasteners between the front and rear panel support members to preclude any unauthorized disassembly of the base and seat segments of the bench and also providing flanged means in peripherally overlapping relation to said front and rear advertising panels to releaseably hold them in place on the bench.

4,717,204

RECLINING ANGLE ADJUSTMENT DEVICE

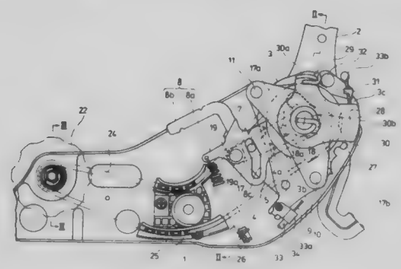
Takeshi Tezuka, Fujisawa, Japan, assignor to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Fujisawa, Japan

Continuation of Ser. No. 755,145, Jul. 15, 1985, abandoned. This application Apr. 22, 1987, Ser. No. 41,619

Claims priority, application Japan, Aug. 10, 1984, 59-123342[U]

Int. Cl.⁴ A47C *1/025*; B60N *1/06*

U.S. Cl. 297—362 **2 Claims**



1. A reclining angle adjustment device comprising:

(a) a first arm;

(b) a pawl angularly movably mounted on said first arm;

(c) a second arm pivotably mounted by an angularly movable shaft on said first arm, said second arm having an inner gear;

(d) an intermediate gear plate having an outer gear meshing with said inner gear of said second arm;

(e) a rack provided on an outer edge of said intermediate gear plate and engageable with said pawl;

(f) a release lever angularly movably mounted on said second arm for releasing said pawl out of mesh with said rack for roughly adjusting the angle of inclination of said second arm;

(g) a control handle rotatably mounted on said first arm and operatively connected to said second arm in power-transmitting relation for finely adjusting the angle of inclination of said second arm through a planetary gear mechanism, including said angularly movable shaft and said inner gear and said outer gear, and through a chain being trained around a first sprocket mounted on a handle shaft of said control handle and a second sprocket mounted on said angularly movable shaft; and

(h) a subplate secured to said first arm with said planetary gear mechanism being sandwiched between said first arm and said subplate, said subplate having a burred-out annular flange with a central hole having a diameter slightly larger than that of said angularly movable shaft and through which said angularly movable shaft extends, said release lever being angularly movably mounted on and around said annular flange, said intermediate gear plate forward seat plate portion including a first end proximate to said rearward seat plate portion and a second end comprising the front end of said seat portion, said first and second ends of said forward seat plate portion defining a longitudinal direction for said forward seat plate portion, and

mounting means for pivotably and slidably mounting said forward seat plate portion with respect to said support structure whereby said forward seat plate portion can be pivoted about a pivot axis located proximate to said first end of said forward seat plate portion so as to vary the angle of inclination of said forward seat plate portion with respect to said support structure, and said mounting means can be slidably moved along said support structure in said longitudinal direction.

4,717,203

SEAT HAVING AN ADJUSTABLE SEAT PORTION

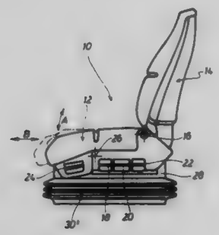
Hermann Meiller, Amberg, Fed. Rep. of Germany, assignor to Grammer Sitzsysteme GmbH, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 903,737

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532608

Int. Cl.⁴ B60H *1/02, 1/06*

U.S. Cl. 297—312 **9 Claims**



1. A seat comprising a support structure and a seat portion carried on said support structure, said seat portion including a seat plate and a seat back portion, said seat plate including a rearward seat plate portion at a location proximate to said seat back portion, and a forward seat plate portion separate from said rearward seat plate portion, said rearward seat plate portion being fixed with respect to said support structure, and said

having a recess defined in a surface thereof remote from said outer gear thereof and substantially coaxial therewith and a guide plate fitted in said recess and fixed to said subplate to support said intermediate gear plate for angular movement on said subplate.

4,717,205

CUTTER

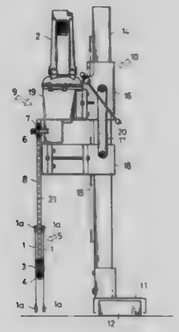
Norio Sasage, 7-22, Akishima Sanwa-chu 1-chome, Nara-shi, Nara-ken, Japan

Filed Jun. 16, 1986, Ser. No. 874,693

Claims priority, application Japan, Jun. 17, 1985, 60-90144[U]

Int. Cl.⁴ E21C *25/18*

U.S. Cl. 299—39 **22 Claims**



1. A cutter comprising

a frame,

driving means mounted on said frame, and having an output shaft,

an elongated casing mounted on said frame and rotatably receiving said output shaft at one end thereof,

a rotatably shaft rotatably mounted on said casing at the other end thereof,

driving force transmitting means mounted in said casing for transmitting the driving force of said output shaft to said rotatable shaft, and

cutting means fixedly mounted on said rotatable shaft substantially at each outermost axial end thereof, and

wherein said casing is interposed between said cutting means,

wherein said cutting means include at least two disc-type blades having substantially the same diameter and being arranged substantially parallel with one another and secured to the rotatable shaft substantially perpendicular thereto so that each of outermost surfaces of the blades and each of end surfaces of the rotatable shaft are in substantially the same plane, and

wherein a thickness of said casing in an axial direction of said rotatable shaft and over substantially an entire length of said casing between the ends thereof is smaller than a spacing between inner peripheries of said blades opposite one another in the axial direction.

4,717,206

ENDLESS CHAINS COMPRISED OF INTERDIGITATED LINK ELEMENTS HAVING A Y-SHAPED CONFIGURATION

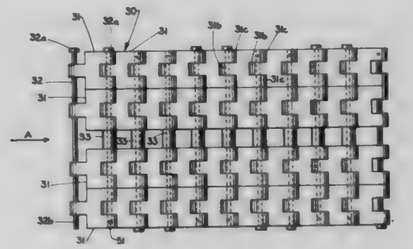
Lester J. Sterwerf, Jr., Harrison, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

Filed May 2, 1985, Ser. No. 729,570

Int. Cl.⁴ E21C *27/26, 25/34*

U.S. Cl. 299—82 **32 Claims**

1. In a continuous chain for a mining machine or the like comprising a plurality of link elements arranged in rows extending across the width of the chain, at least some of said link elements constituting bit carrying link elements, the ends of said link elements having perforations therein for receiving a connecting pin, adjacent rows of said link elements being interdigitated so that the perforations in said interdigitated link elements are in alignment, a connecting pin received in said aligned perforations, and means to retain said connecting pin in said aligned perforations; the improvement which comprises: said link elements being Y-shaped when viewed in plan, each



said Y-shaped link element having a central bridge portion with two sides and two ends, and a pair of spaced parallel legs extending from one side thereof at right angles thereto, and a centrally located stem extending from the other side thereof at right angles thereto, said stem being aligned between said legs, said legs and said stem being parallel to the direction of chain movement, said central bridge being of such dimension from end-to-end as to be capable of supporting thereon one or more bit carrying lugs in a variety of positions.

4,717,207

BOOSTER UNIT FOR MOVING A VEHICLE ON A SLOPE AND METHOD OF CONTROLLING THE SAME

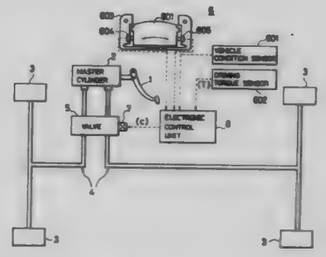
Hitoshi Kubota, Minamishigara, and Sachio Ohno, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 2, 1986, Ser. No. 869,693

Claims priority, application Japan, Jun. 3, 1985, 60-120319; Jun. 21, 1985, 60-135637

Int. Cl.⁴ B60R *25/08*; B60T *17/16*

U.S. Cl. 303—3 **18 Claims**



1. A brake system in which brake fluid pressure is supplied from a master cylinder to wheel cylinders in proportion to the operated force of a brake pedal, comprising:

(a) brake fluid pressure valve means provided between the master cylinder and the wheel cylinders for either maintaining or releasing the fluid pressure;

(b) vehicle tilt sensor means for detecting a vehicle tilt condition;

(c) engine torque sensor means for detecting actual engine torque;

(d) sensor means for detecting a vehicle moving or stopped condition on a slope;

(e) control means for controlling said brake fluid pressure valve means in such a manner that when the actual engine torque reaches a predetermined driving torque necessary for moving the vehicle in the vehicle moving and tilt condition on the slope the brake fluid pressure is released, and the brake fluid pressure is maintained in the vehicle stopped and tilt condition on the slope, thereby securing a smooth moving of the vehicle on a slope and preventing back moving of the vehicle on the slope;

said vehicle moving or stopped condition sensor means comprises a vehicle weight sensor, a vehicle speed sensor, a clutch sensor, and a shift position sensor; and

wherein said engine torque sensor means comprises a two switch device provided at a torque member of a disk brake for detecting a predetermined rotational direction displacement of the torque member to detect that the predetermined driving torque necessary for moving the vehicle is obtained.

4,717,208

BRAKE PRESSURE CONTROL VALVE OF A DOUBLE PIPING HYDRAULIC BRAKING SYSTEM

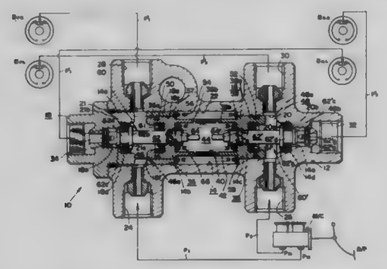
Hitoshi Kubota, Minamiashigara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1984, Ser. No. 619,198

Claims priority, application Japan, Jun. 20, 1983, 58-110411

Int. Cl.⁴ B60T *13/74, 11/00*

U.S. Cl. 303—6 C **10 Claims**



1. A brake pressure control valve for a double piping hydraulic braking system, comprising:

a housing having a bore formed therein;

two substantially identical proportioning valve units coaxially and symmetrically arranged in said bore in back-to-back manner, each unit having a plunger and being constructed to produce, under a certain condition, a controlled outlet hydraulic pressure in accordance with the magnitude of a hydraulic pressure applied thereto;

a first biasing spring compressed between the respective plungers of the two valve units in a manner to bias the plungers away from each other;

a free-piston unit comprising two free-piston parts connected to each other to move together, said unit being axially and slidably disposed in said bore between the two proportioning valve units so that when said free-piston unit is in its neutral position relative to said housing, each unit operates normally, and when one piping system associated with one of said proportioning valve units fails to operate, both piston parts of the free-piston unit move together as a unit and are moved relative to the housing to a fail-safe position to cause the other proportioning valve unit to produce, regardless of the magnitude of the hydraulic pressure applied thereto, an outlet hydraulic pressure which is equal to the hydraulic pressure applied thereto; and

a second biasing spring operative between said free-piston unit and said housing, said second biasing spring biasing said free-piston unit with a predetermined force against movement from said neutral position relative to said housing so as to prevent the movement of said free-piston unit from the neutral position so long as an external force applied to said free-piston unit is smaller than the predetermined force produced by said second biasing spring.

4,717,209

ANTI-SKID CONTROL SYSTEM FOR MOTOR VEHICLES

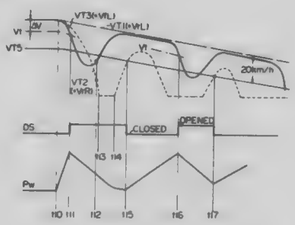
Naoyuki Hagiya, Ageo; Yuji Matsubara, Kazo; Katsuya Miyake, Ageo; Hideo Akima, Yokohama, and Akira Hoashi, Munakata, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Fujitsu Limited, Kanagawa, both of, Japan

Filed Dec. 29, 1986, Ser. No. 947,188

Claims priority, application Japan, Dec. 27, 1985, 60-292996

Int. Cl.⁴ B60T *8/64, 8/60*

U.S. Cl. 303—111 **3 Claims**



1. An anti-skid control system for motor vehicles, wherein brake control with respect to the lefthand front wheel and righthand rear wheel of the vehicle is effected through a first brake oil hydraulic channel common thereto and brake control with respect to the righthand front wheel and lefthand rear wheel of the vehicle is effected through a second brake oil hydraulic channel common thereto, said anti-skid control system means for sensing the rotational speeds of said wheels comprising:

first means for selecting, as a first computed speed, the higher one of said lefthand and righthand rear wheel speeds;

second means for selecting, as a second computed speed, the lower one of said lefthand and righthand rear wheel speeds;

third means for selecting, as a third computed speed, the lower one of said first computed speed and said lefthand front wheel speed;

fourth means for selecting, as a fourth computed speed, the lower one of said first computed speed and said righthand front wheel speed;

fifth means for setting up a reference speed on the basis of said first computed speed in such a manner that said reference speed is lower than said first computed speed by a predetermined amount and follows said first computed speed; and

sixth means arranged such that in said first brake oil hydraulic channel, reduction of the brake pressure is started on the basis of decleration of said third computed speed decelerated through the buildup of the brake pressure in said second brake oil hydraulic channel, and in said second brake oil hydraulic channel, reduction of the brake pressure is started on the basis of deceleration of said fourth computed speed decelerated through the buildup of the brake pressure in said second brake oil hydraulic channel; in case where said second computed speed being decelerated through the buildup of the brake pressure in said first and second hydraulic brake channels does not go below said reference speed, the reduction of the brake pressure in said first and second hydraulic brake channels is stopped in relation to a low peak of said third or fourth computed speed where said third or fourth speed is changed from deceleration to acceleration as a result of the reduction of the brake pressure, and the brake pressure in said first and second hydraulic brake channels is held; and in case where said second computed speed decelerated through the pressure buildup in said first and second hydraulic brake channels, goes below said reference speed, the reduction of the brake hydraulic pressure is stopped at a time when said second computed speed which is then being increased as the result of the reduction of the brake pressure in said first and second brake oil hydraulic circuits, goes above said reference speed, and thereupon buildup of the brake pressure is started.

4,717,210

BRAKE-SLIP-CONTROLLED BRAKE SYSTEM

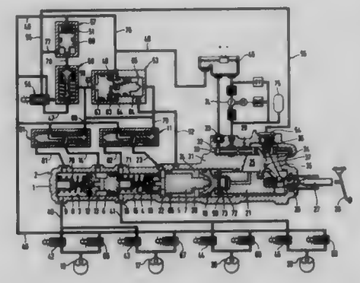
Juan Belart, Walldorf; Woffram Selbert, Pfungstadt, and Norbert Ocvirk, Offenbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,216

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524120

Int. Cl.⁴ B60T *8/44*

U.S. Cl. 303—114 **5 Claims**



1. A slip-controlled brake system for automotive vehicles comprising, in combination:

a pedal-actuated pressure generator including a master cylinder having first and second working chambers therein with each working chamber having a piston slidably mounted therein and said pressure generator having a booster chamber therein and said booster chamber having a pedal-actuated booster piston slidably mounted therein;

a pressure medium supply reservoir;

an auxiliary pressure source having an input connected to said supply reservoir and an output connected to said booster chamber;

an intermediate piston slidably mounted in an annular chamber of said pressure generator between said booster chamber and said first working chamber, said intermediate piston being connected at one end thereof to said booster piston and said intermediate piston engaging one end of the piston in said first working chamber at its other end thereof; and,

a check valve connected between a housing port of said pressure generator which opens into said annular chamber and said supply reservoir, said check valve having a control input connected to said booster chamber for closing the connection between said annular chamber and said supply reservoir when the pressure in said booster chamber exceeds a predetermined level.

4,717,211

METHOD AND APPARATUS FOR THE ANTI-LOCKING BRAKING OF AN AUTOMOTIVE VEHICLE

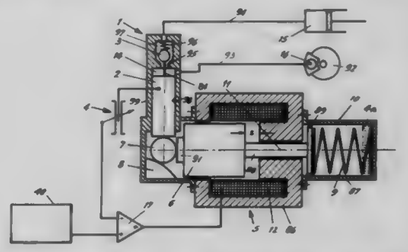
Adam Dittner, Höchstadt, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGa), Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 899,208

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530280

Int. Cl.⁴ B60T *8/60*

U.S. Cl. 303—119 **6 Claims**



1. A method of controlling a spatially closed anti-locking hydraulic braking system for an automotive vehicle, which system includes wheel cylinder means and an expandable chamber connected in a spatially closed arrangement, an operator-controlled master cylinder, said chamber being coupled to a transmission means constructed to convert an input force/-displacement stroke to a force-displacement stroke of substantially greater linearity, and said expandable chamber being interposed between the master cylinder and the wheel cylinder means; said method being comprised of:

increasing master cylinder pressure and measuring wheel deceleration;

and when said wheel deceleration reaches an upper threshold, energizing an electromagnet to operate its armature through a working stroke which is effective to isolate the chamber from the master cylinder and expand the volume of said chamber via said transmission means to reduce braking pressure at the wheel cylinder at a substantially linear rate.

4,717,212

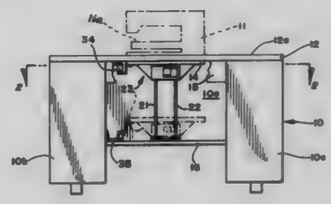
SEWING MACHINE CABINET WITH POWER LIFT

Kent S. Roberts, American Fork, Utah, assignor to Roberts Mfg., Inc., American Fork, Utah

Filed Sep. 20, 1982, Ser. No. 419,820

Int. Cl.⁴ A47B *46/00*

U.S. Cl. 312—21 **7 Claims**



1. In a sewing machine cabinet having a work table elongately apertured, an elongate sewing-machine-receiving platform accommodated by the aperture of the work table, and a power lift assembly for lowering and raising the platform from and back into the aperture, the improvement wherein the power lift assembly comprises a pair of guide columns, but

only a pair, secured to the cabinet at and mutually spaced along one of the elongate sides of the platform intermediate the length thereof, one of said guide columns, but only one, being provided with a rack formation along its height, said power lift assembly further comprising a carriage mounting the platform, a pinion rotatably mounted on said carriage below the platform in operative engagement with the said rack formation of said one guide column for walking up and down the rack formation thereof when rotated in opposite directions, respectively; reversible power means mounted in said carriage for rotating said pinion; means for holding the carriage in selected positions along its path of travel; and means for controlling operation of said power means, said rack formation and said pinion being the sole power lift associated with the said pair of guide columns.

4,717,213

MAGNETIC TAPE CASSETTE BOX

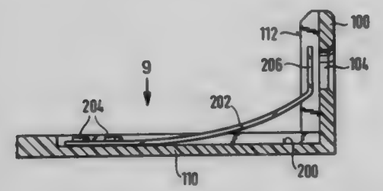
Klaus Bohnet, Waldachtal, Fed. Rep. of Germany, and Peter Ackeret, Kusnacht, Switzerland, assignors to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Division of Ser. No. 729,904, May 3, 1985, Pat. No. 4,592,600, which is a continuation of Ser. No. 488,022, Apr. 25, 1983, abandoned. This application May 23, 1986, Ser. No. 866,265

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3215721

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 312—12 **7 Claims**



1. A storage device for storing flat recording media carriers, such as magnetic tape cassettes, comprising:

a housing adapted to receive at least one media carrier, and having a front wall,

said front wall having an opening permitting movement of a media carrier between a first, inserted position in said housing and a second, exposed position permitting removal of the media carrier from said housing,

a transport means for supporting and moving a media carrier between said first and second positions,

said transport means having a front part exhibiting a surface configured to cover at least part of said opening so as to form part of said front wall when a media carrier is in said first position,

an indicating means for indicating, when said transport means is in said media carrier containing first position, whether a media carrier is contained therein,

said indicating means being mounted on said transport means so as to be actuated upon placing of a media carrier thereon,

said front wall having a window permitting optical recognition therethrough of said indicating means, and

said indicating means comprising a signal flag, a lever pivotably mounted at said front part and pivotable between a first position and a second position, said lever having a first arm adapted to sense the presence of a media carrier on said transport means and a second arm carrying said signal flag, said first arm, when said lever is in said first position, extending into a space defined by said transport means to be occupied by the media carrier, and said second arm assuming a position indicating the absence of a media carrier in said transport means, said first arm, when said lever is in said second position, being displaced by the media carrier and said second arm assuming a position in which said signal flag is visible through said window, and a resilient means for biasing said lever into said first position.

4,717,214

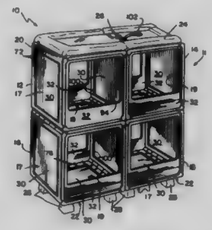
MODULAR DRESSING TABLE AND DEMOUNTABLE MODULES THEREFOR

Donald L. Moore, Columbus, Ind.; Raymond Spilman, Darien, and Thomas Pendleton, Wilton, both of Conn., assignors to Cosco, Inc., Columbus, Ind.

Filed Feb. 8, 1985, Ser. No. 699,997

Int. Cl.⁴ A47B *87/00*

U.S. Cl. 312—107 **7 Claims**



1. A modular dressing table for an infant having a top surface and a bottom surface, said dressing table comprising

an infant restraining means and cushion means for infant comfort affixed to the top surface;

a matrix of individual hollow modular assemblies, each assembly consisting essentially of four identical rectangular panels engaged to form a construction having four rectangular walls hingedly connected and means for engaging said construction to hold each panel rigidly in a position perpendicular to the adjacent panels engaged therewith, each rectangular panel having first and second opposite surfaces, first and second opposite panel engaging edges, and third and fourth opposite lateral edges, said first panel engaging edge being formed as a first connector and said second panel engaging edge being formed as a second connector, said first connector being formed as a hinge post supported in a position substantially parallel and spaced apart from the first edge of the rectangular panel by at least two hinge post support struts, said struts, hinge post and panel edge collectively defining one or more channel wall receiving slots along the first edge of the rectangular panels, said second connector being formed as a hinge post receiving channel having a channel opening, a panel proximal wall, and a panel distal wall, said channel opening toward the second surface of said rectangular panel and sized to receive the hinge post of another of the four rectangular panels, said channel being interrupted along its length by at least two hinge post strut receiving slots traversing the channel at points in alignment with the hinge post support struts of the first connector of said rectangular panels, said hinge post receiving slots defining channel wall segments engageable with the channel wall receiving slots along the first edge of the rectangular panels, said first connector of each rectangular panel being rotatably engageable with the second connector formed at the edge of a second rectangular panel to hingedly connect said rectangular panels along their respective first and second edges, whereby, when said panels are connected by engaging the first edge of each panel with the second edge of another, the panels form a construction having rectangular walls hingedly connected, the first surfaces of said panels forming the interior of said construction and the second surfaces forming the exterior of said construction, said means for engaging said construction to hold each panel rigidly in a position perpendicular to adjacent panels connected therewith comprising a support member sized to engage at least two of the four rectangular panels and means for securing said support member to said rectangular panel, and wherein, in each assembly, the channel opening at the second edge of each hingedly connected rectangular panel is formed to have a channel insert receiving surface adapted to receive a channel opening engaging insert having a channel opening engaging surface complementary to the channel insert receiving surface and wherein in each assembly the hinge post support struts of each hingedly connected panel are provided with a channel insert receiving surface positioned to engage the channel opening engaging surface of the channel opening engaging insert when said insert is positioned to engage the channel opening, whereby said insert provides mechanical resistance to racking of said assemblies.

4,717,215

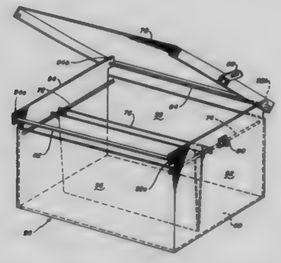
FILING MODULE

Kenneth A. Everts, 15 Willow St., Box 388, Westwood, Mass. 02090

Filed Nov. 20, 1986 Ser. No. 934,175

Int. Cl.⁴ A47B *63/00*

U.S. Cl. 312—184 **12 Claims**



1. A filing module comprising:

a box having a bottom panel, a front panel, a back panel and two end panels, upper portions of said front panel and said back panel extending outwardly beyond each of said end panels to define projections;

a first pair of parallel rods extending between corresponding projections on said front panel and said back panel and spaced to provide supports for hanging folders of a first specified size, said projections having lower edges for resting on rails spaced for receiving hanging folders of said first specified range; and

a cover hinged to said front panel and said rear panel by one of said rods for pivoting movement,

said filing module being sized and shaped for a placement in a file drawer dimensioned for receiving hanging folders of said specified size.

4,717,216

MULTI CIRCUIT BOARD CARD ENCLOSURE

Andrew J. Hornak, New Milford, Conn., assignor to General Datacomm, Inc., Middlebury, Conn.

Filed Aug. 13, 1985, Ser. No. 765,282

Int. Cl.⁴ A47B *43/00*

U.S. Cl. 312—257 R **11 Claims**

1. A housing for printed circuit boards, comprising:

a cover having a top wall and first and second depending side walls; a rim in said top wall;

said rim having spaced slots; said cover having a plurality of spaced posts depending from said side walls;

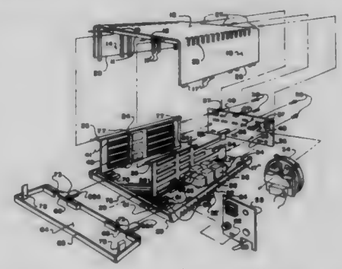
a rectangular housing base having a peripheral rim with an inside surface, top and bottom edges; a pair of parallel vertical card guide brackets removably mounted on said base and having a top edge; said card guide brackets having at the upper front part thereof forward extending tabs engageable in said slots of said rim of said cover; said guide brackets having opposing open grooves; and said tabs of said card guide brackets being received in said slots;

said base having a plurality of upstanding posts frictionally engaging said sides of said cover;

said posts on said cover frictionally engaging said inside surface of said peripheral rim;

said bottom edge of said cover being separated by a vent gap from said top edge of said base when said cover is fully engaged with said base and when said base and said cover are mutually assembled to said card guide brackets and to a rear vertical panel;

a plurality of vent slots along the sides of said peripheral rim



of said base adapted to receive detachable mounting brackets and similar vent slots along the upper side corner sections of said cover;

one of said guide brackets being spaced from the adjacent peripheral side rim of said base to define a power source compartment;

said rear vertical panel removably secured to the rear of said brackets and to the rear of said cover;

spaced detachable mounting brackets removably secured to said vent slots of said cover and said rim, said spaced detachable mounting brackets having means for engaging said vent slots; a door having a peripheral rim and a base at the bottom thereof, said door shaped so as to bear against the bottom of said housing base in the fully open position of said door, so as to prevent said door from rotating below the horizontal plane of said door in said fully open door position, and a hinged lever detachably securing said door to said housing base.

4,717,217

CONNECTOR FOR MATING MODULAR PLUG WITH PRINTED CIRCUIT BOARD

Stephen B. Bogese, II, Roanoke, Va., assignor to Virginia Patent Development Corporation, Roanoke, Va.

Continuation of Ser. No. 565,478, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 215,054, Dec. 10, 1980, Pat. No. 4,457,570, which is a continuation-in-part of Ser. No. 120,846, Feb. 12, 1980, which is a continuation of Ser. No. 915,457, Jun. 14, 1978, abandoned. This application Jun. 26, 1985, Ser. No. 748,717

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 439—83 **31 Claims**

1. A telephone-type modular jack for directly coupling to a printed circuit board a telephone-type modular plug, the modular jack comprising:

an insulating housing having a front portion, a rear portion

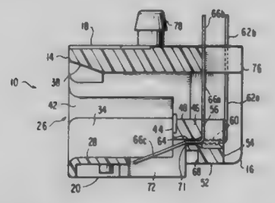
VOL 1086 ISS 1 JA 5 1988 UMI

and an outer wall for positioning adjacent the printed circuit board;

an opening formed in said front portion of said housing for receiving the modular plug, said opening defined by a rear partition, an inner end wall and inner side walls;

said outer wall, said rear partition and said inner end wall including means for accommodating a plurality of electrical conductors arranged in a side-by-side spaced apart fashion in said housing;

each of said conductors having one end portion extending



normally from said outer wall and another end portion extending from said rear partition into said opening and towards said inner end wall;

said another end portions of said conductors engaging by spring contact the correspondingly spaced contact terminals in the modular plug upon insertion of the plug into the jack;

each of said conductors included in a plane defined by its said one end portion and the point of spring contact of its said another end portion, the planes so defined by said plurality of conductors being non-parallel.

4,717,218

ELECTRIC CIRCUIT BOARD ASSEMBLY

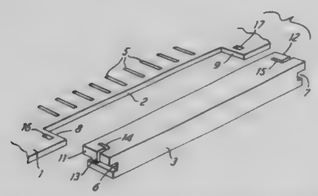
Colin K. Ratcliff, Sandy Hook, Conn., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 24, 1986, Ser. No. 855,273

Claims priority, application United Kingdom, Apr. 29, 1985, 8510839

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 439—59 **11 Claims**



1. An electric circuit board assembly comprising an electric circuit board and an electrical connector mounted thereto,

said board comprising a front edge, a centrally located substantially rectangularly shaped cut-out in said front edge, said cut-out being defined by oppositely facing side edge parts and a substantially straight front edge surface, recess means provided on said board adjacent to each of said side edge parts of said cut-out, and a plurality of face contacts on a first surface of said board extending towards said front edge surface and being electrically connected to said connector;

said connector having an elongated body including a front surface, a back surface, a top surface, a bottom surface and opposite side edges, a groove in each of said side edges of said body extending from said front surface to said back surface, electrical contacts in said body in electrical connection with said face contacts, said body having a width substantially equal to the length of said substantially straight front edge surface of said cut-out and said side edge parts of said cut-out being received in said grooves of said connector, such that said back surface of said body is substantially flush with said front edge of said board adjacent to said side edge parts, detent means integral with said body and extending downwardly into said grooves and being received in said recess means to retain said board and said connector together, a slot partially separating said detent means from said body whereby said detent means is resiliently deflectable from said body to permit entry of said detent means into the respective recess means in the action of loading said body to said board in a direction planar to said board to provide a snap-together engagement between said board and said connector.

4,717,219

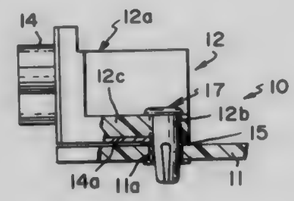
ELECTRICAL CONNECTOR AND ASSEMBLY EYELETS

Robert H. Frantz, Newville; James A. Paulo, Harrisburg, and Robert N. Whiteman, Jr., Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 19, 1986, Ser. No. 876,017

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 439—82 **17 Claims**



1. An electrical connector assembly for mounting to a printed circuit board comprising:

a dielectric housing having an integral flange having a mounting face for engaging the printed circuit board, an opposed holding face and an aperture extending therebetween;

an eyelet disposed in said aperture, said eyelet comprising flange means engaging the holding face, an inverted end remote from said flange means and a generally tubular shank extending therebetween, the generally tubular shank having a bore, a first section within the aperture for providing an interference fit therewith, and a second section extending below the mounting face for disposition within an aperture of the printed circuit board, said inverted end extending inwardly from the second section, said inverted end being engagable through the bore of the generally tubular shank, whereby when the connector assembly is positioned on the printed circuit board with the second section in an aperture in the printed circuit board, and the inverted end is driven outwardly, such as by a rod inserted axially within the bore of the generally tubular shank, the second section is expanded into engagement with the printed circuit board so as to secure the connector assembly to the printed circuit board.

4,717,220

LIQUID OPTICAL FILTER AND METHOD FOR THE NEAR INFRARED LIGHT

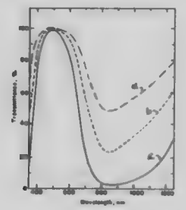
Gil Navon, Ramat Gan, Israel, assignor to Ramot University Authority for Applied Research & Industrial Development Ltd., Tel Aviv, Israel

Filed Jan. 8, 1986, Ser. No. 817,083

Claims priority, application Israel, Jan. 25, 1985, 74159

Int. Cl.⁴ G02B *5/24*

U.S. Cl. 350—1.5 **20 Claims**



1. An optical filter solution characterized in that it includes copper and chloride having a chloride ion concentration greater than 0.7 N to form a complex which has optical absorption properties stronger than free copper ions.

4,717,221

DIFFRACTIVE COLOR AND TEXTURE EFFECTS FOR THE GRAPHIC ARTS

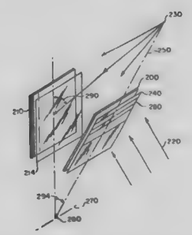
Stephen P. McGrew, 1718 Columbus Pl., Santa Clara, Calif. 95051

Continuation of Ser. No. 314,553, Feb. 8, 1982, Pat. No. 4,629,282, and a continuation-in-part of Ser. No. 203,563, Nov. 5, 1980, abandoned. This application Jan. 17, 1986, Ser. No. 820,195

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ G02B *5/32*

U.S. Cl. 350—3.7 **6 Claims**



1. A method of making a diffractive pattern for use in graphical compositions incorporating the diffractive effects of color and texture, comprising:

generating a temporally coherent and spatially incoherent light field randomly spatially incoherent in one direction;

interfering said light field with a reference beam temporally coherent thereto having a predetermined angular relationship to said light field; and

recording the interference pattern resulting from the interference between said light field and said reference beam on a photosensitive medium to form a diffractive pattern which will widely diffuse light in said one direction while spectrally dispersing light in a direction perpendicular thereto.

4,717,222

OPTICAL SCANNING TYPE SYSTEM

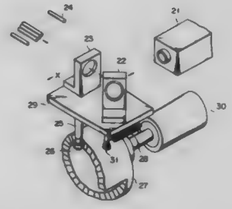
Kenji Iwasaki, Utsunomiya; Susumu Shimizu, and Hidenosuke Ono, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 12, 1986, Ser. No. 895,820

Claims priority, application Japan, Aug. 13, 1985, 60-179069

Int. Cl.⁴ G02B *26/08, 5/08*

U.S. Cl. 350—6.5 **9 Claims**



1. A system comprising:

means for generating a laser beam;

first reflection means for reflecting the laser beam generated;

optical means arranged at a predetermined pitch and having a number of light-receiving sections into which the reflected laser beam is introduced; and

a moving mechanism for moving either one of the first reflection means and optical means stepwise in a specified direction, to allow the reflected laser beam to sequentially enter the respective light-receiving sections of the optical means,

in which the moving mechanism comprises means for generating a drive force, a cam body having a cam surface defining a number of steps and having a stepwise varying height, the steps being formed so as to have a pitch corresponding to the pitch of the respective light-receiving section, and a cam follower mechanically coupled to either one of said first reflection means and optical means, to allow the cam follower to follow the surface of the cam body.

4,717,223

OPTICAL DEFLECTOR

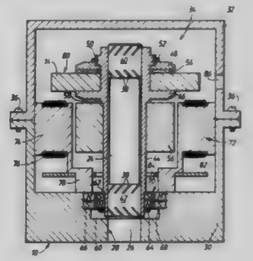
Takao Ishida, Kawasaki, and Kenichi Tsuneeda, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 735,985, May 20, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 933,359

Claims priority, application Japan, May 21, 1984, 59-102038

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.8 **2 Claims**



1. An optical deflector with a polygonal mirror for deflecting a light beam comprising:

a fixed supporting shaft of nonmagnetic cemented carbide, said fixed supporting shaft having inclined grooves on the peripheral surfaces of upper and bottom portions of said fixed supporting shaft;

a hollow cylindrical shaft of nonmagnetic cemented carbide, rotatably and coaxially overlapping said fixed supporting shaft with a gap between the peripheral surfaces of the upper and bottom portions of said fixed supporting shaft and the inner surface of said hollow cylindrical shaft thereby defining journal bearings of a dynamic pressure type, for supporting and rotating the polygonal mirror so that a light beam reflected by the polygonal mirror is deflected without relative eccentricity of said cylindrical shaft, said journal bearings rotatably supporting said cylindrical shaft by flowing air into the gap;

a magnetic thrust bearing for axially suspending said cylindrical shaft, said magnetic thrust bearing comprising a first magnetic member disposed on the peripheral surface of the bottom portion of said cylindrical shaft and a second magnetic member for producing an attractive magnetic force between said first and second magnetic members;

a rotor fixed on said cylindrical shaft; and

a stator, disposed coaxially with said rotor, for rotating said cylindrical shaft magnetically cooperating with said rotor.

4,717,224

LASER SCANNING DEVICE FOR FASTEST POSSIBLE DEFLECTION OR SWEEP VELOCITIES

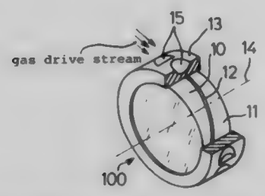
Christian Diehl, and Horst Kirsche, both of Munich, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 923,003

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537843

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.9 **6 Claims**



1. A laser scanning device for highest possible deflection or sweep velocities in laser guide beam systems, comprising scanning means including a first transparent cylindrical wedge, a second transparent cylindrical wedge, a mirror surface located between said first and second wedges for forming a scanning mirror and frame means (13) for mounting said scanning mirror, said frame means (13) being arranged coaxially on a rotation axis for rotating about said rotation axis, each of said first and second cylindrical wedges comprising an outer end surface perpendicular to said rotation axis and an inner slanted end surface deviating by an angle α from a perpendicular to said rotation axis, said mirror surface being located between said inner slanted end surfaces of said first and second cylindrical wedges, thereby forming a scanning cylinder through which said mirror surface passes at a slant, and wherein said frame means include means (15) for rotating said scanning cylinder by a driving gas stream.

4,717,225

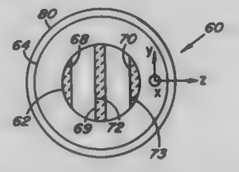
FORM POLARIZING FIBERS AND METHOD OF FABRICATION

John R. Feth, Topanga; Chin-Lang Chang, Woodland Hills, both of Calif., and Steven C. Furlong, Fanwood, N.J., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 659,804, Oct. 11, 1984, abandoned. This application May 15, 1985, Ser. No. 734,211

Int. Cl.⁴ G02B *6/18, 6/22*

U.S. Cl. 350—96.33 **14 Claims**



1. A polarizing fiber optic waveguide, comprising:

a core formed of a plurality of alternating dielectric layers, each layer having a characteristic refractive index, said core being formed such that the dielectric layers provide a first core refractive index for light of a first polarization and a second core refractive index for light of a second polarization; and

a cladding surrounding said core, said cladding being formed of a dielectric material having a refractive index at least as large as said first core refractive index and less than said second core refractive index such that said core guides only light of said second polarization and light of all other polarizations propagate from said core into said cladding.

4,717,226

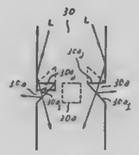
PHOTORADIATOR INCLUDING LIGHT CONDUCTING RODS WITH FRUSTO-CONICAL END PORTIONS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 555,866, Nov. 28, 1983. This application Jul. 16, 1986, Ser. No. 886,865

Int. Cl.⁴ G02B *6/00*; F21V *7/04*

U.S. Cl. 350—96.10 **3 Claims**



1. A photoradiator for diffusing light transmitted therethrough comprising a first and second cylindrical light conducting rods each na /ing a longitudinal axis and each having an outer cylindrical wall, said first cylindrical light conducting rod having a first lognitudinal end section, said first longitudinal end section having an inner frusto-conical wall and an inner flat end wall, said inner frusto-conical wall having a large diameter end and a small diameter end, said large diameter end being coincident with a circumferential line on said outer cylindrical wall of said first cylidrical light conduting rod, said inner flat end wall having a circular configuration, said smaller diameter end of said inner frusto-conical wall beng coincident with said inner flat circular end wall, said second cylindrical light conducting rod having a second longitudinal end sections said second longitudinal end section having an outer frusto-conical wall and an outer flat end wall, said outer rusto-conical wall having a large diameter end and a small diameter end, the last said large diameter end being coincident with a circumferential line on said outer cylindrical wall of said second cylindrical light conducting rod, said outer flat end wall having a circular configuration, said small diameter end of said outer frusto-conical wall being coincident with said outer flat circular end wall, said inner frusto-conical wall, along with said inner flat circular end wall, being complementarily arranged and axially aligned respectively with said outer frusto-conical wall along with said outer flat circular end wall; and a semitransparent layer deposited on either one of said inner frusto-conical wall of said first cylindrical light conducting rod and said outer frusto-conical wall of said second cylindrical light conducting rod, whereby light propagating through said first cylindrical light conducting rod is transmitted to said second cylindrical light conducting rod via said inner and outer flat circular end walls while the rest of the light being propagated is partly reflected laterally outwardly by said inner and outer frusto-conical wall via said semitransparent layer and partly transmitted through said inner and outer frusto-conical walls and said semitransparent layer into said second cylindrical light conducting rod.

4,717,227

SOLAR RAY COLLECTING DEVICE INCLUDING PROTECTIVE COVER AND FILTER

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

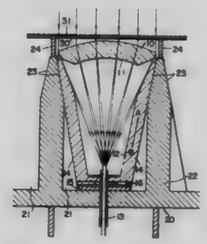
Filed Oct. 2, 1984, Ser. No. 657,105

Claims priority, application Japan, Oct. 4, 1983, 58-186113

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ G02B *6/00*; B64G *1/44*; F24J *2/08*

U.S. Cl. 350—96.10 **7 Claims**



1. A solar ray collecting device for use in space comprising a heat-conducting support base plate provided with a plurality of adjacent hexagonal recess portions, optical system means installed on each of said recess portions, each of said recess portions having a side wall with an upper surface, heat-conductive protective bars disposed on said upper surfaces of said side walls, and a protective cover and filter means disposed on said upper surfaces of said side walls, said protective cover and filter means permitting visible rays to pass therethrough such that visible rays are thereby transmitted through said protective cover and filter means to the optical system means, said protective cover and filter means being in heat-conductive contact with said upper surfaces of said side walls such that heat received by said protective cover and filter means is transmitted to said side walls and said heat-conducting support base plate.

4,717,228

OPTICAL DIRECTIONAL COUPLER WITH AMPLIFICATION

Lars Helge Thylén, Huddinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

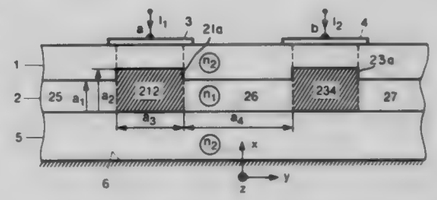
PCT No. PCT/SE85/00462, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986, PCT Pub. No. WO86/03306, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 18, 1985, Ser. No. 882,932

Claims priority, application Sweden,

Int. Cl.⁴ G02F *1/00*

U.S. Cl. 350—96.14 **8 Claims**



1. An optical directional coupler with amplification comprising a first waveguide means for receiving and carrying incoming light, a second waveguide means for bar coupling of the light from the first waveguide, and a third waveguide means for cross coupling of the light from the first waveguide means, said waveguide means having a coupling area and being transparent for the wavelength of the incoming light and having a characteristic refractive index in said coupling area, said coupler further comprising waveguide sections constituting coupling elements for said first, second and third waveguide means and comprising electrodes operatively associated with said sections, and means for achieving optical amplification of light passing through the first (23) and the second (24) waveguide means in the bar coupling state of said directional coupler and optical amplification of the light passing through the first (23) and the third (22) waveguide means in the cross coupling state of the directional coupler by feeding a current (I_1, I_2) to said electrodes (3, 4 or 3a, 3b, 4a, 4b) according to which coupling state is desired, and by thus achieving an alteration of both real and imaginary parts of the refractive index (n_1) of the respective waveguide sections (212, 234), an alteration of the imaginary part achieving an amplification and an alteration of the real part achieving an alteration of the state of the coupler for bar coupling or cross coupling of the incoming light such that the coupler can be switched between the bar and cross coupling states with the same amplification of an incoming light signal.

4,717,229

BI-DIRECTIONAL OPTICAL FIBER COUPLER

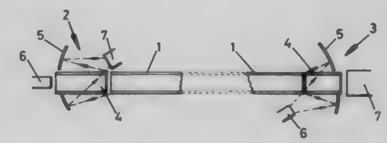
Albert E. Cutler, Barnett, United Kingdom, assignor to Communications Patents Limited, London, England

Filed Sep. 20, 1985, Ser. No. 780,196

Claims priority, application United Kingdom, Sep. 21, 1984, 8423975

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **3 Claims**



1. An optical communications link comprising: a main opti-

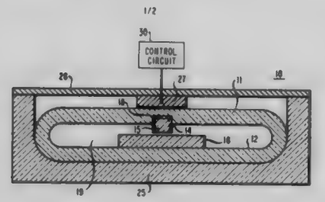
cal fibre; a pair of secondary optical fibres, one end of each of which is in abutment with a respective end of the main fibre, each secondary fibre having the same outside and core diameters as the main fibre but a lower numerical aperture than the main fibre; a first optical source positioned to launch light into one of the secondary fibres at an end of the secondary fibre remote from the main fibre; a first light detector positioned to receive light from the other secondary fibre at an end of the secondary fibre remote from the main fibre; a second optical source positioned to launch light into one end of the main fibre through an outer surface of the adjacent secondary fibre, the light launched into the main fibre having propagation angles greater than the maximum propagation angle of the secondary fibre; a second light detector positioned adjacent the end of the main fibre remote from the second optical source; and a mirror positioned to focus light emerging from the outer surface of the secondary fibre adjacent the second light detector onto the second light detector.

4,717,230

OPTICAL ERASER AND NODE SWITCH FOR AN OPTICAL NETWORK

Frank H. Levinson, Redwood City, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 28, 1985, Ser. No. 750,811
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **12 Claims**



1. Apparatus comprising a hollow sleeve having a longitudinal axis and an internal surface, said sleeve having a cross-sectional geometry normal to said axis such that at least first and second portions of said internal surface are closely juxtaposed with one another, said first portion including means parallel to said axis for securing a waveguide, said apparatus including a waveguide secured by said means, said waveguide protruding beyond said sleeve, said apparatus further including absorber means adapted for absorbing optical energy from said waveguide when moved into close proximity therewith, said absorber means being connected to said second portion of said internal surface, said absorber means being completely located within said hollow sleeve, said sleeve being of a geometry such that said absorber means and said waveguide are normally spaced apart a distance such that said absorber means normally absorbs only negligible energy from said waveguide.

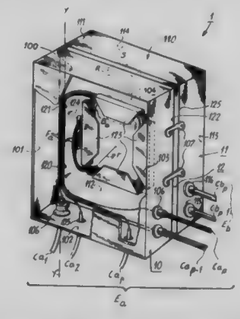
4,717,231

INTERCONNECTING AND DISTRIBUTING BOX FOR OPTICAL FIBERS

Vincent Dewez, 150, rue Saint Maur, 75011 Paris; Jean-Pierre Michaux, 75, rue des Pyrénées, 75020 Paris, and Daniel M. Moulinc, 12, rue Yves Farges, 94500 Champigny, all of France

Filed Jan. 5, 1984, Ser. No. 568,503
Claims priority, application France, Jan. 5, 1983, 83 00075
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **17 Claims**

1. A box for interconnecting first and second optical fiber arrays comprising a panel mounted in said box dividing said box into first and second compartments, each of said compartments having at least one aperture for receiving a fiber of the arrays that extends from out of the box into the box, said panel having at least one aperture for receiving a fiber of the arrays that extends between said compartments, plural optical fiber connecting devices mounted in said second compartment, each optical fiber connecting device connecting an end section of an optical fiber from said first array to an end section of an optical fiber from said second array, fibers of said first array entering the first compartment via the at least one aperture in the first compartment and being arranged in flat loops in said first compartment, the fibers from said first array having end sections extending from the flat loops in said first compartment



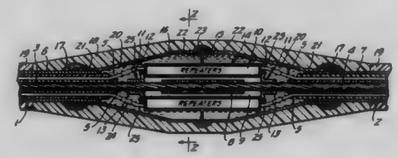
through the at least one aperture of the panel into the second compartment and being inserted into said connecting devices, fibers of said second array entering the second compartment via an exterior wall in the at least one aperture in the second compartment and being arranged in flat loops in said second compartment, fibers from said second array having end sections in the second compartment inserted into said connecting devices so that the end sections of the fibers of the first and second arrays are connected together by the connecting devices in the second compartment.

4,717,232

SUBMARINE CABLE JOINT WITH OPTOELECTRONIC REPEATERS

Paolo G. Priaroggia, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jul. 18, 1985, Ser. No. 756,777
Claims priority, application Italy, Aug. 1, 1984, 22161 A/84
Int. Cl.[4] B02B *6/36, 7/26*
U.S. Cl. 350—96.20 **10 Claims**



1. A joint between a pair of submarine, optical fiber cables, each cable comprising a central armoring for withstanding the stresses on the cable including the hydrostatic pressure stresses, signal transmitting, optical fibers disposed around the central armoring and a sheath around the optical fibers, said joint comprising:

interconnecting means mechanically interconnecting the end of the central armoring of one cable to the end of the central armoring of the other cable;

a watertight housing around said interconnecting means and secured to one of said central armoring and said interconnecting means for preventing movement of said housing relative to said central armoring, said housing enclosing optoelectronic repeaters connected to said optical fibers for receiving and transmitting signals transmitted by said optical fibers; and

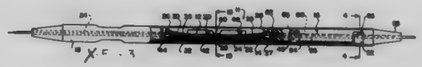
a watertight, metallic casing surrounding said housing.

4,717,233

OPTICAL FIBER SPLICE SYSTEM

Edmund J. Szkaradnik, Philadelphia, Pa., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 15, 1983, Ser. No. 562,394
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **14 Claims**



1. An apparatus for splicing a pair of optical fibers together comprising:

a connector having:

(a) a clear, glass, double elbow guide having a channel extending therein, the channel being adapted for receiving a pair of optical fiber cores, the guide having a straight central portion and a pair of end portions equipped with entryways, the ends of the guide being flared and extending at an obtuse angle to the central portion;

(b) an ultraviolet-curable clear adhesive for splicing the cores together in the guide in end-to-end relationship;

(c) an elongated alignment cradle having a longitudinal axis, end sections, and an intermediate section between the end sections and including a flat base, the intermediate section having means for holding the guide in position to receive the optical fibers with the flared ends and central portion of the guide on the base, each section of the cradle including at least one pair of opposed tabs;

(d) a pair of flexible sleeves for placement in a respective one of the end sections of the cradle, each sleeve having a fiber receiving channel therethrough, the sleeves having a degree of flexibility that is responsive to the bending of the fibers by themselves being bent without damage to the fibers, the outer wall of each sleeve having indents corresponding to the tabs of the cradle for locating and holding the sleeves in a fixed position in the cradle relative to each other; and

support means for said connector for supporting the optical fiber cores extending from the entryways of said guide at an angle that is equal to the angle that the end portions of the glass guide make with the central portion of the guide.

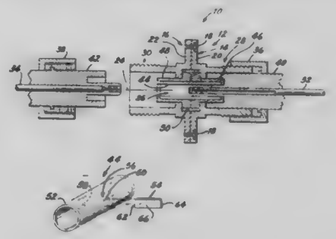
4,717,234

IN-LINE OPTICAL ATTENUATORS

Robert W. Barlow, Canton, and Barry J. Opdahl, Williamsport, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 20, 1986, Ser. No. 842,081
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **2 Claims**

1. An in-line optical attenuator for optical fibers comprising: a housing having a longitudinal axis and a longitudinal aperture aligned therewith including first and second ends for receiving first and second axially aligned optical fibers; an attenuator holder positioned in said longitudinal aperture, said holder being tubular and having a longitudinal slit running the entire length of said holder, and a pair of attenuator receiving windows formed in said holder, transverse to said longitudinal axis and oppositely disposed from one another, said windows having a given height and a given width; and an optical attenuator having first and seconds ends disposed in said holder, said first end of said attenuator engaging one of said windows and said second end of said attenuator engaging the other of said windows, the body of said attenuator intermediate said ends being disposed across said longitudinal axis, said attenuator having a



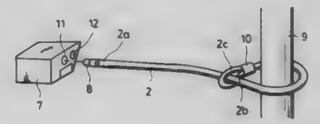
height substantialy equal to said given height and a thickness substantialy less than said given width.

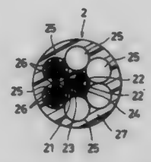
4,717,235

FLEXIBLE TYING MEMBER FOR THEFTPROOF DEVICE

Tadao Kitagawa, Kasifukuoka; Yutaka Kosuge, Sayama; Yoichiro Noda, Miyazaki, and Tomosaburo Sato, Kawagoe, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo; Kabushiki Kaisha Honda Rokin, Miyazaki and Kokoku Control Cable Kabushiki Kaisha, Saitama, all of, Japan

Filed Nov. 1, 1982, Ser. No. 438,341
Claims priority, application Japan, Nov. 16, 1981, 56-183389; Nov. 16, 1981, 56-183390; Nov. 17, 1981, 56-184284
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **6 Claims**



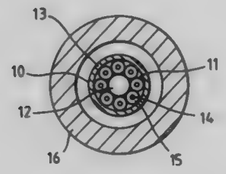


1. An elongate flexible tying member having an optical fiber longitudinally extending through said flexible tying member and a pair of photoelectric elements arranged at opposite ends of said optical fiber, for use in a theftproof device including means responsive to a change in an electrical signal generated by one of said photoelectric elements, which corresponds to a change in a photo signal generated by the other of said photoelectric elements and transmitted in said optical fiber, for performing a warning function, said flexible tying member further comprising:

a first layer including said optical fiber and at least one electric wire which longitudinally extends through said flexible tying member and is electrically connected to at least one of said photoelectric elements, said optical fiber and at least one electric wire being arranged around the axis of the tying member,

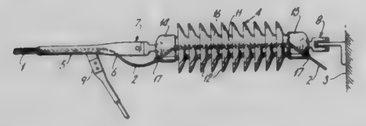
said first layer being disposed at a diametric center of said flexible tying member and extending along an axis thereof,
said first layer including a coating material coating said optical fiber and said at least one electric wire; and
a second layer including a reinforcing member wound around said first layer and longitudinally extending through said flexible tying member,
said reinforcing member of said second layer comprising a plurality of strands, each strand comprising a plurality of twisted steel wires,
said second layer being coaxially arranged around an outer peripheral portion of said first layer and substantially in contact with the first layer;
said coating material filling gaps between said optical fiber, said at least one electric wire, and said reinforcing member.

4,717,236
OPTICAL FIBER CABLE HAVING A HYDROGEN-ABSORBING ZEOLITE
John Dewing, Chester, England, assignor to STC, PLC, London, England
Filed May 8, 1985, Ser. No. 731,900
Claims priority, application United Kingdom, May 18, 1984, 8412721
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **4 Claims**



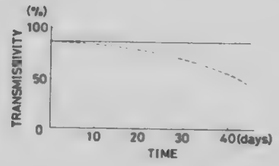
1. An optical fiber cable, including one or more optical fibers contained in a protective sheath, the cable being filled with a water blocking compound having dispersed therein a sodium aluminosilicate zeolite in which a portion of the sodium is substituted with silver, the zeolite being hydrogen absorbent such that hydrogen evolved within the cable is absorbed so as to maintain the optical fibers of the cable in a substantially hydrogen free environment.

4,717,237
OVERHEAD ELECTRIC AND OPTICAL TRANSMISSION SYSTEMS
Kenneth A. Austin, Ifold, West Sussex, England
Filed Sep. 24, 1985, Ser. No. 779,530
Claims priority, application United Kingdom, Sep. 28, 1984, 8424584
Int. Cl.⁴ G02B *6/44*; H02G *7/00*
U.S. Cl. 350—96.23 **11 Claims**



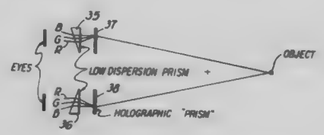
1. An overhead electric and optical transmission system of the kind in which at least one overhead electric conductor is freely supported in long lengths between towers and includes over at least a part of its length at least one optical guide for use in the communications field adapted for transmission of light, a mechanical connection between an overhead electric conductor incorporating at least one optical guide and a tower in which an end of the overhead electric conductor is mechanically secured to and is electrically insulated from the tower by at least one elongate tension insulator and the electric conductor is electrically connected to another electric conductor, wherein the elongate tension insultor comprises an elongate body of substantially rigid, electrically insulating material of high tensile strength which has, mechanically secured to its ends, metal terminal fittings connected to the overhead conductor and to the tower, which has, at each of a plurality of positions mutually spaced along the length of and integral with the body, an outwardly extending shed whereby the creepage path between the ends of the tension insulator is increased, and which has, extending along the body, a central throughbore through which the optical guide of the electric conductor passes from the conductor to an optical guide joint remote from the insulator.

4,717,238
INFRARED OPTICAL FIBER
Shiro Sakuragi, and Kyoshiro Imagawa, both of Kyoto, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan
Filed Jan. 16, 1981, Ser. No. 225,744
Claims priority, application Japan, Jan. 22, 1980, 55-5316
Int. Cl.⁴ G02B *6/00*
U.S. Cl. 350—96.34 **4 Claims**



1. An infrared optical fiber having a core of a material preponderantly comprising a halogenide selected from the group consisting of TlBr, TlCl, AgBr, AgCl, CsI and CsBr, said core incorporating a trace quantity of a dopant comprising a halogenide consisting of a cation selected from the group consisting of Li, Na, K, Rb, Cs, Ca, Sr, Ba and Tl and an anion selected from the group consisting of F, Cl, Br and I, the proportion of said trace quantity of a dopant to said core material falling within the range of from 10^{-1} to 10^{-4} mol based on the amount of said core material.

4,717,239
STEREOSCOPIC PROCESS AND APPARATUS USING DIFFRACTIVE OPTICAL ELEMENTS
Richard A. Steenblik, Stone Mountain, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.
Division of Ser. No. 568,419, Jan. 5, 1984, Pat. No. 4,597,634. This application Mar. 4, 1986, Ser. No. 835,943
Int. Cl.⁴ G02B *27/22, 27/42*
U.S. Cl. 350—144 **31 Claims**

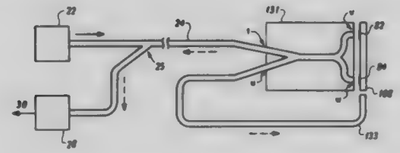


19. A stereoscopic system for producing and viewing an image, comprising:

a color coded image; having each portion of the image to be viewed colored according to the desired appearance depth of said portion with respect to the remaining portions of said image; and
viewing means including at least one optical element for each of the left and right eye wherein the at least one optical element is a diffractive optical element for viewing said image through the viewer means which passes light of a chosen color without imparting an angular deviation to said light from its original path, and which deviates light of other colors to either side of the chosen color through various angles according to the spectral relationship of each color with respect to the chosen color, and said color coded portions of said image appearing at said desired appearance depth.

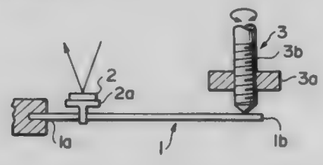
23. The system according to claim 19 wherein the color coding of each portion is modified by the natural appearance, size and natural color of said each portion.

4,717,240
INTERFEROMETERIC BEAMSPLITTER
Anthony C. Gilby, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Filed Jul. 21, 1986, Ser. No. 888,556
Int. Cl.⁴ G01B *9/02, 11/02*
U.S. Cl. 350—163 **8 Claims**



1. An optical beamsplitter device for use in communicating optical power to a resonant element, comprising:
(a) a source of optical power;
(b) a first light beam pathway for carrying said optical power to a beamsplitter;
(c) means for dividing said first light beam pathway and said optical power into at least second and third interferometer light beams pathways, each carrying a portion of said optical power; and
(d) means for communciating the optical power on said at least second and third light beam pathways to adjacent locations on the resonant element such that differential motion between these resonant element locations modulates at least a portion of said optical power by interferometry to produce a modulated optical power beam signal.

4,717,241
LIGHT DEFLECTION DEVICE
Toshitaka Agano, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Jun. 11, 1985, Ser. No. 743,376
Claims priority, application Japan, Jun. 11, 1984, 59-119657
Int. Cl.⁴ G02B *7/18, 5/08, 27/10, 26/08*
U.S. Cl. 350—174 **5 Claims**



1. A light deflection device for precisely deflecting a laser beam so that the laser beam can be precisely aligned coincident with at least one other laser beam, comprising a cantilever having a fixed end and a free end, a light deflecting element disposed in the vicinity of the fixed end of the cantilever and movable with high precision in response to movement of an intermediate portion of the cantilever between the fixed and free ends, and a deflection means for imparting a desired amount of deflection to the free end of the cantilever to cause a lesser deflection of the intermediate portion of the cantilever between the fixed end and free end, said deflection means comprising a screw and a motor, and said deflection means being capable of causing an angle of deflection of the light deflecting element to be precisely adjusted by the deflection imparted to the free end of the cantilever by the deflection means.

4,717,242
ILLUMINATION OPTICAL SYSTEM
Hiroshi Echizen, Tokyo, and Takashi Omata, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 19, 1985, Ser. No. 810,754
Claims priority, application Japan, Dec. 22, 1984, 59-271691
Int. Cl.⁴ G02B *27/00, 27/30*
U.S. Cl. 350—276 R **6 Claims**

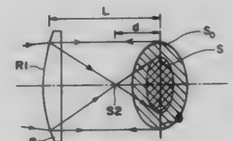
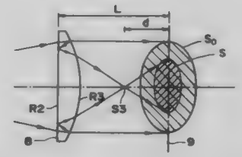


FIG. 2B



1. An illumination optical system for irradiating an object with a light beam, said system comprising:
a light source portion for supplying a light beam; and
a collimator lens system for receiving the light beam from said light source portion and for irradiating the object with the light beam passed through said collimator lens system, said collimator lens system having a focal point and being disposed so that the focal point thereof is positioned substantially at said light source portion, said collimator lens system also having a surface at least partially reflecting, toward the object, a light beam reflected from the object irradiated with the light beam passed through said collimator lens system, said surface of said collimator lens system having a shape which satisfies the following relation:

$$S/S_0 \geq P_1 \times P_2/m$$

$$m = E\max/E_0$$

wherein S is the area on the object as irradiated by the light beam reflected from said surface of said collimator lens system, S_0 is the area on the object as irradiated by the light beam passed through said collimator lens system, P_1

is the reflection factor of the surface of the object, P_2 is the reflection factor of said surface of said collimator lens system, Emax is an allowable maximum illuminance on the object as defined by the light beam reflected from said surface of said collimator lens system, E_0 is the illuminance on the object as defined by the light beam passed through said collimator lens system, and m is the ratio Emax to E0.

4,717,243

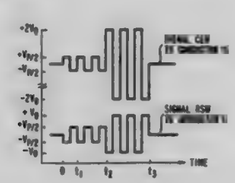
BISTABLE LIQUID CRYSTAL DISPLAY UTILIZING PRIMING VOLTAGES

Gary D. Boyd, Rumson, and Julian Cheng, Little Silver, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 411,305, Aug. 25, 1982, abandoned. This application Mar. 21, 1986, Ser. No. 843,855

Int. Cl.[4] G02F *1/137*; G09G *3/36*

U.S. Cl. 350—332 **13 Claims**



1. A liquid crystal display, comprising:

liquid crystal material disposed between first and second substrates, said liquid crystal material being switchable from a first configuration to a second, different configuration through the application, over a finite time period, of a single electric field having an amplitude equal to or greater than a threshold amplitude related to said finite time period; and

switching means for electrically switching at least a portion of said liquid crystal material from said first configuration to said second configuration, Characterized In That

said switching means includes means for applying at least a first electric field to said liquid crystal material in said first configuration during a first time period and at least a second electric field during a second time period which is subsequent to said first time period, said first field exhibiting a first, nonzero amplitude and said second field exhibiting a second, nonzero amplitude greater than said first amplitude, said liquid crystal material exhibiting the identical sign for the dielectric anisotropy of identical sign, when subjected to said first and second fields, and said first field and first time period being chosen to produce a distortion of said first configuration of said portion and said second field and second time period being chosen to switch said portion from said distorted first configuration to said second configuration.

4,717,244

ACTIVE MATRIX ADDRESSED LIQUID CRYSTAL DISPLAY WHEREIN THE NUMBER OF OVERLAP REGIONS OF THE ADDRESS LINE IS REDUCED

Cyril Hilsum, Pinner, and René J. Van de Poel, London, both of England, assignors to The General Electric Company, p.l.c., England

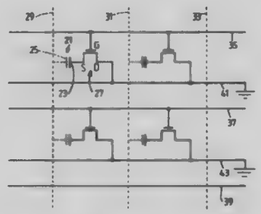
Filed Mar. 18, 1986, Ser. No. 840,669

Claims priority, application United Kingdom, Apr. 3, 1985, 8508656

Int. Cl.[4] G02F *1/13*; G09G *3/36*

U.S. Cl. 350—333 **7 Claims**

1. A liquid crystal display comprising: a two-dimensional array of pixels, each constituted by at least one liquid crystal cell, each cell having two electrodes, each carried on a surface of a respective one of two plates, each cell being connected to a pair of electrical address lines by a respective transistor means, each address line within a pair being connected to a different plurality of pixels within the array and being carried on a different one of the plates, each cell being switchable by



means of electrical signals applied to selected ones of said pairs of address lines within the pixel connected to said selected pair, the pulses applied to the selected lines being such that the polarity of the voltage applied across each cell periodically alters.

4,717,245

HIGH RELATIVE APERTURE GAUSS TYPE LENS

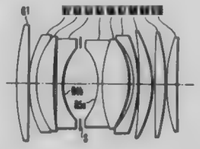
Sadatoshi Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1986, Ser. No. 938,445

Claims priority, application Japan, Dec. 12, 1985, 60-280060

Int. Cl.[4] G02B *9/00, 11/34*

U.S. Cl. 350—463 **10 Claims**



1. A photographic lens comprising, from front to rear, a first lens unit including at least one positive lens; a negative meniscus-shaped second lens convex toward the front, a positive third lens with its front surface of strong refractive power convex toward the front, a negative fourth lens with its rear surface of strong refractive power concave toward the rear, a negative fifth lens with its front surface of strong refractive power concave toward the front, a positive sixth lens with its rear surface of strong refractive power convex toward the rear, a negative meniscus-shaped seventh lens convex toward the rear, a positive meniscus-shaped eighth lens convex toward the rear, a positive ninth lens and a positive meniscus-shaped tenth lens convex toward the front.

4,717,246

MICROSCOPE WITH MOVABLE BINOCULAR TUBE

Erwin Fehr, Heerbrugg, and Andreas Schaefer, Balgach, both of Switzerland, assignors to Wild Heerbrugg AG, Heerbrugg, Switzerland

Filed Jun. 27, 1985, Ser. No. 749,275

Claims priority, application Switzerland, Jun. 29, 1984, 3157/84

Int. Cl.[4] G02B *21/20, 7/02*

U.S. Cl. 350—516 **9 Claims**

1. A microscope comprising:

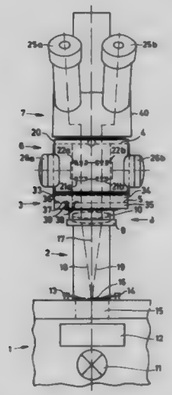
a binocular tube;

an optical support, said tube being fixed to said support;

oculars in said tube defining parallel first and second ocular optical axes;

a fixedly mounted microscope objective defining a fixed objective optical axis;

displacement means for moving said tube and said support relative to said objective and for maintaining the ocular and objective axes parallel during movement of the tube and support, said displacement means moving the tube and



support between a first position in which the ocular optical axes are essentially equally spaced from the objective ocular axis and a second position in which one of said ocular optical axes is essentially coaxially aligned with the objective optical axis; and

means for selectively preventing passage of light from the objective to the support and tube along the other ocular optical axis when said one optical axis is coaxially aligned with the objective optical axis.

4,717,247

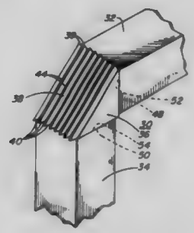
ARRANGEMENT FOR DIVERTING LIGHT

David A. Kahn, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 12, 1986, Ser. No. 906,708

Int. Cl.[4] G02B *6/00, 5/08, 5/04*

U.S. Cl. 350—617 **12 Claims**



1. An arrangement for diverting light from a first direction through a predetermined angle to a second direction, the arrangement comprising:

first and second optical conductors for alignment, respectively, with said first and second directions, each optical conductor comprising an elongate member of light transmissive material; and

a connecting member for optically connecting said first and second optical conductors together;

said connecting members having a face comprising at least one pair of adjacent facets extending in mutually intersecting planes, the line of their intersection extending parallel to the plane containing said first and second directions and inclined to said first and second directions such that light incident on one of said pair of adjacent facets in said first direction will be reflected at said one of said facets onto the other of said pair of adjacent facets and reflected at said other of said adjacent facets to depart from said other of said adjacent facets in said second direction.

4,717,248

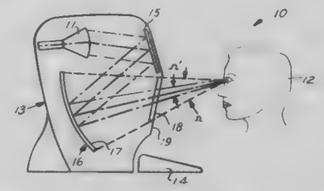
DISPLAY SYSTEM

Joseph LaRussa, 451 Rutledge Dr., Yorktown Hgts., N.Y. 10598

Filed Oct. 3, 1985, Ser. No. 783,654

Int. Cl.[4] G02B *7/18, 27/14*

U.S. Cl. 350—618 **4 Claims**



1. A display system, comprising, a computer housing, a cathode ray tube positioned in said housing, a plane mirror secured in said housing, focusing means secured in said housing, for cooperation with said plane mirror to project and magnify an image produced by said cathode ray tube, for causing said image to appear a distance of approximately three feet from an observer and having a magnification of approximately three and a half times, and a cover glass secured in said housing for said observer to view said image, approximately six and a quarter inches being provided between said plane mirror and said cathode ray tube and approximately twelve and a half inches being provided between said plane mirror and said focusing means, said focuing means being a spherical mirror and including approximately a thirty six inch radius of curvature and cooperating with said plane mirror and said cathode ray tube to place said image said distance of approximately three feet from an observer.

4,717,249

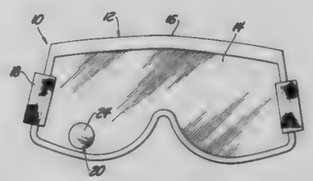
DIVING MASK WITH AUXILIARY LENS

Bernard D. Fischer, 394 South St., Rochester, Mich. 48063-4789

Filed Jun. 6, 1986, Ser. No. 871,317

Int. Cl.[4] G02B *5/04*; G02C *7/14*

U.S. Cl. 351—43 **11 Claims**



1. A diving mask assembly (10) comprising: a face-engaging support means (12), a diving mask window (14) supported by said support means for viewing through said mask, said assembly characterized by: a prism lens means (20) attached to said window at a position laterally removed from the nomral line of

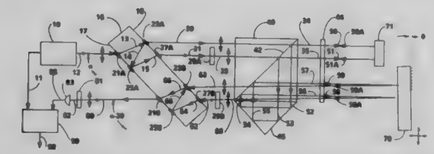
sight through the window and having a planar surface (22) and a spaced spherical surface (24) with a chord (26) of the spherical surface (24) disposed at an acute angle relative to said planar surface (22) for magnifying and bending the line of sight through the prism lens means (20) to allow viewing therethrough at an acute angle between the eye and the prism lens means (20).

4,717,250

ANGLE MEASURING INTERFEROMETER

Gary E. Sommargren, Madison, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Mar. 28, 1986, Ser. No. 845,926
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—349 94 Claims



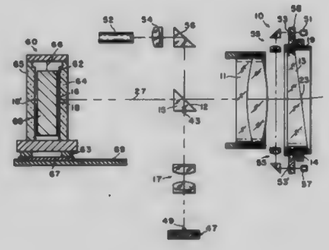
1. An angle measuring plane mirror interferometric system comprising: a pair of plane mirrors being angularly variable with respect to each other by a variable angle-between said pair of plane mirrors; source means for emitting an input beam comprising two stabilized orthogonally polarized optical frequencies having a frequency difference, said source means further comprising means for providing an electrical reference signal corresponding to said frequency difference between said two stabilized optical frequencies; means optically coupled to said input beam for converting said input beam into two separated parallel orthogonally polarized beams; means optically disposed in the path of one of said two separated parallel orthogonally polarized beams for converting said two separated parallel orthogonally polarized beams into two separated parallel beams having the same polarization and frequency difference; means optically coupled to said two separated parallel same polarized beams for causing each of said separated different frequency parallel same polarized beams to be reflected once by each one of said pair of angularly variable plane mirrors to produce two parallel output beams having the same polarization; means optically disposed in the path of one of said two separated same polarized parallel output beams for converting said two separated same polarized parallel output beams into two separated orthogonally polarized parallel output beams; means optically coupled to said two separated parallel orthogonally polarized output beams for converting said two separated parallel orthogonally polarized output beams into a single output beam having a pair of orthogonally polarized frequency components, with a phase difference therebetween being directly proportional to said variable angle between said pair of plane mirrors; means optically coupled to said single output beam for mixing said orthogonally polarized components thereof and producing an electrical measurement signal therefrom; and means operatively connected to said electrical measurement signal and said electrical reference signal for indicating a difference in phase between said electrical reference signal and said electrical measurement signal, variations in said indicated phase difference being proportional to angular changes in said variable angle between said pair of plane mirrors; whereby an optical configuration in which the angular measurements are extremely insensitive to three dimensional displacement of said plane mirrors is provided for said interferometric system.

4,717,251

ELEVATION MEASUREMENT IN HIGH ORDER SURVEYING

Leon W. Wells, Closter, N.J.; William E. Mimmack, El Paso, Tex., and Werner Hauschild, Whippany, N.J., assignors to Cubic Corporation, San Diego, Calif.

Filed Feb. 6, 1986, Ser. No. 826,732
Int. Cl.[4] G01C 3/08, 1/10; A47G 23/02; F16M 11/14
U.S. Cl. 356—4 7 Claims



1. Measuring apparatus comprising:
(a) an instrument including optical target viewing means comprising an objective lens;
(b) an optical wedge element situated on a first segment of the line of sight of said viewing means at a point between said objective lens and a target under observation, thereby to divert said line of sight a fixed degree from said first segment;
(c) means mounting said wedge for controlled incremental rotation about said line of sight segment, thereby to cause said diverted line of sight to be displaced a controlled distance along a circle segment at the perpendicular plane of said target;
(d) controllable drive means for rotating said wedge mounting means and effecting said incremental wedge rotation;
(e) angle-measuring means associated with said wedge mounting means for indicating the extent of said incremental rotation thereof;
(f) azimuth base means mounting said instrument in a substantially horizontal plane;
(g) controllable azimuth base drive means for incrementally rotating said instrument about an axis substantially perpendicular to said first line of sight segment;
(h) photoelectric image sensing means situated on the line of sight of said viewing means at a focal plane thereof for providing electrical data indicative of the relative position of a sensible photic target image with respect to a predetermined point on the photosensitive surface of said image sensing means;
(i) means responsive to said electrical data for controlling the respective wedge- and instrument-rotating drive means, thereby to cause movement of said target image toward said predetermined point; and
(j) distance measuring means for determining the distance between said instrument and said target.

4,717,252

METHOD AND APPARATUS FOR DETECTING DISTANCE AND FORMING IMAGE OF OBJECT IN TURBID MEDIUM USING LASER

Thorsteinn Halldorsson; John Langerholc, both of Munich; Sigmund Manhart, Haar, and Ernst-August Seiffarth, Taufkirchen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 744,113
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425098
Int. Cl.[4] G01C 3/08
U.S. Cl. 356—5 6 Claims

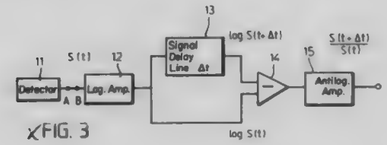


FIG. 3

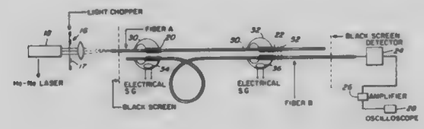
5. A method of detecting, measuring the distance to and producing an image of, objects which may be both light absorbing and light reflecting and which are hidden from sight by a medium which strongly dampens light due to light dispersion, while employing a pulsed laser as a radiation source, characterized by recording backscatter signal from the medium while it is scanned with a concentrated, pulsed laser beam in a manner such that an entire variation in time of the backscatter is used for detecting an object present in the medium, by making the detecting system responsive only to a signal which is representative of non-uniformity of the object, by splitting the received backscatter signal, causing one of the split signal parts to lag in time, and forming the quotient of the lagging and the non-lagging measured signals, with the amount of lagging being variable and adjustable to damping parameters of the medium and to the laser pulse duration.

4,717,253

OPTICAL STRAIN GAUGE

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 22, 1985, Ser. No. 800,676
Int. Cl.[4] G01B 11/16
U.S. Cl. 356—32 11 Claims



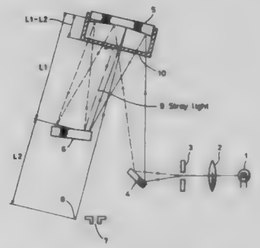
1. Apparatus for measuring strain in a structure at a plurality of locations substantially simultaneously comprising:
an input fiber and an output fiber spaced from one another at the plurality of locations for evanescent field coupling at these locations, the length of the input fiber being different from that of the output fiber between the locations to introduce time delays;
means for injecting light pulses into the input fiber and means for detecting light pulses in the output fiber to generate an output signal related to the separation of the input and output fibers at the plurality of locations of evanescent field coupling.

4,717,254

STRAY-LIGHT SUPPRESSOR FOR LITTROW SPECTROSCOPE

Toshizo Maeda, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,610
Claims priority, application Japan, Aug. 26, 1985, 60-129742[U]; Aug. 26, 1985, 60-129743[U]
Int. Cl.[4] G01J 3/22
U.S. Cl. 356—334 2 Claims



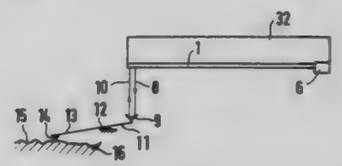
1. For use with a Littrow spectroscope including a concave mirror for reflecting light from a source, a diffraction grating for further reflecting the light reflected by the concave mirror, said diffraction grating being made rotatable to allow said concave mirror to re-reflect the light therefrom, and an exit on which the light re-reflected by the mirror is focused; a stray-light suppressor in the form of a strip disposed in front of, and horizontally in parallel with the longitudinal central axis of, said concve mirror, said suppressor being held in front of said concave mirror at a distance of (L1—L2) therefrom, where L1 is the distance between said concave mirror and said diffraction grating and L2 is the distance between said grating and said exit.

4,717,255

DEVICE FOR MEASURING SMALL DISTANCES

Gerd Ulbers, VS-Weilersbach, Fed. Rep. of Germany, assignor to Hommelwerke GmbH, Fed. Rep. of Germany

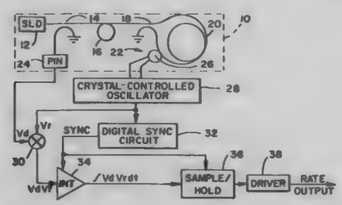
Filed Jul. 9, 1986, Ser. No. 883,553
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610154
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—345 17 Claims



1. A device for measuring small distances, said device including a sensing tip mounted to be movable in the direction of the distance to be measured, a transducer for converting the movements of said sensing tip into corresponding electric signals, and indicating means for indicating said electrical signals, characterized in that said transducer comprises:
a laser for emitting light;
an optical interferometer, said interferometer including first and second ends and a measuring waveguide, said first end interconnected to said laser;
optical means, interconnected to said second end of said measuring waveguide, for focusing said light; and
a measuring mirror, disposed at a distance from said optical means, for receiving said focused light and reflecting said

light back to said optical means, said mirror being interconnected to said sensing tip;
said interferometer further including a reference waveguide coupled to said measuring waveguide, at one end having disposed a mirror and at its other end having disposed a photoelectric transducer connected to said indicating means for indicating the electric output signal of the photoelectric transducer.

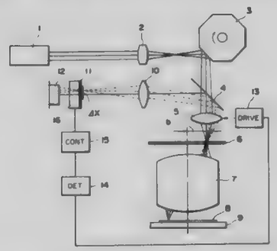
4,717,256
FIBER OPTIC RATE SENSOR
Donald Easley, Bodega Bay, and Hiroshi Satake, El Sobrante, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 21, 1986, Ser. No. 891,809
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 18 Claims



1. In a fiber optic rate sensor of the type employing a Sagnac ring circuit wherein an optical source launches an optical signal which is divided into two equal signals which are coupled in opposite directions through a multiturn fiber optic coil to provide two counter-propagating optical signals, the two counter-propagating optical signals being coupled to a photodetector after passing through the multiturn fiber coil, the signals detected at the photodetector having traversed identical optical paths between said source and said photodetector and having undergone a Sagnac phase shift directly related to the rate of rotation of the fiber coil about its axis in inertial space, and wherein the two counter-propagating signals are phase modulated by a phase modulation means at one end of the fiber optic coil and the output of the photodetector undergoes signal processing in a signal processing means to produce a rate output directly related to said rate of rotation of said fiber coil, the improvement being an improved phase modulation and signal processing means, which comprises:
(a) a crystal-controlled oscillator, said crystal-controlled oscillator providing a sine wave reference signal;
(b) means for coupling the crystal of said crystal-controlled oscillator to said optical fiber at one end of said coil to produce a non-reciprocal phase modulation of said counter-propagating optical signals;
(c) means for multiplying said sine wave reference signal and the output from the photodetector to produce a product output; and
(d) means for integrating said product output over a whole number of complete reference cycles to produce said rate output, the sine wave reference signal being coupled to said means for integrating to control the integration period of said means for integrating.

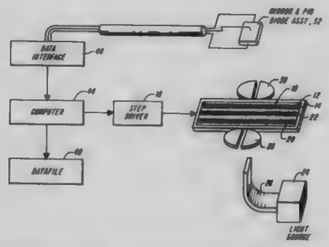
4,717,257
ALIGNMENT DEVICE
Minoru Kaneta, Tokyo, and Ichiro Ishiyama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1985, Ser. No. 763,710
Claims priority, application Japan, Aug. 13, 1984, 59-167780
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—400 5 Claims

1. An alignment device for aligning a first member with a second member with the aid of a projection optical system for projecting a pattern of the first member onto the second member, said device comprising:
an objective optical system for receiving a light beam from the second member that has passed through the projection optical system;
means for displacing said objective optical system;
filtering means having a filtering portion providing a predetermined filtering action relative to the light beam from the second member that has passed through the projection



optical system and has been introduced by said objective optical system to said filtering means; and
means for adjusting the position of said filtering portion of said filtering means in accordance with (i) an error of the projection optical system related to a position of incidence, upon said filtering means, of the light beam from said second member and (ii) a position of an optical axis of said objective optical system relative to an optical axis of the projection optical system.

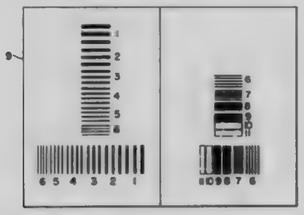
4,717,258
3-CHANNEL MICRODENSITOMETER FOR ANALYSIS OF PLATE SPECTRA
C. Sean Sutton, Northampton, Mass., assignor to Smith College, Northampton, Mass.
Filed Dec. 31, 1985, Ser. No. 815,148
Int. Cl.[4] G01J *3/40*
U.S. Cl. 356—444 14 Claims



1. A densitometer for automated multi-trace, simultaneous scanning of plural spectra tracks adjacent to each other on a substrate comprising:
means for illuminating the plural spectra tracks with radiation collimated to simultaneously illuminate predetermined portions of the tracks;
means for supporting said substrate for translational motion relative to said illuminating means in a direction parallel to the direction in which the plural spectra tracks extend on said substrate;
means for detecting radiation from the simultaneously illuminated portions of the plural tracks;
means for automatically translating said substrate over a predetermined distance relative to said illuminating means in the direction in which the tracks extend;

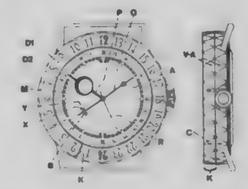
means for providing an output indication in the form of plural electrical signals each corresponding to the density of an associated track at the simultaneously illuminated portions along the direction of translation; and
means for coordinating said translating means and said output providing means to provide a predetermined association between the plural electrical signals and illuminated portions of said substrate whereby the electrical signals for the same position on adjacent tracks are associated with each other.

4,717,259
LUSTER RATING METHOD AND APPARATUS
Shigeru Suga, 4-14 Shinjuku 5-chome, Shinjuku-ku, Tokyo, Japan
Filed Mar. 21, 1985, Ser. No. 714,492
Claims priority, application Japan, May 2, 1983, 58-76194
Int. Cl.[4] G01N *21/47*
U.S. Cl. 356—446 4 Claims



1. A method of determining the luster of a surface as a numerical value, comprising:
projecting light from a light source through a light diffusing means and through a layer of semi-transparent material having thereon sets of spaced parallel opaque lines for projecting the lines of the sets onto the surface of a sample, the luster of which is to be determined, the thicknesses of the lines in the successive sets being reduced and the successive sets having an assigned numerical value;
viewing with the eyes the sets of lines this projected onto the surface of the sample and determining in which of the sets the lines first appear to have a wavy edge along the spaces between the lines in the set as compared to the lines which appear to have straight edges in the adjacent set having larger lines, and then choosing the numerical value assigned to sid adjacent set as the value of the degree of gloss of the surface, and then determining in which of the sets the lines first appear to run together as compared to the lines which appear to be separate in the adjacent set having larger lines, and then choosing the numerical value assigned to said lastmentioned adjacent set as the value of the degree of clarity of the surface;
visually comparing the surface with a scale of predetermined lightness values having preassigned numerical values for determining the closest lightness value, and obtaining a lightness coefficient from said lightness value; and
multiplying the sum of said gloss value and said clarity value by said lightness coefficient for obtaining a numerical value for the luster of the surface of the sample.

4,717,260
TIME DIFFERENTIAL CORRECTING ANALOG TIMEPIECE OF TWENTY-FOUR HOUR SYSTEM
Shigeru Tsuji, 9-1-205, Sanno 2-chome, Ota-ku, Tokyo, 143, Japan
PCT No. PCT/JP86/00026, § 371 Date Nov. 4, 1986, § 102(e) Date Nov. 4, 1986, PCT Pub. No. WO86/05287, PCT Pub. Date Sep. 12, 1986
PCT Filed Jan. 24, 1986, Ser. No. 935,468
Claims priority, application Japan, Mar. 4, 1985, 60-41329
Int. Cl.[4] G04B *19/22*
U.S. Cl. 368—21 3 Claims

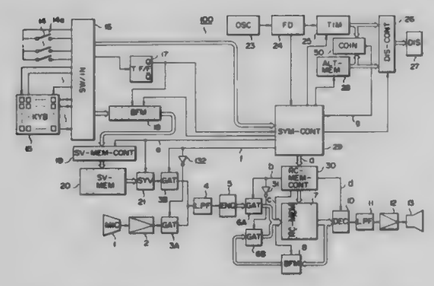


1. An analog 24-hour timepiece capable of adjustment to simultaneously indicate the time in two different time zones comprising: a body, a first dial secured to said body and including 24 equally spaced reference characters representing 24 hours in a first time zone, a ring mounted for rotation relative to said body and said first dial, a second dial on said ring and including 24 equally spaced reference characters representing 24 hours, said second dial being rotatable with said ring relative to said first dial to position a reference character representing an hour in a second time zone on said second dial relative to a reference character on said first dial, a display of a code correlating a plurality of said reference characters on said first dial and said second dial with time zones, visual alignment means comprising a changeable pattern including first indicia of alignment on said body and second indicia of alignment on said ring, said first and second indicia of alignment establishing a first visual pattern when each of the reference characters on said second dial are radially opposite a reference character on said first dial and establishing a second visual pattern when the reference characters on said second dial are arcuately displaced from the reference characters on said first dial a predetermined arcuate distance less than the arcuate distance between adjacent reference characters on said first dial; an hour hand rotatable about said first dial and said second dial once every 24 hours; a minute and second dial; a minute hand and a second hand.

4,717,261
RECORDING/REPRODUCING APPARATUS INCLUDING SYNTHESIZED VOICE CONVERTER
Kazunori Kita; Hideyuki Shoji, and Toshiharu Aihara, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jan. 8, 1986, Ser. No. 817,054
Claims priority, application Japan, Jan. 16, 1985, 60-2818[U]; Jan. 16, 1985, 60-4041
Int. Cl.[4] G04B *21/08*; G11C *27/00*
U.S. Cl. 368—63 23 Claims

1. A recording/reproducing apparatus, comprising:
key input means operative for inputting digital input data;
speech synthesizing circuit means arranged to be coupled to said key input means for producing speech-synthesized data from the digital input data;
acoustic converter means for converting incoming speech sounds to a speech signal;
selecting means coupled to said speech synthesizing circuit means and said acoustic converter means for selecting one of said speech signal and said speech synthesized data;
encoding means coupled to said selecting means for encod-

ing the one of said speech signal and said speech synthesized data which is selected by said selecting means, and producing corresponding encoded data;
encoded data storing means including a memory for storing said encoded data at a number of address regions;
addressing means coupled to said encoded data storing means for addressing the regions of said storing means;
readout control means associated with said addressing means



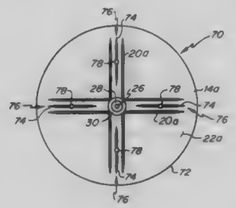
for reading the speech encoded data out from said encoded data storing means by controlling the addressing operation of said addressing means;
decoding means coupled to said storing means for decoding the speech encoded data when read out by the readout control means, into a decoded speech signal; and
speech generating means coupled to said decoding means for generated the decoded speech signal in the form of audible speech.

4,717,262
FLAT BOTTOM PLASTIC BAG AND METHOD OF MAKING SAME
Ralph M. Roen, and Terry D. Gebhardt, both of Longview, Tex., assignors to T.C. Manufacturing Company, Inc., Evanston, Ill.
Filed Jan. 9, 1987, Ser. No. 1,856
Int. Cl.[4] B65D *30/20, 30/16*
U.S. Cl. 383—120 **4 Claims**



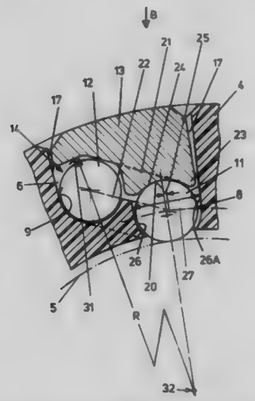
1. A flat bottom bag of integral one piece construction formed from heat sealable tubular plastic material, said bag comprising:
a pair of single ply side panels that are integrally joined together along and across the bag bottom by a continuous gusset having a central fold line that is, in the flattened relation of the bag wherein said bag side panels are in closely spaced relation, centrally disposed between the lower portions of said bag side panels within the bag bottom,
said gusset and said side panels being of sustantially the same dimension across the length of said bag,
said gusset between the respective bottom edgings of said bag side panels and said central fold defining a pair of in-fold panels, one of which opposes the lower portion of one of said bag side panels of said bag to form a pair of adjacent bag plies in said flattened relation of said bag, and the other of which opposes the lower portion of the other of said bag side panels to form a second pair of bag plies in said flattened relation of said bag,
with said bag side panels being integrally joined together along the ends of the bag by rectilinear heat seal seams that extend generally normally of said gusset,
with said first pair of bag plies being joined together free of adherence to said second pair of bag plies along heat seals that extend diagonally from adjacent said bag ends to adjacent the bottom edging of said bag one side panel,
and with said second pair of bag plies being joined together free of adherence to said first pair of bag plies along heat seals that extend diagonally from adjacent said bag ends to adjacent the bottom edging of said bag other side panel,
said bag ends extending substantially through said gusset adjacent the bag bottom,
with said gusset being imperforate between said bag ends,
said bag side panels being formed to define congruent upper end portion that include convexly contoured parabolically shaped top edges that are centered relative to the length dimension of said bag and that are formed to define congruently located apertures for forming hand holds for the bag,
with said bag top edges being free of each other for forming the open end of said bag,
and said bag ends terminating at said top edges at either end of the bag, equidistantly from said gusset fold line,
said bag side panel convexly contoured top edges defining bag top portions with said apertures centered therein in substantial coaxial relation thereto, and the distance heightwise of the bag between the level of said bag end terminations and said apertures significantly exceeding the distance heightwise of the bag between said apertures and top edges of the bag at said bag top portions.

4,717,263
GAS BEAKING
Edward H. Phillips, Middletown, Calif., assignor to Compact Spindle Bearing Corporation, Middletown, Calif.
Continuation of Ser. No. 759,185, Jul. 26, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 938,859
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—12 **14 Claims**



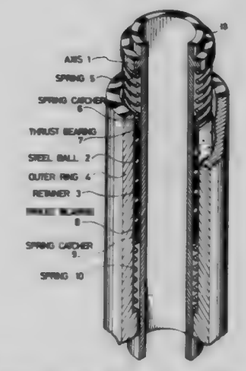
1. A statically pressurized gas bearing comprising:
a first bearing part having a bearing surface;
a second bearing part having a conforming bearing surface;
a gas inlet and an input flow restrictor formed in the second bearing part;
a cross bearing pocket comprising slots formed in the conforming bearing surface of the second bearing part and disposed in communication with the input flow restrictor;
at least one portion of the cross bearing pocket having a double slot configuration; and
at least one supplemental exhaust slot formed within a portion of the cross bearing pocket having the double slot configuration.

4,717,264
BALL BEARING FOR LENGTHWISE MOVEMENT
Lothar Walter, Schweinfurt; Uwe Mayer, Münnerstadt; Otmar Winkler, Schweinfurt, and Herbert Dobhan, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to SKF Linearsysteme GmbH, Schweinfurt, Fed. Rep. of Germany
Filed Apr. 2, 1986, Ser. No. 847,287
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3512013
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—43 **10 Claims**



1. In a ball bearing for lengthwise movement between a shaft and a housing, said ball bearing comprising a cage sleeve which encircles said shaft and which is provided with a plurality of first linear raceways and a plurality of second linear raceways for guiding loaded and unloaded balls respectively in a plurality of respective endless row of balls, and a plurality of pairs of semicircular reversing raceways connecting said first and second linear raceways, said linear and reversing raceways forming respective paths of travel for circulating balls of said rows, and further comprising a plurality of load-transmitting raceway rails arranged in a corresponding plurality of radial openings in said cage sleeve, each of said raceway rails having a central surface on its radially inwardly directed side with a longitudinal raceway groove for guiding said loaded balls of a corresponding row and having a pair of end surfaces at opposing ends of said central surface which radially outwardly cover said corresponding reversing raceways in which said row of balls travel, the improvement wherein each of said longitudinal raceway grooves opposes a corresponding one of said first linear raceways and is formed by an outer shoulder and an inner shoulder, said outer shoulder extending longitudinally across said radially inwardly directed side of said corresponding raceway rail from a point on one of said end surfaces to a point on the other of said end surfaces, and said inner shoulder extending longitudinally between said end surfaces, said outer shoulder being arranged further away then said inner shoulder from a corresponding one of said second linear raceways, and wherein each of said end surfaces has a substantially planar surface portion which is substantially tangent to a hypothetical extension of said corresponding longitudinal raceway groove such that said planar surface portion of each of said end surfaces is connected to a corresponding end of said corresponding longitudinal raceway groove without a step, for enabling smooth rolling of a circulating ball during transitions between said corresponding first linear raceway and said corresponding reversing raceways.

4,717,265
SUPPORTING MECHANISM OF A LINEARLY MOVABLE BEARING
Toshimi Shioda; Minoru Noda; Masahide Nagai; Masatoshi Higake; Yutaka Makishima, and Kazutoshi Yokose, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed May 6, 1986, Ser. No. 860,124
Claims priority, application Japan, May 7, 1985, 60-96511
Int. Cl.[4] F16C *29/04*
U.S. Cl. 384—49 **7 Claims**



1. A supporting mechanism for supporting an industrial robot arm and the like comprising: a stationary upstanding tubular outer member; a displaceable inner member supported within the outer member to undergo axial displacement in upward and downward directions and angular displacement in clockwise and counterclockwise directions; bearing means interposed between the inner and outer members for supporting the inner member to undergo axial and angular displacement, the bearing means comprising a retainer member rollably retaining thereon a plurality of rollable elements, the retainer member being interposed between the inner and outer members with the rollable elements in rolling contact with opposed surfaces of the inner and outer members thereby supporting the inner member to undergo axial and angular displacement; and elastic balancing and restoring means for applying elastic biasing forces in opposite axial directions to the upper and lower ends of the retainer member, the oppositely directed elastic biasing forces having a predetermined force difference therebetween effective to counterbalance the combined weight of the retainer member and rollable elements so that up and down displacement of the inner member normally effects proportionate up and down displacement of the retainer member, the elastic balancing and restoring means being operative in the event the retainer member fails to maintain proportionate displacement with the inner member to temporarily increase the magnitude of the force difference between the oppositely directed elastic biasing forces in a direction effective to restore the proportionate displacement.

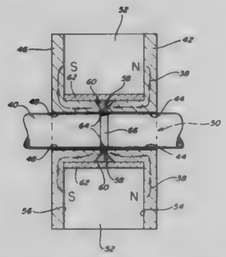
4,717,266
LOW FRICTION FERROFLUID BEARING ARRANGEMENT
Edward E. Hart, Jr., Springfield, and Joseph G. Pattea, Troy, both of Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Jun. 12, 1986, Ser. No. 873,409
Int. Cl.[4] F16C *32/04*; F16J *15/40*
U.S. Cl. 384—100 **14 Claims**

1. A low friction bearing arrangement, comprising:
first pole means of magnetically permeable material defining a first pole surface and a first side surface,

second pole means of magnetically permeable material defining a second pole surface and a second side surface, said second pole surface facing said first pole surface and second side surface being aligned with said first side surface,

nonmagnetic spacer means extending between and contacting said first and second pole surfaces,

a quantity of ferrofluid positioned intermediate said first and second pole surfaces and adjacent said first and second side surfaces,



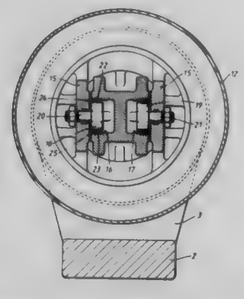
means for supplying magnetic flux to a flux path including said first and second pole means, whereby magnetic flux extends between said first and second pole means and fringes outwardly therefrom beyond said first and second side surfaces so as to hold said ferrofluid between said first and second side surfaces at a level which extends beyond said side surfaces, and

a rotatable shaft of nonmagnetic material, supported on said quantity of ferrofluid and held out of contact with said side surfaces thereby, such that said shaft is freely rotatable.

4,717,267
ARRANGEMENT IN AN ADJUSTABLE ROLLER BEARING FOR LATERAL GUIDANCE OF RUNNING WEBS

Sven Barthel, Nesbru, Norway, assignor to Thune-Eureka A/S, Traaby, Norway

Filed Jun. 16, 1986, Ser. No. 875,238
Claims priority, application Norway, Jun. 21, 1985, 852521
Int. Cl.⁴ F16C *23/00, 25/08*
U.S. Cl. 384—247 **4 Claims**

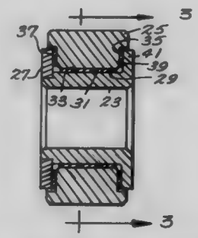


1. In an adjustable roller bearing for lateral guidance of travelling webs, said roller bearing comprising a base having a pair of diametrically disposed guide members extending toward one another, a bearing casing slidably mounted in said base between said guide members by means of a pair of projections each received by a respective said guide member, each said projection being guided in its respective said guide member by a pair of coaxial rollers received in a pair of parallel guide grooves, each said guide groove having a pair of parallel faces straddling its respective said roller, and a hydraulic or pneumatic bellows encasing each said guide member and its corresponding said projection; the improvement in which each of said pair of faces of each said groove has a concave, semicylindrical shape generated about an axis perpendicular to and intersecting the axis of its respective said roller, each said face being provided with a lining having a matching convex semicylindrical surface contacting said face and a planar surface adapted to contact the corresponding said roller.

4,717,268
BEARING CONSTRUCTION

Stanley S. Orkin, Vernon, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Continuation of Ser. No. 253,634, Apr. 20, 1981, abandoned.
This application Jan. 3, 1984, Ser. No. 567,612
Int. Cl.⁴ F16C *33/20*
U.S. Cl. 384—280 **5 Claims**

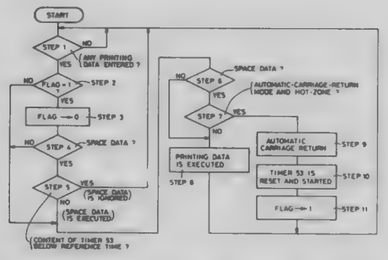


1. A track-roller bearing assembly comprising a fixed inner race member having an outwardly facing peripheral bearing surface; an annular body of self-lubricating bearing material affixed to the outwardly facing bearing surface of said inner race; and a coaxial outer race rotatable about said inner race, said outer race including a metal bearing portion having an annular surface in sliding engagement with said bearing material.

4,717,269
ELECTRONIC TYPEWRITER

Hideo Ueno, and Hiroshi Hattori, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 4, 1985, Ser. No. 784,233
Claims priority, application Japan, Oct. 12, 1984, 59-214884
Int. Cl.⁴ B41J *19/60*
U.S. Cl. 400—51 **8 Claims**



1. An electronic typewriter having a carriage which is automatically returned upon entering of space data through one operation of a space key on a keyboard, which space data is to be executed within an automatic-carriage-return zone which consists of a desired number of columns just before a right-hand margin of a line of printing, comprising:

check means for checking whether printing data entered through said keyboard immediately after space data which causes an automatic carriage return, is another space data or not;

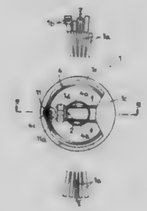
a time which is started upon entering of said carriage-return space data; and

control means for comparing data of a time which is given by said timer when said another space data is entered, with data of a predetermined reference time, and thereby executing said another space data so as to make a space at the first column in a new line of printing if the data of said time of said timer which is given by said timer is found to be beyond the data of said reference time, said control means neglecting said another space data if the data of said time of said timer is not beyond said reference time.

4,717,271
CHARACTER-CARRYING DISC FOR A PRINTING MACHINE

Eric Bauer, Neuchatel, and Blaise Moulin, Corcelles, both of Switzerland, assignors to Caracteres S.A., Switzerland

Filed Apr. 9, 1987, Ser. No. 36,113
Claims priority, application Switzerland, Apr. 16, 1986, 1530/86
Int. Cl.⁴ B41J *1/30*
U.S. Cl. 400—175 **4 Claims**

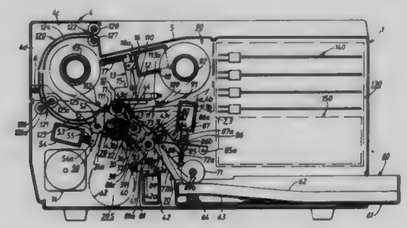


1. A character-carrying disc mountable on a printing machine having a driving member, said driving member having a hole therein and a shaft upon which said driving member is mounted, said shaft having at least one recess therein, said disc, comprising a disc body, a movable member mounted on said body and movable between a working position in which said movable member is engaged with said hole in said driving member, and a retracted position in which said movable member is withdrawn from said hole, a spring acting on said movable member for urging it into said working position, said spring having parallel leg portions spaced apart a distance less than the diameter of said shaft adapted to co-operate with said recess in said shaft so as to maintain the disc in place on said printing machine, said spring functioning both to secure the disc on said shaft which carries it and as an elastic return device to return said movable member of the disc to said working position.

4,717,270
PAPER CIRCULATING ASSEMBLY FOR FIELD SEQUENTIAL MULTI-COLOR PRINTING APPARATUS

Teruo Tsutsumi, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 15, 1986, Ser. No. 885,834
Claims priority, application Japan, Feb. 28, 1986, 61-43301; Mar. 27, 1986, 61-69036; Mar. 27, 1986, 61-69037
Int. Cl.⁴ B41J *3/02;* **B65H** *5/16*
U.S. Cl. 400—120 **12 Claims**



1. In a field sequential printing apparatus for printing multiple-color images onto a printing medium using a ribbon having a plurality of color ink segments, the apparatus including a printing paper path leading to a printing head and printing platen, and a paper circulating assembly to convey the printing medium back to the printing head and printing platen after the printing of an initial ink color for the printing of at least one subsequent ink color, the method of conveying the printing medium back to the printing head and printing platen comprising the steps of:

conveying the leading edge of the printing medium, a first predetermined time period after the leading edge emerges from the printing head and printing platen, to a recirculation paper path which flows into the printing paper path;

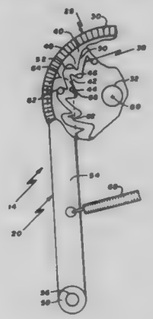
delaying further conveyance of the leading edge of the printing medium for a second predetermined time period; and

conveying the leading edge of the printing medium to the printing paper path for the printing of a subsequent ink color.

4,717,272
RIBBON FEED MECHANISM

Stephen M. Pawlak, Homer, N.Y., assignor to Smith Corona Corporation, Cortand, N.Y.

Continuation of Ser. No. 769,217, Aug. 26, 1985, abandoned.
This application Jan. 27, 1987, Ser. No. 7,142
Int. Cl.⁴ B41J *33/39*
U.S. Cl. 400—232 **3 Claims**



1. A ribbon feed mechanism for printing machines having a ribbon mounted thereon comprising:

a motor mounted in the printing machine operable in a ribbon feed direction and in a reverse direction;

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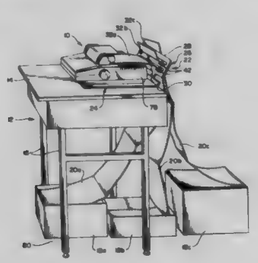
a drive member having
a gear directly coupled to the motor for movement thereby in the ribbon feed direction and in the reverse direction,
a shaft for feeding the ribbon in response to activation of the motor, and
a cam profile integrally formed thereon having an abutment and a rest position for each feed increment;
an arm pivotable about pivot post;
a cam follower mounted on the arm for movement in an arc centered about the pivot post of the arm between the rest position and a position for contacting the abutment to simultaneously stop movement of the drive member and the motor for limiting the amount of ribbon feed to predetermined feed increments; and
the abutment of the drive member having a locking angle for interfering with the arc movement of the cam follower to prevent the cam follower from returning to a rest position until the drive member has been rotated in the reverse direction by the motor.

4,717,273

MULTIPLE PAPER HOLDER AND METHOD FOR A COMPUTER PRINTER

Keith C. Elderfield, 3300 Waittier Avenue, Victoria, B.C., Canada V8Z 3C9

Filed Nov. 7, 1986, Ser. No. 928,320
Int. Cl.[4] B41J *11/26*
U.S. Cl. 400—613.2 **18 Claims**



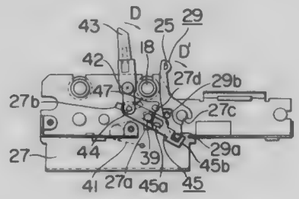
17. A method of selectively feeding paper having spaced apertures along a lengthwise axis thereof from a plurality of paper sources to a printer having a manually accessible infeed location, said method comprising:
(a) providing a paper feeding apparatus comprising:
(i) a paper locating section,
(ii) a base section to which said paper locating section is mounted in a manner to position said paper locating section at the infeed location,
(iii) said paper locating section defining a plurality of slot means spaced from one another, with each slot means positioned and arranged at respective slot locations to receive a free end portion of a respective paper source and to position said free end portion to be manually accessible at said infeed location to be fed into said printer for travel in an infeed direction, and
(iv) a plurality of paper retaining members, each positioned at a related slot location and having a retaining element having a first retaining position to engage at least one of said edge apertures of said paper in a manner to prevent travel of said paper in a direction opposite to said infeed direction, each retaining element being mounted in its paper retaining member to be moveable to a nonretaining position so as to permit free movement of the paper from its related source in an infeed direction into the printer,
(b) locating said apparatus with the paper locating section adjacent to the infeed location of the printer,
(c) providing a plurality of paper sources and inserting the free ends of these paper sources in respective slot means of the apparatus,
(d) operating at least some of said paper retaining members to engage edge apertures of the free ends of each paper source to retain the free ends in the slot means,
(e) pulling a selected free end of one of said paper sources in an infeed direction and causing release of the related retaining member for that free end of the selected paper source,
(f) upon completion of a printing operation, separating a remaining portion of said selected paper source from paper which has been printed, so as to form a new free end of the selected paper source, and moving said new free end rearwardly into engagement with its related retaining member.

4,717,274

PRINTER

Tetsuo Kimura, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 766,675, Aug. 16, 1985, abandoned, which is a continuation of Ser. No. 558,601, Dec. 6, 1983, abandoned. This application May 5, 1987, Ser. No. 47,547
Claims priority, application Japan, Dec. 9, 1982, 57-216330
Int. Cl.[4] B41J *11/30, 13/036*
U.S. Cl. 400—616.2 **4 Claims**



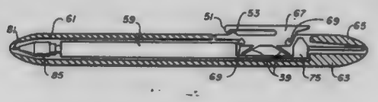
1. A printer comprising:
a sheet advancing roller having wound around it a first printing sheet with perforations or a second printing sheet without perforations and adapted, upon rotation, for advancing the printing sheet of either type;
advancing means, provided with a plurality of pins around the periphery thereof, for advancing the first printing sheet to said sheet advancing roller upon rotation when the perforations of the first printing sheet are fitted on the pins, said advancing means effecting sheet advancing upon rotation of said sheet advancing roller;
holding means for holding said printing sheet to said advancing means so as to maintain the perforations of the first printing sheet on the pins of said advancing means;
means for manually rotating said sheet advancing roller;
first and second movable pressure rollers which can be maintained in contact with or separated from said sheet advancing roller, said first movable pressure roller being located nearer said advancing means than said second movable pressure roller; and
operating lever means comprising a movable lever and a link attached to said lever for contacting or separating said first and second movable pressure rollers with or from said sheet advancing roller, said link having first and second opposite ends, the first end of said link being pivotally connected to said lever, the second end of said link being formed with a hook, said first movable pressure roller having an axle which engages a slot in a central portion of said link, said movable lever having a first position wherein said first and second movable pressure rollers are in contact with said sheet advancing roller, a second position wherein said first movable pressure roller is in contact with said sheet advancing roller and said second movable pressure roller is separated from said sheet advancing roller by said link and said second movable pressure roller is in contact with said sheet advancing roller, in said second position the hook of said link engaging a projection on an arm mounting said second movable pressure roller so as to cause said arm to pivot, thus releasing the second movable pressure roller from said sheet advancing roller, in said third position said link causing the axle of the first movable pressure roller translate, thus causing the first movable pressure roller to be released from said sheet advancing roller, also in the third position said hook becoming disengaged from the projection of the arm allowing the second movable pressure roller to remain engaged with the sheet advancing roller, said movable lever being maintained in a positive detent location in said first position, said second position and said third position.

4,717,275

WRITING INSTRUMENT WITH A RETRACTABLE CLIP

Dietmar Burkhardt, Jr., 109 Quarry La., Santa Cruz, Calif. 95060

Filed Jun. 20, 1986, Ser. No. 876,917
Int. Cl.[4] B43K *21/06, 24/04, 24/12, 27/00*
U.S. Cl. 401—104 **15 Claims**



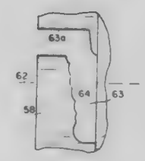
1. A writing instrument comprsing,
at least one writing member,
a tubular casing housing said writing member, said casing having a casing axis and an axially-extending lateral slot and having a front end and a back end, said front end having an opening,
a slidable pocket clip having a cantilevered arm retractably extending from said lateral slot parallel to said casing axis, said writing member being in contact with said pocket clip, said pocket clip having a plurality of guide tabs , said cantilevered arm extending from a first side of said pocket clip and said guide tabs extending from at least one side of said pocket clip perpendicular to said first side,
structure having recesses defining recessed guide channels associated with said casing, said guide channels disposed to slidably accept said guide tabs whereby motion of said pocket clip moves said writing member in an axial direction, said guide channels having a configuration to secure said socket clip in at least two positions including a first write position wherein said cantilevered arm is retracted into said lateral slot and a first writing member extends from said opening of said front end, and
a biasing means for urging said pocket clip in a direction substantially perpendicular to said casing axis to releasably lock said pocket clip in said positions.

4,717,276

END CAP STRUCTURE FOR ATTACHING PAINT SLEEVE TO ROLLER

Lawrence B. O'Brien; Walter E. Winston, both of Carmel; Edmund L. Abner, Indianapolis; William L. Buehler, Indianapolis, and Walter A. Mesnick, Indianapolis, all of Ind., assignors to Triune Automated Painting Systems, Indianapolis, Ind.

Continuation of Ser. No. 565,811, Dec. 27, 1983, abandoned, which is a division of Ser. No. 218,354, Dec. 22, 1980, Pat. No. 4,424,011. This application Sep. 24, 1985, Ser. No. 779,518
Int. Cl.[4] B05C *17/02, 1/10*
U.S. Cl. 401—197 **18 Claims**



1. A painting roller apparatus comprising:
roller body means having an axis and rotatably mountable on an axle for rotation on said axis;
a flexible cover snugly received on and supported by said body means;
cover retainer means on at least one end of said body means and operable upon turning said retainer means relative to said body means about said axis for clamping said cover against said body means on said one end; and
cooperating detent means on said retainer means and said body means and having successive detents to provide successive detenting action upon said turning to impede unintentional turning of said retainer means relative to said body means, said retainer means being readily lockable to and releasable from said body means when desired for, respectively, clamping and unclamping said cover.

4,717,277

WRITING POINT AND METHOD FOR THE PRODUCTION THEREOF

Rudi Hutt, Jaegerstrasse, D-7065 Winterbach bei Stuttgart, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,888
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601676
Int. Cl.[4] B43K *710;* **B23P** *11/00*
U.S. Cl. 401—216 **6 Claims**



1. In a writing point having a ball for liquid ink, comprising a tube of small diameter which is provided with a recess for abutment with the ball, an ink conductor being provided in the tube and substantially filling the interior of said tube, the ball being held between the recess, which forms a ball supporting surface, and an inwardly bent edge at the free end of the tube,

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the improvement wherein said recess is annular, said tube has a substantially constant diameter exept at said recess and front end, ink channels are provided in the front portion of the tube and extend parallel to one another with a spacing therebetween in the internal wall of said tube, the length of said channels being so dimensioned that they partially surround the ink conductor, extending through the area of said recess whereby they have the same profile as said recess in cross section.

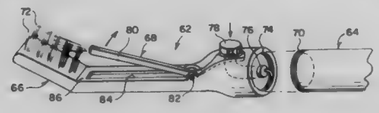
5. A method of producing a writing point having a ball for liquid ink by utilising a tube having a small internal diameter, comprising providing axially extending ink channels in the internal wall of the tube having an internal diameter which substantially corresponds to the ball diameter, with said ink channels extending throughout a given length thereof from the free end of the tube and being spaced fom one another; making a circumferential, annular recess in a portion of the tube spaced from the free end of said tube to form a seat for the ball, said annular recess being within said given length whereby said channels in the region of said recess have the profile in cross section of said recess; then inserting the ball into the free end until it abuts against the recess; inwardly flanging the free edge of the tube for retaining the ball and inserting a substantially cylindrical ink conductor into the remote end of the tube up to said given length.

4,717,278

CONTAINER TOOTHBRUSH

George Kemeny, 2750 W. 33rd St., Apt. 2344, Brooklyn, N.Y. 11224

Filed Jan. 21, 1983, Ser. No. 460,031
Int. Cl.[4] A46B *11/04*
U.S. Cl. 401—286 1 Claim



1. A container toothbrush that uses liquid toothpaste which comprises:
   (a) replaceable container for holding the liquid toothpaste having an open threaded end portion;
   (b) a toothbrush having a plurality of projecting bristles, a threaded counter bore that is removably attached to the threaded end portion of the replaceable container and a built-in pump mechanism that will enter the open threaded end portion of the replaceable container; and
   (c) a dispensing member having a push button on one side and a hollow arm on the other side and pivotally mounted with a recess running along top of the toothbrush so that when the push button is depressed it will activate the built-in pump and simultaneously pivot the hollow arm at the proper angle for dispensing the liquid toothpaste from the container onto the bristles of the toothbrush via the dispensing member.

4,717,279

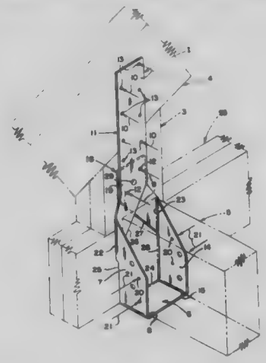
BUCKET HANGER

Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Apr. 21, 1987, Ser. No. 40,945
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] F16B *5/06*
U.S. Cl. 403—187 5 Claims

1. A sheet metal hanger constructed from a single member and formed by bending along subtantially straight bend lines for attachment to a vertical portion of a supporting wood member and for supporting a wood carried member, said hanger comprising:

a. a continuous non-overlapped single seat member adapted for supporting said carried wood member;
b. a first side member integrally connected to a first portion of said seat member and forming a generally right angle therewith;
c. a plurality of attachment members adapted for connection to said supporting wood member;
d. a first back member having a length substantially greater than the length of said seat integrally connected to said first side member and forming a generally right angle therewith and formed with spaced openings adapted for receipt therethrough of at least one of said plurality of attachment members;
e. a second side member integrally connected at a right angle to a second portion of said seat member and side members being disposed on opposite sides of said seat to form an



opening and said second side member is generally parallel to said first side member;
f. a second back member integrally connected to said second side member and forming a generally right angle therewith, and said second back member is substantially parallel and closely adjacent to said first back member, and is formed with at least one opening adapted for receiving at least one of said plurality of attachment members, and at least a portion of said second back member overlaps a portion of said first back member wherein said opening in said overlapping portion of said second back member is in alignment with at least one of said openings in said first back member; and
g. at least one of said plurality of attachment members holds said first and second back members together and transfers said design load in shear substantially evenly to said first and second overlapped back members.

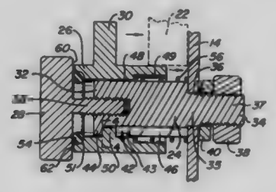
4,717,280

RETAINING AND LOCKING CLAMP AND METHOD

George E. Baker, Healdsburg, and Robert F. Schaefer, Sebastopol, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1986, Ser. No. 841,912
Int. Cl.[4] F16B *2/22*
U.S. Cl. 403—338 24 Claims

1. A retaining and locking clamp, mounted onto a first apparatus, for retaining and locking a second appparatus to said first apparatus, said first apparatus has a plate which in turn includes an aperture, comprising:
   an inner rod having a first end portion and a second end portion, said second end portion being adapted to be received within the aperture of said first apparatus plate so as to mount said inner rod to said first apparatus;
   an outer sleeve that is rotatbly mounted onto said inner rod, said outer sleeve has a retaining and locking flange and a surface;
   said inner rod and said outer sleeve including cooperating means for providing limited rotational and translational relative movements between said inner rod and said outer sleeve; and



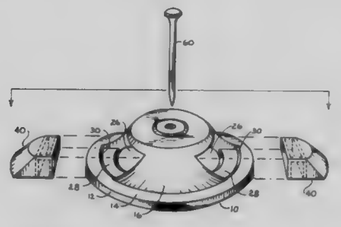
   a turn knob that is rotatably mounted onto said inner rod, said turn knob has a surface that is adapted to frictionally engage said outer sleeve surface, whereby
   rotating said turn knob causes said turn knob surface to frictionally engage said outer sleeve surface so as to permit said outer sleeve flange to retain said second apparatus.

4,717,281

ROAD MARKER SYSTEM AND METHOD OF INSTALLATION

Kathleen P. Shepherd, and Tobin Djerf, both of 401 E. Madison, Port Isabel, Tex. 78578

Filed Oct. 10, 1986, Ser. No. 917,433
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—16 25 Claims



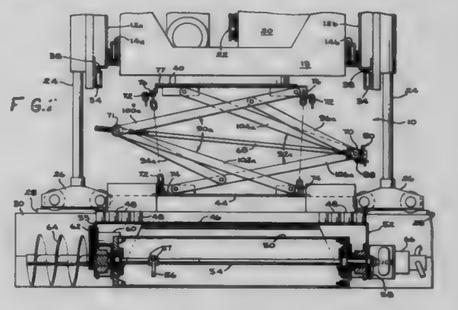
1. A road marker comprising:
   a stiff resilient unitary body having
   a central vertical axis;
   a planar peripheral portion;
   a central frusto-conical portion mutually concentric with said planar peripheral portion about said central vertical axis of said body;
   one or more open cavities extending into the interior of said body from the base thereof;
   one or more apertures extending from the outer surface of said central frusto-conical portion into the interior thereof, having one or more longitudinal axes perpendicular to said central vertical axis of said body, and being in interconnection with one or more of said open cavities;
   one or more elements to be received in said one or more apertures, each having
   a shell-like body with at least one top wall, one rear wall, two side walls and one front wall; and
   one or more open chambers extending into said shell-like body from the base thereof.

4,717,282

ROLLER CARRIAGE ASSEMBLY FOR USE WITH A ROAD SURFACE FINISHING MACHINE

Roger K. Anderson, P.O. Box 293, New Middletown, Ind. 47160

Filed Jul. 15, 1986, Ser. No. 885,768
Int. Cl.[4] E01C *19/28, 19/29*
U.S. Cl. 404—122 16 Claims



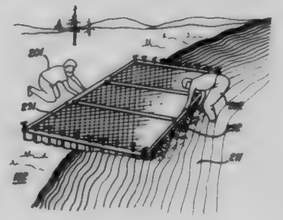
1. In a surface finishing machine for a road or other surface of the type which includes a main frame adapted to extend above and across a surface being finished, a roller carriage assembly comprising
   an upper frame connected to said main frame for movement back and forth above and across said surface,
   a lower frame disposed beneath said upper frame,
   roller means for rolling upon and across said surface for finishing the same, said roller means being connected to said lower frame,
   a scissors type extension mechanism disposed between and being pivotally connected to said upper and lower frames for suspending said roller means and for selectively changing the distance between said upper and lower frames such that the vertical distance between said roller means and upper frame can be changed by any desired amount between fully retracted and fully extended positions of said scissors, and
   means for locking said scissors for maintaining a selected distance between said upper and lower frames.

4,717,283

INSTALLATION FRAME FOR A GRID SOIL CONFINEMENT SYSTEM

Gary Bach, Appleton, Wis., assignor to Presto Products, Incorporated, Appleton, Wis.

Filed Jul. 22, 1985, Ser. No. 757,598
Int. Cl.[4] E02B *3/12*
U.S. Cl. 405—17 48 Claims



1. A frame for installing a grid section of cells of a grid confinement system for soil comprising:
   a generally planar frame having a plurality of support mem-

bers connected to one another forming sides of the frame and providing a coherent frame structure; and

a plurality of grid section holding members disposed along two sides of the generally planar frame to engage the grid section of cells wherein:

each grid section holding member has a grid section holding means for engaging the grid section of cells and a control means for activating the grid section holding means;

the control means for each grid section holding means is independently operable of the control means for any other grid section holding means; and

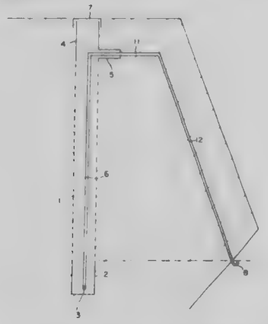
each grid section holding means can be controlled independently of any other grid section holding means.

4,717,284

DEVICE FOR DRAINING SOILS IN DEPTH

Jean-Claude Gress, Fontaines, France, assignor to Hydrogeo S.A., Fontaines, France

Filed Mar. 25, 1987, Ser. No. 30,147
Int. Cl.⁴ E02B *11/00*
U.S. Cl. 405—50 **7 Claims**



1. A device for draining ground in depth by siphoning off the water collected by drains placed in the ground, characterized by the fact that each drain includes a tube with perforations in its middle part (1) having solid walls and closed at its lower part so as to form a cup (2) and with solid walls and open at its upper part (4), this upper part (4), being provided with a side duct (5), at least one siphoning pipe (6) being permanently immersed by its lower end (3) in the cup (2), rising up through the inside of the tube (1) and leaving through the side duct (5) to drop down again (11, 12) towards an outlet (8) situated, in altitude, at the level of the upper ege of the cup (2).

4,717,285

CISTERN FOR LIQUID OR GAS, CONSTRUCTED OF REINFORCED CONCRETE

Jorma Pulkkinen, Porvoo, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI84/00062, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01559, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 5, 1984, Ser. No. 860,225
Int. Cl.⁴ E02D *27/00*
U.S. Cl. 405—55 **20 Claims**

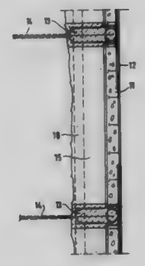
1. A cistern structure for use as a subterranean cistern, comprising:

a shell forming an inner surface of said cistern structure and formed of a material impermeable to substance to be stored therewithin;

a plurality of mutually-spaced, annular juncture elements, encircling said shell;

at least one anchoring element provided in each juncture element for anchoring said cistern structure into surrounding rock or soil;

a plurality of structural elements arranged one above the



other and joined with said annular juncture elements to form a compound structure; and

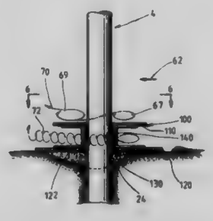
an intermediate layer of material situated between said mutually-spaced juncture elements.

4,717,286

ANTI-SCOUR APPARATUS AND METHOD

Kenneth H. Loer, Katy, Tex., assignor to Gulf Applied Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 440,666, Nov. 10, 1982, abandoned. This application Oct. 21, 1983, Ser. No. 543,070
Int. Cl.⁴ E02B *3/04*
U.S. Cl. 405—74 **38 Claims**



1. An anti-scour apparatus for preventing, reducing or repairing scour in the vicintiy of a structure extending upwardly from the floor beneath a body of moving water comprising:

(a) one or more deflectors in the vicinity of the structure for deflecting the downwash caused by the impact of the moving water on the structure and for preventing the impact of the downwash on the floor,

(b) one or more members for maintaining the positional relationship between each deflector and the floor beneath the body of moving water, and

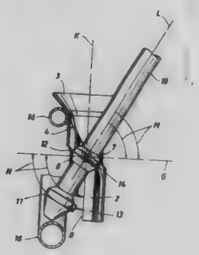
(c) a device for inducing turbulent flow in the vicinity of the structure such that the cooperative action of said deflectors and of said device for inducing turbulent flow simultaneously inhibit the downward vertical flow of the water moving parallel to the structure and enhance the horizontal flow of the water moving perpendicular to and around the structure, respectively.

4,717,287

APPARATUS FOR INSTALLING A FLOWLINE SECTION NEAR THE SEABED

Nils K. Laursen, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 757,707, Jul. 22, 1985. This application Feb. 6, 1987, Ser. No. 12,093
Claims priority, application Netherlands, Aug. 17, 1984, 8402530
Int. Cl.⁴ F16L *1/04*
U.S. Cl. 405—169 **2 Claims**



1. An apparatus for receiving, guiding, and anchoring a flowline section adjacent a seabed which forms the bottom of a body of water, said apparatus comprising:

a guide tube having a guide funnel carried at the upper end thereof, said guide tube and guide funnel having a central opening defined downwardly therethrough, said guide tube and guide funnel having passages extending radially outward therethrough from said central opening, said guide tube having a helical shoulder formed within said central opening and slots formed along the sides of said central opening of said guide tube, the lower end of said slots ending in shoulders which form pivot supports; and

a flowline section having a central longitudinal axis, one end of said flowline section having a first collar and a second collar situated at some distance from said first collar, said first collar having a radial key extending radially outward therefrom, said key operatively engageable with said helical shoulder, said second collar having two pivots positioned opposite one another and extending radially outward from said second collar, said pivots operatively engageable with said slots formed within the central opening of said guide tube, said pivots carried by said pivot supports which form shoulders located at the ends of said slots, said pivots rotated in said pivot supports to position said flowline section substantially horizontal to said seabed, said flowline section passing through said passages which extend radially outward from said central opening when said flowline section is rotated to a substantially horizontal position.

4,717,288

FLEX JOINT

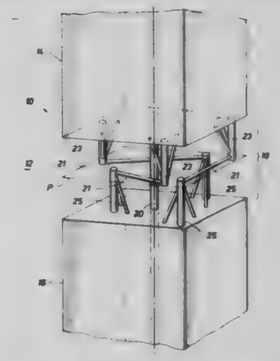
Lyle D. Finn, and Leonard D. Power, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 756,405, Jul. 17, 1985, abandoned. This application Aug. 13, 1986, Ser. No. 895,538
Int. Cl.⁴ E02B *17/00*; F16D *3/00*
U.S. Cl. 405—202 **44 Claims**

1. A flex joint for use in an articulated structure having first and second sections located generally along a longitudinal axis of said structure, said flex joint adapted to permit said first section to pivot laterally with respect to said second section in respnse to transverse loads, said flex joint comprising:

an axial load member attached to both said first and second sections and adapted to transmit axial loads therebetween; and

shear and torsion means for transmitting shear and torsion loads between said first and second sections, said shear and torsion means having at least three elongated shear and torsion links located between said first and second



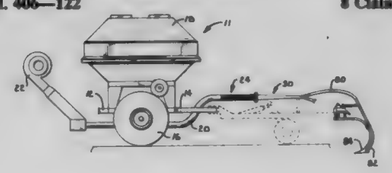
sections and oriented so as to be substantially in a plane perpendicular to said longitudinal axis of said structure, each of said links having a first end connected to said first section and a second end connected to said second section, said axial load member and said shear and torsion links adapted to accommodate lateral pivoting of said first section through elastic bending.

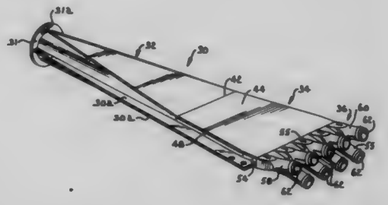
4,717,289

HORIZONTALLY DISPOSED APPARATUS FOR THE RANDOM DISTRIBUTION OF SEEDS AND GRANULAR MATERIALS

Stanley Popowich; Barry B. Barsi, and James W. Henry, all of Yorkton, Canada, assignors to Morris Rod Weeder Company, Ltd., Yorkton, Canada

Filed Jan. 16, 1987, Ser. No. 4,051
Int. Cl.⁴ B65G *53/56*
U.S. Cl. 406—122 **8 Claims**





1. In a farm implement having a container for holding a supply of particles to be distributed, a conduit for receiving particles from said container, means for producing an air stream within said conduit for entraining the particles within said stream and propelling the same toward a point of dis-

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charge, and apparatus for splitting said stream into a plurality of individual, particle-entraining streams containing uniform and randomly divided quantities of said particles, said apparatus comprising:

a horizontally disposed, transversely corrugated pipe of circular cross-section in downstream communication with said conduit for providing a uniform flow of particles through an annular discharge passage of said pipe,

said pipe having a longitudinal series of internal, annular, radially inwardly projecting corrugations disposed for random impingement with the particles of said stream as the particles flow through the pipe whereby to randomly distribute the particles throughout the transverse cross-sectional area of the pipe; and

a horizontally disposed, tubular, stream-splitting distribution body coupled in downstream communication with said pipe,

said body having a transition section progressively and symmetrically changing in a downstream direction from a circular configuration toward a generally flat, rectangular configuration disposed in a horizontal plane, a generally flat transfer section leading from said transition section and spreading symmetrically laterally outwardly in the downstream direction, and a single layer of generally horizontally disposed outlet tubes at the downstream end of said transfer section,

said transition section having a circular inlet for receiving particles from said pipe discharge passage, said pipe discharge passage and said inlet being of substantially the same cross sectional area and axially aligned for undisturbed flow of particles from said pipe to said body,

said transition section flaring laterally outwardly toward a rectangular downstream end which is substantially wider and substantially shallower than said circular inlet,

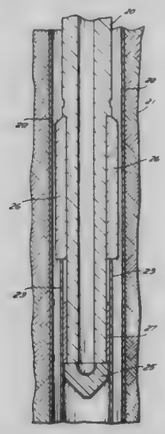
said transfer section having a horizontal top wall, a horizontal bottom wall, and a pair of spaced apart sidewalls interconnecting said top and said bottom walls and diverging from said downstream end of the transition section.

4,717,290

MILLING TOOL

Carl D. Reynolds, Oklahoma City; Thurman B. Carter, Jr., Tuttle, and Shane P. Hart, Yukon, all of Okla., assignors to Homco International, Inc., Bellaire, Tex.

Filed Dec. 17, 1986, Ser. No. 942,979
Int. Cl.[4] E21B *10/56*
U.S. Cl. 407—34 32 Claims



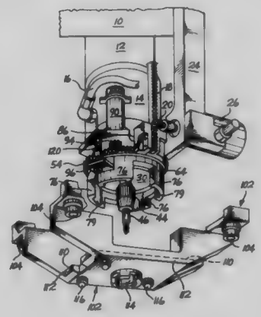
1. A milling tool to remove material from an underground location comprising a cylindrical tool body, a longitudinal passage through said tool body, means at one end for connection to a drive means, and a plurality of cutter blades having cutting inserts thereon attached to the surface of said tool body, said cutter blades having a negative axial rake of about 1 to about 10 degrees and a substantially constant negative radial rake.

4,717,291

AUTOMATIC COUNTERSINK DEPTH CONTROL TOOL FOR FASTENER INSTALLER

Avinoam Zafir, Karmiel, Israel, assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 6, 1986, Ser. No. 915,633
Int. Cl.[4] B23B *49/00*
U.S. Cl. 408—13 11 Claims



1. A depth control device for a cutting tool, comprising:

a nonrotatable generally cylindrical stop for limiting the cutting depth of a cutting tool on a workpiece, the cutting tool being associated with the stop and limited in cutting depth by action of the stop;

a rotatable generally cylindrical member threadedly engaged with said stop so that when said rotatable member is rotated, said stop is driven in the threaded engagement toward or away from the workpiece in accordance with the depth to be cut;

a motor engaged with said rotatable member and an encoder associated with the motor for receiving a command from a controller as to the depth to be cut;

said command to the motor and encoder requiring the motor to rotate said rotatable member an amount sufficient to move the stop toward or away from the workpiece corresponding to the depth to be cut;

a base supporting said stop, said rotatable member, and said motor and encoder;

said base, said stop, and said rotatable member being securable in a cutting tool device to surround a cutting tool spindle adjacent the cutting tool;

said base having a cylindrical portion fitted within and on which said rotatable member is radially supported for rotatable engagement;

said base having a flange extending over said rotatable member, and said stop; and

means secured to and under said cylindrical portion of said base extending radially outwardly into said stop to prevent rotation thereof.

4,717,292

DRILL BIT

John A. Phillips, Balsham, England, assignor to Dom Holdings PLC, United Kingdom

Continuation of Ser. No. 785,502, Oct. 8, 1985, abandoned. This application May 6, 1987, Ser. No. 45,713
Claims priority, application United Kingdom, Oct. 8, 1984, 8425400
Int. Cl.[4] B23B *51/00*
U.S. Cl. 408—226 13 Claims



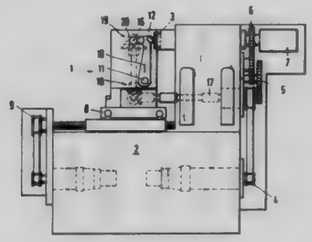
1. A drill bit for insertion into a tool receiver of a rotary percussive drilling machine, said drill bit comprising a generally cylindrical shank portion and a working portion extending axially from one end of said shank portion, said shank portion having two substantially opposed peripheral longitudinal grooves each open at a free end of said shank portion, each groove having a substantially flat base surface recessed from the cylindrical periphery of said shank portion and two non-radial sidewalls diverging outwardly from opposite lateral edges of said base surface toward the cylindrical periphery of said shank portion, each sidewall forming a small obtuse angle with said base surface which is smaller than an angle formed with said base surface by a diametrical plane that intersects the lateral edge of said base surface from which that sidewall extends.

4,717,293

METHOD FOR CHAMFERING THE AXIALLY FACING ENDS OF TOOTHED WORKPIECES, A MESHING ENGAGEMENT AID MANUFACTURED ACCORDING TO THIS METHOD, AND AN APPARATUS FOR PERFORMING THE METHOD

Johann Spensberger, Poing; Heinrich Fischer, and Richard Mueller, both of Munich, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,666
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434552
Int. Cl.[4] B23F *19/10*
U.S. Cl. 409—9 26 Claims



1. A method for chamfering the axially facing ends of toothed cylindrical or conical workpieces by pushing an effective tool into cutting engagement with said workpiece, which method includes the steps of moving said tool back and forth in response to the peripheral speed of the said workpiece which continuously rotates about its axis of rotation, engaging said tool with said workpiece during said back and forth movement for removing material from said workpiece during each stroke of said tool which is directed onto said axially facing ends of successive teeth of said workpiece, the improvement wherein said step of moving said tool back and forth includes the step of orienting a cutting edge on said tool on a circular segment, the axis of which extends parallel to a radial of said workpiece, which radial starts out from said axis of said workpiece and extends through a tooth on which machining is being performed.

13. A contoured chamfered surface meshing engagement aid on toothed workpieces manufactured according to the method of claim 1, wherein a rounded ridge is provided between a pair of chamfer surfaces and is produced at the same time that the chamfer surfaces are produced.

14. An apparatus for sloping and at least one of chamfering and deburring of the axially facing ends of toothed cylindrical or conical workpieces, comprising:

a machine frame means;

a support means on said frame means for supporting said workpiece for rotation and drive means for continuously rotatingly driving said workpiece;

a rocking lever and pivot axis means for pivotally supporting said rocking lever on said frame means;

a control shaft on said machine frame means and which is supported for rotation;

a tool having a gear cutting edge mounted on a free end of said rocking lever, at least one cam plate means mounted on said control shaft, said cam plate means engaging said rocking lever to cause it to carry out swinging movements about said pivot axis means therefor and which are directed toward a tooth on said workpiece which is to be machined, said cutting edge being oriented at the end of said rocking lever remote from said pivot axis means, said pivot axis means extending parallel to a radial of said workpiece, which radial starts out from said axis of said workpiece and extends through the tooth of said workpiece which is to be machined;

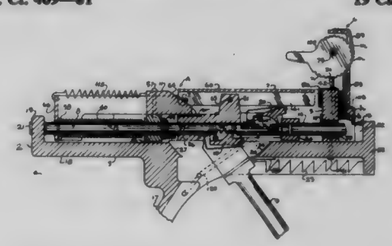
said rotary drive means for said workpiece and said rotary drive of said control shaft being adjusted to one another in such a manner that said gear cutting edge on said tool during one workpiece rotation carries out z strokes toward said workpiece and again back away from said workpiece and thereby machines per stroke one tooth half, whereby z is the tooth count of the workpiece.

4,717,294

HOUSE-KEY CODE CUTTER

William M. Grasser, Lakewood, Ohio, assignor to Curtis Industries, Inc., Eastlake, Ohio

Filed Nov. 24, 1986, Ser. No. 933,992
Int. Cl.[4] B23C *1/16*
U.S. Cl. 409—81 19 Claims



1. A portable house-key code cutter having a body, a reciprocating punch rod mounted for limited axial movement in said body and having a key-shearing punch at its forward and, an anvil having an aperture in alignment with said punch, a hand

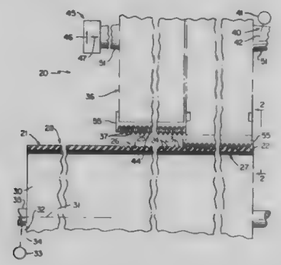
lever pivotally mounted on said body, a track support mounted for upward and downward movement on said body, means for lowering said track support in response to advancing movement of said punch rod, a cam-set holder including a carriage mounted for transverse movement on said support and having means for supporting a key blank in a position to be cut by said punch, several spaced grooves in said punch rod including a forward groove and an intermediate groove defining a plurality of ratchet teeth, a force-multiplying drive pawl having an end portion sequentially engageable with each ratchet tooth, first stop means for locating said rod to permit said last-named end portion to enter the forward groove when said hand lever is in its forward released position, second stop means for locating said rod to permit said last-named end portion to enter the intermediate groove when the hand lever is returned to said forward position and the punch is adjacent the key blank, and means responsive to pivotal movement of said hand lever for causing said driving pawl to move the punch axially against the key blank and force it part way through the blank towards said anvil.

4,717,295

POLYMERIC BELT CUTTING APPARATUS AND METHOD OF MAKING SAME

G. Brian Hetz, 1733 E. Holiday, Springfield, Mo. 65807

Division of Ser. No. 544,929, Oct. 24, 1983, Pat. No. 4,534,102, which is a division of Ser. No. 267,189, May 26, 1981, Pat. No. 4,496,269. This application Jun. 10, 1985, Ser. No. 743,132
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] B23C *3/04*; B29H *7/22*
U.S. Cl. 409—132 11 Claims



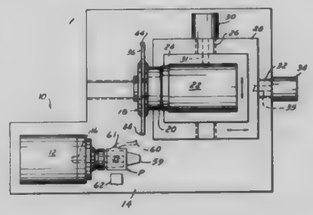
1. In a method for cutting a non-contoured and cured polymeric belt sleeve to define an endless power transmission belt construction having at least one pair of opposed non-parallel side portions, said method comprising the steps of disposing said belt sleeve on a mandrel for supporting said belt sleeve for rotation about a longitudinal axis, rotating said mandrel and belt sleeve about said longitudinal axis, rotating a cutting instrument having at least one pair of substantially identical symmetrically arranged and outwardly diverging integral cutting means for cutting said pair of side portions, and cutting said belt sleeve by moving said rotating cutting instrument toward said sleeve to urge said cutting instrument during rotation thereof against the rotating belt sleeve to define said belt construction, the improvement wherein said step of rotating a cutting instrument comprises the step of rotating a support body having a central axis and having at least one rake-like cutting bar having an elongate axis and having said one pair of cutting means provided thereon as an integral part thereof, said bar being supported on said body with said elongate axis parallel to and in radially spaced relation from said central axis with said one pair of cutting means extending perpendicular to said elongate axis, said step of cutting said belt sleeve comprising the step of plunging said cutting instrument into said belt sleeve to its full cutting depth before said belt sleeve makes one complete revolution from the time said cutting instrument makes initial cutting contact therewith to the time said cutting instrument is at its full cutting depth therein.

4,717,296

METHOD AND APPARATUS FOR FINISHING WORKPIECES

James D. Phillips, Posen, Mich., assignor to J. D. Phillips Corporation, Alpena, Mich.

Filed Aug. 11, 1986, Ser. No. 895,333
Int. Cl.[4] B23C *3/04*, *3/14*
U.S. Cl. 409—132 5 Claims



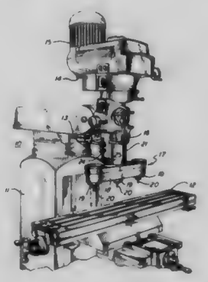
1. A method of rough finishing a cylindrical workpiece such as a piston or the like having a sprue on its cylindrical surface, comprising breaking off said sprue leaving residual sprue material on said cylindrical surface, axially rotating said workpiece, providing a circular milling cutter having a multiplicity of cutting elements along its periphery, axially rotating said milling cutter, and milling said workpiece by relatively positioning said axially rotating workpiece and said axially rotating milling cutter so that said cutting elements successively engage and remove stock from the surface of said rotating workpiece, said milling including relatively moving said rotating workpiece and rotating milling cutter parallel to the workpiece axis to cause said cutting elements to engage and remove stock, including residual sprue material, from the cylindrical surface of said workpiece.

4,717,297

SUPPORT AND GUIDE FOR MULTIPLE SPINDLE HEAD

William J. Camloh, Lafayette, and Charles Alcott, Canastota, both of N.Y., assignors to Camloh Industries, Inc., Tully, N.Y.

Filed Dec. 12, 1986, Ser. No. 941,056
Int. Cl.[4] B23C *9/00*
U.S. Cl. 409—144 11 Claims



1. Support bracket and guide assembly for a multiple spindle head to be mounted on a milling machine of the type which comprises a base, a table mounted on said base, a dovetail ways supported on said base, and a power head on said ways and having a rotary spindle to receive and rotate a tool shaft; the multiple spindle head comprising an elongated housing, an input shaft extending above said housing at a central portion thereof to fit said rotary spindle, a plurality of output spindles disposed at an underside of said housing, and transmission means in the housing to carry rotary motion from said input shaft to said output spindles; said multiple spindle head also comprising a mounting plate on said housing at the location of said input shaft, and a collar removably mounted on said mounting plate around said input shaft;

said support bracket and guide assembly comprising:

a support bracket including dovetail means to mount on said dovetail ways, a guide plate having a vertical channel means formed therein, and means supporting said guide plate on said dovetail means;

an arcuate horseshoe member mounted on said multiple spindle head mounting plate to have a center of curvature at the axis of said input shaft;

a vertical guide bar slidably received in the vertical channel means of said guide plate; and

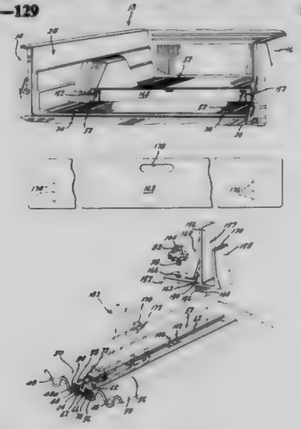
slider means affixed onto said guide bar for sliding along said arcuate horseshoe member and including clamping means to clamp said slider means onto said horseshoe member at a selected positin to establish an angular position of said multiple spindle head relative to the milling machine table.

4,717,298

CARGO RESTRAINT SYSTEM

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 745,587, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 483,227, Apr. 8, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,563
Int. Cl.[4] B60D *45/00*; B60P *1/64*; F16B *21/09*
U.S. Cl. 410—129 5 Claims



1. A cargo restraint system comprising

a pair of slat elements; and

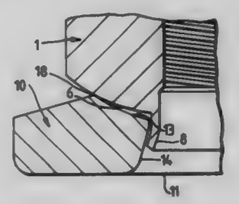
at least one cargo restraining member substantially disposed between said slats and including means for being clampingly engaged with each of said slats to restrain a load at any point along the length of each of said slats, said member being comprised of a pair of end brackets each having a slot therein formed of two walls and a base and an elongated element disposed between said brackets and into said slots, said elongated element being removable from said brackets, wherein at least one of said brackets includes means for locking said bracket and elongated element together, comprising a fixed lug on one of said elongated element or one wall of said at least one bracket and a recess in the other of said elongated element or one wall of said at least one bracket, wherein said fixed lug is insertable in said aperture to positively lock said elongated element within said slot of said at least one bracket.

4,717,299

WHEEL NUT ASSEMBLIES

Alan K. Underwood, Pontypridd, Great Britain, assignor to Armstong Fasteanings, Ltd., Pontypridd, Great Britain

Filed Feb. 27, 1986, Ser. No. 834,221
Int. Cl.[4] F16B *31/00*
U.S. Cl. 411—11 3 Claims



1. A wheel nut adapted to bear against a flat work surface and comprising an internally threaded nut body and a seating washer, the nut body having a convex bearing surface and the washer a cooperating concave seating surface, both said surfaces being spherical in character whereby to allow freedom of movement between said nut body and said washer as the nut body is moved from an initial to a tightened condition to accommodate misalignment of a cooperating stud disposed nominally perpendicular to said flat surface;

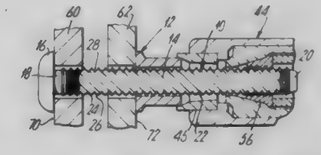
said washer having a substantially centrally-disposed opening for receiving the stud, a flat bearing surface for continuous flat bearing engagement with the flat work surface along the entirety of said bearing surface, a continuous peripheral sidewall extending between said flat bearing surface and said concave seating surface, and a solid cross-section between said bearing surface and said seating surface and between said centrally-disposed opening and said peripheral sidewall, said washer being formed of softer material than said nut body and having its seating surface initially in contact with the nut body at the outer periphery of said surface and in the tightened condition of the nut body making contact over its whole area by virtue of elastic deformation of the washer.

4,717,300

PIN FOR A FASTENER, AND METHOD OF MAKING SAME

Zia R. Alvi, Hatfield, and Christopher R. Hiblen, Welwyn Garden City, both of England, assignors to Avdel Limited, Hertfordshire, England

Filed Jan. 28, 1987, Ser. No. 7,506
Claims priority, application United Kingdom, Feb. 11, 1986, 8603299
Int. Cl.[4] C21D *9/00*
U.S. Cl. 411—361 12 Claims



12. A pin for a fastener of the type comprising a swageable tubular member and a pin having a plurality of annular grooves into which the tubular member can be swaged, and wherein at

least one of the grooves defines a breakneck at which the pin will break when subjected to a predetermined tensile stress, said pin comprising an elongate, annularly grooved shank having a substantially homogeneous microstructure consisting substantially entirely of sorbitic tempered martensite, said pin being made by the method comprising:

(a) cold working spheroidised annealed, deoxidised, medium carbon steel to form a pin-blank having the shape desired of the pin for the fastener, and having a coarse-grained microstructure having a grain size of from ASTM 3 to ASTM 7;

(b) heating the pin-blank in a carbon-restoring atmosphere to a temperature exceeding the A3 critical temperature of the steel until the steel of the pin-blank becomes completely austenitic, and has a substantially homogeneous, coarse-grained microstructure,

(c) quenching the austenitic pin-blank to convert the austenite to martensite, and

(d) tempering the martensitic pin-blank to convert the martensite to sorbite.

4,717,301

PANEL FASTENER SUPPORTING BUSH FOR COVER PANELS COMPRISING A BASE PANEL AND A FOAM PORTION

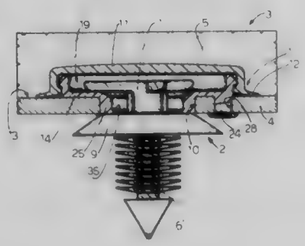
Manrico Oddenino, Buttigliera Alta, Italy, assignor to ITW Fastex Italia S.p.A., Turin, Italy

Filed Feb. 13, 1987, Ser. No. 14,295

Claims priority, application Italy, Feb. 21, 1986, 53016/86[U]

Int. Cl.⁴ F16B *19/00*

U.S. Cl. 411—373 **6 Claims**



1. A supporting bush for a panel fastener designed to enable click-on assembly on to a support, e.g. an inner vehicle body member, of a cover panel comprising a base panel and a foam portion; the said bush being formed in such a manner as to be locked, during manufacture of the said cover panel, between the said base panel and the said foam portion; characterised by the fact that it comprises:

a first cup-shaped element having a peripheral annular sealing lip designed to cooperate, in substantially fluidtight manner, with an inner surface of the said base panel and designed to be gripped under pressure between the said base panel and the said foam portion;

a second cup-shaped element secured integral with the said first element, with its concave side facing that of the said first element, so as to define with the same an inner cavity for housing the head of the said panel fastener; the said second cup-shaped element comprising a sleeve portion and respective pins for assembly to the said base panel; said pins projecting axially from the opposite side to that facing the said first cup-shaped element and being designed to engage with respective through holes on the said base panel;

a break-off tab projecting from the mouth of the said sleeve portion in such a manner as to close off the said inner cavity and determine, at the said sleeve portion and subsequent to breakage, the formation of a through hole enabling access to the said cavity and engageable by the said panel fastener.

4,717,302

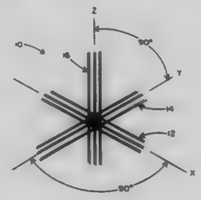
COMPOSITE FASTENER

Thomas R. Adams, Huntington Beach, and Gary R. Wittman, Costa Mesa, both of Calif., assignors to Tiodize Company, Inc., Huntington Beach, Calif.

Filed Jun. 18, 1984, Ser. No. 621,590

Int. Cl.⁴ F16B *35/00*

U.S. Cl. 411—378 **9 Claims**



1. A fastener member having at least one transverse integral load-bearing flange, comprising a first plurality of resin-impregnated fibers extending continuously therethrough along a longitudinal axis, a second plurality of resin-impregnated fibers disposed transversely at right angles to the first plurality and a third plurality of resin-impregnated fibers disposed transversely at right angles to each of the first and second plurality, wherein at least a portion of the second and third plurality of resin-impregnated fibers extends continuously across the cross-section of the fastener to form the load-bearing flange.

4,717,303

JOINT MECHANISM FOR MANIPULATORS

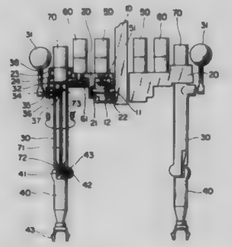
Seiji Kawai, Ogaki, Japan, assignor to Kabushiki Kaisha Meidensha and Doryokuro Kakunenryo Kaihatsu Jigyodan, both of Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 832,270

Claims priority, application Japan, Feb. 25, 1985, 60-25885[U]; Feb. 25, 1985, 60-25886[U]

Int. Cl.⁴ B25J *11/00*

U.S. Cl. 414—4 **11 Claims**



1. A joint mechanism of a manipulator, comprising:

(a) a manipulator base;

(b) a shoulder frame support axle fixedly supported on the manipulator base;

(c) a shoulder frame rotatably mounted on the shoulder frame support axle;

(d) an upper arm movably connected to the shoulder frame and having a transverse axis rotatable about the shoulder frame support axle;

(e) a lower arm pivotably connected to the upper arm;

(f) a first motor having a first drive shaft and fixed to the shoulder frame;

(g) a second motor having a second drive shaft and fixed to the shoulder frame, the second drive shaft being in parallel to the longitudinal axis of the upper arm, a drive of the second motor being independent of a drive of the first motor;

(h) a third motor fixed to the upper arm and movably mounted on the shoulder frame, the third motor having a third drive shaft extending on the longitudinal axis of the upper arm, a drive of the third motor being independent of drives of the first and second motors;

(i) a first drive assembly housed within the shoulder frame and receiving power from the first motor so as to pivot the shoulder frame in back and forth (A—A') direction about the stationary shoulder frame support axle;

(j) a second drive assembly housed within the shoulder frame and receiving power from the second motor so as to rotate the upper and lower arms in clockwise and counter-clockwise (B—B') direction within 360° about the longitudinal axis of the upper arm; and

(k) a third drive assembly housed within the lower arm and receiving power from the third motor so as to pivot the lower arm in a back and forth or up and down (C—C') direction relative to the upper arm.

4,717,304

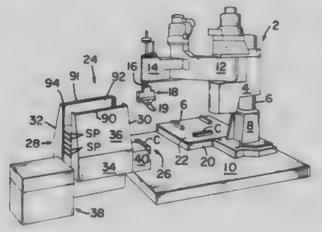
ELECTRICAL CONNECTOR FEEDING APPARATUS

Keith A. Bocchicchio, Middletown; Glenn I. Hoffner, Mechanicsburg, and Karl H. Letsch, Wyomissing, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1986, Ser. No. 927,194

Int. Cl.⁴ H05K *13/02*

U.S. Cl. 414—126 **15 Claims**



1. Apparatus for sequentially feeding electrical connectors arranged in rows in elongate tubular packs, for pick-up by connector pick-up means, the apparatus comprising:

an elongate frame having a first end, a second end, a lower part, and an upper magazine part for containing a vertical stack of said packs with said packs extending lengthwise of the frame;

a pack transfer elevator mounted in the lower part of the frame for vertical movement towards and away from said upper part, between a pack pick-up raised position, a connector feed lowered position and a pack eject intermediate position;

a connector pick-up station beyond the first end of the frame and in alignment with said elevator when it is in its connector feed position;

a connector feed and pack eject ram mounted to the frame for movement from said second end thereof towards and away from said connector pick-up station, said ram having pack engaging means thereon; and

means for actuating said elevator and said ram, to cause, consecutively, said elevator to move to its pack pick-up position to pick up the lowermost pack of the stack, said elevator to move to its connector feed position, said ram to advance intermittently from said second end of the frame and through said lowermost pack to feed each connector therein in turn, to said connector pick-up station, said ram to retract from said lowermost pack, towards said second end, said elevator to be raised to its pack eject position, said ram to be advanced beneath said pack so that said pack engaging means thereon engages said lowermost pack, and said ram to be retracted towards said second end of the frame to eject said lowermost pack from the apparatus.

4,717,305

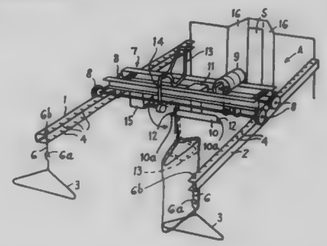
SELF-SERVICE APPARATUS

John D. Edwards, Sylvan Hurst, Tower Hill, Dorking, Surrey, RH4 2AN, England

Filed Sep. 8, 1986, Ser. No. 905,480

Int. Cl.⁴ B65G *1/04*

U.S. Cl. 414—134 **7 Claims**



1. In a self-service apparatus for the delivery of sheet-like articles, including two parallel rails each provided with a plurality of storage locations at which articles ready to be delivered to a customer may be suspended such that they lie in planes normal to the direction of the rails, means for spacing said rails so as to define a passageway between articles suspended from the rails, conveyor means for picking up and conveying an article from any specific location to a reception region at which the article can be received by a customer, said conveyor means comprising a carriage which is mounted over said rails so as to be capable of travel from one end of the rails to the other and a pick-up device for picking up an article from any of the storage locations on either of the rails, and operating means actuated in response to an authorized request for initiating operation of the conveyor means to pick up and deliver an article from a specified location to the customer, the improvement which comprises a control device which is mounted on the conveyor means and actuated as a selected article is picked-up by the conveyor means, the said control device consisting of a member mounted on an arm and means for rotating said arm so that said control device can be swung between an inoperative position and an operative position, so as to rotate the article from its storage position to a position at which it is conveyed edgewise-on towards the reception region, said control device further being operative to maintain the article in this edgewise-on attitude as it is being conveyed.

4,717,306

HAND-OPERATED PALLET CHANGER

Eishin Satake, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Ishikawa, Japan

Filed Dec. 8, 1986, Ser. No. 938,901

Claims priority, application Japan, Dec. 28, 1985, 60-293473

Int. Cl.⁴ B65H *1/00*

U.S. Cl. 414—222 **7 Claims**

1. A hand-operated pallet changer for changing work pallets to be fed onto a pallet mounting portion of a machine tool, each of said work pallets being adapted to secure a work piece thereon, comprising:

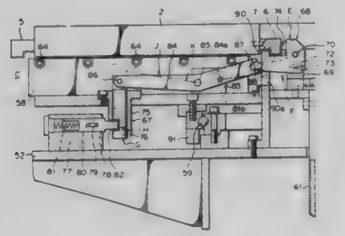
a base unit arranged in a vicinity of said machine tool;

a turntable rotatably supported on said base unit and having at least two supporting portions for supporting said work pallets thereon, respectively, said supporting portions

being spaced from each other in a rotational direction of said turntable;

a table-indexing unit for stopping a rotational movement of said turntable and locking said turntable when each of said supporting portions of said turntable arrive at a predetermined position in which each of said supporting portions is in alignment with said pallet mounting portion of said machine tool; and

a movable hook for preventing a rebound of said work pallet fed from said pallet mounting portion of said machine tool onto one of said supporting portions located on said predetermined position, said movable hook having a stopper portion for stopping said work pallet fed from said pallet mounting portion of said machine tool onto one of said supporting portions located on said predetermined position and being movably supported on said base unit so as to move between a releasing position in which said mov-



able hook permits a movement of said work pallet from said one of said supporting portions located on said predetermined position toward said mounting portion of said machine tool and a latching position in which said movable hook can prevent a rebound of said work pallet from said one of said supporting portions located on said predetermined position toward said supporting portion of said machine tool, said movable hook being moved from said releasing position to said latching position by a pushing force acting on said stopper portion thereof from said work pallet fed from said pallet mounting portion of said machine tool onto said one of said supporting portions of said turntable, and moved from said latching position to said releasing position by a pushing force acting thereon from said work pallet when said one of said supporting portions departs from said predetermined position in said rotational direction of said turntable.

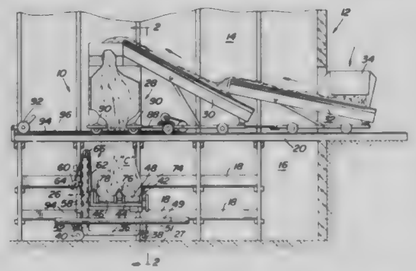
4,717,307

APPARATUS FOR SUPPLYING COMPOST TO MUSHROOM GROWING BEDS

Andrew J. Ciuffetelli, 813 Merrimac La., Unionville, Pa. 19375

Filed Oct. 1, 1985, Ser. No. 782,764
Int. Cl.⁴ A01G *1/04*; B65G *65/28*
U.S. Cl. 414—300 **8 Claims**

1. For use in a mushroom house having tiers of vertically spaced mushroom cultivating beds therein, a supporting surface disposed above the beds, and feed means for supplying compost to the house, means for distributing compost to the beds, comprising: a selectively positionable distributor for feeding compost to the beds, said distributor having means for selectively adjusting said distributor to the heights of said beds, means operatively associated with said distributor to facilitate positioning of said distributor in juxtapostion to the beds along the lengths thereof and below the supporting surface, and means for supply compost to said distributor, said means for supplying compost to said distributor comprising a movable guide supported by the surface and having means thereon to facilitate movement of said guide with respect to the surface, said guide being selectively positionable to receive compost from the feed means and to be positioned above said distributor, whereby compost received by said guide from the feed means is directed to said distributor, and said distributor comprising a base portion, said means to facilitate positioning of said distributor comprising rolling support means coupled to said base portion, and conveyor means operatively coupled to



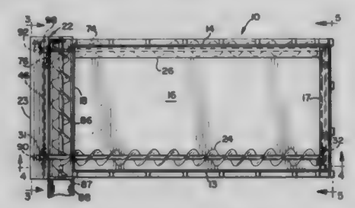
and supported by said base portion, said means for adjusting said distributor to the heights of said beds comprising a vertically adjustable carriage, said conveyor means being mounted on said carriage for vertical adjustment therewith.

4,717,308

CONTAINER UNLOADING SYSTEM

Abe B. Kuhns, Arthur, Ill., assignor to E-Z Trail, Inc., Arthur, Ill.

Filed Dec. 14, 1983, Ser. No. 561,308
Int. Cl.⁴ B60P *1/42*
U.S. Cl. 414—307 **16 Claims**



1. A system for unloading material from a container, the container having a floor and a pair of substantially parallel sidewalls, said system comprising:

an auger rotatable about an axis and extending in a direction substantially parallel to the sidewalls of the container;

a first fluid motor on said auger for rotating said auger about the axis to convey material in the container toward one end of the auger;

mounting means for mounting said auger to advance transversely across the floor of the container between the sidewalls, beneath the material in the container, and in a direction substantially perpendicular to the sidewalls;

drive means including a second fluid motor for driving said mounting means to advance the auger transversely back and forth across the floor and adjacent the bottom of the material in the container while said auger is rotating;

conduit means connecting the discharge of said first fluid motor to said second fluid motor;

bypass conduit means communicating with said conduit means and bypassing said second fluid motor; and

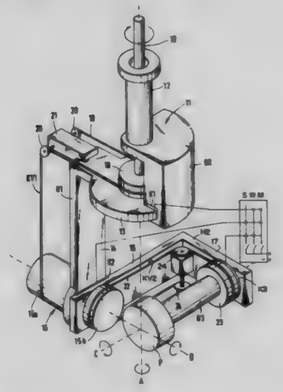
resistance sensing means, including relief valve means in said bypass conduit means, which senses the resistance to the transverse movement of the auger by the material in the container to bypass fluid by said second fluid motor in response to the resistance to vary the speed of the transverse movement of the auger across the floor of the container.

4,717,309

APPARATUS FOR POSITIONING A SPECIMEN

Dietmar Neuhaus, Düsseldorf, Fed. Rep. of Germany, assignor to Deutsche Forschungs—und Versuchsanstalt fur Lift—und Raumfahrt E.V., Fed. Rep. of Germany

Filed Jun. 25, 1985, Ser. No. 748,738
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423432
Int. Cl.⁴ B25J *17/02*
U.S. Cl. 414—735 **7 Claims**



7. An apparatus for rotating a specimen about three mutually perpendicular axes with only a single rotary input shaft, comprising:

a single rotary input shaft,

three interconnected brackets rotatable along three mutually perpendicular axes, all three axes intersecting at a single point, one of said brackets being designed to hold a specimen,

a plurality of power transmission means for transmitting rotational motion imparted by said single input shaft to each of said brackets, and

a plurality of fixable couplings, operative on each of said brackets, for selectively fixing the relative position of each of said brackets. ixable couplings, operative on each of said brackets, for selectively fixing the relative position of each of said brackets.

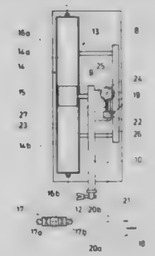
4,717,310

APPARATUS FOR REMOVING MOLDED ARTICLES FROM INJECTION MOLDING MACHINES

Friedrich Heindel, Baden, Austria, and Wolf D. Hellmann, Beilngries, Fed. Rep. of Germany, assignors to Battenfeld Kunststoff maschinen Ges. m.b.H.

Filed Sep. 11, 1986, Ser. No. 906,320
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532300
Int. Cl.⁴ B25J *3/00*
U.S. Cl. 414—753 **7 Claims**

1. In an apparatus for removing injection molded articles from an open injection mold of an injection molding machine, including a first guide member extending in alignment with the closing direction of the injection mold, a first carriage movable on the first guide member, a second vertically extending guard member mounted on the first carriage, a second carriage vertically movable on the second guide member, a support member attached to the second carriage, a grasping means mounted on the bottom end of the support member, the grasping means being pivotable about two axes extending perpendicularly relative to each other, the first carriage moved on the first guide member and the second carriage moved on the second guide member by means of pneumatic linear drives, the improvement which comprises a braking means mounted between the second carriage and the second guide member, the braking means serving to lock the movement of the second carriage relative to the second guide member, wherein the pneumatic linear drive for the second carriage includes a cylinder having an axis, a piston axially movable in the cylinder, the cylinder defining separate first and second working chambers, the piston separating the first and second working chambers from each other, an electromagnetic valve controlled to the first and second working chambers by means of compressed air



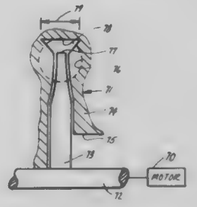
lines, the electromagnetic valve controlled by two electromagnets, so that compressed air is supplied to or discharged from the working chambers via the compresses air lines, depending upon the position of the electromagnetic valve effected by the electromagnets, and wherein the electromagnetic valve of the drive for the second carriage and the braking means are controlled in such a way that the braking means is disengaged when the drive of the second carriage is actuated, and the braking means is engaged when the drive for the second carriage is not actuated.

4,717,311

CENTRIFUGAL PUMP

Russell J. Willette, 718 E. Spruce St., Sault Ste. Marie, Mich. 49783

Filed Jul. 9, 1986, Ser. No. 883,600
Int. Cl.⁴ F04D *29/42*
U.S. Cl. 415—206 **6 Claims**



1. In a centrifugal pump, the combination comprising:

(a) a casing having at least one impeller rotatably mounted therein and having an axial fluid inlet opening and a discharge outlet opening;

(b) said impeller being constructed for rotation in one direction so as to receive fluid from said casing axial inlet opening and exert a centrifugal force on said fluid to pressurize the fluid and force it into a delivery area and thence out of the casing through said casing discharge outlet opening;

(c) said impeller being provided with a plurality of radially disposed impeller blades which each has a tip, and which are evenly spaced, circumferentially, around the impeller, and have decreasing widths radially outward; and

(d) the delivery area in the casing into which the impeller

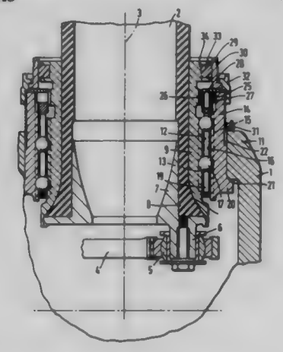
discharges fluid being equal to the circumferential area of the impeller at the discharge tips of the blades, and the area of said casing discharge outlet opening being at least equal to said delivery area and at least equal to said circumferential area.

4,717,312

VARIABLE-PITCH BLADED ROTORS

Roger W. Seeley, Cheltenham, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Jun. 30, 1986, Ser. No. 879,999
Claims priority, application United Kingdom, Jul. 10, 1985, 8517474
Int. Cl.[4] B64C 11/32
U.S. Cl. 416—145 7 Claims



1. A variable pitch bladed rotor which comprises

a hub having a plurality of ball-screw means mounted thereon and from which a plurality of blades extend;

wherein a ball screw means includes

an inner race having at least one helical groove formed therein;

an outer race having at least one helical groove formed therein;

a passage defined between the helical grooves;

a rotatably driveable cylindrical cage disposed between the inner and outer races which has longitudinal slots formed therein;

a plurality of balls positioned in said passage and within the confines of the slots and movable longitudinally with respect thereto; and

drive means forming a part of the cage to drive the cage on a pitch change movement.

4,717,313

SWASH PLATE TYPE COMPRESSOR WITH INTERNAL SEALING

Makoto Ohno; Hideo Mori; Toshihiko Nasu, and Hideki Watanabe, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jan. 15, 1987, Ser. No. 4,190
Claims priority, application Japan, Jan. 17, 1986, 61-005590[U]
Int. Cl.[4] F04B 27/08, 39/10
U.S. Cl. 417—269 4 Claims

1. A swash plate type compressor comprising:

a pair of axially combined front and rear cylinder blocks forming therein a plurality of cylinder bores and a swash plate chamber;

a pair of front and rear housings arranged at axial ends of said combined cylinder blocks, each housing having therein an inner suction chamber for a refrigerant prior to compression and an outer exhaust chamber for a refrigerant after compression;

a separation wall arranged in each said front and rear housings for isolating said inner suction chamber from said outer exhaust chamber;

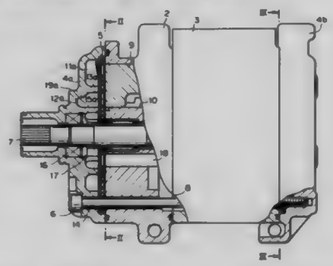
valve plates and disks interposed between said front and rear housings and said axial ends of said combined cylinder blocks;

a plurality of tightening screw bolts axially and hermetically combining said front and rear housings, said valve plates and disks, and said combined cylinder blocks together;

a drive shaft extending axially through said swash plate chamber of said combined cylinder blocks;

a swash plate in said swash plate chamber rotatably supported on said drive shaft;

a plurality of pistons engaged with said swash plate so as to be reciprocated in said cylinder bores;



a plurality of inlet passageways extending through said combined cylinder blocks and said valve plates and disks for communicating between said swash plate chamber and said suction chambers of said front and rear housings, and;

internal sealing means arranged in said front and rear housings for providing a hermetic seal between said axial ends of said combined cylinder blocks and said valve plates and disks, said internal sealing means comprising a plurality of support ribs individually formed in said front and rear housings for rigidly holding said valve plates and disks against pressure of said refrigerant after compression within said cylinder bores of said combined cylinder blocks, thereby reinforcing a hermetic seal between said axial ends of the combined cylinder blocks and said valve plates and disks.

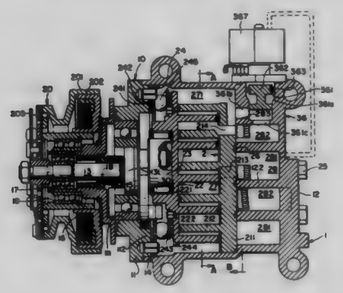
4,717,314

SCROLL COMPRESSOR WITH CONTROL DEVICE FOR VARIABLE DISPLACEMENT MECHANISM

Tadashi Sato; Atsushi Mabe, and Kiyoshi Terauchi, all of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Aug. 11, 1986, Ser. No. 895,494
Claims priority, application Japan, Aug. 10, 1985, 60-174968; Sep. 4, 1985, 60-134406
Int. Cl.[4] E04B 49/00
U.S. Cl. 417—310 5 Claims

1. A scroll type compressor including a housing having an inlet port and outlet port, a fixed scroll fixedly disposed within said housing and having a circular end plate from which a first spiral element extends into the interior of said housing, an orbiting scroll having a circular end plate from which a second spiral element extends, said first and second spiral elements interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of fluid pockets within the interior of said housing, a driving mechanism operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, a rotation preventing mechanism for preventing the rotation of said orbiting scroll during the orbital motion to thereby change the volume of fluid pockets, said circular end plate of said fixed scroll dividing the interior of said housing into a front chamber and a rear chamber, said front chamber including a suction chamber communicating with said inlet port, and said rear chamber being divided into a discharge chamber which communicates between said outlet port and a central fluid pocket formed by both said scrolls and an intermediate pressure chamber, at least one pair of holes formed through said circular end plate of said fixed scroll to form a fluid channel between the fluid pockets and said intermediate pressure chamber, a cylinder connected for fluid communication with said intermediate pressure chamber, said suction chamber and said discharge chamber means for selectively passing fluid from said discharge chamber to said cylin-



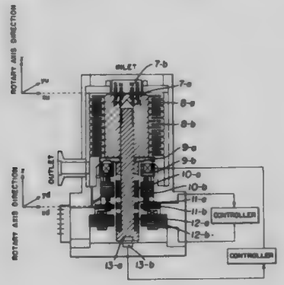
der, and control means for controlling communication between said intermediate pressure chamber and said suction chamber through said cylinder, said control means comprising a piston slidably disposed within said cylinder and communicating means for leaking fluid received in said cylinder from said discharge chamber to said suction chamber, said piston sliding within said cylinder in accordance with a pressure difference between the pressure in said cylinder above said piston and the pressure in said intermediate pressure chamber, and said communicating means leaking the received fluid at an increased rate from said cylinder when said piston pushed upward a predermined distance from a lowermost position.

4,717,315

SMALL SIZE AXIAL-FLOW MOLECULAR PUMP USING A MAGNETIC BEARING

Masaharu Miki; Tadao Ishizawa, and Chiaki Urano, all of 31-1, Kameido 6-chrome, Koto-ku, Tokyo, Japan

Continuation of Ser. No. 413,569, Aug. 31, 1982, abandoned.
This application Jan. 25, 1985, Ser. No. 694,907
Claims priority, application Japan, Sep. 4, 1981, 56-139556
Int. Cl.[4] F04B 17/00
U.S. Cl. 417—365 14 Claims



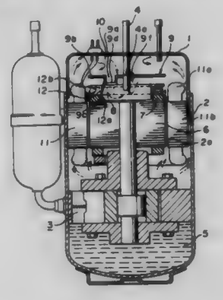
1. In an axial flow molecular pump having an upstanding housing having an inlet opening for introducing gaseous molecules during use of the pump and an outlet opening for discharging the gaseous molecules: a set of fixed blades fixedly mounted within the housing and extending radially thereof; a rotatable pump member rotatably disposed within the housing to undergo rotation about a vertical rotary axis and carrying a set of radially-extending blades which coact with the fixed blades to pump the gaseous molecules from the inlet opening to the outlet opening during rotation of the pump member; and supporting means for magnetically rotatably supporting and maintaining the pump member to undergo rotation about the vertical rotary axis, the supporting means comprising first magnetic bearing means for both axially supporting the pump member and actively controlling the axial position of the pump member and comprised of a set of permanent magnets on the upper end of the pump member cooperating with a set of permanent magnets fixedly mounted at the upper end of the housing, first energizeable electromagnetic means axially spaced from the sets of permanent magnets and coacting therewith when energized for axially supporting the pump member and controlling the axial position thereof, and axial detecting means for detecting axial displacement of the pump member and accordingly controlling the energization of the first electromagnetic means, and second magnetic bearing means for both radially supporting the pump member and actively controlling the radial position of the pump member and comprised of second energizeable electromagnetic means disposed axially below the outlet opening and operative when energized for radially supporting the lower portion of the pump member and controlling the radial position thereof, and radial detecting means for detecting radial displacement of the lower portion of the pump member and accordingly controlling the energization of the second electromagnetic means.

4,717,316

ROTARY COMPRESSOR

Shigeru Muramatsu; Shigeru Shida; Takeo Horie, and Masashi Yamada, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1987, Ser. No. 43,450
Claims priority, application Japan, Apr. 28, 1986, 61-99124
Int. Cl.[4] F04B 35/00, 39/02, 39/06; F01M 1/00
U.S. Cl. 417—372 4 Claims



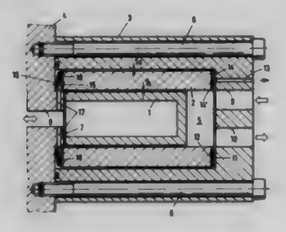
1. A rotary compressor comprising a sealing case, a motor element housed in the upper part of said sealing case, a compression element housed in the lower part of said sealing case so as to be driven by said motor element, a discharge tube provided at the top of said sealing container so that compressed gas filled in the upper part of said sealing case is discharged out of the same and an oil separating means mounted on the rotor of said motor element, characterized in that said oil separating means has a circular plate having a diameter substantially equal to the outer diameter of said rotor, wherein a channel-like recess projecting toward said rotor is formed in said circular plate at a position deviated from its central portion; the lower surface of the channel-like recess is adapted to be firmly connected to the upper surface of said rotor, and an

aperture is formed at the central portion so that said discharge tube is loosely inserted in the aperture.

4,717,317
RECIPROCATING PUMP

Robert Hofer, Elgg, and Anton Steiger, Illnau, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 22, 1985, Ser. No. 801,091
Claims priority, application Switzerland, Feb. 5, 1985, 506/85
Int. Cl.⁴ F04B *9/10*
U.S. Cl. 417—392 **9 Claims**

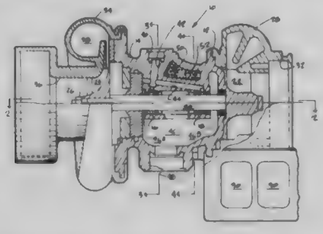


1. A reciprocating pump comprising
a casing having a delivery chamber for receiving and expelling a liquid fuel suspension;
a sleeve disposed in said casing in spaced relation to define a first annular gap therebetween, said sleeve having an end face sealingly engaging a mating surface of said casing adjacent said delivery chamber and an opposite end face in permanent communication with said gap;
a piston disposed in said sleeve to be driven by a hydraulic pressure medium and being in spaced relation to said sleeve to define a second annular gap therebetween; and
means for delivering a flow of pressure medium to drive said piston towards said delivery chamber, said means being in communication with each said annular gap to deliver the pressure medium thereto to obviate radial expansion of said sleeve.

4,717,318
TURBOCHARGER HEAT TRANSFER CONTROL METHOD AND APPARATUS

David G. Elpern, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 681,531, Dec. 14, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,317
Int. Cl.⁴ F04B *17/00*
U.S. Cl. 417—407 **5 Claims**

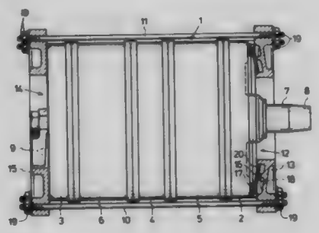


1. A turbocharger comprising a housing having a pair of axially spaced bearing members journaling an elongate shaft therein, a turbine wheel drivingly carried at one end of said shaft, and a compressor wheel drivingly carried at the opposite end of said shaft, said housing defining an exhaust gas inlet to said turbine wheel and an exhaust gas outlet therefrom, said housing further defining an air inlet to said compressor wheel and an air outlet therefrom, said housing completely defining a closed cavity substantially surrounding said shaft and extending between said turbine wheel and said compressor wheel, said closed cavity being substantially of inverted U-shape in transverse section to embrace said pair of bearing members and said elongate shaft while being spaced therefrom, said housing further defining an oil drain gallery below said shaft, said closed cavity including a pair of depending leg portions extending downwardly toward but short of said oil drain gallery, said oil drain gallery also extending axially between said turbine wheel and said compressor wheel and having a greater axial extent than said closed cavity and including a first and a second axially spaced apart upwardly extending portions respectively interposing axially between said turbine wheel and said compressor wheel and the one of said pair of axially spaced bearing members proximate to each of said wheels and surrounding said shaft, said closed cavity and said oil drain gallery intermeshing to embrace said pair of bearing members in surrounding relationship therewith, and a determined quantity of heat conductive and heat absorptive material captively received within said closed cavity.

4,717,319
HOUSING OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Dankwart Eiermann, Weissensberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 876,196
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604428
Int. Cl.⁴ F01C *1/22, 21/10*; F16M *1/04*
U.S. Cl. 418—60 **4 Claims**

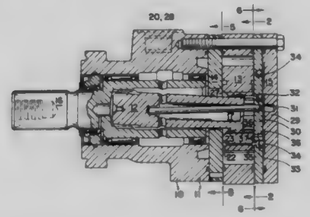


1. A housing of a rotary piston internal combustion engine of trochoidal manner of construction, which consists of two side parts and at least two mantle parts with an inner surface in form of a trochoid with two lobes having outermost and innermost points as well as a long axis and a short axis of the trochoid, the outermost points of these lobes being intersected by the long axis and the innermost points being intersected by the short axis of the trochoid, and a center part between two mantle parts, which parts are connected along radial periphery of the housing by adjustable bolts directed axially, and having an eccentric shaft passing through the housing and including a triangular piston upon an eccentric of the eccentric shaft upon which the piston rotates in continuous engagement of the corners thereof with the mantle runway, comprising the following additional features including:
(a) clamping rings provided on each of two ends of the housing;
(b) said claiming rings being circular in axial plan view and having a diameter equal to length of the long axis of said housing and including a transition in a radial direction via said housing in the region of the short axis thereof;
(c) said clamping rings being connected via said adjustable bolts in the region of the short axis of said housing; and
(d) a cup spring arranged between one of the two clamping rings and that engaging against said housing, said cup spring being pressed by tension of said adjustable bolts by said one clamping ring against an end of the housing as well as the housing being pressed against the other clamping ring.

4,717,320
GEROTOR MOTOR BALANCING PLATE

Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240

Continuation-in-part of Ser. No. 603,994, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 390,328, Jun. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 360,832, Mar. 23, 1982, Pat. No. 4,454,744, which is a continuation-in-part of Ser. No. 113,400, Jan. 18, 1980, Pat. No. 4,357,133, which is a continuation of Ser. No. 910,075, May 26, 1978, abandoned. This application Nov. 15, 1985, Ser. No. 798,301
Int. Cl.⁴ F01C *9/08, 1/10*
U.S. Cl. 418—61 B **17 Claims**



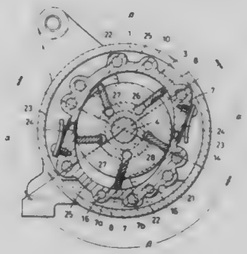
1. In a pressure device having a moving part confined between first and second plates with high pressure biasing the moving part more against the second plate than the first plate so as to create an imbalance of the forces between moving part and the first and second plates, an improvement of a means to counter the high pressure biasing of the moving part so as to compensate for the otherwise inbalance of forces between the moving part and the first and second plates, said means comprising a balancing plate, said balancing plate being between the second plate and the moving part, means to fixedly connect said balancing plate to the second plate, means to contain pressure between said balancing plate and the second plate and means to pressurize said means to contain pressure between said balancing plate and the second plate so as to bow said balancing plate back against the moving part and force the moving part against the first plate so as to compensate for the otherwise imbalanced forces between the first and second plates and the moving part.

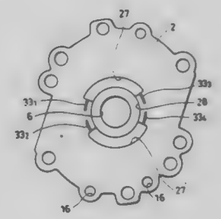
4,717,321
VANE COMPRESSOR WITH VANE BACK PRESSURE ADJUSTMENT

Tsunesori Shibuya; Yutaka Ishizaka; Haruhiko Takada; Teruo Nakamura, and Hidehiko Takayama, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 640,312, Aug. 13, 1984, Pat. No. 4,611,977, which is a division of Ser. No. 502,666, Jun. 9, 1983, Pat. No. 4,571,164. This application Jun. 16, 1986, Ser. No. 874,555
Claims priority, application Japan, Jun. 18, 1982, 57-91163
Int. Cl.⁴ F04C *18/344, 29/02*
U.S. Cl. 418—76 **3 Claims**

1. A vane compressor, comprising:
(a) a compressor body including a cylinder having at least one pump outlet and opposite axial ends, and a pair of side blocks secured to said axial ends of said cylinder and having opposite inner end surfaces;
(b) a rotor rotatably mounted in said compressor body and having opposite end surfaces facing said inner end surfaces of said side blocks, said rotor carrying a plurality of vanes slidably fitted therein, said rotor having a plurality of back-pressure chambers defined therein and surrounded by said vanes and said side blocks, said back-pressure chambers each having opposite axial ends opening in said opposite end surfaces of said rotor;
(c) an oil sump;
(d) said opposite axial ends of each of said back-pressure chambers being disposed to follow a path against each of said opposite inner end surfaces of said side blocks, said path being divided into at least one high-pressure zone through which said vanes move across said pump outlet, and at least one normal-pressure zone;
(e) said opposite inner end surfaces of said side blocks each having at least one oil groove defined therein at a location corresponding to said normal-pressure zone and disposed to communicate with said back-pressure chambers through said normal-pressure zone;
(f) means for feeding oil from said oil sump to said oil grooves;
(g) restrictor means provided in said high-pressure zone of said path and communicating with said back-pressure





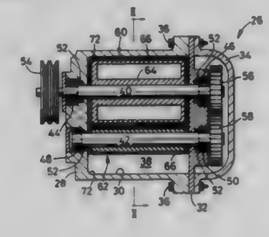
chambers, said restrictor means comprising restriction slits defined in said opposite inner end surfaces of said side blocks at locations corresponding to said high-pressure zone and having at least one end communicating with said oil grooves; and
(h) wherein while said axial ends of each of said back-pressure chambers travel through said normal-pressure zone as said rotor rotates, said oil grooves are in communication with said back-pressure chambers to introduce oil in said oil grooves into said back-pressure chambers, and while said axial ends travel through said high-pressure zone, said back-pressure chambers are out of communication with said oil grooves so that oil in said back-pressure chambers is substantially confined therein to counter radially inward movement of said vanes as the vanes move past the pump outlet, with a fractional quantity of the oil being allowed to leak through said restrictor means to prevent the vanes from pressing with excessive force against said cylinder.

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4,717,322
ROOTS-TYPE FLUID MACHINE

Naofumi Masuda, Nagoya; Hajime Takeshita, Toyota; Takahiro Iwase, Anjyo; Hiroyuki Mochizuki, Aichi; Takao Sibata, Aichi; Takashi Miyake, Aichi, and Nobuo Kobayashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 1, 1986, Ser. No. 892,039
Int. Cl.[4] F04C *18/18, 27/00*
U.S. Cl. 418—144 7 Claims



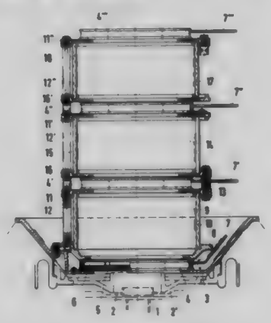
1. A rotary fluid machine of a Roots type comprising:
a housing structure including a generally cup-shaped main housing body having a bore therein, said bore being closed at one end thereof and open at another end, said housing structure further including a covering member which closes said another open end of said bore and which cooperates with said main housing body to define a chamber;
a plurality of rotors accommodated in said chamber in a substantially fluid tight condition with respect to each other and to said housing structure, wherein each of said rotors has an outer surface including opposite end faces, one of which faces an inner flat surface of said main housing body defining said closed end of said bore, said outer surface of each of said rotors also including an outer peripheral surface facing an inner peripheral surface of said main housing body, said inner peripheral surface of said main housing body defining a periphery of said bore;
a resin layer being coated on said outer surface of said each rotor; and
a fillet portion integral with said main housing body, said fillet portion bridging said inner flat surface and said inner peripheral surface, said fillet portion being formed along a line of intersection of extensions of said inner flat surfce and said inner peripheral surface, said fillet portion projecting into said bore with respect to said line of intersection, said fillet portion having a generally triangular shape in cross section taken in a direction perpendicular to said line of intersection,
said plurality of rotors being positioned relative to a base of said generally triangular shape of said fillet portion for minimum amounts of clearances between said outer peripheral surface of said each rotor and said inner peripheral surface of said main housing body, and between said one end face of said each rotor and said inner flat surface of said main housing body.

4,717,323
DEVICE FOR COOLING A FOIL TUBING

Veit-Holger Karl, Habichtweg 12, 8903 Bobingen, and Klaus Wirtele, Eppanor Strasse 8, 8904 Friedberg, both of Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 857,360
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 8525622[U]
Int. Cl.[4] B29C *47/92*
U.S. Cl. 425—72 R 8 Claims

1. A device for cooling foil tubing in the plastic state as it issues from an annular nozzle comprising:
(a) an annular air outlet orifice which surrounds the nozzle,
(b) a first cylindrical chamber connected in the direction of the course of the foil tubing to the air outlet orifice,
(c) a first iris diaphragm at the upper end of the first cylindrical chamber,
(d) a second cylindrical chamber connected to the first chamber at the other side of the first iris diaphragm,
(e) a first additional iris diaphragm at the upper end of the second cylindrical chamber,
(f) at least a third cylindrical chamber connected to the second cylindrical chamber at the other side of the first additional iris diaphragm,



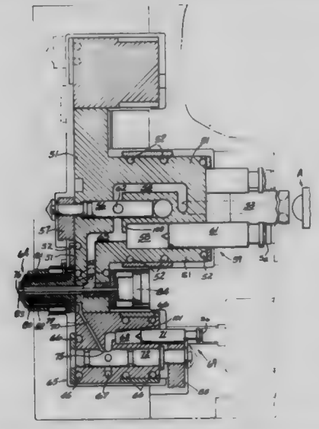
(g) a second additional iris diaphragm at the upper end of the third cylindrical chamber,
(h) adjusting mechanisms for the iris diaphragms for adjusting each iris diaphragm independent of the other iris diaphragms,
(i) the walls of the chambers being constructed of solid and at least in part of transparent material,
(j) the iris diaphragms being held airtight to adjacent chambers so that the air flowing into the chambers flows out between the inner rim of the diaphragms and the foil tubing.

4,717,324
COINJECTION OF HOLLOW ARTICLES AND PREFORMS

Robert D. Schad, Toronto, and Paul P. Brown, Orangeville, both of Canada, assignors to Husky Injection Molding Systems, Inc., Bolton, Canada

Filed May 12, 1986, Ser. No. 862,269
Int. Cl.[4] B29C *45/02, 45/16, 45/20*
U.S. Cl. 425—130 13 Claims

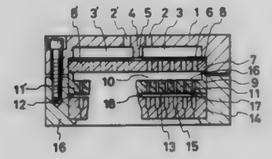
1. A coinjection molding apparatus for molding articles and preforms, said apparatus comprising:
at least one mold cavity, said cavity having a nozzle including a nozzle gate individual thereto,
a hot runner system including conduit means in said nozzle for supplying at least two thermoplastic materials to said nozzle gate, each material originating from a separate source and each material having a substantially different optimum processing temperature,
said conduit means including a first nozzle channel providing a conduit to said gate for a first molding material, and a second nozzle channel providing a conduit to said gate for a second molding material,
heating means individual to each channel for maintaining each said channel at said substantially different optimum temperature appropriate for molding material flowing through the respective channel, and
insulating means in said nozzle separating said channels, said insulating means being substantially coextensive with said nozzle and with said first and second nozzle channels whereby the insulating means is operative to block heat transfer from one nozzle channel to the other so that the respective molding materials arrive at the nozzle gate at said optimum processing temperatures.



4,717,325
SPINNERET ASSEMBLY

Isao Fujimura, Moriyama, and Taiju Terakawa, Shiga, both of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 25, 1984, Ser. No. 614,015
Claims priority, application Japan, Jun. 1, 1983, 58-97285
Int. Cl.[4] D01D *13/00*
U.S. Cl. 425—131.5 16 Claims

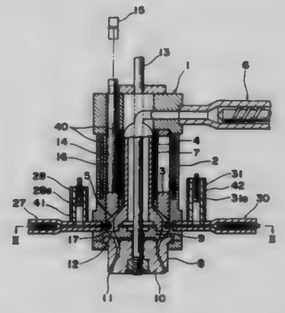


1. A spinneret assembly for composite fibers of the sheath-and-core type, comprising:
means forming a core liquid reservoir and a separate sheath liquid reservoir;
a first distribution plate having a plurality of parallel through introducing holes, with a first plurality of said introducing holes being in fluid communication with said core liquid reservoir and a second plurality of said introducing holes being in fluid communication with said sheath liquid reservoir;
a second distribution plate being parallel to said first distribution plate;
said first and second distribution plates having means forming therebetween a plurality of parallel separate grooves, with a first plurality of said grooves in fluid communication with said first plurality of introducing holes on the side of said first distribution plate opposite from said core liquid reservoir and a second plurality of said grooves in fluid communication with said second plurality of introducing holes on the side of said second distribution plate opposite from said sheath liquid reservoir;
said second distribution plate having a plurality of through core liquid pressure control holes communicating on one side with said first plurality of grooves and further having a plurality of through sheath liquid pressure control holes communicating on one side with said second plurality of grooves;
a spinning plate spaced from and parallel to said second distribution plate, and having a fixed pattern of a plurality of through spinning holes coaxial in pairs with said core liquid pressure control holes, respectively;
said second distribution plate and said spinning plate having adjacent flat parallel unobstructed surfaces interrupted only by said holes and forming therebetween a narrow continuous mixing zone for combining said core liquid and sheath liquid; and
said sheath liquid pressure control holes entering into said mixing zone in a fixed pattern so as to be equally spaced around adjacent core liquid distribution holes.

4,717,326
EXTRUSION MOLDING EQUIPMENT FOR MULTI-LAYER PARISON

Takao Motonaga; Keizi Fukuhara, both of Hiroshima; Tadashi Tamura, Yokosuka, and Toshiji Yoshida, Yokohama, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Japan Steel Works, Tokyo, both of, Japan

Filed Oct. 24, 1986, Ser. No. 922,668
Claims priority, application Japan, Oct. 25, 1985, 60-239155
Int. Cl.[4] B29C *47/86*
U.S. Cl. 425—133.1 14 Claims



1. Extrusion molding equipment for molding a multi-layer parison, which comprises:
an accumulator head;
a cylindrical member disposed in such accumulator head and having therein a first temperature control means for controlling a chief resin material temperature-wise;
a ringed piston reciprocal along the inner peripheral surface of said cylindrical member for further extruding said chief resin material extruded from an extruding means;
a first core member coaxially disposed inside said ringed piston;
said cylindrical member and said first core member cooperating together to define therebetween an annular resin storing space internally accommodating said ringed piston;
an annular die coaxially and securely mounted on said accumulator head at the lower endportion thereof;
a second core member coaxially and reciprocably engaged with said first core member at the lower end portion thereof;
said cylindrical member, said die and said first core member cooperating together to define an annular resin passage directly communicating said resin storing space at the downstream side thereof, into which resin passage said chief resin material is forcibly extruded by said ringed piston; and
at least one ringed member coaxially disposed within said

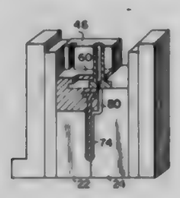
resin passage and having at least one injection opening defined therein, which opening communicates an extruding means for extruding an auxiliary resin material, with a second temperature control means for controlling said auxiliary resin material temperature-wise being arranged in the vicinity of said extruding means and away from said first temperature control means.

4,717,327

INJECTION MOLDING APPARATUS

Daniel Fuessel, P.O. Box 278, Milford, N.H. 03055

Filed Mar. 21, 1986, Ser. No. 842,301
Int. Cl.[4] B29C 45/03, 45/04
U.S. Cl. 425—190 10 Claims



1. An injection molding apparatus for forming plastic items employing a mold formed of tool members that mate to form a mold cavity, said apparatus comprising,

a mold core assembly including a pull core adapted to extend into said mold cavity, and including a core support member from which the pull core depends,

a nozzle for introducing liquid to said mold cavity and having a retracted position and an injection position,

means for attaching said nozzle to said core support member such that movement of said nozzle between said retracted position and said injection position causes movement of said pull core and such that said core support member is permitted to move laterally with respect to said nozzle, and

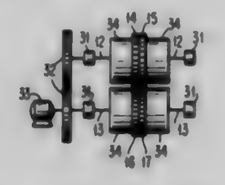
means for moving said nozzle and core support member in unison between said retracted position and said injection position.

4,717,328

SLITTER-CORRUGATOR APPARATUS FOR PASTA

Joseph C. D'Alterio, 64 Sugar Maple La., Glen Cove, N.Y. 11542

Filed Apr. 7, 1986, Ser. No. 848,623
Int. Cl.[4] A21C 11/10
U.S. Cl. 425—290 20 Claims



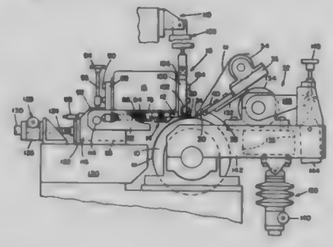
1. An apparatus for forming an alignment of longitudinally spaced short slits with undulated edges in a sheet of fresh pasta, which comprises a pair of meshing but nonconstacting identical gear-like elements mounted on rotatively driven parallel shafts, each said gear-like element being only two identical bevel-toothed disks wherein the grooves between the bevel teeth are appreciably wider than the width of said bevel teeth, said two disks being face-to-face abutted so that said bevel teeth of one said disk are substantially midway between said bevel teeth of the other said disk and the top ends of all said bevel teeth are at the abutted faces of said disks, and each said gear-like element being positioned between coaxial rollers.

4,717,329

APPARATUS FOR COMPRESSIVELY TREATING TRAVEL FLEXIBLE SHEET MATERIAL

Thomas D. Packard, Stoughton, and William C. Goodchild, Attleboro, both of Mass., assignors to Bird Machine Company, Inc., South Walpole, Mass.

Filed Dec. 30, 1986, Ser. No. 948,319
Int. Cl.[4] B29C 53/28; B31F 1/14
U.S. Cl. 425—328 8 Claims



1. Apparatus for compressively treating traveling flexible sheet material, having a drive roll for advancing the material, retarder means engageable with the material driven by said roll, mechanism for compressing said material against the surface of said roll before engagement with said retarder means comprising an assembly of superposed sheet members extending across the width of said material on said drive roll, including an inner primary member disposed closest to said drive roll and an outer member, holder means connected at least to said primary member and said outer member adjacent their edges disposed rearwardly in the direction of travel of the material to support said assembly as a cantilever, pressure means to apply adjustable pressure to said assembly to flex the suspended portion thereof toward said drive roll so that said primary member compresses said material against said drive roll surface, and means mounting said pressure means and holder means for movement into and out of operative position and for adjustment of relative position;

wherein the connection of said holder means to sheet members of said assembly is by a plurality of pins on said holder means spaced across the direction of travel of the material and received in corresponding slots in said connected superposed sheet members adjacent their edge disposed rearwardly in said direction of travel, said slots extending transversely of said direction of travel and having sufficient clearance from said pins to permit movement thereof relative to said pins corresponding to local expansion of said connected sheet members by heat induced therein when the apparatus is operating and to local contraction thereof by cooling when said apparatus is not operating.

4,717,330

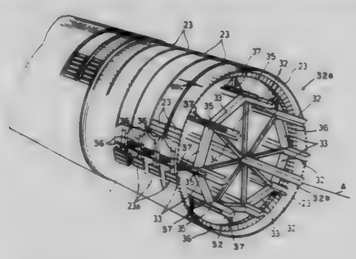
APPARATUS FOR MAKING A STRUCTURAL COMPONENT

Branko Sarh, Watertown, Mass., assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Division of Ser. No. 670,472, Nov. 9, 1984, Pat. No. 4,633,632.
This application Nov. 18, 1986, Ser. No. 932,686
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341564
Int. Cl.[4] B29C 41/40, 65/70
U.S. Cl. 425—403 12 Claims

1. An apparatus for constructing a structural component

having a longitudinal central axis and a curved wall extending relative to said central axis, said curved wall comprising longitudinally extending stringers, crosswise extending ribs forming a grid structure with said stringers, and planking means covering said grid structure, said stringers, ribs, and planking means being made of fiber reinforced synthetic material and bonded to one another by curing of said synthetic material, said apparatus comprising a plurality of individual mold means having mold surfaces for carrying tapes of said fiber reinforced synthetic material wound onto said mold surfaces and being longitudinally and circumferentially spaced for receiving said longitudinal stringers and said crosswise ribs respectively therebetween, internal mandrel means extending coaxially with said



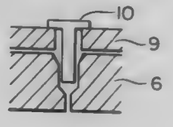
central axis for supporting said mold means, axial and radial position adjustable support means operatively secured to said mandrel means for individually carrying and axially and radially adjusting said mold means on said mandrel means, axial adjustment means arranged on said mandrel means for adjusting the axial position of said support means, whereby the axial spacing between said mold means carried by said support means is adustable, and radial adjustment means arranged for adjusting the radial position of said support means, thereby adjusting the circumferential spacing between said mold means carried by said support means such that the stringers and ribs may be positioned between the individual mold means and releasably held therebetween.

4,717,331

SPINNING NOZZLE

Naoyuki Maeda, Tokyo; Osamu Kato; Hirosaka Oshimi, both of Yokohama; Akira Nii, Kawasaki; Hiroshi Shimada; Michiharu Harakawa, both of Yokohama; Takuji Hirano, and Shigeo Hara, both of Hiratsuka, all of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,155
Claims priority, application Japan, Jun. 1, 1984, 59-111013
Int. Cl.[4] B29C 47/12
U.S. Cl. 425—467 7 Claims



1. A nozzle for controlling the cross-sectional structure of a pitch fiber produced by melt-spinning a mesophase pitch, said nozzle comprising:

a capillary defining an elongated capillary channel extending along a predetermined axis for forming said pitch fiber;

a counterbore orifice of greater cross sectional dimension than that of said capillary channel aligned therewith, said orifice defining a cavity having an inner surface; and

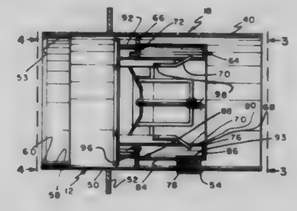
an elongated molded piece dimensioned so as not to contact said capillary and so as to be centrally received within said cavity with a predetermined spacing between said molded piece and said inner surface, said spacing defining an annular pitch flow path communicating with said capillary channel, said molded piece having a contoured outer surface including a groove or projection thereon, said groove or projection disposed within said counterbore orifice operative to orient the molecular structure of said pitch as it flows thereover to produce a fiber having a random on onion-skin cross-sectional structure.

4,717,332

FLAME RETENTION BURNER APPARATUS AND METHOD

P. Clifton Edens, 12 Lakeview Estates, Winfield, Kans. 67156

Filed Nov. 22, 1985, Ser. No. 800,674
Int. Cl.[4] F23D 14/46; F23C 1/00
U.S. Cl. 431—8 14 Claims



1. In a heat exchange apparatus operable to be supplied with a liquid and a gaseous fuel to be mixed with an inlet air supply for combustion and subsequent heat transfer, the improvement being a flame retention burner apparatus, comprising:

(a) a combustion head assembly including a main combustion chamber housing and an inlet fuel and air diffuser assembly mounted within said main combustion chamber housing and connected to the gaseous fuel supply;

(b) said inlet fuel and air diffuser assembly includes an inlet fuel diffuser assembly having an inner fuel nozzle assembly and an outer fuel nozzle assembly, each having a concentric ring of forwardly projected nozzle members to direct and supply the gaseous fuel axially of said main combustion chamber housing;

(c) said inlet fuel and air diffuser assembly includes a support and air diffuser assembly mounted about said inlet fuel diffuser assembly;

(d) said support and air diffuser assembly includes an air diffuser ring having a plurality of openings to receive and agitate the inlet air supply moving therethrough; and

(e) an inlet air supply is connected to one end of said main combustion chamber housing with inlet air directed and flowing in the center and about the outer periphery of said inlet fuel and air diffuser assembly to mix with the gaseous fuel prior to combustion for maximum atomization of particles and efficiency in combustion.

12. A method of achieving high efficiency and complete combustion of either an inlet air supply and a gaseous fuel mixture or an inlet air supply and a liquid fuel mixture within a flame retention burner apparatus, comprising the following steps:

(a) supply the inlet air supply to an inlet end of said flame retention burner apparatus having a main combustion chamber housing with an inlet fuel and air diffuser assembly mounted in said main combustion chamber housing and said inlet fuel and air diffuser assembly includes a support and air duffuser assembly mounted about an inlet fuel diffuser assembly;

(b) supplying a gaseous fuel to said inlet fuel diffuser assembly for discharge through a concentric circle of an inner fuel nozzle assembly and an outer fuel nozzle assembly; and

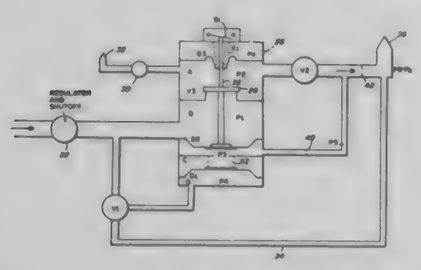
(c) directing a portion of the inlet air supply about an outer periphery of said inlet fuel diffuser assembly to said sup-

port and air diffuser assembly to cause a mixing thereof with the gaseous fuel supply through said outer fuel nozzle assembly to achieve maximum combustion and efficiency thereof.

4,717,333
BURNER IGNITION SYSTEM

Forest J. Carignan, Bedford, Mass., assignor to Advanced Mechanical Technology, Inc., Newton, Mass.

Division of Ser. No. 459,787, Jan. 21, 1983, Pat. No. 4,565,519. This application Jan. 17, 1986, Ser. No. 820,450
Int. Cl.[4] F23Q *9/08*
U.S. Cl. 431—44 9 Claims

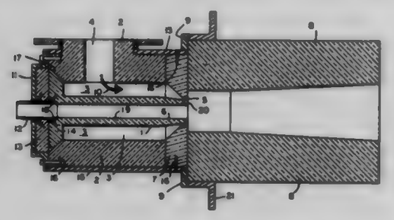


1. A gas control in a gas burning system comprising a safety valve in series with a main gas valve and a pilot nozzle, the safety valve comprising a normally closed valve element for preventing gas flow to the main gas valve, a control chamber, means for increasing the pressure in the control chamber and valve control means responsive to increased pressure in the control chamber to open the valve element, the gas control further including a time delay orifice for venting the control chamber and flame responsive means for opening the main gas valve and terminating venting of the control chamber through the time delay orifice when a flame is sensed such that the safety valve closes after a predetermined delay if no flame is sensed.

4,717,334
CERAMIC BURNER HAVING HIGH TURNDOWN RATIO

Ray L. Newman, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 24, 1982, Ser. No. 444,104
Int. Cl.[4] F23C *7/00*
U.S. Cl. 431—187 4 Claims



1. A gas burner comprising: a ceramic inlet tube, having a tip, for delivery of a gaseous fuel therethrough; a ceramic body spaced from, and surrounding, the ceramic inlet tube, the space between the ceramic body and the ceramic inlet tube defining a chamber; means for delivering preheated combustion air into the chamber; a venturi around the tip of the ceramic inlet tube, the venturi being angled with respect to the inlet tube so that the path of the venturi intersects the axis of the ceramic inlet tube forward of the tip of the ceramic inlet tube.

4,717,335
CHILD RESISTANT LIGHTER

Guy M. Lovelass, 470 Hickory, Apt. 203, Westland, Mich. 48185

Filed Aug. 28, 1986, Ser. No. 901,422
Int. Cl.[4] F23Q *1/02*
U.S. Cl. 431—277 2 Claims



1. A gas lighter, comprising:
a housing for containing a fuel;
a gas nozzle mounted on the housing for discharging fuel therefrom;
a pushbutton-actuated valve mounted on the housing such that when depressed, the nozzle discharges the fuel;
a flint mounted on the housing between the nozzle and the pushbutton-actuated valve;
a spark-generating, serrated wheel mounted on the housing so as to be rotatable in a first direction when manipulated by the user to engage the flint to deliver a spark toward the fuel being discharged from the nozzle, the wheel being rotatable in the opposite direction;
first structure mounted on the wheel so as to be rotatable therewith along a path of motion between the flint and the pushbutton-actuated valve; and
second structure mounted on the housing between the wheel and the housing to engage the first structure as the wheel is being rotated in said first direction to limit such rotational motion in the first direction, said second structure being operable to engage the first structure as the wheel is being rotated in the opposite direction to limit rotational motion in the opposite direction;
whereby the user cannot manipulate the wheel to rotate it in the first direction to deliver a spark toward the fuel after the first structure engages the second structure, unless the wheel is first manipulated in the opposite direction.

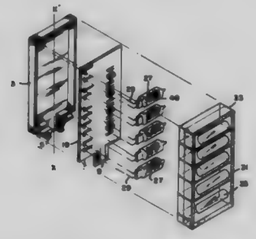
4,717,336
FLASHED-LAMP INDICATOH

John W. Shaffer, Montoursville, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Filed Mar. 12, 1986, Ser. No. 838,987
Int. Cl.[4] F21K *5/02*
U.S. Cl. 431—360 13 Claims

1. A flashed-lamp indicator composition comprising a volatile dye, a nonvolatile particulate heat-absorbing material, a binding agent, and inert platelet-shaped particles, said particles having an average particle size within the range of from about 0.5 to about 1.5 micron.

8. A multilamp photoflash array comprising:
a base member formed to receive a circuit board;
a circuit board with a printed circuit on one surface thereof and affixed to said base member;
a plurality of flashlamps in parallel alignment and affixed to said circuit board; and
a transparent plastic cover member affixed to said base member and enclosing said circuit board and flashlamps therebetween; wherein each of said flashlamps has at least one spot of flashed-lamp indicator composition in heat-receiving relationship therewith, said flashed-lamp indicator composition comprising a volatile dye, a nonvolatile particulate heat-absorbing material, a binding agent, and inert

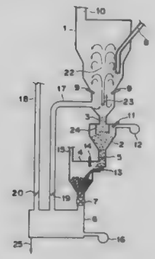


platelet-shaped particles, said particles having an average particle size within the range of from about 0.5 to about 1.5 micron.

4,717,337
METHOD FOR PRODUCING WHITE CEMENT CLINKER

Toshikazu Ichiyanagi, Kumagaya; Kazzaburo Sudo, Saitama; Zenzaburo Kawai, Kumagaya; Shoji Sekine, Niza, and Hiroshi Teshigawara, Koshigaya, all of Japan, assignors to Kabushiki Kaisha and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 796,239, Dec. 16, 1985, abandoned, which is a division of Ser. No. 743,498, Jun. 11, 1985, Pat. No. 4,573,908. This application Jan. 27, 1987, Ser. No. 8,080
Claims priority, application Japan, Jun. 11, 1984, 59-118345
Int. Cl.[4] F26B *3/08;* F27B *7/02*
U.S. Cl. 432—14 1 Claim

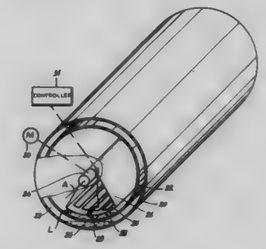


1. A method for producing white cement clinker comprising the steps of feeding white cement raw material particles into a fluidized-bed burning furnace and burning them into clinker particles, introducing the burned high-temperature clinker particles into a reduction chamber, feeding into said reduction chamber fuel and air a quantity of which is less than a theoretically required air quantity for combustion of the fuel to thereby gasify the fuel, reducing said clinker particles with the generated reducing gas, feeding said clinker particles thus reduced into a primary cooling chamber and cooling them to 600°–700° C. with water while being isolated from a surrounding atmosphere, and feeding the clinker particles thus cooled into a secondary cooling chamber so as to cool them further with air.

4,717,338
HEATER DRUM FOR MANUFACTURING PROCESS

Jacques Cellier, Marliox, France, assignor to Cellier S.A., Aix-Les-Bains, France

Filed Apr. 14, 1986, Ser. No. 851,328
Claims priority, application France, Apr. 12, 1985, 85 06078
Int. Cl.[4] F27B *9/28;* H05B *3/02*
U.S. Cl. 432—60 3 Claims



1. A heater drum comprising:
an outer cylindrical wall centered on and rotatable about an axis;
an inner cylindrical wall fixed concentrically within the outer wall and defining therewith a substantially closed annular chamber at subatmospheric pressure;
a body of a heat-transmitting fluid in the chamber in heat transmitting contact with both walls;
a core body fixed nonrotatably about the axis inside the inner wall out of direct contact therewith, of part-cylindrical section generally centered on the axis, lying generally below the axis, and having an outer surface spaced slightly radially inward of the inner wall;
means including a heat sensor fixed in the core body for heating the core body to a high treatment temperature and for thereby partly vaporizing the fluid in the chamber;
means including a body of heat-conducting liquid in simultaneous contact with the outer surface of the core body and with the inner wall for transmitting heat radially from the core body to the inner wall; and
drive means for rotating the walls jointly about the axis relative to the core body and thereby distributing the heat of the inner wall via the fluid body to the outer wall.

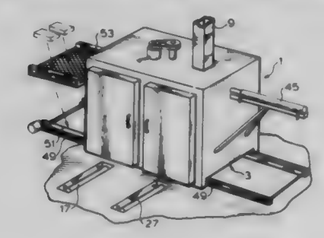
4,717,339
CURING OVEN

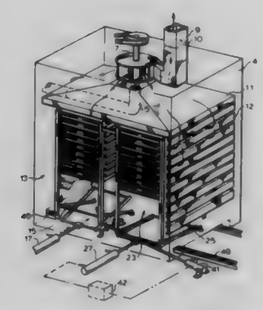
Erik Kersting, 45 Cross Street, Unit 1, Guelph, Ontario N1E 2Z5, Canada

Continuation of Ser. No. 796,970, Nov. 12, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 13,202
Int. Cl.[4] F27B *9/00, 5/16;* F27D *3/04*
U.S. Cl. 432—125 1 Claim

1. A curing oven having a housing enclosing an internal curing chamber comprising forward and rearward regions with bottom located forward and rearward access openings to and from said forward and rearward regions, a burner providing heated gases in a combustion region located above and isolated from said curing chamber by a heat shielding partition with deflectors therearound for deflecting and diffusing the heated gases from said burner downwardly into said curing chamber, said burner operating at a temperature sufficiently hot to provide a substantially non-poluting exhaust directly to atmosphere, fan means for blowing the heated gases downwardly into said curing chamber for curing of the material with the heated gases rising back upwardly and creating a negative pressure to draw a supply of fresh outside air into said curing oven through said bottom located access openings, a plurality of trays for carrying the material through said curing chamber, said trays being supported in side by side first and second vertical stacks in said forward and rearward regions

and including a tray moving system comprising a first scissor lift for lifting said trays individually onto a cam operated pivotal catch weighted to normally assume a first stack supporting position relieving load on and freeing said first scissor lift to lower and receive further trays to be lifted to said pivotal catch, means for transfering the trays from atop the first vertical stack in said forward region to atop the second vertical

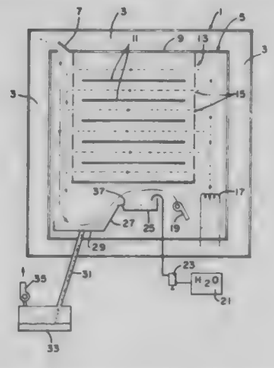




stack in said rearward region, a second scissor lift for lowering the trays individually in the second vertical stack onto a slide bar immediately beneath the lowermost tray to assume a second stack supporting position with said slide bar being operated by a pivotal linkage which is in turn controlled by a piston to slide said slide bar in and out of the second stack supporting position.

4,717,340
DEBINDERIZER FOR RAPIDLY REMOVING BINDER FROM A GREEN BODY
Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corp., Camarillo, Calif.
Filed Jun. 4, 1986, Ser. No. 870,415
Int. Cl.[4] F27D *7/04*
U.S. Cl. 432—199 **18 Claims**

1. A debinderizing system which comprises:
(a) a housing,
(b) a continuous defined atmosphere path within said housing having an atmosphere therealong,
(c) means in said atmosphere path for applying water to said atmosphere,
(d) heating means for heating said atmosphere,
(e) sample holding means in said atmosphere path for holding samples, and
(f) means for causing said atmosphere to move along said atmosphere path at sufficient velocity to provide turbulent



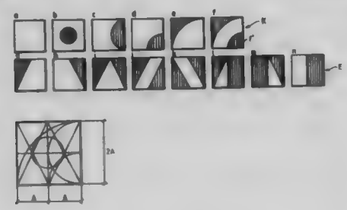
flow along the surface of samples at said samp[1]_ holding means.

4,717,341
ORTHODONTIC APPLIANCE SYSTEM
A. Jon Goldberg, 74 Rumford St., West Hartford, Conn. 06107, and Charles J. Burstone, 252 Old Mountain Rd., Farmington, Conn. 06032
Filed Jan. 13, 1986, Ser. No. 817,925
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—9 **15 Claims**



1. In an orthodontic appliance system for applying corrective forces to the teeth of a patient, the improvement wherein a force delivery component of the system is formed from a fiber reinforced composite material comprising a polymeric matrix and at least 5% by weight of reinforcing fibers embedded in the matrix, said composite material having a modulus of elasticity below 30×10^6 psi and a preselected ratio of Yield strength to modulus of elasticity within the range from a level comparable to that of 18-8 stainless steel up to at least 300 percent that of such stainless steel whereby more constant force levels can be applied with time and a continuous range of stiffness is achieved, said composite material having a higher maximum elastic deflection than said stainless steel and an ability to provide complex orthodontic configurations so as to enhance the ease and accuracy of force delivery.

4,717,342
COMBINABLE SET OF QUADRATIC ELEMENTS
Valéria Hidvégi, Budapest, Hungary, assignor to Pilky S. A.
PCT No. PCT/HU85/00004, § 371 Date Sep. 30, 1985, § 102(e) Date Sep. 30, 1985, PCT Pub. No. WO85/03453, PCT Pub. Date Aug. 15, 1985
PCT Filed Jan. 28, 1985, Ser. No. 784,882
Claims priority, application Hungary, Jan. 31, 1984, 418/84
Int. Cl.[4] G09B *1/32*
U.S. Cl. 434—96 **15 Claims**



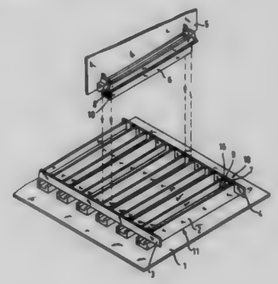


1. A combinable set of quadratic elements for laying out quadratic surfaces having variable appearance, with the sides of the surfaces being equal, said quadratic surfaces being divided into types of patterns with geometric dimensions equal to the half or the whole of the sides of each quadratic surface of different appearance, in which the number of quadratic elements is greater than the number of types comprising the following types where the quadratic surface is:
(a) uniform in color;
(b) divided into several non-overlapping and differently colored surfaces, with said colored surfaces adjoining along a 90-degree circular arc, the center of curvature of which lies in a corner and the radius of which equals half the length of the side of the quadratic surface;
(c) divided into several non-overlapping and differently colored surfaces, adjoining along a 90-degree circular arc, the center of curvature of which lies in a corner and the radius of which equals the length of the side of the quadratic surface;
(d) divided into three different colored surfaces, adjoining along respective 90-degree circular arcs, the center of curvature of the two arcs lying in a common corner, whereby the radii of the arcs respectively equal half the length and the length of the side of the quadratic surface; and
(e) divided into several non-overlapping and differently colored surfaces, adjoining along a semicircle, the center of curvature of which lies at the midpoint of a side of the quadratic surface and the radius of which equals half the length of said side.

4,717,343
METHOD OF CHANGING A PERSON'S BEHAVIOR
Alan B. Densky, 2060 Collier Ave., Suite 14, Ft. Myers, Fla. 33901
Filed Jun. 30, 1986, Ser. No. 880,551
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 **7 Claims**

1. A method of relieving a person of an undesirable habit by having that person view a program of pictures projected onto a screen, said program including the following sequence:
(a) a bright, clear first picture in color filling the screen and designed to cause a stressful thought in the mind of the person for approximately three seconds,
(b) then causing that first picture to gradually become blurred and smaller and become only black and white and finally shrink to a pinpoint at the center of the screen and disappear over a period of approximately six seconds,
(c) then out of the center of the screen causing a second picture to appear which is originally blurred and in black and white and as the second picture gets larger it becomes colored, clear and bright during a period of approximately six seconds until it fills the entire screen, said picture designed to cause a relaxing throught and in its largest size being held on the screen for a period of approximately three seconds,
(d) then causing the screen to go blank white for a period of approximately five seconds,
(e) then repeating the foregoing sequence of pictures (a) through (d) several times, and
(f) then speeding up the foregoing sequence of pictures (a) through (d) by 50% and repeating the foregoing sequence of pictures several times except that at the end of each sequence the screen goes blank white for approximately five seconds.

4,717,344
CONNECTOR FOR CIRCUIT BOARDS
Otto Schempp, and Martin Herold, both of Heilbronn, Fed. Rep. of Germany, assignors to Litton Precision Products International GmbH, Heilbronn-Biberach, Fed. Rep. of Germany
Filed Aug. 7, 1986, Ser. No. 894,412
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528912
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—61 **16 Claims**



1. A printed circuit board connector for electrically coupling a printed circuit board to a mating element, the connector comprising:
an elongated housing;
a first array of signal contacts mounted in said housing, wherein a first portion of said signal contacts extend out of

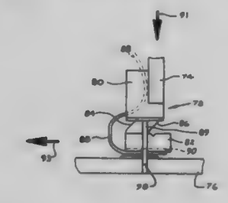
said housing and a second portion of said signal contacts are surrounded by said housing;
a polarity key means formed on at least one end of the elongated housing and asymmetrically positioned with respect thereto for preventing polarity reversal;
a recess formed in the polarity key means;
a lateral contact mounted in the recess and having a portion which protrudes from said recess; and
a termination contact formed on one end of said lateral contact, said termination contact being mounted adjacent the first portion of said signal contacts.

4,717,345

SOLDERLESS CONNECTOR TECHNIQUE AND APPARATUS

Herman B. Gordon, and Jeff Cannane, both of Phoenix, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 757,741, Jul. 22, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 898,121
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—67 5 Claims



1. In a solderless connector wherein mechanical means applies force against an elastomeric element to effect electrical contact between terminal portions of circuit devices, at least one of said devices being a flexible circuit device, the improvement comprising:
means for providing camming action against said elastomeric element wherein said terminal portions of said circuit devices will undergo relative movement during the electrical connection therebetween, wherein said means for providing camming action comprises:
first and second rigid members, said rigid members being mechanically interconnected by at least one spring means and being electrically interconnected by a flexible circuit interconnecting device, each of said first and second rigid members being adapted to connect with respective first and second rigid or flexible circuit devices;
an elastomeric pad being positioned between said second rigid member and said flexible circuit interconnection device; and
wherein force directed onto said first rigid member will be transmitted to said spring means and result in lateral movement between said flexible circuit interconnecting device on said second rigid member and the rigid or flexible circuit device adapted to be connected thereto.

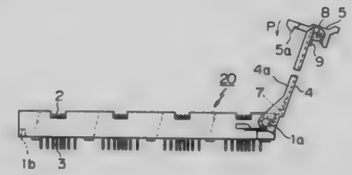
4,717,346

IC SOCKET

Tsutomu Yoshizaki, Yokosuka, Japan, assignor to Fujitsu Limited, Kanagaw, Japan

Continuation of Ser. No. 769,809, Aug. 28, 1985, abandoned, which is a continuation of Ser. No. 534,212, Sep. 20, 1983, abandoned. This application Dec. 12, 1986, Ser. No. 942,015
Claims priority, application Japan, Jul. 30, 1982, 57-169507; Sep. 28, 1982, 57-167524
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—71 2 Claims

1. An IC socket for leadless chip carrier type IC device, said IC socket comprising:
a socket body of molded resin having a plurality of recesses for receiving a plurality of said IC devices;
a cover which commonly covers said plurality of recesses for receiving said IC devices and which biases said IC devices toward said socket body;
a plurality of springy contacts arranged in said socket body, each contact resiliently contacting corresponding electrodes of the IC device from the bottom side thereof;
said cover being pivotally mounted on said socket body at an end thereof and including,
(a) a first spring biasing said cover to the open position
(b) a locking lever having a hook on a tip thereof and being pivotally mounted on said cover at the end opposite from said first spring, said hook being engaged with a latching recess in said socket body for securing said cover in the closed position and
(c) a second spring biasing said hook to the closed position for engagement with said latching recess, said hook having a tapered surface which abuts said socket body



during closing to force said locking lever and hook against the biasing force of said second spring, away from said latching recess to allow said hook to latch with said latching recess; and
an opening in the bottom each said recess of said socket body, such that an IC device in said recess may be pushed outward from said recess by an object inserted through said opening;
wherein said socket body includes grooves in which said springy contacts are disposed, said grooves being positioned at the sides of each of said recesses on an upper surface thereof, each of said grooves opening at an upper edge of a side surface of said socket body, and wherein each of said springy contacts comprise a U-shaped springy portion having an upward projection formed at an end of one leg of said U-shaped springy portion, and an integral pin-like lead terminal projection perpendicularly from the bottom surface of said socket body, said lead terminal being formed on the other leg of leg of said U-shaped springy portion.

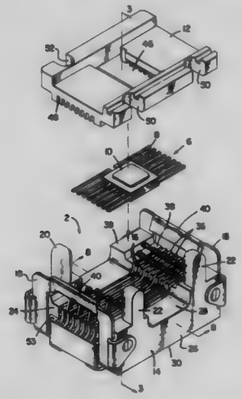
4,717,347

FLATPACK BURN-IN SOCKET

David A. Babow, Phoenix; Thomas K. Doench, Scottsdale, and Angelo V. Angeleri, Mesa, all of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 781,570, Sep. 30, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 6,315
Int. Cl.[4] H01R 23/72, 13/627
U.S. Cl. 439—72 20 Claims

1. A socket for establishing electrical interconnection to a flatpack semiconductor component having a plurality of leads projecting in a planar array from a base, the socket comprising:
an insulative housing;
means for securing the flatpack semiconductor component on an upper surface of the housing; and
a plurality of terminals positioned within the housing in registry with the flatpack leads, each terminal comprising a lead portion extending through the housing from the housing upper surface to a housing lower surface and a resilient contact portion in transition with a lower leg portion extending laterally along the spaced above the housing upper surface, the lead portion and the leg portion having a substantially L-shaped profile, each contact portion being doubly reversely formed intermediate the ends thereof, a first reversely formed section being adjacent and in a noncontacting relationship with the housing upper surface, the second reversely formed section being in transition with the first reversely formed section and



spaced from the housing upper surface, the first and second reversely formed sections being mutually reversely formed, whereby each contact portion is deflectable when a flatpack semiconductor component is secured to the upper surface of the housing with the leads engaging corresponding second reversely formed sections to establish and maintain electrical contact with corresponding leads.

4,717,348

MULTI-OUTLET ELECTRICAL SOCKET BOXES

Raymond Mazzullo, Villa Serena, Price Drive, Constantia, Cape Town, and Rowland B. Van Zyl, Lakeside, both of South Africa, assignors to Raymond Mazzullo, Constantia, South Africa

Filed Sep. 17, 1986, Ser. No. 908,366
Claims priority, application South Africa, Sep. 20, 1985, 85/7244
Int. Cl.[4] H01R 9/09, 13/11
U.S. Cl. 439—76 15 Claims



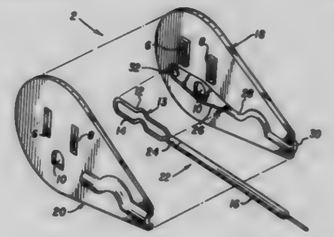
1. An electrically conductive component which comprises a horizontal base for mounting on a printed circuit board, and an upstanding structure comprising a pair of columns which are laterally spaced from one another on said base, the lower ends of which are joined to the base, and which extend upwardly from the base, a pair of spaced apart corrugated sections lying between said columns, and a pair of hairpin bends, a vertical edge of each section being joined to a vertical edge of the adjacent one of said columns by one of said hairpin bends, each section including first and second arcuate portions of different diameters and a third portion which is three sided, the sides of each third portion being generally at right angles to one another, said arcuate portions of said sections facing one another and defining two circular passages of different diameters and said third portions also facing one another and defining a passage of generally rectangular cross section, the axes of said passages being normal to said base, and said base protruding horizontally beyond said upstanding structure and there being a hole in the laterally protruding part of said base.

4,717,349

ELECTRICAL GROUNDING ACCESSORY

Hugh G. Johnson, Laurel Hollow, N.Y., assignor to Creek Electronics, Inc., Plainview, N.Y.

Continuation-in-part of Ser. No. 786,405, Oct. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 716,909, Mar. 28, 1985, abandoned. This application Aug. 26, 1986, Ser. No. 900,645
Int. Cl.[4] H01R 4/66
U.S. Cl. 439—92 20 Claims



1. An electrical grounding accessory comprising:
(a) a wafer-like body of electrical insulating material having three apertures therethrough configured and disposed to permit passage therein, with clearance, of the two power line prongs and ground prong of a three-prong electrical plug;
(b) contact means of resilient electrically conductive material embedded within the wafer-like body, the contact means having part thereof exposed in the ground prong aperture which, in use of the accessory, yieldably interferes with, and thereby makes electrical contact with, the ground prong of the three-prong electrical plug; and
(c) an elongated electrical wire lead having a first length portion embedded within the wafer-like body and electrically connected to the contact means, the remaining length portion of the wire lead extending away from the wafer-like body for connecting ground from a grounded wall outlet, into which the ground prongs of the three-prong electrical plug are inserted via the prong apertures of the accessory, to a remote component not otherwise grounded by way of the plug.

4,717,350

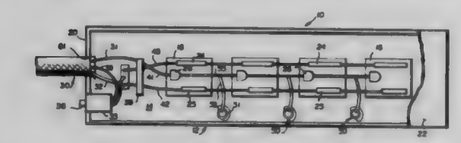
MULTIPLE OUTLET STRIP WITH INTEGRAL GROUNDING OF OTHER EQUIPMENT

Jonathan R. Lax, Langhorne, Pa., assignor to Voyager Technologies, Inc., Langhorne, Pa.

Filed Jul. 10, 1986, Ser. No. 883,939
Int. Cl.[4] H01R 13/652
U.S. Cl. 439—92 19 Claims

1. A multiple electrical outlet strip comprising:
a plurality of electrical outlet receptacles, having live, neutral and ground terminals, the terminals of the electrical outlet receptacles being adapted to be connected into a parallel circuit;
a three wire conductor for carrying an electrical current to the outlet receptacles, the conductor having live, neutral and ground leads;

a casing having a top with apertures therein for receipt of said receptacles, and side and end walls to enclose a space into which the receptacles extend from the top, the casing having an open side opposite the top and there being a cover to complete the enclosure of the space inside the casing the receptacles having openings that are exposed on the outside of the casing for receiving two and three pronged electrical plugs for connection to the terminals; and



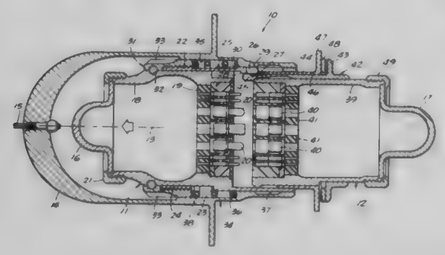
at least one ground connector jack, distinct from said receptacles, for grounding an accessory electrical device not plugged into any of said receptacles, said at least one ground connector jack mounted in an aperture formed in the top of said casing adjacent a receptacle, and exposed on the outside of the casing for receipt of a grounding plug of an accessory device, said at least one ground connector jack electrically connected to the ground lead for the three wire conductor by as ground wire extending from said at least one jack to the ground lead at a location between adjacent receptacles.

4,717,351

REDUNDANT ELECTRICAL CONNECTOR RELEASE

Larry L. McCormick, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Aug. 15, 1986, Ser. No. 896,873
Int. Cl.⁴ H01R *13/629*
U.S. Cl. 439—153 **7 Claims**



1. An electrical connector including plug and receptacle parts mated and unmated by relative movement along an axis, comprising:

releasable locking means interrelating mated plug and receptacle parts, said locking means including a plurality of fingers extending from each connector part, said fingers on the plug part being alignable with corresponding fingers on the receptacle part and enlarged end portions of the aligned fingers interlocking together on connector mating;

first spring-loaded means for releasing the locking means when a separating force exceeding a first predetermined minimum is applied to the connector; and

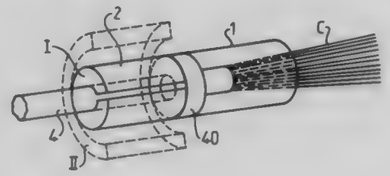
second spring-loaded means for releasing the locking means when a separating force exceeding a second predetermined minimum greater then the first predetermined minimum is applied to the connector.

4,717,352

CONNECTION ELEMENT BETWEEN AN ELECTRIC CONNECTOR AND A CONNECTOR CONTACT

Michel De Mendez, Montlhery; Raymond Bargain, Sartrouville; Yves Dohan, Paris, and Guy Herubel, Marly Le Roi, all of France, assignors to Souriau & Cie, France

Filed Mar. 13, 1986, Ser. No. 839,098
Claims priority, application France, Mar. 19, 1985, 85 04041; Jun. 3, 1985, 85 08331
Int. Cl.⁴ H01R *13/20*
U.S. Cl. 439—161 **16 Claims**



1. A connection element between an electric conductor and the rear part of a connector contact comprising:

a shank intended to receive the electric conductor; and

an active connection part intended to ensure electric connection and mechanical cohesion with the contact;

said active part being of conductive, homogeneous shape-memory material;

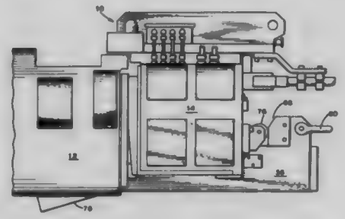
said active part being shaped in a manner to be able to adapt tightly to the rear part of the contact in a first shape-memory state and able to ensure the zero insertion force disengagement and/or the engagement of said element in a second shape-memory state said first and second shape-memory state of said active part being reversible.

4,717,353

DOCKING HEAD AND PLATE

Forest E. Block, Rockford, Ill., assignor to McDermott Incorporated, New Orleans, La.

Filed Jan. 21, 1987, Ser. No. 5,721
Int. Cl.⁴ H01R *13/629*
U.S. Cl. 439—310 **13 Claims**



1. A docking head and plate assembly, comprising:

a. a docking head having service connections for receiving and supplying services;

b. a docking plate removably engageable with said docking head and having service connections adapted for supplying services to said docking head; and

c. means for engaging and disengaging said service connections between said docking head and docking plate, comprising:

i. an air motor and drive shaft positioned in said docking plate;

ii. a screw drive rotatably mounted in said docking head and adapted to rotatably engage with said drive shaft; and

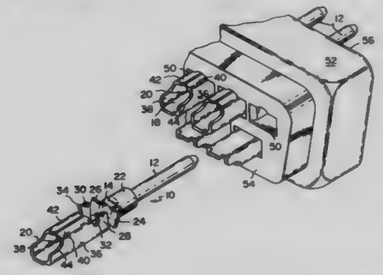
iii. a bushing plate threadably engaged on said screw drive for translational movement within said docking head in response to rotation of said screw drive.

4,717,354

SOLDER CUP CONNECTOR

Earl W. McCleerey, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 672,632, Nov. 19, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,431
Int. Cl.⁴ H01R *13/41, 13/428*
U.S. Cl. 439—444 **14 Claims**



1. A solder cup connector comprising an insulative housing having a mating face, an opposed rear face, and a plurality of passages therethrough from said mating face to said rear face, said passages having respective electrical terminals mounted therein, each terminal being stamped and formed from standard metal strip stock, each said terminal comprising a mating portion formed in a first direction from the plane of the stock material, a solder cup portion formed in a second, opposite direction from the plane of the stock material, and a transition portion therebetween, said transition portion crossing the longitudinal axis of the terminal to axially align the mating portion and the solder cup portion, said connector being characterized by a one-piece housing, said terminals being inserted in respective passages from said rear face, each said terminal having first retention means comprising a pair of opposed flanges extending laterally from the transition portion, said flanges bending to engage the side walls of the passage during insertion, said flanges serving to retain said terminals against withdrawal from said rear face.

4,717,355

COAXIAL CONNECTOR MOISTURE SEAL

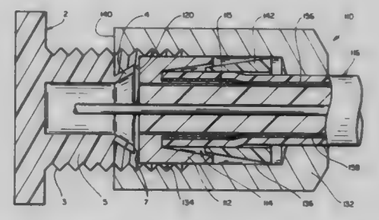
John S. Mattis, Sunnyvale, Calif., assignor to Raychem Corp., Menlo Park, Calif.

Filed Oct. 24, 1986, Ser. No. 922,607
Int. Cl.⁴ H01R *13/58*
U.S. Cl. 439—452 **6 Claims**

1. An apparatus for sealing a coaxial cable, comprising:

a connector disposed on an end of the cable so as to terminate the cable, the connector having an exposed face surrounded by an internal surface, the face and the internal surface defining a cavity having an open side, the face forming part of the cable end, and

a plug having threads engageable with the connector so as to close the cavity, an end face of the plug confronting the connector exposed face having formed therein a surface having an outermost cross-sectional area substantially less than the cross-sectional area of a threaded portion of the plug, the plug including a flange which interconnects the plug, threaded portion and the plug end face, the flange having a cross-sectional area subatntially less than the plug threaded portion, the plug being threadably secured to the connector such that the plug surface is sealingly



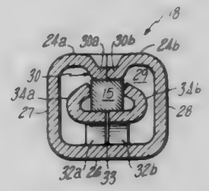
deformed against the connector face and maintained thereagainst, the plug electrically isolating the cable end.

4,717,356

ELECTRICAL RECEPTACLE TERMINAL

Thomas F. Rahrig, Antwerp, Ohio, and Thomas E. Hall, Fort Wayne, Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Apr. 10, 1986, Ser. No. 850,458
Int. Cl.⁴ H01R *13/58*
U.S. Cl. 439—464 **8 Claims**



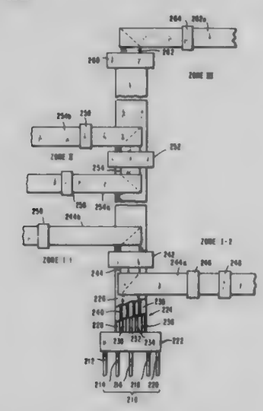
1. An improved electrical receptacle terminal having a longitudinal body for receiving an electrical pin terminal, spring means secured to the body and extending longitudinally therein and the direction of insertion of the pin terminal and being disposed for urging the pin terminal into contact with a part of the body, the improvement comprising:

said body including first and second opposing wall regions, a pair of opposing side walls connecting said first and second opposing wall regions, said body being of generally rectangular configuration in cross section transverse to its longitudinal extent, the forward ends of said first wall region and said pair of side walls being folded in and rearward and said spring means being integrally joined at only one end to said body and comprising a forward extension of said second wall which is also folded in and rearward at said one end of said spring means thereby to cumulatively define a substantially continuous entry aperture at the front of said receptacle body;

longitudinal rib means extending inwardly from said first wall region; and

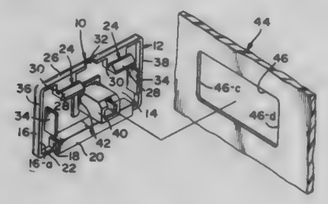
the spring means being intermediate said rib means and said second wall region and being split longitudinally from the other end thereof for at least part of its length to bifurcate said spring means and provide first and second relatively independent spring arms, a region of said spring means remote from said one end being normally in engagement with said second wall region prior to insertion of the pin terminal, and said first and second spring arms opposing said longitudinal rib means for receiving the inserted terminal pin therebetween and for independently and cooperatively contacting and urging the terminal pin into contact with the longitudinal rib.

4,717,357
SYSTEM AND METHOD FOR ELECTRICAL POWER INSTALLATION
William S. Greenwood, Nutley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Continuation of Ser. No. 630,795, Jul. 13, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,509
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—492 13 Claims



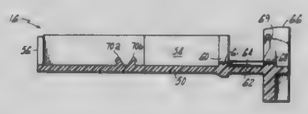
1. A flat conductor cable power distribution system comprising a discrete wire multi-phase feeder, a main flat cable having at least four conductors and connected to said feeder to have plural phase energization, an insulation-piercing power outlet receptacle overlying and connected to said main cable and thereby energized with a selective one of such phases, and a secondary flat conductor cable having at least one conductor less than the number of conductors of said main cable connected to said main cable and said power outlet receptacle at the juncture thereof, said secondary cable underlying said power receptacle and being energized by said one phase.

4,717,358
COVER PLATES FOR POWER DISTRIBUTION SYSTEM
George C. Chaundy, Westchester, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 31, 1986, Ser. No. 893,071
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—557 2 Claims



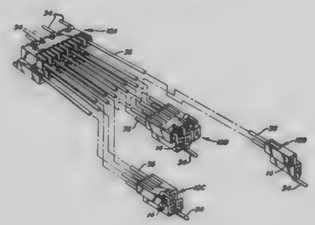
1. A cover plate for use with a wire raceway panel comprising:
dielectric plate means having a front face and a back face;
voice, data and/or fiber optic connectors mounted in said plate means with pluggable access on the front face for interconnecting voice and data equipment on the outside of the panel and means on the back face for connecting with appropriate wires and cables within the raceway; and
latch means on the plate means for latching said plate means in an opening in said panel, said latch means including slot means spaced from and extending along one edge of said back face and opening out parallel to the plane of said plate means and a latch member projecting outwardly from an opposite edge of said back face perpendicularly to the plane of said plate means and having shoulder means facing said back face, said slot means adapted to slide onto one edge of said opening in said panel and said latch member adapted to extend into said opening with said shoulder means engaging an inner surface of said panel adjacent an opposite edge of said opening and with a perimeter of said back face abutting the outer surface of said panel around the periphery of said opening.

4,717,359
ARRANGEMENT FOR SECURING ELECTRICAL TERMINAL IN TERMINAL HOLDER
Thomas F. Rahrig, Antwerp, Ohio, and Thomas E. Hall, Fort Wayne, Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Apr. 10, 1986, Ser. No. 850,459
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—595 10 Claims



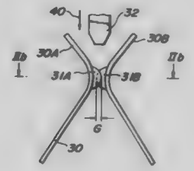
1. In a connector assembly including at least a terminal holder and an elongate terminal mounted in operative association with the terminal holder, the improvement wherein:
said terminal includes a mounting opening extending transversely through a longitudinal wall thereof; and
said terminal holder includes resilient snap-lock means extending from a support member through said terminal mounting opening for substantially preventing longitudinal motion of the terminal relative to the terminal holder and for substantially independently, yieldably restricting relative motion of the terminal substantially normal to and away from said terminal holder support member.

4,717,360
MODULAR ELECTRICAL CONNECTOR
Edwin E. Czaja, Mount Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Mar. 17, 1986, Ser. No. 840,628
Int. Cl.[4] H01R *9/00*
U.S. Cl. 439—710 8 Claims



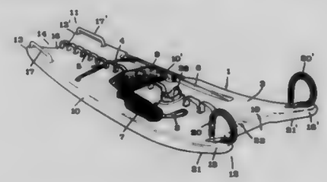
1. An electrical connector, comprising an elongate housing defining at least two laterally spaced, generally parallel rows of equally spaced contact supporting cavities, the contact supporting cavities in each row being in longitudinal positions offset relative to the longitudinal positions of corresponding ones of the cavities in the opposite row, said contact supporting cavities having common mating ends and terminating ends, and the conductor terminating ends of all the cavities having access means on one side of the connector for receiving conductors therethrough for termination to appropriate insulation displacement contacts supported in the cavities.

4,717,361
CONTACT FOR CONNECTOR
Yoshiaki Igarashi, Mooka; Hiroo Ohtsuka, Utsunomiya, and Osamu Hara, Kodaira, all of Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha and Iwatsu Electronic Co., Inc., both of Tokyo, Japan
Filed Jul. 29, 1986, Ser. No. 891,357
Claims priority, application Japan, Aug. 2, 1985, 60-119201
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—856 7 Claims



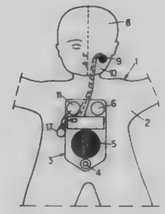
1. A contact for a connector, said contact including two opposed contact elements for receiving a male contact of a mating connector inserted therebetween in a direction of insertion;
each said contact element having a width and being provided with at least one protrusions for embracing said male contact, said protrusion of each of said two opposed contact elements extending to portions of said respective opposing contact elements devoid of said protrusions to overlap each other before said male contact is inserted therebetween, the sum of the total number of said protrusions on both said elements combined being at least three; and
each of said protrusions being symmetrically arranged across said widths of said opposed elements on a perpendicular axis to said direction of insertion.

4,717,362
LIFESAVING CRAFT
Urban Kraft, Stenhuggarvägen 3D, Bollnäs, Sweden
PCT No. PCT/SE85/00142, § 371 Date Jan. 13, 1986, § 102(e) Date Jan. 13, 1986, PCT Pub. No. WO85/05340, PCT Pub. Date Dec. 5, 1985
PCT Filed Mar. 29, 1985, Ser. No. 822,302
Claims priority, application Sweden, May 16, 1984, 8402637-6
Int. Cl.[4] B63C *9/32*
U.S. Cl. 441—82 4 Claims



1. An ice rescue craft comprising;
a bouyant structure which has a length substantially greater than its width so as to accommodate both the person in distress and a rescuer,
the bottom of the structure being generally flat,
at least one end of the structure having two projections, each being a prolongation of one of the sides of the structure,
at least one grab means located on top of each said projection, positioned to be grabbed by a person in distress,
said at least one end, between said projections, when viewed from above being in the shape of a shallow curved recess which comprises a means for receiving and centering a person in distress as that person is pulled onto the craft,
at least the bottom of each said projection being inclined upward in the direction toward the outermost end of that projection to constitute a means for facilitating movement of the craft up on an ice edge,
the upper side of the buoyant structure adjacent said shallow curved recess being inclined outwardly and downwardly toward the edge of said recess to constitute a means for facilitating pulling the person in distress up onto the craft,
and the end opposite from said one end having grasping means for the rescuer to grasp the craft.

4,717,363
DOLLS OR SIMILAR TOYS
Jacques Refabert, Saint Cyr S/Loire, France, assignor to Ets Anselme S.A., Langeais, France
Filed Jul. 29, 1986, Ser. No. 891,519
Claims priority, application France, Jul. 30, 1985, 85 11612
Int. Cl.[4] A63H *3/28*
U.S. Cl. 446—14 3 Claims



1. A toy comprising a doll body including a head with facial surface and an electrical circuit for generating the sound of a crying baby through a speaker, the improvement comprising an infrared radiation detector located immediately below said facial surface to receive heat emitted by a heat source in close proximity to said facial surface, said infrared detector generating a first electrical signal, an amplifier means coupled to and activated by said first electrical signal for generating a second electrical signal in response to said detector generated first electrical signal when infrared radiation exceeds a threshold level, and a switch means coupled to and activated by said second electrical signal for interrupting said electrical circuit and the generation of said sound through said speaker.

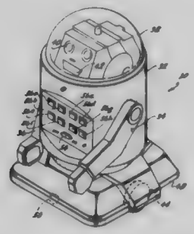
4,717,364
VOICE CONTROLLED TOY
Masami Furukawa, Tokyo, Japan, assignor to Tomy Kogyo Inc., Tokyo, Japan
Filed Sep. 4, 1984, Ser. No. 647,144
Claims priority, application Japan, Sep. 5, 1983, 58-162008
Int. Cl.[4] A63H *11/10*
U.S. Cl. 446—175 18 Claims

1. A robot which comprises:
a housing;
a plurality of movable means movable mounted on said housing for movement relative to said housing;
a motor means for producing a first output and a second output mounted on said housing, one of said first and second outputs comprising a clockwise output and the other of said first and second outputs comprising a counterclockwise output;

a drive means for propagating motion, said drive means operatively associated with said motor means so as to receive both of said first and second outputs of said motor means;

said drive means further operatively associated with each of said plurality of movable means, said drive mans for transmitting said first output of said motor means independently to each of said movable means so as to move said movable means relative to said housing;

said drive means including selector means for transfering at least said first output, said selector means rotatably mounted on said housing, said selector means rotating in response to said second output and said selector means remaining stationary in one of a plurality of positions in response to said first output, in each of said positions said selector means transferrings aid first output to one of said



plurality of movable means to move said respective movable means with respect to said housing;

a control means for controlling in which of said plurality of positions said selector means remains stationary, said control means operatively associated with said selector means;

said selector means includes a rotating member, said rotating member including a plurality of switch engagement means for engaging switches, said switch engagement means located on said rotating member in a spaced array;

said control means includes a plurality of switch means for switching, each of said switch means associated with one of said movable means, said switch means positioned in association with said rotating member whereby said array of said switch engagement means sequentially interacts with said plurality of switch means in response to rotation of said rotating member.

4,717,365

TRANSFORMABLE TOY VEHICLE AND SWORD COMBINATION

Michael A. Andersen; Henry Arias, both of Chicago, and Wayne A. Kuna, River Forest, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 12, 1987, Ser. No. 2,436
Int. Cl.[4] A63H *27/01, 33/30*
U.S. Cl. 446—230 **18 Claims**

1. A toy vehicle transformable into a toy sword comprising:

an elongated generally hollow body shell having an open forward end;

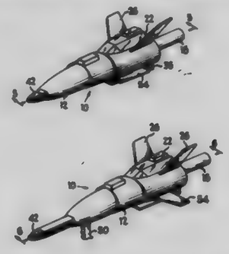
a handle projecting rearwardly from the body shell;

track means within the shell;

an extendable elongated blade member receivable within the shell, the blade member having guide means slidably received in the track means;

the blade member being slidable from a retracted position in which the blade member is substantially contained within the shell to a extended position in which a substantial part of the blade member extends beyond the open, forwrd end of the shell; and

another handle pivotally connected at one end to the blade member for movement between a folded down position in which the length of the handle is generally transverse to the length of the blade and a folded up position in which



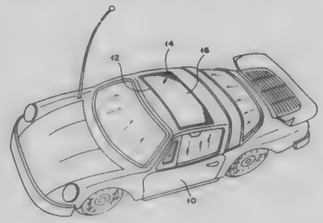
the length of the handle is generally parallel to the length of the blade.

4,717,366

DISGUISING TOY CAR

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,172
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—470 **4 Claims**



1. A disguising toy car, which comprises a car body of a predetermined width and shape and having a longitudinal axis and a body portion formed with an opening extending transversely of said longitudinal axis substantially across the width of the car body, a rotatable disguising mechanism arranged in said opening and comprising a rotatable element having first and second faces and being elastically supported for normally exposing, through an elastic force generated by the elastic support, said first face in said opening of the car body for blending-in with the shape of the car body, said second face of the rotatable element being exposed in said opening on rotating said rotatable element by an electric motor against said elastic force, said second face extending outwardly of the car body to impart to said car body a shape different from that provided by said first face, said rotatable disguising mechanism being operated by remote control.

4,717,367

TOY VEHICLE WITH EXTENDABLE SECTION

Leonard J. Stubenfoll, Chicago; Russell G. Rasmussen, Skokie, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 21, 1986, Ser. No. 819,735
Int. Cl.[4] A63H *17/02*
U.S. Cl. 446—437 **12 Claims**

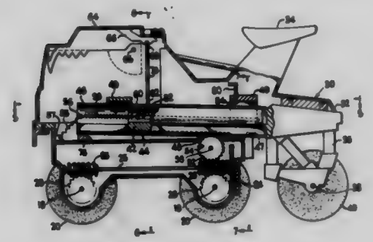
1. A toy vehicle including:

a front to back dimension;

a body having a forward end and a rearward end;

an extendable section carried adjacent one end of the body for extension from a first position adjacent the one end toward a second position to increase the front to back dimension of the vehicle;

the section having a proximal portion engaging the body and a distal portion spaced from the proximal portion and the one end of the body; and



means for extending the section away from the body upon the toy vehicle encountering a change in the angle of a playing surface upon which the toy vehicle moves.

4,717,368

STEPLESS BELT TRANSMISSION

Kozo Yamaguchi, Nagoya, and Masahiro Hasebe, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Jan. 23, 1986, Ser. No. 824,383
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—28 **3 Claims**

1. A belt-type stepless transmission for an automotive vehicle, comprising:

a transmission mechanism which comprises an input pulley and an output pulley of variable effective diameters, each having a movable flange and a stationary flange, a transmission belt stretched between the input and output pulleys, and servomechanisms for varying the effective diameters of the input and output pulleys, and wherein at least one of the servomechanisms being a hydraulic actuator; and

a control unit operable for supplying the hydraulic actuator with a working fluid or for discharging the working fluid from the hydraulic actuator dependent upon running conditions of the automotive vehicle in order to shift the transmission mechanism, wherein the control unit comprises:

a supply port for supplying the working fluid to the hydraulic actuator;

a discharge port for discharging the working fluid from the hydraulic actuator;

a lead mechanism for changing working fluid pressure internally of the hydraulic actuator by varying an opening degree of the supply port or the discharge port by means of an electric motor controlled independently of the working fluid and dependent upon the running conditions of the automotive vehicle; and

a follow-up mechanism operatively associated with a movable flange displaced by the changed working fluid pressure for restoring the opening degree varied by the lead mechanism, wherein the supply and discharge of the working fluid for operating the hydraulic actuator is controlled.

4,717,369

INCREMENTALLY VARIABLE TRANSMISSION

Royce H. Husted, 711 Lakeside Dr., Wheaton, Ill. 60187, assignor to Royce Husted and Samuel Shiber, both of Wheaton, Ill.

Continuation-in-part of Ser. No. 643,031, Aug. 21, 1984, Pat. No. 4,645,475, which is a continuation-in-part of Ser. No. 456,736, Jan. 10, 1983, Pat. No. 4,521,207, which is a continuation-in-part of Ser. No. 387,618, Jun. 11, 1982, Pat. No. 4,493,678, which is a continuation-in-part of Ser. No. 310,506, Oct. 13, 1981, abandoned. This application Oct. 27, 1986, Ser. No. 925,541
The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.
Int. Cl.[4] F164 *55/30, 55/54*
U.S. Cl. 474—49 **2 Claims**



1. A variable-sprocket mounted on an axle having crank-arms defining an imaginary line, comprising in combination:

a drive-flange and an indexing flange,

two sprocket-segment-planets and at least two idler-planets, and planets being connected to said flanges and adapted to radially slide on them, means for radially expanding and contracting said planets in order to increase and decrease, respectively, the effective diameter of said sprocket,

a chain which wraps approximately one half of said sprocket while being supported by said planets,

said sprocket-segment-planets having teeth adapted to engage with said chain,

said imaginary line passing through said sprocket-segment-planets.

4,717,370

NOVEL PULLEY WITH DAMPENING ELEMENT

Harald Röhrig, Bonn, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,694
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535859
Int. Cl.[4] F16H 55/06
U.S. Cl. 474—161 10 Claims



1. A pulley comprising an outer rim provided with an outer running surface for a pulley belt and a hub concentric with the rim and a dampening element connected to the rim and hub in a non-rotating manner, the rim and hub being rigidly supported to one another in a radial and axial direction and the rim capable of moving at an angle to the hub in the circumferential direction, the rim and hub being made of a hard polymeric material and the dampening element being made of a softer polymeric material, the outer rim (3,15,22) and the hub (4,14,21) are connected to form an integral element by leaf spring-type ribs (6,16,23) having their least bending resistance moment around axes running parallel to the longitudinal axis of the pulley (1,13,20).

4,717,371

APPARATUS FOR MAKING BULK CONTAINERS FROM LAMINATED PAPERBOARD

Wayne F. Everman, Cedar Falls; Randy J. Klug, Dike, and Raymond L. Russell, Cedar Falls, all of Iowa, assignors to Container Corporation of America, Alton, Ill.

Filed Dec. 22, 1986, Ser. No. 944,861
Int. Cl.[4] B31B 7/00
U.S. Cl. 493—96 2 Claims

2. Apparatus for making a bulk container from a pair of outer body and inner linear blanks of foldable sheet material, such as paperboard, which are laminated together, scored, folded, and glued to form a tubular structure, said apparatus comprising:

(a) a laminating station including means for bringing a body blank and linear blank together in face to face relation and interposing adhesive therebetween to form a laminated sheet;

(b) a first clamping station including means for receiving a plurality of said laminated sheets, one at a time, and simultaneously clamping several while said adhesive is curing, said clamping station comprising:

(i) a frame;

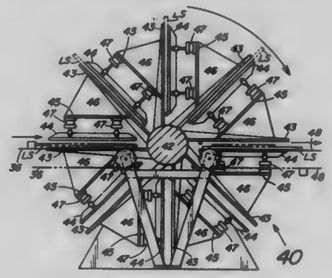
(ii) a shaft carried by said frame for rotation about a horizontal axis;

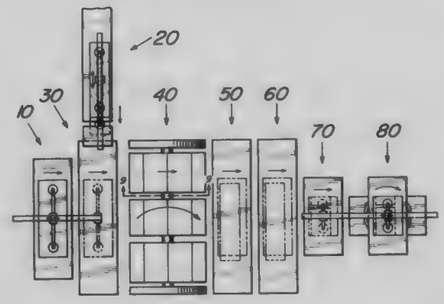
(iii) a plurality of circumferentially spaced clamping members extending radially outward from said shaft and each comprising a fixed plate, a movable plate, and means for moving the movable plate toward and away from the fixed plate;

(c) said means for moving the movable plate of one clamping member toward and away from the related fixed plate of said one clamping member including a cylinder mechanism interconnected between said movable plate and fixed plate of an adjacent clamping member;

(d) a scoring station including means for forming folding scores in said laminated sheets;

(e) a folding station including means for folding opposite





ends of said laminated sheet into overlapped relation to form a tubular structure;

(f) a second clamping station including means for clamping said tubular structure to complete the making of a container;

(g) conveyor means for transferring said blanks and sheets between said stations.

4,717,372

APPARATUS FOR PRODUCING A MACHINE-DIRECTION INTERMITTENT HEAT SEAL

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1986, Ser. No. 938,894
Int. Cl.[4] B31B 23/64, 23/86
U.S. Cl. 493—193 7 Claims

1. Apparatus for producing a machine-direction intermittent heat seal in opposing layers of thermoplastic film in a hem in a moving web of thermoplastic film comprising:

a block supported on one side of the hem,

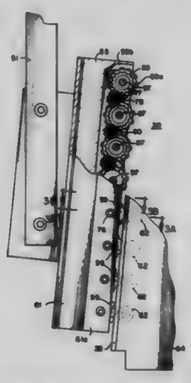
a plurality of wheels having heat conducting surfaces spaced around the periphery and mounted on said block at spaced locations in tandem in the direction of web movement for engaging one of the opposing layers of film at intermittent locations along the path of the hem in the direction of web movement, said block having a corresponding plurality of surfaces each of which is engaged by a side of one of said wheels,

gear means interconnecting said wheels to maintain said wheels in register with the intermittent portions of the heat seal in the hem during rotation of said wheels,

means for heating said block and its plurality of surfaces,

means for maintaining said wheels in contact with said plurality of surfaces on said block for heating said wheels by conduction from said block, and

means supported on the opposite side of the web comprising a plurality of back-up rollers for engaging the opposing layer of film in the hem and cooperating with said plurality of heated wheels to press together the opposing layers of film in the hem, said plurality of heated wheels and said



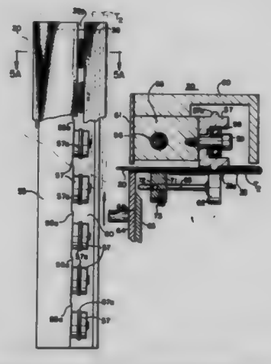
plurality of back-up rollers being freely rotatable whereby movement of the web through the heat sealing apparatus causes said plurality of heated wheels and said plurality of back-up rollers to rotate and heat seal the opposing layers of film in the hem at the intermittent locations along the path of the hem in the direction of web movement to produce the intermittent heat seal in the hem.

4,717,373

APPARATUS FOR SEALING A HEM IN A MOVING WEB OF FILM USING ANGULARLY ORIENTED HOT WHEELS

Vernon C. Catchman, Palmyra, and Fox J. Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,449
Int. Cl.[4] B31B 23/64, 23/86
U.S. Cl. 493—193 9 Claims



1. Apparatus for producing a machine-direction heat seal in opposing layers of thermoplastic film in a hem in a moving web of thermoplastic film, comprising:

a block supported on one side of the hem,

a plurality of rollers mounted on said block at spaced locations in tandem in the direction of web movement for engaging one of the opposing layers of film of the hem along the path of the hem in the direction of web movement, said block having a corresponding plurality of surfaces each of which is engaged by a side of one of said rollers, each of said surface being slightly angled with respect to the path of the hem in the direction of web movement,

means for heating said block and its plurality of surfaces, and

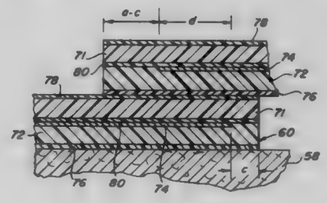
a plurality of shafts corresponding with said plurality of rollers, said shafts projecting from said corresponding plurality of angled surfaces of said block and supporting said rollers for free rotation about their axes with said one side thereof engaging said angled surfaces to provide a corresponding angled orientation of the axes of said rollers relative to the direction of web movement, whereby movement of the web through the heat sealing apparatus causes said plurality of rollers to rotate and the angled orientation of the axes thereof produces a force holding said rollers in contact with said plurality of angled surfaces whereby said rollers are in turn heated by conduction from said heated block.

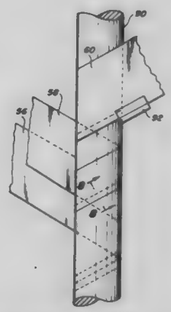
4,717,374

METHOD FOR FORMING A COMPOSITE CONTAINER WITH HIGH BARRIER LINER LAYER

Thomas C. Elias, Ballwin, Mo., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Oct. 6, 1986, Ser. No. 915,549
Int. Cl.[4] B31C 13/00
U.S. Cl. 493—292 7 Claims





1. A method for forming a helically wound composite container, comprising the steps of:

(a) vacuum depositing on a first face of a supply web (72) of synthetic plastic material a plurality of parallel spaced first metal strips (74) arranged in parallel relation to the longitudinal edge of said web, said supply web being coated on its opposite face with a first layer (76) of heat-sealable material;

(b) coating the metal strips and the adjacent exposed portions of said first supply web face with at least one second layer (78) of a heat-sealable material compatible with said first heat-sealable layer;

(c) longitudinally severing said supply web along parallel

lines of severance (84) each extending in spaced relation between the adjacent longitudinal edges of a successive pair of said metal strips, respectively, thereby to define at least one first inner liner web (60), each line of severance being spaced a given distance (c) from the corresponding edge of the associated metal strip, respectively;

(d) helically winding the first web (60) on a mandrel in edge-overlapping relation such that the longitudinal edge of one metal strip overlaps the other longitudinal edge of that strip by a given distance (d); and

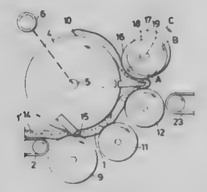
(e) heat sealing together the adjacent surfaces of the overlapping edge portions of said first web, thereby to define a reinforcing liquid-impervious tubular inner liner structure.

4,717,375

APPARATUS FOR FOLDING A FLEXIBLE ARTICLE

Einar Lundmark, Bålsta, Sweden, assignor to Mo och Domjo Aktiebolag, Ornskoldsvik, Sweden

Filed Nov. 26, 1986, Ser. No. 935,417
Claims priority, application Sweden, Jan. 8, 1986, 8600074
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—360 **10 Claims**



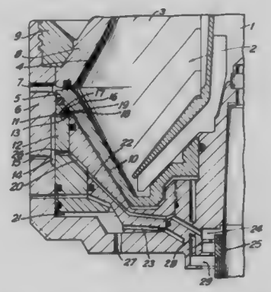
1. Apparatus for folding a flexible article (1). for example a diaper, in which the article is advanced in a transport direction and in a substantially flat state by conveyor means (2) to a folding station and discharged from said station in a folded state, characterized in that the folding station includes a driven main folding roll (4) which co-acts with an underlying counter roll (9), said two rolls defining therebetween a nip for capturing and further transport of the article from the conveyor (2) to at least one driven transport roll (11,12) intended for guiding the forward end (10) of the article (1), as seen in the transport direction, onto a first arcuate surface of a first portion of a folding roll member (16,17) for co-acting with the main folding roll (4), the first portion of the folding roll member being arranged to be driven in a first folding phase in a first rotational direction (B) and for frictionally engaging the first arcuate surface with the article (1) to transport said article through a given distance up against the upper part of the main folding roll (4) and, the folding roll member having a second portion, with a second arcuate surface, for co-acting with the main folding roll during a second folding phase, and for being driven in a second rotational direction (A) opposite to the first rotational direction and for frictionally engaging the second arcuate surface with the article to move the forward part of said article, as seen in the transport direction, down from the upper part of the main folding roll; and arranged in the interior of the main folding roll (4) is a folding-finger device (7) which, during said second folding phase, is intended to be moved by drive means (22; 34) out from the main folding roll so as to press a central part of the article (1) into the nip between the folding roll member (16,17) and the transport roll (12) located therebeneath.

4,717,376

CENTRIFUGE WITH A SELF-EMPTYING DRUM

Paul Bruning, and Willi Niemerg, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,883
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524731
Int. Cl.[4] B04B *3/08*
U.S. Cl. 494—40 **3 Claims**



1. In a centrifuge with a self-emptying drum having a jacket with expulsion apertures that lead from a solids space in the drum, a first axially movable piston slide for closing off the expulsion apertures, means forming a closure chamber for effecting closing movement of the piston, channels for supplying closure liquid to the chamber and a let-off channel for the closure chamber including means forming an annular gap, an annular chamber that can accommodate all of the closure liquid and let-off bores with constrictions and extending out through the jacket of the drum, a hydraulically controlled valve body for closing off the annular gap, the improvement wherein the valve body comprises a second axially movable piston slide and has means forming an annular valve gap at the periphery of the closure chamber and wherein the annular gap and the valve gap are disposed between an upper surface of the second piston slide and a lower surface of the first piston slide, and wherein the inside diameter of the annular chamber is at least as long as the outside diameter of the closure chamber.

4,717,377

BLOOD CIRCULATING CIRCUIT FOR MEMBRANE-TYPE ARTIFICIAL LUNG, AND RESERVOIR FOR USE IN BLOOD CIRCULATING CIRCUIT

Hiromichi Fukasawa, Funabashi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

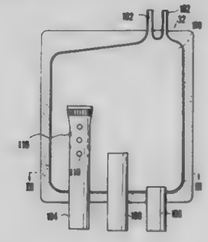
Continuation of Ser. No. 595,906, Apr. 2, 1984, abandoned, which is a division of Ser. No. 439,422, Nov. 5, 1982, abandoned. This application Aug. 15, 1986, Ser. No. 898,818
Claims priority, application Japan, Nov. 13, 1981, 56-180983
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—4 **4 Claims**

1. A flexible reservoir comprising:

a flexible vessel having a dearation port provided at an upper portion thereof;

a blood inflow tube extending substantially upward into said vessel and coupled to a source of blood to introduce blood into said vessel, said blood inflow tube having an upper end portion extending a predetermined distance into said vessel and a lower end portion also extending into said vessel, the upper end of said upper end portion being sealed closed, and said blood inflow tube having a plurality of side apertures in said upper end portion adjacent said sealed closed upper end for blood inflow into said vessel to provide a debubbling effect to the inflowing blood and in order to make the blood inflow smooth and gentle, said side aperture being provided at a predetermined height in said vessel, and lower end portion of said blood inflow member being devoid of said side apertures, the portions of said blood inflow tube interior of said vessel being in free blood flow communication with substantially the entire interior of said vessel; and

said vessel being devoid of debubbling materials around said blood inflow tube, whereby the portion of said blood inflow tube interior of said vessel is in free blood flow communication with the entire interior of said vessel;



blood outflow means including a blood outflow port opening into said vessel at a position lower than said side apertures by a predetermined distance; and

wherein when the sum of the opening areas of said side apertures is represented by y (cm^2) and the rate of blood inflow into said vessel from said side apertures is represented b x (l/min), in order to provide defoaming of blood without providing debubbling material in or around said blood inflow tube, the following relation is satisfied:

$$0.17x+0.2<y<0.17x+1.5.$$

4,717,378

METHODS FOR DETECTING DEHYDRATION OF A BIOMEDICAL HYDROGEL

James J. Perrault, Brooklyn Center, Minn., and George Jordan, Fairfield, Conn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 31, 1986, Ser. No. 846,387
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **10 Claims**

1. A visual method for detecting the state of dehydration of a polymeric gel disposed on the skin-contacting surface of a biomedical device comprising the steps of:

selecting a weakly acidic or weakly basic, pH sensitive colored indicator;

preparing the gel by incorporating the selected indicator therein to produce a gel having a first color;

applying the first color gel to a skin-contacting surface of a biomedical device; and

shortly before the device is to be used, visually comparing the color of the gel just before used with its first color to determine the relative state of dehydration of the gel.

4,717,379

CATHETER, PROBE OR SIMILAR DEVICE

Erik Ekholmer, Danderyd, Sweden, assignor to Mediplast AB, Solna, Sweden

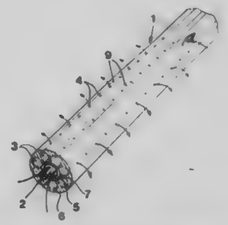
PCT No. PCT/SE85/00267, § 371 Date Feb. 28, 1986, § 102(e) Date Feb. 28, 1986, PCT Pub. No. WO86/00232, PCT Pub. Date Jan. 16, 1986
PCT Filed Jul. 1, 1985, Ser. No. 841,516
Claims priority, application Sweden, Jun. 29, 1984, 8403474
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—43 **6 Claims**

1. A catheter having two ends and being adapted to be inserted at one end into a body cavity, said catheter comprising:

an inner tube and an outer coaxial tube, both of said tubes having exterior and interior surfaces;

longitudinal partitions extending between the exterior surface of the inner tube and the interior surface of the outer tube;

said longitudinal partitions defining separate longitudinal passages between the exterior surface of the inner tube and the interior surface of the outer tube;



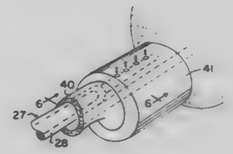
said outer surface of the outer tube having a plurality of capillary holes extending therethrough and communicating with the longitudinal passages; and at least some of the longitudinal passages being adapted to be attached to a pressure source means for supplying fluid which is admitted to penetrate the plurality of capillary holes into the body cavity outside of the catheter.

4,717,380

METHOD AND APPARATUS FOR MEDICALLY TREATING RECESSED BODY TISSUE

George C. Baumgartner, 41450 N. West Lake Ave., Antioch, Ill. 60002

Filed Dec. 23, 1985, Ser. No. 812,519
Int. Cl.[4] A61M *31/00*; A61B *1/06*
U.S. Cl. 604—54 **4 Claims**



1. The method of medically treating recessed body tissue such as that of a prostate gland, comprising the steps of:

providing a tube defining a lumen and having an end portion having at least one opening communicating with said lumen;

inserting said end portion of the tube through a patient's body into tissue to be treated recessed therein;

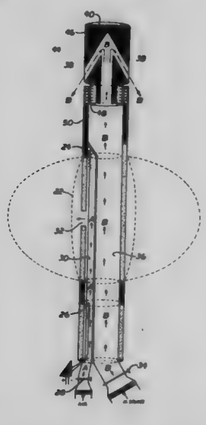
aspirating fluid from the tissue outwardly through the opening and tube lumen;

maintaining the tube end portion in the tissue following the aspirating step and delivering medicament fluid through the tube lumen and opening to the aspirated tissue; and

withdrawing the tube from the tissue and body, viewing means being associated with said tube, said method further including the observation of the disposition of said tube end portion as it is inserted into the tissue to be treated.

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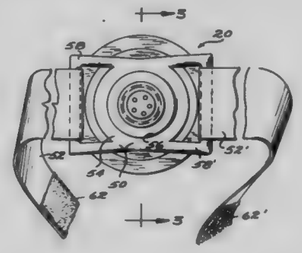
4,717,381
HYDRODYNAMICALLY PROPELLED CATHETER
Apostolos C. Papantonakos, Athens, Greece, assignor to Kos Medical Technologies, Ltd., Tampa, Fla.
Filed May 13, 1986, Ser. No. 862,677
Claims priority, application Greece, May 13, 1985, 1148
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—95 13 Claims



1. A hydrodynamically propelled catheter of the type primarily used for insertion of temporary pacemaker into the right ventricle of a patient's heart, said catheter comprising; an elongated flexible catheter tube for insertion through the patient's blood vessels into the right ventricle, said catheter tube having a cephalic end and a rearward end; said cephalic end including a plurality of rearwardly facing ports substantially equally spaced around the perimeter thereof, eaach of said ports including an axis which defines an angle with the axis of said catheter tube of from about 5° to about 30°; said catheter tube further having at least one fluid lumen disposed longitudinally inside said tube, a distal end of said fluid lumen being in fluid-communicating relation to at least one of said ports and a rearward end of said fluid lumen exiting said catheter tube rearward end, said fluid lumen rearward end being operatively connected to a fluid source whereby fluid may pass from the source through said fluid lumen and be expelled through at least said one port to impart a forward thrust to said cephalic end; said catheter further comprising spaced apart first and second pacing electrodes, said first electrode being disposed substantially adjacent said cephalic end and said second electrode being disposed rearwardly of said cephalic end, both said first and second electrodes being positioned for electrical contact with the patient and being operatively connected to a source of electricity whereby an electrical stimulus may be applied to the patient's heart.

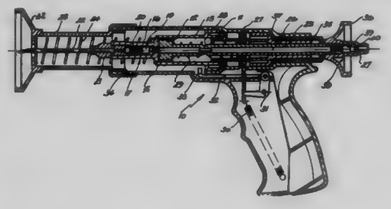
4,717,382
NONINVASIVE APPARATUS FOR TREATING A SUCKING CHEST WOUND
R. Michael Clemens, Beltsville, and Kenneth A. Zoltvay, Rockville, both of Md., assignors to Emergency Management Products, Inc., Rockville, Md.
Continuation-in-part of Ser. No. 724,820, Apr. 18, 1985, abandoned. This application Feb. 5, 1986, Ser. No. 826,225
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—122 9 Claims

1. A noninvasive apparatus for temporarily assisting in treatment of a sucking chest wond, said apparatus comprising:
- a flexible, annular member for placement in fluid-tight relationship against a patient's body and around said wound;
- transparent, rigid, dome-shaped means attached in fluid-tight relationship to said annular member for enabling visual monitoring of levels of fluids escaping from said wound and entering said apparatus beneath said dome-shaped means;
- said dome-shaped means including an annular flange attached in fluid-tight relationship to said annular member; a first annular sidewall projecting upwardly from said flange; an annular surface projecting inwardly from said sidewall and substantially parallel with said flange; a second annular sidewall projecting upwardly from said annular surface; a substantially flat element defining at least one aperture therein and connected to upper extremities of said second annular sidewall in substantially parallel relationship with said annular surface; and a third annular sidewall surrounding said aperture and projecting upwardly from said flat element;



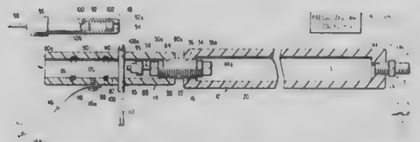
- valve means in operative relationship with said flat element and said aperture for automatically enabling passage of air in substantially only one direction from within said dome-shaped means outwardly through said aperture and for permitting escape of air from the patient's thoracic cavity while preventing air from entering the patient's thoracic cavity through the wound;
- a fastening member shaped to fit over and slidably engage said second annular sidewall and to be positioned and held on said annular surface; and
- strapping means attached to said fastening member for holding said fastening member in position on said annular surface and for enabling the adjustable strapping of said apparatus in substantially fluid-tight relationship against the patient's body and over the wound.

4,717,383
INJECTOR
Ian R. Phillips, Killara; Robert H. Lodge, and Glen W. Bunyan, both of Dee Why, all of Australia, assignors to N.J. Phillips Pty. Limited, New South Wales, Australia
Filed Jul. 30, 1985, Ser. No. 760,393
Claims priority, application Australia, Jul. 31, 1984, PG6305
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—135 13 Claims



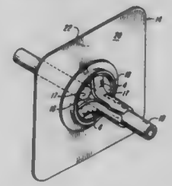
1. An injector to deliver a predetermined dose into an animal, said injector comprising a hollow body, an interacting piston and cylinder mounted within the body and cooperating to define a variable volume working space, said piston or cylinder being fixed to said body and the other being movable longitudinally along the longitudinal axis of said piston and cylinder between a rest position defining a minimum volume of said space and a cocked position defining a maximum volume for said space, delivery means including a needle fixed to said body and communicating with said space and through which said dose is delivered into said animal, an inlet means to be connected to a supply of liquid and communicating with said space so that liquid forming said dose may be delivered into said space, spring means biasing said piston or cylinder to said rest position, retaining means to selectively retain said piston or cylinder in said cocked position and operable to release said piston or cylinder, and release means to automatically operate said retaining means upon said needle being located at predetermined distance within said animal to thereby release said piston or cylinder.

4,717,384
PNEUMATIC HYPODERMIC SYRINGE POLE
Robert B. Waldeisen, Williamsport, Pa., assignor to Pneu Dart Inc., Williamsport, Pa.
Filed Jan. 15, 1987, Ser. No. 3,517
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—143 12 Claims



1. A pneumatic hypodermic syringe pole for supporting a tubular hypodermic syringe, said hypodermic syringe comprising a hollow tubular syringe body having a needle at one end, having internally a drug injection chamber communicating with said needle, a plunger within said chamber, sealing off said chamber and being axially displaceable to eject a drug from said drug injection chamber through the needle when displaced in the direction of the needle, an opening within the end of said syringe body opposite said needle for receiving a pressurized gas to displace the plunger axially to effect drug ejection, comprising at least one elongated hollow tube, means defining a gas storage chamber within said at least one hollow tube, one end of said at least one hollow tube forming a handle for manual grasping, the other end of said at least one hollow tube including an axial bore for supporting said hypodermic syringe therein, means for supporting an axially shiftable valve member internally of said at least one hollow tube coaxially with said syringe, said valve member having one end positioned in the path of said movement of said axially displaceable syringe, fluid passage means within said axially displaceable valve aligned within said syringe and being selectively opened or closed off to said gas storage chamber at the end opposite said needle and means for biasing said axially slidable valve member in a direction tending to close off communication between said gas storage chamber and said fluid passage means within said axially slidable valve member such that, an operator by grasping the handle end of said at least one elongated hollow tube and jabbing the needle of said axially displaceable syringe into the body of an animal, causes said syringe to move axially relative to said at least one elongated hollow tube to the extent of completing communication between the hole within the syringe body opposite the needle and the end of the axially displaceable valve member proximate to said syringe thereby forcing said axially shiftable valve member to move against said biasing means and to complete communication between the gas storage chamber and the interior of the syringe behind the plunger such that a charge of pressurized gas is applied to said plunger to force the plunger to move axially within the hypodermic syringe body and to inject the drug from the injection chamber into the body of the animal through and wherein, retraction of the handle by the operator and removal of the needle from the body of the animal automatically causes said valve to close preventing further flow of gas from the storage chamber to said syringe body.

4,717,385
SURGICAL TUBE ANCHORING DEVICE AND METHOD FOR USING SAME
Pamela E. Cameron, Framingham, and Esther F. Borrelli, Cambridge, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.
Continuation of Ser. No. 722,354, Apr. 12, 1985, abandoned. This application Dec. 10, 1986, Ser. No. 939,276
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—174 27 Claims



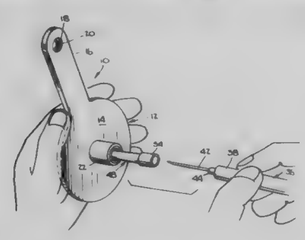
1. An apparatus for stabilizing surgical tubing, comprising:
- a wafer, having a hole in its center, a first side of said wafer affixed to the patient and a second side of said wafer opposite the first side having a flanged ring concentric with the hole; and
- a support tube through which surgical tubing can be passed, provided at one end with at least three bent legs connected with and extending from said support tube, each leg having edges and a part contiguous to said support tube and an extended part, said contiguous parts extending substantially axially to the support tube, said extended part extending substantailly radially outward from the long axis of the support tube, said legs being shaped such that the edges of said legs at the bends of said legs are equally spaced apart around the perimeter of a circle concentric with said support tube, said legs being flexible and capable of releasably attaching said support tube under a flanged portion of the flanged ring of said wafer, such that when said legs are attached under the flanged ring of said wafer affixed to a patient, a surgical tube passed from an incision in the patient through the hole in said wafer, hole in the flanged ring, and said support tube is secured.

4,717,386
SAFETY DEVICE FOR A NEEDLE
John Simmons, R.D. #2 Independence Ct., Brewster, N.Y. 10509
Continuation of Ser. No. 811,499, Dec. 20, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 944,436
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 33 Claims

1. A device for uncapping and recapping a removable protective sheath of a needle comprising, a plate-like member having one surface provided with at least one sheath holding means and an opposite flat planar surface, said sheath holding means including a sheath retainer with a reces for accommodating said sheath, engaging means in said sheath retainer for detenting said sheath in said recess with a predetermined detent when said sheath is located in a predetermined position in said recess, said sheath retainer having a closed end portion to prevent projection of the detented sheath beyond said opposite

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flat planar surface whereby the opposite flat planar surface can make surface-to-surface contact with a flat support surface

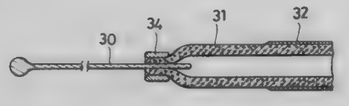


thereby permitting stable positioning of said plate-like member on the flat surface when said sheath is disposed in said recess.

4,717,387
CATHETER

Kiyoshi Inoue, Urawa; Keiichi Kuwaki, Tokyo, and Koichi Tsuno, Osaka, all of Japan, assignors to Sumitomo Electric Industries Ltd., Japan

Division of Ser. No. 592,719, Mar. 23, 1984, Pat. No. 4,619,247. This application Jun. 25, 1986, Ser. No. 878,133
Int. Cl.⁴ A61M *5/325, 35/00*
U.S. Cl. 604—264 **6 Claims**

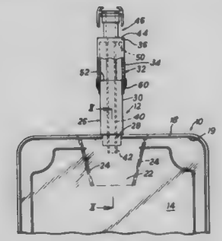


1. A catheter for insertion into a living body comprising a flexible tube having a fluid passageway for a first fluid, means at the rear end portion of said tube for providing a connection to means for admitting a first fluid to said fluid passageway and means disposed at a front end portion of said flexible tube for allowing said first fluid fed through said fluid passageway from said rear end portion to eject into the living body to directions other than the axial direction as well as the axial direction, said flexible tube comprising a porous tube covered with a pressure-resistant covering except for end portion thereof, said means at the front end comprising the exposed end portion of said porous tube.

4,717,388
BAG AND VALVE ASSEMBLY FOR MEDICAL USE

Peter L. Steer, Surrey, and John V. Edwards, Sussex, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 22, 1982, Ser. No. 400,767
Claims priority, application United Kingdom, Aug. 7, 1981, 8124291
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—323 **3 Claims**



1. A bag and valve assembly for medical use, said bag comprising two sheets of plastics material welded together around their periphery except for an opening at the top edge, a flap valve comprising two flaps of plastics material individually welded at their upper edges to the sheets of plastics material which form said bag so that said top edge opening leads into said flap valve, said flaps also welded to each other along their side edges but not connected at their lower edges, and a second valve comprising a first tubular member secured to said top bag opening and a second longitudinally slidable tubular valve member having a downwardly extending tube which in the open position passes down through said first tubular member and extends between said flaps so as to provide access to the contents of said bag, said first tubular member having a cylindrical portion extending upwardly outside said bag and said longitudinally slidable tubular valve member having an external sleeve which slides on said cylindrical portion so as to move said downwardly extending tube from a closed to an open position.

4,717,389
HAIR-RESERVING DYEING OF WOOL- AND FUR-BEARING SKINS

Rudolf Seitz, Ormalingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 30, 1986, Ser. No. 868,459
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520105
Int. Cl.⁴ D06P *3/04, 3/32*
U.S. Cl. 8—436 **29 Claims**

1. A process for dyeing the leather side of a tanned wool- or fur-bearing skin which comprises dyeing said skin in an aqueous medium with (a) a hydrosoluble sulpho group-containing sulphur dye or a mixture of such dyes in the presence of (b) a dye-substantive uptake assistant or a mixture of such assistants and (c) a non-ionic or anionic hydrophilic dispersant or mixture of such dispersants, there being employed 2–200 parts by weight of (b) and 2–500 parts by weight of (c) per 100 parts by weight of (a).

4,717,390
METHOD FOR DYEING LEATHER WITH WATER-SOLUBLE SULPHO GROUP-CONTAINING SULPHUR DYES

Michel Dien, Rixheim, France, assignor to Sandoz Ltd., Basel, Switzerland

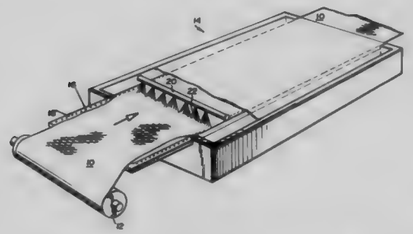
Filed Jan. 30, 1986, Ser. No. 823,927
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502955; Jan. 30, 1985, 3502954
Int. Cl.⁴ D06P *3/32*
U.S. Cl. 8—436 **28 Claims**

1. A process for the penetration dyeing of tanned leather which comprises dyeing the tanned leather in an aqueous medium with a hydrosoluble sulpho group-containing sulphur dye in the presence of a dye-substantive uptake assistant which is a surface-active quaternized or non-quaternized fatty amine or fatty aminoalkylamine, said amine or aminoalkylamine containing an aliphatic linear hydrocarbon radical of at least 12 carbon atoms and being oxyethylated with at least 20 moles of ethylene oxide per mol and the alkylene bridge of said aminoalkylamine being linear polymethylene of 2 to 6 carbon atoms.

4,717,391
METHOD FOR SPRAYING OF DYES FROM HIGH-BOILING SOLVENT DISPERSIONS ONTO OPEN WIDTH FABRIC WITH HEAT SETTING

Vernon T. Daniel, Oak Ridge, and Jessie Gettliffe, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 28, 1986, Ser. No. 935,716
Int. Cl.⁴ D06P *7/00*
U.S. Cl. 8—489 **9 Claims**



1. A continuous process for simultaneously uniformly solvent dyeing and uniformly heatsetting a synthetic textile fabric in open width at an elevated temperature in a closed environment, the process comprising the steps of:

(a) providing a heated, enclosed chamber having an entrance, an exit, means to hold fabric by the edges in open width in the heated, enclosed chamber, means to adjust the fabric width while it is so held, a dye applicator for applying a dyestuff-containing dispersion directly to the fabric without the applicator directly contacting the fabric, and means to move the fabric through the chamber from the entrance to the exit;

(b) continuously supplying fabric in open width to the means for holding the fabric and passing the fabric through the heated, enclosed chamber while adjusting the fabric width, as required, as the fabric passes through the chamber;

(c) spraying a heated dispersion of a dyestuff dispersed in a non-aqueous, high-boiling solvent to the fabric in open width in the heated, enclosed chamber, the dispersion being sprayed onto the fabric at a temperature of from about 300° F. to about 400° F.; and

(d) exposing the fabric to heat in the chamber, at a temperature of from about 350° F. to about 400° F. while the dye dispersion is in contact with the fabric and allowing the dye dispersion to migrate, penetrate thoroughly through the fabric and level substantially evenly across the entire width of the fabric thereby simultaneously uniformly dyeing and uniformly heatsetting the fabric; and

(e) removing the heatset and dyed fabric from the chamber.

4,717,392
METHOD OF PRODUCING AN IGNESCENT MATERIAL

Sören Linzie, and Inger Linzie, both of S:a Bryggerivägen 40, S-663 02 Hammarö, Sweden

PCT No. PCT/SE84/00398, § 371 Date Jul. 14, 1986, § 102(e) Date Jul. 14, 1986, PCT Pub. No. WO86/03219, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 20, 1984, Ser. No. 885,593
Int. Cl.⁴ C10L *11/06*
U.S. Cl. 44—41 **10 Claims**

1. A method of producing an ignescent material, said method comprising feeding cellulose pulp in the form of an elongate web having a thickness of between 1 and 4 mm and a grammage of between 550 and 700 g/m^2 through a bath of molten, combustible, organic impregnating substance consisting essentially of paraffin having a melting point of between 50° and 60° C., to thereby impregnate said pulp with said impregnating substance, at least 75% of said pulp being chemically modified thermomechanical pulp (CTMP) with the balance being essentially sulphate pulp, said impregnating substance being at an impregnation melt temperature of over 90° C. during impregnation of said web.

2. The method according to claim **1**, wherein said web has a thickness of between 1.5 and 3 mm, and a grammage of between 550 and 700 g/m^2.

9. The method according to claim **1**, wherein excess impregnating substance is allowed to drain off said web, said web thereafter being cooled at a temperature of between 20° C. and 40° C. while kept flat, said web being finally cut into flat sheets having a thickness essentially the same as that of the web prior to impregnation.

4,717,393
POLYIMIDE GAS SEPARATION MEMBRANES

Richard A. Hayes, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1986, Ser. No. 923,485
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—16 **6 Claims**

1. A process for separating gases comprising bringing a mixture of two or more gases under pressure into contact with a membrane formed of a photochemically crosslinked aromatic polyimide of the formula

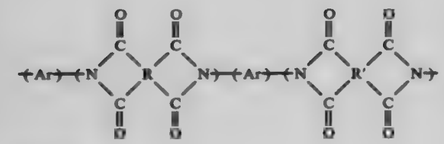
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POLYIMIDE GAS SEPARATION MEMBRANES

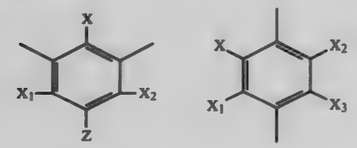
Richard A. Hayes, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1986, Ser. No. 923,486
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 7 Claims

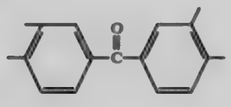
1. A process for separating gases comprising bringing two or more gases under pressuer into contact with a membrane formed of an aromatic polyimide comprising units of the formula



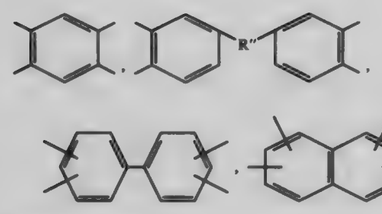
Where —Ar— is



or mixtures thereof,  is



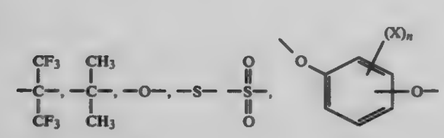
and  is



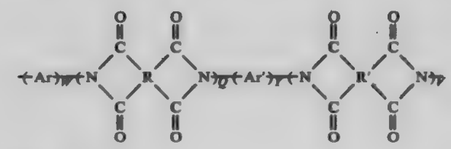
or mixtures thereof

—X,—X_1, —X_2, and —X_3 are independently primary or secondary alkyl group having 1 to 6 carbon atoms preferably methyl or ethyl,

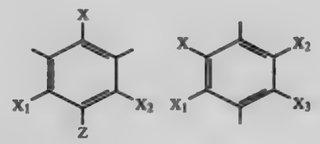
—Z is —H, —X, —X_1, —X_2, or —X_3 and —R″ is



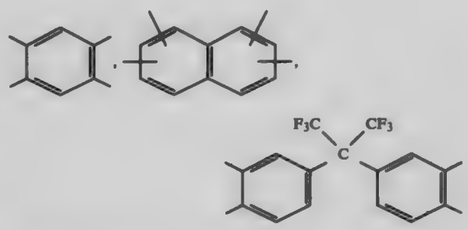
(where n=0 to 4) or alkylene radicals of 1 to 3 carbon atoms and from 5 to 100% of —R— and R′ are R, whereby at least one of said gases is enriched upon permeating the membrane.



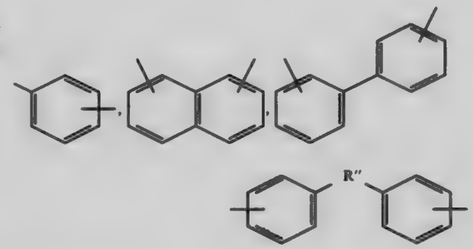
where —Ar— is



or mixtures thereof, R is



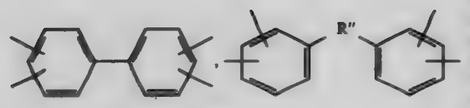
or mixtures thereof, —Ar′— is



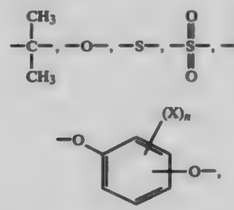
or mixtures thereof,



is



or mixtures thereof, and —R″— is



where n=0 to 4, alkylene radicals of 1 to 3 carbon atoms or mixtures thereof,

—X, —X_1, —X_2, and —X_3 are independently alkyl groups having 1 to 6 carbon atoms preferably methyl or ethyl, or aromatic groups of 6 to 13 carbon atoms,

Z is —H, —X, —X_1, —X_2, or —X_3

W is 5% to 100%

Q is 5% to 100%

Y is 100% minus W

V is 100% minus V

Y plus V is at least 5%, whereby at least one of said gases is enriched upon permeating the membrane.

4,717,395

GAS SEPARATIONS USING MEMBRANES COMPRISING SULPHONATED POLYETHER SULPHONE

Cherry C. Chiao, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 7, 1986, Ser. No. 894,190
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 9 Claims

1. A method of separating a gas comprising carbon dioxide from a mixture of gases containing carbon dioxide and light hydrocarbons, wherein the method comprises

A. contacting the gas mixture with a membrane containing a thin dense discriminating layer comprising a polymer of sulfonated polyether sulphone under conditions such that carbon dioxide selectively permeates through the membrane to the other side of the membrane such that the separation factor for carbon dioxide over light hydrocarbons is 50 or greater; and,

B. removing the permeated carbon dioxide from the other side of the membrane.

4,717,396

FLOATING PRESSURE CONTROL FOR A GAS DISTRIBUTION SYSTEM

Nancy K. Steagle, and James W. Hobbs, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1986, Ser. No. 907,948
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—20 17 Claims

1. A method for controlling a gas distribution system for supplying gas to a plurality of process equipment and then transmitting said gas to a distribution network for consumable utilization therein, wherein the discharge outlet of a compressor simultaneously feeds a first line and a second line in parallel operations, and wherein a first portion of said gas from a discharge outlet of said compressor is passed through a first flow control valve and at least a first process equipment operably located in said first line wherein said flow rate of said first portion of said gas is manipulated in response to the demands of said first process equipment, and wherein a second portion of said gas from the discharge outlet of said compressor is passed through a back pressure control valve operably located in said second line so as to manipulate back pressure on the discharge outlet of said compressor, and wherein said first portion and said second portion are transmitted to said distribution network, said method comprising the steps of:

(a) establishing a first signal representative of the position of said first flow control valve;

(b) establishing a second signal representative of the position of said back pressure control valve;

(c) establishing a high limit signal representative of the desired maximum open position of said first flow control valve and said back pressure control valve;

(d) using computer means for comparing said first signal and said second signal to said high limit signal to determine if the position of both said first flow control valve and said back pressure control valve is less than the maximum open position represented by said high limit signal, and to determine if the open position of said first flow control valve or said back pressure control valve is greater than the maximum open position represented by said high limit signal;

(e) establishing a control signal representative of the desired back pressure acting against said compressor, wherein said control signal is periodically increased or decreased by a fixed increment depending on comparisons made in paragraph (d) so as to allow at least one of said flow control valve and said back pressure control valve to open to a position substantially equal to the open position represented by said high limit signal, thereby floating said back pressure acting against said compressor; and

(f) manipulating the back pressure acting against said compressor in response to said control signal so as to maintain the actual back pressure substantially equal to the desired pressure as represented by said control signal.

9. Apparatus comprising:

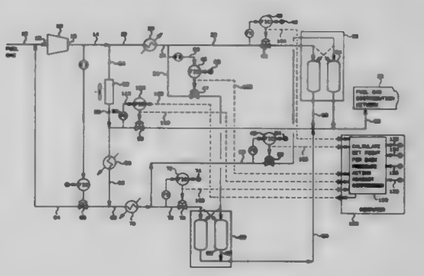
(a) a compressor having a suction inlet and a discharge outlet;

(b) means for supplying a gas to the suction inlet of said compressor;

(c) means for flowing a first portion of said gas from the discharge outlet of said compressor through a first line to a first process equipment and from said first process equipment to a distribution network and for flowing a second portion of said gas from the discharge outlet of said compressor through a second line to said distribution network;

(d) a first flow control valve operable located in said first line so as to manipulate the flow of said first portion of said gas, wherein the flow rate of said first portion is manipulated in response to the demands of said first process equipment;

(e) a back pressure control valve operably located in said second line so as to manipulate the pressure in said second line, wherein the pressure in said second line provides a



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back pressure acting against the discharge outlet of said compressor;

(f) means for establishing a first signal representative of the actual position of said first flow control valve;

(g) means for establishing a second signal representative of the actual position of said back pressure control valve;

(h) computer means;

(i) means for establishing in said computer means a high limit signal representative of the maximum desired open position of said first flow control valve and said back pressure control valve;

(j) means for providing said first signal and said second signal to said computer means, and for comparing said first signal and said second signal to said high limit signal to determine the relationship of the position of said first flow control valve and the position of said back pressure control valve to said high limit signal;

(k) means for establishing a control signal representative of the desired back pressure acting against said compressor, wherein said control signal is periodically increased or decreased by a fixed increment depending on the comparisons made in paragraph (j) so as to allow at least one of said first flow control valve and said back pressure control valve to open to a position substantially equal to the open position represented by said high limit signal, thereby floating the back pressure acting against said compressor; and

(l) means for manipulating the back pressure acting against said compressor in response to said control signal so as to maintain the actual back pressure substantially equal to the desired back pressure as represented by said control signal.

4,717,397

ADSORBATE RECOVERY IN PSA PROCESS

Frank Wiessner, and Alfred Bolkart, both of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 895,618

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528904

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—26 **12 Claims**

1. In a pressure swing adsorption process, for the separation of a gaseous mixture comprising: (a) an adsorption phase operated under elevated pressure wherein adsorbable components are selectively adsorbed on an adsorbent resulting in a gaseous stream depleted in the adsorbed components, (b) an expansion phase wherein the adsorber pressure is lowered, (c) a purging phase wherein the adsorbent is regenerated by passing a purging gas thereover under low pressure, and (d) a pressurizing phase wherein the adsorber is again brought to the elevated pressure, so that the cycle can be repeated,

the improvement wherein the gaseous mixture contains a most strongly adsorbable component and a less strongly adsorbable component and, during the purging phase (c), an adsorber is purged in a first purge step with a purge gas under an intermediate pressure between the adsorption pressure and the lowest expansion pressure and a gas is withdrawn from the adsorber which is enriched in the most strongly adsorbable component; and further comprising, after completion of said first purge step, conducting an expansion cocurrently for a first section of the adsorber loaded predominantly with the most strongly adsorbable component, and countercurrently for a second section of the adsorber loaded predominantly with the less strongly adsorbable component, lowering the pressure to the lowest expansion pressure, and withdrawing a residual gas from the adsorber.

4,717,398

SELECTIVE ADSORPTION AND RECOVERY OF ORGANIC GASES USING ION-EXCHANGED FAUJASITE

Graeme K. Pearce, Walkington, England, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 677,924, Dec. 4, 1984, abandoned. This application Apr. 1, 1986, Ser. No. 846,843

Claims priority, application United Kingdom, Dec. 30, 1983, 8334610

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—58 **19 Claims**

1. A pressure swing process for selectively absorbing and recovering an organic gas containing unsaturated linkages from a mixture of gases by passing the mixture over a zeolite ion-exchanged with cuprous ions characterized in that the zeolite has a faujasite type structure and has a silicon to aluminum atomic ratio from 1.2–3 and wherein the zeolite has been granulated after being copper ion-exchanged and prior to contact with the gaseous mixture.

13. A pressure swing process for selectively absorbing and recovering an organic gas containing unsaturated linkages from a mixture of gases by passing the mixture over a zeolite ion-exchanged with cuprous ions,

characterised in that the zeolite has a faujasite type structure and has a silicon to aluminum atomic ratio from 1.2–3; and

wherein the zeolite is prepared by the following series of steps:

initially exchanging the zeolite by treatment with cupric ions,

granulating the initially exchanged zeolite so that the granulated zeolite has a particle size greater than 1 mm, and

reducing the granulated zeolite containing cupric ions to said cuprous ion exchanged zeolite,

prior to contact with the gaseous mixture.

4,717,399

PROCESS FOR ADSORBING MERCURY FROM NATURAL GAS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,136

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—72 **3 Claims**

1. A process for removing trace quantities of mercury from a hydrocarbon gas containing said trace quantities comprising:

(a) contacting a porous mass of aluminum metal with an aqueous solution of a soluble mercuric salt;

(b) drying said porous mass with a non-oxidizing gas at a temperature between about 45° and about 95° C.; and

(c) subsequently contacting said porous mass with said hydrocarbon gas containing trace quantities of mercury, thereby absorbing or amalgamating said mercury onto said mass of aluminum metal.

4,717,400

COMBINED MOISTURE SEPARATOR AND REHEATER

Toshiaki Ozeki, and Kenji Satoh, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1986, Ser. No. 844,508

Claims priority, application Japan, Mar. 29, 1985, 60-65429; Nov. 29, 1985, 60-268858

Int. Cl.⁴ B01D *53/26*

U.S. Cl. 55—186 **9 Claims**

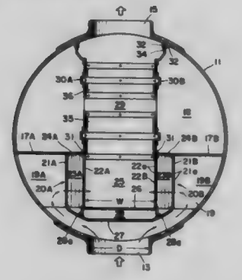
1. A combined moisture separator and reheater comprising:

an axially elongated cylindrical shell having sealed opposite ends;

a pair of horizontal partition plates for dividing the interior of said cylindrical shell into an upper chamber and a lower chamber;

a pair of moisture separating structures extending in the lower chamber of said cylindrical shell in the axial direction thereof and sufficiently spaced apart so as to define a central chamber therebetween;

a closure structure which seals the bottoms of said central chamber and said pair of moisture separating structures and defines an incoming steam passage between said bottoms of said central chamber and said moisture separating structures and said shell;



a pair of side walls disposed in said upper chamber of said shell sufficiently spaced apart so as to define a steam passage therebetween;

at least one reheater disposed in said steam passage for reheating moisture-free steam; and

connecting means for loosely joining the upper edge of each of said side walls to said shell so as to prevent damage to the connection between said shell and said side walls upon thermal deformation of said shell.

4,717,401

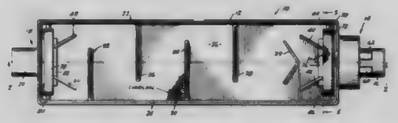
FUEL VAPOR RECOVERY SYSTEM

Peter J. Lupoli, Hamden; Donald J. Mattis, Norwalk, and Robert S. Miller, Stratford, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Sep. 24, 1986, Ser. No. 911,112

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—208 **26 Claims**



1. A fuel vapor recovery canister, comprising in combination:

(a) a housing having an outer wall and two spaced-apart vapor ports disposed in said wall,

(b) a quantity of adsorbent material carried in said housing or adsorbing and storing fuel vapors entering one of said ports or releasing fuel vapors and permitting then to exit through said one port,

(c) means carried by said housing defining a series of interleaved baffle plates disposed between the ports, wnereby any vapors entering one port are forced to flow along a serpentine path through the housing as they approach the other port,

(d) a filter element disposed in the housing adjacent said outer wall and the other of said ports, said filter element confining said adsorbent material in the housing and being disposed in the path of vapor flow through said other port,

(e) a mass of PTC material carried completely within the housing and disposed between said filter element and said other port of the housing, said material being arranged in heat-exchanging relation with air entering said other port so as to be capable of imparting heat to said air, said air in turn imparting heat to the said filter element and said adsorbent material contained in the housing, and

(f) means passing through the housing wall and extending externally of the housing, for making electrical connections to the PTC material to enable the latter to be electrically energized.

4,717,402

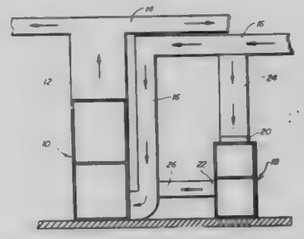
AIR PURIFICATION SYSTEM

Rickey S. Lutterbach, and Ronald W. Marsh, both of Michigan City, Ind., assignors to Control Resource Systems, Inc., Michigan City, Ind.

Filed Oct. 1, 1984, Ser. No. 656,708

Int. Cl.⁴ B01D *46/10*

U.S. Cl. 55—269 **20 Claims**



1. An air purification system for use in combination with an air conditioning apparatus which includes an air circulation system having supply conduit means for supplying heated air to a given area and return conduit means for drawing air from said area, the air purification system comprising:

air purification means including inlet means and outlet means, filter means between said inlet means and said outlet means, and blower means independent of said air conditioning apparatus for drawing air in through said inlet means, through said filter means and out through said outlet means;

means connecting said inlet means with said air circulation system for drawing therefrom, by said blower means, only a portion of the air passing therethrough; and

means connecting said outlet means with said air circulating system downstream of the inlet communicating means for returning said portion of the air back to the circulation system after it has passed through said air purification means.

4,717,403

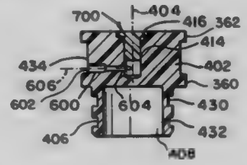
LIQUID TRAP FOR MEDICAL APPLICATION

Pradip V. Choksi, Northridge, Calif., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Apr. 17, 1986, Ser. No. 853,077

Int. Cl.⁴ B01D *45/12*

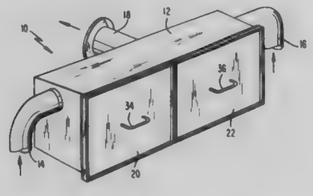
U.S. Cl. 55—429 **3 Claims**



1. An apparatus for separating liquid from gas in a sampled airstream from a patient, comprising:

a moisture collection cup; and
moisture separation means mounted on said moisture collection cup, said moisture separation means having:
(a) a cylindrical separation chamber having a volume that is substantially smaller than the volume of said collection cup;
(b) an input channel tangentially open to the interior of said separation chamber;
(c) a gas outlet port positioned above said input channel;
(d) a moisture outlet channel positioned below said input channel and extending between said separation chamber and moisture collection cup, said separation chamber being devoid of any physical structure between said input channel and gas outlet part; and
(e) a channel extending into the upper portion of said moisture collection cup.

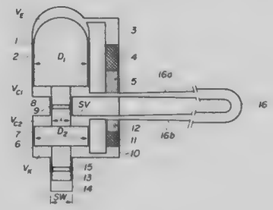
4,717,404
DUST SEPARATOR
Earl Fore, South Plainfield, N.J., assignor to L.A. Dreyfus Company, Edison, N.J.
Filed Feb. 27, 1987, Ser. No. 20,222
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—444 **10 Claims**



1. A dry solids separator for removing powdery materials from a gas stream passing therethrough without a substantial pressure drop comprising:
a housing having at least one gas inlet in communication with said gas stream and at least one gas outlet therefor, an opening in a front or back wall of the housing, and a drawer slidably received therein disposed between the inlet and the outlet;
a plurality of mutually spaced, baffle plates slidably received within said drawer and disposed at an acute angle to the plane containing the inlet, each plate comprising a plurality of mutually spaced parallel, channel shaped baffles opening in the direction of flow of said gas stream through the inlet, adjacent baffles defining vertically oriented slit nozzles for accelerating the flow of gas therethrough, said individual baffles being staggered so that a baffle in each adjacent downstream plate is disposed behind each upstream nozzle in the adjacent upstream plate.

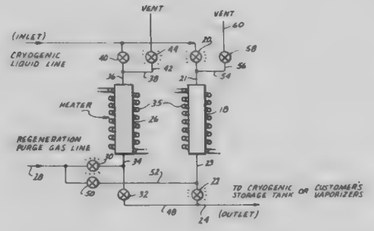
4,717,405
STIRLING MACHINE
Jean-Pierre Budliger, Onex, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland
Filed Oct. 3, 1986, Ser. No. 915,100
Claims priority, application Switzerland, Oct. 7, 1985, 4325/85
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **10 Claims**

1. A Stirling machine comprising a cylinder, a displacer piston mounted in the cylinder to define two variable-volume compartments for the compression and expansion respectively of a gaseous working fluid contained in said machine, a conduit providing communication between the compression compartment and the expansion compartment, a heat exchanger in said conduit. adapted to be associated with a hot source, a regenerator in said conduit, and a heat exchanger in said conduit adaPted to be associated with a heat sink, and an oscillatory member synchronized with said displacer piston. characterised in that the said oscillatory member is a resonance tube tuned to



the frequency of the said piston, and a return means associated with the end of said piston defining the said compression compartment is provided for effecting return motion of said piston.

4,717,406
CRYOGENIC LIQUIFIED GAS PURIFICATION METHOD AND APPARATUS
Frederick W. Giacobbe, Naperville, Ill., assignor to Liquid Air Corporation, Walnut Creek, Calif.
Filed Jul. 7, 1986, Ser. No. 882,268
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—18 **17 Claims**

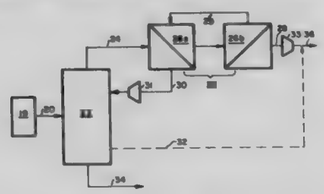


1. A method for the on-site adsorption of impurities contained in liquified gases prior to and/or subsequent to storage and transport and prior use comprising:
passing said liquified gas through an activated adsorbent material at cryogenic temperatures and pressures for a time sufficient to permit adsorption of the impurities by the adsorbent; and,
passing said liquified gas issuing from said adsorbent through a filter to remove any particles of entrained adsorbent contained therein.

4,717,407
PROCESS FOR RECOVERING HELIUM FROM A MULTI-COMPONENT GAS STREAM
Jung S. Choe; Rakesh Agrawal, both of Allentown, and Steven R. Auvil, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Continuation-in-part of Ser. No. 759,027, Jul. 25, 1985, Pat. No. 4,654,063, which is a continuation-in-part of Ser. No. 684,655, Dec. 21, 1984, Pat. No. 4,595,405. This application Jun. 16, 1986, Ser. No. 874,745
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—18 **22 Claims**

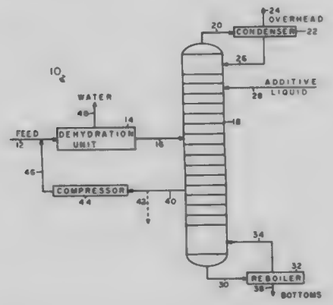
1. A process for recovering helium from a feed gas mixture comprising helium and at least one other component, said process comprising providing an additional degree of freedom for adjusting the process parameters by:

(a) treating said feed gas mixture in a non-membrane separation unit to produce a helium-enriched stream and a helium-depleted stream;
(b) withdrawing at least a portion of the helium-enriched stream from the non-membrane separation unit;
(c) feeding said portion of said helium-enriched stream to a membrane separation unit, wherein said helium-enriched



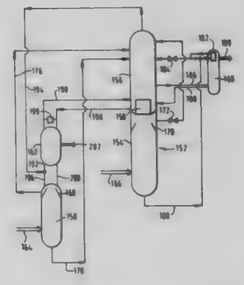
stream is separated to form a helium-rich stream and a helium-lean stream;
(d) recycling the helium-lean stream to the non-membrane separation unit for further treatment and separation to produce a helium-depleted stream; and
(e) recovering the helium-rich stream from the membrane separation unit.

4,717,408
PROCESS FOR PREVENTION OF WATER BUILD-UP IN CRYOGENIC DISTILLATION COLUMN
Richard B. Hopewell, Medfield, Mass., assignor to Koch Process Systems, Inc., Westboro, Mass.
Filed Aug. 1, 1986, Ser. No. 892,920
Int. Cl.[4] F25J *3/08*
U.S. Cl. 62—20 **20 Claims**



1. In a process for the separation of a hydrocarbon and acid gas containing feed stream in a cryogenic distillation column, a zone of said column which is operated at a temperature of 60° F. or less, wherein free water accumulates or forms hydrates in said column from water vapor in the feed stream during the cryogenic process, and which process comprises separating the said feed stream in said column into an overhead stream and a bottom stream, the improvement which comprises:
withdrawing a hydrocarbon and acid gas vapor stream which stream is enriched in water vapor with respect to said feed stream, thereby preventing the excess accumulation of free water or the formation of hydrates in said cryogenic column.

4,717,409
LIQUID VAPOR CONTACT METHOD AND APPARATUS
Timothy D. Atkinson, London, England, assignor to The BOC Group plc, Windlesham, England
Filed May 12, 1986, Ser. No. 861,952
Claims priority, application United Kingdom, May 17, 1985, 8512562
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **15 Claims**



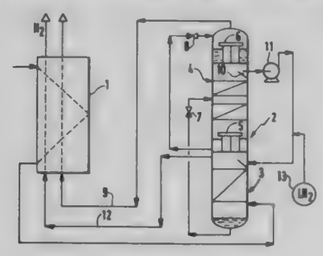
1. Apparatus for separating argon from a gas mixture comprising oxygen, nitrogen and argon, comprising means defining a plurality of distillation zones, an inlet to at least one of said distillation zones for a gaseous mixture comprising oxygen, nitrogen and argon, an outlet for argon product from at least one of said distillation zones, means defining a liquid-vapour contact and mixing zone having a relatively warm end spaced from a relatively cold end, a first inlet, communicating with at least one of the distillation zones, for a vaporous nitrogen stream , spaced from a second inlet, communicating with at least one of the distillation zones, for a liquid oxygen stream, an outlet from said liquid-vapour contact and mixing zone intermediate of said inlets for the withdrawal of a mixed waste stream containing both oxygen and nitrogen, liquid-vapour contact means in said liquid-vapour contact and mixing zone which enable there to be established through the zone a flow of fluid that becomes in the direction of liquid flow progressively richer in nitrogen through mass exchange with an opposed flow of vapour that becomes in the direction of vapour flow progressively richer in oxygen, means for employing fluid in or from said liquid-vapour contact and mixing zone to provide heat transfer for the distillation of the said gaseous mixture, whereby some of the work of mixing that takes place in said contact and mixing zone in operation of the apparatus is recovered, means for passing a third fluid stream comprising vaporous oxygen from the relatively warm end region of the said liquid-vapour contact and mixing zone to one of the distillation zones means for condensing vaporous oxygen from the relatively warm end of said liquid-vapour contact and mixing zone and returning the condensate to the contact and mixing zone.

4,717,410
PROCESS AND INSTALLATION FOR PRODUCING NITROGEN UNDER PRESSURE
Maurice Grenier, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Mar. 6, 1986, Ser. No. 837,049
Claims priority, application France, Mar. 11, 1985, 85 03515
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—29 **10 Claims**

1. A process for producing nitrogen under a pressure termed high pressure, comprising compressing air and cooling said air to substantially the dew-point thereof, introducing at least a part of said air at a base of a main distillation column operating at said high pressure; receiving a rich liquid at the base of said

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column and expanding said rich liquid to a medium pressure between said high pressure and atmospheric pressure and introducing the rich liquid at an intermediate place of an auxiliary distillation column operating at said medium pressure; cooling a top condenser of the main column by means of the liquid of the base of the auxiliary column; expanding a part of

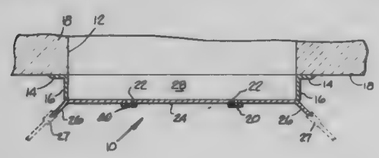


the last-named liquid to a low pressure so as to cool a top condenser of the auxiliary column; withdrawing liquid from the top of the auxiliary column, pumping said withdrawn liquid up to said high pressure and injecting it at the top of the main column; and withdrawing product nitrogen from the top of the main column.

4,717,411
DRAIN BUSHING

Samuel R. Fowler, Tucson, Ariz., assignor to Manville Corporation, Denver, Colo.

Filed May 6, 1986, Ser. No. 860,290
Int. Cl.⁴ C03B *37/09*
U.S. Cl. 65—1 **9 Claims**

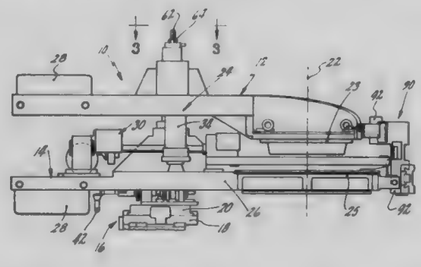


1. A nonprecious metal drain bushing, adapted to be electrically heated, for draining molten glass from a glass melting apparatus, comprising:
- an electrically conductive relatively thick bottom wall structurally connected to electrically conductive side walls and end walls to form a receptacle for molten glass, the thickness of the bottom wall being substantially greater than the thickness of the side walls and end walls;
- the upper extremities of the side walls being spaced apart a distance greater than the width of the bottom wall, whereby the side walls converge from the upper end of the receptacle down to the bottom wall;
- the bottom wall containing drain holes through which molten glass can flow;
- an electrically conductive relatively thick terminal ear extending from each end of the bottom wall at an angle thereto;
- each terminal ear comprising a main body portion and an end portion;
- the width of the main body portion of the terminal ears extending in the same direction as the width of the bottom wall; and
- the end portion of the terminal ears being of substantially reduced thickness compared to the thickness of the main body portion of the terminal ears and being adapted to receive a power clamp for supplying heating current to the bushing.

4,717,412
STATIONARY TUBE HOLDER AND REVOLVING ROTOR ASSEMBY FOR A GLASS SPOUT BOWL

Constantine W. Kulig, Windsor, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 8, 1986, Ser. No. 939,399
Int. Cl.⁴ C03B *7/08*
U.S. Cl. 65—327 **2 Claims**



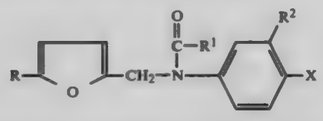
1. A stationary tube holder and revolving rotor assembly for use in conjunction with a glass spout bowl comprising:
- a stationary tube holder assembly including an elongated horizontally extending arm for supporting a tube at one end and a counterweight at the other end,
- a revolving rotor assembly including an elongated horizontally extending arm for supporting a rotor at one end and a counterweight at the other,
- a compound X, Y, slide assembly for horizontally displacing structure secured thereto in the X or Y direction,
- vertical spacer means secured between said compound X, Y slide assembly and said elongated tube holder assembly arm for supporting said stationary tube holder assembly, said spacer means including a jack screw assembly having a vertical jack screw for elevating said tube holder assembly relative to said compound X, Y slide assembly,
- vertical post means secured at its bottom end to said compound X, Y slide assembly, and
- said stationary tube holder assembly arm including a support casting having a hole with an extended bushing therein for receiving a portion of said post means,
- said post means additionally including means for elevating said revolving rotor assembly.

4,717,413
N-CARBONYL-N-(2-FURFURYL)-4-HALOANILINES AND HERBICIDAL USE THEREOF

Don R. Baker, Orinda, and Teresa M. Tam Chow, Vallejo, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

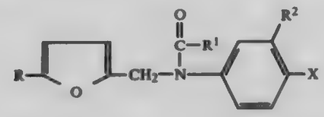
Filed Dec. 15, 1986, Ser. No. 941,678
Int. Cl.⁴ A01N *43/08*; C07D *307/54, 307/75*
U.S. Cl. 71—88 **10 Claims**

1. A compound having the structural formula



wherein R is nitro or hydrogen; R^1 is C_1–C_4 alkyl, C_1–C_3 alkylthio, or cyclopropyl; and R^2 is hydrogen or chlorine and X is chlorine, bromine, or iodine.

6. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



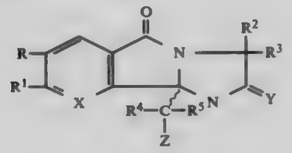
wherein R is nitro or hydrogen; R^1 is C_1–C_4 alkyl, C_1–C_3 alkylthio, or cyclopropyl; and R^2 is hydrogen or chlorine and X is chlorine, bromine, or iodine.

4,717,414
HERBICIDALLY ACTIVE IMIDAZOPYRROLO-PYRIDINE (OR BENZENE) DERIVATIVES

David A. Hunt, Copley, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 8, 1986, Ser. No. 894,590
Int. Cl.⁴ A01N *43/48*; C07D *471/00, 491/00, 235/00*
U.S. Cl. 71—92 **4 Claims**

1. A compound of the formula:



wherein:
- R and R^1 are the same or different and represent hydrogen, halogen, C_1 to C_4 alkyl, alkoxy, alkylthio or haloalkyl; up to C_6 alkenyl or alkynyl; phenyl or phenyl alkyl;
- R^2 and R^3 are the same or different and represent C_1 to C_4 alkyl, haloalkyl or alkoxy;
- X is CH or nitrogen;
- Y is oxygen or sulfur;
- Z is nitro, amino, cyano or —$COOR^6$ wherein R^6 is hydrogen, alkali metal or C_1 to C_4 alkyl;
- R^4 is hydrogen, C_1 to C_4 alkyl, haloalkyl, alkoxy or alkylthio, or up to C_6 alkenyl or alkynyl; and
- R^5 is Z or R^4.

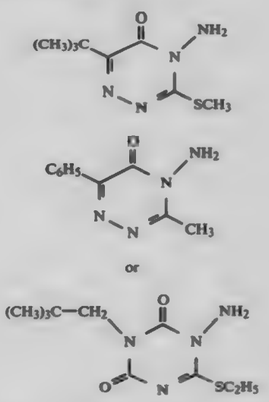
4. In a method of controlling vegetative growth by applying to the locus of the vegetative growth a growth controlling amount of a growth controlling chemical wherein the improvement resides in using as the growth controlling chemical a compound or mixture of compounds defined by claim 1.

4,717,415
HERBICIDAL COMPOSITIONS OF TRIAZINONE OR TRIAZINEDIONE DERIVATIVES AND HALOALKANOIC ACID AMIDE SYNERGISTS

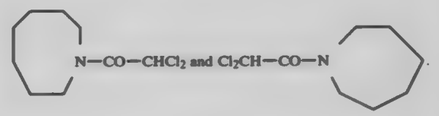
Klaus Ditgens; Ulrich Heinemann; Winfried Lankenheimer; Hans-Jochem Riebel; Jörg Stetter; Rudolf Thomas, all of Wuppertal, and Carl Fedtke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 534,536, Sep. 22, 1983, abandoned. This application Nov. 8, 1985, Ser. No. 796,386
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3238007
Int. Cl.⁴ A01N *43/64*
U.S. Cl. 71—93 **10 Claims**

1. A herbicidal composition comprising a selectively herbicidally effective amount of a combination of (A) a triazinone or triazinedione of the formula



and (B) an excess up to about 50 times its weight of a synergistically effective amount of a halogenocarboxylic acid amide selected from the group consisting of

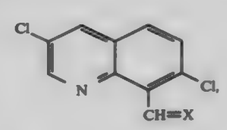


4,717,416
3,7-DICHLORO-8-QUINOLINE DERIVATIVES, AND THEIR USE FOR CONTROLLING UNDERSIRABLE PLANT GROWTH

Helmut Hagen, Frankenthal; Rolf-Dieter Kohler, Edingen-Neckarhausen; Juergen Markert, Mutterstadt, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 520,080
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229175
Int. Cl.⁴ A01N *43/42*; C07D *215/20*
U.S. Cl. 71—94 **7 Claims**

1. A 3,7-dichloro-8-quinoline derivative of the formula



(I)

where
X is =NR^5 and
R^5 is ureido or anilino.

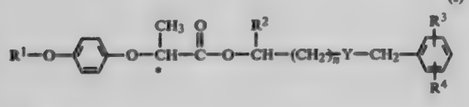
4,717,417

CERTAIN 2-PYRIDYLOXYPHENOXYPROPANOIC ACID ESTERS HAVING HERBICIDAL ACTIVITY

Koichi Moriya, Hachioji, Japan; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal, both of Fed. Rep. of Germany; Ludwig Ebe, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 560,725, Dec. 12, 1983, Pat. No. 4,596,599.
This application Mar. 14, 1986, Ser. No. 839,752
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247930
Int. Cl.[4] C07D *213/64;* A01N *43/40*
U.S. Cl. 71—94 8 Claims

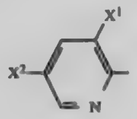
1. Dextrorotatory enantiomer of phenoxypropionic acid derivative of the formula



(I)

in which

R^1 represents a radical of the formula



wherein

X^1 represents hydrogen or halogen,

X^2 represents halogen or trifluoromethyl,

Y represents S,

wherein

R^2 represents hydrogen or methyl,

n represents 1 or 2 and

R^3 and R^4 independently of one another represent hydrogen, halogen, alkyl with 1 to 4 carbon atoms.

8. A method according to claim 7, wherein said dextrorotatory enantiomer is applied to the weed or its habitat in an amount of 0.01 to 15 kg per hectare of soil surface.

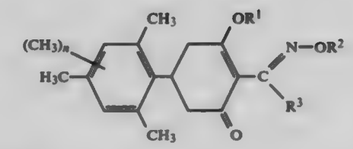
4,717,418

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Richard B. Warner, Ringwood; Alexander Serban, Doncaster; Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne; Lindsay E. Cross, Maribyrnong, and Graeme J. Farquharson, Reservoir, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 10, 1982, Ser. No. 440,592
Claims priority, application Australia, Nov. 20, 1981, PF1635; May 25, 1982, PF4137
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] A01N *31/04, 33/08;* C07C *131/00, 83/00*
U.S. Cl. 71—98 14 Claims

1. A compound of the formula I



wherein:

R^1 is selected from the group consisting of: hydrogen; C_2 to C_6 alkanoyl; benzoyl and substituted benzoyl wherein the benzene ring is substituted with from 1 to 3 substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; and an inorganic or organic cation selected from the alkali metal ions, the alkaline earth metal ions, transition metal ions and the ammonium ion $R^4R^5R^6R^7N^{\oplus}$ wherein R^4, R^5, R^6 and R^7 are independently selected from the group consisting of: hydrogen; C_1 to C_{10} alkyl; and substituted C_1 to C_{10} alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of hydroxy and C_1 to C_6 alkoxy;

R^2 is selected from the group consisting of: C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; C_1 to C_6 haloalkyl; C_2 to C_6 haloalkenyl; C_1 to C_6 alkyl substituted with C_1 to C_6 alkoxy; C_1 to C_6 alkyl substituted with C_1 to C_6 alkylthio; and benzyl and substituted benzyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro and C_1 to C_6 alkyl;

R^3 is selected from the group consisting of C_1 to C_6 alkyl; and

n is an integer chosen from 0 to 2.

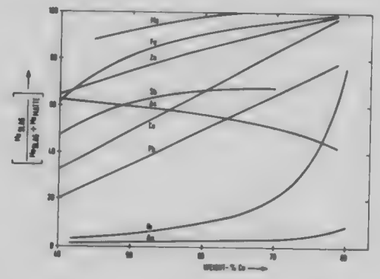
9. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

4,717,419

METHOD FOR TREATING IRON-BEARING SLAGS CONTAINING PRECIOUS METALS, PARTICULARLY SLAGS CREATED IN THE SMELTING PROCESS OF COPPER AND NICKEL

Juho K. Mäkinen, Vaahe-Ulvila; Keith B. Murden, Espoo, and Heikki P. Saari, Vaahe-Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 755,958, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 471,292, Mar. 2, 1983, abandoned. This application Jul. 18, 1986, Ser. No. 888,102
Claims priority, application Finland, Mar. 18, 1982, 820941
Int. Cl.[4] C22B *7/04*
U.S. Cl. 75—24 4 Claims



1. A method for processing magnetite-containing slags produced in pyrometallurgical processes, which slags contain one or more of the valuable metals nickel, cobalt and molybdenum as well as magnetite, to separate the valuable metals nickel, cobalt and molybdenum therefrom, comprising:

(a) lowering the magnetite content of the slag in a preliminary reduction stage by treating the slag under reducing conditions in a temperature range of about 1100°–1400° C., producing molten slag; then

(b) further reducing the slag by sulphidization to produce a metallicized sulphide matte containing the valuable metals to be recovered by adding a sulphidizing material containing copper and/or iron to the molten slag; and then

(c) allowing said matte to cool in a controlled manner within a temperature range of about 1000°–500° C., and then separating the valuable metals.

4,717,420

METHOD FOR CONVERTING URANIUM OXIDES TO URANIUM METAL

Walter K. Duerksen, Norris, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1987, Ser. No. 6,841
Int. Cl.[4] C22B *60/02*
U.S. Cl. 75—84.1 R 4 Claims

1. A method for converting uranium oxide to uranium metal comprising the steps of heating uranium oxide in the presence of a reducing agent to a temperature sufficient to reduce the uranium oxide to uranium metal and form a heterogeneous mixture of a uranium metal product and oxide by-products,

heating the mixture in a hydrogen atmosphere at a temperature sufficient to convert uranium metal in the mixture to uranium hydride,

cooling the resulting uranium hydride-containing mixture to a temperature sufficient to produce a ferromagnetic transition in the uranium hydride,

magnetically separating the cooled uranium hydride from the mixture,

and thereafter heating the separated uranium hydride in an inert atmosphere to a temperature sufficient to convert the uranium hydride to uranium metal.

4,717,421

SOLID TIN-PALLADIUM CATALYST FOR ELECTROLESS DEPOSITION INCORPORATING STANNOUS SALTS OF ORGANIC ACIDS

C. Richard Frisby, Strongsville, and Billie I. Page, Cleveland Heights, both of Ohio, assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Apr. 28, 1986, Ser. No. 857,034
Int. Cl.[4] B01J *27/06, 31/30;* C23C *3/02*
U.S. Cl. 106—1.11 23 Claims

1. A method of preparing a solid catalyst composition comprising the steps of

(a) preparing a mixture comprising stannous halide, an alkali metal halide and water,

(b) reacting said mixture with a palladium halide salt at an elevated temperature,

(c) adding a stannous salt of an organic carboxylic acid to the reaction mixture obtained in step (b),

(d) continuing the heating of the reaction mixture to complete the reaction, and

(e) cooling the reaction mixture and recovering the solid product.

4,717,422

ANTI-SCALING OR MARKING COMPOSITION FOR APPLICATION TO METAL PRODUCTS AND METHOD OF MAKING AND USING THE COMPOSITION

Bruno M. Perfetti, Jeannette, Pa., assignor to USX Corporation, Pittsburgh, Pa.

Filed Dec. 1, 1982, Ser. No. 445,790
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—19 4 Claims

1. A method of making a composition suitable for application to metal products for anti-scaling purposes or to produce legible markings on said products, said method comprising:

(a) providing a first alkali metal-silicate solution having a ratio of silica-to-alkali metal oxide within the range of 2.0 to 2.8;

(b) providing a second alkali metal-silicate solution having a ratio of silica-to-alkali metal oxide within the range of 3.0 to 3.9;

(c) mixing sufficient portions of said first and second solutions to provide a third solution having a ratio of silica-to-alkali metal oxide within the range of 2.60 to 3.25;

(d) adding a cross-linking binder to one of said alkali metal silicate solutions;

(e) then adding water to adjust viscosity as necessary and an opacifying pigment to said third solution;

the final composition of said mixture consisting essentially of

(a) solids of from about 30 to about 50 parts by weight of said opacifying pigment, from about 43 to about 58 parts by weight alkali metal silicate binder, at least 50 percent of said alkali metal silicate being sodium silicate, and sufficient cross-linking binder to provide from about 1.5 to about 5.0 parts by weight of B_2O_3, the ratio of total pigment to total binder solids being within the range of 0.50 to 1.0 and (b) that amount of water to give said mixture a viscosity within the range of 800 to 5000 centipoise.

4,717,423

MIXTURES OF DYE PRECURSORS, AND PRESSURE-SENSITIVE RECORDING MATERIAL CONTAINING THESE MIXTURES

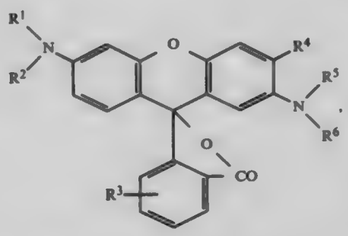
Rainer Dyllick-Brenzinger, Weinheim; Udo Mayer, Frankenthal, and Andreas Oberlinner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 833,280
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507173
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 7 Claims

1. A mixture of dye precursors, containing essentially

(a) the lactone of 2-carboxy-4,4'-bisdimethylaminobenzhydrol (I) and

(b) crystal violet lactone, one or more fluoran lactones of the formula



(II)

or a mixture of crystal violet lactone and one or more fluoran lactones, wherein, in the formula, R^1 is C_1–C_4-alkyl, R^2 is C_1–C_4-alkyl, C_7–C_{10}-phenalkyl, unsubstituted

or C_1–C_4-alkyl-substituted phenyl or C_5- or C_6-cycloalkyl, or



is pyrrolidinyl, piperidinyl or morpholinyl, R^3 is hydrogen or tert.-butyl, R^4 is hydrogen or methyl, R^5 is hydrogen, C_1–C_4-alkyl or C_7- or C_8-phenalkyl and R^6 is hydrogen, C_1–C_{12}-alkyl, C_7–C_{10}-phenalkyl or C_5- or C_6-cycloalkyl, or is phenyl which is unsubstituted or substituted by chlorine, C_1–C_4-alkyl, methoxy, ethoxy, C_1- or C_2-alkylcarbonyl, benzyl or phenoxy, or



pyrrolidinyl, piperidinyl or morpholinyl.

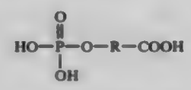
4,717,424

METAL PIGMENTS STABILIZED WITH CARBOXY-ALKYLENE PHOSPHORIC ACID ESTER OR CARBOXY-ALKYLENE PHOSPHONIC OR PHOSPHINIC ACID

Werner Wilflinger, Graz, and Maximilian Friedl, Gratkorn, both of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

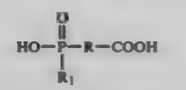
Filed Jun. 20, 1986, Ser. No. 877,002
Claims priority, application Austria, Jun. 20, 1985, 1829/85
Int. Cl.⁴ C09C *1/62*; C09D *5/38, 7/12*
U.S. Cl. 106—308 Q **21 Claims**

1. Metal pigments stabilized against water and moisture, said pigments having their surfaces treated with a carboxy alkylene phosphoric acid ester of formula (I)



(I)

or a carboxy alkylene phosphonic acid or carboxy alkylene phosphinic acid of formula (II)



(II)

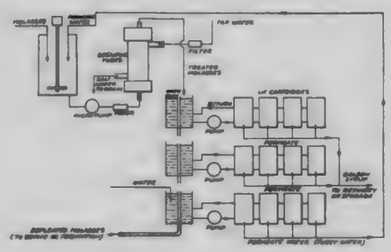
wherein R is a substitutes or insubstituted straight chain or branched chain alkylene radical with 2 to 17 C-atoms and R_1 is a hydroxy group or a hydrogen atom.

4,717,425

IMMOBILIZED INORGANIC DIFFUSION BARRIERS AND THE USE THEREOF IN THE SEPARATION OF SMALL MOLECULAR SPECIES FROM A SOLUTION

Michel S. M. Lefebvre, Sydney, Australia, assignor to Limitinstant Limited, London, United Kingdom

PCT No. PCT/AU83/00023, § 371 Date Oct. 12, 1983, § 102(e) Date Oct. 12, 1983, PCT Pub. No. WO83/02905, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 22, 1983, Ser. No. 552,035
Claims priority, application Australia, Feb. 26, 1982, PF2870; Feb. 26, 1982, PF2895; Feb. 26, 1982, 87532/82
Int. Cl.⁴ C13D *3/16*; B01D *13/01*
U.S. Cl. 127—10 **40 Claims**



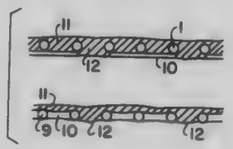
1. A diffusion barrier for selective counter diffusion, comprising a microporous matrix including a plurality of porous hollow fibre membranes and having one or more inorganic salts in the pores and on the inside surfaces of the cores of the hollow fibre membranes and forming an immobilized inorganic molecular grid or screen having a substantially uniform lattice structure defining pores or channels through the fiber walls having a diameter in the range of about 10 to about 50 Angstroms, said diffusion barrier having substantially uniform permeability.

4,717,426

METHOD AND DEVICE FOR CLEANING PRINTING INK AND PRINTING MOULD FOR SERIGRAPHY SCREENS

Erik Brynildsen, Haukeveien 19, 1340 Bekkestua, Norway

Filed Oct. 21, 1985, Ser. No. 789,976
Claims priority, application Norway, Nov. 8, 1984, 844469
Int. Cl.⁴ B08B *30/00*
U.S. Cl. 134—26 **4 Claims**



1. A method of cleaning printing ink and printing mould from a screen of a serigraphical printing frame which comprises applying a first high pressure aqueous flush to said screen to loosen said printing ink and printing mould wherein the aqueous flush comprises heated water to which an alkaline washing powder has been added, followed by applying to said screen a second high pressure flush comprising water to remove remaining printing ink and printing mould from said screen and thereafter drying the cleaned screen for reuse.

4,717,427

METHOD OF MANUFACTURING ZIRCONIUM ALLOY PLATES

Michel Morel, Tassin, and Jean-Paul Mardon, Caluire, both of France, assignors to "FRAGEMA", Courbevoie, France

Filed Jan. 8, 1986, Ser. No. 817,187
Claims priority, application France, Jan. 10, 1985, 85 00310
Int. Cl.⁴ C22F *1/18*
U.S. Cl. 148—11.5 F **5 Claims**



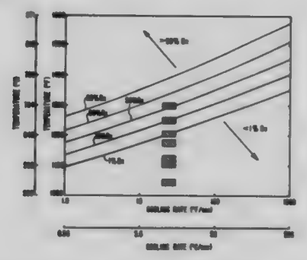
1. A method of manufacturing Zirconium alloy plates having abutment bosses, for use in a grid for holding nuclear fuel elements in a fuel assembly, comprising the steps of
(a) forming a Zirconium alloy strip by hot rolling;
(b) cold rolling said strip;
(c) subjecting the cold rolled strip to reheating to remove tensile stresses at a temperature lower than the recrystallization temperature for a time sufficient to remove internal stresses;
(d) cutting out the plates in said strip with the length of said plates transverse to the rolling direction of the strip so as to obtain high mechanical strength and low creep; and
(e) cold forming said bosses in said plates.

4,717,428

ANNEALING OF ZIRCONIUM BASED ARTICLES BY INDUCTION HEATING

Robert J. Comstock, Penn Township, Westmoreland County; William A. Jacobsen, Burrell Township, Indiana County; Francis Cellier, and George P. Sabol, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1985, Ser. No. 762,094
Int. Cl.⁴ C21D *1/00*
U.S. Cl. 148—11.5 F **7 Claims**



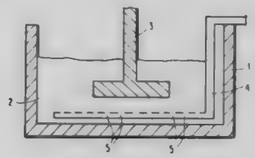
1. A process for alpha annealing of about 70% to about 85% cold worked Zircaloy tubing comprising the steps of:
rapidly heating said cold worked Zircaloy to a temperature between about 540° and about 900° C. at a rate in excess of 800° F. per second using a scanning induction heating coil;
maintaining said temperature for less than about 1 second;
and then cooling said Zircaloy at a rate between about 5° to 100° F. per second as said Zircaloy exits said coil,
thereby better controlling the microstructural changes by causing the changes to occur predominantly during cooling.

4,717,429

PROCESS FOR THE REMOVAL OF ALKALI METAL NITRITE FROM NITRATE CONTAINING SALT BATHS

Helmut Kunst, Rodenbach, and Christian Scondo, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,513
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533935
Int. Cl.⁴ C21D *1/607*
U.S. Cl. 148—15 **7 Claims**



1. A method for the removal of alkali metal nitrites from a salt bath for cooling of nitrided iron and steel components comprising oxidizing said nitrite into the nitrate.

4,717,430

SOLDERING COMPOSITIONS, FLUXES AND METHODS OF USE

Roy E. Beal, Scottsdale, Ariz., assignor to Copper Development Association, Inc., Birmingham, Mich.

Division of Ser. No. 621,674, Jun. 18, 1984, Pat. No. 4,647,308. This application Oct. 29, 1986, Ser. No. 924,308
Int. Cl.⁴ B23K *35/34*
U.S. Cl. 148—24 **21 Claims**

1. A method of joining metal surfaces comprising contacting said metal surfaces with a zinc-based filler composition and joining said metal surfaces, said zinc-based filler composition comprising, by weight:
from about 0.1 to about 4.0 percent copper;
from about 0.1 to about 1.0 percent nickel;
from about 0.01 to less than 0.5 percent aluminum;
0 to about 0.5 percent chromium;
0 to about 0.5 percent titanium; and the remainder being zinc.

4,717,431

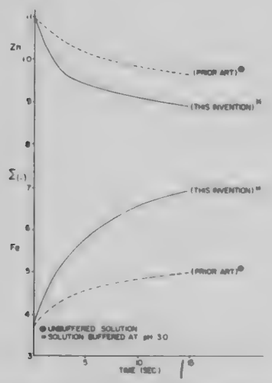
NICKEL-FREE METAL PHOSPHATING COMPOSITION AND METHOD FOR USE

Mark B. Knaster, Ambler, and William R. Skowronek, Jeffersonville, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Feb. 25, 1987, Ser. No. 18,885
Int. Cl.⁴ C23C *22/08*
U.S. Cl. 428—628 **34 Claims**

1. A nickel-free aqueous solution for depositing a phosphate coating on a substrate of one or more metals simultaneously comprising the following, each present in a phosphating-effecting amount:
(A) phosphate anions;
(B) zinc cations;
(C) cobalt cations;
(D) at least one buffer capable of, and present in an amount

sufficient to, maintain the solution pH at about 2.8 to 3.2; and



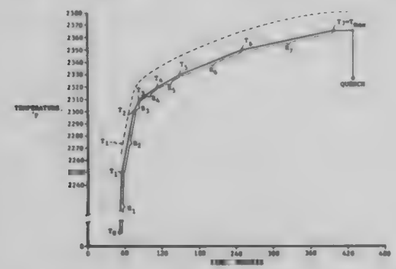
(E) two or more of the group comprising: Al^{+++}, Ba^{++}, Ca^{++}, Mg^{++}, Mn^{++}, and Sr^{++}.

4,717,432

VARIED HEATING RATE SOLUTION HEAT TREATMENT FOR SUPERALLOY CASTINGS

Earle A. Ault, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 9, 1986, Ser. No. 849,938
Int. Cl.[4] C22F *1/10*
U.S. Cl. 148—162 **9 Claims**



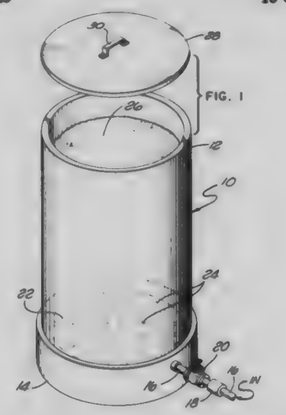
1. A method for heat treating a cast nickel base superalloy article having a gamma phase matrix and containing gamma prime strengthening phases and low melting temperature segregated phases, the strengthening phases having a solvus temperature T_s and the segregated phases having an incipient melting temperature T_i, comprising raising the temperature of the article to predetermined, progressively increasing temperatures greater than T_s and less than T_i to a maximum temperature T_{max}, and then rapidly cooling the article to below T_s, wherein the rate of temperature increase between successive ones of said predetermined temperatures closely approximates the rate at which the incipient melting temperature is not constant, and increases between said successive ones of said predetermined temperatures, and there are no intentional holds at temperatures less than T_{max}, wherein substantially all of the gamma prime phase is solutioned and substantially all of the segregate phases are homogenized.

4,717,433

METHOD OF COOLING A HEATED WORKPIECE UTILIZING A FLUIDIZED BED

Edward D. Weisert, San Carlos, and David W. Schulz, Belmont, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1983, Ser. No. 472,911
Int. Cl.[4] C21D *1/53*
U.S. Cl. 148—20.3 **10 Claims**



1. A method of cooling a heated workpiece, the heated workpiece being at a temperature within or above its critical temperature range, which comprises:

providing a fluidized bed containing a solid particulate material circulated by means of a pressurized fluid, said particulate material being at a temperature substantially below that of the workpiece;

immersing said heated workpiece into said fluidized bed;

cooling said workpiece in said fluidized bed to a temperature below the critical temperature range for the workpiece material such that transformation of the workpiece material is substantially minimized;

decreasing the flow of said pressurized fluid such that said solid particulate material collapses around said workpiece, thereby substantially embedding and supporting said workpiece;

allowing said workpiece to cool while embedded within said particulate material; and

removing said workpiece from said particulate material.

4,717,434

ZIRCONIUM ALLOY PRODUCTS

Samuel G. McDonald, Monroeville, and George P. Sabol, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 571,122, Jan. 13, 1984, Pat. No. 4,584,030, which is a continuation-in-part of Ser. No. 343,787, Jan. 29, 1982, abandoned. This application Mar. 12, 1986, Ser. No. 838,854
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] C22F *1/18*
U.S. Cl. 148—407 **16 Claims**

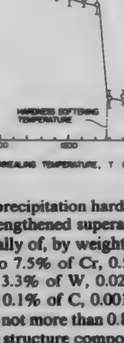
1. A final size Zircaloy alloy, nuclear fuel cladding tube comprising:

said Zircaloy alloy selected from the group consisting of Zircaloy-2 and Zircaloy-4;

a microstructure adjacent to the outer circumferential surface of said fuel cladding tube, said microstructure containing precipitates;

said precipitates having an average size below about 1100 angstroms and distributed substantially randomly throughout said microstructure;

the outer circumferential surface of said fuel cladding tube



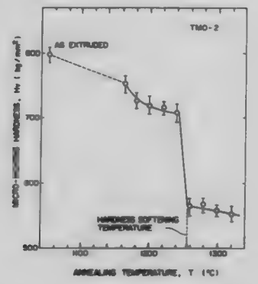
characterized by excellent nodular corrosion resistance as evidenced by a uniform, continuous and adherent oxide film after five days exposure to a 454° C. 10.3 MPa steam test.

4,717,435

GAMMA-PRIME PRECIPITATION HARDENING NICKEL-BASE YTTRIA PARTICLE-DISPERSION-STRENGTHENED SUPERALLOY

Yozo Kawasaki; Katsuyuki Kusunoki, both of Yokohama; Shizuo Nakazawa, Tokyo, and Michio Yamazaki, Zushi, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Sep. 3, 1986, Ser. No. 903,135
Claims priority, application Japan, Oct. 26, 1985, 60-238616
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—410 **12 Claims**



1. A gamma-prime precipitation hardening nickel-base yttria particle-dispersion-strengthened superalloy having a composition consisting essentially of, by weight, 3.0 to 6.0% of Al, 8.5 to 10.9% of Co, 3.9 to 7.5% of Cr, 0.5 to 1.2% of Ti, 3.6 to 6.3% of Ta, 11.4 to 13.3% of W, 0.02 to 0.2% of Zr, 1.3 to 2.6% of Mo, 0.001 to 0.1% of C, 0.001 to 0.02% of B, 0.5 to 1.7% of yttria (Y_2O_3), not more than 0.8% of 0 and the balance being Ni and having a structure composed of coarse recrystallized grains with a grain aspect ratio of at least 20 and a short axis diameter of at least 0.5 mm, said alloy having a creep rupture life, measured under creep conditions of 1,050° C. and 16 kgf/mm^2, of at least 4,000 hours, said alloy having been produced by mechanically mixing a nickel carbonyl powder, element powders of Co, Cr, Ta, W and Mo, alloy powders of Ni—Al, Ni—Ti—Al, Ni—Zr and Ni—B, and a fine yttria powder in amounts to provide said composition, sealing the mixed powder into an extrusion can, extruding it, and subjecting the extruded material to zone annealing heat-treatment while its maximum temperature is within the range from its hardness softening temperature to its solidus temperature.

4,717,436

WIRE FOR BONDING A SEMICONDUCTOR DEVICE

Naoyuki Hosoda, Osaka; Masaki Morikawa, Iwatsuki; Naoki Uchiyama, Osaka; Hideaki Yoshida, Kasukabe, and Toshiaki Ono, Osaka, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 844,350, Mar. 26, 1986, Pat. No. 4,676,827. This application Apr. 9, 1987, Ser. No. 36,249
Claims priority, application Japan, Mar. 27, 1985, 60-62974; Nov. 8, 1985, 60-250410; Feb. 20, 1986, 61-35627
Int. Cl.[4] C22C *9/00*
U.S. Cl. 148—432 **2 Claims**

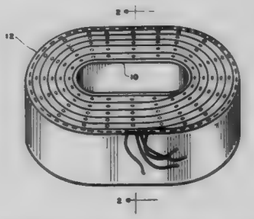
1. A very fine wire for use in the bonding of a semiconductor device which is made of high-purity copper that contains no more than 0.1 ppm of each of S, Se and Te as an incidental impurity, with the total content of these and any other incidental impurities present being held at a level not exceeding 0.3 ppm.

4,717,437

LOW MODULUS DAMPING FILM

Richard D. Blaugher, Pittsburgh, Pa., and Robert L. Kolek, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 3, 1986, Ser. No. 870,044
Int. Cl.[4] H02K *15/04*
U.S. Cl. 156—52 **3 Claims**



1. The method using a polymer as a low modulus damping film in the interface area between the outer winding surfaces and the winding support of an epoxy impregnated winding of multi-stranded Nb_3Sn superconductor in a generator; said polymer being a polycarbonate which is a non-polar, linear polyester of carbonic acid derived from bisphenol A, which at cryogneic temperature has a ratio of elongation to contraction of at least 10; and using an adhesive for affixing the film to the winding surface.

4,717,438

METHOD OF MAKING TAGS

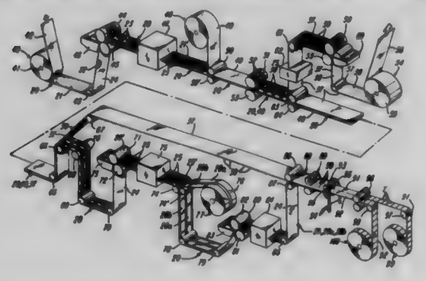
S. Eugene Benge, Middletown, and Robert L. Frouing, Kettering, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 29, 1986, Ser. No. 912,466
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—152 **9 Claims**

1. Method of making tags for use in an electric article surveillance system, comprising the steps of: providing a first web having a series of longitudinally recurring first patterns of adhesive, providing a second web having a series of longitudinally recurring second patterns of adhesive, cutting a web of

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conductive material to form longitudinally recurring pairs of first and second contiguous, coplanar, spiral conductors wrapped about each other, the first and second webs being positioned on opposite sides of the conductive material web with the first adhesive patterns in contact with only the first conductors and with the second adhesive patterns in contact with only the second conductors, separating the first web with



the first conductors adhered thereto and the second web with the second conductors adhered thereto from each other, thereafter positioning the first and second conductors into a related arrangement for capacitive and inductive coupling, and connecting the related first and second conductors to provide a composite tag web of a series of tags each having a resonant circuit.

4,717,439

PROCESS FOR THE TREATMENT OF COPPER OXIDE IN THE PREPARATION OF PRINTED CIRCUIT BOARDS

Juan Hajdu, Orange, Conn., and Martin W. Bayes, Ossining, N.Y., assignors to Enthone, Incorporated, West Haven, Conn.

Filed Oct. 24, 1985, Ser. No. 790,999
Int. Cl.⁴ H05K *1/09, 3/22;* C23F *11/00*
U.S. Cl. 156—280 **10 Claims**

1. A process for improving the leach resistance of copper oxide to an acid copper electroplating bath comprising contacting the copper oxide layer on top of a copper layer of a printed circuit board laminate for a sufficient time to provide increased leach resistance to said copper electroplating bath with an aqueous solution containing an element selected from the group consisting of selenium, tellerium, sulfur and mixtures thereof and having a pH of about 1 to 5.

4,717,440

COMPOSITIONS CURABLE BY IN SITU GENERATION OF CATIONS

Kieran F. Drain, Meriden, Conn., and David J. Dunn, Aurora, Ohio, assignors to Loctite Corporation, Newington, Conn.

Filed Jan. 22, 1986, Ser. No. 821,570
Int. Cl.⁴ C08F *4/06;* C08G *59/68*
U.S. Cl. 156—310 **25 Claims**

1. A two-part composition curable by contact of respective parts with one another, comprising:

a first part comprising a cationically polymerizable material and a first latent curing component selected from the group consisting of organic halides and water;

a second part comprising a cationically polymerizable material and a second latent curing component which is reactive with said first component to form cations which are curingly effective for said cationically polymerizable material

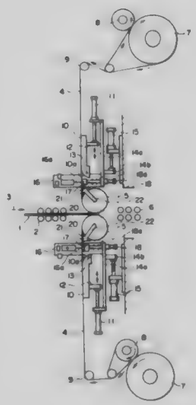
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4,717,441

LAMINATOR

Mitsuhiro Seki, Tokyo, and Fumio Hamamura, Kanagawa, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,297
Int. Cl.⁴ B32B *31/10*
U.S. Cl. 156—521 **2 Claims**



1. A laminator for continuously and automatically depositing a sheet cut into desired length from a web (**4**) onto a side of a base panel (**1**), comprising:

(a) means (**10**) for holding a leading edge of said web;

(b) means (**11**) for transferring said holding means and attendantly said held leading edge of the web toward said base panel so that the leading edge of said web is tentatively bonded to said base panel;

(c) a pair of press rolls (**5**) for press sealing said web onto said base panel;

(d) cutter means (**16**) for cutting said web into a cut sheet, said cutter means being disposed near a tip (**10***a*) of said holding menas;

(e) cut sheet support means (**20**) for retentively supporting a trailing edge of said cut sheet and smoothly guiding said trailing edge into a nip between said base panel and an associated one of said press rolls, said support means being configured as a yoke comprising a hollow central member extending axially across said one press roll proximate an outer surface thereof, a pair of parallel, radially oriented mounting arms (**22**) coupled at one ends thereof to ends of the central member and pivotally journaled at other, opposite ends about an axis of said one press roll, a plurality of suction holes (**21**) defined in and extending across said central member, and means (**23**) for communicating a vacuum to said central member; and

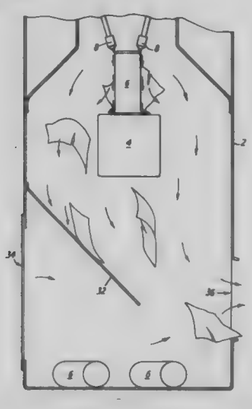
(f) means (**25–27**) for rotatably driving said support means about said axis at a speed equal to or slightly lower than a circumferential speed of said one press roll such that said retained trailing sheet edge is prevented from becoming wrinkled as it enters said nip.

4,717,442

APPARATUS FOR REMOVING LABELS OR CARRIERS FROM CONTAINERS

Eric C. Hopson, Swindon, England, assignor to Metal Box Public Limited Company, Reading, England

Division of Ser. No. 620,169, Jun. 13, 1984, Pat. No. 4,661,195. This application Jan. 30, 1987, Ser. No. 9,228
Claims priority, application United Kingdom, Jun. 21, 1983, 8316823
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—584 **15 Claims**



1. Apparatus for removing spent wrap-around labels or carriers from containers after decoration by thermal transfer of dyes, said wrap-around labels or carriers comprising labels or carriers in which the opposing ends are brought into overlapping relationship and adhesively secured together, said apparatus comprising:

a conveyor to carry the containers along a path through a station;

means to allow access for air between said label and said container;

a nozzle to direct a gas or air jet between each label or carrier and its container against the reactive force of the conveyors, said gas or air jet being sufficient force to rupture the label or carrier absent melting thereof; and

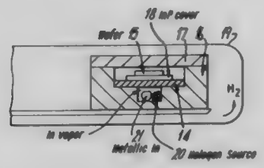
means to create a gas or air draught to carry the label or carrier after rupture away from said path.

4,717,443

MASS TRANSPORT OF INDIUM PHOSPHIDE

Peter D. Greene, Harlow, and Daniel S. O. Renner, Sawbridgeworth, both of United Kingdom, assignors to Standard Telephones and Cables, PLC, London, England

Filed May 20, 1985, Ser. No. 735,754
Claims priority, application United Kingdom, Jun. 28, 1984, 8416417
Int. Cl.⁴ C30B *23/02, 23/06, 25/16, 29/40*
U.S. Cl. 437—228 **5 Claims**



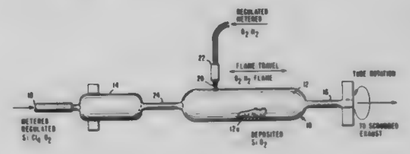
1. A mass transport process, for use in the manufacture of semiconductor devices, including the steps of disposing in an unsealed graphite crucible a semiconductor wafer on which InP is to be grown by mass transport, covering the semiconductor wafer with a cover wafer of InP from which InP is to be mass transported to the semiconductor wafer, disposing transport agent material in the crucible, the transport agent material including a material selected from the group consisting of crystalline KI, crystalline RbI and crystalline CsI, and heating the unsealed crucible in a hydrogen atmosphere at a temperature and for a time consistent with a required amount of growth.

4,717,444

METHOD FOR MAKING HIGH-PURITY, ESSENTIALLY CRACK-FREE CRYSTALS

Fred W. Hill, and Michael R. Vince, both of Thousand Oaks, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 3, 1985, Ser. No. 771,878
Int. Cl.⁴ C10B *15/10*
U.S. Cl. 156—624 **12 Claims**



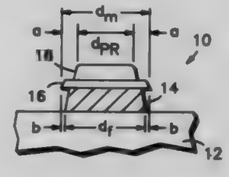
1. A method of making a crystal comprising the step of growing the crystal in a container having interior walls limiting the crystal expansion during growth in the lateral direction, said walls being coated with inert particulate silica, wherein the particles of inert silica form a deformable coating the adheres to the surface of said walls and which aids in the preventing of cracking of crystals.

4,717,445

ETCH BIAS MONITORING TECHNIQUE

Howard K. H. Leung, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 24, 1986, Ser. No. 843,457
Int. Cl.⁴ H01L *21/306*
U.S. Cl. 156—626 **19 Claims**



1. In an etch bias monitoring technique for determining the etch bias of a device feature layer, the improvement comprising the steps of:

examining a cross-sectional profile of an etched critical dimension feature comprising at least two different layers: a hard mask reference layer and a device feature layer;

obtaining measurements of the cross-sectional profile of a critical dimension feature of the hard mask reference layer, d_m, the same critical dimension feature of the device feature layer, d_f, the distance from one edge of the photoresist layer to the edge of the hard mask reference layer, a,

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and the distance from one edge of the hard mask reference layer to the edge of the device feature layer, b; and

calculating the etch bias, B, by a method selected from the group of methods consisting of:

comparing d_m with d_f; and

calculating the value of 2a and 2b and taking the greater value.

4,717,446

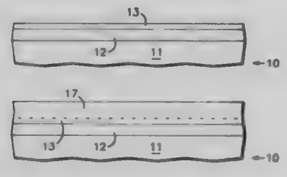
METHOD OF DETECTING THE ENDPOINT OF THE ETCH OF EPITAXIALLY GROWN SILICON

Andrew G. Nagy; Donald K. Stemple, and Clarence J. Tracy, all of Tempe, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 18, 1986, Ser. No. 909,043

Int. Cl.⁴ H01L *21/306*

U.S. Cl. 156—626 **13 Claims**



1. A method of detecting the endpoint of epitaxially grown silicon comprising the steps of:

providing a working wafer having a silicon substrate;

providing a monitor wafer having a substrate, an oxide layer disposed on said substrate, and a polysilicon layer disposed on said oxide layer;

growing an epitaxial layer on said working wafer and said monitor wafer simultaneously;

etching said working wafer and said monitor wafer;

detecting an endpoint between said polysilicon layer and said oxide layer of said monitor wafer using a laser; and

halting said etching when said endpoint is detected by said laser.

4,717,447

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY MEANS OF PLASMA ETCHING

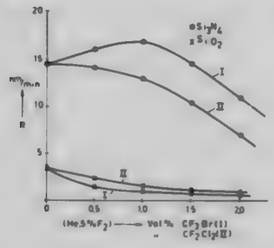
Jan Dieleman, and Franciscus H. M. Sanders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,178

Claims priority, application Netherlands, Nov. 16, 1982, 8204437

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **4 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of

forming a plasma in a reactor, said plasma including fluorine or a fluorine compound, and said plasma being substantially oxygen-free,

adding 0.1 to 25% by volume of a halogen different from fluorine to said plasma, wherein said halogen different from fluorine is a bromine or bromine compound, and wherein said bromine compound is CF_3Br, and

etching a layer of silicon nitride on a substrate with said plasma, wherein said plasma includes helium and 2 to 10% by volume of fluorine to which 0.5 to 2% by volume of said CF_3BR is added.

4,717,448

REACTIVE ION ETCH CHEMISTRY FOR PROVIDING DEEP VERTICAL TRENCHES IN SEMICONDUCTOR SUBSTRATES

Randy D. Cox, Round Rock, Tex.; Arthur B. Israel, Colchester, and Edward H. Payne, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1986, Ser. No. 917,131

Int. Cl.⁴ B44C *1/22*; H01L *21/308*

U.S. Cl. 156—643 **18 Claims**

1. A process for etching portions of a monocrystalline silicon material so as to form trenches having sidewalls and bottoms therein, comprising the step of treating the material in a reactor having a gaseous plasma comprised of more than 70% hydrogen chloride, oxygen, and an amount of boron trichloride sufficient to remove oxides formed during said etching process from bottoms of said trenches without substantially removing oxides formed during said etching process from sidewalls of said trenches.

4,717,449

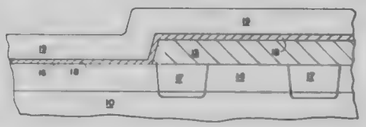
DIELECTRIC BARRIER MATERIAL

David G. Erie, Cottage Grove; Jon A. Roberts, Minnetonka, and Eddie C. Lee, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 603,861, Apr. 25, 1984, abandoned. This application Jul. 25, 1986, Ser. No. 890,874

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 437—195 **29 Claims**



1. A method of fabricating an integrated circuit comprising:

providing a substrate comprising a semiconductor material and having a first surface;

forming a first layer of metalization interconnects over the first surface, each interconnect having a width;

depositing a first thin film layer comprising a dielectric barrier material directly onto the first layer of metalization interconnects and portions of the first surface which are free of the first layer of metalization interconnects;

depositing a second thin film layer comprising a dielectric passivating material directly onto the first thin film layer of dielectric barrier material;

plasma etching part of a via through the dielectric passivating material to the dielectric barrier material using a first etch gas to thereby expose a portion of the dielectric barrier material but which portion is free of any substantial etching, the vin to have an extent greater than the width of a metalization interconnect;

plasma etching the exposed portion of the dielectric barrier material through to the first layer of metalization interconnects using a second etch gas to remove this exposed portion of the dielectric barrier material to thereby complete the via; and

forming a second layer of metalization interconnects, a metalization interconnect from each of the first and second layers of metalization interconnects being electrically connected in the via.

4,717,450

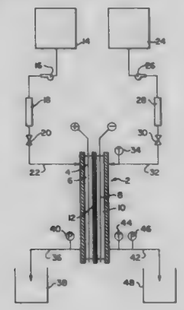
REMOVAL OF CHLORIDE FROM PROCESS SOLUTIONS

John M. Shaw, Toronto, and Colin W. Oloman, Vancouver, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Aug. 19, 1985, Ser. No. 767,169

Int. Cl.⁴ D21C *11/00*; C02F *1/46*

U.S. Cl. 162—29 **3 Claims**



1. A method of removing chloride ions from a spent cooking liquor from a pulp mill, containing sulfide ions and at least 1 g/l chloride ions, utilizing an electrochemical reactor having an anode and a cathode, disposed in respective anode and cathode compartments separated solely by an anion selective separator means, the method comprising:

(a) first oxidizing essentially all of the sulfide ions in the spent cooking liquor to oxidized sulphur anions; then

(b) flowing the spent cooking liquor through the cathode compartment of the reactor as the catholyte while simultaneously flowing an aqueous electrically conducting solution through the anode compartment as the anolyte; and

(c) maintaining a current density in a range of about 500 to 5,000 amp/m^2 between the anode and the cathode, to cause the chloride anions in the catholyte to pass through the anion exchange membrane into the anolyte and generate corresponding hydroxyl ions at the cathode which are incorporated in the catholyte.

4,717,451

PROCESS FOR THE PREPARATION OF ANTHRAQUINONE DISPERSIONS AND THEIR USE IN ALKALINE WOOD DIGESTION PROCESSES

Michel Devic, Sainte Foy les Lyon, and Jean-Pierre Schirmann, Oullins, both of France, assignors to Atochem, France

Filed Dec. 18, 1985, Ser. No. 810,405

Claims priority, application France, Dec. 21, 1984, 8420090

Int. Cl.⁴ C07C *50/18*; D21C *3/20*

U.S. Cl. 162—72 **5 Claims**

1. In the process of alkaline digestion of wood in a conventional alkaline wood-digestion bath, the improvement comprising adding to said digestion bath a dispersion containing about 20 to 50% by weight of anthraquinone, said dispersion prepared by cyclizing ortho-benzoylbenzoic acid at a temperature of about 150° to 180° C. and at an absolute pressure between about 5 and 40 millibars in the presence of between about 0.5 to 2 parts by weight of sulfuric acid, having a concentration of at least about 95%, per part by weight of ortho-benzoylbenzoic acid to form a reaction mixture containing anthraquinone, bringing the reaction mixture to a pH of at least about 7 by addition thereto at a temperature between about ambient temperature and 100° C. of an aqueous solution of sodium hydroxide or potassium hydroxide containing between about 10% and 40% hydroxide by weight to form a suspension, and then grinding said suspension to form a dispersion thereof containing anthraquinone and the impurities resulting from such reactions.

4,717,452

COMPOSITION FOR SIZING AGENT AND PROCESS FOR USING THE SAME COMPOSITION

Shigehiko Yoshioka, Akashi; Tsuneo Yoshida, Nagaoka; Hisatake Sato, Yokohama; Hideto Yamada, Akashi, and Yoshio Adachi, Nishinomiya, all of Japan, assignors to Seiko Kagaku Kogyo Co., Ltd.; Nippon Oil Co., Ltd. and Hokuetsu Paper Mills, Ltd., all of, Japan

Filed Sep. 25, 1985, Ser. No. 780,083

Int. Cl.⁴ D21H *3/08*

U.S. Cl. 162—158 **4 Claims**

1. A process for making paper using a sizing agent, comprising:

dispersing a sizing agent in an aqueous solution of an aqueous soluble polymer compound, said sizing agent comprising (a) 70 to 99.9% by weight of a member selected from the group consisting of substituted alkyl succinic anhydrides, substituted alkenyl succinic anhydrides and mixtures thereof, wherein said substituted succinic anhydride is an additive reaction product of maleic anhydride and a straight chain inner olefin having 12–36 carbon atoms, and (b) 0.1 to 30% by weight of a member selected from the group consisting of phosphates of polyoxyethylene alkyl ether esters, phosphates of polyoxyethylene alkyl aryl ether esters and mixtures thereof;

adding the resultant aqueous dispersion to a pulp slurry of paper making material; and then

making the paper.

4,717,453

WEB FORMING DEVICE WITH RIGID CONCAVE/CONVEX PRESSURE PLATE

Per L. Reiner, Matfors, Sweden, assignor to Mölnlycke Aktiebolag, Gothenburg, Sweden

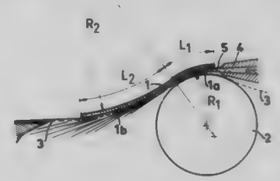
PCT No. PCT/SE85/00152, § 371 Date Dec. 9, 1985, § 102(e) Date Dec. 9, 1985, PCT Pub. No. WO85/04680, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 1, 1985, Ser. No. 824,007

Claims priority, application Sweden, Apr. 10, 1984, 8401995

Int. Cl.⁴ D21F *1/02*

U.S. Cl. 162—312 **16 Claims**



1. A device for forming a fiber web from a fiber pulp suspension, including a head box with a nozzle for applying the pulp suspension on a wire movable past the nozzle, comprising:

a pressure plate located after the nozzle and over the pulp suspension, the pressure plate having a rigid concave formed portion adjacent the nozzle and facing the pulp suspension and a rigid convex formed portion facing the pulp suspension, the wire having an unsupported portion, said pressure plate being arranged so that the pulp suspension follows the rigid concave formed portion under influence of centrifugal force in the absence of contact with the

wire whereby substantially no dewatering of the suspension occurs along said rigid concave formed portion;

the rigid convex formed portion and the unsupported portion of the wire defining a forming zone where the pressure plate and the wire are pressed against each other so as to effect dewatering of the pulp suspension.

4,717,454

PROCESS FOR REMOVING ACETONE FROM REACTION MIXTURES OF CARBONYLATION REACTIONS

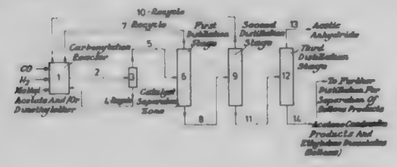
Heinz Erpenbach, Cologne; Klaus Gehrmann; Peter Hörstermann, both of Erftstadt, and Georg Kohl, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Werk Knapsack, Fed. Rep. of Germany

Continuation of Ser. No. 442,105, Nov. 16, 1982, abandoned. This application Sep. 10, 1985, Ser. No. 774,384

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149094

Int. Cl.⁴ B01D *5/00*

U.S. Cl. 203—29 **5 Claims**



1. In a process for removing byproduct acetone from reaction mixtures obtained from the carbonylation of a starting material, wherein the starting material is methyl acetate, dimethyl ether, or mixtures thereof, in the presence of a catalyst system consisting essentially of:

a carbonyl complex of a noble metal of group VIII of the Periodic System of the elements, acetic acid, an organophosphorus or organonitrogen compound, and methyl iodide in a molar ratio of 1:(25–600):(10–300):(10–300), the improvement comprising:

(a) subjecting the acetone obtained as a by-product during the reaction to condensation at temperatures of 50° to 250° C., under pressures of 0.01 to 150 bars and at a molar ratio as above defined of 1:(25–500):(10–100):(-15–150), and as a result of said conditions acetone condensation products containing 6 to 12 carbon atoms are produced from the acetone;

(b) conveying the contents of the carbonylation zone to a catalyst separation zone and separating the volatile constituents of said contents from the non-volatile constituents of the catalyst system;

(c) conveying the said volatile constituents obtained in said step (b) to a first distillation zone to provide a lower-boiling overhead mixture containing methyl iodide, unreacted starting material, and a residual acetone content of about 5 weight % acetone, and a higher-boiling bottoms product containing acetic acid, acetic anhydride, ethylidene diacetate, and the acetone condensation products; and recycling said overhead mixture to the carbonylation zone; whereby the acetone content of said overhead mixture is reduced due to the content of acetone condensation products in the bottoms product.

4,717,455

PROCESS FOR MANUFACTURING A MICROFILTER

Marcus Textor, Schaffhausen; Martin Werner, Singen, and Wilhelm Franschitz, Neuhausen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 18, 1986, Ser. No. 932,447

Claims priority, application Switzerland, Nov. 25, 1985, 5068/85

Int. Cl.⁴ C25D *5/44, 11/06, 11/36, 11/38*

U.S. Cl. 204—33 **13 Claims**

1. Process for manufacturing a microfilter from a recrystallized aluminum foil using electrolytic etching, which comprises: providing a 20 to 250 μm thick aluminum foil of at least 99.95% purity, subjecting said foil to a recrystallizing anneal, etching in an electrolyte in at least one step of constant current density in the range of 0.1 to 2.0 kA/m² to form an aluminum foil having through-flow pores suitable for use as a microfilter, and stabilizing the surface of the resultant product to prevent a hydration reaction.

4,717,456

TWO-STEP ELECTROLYTIC ACTIVATION PROCESS FOR CHROMIUM ELECTRODEPOSITION

Hyman Chessin, Brick, and William C. Korbach, Howell Township, both of N.J., assignors to M&T Chemicals, Woodbridge, N.J.

Filed Jan. 6, 1986, Ser. No. 816,180

Int. Cl.⁴ C25D *5/26*

U.S. Cl. 204—34 **11 Claims**

1. A method of forming adherent, bright, smooth and hard chromium electrodeposits on a cast iron substrate comprising:

(a) activating said substrate by a two-step electrolytic activation process comprising anodically treating said substrate in an oxidizing solution, to form a passive layer thereon without introducing surface roughness, and sequentially, cathodically treating said substrate, to reduce the passive layer and condition the substrate to receive an adherent chromium electrodeposit and,

electrodepositing chromium on said thus-activated substrate.

4,717,457

METHOD OF PROVIDING A TRANSPARENT LAYER ON A SUBSTRATE

Pieter van der Werf, and Albertus Versteyne, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1984, Ser. No. 647,247

Claims priority, application Netherlands, Sep. 15, 1983, 8303183

Int. Cl.⁴ C23C *28/00;* **C25D** *11/04*

U.S. Cl. 428—701 **4 Claims**

1. A method of producing a transparent coating on a substrate, said method comprising:

(a) providing a transparent electrically conductive layer of an oxide of cadmium, doped if necessary to increase its electrical conductivity, on a substrate;

(b) providing an aluminum layer on said transparent conductive layer of cadmium oxide and, if desired, providing one or more layers of another metal(s) on said layer of aluminum; and

(c) then electrolytically converting said aluminum layer into a layer of aluminum oxide and if present, said layer(s) of said other metal(s) into oxides of said other metal(s).

4. A substrate having a composition of transparent layers obtained by means of the method as claimed in claim 1.

4,717,458

ZINC AND ZINC ALLOY ELECTROLYTE AND PROCESS

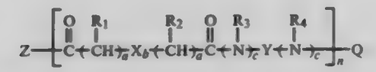
Sylvia Martin, Utica; Roy W. Herr, Troy; Walter J. Wieczerniak, Utica, and Alice M. Strom, Warren, all of Mich., assignors to OMI International Corporation, Warren, Mich.

Filed Oct. 20, 1986, Ser. No. 920,636

Int. Cl.⁴ C25D *3/22, 3/56*

U.S. Cl. 204—44.2 **28 Claims**

1. An aqueous bath suitable for electrodepositing zinc and zinc alloys on a conductive substrate comprising zinc ions present in an amount sufficient to electrodeposit zinc, and in the case of a zinc alloy, additional metal ions selected from the group consisting of nickel, cobalt and iron present in an amount to electrodeposit an alloy of zinc and nickel, zinc and cobalt; zinc, nickel and cobalt; zinc and iron; zinc, iron and nickel; zinc, iron and cobalt; and zinc, iron, nickel and cobalt; and a brightening amount of a bath soluble AABB-type polyamide brightener of the structural formula;



Wherein:

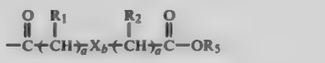
a is 0 or an integer of 1 to 3;

b is 0 or 1;

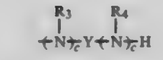
c is 0 or 1;

n is at least 1;

Q is H,



Z is —O—R_5,

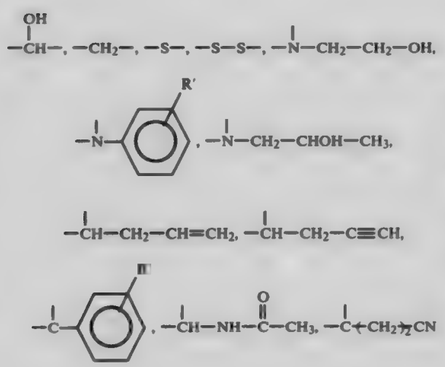


R_1 and R_2 is —H, —CH_3, —OH;

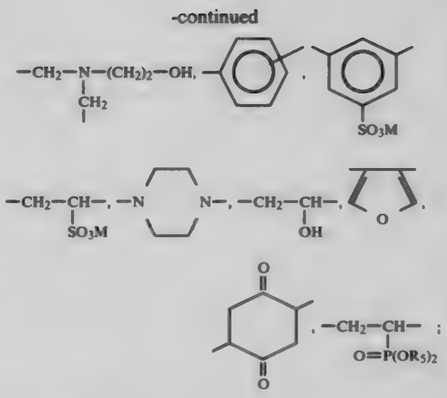
R_3 and R_4 is —H, C_1–C_4 alkyl group, C_3–C_5 alkenyl group, C_3–C_6 alkynyl group, —CH_2—CH_2—OH, —CH_2—CHOH—CH_3,

R_5 is —H, C_1–C_4 alkyl group or M;

X is

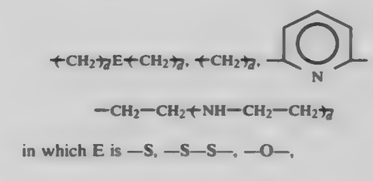


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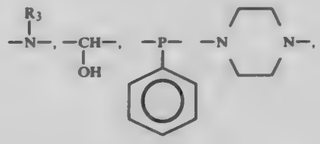


in which M is Li, Na, K, Mg, NH_4 and R′ is —H, —NO_2, —SO_3M, —CO_2R_5, —CHO, —F, —Cl, —Br, —I, C_1–C_4 alkyl group, C_2–C_4 alkenyl group, C_2–C_4 alkynyl group;

Y is



in which E is —S, —S—S—, —O—,



and d is O or an integer of 1–6;

as well as the alkylated or cross-linked derivatives and mixtures thereof, the type and number of constituent groups being selected so that said polyamide always contains at least two amide groups.

4,717,459

ELECTROLYTIC GOLD PLATING SOLUTION

Masao Nakazawa; Yoshirou Nishiyama, and Shinichi Wakabayashi, all of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Mar. 28, 1986, Ser. No. 845,522

Claims priority, application Japan, May 30, 1985, 60-115278; May 30, 1985, 60-115279; May 30, 1985, 60-115280

Int. Cl.⁴ C25D *3/48, 3/62*

U.S. Cl. 204—44.3 **10 Claims**

1. An electrolytic gold plating solution comprising a soluble gold salt, a conductivity salt, a grain refining quanity of a lead component selected from the group consisting of (1) a mixture of a lead compound and a complexing agent having a stability constant with lead of not less than 15 and (2) a complex formed from said lead compound and said complexing agent, and an amine compound having a pyrrolidine, piperazine, piperidine, or pyridine skeleton.

4,717,460

TIN LEAD ELECTROPLATING SOLUTIONS

Fred I. Nobel, Sands Point; Barnet D. Ostrow, Roslyn, and David N. Schram, Freeport, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 852,063, Apr. 15, 1986, which is a continuation-in-part of Ser. No. 778,353, Sep. 20, 1985, Pat. No. 4,167,097, which is a continuation-in-part of Ser. No. 564,516, Dec. 22, 1983, Pat. No. 4,599,149, which is a continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 738,615, May 28, 1985, Pat. No. 4,701,244. This application Jun. 18, 1987, Ser. No. 64,167

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] C25D *3/58*

U.S. Cl. 204—444 18 Claims

1. A tin, lead or tin-lead alloy electroplating bath which comprises:

(a) a bath containing an alkane sulfonic acid and either a divalent tin salt, divalent lead salt thereof or both;

(b) at least one cationic, amphoteric or nonionic surfactant;

(c) an aromatic aldehyde; and

(d) acetaldehyde.

4,717,461

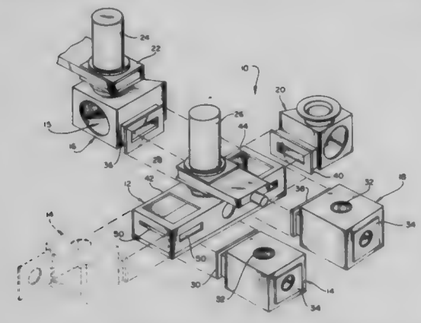
SYSTEM AND METHOD FOR PROCESSING WORKPIECES

Thomas L. Strahl, Fremont; Lawrence T. Lamont, Jr., San Jose; Carl T. Peterson, Fremont; Hobart A. Brown, Santa Cruz; Lonnie W. McCormick, Cupertino, and Roderick C. Mosely, Mountain View, all of Calif., assignors to Machine Technology, Inc., Parsippany, N.J.

Filed Sep. 15, 1986, Ser. No. 907,578

Int. Cl.[4] C23C *14/00*

U.S. Cl. 204—192.1 14 Claims



1. A method of processing a plurality of workpieces comprising placing a plurality of workpieces in a first chamber adjacent to a transfer region, moving a workpiece out of the first chamber into the transfer region when the first chamber is closed to the ambient atmosphere, advancing the workpiece through the transfer region and into a second chamber, processing the workpiece in the second chamber, returning the workpiece through the transfer region to the first chamber, and repeating the moving, advancing, processing and returning steps for each workpiece of the plurality until all of the workpieces have been processed in the second chamber.

4,717,462

SPUTTERING APPARATUS

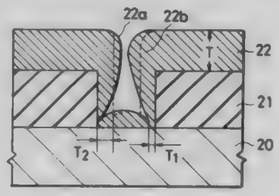
Yoshio Homma, Hinode; Sukeyoshi Tsunekawa, Tokorozawa, and Shunji Sasabe, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 922,892

Claims priority, application Japan, Oct. 25, 1985, 60-237258

Int. Cl.[4] C23C *14/00*

U.S. Cl. 204—298 11 Claims



1. A sputtering apparatus comprising:

a cathode disposed within a vacuum chamber;

a substrate electrode disposed in face-to-face relationship with said cathode; and

an intermediate electrode disposed between said cathode and said substrate electrode and including a plurality of openings, each of said openings having an aspect ratio between 0.1 and 3.0;

wherein ions are made to collide against a target disposed on said cathode so as to liberate particles of materials of which said target is composed, thereby depositing a thin film on a substrate disposed on said substrate electrode.

4,717,463

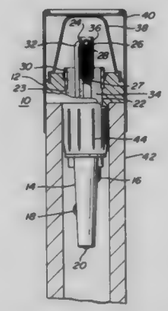
OXYGEN SENSOR

Harry G. Clauss, Wexford, Pa., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 862,735, May 13, 1986, abandoned. This application Jan. 15, 1987, Ser. No. 6,302

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—422 5 Claims



1. An improved immersion oxygen sensor having an electrical output that is more stable and less susceptible to initial overshoot of the measured value upon immersion in a bath of molten metal comprising a zirconia solid electrolyte having its outer surface exposed to said molten metal upon immersion in said bath, a Cr, Cr_2O_3 reference electrode contacting the inner surface of said solid electrolyte to provide a reference level of oxygen partial pressure, a first electrical conductor providing electrical contact with said reference electrode, and a second electrical conductor for making electrical contact with said molten metal upon immersion, characterized in that NiO and Fe are combined in said reference electrode.

2. An improved oxygen sensor capable of immersion in a bath of molten metal for the determination of dissolved oxygen content in said bath comprising

a sensor cartridge having a body portion with a cavity in one face of said body portion,

a closed end tube of solid electrolyte mounted in said cavity with said closed end of said tube extending beyond said surface of said cartridge,

an oxygen reference material mounted within said closed end tube and in contact with the inner surface of said tube,

a first electrical conductor extending through said cartridge and into said closed end tube making electrical contact with said oxygen reference material,

a second electrical conductor extending through said cartridge to provide electrical contact with said bath of molten metal when said sensor is immersed in said bath, and

a resin-sand material filling said cavity to maintain said closed end tube securely in said cartridge.

4,717,464

OXYGEN SENSOR

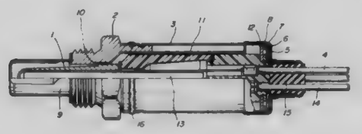
Norio Oshima, Nagoya; Takao Murase, Konan, and Shuichiro Oki, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 27, 1986, Ser. No. 900,892

Claims priority, application Japan, Sep. 2, 1985, 60-133045[U]; Sep. 2, 1985, 60-133046[U]

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—427 6 Claims



1. An oxygen sensor comprising a solid electrolyte tube having a closed and an open end, said closed end having an electrode on an inside and an outside surface thereof, a housing supporting said electrolyte tube and isolating the inside surface of the electrolyte tube hermetically from an exhaust gas, said closed end of the tube protruding from the housing toward the exhaust gas, and a metallic sleeve is fixed to said housing, said metallic sleeve enclosing the open end of said solid electrolyte tube and including at least one air passage therein, a filter covering said at least one air passage and a first metallic member for supporting said filter, said first metallic member including a plurality of aperatures therethrough and at least one air groove which communicates with said apertures, whereby said filter is sandwiched between said metallic sleeve and said first metallic member such that each of said at least one passage in the metallic sleeve communicates with said plurality of apertures in said first metallic member through said filter.

4,717,465

PROCESS FOR PRODUCING JET FUEL WITH ZSM-22 CONTAINING CATALIST

Nai Y. Chen, Titusville, and William E. Garwood, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

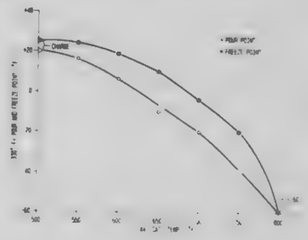
Continuation of Ser. No. 688,081, Dec. 31, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,935

Int. Cl.[4] C10G *45/64*

U.S. Cl. 208—111 5 Claims

1. A process for the production of jet fuel having an extended end point of up to 750° F. and low pour point and freeze point, which comprises:

contacting a hydrocarbon feedstock having a boiling range of 330° to 750° F., a pour point and a freeze point and aromatic content above that of the jet fuel with a catalyst comprising zeolite ZSM-22 and a hydrogenation component in the presence of hydrogen at elevated pressure of 200 to 2000 psig and at a temperature high enough to



reduce the freeze and pour points to jet fuel specification by shape selective dewaxing over the zeolite and which is low enough to reduce the aromatic content to jet fuel specification, to produce a dewaxed, hydrogenated jet fuel product of extended end point, low pour point and freeze point and reduced aromatic content.

4,717,466

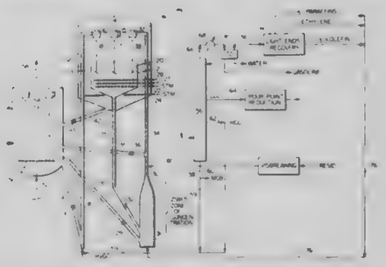
MULTIPLE RISER FLUIDIZED CATALYTIC CRACKING PROCESS UTILIZING HYDROGEN AND CARBON-HYDROGEN CONTRIBUTING FRAGMENTS

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1986, Ser. No. 903,341

Int. Cl.[4] C10G *11/18, 37/02*

U.S. Cl. 208—113 30 Claims



1. A fluidized catalytic cracking process possessing at least a first and a second riser reaction zone at least one stripping zone in which entrained hydrocarbon material is removed from catalyst and at least one hydrothermal catalyst regeneration zone in which spent cracking catalyst is regenerated, which comprises:

(a) converting a hydrogen-deficient first heavy hydrocarbon feed in the first riser reaction zone in the presence of at least the first catalyst component of a mixed catalyst composition comprising as said first catalyst component, an amorphous cracking catalyst and/or a large pore crystalline cracking catalyst and, as a second catalyst component, a shape selective medium pore crystalline silicate zeolite, to provide gasoline boiling range material and one or more light hydrocarbons;

(b) converting a hydrogen-rich hydrocarbon feed in a lower region of the second riser reaction zone in the presence of the second component of the mixed catalyst composition to provide gasiform material contributing mobile hydrogen species and/or carbon-hydrogen fragments for combi-

nation with a thermally treated, relatively hydrogen-deficient second heavy hydrocarbon feed introduced to an upper region of the second riser reaction zone; and

(c) converting the gasiform material and thermally treated, relatively hydrogen-deficient second heavy hydrocarbon feed in an upper region of the second riser reaction zone in the presence of the mixed catalyst composition under conditions affecting cracking and additive carbon-hydrogen reactions to provide a gasoline product of increased octane number and/or higher quality,

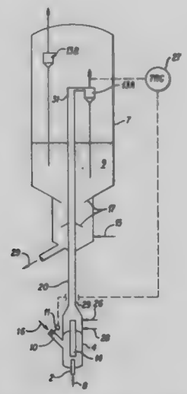
there being a sufficient difference in average particle density, particle size and/or particle geometry of the catalyst components as to confer a higher average settling rate upon particles of second catalyst component compared to that of particles of first catalyst component with the result that particles of second catalyst component will possess a longer residence time in the lower region of the second riser reaction zone compared to that of particles of first catalyst component, the second catalyst component additionally defining a zone of concentration in said lower region.

4,717,467

PROCESS FOR MIXING FLUID CATALYTIC CRACKING HYDROCARBON FEED AND CATALYST

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 15, 1987, Ser. No. 50,269
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 **16 Claims**



1. A process for mixing fluid catalytic cracking catalyst and hydrocarbon feedstock comprising the steps of:

passing a first stream of said catalyst into a catalyst bed in an enclosed chamber;

passing lift gas through a first vertical conduit into said enclosed chamber;

axially passing said lift gas from said first conduit into an upstream end of a second vertical conduit, said upstream end of said second conduit being immersed in said bed;

passing said catalyst from said bed along with said lift gas into said second conduit;

accelerating said catalyst through said second conduit;

axially passing said catalyst and lift gas from said chamber, to an upstream end of a fluid catalytic cracking riser, through said second conduit, said riser comprising an elongated tubular vessel;

atomizing said hydrocarbon feedstock and passing said atomized hydrocarbon feedstock in annular flow about an inner periphery of said riser upstream end;

combining said hydrocarbon feedstock, catalyst and lift gas in said riser to form a mixture; and

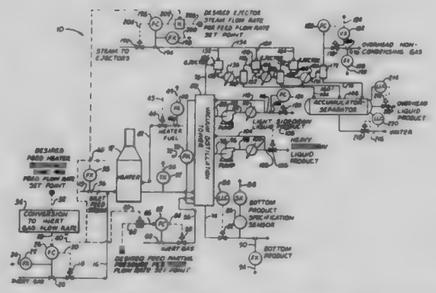
upwardly passing said mixture through said riser at fluid catalytic cracking conditions.

4,717,468

DISTILLATION PROCESS CONTROL FOR MAXIMUM RECOVERY USING MINIMUM ENERGY

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 812,263, Dec. 23, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 9,651
Int. Cl.[4] B01D *3/42*
U.S. Cl. 208—356 **17 Claims**



1. In a distillation process wherein a feed stream containing components to be separated is combined with a first inert gas stream, the combined inert gas-feed stream is passed through a heater whereby it is heated, the heated combined inert gas-feed stream is introduced into a distillation tower wherein the feed stream is subjected to distillation at a low total tower pressure, a second inert gas stream is introduced into the distillation tower and a liquid bottom product of required specification, one or more sidedraw liquid products and overhead gases are withdrawn from the distillation tower, the improvement whereby the recovery of liquid product other than liquid bottom product is maximized with minimum energy input while meeting the bottom product specification comprising:

maintaining the total distillation tower pressure at a low level;

controlling the flow rate of said first inert gas stream in proportion to the flow rate of said feed stream and additionally in a ratio therewith such that the residence time of said feed stream in said heater is minimized;

controlling the flow rate of said second inert gas stream in proportion to the flow rate of said feed stream and additionally at a total flow rate such that the partial pressures of said feed stream components are minimized in said tower; and

controlling the temperature of the combined inert gasfeed stream exiting said heater at the minimum temperature whereby minimum overflash is produced in said tower while maintaining the required bottom product specification and process conditions.

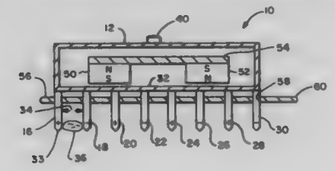
4,717,469

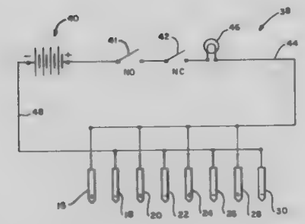
DEVICE FOR SCAVENGING METAL FROM EARTH DEPOSITS

Anton Pirc, 3201 Wagner Place, Santa Rosa, Calif. 95405

Filed Oct. 29, 1986, Ser. No. 924,288
Int. Cl.[4] B03C *1/02*
U.S. Cl. 209—8 **12 Claims**

1. A device for scavenging ferrous and non-ferrous metal bodies from above-ground and submerged metal-bearing sand and earth deposits, the device comprising the combination of a frame, a plurality of generally parallel, spaced-apart scavenger elements mounted on and extending outwardly from at least one side of the frame, the elements having surfaces comprised of an electrical conductive material, control circuit means for applying an electrical charge to the elements with the facing surfaces of adjacent elements having opposite polarities and





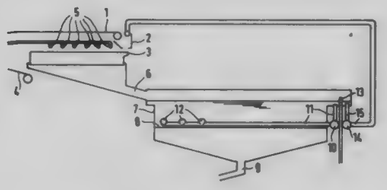
with metal bodies contained in the deposits bridging across and contacting the surfaces of adjacent elements to create electrical paths across the bodies for the flow of direct current with the current establishing magnetic fields about the bodies, and magnet means in the frame for attracting the magnetic fields and capturing the bodies between the elements.

4,717,470

METHOD FOR CLASSIFYING SAND

Ivar Apeland, N-4137 Årdal, Norway

Continuation of Ser. No. 581,074, Feb. 17, 1984, abandoned. This application Jul. 29, 1985, Ser. No. 759,928
Claims priority, application Norway, Mar. 24, 1983, 831049
Int. Cl.[4] B03B *5/62, 5/64*
U.S. Cl. 209—17 **10 Claims**



1. An apparatus for the production of classified sand containing different-size sand grains including fines and for the conservation of water, said apparatus including a classification tank containing water and further comprising:

(a) a generally horizontal sieve at an inlet end of said classification tank into which a mixture of water and raw sand materials is introduced through said sieve, said sieve being located completely above the water level in said tank,

(b) said tank having a bottom on which settling takes place,

(c) means at said bottom for receiving classified sand,

(d) a common outlet pipe means for the classified sand at a level below said bottom,

(e) an overflow means in said tank for receiving overflow water, and

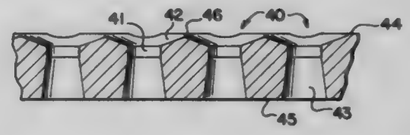
(f) recirculation means partially in said tank for also receiving overflow water containing fines, said recirculation means having an inlet at an end opposite said inlet end and an outlet above said sieve where the raw sand material is originally introduced, said recirculated overflow water containing fines flows through said sieve and into said tank, thereby recirculating the fines to increase the percentage of fines precipitated to said bottom and retained in the classified sand and decreasing the percentage of fines flowing out of the tank through said overflow means, as well as conserving water by restricting the supply of fresh water required.

4,717,471

APPARATUS FOR SCREENING PAPER FIBER STOCK

Jimmy L. Winkler, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 772,809, Sep. 5, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,619
Int. Cl.[4] B07B *1/04, 1/20, 1/50, 1/52*
U.S. Cl. 209—273 **19 Claims**



1. Screening apparatus for paper making stock comprising, a pressure housing, a cylindrical screening member of predetermined uniform thickness dividing the interior of said housing into an inlet chamber and an accepts chamber, said screening member having multiple screening perforations therethrough, and a rotor mounted for rotation in said housing on an axis concentric with that of said screening member and including means for creating alternative positive and negative pressure waves effective on said perforations to prevent plugging thereof, said screening member being further characterized in that:

(a) each of said perforations is circular in cross section and includes a portion of predetermined minimum diameter which is cylindrical,

(b) each of said perforations includes a frustoconical inlet end portion concentric with said cylindrical portions which faces said inlet chamber and has a maximum diameter at the surface of said screening member that is substantially greater than both said minimum diameter and the axial dimension of said inlet portion,

(c) said axial dimension of said inlet portion constitutes a minor fraction of the thickness of said screening member and of said maximum diameter of said inlet portion,

(d) said perforations are arranged in rows which define directions extending perpendicularly to each other along said cylindrical screening member,

(e) the spacing of adjacent said perforations and said maximum diameter of said inlet portions thereof are such that each inlet portion projects into space between adjacent said inlet portions in said rows extending on either side thereof in at least one of said perpendicular directions, and

(f) the relative spacing of adjacent said perforations and the maximum diameter of said inlet portions thereof are such that adjacent said inlet portions define ridges on the surface of the inlet side of said screening member which cooperate with said rotor to create patterns of irregular eddies adjacent the inlet ends of said perforations.

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OIL FILTER ASSEMBLY HAVING MULTIPLE REMOVABLE FILTER MEMBERS AND COOLING FINS

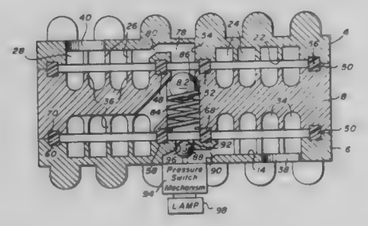
Gordon D. Oberg, Lynwood, Wash., assignor to Oberg Enterprises, Inc., Everett, Wash.

Continuation of Ser. No. 600,772, Apr. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 387,151, Jun. 10, 1982, Pat. No. 4,446,017. This application Jan. 14, 1986, Ser. No. 819,006

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[4] B01D *27/10*

U.S. Cl. 210—90 7 Claims



1. A multistage oil filter assembly, comprising

(a) a sectional housing containing an enclosed filter chamber and including a cover member and a base member each having an outer surface and a planar inner surface, each of said planar inner surfaces containing a plurality of circular, concentrically spaced grooves and a radial groove defining a passage affording communication between said circular grooves, respectively, said cover member containing an inlet opening communicating with said cover member radial groove and said base member containing an outlet opening communicating with said base member radial groove;

(b) intermediate member means arranged between said cover and base members to divide said filter chamber into a plurality of filter subchambers, said intermediate member means having planar surfaces arranged adjacent said cover and base member planar surfaces, respectively, a portion of said intermediate member means containing a plurality of segmented circular concentrically spaced throughslots corresponding with said cover and base member circular grooves;

(c) planar circular mesh filter means arranged in said filter subchambers, respectively, on opposite sides of said intermediate member means, said filter means extending parallel to and completely across said slotted portion of said intermediate member means, said filter means containing a central opening and including inner and outer sealing means adjacent said central opening and the circumference thereof, respectively, the planar surfaces of said cover and base members and of said intermediate member means each containing inner and outer circular seating channels for receiving said inner and outer sealing means of said filter means, respectively; and

(d) means connecting said cover member, said intermediate member means, and said base member together, whereby when oil to be filtered is supplied to said inlet opening, the oil is distributed across said cover member planar inner surface via the radial and circular grooves thereof, passes successively through said filter subchambers and said filter means arranged therein via said throughslots contained in said intermediate member means, and is discharged from said outlet opening via the circular and radial grooves contained in said base member planar inner surface.

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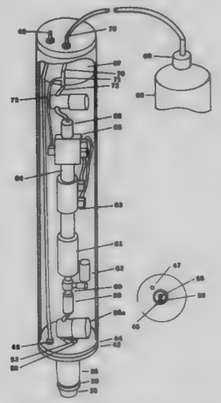
APPARATUS FOR TIME-AVERAGED OR COMPOSITE SAMPLING OF CHEMICALS IN GROUND WATER

Scott R. Burge, 999 E. Baseline #3111, Tempe, Ariz. 85283, and Russell Burge, 21140 Covina Hills Rd., Covina, Calif. 91724

Filed Jan. 20, 1987, Ser. No. 4,872

Int. Cl.[4] E21B *47/00, 33/127, 23/06;* B01D *17/12*

U.S. Cl. 210—170 4 Claims



1. In a well casing, a ground water sampling system comprising:

a. a pumping unit,

b. a sorption column and physical or chemical cell mounted under said pumping unit for analyzing different chemical parameters, and

c. a packer used to mount said pumping unit and sorption column and physical or physical cell in a well casing, whereby said packer provides a means of preventing exchange of gases between atmosphere and ground water.

4,717,474

OIL REFINER WITH ATOMIZING NOZZLE

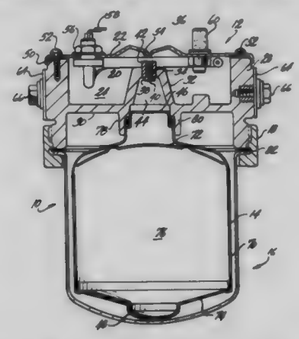
Loyie H. Sims, Santa Ana, Calif., assignor to David V. Sims and Michael J. Sims, both of Irvine, Calif., trustees for the David V. Sims and Michael J. Sims 1983 Revocable Estate Trust

Continuation of Ser. No. 704,539, Feb. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 417,650, Sep. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 281,338, Jul. 8, 1981, Pat. No. 4,349,438. This application Feb. 20, 1987, Ser. No. 16,850

Int. Cl.[4] B01D *35/18, 3/28*

U.S. Cl. 210—180 10 Claims

1. An oil decontaminating device sized and dimensioned to accomodate oil flow at a rate of six gallons per hour comprising a vaporization unit which defines an internal vaporization chamber and a decontaminated oil outlet therefrom and filtered oil inlet means including atomizing means for dispersing oil flowing into said vaporization chamber into atomized droplets which are suspended as a mist within said vaporization chamber, and said atomizing means defines an orifice with a diameter of between about 0.0135 inches and about 0.030 inches, electric heating means disposed within said vaporization unit to heat said vaporization chamber, a disposable detachable filter cartridge releasably coupled to said vaporization unit and having a contaminated oil inlet and a filtered oil outlet which is in communication with said filtered oil inlet means of said vaporization unit, thereby defining a pressure chamber therebetween, whereby said orifice of said atomizing unit constricts oil flow from said pressure chamber to said vaporization chamber with supply of pressure of about 40 pounds per



square inch to said pressure chamber and atomizes oil as suspended droplets as said oil enters said vaporization chamber.

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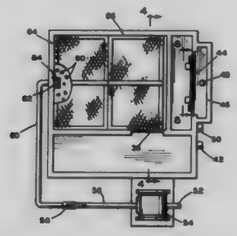
APPARATUS FOR SEPARATING WATER AND OIL BY MEANS OF SEPARATE CONTAINERS OF OLEOPHILIC BODIES

Robert H. Brandt, Bowling Green, and Merlin P. Hoodlebrink, Bradner, both of Ohio, assignors to Brandt & Associates, Inc., Pemberville, Ohio

Filed May 8, 1986, Ser. No. 860,820

Int. Cl.[4] B01D *23/10*

U.S. Cl. 210—237 6 Claims



1. Separating apparatus for separating water and oil comprising tank wall means forming a main tank having an end wall, a supply pipe for supplying water and oil to be separated, said supply pipe having an extension projecting into said tank through a central portion of the end wall of said tank, a first coalescent unit comprising unit wall means forming an enclosed container having front, rear, side, bottom, and top walls, said container walls having means defining a multiplicity of openings to minimize resistance to the flow of liquids therethrough, means forming a perforate recess extending into said container at an intermediate portion of said front wall to receive the extension of said supply pipe which projects into said tank, the depth of said perforate recess exceeding the length of said extension of said supply pipe, a second coalescent unit comprising second unit wall means forming a second enclosed container having second front, rear, side, bottom, and top walls, said second walls having means defining a multiplicity of openings therein to minimize resistance to flow of liquids therethrough, a multiplicity of oleophilic bodies in each of said first and second coalescent units, said bodies being of the same shape with the shape being such that said bodies will not nest together nor nest in a manner to cause channelization of the liquids through said units, support means supporting said first coalescent unit in said tank with the front wall thereof adjacent the end wall of said tank through which said supply pipe extension projects, whereby water and oil supplied through said supply pipe and said extension are dispersed immediately when entering said first coalescent unit, said support means also supporting said second coalescent unit in said tank in side-by-side relationship with repsect to said first coalescent unit and with said front wall of said second coalescent unit adjacent said rear wall of said first coalescent unit, said tank wall means forming an upper opening in an upper portion of said tank above the top walls of said coalescent units, through which opening oil can flow, said tank wall means forming a lower opening through which water can flow, said lower opening being below said first and second coalescent units, chamber wall means forming a chamber receiving water through said lower opening, said chamber wall means forming a discharge opening at an upper level in said chamber from which water in said chamber can be discharged, an adjustable flow control panel, means mounting said flow control panel adjacent a lower portion of said discharge opening, and adjustment means for raising and lowering said flow control panel relative to said discharge opening to change the level of the water in said chamber.

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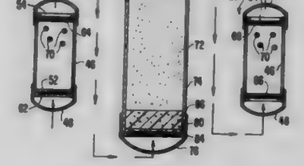
WATER PURIFICATION APPARATUS

Colonel W. Scott, 133 Lake Front Dr., Apt. #3801, Daphne, Ala. 36526

Filed Apr. 25, 1986, Ser. No. 855,734

Int. Cl.[4] B01D *35/24*

U.S. Cl. 210—266 4 Claims



1. Apparatus for removing chemicals and particulate solid materials from municipally treated water, said apparatus comprising:

a cabinet enclosure having an inlet for connection to a pressurized supply of municipally treated water and an outlet for discharging purified drinking water to a controlled delivery tap on demand;

a first purification stage unit in said cabinet for filtering relatively large solid particles from water passing from said inlet;

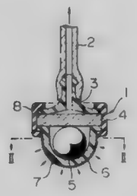
a second purification stage unit in said cabinet for removing chemicals from water passing said first stage unit;

a third purification stage unit in said cabinet for removing relatively small solid particles from water passing said second stage unit;

each of said first and third stage units including means to define a relatively large chamber, a pair of filter pads spaced by said chamber and restricted inlet and outlet openings spaced by said chamber to maintain a highly turbulent flow in said chamber of said first and third stage units, respectively, upon discharge of purified water from said delivery tap, said filter pads covering said restricted inlet and outlet openings; and

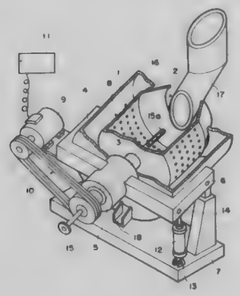
scrubber means in the chamber between said pair of filter pads in each of said first and third stage units for cleansing said filter pads of filtered particles.

4,717,477
SWINGABLE FILTER
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Jul. 21, 1986, Ser. No. 888,450
Claims priority, application Japan, Aug. 9, 1985, 60-122503[U]
Int. Cl.⁴ B01D 35/28, 35/02
U.S. Cl. 210—314 3 Claims



1. A swingable filter comprising:
an upper lid for discharging a liquid therethrough, said upper lid being connected to a flexible suction pipe of a liquid suction device;
a rotatable weight;
a plurality of ribs defining a space for housing and supporting said weight therein for rotation of said weight upon said ribs;
a first filter element located on an outer periphery of the ribs; and
a second filter element interposed between the upper lid and the weight, said weight simultaneously contacting said ribs and a lower surface of said second filter element for simultaneous rotation thereon, whereby said simultaneous rotation of said weight simultaneously cleans said first and second filter elements.

4,717,478
APPARATUS FOR IMPROVING CHARACTERISTICS OF SAND
Hisashi Shiraki; Toshio Nagahisa, both of Fuchu; Kiyonori Takeda, Fukuyama, and Takeshi Harada, Fuchu, all of Japan, assignors to Kitagawa Iron Works Co., Ltd., Hiroshima, Japan
Filed Jun. 12, 1986, Ser. No. 873,415
Claims priority, application Japan, Jun. 20, 1985, 60-135326; Feb. 19, 1986, 61-23054
Int. Cl.⁴ B01D 17/038
U.S. Cl. 210—360.2 22 Claims



1. Apparatus for processing sand to improve the characteristics thereof comprising:
means designed for removing impurities and water from sand quickly and uniformly including
a stationary support;
a hollow rotary body with walls formed concentrically around an axis extending between a closed end and an opposite open end with an opening therein sized to admit sand therethrough, and filtering means for passing water from the sand through a peripheral wall of the rotary body while retaining the sand;
mounting means for coupling said rotary body to said support for rotation around said axis;
means for forming a layer of sand on the inner periphery of said rotary body so as to make the sand layer thickness uniform;
means for supplying water, in a substantially uniform manner, to the sand of uniform thickness within the rotary body; and
means coupled to said support for rotating said rotary body at a variable speed high enough to apply a centrifugal force to the sand of sufficient magnitude to remove at least some of the water therefrom and to pass the removed water through said filtering means.

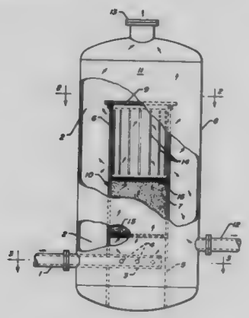
4,717,479
HYDROPHILIZED POROUS POLYOLEFIN MEMBRANE AND PRODUCTION PROCESS THEREOF
Hajime Itoh, Hiroshima, and Kazutami Mitani, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Division of Ser. No. 928,163, Nov. 7, 1986, Pat. No. 4,678,813.
This application Mar. 27, 1987, Ser. No. 30,745
Claims priority, application Japan, Nov. 11, 1985, 60-252203; Nov. 12, 1985, 60-253561
Int. Cl.⁴ B01D 25/04
U.S. Cl. 210—490 4 Claims

1. A hydrophilized porous polyolefin membrane, wherein a polymer of a monomer containing at least one unsaturated polymerizable bond and having an HLB value of 2–20 is held on at least a part of the pore walls of a starting porous polyolefin membrane.

4,717,480
METHOD FOR SEPARATION OF LIQUID MIXTURE
Takaharu Akedo, and Seiichi Manabe, both of Osaka, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan
Filed Mar. 24, 1986, Ser. No. 842,838
Claims priority, application Japan, May 31, 1985, 60-116801; May 31, 1985, 60-116802
Int. Cl.⁴ B01D 11/04
U.S. Cl. 210—638 19 Claims

1. A method for the separation of a designated component from a liquid mixture, which comprises:
concentrating a designated component, which is originally mixed in a liquid mixture, in the interiors of formed particles having an average diameter of 0.1 to 10 μm,
transporting said formed particles under an electrostatic field to the surface of a polymeric porous membrane which selectively permits only the passage of said formed particles and which has an average pore diameter of from 0.1 to 50 times the average diameter of said formed particles, and
separating said formed particles from said liquid mixture by the selective passage of said formed particles through said membrane under a membrane pressure placed on said membrane.

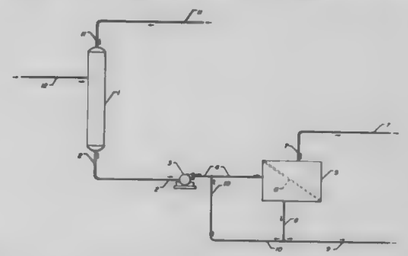
4,717,481
APPARATUS FOR IMPROVING THE SEPARATION OF FLUIDS OF DIFFERENT DENSITIES
Bruce E. Staehle, Buffalo Grove, and David L. Holbrook, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Filed Jul. 28, 1986, Ser. No. 889,997
Int. Cl.⁴ B01D 17/02
U.S. Cl. 210—649 15 Claims



1. Apparatus for mounting in a fluid separation zone to improve the gravitational separation of fluids having different densities, said apparatus comprising:
(a) fluid entry means connected to an opening into said separation zone;
(b) fluid distribution means mounted upon the terminus of said fluid entry means within said separation zone;
(c) said fluid distribution means including at least one aperture whereby said fluids are dispersed within said separation zone;
(d) an elongated imperforate chamber which is vertically oriented, and encompasses and is in fluid communication with said fluid distribution means;
(e) a slotted chamber which is coextensive and in fluid communication with an upper end of said imperforate chamber;
(f) said slotted chamber having an imperforate upper end plate and having vertically oriented slots arranged about the sides of said slotted chamber and in direct communication with said fluid separation zone; and
(g) packing means disposed in at least a portion of said imperforate chamber, the cross-sectional area of said slots of said slotted chamber being sufficient with respect to the available flowing cross-sectional area of the resulting packed bed of said imperforate chamber, to prevent an increase in the velocity of said fluids to improve the gravitational separation of said fluids having different densities.

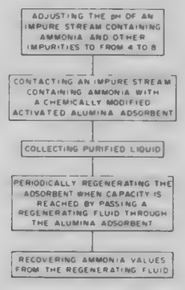
4,717,482
PRODUCTION OF LOW ALCOHOLIC CONTENT BEVERAGES
William G. Light, San Diego, Calif., assignor to Allied Corporation, Morristown, N.J.
Continuation-in-part of Ser. No. 736,047, May 20, 1985, Pat. No. 4,617,127. This application Oct. 8, 1986, Ser. No. 916,767
The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.
Int. Cl.⁴ B01D 13/00
U.S. Cl. 210—651 13 Claims

1. A continuous feed and bleed process for the diminution of the alcoholic content of an alcoholic beverage which comprises passing a mixture of water and said beverage from a reservoir containing the same across a semipermeable membrane, said membrane possessing a chloride ion rejection greater than about 80% at 400 pounds per square inch net pressure and displaying a permeation rate for alcohol that is dependent on net pressure for low net pressure and that is essentially independent of net pressure for high net pressure, the separation conditions including a net pressure of from about 50 to about 250 pounds per square inch to form a permeate comprising alcohol and water, and a retentate comprising said beverage containing a reduced alcoholic content, removing said permeate, recycling a portion of said retentate to



admix with added fresh alcoholic beverage and water prior to contact with said semipermeable membrane to form a feed admixture, the portion of said retentate which is recycled comprising from about 80% to about 99% of said retentate, with the portion of the retentate which is not recycled being recovered as the product.

4,717,483
PURIFICATION OF WASTE STREAM FROM TANNING PROCESS BY ADSORPTION ON AN ADSORBENT COMPRISING A MIXTURE OF ALUMINA AND Y ZEOLITE
John F. Bush, Plum Borough, and Hubert L. Fleming, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Jun. 23, 1986, Ser. No. 877,554
Int. Cl.⁴ C02F 1/28
U.S. Cl. 210—681 10 Claims



1. An improved process for the adsorption of ammonia and organic impurities from an effluent which comprises contacting the effluent with an adsorbent comprising a mixture of an activated alumina and a Y zeolite.

4,717,484

PROCESS FOR COMPLETING CIRCULATORY SYSTEMS USED TO PURIFY WATER AND SEWAGE

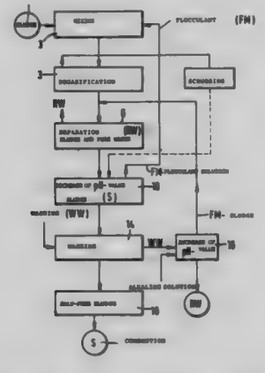
Karl C. Kiuffer, Provinostrasse 52, D-8900 Augsburg, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,363

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507839; Dec. 23, 1985, 3545839

Int. Cl.⁴ C02F *1/52, 1/20*

U.S. Cl. 210—711 **15 Claims**



1. A process of completing circulatory systems in the purification of sewage and sewage sludge which contains chemically precipitable and organic wastes, comprising the following process steps:

(a) mixing the sewage or sewage sludge with an effective amount of a flocculant consisting of a metal salt solution to form a flocculated mixture consisting of metal hydroxides and organic sludge;

(b) degasifying the sewage-flocculant mixture to remove dissolved CO_2 and collecting the evolved gas;

(c) separating pure water from the flocculated mixture;

(d) decreasing the pH value of the mixture with a supply of CO_2 until metal hydroxides are dissolved to form a metal salt solution, which is recycled as a flocculant to process step (a), and transferring the sludge, which substantially consists of organic components, to a washer;

(e) washing the sludge with wash water to remove residual metal salts from said sludge;

(f) separating the washed sludge and the wash water;

(g) increasing the pH value of the wash water until the residual metal salts dissolved in the wash water are precipitated to form a metal hydroxide sludge, and

(h) admixing the metal hydroxide sludge with the sewage-flocculant mixture between process steps (b) and (c) to aid in separation of pure water from the mixture.

4,717,485

MULTI-PHASE SEPARATOR WITH POROUS FILTER DISKS

Zahra K. Brunsell, and Dennis A. Brunsell, both of 4615 Christopher Pl., Houston, Tex. 77066

Continuation of Ser. No. 689,819, Jan. 8, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 904,834

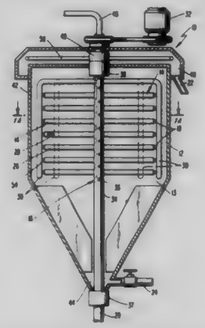
Int. Cl.⁴ B01D *33/26*

U.S. Cl. 210—781 **17 Claims**

10. A method of separating multiple phases of solids or fluids with at least one fluid that comprises the steps of:

(a) introducing at least one fluid phase with or without a solid phase into an interior chamber of an exterior housing near a common central passage of a plurality of porous filter disks positioned within the interior chamber of the exterior housing and around the common central passage, each filter disk comprising a first member and a second member including a fluid passage defined therebetween, the disks being capable of being rotated around the central passage;

(b) creating a centrifugal force within the interior chamber to form a pressure differential within the fluid passages within the disks to draw the fluid phase inside the disks



into the fluid passages and away from the central passage while propelling any solids in the interior chamber away from the central passage and the disk surfaces toward the exterior housing; and

(c) collecting at the periphery of the disks the fluid phase drawn through the fluid passages of the disks.

4,717,486

METHOD OF FILTERING SUSPENSION

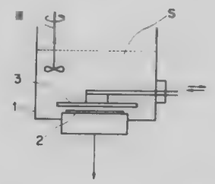
Mospei Shirato; Eiji Iritani; Aisaburo Yagishita, and Kazuhiko Yagishita, all of Nagoya, Japan, assignors to Kabushiki Kaisha Sanshin Seisakusho, Japan

Filed Sep. 26, 1986, Ser. No. 912,426

Claims priority, application Japan, Feb. 28, 1986, 61-041393

Int. Cl.⁴ B01D *35/20*

U.S. Cl. 210—785 **2 Claims**



1. A method of filtering and condensing a liquid suspension containing a solid suspended substance, comprising the steps of: providing a chamber having an outlet in the lower portion thereof for containing said suspension; providing a filter across the outlet to said chamber; providing a flat board member disposed within said chamber and contained within a plane parallel to the plane containing said filter surface and spaced adjacent thereto; and vibrating said board member in said suspension in opposed relation with said filter surface in a direction parallel to said filter surface.

4,717,487

PROCESS FOR THE PREPARATION OF ASBESTIFORM CRYSTALLINE CALCIUM SODIUM METAPHOSPHATE FIBER

Edward J. Griffith, Manchester; John R. Jany, Ellisville; Vaidy R. Nathan, St. Louis, and Toan M. Ngo, Eureka, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 8, 1986, Ser. No. 938,943

Int. Cl.⁴ C01B *25/30*

U.S. Cl. 252—1 **18 Claims**

1. A process for the preparation of asbestiform crystalline calcium sodium metaphosphate fiber, which process comprises:

(a) bringing together in aqueous media source materials for CaO, Na_2O, and P_2O_5 in proportions sufficient to provide a $CaO/Na_2O/P_2O_5$ mol percent ratio on a dry basis of about 24.0–34.0/12.0–18.0/50.0–60.0, with the proviso that the CaO/Na_2O mol ratio is from about 1.60 to about 2.00, and form a wet mix slurry containing a solid phase and an aqueous liquid phase;

(b) dispersing the wet mix slurry onto substrate calcium sodium metaphosphate crystals in a crystal formation and growth zone under conditions sufficient to remove the aqueous liquid phase and deposit the solid phase onto the substrate crystals and cause identically oriented continuous crystal formation and growth between the solid phase deposit and the substrate crystals to thereby form product crystals of calcium sodium metaphosphate; and

(c) fiberizing the product crystals of calcium sodium metaphosphate into asbestiform crystalline calcium sodium metaphosphate fiber.

4,717,488

SPACER FLUID

James M. Schenlt, and Ernest L. Grebe, both of Spring, Tex., assignors to Merck Co., Inc., Rahway, N.J.

Filed Apr. 23, 1986, Ser. No. 856,073

Int. Cl.⁴ E21B *43/00*; C08B *37/00*

U.S. Cl. 252—8.551 **6 Claims**

1. A slurry useful in preparing spacer fluids, said slurry consisting essentially of:

	% (wt.)
Heteropolysaccharide S-130	25–60
Organophilic clay	0.5–6
Hydrocarbon solvent	30–70
Surfactant	0–10
Lower alkanol	0–6

wherein the surfactant is ethoxylated nonylphenol, the fatty acid esters of vegetable or animal oil, ethoxylated linear alcohol, or ethylene glycol monobutyl ether.

4,717,489

HEAVY DUTY DIESEL ENGINE OIL BLEND

Richard D. Schieman, Rocky River, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed May 9, 1984, Ser. No. 608,674

Int. Cl.⁴ C10G *41/00*

U.S. Cl. 252—32.7 E **4 Claims**

1. A blend of solvent extracted neutral (SEN) oils suitable as a base oil for the manufacture of a multi-grade motor oil which demonstrates minimal oil consumption and stability at high temperatures, the base oil blend comprising:

A. from 45 to 55 volume percent of SEN 100;

B. an amount up to 35 volume percent of SEN 140;

C. at least 14 volume percent of SEN 300; and

wherein the blend has a 210° F. viscosity of from 4.3 to 5.0 centistokes and a 100° F. viscosity of from 25 to 30 centistokes; and wherein no more than 10 percent of the blend boils at 675° F., no more than 50 percent boils at 760° F., and the remainder of the blend boils below 970° F.

4,717,490

SYNERGISTIC COMBINATION OF ALKALI METAL BORATES, SULFUR COMPOUNDS, PHOSPHITES AND NEUTRALIZED PHOSPHATES

Christopher G. Salentine, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1986, Ser. No. 913,286

Int. Cl.⁴ C10M *141/10*

U.S. Cl. 252—32.7 E **14 Claims**

1. A lubricating composition comprising an oil of lubricating viscosity having dispersed therein a minor amount of a mixture of:

(a) a hydrated alkali metal borate;

(b) an oil-soluble sulfur-containing compound;

(c) a dialkyl hydrogen phosphite; and

(d) a mixture of neutralized phosphates said phosphates being essentially free of monothiophosphates.

4,717,491

REACTION PRODUCTS OF DIALKYL AND TRIALKYL PHOSPHITES WITH ELEMENTAL SULFUR, ORGANIC COMPOSITIONS CONTAINING SAME, AND THEIR USE IN LUBRICANT COMPOSITIONS

Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 9, 1986, Ser. No. 883,665

Int. Cl.⁴ C10M *135/02*

U.S. Cl. 252—46.7 **9 Claims**

1. A process for making a reaction product suitable for use as an additive in lubricating oils comprising

(a) reacting a dialkyl or trialkyl phosphite with elemental sulfur in a mole ratio of sulfur to phosphite of between about 0.8 and about 1.2 at a temperature between about 75° and about 110° C. and in the absence of any catalytic material added to promote reaction of the two reactants:

(b) separating the reaction product thereby obtained;

(c) reacting the reaction product from (b) with an amine in a mole ratio of amine to phosphite of about 0.9 to about 1.2, at a temperature between about 10° and about 90° C.: and

(d) separating from the resulting reaction mixture the desired product.

4,717,492

PHENOLIC-CONTAINING MANNICH BASE REACTION PRODUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

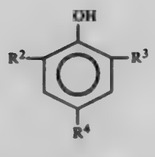
Sheldon Clubulk, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1985, Ser. No. 813,813

Int. Cl.⁴ C10M *129/10*

U.S. Cl. 252—51.5 R **21 Claims**

1. A product of reaction suitable for use as a lubricant additive made by reacting a preformed Mannich base with reactive hydrocarbyl amines in a molar ratio of Mannich Base to reactive amine of from about 1 to 1 to about 2 to 1 at temperatures varying from ambient or flux to about 250° C. under ambient or slightly higher pressures having at least one reactive hydrogen, said Mannich Base having been prepared from (1) a phenol, having the following generalized structural formula:



where R^2 and R^3 are the same or different and are hydrogen or C_1 to about C_{18} alkyl or tertiary alkyl and R^4 is H or C_1 to about C_{30} hydrocarbyl, (2) a C_1–C_8 alkyl aldehyde and (3) an amine having a lower boiling point than that of said reactive amine.

4,717,493

PREPARATION OF MAGNETIC COATING

Duncan W. Frew, Alamo; Zorro Stefanini, San Jose; Edward A. Schnee, Byron, and Leo di Ricco, San Jose, all of Calif., assignors to Unisys Corporation, Detroit, Mich.

Continuation of Ser. No. 495,554, May 17, 1983, abandoned. This application Oct. 3, 1986, Ser. No. 914,522

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.[4] H01F 1/02

U.S. Cl. 252—62.54 **29 Claims**

1. A method of preparing a phenol-epoxy magnetic disk coating recording composition including magnetic particles dispersed in a phenolic-epoxy resin binder, the method including the steps of: intermixing a solvent with sufficient of a phosphate-ester to both disperse the particles adequately as well as to catalyze sufficient cross-linking of phenolic and epoxy resin to yield a three-dimensional network of enhanced durability; the solvent including a dibasic ester component.

4,717,494

LIQUID THERMAL ACCUMULATOR COMPOSITION AND THERMAL ACCUMULATION PROCESS

Hiroshi Itatani; Mikito Kashima, and Masami Aikawa, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jun. 25, 1986, Ser. No. 878,317

Claims priority, application Japan, Jun. 28, 1985, 60-143368

Int. Cl.[4] C09K 5/06

U.S. Cl. 252—70 **12 Claims**

1. A process for accumulation of thermal energy which comprises separating, from a liquid composition comprising a dicarboxylic acid anhydride, an alcohol and an ester of the dicarboxylic acid and the alcohol, a portion of the alcohol with supplying thermal energy to the liquid composition from an outside energy source, whereby producing a composition containing an increased amount of the dicarboxylic acid anhydride.

4,717,495

DIESEL ENGINE COOLING SYSTEM COMPOSITIONS

Richard D. Hercamp, Columbus, Ind., and Roy D. Hudgens, Cookeville, Tenn., assignors to Fleetguard, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 676,554, Nov. 30, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 835,010

Int. Cl.[4] C09K 5/00

U.S. Cl. 252—75 **10 Claims**

1. A heavy duty supplemental cooling additive composition for use in diesel engine coolants which performs the functions of buffering, liner pitting inhibition, metal corrosion and hot surface corrosion protection, defoaming and scale inhibition, said additive comprising:

(a) a sodium-free buffer containing at least one compound selected from the group consisting of borate and phosphate salts,

(b) a cavitation liner pitting inhibitor containing at least one compound selected from the group consisting of nitrite and molybdate salts,

(c) a metal corrosion and hot surface corrosion inhibitor containing at least one compound selected from the group consisting of nitrates, silicates and azole compounds,

(d) a defoamer containing at least one compound selected from the group consisting of silicone defoamers, alcohols and glycols, and

(e) a hot surface deposition and scale inhibitor containing at least one compound selected from the group consisting of phosphonates, polyacrylates and sulfonate compounds.

4,717,496

STIFFENING MATERIAL WITH MELT-ADHESIVE PROPERTIES

Harald Brehmer, Neuhofen, and Emil Wilding, Birkenheide, both of Fed. Rep. of Germany, assignors to Giulini Chemie GmbH, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 677,296, Dec. 3, 1984, abandoned. This application Mar. 4, 1985, Ser. No. 708,059

Int. Cl.[4] C08K 9/10; C08L 23/08, 67/04, 75/04

U.S. Cl. 525—129 **11 Claims**

1. A stiffening material composed of filler and binder and produced by melting the binder, shaping a composition which includes filler and binder, and then cooling the shaped composition, said stiffening material comprising 30 to 80 weight percent filler and 70 to 20 weight percent binder, wherein the filler consists of at least one type of particle selected from the group consisting of plastic particles, organic filler particles coated with at least one plastic surface layer, and inorganic filler particles coated with at least one plastic surface layer, said particles being present in a particle size distribution of from 50 to 500 microns, the plastic comprising the plastic particles or the surface layer of the coated filler particles being selected such that it will not dissolve in the binder at temperatures of about 50° C. to 80° C. but the particles remain in the form of essentially discrete bodies, wherein the binder firmly adheres to the filler particles; and wherein the binder is thermoplasticly deformable in a temperature range of about 50° C. to 80° C. and has melt-adhesive characteristics.

4,717,497

TIN-PLATE DEGREASING DETERGENT

Kiyotada Yasuhara, and Masae Adachi, both of Neyagawa, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 8, 1985, Ser. No. 709,634

Claims priority, application Japan, Mar. 10, 1984, 59-045990

Int. Cl.[4] C11D 7/16

U.S. Cl. 252—135 **10 Claims**

1. A degreasing detergent composition for tin consisting of an aqueous alkaline solution of:

(a) at least 1.5 g/l of an alkali metal salt or ammonium salt of orthophosphoric acid;

(b) at least 0.5 g/l of an alkali metal salt of nitrous acid; the mol ratio of a:b being about 1–3.86:1;

(c) 0 to 1 g/l of a nonionic surfactant;

(d) sufficient of at least one alkali metal salt of carbonic acid to adjust the pH of said solution to 9 to 11; and

(e) water, q.s.

4,717,498

DIMETHICONE COPOLYOL SULFOSUCCINATES

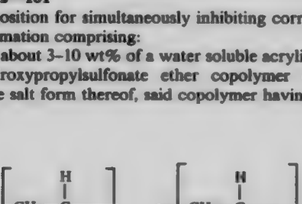
Bartley D. Maxon, Cicero, Ill., assignor to McIntyre Chemical Company, Chicago, Ill.

Filed Jan. 5, 1987, Ser. No. 479

Int. Cl.[4] C11D 1/04, 1/12, 9/36

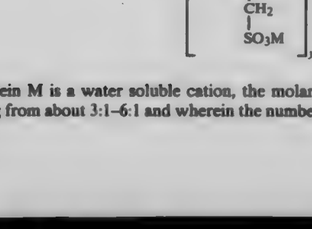
U.S. Cl. 252—174.15 **20 Claims**

1. A compound of the formula:



wherein R is a polymer or copolymer of ethylene or propylene oxide, M is an alkali metal or ammonium group and x and y range in value so as to produce a compound with an equivalent weight between 700 and 1600 grams.

5. A compound of the formula:



wherein R is a polymer or copolymer of ethylene or propylene oxide, M' is an alkaline earth metal and x and y range in value so as to produce a compound with an equivalent weight between 700 and 1600 grams.

4,717,499

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

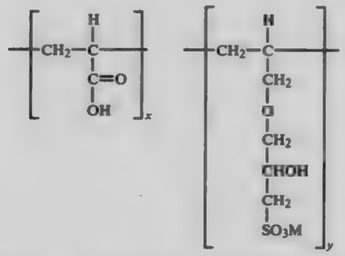
Division of Ser. No. 861,785, May 9, 1986, Pat. No. 4,659,482, which is a continuation-in-part of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Mar. 26, 1987, Ser. No. 31,338

Int. Cl.[4] C02F 5/14

U.S. Cl. 252—181 **9 Claims**

1. Composition for simultaneously inhibiting corrosion and deposit formation comprising:

(a) from about 3–10 wt% of a water soluble acrylic acid/allylhydroxypropylsulfonate ether copolymer or water soluble salt form thereof, said copolymer having the formula



wherein M is a water soluble cation, the molar ratio x:y being from about 3:1–6:1 and wherein the number average molecular weight of said copolymer is from about 5,000 to 10,000;

(b) from about 0.3–2 wt.% of a water-soluble divalent zinc compound;

(c) from about 0.5–4 wt% of a water soluble phosphonate compound;

(d) remainder water.

4,717,500

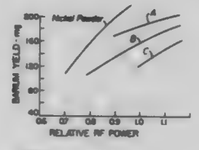
GETTER DEVICE FOR FRIT SEALED PICTURE TUBES

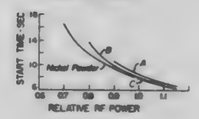
Herbert A. Fisch, Beachwood; Edward M. Paisha, Lakewood, and Sandra L. Skotko, North Royalton, all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

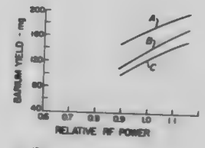
Filed Nov. 27, 1985, Ser. No. 802,328

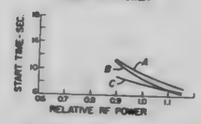
Int. Cl.[4] H01J 7/18

U.S. Cl. 252—181.4 **6 Claims**









1. A getter device comprising a metal getter container, a getter material filler in said getter container comprising a blended mixture of a particulated barium-aluminum alloy and a nickel base powder, said nickel base powder consisting essentially of an alloy containing boron and chromium in combination for suppressing particle ejection from the getter, said alloy composed of from about 0.05 to 4% boron, 0.25 to 18.5% chromium, up to 5% iron, up to 5% silicon, all by weight percents, and the balance nickel.

4,717,501

PEARL LUSTER DISPERSION

Hajime Hirota, Tokyo; Shinichi Isoda, Choufu, and Hiroshi Watanabe, Funabashi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 482,441, Apr. 6, 1983. This application Oct. 11, 1985, Ser. No. 786,755

Claims priority, application Japan, May 28, 1982, 57-90921

Int. Cl.[4] B01J 13/00

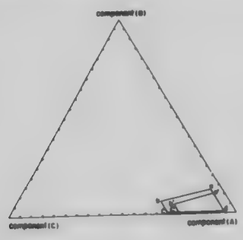
U.S. Cl. 252—311 **1 Claim**

1. A process for producing a pearl luster dispersion which comprises:

(1) incorporating the following essential components (A),

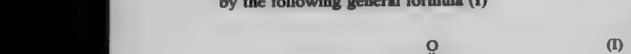
(B), (C) and (D) in the ratio defined by an area surrounded by straight lines obtained by connecting the following four points on the triangular coordinates of the three-component system:

a [(B)=12.5: (C)=5: (D)=82.5],



b [(B)=6.25: (C)=30: (D)=63.75],
c [(B)=0.5: (C)=30: (D)=69.5],
d [(B)=0.5: (C)=5: (D)=94.5],

(A) 15 to 40 wt% of a fatty acid glycol ester represented by the following general formula (I)



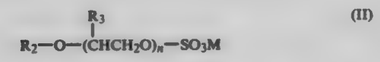
(I)

in which R_1 represents a linear or branched, saturated or unsaturated hydrocarbon group from 13 to 21 carbon atoms, Y represents a hydrogen atom or a group



and m is an integer of from 1 to 3 and means an average number of addition moles;

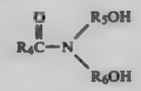
(B) 0.3 to 12.5 wt% of an alkylsulfate or polyoxyalkylene alkylsulfate represented by the following general formula (II)



(II)

in which R_2 represents a linear or branched alkyl group having from 8 to 20 carbon atoms, R_3 represents a hydrogen atom or methyl group, M represents an alkali metal, alkaline earth metal, ammonium ion, ammonium substituted with an alkyl having from 1 to 3 carbon atoms, or ammonium substituted with a hydroxyalkyl having 2 or 3 carbon atoms, and n is an integer of 0–8 and means an average number of addition moles;

(C) 3 to 25 wt% of a fatty acid dialkanolamide represented by the following general formula (III)



(III)

in which R_4 represents a linear or branched, saturated or unsaturated hydrocarbon group having from 7 to 17 carbon atoms, and R_5 and R_6 independently represent $—C_2H_4$ or $—C_3H_6$; and

(D) 45 to 85 wt% of water,

(2) heating the thus obtained mixture of components (A), (B), (C) and (D) to a temperature not lower than the melting point of the component (A) to prepare an emulsion, and

(3) cooling the emulsion to a temperature lower than the melting point of component (A), thereby obtaining a peal luster dispersion.

4,717,502

AQUEOUS OPTICAL BRIGHTENER COMPOSITIONS

Hans-Rudolf Schmid, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 21, 1986, Ser. No. 820,043

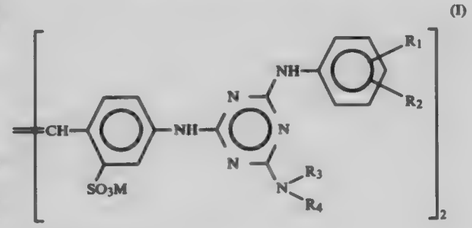
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502038

Int. Cl.⁴ C09K *11/06*

U.S. Cl. 252—301.23 **26 Claims**

1. An aqueous optical brightener composition consisting essentially of:

(a) at least one optical brightener of formula



(I)

in which

R_1 is hydrogen or $—SO_3M$;

R_2 is hydrogen or $—SO_3M$;

R_3 is hydrogen, C_{2-3}—hydroxyalkyl, C_{1-4}—alkyl, $—CH_2—CH_2—CN$ or $—CH_2—CH_2—CONH_2$;

R_4 is hydrogen, C_{1-4}—alkyl, C_{2-3}—hydroxyalkyl, hydroxy—ethoxyethyl, N,N-Bis-(C_{1-3}—alkyl)—amino—C_{2-6}—alkyl or benzyl;

or

R_3 and R_4 together with the nitrogen atom to which they are attached signify a morpholine, pyrrolidine, piperidine or N-methylpiperazine ring;

and

M is hydrogen or a colourless cation;

provided that at most one of R_3 and R_4 is hydrogen;

(b) polyethylene glycol with an average molecular weight in the range of 1000 to 3000;

and

(c) water;

component (a) being selected from the group consisting of (a_1) compounds of formula (I) in which R_2 is $—SO_3M$, (a_2) compounds of formula (I) in which R_1 and R_2 are both hydrogen, and mixtures of (a_1) and (a_2),

component (b) being present in an amount of 10 to 500 parts by weight per 100 parts by weight (a_1) when (a) comprises only (a_1) or a mixture of (a_1) and (a_2) and in an amount of 10 to 500 parts by weight per 100 parts by weight (a_2) when (a) comprises only (a_2), and

component (c) being present in an amount of at least 20% by weight of the aqueous composition.

4,717,503

DEMOLITION AGENT FOR BRITTLE MATERIALS

Yoshio Makino, Tokyo; Toshiaki Kakizawa, Yokoze; Tomio Iwata, Chichibu; Masumi Itoh, Takatsuki, and Takayoshi Hirose, Osaka, all of Japan, assignors to Mitsubishi Mining & Co., Ltd., Tokyo and Fujisawa Pharmaceutical Co., Ltd., Osaka, both of, Japan

Filed Aug. 12, 1983, Ser. No. 522,671

Claims priority, application Japan, Aug. 18, 1982, 57-142794; Feb. 28, 1983, 58-033646

Int. Cl.⁴ C09K *3/00*; **C06D** *5/10*; **C11D** *7/12*

U.S. Cl. 252—350 **13 Claims**

1. A demolition agent for brittle materials in the form of a powder mixture which comprises:

(a) 100 parts by weight of quicklime,

(b) 0.05 to 5 parts by weight of an alkali metal carbonate or bicarbonate, and

(c) 0.1 to 5 parts by weight of a fluidization agent.

4,717,504

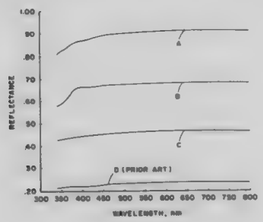
REFLECTANCE STANDARD

Ralph S. Hernicz, Osceola, Ind., assignor to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 678,120, Dec. 4, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,821

Int. Cl.⁴ G01N *31/00, 33/00*

U.S. Cl. 252—408.1 **8 Claims**



1. A method for standardizing of light reflection measurements consisting essentially of directing light on a reflectance standard comprising an acrylate polymer having transmittance greater than 90% over the range of from 325 nanometers to 1000 nanometers for a 0.32 centimeter thick sample and at least 40% by weight of barium sulphate, wherein said barium sulphate has a purity equivalent to at least USP Grade and a particle size of between about 0.3 to about 2 microns, and measuring the light reflected from said reflective standard.

4,717,505

ELECTRICALLY CONDUCTIVE THERMOPLASTIC MATERIAL

René Delphin, Fontenay Aux Roses, and Bernard Regnaut, Antony, both of France, assignors to Occidental Chemical Corporation, Norwalk, Conn.

Filed Dec. 18, 1985, Ser. No. 810,121

Claims priority, application France, Dec. 18, 1984, 84 19359

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **4 Claims**

1. An electrically conductive thermoplastic material comprising a mixture of a propylene and ethylene copolymer, of carbon black in a proportion of 30% to 50% by weight, and of a fibrous carbon fill in a proportion of 3% to 10% by weight, wherein said material has an electrical resistivity of less than 0.5 Ωcm.

4,717,506

PYRAN DERIVATIVES AND PERFUME COMPOSITION CONTAINING THE SAME

Hiroshi Takada; Shin'ichi Masuda, both of Wakayama, and Motoki Nakajima, Saitam, all of Japan, assignors to Kao Corporation, Tokyo, Japan

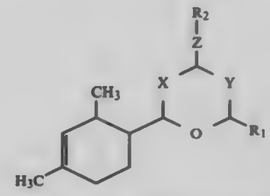
Filed Jan. 22, 1986, Ser. No. 821,456

Claims priority, application Japan, Jan. 23, 1985, 60-10516

Int. Cl.⁴ A61K *7/46*; **C07D** *309/18*

U.S. Cl. 512—11 **4 Claims**

1. A compound of the formula (I):

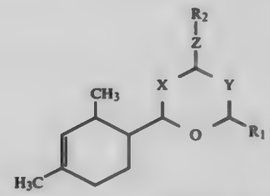


(I)

wherein R_1 is H or CH_3, R_2 is CH_2 only when Z is a double bond or R_2 is CH_3, one of the bonds X, Y or Z is a double bond and the remaining two bonds are single bonds.

2. A perfume composition, comprising:

an effective aromal amount of the compound represented by the formula (I):



(I)

wherein R_1 is H or CH_3, R_2 is CH_2 only when Z is a double bond or R_2 is CH_3, one of the bonds X, Y or Z is a double bond and the remaining two bonds are single bonds; and an acceptable carrier therefore.

4,717,507

LIQUID DETERGENT WITH FABRIC SOFTENING PROPERTIES

Karl Schwadtke, Leverkusen; Eduard Smulders, Hilden, and Hans Andree, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 860,275

Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516091

Int. Cl.⁴ C11D *3/32*

U.S. Cl. 252—548 **12 Claims**

1. A liquid detergent consisting essentially of

(a) from about 5 to about 15% by weight of a sodium alkylbenzene sulfonate, said sodium alkylbenzene sulfonate having a linear alkyl group containing from 10 to 14 carbon atoms;

(b) from about 7 to about 20% by weight of a water-soluble ethoxylated alcohol containing from 12 to 18 carbon atoms in the alcohol moiety and from 5 to 10 glycol ether groups;

(c) a water-soluble soap prepared from fatty acids having from 12 to 18 carbon atoms in an amount of from about 6 to about 16% by weight on the basis of the fatty acid content;

(d) from about 7 to about 15% by weight of a fatty acid

diethanolamide prepared from fatty acids having from 16 to 18 carbon atoms wherein at least 50% of said fatty acids are monounsaturated.

(e) from about 0.2 to about 3% by weight of a sequestering agent selected from the group consisting of polycarboxylic acid-type sequestering agents, polyphosphonic acid-type sequestering agents and mixtures thereof;

(f) from about 5 to about 15% by weight of a water-miscible organic solvent; and

(g) water; wherein the ratio of (a) to (b) is in the range of 1:1 to 1:2, the ratio of (a) to (c) is in the range of 1:1 to 1:2, and the ratio of (a) to (d) is in the range of 1:1.5 to 1:2.5.

4,717,508

ORGANIC NONLINEAR OPTICAL SUBSTRATES

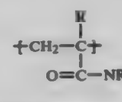
Ronald N. DeMartino, Wayne, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 3, 1985, Ser. No. 771,864

Int. Cl.⁴ G03C *1/03*; G02F *1/00*; H03F *7/00*; H01S *3/10*

U.S. Cl. 252—583 **7 Claims**

1. An optically transparent solid solution comprising a homogeneous blend of an organic compound component which exhibits nonlinear optical response, and a thermoplastic polymer component which has a weight average molecular weight between about 1000–500,000 and which contains a recurring monomeric unit corresponding to the formula:



where R is a substituent selected from hydrogen, methyl and ethyl groups, and R^1 is an alkyl substituent containing between about 1–4 carbon atoms; wherein the organic compound component is present in a quantity of at least about 25 weight percent based on the weight of solid solution, and the organic compound component has a charge asymmetric electronic structure consisting of an electron-withdrawing group which is in conjugation with an electron-donating group.

4,717,509

REACTIVE FIRE-PROTECTIVE FORMULATION FOR RENDERING POLYURETHANE RIGID FOAM MATERIALS FLAME-RESISTANT AND PROCESS FOR PREPARING SAME

Walter Büttgens, Bad Honnef; Utto Kerscher, Erftstadt, and Ernst Neukirchen, Cologne, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk, Cologne, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,745

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611566

Int. Cl.⁴ C09K *21/00*

U.S. Cl. 252—609 **7 Claims**

1. A reactive fire-protective formulation for rigid polyurethane foam materials comprising a homogeneous liquid mixture of:

a polyether-polyol based on an aromatic amine, or sorbitol, or tetrol, or mixtures thereof;

a neopentane compound containing bromine and hydroxy groups; and

a reaction product of diethanol amine and dimethyl methane phosphonate.

4,717,510

ENCAPSULATION OF WASTE MATERIAL

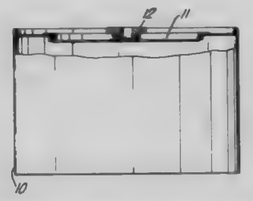
John M. James, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 23, 1984, Ser. No. 633,028

Claims priority, application United Kingdom, Aug. 2, 1983, 8320841

Int. Cl.⁴ G21F *9/34*

U.S. Cl. 252—628 **9 Claims**



1. A method of encapsulating waste material enabling filling of encapsulant to be carried out less restrictedly which comprises charging the material into a container through an opening in the container in an environmentally restricted area, closing the opening with a cover having temporarily sealed filling and vent port means to isolate the material, transporting the thus closed container to an encapsulating station, there establishing sealed filling and vent connections respectively with the filling and vent port means and causing simultaneously or thereafter the removal of the temporary sealing of the filling and vent port means while otherwise maintaining isolation of the material, and feeding a solidifiable encapsulating medium into the container through the filling connection to fill space in the container unoccupied by the waste material whilst allowing the atmosphere in that space to be displaced from the container through the vent connection exclusively.

4,717,511

CHEMILUMINESCENT COMPOSITION

Anthony Koroscil, Escambia, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1985, Ser. No. 813,346

Int. Cl.⁴ C09K *11/00*; C07D *235/00*

U.S. Cl. 252—700 **15 Claims**

1. A composition adapted to be reacted with hydrogen peroxide to provide chemiluminescent blue light, said composition containing the ingredients (1) an oxalate compound and (2) 9,10-bis(4-methoxyphenyl)-2-chloroanthracene, the amounts of said ingredients being such as to provide visible blue light.

4,717,512

PREPARATION OF ACYLATED GLYCEROPHOSPHOCHOLINES AND GLYCEROPHOSPHOETHANOLAMINES

Friedrich Paltauf, and Albin Hermetter, both of Graz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

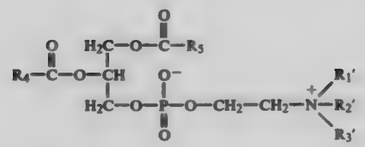
Division of Ser. No. 733,619, May 13, 1985, Pat. No. 4,622,180. This application Jul. 29, 1986, Ser. No. 891,515

Claims priority, application Austria, May 15, 1984, 1590/84

Int. Cl.⁴ C07F *9/10*; A61K *31/685*

U.S. Cl. 260—389 **1 Claim**

1. Method for preparing 1,2-diacyl-sn-glycero-3-phosphocholines and 1,2-diacyl-sn-glycero-3-phosphoethanolamines of the formula



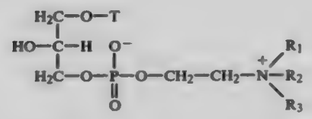
IV

in which

R_1', R_2' and R_3' are identical and in each case denote either 3 hydrogen atoms or 3 methyl groups, and

R_4 and R_5 are different and independently of one another denote a straight chain or branched C_1 to C_{24}-alkyl radical, a straight chain or branched C_1 to C_{24}-alkyl radical substituted by one or more halogen atoms or alkoxy groups, a straight chain or branched monounsaturated or polyunsaturated C_3 to C_{24}-alkenyl radical or a straight chain or branched monounsaturated or polyunsaturated C_3 to C_{24}-alkenyl radical substituted by one or more halogen atoms or alkoxy groups, which method comprises

(a) acylating a compound of the formula:

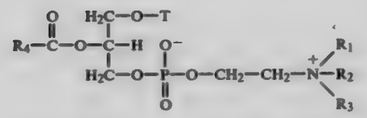


I

in which

T denotes an unsubstituted or substituted triphenylmethyl group wherein the substituent is C_{1-6} alkyl, C_{1-6} alkoxy or halogen and the radicals

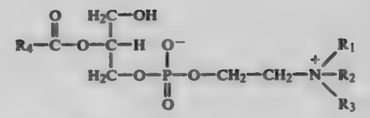
R_1, R_2 and R_3 either are identical and each represent a methyl group or are different, in which case two of the radicals R_1, R_2 and R_3 always denote hydrogen and the third radical represents an unsubstituted or substituted triphenylmethyl group wherein the substituent is C_{1-6} alkyl, C_{1-6} alkoxy or halogen, by reaction with an acylating derivative of a carboxylic acid of the formula R_4COOH to give a compound of the formula:



V

wherein R_4 and T are as defined above and R_1, R_2 and R_3 either are identical and each represent a methyl group or are different, in which case two of the radicals R_1, R_2 and R_3 always denote hydrogen and the third radical represents an unsubstituted or substituted triphenylmethyl group,

(b) eliminating the 1-O-triphenylmethyl group from the resulting compound of formula V by the action of an acid, with the proviso that, in the case of compounds of formula V in which one of the radicals R_1, R_2 and R_3 is a triphenylmethyl group, the acid is a Lewis acid, with formulation of a 2-acyl-sn-glycero-3-phosphcholine or a 2-acyl-sn-glycero-3-phospho-N-triphenylmethyl)-ethanolamine of the formula:

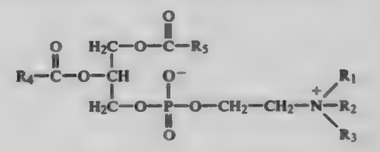


VI

in which

R_1, R_2, R_3 and R_4 have the meaning given above

(c) acylating the compound of the formula VI by reaction with an acylating derivative of a carboxylic acid of the formula R_5COOH to give a 1,2-diacyl-sn-glycero-3-phosphocholine or 1,2-diacyl-sn-glycero-3-phospho-(N-triphenylmethyl)-ethanolamine of the formula:



VII

in which

R_1, R_2 and R_3 are as defined in formula V, and

R_4 and R_5 have the meaning given in formula IV, and

(d) eliminating any N-triphenylmethyl group present in the compound of formula VII by the action of an acid in an aprotic solvent.

4,717,513

SILICA INTERCALATED CRYSTALLINE ZIRCONIUM PHOSPHATE-TYPE MATERIALS

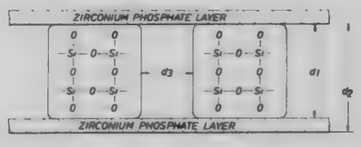
Robert M. Lewis, Sugarland, Tex.; Rutger A. Van Santen, Amsterdam, Netherlands, and Kevin C. Ott, Thousand Oaks, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 27, 1984, Ser. No. 604,543

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.⁴ C07F *3/00*; B01J *21/16*

U.S. Cl. 556—9 **5 Claims**



1. A composition comprising crystalline, layered zirconium phosphate-type material having silica pillars intercalated between the interlayers of said material wherein said silica pillars comprise at least two silicon atom layers.

4,717,514

PROCESS FOR PREPARING F-TOLUIDINE-2-SULPHONIC ACID

Heinz U. Blank, Odenthal; Herbert Emde, Cologne, and Rolf Schimpf, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 692,604, Jan. 17, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,357

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401572

Int. Cl.⁴ C07C *143/58*

U.S. Cl. 260—508 **14 Claims**

1. A process for preparing 5-amino-2-methylbenzenesul-

phonic acid which comprises adding SO_3-containing sulphuric acid, said SO_3-containing sulphuric acid having a free SO_3 content of 60 to 65% by weight and being employed in an amount of 1–3 moles of free SO_3 per mole of p-toluidine, to p-toluidine dissolved in 1.5–10 moles of sulphuric acid per mole of p-toluidine, wherein in a first reaction conducted at a temperature of 10° to 55° C. a portion of the total required amount of the SO_3-containing sulfuric acid is added to the p-toluidine, said portion being at least 50% of the total required amount of the SO_3-containing sulphuric acid, and thereafter conducting a secondary reaction at a temperature of 55° to 80° C. wherein the remaining amount of the required amount of the SO_3-containing sulphuric acid is added, and wherein after said secondary reaction, water is added to the reaction mixture, said water added in an amount whereby to form, in addition to crystallized 5-amino-2-methylbenzenesulfonic acid, an aqueous phase of a dilute acid having a sulphuric acid content of 10 to 60% by weight, relative to the total aqueous phase.

4,717,515

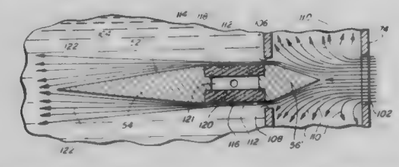
APPARATUS FOR DISPERSING FLUIDS IN LIQUIDS

Robert H. Forsyth, Englewood, and Troy W. Fleselman, Littleton, both of Colo., assignors to Wilfley Weber, Inc., Englewood, Colo.

Continuation of Ser. No. 728,105, Apr. 29, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 908,644

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—122 **10 Claims**



1. A fluid diffuser for dispersing gas bubbles or liquid droplets into a body of receiving liquid, said fluid being supplied under pressure to the diffuser from a fluid source, said diffuser being activated by a shearing liquid supplied under pressure to the diffuser from a shearing liquid source, which fluid diffuser comprises:

(a) a fluid-emitting member for communication with said body of receiving liquid, said member including external walls that define a fluid plenum and define a fluid inlet for supplying fluid under pressure to the interior of said fluid plenum, a portion of at least one of said walls being porous and having a foraminous outer surface, said porous wall portion permitting the passage of fluid from said plenum through said foraminous outer surface and into said body of liquid, said foraminous surface having a downstream border and an upstream border; and

(b) a slot-forming chamber having a wall that defines a narrow, elongated slot extending parallel to said foraminous outer surface of said at least one plenum-defining wall of said fluid-emitting member, said slot being formed by two opposed interior walls each of which is imperforate for substantially its entire extent, said slot having an inlet end and an outlet opening and providing a narrow passage to direct the flow of a stream of said shearing liquid therethrough and across and in contact with the foraminous outer surface of said fluid-emitting member,

the downstream extension of each straight line that lies in a predetermined one of said opposed interior walls just upstream of said outlet opening, and that is oriented in the direction of flow of said stream of shearing liquid, lying in said foraminous surface in at least the portion of said surface adjacent said outlet opening,

the cross-sectional area of the path open to the flow of said stream of shearing liquid as it moves in a downstream direction from said outlet opening of said elongated slot and across said foraminous surface being larger at all points than the cross-sectional area of said outlet opening and not decreasing at any point downstream of said outlet opening,

the outlet opening of said slot being located adjacent said upstream border of said foraminous outer surface, with said foraminous outer surface lying primarily outside and primarily downstream of said slot, the inlet end of said slot being in communication with said chamber and its outlet opening in communication with said body of receiving liquid, said chamber having an inlet for the introduction into the chamber of said shearing liquid under pressure,

whereby said fluid supplied under pressure to said plenum will flow out through said porous wall portion to produce small nascent fluid spheroids on said foraminous surface, and shearing liquid introduced into said slot-forming chamber under pressure will exit through the outlet opening of said narrow, elongated slot to form a stream of liquid that then sweeps across and in contact with at least a majority of the area of said foraminous outer surface of said plenum-defining wall of said fluid-emitting member, to shear said nascent spheroids off said foraminous surface and form fine gas bubbles or fine liquid droplets, which are carried into said body of receiving liquid by said stream of shearing liquid as it exits from said slot and moves into the body of receiving liquid.

4,717,516

PRODUCTION OF POLYESTER SHAPED PRODUCT

Tsutomu Isaka, and Hiroshi Nagano, both of Aichi, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 600,056, Apr. 13, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,305

Claims priority, application Japan, Apr. 13, 1983, 58-65878; Apr. 13, 1983, 58-65879; Apr. 13, 1983, 58-65880

Int. Cl.⁴ B32B *31/28*

U.S. Cl. 264—22 **14 Claims**



1. A process for enhancing the adhesion of the surface of a shaped product made of a polyester composition which comprises supplying a shaped product at a rate from 1 to 500 m/min, and applying corona discharge to said surface under the continuous movement between an electrode for discharge and another electrode opposite thereto while jetting nitrogen or a modified air having a higher nitrogen content than the air onto the part of said surface to which corona discharge is applied at a rate not less than 1% of the supply rate of the shaped product so as to achieve the following relationships among oxygen indexes and nitrogen indexes before and after the application of corona discharge and at an inside layer 100 Å thick from the surface:

$$-3.5 \leqq (Oi' - Oi)/(Ni' - Ni) = 1.5 \quad (1)$$

$$3 \leqq Ni' \quad (2)$$

wherein Oi and Oi' are respectively the oxygen indexes before and after the application of corona discharge, said polyester composition comprising at least one polyester comprising units of at least one dibasic acid, of which not less than 80 mol % is terephthalic acid, and units of at least one diol as the component (A) and optionally at least one block copolymerized polyester comprising units of a high melting point crystalline polyester segment, the polymer constituted with the high melting point crystalline polyester segment alone having a melting point of not lower than 170° C., and units of a low melting point soft polyester segment having a molecular weight of 400 to 10,000, the polymer constituted with the low melting point soft polyester segment alone having a softening or melting point of not higher than 100° C., as the component (b) and/or at least one polyester comprising units of at least one dibasic acid, of which 25 to 85 mol % is terephthalic acid, and units of at least one diol as the component (c) in a weight proportion satisfying the following relationships:

$$(B+C)/(A+B+C) \times 100 \leqq 60 \quad (3)$$

$$0 \leqq B/(B+C) \leqq 100 \quad (4)$$

wherein A, B and C are respectively the weights of the components (A), (B) and (C).

4,717,517

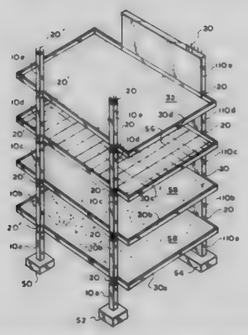
CONCURRENT METHOD OF BUILDING CONSTRUCTION AND FORMWORK STRUCTURE THEREFORE

Alex E. Halberstadt, 104 Crandon Blvd., Key Biscayne, Fla. 33149

Filed Aug. 13, 1982, Ser. No. 407,756

Int. Cl.⁴ B22D *19/04*; E04B *1/16*; E04G *11/02, 17/06*

U.S. Cl. 264—33 **15 Claims**



1. A method of constructing a multi-story building made of poured-in-place concrete, in which each story thereof has a concrete slab constituting a floor thereof and vertical support members supporting a concrete slab constituting the floor for the next story thereabove, with the vertical support members for each said story being substantially in vertical alignment with corresponding vertical support members of the next story therebeneath, comprising

erecting vertical formwork members for the vertical support members for one said story;

erecting decking formwork for the concrete slab of the next story thereabove;

affixing formwork spacers to the top of said vertical formwork members, said spacers providing mounts extending through the thickness of the slab to be formed in said decking formwork for mounting vertical formwork members for the next story;

erecting said vertical formwork members for said next story;

pouring fresh concrete at least into said vertical formwork members of said one story to solidify into said vertical support members;

curing said vertical support members;

pouring and curing said slabs and vertical support members for at least the next story thereabove; and

stripping said vertical formwork members from said vertical support members and said decking formwork from said concrete slabs.

14. Formwork structure for use in construction of a multi-story building made of poured-in-place concrete and in which each of various steps of construction can be carried out concurrently on successively arranged stories thereof, each such story having a concrete slab constituting a floor thereof and vertical support members supporting a concrete slab constituting the floor for the next story thereabove, with the vertical support members for each said story being substantially in vertical alignment with corresponding vertical support members of the next story therebeneath, comprising

vertical formwork members defining spaces into which fresh concrete can be poured to form said vertical support members for one such story, each said formwork member extending from a position corresponding to an upper surface of one slab to a position corresponding to a lower surface of the corresponding slab for the next story thereabove, the formwork members being strippable from the vertical support members formed therewithin for reuse in forming similar such support members;

vertical formwork spacers removably affixed to the top of said vertical formwork members of each of a plurality of stories and extending through the thickness of the slab to be formed for the next story thereabove and constituting mounts upon which the vertical formwork members for the next story are supported; and

horizontal decking formwork means in which the concrete slabs for each of said plurality of stories are formed in place, such means being strippable from the associated slabs when the later have been formed and cured;

with said vertical formwork members, said formwork spacers, and said horizontal decking formwork means for said plurality of said stories being erected and supported only by their own structure, before concrete support members in the vertical formwork members for the lowermost of said plurality of stories have cured sufficiently to support structural stresses.

4,717,518

NOVEL PROCESS FOR MAKING POLYURETHANE PRODUCTS WHICH REQUIRE REDUCED CRUSHING IN PREVENTING SAID PRODUCTS FROM SUBSTANTIALLY SHRINKING OR CHANGING DIMENSIONALLY UPON COOLING

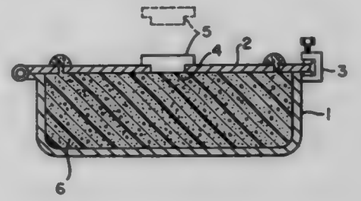
Keith D. Cavender, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 20, 1985, Ser. No. 778,307

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.⁴ B29C *67/22, 39/10, 9/38*

U.S. Cl. 264—51 **9 Claims**



1. A process for making molded high resilience polyurethane cellular products which require reduced crushing in preventing said products from substantially shrinking or changing dimensionally upon cooling comprising:

(a) introducing a liquid foamable polyurethane reaction mixture into a mold adopted to expose the mixture to atmospheric pressure during the curing of said product and said mold adapted to be closed;

(b) closing said mold;

(c) permitting said reaction mixture to expand into contact with the confines of the mold to form a curing molded

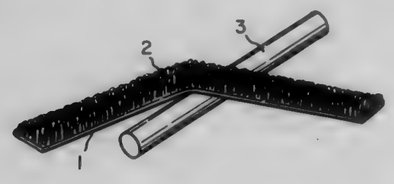
polyurethane cellular product containing cells having cell walls of curing polyurethane and pressurized expansion gases contained within and supporting said cell walls;
(d) exposing said curing product to atmospheric pressure while in contact with the confines of the mold at a time when said cell walls of said curing polyurethane cellular product have cured sufficiently to develop sufficient strength to partially resist bursting by the pressure of said expansion gases contained within said cell walls upon exposure to atmospheric pressure, but before said cell walls have cured sufficiently to develop sufficient strength so that exposure to atmospheric pressure does not result in a reduction of the crushing force necessary to prevent said products from substantially shrinking or changing dimensionally;
(e) allowing said curing polyurethane product to continue to cool and cure in said mold until it has developed sufficient strength to be removed from the mold without permanently distorting its shape;
(f) removing said product from said mold; and
(g) crushing said product to prevent shrinkage or dimensional change.

4,717,519

METHOD FOR PRODUCING A STRING-SHAPED BACTERIA BED FOR SEWAGE OR WASTEWATER TREATMENT

Koji Sagami, 696-47 Shikawatashi, Yotsukaido-shi, Chiba Prefecture, Japan

Filed Mar. 11, 1987, Ser. No. 24,773
Int. Cl.[4] B29C *53/02, 61/02, 61/10*
U.S. Cl. 264—103 5 Claims



1. A method for producing a string-shaped bacteria bed having many loops of fiber on the whole surface thereof, which is used for sewage or wastewater treatment, comprising preparing a narrow strip of cloth made from a thermoplastic material, having many loops of fiber on the obverse thereof, and heating the reverse thereof having no loops of fiber by contacting it with a heating rod while tensing and drawing it diagonally, thereby the strip of cloth is diagonally curled and stranded by heat to form a string having many loops of fiber on the whole surface thereof.

4,717,520

PROCESS FOR THE NETLIKE OPENING OF FIBRILLED FILMS

Franco Angella, Villafranca Lunigiana; Adriano Grondona, and Andrea Vittone, both of Milan, all of Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed Dec. 5, 1985, Ser. No. 804,822
Int. Cl.[4] B29D *28/00;* B29C *55/08*
U.S. Cl. 264—147 2 Claims

1. Process for the netlike opening of fibrilled films consisting in the following operations:
(a) formation of non-permanent or semi-permanent indulations on a prevalently monooriented fibrilled or longitudinally slitted synthetic polymeric film or complex of such superimposed films, the front of the undulations being substantially perpendicular to the longitudinal axis of the film or such combination of films;
(b) feeding of the film or combination of films, containing the undulations, to a continuous pair of translation elements moving in a substantially perpendicular direction to the front of the undulations and mutually diverging, pro-



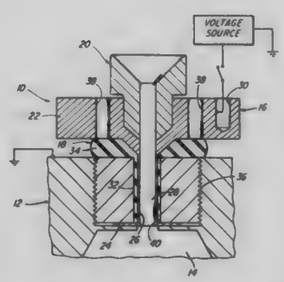
vided with pulling elements that initially grip the undulations but do not then hinder their spreading due to the longitudinal shrinkage;
(c) the optional thermal stabilization of the film in the opennet condition by means of heating it at a temperature lower than the melt temperature of the polymer of which is made the film.

4,717,521

THERMAL GATE FOR PLASTIC MOLDING APPARATUS AND METHOD OF USING IT

John Border, Amherst, N.H., and Russell B. Ford, Brookline, Mass., assignors to Intelitec Corporation, Grosse Pointe Farms, Mich.

Filed Mar. 21, 1986, Ser. No. 842,614
Int. Cl.[4] B29C *45/28*
U.S. Cl. 264—219 17 Claims



1. In a molding process wherein molten molding material is supplied under pressure to a mold having a cavity defining the shape of a part to be molded, the improved method for controlling flow of molding material into the cavity which comprises:
directing the molten molding material through a thin-walled elongated tube which defines a restricted flow passage located in the mold immediately upstream of the cavity, said tube being formed of an electrically conductive material which functions as an electrical resistance heater when electric current is applied thereto;
applying electrical current to one end of said tube and passing said current through substantially the entire length of said tube to electrically heat the walls thereof to an elevated temperature above the melting point of the molding material to permit said material to flow through said passage and into the cavity when said current is applied;
thermally insulating the exterior of said tube with a thin-walled sleeve formed of an electrically non-conductive material selected so that the product of its density, specific heat and thermal conductivity is minimized, and said sleeve being dimensioned to be in intimate contact with the exterior of said tube, so that the temperature of the passage walls can be efficiently maintained at said elevated temperature notwithstanding the much lower temperature of the surrounding mold;

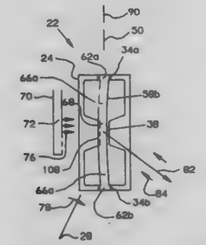
forming both said tube and said sleeve of materials such that the coefficients of thermal expansion of said tube and said sleeve are each less than about 0.000004 in./in./°C.;
cooling the surface of said insulating sleeve which is remote from said tube to a temperature which is substantially below said melting temperature of the molding material;
causing the flow of said molding material through said passage to be stopped at a predetermined time by terminating said electrical current, the relatively low mass and high surface area of said tube enabling it to rapidly cool to a temperature which freezes the molding material in said passage;
whereby the initiation and termination of flow of molding material into the cavity may be precisely controlled by the ability of said tube to rapidly melt or freeze the molding material therein in response to the presence or absence of electrical current flow through said tube, and the dimensional compatibility of said tube and said liner is maintained throughout the temperature range of the melting and freezing cycle.

4,717,522

THERMOPLASTIC CONTAINER FORMING METHOD

William W. Evely, Chardon, Ohio, assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 714,733, Mar. 22, 1985, Pat. No. 4,650,628.
This application Oct. 27, 1986, Ser. No. 923,511
Int. Cl.[4] B29C *49/04*
U.S. Cl. 264—520 13 Claims



1. A method for straightening a parison tube that has a longitudinal axis, that includes a curvature, that has been placed between opened halves of a blow mold, and that has been grasped proximal to a first end thereof between partially closed halves of said blow mold, which method comprises:
(a) orienting the curvature of said parison tube in a first and generally predetermined direction; and
(b) applying a straightening force to said grasped parison tube in a second and predetermined direction that is generally transverse to said longitudinal axis and thereby correcting said curvature.

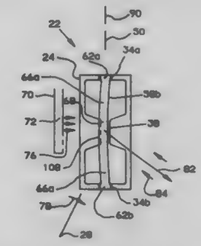
4,717,523

THERMOPLASTIC CONTAINER FORMING METHOD

William W. Evely, Chardon, Ohio, assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 714,733, Mar. 22, 1985, Pat. No. 4,650,628.
This application Oct. 27, 1986, Ser. No. 923,510
Int. Cl.[4] B29C *49/04*
U.S. Cl. 264—527 5 Claims

5. In a process of molding hollow articles in a rotary blow molding machine having mold halves for clamping off a top and bottom portion of plastic tubing advanced between said mold halves when in an open position and thereafter inflating said tubing against the walls of at least two body cavities formed therein and joined together by a narrower intermediate cavity, an improvement in aligning said tubing between continuously moving mold halves in said rotary blow molding machine, particularly along the narrower intermediate cavity portion and thereby avoiding unnecessary pinching off of the tubing within the confines of the intermediate cavity, said improvement comprising introducing just prior to mold closure of said mold halves a stream of fluid directed between said



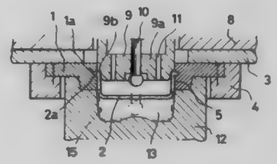
mold halves and substantially perpendicular to the longitudinal axis of the tubing, said stream exerting a force effective to cause the concentricity of said tubing within the narrow intermediate cavity upon closure of said mold halves about said parison tube.

4,717,524

METHOD FOR MOLDING A THIN-WALL CONTAINER USING SYNTHETIC RESIN

Katashi Aoki, 6037, Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

Filed Feb. 22, 1985, Ser. No. 704,290
Claims priority, application Japan, Feb. 24, 1984, 59-33772
Int. Cl.[4] B29C *49/42, 49/56, 49/02*
U.S. Cl. 264—550 1 Claim



1. A method for molding a thin-wall container using synthetic resin, the method comprising:
providing a horizontally divisible holding mold including a pair of mold halves which define a cavity and are divisible in a horizontal direction, said mold halves each having a horizontal groove in an inner peripheral wall thereof and together forming an inner peripheral wall of said cavity, said grooves together forming a horizontal lateral groove for molding an outer edge of a preform in said peripheral wall of said cavity formed by the holding mold, the cavity having the same cross-sectional plane shape as that of a cup-like or box-like container or the like to be molded;
interposing the holding mold between an upper mold and a lower mold;
injection molding a plate-like or flat preform whose outer edge is fitted into the lateral groove of the holding mold;
releasing the preform from the upper mold and the lower mold while retaining moldable heat to transfer it together with the holding mold to a container molding position;
immediately closing a core member above the holding mold and a container molding mold below the holding mold, and providing the container molding mold with a shoulder facing the core member and a side wall projecting upwardly of the shoulder and within said peripheral wall of the cavity;
holding the circumference of the preform between (1) the

peripheral wall of the cavity of the holding mold, (2) the shoulder of the container molding mold, and (3) the sidewall upward of the shoulder of the container molding mold, so as to press the side of the preform toward the wall of the cavity and thereby form an airtight fit between the preform and the holding mold; and

molding a container which is wide in opening and has a thin wall by blowing or vacuum molding of the preform including axially stretching the preform by mechanical means.

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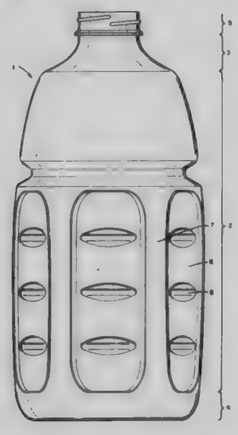
METHOD FOR FORMING PLASTIC CONTAINERS

Takao Iizuka, Matsudo, and Akibo Ota, Funabashi, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 760,548, Jul. 30, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 931,989

Int. Cl.[4] B29C *35/02, 49/20, 71/02, 49/62*

U.S. Cl. 264—521 **8 Claims**



1. A method for producing a blow-molded, heat set container including at least one large collapse panel in a side wall of said container, said method comprising:

blowing-molding a parison of thermoplastic material to form said container in a mold comprising a mold cavity which defines a final shape of said container, said mold cavity having an inner wall and having at least one inwardly projecting mold wall insert corresponding to said large collapse panel to be formed in a side wall of said container; and

applying heat to said mold to heat set said container, an inner surface of said mold wall insert being heated to a temperature sufficiently lower than a temperature to which adjacent portions of said inner wall of said mold are heated to heat set said large collapse panel at a lower temperature than remaining sections of said container sufficient to prevent distortion of said large collapse panel when said container is removed from said mold.

4,717,526

POLOIDAL COIL ARRANGEMENT FOR A NUCLEAR FUSION APPARATUS

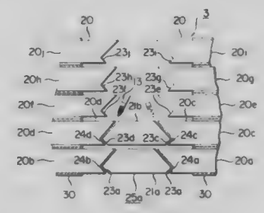
Kazuo Kano; Shigeyuki Takagi; Daisaburo Nagata, and Shintaro Fukumoto, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 30, 1985, Ser. No. 696,576

Claims priority, application Japan, Jan. 31, 1984, 59-14342

Int. Cl.[4] G21C *1/00;* **H01F** *27/24*

U.S. Cl. 376—142 **3 Claims**



1. In a nuclear fusion apparatus having a poloidal coil arrangement, said poloidal coil arrangement comprising;

at least two poloidal coil sections spaced a predetermined distance apart and leaving a gap, each of said coil sections including a plurality of partial conductor turns having end surfaces, and

a plurality of bridging joining members, each having a length substantially equal to the predetermined distance and bridging the gap to electrically and metallurgically join said turn end surfaces of spaced partial conductor turns to form a plurality of complete turns, said joining members having convex end surfaces at opposite ends, said end surfaces of said partial conductor turns being shaped complementary to and contacting said convex joining member end surfaces at end joints to provide the sole support of said joining members upon assembly before the end joints are welded, the length in the circumferential direction of the top side of each joining member being nearly equal to or shorter than the length in the circumferential direction of the opposing lower side of the upper joining member located immediately above each joining member, whereby exposed edges of end joints between contacting end suffaces of each joining member and adjoining spaced partial conductor turns face the upper gap above each joining member to allow heat to be applied to the exposed edges from a welding torch located in the upper gap before a bridging joining member is inserted in the upper gap.

4,717,527

FUEL ASSEMBLY

Robert K. Gjertsen, Monroeville; Elmer A. Bassler, North Huntingdon; Edgar A. Huckestein, Edgewood; Robert B. Salton, Plum Boro., and Stephen N. Tower, Washington Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 626,847

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] G21C *1/06, 7/22, 15/02, 19/28*

U.S. Cl. 376—209 **10 Claims**

1. A fuel assembly adapted for use with a pressurized water nuclear reactor having capabilities for fluid moderator spectral shift control comprising:

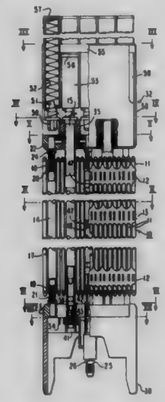
a plurality of parallel arranged elongated nuclear fuel elements;

means for providing for axial support of said fuel elements and for arranging said fuel elements in a spaced array;

a plurality of guide thimbles interspersed among said fuel elements adapted for insertion of a rod control cluster therewithin;

means for structurally joining said fuel elements and said guide thimbles;

fluid moderator control means for providing a volume of low neutron absorbing fluid within the fuel asembly and for removing a substantially equivalent volume of reactor coolant water therefrom, said fluid moderator control means including a plurality of moderator control tubes interspersed among said fuel elements and guide thimbles containing said rod control cluster, said moderator control tubes being sealingly separated from said reactor coolant water;



a first flow manifold at one end of said fuel assembly sealingly connected to a first end of said moderator control tubes whereby said first ends are commonly flow connected; and

a second flow manifold, having an inlet passage and an outlet passage therein, sealingly connected to a second end of said moderator control tubes, at a second end of said fuel assembly, said one of said moderator control tubes being flow separated by separate flow channels within said second manifold from the remainder of said moderator control tubes, whereby said fluid moderator has inlet flow through said second manifold to said remainder of moderator control tubes, and outlet flow from said fuel assembly through said one of said moderator control tubes at said second end of said fuel assembly.

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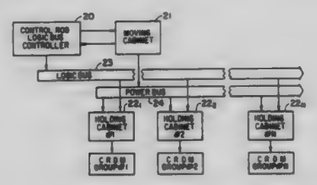
CONTROL ROD CONTROL SYSTEM

Charles E. Meyer, Monroeville; Bruce M. Cook, Pittsburgh; David H. Ditto, Monroeville, and John W. Kaufmann, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 703,003

Int. Cl.[4] G21C *7/12*

U.S. Cl. 376—237 **9 Claims**



1. A system for controlling a nuclear reactor comprising a nuclear core comprising a plurality of fissile fuel elements having openings therebetween, a plurality of control rods containing a neutron absorbing material arranged throughout said core and fitting within said openings between said fuel elements, said control rods being movably insertable and withdrawable from said openings by drive means comprising linear motion apparatus having lift, movable gripper and stationary gripper solenoid coils, said control rods being arranged in groups of a predetermined number of control rods which predetermined number move together, means for directing the movement of said groups of control rods to control the core radial power distribution and the core axial power distribution and means for sharing the power circuitry among said control rod groups, said power circuitry being connected to the drive mechanism of each group of control rods, said means for sharing the power circuitry comprising a plurality of storage enclosures, with one enclosure containing the power circuitry for the lift and movable gripper coils for all of said groups of control rods in combination with separate enclosures which contain the power circuitry for the stationary gripper coils for each respective group of control rods.

4,717,529

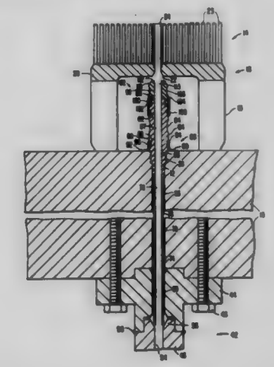
THIMBLE GUIDE ASSEMBLY

Daniel Merkovsky, Monroeville, and Richard E. Schwirian, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 10, 1966, Ser. No. 817,703

Int. Cl.[4] G21C *17/10*

U.S. Cl. 376—245 **18 Claims**



1. In a nuclear reactor having a reactor core plate with a bore and having an elongated hollow thimble which is longitudinally movable through the bore in the reactor core plate and into a fuel assembly supported by the core plate, the bore having an axis and the fuel assembly having a bottom nozzle with an aperture to receive the thimble, the bottom nozzle having legs which rest on the core plate around the bore and the aperture in the bottom nozzle being spaced apart from the core plate and being positioned along the axis of the bore therein, a thimble guide assembly comprising:

an elongated first element having an axis, a top end, and a thimble channel which extends along the axis of the first element to the top end thereof, the first element additionally having means for mounting the first element to the core plate so that the bore of the core plate and the thimble channel of the first element are coaxial and so that the top end of the first element is positioned above the core plate; and

a second element having a top end, a bottom end, an axis running through the top and bottom ends of the second element, and a thimble channel along the axis of the sec-

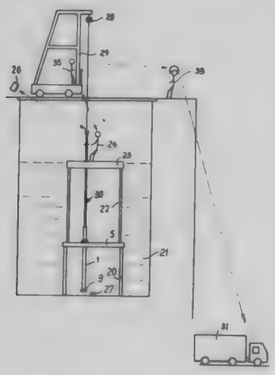
ond element, the second element additionally having means at its bottom end for connecting the second element to the top end of the first element so that the thimble channels of the first and second elements are coaxial, the top end of the second element being spaced apart from the nozzle when the first and second elements are connected, wherein the thimble is longitudinally movable through the first and second elements along the thimble channels thereof.

4,717,530

PROCESS AND DEVICE FOR THE REMOTE UNDERWATER MONITORING OF A SMALL-SIZE COMPONENT OF A NUCLEAR REACTOR

Marcel Beaglot, Meximieux, France, assignor to Service National Electricite de France, Paris, France

Filed Feb. 10, 1986, Ser. No. 827,582
Claims priority, application France, Feb. 12, 1985, 85 01968
Int. Cl.⁴ G21C *17/00*
U.S. Cl. 376—245 **7 Claims**



6. A device for the remote underwater monitoring of a component of a pressurized-water nuclear reactor, where the component is a centering pin (9) of a guide tube for the upper internal equipment of the reactor, the device having in a known way a television camera and means of displacing it in the guide tube arranged vertically under water, wherein the device also has a tube (30), the outside diameter of which is less than the width of the space between the 90° sleeves (12*a*) of the tube (1), integral in its lower part with a bearing ring (45) of an outside diameter substantially equal to the space between the 90° sleeves (12*a*), and an assembly (40—41—42) having an injection tube (40) provided with a nozzle of a diameter less than 3×10^{-3} m in its lower part and mounted slideably in the tube (30) in its axial direction and rotatably in this tube about its axis, means (28,29) of displacing the tube (30) in the vertical direction and means of axial displacement and pivoting relative to the tube (30) of the assembly (40—41—42) which is connected to a pumping system (31) by means of a pipeline.

4,717,531

FUEL TRANSFER SYSTEM UPENDER USING TRANSLATION DRIVE

Roy T. Hardin, Jr., Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

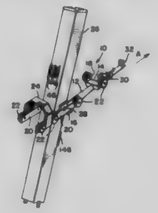
Filed Sep. 23, 1983, Ser. No. 535,134
Int. Cl.⁴ G21C *19/18*
U.S. Cl. 376—261 **19 Claims**

1. An article transport system, comprising:

means for moving said article from a first location toward a second location substantially within a first plane;

means for driving said moving means within said first plane; and

pivotable means fixedly disposed within the vicinity of said



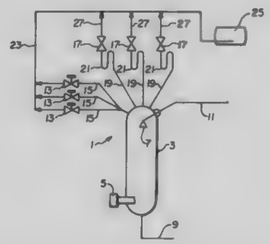
second location for automatically moving said article from said first plane into a second plane in response to said driven movement of said moving means within said first plane.

4,717,532

PRESSURE CONTROL SYSTEM FOR A PRESSURIZED WATER NUCLEAR REACTOR PLANT

John A. Schwab, Upper Tyrone Township, Fayette County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1985, Ser. No. 749,036
Int. Cl.⁴ G21C *9/00*
U.S. Cl. 376—283 **18 Claims**



1. In a pressure control system of a pressurized water nuclear reactor plant, containing a pressurizer, water sprayers, heaters, power operated relief valves, safety valves, and a pressurizer relief tank, containing a liquid coolant, having a sparger therein for release of water and steam from the pressurizer, the improvement wherein said sparger comprises:

a primary conduit having a terminus, terminating within the liquid coolant in the pressurizer relief tank, said conduit having orifices therein for discharge of fluid therefrom;

a secondary conduit, attached to said terminus of said primary conduit, having orifices therein for discharge of fluid therefrom; and

valve means through which said primary and secondary conduits communicate, said valve means responsive to a predetermined pressure differential across said valve means between said primary and secondary conduits.

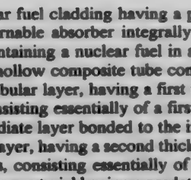
4,717,533

GRID FOR NUCLEAR FUEL ASSEMBLY

Jean P. Denizou, Craponne, France, assignor to Framatome et Cogema, France

Filed Aug. 19, 1985, Ser. No. 766,657
Claims priority, application France, Aug. 24, 1984, 84 13193
Int. Cl.⁴ G21C *3/34*
U.S. Cl. 376—441 **11 Claims**

1. A spacing grid for a longitudinal nuclear fuel assembly having a bundle of parallel fuel elements arranged in a regular triangular array, said grid having a peripheral frame of regular hexagonal shape consisting of six side plates and at least two beds of wires spaced in a longitudinal direction, each of said beds having only two separate series of mutually parallel wires,



said wires having ends secured to said frame, the wires of a same one of said series being parallel to two opposed sides of said frame, all said wires defining passages for supporting said fuel elements and said beds including at least one respective series of wires parallel to each side of said frame.

4,717,534

NUCLEAR FUEL CLADDING CONTAINING A BURNABLE ABSORBER

Toshio Morita, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 702,972
Int. Cl.⁴ G21C *3/06*
U.S. Cl. 376—419 **15 Claims**

1. A nuclear fuel cladding having a predetermined concentration of burnable absorber integrally incorporated therein, for use in containing a nuclear fuel in a reactor, the cladding formed as a hollow composite tube comprising:

an outer tubular layer, having a first thickness of at least 15 mils, consisting essentially of a first zirconium alloy;

an intermediate layer bonded to the inner wall of said outer tubular layer, having a second thickness less than said first thickness, consisting essentially of a mixture of a boron-containing material having a predetermined enrichment of boron and a second zirconium alloy, said second thickness being defined by said predetermined enrichment of boron in said boron-containing material and by the predetermined concentration of burnable absorber incorporated into said fuel cladding; and

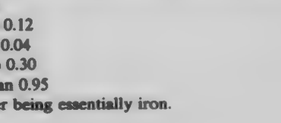
an inner layer of zirconium metal, having a third thickness less than said second thickness, bonded to said intermediate layer, said third thickness being sufficient to isolate said intermediate layer from said nuclear fuel.

4,717,535

METHOD OF MANUFACTURING AN OBJECT OF POWDERED MATERIAL BY ISOSTATIC PRESSING

Jan Adlerborn; Leif Hermansson; Hans Larker; Bertil Mattsson, and Jan Nilsson, all of Robertsfors, Sweden, assignors to ASEA Cerama AB, Robertsfors, Sweden

Filed May 11, 1987, Ser. No. 48,735
Claims priority, application Sweden, May 13, 1986, 8602162
Int. Cl.⁴ B22F *1/00*
U.S. Cl. 419—38 **7 Claims**



1. A method of manufacturing an object of a powdered material by isostatic pressing of a body (10), preformed from the powdered material, with a gaseous pressure medium, comprising providing the preformed body with a casing (19) of glass or of a material forming glass upon heating, arranging a barrier layer (11) containing powdered boron nitride, which counteracts the penetration of glass in melted form from the casing into the preformed body, on the preformed body inside the casing, and making the glass casing impermeable to gas by heating before carrying out the isostatic pressing while sintering the preformed body, characterized in that the barrier layer is built up of at least two layers (12, 13) containing powdered boron nitride, of which one layer (12) at least substantially consists of boron nitride and one layer (13) of a mixture of powered boron nitride and a powdered additive material with the ability, upon contact with the glass in melted form from the casing, to make a layer containing boron nitride tighter against melted glass in the casing.

4,717,536

WELD BEAD ELECTRODE FOR PRODUCING SAME AND METHOD OF USE

Chang-Shung Chai, South Euclid, and Jon McCollister, Mentor, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Jan. 24, 1986, Ser. No. 822,273
Int. Cl.⁴ C22C *38/28;* B23K *35/368*
U.S. Cl. 420—103 **8 Claims**

1. An electric arc deposited weld bead having the following essential analysis in weight percent of total weight of a weld bead sample:

Ti: 0.03 to 0.12
N: 0.01 to 0.04
Cr: 0.05 to 0.30
Al: less than 0.95

the remainder being essentially iron.

4,717,537
PROCESS FOR MAKING METALLIC ALLOYS USING PRECARBURIZED FERROALLOYS
Enrico W. Betz, Araxa, and Cyro Takano, Sao Paulo, both of Brazil, assignors to Companhia Brasileira de Metalurgia e Mineracao, Sao Paulo, Brazil
Filed Aug. 7, 1986, Ser. No. 894,348
Claims priority, application Brazil, Aug. 7, 1985, 8503727
Int. Cl.[4] B22F *1/00*
U.S. Cl. 420—129 6 Claims

1. A process for forming a metallic alloy having improved material strength and resistance to wear and impact comprising the steps of,
precarburizing master alloys containing elements selected from the group of elements consisting of niobium, titanium, vanadium, molybdenum, tungsten, hafnium, chromium, tantalum, and zirconium to form a fine dispersion of metallic carbides in a metallic matrix,
adding the precarburized master alloys to a liquid melt,
dissolving the metallic matrix of the precarburized master alloys in the liquid melt,
releasing from the metallic matrix fine particles of stable carbides in the liquid melt, and
thereafter forming a homogeneous distribution of the stable carbide particles throughout the metallic matrix.

4,717,538
MOLYBDENUM-TUNGSTEN-TITANIUM-ZIRCONIUM-CARBON ALLOY SYSTEM
Thomas J. Patrician, Monroeton; Gene T. Schaeffer, Towanda, and Harry D. Martin, III, Troy, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Nov. 28, 1986, Ser. No. 935,910
Int. Cl.[4] C22C *27/04*
U.S. Cl. 420—429 2 Claims

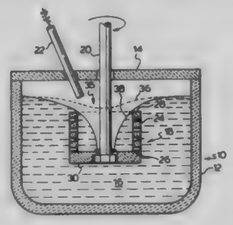
1. A molybdenum-tungsten-titanium-zirconium-carbon alloy system consisting essentially of in percent by weight from about 10 to about 60 tungsten, from about 0.40 to about 0.75 titanium, from about 0.06 to about 0.20 zirconium, from about 0.01 to about 0.15 carbon, and the balance molybdneum.

4,717,539
CORROSION RESISTANT ALLOYS
David P. Morisey, Concord, Calif., assignor to Alma Phillips, Oakland and Hugh Finley, Piedmont, both of, Calif., part interest to each
Continuation of Ser. No. 701,300, Feb. 13, 1985, abandoned. This application Apr. 22, 1986, Ser. No. 854,995
Int. Cl.[4] C22C *9/06, 19/03;* A61C *13/08*
U.S. Cl. 420—457 13 Claims

1. As compositions of matter, alloys consisting essentially of about 41 to 65 percent by weight copper, about 30 to 33 percent by weight nickel, about 5 to 6 percent by weight tantalum, and about 0.05 to 0.25 percent by weight lithium.

4,717,540
METHOD AND APPARATUS FOR DISSOLVING NICKEL IN MOLTEN ZINC
Dale L. McRae, Fruitvale; Robert D. H. Willans, Trail, and Eric L. Mawer, Fruitvale, all of Canada, assignors to Cominco Ltd., Vancouver, Canada
Filed Sep. 8, 1986, Ser. No. 904,536
Int. Cl.[4] C22C *18/00*
U.S. Cl. 420—513 13 Claims

1. A method for the dissolution of nickel in molten zinc which comprises the steps of establishing a melt of zinc in a vessel; submerging a rotatable device in said melt; said rotatable device consisting of a hollow cylinder having a side wall with an upper end and a lower end, said cylinder being open at the upper end and closed at the lower end, said side wall having an array of equispaced openings adapted to retain nickel added in particulate form in said device in said rotatable device and to allow said molten zinc to pass through said openings, and means attached to the bottom plate for rotation of the rotatable device; rotating said rotatable device at a predetermined speed sufficient to draw at least a partial vortex in said melt of zinc and said rotatable device; feeding nickel in particulate form into said vortex in an amount sufficient to provide a melt of desired composition of zinc containing dissolved nickel; washing said nickel added in said device with



said melt of zinc while rotating said device causing said molten zinc to flow into the top of said device and out through said openings; said washing with molten zinc while rotating said device causing dissolution of said nickel in said rotatable device and formation of a melt of zinc containing said predetermined amount of nickel; and withdrawing a melt of said desired composition from said vessel.

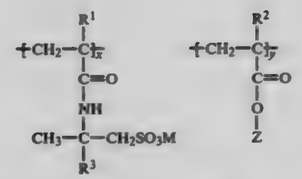
4,717,541
REACTION PRODUCT OF TRIFLUOROETHANOL AND A CYCLOHEXYLAMINE AND/OR A DICYCLOHEXYLAMINE
Maurice S. Baseman, 5905 Hobart St., Pittsburgh, Pa. 15217
Filed Feb. 11, 1987, Ser. No. 13,686
Int. Cl.[4] C23F *11/02*
U.S. Cl. 422—7 31 Claims

1. A composition having corrosion inhibiting properties consisting essentially of a carrier liquid and disposed therein; about 0.1 to about 10 weight percent of a product selected from the group consisting of (1) the reaction product of a triflouroethanol with a cyclohexylamine and (2) the reaction product of a triflouroethanol with a mixture of a cyclohexylamine and a dicyclohexylamine.

11. A combination of a solid body carrying thereon a product having corrosion inhibiting properties selected from the group consisting of (1) the reaction product of a triflouroethanol with a cyclohexylamine and (2) the reaction product of a triflouroethanol with a mixture of a cyclohexylamine and a dicyclohexylamine.

4,717,542
INHIBITING CORROSION OF IRON BASE METALS
Wayne A. Mitchell, Crystal Lake, Ill., assignor to W. R. Grace & Co., New York, N.Y.
Filed Jan. 23, 1987, Ser. No. 6,393
Int. Cl.[4] C23F *11/16*
U.S. Cl. 422—15 20 Claims

1. A composition suitable for inhibiting the corrosion of an iron based metal in contact with the system water in an aqueous system comprising a combination of
(a) hydroxyphosphonoacetic acid or a water-soluble salt thereof; and in a weight ratio to component
(a) between about 10:1 and about 1:1000,
(b) a copolymer having the general formula:



wherein R^1 and R^2 each independently represent hydrogen or methyl; R^3 represents hydrogen or C_1–C_{12} straight or branch chain alkyl group, or a cycloalkyl group having up to six carbon atoms or a phenyl group; each M, which may be the same or different, represents hydrogen or an alkali metal cation or ½ an alkaline earth metal cation or an ammonium cation; each Z, which may be the same or different, represents hydrogen or an alkali metal or ammonium cation; x and y are integers such that the ratio of x to y is from 5:1 to 1:5 and the sum of x+y is such that the copolymer has a weight average molecular weight of 1,000 to 100,000.

2. A composition according to claim 1 wherein the water-soluble hydroxyphosphonoacetic acid compound is hydroxyphosphonoacetic acid, an ammonium salt thereof, or an alkali metal salt thereof.

3. A composition according to claim 2 wherein the copolymer is formed from 2-acrylamido-2-methylpropane sulfonic acid and acrylic acid or methacrylic acid, said copolymer-forming acids being in the form of free acids or at least partially neutralized with an alkali metal cation or an ammonium cation.

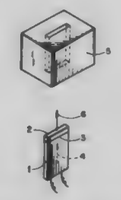
4,717,543
METHOD OF INHIBITING THE CORROSION OF COPPER AND COPPER ALLOYS
Nancy S. Sherwood, Coraopolis, and Nicholas J. Alfano, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.
Filed Aug. 4, 1986, Ser. No. 892,635
Int. Cl.[4] C23F *11/14*
U.S. Cl. 422—15 3 Claims

1. A method of inhibiting copper and copper alloy corrosion in an aqueous system containing oxygen which is in contact said copper or copper alloy comprising adding to said system an effective amount of a polymer having an intrinsic viscosity of 0.05 to 2.5 dl/g and 1.0 M NaCl, which comprises:
(A) about 35 to about 45%, by weight, of acrylic acid or methacrylic acid
(B) about 35 to about 45%, by weight, of 2-acrylamido-2-methylpropylsulfonic acid or 2-methacrylamido-2-methylpropylsulfonic acid; and
(C) about 18 to about 22%, weight, of 2-acrylamido2-methylpropylphosphonic acid or 2-methacrylamido-2-methylpropylphosphonic acid.

4,717,544
METHOD OF STERILIZATION USING A SUSTAINED RELEASE DISINFECTANT
Lidia T. Calcaterra, Arlington Heights, and Harry W. Gibson, Lake Zurich, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.
Filed Jul. 25, 1986, Ser. No. 889,155
Int. Cl.[4] A01N *35/04;* A61L *2/20, 9/02*
U.S. Cl. 422—36 6 Claims

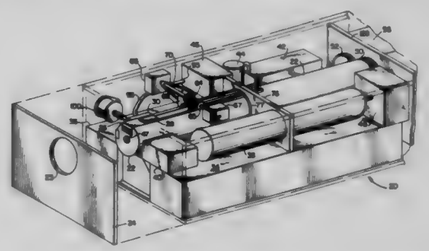
1. A method of disinfecting a material by the slow, controlled release of a gaseous aldehyde selected from the group consisting of glyoxal, malondialdehyde, and glutaraldehyde comprising depolymerizing at a temperature from about 15° to about 40° C. without preirradiation a solid homopolymer of said aldehyde to give gaseous monomeric aldehyde in a disinfectant-effective amount and contacting said material with the gaseous aldehyde.

4,717,545
DEVICE AND METHOD FOR CHEMICAL ANALYSIS OF FLUIDS WITH A REAGENT COATED LIGHT SOURCE
David A. N. Morris, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Sep. 11, 1986, Ser. No. 906,086
Int. Cl.[4] G01N *21/03, 30/96*
U.S. Cl. 422—56 8 Claims



1. A device for determining the presence or concentration of a ligand in a specimen by measuring light, wherein the device consisting essentially of
light source means for providing illumination;
light responsive means for generating an electrical signal in response to light; and
means for measuring the electrical signal from the light responsive means;
wherein the light source has an end surface through which or from which light passes; and
said end surface contains a reagent that is chemically reactive with a ligand in a specimen; and
light from the light source passes through the end surface and through or from the end surface to the light responsive means.

4,717,546
GLUCOSE LEVEL MEASURING APPARATUS
J. Craig Barnett, Denver, Colo., assignor to Texas Tech University Health Sciences Center, Lubbock, Tex.
Filed Nov. 19, 1984, Ser. No. 673,153
Int. Cl.[4] G01N *21/13, 33/48, 35/00*
U.S. Cl. 422—63 11 Claims



1. An apparatus for performing a test to determine the glucose level in a sample of blood placed on a reagent pad attached to an elongated test strip of flexible material, the apparatus comprising the combination of individual means respectively defining a receiving station, a wash station, a de-watering station, and a measuring station in spaced relationship from each other;
carrier means for holding a test strip having a reagent pad thereon, said carrier means being movable to transport a test strip having a reagent pad thereon to each of said stations in sequence, said carrier means comprising

a generally cylindrical body having a central axis, said stations being disposed around the circumference of said body;

means for mounting said body for rotation about said central axis;

an axially extending holder on said body for receiving and retaining said pad, said holder including means for receiving and retaining a test strip having a reagent pad thereon comprising an elongated body having a flat portion dimensioned to receive (said) a test strip having a reagent pad thereon, said elongated body being slidably mounted on said cylindrical body for axial movement between a retracted position and an extended position; and

means for controllably moving said elongated body between said retracted and extended positions, said means defining a receiving station located at the same axial position with respect to said central axis as the extended position of said elongated body and said individual means defining a wash station, a de-watering station and a measuring station being located at the same axial position with respect to said central axis as the retracted position of said elongated body, control and drive means for moving said carrier means to transport a reagent pad mounted on a test strip elongated body to said stations and to hold (said) such a test strip sequentially at each of said individual means defining a watering station, a de-watering station and a measuring station while in said retracted position and at said means defining a receiving station while in said extended position for preselected intervals of time,

said means defining a wash station including means for washing a reagent pad mounted on a test strip retained by said elongated body when said carrier is moved to present said elongated body to said (said) means defining a wash station,

said means defining a de-watering station including means for removing superficial water remaining after washing from a reagent pad mounted on a test strip retained by said elongated body when said (pad) elongated body is moved to said means defining a de-watering station,

said means defining a measuring station including means for producing a signal representative of color characteristics of a reagent pad mounted on a test strip retained by said elongated body when said elongated body is moved to said means defining a measuring station, and

means for receiving said signal and for producing a display representative of color characteristics of a reagent pad mounted on a test strip which is carried by said elongated body.

4,717,547

APPARATUS FOR ADJUSTING THE AMINE LOAD UPON A COLUMN FOR SCRUBBING NATURAL GAS

Georges-Michel Barthu, Versailles; Jean-Claude Gherardi, and Bernard Leconte, both of Artix, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Dec. 20, 1985, Ser. No. 811,777

Claims priority, application France, Dec. 21, 1984, 84 19616

Int. Cl.⁴ G01N *21/05*; B01J *10/00*

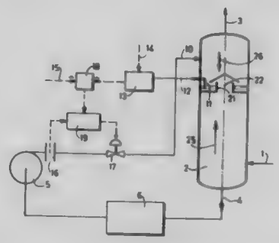
U.S. Cl. 422—62 **4 Claims**

1. Apparatus for scrubbing natural gas of an undesirable component, comprising:

an absorption column having a natural gas inlet and a natural gas outlet spaced therefrom and so disposed that a flow of natural gas may be established through said column, said absorption column further having an amine inlet and an amine outlet spaced therefrom and so disposed that a flow of amine may be established through said column and in contact with said flow of natural gas, whereby said undesired component may be taken up by the amine;

amine transport means for supplying amine to said amine inlet;

tapping means disposed intermediate said amine inlet and said amine outlet for withdrawing from said column a sample of liquid amine bearing the undesired component;



an optical analyzer, including a high pressure, high temperature optical absorption cell in communication with said tapping means, for generating a signal indicative of the content in the amine of the undesired component; and

regulating means for varying a flow rate of amine in said amine transport means and to said amine inlet of said absorption column.

4,717,548

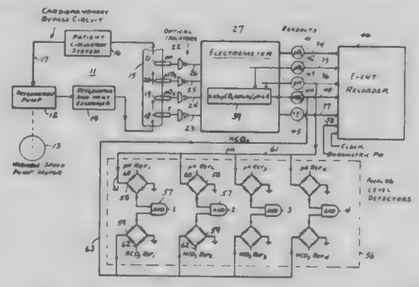
ANALYTICALLY CONTROLLED BLOOD PERFUSION SYSTEM

Albert K. Lee, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 157,380, Jun. 9, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,344

Int. Cl.⁴ G01N *33/00*; A61M *31/00*

U.S. Cl. 422—68 **16 Claims**



1. A patient blood perfusion system comprising a blood flow circuit adapted to be connected with a patient's blood circulatory system, said blood flow circuit including variable-speed pump means, blood oxygenation means and flow conduit means in circuit with said pump means and blood oxygenation means, electrode means mounted in said flow conduit means for generating electrical signals in accordance with conditions in the blood flowing in said flow conduit means, and means to vary the speed of said pump means in accordance with said electrical signals corresponding to predetermined levels of blood conditions sensed by said electrode means, and wherein said electrode means includes respective pH and CO_2 sensing electrodes, and said speed-varying means includes means for computing HCO_3.

4,717,549

OXYGEN CHEMICAL GENERATION RESPIRATION APPARATUS

Jean Malafosse; Gérard Variot, and Michel Pierre, all of Chalon-sur-Saone, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 12, 1984, Ser. No. 599,681

Claims priority, application France, Apr. 12, 1983, 83 05922

Int. Cl.⁴ A62B *7/08*

U.S. Cl. 422—122 **6 Claims**

1. An oxygen chemical generation respiration device, comprising

a housing having at least one closed side wall, a closed bottom wall connected to said at least one side wall, and a top wall having centrally disposed opening therein, said at least one side wall being connected to said bottom wall and top wall to make said housing gas impervious except for the opening in said top wall;

a pair of perforated plates within said housing and extending thereacross generally parallel to said top and bottom walls, so as to define within said housing an upper zone lying between said top wall and an upper of said perforated plates, a bottom zone lying between said bottom wall and a lower of said perforated plates, and a middle zone lying between said upper and lower perforated plates, said middle zone defining a space for receiving an adsorbing regenerating charge in the form of pellets to form a thick bed thereof supported by said perforated plates;

a gas intake tube, formed of heat conductive material, passing through and coaxial with the opening in said top wall and extending downwardly through the upper zone, through the upper perforated plate, through the middle zone and through said bottom perforated plate to which said gas intake tube is connected, said tube thereby defining means for passing gases external of said housing into the bottom zone through said tube whereupon the gases then pass upwardly through said lower perforated plate, through the middle zone capable of containing an adsorbing regenerating charge in the form of pellets, through said upper perforated plate and into the upper zone from whence the gases escape through the opening in the top wall; and

a series of light weight fins, formed of material having high heat conductivity, disposed in the middle zone immediately beneath said upper perforated plate and extending generally perpendicular to said upper perforated plate, said fins being fastened to one another, to said intake tube and to said at least one side wall of said housing, and each fin having a height which is between ¼ and ½ the height of the middle zone.

4,717,550

PROCESS FOR PURIFYING ALUMINA

Donald P. Spitzer, Riverside; David W. Lipp, Stamford; Alan S. Rothenberg, Norwalk, and Hans P. Panzer, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 9, 1986, Ser. No. 916,981

Int. Cl.⁴ C01F *7/06*

U.S. Cl. 423—121 **7 Claims**

1. In a process for separating insoluble red mud from Bayer process streams the improvement which comprises contacting and mixing a Bayer process stream with a tertiary polyamine having a molecular weight of at least about 10,000 in an amount effective to reduce the iron content thereof.

4,717,551

TITANIUM-BASED ALLOY USED AS A GETTERING MATERIAL

Otto Bernauer, Weiastadt, and Klaus Ziegler, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 751,972

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425055

Int. Cl.⁴ B01D *53/34*

U.S. Cl. 423—219 **4 Claims**

1. The method of absorbing a plurality of different gases using a gettering material comprising an alloy of the formula

$$Ti(V_{1-a-b}Fe_aAl_b)_xCr_yMn_z$$

where

x=greater than 1. to 2
y=0 to 0.2
x+y=at most 2
a=0 to 0.4
b=0 to 0.2
a+b=at most 0.5
(1-a-b).x=at least 1
Z=0 to (2-x-y)

by contacting said different gases with the getter material.

4,717,552

GAS PURIFICATION

Peter J. H. Carnell, Stockton-on-Tees, and Patrick J. Denny, Croft-on-Tees, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 25, 1986, Ser. No. 889,464

Claims priority, application United Kingdom, Aug. 14, 1985, 8520353

Int. Cl.⁴ C01B *31/20, 17/16*

U.S. Cl. 423—230 **7 Claims**

1. A process for the purification of natural gas containing water vapour, carbon dioxide and hydrogen sulphide comprising passing said gas at a temperature below 30° C. through a bed of pellets or granules of a solid material comprising zinc oxide and then drying said gas by passage through a molecular sieve.

4,717,553

REMOVAL OF AMINES FROM AIR STREAMS

Amos Turk, Danbury, Conn., assignor to J. Michael Brassey, New York, N.Y., a part interest

Filed Oct. 14, 1986, Ser. No. 918,072

Int. Cl.⁴ B01J *8/00*

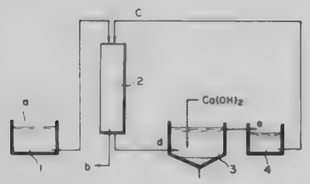
U.S. Cl. 423—245 **4 Claims**

1. In a process for removing amines having normal boiling points under about 100° C. which amines are present in an oxygen-containing gas, from said gas, which comprises passing said gas through activated carbon and releasing the gas into the atmosphere, said gas containing from about 5 ppm to about 5,00 ppm by volume of said amines and having a relative humidity from about 0 to about 80%, the improvement which comprises adding to said gas from about 500 ppm to about 30,000 ppm by volume of carbon dioxide prior to the passage of the gas through the activated carbon.

4,717,554
PROCESS FOR ADSORPTION TREATMENT OF DISSOLVED FLUORINE

Junji Nomura; Hideaki Imai; Yuzuru Ishibashi, and Tokuzo Konishi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,805
Claims priority, application Japan, Feb. 21, 1985, 60-31625; Feb. 22, 1985, 60-32853
Int. Cl.[4] C01F *17/00*; C02F *1/58*
U.S. Cl. 423—263 26 Claims



1. A process for separating dissolved fluorine or fluorine compounds, which comprises:

bringing a solution having a pH ranging from 2 to 5 and containing fluorine or fluorine compounds dissolved thereinto into contact with a hydrated rare earth oxide or insoluble hydrated rate earth salt as an adsorbent.

4,717,555
ANTICAKING AND ANTIDUSTING COMPOSITION FOR AMMONIUM NITRATE

Anthony W. Newman, Fort Worth, and Michael L. Bishop, North Richland Hills, both of Tex., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 29, 1986, Ser. No. 823,520
Int. Cl.[4] C05C *1/02*
U.S. Cl. 423—268 10 Claims

1. An aqueous liquid anticaking and antidusting composition comprising, from 20 to 30 parts of a sodium napthalene sulfonate, from 17 to 28 parts of an ammonium naphthalene sulfonate, the naphthalene of the aforesaid sulfonates being selected from naphthalene and methyl-substituted derivatives thereof, and from 30 to 80 parts of water, said composition being neutralized with acid to a pH of from about 5 to about 7.

4,717,556
METHOD FOR PRODUCING OF β-TRICALCIUM PHOSPHATE

Sukezo Kawamura, Inuyama, and Motohiro Toriyama, Nagoya, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,746
Claims priority, application Japan, Oct. 11, 1985, 60-227545
Int. Cl.[4] C01B *15/16*
U.S. Cl. 423—311 8 Claims

1. A method for the production of microfine particulate β-tricalcium phosphate having a specific surface area within the range of 70 to 100 m^2/ g, which comprises:

mixing calcium hydrogen phosphate powder, calcium carbonate powder, and water thereby preparing an aqueous slurry containing said compounds in a calcium/phosphorus atomic ratio in the range of 1:1.4∼1.6 and having a solids concentration in the range of 5 to 15% by weight;

subsequently subjecting said aqueous slurry to attrition for a period in the range of 5 to 50 hours; and

separating particles of said β-tricalcium phosphate from the resulting product of attrition.

4,717,557
SPHEROIDAL ALKALI METAL POLYPHOSPHATES OF LOW APPARENT DENSITY, AND PROCESS FOR MAKING THEM

Werner Kowalski, Wellerswist; Hans Haas, Swisttal; Theo Dahmen, Brühl, and Markus Erpenbach, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,492
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513744
Int. Cl.[4] C01B *15/16, 25/26*
U.S. Cl. 423—315 3 Claims

1. A process for making hollow spheroidal alkali metal polyphosphates in a spray tower which comprises: forcing an aqueous solution of an alkali metal orthophosphate and an inflating agent selected from the group consisting of urea, a low-valent phosphorus compound, an alkali metal carbonate and an alkali metal bicarbonate under a pressure of 6 to 40 bars into a fluidization zone arranged inside the spray tower and flow-connected to a plurality of single medium spray nozzles, injecting a finely dispersed permanent gas selected from the group consisting of compressed air, carbon dioxide, nitrogen and mixtures thereof into the fluidization zone, maintaining the finely dispersed permanent gas under a pressure at least 20% higher than that selected for the solution, and spraying the solution containing the finely dispersed permanent gas via the plurality of single medium nozzles through a flame zone produced inside the spray tower with the resultant formation of alkali metal polyphosphates having a bulk density of 200 to 320 g/l and an alkali metal polyphosphate content of at least 97.9%.

4,717,558
PHOSPHORUS RECOVERY FROM PHOSPHORUS-CONTAINING POND SLUDGE

Steven M. Beck, Columbia, Tenn., and Edward H. Cook, Jr., Niagara Falls, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,476
Int. Cl.[4] B01D *12/00*
U.S. Cl. 423—322 9 Claims

1. A process for recovering phosphorus from phosphorus-containing pond sludge having a phosphorus concentration of from about 5% to about 70% by weight, said sludge being an emulsion of phosphorus in water, said process comprising the steps of:

(a) mixing the pond sludge with additional water and heating the mixture in a vessel under mild agitation at a temperature of from about 165° F. to about 212° F. for at least about one-half hour to increase said phosphorus concentration in the sludge, said mild agitation being effective to prevent the formation of layers of different composition within the vessel,

(b) allowing the concentrated sludge to settle to the bottom of the vessel,

(c) introducing water at a temperature of from about 130° F. to about 150° F. into the vessel to wash the concentrated sludge.

(d) repeating step (a) to further increase said phosphorus concentration in the sludge from step (c), and

(e) recovering said sludge from step (d).

4,717,559
KAOLIN CALCINER WASTE HEAT AND FEED RECOVERY SYSTEM AND METHOD

Carl S. Cummings, Warthen, and J. Richard Hudson, McIntyre, both of Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Filed Jun. 3, 1986, Ser. No. 870,222
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 7 Claims

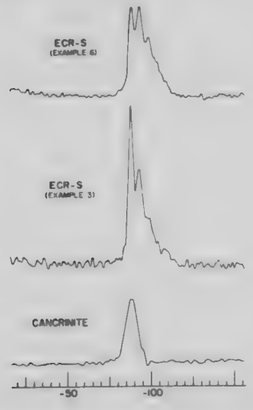
1. In the method for producing a calcined kaolin pigment product, by feeding an aqueous slurry of kaolin to a spray drier which is provided with heated gases from a combustor, feeding the dried kaolin product from said spray drier to a calciner; and recovering the calcined product; the improvement enabling recovery of heat energy and calciner dust from said calciner, comprising:

cycling the hot exhaust gases and entrained calciner dust from said calciner back to said spray drier by joining the said exhaust gases and calciner dust with the said heated combustor gases being provided to said calciner; and collecting said calciner dust from said drier and providing same together with the said dried kaolin product as feed to said calciner.

4,717,560
CRYSTALLINE ZEOLITE COMPOSITION (ECR-5) HAVING A CANCRINITE-LIKE STRUCTURE AND PROCESS FOR ITS PREPARATION

David E. W. Vaughan, Flemington, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 4, 1985, Ser. No. 698,014
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 13 Claims



1. A crystalline zeolite, being isostructural to cancrinite, in which the twelve-ring channel has a sorption of greater than about 1% by weight hexane, said crystalline zeolite having a composition, in terms of mole ratios of oxides in the range:

1.0 to 1.3 Na_2O:Al_2O_3:2.1 to 8.0 SiO_2.

4. A process for preparing a crystalline zeolite having a composition, in terms of mole ratios of oxides, in the range:

1.0 to 1.3 Na_2O:Al_2O_3:2.1 to 8.0 SiO_2

and being isostructural to cancrinite, in which the twelve-ring channel thereof has a sorption of greater than about 1% by weight hexane, comprising the steps of:

(a) preparing a reaction mixture comprising aqueous ammonia, a source of silica-alumina, and sodium hydroxide, said reaction mixture having a composition, in terms of mole ratios of oxides, within the following ranges:
Na_2O:Al_2O_3:2 to 17
SiO_2:Al_2O_3:2 to 25
H_2O:Al_2O_3:30 to 450
(H_2O+NH_3):Al_2O_3:50 to 600
wherein the ammonia is present in the reaction mixture in an amount of 15 to 30 percent, based on total moles of H_2O; and

(b) maintaining the reaction mixture at a temperature between about 70° and 180° C. and for a time of about 1 to 10 days.

4,717,561
PRECIPITATED SILICA CARRIER FOR VITAMINS

Thomas G. Krivak, Akron, Ohio; Stanley A. Heimburger, Pittsburgh, Pa., and James T. Dew, Sulphur, La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 725,444, Apr. 22, 1985, Pat. No. 4,617,294.
This application Aug. 6, 1986, Ser. No. 893,526
Int. Cl.[4] C01B *33/12*
U.S. Cl. 425—335 6 Claims

1. A substantially dust-free, granular amorphous precipitated silica having a density of at least 14 pounds per cubic foot, wherein at least 94 percent of the silica particles are within the range from 0.14 millimeters to 0.84 millimeters, a BET surface area of from about 140 to 160 square meters per gram and an dibutylphthalate oil absorption of from about 160 to 220 milliliters per 100 grams.

4,717,562
PURE SILVER (III) OXIDE

Martin Jansen, Hanover, and Burkhard Standke, Adenstedt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 797,527, Nov. 13, 1985, Pat. No. 4,695,353.
This application Apr. 14, 1987, Ser. No. 37,970
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442719
Int. Cl.[4] C01G *5/00*
U.S. Cl. 423—604 2 Claims

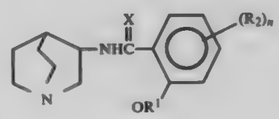
1. Pure Ag_2O_3.

4,717,563
2-ALKOXY-N-(1-AZABICYCLO(2.2.2)OCT-3-YL) BENZAMIDES AND THIOBENZAMIDES IN A METHOD FOR ALLEVIATING EMESIS CAUSED BY NON-PLATINUM ANTICANCER DRUGS

Reevis S. Alphin; William L. Smith; Harry R. Munson, Jr., and Robert F. Boswell, all of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Mar. 5, 1986, Ser. No. 836,518
Int. Cl.[4] A61K *31/44*
U.S. Cl. 424—10 13 Claims

1. A method for treating warm blooded animals for emesis caused by administration of non-platinum anticancer drugs during cancer treatment which comprises internally administering thereto an emesis inhibiting effective amount of a compound selected from the group consisting of 2-alkoxy-N-(1-azabicyclo[2.2.2]oct-3-yl)benzamides and thiobenzamides of the formula:



wherein;

X is oxygen or sulfur,

R_1 is loweralkly containing up to eight carbon atoms,

R_2 is selected from the group consisting of hydrogen, halo, 4,5-benzo, methylsulfonyl, loweralkoxy containing up to eight carbon atoms, or Am wherein Am is selected from amino, methylamino or dimethylamino,

n is 1 or 2,

and the pharmaceutically acceptable acid addition salts thereof.

4,717,564
HIGH TITER VARICELLA-ZOSTER IMMUNE GLOBULIN FOR INTRAVENOUS ADMINISTRATION
Milton B. Dobkin, Lafayette, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Division of Ser. No. 795,811, Nov. 7, 1985, Pat. No. 4,665,159. This application Mar. 9, 1987, Ser. No. 23,734
Int. Cl.[4] A61K *39/25*
U.S. Cl. 424—86 6 Claims

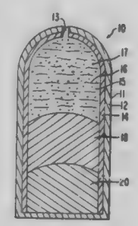
1. An intravenously injectable immune globulin having a high titer of antibody to varicella-zoster virus in the range of from about 1:750,000 to about 1:1,500,000, as determined by an enzyme-linked immunosorbent assay, produced by
(a) randomly screening plasma from donors who have not been vaccinated with a varicella-zoster virus vaccine for a titer of antibody to varicella-zoster virus of at least about 1:150,000, as determined by an enzyme-linked immunosorbent assay,
(b) pooling the donor plasma selected according to step (a) above, thereby obtaining a six-fold increase in titer of antibody to varicella zoster virus in the plasma pool when compared with normal plasma pools,
(c) preparing a immune globulin from the plasma pooled according to step (b) above, and
(d) rendering the immune globulin obtained according to step (c) above intravenously injectable.

4,717,565
PROCESS FOR THE PREPARATION OF MEDICAMENT ADSORBATES
John Denick, Jr., Newton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Mar. 27, 1986, Ser. No. 844,901
Int. Cl.[4] A61K *9/18*
U.S. Cl. 424—155 18 Claims

1. A process for preparing a medicament adsorbate which comprises:
admixing a complex magnesium aluminum silicate with a medicament drug and a sufficient amount of solvent to dissolve the medicament drug and hydrate the complex magnesium aluminum silicate to form a swollen mass containing said drug in an adsorbed condition, said solvent having a water content of at least about 50% by weight of the solvent, drying the swollen mass to a final solvent content up to about 20% by weight of the medicament adsorbate, and recovering the medicament adsorbate.

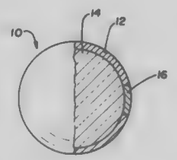
4,717,566
DOSAGE SYSTEM AND METHOD OF USING SAME
James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 780,863, Sep. 27, 1985, Pat. No. 4,612,186, which is a continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Jun. 23, 1986, Ser. No. 877,586
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.[4] A61K *9/00, 9/20*; A61M *31/00*
U.S. Cl. 424—438 31 Claims

1. A method for producing an antiparasitic effect in an animal suffering therewith, which method comprises:
(a) admitting into the animal a dosage form comprising:
(1) a wall comprising cellulose acetate butyrate and cellulose acetate, which wall defines an internal space;
(2) a composition comprising a dosage unit amount of avermectin and at least one wax for forming a dispensable formulation in the space;
(3) a composition comprising sodium carboxymethylcellulose and sodium chloride in the space;
(4) a density member in the space, which density member maintains the dosage form in the animal environment over a prolonged period of time; and,
(5) at least one exit means in the dosage form for delivering the avermectin; and,



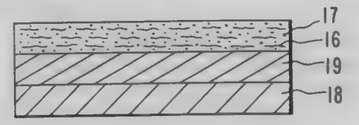
(b) administering the avermectin by composition (3) expanding in the space and exerting pressure against (2), whereby the avermectin is delivered through (5) to the animal for producing the antiparasitic effect.

4,717,567
RUMEN-STABLE PELLETS
Stephen H. Wu, and Edward G. Miller, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 25, 1985, Ser. No. 802,102
Int. Cl.[4] A61K *9/22, 9/24*
U.S. Cl. 424—462 9 Claims



1. A capsule suitable for oral administration to ruminant animals having
(a) a core comprising a substance beneficial to ruminant animals postruminally, and
(b) a shell enclosing said core, said shell comprising
(1) a first portion of a physiologically acceptable film-forming material having at least one area of discontinuity, said first portion being resistant to mechanical damage by conventional handling and processing techniques and stable in the environment of the rumen for a period of at least 30 hours, and
(2) a second portion occupying the discontinuity in said first portion, said second portion comprising a substance different from said first portion which is also stable in the environment of the rumen for a period of at least 30 hours, but which loses its integrity postruminally within about 6 hours.

4,717,568
LAMINAR ARRANGEMENT FOR INCREASING DELIVERY OF BENEFICIAL AGENT FROM DISPENSER
James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 764,143, Aug. 9, 1985, Pat. No. 4,624,945, which is a continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Aug. 11, 1986, Ser. No. 895,610
Int. Cl.[4] A61K *9/20, 9/24*
U.S. Cl. 424—469 2 Claims



1. A laminated arrangement useful for manufacturing a delivery device for delivering a beneficial agent formulation to an animal, wherein the laminated arrangement comprises: first lamina means for absorbing heat from the animal for forming a dispensable formulation, said first lamina means comprising a beneficial agent formulation that produces a beneficial effect when dispensed to an animal, which first lamina means is in laminar arrangement with a second lamina means, said second lamina having means for lessening unwanted migration of beneficial agent from the first lamina means, said second lamina means exhibiting a lower passage to the beneficial agent then the first lamina means there by lessening migration from the first lamina means into the second lamina means, and wherein when the laminated arrangement is in a delivery device in operation, which delivery device comprises means for producing an expandable force for assisting in operating the delivery device, the first lamina and the second lamina operate as a cooperating means for increasing the delivery of the beneficial agent from the delivery device.

4,717,569
UNIT DOSAGE FORM OF SPARINGLY SOLUBLE MEDICAMENTS
Paul J. Harrison; John R. Lasgridge, and Christopher J. Potter, all of Alnwick, England, assignors to Sterling Drug Inc., New York, N.Y.
Filed May 24, 1985, Ser. No. 738,104
Claims priority, application United Kingdom, Jun. 4, 1984, 8414221
Int. Cl.[4] A61K *9/14, 31/57, 31/565*
U.S. Cl. 424—494 7 Claims

1. A pharmaceutical composition for oral administration comprising a plurality of nonpareil beads having, as a single coating bound thereto, by a binder soluble in water and aqueous media at all pH values normally found in the gastrointestinal tract, a medicament selected from the group consisting of 17α-pregna-2,4-diene-20-yno[2,3-d]isoxazol-17-ol, 17β-hydroxy-17α-methylandrostano[3,2-c]pyrazole, 17β-hydroxy-17α-ethynyl-4-androsteno[3,2-c]-2'-(para-fluorophenyl)-pyrazole, 4α,5α-epoxy-17β-hydroxy-4,17-dimethyl-3-oxoandrostane-2α-carbonitrile and 4α,5α-epoxy-17β-hydroxy-3-oxoandrostane-2α-carbonitrile.

4,717,570
PROCESS AND DOUGH COMPOSITION FOR PRODUCING MULTI-TEXTURED COOKIES
Robert A. Polizzano, Teaneck, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.
Filed Oct. 10, 1985, Ser. No. 786,098
Int. Cl.[4] A21D *8/00, 13/00*
U.S. Cl. 426—94 13 Claims

1. A process for preparing a multi-textured cookie which process comprises:
mixing flour, a humectant and fat or shortening to produce a first cookie dough;
mixing flour, a sugar, fat or shortening, casein and an edible water-soluble phosphate to produce a second cookie dough in which the casein and the water-soluble phosphate are distributed throughout the second cookie dough, the casein being added to the second cookie dough in an amount of from about 1.1 to about 8.7 percent by weight of the flour in the second cookie dough, the water-soluble phosphate being added to the second cookie dough in an amount of from about 0.12 to about 1 percent by weight of the flour in the second cookie dough, and the weight ratio of the casein to the water-soluble phosphate in the second cookie dough being in the range of from about 4:1 to about 17:1;
enrobing a portion of the first cookie dough within a portion of the second cookie dough to produce a composite dough piece; and
baking the composite dough piece to form a multi-textured cookie with a center having a soft and moist texture and a firm outer layer.

4,717,571
METHOD FOR MANUFACTURING A DESSERT HAVING AN ORNAMENTAL PATTERN
Shigeo Okonogi; Hiroya Yuguchi, both of Tokyo; Keizi Morimoto, Matsudo, and Minoru Ohta, Ohmiya, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan
Filed Jan. 16, 1986, Ser. No. 819,407
Claims priority, application Japan, Jan. 25, 1985, 60-10783
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—104 3 Claims

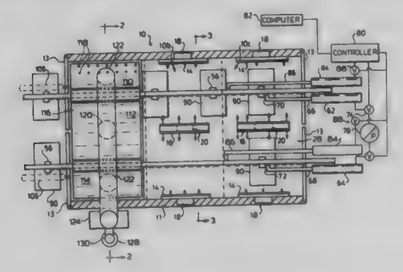
1. A method of manufacturing a gelable dessert having an ornamental pattern, wherein a liquid base material and a liquid sauce material, each containing a gelling agent, are mixed to form the ornamental pattern, and then the mixed base and sauce material are cooled to form a gel, which process comprises:
(a) separately preparing one or more sauce materials and a base material, each of said sauce and base materials containing at least two gelling agents selected from the group consisting of gelatin, agar, furcellaran, carrageenan, low methoxyl pectin and a mixture of locust bean gum and xanthan gum;
(b) cooling each of said sauce material and base material to form a gel;
(c) agitating each gel to form a pasty sauce material and a pasty base material;
(d) filling a container with said pasty base material and then extruding one or more pasty sauce materials thereon to form an ornamental dessert; and
(e) cooling said ornamental dessert to gel the same.

4,717,572

MULTI-CONVEYOR PROCESSING SYSTEM

Guy E. Buller-Colthurst, Erin, Canada, assignor to Knud Simonsen Industries Ltd., Rexdale, Calif.X

Continuation-in-part of Ser. No. 618,424, Jun. 7, 1984, Pat. No. 4,610,886. This application Jun. 13, 1986, Ser. No. 874,127
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[4] G01N *33/02*; A23B *4/04*; B65G *23/38*
U.S. Cl. 426—233 15 Claims



11. A method of processing first and second meat products under identical process conditions, said first and second meat products being suitable for processing under the same conditions, one of said first and second products being processed at different timings than the other of said first and second products, and comprising:

assembling batches of said first product and batches of said second product on separate batch support means;

introducing a batch of said first product into a processing chamber defining at least two sequential zones, along a first conveyor path passing through said zones;

introducing a batch of said second product into the same said processing chamber along a second conveyor path parallel to and spaced from said first conveyor path, and passing the same through each of said zones of said chamber;

in a first one of said zones continuously flowing streams of water at an elevated temperature downwardly through said first one of said zones thereby establishing a first processing condition in said first one of said zones;

establishing a second processing condition in a second one of said zones;

moving said batch of said first product in steps through said zones of said chamber and stopping same for processing at predetermined time intervals, whereby to procure first predetermined dwell times of said batch of said first product in each of said zones, and,

moving said batch of second product in steps through each of said zones and stopping same for processing under conditions identical to those processing said batch of said first product at a predetermined second series of timed intervals whereby to procure second dwell times in each of said zones different from said first dwell times of said batch of said first product.

4,717,573

PROCESS FOR THE MANUFACTURE OF LOLLIPOPS, A DEVICE TO BE USED FOR THIS PURPOSE AND THE PRODUCT OBTAINED FROM THIS PROCESS

Coenraedus H. Aquarius, Maaseik, Belgium, assignor to Enrique Bernat Fontlladosa, Barcelona, Spain

Filed May 22, 1985, Ser. No. 736,694
Claims priority, application Belgium, Mar. 18, 1985, 2/60646
Int. Cl.[4] A23G *3/12*
U.S. Cl. 426—274 2 Claims

1. In a process of forming lollipops from a continuously supplied stream of sugar paste, said process characterized by the steps of:

separating the end portion of said stream into two substantially equal portions and depositing said portions along an axis on opposite sides of a central molding element;

molding each said portion into two substantially identical hemispherical shells using a guide means and two molding dies wherein said molding dies are aligned along said axis and move toward said central molding element thereby compressing said portions between said dies and said central molding element and wherein said guide means substantially precludes any portion of said paste from escaping during the molding process;

affixing a handle to one of said hemispherical shells;

separating said molding dies and shells from said central molding element and thereafter removing said central molding element; and

introducing a sweet substance between said shells and restraining said sweet substance along said axis by the use of a restraining means, and forming a substantially spherical lollipop by bringing together and affixing said shells by moving said dies together along said axis, thereby enclosing said sweet substance within the hollow portion formed by said shells.

4,717,574

PROCESS FOR PRODUCING NATURALLY PRESERVED RAW MEAT PRODUCTS

Emil Liesenfeld, Bopparder Str. 65, and Edgar Liesenfeld, Lämmergasse 6, both of D-5404 Bad Salzig, Fed. Rep. of Germany

PCT No. PCT/DE83/00168, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/01419, PCT Pub. Date Apr. 11, 1985
PCT Filed Sep. 30, 1983, Ser. No. 740,908
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—315 6 Claims

1. A process for preserving raw meat products, comprising treating said meat products with salt,

placing said meat products atop one another in layers in a compressive vessel, and

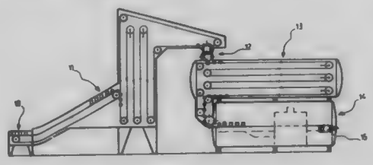
kneading said meat products by subjecting them to periodic surges of increasing mechanical pressure to remove juices from said meat products, each surge being followed by a decrease in pressure to return removed juices to said meat products, whereby juices within said meat products pass in and out of said meat products and said salt is distributed uniformly within said meat products.

4,717,575

METHOD FOR CANNING FOOD PRODUCT

Michel H. R. Larroche, 12, Allée Lamartine, 47300 Villeneuve-sur-Lot, France

Filed Mar. 21, 1985, Ser. No. 714,270
Claims priority, application France, Mar. 22, 1984, 84 40437; Mar. 14, 1985, 85 03782
Int. Cl.[4] B65B *31/02, 55/14*; A23L *3/02*
U.S. Cl. 426—402 6 Claims



1. A method of obtaining a canned food product, packed under high vacuum in a hermetically closed rigid container, said product being capable of being added with water without impairing or damaging the organoleptic qualities thereof, comprising the steps of:

filling food product into a rigid container;

then adding to said container to the brim a covering liquid so as to fully substitue said liquid for air or uncondensible gas present in said container;

then placing the whole unit thus provided within a substantially airless steam atmosphere;

removing from said container at least a part of said covering liquid while in said steam atmosphere, so as to substitute steam therefore;

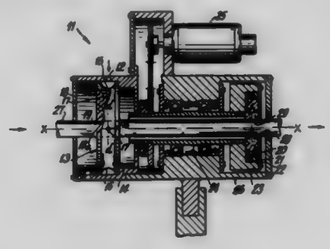
and then hermetically closing said container, before or after having subjected the whole unit to a heat treatment while subjecting the same simultaneously to variation in pressure so as to keep steam evolving from and above the container, thereby achieving within the container such a vacuum level to prevent any uncondensible gases and oxygen from being present therein and to provide for the preservation of said food product without any loss of either taste or color thereof.

4,717,576

TAR-DEPLETED, CONCENTRATED, LIQUID SMOKE COMPOSITIONS AND METHOD FOR PRODUCING

Myron D. Nicholson, Lockport, and John H. Beckman, Downers Grove, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 744,682, Jun. 14, 1985, Pat. No. 4,657,765, which is a division of Ser. No. 465,924, Feb. 14, 1983, Pat. No. 4,540,613. This application Jan. 30, 1987, Ser. No. 9,260
Int. Cl.[4] A23L *1/232*
U.S. Cl. 426—533 37 Claims



1. A method for making a tar-depleted, concentrated, liquid smoke which comprises (1) contacting an aqueous, tar-containing, substantially unneutralized liquid smoke solution and a liquid solvent at a volume ratio of between about 1:1 and about 65:1, respectively, under conditions sufficient to form a tar-enriched, liquid solvent fraction and a substantially unneutralized aqueous, tar-depleted, liquid smoke fraction, the tar-depleted, liquid smoke fraction having an absorptive power of at least about 0.15 at a wave length of 340 nm, and having a light transmittance of at least about 50 %; the liquid solvent being nonreactive with the liquid smoke solution or reactive with the liquid smoke solution to form a derivative liquid solvent, the liquid solvent being immiscible in the liquid smoke solution, and the liquid solvent having a hydrogen bonding solubility parameter in the environment of the liquid smoke solution of at least about 2.7; (2) separating the tar-depleted, liquid smoke fraction from the tar-enriched liquid solvent fraction; and (3) concentrating the tar-depleted, liquid smoke fraction at a temperature of less than about 70° C. to a concentration ratio of between about 2:1 and about 5:1 to form an unneutralized tar-depleted, concentrated, liquid smoke composition.

4,717,577

PRODUCING MULTI-TEXTURED COOKIES CONTAINING GUM

Patricia Constance, Wyckoff, and Robert A. Polizzano, Teaneck, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 10, 1985, Ser. No. 786,089
Int. Cl.[4] A21D *8/00, 13/00*
U.S. Cl. 426—549 8 Claims

1. A process for preparing a multitextured cookie, which process comprises:

mixing flour, a humectant and fat or shortening to produce a first cookie dough;

enrobing a hydrocolloid gum in a shortening or fat;

mixing flour, a sugar, fat or shortening and said enrobed hydrocolloid gum to produce a second cookie dough;

enrobing a portion of the first cookie dough within a portion of the second cookie dough to produce a composite dough piece; and

baking the composite dough piece to form a multi-textured cookie with a center having a soft and moist texture and a firm outer layer, said hydrocolloid gum being used in an amount of from about 0.1 to about 3 percent by weight of the flour in the second cookie dough, the hydrocolloid functioning to aid in maintaining a firm texture during storage.

4,717,578

PROCESS FOR PRODUCING DEHYDRATED PRODUCT RECONSTITUTABLE WITH AQUEOUS LIQUIDS

Florian Biller, Untergruppenbach-Unterheinriet, and Horst Klukowski, Heilbronn-Böckingen, both of Fed. Rep. of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 184,578, Sep. 8, 1980, abandoned. This application Apr. 16, 1984, Ser. No. 600,589
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 2938596
Int. Cl.[4] A23L *1/39*
U.S. Cl. 426—589 3 Claims

1. A process for producing a reconstituted dehydrated product which comprises

(a) admixing tomato solids and a starch sponge consisting of a starch matrix having pores of approximately the same diameter as the walls of the matrix and which will retain a pulpy texture for at least 30 seconds of cooking time, wherein the grain size of the starch sponge component is within the range of 0.125 mm. to 6 mm., and wherein the starch sponge amounts to from 1% to 50% by weight of the total product; and

(b) reconstituting said dehydrated product by adding aqueous liquid, and bringing the dehydrated product to boiling,

thereby forming a pulpy textured tomato sauce, soup, juice or compote.

4,717,579

FLOWABLE FROZEN TEA MIX CONCENTRATE WHICH CONTAINS HIGH LEVELS OF SUGAR

Michael J. Vietti, Cincinnati; Phillip F. Pflaumer, Hamilton, and William J. Brabbs, Cincinnati, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 7, 1986, Ser. No. 860,606
Int. Cl.[4] A23F *3/16*
U.S. Cl. 426—597 8 Claims

1. A frozen tea mix concentrate, which comprises:

a. from about 0.5 to about 2% by weight tea solids;

b. from about 40 to about 70% by weight of a sugar component, which comprises, by weight of said sugar component:

1. from about 25 to about 45% monosaccharides selected

from the group consisting of dextrose, fructose and mixtures thereof;
2. from about 20 to about 55% sucrose;
3. from about 10 to about 25% glucose-based di- and tri-saccharides selected from the group consisting of maltose, isomaltose, maltotriose, isomaltotriose, and mixtures thereof;
4. from 0 to about 20% other saccharides;
c. the balance water.

4,717,580

METHOD OF ENHANCING THE BITTERNESS OF BEER

Ian S. Forrest; James C. Seaton, both of Midlothian, and Michael Moir, Edinburgh, all of Scotland, assignors to Scottish & Newcastle Breweries plc, Edinburgh, Scotland

Filed Apr. 11, 1985, Ser. No. 721,927
Claims priority, application United Kingdom, Apr. 12, 1984, 8409498; Feb. 2, 1985, 8502683; Mar. 16, 1985, 8506875
Int. Cl.⁴ C12C *3/00*
U.S. Cl. 426—600 **7 Claims**

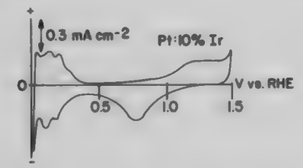
1. A method of providing bitter flavor for beer, comprising the steps of:
providing a carbon dioxide extract of hops containing α-acids and β-acids;
isomerizing the α-acids to provide a fluid mixture containing iso-α-acids and β-acids;
heating the fluid mixture containing iso-α-acids and β-acids to a temperature of between 50° C. and boiling point, so that said fluid mixture separates into a first fluid layer containing the iso-α-acids and a second fluid layer containing the β-acids;
withdrawing the fluid comprising one of said layers from the other of said layers to separate said layers;
oxidizing the β-acids contained in the separated second fluid layer so as to produce a mixture containing hulupone; and
introducing the hulupone into the beer during its manufacture.

4,717,581

IRIDIUM OXIDE COATED ELECTRODES FOR NEURAL STIMULATION

Lois S. Robblee, Norwood, Mass., assignor to EIC Laboratories, Inc., Norwood, Mass.

Division of Ser. No. 829,693, Feb. 6, 1986. This application Nov. 13, 1986, Ser. No. 929,778
Int. Cl.⁴ A61N *1/05*
U.S. Cl. 427—2 **6 Claims**



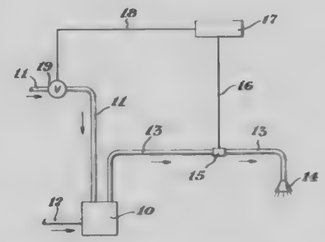
1. The method of making a neural stimulator having an iridium oxide coated electrode which method includes the steps of,
forming an acid/alcohol solution containing at least one dissolved iridium complex by heating Ir(III) trichloride in hydrochloric acid until more than half the solution is evaporated to convert the Ir(III) trichloride to a hexachloroiridate ion, $[IrCl_6]^{2-}$,
adding alcohol to the solution following evaportion to restore the solution to its original volume,
aging the restored acid/alcohol solution to slowly convert the hexachloroiridate ion to a chloroiridate-alcohol complex of Ir(IV),
soaking said metallic electrode in the aged acid/alcohol solution for a prolonged period of time so that the electrode metallic surface becomes completely covered with the iridium complexes in the aged acid/alcohol,
removing the covered metallic electrode from the aged acid/alcohol solution and drying the latter in air at room temperature,
and annealing the dried coated electrode at a temperature sufficiently high for sufficient time to convert the chloroiridate-alcohol complexes deposited on the electrode surface to an oxide of iridium.

4,717,582

METHOD AND APPARATUS FOR CONTROLLING THE DENSITY OF A FOAM

Femi O. Kotoye, and John M. Kernstock, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1986, Ser. No. 866,175
Int. Cl.⁴ B05D *5/00*; B05C *11/10*
U.S. Cl. 427—8 **22 Claims**



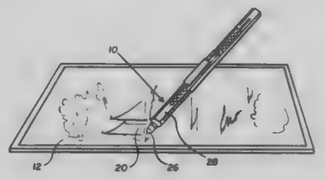
1. A method for controlling the density to a predetermined level of a foam during the preparation thereof wherein the electrical conductivity of the foam varies with the density thereof, the steps of the method comprising:
(a) measuring the electrical conductivity of the foam during its preparation; and
(b) adjusting the density of the foam in response to the measured electrical conductivity to produce an electrical conductivity corresponding to the desired density, thereby providing a foam with the desired predetermined density.

4,717,583

MATERIAL AND PROCESS FOR RETOUCHING OFFSET PLATES

Gregory L. McKissick, 543 N. 44 West Ave., Tulsa, Okla. 74127, and James L. Orcutt, 5410 Deaton Pl., Madison, Wis. 73711

Division of Ser. No. 772,614, Sep. 4, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 21,177
Int. Cl.⁴ B41M *5/26*; A46B *11/08*; B32B *35/00*; G03C *5/00*
U.S. Cl. 427—11 **3 Claims**



1. A method for correcting an offset printing plate, comprising the steps of:

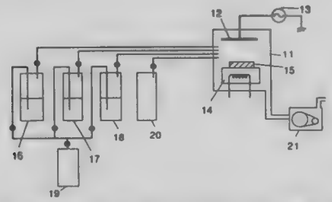
forming a solid polyester resin applicator with a selected fiber loading, and
rubbing said applicator on said printing plate to transfer said resin and fibers to said plate in correspondence with a correction to be made.

4,717,584

METHOD OF MANUFACTURING A MAGNETIC THIN FILM

Masaki Aoki, Minou; Hideo Torii, Higashiosaka; Hideyuki Okinaka, Toyonaka, and Masayuki Sakai, Minamikawachi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 5, 1986, Ser. No. 826,386
Claims priority, application Japan, Feb. 7, 1985, 60-22269; Apr. 19, 1985, 60-83775; Jun. 12, 1985, 60-127406; Jul. 26, 1985, 60-165123
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **11 Claims**



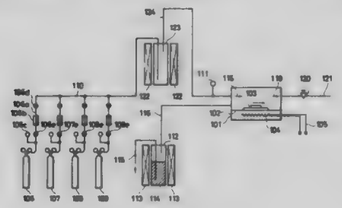
1. A method of manufacturing a magnetic thin film, wherein a gas of a metal organic compound containing elements constituting a magnetic material and oxygen as a reaction gas is decomposed in high frequency plasmas, magnetron discharge plasmas or electron cyclotron plasmas under a pressure from 10 to 10^{-4} Torr, and a thin film of magnetic oxide is deposited on a substrate at a temperature of up to 350° C. or with no heating of the substrate.

4,717,585

PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai, Tokyo; Shunri Oda, Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Toyko, Japan

Filed Feb. 6, 1986, Ser. No. 826,898
Claims priority, application Japan, Feb. 9, 1985, 60-023913; Feb. 12, 1985, 60-025897; Feb. 18, 1985, 60-029808; Feb. 19, 1985, 60-031052; Feb. 20, 1985, 60-031870; Feb. 21, 1985, 60-031583
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—39 **21 Claims**



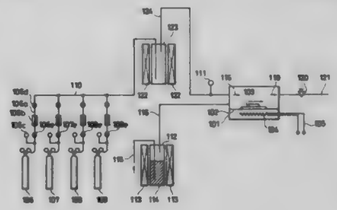
1. A process for forming a deposited film, which comprises introducing into a film forming space housing a substrate therein an active species (A) formed by decomposition of a compound containing carbon and a halogen and an active species (B) formed by decomposition of a chemical substance for film formation which is reactive with said active species (A) separately from each other, and then allowing both the species to react with each other thereby to form a deposited film on the substrate.

4,717,586

PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai, Tokyo; Shunri Oda, Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 829,072
Claims priority, application Japan, Feb. 18, 1985, 60-29807
Int. Cl.⁴ H01L *21/469*
U.S. Cl. 427—39 **16 Claims**



1. A process for forming a deposited film comprising
separately introducing an activated species (A) and an activated species (B) into a film forming space for forming a deposited film on a substrate, said activated species (A) being formed by decomposing a compound containing silicon and a halogen; and said activated species (B) being formed by decomposing a germanium containing compound for film formation which is chemically mutually reactive with said activated species (A); and
permitting both activated species (A) and activated species (B) to react chemically with each other thereby to form a deposited film on the substrate.

4,717,587

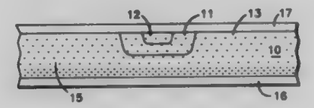
METHOD OF PRODUCING METALLIC STRUCTURES ON NON-CONDUCTORS

Harald Sahr, Tübingen; Christian Oehr, Reutlen, and Ernst Feurer, Tübingen, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 840,648
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510982
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—39 **13 Claims**

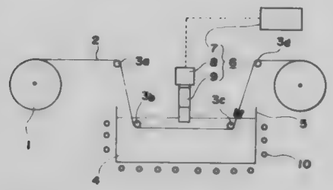
1. A method of producing electrically-conductive structures on non-conductors, comprising the steps of providing a plasma reactor having a glow discharge zone; placing said non-conductors on an electrode of said plasma reactor; evacuating said plasma reactor to a given pressure; and then feeding into said glow discharge zone metallo-organic compositions together with a carrier inert gas so that a metallic film is deposited on said non-conductors by disintegration of metallo-organic compositions in said glow discharge zone, said carrier inert gas being argon or helium.

4,717,588
METAL REDISTRIBUTION BY RAPID THERMAL PROCESSING
Syd R. Wilson, Phoenix; Wayne M. Paulson, Paradise Valley, and Charles J. Varker, Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Dec. 23, 1985, Ser. No. 812,557
Int. Cl.[4] B05D 3/14
U.S. Cl. 427—51 10 Claims



1. A method for fabricating a semiconductor device, comprising:
forming a transistor on the front side of a silicon substrate;
depositing a layer of a metal dopant on the back side of the silicon substrate;
capping the front and the back of the substrate with a layer of deposited oxide;
diffusing the metal dopant into the transistor with a rapid heating apparatus; and
rapidly cooling the device in a uniform manner.

4,717,589
METHOD FOR MANUFACTURING A SILICON CARBIDE FIBER REINFORCED GLASS COMPOSITE
Toshikatsu Ishikawa, Tokyo; Haruo Teranishi, Machida; Hiroshi Ichikawa, Yokohama; Yoshikazu Imai, and Masanobu Umezawa, both of Tokyo, all of Japan, assignors to Nippon Carbon Co. Ltd., Tokyo, Japan
Filed Oct. 9, 1986, Ser. No. 917,011
Claims priority, application Japan, Oct. 14, 1985, 60-227020; Oct. 14, 1985, 60-227021
Int. Cl.[4] B05D 3/12, 1/18; C03B 11/00
U.S. Cl. 427—57 3 Claims

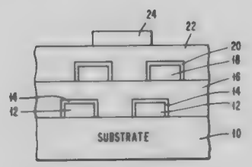


1. A method for manufacturing a silicon carbide fiber reinforced glass composite, which comprises dipping silicon carbide fibers in molten glass given wave vibration of 10 to 30 KHz by a supersonic vibrator provided with a cooling means to unravel the fibers and have the molten glass permented therebetween thereby obtaining a silicon carbide fiber/glass perform, molding the thus obtained preform into a predetermined form and then subjecting the molded perform to thermal molding thereby to manufacture the silicon carbide fiber reinforced glass composite in the form of a molding.

4,717,590
PROCESS FOR BINDING PIGMENT PARTICLES TO PHOSPHOR PARTICLES
Robert W. Wolfe, Wysox, and Harry O. Schulze, Wyalusing, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Nov. 28, 1986, Ser. No. 936,051
Int. Cl.[4] B05D 5/06
U.S. Cl. 427—68 5 Claims

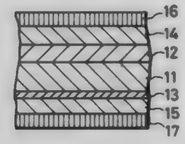
1. A process for bonding pigment particles to phosphor particles, said process comprising:
(a) forming a relatively uniform blend of a phosphor, one or more pigments, colloidal silicon dioxide, and water, with the amount of water in said blend being no greater than about 10% by weight of said blend; and
(b) heating said blend at a temperature of at least about 150° C. to produce a pigmented phosphor having an overcoating of silicon dioxide.

4,717,591
PREVENTION OF MECHANICAL AND ELECTRONIC FAILURES IN HEAT-TREATED STRUCTURES
Raul E. Acosta, White Plains; Wilma J. Horkans, Ossining, both of N.Y.; Ruby Mukherjee, San Jose, Calif., and Judith D. Olsen, Goldens Bridge, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 509,742, Jun. 30, 1983, abandoned.
This application Mar. 6, 1986, Ser. No. 836,781
Int. Cl.[4] C23C 18/36; H05K 3/46
U.S. Cl. 427—96 11 Claims



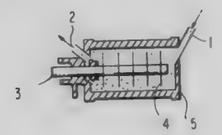
1. A method for making a multi-level electrical structure, including the steps of:
providing a substrate,
forming on said substrate a first level of electrically conductive material for carrying electrical currents, said level including copper-containing metal lines to which electrical contact is made,
forming a continuous, substantially pinhole-free protective coating on said copper-containing metal lines, said continuous coating preventing chemical attack of said metal lines during thermal cycling to elevated temperatures, said coating consisting of Co and P, said P being present in said coating in an amount of about 2% to about 15% by weight,
forming a layer 16 of an insulating material contacting said metal lines and having acceptable dielectric properties, and
heating said multilayer structure to an elevated temperature, wherein said continuous coating protects said metal lines durng said heating step.

4,717,592
VERTICAL MAGNETIZATION TYPE RECORDING MEDIUM AND MANUFACTURING METHOD THEREFOR
Makoto Nagao; Fumio Yamanaka; Kunihiko Sano, and Akira Nahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 17, 1985, Ser. No. 809,828
Claims priority, application Japan, Dec. 24, 1984, 59-270649; Dec. 26, 1984, 59-273365; Dec. 26, 1984, 59-273366
Int. Cl.[4] B05D 5/00, 5/12
U.S. Cl. 427—128 11 Claims



1. The method of manufacturing a vertical magnetization type recording medium in which a soft magnetic film layer essentially containing Co-Cr is formed by vacuum deposition or sputtering on each side of a film-shaped support which is run along cylindrical cans, the improvement comprising the steps of: forming each said soft magnetic film layer by forming a first soft magnetic film layer on each side of said support with said cylindrical cans held at a temperature of 30 °C or lower by vacuum deposition or sputtering, and a second soft magnetic film layer on said first soft magnetic film layer is formed with said cylindrical cans held at a temperature of 60 C or higher by vacuum deposition or sputtering, with the thickness of said first soft magnetic film layer on one side of said support being different from that of said first soft magnetic film layer on the other side of said support.

4,717,593
HEAT-SENSITIVE RECORDING SHEET
Akira Igarashi, and Sukenori Nakamura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 21, 1982, Ser. No. 435,862
Claims priority, application Japan, Oct. 21, 1981, 56-168140
Int. Cl.[4] B41M 3/12
U.S. Cl. 427—150 6 Claims

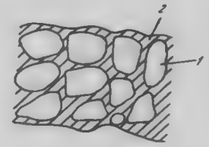


1. A process for preparing a heat-sensitive recording sheet, comprising the steps of:
providing a support base sheet;
preparing a first dispersion of an aqueous solution of water-soluble high polymers containing an electron donating colorless dye;
preparing a second dispersion of an aqueous solution of water-soluble high polymers containing an electron accepting compound, the second dispersion being prepared by dispersing the electron accepting compound in the aqueous solution by means of a horizontal sand mill;
applying the mixture of the first and second dispersion to the support base sheet; and
drying in order to form the heat-sensitive recording sheet.

4,717,594
HIGH STRENGTH PARTICULATES
John W. Graham, Rte. 5, Box 289 (210 Co. Rd. 147), Alvin, Tex. 77511, and A. Richard Sinclair, 2903 Virginia, Houston, Tex. 77098
Continuation of Ser. No. 626,754, Jul. 2, 1984, Pat. No. 4,585,064. This application Aug. 26, 1985, Ser. No. 769,304
Int. Cl.[4] B05D 3/02, 7/00; E21B 43/267
U.S. Cl. 427—214 18 Claims

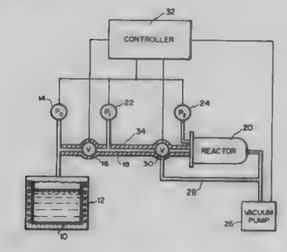
1. A process for the preparation of high strength self-consolidating dual resin coated particles comprising:
providing a particulate substrate;
coating said particulate substrate with a curable inner resin coating;
substantially curing said inner coating resin to produce a substantially cured resin coated particle having increased crush resistance;
coating said substantially cured resin coating particle with an outer coating of fusible curable resin;
hardening said outer resin coating so as to form a free flowing high strength self-consolidating dual resin coated particle.

4,717,595
MOLDED CARBONACEOUS MATERIAL
Koichi Watanabe; Michinobu Maesaka, and Michihiro Murata, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Continuation of Ser. No. 770,067, Aug. 28, 1985, abandoned.
This application Nov. 17, 1986, Ser. No. 931,911
Claims priority, application Japan, Aug. 31, 1984, 59-183202
Int. Cl.[4] B05D 7/00
U.S. Cl. 427—221 13 Claims



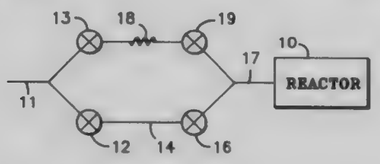
1. A process for producing a molded carbonaceous material, comprising the steps of
mixing a carbonaceous powder dispersion with natural or synthetic latex dispersion selected from the group consisting of natrual rubber latex, styrene-butadiene rubber, acrylonitrilebutadiene rubber, chloroprene rubber, polyarylate, polyvinyl acetate, polyvinyl chloride emulsion, natural rubber dispersion, regenerated rubber dispersion, stereo-regular rubber lattice and solution or bulk poiymerized polymer latex,
stirring the dispersion mixture to attach the solid content of said latex as binder to the surface of the carbonaceous powder particles,
removing the solvent portion of the stirred mixture system so as to obtain a mixture in an aggregated state, and
molding the mixture in an aggregated state such that the particles of said carbonaceous powder are bound together by means of said binder with the surface of said carbonaceous powder being not wholly covered with said binder.

4,717,596
METHOD FOR VACUUM VAPOR DEPOSITION WITH IMPROVED MASS FLOW CONTROL
Steven G. Barbee, Dover Plains; Gregory P. Devine, Poughquag; William J. Patrick, Newburgh, and Gerard Seeley, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 792,729, Oct. 30, 1985, Pat. No. 4,640,221.
This application Oct. 3, 1986, Ser. No. 915,174
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—248.1 7 Claims



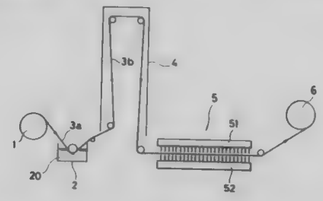
1. A method of forming a layer of material upon the surface of an object, said material being deposited from a gas, said method comprising:
heating a reservoir to a temperature sufficient to vaporize a material from which said gas is formed;
creating a vacuum in a reactor containing said object to cause said gas to flow from said reservoir through an outlet from said reservoir and through said first valve and through a connecting means to said reactor; and
maintaining the reservoir outlet pressure at said outlet from said reservoir at a substantially constant value by measuring said outlet pressure and adjusting said first valve to maintain said outlet pressure substantially constant and maintaining the reactor inlet pressure at a substantially constant value, thereby providing a constant mass flow rate of said gas into said reactor.

4,717,597
METHOD FOR PROVIDING IMPURITIES INTO A CARRIER GAS LINE
Eric S. Johnson, Scottsdale, and Neal J. Mellen, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 21, 1986, Ser. No. 842,690
Int. Cl.[4] C23C *16/30*
U.S. Cl. 437—81 9 Claims



1. A method of making a GaAs structure having at least one layer of AlGaAs material and at least one layer of AlGaAs:O material comprising passing carrier gas carrying the Al, Ga, and As through a non-permeable tube to a reaction chamber to provide the layer of AlGaAs, and passing the carrier gas through a permeable tube exposed to a source of oxygen to provide the layer of AlGaAs:O.

4,717,598
MANUFACTURING METHOD OF COMPOSITE SHEET MATERIAL HAVING DIFFERENT TYPE OF SURFACES
Yasuyuki Suzuki, Tokyo, Japan, assignor to Suzuki Kaishi Co., Ltd., Tokyo, Japan
PCT No. PCT/JP86/00346, § 371 Date Dec. 8, 1986, § 102(e) Date Dec. 8, 1986
PCT Filed Jul. 4, 1986, Ser. No. 10,086
Int. Cl.[4] B05D *1/18, 3/02*
U.S. Cl. 427—374.1 1 Claim



1. A manufacturing method of composite sheet material having a different type of surfaces, comprising steps of: impregnating a synthetic resin in a glass fiber sheet material; drying the resin impregnated sheet material; and heating one surface of dry sheet material to form a fully cured surface and simultaneously cooling other surface to retain as an uncured layer.

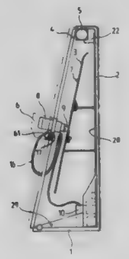
4,717,599
WATER REPELLENT FOR MASONRY
Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.
Continuation of Ser. No. 841,979, Mar. 20, 1986, abandoned.
This application Dec. 23, 1986, Ser. No. 945,584
Int. Cl.[4] B05D *3/02;* C08F *283/12*
U.S. Cl. 427—387 22 Claims

1. A method for rendering masonry water repellent, comprising:
(a) contacting the masonry with a solution comprising an organopolysiloxane resin selected from the group consisting of resins containing $R_3SiO_{0.5}$ units and SiO_2 units, the ratio of $R_3SiO_{0.5}$ units to SiO_2 units ranging from about 0.2 to about 0.9:1 (e.g. MQ resins), and resins containing $R_3SiO_{0.5}$ units, R_2SiO units, and SiO_2 units, the ratio of $R_3SiO_{0.5}$ units to SiO_2 units ranging from about 0.2 to about 0.9:1 and the ratio of R_2SiO units to SiO_2 units being up to about 0.1:1; where each R is an independently selected substituted or unsubstituted alkyl radical, aryl radical, alkaryl radical, aralkyl radical, cycloalkyl radical or alkenyl radical, and
(b) evaporating the solvent.

4,717,600
PROCESS FOR IMPROVING THE TOUCH AND DRAPING CHARACTERISTICS OF TEXTILE PRODUCTS BASED ON POLYESTER
Roberto Borgia, Verbania Intra, and Giorgio Honorati, Milan, both of Italy, assignors to Montefibre S.p.A., Milan, Italy
Filed Jun. 9, 1986, Ser. No. 872,024
Claims priority, application Italy, Nov. 23, 1984, 44823 A/84
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—393.1 4 Claims

1. A process for improving the touch and draping characteristics of textile products based on polyester by discontinuous hot treatment with an aqueous solution of a hydroxide of an alkaline metal containing a hydrolysis accelerator, characterized in that the amount of the alkaline metal hydroxide contained in the solution is adjusted as a function of the textile product weight loss to be obtained according to the weight ratio 1:2.4, that the ratio: textile product weight/aqueous solution volume ranges from 1:5 to 1:100, and that the hydrolysis accelerator is selected from the class consisting of cetyl-trimethyl-ammonium bromide, lauryl-dimethyl-benzyl-ammonium chloride, trimethyl-stearyl-ammonium methyl sulphate and dimethyl-ethyl-coco-ammonium-ethyl sulphate.

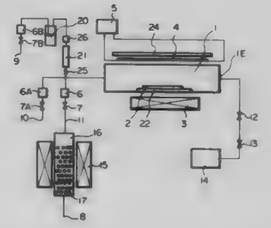
4,717,601
PROCESS AND DEVICE FOR WAXING SKIS BY SPRAYING
Jean-Pierre Bocquet, La Motte Servolex, France, assignor to Skid, La Motte Servolex, France
Filed Feb. 28, 1986, Ser. No. 835,046
Claims priority, application France, Feb. 28, 1985, 85 03471
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—421 11 Claims



1. Apparatus for waxing by spraying the running surface of a ski, said apparatus comprising:
a. a closed reservoir;
b. a supply of low viscosity liquid mixture within said reservoir;
c. said liquid mixture comprising a solution of wax and volatile solvent;
d. said reservoir having a fill orifice closed by a plug and a small vent for the intake of air to establish atmospheric pressure inside said reservoir;
e. an output duct connected to said reservoir;
f. at least one spray nozzle at the output end of said duct;
g. said nozzle positioned to be directed toward the surface to be waxed;
h. a pump for forcing said liquid mixture from said reservoir into said duct and into and through said spray nozzle;
i. a frame having support means for holding a ski to be waxed;
j. guide means for supporting said spray nozzle and holding it in a position directed toward the running surface of said ski; and
k. drive means for moving said nozzle translationally in the lengthwise direction of said ski for sweeping along the surface to be waxed.

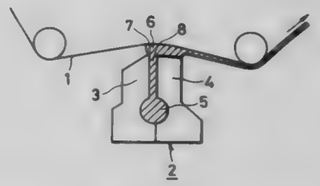
4,717,602
METHOD FOR PRODUCING SILICON NITRIDE LAYERS
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan
Continuation of Ser. No. 710,110, Mar. 11, 1985, abandoned.
This application Jul. 24, 1986, Ser. No. 888,645
Claims priority, application Japan, Mar. 12, 1984, 59-46838; Oct. 19, 1984, 59-220107
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 11 Claims

1. A method for depositing a silicon nitride comprising:
supplying a quantity of silicon fluoride gas and a quantity of hydrogen nitride gas to the vicinity of a surface on which the silicon nitride is to be deposited;
carrying out a chemical reaction between the silicon fluoride and hydrogen nitride, yielding hydrogen fluoride as a by-product in addition to silicon nitride depositing as the product; and



reacting the hydrogen fluoride with any oxygen containing substance in the product to remove the oxygen from the product.

4,717,603
METHOD OF APPLYING A LIQUID TO A MOVING WEB
Naoyoshi Chino; Yasuhito Hiraki; Tsunehiko Sato; Hiroshi Chikamasa, all of Kanagawa, and Norio Shibata, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 14, 1986, Ser. No. 930,475
Claims priority, application Japan, Nov. 15, 1985, 60-255011
Int. Cl.[4] H01F *10/02;* B05D *1/18*
U.S. Cl. 427—434.3 2 Claims



1. A method of applying a liquid to a moving web while pushing an extrusion application head to said moving web without supporting said moving web on the reverse side thereof, the extrusion head having a back blade and a front blade which define a slit through which the liquid leaves the head, and wherein a liquid accumulation forms in a narrow gap between the web and extrusion application head, comprising: applying the liquid to the web while the accumulation of said liquid to be applied to said moving web is maintained by (a) the moving web and (b) an edge of the back blade of the extrusion application head, the edge being defined by the intersection of (1) a first surface of the back blade which faces the front blade and which is nearest the web, and (2) a second surface of the back blade which is more remote from the front blade than the first surface and, wherein the pressure of the liquid of the accumulation located between the web and the outlet portion of the slit of the extrusion application head is set within a range from 0.2 kg/cm^2 guage to 0.8 kg/cm^2 guage per 50 cm of width of applied liquid.

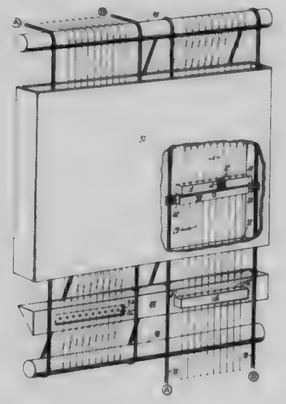
VOL 1086 ISS 1 JA 5 1988 UMI

4,717,604

DIE BAR CARRIER AND METHOD

Paul E. Justus, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 27, 1986, Ser. No. 867,717
Int. Cl.⁴ B05C 3/12, 1/26
U.S. Cl. 427—434.7 12 Claims



8. A method for moving a die bar having wires threaded therethrough through a space characterized by:

abutting an upper face of a beam against a lower side of said die bar to removably support said die bar;

attaching said beam to a driving means for moving said supporting beam and die bar through a space; and

activating said driving means for moving said supporting beam and die bar.

4,717,605

RADIATION CURABLE ADHESIVES

Manfred Urban, Weiterstadt, and Jörg Ohngemach, Reinheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,722
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418149
Int. Cl.⁴ C09K 19/00
U.S. Cl. 428—1 16 Claims

1. A method of gluing optical glass components comprising inserting an adhering effective amount of a radiation curable adhesive between the components,

the adhesive comprising effective amounts of an ionically photopolymerizable epoxide system and an ionic photoinitiator for the epoxide system and effective amounts of an ethylenically unsaturated compound which is photopolymerizable by free radicals and a free radical photoinitiator for the unsaturated compound,

exposing the adhesive to actinic radiation for a time sufficient for the adhesive to partially harden, but not fully harden, to an extent whereby the components are fixed to each other but remain displaceable with respect to one another, adjusting the components to achieve the desired orientation relative to one another, and then fully hardening the adhesive by exposing it to further actinic radiation for a sufficient time period.

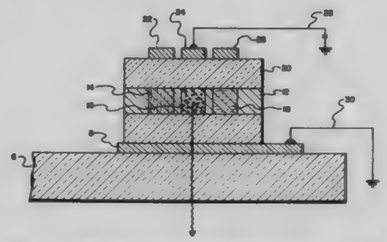
12. In an optical component comprising at least two optical glass elements glued together by a radiation cured adhesive, the improvement wherein the elements are glued together by the method of claim 1.

4,717,606

METHOD OF FABRICATING A THIN FILM ELECTROLUMINESCENT DISPLAY PANEL

Leonard G. Hale, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 21, 1986, Ser. No. 865,498
Int. Cl.⁴ C09K 19/00; B32B 9/00; H01J 1/62; 428 1, 690, 917; 313 503, 506
U.S. Cl. 428—1 15 Claims



12. An electroluminescent display panel having an active layer with at least two closely spaced regions which have been ion implanted with different dopants to obtain different color electroluminescence, and electrode means for separately addressing each of said regions.

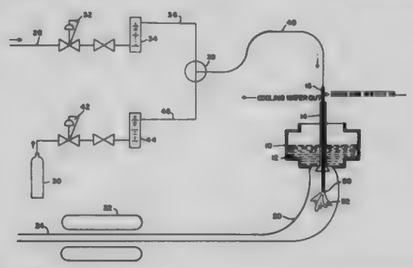
14. An electroluminescent display panel as claimed in claim 12 including a transparent substrate having transparent electrodes.

4,717,607

METHOD OF MAKING A FLUORESCENT LAMP

Paul A. Pfizenmaier, Littleton, and Richard C. Marlor, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Mar. 11, 1987, Ser. No. 24,733
Int. Cl.⁴ C03B 15/14
U.S. Cl. 428—35 10 Claims



1. A method of making fluorescent lamps having increased brightness and improved maintenance thereof comprising the steps of:

drawing hot glass from a melt through a bag stage and into the shape of tubing, the temperature of said hot glass at said bag stage being within the working range of said glass;

dispensing into the hot bag a predetermined mixture of an organo-fluoride gas and an oxidizing agent;

continuously combusting said predetermined mixture of said organo-fluoride gas and said oxidizing gas within said hot bag to produce an amount of fluoride gas sufficient to react with alkali ions and alkaline earth ions on the inner surface of said hot glass at said bag stage to form alkali and alkaline earth compounds;

cooling and cutting said tubing into predetermined lengths;

coating said predetermined lengths with phosphor; and

forming said coated predetermined lengths into fluoroescent lamps.

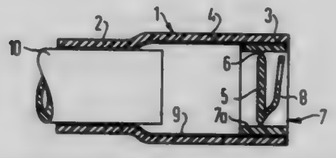
10. A fluorescent lamp made by the method of claim 1.

4,717,608

TERMINATING PART MADE OF SHRINKABLE MATERIAL FOR CLOSING OPEN ENDS AND CABLE FITTINGS, CONDUITS AND SOCKETS

Hans-Juergen Meitsch, Schwerte-Ergste, Fed. Rep. of Germany, assignor to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,534
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506990
Int. Cl.⁴ B65D 59/06; H02G 15/02
U.S. Cl. 428—35 33 Claims



1. A terminal assembly for sealingly closing an opening in a conduit and allowing forming a sealing closure on an elongated object inserted through the assembly into the opening, said assembly comprising a shrink tube, an end part with an end wall and a supporting element, said shrink tube being of heat-shrinkable material having one end adapted for being shrunk onto the conduit, the end part and the supporting element being received in the tube with the end part being located at the other end of the shrink tube to sealingly close said other end, said end wall being removable from said end part without damage to the shrink tube so that the remaining portions of the shrink tube can be shrunk onto an inserted elongated object to form a sealing closure therewith.

4,717,609

ADHESIVE COMPOSITION AND ADHESIVE FILM OR SHEET ON WHICH THE COMPOSITION IS COATED

Morio Gaku, Saitama; Nobuyuki Ikeguchi, Ibaraki, and Hidenori Kimbara, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 711,291, Mar. 13, 1985, Pat. No. 4,645,805.
This application Nov. 19, 1986, Ser. No. 934,944
Claims priority, application Japan, Mar. 14, 1984, 59-48459; May 7, 1984, 59-90697
Int. Cl.⁴ C08L 67/02
U.S. Cl. 428—40 7 Claims

1. An adhesive composition comprising:

(A) at least one cyanate ester compound selected from the group consisting of:

(i) polyfunctional aromatic cyanate ester monomers having the formula

$$R—O—C{\equiv}N)_n$$

wherein n is integer of 2–10 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring or said aromatic organic group;

(ii) homoprepolymers of (i) and

(iii) coprepolymer of (i) and an amine, and

(D) at least one thermosetting resin monomer or prepolymer, characterized in that the composition contains

(B) at least one essentially amorphous thermoplastic saturated polyester resin, said saturated polyester resin consisting essentially of a condensate of an aromatic or aliphatic dicarboxylic acid of the formula



wherein R is an aromatic or aliphatic hydrocarbon radical or an acid anhydride of said aromatic or aliphatic dicarboxylic acid, and an aliphatic or alicyclic polyol.

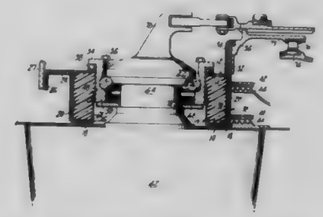
5. An adhesive sheet comprising a release film or sheet and the composition of claim 1 coated on the film or sheet.

4,717,610

COMPOSITE DISK FOR SUPPORTING FAN BLADES

William T. Deanison, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 2, 1987, Ser. No. 10,237
Int. Cl.⁴ B32B 5/02, 5/12
U.S. Cl. 428—65 14 Claims



1. A ring for the support of a row of fan blades for a bypass turbine engine, the blades being turnable on a radial axis for pitch changing, said ring being a composite in which:

substantially the outer half of the ring has the plies of the fibers generally arranged at 0° to the circumferential direction of the ring,

substantially the inner half of the ring having about 40% of the plies arranged at 0° and alternating with an additional 30% of plies at 45° and the remaining 30% at 90 degrees, with additional plies of fibers arranged generally on the side surfaces of the main ring and on the inner and outer surfaces and extending beyond the ring to form mounting flanges for the ring and other flanges thereon, said plies being generally at substantially 45°,

said composite ring after being cured having radial holes formed therein for the fan blades, and

mounting bosses positioned in said holes to receive the blade roots.

4,717,611

VOID-FREE MOLDED POLYURETHANE ARTICLES WITH SURFACE ATTACHMENT STRIPS

Robert G. Petrella, Allentown, and Michael Scarpati, Lehighton, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 17, 1986, Ser. No. 942,903
Int. Cl.⁴ B29C 67/00; B32B 3/06
U.S. Cl. 428—99 21 Claims

18. A molded polyurethane foam article having a material of low surface energy secured to the article's surface, the low surface energy material containing a cured coating composition, the coating composition consisting essentially of a polyvinyl alcohol, an organic polyisocyanate, a plasticizer for the polyvinyl alcohol and a catalyst for the urethane reaction.

19. The article of claim 18 in which the coating composition consists essentially of (in part by weight)

0.5–10 parts fully hydrolyzed polyvinyl alcohol

15–60 parts organic polyisocyanate

1–15 parts plasticizer, and

0.05–0.5 parts tertiary amine catalyst.

20. The article of claim 19 in which the low surface energy material is a polyolefin nonwoven.

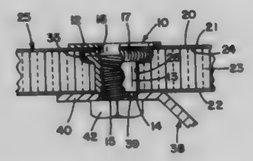
21. The article of claim 20 in which the nonwoven is the backing of an attachment strip having molded teeth.

4,717,612

FASTENERS FOR HONEYCOMB STRUCTURES

James R. Shackelford, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 20, 1986, Ser. No. 920,545
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—116 4 Claims



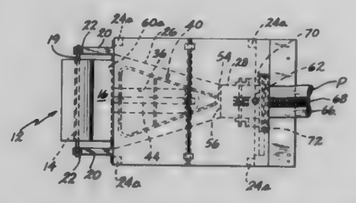
1. A honeycomb panel with at least one fastener insert therein; said panel having an upper cover sheet member and a lower cover sheet member separated by a honeycomb core therebetween; at least one fastening hole extending through said cover sheet members and through said honeycomb core; each of said sheet members having an exterior surface and an interior surface; said interior surfaces being connected to said honeycomb core; an integral one piece hollow fastener having a flat annular thin flange, a sleeve and an annular edge at one end of said sleeve; said flat flange located at the other end of said sleeve; said fastener located in said hole and extending from the exterior surface of one of said cover sheet members to have said annular edge adjacent the exterior surface of the other one of said cover sheet members; said hollow fastener having a central bore; said flat annular thin flange abuttingly engaging the exterior surface of said one sheet member; said bore of said fastener having at least a portion thereof threaded, and said sleeve having a bulged portion engaging the interior surface of said one sheet member opposite said exterior surface engaged by said flange to captively locate said fastener in said honeycomb panel as said annular edge contacts the side of said hole in said other one of said cover sheet members.

4,717,613

MECHANISM AND METHOD FOR PRODUCING CUSHIONING DUNNAGE

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corporation, Willoughby, Ohio

Filed May 10, 1984, Ser. No. 609,001
Int. Cl.[4] B31F 1/10; B32B 3/04
U.S. Cl. 428—129 32 Claims



1. In a mechanism for producing low density pad-like cushioning dunnange from sheet-like stock material comprising, a support, crumpler means mounted on said support and having an entry opening, and an exit opening spaced lengthwise from said entry opening, said crumpler means being adapted to receive the sheet-like stock material, means for causing inward rolling of the lateral edges of the stock material into generally rolled form prior to passage of the sheet-like stock material into said crumpler means, means coacting with said crumpler means for connecting the confronting rolled edges, resulting in a unitary dunnange product of pad-like configuration as produced from said mechanism, said connecting means including means for pulling the stock material from a supply thereof into said crumpler means, said means for causing inward rolling including a forming frame mounted on said support and disposed generally in line with said crumpler means, said frame adapted to be engaged slidingly with and to press against the sheet-like stock material, said crumpler means being tunnel-like and being adapted to cause the stock material to be generally radially compressed as it passes into and through said crumpler means, said forming frame being generally triangular shaped in plan with the forward end nose portion of the triangular configuration disposed closely adjacent to said entry opening of said crumpler means, said nose portion of said frame projecting into the path of travel of the stock material from the supply thereof to said crumbler means, to cause deflection of the stock material adjacent said entry opening.

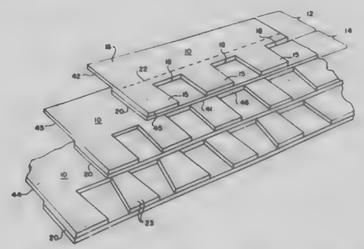
29. Paper dunnage product comprising a pad-like article for use in packaging, formed from paper sheet or the like with the lateral edges of the sheet having been generally loosely rolled inwardly and forming radially crumpled pillow-like portions defining the lateral extremities of said packaging article, and means connecting the rolled confronting edges of the pillow-like portions together along the generally central portion of the pad-like article, lengthwise thereof, the last mentioned means comprising lengthwise spaced transversely extending coined portions of said paper material, said laterally arranged pillow-like portions of said article possessing considerable resiliency, each being of a substantially greater thickness than said central coined connected portion, and occasioned by said paper material having been urged outwardly into said pillow-like portions of the formed product instead of remaining in said central connected portion giving said pillow-like portions greater dimension and resiliency, with said central connected portion being comprised of minimum layers of connected paper material as coined, said article having a density of approximately 0.6 to 0.7 pounds per cubic foot as compared to a density approximately one pound per cubic foot for prior art dunnage product pad-like articles of generally similar configuration.

4,717,614

ASPHALT SHINGLE

Alfredo A. Bondoc, S. Bound Brook; Duane A. Davis, Plainfield; Stanley P. Frankoski, W. Milford, and Bruno E. Magnus, Middlesex, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Feb. 14, 1986, Ser. No. 829,586
Int. Cl.[4] E04D 1/26
U.S. Cl. 428—143 15 Claims



1. A shingle consisting essentially of a rectangular sheet having an headlap portion and a butt portion said headlap portion and said butt portion having an asphaltic undercoating of varying thickness such that a major area of the headlap portion extending from its free marginal edge to the area above said butt portion and representing between about 6/7th and about 4/7th height of the upper headlap portion is coated with a layer of asphaltic material in a lesser thickness of between about 1/20th and about ¼th the asphaltic undercoat thickness on the butt portion and the remaining 1/7th to 3/7ths area of the adjoining headlap portion extending immediately above said butt portion.

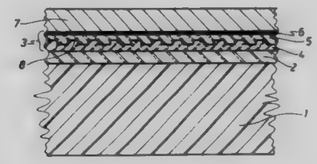
3. A composite roofing shingle consisting essentially of a rectangular sheet having an undivided headlap portion and a butt portion comprising a series of tab segments separated by spaces extending continuously from the headlap portion to the exposed edge of the butt portion, said headlap portion and said butt portion having an asphaltic undercoating of varying thickness such that a major area of the headlap portion extending from its free marginal edge to the area above said butt portion and representing from about 6/7 to about 4/7 height of the upper headlap portion is coated with a layer of asphaltic material in a lesser thickness of between about 1/20th and ¼th the undercoating thickness of the asphaltic undercoat thickness on the butt portion and the remaining 1/7th to 3/7ths area of the adjoining headlap portion extending immediately above the butt portion; and an elongated asphaltic coated rectangular strip having approximately the same length as said sheet and a height equal to the area of the thicker undercoated area of the rectangular sheet said strip being longitudinally mounted beneath said butt portion and adjoining said 1/7th to 3/7th area of the headlap portion.

4,717,615

MULTI-LAYER FOIL AND PROCESS FOR THE PRODUCTION THEREOF

Werner Reinhart, Nuremberg, Fed. Rep. of Germany, assignor to Leonard Kurz GmbH & Co, Bavaria, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 888,571
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527412
Int. Cl.[4] B32B 3/00; C09J 7/02
U.S. Cl. 428—161 11 Claims



1. A multi-layer foil comprising a backing foil having first and second surfaces, said first surface of said backing foil being provided with a three-dimensional patterning layer, said patterning layer being comprised of at least first and second successive layers formed of transparent lacquers of different optical properties thereby forming said patterning at an interface region thereof, said first and second layers when formed being transparent lacquers including organic groups which are not yet crosslinked and upon curing are bonded thereby inseparable from each other by means of chemical and physical methods.

4,717,616

SHIPPABLE, SHEET LIKE FABRIC USEFUL IN MAKING MOP HEADS

Albert D. Harmon, Clemson, S.C., and Ernest Koella, III, Rockford, Tenn., assignors to Rockford Manufacturing Company, Rockford, Tenn.

Filed Feb. 26, 1986, Ser. No. 833,828
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—195 8 Claims

1. A shippable, sheet-like fabric useful in the making of mop heads, comprising a handleable, joined sheet-like fabric structure of an extended length and a predetermined width having

a. a plurality of twisted, elongate cords of textile material arrayed in side-by-side, substantially parallel adjacency to one another and extending from said fabric-width's midline outwardly on both sides of said midline, wherein the outwardly extending ends of said cords are in the form of closed loops of yarn, and the cords have twists extending inwardly from said looped ends toward said midline, the cords on both sides of said midline having twist in the same twist sense and being joined to the cords on the other side of said midline by said yarn; and



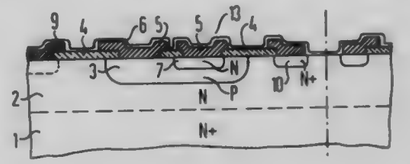
b. a plurality of binding tapes extending lengthwise said fabric substantially parallel to said midline thereof and adhesively bound to said cords at a surface thereof with an adhesive binding or delamination strength within the range of from 15 to 45 ounces of force per inch of tape width.

4,717,617

METHOD FOR THE PASSIVATION OF SILICON COMPONENTS

Joachim Dathe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 259,822, May 4, 1981, abandoned. This application Oct. 12, 1982, Ser. No. 433,680
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021175
Int. Cl.[4] H01L 21/28
U.S. Cl. 428—209 4 Claims



1. A passivated aluminum-metalized component with metallic contacts and with a contactable surface for additional metallic contacts without etching comprising an aluminum-metallized silicon component with metallic contacts, a passivating layer obtained by applying a silicon layer having a thickness from about 0.05 μm to about 0.1 μm on said silicon component with metallic contacts covering the surface of the component, and annealing at a temperature from 420° to 480° C. to provide a contactable surface for additional metallic contacts with the aluminum of the component without etching to remove the silicon layer, said contactable surface having no other passivating layer deposited thereon.

VOL 1086 ISS 1 JA 5 1988 UMI

4,717,618

FILM AND BLENDS OF POLYETHERAMIDE BLOCK COPOLYMER AND ETHYLENE VINYL ALCOHOL COPOLYMER

Samuel W. Tao, and George O. Schroeder, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

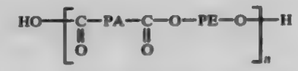
Continuation of Ser. No. 558,820, Dec. 6, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,386
Int. Cl.[4] B32B *27/08, 27/28;* C08L *29/04, 53/00*
U.S. Cl. 428—213 42 Claims

1. As a composition of matter, a polymeric blend, comprising:

(a) 5 percent to about 40 percent by weight polyetheramide block copolymer; and

(b) about 60 percent to 95 percent by weight ethylene vinyl alcohol copolymer,

the polyetheramide block copolymer having the formula:



wherein PA is a polyamide and PE is a polyether, n being an integer indicative of the degree of polymerization of the block copolymer, the degree of polymerization being such that its Shore Hardness is about 65D to 60A.

4,717,619

PROCESS FOR THE PRODUCTION OF MOLDED POLYBENZIMIDAZOLE ARTICLES AND THE RESULTANT ARTICLES

John S. Letinski, Metuchen, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 29, 1985, Ser. No. 792,383
Int. Cl.[4] B32B *27/12;* B29B *9/04;* B29C *39/14, 43/00*
U.S. Cl. 428—287 26 Claims



1. A process for the production of shaped polybenzimidazole articles comprising:

(a) preparing a solvent solution of a polybenzimidazole polymer wherein the inherent viscosity of the polybenzimidazole polymer is in the range of about 0.25 to 0.7;

(b) forming a film from the solvent solution;

(c) removing sufficient solvent from the film such that the film retains from about 10 to about 30 percent by weight of the solvent;

(d) forming the film having retained solvent into particulates of sufficiently small size to be used in a molding process; and

(e) molding the particles into a shaped article.

4,717,620

DECORATIVE COATINGS PROVIDING A MULTICOLOR, TEXTURED SURFACE

Thomas N. E. Bowen, Woobura Green; Jonathan A. Graystone, Maidenhead, and Andrew J. W. Hobbs, Reading, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 12, 1986, Ser. No. 828,745
Claims priority, application United Kingdom, Feb. 22, 1985, 8504632; Mar. 27, 1985, 8507949
Int. Cl.[4] B32B *5/16, 27/00;* C08K *7/16;* C09D *5/29*
U.S. Cl. 428—323 12 Claims

1. A multitone or multicolour, decorative, textured coating on a substrate, the coating comprising 15–95% by volume, based on the total dry coating volume, of rigid, spheroidal, polymeric beads distributed in a random pattern and embedded in a coherent dry coating film which comprises a film-forming polymer, wherein:

(a) the rigid polymeric beads have an effective maximum diameter (as herein defined) which is within the range 1.2 to 3.5 × (the overall average thickness of the coherent dry coating film - which is defined as the quotient of the total weight of the coherent coating film per unit area divided by the density of the total coherent coating film) but where up to 5% by weight of the individual beads, based on the total weight of the beads, may have a diameter greater than the effective maximum diameter;

(b) the overall size of the beads is such that 90% by weight of the beads have a diameter which is within the range 0.6 to 3.0 × (the overall average thickness of the coherent dry coating film);

(c) at least 40% by weight of the beads have a diameter which is within the range 0.5 to 1.0 × (the effective maximum diameter of the beads); and

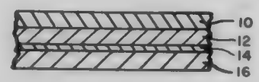
(d) there is a contrast in tone or colour between the coherent dry coating film and at least some of the rigid polymeric beads.

4,717,621

LETTERING MATERIAL FOR FABRIC AND THE LIKE

Philip K. So, Waltham, and John J. Pine, Arlington, both of Mass., assignors to Bemis Associates, Inc., Watertown, Mass.

Filed Oct. 1, 1984, Ser. No. 656,793
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—349 6 Claims



1. An improved multi-layer labelling material for attachment to a textile fabric or the like, for the purpose of displaying an indicium affixed to said fabric, wherein said material comprises:

(A) a first, outer labelling layer, with a display surface and a bonding surface; and

(B) a second, bonding layer of meltable thermoplastic material, bonded to said bonding surface of said labelling layer, said thermoplastic material being capable of melting at an elevated temperature and working its way into intimate contact with said fabric to form a bond,

wherein the improvement comprises:

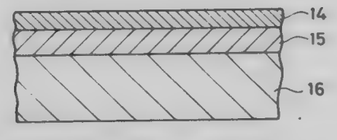
a third, adhesive layer, substantially thinner than said bonding layer and bonded to the other surface of said bonding layer, comprising a tacky, displaceable, hot-melt, thermoplastic, pressure-sensitive adhesive material which has flow characteristics such that at said elevated temperature the adhesive layer melts and flows ahead of the melting thermoplastic material of said bonding layer, and is thus displaced by said melting material.

4,717,622

MAGNETIC RECORDING MEDIA

Hideo Kurokawa, Katano; Tsutomu Mitani, Neyagawa, and Taketoshi Yonezawa, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 11, 1986, Ser. No. 838,814
Claims priority, application Japan, Mar. 13, 1985, 60-50031
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—408 8 Claims



1. A magnetic recording medium, comprising:

a base material made of non-magnetic material;

a recording layer disposed on said base material, said recording layer being made of a ferromagnetic material; and

a protective layer disposed on said recording layer;

said protective layer being constituted by a diamond-like film of carbon having a Vicker's hardness of more than 2000 kg/mm^2 and a specific resistance of 10^7 Ω-cm to 10^{13} Ω-cm; and

said ferromagnetic material comprising an element which forms a carbide with carbon of said protective layer, in which said element is bonded to said carbon by covalent bonding or forms an intermetallic compound therewith.

4,717,623

RADIATION-CURABLE COATING COMPOSITIONS APPLIED TO FLUORINE-TREATED SURFACES

Wallace H. Brown, Des Plaines; Dennis G. Anderson, Arlington Heights, and John T. Vandeberg, Barrington, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 14, 1986, Ser. No. 818,865
Int. Cl.[4] G11B *5/70, 5/702*
U.S. Cl. 428—409 12 Claims

1. A method for coating a terephthalate polyester surface to increase the adhesion between the surface and a subsequently applied radiation-curable coating comprising the steps of contacting the surface with a gas containing elemental fluorine including at least about 99 percent of an inert gas, based on the volume of the fluorine-containing gas, at a temperature less than about 40 degrees Centigrade and for a period of time less than about 1 minute, applying to the so-treated surface a radiation-curable coating composition, and then exposing said radiation-curable coating to radiation to cure the same.

12. A coated polymeric surface treated with a fluorine-containing gas according to the method of claim 1.

4,717,624

METHOD OF MANUFACTURING A MOLDED ARTICLE HAVING GOOD DIMENSIONAL STABILITY

Yukio Ikenaga; Katsuhiko Takahashi, both of Fuji; Tsuneyoshi Okada, Kawasaki; Kenji Hijikata, and Toshio Kanoe, both of Fuji, all of Japan, assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 22, 1985, Ser. No. 801,101
Claims priority, application Japan, Nov. 28, 1984, 59-251292
Int. Cl.[4] B29C *65/66*
U.S. Cl. 428—423.1 29 Claims

1. A method for manufacturing an article of superior dimensional stability comprising laminating:

(a) at least one first layer of a molecularly oriented sheet formed by the melt-processing of a thermoplastic polymer which exhibits an anisotropic melt phase wherein said molecularly oriented sheet exhibits a negative linear thermal expansion coefficient in the direction of the polymer flow during its formation, and

(b) at least one second layer which exhibits a positive linear thermal expansion coefficient,

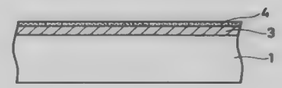
wherein said first and second layers are regulated in thickness so that in the resulting article the respective negative and positive linear thermal expansion coefficients of (a) and (b) are substantially balanced thereby imparting stability to the overall laminate.

4,717,625

PHOTOMASK MATERIAL

Yaichiro Watakabe, and Shuichi Matsuda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,355
Claims priority, application Japan, Aug. 30, 1985, 60-192815
Int. Cl.[4] B32B *15/00, 17/06;* G03F *9/00*
U.S. Cl. 428—432 4 Claims



1. A photomask material to be used for manufacturing of a semiconductor device, comprising:

a transparent substrate,

a transition metal silicide film formed on said transparent substrate, and

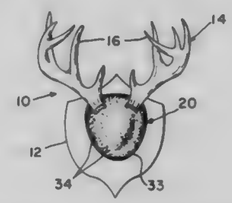
an oxidized transition metal silicide film formed on said transition metal silicide film.

4,717,626

TROPHY MOUNT

Gary W. Badger, R.D. #1, Box 381-A, Lewisburg, Pa. 17837

Filed Jan. 12, 1987, Ser. No. 2,508
Int. Cl.[4] B44C *5/02*
U.S. Cl. 428—542.4 6 Claims



1. A trophy mount for the display of a pair of animal antlers comprising:

(a) A pair of spaced apart animal antlers and an integral portion of skull bone forming a bridge joining the horns together;

(b) A hardened base having

i. A flat base-mounting surface, and

ii. A smoothly convexly shaped outer surface, said surfaces joining each other at a peripheral edge extending around the base,

(c) Said bridge being embedded within said base between the surfaces so that the bridge is completely surrounded by the base and the horns project outwardly through the outer base surface,

(d) Plaque fastening means embedded within the base adjacent to the communicating with the base mounting surface and below of the bridge,

(e) A plaque having a flat exterior plaque mounting surface, and

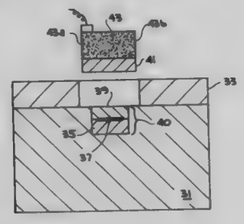
(f) Mounting means engageable with the plaque and the fastening means to secure base to the plaque with the base and plaque mounting surfaces in flush engagement.

4,717,627

DYNAMIC HIGH PRESSURE PROCESS FOR FABRICATING SUPERCONDUCTING AND PERMANENT MAGNETIC MATERIALS

William J. Nellis, Berkeley; Theodore H. Geballe, Woodside, and M. Brian Maple, Del Mar, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1986, Ser. No. 937,794
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—552 17 Claims



1. A method for preparation of a class of fine grain solid materials having desirable superconducting or magnetic properties, the method comprising the steps of:

providing a first planar layer of a first predetermined solid material, with the first layer having a first end and a second end spaced apart from one another and facing one another along the plane defining the first planar layer;

providing a second planar layer comprising a second predetermined material in powder form, with the second layer having a first end and a second end spaced apart from one another and facing one another along the plane defining the second planar layer;

providing a tnird planar layer of a tnird predetermined solid material, positioned so that the second layer lies between and is transversely contiguous with the first layer and the third layer, with the third layer having a first end and a second end spaced apart from one another and facing one another along the plane defining the third planar layer;

providing an open container for the first, second and third planar layers, with the container having a first wall that is transversely contiguous with the third layer and is positioned so that the third layer lies between the second layer and the first container wall, and with the container having side walls that fit snugly against the first and second ends of each of the first and third planar layers of solid material, the container being composed of rigid material that resists deformation caused by deformation of adjacent material in the first layer or the third layer;

providing a shock wave with velocity of propagation that is supersonic with respect to the speed of sound in each of the first, second and third predetermined materials;

causing the shock wave to propagate substantially transversely through the first planar layer, the second planar layer and the third planar layer in that order so that the second layer of powder is compressed and heated to a temperature substantially as large as or greater than the highest melt temperature of the materials comprising the second layer, with an associated shock wave pressure of at least 50 kilobars;

allowing the powder in the second planar layer to at least partially melt so that the powder particles coalesce into a material of higher material density than the initial material density of the second layer; and

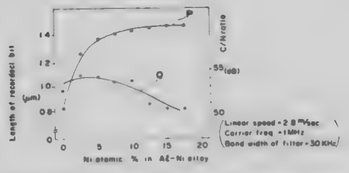
allowing excess thermal energy in this former powder layer to rapidly flow into the contiguous first and third planar layers of material, to achieve rapid cooling of the second layer to temperatures substantially the same as the temperature in the first and third layers.

4,717,628

MAGNETOOPTICAL STORAGE ELEMENT

Akira Takahashi, Nara; Yoshiteru Murakami, Nishinomiya; Hiroyuki Katayama, Nara; Junji Hirokane, Tenri, and Kenji Ohta, Yao, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1986, Ser. No. 830,862
Claims priority, application Japan, Feb. 21, 1985, 60-34133
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—457 12 Claims



1. A magnetooptical storage element having a multi-layer construction including a reflective layer, wherein said reflective layer comprises an aluminium-nickel alloy containing approximately 2 to 10 atomic percent of nickel.

4,717,629

COMPACT OF HYDROGEN ADSORPTION ALLOY

Hiroshi Ishikawa; Keisuke Oguro; Hiroshi Suzuki; Akihiko Kato; Teruya Okada; Shizuo Sakamoto; Iwao Nishimura, all of Osaka, and Keizo Sakaguchi, Hyogo, all of Japan, assignors to Agency of Industrial Science & Technology and Kurimoto Ltd., both of, Japan

Continuation of Ser. No. 758,015, Jul. 24, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 9,007
Claims priority, application Japan, Nov. 30, 1984, 59-254415
Int. Cl.[4] C01B *6/00*
U.S. Cl. 428—566 2 Claims

1. A compact of hydrogen adsorption alloy, comprising:

a porous metal foam member; and

fine particles infiltrated into the pores of the porous metal foam member, wherein:

the fine particles are selected from the group consisting of lanthanum-nickel, misch metal-nickel-aluminum, iron-titanium, titanium-manganese, calcium nickel, magnesium-copper or magnesium-nickel, said fine particles having an average grain size of not more than 15 μm, all surfaces of said fine particles being completely coated before infiltration into the pores of the porous metal foam member with copper by autocatalytic type wet electroless plating using a reducer while maintaining porosity permitting permeation of hydrogen gas; and

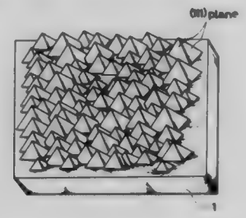
the porous metal foam member and the infiltrated coated fine particles are compacted by compression molding.

4,717,630

SUBSTRATE FOR MANUFACTURING SINGLE CRYSTAL THIN FILMS

Yoshihiro Hamakawa, Kawanishi, and Hideyuki Takakura, Ikeda, both of Japan, assignors to Yoshihiro Hamakawa, Hyogo, Japan

Continuation of Ser. No. 543,452, Oct. 18, 1983, abandoned.
This application May 9, 1986, Ser. No. 862,199
Claims priority, application Japan, Nov. 17, 1982, 57-202298
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—612 1 Claim



1. An article comprising:

an original plate produced by anisotropically etching a silicon single crystal wafer having a (100) surface to provide a single crystal cleavage plane, said original plate having a plurality of pyramidal surfaces each of which is a (111) plane;

a layer of metal selected from the group consisting of tin, gold and zinc vapor deposited on said pyramidal surfaces of said original plate;

a layer of nickel plated on said vapor deposited metal layer; and

a stainless steel base fixed on said nickel layer through a brazing metal selected from the group consisting of gold and silver.

4,717,631

SILICON OXYNITRIDE PASSIVATED SEMICONDUCTOR BODY AND METHOD OF MAKING SAME

Grzegorz Kaganowicz, Belle Mead; Ronald E. Enstrom, Skillman, both of N.J., and John W. Robinson, Levittown, Pa., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 819,296, Jan. 26, 1986, abandoned. This application Jun. 25, 1986, Ser. No. 878,240
Int. Cl.[4] H01L *21/316, 21/318*
U.S. Cl. 148—33.3 18 Claims

1. In a semiconductor body having a passivating layer which overlies a surface of said body,

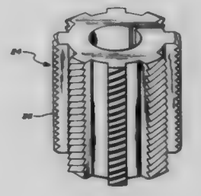
the improvement wherein said passivating layer comprises a silicon oxynitride material deposited by plasma enhanced chemical vapor deposition at a temperature of from about 25° to about 200° C., said layer having a refractive index of between about 1.55 and 1.75 and being comprised of from about 8 to about 20 atomic percent of hydrogen, from about 9 to about 35 atomic percent of silicon, from about 9 to about 35 atomic percent of nitrogen, and from about 10 to about 50 atomic percent of oxygen.

4,717,632

ADHESION AND COMPOSITE WEAR RESISTANT COATING AND METHOD

John E. Keem, Birmingham; James D. Flasck, Rochester, and Richard W. Seguin, Milford, all of Mich., assignors to Ovonic Synthetic-Materials Company, Inc., Troy, Mich.

Continuation of Ser. No. 525,100, Aug. 22, 1983, abandoned.
This application Aug. 11, 1986, Ser. No. 895,530
Int. Cl.[4] B32B *9/04, 13/04, 9/00, 19/00*
U.S. Cl. 428—698 60 Claims



1. An article comprising, in sequential order: a substrate containing material selected from the group consisting of metallic and ceramic material, a metal adherence coating applied over the substrate and a disordered exterior coating applied over the adherence coating and different from the adherence coating, said adherence coating providing good adherence of the exterior coating and said adherence coating consisting essentially of at least one or more metallic elements selected from the group consisting of scandium, titanium, vanadium, chromium, yttrium, zirconium, niobium, molybdenum, hafnium, tantalum, aluminum and tungsten, and which meets any one or more of the following provisos relative to said substrate:

(1) at least one common element is present in said substrate and said adherence coating;

(2) at least one element is present in said substrate and said adherence coating that has about the same atomic radius;

(3) at least one element is present in said substrate that has a high bond energy between at least one element in said adherence coating;

(4) at least one element of said adherence coating is soluble in said substrate; and

(5) at least one element is present in said adherence coating that forms the same type of atomic structure as said substrate after migration therein, and which adherence coating meets any one or more of the following provisos relative to said exterior coating:

(1) at least one common element is present in said exterior coating and said adherence coating;

(2) at least one element is present in said exterior coating and said adherence coating that has about the same atomic radius;

(3) at least one element is present in said exterior coating that has a high bond energy between at least one element of said adherence coating;

(4) at least one element of said adherence coating is soluble in said exterior coating; and

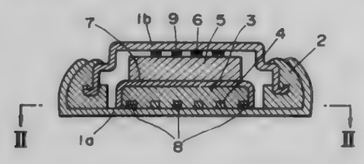
(5) at least one element is present in said adherence coating that forms the same type of atomic structure as said exterior coating after migration therein; said exterior coating comprising at least one transition metal selected from the group consisting of scandium, yttrium, zirconium, niobium, molybdenum, hafnium, tantalum, titanium, vanadium, chromium and tungsten and at least one non-metallic element selected from the group consisting of boron, carbon, nitrogen and oxygen.

4,717,633
ELECTRODE STRUCTURE FOR LIGHTWEIGHT STORAGE BATTERY
Eric Hauser, 63-184 Alderton St., Rego Park, N.Y. 11374
Filed Nov. 25, 1985, Ser. No. 777,708
Int. Cl.[4] H01M *4/02, 4/72*
U.S. Cl. 429—209 14 Claims



1. An electrode for use in a battery comprising a thin layer of active metal provided on a substrate which is made of a material lighter and stronger than the active metal layer, wherein the substrate includes an electrically conductive plastic layer and the active metal layer is electrolytically bonded to a surface of the substrate; and
a copper core protectively enclosed by the substrate such that the copper core is protected from attack by a predetermined electrolytic solution when the electrode is immersed in the electrolytic solution.

4,717,634
ELECTRIC CELLS UTILIZING POLYANILINE AS A POSITIVE ELECTRODE ACTIVE MATERIAL
Hideharu Daifuku; Tadashi Fuse, both of Kodaira; Masao Ogawa, Kawagoe; Yoshitomo Masuda, Kodaira; Shinichi Toyosawa, Tokorozawa, and Ryota Fujio, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 17, 1986, Ser. No. 920,140
Claims priority, application Japan, Oct. 17, 1985, 60-232046; Oct. 21, 1985, 60-236027; Nov. 6, 1985, 60-249492; Feb. 14, 1986, 61-28880; Feb. 20, 1986, 61-36232; Apr. 2, 1986, 61-77453
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—213 6 Claims



1. An electric cell comprising a positive electrode, a negative electrode and an electrolytic solution, wherein said positive electrode contains as an active material a polyaniline having a water content of 1000 ppm or less, said negative electrode contains as an active material lithium or a lithium alloy containing 4×10^{-3} to 170×10^{-3} mol of effective lithium which is capable of electrochemical occlusion and release upon charging and discharging per g of the polyaniline used as the positive electrode active material, and said electrolytic solution being a non-aqueous electrolytic solution containing an electrolyte of more than 1 mol/l to less than 6 mol/l in a non-aqueous solvent.

4,717,635
ELECTROPHOTOGRAPHIC RECORDING MATERIAL
Bernd Reimer, Warstein-Belecke; Hans-Hermann Beschnidt, Erwitte, and Manfred Lutz, Warstein-Belecke, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed May 16, 1986, Ser. No. 863,988
Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518999
Int. Cl.[4] G03G *5/08*
U.S. Cl. 430—57 21 Claims

1. Electrophotographic recording material, comprising:
an electrically conductive substrate;
a first layer provided on the electrically conductive substrate and comprised of an amorphous selenium-tellurium alloy containing from 0.05 to 15 weight % tellurium;
a second layer disposed on the first layer and comprised of an amorphous selenium-tellurium alloy containing from 15 to 60 weight % tellurium; and
a third layer provided on the second layer and comprised of an amorphous alloy of selenium and from 0.05 to 5 weight % of one of arsenic and tellurium.

4,717,636
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER CONTAINING POLYVINYLARYLAL
Hideyuki Takahashi, Yokohama; Masataka Yamashita, Kawasaki; Masakazu Matsumoto, Yokohama, and Minoru Mabuchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 17, 1986, Ser. No. 853,160
Claims priority, application Japan, Apr. 23, 1985, 60-085343
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—58 8 Claims

1. An electrophotographic photosensitive member comprising at least a charge generation layer and a charge transport layer on an electroconductive substrate, wherein said charge generation layer contains, as a binder, a polyvinylacetal resin obtained by acetalization reaction of polyvinyl alcohol and aldehyde compound represented by the following general formula:

Ar-CHO

wherein Ar is a substituted or unsubstituted aryl radical.

4,717,637
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING MICROCRYSTALLINE SILICON
Shuji Yoshizawa, Tokyo; Wataru Mitani; Mariko Yamamoto, both of Yokohama; Akira Sanjoh, Aichi, and Tatsuya Ikezue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Jun. 23, 1986, Ser. No. 877,318
Claims priority, application Japan, Jun. 25, 1985, 60-138221; Jun. 25, 1985, 60-138223; Jun. 25, 1985, 60-138224
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—65 14 Claims

1. An electrophotographic photosensitive member comprising:
a conductive substrate;
a barrier layer provided on the conductive substrate, said barrier layer comprises microcrystalline silicon containing hydrogen, an element included in group III or V of the periodic table, and at least one element selected from carbon, oxygen, and nitrogen; and
a photoconductive layer provided on the barrier layer, said photoconductive layer including a first layer comprised of microcrystalline silicon, at least a part of which contains hydrogen, and a second layer comprised of amorphous silicon containing hydrogen and at least one element selected from carbon, oxygen, and nitrogen, said first and second layers being stacked on top of the photoconductive layer.

4,717,638
PAPER FOR ELECTROSTATOGRAPHY USING ENCAPSULATED TONER
Takeshi Mikami, and Masakazu Mackawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 616,531, Jun. 1, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 853,382
Claims priority, application Japan, Jun. 3, 1983, 58-99238
Int. Cl.[4] G03G *13/22*
U.S. Cl. 430—98 6 Claims

1. In an electrostatographic process wherein an encapsulated toner which comprises a core and a shell enclosing the core is fixed on a substrate under pressure to form a toner image, the improvement which comprises the substrate for retaining the toner image under fixation being a sized fibrous paper sheet having a optically measured surface roughness value of not more than 3.2 μm.

4,717,639
PROCESS FOR PREPARATION OF A STENCIL OR RESIST IMAGE
Alan S. Dubin, Greenville, Del.; Robert A. McMillen, Downingtown, Pa., and R. David Mitchell, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.
Filed Dec. 6, 1985, Ser. No. 805,525
Int. Cl.[4] G03G *13/20;* B05D *3/02, 3/10, 5/12*
U.S. Cl. 430—124 21 Claims

1. A process for the formation of a hardened, insoluble or crosslinked polymeric stencil image on a substrate and modifying the surface of the substrate or image surface comprising:
A. forming an image on a substrate by applying a solvent-soluble thermoplastic copolymer of ethylene and an α,β-ethylenically unsaturated acid having an acid number of at least about 30 to a surface of the substrate that reacts thermochemically with the copolymer;
B. fusing at a temperature and for a duration to induce the thermochemical reaction at a rate of reaction sufficient to partially insolubilize, harden or crosslink the polymeric image and adhere the polymeric image to the substrate surface to facilitate subsequent removal therefrom;
C. modifying either the uncovered substrate surface or the polymeric image surface; and
D. removing the polymeric image from the substrate surface.

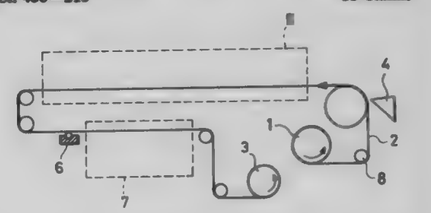
4,717,640
LIGHT-SENSITIVE MIXTURE, RECORDING MATERIAL PREPARED THEREFROM AND PROCESS FOR USE THEREOF
Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 11, 1985, Ser. No. 807,666
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445276
Int. Cl.[4] G03C *1/60, 1/495*
U.S. Cl. 430—192 15 Claims

1. A light-sensitive admixture, suitable for use in producing printing plates, consisting essentially of
at least one positive-working, light-sensitive compound having an increased solubility upon exposure to light, said compound being present in an amount sufficient to impart light-sensitivity to said mixture and being at least one 1,2-quinone diazide;
a binder polymer of a styrene derivative selected from the group consisting of an alkenylsulfonylaminocarbonyloxystyrene and cycloalkenylsulfonylaminocarbonyloxystyrene, wherein said polymer (a) is insoluble in water and soluble in aqueous alkali and (b) is present in an amount such that the mixture forms a layer when coated from solution onto a support.

4,717,641
METHOD FOR PASSIVATING A SEMICONDUCTOR JUNCTION
Emanuel Belmont, and Henry G. Hughes, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Jan. 16, 1986, Ser. No. 819,320
Int. Cl.[4] G03C *11/00*
U.S. Cl. 430—198 4 Claims

1. A method for fabricating a semiconductor device with exposed junctions, comprising:
forming a slurry from a mixture of powdered glass and photoresist;
coating the semiconductor device with a layer of the slurry;
soft baking the device in an oven;
forming a pattern in the slurry layer by exposure and development;
removing the photoresist from the slurry pattern using an oxygen plasma;
fusing the glass by firing the device in a rapid heating apparatus; and
annealing the device to remove stress in the glass.

4,717,642
PROCESS FOR IMPROVING ADHESION BETWEEN PHOTOGRAPHIC LAYERS
Toshihiro Watanabe, and Hideki Tomiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 25, 1986, Ser. No. 855,563
Claims priority, application Japan, Apr. 25, 1985, 60-89493
Int. Cl.[4] G03C *1/30, 1/74;* B05D *3/04;* B32B *27/00*
U.S. Cl. 430—213 11 Claims



1. A process for improving adhesion between photographic layers of a photographic element comprising a support having provided thereon at least
(1) a first dry photographic layer comprising a high molecular weight compound having a functional group capable of reacting with an isocyanate group and
(2) a second photographic layer comprising a high molecular weight compound having a functional group capable of reacting with an isocyanate group which compound is different from the high molecular weight compound of said first layer,
which process comprises coating from 2 to 20 ml/m^2 of a solution containing a polyisocyanate compound having at least two isocyanate groups on the first dry photographic layer, drying said solution, and then coating the second photographic layer.

4. A process as in claim 1, wherein said first dry photographic layer is a neutralization layer and said second photographic layer is an image-receiving layer.

4,717,643

NO THERMAL CURE DRY FILM SOLDER MASK

Bernard J. Scheve, and Clement L. Brungardt, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 6, 1985, Ser. No. 762,906
Int. Cl.[4] G03C *1/71*; C08F *265/02*
U.S. Cl. 430—284 6 Claims

1. A binder material comprising the reaction product of:

(a) a polymerized mixture comprising, in percentage amounts based on the weight of the mixture, about 5% to about 50% polypropyleneglycol monomethacrylate, about 5% to about 50% methacrylic acid, 0% to about 40% a C_1 to about C_{12} alkyl acrylate or a mixture thereof, and 0% to about 40% a C_4 to about C_{12} alkyl methacrylate or a mixture thereof; and

(b) isocyanatoethyl methacrylate.

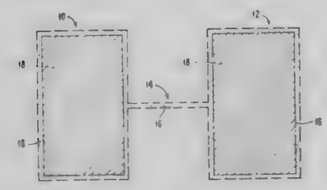
4. In a dry film solder mask composition comprising a binder material, photopolymerizable monomers, and a photoinitiator, the improvement wherein the binder material comprises the reaction product of: (a) a polymerized mixture comprising, in percentage amounts based on the weight of the mixture, about 5% to about 50% polypropyleneglycol monomethacrylate, about 5% to about 50% methacrylic acid, 0% to about 40% a C_1 to about C_{12} alkyl acrylate or a mixture thereof, and 0% to about 40% a C_4 to about C_{12} alkyl methacrylate or a mixture thereof; and (b) isocyanatoethyl methacrylate.

4,717,644

HYBRID ELECTRON BEAM AND OPTICAL LITHOGRAPHY METHOD

Fletcher Jones, and Henry R. Voelker, both of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,682
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—296 10 Claims



1. A method of exposing a radiation sensitive layer to a pattern having electron beam defined edges and resolution, but with improved electron beam exposure system thruput and reduced sensitivity to electron beam proximity effects, comprising the steps of:

electron beam exposing a radiation sensitive layer to an edge pattern, said edge pattern corresponding with the edge regions of a desired exposure pattern,

optically exposing said radiation sensitive layer to a non-edge pattern, said non-edge pattern corresponding with non-edge regions of said desired exposure pattern,

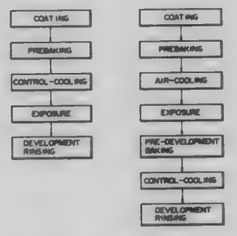
said electron beam exposure of an edge pattern and said optical exposure of a non-edge pattern being superposed to form said desired exposure pattern together.

4,717,645

METHOD AND APPARATUS FOR FORMING RESIST PATTERN

Yoshihide Kato, Kawasaki; Kei Kirita, Tokyo; Toshiaki Shinozaki, Yokohama; Fumiaki Shigemitsu, Yokohama; Kinya Usuda, Yokohama, and Takashi Tsuchiya, Urawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 571,092, Jan. 16, 1984, abandoned. This application Oct. 22, 1985, Ser. No. 789,366
Claims priority, application Japan, Jan. 19, 1983, 58-5876; Jan. 19, 1983, 58-5877; Jan. 19, 1983, 58-6984; Jan. 19, 1983, 58-6985
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—296 15 Claims



1. A method for forming a resist pattern, said method being used in lithography for semiconductor device fabrication and comprising the steps of:

applying a resist material selected from the group consisting of a photoresist material, a far-ultraviolet sensitive resist material, an electron beam sensitive resist material, an X-ray sensitive resist material and an ion beam sensitive resist material to a rigid substrate to form a resist film thereon;

baking said resist film; and, after baking,

controlling the cooling of said resist film with a cooling device wherein said cooling is carried out at a rate higher than 10° C./sec;

selectively irradiating a surface of said resist film with at least one member selected from the group consisting of electron beams, light rays, x-rays and ion beams; and

developing said resist film to form a resist pattern.

4,717,646

COMPOSITION AND METHOD FOR RESTORING OR COLOR CORRECTING FADED COLOR PHOTOGRAPHS AND SNAPSHOTS

Lewis A. Giorgi, 17 Normandy Rd., Yonkers, N.Y. 10701

Continuation-in-part of Ser. No. 673,950, Nov. 21, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,560
Int. Cl.[4] G03C *11/04*; G03D *15/00*; B65D *69/00*, *71/00*
U.S. Cl. 430—359 3 Claims

1. An anhydrous method of restoring faded or discolored color photographs or snapshots for use by amateurs which comprises cleaning those areas of the photographs or snapshots to be restored or color corrected by a preliminary water-free application of anhydrous acetone-free diacetone to remove any moisture or swelling from steam or water present in the gelatin emulsion of the photographs or snapshots, followed by coating the cleaned areas with a color corrective restoration solution of a powdered dye in anhydrous diacetone in the relative proportions of 40 grains:30 ml, thus providing a water-free liquid dyeing formulation.

4,717,647

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC ELEMENTS IN A BLEACHING BATH AND A BLIXING BATH

Akira Abe, Sayama, and Junya Nakajima, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 13, 1985, Ser. No. 775,527
Claims priority, application Japan, Sep. 21, 1984, 59-198197; Sep. 21, 1984, 59-198198
Int. Cl.[4] G03C *5/38*, *5/44*, *7/34*, *7/26*
U.S. Cl. 430—393 14 Claims

1. A method for the processing of a silver halide color photographic element comprising imagewise exposing the element, color developing the exposed element, followed by desilvering, wherein the de-silvering step comprises processing the developed element in a bleaching bath containing a bleaching agent comprising an aminopolycarboxylic acid ferric ion complex salt and subsequently in a blixing bath containing a bleaching agent comprising an aminopolycarboxylic acid ferric ion complex salt and a fixing agent.

4,717,648

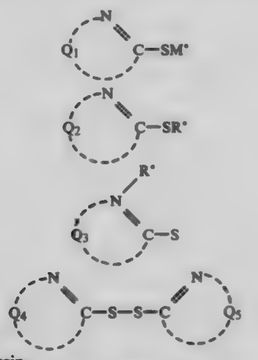
PROCESS FOR PROCESSING A COLOR REVERSAL PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shinji Ueda; Junya Nakajima; Tadao Shishido, and Sadanobu Shuto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 7, 1986, Ser. No. 827,139
Claims priority, application Japan, Feb. 7, 1985, 60-22603; Feb. 14, 1985, 60-26708
Int. Cl.[4] G03C *7/16*, *5/50*, *5/24*
U.S. Cl. 430—379 20 Claims

1. A process for processing a silver halide color reversal photographic light-sensitive material, which comprises treating an imagewise exposed silver halide color reversal photographic light-sensitive material with a black-and-white developer containing at least one compound selected from the compounds of Group A and at least one compound selected from the compounds of Group B, wherein

Group A consists of organic heterocyclic compounds represented by formulae (A-I), (A-II), (A-III), and (A-IV)



wherein

Q_1, Q_2, Q_3, Q_4, and Q_5 each represents an atomic group forming a 5- or 6-membered substituted or unsubstituted heterocyclic group, or an atomic group forming a 5- or 6-membered substituted or unsubstituted heterocyclic group condensed with a benzene ring; R° represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group; and M° represents a hydrogen atom, an alkali metal atom, or an ammonium ion; and

Group B consists of benzimidazole, indazole, benzotriazole, benzoxazole, and benzothiazole compounds, provided that they do not contain a thiol group, a thioether bond, a thioketone group, or a disulfide bond, the color reversal photographic light-sensitive material then being subjected to a fogging treatment and color development.

4,717,649

PHOTOGRAPHIC BLEACH-FIXING COMPOSITIONS

Jeffrey L. Hall, Rochester, and Jacob J. Hastreiter, Jr., Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,329
Int. Cl.[4] G03C *5/38*, *7/00*
U.S. Cl. 430—460 8 Claims

1. A photographic bleach-fixing composition comprising an aqueous alkaline solution of a peroxy compound and an ammonium or amine salt of a weak acid selected from the group consisting of carbonic acid, phosphoric acid, sulfurous acid, boric acid, formic acid, acetic acid, propionic acid, malonic acid and succinic acid.

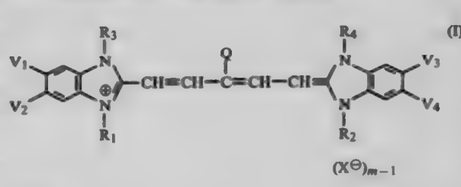
4,717,650

SILVER HALIDE PHOTOGRAPHIC EMULSION

Tadashi Ikeda; Haruo Takei; Masaki Okazaki, and Keizo Kimura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1986, Ser. No. 836,873
Claims priority, application Japan, Mar. 6, 1985, 60-44028
Int. Cl.[4] G03C *1/20*
U.S. Cl. 430—494 15 Claims

1. A silver halide photographic emulsion containing one or more sensitizing dye represented by formula (I)



wherein

R_1, R_2, R_3, and R_4 each represents an alkyl group, a substituted alkyl group or an alkenyl group;

V_1, V_2, V_3, and V_4 each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carboxyl group, an alkylsulfonyl group, a cyano group, or a trifluoromethyl group;

Q represents an alkyl group or an aralkyl group;

$X^\ominus$ represents an anion; and

m is 1 or 2, provided that when said dye forms an internal salt, m is 1.

4,717,651

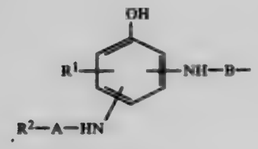
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobutaka Ohki, and Yoshinobu Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

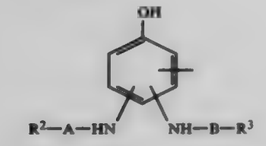
Continuation of Ser. No. 861,104, May 6, 1986, abandoned, which is a continuation of Ser. No. 600,671, Apr. 16, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,737
Claims priority, application Japan, Apr. 15, 1983, 58-66630; May 10, 1983, 58-81523
Int. Cl.[4] G03C *1/34*, *1/40*, *7/26*, *7/40*
U.S. Cl. 430—551 4 Claims

1. A silver halide color photographic light-sensitive material containing: a color stain inhibitor which is a polymer containing a group represented by general formula (I) or (II) as a pendant:

Formula (I)



Formula (II)



wherein:

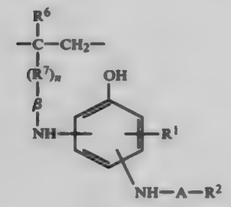
A and B are each —CO— or —SO_2—, provided that at least one of A and B is —SO_2—;

R^1 is selected from the group consisting of a hydrogen atom, a halogen atom, and a substituted or unsubstituted group selected from the group consisting of an alkyl group, an alkoxyl group, an arylsulfonamide group, an alkylsulfonamide group, an acylamino group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfamoylamino group, an alkoxycarbonylamino group, a carbamoylamino group, an acyl group, a sulfonyl group, and a carbamoyl group;

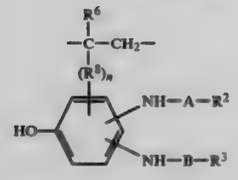
R^2 and R^3 is a substituted or unsubstituted group selected from the group consisting of an aryl group, an alkyl group, and an amino group, and wherein R^2 and R^3 may be the same or different; and

wherein the polymer containing a group represented by general formula (I) or (II) as a pendant is a polymer having a repeating unit represented by general formula (V) or (VI):

Formula (V)



Formula (VI)



wherein:

A, B, R^1, R^2, and R^3 are as defined in general formula (I) or (II);

R^7 and R^8 are each a divalent connecting group;

n is 0 or 1; and

R^6 is selected from the group consisting of a hydrogen atom, a halogen atom, and an alkyl group,

wherein said polymer does not form color by oxidative coupling with color developing agents during color development.

4,717,652

COMPOSITION FOR DETECTION OF PERITONEAL INFLAMMATION OR INFECTION

James L. Babb, Libertyville; Timothy G. Bloomster, Grayslake, and Jon A. Rudbach, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 658,020, Oct. 5, 1984, Pat. No. 4,654,298.
This application Oct. 22, 1986, Ser. No. 921,518
Int. Cl.[4] C12Q *1/00, 3/00*
U.S. Cl. 435—4 4 Claims

1. A composition for the detection of leukocytes in peritoneal lavage samples consisting essentially of a leukocyte lysing agent and a chromogenic or fluorogenic enzyme substrate specific for detecting leukocyte lysosomal enzymes selected from the group consisting of peroxidase, sulfatase, acid phosphatase, alkaline phosphatase, β-glucuronidase, acid β-glycerophosphatase, ribonuclease, cathepsin, lysozyme and phagocytin.

2. A composition according to claim 1 wherein the leukocyte lysing agent is saponin.

3. A composition according to claim 2 wherein the substrate is a member selected from the group consisting of O-phenylenediamine, a mixture of 3-methyl-2-benzothiazolinone hydrozone and 3-(dimethylamino) benzoic acid, 4-chloro-1-napthol, 2,3- azino-di-(3-ethylbenzothiazoline sulfone-6) diammonium salt, and 5-aminosalicylic acid.

4,717,653

METHOD FOR IDENTIFYING AND CHARACTERIZING ORGANISMS

John A. Webster, Jr., 8343 Carrleigh Pkwy., Springfield, Va. 22152

Filed Sep. 25, 1981, Ser. No. 305,498
Int. Cl.[4] C12Q *1/70, 1/68, 1/16;* C12N *15/00*
U.S. Cl. 435—5 41 Claims

1. A method of establishing the species of an unknown organism which comprises:

(1) providing as chromatographic pattern representing the hybridization of ribosomal RNA information containing nucleic acid from or derived from a known probe organism to restriction endonuclease-digested DNA from an unknown organism,

(2) comparing said pattern with a number of additional chromatographic patterns sufficient to enable the establishment of such species; each one of said additional chromatographic patterns representing the hybridization of ribosomal RNA information-containing nucleic acid from or derived from said known probe organism to restriction endonuclease-digested DNA from a known different organism species; and

(3) establishing the species of said unknown organism by means of a set of ribosomal RNA sequence-containing restriction fragments present in said chromatographic pattern of said unknown organism; said set being conserved among different strains of said species but not conserved among different species.

4,717,654

PROCESS FOR SOLID PHASE PLATELET ANTIBODY ASSAY

Kenneth V. Savoca, Edison, and Valerie E. Macdonald, Branchville, both of N.J., assignors to Akzo N.V., Arnhem, Netherlands

Filed Jun. 19, 1984, Ser. No. 622,350
Int. Cl.[4] G01N *33/535, 33/566, 33/554, 33/537*
U.S. Cl. 435—7 19 Claims

1. A method for detecting drug-induced thrombocytopenia which comprises:

(a) contacting blood platelets with a serum or plasma sample derived from a patient suspected of having a drug-induced thrombocytopenia and a drug suspected of causing the thrombocytopenia;

(b) incubating the platelets so treated for about 15 to about 25 minutes at a temperature of about 21 degrees C. to about 24 degrees C. to form a drug-antibody-platelet complex with any antibodies to said drug in said patient sample;

(c) washing the treated platelets with a wash solution containing said drug and resuspending the platelets in the wash solution;

(d) contacting a solid support having first bound thereto one or more of a group of immunoreactive proteins that will specifically react with a human antibody with the resuspended platelets and incubating these to bind any platelets having human antibody or hapten thereon to said solid support;

(e) decanting the platelets that remain unbound in step (d);

(f) measuring the platelets that become bound in step (d) by:

(1) contacting the solid support having platelets bound thereto with an immunological component that is immunoreactive with a human antibody, said immunological component having a detectable label, and incubating these;

(2) removing unbound immunological component by means of washing;

(3) measuring the quantity of label immobilized on said support; and

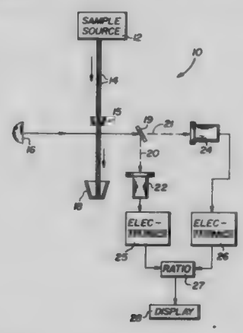
(g) determining whether the platelets that become bound in step (d) are part of the drug-antibody-platelet complex formed in step (b), indicating thrombocytopenia, by comparing the determined quantity of label in step (f)(3) with a standard curve and/or a quantity derived by repeating steps a) through (f) with the proviso that no drug is added in step (a) and that a wash solution containing no drug is used in step (c), whereby the presence of said complex is evidenced by a higher quantity of label determined for the patient sample than given by the standard curve or determined by repeating steps (a) through (f) without adding the drug in steps (a) and (c).

4,717,655

METHOD AND APPARATUS FOR DISTINGUISHING MULTIPLE SUBPOPULATIONS OF CELLS

Mack J. Fulwyler, Sunnyvale, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 412,648, Aug. 30, 1982, Pat. No. 4,499,052.
This application Oct. 15, 1984, Ser. No. 660,993
Int. Cl.[4] G01N *33/53, 33/554;* C12Q *1/04, 1/06*
U.S. Cl. 435—7 10 Claims



1. A method of distinguishing multiple subpopulations of cells comprising:

labeling antibody proteins of the same specificity with two fluorochromes in a pre-selected ratio and employing the same two fluorochromes in different pre-selected ratios to label antibody proteins with different specificities to thereby produce a plurality of differently labeled antibody proteins, each of said fluorochromes having distinct emission spectra;

forming a mixture of said differently labeled antibody proteins;

combining said mixture with a sample of cells believed to have specific receptors for said differently labeled antibody proteins;

providing excitation energy to said cells by flow-through cytometry techniques to excite both types of said fluorochromes;

analyzing each cell to determine the fluorescence emitted by both excited fluorochromes and to establish the ratio of the fluorescence emissions; and

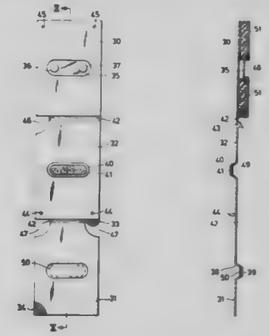
classifying each cell into a subpopulation category by associating the established ratio of each cell with said preselected ratios.

4,717,656

DEVICE FOR CHEMICAL ANALYSES AND USE THEREOF

Carl G. P. Swanljung, Trangsund, Sweden, assignor to Vertrik Bioteknik AB, Trangsund, Sweden

PCT No. PCT/SE84/00409, § 371 Date May 23, 1985, § 102(e) Date May 23, 1985, PCT Pub. No. WO85/02466, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 30, 1984, Ser. No. 740,065
Claims priority, application Sweden, Dec. 2, 1983, 8306666; Jul. 27, 1984, 8403883
Int. Cl.[4] G01N *31/22*
U.S. Cl. 435—7 29 Claims



22. A device for detecting a component in a sample, comprising:

at least one reagent selected to react with a sample to form a product having a detectable substance,

a detecting reagent selected to indicate the presence of the detectable substance and,

a continuous sheet having at least first and second segments, wherein

the first segment having a reaction site on which the at least one reagent is provided,

the second segment having a detecting site on which the detecting reagent is provided,

the first and second segments being foldably connected such that the reaction site may be brought into overlapping relationship with the detecting site, and

the sheet being provided with means for removing one of said detectable substance and an unreacted fraction of said at least one reagent from the reaction site so that the detectable substance may be reacted with the detecting reagent after separation of the detectable substance from an unreacted fraction of the at least one reagent,

wherein the at least one reagent and said detecting reagent form a material for biochemical analysis,

selected from the group consisting of enzyme immunoassay, fluorescence immunoassay, luminescence immunoassay and analysis based on hybridization reactions between nucleic acids.

4,717,657

PREDICTIVE TEST FOR ADVERSE REACTIONS TO IODINATED RADIOGRAPHIC CONTRAST MEDIA

Stephen M. Eaton, Hopewell; Horng-Mou Tsay, Kendall Park; James J. Hagan, Holmdel, and Frederick J. Yost, Long Valley, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 17, 1985, Ser. No. 755,756
Int. Cl.[4] C12Q *1/34, 1/36, 1/38, 1/44*
U.S. Cl. 435—18 19 Claims

1. A predictive test for determining whether a patient will react adversely when injected intravenously with iodine-containing contrast media comprising activating complement in a sample of the patient's whole blood, whole blood depleted of red blood cells or plasma using a non-radiographic media complement activator, quantitating the level of at least one product resulting from complement activation and comparing the level of that product to the level obtained in patients of known reactivity to radiographic contrast media.

4,717,658

GRAM NEGATIVE BACTERIA SCREENING METHOD WITH HORSESHOE CRAB AMEBOCYTE LYSATE (LAL)

Angela A. Michaels, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Dec. 3, 1985, Ser. No. 803,963
Int. Cl.[4] G01N *33/579*
U.S. Cl. 435—19 16 Claims

1. A gram negative bacteria screening method for determining the presence of at least 10^4 gram negative bacteria cells per milliliter of a urine sample, comprising the steps of:

(a) adding an undiluted urine sample to be tested to a test tube containing horseshoe crab amebocyte lysate and a first buffer capable of resisting a pH change in the pH range of from about 6.3 to about 7.5, to form a test tube mixture wherein the concentration of lysate is at least 3.5 milligrams per milliliter of the test tube mixture formed;

(b) incubating the test tube mixture for a time sufficient to activate the lysate;

(c) contacting a test device with the activated test tube mixture, said test device comprising a carrier matrix incorporated with a synthetic peptide substrate containing a chromogenic or fluorogenic leaving group capable of being cleaved by the activated lysate and a second buffer capable of resisting pH change in the pH range of from about 8.0 to about 8.9;

(d) removing the contacted test device; and

(e) determining the concentration of cleaved leaving group.

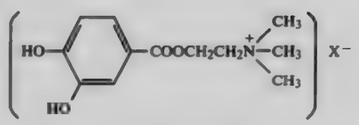
4,717,659

NOVEL METHOD FOR DETERMINING CHOLINESTERASE ACTIVITY

Katsumasa Kuroiwa; Katsuhiro Katayama; Katsuyuki Takabayashi, all of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed May 6, 1985, Ser. No. 731,069
Claims priority, application Japan, May 10, 1984, 59-93547
Int. Cl.[4] C12Q *1/46*
U.S. Cl. 435—20 7 Claims

1. A method for determining cholinesterase activity which comprises admixing a solution containing cholinesterase with a substrate, a protocatechuoylcholine halide derivative represented by the general formula (I),



(I)

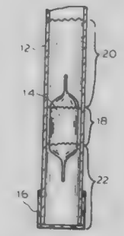
wherein X is a halogen atom, and thereafter measuring the optical absorbance of the resulting solution to determine the cholinesterase activity.

4,717,660

DETECTION OF BACTERIA BY FLUORESCENT STAINING IN AN EXPANDED BUFFY COAT

Thomas H. Schulte, Cary, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 26, 1984, Ser. No. 573,988
Int. Cl.[4] C12Q *1/24*
U.S. Cl. 435—30 17 Claims



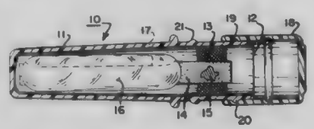
1. A method for the detection of bacteria in a blood sample comprising staining bacteria in a blood sample with ethidium bromide, centrifuging said sample in a hematocrit tube containing a float to cause formation of an expanded buffy coat and whereby the bacteria are concentrated in a buffy coat sublayer and then detecting said bacteria by applying excitation light to said expanded buffy coat and observing fluorescence emission from said expanded buffy coat.

4,717,661

BIOLOGICAL INDICATOR FOR STERILIZATION PROCESSES

Patrick J. McCormick, and John R. Scoville, Jr., both of Henrietta, N.Y., assignors to Castle Company, Rochester, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,354
Int. Cl.[4] C12Q *1/22;* C12M *1/16*
U.S. Cl. 435—31 6 Claims



1. A sterility indicator which comprises:

(a) a means defining an elongated outer compartment having a liquid impermeable and sustantially non-gas absorptive walls, said compartment having a closed end and a first opening at a distal end thereof and a second opening which is gas transmissive and bacteria-impermeable disposed at least partially around the perimeter of said outer compartment and located near said first opening, with a predetermined number of viable microorganisms being confined within said outer compartment and adjacent an area formed by said second opening to allow for direct impingement of a sterilant,

(b) a closure member normally closing said first opening and movable to a second position to also close said second opening; and

(c) an inner compartment containing a nutrient medium disposed within said outer compartment and being out of direct contact with said microorganisms, said inner compartment being adapted to open in response to external pressure thereby permitting said nutrient medium to contact said microorganisms.

4,717,662

THERMAL STABILIZATION OF ALPHA-AMYLASE

Curtis J. Montgomery; Jayarama K. Shetty, both of Elkhart, Ind., and Eric C. Singley, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 697,036, Jan. 31, 1985, abandoned. This application Aug. 22, 1985, Ser. No. 768,370
Int. Cl.[4] C12P *19/14;* C12N *9/96, 9/28;* C12R *1/10*
U.S. Cl. 435—99 21 Claims

8. A stabilized concentrated aqueous solution of alpha-amylase which contains an amphiphile represented by the formula:

R—COO⁻

where R is H or an aliphatic or aromatic group containing from 1 to 14 carbon atoms and is present in a concentration of at least 2.89 mole of carbohydrate per mole of alpha-amylase with a molecular weight of 58,000 daltons for the alpha-amylase being used for calculation purposes and wherein the aqueous solution contains no more than about 50 ppm calcium ion.

4,717,663

METHOD OF PRODUCING XANTHAN GUM

Ryoichi Minoshima, and Osamu Yamada, both of Yokohama, Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 784,897
Claims priority, application Japan, Oct. 12, 1984, 59-212450; Oct. 12, 1984, 59-212451
Int. Cl.[4] C12P *19/06;* C12N *1/38;* C12R *1/64*
U.S. Cl. 435—104 40 Claims

1. A method of producing Xanthan gum, comprising:

culturing a Xanthan gum producing microorganism of genus Xanthomonas under aerobic conditions in an aqueous culture medium comprising an assimilable carbon source and a vitamin, thereby producing Xanthan gum, said vitamin consisting of pantothenic acid or a derivative thereof including salts and esters, or consisting of thiamine or a derivative thereof including salts and esters, or consisting of a combination of pantothenic acid or a derivative thereof including salts and esters, and thiamine or a derivative thereof including salts and esters; and

recovering the Xanthan gum.

4,717,664

METHOD FOR PRODUCING SECONDARY METABOLITES OF PLANTS

Yasuhiro Hara, and Chuzo Suga, both of Ootake, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 405,104, Aug. 4, 1982, abandoned. This application Aug. 16, 1985, Ser. No. 766,672
Claims priority, application Japan, Aug. 11, 1981, 56-124765; Aug. 11, 1981, 56-124766; Aug. 11, 1981, 56-124767; Aug. 11, 1981, 56-124768; Aug. 11, 1981, 56-124769; Aug. 11, 1981, 56-124764
Int. Cl.[4] C12P *7/66, 1/00, 17/16, 17/18, 17/10, 17/12, 7/00;* C12N *5/00, 5/02*
U.S. Cl. 435—133 9 Claims

1. A method for producing secondary metabolites of Juglandaceae plants, Boraginaceae plants, Pyrolaceae plants, Plumbaginaceae plants, Lythraceae plants, or Ranunculaceae plants, by culturing cells of said plants obtained by culturing in a first liquid medium, the composition thereof favoring the growth of said plants and comprising inorganic substances and carbon sources as the essential constituents and further containing at least one of the group consisting of phytohormones, vitamins, and amino acids, and further culturing said cells obtained from the first medium in a second liquid medium, the composition of said second liquid medium favoring the production of the secondary metabolites, wherein the composition of the second liquid medium differs from the composition of the corresponding first liquid medium in at least two of the following concentrations (a) to (c), namely:

(a) the first medium contains inorganic nitrogen in an amount of 40 to 130 mM and the second medium contains inorganic nitrogen in a concentration of not more than 1/5 of the respective concentration in the first medium;

(b) the first medium contains inorganic phosphorus in an amount of 0.8 to 2.4 mM and the second medium contains inorganic phosphorus in a concentration of not more than 1/5 of the respective concentration in the first medium;

(c) the first medium contains potassium in an amount of 10 to 45 mM and the second medium contains potassium in a concentration of not more than 1/5 of the respective concentration in the first medium;

and concurrently in at least one of the concentrations (d) to (i), namely;

(d) the first medium contains copper ions in an amount of 0.015 to 0.15 μM, and the second medium contains copper ions in at least the three times concentration of the respective concentration in the first medium;

(e) the first medium contains manganese ions in an amount of 30 to 300 μM, iodine in an amount of 1 to 15 μM, and molybdate ions in an amount of 0.05 to 0.5 μM, and the second medium contains at least one of manganese ions, iodine ions, and molybdenum ions in a concentration of not more than 1/10 of the respective concentration in the first medium;

(f) the first medium contains vitamins in a total amount of 1 to 500 mg/liter, and the second medium contains vitamins in a concentration of not more than 1/10 of the respective concentration in the first medium;

(g) the first medium contains amino acids in a total amount of 0.1 to 100 mg/liter, and the second medium contains amino acids in a concentration of not more than 1/100 of the respective concentration in the first medium;

(h) the first medium contains cytokinins in a total amount of 0.01 to 10 μM and the second medium contains cytokinins in a concentration of not more than 1/100 of the respective concentration in the first medium;

(i) the first medium contains sulfate ions in an amount of 0.5 to 3 mM, and the second medium contains sulfate ions in at least the ten time concentration of the respective concentration in the first medium.

4,717,665

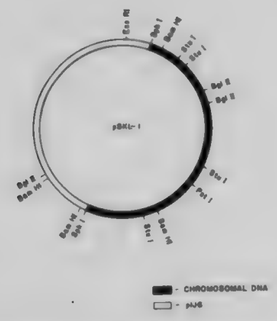
RECOVERY OF MICROBIAL LIPASE

Robert L. Charles, Elkhart; Steven C. Dolby, Middlebury; Chimanbhai P. Patel, Mishawaka, and Jayarama K. Shetty, Elkhart, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 16, 1986, Ser. No. 863,716
Int. Cl.[4] C12N *9/20*
U.S. Cl. 435—198 10 Claims

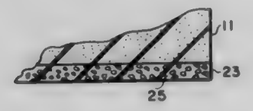
1. In combination with the preparation of microbial lipase by the growth of a species of microorganism in a suitable nutrient growth medium which results in the formation of microbial mycelium having lipase bound to the surface thereof the improvement which comprises contacting a water dispersion of the mycelium having lipase bound thereto with an anhydride of an organic acid at a pH of 7 to 9 to thereby separate the lipase from the mycelium.

4,717,666
CLONED STREPTOMYCETE LIVIDANS EXCRETABLE β-GALACTOSIDASE GENE
Mary E. Brawner, Wayne; Thomas G. Eckhardt, Collegeville, and Louis R. Fare, Lafayette Hill, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 586,536, Mar. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 384,650, Jun. 3, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 681,749
Int. Cl.[4] C12N *15/00, 1/20, 1/00*; C07H *15/12*
U.S. Cl. 435—253 21 Claims



1. An isolated DNA fragment containing the Streptomyces β-galactosidase gene *Streptomyces lividans*.

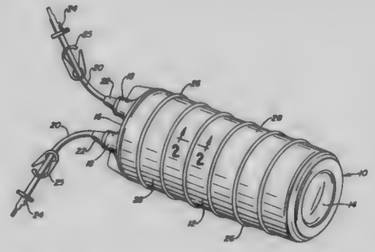
4,717,667
COLONY REPLICATING DEVICE
Richard B. Provoachee, Camden, Me., assignor to FMC Corporation, Philadelphia, Pa.
Filed Jul. 11, 1984, Ser. No. 629,653
Int. Cl.[4] C12M *1/26*; C12Q *1/24*
U.S. Cl. 435—292 14 Claims



1. A device for replicating bacterial or other cell colonies comprising a layered structure of
(i) a rigid layer means;
(ii) a backing layer made of flexible foam which is secured to one side of the rigid means;
(iii) a transfer layer which is attached to the side of the backing layer opposite from the rigid means and which is made from open-cell, porous, flexible foam; and
(iv) a hydrophilic material included within the transfer layer and at its exposed surface, the hydrophilic material-containing foam transfer layer being air-porous and compliant but less resilient than the foam backing layer.

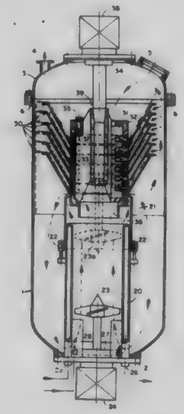
4,717,668
PLASTIC ROLLER BOTTLE FOR SUSPENSION CULTURES
Michael R. Keilman, Mundelein, and Ronald P. Symbol, Round Lake Beach, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Dec. 12, 1986, Ser. No. 940,889
Int. Cl.[4] C12M *1/24*
U.S. Cl. 435—296 11 Claims

1. A plastic culture bottle which comprises: a closed bottle defining a longitudinal axis and having flexible plastic walls; aseptically sealable means for access into said closed body; and a plurality of spaced reinforcement rings defined in said flexible plastic walls about said longitudinal axis, to cause said body to normally retain a predetermined, generally cylindrical



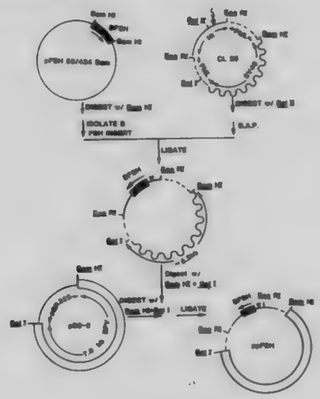
shape, the flexible plastic walls being made of a plastic formulation and being of a thickness, at least apart from said rings, such that the rate of oxygen and carbon dioxide diffusion through said plastic walls is sufficient to permit the culturing of microorganisms and cells of aerobic metabolism.

4,717,669
CENTRIFUGAL FILM FERMENTER
Vaclav Feres, Haid-und Neu-Strasse 14, 7500 Karlsruhe 1, Fed. Rep. of Germany, and Rudolph V. Roubicek, 1304 Delano, Las Cruces, N. Mex. 88001
Filed Aug. 18, 1986, Ser. No. 897,350
Int. Cl.[4] C12M *1/06*
U.S. Cl. 435—315 7 Claims



1. A centrifugal film fermenter comprising:
a closed sterilizable fermentation vessel;
rotatable distributor means disposed axially within said vessel comprising a plurality of perforations to facilitate the flow of liquids and gases therethrough;
two or more truncated conical surfaces fixedly attached to said distributor means and located adjacent to said perforations so as to accept said flow of liquids and gases;
rotation means connected to said distributor means through central shaft means;
cylindrical heat exchange means disposed below said distributor means, and comprising heat exchange medium inlet and outlet means;
cylindrical flow regulator means slidably engaged with the outer surface of said heat exchange means through height adjustment means;
one or more propeller means disposed within said cylindrical heat exchanger means and connected through a shaft to rotatation means;
gas sparging means disposed within said heat exchange means having its outlet inside said vessel and its inlet extending through said vessel to its outer surface.

4,717,670
PORCINE BETA FSH
Anton E. Beck, Chestnut Hill, Mass., assignor to Integrated Genetics, Inc., Framingham, Mass.
Continuation of Ser. No. 618,466, Jun. 8, 1984. This application Oct. 20, 1986, Ser. No. 921,867
Int. Cl.[4] C12N *1/00, 15/00*; C12P *21/00*; C07H *15/12*
U.S. Cl. 435—320 3 Claims

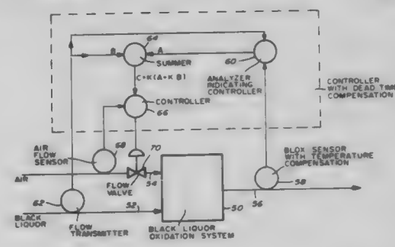


1. A cDNA sequence encoding porcine beta FSH.

4,717,671
STABILIZED WATER INDICATING PASTE COMPOSITION
Frank W. Melpolder, Wallingford, Pa., assignor to Pony Industries, Inc., New York, N.Y.
Division of Ser. No. 507,856, Jun. 27, 1983, Pat. No. 4,578,357. This application Jan. 3, 1986, Ser. No. 816,038
Int. Cl.[4] C09K *3/00*; G01N *33/18, 5/02*
U.S. Cl. 436—39 10 Claims

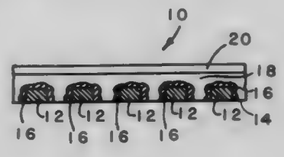
1. A method for detecting water present an an ingredient in an admixture of an aqueous solution and a separate hydrocarbon liquid phase comprising:
(a) providing a water finding probe coated on at least one end thereof with a visual indicating paste composition comprising (i) a water soluble indicator dye capable of changing color in the pH range between about 7 and 11, (ii) an inorganic base in the form of a caustic powder dispersed in a liquid carrier capable of absorbing water but which is not rapidly leached by water or hydrocarbon, (iii) a gelling agent, and (iv) a boron-containing compound which is miscible with or soluble in said carrier and capable of being hydrolyzed upon contact with water to yield boric acid or a salt thereof, present in a moisture inhibiting amount,
(b) inserting the coated end of said probe into said admixture, and
(c) removing said probe from said admixture, and observing thereon, a clear detectable color change, without bleeding or run-off, upon contact with the aqueous solution contained in said admixture.

4,717,672
OXIDATION SENSOR
Bruce I. Fleming, 45 Tunstall Avenue, Senneville, Quebec, Canada (H9X 1T3), and Richard D. Mortimer, 14327 Meadowvale, Pierrefonds, Quebec, Canada (H9H 1N8)
Filed Dec. 10, 1985, Ser. No. 807,149
Claims priority, application Canada, Dec. 21, 1984, 470960
Int. Cl.[4] G01N *35/08*; D21C *11/00*
U.S. Cl. 436—55 8 Claims



1. In a process liquor oxidation system which includes a liquor reactant inlet, an oxidizing agent reactant inlet and treated process liquor outlet, the improvement characterized by:
(i) sensor means located at said treated process liquor outlet, said sensor means comprising a first electrode selected from the group of metals consisting of chromium, silver, molybdenum and tungsten, a second electrode selected from the group consisting of nickel, cobalt, iridium, rhenium, palladium and platinum, means for generating a signal proportional to the potential difference between said first and second electrode;
(ii) control means associated with at least one of said inlets for controlling the amount of at least one of the reactants fed into said process liquor oxidation system; and
(iii) a controller adapted to receive said signal from said sensor means and to send a further signal to said control means to thereby control the amount of said at least one reactant into said process liquor oxidation system in response to the signal from said sensor means.

4,717,673
MICROELECTROCHEMICAL DEVICES
Mark S. Wrighton, Winchester, Mass.; Henry S. White, Jr., Minneapolis, Minn., and James W. Thackeray, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 674,410, Nov. 23, 1984. This application Nov. 19, 1985, Ser. No. 798,263
Int. Cl.[4] G01N *27/22, 27/26*
U.S. Cl. 436—68 19 Claims



1. A microelectrochemical device comprising at least two electrically conductive electrodes, separated by less than two microns, on an inert insulating substrate overlaid with a conducting polymer polymerized from thiophene or derivatives of thiophene.

14. A method for sensing low magnitude chemical or electrical signals comprising:

providing a device including at least two electrically conductive electrodes separated by less than two microns on an inert insulating substrate, wherein said electrodes are overlaid with a polymer of thiophene or derivatives of thiophene, and

detecting signals by measuring changes in conductivity of said polymer that are a result of a change in the state of charge of said polymer which results in a net change in the concentration of ionic species in said polymer.

4,717,674

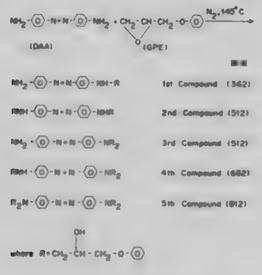
METHOD TO CHARACTERIZE CURING OF EPOXY WITH AROMATIC DIAMINES

Chong S. P. Sung, Mansfield Apts, No. 71, Storrs, Conn. 06268

Continuation-in-part of Ser. No. 800,443, Nov. 21, 1985, abandoned. This application Jun. 25, 1986, Ser. No. 878,138

Int. Cl.⁴ G01N *33/00, 33/44*

U.S. Cl. 436—85 **25 Claims**



1. An epoxy system comprising epoxide, a curing agent, and a label selected from the group consisting of azonapthalene dyes, benzylidene-dianiline dyes and conjugated stilbene dyes, wherein said label reacts with the epoxide at a rate comparable to the reaction rate of the curing agent with the epoxide, said label and concentration of said label selected to produce a fluorescence intensity proportional to the concentration of epoxy cure products.

4,717,675

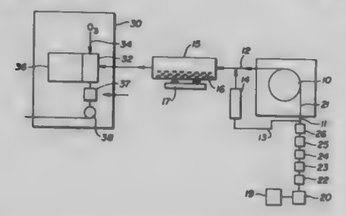
METHOD FOR SELECTIVE CONVERSION OF ORGANIC COMPOUNDS AND DETECTING SAME BY GAS CHROMOTOGRAPHY AND CHEMILUMINESCENCE DETECTION

Robert E. Sievers, and Stefan A. Nyarady, both of Boulder, Colo., assignors to Sievers Research, Inc., Boulder, Colo.

Continuation of Ser. No. 637,505, Aug. 3, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 810,883

Int. Cl.⁴ G01N *21/76*

U.S. Cl. 436—103 **10 Claims**



1. A process for the detection of organic compounds comprising:

catalyzing a heterogeneous phase reduction-oxidation reaction between a nitrogen oxide oxidizing agent, selected from the group consisting of nitric acid and nitrogen dioxide, and a compound capable of reducing said oxidizing agent to nitric oxide, said reducing compound being selected from the group consisting of alcohols, aldehydes, amines, ketones, phenols, olefins, aromatic compounds, and oxygen, sulphur, nitrogen and phosporous-containing compounds of the foregoing and mixtures thereof, in the presence of a solid elemental gold catalyst, whereby said reducing compound is oxidized to a more highly unsaturated, dehydrogenated oxidation state and nitric oxide is thereby produced;

recovering said nitric oxide;

contacting said recovered nitric oxide with ozone, whereby chemiluminescence is emitted; and

detecting the emitted chemiluminescence whereby the measure of light provides an indication of the amount of said reducing compound.

4,717,676

VESICLES AND USE THEREOF IN AN ASSAY

Daniel B. Wagner, Raleigh, N.C., and Uri Piran, Norwood, Mass., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 3, 1986, Ser. No. 835,781

Int. Cl.⁴ G01N *33/544*

U.S. Cl. 436—501 **14 Claims**

1. A composition, comprising:

a sac, said sac including a detectable marker and being derivatized with a ligand, at least a portion of said sac being formed from a compound having the following formula:

X—Y—Z

wherein

X is a hydrophobic radical;

Y is a hydrophilic peptide; and

Z is a radical including a non-hydrolyzable polar group.

4,717,677

FABRICATING A SEMICONDUCTOR DEVICE WITH BURIED OXIDE

Kevin L. McLaughlin, Chandler, and Mark S. Birrittella, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 19, 1985, Ser. No. 766,995

Int. Cl.⁴ H01L *21/76*

U.S. Cl. 437—24 **3 Claims**

1. A method for fabricating, buried oxide integrated circuit devices which comprises:

providing a semiconductor substrate having a first epitaxial layer at a surface thereof;

forming an implant mask over selected regions of the first epitaxial layer, thereby leaving unmasked regions therein;

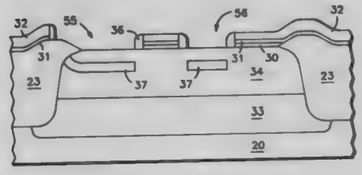
implanting oxygen into the unmasked regions of the first epitaxial layer to form a buried oxide region therein;

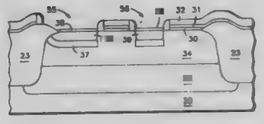
selectively applying a second epitaxial layer on the first epitaxial layer over the buried oxide region;

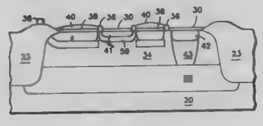
forming an extrinsic base region by selectively applying conductivity determining impurities into the second epitaxial layer;

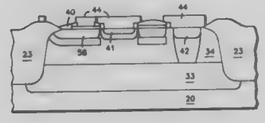
diffusing the impurities through the second epitaxial layer and the first epitaxial layer down to the buried oxide;

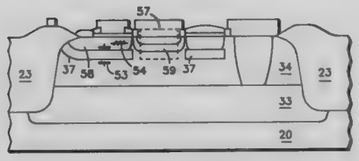
forming an intrinsic base region by selectively applying conductivity determining impurities into the first epitaxial layer adjacent to the extrinsic base region; and











forming an emitter region by selectively applying conductivity determining impurities into the intrinsic base region.

4,717,678

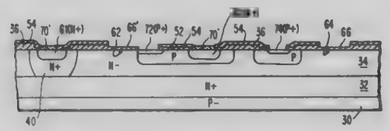
METHOD OF FORMING SELF-ALIGNED P CONTACT

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1986, Ser. No. 837,125

Int. Cl.⁴ H01L *21/265, 21/40*

U.S. Cl. 437—27 **20 Claims**



1. A method for forming low resistance ohmic contacts to doped regions in a semiconductor substrate comprising:

providing a semiconductor substrate having at least one region of a first conductivity type and a second region of a second conductivity type on a surface thereof;

forming an insulator layer on said substrate surface;

forming contact openings in said insulator corresponding to said first and second conductivity type regions;

forming an insulator in said openings, by thermal oxidation the insulator in said opening corresponding to said second conductivity type region being 3–5 times thicker than that in said opening corresponding to said first conductivity type region;

removing said insulator in said opening corresponding to said first conductivity type region while maintaining substantially said insulator in said opening corresponding to said second conductivity type region;

introducing first conductivity type dopant into said first conductivity type region through said corresponding contact opening to reduce contact resistance;

removing said insulator in said contact opening to said second conductivity type region; and

forming ohmic contacts to said first and second conductivity type regions via said respective contact openings.

4,717,679

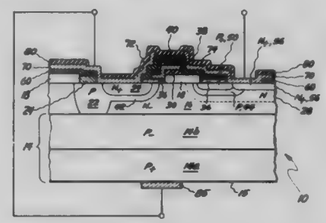
MINIMAL MASK PROCESS FOR FABRICATING A LATERAL INSULATED GATE SEMICONDUCTOR DEVICE

Bantval J. Baliga, and Tat-Sing P. Chow, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 26, 1986, Ser. No. 935,470

Int. Cl.⁴ H01L *21/38, 21/425*

U.S. Cl. 437—29 **31 Claims**



1. A method of fabricating a lateral insulated gate semiconductor device comprising the steps of:

(a) providing a first semiconductor layer of one type conductivity;

(b) providing a second layer of opposite type conductivity atop said first layer;

(c) establishing a first protective layer atop said second layer;

(d) opening a first window in said first protective layer to expose a first surface portion of said second layer;

(e) doping said first surface portion of said second layer with one type conductivity material to establish a first region of one type conductivity in said second layer;

(f) forming a second protective layer in said first window;

(g) opening a second window through said first protective layer to expose a second surface portion of said second layer;

(h) doping said second surface portion of said second layer with opposite type conductivity material to establish a second region within said second layer;

(i) forming a third protective layer in said first and second windows;

(j) opening a third window through said first, second and third protective layers to expose a third surface portion of the second layer comprising a portion of the surface of said first region and said second layer;

(k) opening a fourth window through said third protective layer to expose a fourth surface portion of said second region;

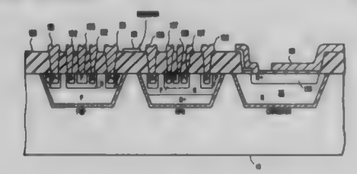
(l) establishing a fourth protective layer within said third and fourth windows;
(m) forming a gate layer within said third window atop said fourth protective layer;
(n) introducing one type conductivity dopants through said third and said fourth windows to form a third region in said third surface portion of said second layer and a fourth region in said fourth surface portion of said second layer;
(o) removing said third protective layer to expose a fifth surface portion of said second layer; and
(p) doping said third and fifth surface portions of said second layer with opposite type conductivity impurities to establish fifth and sixth regions of opposite type conductivity wherein said fifth region is established within said third region and said sixth region is established within said second layer.

4,717,680

FABRICATION OF VERTICAL NPN AND PNP BIPOLAR TRANSISTORS IN MONOLITHIC SUBSTRATE

Leo R. Piotrowski, Indian Harbour Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 787,927, Oct. 16, 1985, Pat. No. 4,665,425.
This application Jan. 5, 1987, Ser. No. 377
Int. Cl.[4] H01L *21/425*
U.S. Cl. 437—31 **21 Claims**



21. A process for forming bipolar devices in dielectrically isolated first and second conductivity type regions in a semiconductor substrate comprising the steps of:
(a) selectively introducing first type impurities into said dielectrically isolated second and first conductivity type regions to form bases of first bipolar devices and collector contact regions of second bipolar devices;
(b) selectively introducing second type impurities into said dielectrically isolated second and first conductivity type regions to form collector contact regions of first bipolar devices and bases of second bipolar devices;
(c) selectively introducing second type impurities to a prescribed depth in the said first type bases of said first bipolar devices to form first emitter regions of first bipolar devices, the base widths of said first bipolar devices being defined between the bottoms of said second type emitter regions and the bottoms of said first type base regions; and
(d) selectively introducing first type impurities to a prescribed depth in the second type bases of said second bipolar devices to form first type emitter regions of second bipolar devices, the base widths of said second bipolar devices being defined between the bottoms of said first type emitter regions and the bottoms of said first second base regions.

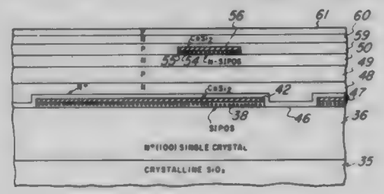
4,717,681

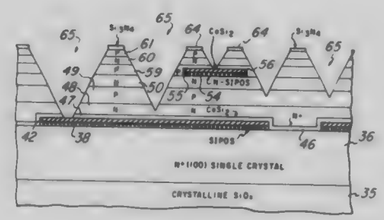
METHOD OF MAKING A HETEROJUNCTION BIPOLAR TRANSISTOR WITH SIPOS

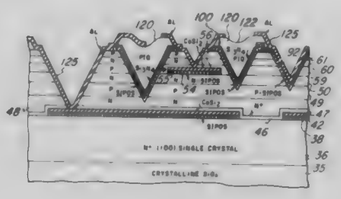
Patrick A. Curran, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

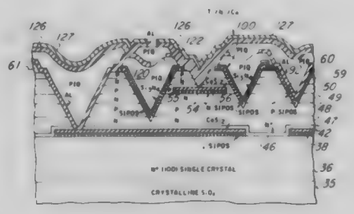
Filed May 19, 1986, Ser. No. 864,671
Int. Cl.[4] H01L *21/265, 29/72*
U.S. Cl. 437—31 **5 Claims**

1. A method for the fabrication of semiconductor device structures, comprising:
(a) providing a monocrystalline silicon substrate of crystal orientation;
(b) by molecular beam deposition, forming on said substrate a first layer of oxygen doped polycrystalline silicon;
(c) depositing a first layer of transition metal silicide on said polycrystalline silicon layer;
(d) patterning said deposited layers to re-expose selected substrate areas;
(e) depositing three monocrystalline layers of silicon over the patterned structure, of alternating conductivity type, to form collector, base, and emitter regions, respectively;









(f) depositing a second layer of oxygen doped polycrystalline silicon on the third monocrystalline silicon layer;
(g) depositing a second layer of transition metal silicide on said second polysilicon layer;
(h) patterning the second polysilicon and second silicide layers to selectively re-expose portions of said third monocrystalline silicon layer;
(i) epitaxially growing fourth, fifth and sixth layers of monocrystalline silicon, of alternating conductivity type, on the resulting composite from step h;

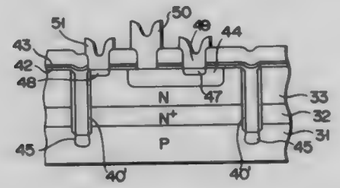
(j) selectively masking and anisotropically etching the structure from step i to form a plurality of V-shaped grooves of different depths, controlled by the widths of exposed silicon;
(k) thermally annealing the resulting composite to modify the grain structure of the oxygen doped polycrystalline silicon layers; and
(l) completing the structure by passivation and selective metallization of ohmic contact areas.

4,717,682

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH CONDUCTIVE TRENCH SIDEWALLS

Shin-ichi Taka; Jiro Ohshima, both of Kawasaki; Masahiro Abe, Yokohama, and Masaharu Aoyama, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1986, Ser. No. 830,928
Claims priority, application Japan, Feb. 20, 1985, 60-30576
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—31 **5 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:
(a) forming a buried region doped with an impurity in a major surface of a semiconductor substrate;
(b) forming a epitaxial layer on the major surface of said semiconductor substrate which includes said buried region;
(c) forming an annular trench extending through said buried region;
(d) depositing impurity-doped polysilicon on an inner surface of said annular trench, saidn impurity being of the same conductivity type as that of said buried region;
(d') etching the impurity-doped polysilicon by reactive ion etching to leave as a conductive layer a portion of said impurity-doped polysilicon in direct contact with a side wall surface of said annular trench;
(e) filling said annular trench with an insulating material; and
(f) forming a functional element in said epitaxial layer surrounded by said buried region and said insulating material within said annular trench.

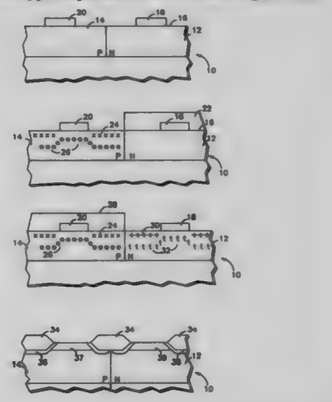
4,717,683

CMOS PROCESS

Louis C. Parrillo, Austin, Tex.; Stephen J. Cosentino, and Bridgette A. Bergami, both of Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 23, 1986, Ser. No. 910,927
Int. Cl.[4] H01L *21/22, 21/265*
U.S. Cl. 437—34 **10 Claims**

1. A process for fabricating complementary insulated gate field effect transistors including doped field isolation regions which comprises the steps of:
providing a silicon substrate having an N-type first surface region and a P-type second surface region;
forming first and second masks overlying active areas of said first and second surface;
forming a third mask overlying said first region and said first mask;
implanting first P-type impurities into said second region with an implant energy sufficient to penetrate through said second mask but insufficient to penetrate through said third mask;
implanting second P-type impurities into said second region with an implant energy insufficient to penetrate through said second mask;
forming a fourth mask overlying said second region and said second mask;
implanting first N-type impurities into said first region with



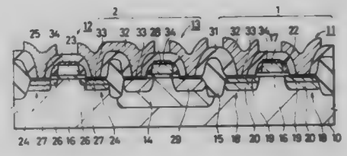
an implant energy sufficient to penetrate through said first mask but insufficient to penetrate through said fourth mask;
implanting second N-type impurities into said first region with an implant energy insufficient to penetrate through said first mask;
and oxidizing to form a field oxide at portions of said first and second surface regions not overlaid by said first and second masks.

4,717,684

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hisao Katto, Hinode, and Kousuke Okuyama, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,587
Claims priority, application Japan, Feb. 1, 1985, 60-16508
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—34 **29 Claims**



17. A method of manufacturing a semiconductor integrated circuit device which has first and second MOSFETs of N-channel type and a third MOSFET of P-channel type which are formed on a semiconductor substrate, comprising:
the step of forming gate electrodes of said first, second and third MOSFETs on said semiconductor substrate;
the step of forming on said semiconductor substrate a first mask which covers at least a region to form said third MOSFET;
the step of introducing, after forming said first mask, an impurity of a first conductivity type at a low concentra-

tion into at least a region to form said first MOSFET, by employing said gate electrodes as a mask, whereby second semiconductor regions are formed;
the step of forming side wall spacers on two side walls of each of said gate electrodes of said first, second and third MOSFETs;
the step of forming on said semiconductor substrate a second mask which covers regions to form said first and third MOSFETs;
the step of introducing, after forming said second mask, phosphorus impurity into a region to form said second MOSFET, by employing said gate electrode and said side wall spacers as a mask, whereby third semiconductor regions as source and drain regions of said second MOSFET are formed, said source and drain regions being phosphorus-doped source and drain regions, an impurity concentration of said third semiconductor regions being higher than that of said second semiconductor regions;
the step of forming on said semiconductor substrate a third mask which covers at least a region to form said third MOSFET;
the step of introducing, after forming said third mask, an impurity of the first conductivity type into at least said region to form said first MOSFET, by employing said gate electrode and said side wall spacers as a mask, whereby first semiconductor regions are formed, an impurity concentration of said first semiconductor regions being higher than that of said second semiconductor regions, a source or drain region of said first MOSFET being made of said first and second semiconductor regions;
the step of forming on said semiconductor substrate a fourth mask which covers regions to form said first and second MOSFETs; and
the step of introducing an impurity of a second conductivity type into said region to form said third MOSFET, by employing said gate electrode and said side wall spacers as a mask, whereby fourth semiconductor regions as source and drain regions of said third MOSFET are formed.

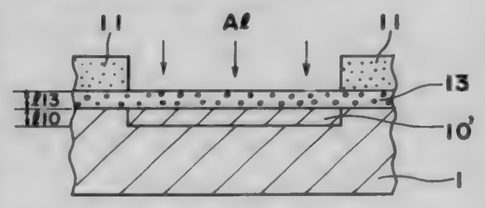
4,717,685

METHOD FOR PRODUCING A METAL SEMICONDUCTOR FIELD EFFECT TRANSISTOR

Shigeru Nakajima, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 7, 1986, Ser. No. 860,425
Claims priority, application Japan, May 9, 1985, 60-98293
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—44 **3 Claims**

1. A method for producing a metal semiconductor field effect transistor comprising the steps of:
depositing a film layer of silicon nitride with a thickness of approximately 1000 Å on the upper surface of a semiconductor substrate of GaAs;
forming a first mask pattern wherein the mask is made of a material selected from the group consisting of SiO_2, Ti, W, Mo, or Ni on one portion of the upper surface of the film layer of silicon nitride;
forming a first layer which will be a buffer layer of $Al_x Ga_{(1-x)}As$ in a predetermined region of the semiconductor substrate using said first mask pattern by selective Al ion implantation at a dose of 8×10^{16} cm^{-2} and an acceleration energy of 30 keV;
forming a second layer which will become an active layer of GaAs in a predetermined region of the semiconductor substrate using said first mask pattern by selective ion implantation at a dose of 8×10^{12} cm^{-2} and an acceleration energy of 60 keV;
removing said first mask pattern;
removing said film layer of silicon nitride,
forming a metal gate electrode on the upper surface of the semiconductor substrate, the metal being of a material which when connected to GaAs forms a Schottky contact,
forming a second mask pattern wherein the mask is made of a material selected from the group consisting of SiO_2, Ti, W, Mo, or Ni on one portion of the upper surface of a semiconductor substrate of GaAs;
forming regions of high impurity concentration regions in predetermined regions at both sides of said gate electrode in the semiconductor substrate using said second mask pattern by ion implantation at a dose of 4×10^{13} cm^{-2} and an acceleration energy of 150 keV;
removing the second mask pattern;



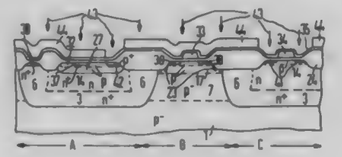
annealing the semiconductor substrate comprising said first and second layers and said regions in N_2 gas at 800° C. for 20 minutes, wherein said first and said second layers become a buffer layer of $Al_xGa_{(1-x)}As$ and an active layer of GaAs, respectively, and said regions become high impurity concentration regions; and
forming a source electrode and a drain electrode on the upper surface of said high impurity concentration regions, respectively,
whereby said buffer layer of $Al_xGa_{(1-x)}As$ is formed above the active layer of GaAs.

4,717,686

METHOD FOR THE SIMULTANEOUS MANUFACTURE OF BIPOLAR AND COMPLEMENTARY MOS TRANSISTORS ON A COMMON SILICON SUBSTRATE

Erwin P. Jacobs, Vaterstetten, and Josef Winnerl, Landshut, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 869,306
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519790
Int. Cl.⁴ H01L *21/265, 21/22, 29/78*
U.S. Cl. 437—56 **21 Claims**



1. A method for the simultaneous manufacture of bipolar and complementary MOS transistors on a common silicon substrate which comprises, in sequence:
(a) providing a p-doped silicon substrate,
(b) applying a surface-wide double insulation layer composed of silicon dioxide and silicon nitride over said substrate,
(c) photolithographically structuring said silicon nitride layer,
(d) forming a deeply extending collector region in said substrate by deep implantation of said substrate with n-doping ions through said silicon nitride,
(e) removing the silicon nitride structures from said substrate,
(f) implanting n-doping ions into said substrate to form n-wells in the regions from which said silicon nitride was removed,
(g) diffusing in n-doping ions into said substrate while simultaneously oxidizing the surfaces of said n-wells to form oxide masks,
(h) removing said silicon nitride layer and performing deep channel implantation of boron ions into said substrate through said oxide masks,
(i) applying a double layer of silicon dioxide and silicon nitride over said substrate,
(j) structuring said silicon nitride layer to open the active regions and selectively masking by photoresist selected regions of the opened area,
(k) implanting boron ions through the masks provided in step (j) to dope the field oxide regions of the n-channel transistors to be formed,
(l) removing the photoresist mask provided in step (j) and locally oxidizing said substrate to form field oxide regions for separating the active transistor regions of said substrate, utilizing the silicon nitride applied in step (i) as a mask,
(l') applying a photoresist mask to define the base of the bipolar transistor,
(m) implanting boron ions to form base zones in the bipolar transistor region,
(n) removing the photoresist mask and oxidizing the substrate surface-wide to produce a gate oxide thereon,
(o) implanting boron ions surface-wide to dope the channel regions of the n-channel and p-channel MOS transistors,
(p) depositing a gate material surface-wide to provide the gate electrodes of said MOS transistors,
(q) vapor depositing a surface-wide layer of silicon dioxide to form an intermediate oxide,
(r) selectively implanting n-doping ions to form source/drain regions of the n-channel transistors and the n^+ emitter and the n^+ collector contact of the bipolar transistors having masked before all other regions by photoresist,
(s) selectively implanting boron ions to form source/drain regions of the p-channel transistors and the p^+ base contact of the bipolar transistors having masked before all other regions by photoresist, and
(t) removing the photoresist mask, etching the contact holes, and performing usual metallization technique.

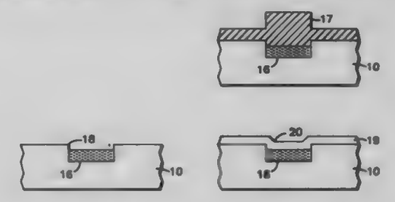
4,717,687

METHOD FOR PROVIDING BURIED LAYER DELINEATION

Jaipal S. Verma, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 26, 1986, Ser. No. 878,931
Int. Cl.⁴ H01L *21/383, 21/425*
U.S. Cl. 437—97 **5 Claims**

1. A method of providing a buried layer having inherent pattern delineation, comprising: adding dopants to a preselected area of a substrate; heating the substrate to a predetermined temperature for annealing; growing oxide on the substrate while maintaining the added dopants in a metastable state so that the area containing the added dopants oxidizes faster; increasing the temperature of the substrate to diffuse the added dopants to form the buried layer; removing the oxide to leave the buried layer at a lower level than the surface of the substrate; and growing an epitaxial layer over the substrate thereby burying the buried layer and causing a depression in



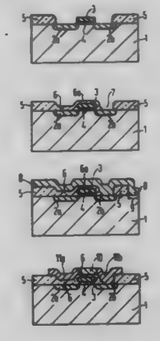
the epitaxial layer due to the difference in level between the surface of substrate and the buried layer, and wherein the depression provides the pattern delineation.

4,717,688

LIQUID PHASE EPITAXY METHOD

Ottomar Jaentsch, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,486
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612128
Int. Cl.⁴ H01L *21/368*
U.S. Cl. 437—120 **7 Claims**



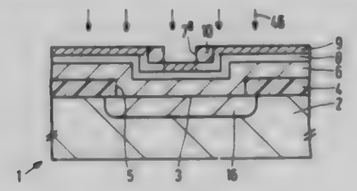
1. In a liquid phase epitaxy method for the manufacture of three-dimensional semiconductor structures on a silicon substrate in which a molten metal solvent is employed for the manufacture of uniformly doped silicon layers, the improvement which comprises:
employing as the solvent a metal having the following characteristics:
(1) a solution of said metal saturated with silicon is molten at temperatures below 900° C.,
(2) the metal does not produce doping in the silicon which corresponds to a concentration of more than 10^{17} doping atoms/cm^3, and
(3) the metal is not a silicide-forming agent.

4,717,689

METHOD OF FORMING SEMIMICRON GROOVES IN SEMICONDUCTOR MATERIAL

Henricus G. R. Maas, and Johannes A. Appels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,330
Claims priority, application Netherlands, Sep. 18, 1984, 8402859
Int. Cl.[4] H01L 21/76
U.S. Cl. 437—225 33 Claims



2. A method of forming at least one narrow groove in a substantially uniform layer of a material, said narrow groove having a width determined in a self-registering manner, said method comprising the steps of

providing a first masking layer of a first masking material at a major surface of a substrate, said first masking layer having at least one opening or depression,

providing a substantially uniform layer of a first material on said first masking layer, said layer of said first material having a first depression over said at least one opening or depression,

providing a substantially uniform second masking layer of a second masking material on said layer of said first material, said second masking layer having a second depression over said first depression of said first material,

providing a substantially uniform first convertible layer of a first convertible material on said second masking layer, said first convertible layer having a third depression over said second depression of said second masking layer,

forming an intermediate mask from said first convertible material, said intermediate mask having an opening at sides of said third depression to expose said second masking layer

etching exposed portions of said second masking layer at sides of said second depression and removing said intermediate mask, and

etching at least one narrow groove through said first material at sides of said first depression using said second masking layer as a mask, wherein said intermediate mask is formed by the steps of providing a substantially uniform third masking layer of a third masking material on said first convertible layer, etching said third masking layer to form only edge covers on said first convertible layer at sides of said third depression, converting uncovered positions of said first convertible material into said intermediate mask, and removing said edge covers.

4,717,690

OVERGLAZE INKS

Dana L. Hankey, Santa Barbara, Calif., and Robert C. Sutterlin, Aston, Pa., assignors to Heraeus, Inc. Cermalloy Division, W. Conshohocken, Pa.

Filed Feb. 12, 1986, Ser. No. 828,938
Int. Cl.[4] C03C 8/16
U.S. Cl. 501—20 23 Claims

1. An overglaze ink consisting essentially of

(a) 55 to 70 weight % of a glass composition, the glass composition consisting essentially of

(1) 15 to 43 weight % of a main glass component selected from the group consisting of BaO, SrO and SrO+BaO,

(2) a glass forming component consisting essentially of 34 to 45 weight % B_2O_3 and 0 to 6 weight % SiO_2

(3) 0 to 2 weight % of a colorant selected from the group consisting of Cr_2O_3, Co and NiO,

(4) 7 to 20 weight % of a thermal expansion modifier consisting essentially of TiO_2, and

(5) 1 to 7 weight % of a dopant consisting essentially of one or more of the following:
ZnF_2 having a weight % of 0 to 5,
Li_2O having a weight % of 0 to 2,
Na_2O having a weight % of 0 to 2,
K_2O having a weight % of 0 to 2,
LiF having a weight % of 0 to 2,
NaF having a weight % of 0 to 2,
KF having a weight % of 0 to 2,
BaF_2 having a weight % of 0 to 2,
Na_2SiF_6 having a weight % of 0 to 2,
PbO having a weight % of 0 to 3,
V_2O_5 having a weight % of 0 to 2, and
BiO_3 having a weight % of 0 to 2, and

(b) 30 to 45 weight % of an organic vehicle.

4,717,691

FLUORIDE GLASS COMPOSITIONS BASED ON ACTINIDES OR YTTRIUM

Jacques Lucas, Betton, and Gilles Fonteneau, Chateaugiron, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris, France

Continuation-in-part of Ser. No. 373,482, Apr. 16, 1982, abandoned. This application May 28, 1985, Ser. No. 738,362
Claims priority, application France, Aug. 19, 1980, 80 18139; PCT Int'l Appl., Aug. 18, 1981, PCT/FR81/00103
Int. Cl.[4] C03C 3/12, 21/00
U.S. Cl. 501—40 31 Claims

25. A fluoride glass consisting essentially of

(1) a glass-forming agent consisting of a fluoride MF_4 present in an amount of 20–50 mole percent thereof wherein M is thorium or uranium;

(2) a further glass-forming agent consisting of a fluoride M_1F_3 present in an amount up to 60 mole percent thereof wherein M_1 is selected from the group consisting of yttrium, erbium, thulium, ytterbium and lutetium;

(3) a lattice modifier consisting of at least a fluoride MtF_2 present in an amount up to 60 mole percent thereof wherein Mt is zinc or manganese;

(4) a further lattice modifier consisting of at least a fluoride $M_{II}F_2$ present in an amount up to 30 mole percent thereof wherein M_{II} is barium, strontium or lead; and

(5) 0–10 mole percent of an adjuvant consisting of at least one metal fluoride $M_{II}F_2$, $M_{III}F_3$ or $M'F_4$, wherein M_{II} is a bivalent metal different from M_{II} and Mt, M_{III} is selected from the group consisting of aluminum, chromium and iron III, and M' is selected from the group consisting of titanium, hafnium and zirconium, said glass being free of hydrofluoric acid.

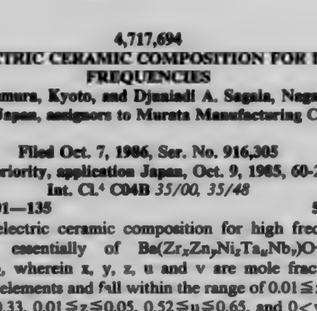
4,717,692

COMPOSITES COMPRISING ONE OR MORE INTERWOVEN MATRIX COMPOSITIONS EACH CONTAINING A REFRACTORY HARD METAL AND METHOD OF FORMING SAME

Siba P. Ray, Pitua, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 604,913, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 423,673, Sep. 27, 1982, Pat. No. 4,454,015. This application Oct. 21, 1985, Ser. No. 789,438
Int. Cl.[4] C04B 35/10, 35/56, 35/58
U.S. Cl. 501—87 14 Claims

1. A shaped composite comprising at least two interwoven matrix compositions, formed by mixing together reactants capable of forming at least two interwoven matrix compositions prior to reacting said reactants whereby excessive exothermic heat generated during the reaction by reactants forming one or more of the materials in the two interwoven matrix compositions will be compensated for by other reactants



which will liberate a lesser amount of exothermic heat while reacting simultaneously to form another of said materials in said interwoven matrix compositions whereby distortion and warping of said composite by generation of excessive exothermic heat during the reaction to form said interwoven matrix compositions will be inhibited.

4,717,693

PROCESS FOR PRODUCING BETA SILICON NITRIDE FIBERS

Dale E. Wittmer, Carbondale, Ill., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 24, 1986, Ser. No. 922,650
Int. Cl.[4] C04B 35/58; C01B 21/068
U.S. Cl. 501—97 12 Claims

1. A process for producing beta silicon nitride fibers, said process comprising:

(a) heating a silicon nitride green article in a furnace, said article being covered with a cover made of material selected from the group consisting of silicon carbide and silicon nitride, said heating being carried out at a temperature of from about 1700° C. to about 2000° C. at a pressure of at least about 100 psig of nitrogen gas and

(b) vapor depositing silicon nitride fibers, the major portion of which are beta silicon nitride fibers on the silicon nitride or silicon carbide.

4,717,694

DIELECTRIC CERAMIC COMPOSITION FOR HIGH FREQUENCIES

Hiroshi Tamura, Kyoto, and Djuaidi A. Sagala, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 7, 1986, Ser. No. 916,305
Claims priority, application Japan, Oct. 9, 1985, 60-225627
Int. Cl.[4] C04B 35/00, 35/48
U.S. Cl. 501—135 5 Claims

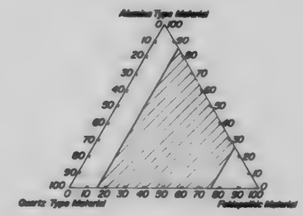
1. A dielectric ceramic composition for high frequencies consisting essentially of $Ba(Zr_xZn_yNi_zTa_uNb_v)O_{7/2-x/2-3y/2-3z/2}$, wherein x, y, z, u and v are mole fractions of respective elements and fall within the range of $0.01 \leq x \leq 0.06$, $0.28 \leq y \leq 0.33$, $0.01 \leq z \leq 0.05$, $0.52 \leq u \leq 0.65$, and $0 < v \leq 0.13$, and wherein $x+y+z+u+v=1.00$.

4,717,695

HIGH STRENGTH FELDSPATHIC PORCELAIN

Isao Oda, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Dec. 30, 1985, Ser. No. 814,508
Claims priority, application Japan, Jan. 18, 1985, 60-7139
Int. Cl.[4] C04B 33/24
U.S. Cl. 501—143 7 Claims



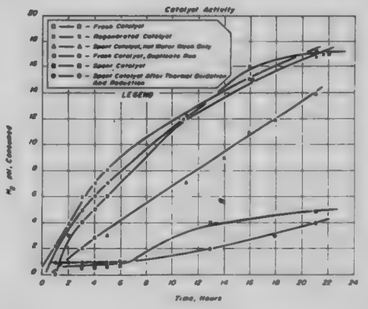
1. High strength feldspathic porcelain with an unglazed bending strength of greater than 1,800 kg/cm^2, the porcelain consisting essentially of 22–85% by weight of SiO_2, 18.8–73% by weight of Al_2O_3, not greater than 1.5% by weight of Fe_2O_3, not greater than 1.5% by weight of TiO_2, not greater than 0.7% by weight of CaO, not greater than 0.5% by weight of MgO and 1.5–6.5% by weight of at least one oxide selected from the group consisting of K_2O and Na_2O; the porcelain having a crystal phase formed from corundum in an amount of 20–60% by weight and at least one second crystal phase selected from the group consisting of mullite, cristobalite, and quartz, a total degree of crystallinity of said second crystal phase being greater than 40% by weight, a degree of crystallization for said at least one second crystal phase being selected in ranges of 5–50% by weight for mullite, not greater than 40% by weight of cristobalite, and not greater than 10% by weight for quartz, a grain size of said crystal phases being not greater than 20 μm, and a size of defects in said porcelain being not greater than 40 μm.

4,717,696

REGENERATION OF A SUPPORTED PALLADIUM CATALYST USED IN THE CONVERSION OF CYANOHYDRINS TO THEIR ALDOSES

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 31, 1986, Ser. No. 925,763
Int. Cl.[4] B01J 29/36, 38/62, 38/60; C07H 1/00
U.S. Cl. 502—28 6 Claims



1. In the process of reducing an aldocyanohydrin with concomitant hydrolysis to afford an aldose as the reduction product by hydrogenation of the aldocyanohydrin in an aqueous

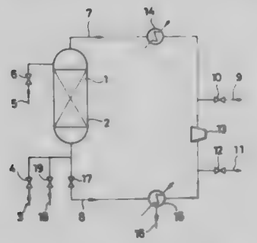
medium at a pH between about 1.0 and about 5.0 using as a catalyst zerovalent palladium dispersed on an inert support, the improvement whereby catalyst is regenerated by washing the deactivated catalyst with from about 2 to about 10 volumes of water at a temperature from about 50° to about 100° C., contacting the washed catalyst with from about 2 to about 10 volumes of a 1 to 4 molar solution of an acid at a temperature in the interval from about 40° to about 100° C. for a time from about 2 to about 6 hours, washing the acid-treated catalyst with water until the wash pH of the liquid after wash is at least 5, and recovering and drying the solid catalyst regenerated thereby.

4,717,697

METHOD OF REGENERATING ZEOLITE TO REMOVE ACETONE AND WATER

Kiyomitsu Kunogisa; Tadaaki Yamamoto, and Hitoshi Sawada, all of Yamaguchi, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 8, 1986, Ser. No. 883,120
Claims priority, application Japan, Jul. 16, 1985, 60-157572
Int. Cl.⁴ B01J *29/38, 38/04;* **B01D** *53/04;* **C07C** *45/79*
U.S. Cl. 502—34 **3 Claims**



1. A method of regenerating hydrous zeolite which contains acetone as well as water after having been used to dehydrate hydrous acetone which comprises: placing the hydrous zeolite in a closed system in which a heated inert gas is circulated at a pressure more than atmospheric pressure to bring the inert gas into contact with the hydrous zeolite to remove the acetone and water from the zeolite, and condensing the acetone and water in the closed system and removing them from the closed system,

wherein the hydrous zeolite is regenerated in two stages composed of the first and second stage in which in the first stage the inert gas is heated to a temperature of about 60°–120° C. to evaporate the acetone on the zeolite to remove the acetone, and in the second stage the inert gas is heated to a temperature of about 200°–250° C. to desorb the water from the zeolite.

2. The method as claimed in claim 1 wherein the inert gas is circulated in the closed system at a linear velocity of about 0.1–5 m/sec. under a pressure of 0.1–20 kg/cm^{2}G.

3. The method as claimed in claim 1 wherein the inert gas is nitrogen gas.

4,717,698

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,091
Int. Cl.⁴ B01J *27/19, 27/188, 27/18;* **C01F** *7/02*
U.S. Cl. 502—211 **46 Claims**

1. A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, which process comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with a solution containing solubilized salts of cobalt and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the gel is sufficient to yield a final catalyst having from about 1%w to about 5%w cobalt and from about 8%w to about 32%w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,717,699

PROCESS FOR ACID TREATING CLAY FOR IMPROVED FILTRATION

Grant A. Mickelson, Yorba Linda, Calif., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Jan. 2, 1986, Ser. No. 815,704
Int. Cl.⁴ B01J *20/12, 20/30*
U.S. Cl. 502—83 **32 Claims**

1. A method of treating clay with acid to provide the clay with increased effectiveness in filtering contaminants from a liquid for removal of said contaminants from the liquid comprising

drying the clay to a moisture not greater than 20% by weight;

grinding the clay to a particle size distribution such that at least 95% of the particles, dry weight basis, have a particle size in the range of 5 to 400 microns, with less than 2% of the clay particles, dry weight basis, greater than 400 microns and less than 3% of the clay particles, dry weight basis, less than 5 microns;

adding the clay to an acid solution having an acid concentration of 10 to 35% by weight acid to form a clay slurry having a clay solids content of 15 to 45% by weight;

agitating said clay slurry having an acid content of 10–35% by weight and for a time sufficient and at a temperature of 80° C. to 100 ° C. so that the acid interacts with the clay to beneficeate the contaminant filtration characteristics of said clay to form an acid treated clay;

separating the acid treated clay from a majority of the acid solution;

washing the acid treated clay with a suitable aciddiluting liquid to remove most of the acid solution from the clay and form a washed, acid treated clay;

filtering the washed, acid treated clay to a liquid content less than about 60% by weight; and

drying the acid treated clay to a liquid content less than about 20% by weight.

4,717,700

CATALYST DRYING AND ACTIVATION METHODS

Ramdas Venkatram, Morris Township, Morris County, N.J.; John C. Roarty, Baton Rouge, La.; Theodorus M. Wortel, Rhoon, Netherlands, and James L. Carter, Savannah, Ga., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 16, 1986, Ser. No. 874,525
Int. Cl.⁴ B01J *29/06, 37/00*
U.S. Cl. 502—85 **29 Claims**

1. A method of drying a moist catalyst including a zeolite and a metallic oxide or metallic oxide complex dispersed in the pores of said zeolite comprising heating said catalyst while

contacting said catalyst with a gas, and limiting the rate of heat input to said catalyst to thereby limit the rate of water evolution from said catalyst during said heating step so that said metallic oxide or metallic oxide complex remains dispersed after said heating step.

2. A method as claimed in claim 1 including the step of controlling the gas flow so that the gas is contacted with the catalyst at a space velocity during said heating step and the water vapor concentration in said gas during contact with the catalyst is thereby limited by the rate of water evolution from the catalyst during said heating step.

3. A method as claimed in claim 2 wherein said zeolite is a type L zeolite.

4,717,701

OLEFIN POLYMERIZATION

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 688,928, Jan. 4, 1985, Pat. No. 4,622,371. This application Aug. 13, 1986, Ser. No. 896,026
Int. Cl.⁴ C08F *4/62, 4/70*
U.S. Cl. 502—107 **29 Claims**

13. A method for preparing a polymerization catalyst, said method comprising:

(a) preparing a hydrogel comprising about 1 to about 100 mole percent of at least one iron compound selected from the group consisting of iron phosphate and iron polyphosphate, with the remainder of said hydrogel being at least one aluminum compound selected from the group consisting of aluminum phosphate and aluminum polyphosphate, and

(b) removing free water from said hydrogel using a volatile oxygen containing water miscible low surface tension organic liquid followed by drying, to produce a xerogel, and

(c) activating said xerogel at an elevated temperature in the presence of an oxidizing ambient.

25. A method according to claim 13 wherein after the activation of step (c) a chromium compound selected from the group consisting of zerovalent chromium and chromium(II) is added to said xerogel.

4,717,702

CATALYST FOR CONVERSION OF SYNTHESIS GAS TO DIESEL FUEL AND PROCESS FOR PREPARATION OF SUCH CATALYST

Harold Beuther, ChesWick; Charles L. Kibby, Gibsonia; Thaddeus P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Shell Internationale Research Maatschappij BV, The Hague, Netherlands

Division of Ser. No. 755,657, Apr. 26, 1985, Pat. No. 4,613,624, which is a continuation of Ser. No. 310,969, Oct. 13, 1981, abandoned. This application Jun. 20, 1986, Ser. No. 876,458
Int. Cl.⁴ B01J *21/04, 23/10, 23/74*
U.S. Cl. 502—303 **18 Claims**

1. A catalyst for the conversion of synthesis gas consisting essentially of cobalt and a Group IIIB or IVB metal oxide on a high surface area, high purity, low acidity alumina support of gamma-alumina, eta-alumina or mixtures thereof, said catalyst having a hydrogen chemisorption value of about 100 to about 300 micromol of hydrogen per gram of total catalyst when measure at 25° C. said catalyst having been prepared by (A) impregnation of said alumina support with a non-aqueous, organic solvent impregnation solution of cobalt nitrate containing sufficient amounts of a Group IIIB or IVB metal salt to provide said catalyst with from about 0.05 to about 100 parts by weight of a Group IIIB or IVB metal oxide per 100 parts by weight cobalt, (B) reduction of said impregnated alumina support by heating, in the presence of hydrogen, at a heating rate of from about 0.5° to about 5° C. per minute to a maximum temperature in the range of 180° to about 220° C. for a hold time of 6 to about 24 hours and thereafter heating said impregnated alumina support in the presence of hydrogen while heating up to a maximum hold temperature of from about 250° to about 400° C. for a hold time of 6 to about 65 hours.

4,717,703

PROCESS FOR MAKING ETHYLENE OXIDE CATALYST

Jean-Marie Cognion, Saint Genis Laval, and Gerard Letray, Le Havre, both of France, assignors to Atochem, France

Filed May 27, 1986, Ser. No. 867,780
Claims priority, application France, Apr. 11, 1986, 86 05410
Int. Cl.⁴ B01J *21/04, 23/04, 23/66*
U.S. Cl. 502—348 **13 Claims**

1. A process for manufacturing silver catalysts deposited on a porous refractory support, comprising impregnating a refractory support with a portion of the silver required for the catalyst by immersing the support in a substantially anhydrous solution of an organic carboxylic acid salt of silver in an organic liquid which complexes the silver ions, removing excess organic liquid from the support without causing the deposition of metallic silver thereon by heating same at a temperature equaling at most 100° C.; depositing the remainder of the silver and at least one promoter selected from cesium, rubidium, or potassium on the support modified by the first organic carboxylic salt of silver deposit by immersing said modified support in a practically anhydrous solution of an organic carboxylic acid salt of silver in an organic liquid which complexes the silver ions, said organic liquid containing, in the solubilized state, a salt of at least one of the promoters, before transformation of the silver deposited into metallic silver.

4,717,704

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,221
Int. Cl.⁴ B01J *27/19, 27/188, 27/185;* **C10G** *45/08*
U.S. Cl. 502—211 **86 Claims**

1. A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, which process comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with dry, water-soluble salts of cobalt and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at a pH in the range between about 4.0 and about 10.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1% w to about 5% w cobalt and from about 8% w to about 32% w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,717,705

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,097
Int. Cl.⁴ B01J *27/19, 27/188, 27/185;* **C10G** *45/08*
U.S. Cl. 502—211 **42 Claims**

1. A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m^2/g and at least

about 80% of the pore volume in pores having less than about 70 Å, which process comprises:
(a) precipitating an aqueous solution of one or more aluminum salt(s) by adjusting the pH to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,
(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,
(c) washing the precipitate,
(d) mixing the precipitate with dry, water-soluble salts of cobalt and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1% w to about 5% w cobalt and from about 8% w to about 32% w heavy metal,
(e) extruding the product of step (d), and
(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,717,706

WIDE-PORE HYDROGEL-DERIVED CATALYSTS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,228
Int. Cl.⁴ B01J *27/19, 27/188, 27/18;* **C01F** *7/02*
U.S. Cl. 502—211 **65 Claims**

1. A process for preparing wide-pore containing catalysts having surface areas above about 300 m^2/g and at least about 20% of the pore volume in pores having diameters greater than about 150 Å, which process comprises:
(a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound in an aqueous solution containing about 15% v to about 50% v of an alcohol selected from the group consisting of methanol, ethanol and mixtures thereof, by adjusting the pH of said solution to a range between about 5.5 and about 10.0,
(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 9.0 to about 12.0,
(c) washing the precipitate,
(d) mixing the precipitate with a solution containing solubilized salts of a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and an element selected from the group consisting of nickel, cobalt and mixtures thereof, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 20° C. and about 90° C. until adsorption of said salts onto the gel is sufficient to yield a final catalyst having a catalytically effective amount of metals present,
(e) extruding the product of step (d), and
(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,717,707

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,227
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.⁴ B01J *27/19, 27/188, 27/185;* **C10G** *45/08*
U.S. Cl. 502—211 **26 Claims**

1. A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 50 Å, which process comprises:
(a) precipitating an aqueous solution of one or more aluminum salt(s) by adjusting the pH of said solution to a range between about 5.5 and about 10.0 and a temperature in the range between about 20° C. and about 90° C.,
(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 11.0 to about 12.5,
(c) washing the precipitate,
(d) mixing the precipitate with a solution containing solubilized salts of a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof and an element selected from the group consisting of nickel, cobalt and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the gel is sufficient to yield a final catalyst having from about 1% w to about 5% w nickel and/or cobalt and from about 8% w to about 32% w heavy metal,
(e) extruding the product of step (d), and
(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,717,708

INORGANIC OXIDE AEROGELS AND THEIR PREPARATION

Chung-Ping Cheng, Mt. Kisco, and Paul A. Iacobucci, Dobbs Ferry, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 27, 1983, Ser. No. 565,937
Int. Cl.⁴ B01J *21/00, 23/06*
U.S. Cl. 502—233 **35 Claims**

1. A method of preparing inorganic oxide aerogels comprising:
(a) hydrolyzing a compound comprising at least one metal dissolved in a solvent, to produce a gel;
(b) ageing the gel produced;
(c) contacting the aged gel in an autoclave with a fluid above the critical temperature and pressure of the fluid to extract the solvent; and
(d) drying the gel.

28. An inorganic oxide aerogel product, produced by the method of claim 1.

30. The inorganic oxide aerogel of claim 28 wherein the product is silica.

31. The inorganic oxide aerogel of claim 28 wherein the product is alumina.

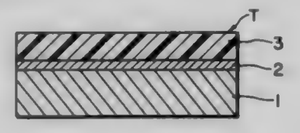
32. The inorganic oxide aerogel of claim 28 wherein the product is a zinc oxide aerogel.

4,717,709

THERMOSENSITIVE RECORDING MATERIAL

Akira Suzuki, Shizuoka, Japan, assignor to Tomoegawa Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 791,808
Claims priority, applications Japan, Nov. 2, 1984, 59-165645; Nov. 2, 1984, 59-165646
Int. Cl.⁴ B41M *5/18*
U.S. Cl. 503—200 **8 Claims**



1. A thermosensitive recording material comprising: a support sheet; a polyolefin resin layer; and a thermosensitive coloring layer formed on one side of said support sheet in this order; said thermosensitive coloring layer comprising a normally colorless or pale-colored leuco dye and an acidic material capable of coloring said leuco dye upon being heated; said polyolefin resin layer being corona-discharge treated in order to improve the adhesion of said thermosensitive coloring layer to said polyolefin resin layer.

4,717,710

THERMOCHROMIC COMPOSITION

Goro Shinitzu, Shiga, and Yoshimi Hayashi, Kyoto, both of Japan, assignors to Matsui Shikiso Chemical Co. Ltd. and Sanrio Company, Ltd., both of, Japan

Filed Jan. 3, 1985, Ser. No. 688,629
Int. Cl.⁴ G03C *1/733;* **G01K** *11/12*
U.S. Cl. 503—213 **6 Claims**

1. Reversible thermochromic composition capable on heating of color change from colored to colorless state, comprising four components (1), (2), (3) and (4), each of which is individually different from the other three components, said four components comprising
(1) an electron-donating chromogenic material,
(2) a 1,2,3-triazole compound having a hydrogen atom at the 1 or 2 N-atom position thereof and which serves ad corresponding color developer for said chromogenic material for reversibly achieving the colored state,
(3) a weakly basic, sparingly soluble azomethine or carboxylic acid primary amine salt,
said azomethine being selected from the group consisting of compounds having the formulae

R—CH=N—R′

R—CH=N—R′—N—CH—R,

and

R—N=HC—R′—CH=N—R

Wherein R and R′ are each substituents selected from the group consisting of aliphatic, substituted aliphatic, aromatic substituted aromatic, heterrocyclic and substituted amino, the corresponding compound of each such formula including one of an aromatic or a substituted aromatic substituent, and
said salt having the formula

$R-(COOH)_x \cdot R'-(NH_2)_y$

wherein R and R′ are the same as defined above and x and y are positive integers, and
(4) an alcohol, amide or ester serving as a solvent,
each of said azomethine and said salt being capable of dissociating an amine therefrom upon heating, for achieving a desensitizing effect in the presence of said solvent for changing the composition from colored to colorless state.

4,717,711

SLIPPING LAYER FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Noel R. Vanier; Daniel J. Harrison, both of Rochester, and Hsin-Chia Kan, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,199, Dec. 24, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 925,949
Int. Cl.⁴ B41M *5/26*
U.S. Cl. 503—227 **20 Claims**

9. In a process of forming a dye transfer image comprising
(a) imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer and on the other side a slipping layer comprising a lubricating material dispersed in a polymeric binder, and
(b) transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said lubricating material is
poly(vinyl stearate), poly(caprolactone) or a straight chain alkyl or polyethylene oxide perfluoroalkylated ester or perfluoroalkylated ether.

4,717,712

LUBRICANT SLIPPING LAYER FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Daniel J. Harrison; Noel R. Vanier, both of Rochester, and Hsin-Chia Kan, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,215, Dec. 24, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 925,948
Int. Cl.⁴ B41M *5/26*
U.S. Cl. 503—227 **17 Claims**

7. In a process of forming a dye transfer image comprising
(a) imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer and on the other side a slipping layer, and
(b) transferring a dye image to a dye-receiving element to form said dye transfer image,
the improvement wherein said slipping layer consists essentially of a lubricating material of a polyethylene glycol having a number average molecular weight of about 5000 or above or fatty acid esters of polyvinyl alcohol.

4,717,713

CONTROLLED RELEASE LIQUID PHARMACEUTICAL

Joel L. Zatz, Metuchen, N.J., and David W. Woodford, Rensselaer, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 546,846
Int. Cl.⁴ A61K *37/00, 31/715*
U.S. Cl. 514—2 **24 Claims**

1. A method for the controlled release administration of a pharmaceutically active agent comprising orally introducing said agent to the body in a normally liquid formulation containing a solution or suspension vehicle selected from the group consisting essentially of xanthan gum, sodium alginate, gelatin, carrageenan, methylcellulose and mixtures thereof in an amount from about 0.3 to about 5.0 percent by weight which forms a semi-solid gel-like matrix in the environment of the stomach thereby controlling the release of said pharmaceutically active agent.

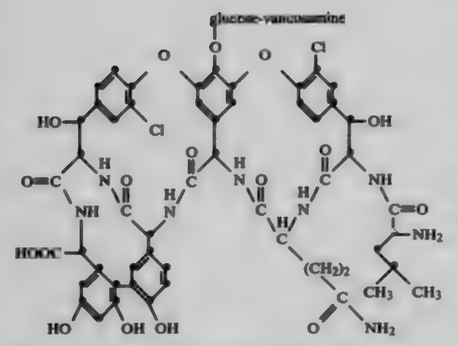
4,717,714

A-51568B ANTIBIOTIC

LaVerne D. Boeck; Gary G. Marconi, and Marvin M. Hoehn, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 561,008, Dec. 13, 1983, Pat. No. 4,558,008. This application Sep. 12, 1986, Ser. No. 775,071
Int. Cl.⁴ A61K *37/02, 31/71;* **C07H** *15/20*
U.S. Cl. 514—10 **4 Claims**

1. Antibiotic A-51568B, which has the structure



and a pharmaceutically-acceptable, non-toxic salt thereof.

3. The method for treating bacterial infections in a mammal which comprises administering to the mammal a therapeutically-effective dose of the antibiotic compound of claim 1, or a pharmaceutically-acceptable, non-toxic salt thereof.

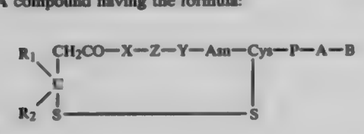
4,717,715

ARG^7-ARG^8-VASOPRESSIN ANTAGONISTS

Fadia E. Ali, Cherry Hill, N.J., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jun. 23, 1986, Ser. No. 877,571
Int. Cl.^{4} H61K *37/34*; C07K *7/16*
U.S. Cl. 514—11 **16 Claims**

1. A compound having the formula:



in which:

P is a D or L isomer of Arg, Lys, HArg, MeArg, MeLys or MeHArg;

A is a D or L isomer of Arg, Lys, HArg, MeArg, MeLys or MeHArg;

B is OH, NH_2 or NHAlk;

Z is Phe, Phe(4'-Alk), Tyr(Alk), Ile or Tyr; X is a D or L isomer of Phe, Phe(4'-AlK), Val, Nva, Leu, Ile, Pba, Nle, Cha, Abu, Met, Chg, Tyr or Tyr(Alk);

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Thr, Nle, Phe, Leu or Gly; and

R_1 and R_2 are, each, hydrogen, methyl or, when taken together and with the β-carbon to which they are attached, a cycloalkylene ring of 4–6 members; and Alk is C_{1-4}-alkyl;

or a pharmaceutically acceptable salt or prodrug thereof.

4,717,716

IMMUNO-REGULATOR

Kineshiro Nagai, Tokyo, and Taiko Seda, Kashiwa, both of Japan, assignors to Nihon University, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,157
Claims priority, application Japan, Feb. 13, 1985, 60-25494
Int. Cl.^{4} A61K *37/02*
U.S. Cl. 514—19 **7 Claims**

2. A method of suppressing immuno-reactions in a patient in need of such therapy, comprising administering to a patient suffering from an immuno-disease an amount sufficient of L-carnosine or pharmaceutically acceptable salt thereof to suppress an immuno-response.

4,717,717

STABILIZED COMPOSITIONS CONTAINING EPIDERMAL GROWTH FACTOR

Amy L. Finkensur, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Nov. 5, 1986, Ser. No. 927,627
Int. Cl.^{4} C07K *13/00*; A61K *35/22, 37/36*
U.S. Cl. 514—21 **12 Claims**

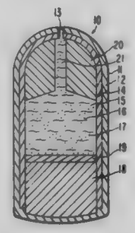
1. A sterile aqueous medicinal composition containing epidermal growth factor and an amount of a water-soluble cellulose polymer sufficient to stabilize said epidermal growth factor against loss of biological activity.

4,717,718

DEVICE FOR THE CONTROLLED DELIVERY OF A BENEFICIAL AGENT

James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 764,143, Aug. 9, 1985, Pat. No. 4,624,945, which is a continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Aug. 11, 1986, Ser. No. 895,612
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.^{4} A61K *31/70, 9/22*
U.S. Cl. 514—30 **9 Claims**



1. A device for the controlled delivery of a beneficial agent comprising: (a) a formulation layer and (b) a layer comprising means for pushing the formulation layer from said device; and, wherein the formulation layer comprises

the beneficial agent avermectin and a copolymer of 1,2-butylene oxide and ethylene oxide.

4,717,719

MODIFIED GLUCOSAMINOGLUCANS HAVING ANTITHROMBOTIC ACTIVITY

Giancarlo Sportoletti; Piergiuseppe Pagella, and Pietro Cremonesi, all of Milan, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

Filed Jan. 20, 1984, Ser. No. 572,448
Claims priority, application Italy, Oct. 25, 1983, 23422 A/83
Int. Cl.^{4} A61K *31/725*
U.S. Cl. 514—56 **1 Claim**

1. The method of preventing and treating cardiac infarct, cerebral infarct and venous thrombosis in a living subject which consists of administering to said living subject a modified heparin which exhibits low anticoagulant activity, low anti-Xa activity, said modified heparin being obtained by hydrolyzing the N-sulfate groups present in the original heparin to obtain a hydrolysed heparin containing less than 10% of said N-sulfate groups and then treating said modified heparin with succinyl anhydride or a compound capable of acting as a succinyl radical donor whereby said modified heparin contains more than 0.6 succinyl radical per disaccharide unit, in the amount of 0.5–300 mg/kg of body weight of said living subject.

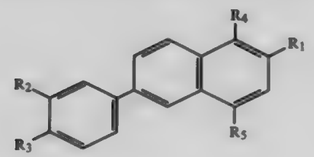
4,717,720

BENZONAPHTHALENE DERIVATIVES AND COMPOSITIONS

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Nice, all of France, assignors to Centre International de Recherches Dermatologiques (C.I.R.D.), Valbonne, France

Filed Apr. 10, 1986, Ser. No. 850,145
Claims priority, application Luxembourg, Apr. 11, 1985, 85849
Int. Cl.^{4} A61K *31/19, 31/695*; C07C *57/28*; C07F *7/06*
U.S. Cl. 514—63 **16 Claims**

1. A benzonaphthalene compound of the formula



(I)

wherein

R_1 represents (i)



R_6 represents OR_7 wherein R_7 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl or polyhydroxyalkyl,

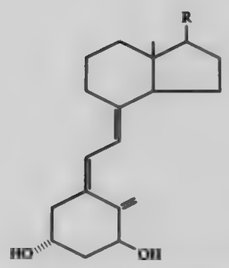
R_2 represents hydrogen, branched or straight chain alkyl 1–15 carbon atoms, alkoxy having 1–4 carbon atoms or a cycloaliphatic radical,

R_3 represents hydrogen, hydroxy, branched or straight chain alkyl having 1–4 carbon atoms, alkoxy having 1–10 carbon atoms, a cycloaliphatic radical optionally substituted, a thiocycloaliphatic radical, or $—O—Si(CH_3)_2—R_8$ wherein R_8 represents linear or branched lower alkyl, provided that at least one of R_2 and R_3 is adamantyl or adamantylthio and

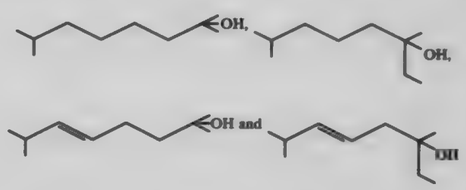
R_4 and R_5 each independently represent hydrogen, lower alkyl, hydroxy or lower acyloxy,

or a salt thereof.

15. A pharmaceutical composition comprising a pharmaceutically acceptable vehicle suitable for enteral, parenteral, topical or ocular administration and an effective amount of as the active principle at least one compound of claim 1 or a salt thereof.



where R is a homo-steroid sidechain selected from the group consisting of



in a molar concentration no greater than about 1×10^{-8} moles/liter but in an amount sufficient to induce and enhance cell differentiation.

4,717,721

SIDECHAIN HOMO-VITAMIN D COMPOUNDS WITH PREFERENTIAL ANTI-CANCER ACTIVITY

Hector F. DeLuca; Heinrich K. Schnoes, both of Madison, Wis.; Nobuo Ikekawa, Tokyo, Japan, and Vouis Ostrem, Madison, Wis., assignors to Howard W. Bremer, Madison, Wis.

Filed May 30, 1985, Ser. No. 739,332
Int. Cl.^{4} A61K *31/59*; C07J *9/00*
U.S. Cl. 514—167 **10 Claims**

1. A method for inducing and enhancing cell differentiation in malignant cells which comprises exposing said cells to at least one 1 alpha-hydroxylated vitamin D derivative having the structure

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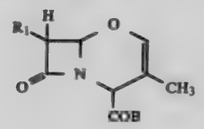
4,717,722

SUBSTITUTED 1-OXA-DETHIACEPHALOSPORINS AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

James B. Doherty, New Milford, and William K. Hagmann, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 7, 1984, Ser. No. 607,536
Int. Cl.^{4} A61K *31/395, 31/535*
U.S. Cl. 514—210 **4 Claims**

1. A pharmaceutical composition for treating elastase-mediated diseases in a mammalian species comprising a non-toxic pharmaceutical carrier and an effective amount of a compound of structural formula:



wherein R_1 is

H
R"CON where R"

represents phenyl or substituted phenyl; and B is OB_1 wherein B_1 is C_{1-6} alkyl, benzyl or substituted benzyl.

4,717,723

PHARMACEUTICAL COMPOSITIONS

Keith Sugden, Beverly, Great Britain, assignor to Reckitt & Colman Products Limited, London, Great Britain

Filed Oct. 8, 1985, Ser. No. 785,544
Claims priority, application United Kingdom, Oct. 16, 1984, 8426152
Int. Cl.⁴ A61K 31/54
U.S. Cl. 514—224 10 Claims

1. A buccal tablet comprising an effective amount in the control of nausea, vomiting, or in the treatment of vertigo of prochlorperazine maleate, at least one monosaccharide, disaccharide or a mixture thereof, and a mixture of xanthan gum and locust bean gum in a weight ratio of 3:1 to 1:1, and wherein the total weight of the mono- and/or disaccharides relative to the combined weight of the xanthan and locust bean gums is in the ratio of 20:1 to 5:1.

4,717,724

1-(1,3-DIOXOLAN-2-YLMETHYL)AZOLES, THEIR SALTS AND THEIR USE

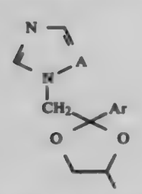
Wolfgang Schaper, Frankfurt am Main; Ernst Blume, Bad Soden am Taunus; Wolfgang Raether, Dreieich, and Walter Dittmar, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,585
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308554
Int. Cl.⁴ A61K 31/47; C07D 401/14
U.S. Cl. 514—278 3 Claims

1. A 1-(1,3-dioxolan-2-ylmethyl)azole of the formula I

G-CH_2-O-D (I)

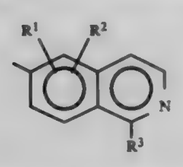
or a stereoisomer thereof or a salt thereof with a physiologically tolerated acid, in which G denotes a 1-(1,3-dioxolan-2-ylmethyl)azole radical of the structure



(G)

in which A denotes nitrogen or methine, Ar denotes naphthyl, biphenylyl, thienyl, or a phenyl group which is unsubstituted or bears one, two or three substituents, the substituents being identical or different and denoting fluorine, chlorine, bromine, iodine, trifluoromethyl, C_1–C_4-alkyl or C_1–C_4-alkoxy, and D in formula I denotes either

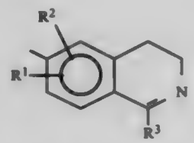
(a) an isoquinoline group of the formula D I



(D I)

where R^1 and R^2, independently of one another, denote a hydrogen atom, fluorine, chlorine, bromine, iodine, C_1–C_4-alkyl or C_1–C_4-alkoxy, and R^3 denotes a hydrogen atom, C_1–C_{12}-alkyl, C_3–C_8-cycloalkyl, C_3–C_5-alkenyl, C_3–C_5-alkinyl, trifluoromethyl, trichloromethyl, an aryl group selected from phenyl, naphthyl and biphenylyl groups, an aryl-(C_1–C_5-alkyl) group wherein said aryl is selected from phenyl, naphthyl and biphenylyl groups, a heteroaryl group selected from thienyl, furyl and pyridyl groups, a heteroaryl-(C_1–C_5-alkyl) group wherein said heteroaryl is selected from thienyl, furyl and pyridyl groups, and wherein said aryl, aryl-(C_1–C_5-alkyl), heteroaryl and heteroaryl-(C_1–C_5-alkyl) groups may be unsubstituted or may bear one, two or three substituents, said substituents being identical or different, and each denoting fluorine, chlorine, bromine, iodine, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-dialkylamino wherein the alkyl groups in said C_1–C_4-dialkylamino are separate or form together with the nitrogen atom to which they are attached a pyrrolidine, piperidine or hexamethylene imine ring, phenylthio, halogenophenylthio, phenoxy or halogenophenoxy, or

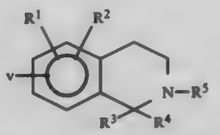
(b) denotes a 3,4-dihydroisoquinoline group of the formula D II



(D II)

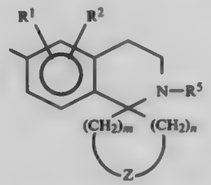
where R^1, R^2 and R^3 have the meanings indicatd for formula D I, or

(c) denotes a 1,2,3,4-tetrahydroisoquinoline group of the formula D III



(D III)

where v indicates the position of linkage of the isoquinoline system to the G-CH_2-O radical, R^1, R^2 and R^3 have the meanings indicated for formula D I, and R^4 denotes a hydrogen atom or a C_1–C_4-alkyl group, and additionally, if R^3 and R^4 are alkyl groups, these, together with the carbon atom bearing them, can denote a spirocyclic ring system of the formula D III'



(D III')

in which m and n denote 1, 2 or 3, and z denotes either a methylene group or, if m=n=2, a heteroatom from the group consisting of oxygen, sulphur and nitrogen, the nitrogen being unsubstituted or substituted by a radical R^6 which denotes C_1–C_4-alkyl, C_1–C_5-alkanoyl, C_1–C_4-alkoxycarbonyl, or a benzoyl or benzyl group which is unsubstituted or bears one or two substituents, the substituents on the benzoyl or benzyl group being identical or different and each denoting fluorine, chlorine, bromine, iodine, C_1–C_4-alkyl, trifluoromethyl or C_1–C_4-alkoxy and, when R^3 and/or R^4 is not a hydrogen atom, v denotes the 6-position, or, when R^3 and R^4 are hydrogen atoms, v denotes the 5-, 6-, 7- or 8-position, and, if R^3 and/or R^4 is not a hydrogen atom, R^5 denotes a hydrogen atom or a C_1–C_4-alkyl group, or, if R^3 and R^4 are hydrogen atoms and v denotes the 5-, 7- or 8-position, R^5 has the meanings

indicated for R^3 in formula D I, with the proviso that R^5 does not denote an aryl or heteroaryl group, or, when R^3 and R^4 are hydrogen atoms and v denotes the 6-position, R^5 has the meanings indicated for R^3 in formula D I, and R^5 also denotes an acyl group of the formula Q,



(Q)

where R^7 has the meanings indicated for R^3 in the formula D I.

3. A method of treating a mammal for controlling mycoses, protozoa and Gram-positive and Gram-negative bacteria which comprises administering to said mammal daily doses of 50–200 mg of a compound of the formula I or a stereoisomer or a salt thereof as claimed in claim 1.

4,717,725

OPHTHALMIC WOUND HEALING WITH ALDOSE REDUCTASE INHIBITORS

Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 599,283, Apr. 11, 1984, Pat. No. 4,600,717. This application Jan. 7, 1986, Ser. No. 816,870
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.⁴ A61K 31/44
U.S. Cl. 514—278 8 Claims

1. A method of promoting wound healing in a wounded host organ comprising applying to the wounded host organ a therapeutically effective wound healing amount of a pharmaceutical composition containing an aldose reductase inhibitor.

4,717,726

3,5-DICHLORO-2,4-DIMETHOXY-6-(TRICHLOROMETHYL)PYRIDINE HAVING ANTI-TUMOR ACTIVITY

Helen K. Tobol, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 10, 1986, Ser. No. 905,906
Int. Cl.⁴ C07D 213/24, 213/30; A61K 31/44
U.S. Cl. 514—348 10 Claims

1. 3,5-Dichloro-2,4-dimethoxy-6-(trichloromethyl)pyridine.

4. A method for inhibiting the growth of a susceptible malignant neoplasm selected from the group consisting of leukemia, lymphoma, mammary carcinoma, or ovarian sarcoma in a mammal afflicted therewith which comprises administering to said mammal, in an amount effective to inhibit said growth, the compound 3,5-dichloro-2,4-dimethoxy-6(trichloromethyl)-pyridine.

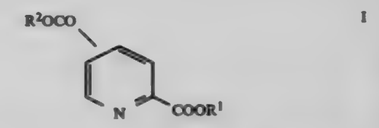
4,717,727

ESTERS OF PYRIDINE-2,4- AND 2,5-DICARBOXYLIC ACID AS MEDICAMENTS FOR THE INHIBITION OF PROLINE HYDROXYLASE AND LYSINE HYDROXYLASE

Volkmar Günzler, Bodenheim; Hartmut Hanauske-Abel, Dexheim; Jürgen Mohr, Bischofsheim; Georg Tschank, Mainz, all of Fed. Rep. of Germany; Kari Kivirikko, Oulu, Finland; Kari Majamaa, San Pedro, Calif., and Dietrich Brocks, Hünfelden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 29, 1985, Ser. No. 770,676
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432094
Int. Cl.⁴ A61K 31/44
U.S. Cl. 514—354 15 Claims

1. A pharmaceutical preparation for inhibiting proline hydroxylase and lysine hydroxylase and for use as a fibrosuppressant and immunosuppressant which comprises an effective inhibiting or suppressing amount of a compound of the formula I



I

in which R^1 and R^2, which are identical or different, both are alkyl of 1 to 6 carbon atoms, or one of R^1 and R^2 is hydrogen and the other said alkyl, the group R^2OCO being bonded in the 4- or 5-position of the pyridine ring and a tolerated pharmaceutical vehicle.

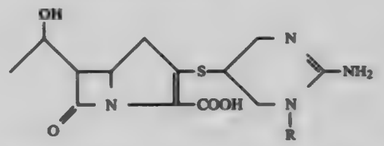
4,717,728

CYCLIC AMIDINYL AND CYCLIC GUANIDINYL THIO CARBAPENEMS

Minoru Furukawa, Ichikawa, and Makoto Sato, Funabashi, both of Japan, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 21, 1983, Ser. No. 553,609
Int. Cl.⁴ C07D 487/04; A61K 31/395
U.S. Cl. 514—210 5 Claims

1. A compound of the formula:



wherein R is hydrogen or alkyl of 1 to 6 carbon atoms; and the pharmaceutically acceptable salts thereof.

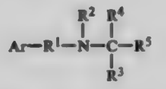
4,717,729

TRIPHENYLENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 499,331, May 31, 1983, Pat. No. 4,551,282. This application Sep. 5, 1985, Ser. No. 772,690
Int. Cl.⁴ C07C 15/16, 83/08, 14.9/02; A61K 31/135
U.S. Cl. 514—654 6 Claims

1. A pharmaceutical formulation containing a compound of formula (I)



(I)

wherein

Ar is triphenylene or triphenylene substituted with halogen, C_{1-6} alkyl, C_{1-6} alkoxy, halo C_{1-6} alkyl, C_{1-6} alkylthio, hydroxy C_{1-6} alkyl, hydroxy C_{1-6} alkylthio, cyano, C_{1-6} alkylsulphinyl or C_{1-6} alkylsulphenyl;

R^1 is C_{1-3} alkylene;

R^2 is hydrogen or C_{1-6} alkyl;

R^3 is hydroxy C_{1-6} alkyl; and

R^4 and R^5 are the same or different and are hydrogen, C_{1-6} alkyl or hydroxy C_{1-6} alkyl, or a C_{1-6} alkylcarboxylic acid ester derived therefrom or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier therefor.

4,717,730

4,5-DIHYDRO-6-(SUBSTITUTED)PHENYL-5-METHYL-3-(2H)-PYRIDAZINONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE COMPOUNDS AS ACTIVE COMPONENTS

Ila Sircar, and James A. Bristol, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 3, 1982, Ser. No. 446,797

Int. Cl.[4] C07D *403/10*; A61K *31/50*

U.S. Cl. 514—252 **2 Claims**

1. A pharmaceutical composition for increasing cardiac contractility comprising an effective amount of 4,5-dihydro-6-[4-(1H)-imidazol-1-yl)phenyl]-5-methyl-3(2H)-pyridazinone or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,717,731

7H-THIENO[2,3-a]QUINOLIZINES, USEFUL AS α_2-ANDRENOCEPTOR ANTAGONIST

Alan C. White, Englefield Green; Robin G. Shepherd, Maidenhead, and Barry J. Langham, Slough, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 764,904, Aug. 12, 1985, Pat. No. 4,640,924. This application Oct. 23, 1986, Ser. No. 922,484

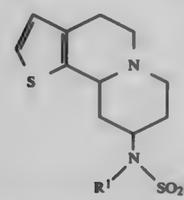
Claims priority, application United Kingdom, Aug. 14, 1984, 8420602

Int. Cl.[4] A61K *31/38*; C07D *455/00*

U.S. Cl. 514—291 **10 Claims**

1. A compound selected from the group consisting of a thienoquinolizine of the formula

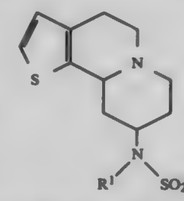
(I)



and a pharmaceutically acceptable acid addition salt thereof, where R^1 is hydrogen or lower alkyl and R^2 is lower alkyl, (halo lower) alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylene dioxy, nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkylamino or trifluoromethyl, optionally substituted quinoline, furan, thiophene, imidazzole, pyridine, piperidine, pyrrolidine, indolyl or 1,2,3,4-tetrahydroquinoline wherein the substituents are selected from one or more of the group consisting of halogen, lower alkoxy lower alkyl, lower alkylenedioxy, amino, loweralkylamino, diloweralkylamino, trifluoromethyl, carbamoyl, phenyl and phenyl substituted by one or more of said substituents in connection with the heterocyclic group or —A—NR^3R^4 (where A represents a direct bond between the S and N atoms or a lower alkylene group having 1 to 3 carbon atoms in the chain between the S and N atoms and R^3 and R^4 each independently represent hydrogen, lower alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkylamino or trifluoromethyl, or phenyl(lower)alkyl or phenyl(lower)alkyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkylamino or trifluoromethyl, or together with the nitrogen atom to which they are attached represent a five or six membered heterocyclic ring).

6. A composition having α_2-adrenoceptor antagonistic activity consisting essentially of an α_2-adrenoceptor antagonistic amount of a compound selected from the group consisting of a thienoquinolizine of the formula

(I)



and a pharmaceutically acceptable acid addition salt thereof, where R^1 is hydrogen or lower alkyl and R^2 is lower alkyl,-halo(lower)alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkylamino or trifluoromethyl optionally substituted quinoline, furan, thiophene, imidazole, pyridine, piperidine, pyrrolidine, indolyl or 1,2,3,4-tetrahydroquinoline wherein the substituents are selected from one or more of the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, amino, loweralkylamino, diloweralkylamino, trifluoromethyl, carbamoyl, phenyl and phenyl substituted by one or more of said substituents in connection with the heterocyclic group or —A—NR^3R^4 (where A represents a direct bond between the S and N atoms or a lower alkylene group having 1 to 3 carbon atoms in the claim between the S and N atoms and R^3 and R^4 each independently represent hydrogen, lower alky, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy. nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkyamino or trifluoromethyl, or phenyl(lower)alkyl or phenyl(lower)alkyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, nitro, amino, lower alkyl carbonylamino, lower alkylamino, dilower alkylamino or trifluoromethyl, or together with the nitrogen atom to which they are attached represent a five or six membered heterocyclic ring) in association with a pharmaceutically acceptable carrier.

4,717,732

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES AND THEIR USE AS PESTICIDES

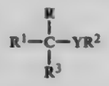
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,573

Int. Cl.[4] C07D *409/14*; A61K *31/38*

U.S. Cl. 514—333 **4 Claims**

1. A compound corresponding to the formula



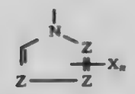
wherein

R represents pyridyl, or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents thienyl or thienyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,717,733

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES AND THEIR USE AS PESTICIDES

Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,574

Int. Cl.[4] C07D *401/06*; A61K *31/415*

U.S. Cl. 514—333 **4 Claims**

1. A compound corresponding to the formula



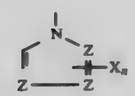
wherein

R represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,717,734

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES AND THEIR USE AS PESTICIDES

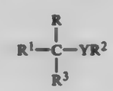
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,434

Int. Cl.[4] C07D *409/12*; A61K *31/38*

U.S. Cl. 514—359 **4 Claims**

1. A compound corresponding to the formula



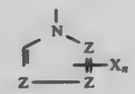
wherein

R represents hydrogen, phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,717,735

COMPOSITION FOR BODY WRAP

Richard C. Strem, Reno, Nev., assignor to European Body Wrap, Inc., Sparks, Nev.

Filed Apr. 10, 1986, Ser. No. 850,138

Int. Cl.[4] A61L *15/03*

U.S. Cl. 424—447 **7 Claims**

1. A composition for use in the practice of body wrapping, which composition when applied to the skin of a human will extract waste products and toxins through the pores, and which composition comprises:

INGREDIENT	PARTS BY VOLUME
Clay	
Bentonite	0 to 2.5
Montmorillonite	2.5 to 0
Sodium Chloride	¼ to ½
Magnesium chloride	½ to 1.25
Magnesium Sulfate	1.5 to 2.5
Zinc Oxide	less than .001
Water	1.5 to 2.5

wherein the total bentonite-montmorillonite clay component is present in at least 1.5 parts.

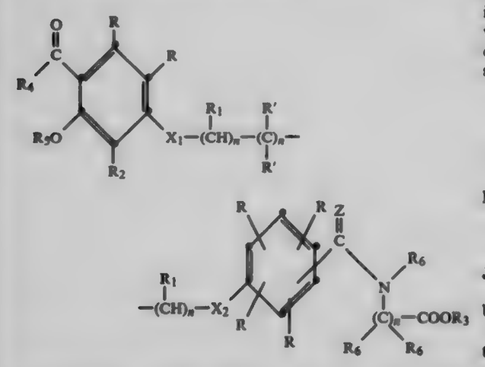
4,717,736

ANTAGONISTS OF SLOW REACTING SUBSTANCES OF ANAPHYLAXIS

Joshua Rokach, Chomedey, Laval, Quebec, and Robert N. Young, Senneville, Quebec, both of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Quebec, Canada

Continuation-in-part of Ser. No. 573,170, Jan. 23, 1984, abandoned. This application Nov. 21, 1984, Ser. No. 673,649
Int. Cl.[4] A61K *31/215, 31/325, 31/195, 31/40;* C07C *103/84;* C07D *207/08*
U.S. Cl. 514—539 14 Claims

1. A compound having the formula:



wherein: each R is independently H, OH, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; alkenyl of 2 to 6 carbon atoms which may be straight chain or branched; trifluoromethyl; alkoxy of 1 to 6 carbon atoms which may be straight chain or branched; SH; thioalkyl of 1 to 6 carbon atoms which may be straight chain or branched; phenyl; phenyl substituted by alkyl of 1 to 3 carbon atoms or by halogen; benzyl; phenethyl; halogen; amino; $N(R_3)_2$; $COOR_3$; CH_2OR_3; formyl; CN; trifluoromethylthio; or nitro;

each R′ is independently R_3; OR_3; or together R′ and R′ are doubly bonded O or CH_2;

each R_1 is independently H or alkyl of 1 to 4 carbons;

R_2 is alkyl of 1 to 6 carbon atoms which may be straight chain or branched; or alkenyl of 3 to 6 carbon atoms which may be straight chain or branched;

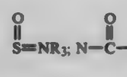
each R_3 is H or alkyl of 1 to 6 carbon atoms which may be straight chain or branched;

R_4 is H, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; alkoxy of 1 to 6 carbon atoms which may be straight chain or branched;

R_5 is H; alkyl of 1 to 6 carbon atoms which may be straight chain or branched; R_3CO— or R_3OCH_2—;

each R_6 is independently R_3 or is such that the structure HNR_6—$(CR_6R_6)_n$—$COOR_3$ is an amino acid or ester thereof;

X_1 and X_2 are independently oxygen, sulfur, sulfoxide, sulfone;



N—CN; or NCONHR$_3$;

Z is O;

each n is independently an integer from 0 to 6;

and a pharmaceutically acceptable salt or acid addition salt thereof.

12. A method of antagonizing leukotriene action in a mammal which comprises administering an amount of a compound of claim 1 effective as a leukotriene antagonist.

14. A method of inducing gastric cytoprotection in mammals comprising administering to a mammal in need of such treatment a gastric cytoprotective amount of a compound of claim 1.

4,717,737

ANTI-BACTERIAL METHODS AND AGENT

Gerald N. Kern, 4631 Louise Ave., Encino, Calif. 91316, assignor to Gerald N. Kern, Encino, Calif.

Filed Jan. 5, 1985, Ser. No. 741,681
Int. Cl.[4] A61K *9/20, 27/00*
U.S. Cl. 514—547 6 Claims

1. A method for treating bacterial infections of animals and humans caused by *Streptococcus pyogenes,* the method comprising the steps of administering to a human or animal infected with *Streptococcus pyogenes* a composition consisting essentially of an anti-bacterially effective dosage of dioctyl sodium sulfosuccinate in a tablet carrier.

4,717,738

POLYURETHANE BASED ON HYDROXYL-CONTAINING POLYMER POLYOL AND PROCESS FOR MAKING THE SAME

Masao Fukuda, Uji, and Koji Kumata, Yawata, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Dec. 18, 1985, Ser. No. 810,264
Claims priority, application Japan, Jan. 22, 1985, 60-10545; Jul. 3, 1985, 60-147304; Jul. 4, 1985, 60-147955
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—137 41 Claims

1. A process for producing a cellular or noncellular polyurethane having improved rigidity and heat resistance, which comprises reacting at least one organic polyisocyanate with a polyol component, at least a part of the polyol component being a pendant hydroxyl radical-containing polymer polyol having a polymer content of at least 30% by weight, said polymer polyol being derived from at least one polyol having an equivalent weight of 200–4,000 and unsaturated monomers,

the polymer portion of said polymer polyol comprisng monomer units of

(a) 5–90% of at least one hydroxyl radical-containing monomer, selected from the group consisting of

(1) esters of an ethylenically unsaturated carboxylic acid with a glycol,

(2) polymerizable unsaturated aliphatic alcohols,

(3) furfuryl alcohol, and

(4) N-alkylol acrylamides;

(b) 5–90% of at least one unsaturated nitrile;

(c) 0–60% of at least one epoxy radical-containing monomer; and

(d) 0–60% of at least one other monomer, based on the total weight of monomers, wherein the total amount of said epoxy radical-containing monomer and said other monomer is 0–60%.

4,717,739

RADIATION CURABLE CLEAR URETHANE ACRYLATE ADHESIVE WITH ACRYLIC ACID MONOACRYLATES, AND OPTIONAL MULTIACRYLATE

Pierre Chevreux, and Christiane A. R. Chevreux, both of Ferney-Voltaire, France, assignors to Deltaglass S.A., Fribourg, Switzerland

Filed Nov. 3, 1983, Ser. No. 548,436
Claims priority, application United Kingdom, Nov. 5, 1982, 31736
Int. Cl.[4] C08F *2/50, 26/00, 20/06;* B32B *27/16*
U.S. Cl. 522—79 32 Claims

1. A radiation-curable clear homogeneous fluid adhesive composition for the production of clear glass laminate comprising (a) a urethane acrylate component in (b) liquid α,β-ethylenically unsaturated diluent component;

said urethane acrylate component comprises at least one urethane acrylate having an average of at least about 2 α,β, ethylenically unsaturated groups per molecule and being obtainable by reaction of an oligomeric urethane intermediate having end groups selected from the —OH and —NCO with an α,β,-ethylenically unsaturated compound which has a group reactive with an end group of the intermediate and also a carboxy (—COO) group attached to a carbon atom which is attached to a methylene group by a double bond, and not less than a major proportion of said urethane acrylate component is formed of material having a molecular weight (M_N) above 1500, and substantially all of the unsaturation in the urethane acrylate is terminal alpha, beta-unsaturation,

said diluent component comprises (i) acrylic acid, (ii) an effective amount of at least one acrylate selected from the group consisting of monoesters of acrylic acid and alkanols having from 1 to 6 carbon atoms and substituted derivatives of such alkanols wherein each substituent contains only carbon, hydrogen and oxygen atoms, said component (i) being present in an amount of from 35% to 90% by weight, based on the total weight of component (i) and component (ii),

and components (i) and (ii) form more than 50% of the diluent,

(iii) from 0% to about 40% by weight based on the weight of the diluent of a multiacrylate selected from the group consisting of the di- and higher esters of acrylic acid with polyhydric alcohols; and

said urethane acrylate component forms 45% to 75% by weight of the mixture of urethane acrylate and diluent, and the diluent forms from 55% to 25% by weight of said mixture.

4,717,740

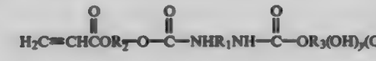
AQUEOUS ALKALINE DEVELOPABLE, UV CURABLE URETHANE ACRYLATE COMPOUNDS AND COMPOSITIONS USEFUL FOR FORMING SOLDER MASK COATINGS

Paul L. K. Hung, Edison, and Kenneth K. S. Tseng, Piscataway, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed May 17, 1985, Ser. No. 735,411
Int. Cl.[4] C08F *2/50, 26/02*
U.S. Cl. 522—96 14 Claims

1. A UV curable, aqueous alkaline developable, urethane acrylate composition comprising:

(a) 40–70% by weight of a urethane acrylate which has the following formula:



where

R_1 is aliphatic or cycloaliphatic,

R_2 and R_3 are alkylene.

R_4 is aliphatic or cycloaliphatic, saturated or unsaturated, y is 0–4 and n is 1–5, provided that if y if 0, then n is at least 2;

(b) 20–50% by weight of a reactive monomer diluent, and

(c) 0.5–10% by weight of a photoinitiator.

4,717,741

RUBBER MODIFIED STYRENIC POLYMER COMPOSITIONS FORMED FROM HYDROPEROXIDE DERIVATIVES OF RUBBERY POLYMERS

Jerry L. Hahnfeld; Alan E. Platt, and David A. Habermann, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 16, 1985, Ser. No. 734,622
Int. Cl.[4] C08J *3/28*
U.S. Cl. 522—116 12 Claims

1. A rubber modified polymeric composition the composition comprising:

(a) a generally rigid matrix phase of a homopolymer of a monovinylidene aromatic monomer or an interpolymer of a monovinylidene aromatic monomer and one or more monomers copolymerizable therewith; and

(b) a rubber modifying grafted rubbery copolymer said grafted rubbery copolymer being formed by a process, the steps of the process comprising:

(1) forming a polymerizable mixture comprising one or more free-radically polymerizable monomers;

(2) dissolving a rubbery polymer having allylic hydrogen in the polymerizable mixture to form a rubber-containing polymerizable solution;

(3) adding to the rubber-containing polymerizable solution, a photosensitizing amount of a photosensitizing agent;

(4) oxygenating the rubber-containing polymerizable solution;

(5) exposing the oxygenated rubber-containing polymerizable solution to electromagnetic radiation wherein triplet oxygen is converted to singlet oxygen, and an average of from about 0.5 to about 4 hydroperoxide derivatives of the rubbery polymers are formed on each rubbery polymer chain;

(6) initiating polymerization of the rubber-containing polymerizable solution; and

(7) continuing polymerization of the rubber-containing polymerizable solution at least until the desired degree of grafting to the rubbery polymer is obtained; wherein the rubber-modified polymeric composition has a rubbery polymer content of from about 2 to about 30 weight percent based on total composition weight.

4,717,742

REINFORCED POLYMER COMPOSITES WITH WOOD FIBERS GRAFTED WITH SILANES - GRAFTING OF CELLULOSES OR LIGNOCELLULOSES WITH SILANES TO REINFORCE THE POLYMER COMPOSITES

Alphons D. Beshay, 3595 de Courval, Trois Rivieres, Quebec, Canada (G8Z 1S8)

Filed May 29, 1985, Ser. No. 739,469
Int. Cl.[4] C08K *9/06*
U.S. Cl. 523—203 7 Claims

1. A process for preparing a reinforced composite material, which comprises providing a filler material selected from the group consisting of chemicalthermomechanical wood pulp derived from aspen, birch or spruce, and wood flour derived from aspen, birch or spruce, providing acetone in a 1:2 weight ratio with respect to said filler material, adding 1–4 weight percent gamma-methacryloxypropyltrimethoxy silane or gamma-amino propyltriethoxy silane, 0.8 weight percent of benzoyl peroxide and 1 weight percent maleic anhydride to said acetone to give an organic solution, spraying said filler material with said organic solution while continuously stirring said filler material, passing a current of warm air over said wetted filler material until there is obtained a grafted filler material, mixing said grafted material with a linear low density polyethylene or isotactic polypropylene on a hot roll-mill or in an extruder to give said reinforced composite material.

4,717,743

POLYOLEFIN-BASE RESIN COMPOSITION

Hiroyuki Wakabayashi; Fumio Kato, both of Kariya; Tamotsu Matsubara, Chiryu, and Yasuo Ishikawa, Kuwana, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 27, 1986, Ser. No. 845,112
Claims priority, application Japan, Mar. 29, 1985, 60-68266
Int. Cl.⁴ C08L *23/04, 1/02, 21/00*
U.S. Cl. 524—13 **5 Claims**

1. A polyolefin-base resin composition comprising:
a vegetable fibrous material having a fiber length of more than 0.3 mm, said vegetable fibrous material containing cellulose as a major constituent; and
a polyolefin-base resin having a melt index of 20 to 100, said vegetable fibrous material being 20 to 60% by weight of said composition and said polyolefin-base resin being 40 to 80% by weight of the composition.

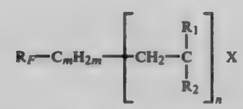
4,717,744

FLUORINATED TELOMERS CONTAINING HYDROPHILIC GROUPS, PROCESS FOR PREPARATION THEREOF, AND THE USE THEREOF AS SURFACTANTS IN AQUEOUS MEDIA

Bernard Boutevin, Montpellier; Yves Pietrasanta, Meze; Mohamed Taha, Montpellier, and Andre Lantz, Veranison, all of France, assignors to Atochem, France

Filed Dec. 24, 1985, Ser. No. 813,061
Claims priority, application France, Dec. 26, 1984, 84 19834
Int. Cl.⁴ A62D *1/04;* **B01F** *17/52*
U.S. Cl. 524—17 **18 Claims**

1. Fluorinated telomers having the general formula:



(I)

wherein R_F is a poly- or perfluorinated radical; X is iodine, chlorine or bromine; m is 0, 1 or 2; n is from 5 to 1000; R_1 is hydrogen or methyl; and R_2 is a —COOH or —$CONR_3R_4$ group, R_3 and R_4, which can be the same or different, each being hydrogen or an alkyl or hydroxyalkyl group.

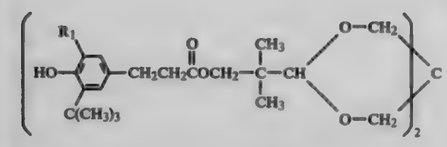
4,717,745

STABILIZED POLYACETAL RESIN COMPOSITIONS

Tamaki Ishii, Suita; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Haruki Okamura, Osaka, and Masahisa Shionoya, Izumi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Apr. 4, 1986, Ser. No. 848,116
Claims priority, application Japan, Apr. 11, 1985, 60-77260
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.⁴ C08K *5/34, 5/49*
U.S. Cl. 524—91 **4 Claims**

1. A stabilized polyacetal resin composition which comprises a polyacetal resin and a stabilizing amount of a phenolic type compound represented by the general formula (I),



(I)

wherein R_1 represents a C_1–C_3 alkyl group.

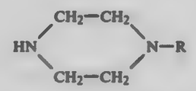
4,717,746

ADHESION PROMOTERS OF PLASTISOLS, CAPABLE OF MAINTAINING PLASTISOL COLOR STABLE TOWARDS THE EFFECT OF THE APPLICATION THERMAL TREATMENT

Roberto Leoni; Angela Rossini, both of Milan, and Massimo Taccani, Arcore, all of Italy, assignors to Chem-Plast, Milan, Italy

Filed Jul. 26, 1985, Ser. No. 759,184
Claims priority, application Italy, Aug. 2, 1984, 22208 A/84
Int. Cl.⁴ C08K *5/34;* **C08G** *63/54*
U.S. Cl. 524—100 **11 Claims**

1. Adhesion promoters for plastisols of polymers or copolymers of polyvinyl chloride, characterized in that they are constituted by fluid polyaminoamide resins having decolorization resistance when associated polymers are subject to heat treatment, said polyaminoamide resins being obtained by means of the condensation of:
1 equivalent of polycarboxylic acids, as obtained by means of the polymerization of unsaturated fatty acids, of composition comprised within the following ranges: 0–2% monomers, 10–50% dimers, 50–90% trimers, with
from 1.0 to 2.2 equivalents of an heterocyclic amine of the general formula



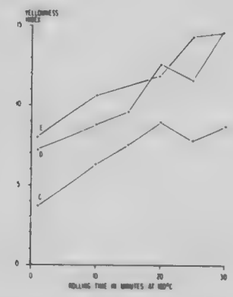
wherein R can be H or an alkylamino group —R′—NH_2, wherein R′ is a saturated aliphatic chain.

4,717,747

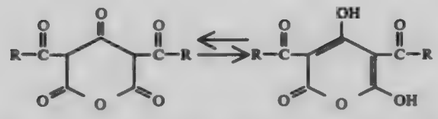
STABILIZER MIXTURES FOR VINYL CHLORIDE POLYMER MASSES

Theodor Völker, Reinach, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jun. 20, 1985, Ser. No. 746,677
Claims priority, application Switzerland, Jul. 6, 1984, 3282/84
Int. Cl.⁴ C08K *5/15;* **C09K** *15/06*
U.S. Cl. 524—110 **10 Claims**



1. Stabilizer mixture for vinyl chloride polymerizates for the improvement of the initial clarity and the heat constancy thereof, consisting essentially of (i) a nitrogen-free 3,5-substituted tetrahydropyrane-2,4,6-trione compounds of the formula:



wherein R is an alkyl having 1 to 6 carbon atoms, and (ii) a salt of a monovalent or bivalent metal and an aliphatic or aromatic carboxylic acid radical.

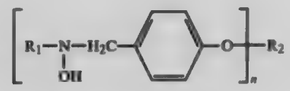
4,717,748

COMPOSITIONS STABILIZED WITH SUBSTITUTED ALKOXYBENZYLHYDROXYLAMINES

Ramanathan Ravichandran, Yonkers, and Thomas E. Snead, Dobbs Ferry, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,839
Int. Cl.⁴ C07C *83/00, 83/04;* **C08K** *5/17*
U.S. Cl. 524—236 **28 Claims**

1. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of the formula



wherein
R_1 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalky of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms of said aralkyl substituted by alkyl of 1 to 36 carbon atoms or —OR_3, wherein R_3 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl or 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;
n is 2–4;
R_2, when n is 2, is alkylene of 2 to 12 carbon atoms, alkylidene of 2 to 6 carbon atoms, cycloalkylene of 6 to 19 carbon atoms, arylene of 6 to 10 carbon atoms or alkylarylenealkylene of 8 to 10 carbon atoms;
R_2, when n is 3, is alkanetriyl of 3 to 6 carbon atoms; and
R_2, when n is 4, is alkanetetrayl of 4 to 6 carbon atoms.

4,717,749

PRESSURE SENSITIVE ADHESIVES CONTAINING BLOCK COPOLYMER

Raymond W. Tang, Houston, Tex., and Lu H. Tung, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 693,391, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 608,626, May 9, 1984, abandoned. This application Aug. 22, 1985, Ser. No. 768,378
Int. Cl.⁴ C08L *53/02*
U.S. Cl. 524—271 **7 Claims**

1. A pressure sensitive adhesive composition comprising
(1) a block coplymer of ABA configuration wherein A is a copolymer of alpha-methylsytrene and styrene and the B portion of the polymer is a polydiene;
(2) a diblock copolymer of AB type of an amount from 0 to 20 parts by weight per hundred parts of the ABA triblock copolymer;
(3) a tackifying resin compatible with block B in the amounat of 10 to 200 parts hundred parts of the ABA block copolymer;
(4) a reinforcing resin having a higher softening point than the block A in the ABA polymer in the amount of from about 0 to 100 parts per hundred parts of the block ABA block copolymer;
(5) an extending oil in an amount from 0 to 50 parts by weight per hundred parts by weight of the ABA block copolymer; and
(6) a stablizer in the amount of 0 to 5 parts per hundred parts by weight of the ABA block copolymer.

4,717,750

STRUCTURE REINFORCED LATEX PARTICLES

Ashok C. Makati; Do I. Lee, and Mezzie L. Ash, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 29, 1985, Ser. No. 759,994
Int. Cl.⁴ C08F *2/16*
U.S. Cl. 524—458 **10 Claims**

1. A process for preparing a structure reinforced latex particle whose film has improved tensile and elongation properties prepared by an emulsion polymerization comprising:
(a) polymerizing a first monomer feed to form a core region;
(b) polymerizing in the presence of said (a) a second monomer feed, a polymer of which would have a glass transition temperature greater than (a), in an amount from about 5 to about 30 parts per hundred parts monomer in said latex particle to form an intermediate layer; and
(c) polymerizing in the presence of (a) and (b) a third monomer feed, a polymer of which would have a T_g less than said (b), to form a shell region whereby a structure reinforced latex particle is produced having a soft polymer core, a hard polymer intermediate layer and a soft polymer shell.

4,717,751

LINEAR POLYESTER RESIN BLENDS WITH HIGH IMPACT RESISTANCE

John B. Yates, III, and Timothy J. Ullman, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 717,938, Mar. 29, 1985, Pat. No. 4,619,971. This application Jun. 19, 1986, Ser. No. 876,151
Int. Cl.⁴ C08L *67/02*
U.S. Cl. 525—166 **5 Claims**

1. A resinous composition having a notched Izod impact strength at room temperature in excess of 635 joules/m., wherein the resinous components consist essentially of:
(A) at least one polyester selected from the group consisting of poly(ethylene terephthalate) and poly(butylene terephthalate), and
(B) a blend of:
(B-1) at least one elastomeric addition copolymer consisting essentially of structural units derived from acrylonitrile and at least one conjugated diene or a combination of at least one conjugated diene and at least one acidic monomer, and
(B-2) at least one elastomeric copolymer consisting essentially of ethylene, propylene and non-conjugated diene units; said blend containing nitrile structural units in an amount to provide from 1% to about 8% by weight of said units in said resinous composition.

4,717,752

LINEAR POLYESTER RESIN BLENDS WITH HIGH IMPACT RESISTANCE

John B. Yates, III, and Timothy J. Ullman, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 717,938, Mar. 29, 1985, Pat. No. 4,619,971. This application Jun. 19, 1986, Ser. No. 876,147
Int. Cl.⁴ C08L *67/02, 9/02*
U.S. Cl. 525—175 **5 Claims**

1. A resinous composition which, when unfilled, has a notched Izod impact strength at room temperature in excess of

795 joules/m., wherein the resinous components consist essentially of:

(A) at least one polyester selected from the group consisting of poly(ethylene terephthalate) and poly(butylene terephthalate), and

(B) at least one elastomeric addition copolymer consisting essentially of structural units derived from acrylonitrile and at least one conjugated diene or a combination of at least one conjugated diene and at least one acidic monomer, said acrylonitrile-derived units being present in an amount to provide from 6% to about 10% by weight of said units in said resinous composition.

4,717,753

CHLOROSULFONATED ALKYLENE-ALKYL ACRYLATE COPOLYMERS

Mahmood R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 680,568, Dec. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 514,336, Jul. 15, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 853,371

Int. Cl.⁴ C08F *8/38*

U.S. Cl. 525—330.4 **7 Claims**

1. A granular, elastomeric, flame retardant chorosulfonated alkylene-alkyl acrylate copolymer having a tensile modulus of less than about 2,000 psi and a crystallinity of less than about 10 percent, prepared by reacting an alkylene-alkyl acrylate copolymer with a gaseous chlorosulfonating agent in the absence of solvent or diluent wherein the copolymer has about one to about 50 percent by weight combined alkyl acrylate; a total chlorine content of about 5 to about 55 percent by weight; and a sulfur content of about 0.1 to about 10 percent by weight.

4,717,754

OIL ADDITIVES CONTAINING A THIOCARBAMYL MOIETY

Stanley J. Brois, Spring, Tex., and Antonio Gutierrez, Mercerville, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 776,019, Sep. 13, 1985, abandoned, which is a continuation of Ser. No. 320,574, Nov. 12, 1981, abandoned, which is a continuation of Ser. No. 109,778, Jan. 7, 1980. This application Sep. 18, 1986, Ser. No. 908,786

Int. Cl.⁴ C08F *8/34*

U.S. Cl. 525—331.8 **9 Claims**

1. A polyalkenyl thiocyanate having the thiocyanate group attached to a carbon which is one carbon removed from an ethylenically unsaturated carbon, said polyalkenyl thiocyanate being obtained by the method of adding a solution of a thiocyanogen halide in acetic acid, tetrahydrofuran or alcohol solvent to a polyalkene to form an adduct, removing a hydrogen halide from said adduct to produce said polyalkenyl thiocyanate, wherein the polyalkene is selected from the group consisting of polypropylene, polyisobutylene, ethylene copolymers, ethylene terpolymers, polybutadiene-isoprene interpolymer, butyleneisoprene interpolymer, and mixtures thereof.

4,717,755

PROCESS FOR PRODUCING PROPYLENE POLYMER

Yoshiharu Doi; Kazuo Soga, both of Kanagawa; Satoshi Ueki, and Makoto Miyazaki, both of Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1985, Ser. No. 810,638

Claims priority, application Japan, Dec. 26, 1984, 59-273121

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—333.7 **7 Claims**

1. An essentially monodisperse propylene polymer in which essentially every polymer chain is terminated with a carbonyl group.

4,717,756

PROCESS FOR PREPARING METHACRYLATE POLYMER

Yasuyuki Kato; Masahiro Yuyama; Masahiko Moritani, all of Niihama, and Yukio Yasunori, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP86/00400, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO87/00842, PCT Pub. Date Feb. 12, 1987

PCT Filed Aug. 4, 1986, Ser. No. 46,983

Claims priority, application Japan, Aug. 6, 1985, 60-173915

Int. Cl.⁴ C08F *4/50*

U.S. Cl. 526—146 **16 Claims**

1. A process for preparing a methacrylate polymer comprising polymerizing a methacrylate ester or a mixture of unsaturated monomers comprising the methacrylate ester as a main component in the presence of (1) a hydroperoxide polymerization initiator, (2) a reductant containing sulfur in a molecule, (3) a hydrogen halogenide salt of amine or a quarternary ammonium halogenide and (4) a copper-containing compound.

4,717,757

MESOMORPHIC SIDE-CHAIN POLYMERS HAVING HIGH DIELECTRIC ANISOTROPY AND A METHOD FOR PRODUCING SAID POLYMERS

Jean C. Dubois, St. Remy Les Chevreuses; Gilles Ravaux, Les Ulis, and Pierre Le Barny, Orsauy, all of France, assignors to Thomson-CSF, Paris, France

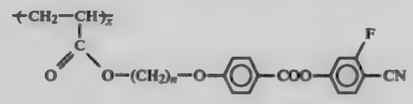
Filed Mar. 23, 1987, Ser. No. 29,143

Claims priority, application France, Mar. 25, 1986, 86 04285

Int. Cl.⁴ C08F *18/20*

U.S. Cl. 526—246 **1 Claim**

1. A mesomorphic side-chain polymer which exhibits high dielectric anisotropy and corresponds to the following chemical formula:



where x indicates the degree of polymerization and $4 \leqq n \leqq 15$.

4,717,758

PAPERMAKING ADDITIVE

Masatomi Ogawa, Ichihara, and Mayumi Narushima, Chiba, both of Japan, assignors to DIC-Hercules Chemicals, Inc., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,495

Claims priority, application Japan, Aug. 22, 1985, 60-183128

Int. Cl.⁴ C08F *226/02, 226/03*

U.S. Cl. 526—307 **8 Claims**

1. A papermaking additive useful for papermaking in a neutral to alkaline pH region which comprises a water-soluble copolymer composed of (a) 1 to 20 mole % of dimethylaminopropyl (meth)acrylamide or its quaternized product, (b) 0.1 to 12 mole % of itaconic acid or its salt, and (c) 98.9 to 68 mole % of acrylamide, the (b)/(a) mole ratio being from 0.1 to 0.6.

4,717,759

ETHYLENE COPOLYMERS

Yuichi Orikasa; Shinji Kojima; Takashi Inoue, all of Yokohama; Kaoru Yamamoto; Atsushi Sato, both of Tokyo, and Shigenobu Kawakami, Ichikawa, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

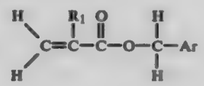
Continuation-in-part of Ser. No. 782,402, Oct. 1, 1985. This application Nov. 4, 1985, Ser. No. 794,622

Claims priority, application Japan, Oct. 3, 1984, 59-207595; Oct. 17, 1984, 59-217924; Nov. 6, 1984, 59-233950

Int. Cl.⁴ C08F *18/16*

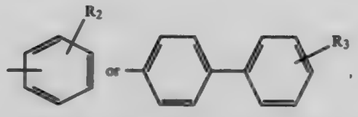
U.S. Cl. 526—326 **5 Claims**

1. An ethylene copolymer comprising 85.0 to 99.995 mol% of an ethylene unit, 0.005 to 5 mol% of a comonomer unit represented by the formula (I)



(I)

wherein Ar is



R_1 is a hydrogen atom or a methyl group, each of R_2 and R_3 is a hydrogen atom, or a straight-chain or a side-chain alkyl group having 1 to 4 carbon atoms, and 0 to 10 mol% of an ethylenic unsaturated monomer unit, said ethylene copolymer having a density of 0.860 to 0.970 g/cm³ and a melt index of 0.05 to 100 g/10 minutes.

4,717,760

FLUORINATED TRIS-EPOXIDES BASED ON TRIPHENYL METHANE

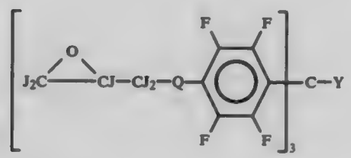
Theodore L. Parker, Lafayette, and Robert R. Stringham, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 10, 1986, Ser. No. 884,144

Int. Cl.⁴ C08G *59/32*; C07D *303/02, 303/08*

U.S. Cl. 528—98 **17 Claims**

1. The tris-epoxides represented by the formula



(I)

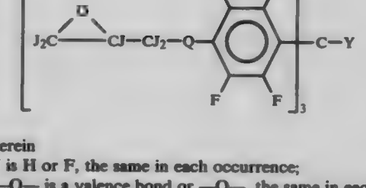
wherein

J is H or F, the same in each occurrence;

—Q— is a valence bond or —O—, the same in each occurrence; and

Y=H or F, independently.

11. The method of preparing an epoxide of the formula



(I)

wherein

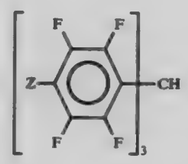
J is H or F, the same in each occurrence;

—Q— is a valence bond or —O—, the same in each occurrence; and

Y=H, independently,

by carrying out the following steps:

first, reacting an allylic halide of the formula $CJ_2=CJ-CJ_2X$, X being F, Cl, Br, or I, with a compound of the formula



(II)

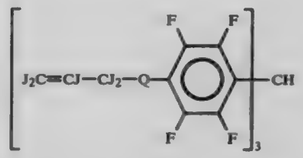
wherein

Z=MO-, hal. Mg- or Ag

M=Cs, K, Na, or Li; and

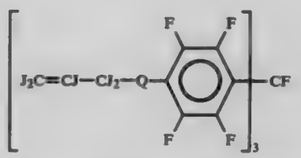
hal=Br or I.

thereby forming a compound of the formula



(III)

then, if Y in said epoxide formula I is to be F, converting the compound of formula III to the corresponding compound of the formula



(IV)

and finally, converting the compound of formula III or IV to the compound of formula I in which Y is H or F respectively.

4,717,761

THERMOPLASTIC AROMATIC POLYETHERKETONES

Philip A. Staniland, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 5, 1985, Ser. No. 804,847
Claims priority, application United Kingdom, Dec. 5, 1984, 8430669
Int. Cl.[4] C08G 8/02, 14/00
U.S. Cl. 528—125 10 Claims

1. A polymeric material having the repeating units I and II

—O—
Ph—O—
Ph—CO—
Ph—I

and

—O—Ph—Ph—O—Ph—CO—Ph— II

wherein the repeating units I and II are in the relative molar proportions I:II of from 95:5 to 60:40, and Ph is a phenylene group.

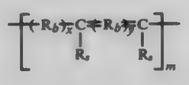
4,717,762

ELECTROACTIVE POLYMERS HAVING AROMATIC AND QUINONOID BONDING STRUCTURES

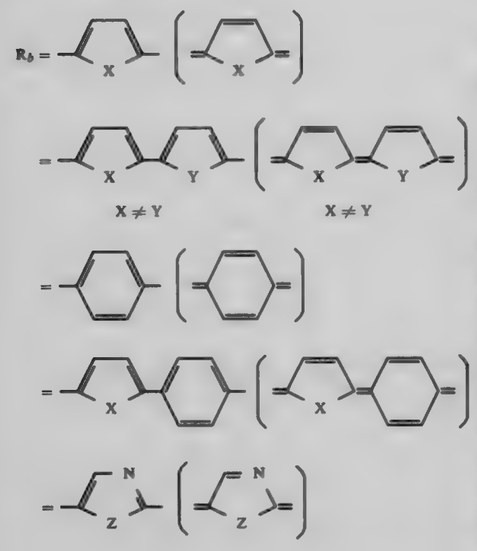
Samson A. Jenekhe, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 904,746
Int. Cl.[4] C08G 16/02; H01B 1/00
U.S. Cl. 528—251 18 Claims

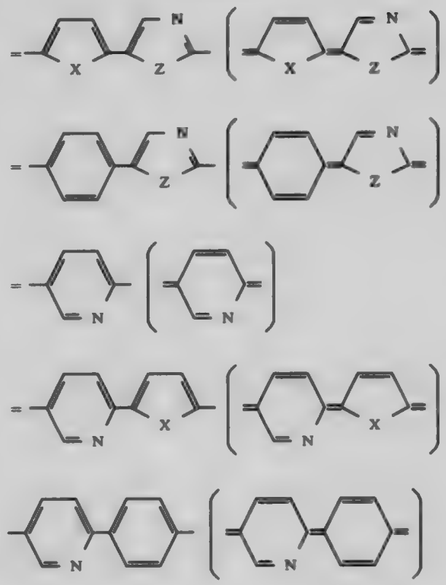
1. Electroactive polymers having the structural formula:



wherein backbone group R_b is selected from the class consisting of five- and six-membered aromatic and heterocyclic rings, and combinations thereof, which exhibit aromatic and quinonoid bonding structures, selected from the group consisting of



-continued



X or Y = S, O, NH, NCH_3, Se, Te, N
Z = S, O, NH

side chain R_s is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from an aldehyde of the formula R_sCHO;
x and y are positive integers having a value of 1 to 5;
and m is a positive integer having a value from 1 to about 10,000.

4,717,763

BLOCK COPOLYETHERAMIDES FLEXIBLE AT LOW TEMPERATURES

Jean Coquard, Craponne, and Jean Goletto, Ecully, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 11, 1985, Ser. No. 807,647
Claims priority, application France, Dec. 11, 1984, 84 19100
Int. Cl.[4] C08G 69/14
U.S. Cl. 528—324 27 Claims

1. A homogeneous, flexible block copolyetheramide having a melting/softening point of at least 170° C., a glass transition temperature, measured at zero percent relative humidity, of at most −5° C., and a melt viscosity of at least 500 poises, said block copolyetheramide comprising a polycondensate produced in the presence of a catalyst selected from the group consisting of (a) an oxyacid having at least one acid function which has a pKa of not greater than 4 and selected from the group consisting of strong inorganic oxyacids and strong organic oxyacids other than carboxylic acids and (b) an alkali or alkaline earth metal salt of said oxyacid (a), and wherein said polycondensate is of an admixture of (i) a lactam having from 4 to 12 carbon atoms with (ii) a solution of (iii) a salt of a fatty acid dimer and a mixture of polyoxyalkylenediamine and a triamine in (iv) a solvent medium which comprises (1) a mixture of water and an aliphatic alcohol having less than than 5 carbon atoms, (2) a water/alcohol/lactam mixture wherein the alcohol and lactam are as defined above, (3) a melt of said lactam, or (4) a mixture of water and a water-soluble lactam, the stoichiometry of said salt (iii) having been adjusted such that the pH thereof is essentially that as exists at the equivalence point thereof.

4. A homogeneous, flexible block copolyetheramide having a melting/softening point of at least 170° C., a glass transition temperature, measured at zero percent relative humidity, of at most −5° C., and a melt viscosity of at least 500 poises, said block copolyetheramide comprising a polycondensate which has been produced in the presence of a catalyst which is an alkali or alkaline earth metal salt of an oxyacid having at least one acid function which has pKa of not greater than 4 and selected from the group consisting of strong inorganic oxyacids and strong organic oxyacids other than carboxylic acids, and wherein said polycondensate is of an admixture of (i) a lactam having from 4 to 12 carbon atoms with (ii) a solution of (iii) a salt of a fatty acid dimer and a polyoxyalkylenediamine in (iv) a solvent medium which comprises (1) a mixture of water and an aliphatic alcohol having less than 5 carbon atoms, (2) a water/alcohol/lactam mixture wherein the alcohol and lactam are as defined above, (3) a melt of said lactam, or (4) a mixture of water and a water-soluble such lactam, the stoichiometry of said salt (iii) having been adjusted such that the pH thereof is essentially that as exists at the equivalence point thereof.

4,717,764

TWO STAGE MELT POLYMERIZATION PROCESS FOR MAKING POLYMERS CONTAINING AROMATIC AMIDE GROUPS

Bennett C. Ward, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 704,227, Feb. 22, 1985, Pat. No. 4,672,104, and Ser. No. 645,952, Aug. 31, 1984, Pat. No. 4,588,808. This application Sep. 26, 1985, Ser. No. 780,709
Int. Cl.[4] C08G 73/18
U.S. Cl. 528—337 14 Claims

1. A two stage process for producing a polymer containing aromatic amide groups comprising heating with agitation in a first stage in a substantially oxygen-free atmosphere, a mixture of aromatic amine components comprising an aromatic tetramine containing two pairs of amine groups each bonded to adjacent carbon atoms and at least one member of the group consisting of aromatic diamines in which the amine groups are bonded to non-adjacent hydrocarbon ring carbon atoms and aromatic triamines in which two amine groups are bonded to adjacent hydrocarbon ring carbon atoms and the third amine group is bonded to a hydrocarbon ring carbon non-adjacent to each of the other two amine grups, with an aromatic dicarboxylic component in free or esterified form, said heating being at least sufficient to bring the mixture to condensation polymerization temperatures, terminating the agitation while continuing to heat the reaction mass to maintain condensation polymerization temperatures but no higher than about 350° C. until the inherent viscosity of the polymerizing mass reaches at least 0.05 dl/g measured in concentrated sulfuric acid solution, cooling the mass to solidify it, crushing the mass to obtain a ground prepolymer and heating the ground prepolymer in a second stage in a substantially oxygen-free atmosphere at a temperature in excess of the highest temperature employed in said first stage with agitation until the desired inherent viscosity is obtained.

9. The process of claim 1 wherein a catalyst for the reaction is employed.

10. The process of claim 9 wherein said catalyst is triphenyl phosphite.

4,717,765

ANHYDROUS CRYSTALS OF MALTITOL AND WHOLE CRYSTALLINE HYDROGENATED STARCH HYDROLYZATE MIXTURE SOLID CONTAINING THE CRYSTALS, AND PROCESS FOR THE PRODUCTION AND USES THEREOF

Mamoru Hirao; Hiromi Hijiya, and Toshio Miyaka, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 511,762, Jul. 7, 1983, abandoned, which is a division of Ser. No. 321,311, Nov. 3, 1981, Pat. No. 4,408,041. This application Dec. 9, 1985, Ser. No. 809,831
Claims priority, application Japan, Feb. 12, 1981, 56-19512
Int. Cl.[4] A61K 31/605, 9/68; C07G 15/04; A23L 1/226
U.S. Cl. 536—124 12 Claims

1. A process for producing a pulverulent composition consisting essentially of at least 65% anhydrous crystals of maltitol, based on the weight of dry solids, and the remainder being sorbitol and higher sugar alcohols, said process comprising:

providing a 0°–95° C. aqueous maltitol solution having a dissolved solids concentration of 65–95% and a maltitol content of at least 65% based on the weight of the dissolved solids, and a degree of supersaturation of from about 1.05 to about 1.50 based on the weight of the solids dissolved in the solution;

seeding the aqueous solution with an effective amount of anhydrous seed crystals of maltitol;

cooling the aqueous solution under conditions appropriate to obtain a crystal suspension; and

forming a pulverulent solid from said crystal suspension.

4,717,766

METHOD OF PREPARING HIGH TITER ANTI-RESPIRATORY SYNCYTIAL VIRUS INTRAVENOUS IMMUNE GLOBULIN

Milton B. Dobkin, Lafayette, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 822,560, Jan. 27, 1986, Pat. No. 4,659,563. This application Mar. 9, 1987, Ser. No. 23,339
Int. Cl.[4] A61K 39/42, 39/25
U.S. Cl. 530—387 4 Claims

1. A method for preparing an intravenously injectable immune globulin having a titer of antibody to respiratory syncytial virus of at least about 1:250,000 at a globulin concentration of about 5% by weight, as determined by an enzyme-linked immunosorbent assay, which comprises the steps of:

(a) screening plasma from donors for a titer of antibody to respiratory syncytial virus of at least about 1:110,000, as determined by an enzyme-linked immunosorbent assay,

(b) pooling the donor plasma selected according to step (a) above,

(c) preparing an immune globulin from the plasma pooled according to step (b) above, and

(d) rendering the immune globulin obtained according to step (c) above intravenously injectable.

4,717,767

7-AMINO-3-(PYRAZINYLMETHYL) OR (PYRIDAZINYLMETHYL)-CEPHALOSPORINS

Hiroshi Sadaki; Hiroyuki Imaizumi; Takashi Nagai; Kenji Takeda; Isao Myokan, all of Toyama; Takihiro Inabe, Namerikawa; Yasuo Watanabe, Toyama; Yoshikazu Fukuoka, Toyama; Shinzaburo Minami, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

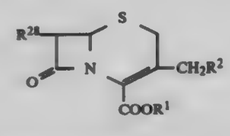
Division of Ser. No. 552,468, Nov. 16, 1983, Pat. No. 4,618,606. This application Jul. 22, 1986, Ser. No. 860,317

Claims priority, application Japan, Nov. 17, 1982, 57-200382; Apr. 19, 1983, 58-67871

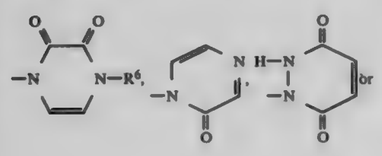
Int. Cl.[4] C07D 501/18

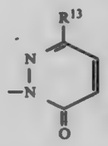
U.S. Cl. 540—222 6 Claims

1. A 7-amino-3-substituted methyl-Δ^3-cephem-4-carboxylic acid derivative represented by the following formula or a salt thereof:



wherein R^1 represents a hydrogen atom or a carboxyl- protecting group; R^2 represents a group of the formula:





in which R^6 represents a hydrogen atom, a C_{1-5} alkyl group or a di-C_{1-5} alkylamino group; R^{13} represents a C_{1-5} alkyl group; and R^{28} represents an amino group.

4,717,768

PROCESS FOR SEPARATION OF SYN AND ANTI OXIME ISOMERS OF CEPHALOSPORIN-COMPOUNDS

Colin Robinson, Allathwaite; David T. Eastlick, Grange-over-Sands, and Andrey J. Bownass, Haverthwaite, all of England, assignors to Glaxo Group Limited, London, England

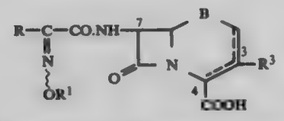
Filed Sep. 7, 1984, Ser. No. 648,382

Claims priority, application United Kingdom, Sep. 9, 1983, 8324152

Int. Cl.[4] C07D 501/12; A61K 31/545

U.S. Cl. 540—222 20 Claims

1. A process for separating a mixture of syn and anti oxime isomers, one from the other, of a water-soluble cephalosporin compound of formula



(II)

wherein each of R, R^1 and R^3 independently represents an organic group and R^3 may additionally represent a hydrogen atom; B is —S— or >S→O (α- or β-) and the dotted line indicates Δ^2 or Δ^3 unsaturation; or an ester, salt or solvate thereof; which comprises adsorbing said mixture of oxime isomers onto a non-functional macroreticular adsorption resin, and eluting said resin to yield at least one eluate fraction containing one of said isomers substantially free of the other of said isomers.

4,717,769

PRODUCTION OF EPSILON-CAPROLACTAM

Hiroshi Sato; Kenichi Hirose; Masaru Kitamura; Youichi Umada, all of Osaka; Norio Ishii, Ehime, and Hideto Tojima, Kyoto, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,851

Claims priority, application Japan, Apr. 21, 1986, 61-91596

Int. Cl.[4] C07D 201/04

U.S. Cl. 540—536 10 Claims

1. A process for preparing ε-caprolactam which comprises bringing cyclohexanone oxime in a gaseous phase into contact with a crystalline metallo-silicate catalyst having Si/metal atomic ratio of 500 or more in crystal skeleton, excluding Al as the metal.

4,717,770

PROCESS FOR PRODUCING EPSILON-CAPROLACTAM

Hiroshi Sato; Kenichi Hirose; Masaru Kitamura, all of Osaka; Hideto Tojima, and Norio Ishii, both of Kyoto, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,921

Claims priority, application Japan, Feb. 27, 1986, 61-43441

Int. Cl.[4] C07D 201/04

U.S. Cl. 540—536 9 Claims

1. A method for preparing ε-caprolactam which comprises bringing cyclohexanone oxime in a gaseous phase into contact with a crystalline zeolite catalyst having a constraint index of 1–12 which has been surface treated with an organometallic compound represented by the following general formula (I):

$$R_{4-n}MX_n \quad (I)$$

wherein R which may be identical or different represent an alkyl group of 1–6 carbon atoms or phenyl group, M represents Si or Ge, X represents Cl or an alkoxy group of 1–6 carbon atoms and n represents 1 or 2.

4,717,771

UNSATURATED ALIPHATIC KETONE [AND USE OF SAME AS PERFUMING INGREDIENT]

Karl-Heinrich Schulte-Elte, Onex, and Dietrich Kastner, Givrins, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

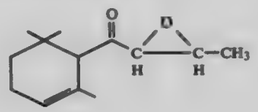
Filed Oct. 4, 1985, Ser. No. 784,126

Claims priority, application Switzerland, Oct. 15, 1984, 4926/84

Int. Cl.[4] C07D 303/32

U.S. Cl. 549—548 1 Claim

1. An epoxy-ketone of formula



(I)

4,717,772

ALKYL ZIRCONATE COLOR IMPROVEMENT

Fritzbert Edouard, Spring Valley, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 17, 1987, Ser. No. 15,760

Int. Cl.[4] C07F 7/00

U.S. Cl. 556—54 10 Claims

1. A process for the color improvement of alkyl zirconates which comprises treating the alkyl zirconate with an effective amount of a nitrogen oxide oxidant to achieve the color improvement.

4,717,773

SILICATE ESTERS AND ORGANOSILICON COMPOUNDS

Malcolm E. Kenney, 1203 Hereford Rd., Cleveland Heights, Ohio 44118, and George B. Goodwin, 8031 Greenwood View Dr. #1203, Parma, Ohio 44129

Filed Oct. 4, 1985, Ser. No. 784,216

Int. Cl.[4] C07F 7/13

U.S. Cl. 556—457 36 Claims

1. A method for preparing alkoxysilanes and alkoxysiloxanes which comprises treating a metal silicate with a solution of anhydrous or aqueous acid in an alcohol, heating the resulting mixture and removing low boiling components from said mixture, then isolating the product from the residue.

4,717,774

PROCESS FOR THE PREPARATION OF TOLUENE DIAMINES

Thirumurti Narayan, Grosse Ile, and Peter T. Kan, Plymouth, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 20, 1985, Ser. No. 811,490

Int. Cl.[4] C07C 51/16

U.S. Cl. 564—422 4 Claims

1. A process of preparing toluene diamine consisting essentially of reacting dinitrotoluene with hydrogen in the presence of

(a) water,

(b) a metallic catalyst wherein the metal is nickel, cobalt, magnesium, copper or silver, and

(c) carbon monoxide wherein the amount of carbon monoxide used is from 0.001 to 0 ? percent by volume based on the volume of hydrogen.

4,717,775

TRANSITION METAL COMPLEX CATALYZED REACTIONS

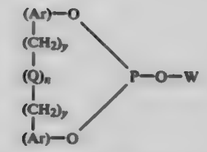
Ernst Billig; Anthony G. Abatjoglou, both of Charleston; David R. Bryant, South Charleston; Rex E. Murray, and John M. Maher, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 685,025, Dec. 28, 1984, Pat. No. 4,599,206, which is a continuation-in-part of Ser. No. 581,352, Feb. 17, 1984, abandoned. This application May 20, 1986, Ser. No. 865,061

Int. Cl.[4] C07C 45/50

U.S. Cl. 568—454 33 Claims

1. A hydroformylation process for producing aldehydes which comprises reacting an olefinically unsaturated organic compound with carbon monoxide and hydrogen in the presence of a rhodium complex catalyst consisting essentially of rhodium complexed with carbon monoxide and a diorganophosphite ligand, and in the added presence of a free diorganophosphite ligand, wherein the diorganophosphite ligand complexed with the rhodium and the free diorganophosphite ligand are each individually ligands having the formula



wherein W represents an unsubstituted or substituted monovalent hydrocarbon radical; wherein each Ar group represents an identical or different substituted or unsubstituted aryl radial, wherein each y individually has a value of 0 to 1, wherein Q is a divalent bridging group selected from the class consisting of $—CR^1R^2—$, —O—, —S—, $—NR^3—$, $—SiR^4R^5—$ and —CO—, wherein each R^1 and R^2 radical individually represents a radical selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, tolyl and anisyl, wherein each R^3, R^4, and R^5 radical individually represents —H or $—CH_3$, and wherein n has a value of 0 to 1, and wherein the hydroformylation reaction conditions comprise a reaction temperature in the range of from about 45° C. to about 200° C., to a total gas pressure of hydrogen, carbon monoxide and olefinically unsaturated organic compound of from about 1 to about 10,000 psia, a H_2:CO molar ratio of gaseous hydrogen to carbon monoxide in the range of from about 1:10 to 100:1, and wherein the reaction medium contains at least one mole of free diorganophosphite ligand per mole of rhodium present in the reaction medium.

4,717,776

BROMINATION PROCESS

David R. Brackenridge, and Bonnie G. McKinnie, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 21, 1986, Ser. No. 854,015

Int. Cl.[4] C07C 43/225, 41/22

U.S. Cl. 568—637 17 Claims

1. A process for making a partially brominated polyphenylene ether, said process comprising reacting said polypeneylene ether with bromine in the presence of a catalytic amount of a zirconium halide catalyst at a temperature from about 10° C. up to reflux wherein said process is conducted using about 5–24 moles of bromine for each equivalent weight of said polyphenylene ether wherein said equivalent weight is the molecular weight of the polyphenylene ether divided by the number of benzene rings in said polyphenylene ether.

4,717,777

PROCESS FOR PREPARING P-ISOPROPENYL PHENOL

Juan M. Garces, Midland, Mich., and John W. Robinson, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 778,040, Sep. 20, 1985. This application Dec. 18, 1986, Ser. No. 943,237

Int. Cl.[4] C07C 36/52

U.S. Cl. 568—806 20 Claims

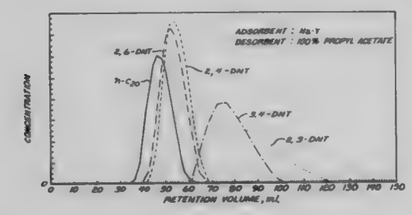
1. A process for the cleavage of dihydroxydiaryl alkanes comprising contacting at least one cleavable dihydroxydiaryl alkane with a catalyst composition under reaction conditions such that there is formed the corresponding alkenyl hydroxyaryl compound; the catalyst composition having the formula $[AO_x]_{1-y}[A(OH)_n]_y[Z_2O]_z \cdot qH_2O$ wherein A is a metal of Group IIA, IIB, IIIB, IVA, IVB or VIIB; Z is an alkali metal; and n and x are numbers sufficient to satisfy the valence of A; q is a non-negative number; z is greater than zero, and y is a positive number ≦1, with the proviso that the ratio y/z is from about 10 to about 80.

4,717,778

PROCESS FOR SEPARATING THE MINOR ISOMERS OF DINITROTOLUENE

Hermaan A. Zinnes, Evanston, and Thad S. Franczyk, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 1, 1985, Ser. No. 782,345
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.
Int. Cl.[4] C07C 79/10
U.S. Cl. 568—934 10 Claims



1. A process for separating at least one minor isomer selected from the group consisting of 2,3-dinitrotoluene and 3,4-dinitrotoluene from a feed mixture comprising said minor isomer, 2,4-dinitrotoluene and 2,6-dinitrotoluene, said process comprising contacting said mixture at a temperature within the range of from about 20° to about 230° C. and a pressure sufficient to maintain liquid phase with an adsorbent comprising a Y type zeolite, cation exchanged with a cation from the group consisting of calcium and sodium, thereby selectively adsorbing said minor isomers, removing the remainder of said mixture from said adsorbent, and then recovering said minor isomers by desorption at a temperature within the range of from about 20° to about 230° C. and a pressure sufficient to maintain liquid phase with a desorbent material selected from the group consisting of propyl or ethyl acetate, a C_3 to C_5 alcohol, 2-heptanone and a mixture of one of said alcohols or 2-heptanone with toluene.

4,717,779

DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Jeffery C. Bricker; Tamotsu Imai, and David E. Mackowiak, all of Mt. Prospect, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 774,841, Sep. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 708,833, Mar. 6, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 893,754
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] C07C 5/40
U.S. Cl. 585—443 19 Claims

1. In a process for the dehydrogenation of a dehydrogenatable hydrocarbon with separate and intermediate selective oxidation of hydrogen which comprises:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first-reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first-reaction dehydrogenation zone effluent stream comprising a mixture of uncovered hydrocarbon dehydrogenation hydrocarbons, hydrogen and steam;

(b) removing said first-reaction dehydrogenation zone effluent from said first-reaction dehydrogenation zone;

(c) passing said removed first-reaction dehydrogenation zone effluent of step (b) to a second-reaction oxidation zone, which is separate and discrete from said first-reaction dehydrogenation zone;

(d) contacting said first-reaction dehydrogenation zone effluent in said second-reaction oxidation zone with an ozygen-containing gas to selectively oxidize said hydrogen within said first-reaction zone effluent to the substantial exclusion of oxidation of said unconverted and dehydrogenation hydrocarbons in the presence of an oxidation catalyst essentially of a Group VIII noble metal, a Group IV metal, and a Group IA or IIA metal composited on an alumina support at oxidation conditions wherein said exothermic selective oxidation of said hydrogen provides additional heat and thereby raises the temperature of said unconverted and dehydrogenated hydrocarbons;

(e) withdrawing said uncoverted and dehydrogenated hydrocarbons from said second-reaction oxidation zone having an increased temperature with respect to the temperature of said first-reaction dehydrogenation zone effluent;

(f) passing said removed second-reaction oxidation zone product stream of step (e) to a third-reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metal-promoted iron catalyst at dehydrogenation conditions to produce dehydrogenated hydrocarbons; and

(g) withdrawing and recovering said dehydrogenated hydrocarbons, the improvement which comprises utilizing as a support precursor for said oxidation catalyst an alumina which posses an Apparent Bulk Density less than about 0.6 g/cc, a pore volume greater than about 0.5 cc/g, a pore distribution such that between about 10% and 70% of the pore volume is present in pores greater than 300 Angstroms in diameter, and which support, after peptizing and calcination thereof, possesses an Apparent Bulk density in the range of from about 0.3 to about 1.1 g/cc, a pore volume greater than about 0.2 cc/g, a pore distribution such that more than 40% of the pore volume is present in pores greater than 1500 Angstroms, a piece density in the range of from about 0.3 to about 2.0 g/cc, a surface area in the range of from about 1 to about 40 m^2/g, and a particle size which possesses a diameter of at least 2 mm.

4,717,780

CATALYTIC AROMATICS CONVERSION

David H. Olson, Pennington; Paul G. Rodewald, Rocky Hill, both of N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 749,240, Jun. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 705,821, Feb. 26, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,047
Int. Cl.[4] C07C 2/68, 5/22
U.S. Cl. 585—467 32 Claims

1. A process for converting feedstock comprising aromatic compounds selected from the group consisting of benzene, monocyclic alkyl-substituted benzene of from 7 to 12 carbon atoms and mixtures thereof, alkyl being methyl, ethyl or a combination thereof, to alkylation conversion product comprising aromatic compounds which differs from said feedstock, which comprises contacting said feedstock and an alkylating agent at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition comprising zeolite ZSM-58.

9. A process for converting feedstock comprising toluene to disproportionation conversion product which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition comprising zeolite ZSM-58.

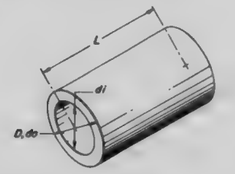
17. A process for converting feedstock comprising xylene isomers to isomerization conversion product which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition comprising zeolite ZSM-58.

4,717,781

PROCESS FOR THE DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Tamotsu Imai, Mount Prospect; Jeffery C. Bricker, Buffalo Grove; Tai-Hsiang Chao, Mount Prospect, and Maureen L. Bricker, Buffalo Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 23, 1987, Ser. No. 28,844
Int. Cl.[4] C07C 4/02
U.S. Cl. 585—441 19 Claims



1. In a process for the dehydrogenation of a dehydrogenatable hydrocarbons with separate and intermediate selective oxidation of hydrogen which comprises the steps of:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first-reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first-reaction dehydrogenation zone effluent stream comprising a mixture of unconverted hydrocarbons, dehydrogenated hydrocarbons, hydrogen and steam;

(b) removing said first-reaction dehydrogenation zone effluent from said first-reaction dehydrogenation zone;

(c) passing said effluent of step (b) to a second-reaction oxidation zone, which is separate and discrete from said first-reaction dehydrogenation zone;

(d) contacting said first-reaction dehydrogenation zone effluent in said second-reaction oxidation zone with an oxygen-containing gas to selectively oxidize said hydrogen within said first-reaction zone effluent to the substantial exclusion of oxidation of unconverted and dehydrogenated hydrocarbons in the presence of an oxidation catalyst consisting essentially of a Group VIII noble metal, a Group IVA metal and a Group IA or IIA metal composited on a metal oxide support at oxidation conditions wherein the exothermic selective oxidation of said hydrogen provides additional heat and thereby raises the temperature of said unconverted and dehydrogenated hydrocarbons;

(e) withdrawing said unconverted and dehydrogenated hydrocarbons from said second-reaction oxidation zone having an increased temperature with respect to the temperature of said first-reaction dehydrogenation zone effluent;

(f) passing said removed second-reaction oxidation zone product stream of step (e) to a third-reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound at dehydrogenation conditions to produce dehydrogenated hydrocarbons; and,

(g) withdrawing and recovering said dehydrogenated hydrocarbons, the improvement which comprises utilizing as said support a shaped particle having one or more channels wherein the channels have an outside diameter, d_o, to inside diameter, d_i, ratio greater than 1.10 and less than 8.0 where d_i is the largest transverse dimension taken across the inside of any channel and d_o is the dimension to the outside walls of the walls surrounding the channel, taken along the line of d_i and the entire particle having a ratio of shape surface to gross volume greater than [4/C. +2/L] in which D is the average overall diameter of the particle in a direction transverse to the axis of the channels and L is the average channel length.

4,717,782

CATALYTIC PROCESS FOR OLIGOMERIZING ETHENE

William E. Garwood, Haddonfield, N.J.; John D. Kushnerick, Media, Pa., and Samuel A. Tabak, Wenonah, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 775,906, Sep. 13, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,522
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—531 14 Claims

1. A catalytic process for converting ethene-rich lower olefinic feedstock containing hydrogen heavier liquid hydrocarbon product, comprising the steps of

contacting said ethene-rich feedstock containing hydrogen at elevated temperature of about 100° to about 450° C. in the presence of water with at least one conversion catalyst comprising a nickel ethene oligomerization component and a shape-selective medium pore acidic zeolite oligomerization component to convert at least a portion of the feedstock to said heavier hydrocarbon product, said water being present in amount sufficient to maintain the nickel component in an oxidized state.

4,717,783

TANTALUM CATALYSTS FOR THE DIMERIZATION OF OLEFINS

Robert A. Dubois, Franklin, and Richard R. Schrock, Winchester, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 16, 1987, Ser. No. 26,358
Int. Cl.[4] C07C 2/26
U.S. Cl. 585—511 14 Claims

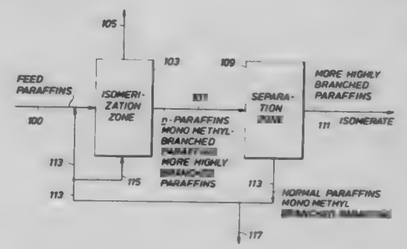
1. A process of forming a dimer having a 1-butene moiety, which comprises contacting a 1-olefin with an organotantalum catalyst under reaction conditions such that the dimer which is optionally substituted at the 2,3-carbon atoms is formed; said catalyst comprising tantalum and a cyclopentadienyl group containing at least one tri-substituted silyl moiety.

4,717,784

TOTAL ISOMERIZATION PROCESS WITH MONO-METHYL-BRANCHED PLUS NORMAL PARAFFIN RECYCLE STREAM

Stephen C. Stem, and Wayne E. Evans, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1986, Ser. No. 940,383
Int. Cl.[4] C07C 5/27
U.S. Cl. 585—738 17 Claims



1. An isomerization process to produce a gasoline blending component from a hydrocarbon stream comprising a C_6 normal paraffin, C_6+ normal paraffins or mixtures thereof, said process comprising the combinative steps of:

(a) passing said paraffins or mixture of paraffins to an isomerization zone maintained at isomerization conditions and containing an isomerization catalyst to produce an isomerization zone effluent stream comprising di-branched paraffins, mono-methyl-branched paraffins and unreacted normal paraffins;;

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(b) passing said isomerization zone effluent stream to a select separatory tectosilicate sieve having a channel size intermediate 5.5×5.5 and 4.5×4.5 and excluding 4.5×4.5A and being sufficient to permit adsorption of said unreacted normal paraffins and said mono-methyl-branched paraffins but restrictive to prohibit adsorption of said di-branched paraffins;

(c) separating with said select tectosilicate sieve said di-branched paraffins as an isomerate product stream from said unreacted normal paraffins and from said mono-methyl-branched chain paraffins at separation conditions; and

(d) recycling at least a portion of said unreacted normal paraffin and mono-methyl-branched paraffin stream to said isomerization zone or to admixture with said normal paraffin or mixture of normal paraffins, which are passed to said isomerization zone.

4,717,785

REMOVAL OF PHOSPHINE IMPURITIES FROM HIGHER OLEFINS

Timm E. Paxson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1986, Ser. No. 940,386
Int. Cl.[4] C07C *7/12, 2/02*
U.S. Cl. 585—823 20 Claims

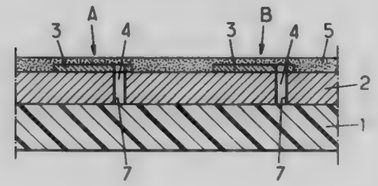
1. A process for removing phosphine impurities from a higher olefin product containing such phosphine impurities, which comprises contacting the said higher olefin product with a macroreticular cation exchange resin in the acid form.

4,717,786

THERMOCOUPLE ARRAY FOR A THERMAL FLUXMETER

Pierre Thery, Villeneuve D'Ascq; Guy Ravalitera, and Michel Cornet, both of Bethune, all of France, assignors to Agence Nationale de Valorization de la Recherche, France

Continuation-in-part of Ser. No. 637,217, Jul. 17, 1984. This application Mar. 18, 1986, Ser. No. 840,695
Claims priority, application France, Nov. 18, 1982, 82 19336
Int. Cl.[4] H01L *35/28*
U.S. Cl. 136—212 21 Claims



1. A thermocouple array for a thermal fluxmeter with a multiplicity of elementary thermocouples, comprising

a continuous layer of a first material selected from the group consisting of conducting and semi-conducting materials, said continuous layer having top and bottom faces and defining a longitudinal direction,

said layer being coated on at least one of its faces with a succession of discrete zones of deposit of a second material selected from the group consisting of conducting and semi-conducting materials and having a thermoelectric power different from that of the first material,

at least one respective channel traversing each of at least most of said zones and the underlying continuous layer, these channels being offset in a given longitudinal direction with respect to the center of each zone passed through, said channels creating a geometrical dissymmetry in each said zone passed through, thereby causing a difference in heat conductivity along the longitudinal direction in each said zone, and

electrically insulating layers on the top and bottom of the assembly which includes said continuous layer and said succession of discrete zones of deposit,

said difference in heat conductivity along the longitudinal direction causing a temperature difference between the longitudinal extremities of each of said zones and thereby providing the generation of an electric potential of thermoelectric origin, when a difference of temperature exists between said two electrically insulating layers.

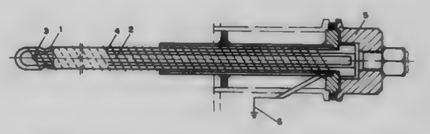
4,717,787

THERMOELEMENT FOR MEASUREMENT OF TEMPERATURE IN VACUUM FURNACES

Willi Freppon, Freigericht; Paul Heilmann, Maintal, both of Fed. Rep. of Germany, and Theo van Heijst, Nuenen, Netherlands, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 4, 1986, Ser. No. 892,647
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528161
Int. Cl.[4] H01L *35/28*
U.S. Cl. 136—226 4 Claims

1. A thermoelement for measuring temperatures in a range of 300° to 1300° C. in a vacuum furnace, the thermoelement comprising a thermocouple, a protective tubing formed of quartz glass for enclosing the thermocouple, and a metal wire wound in a plurality of windings around the quartz glass protective tubing, the wire being grounded such that said grounded metal wire protects the thermoelement from electrical disturbing influences without hindering the transmissivity of the protective tubing to light and infrared rays.

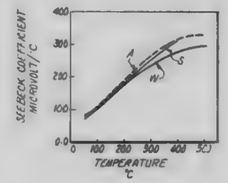


4,717,788

METHOD FOR PRODUCING THERMOELECTRIC ELEMENTS

Harry W. Rauch, Sr., Lionville; Lewis H. Gaau, deceased, late of Collegeville, and June E. Gaau, executrix, Eagleville, all of Pa., assignors to General Electric Company, Fairfield, Conn.

Division of Ser. No. 679,031, Dec. 6, 1984, abandoned. This application Jan. 15, 1987, Ser. No. 61,621
Int. Cl.[4] H01L *35/14, 35/16*
U.S. Cl. 136—237 3 Claims



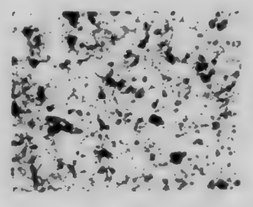
1. The method of making a thermoelectric element which comprises the steps of melting a PbTe thermoelectric composition, chill casting the resulting melt to produce a fine-grained ingot of substantially uniform composition throughout, mechanically reducing the ingot to provide powder of particle size less than about 60-mesh, cold pressing the powder at about 30,000 to 70,000 psi to form a generally cylindrical green body, sintering the green body at a temperature between 700°–900° C. for 20–25 hours and finally cooling the resulting sintered body to room temperature under neutral atmosphere.

4,717,789

THERMOELECTRIC ELEMENTS

Harry W. Rauch, Sr., Lionville; Lewis H. Gaau, deceased, late of Collegeville, and June E. Gaau, executrix, Eagleville, all of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Dec. 6, 1984, Ser. No. 679,031
Int. Cl.[4] H01L *35/14, 35/16*
U.S. Cl. 136—238 6 Claims



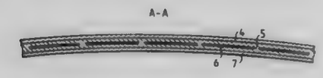
1. A lead telluride thermoelectric element having about 85–87% theoretical density and microstructure characterized by about 2% of a filamentary second phase distributed substan-

tially uniformly and segregated in the grain boundaries, said element being crack free and having excellent thermal- and impact-shock resistance and being joinable to electric contacts without localized cracking.

4,717,790
CONTOURED SOLAR GENERATOR

Hans Gochermann, Holm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 925,179
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538986
Int. Cl.[4] H01L 25/02
U.S. Cl. 136—251 17 Claims

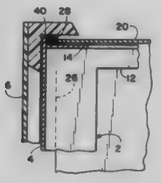


1. A contoured solar generator with associated electrical terminals and connecting lines, comprising:
a curved laminate composed of solar cells bent in at least one dimension, an elastic thermosetting adhesive foil in which said solar cells are embedded, and a curved glass pane overlaying one face of said elastic thermosetting adhesive foil.

4,717,791
SHIELD STRUCTURE FOR LIMITING TRANSMISSION OF ELECTROMAGNETIC RADIATION

Hemendra K. Mathur, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 9, 1986, Ser. No. 883,887
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 R 3 Claims

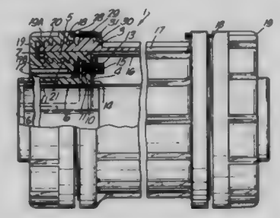


1. A shield structure for limiting transmission of electromagnetic radiation between first and second locations, comprising:
a first shell portion of electrically-conductive material and having a rim that defines an opening;
a second shell portion of electrically-conductive material and having a plate the shape of which corresponds substantially to the shape of the opening and which is slightly smaller in size than the opening, said plate being substantially planar and having coplanar tabs formed integrally therewith, said tabs projecting beyond the periphery of said plate and entering into electrically conductive contact with the rim of said first shell portion; and
a resiliently-compressible and electrically-conductive gasket member interposed between the rim of said first shell portion and said tabs.

4,717,792
SEALED JOINTING APPARATUS

James L. Sterritt, 6 Green Row, Castleward, Strangford, County Down, and George M. Hay, Cloughram Mill House, Knocksticken Road, Downpatrick BT30 8RE, both of Ireland

PCT No. PCT/GB85/00349, § 371 Date Apr. 1, 1986, § 102(e) Date Apr. 1, 1986, PCT Pub. No. WO86/01351, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 5, 1985, Ser. No. 852,307
Claims priority, application United Kingdom, Aug. 3, 1984, 8419847
Int. Cl.[4] H02G 15/08
U.S. Cl. 174—93 10 Claims

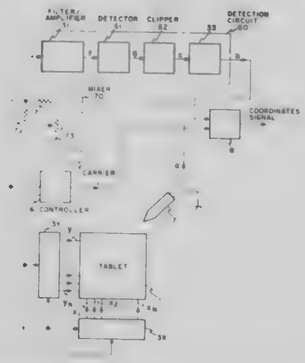


1. Sealed jointing apparatus for use in the connection of conduit sections comprising an annular casing having open ends; spaced end closures at the ends of the casing, and defining with the casing a connection zone into which conduit sections pass for jointing; and releasable securing means for releasably securing at least one of the end closures to the casing; said releasable securing means comprising an end cap having an aperture and including two radially spaced coupling threads, one of which coupling threads threadingly engages an external thread on the casing while the other coupling thread engages an internal thread on said at least one end closure whereby the casing is releasably coupled to said at least one end closure.

4,717,793
GRAPHIC INPUT DEVICE

Tadashi Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 21, 1986, Ser. No. 821,159
Claims priority, application Japan, Jan. 22, 1985, 60-9466
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 11 Claims

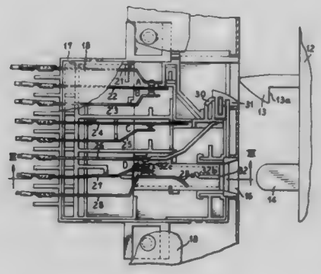


5. A graphical input device comprising a tablet with a data entry surface having a plurality of incremental areas which are identified by conductor elements distributed adjacent the surface to identify coordinates of said surface on the tablet, said conductor elements being an orthogonal array of conductor loops, said loops being energized by a scanning signal including a carrier wave, means for providing an electromagnetic field including said carrier wave in said conductive elements, stylus means for picking up said field in said conductor elements when said stylus means is held on the surface of said tablet and is in the vicinity of said conductor elements, a signal resulting from said picked up field being subject to variations responsive to variations in an angle between said stylus and said surface, means for scanning said conductor elements to detect signals picked up by said stylus in terms of the coordinates of the conductor elements on said surface, and means for mixing the signals picked up responsive to said scanning means for balancing out the variations of said picked up signal which occurs as a result of said variation in said angle, said mixing means mixing by addition said carrier and the signal which is picked up responsive to said scanning means.

4,717,794
INTERLOCK SWITCH

Donald C. Paul, Downers Grove, and Dennis R. Cakora, Manhattan, both of Ill., assignors to Tricon Industries, Incorporated, Downers Grove, Ill.

Filed Aug. 1, 1986, Ser. No. 891,949
Int. Cl.[4] H01H 9/20
U.S. Cl. 200—50 A 8 Claims

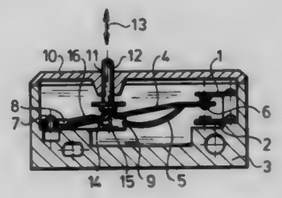


1. A switch mechanism for controlling circuits such as in a microwave oven, comprising in combination:
a door operated latch member movable between a first position wherein a door is closed so that circuits are actuated and a second position wherein the door is open so that said circuits are reversed;
a door operated plunger member movable with said latch member between said first and second positions;
primary microwave circuit switch means for being connected into a series circuit with said switch means closed in the first position of said latch member and said plunger member;
said switch means open in said second position of said latch and plunger members;
a catch engaging said latch member releasably holding it in said first position;
said plunger member being free to move away from said first position to said second position;
a housing supporting said switch means and said catch;
support means in said housing slidably receiving said catch with said catch being removable in a direction lateral of the movement of said latch member between said first and second positions;
a plunger member operated cam engageable by the plunger member in said first position; and
guide means for said plunger cam supporting the cam for slide movement in the same direction as the movement of the plunger member;
said guide means being slidably received by said housing and laterally removable in the direction of movement of the catch when the catch is removed.

4,717,795
PRECISION SNAP-ACTION SWITCH WITH STIFFENING RIBS BETWEEN AN ACTUATING BULGE AND SUPPORT FOR THE ACTUATING SPRING ELEMENT

Jozsef Urban, Budapest, Hungary, assignor to Koutakta Alkatreszgyar, Budapest, Hungary

Filed Oct. 24, 1985, Ser. No. 790,857
Int. Cl.[4] H01H 13/36
U.S. Cl. 200—67 DA 5 Claims



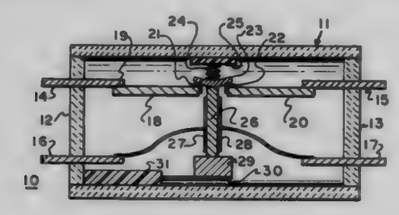
1. A precision snap-action switch comprising:
a switch case having a pair of sides;
a pair of fixed contacts spaced apart in said case at one of the sides thereof;
a unitary three-arm snap-action member in said case and comprising
a pair of outer parallel spring arms each having a free end,
an inner arm parallel to said spring arms and having a free end and a central longitudinal axis, and
a crosspiece connecting ends of said arms opposite the free ends thereof, said crosspiece being formed in alignment with said inner arm with a double contact positioned between said fixed contacts and alternately engageable therewith;
support means in said case forming respective tilting bearings for each of the free ends of said outer spring arms and maintaining said outer spring arms arched;
fixing means engaged with said free end of said inner arm for affixing said free end of said inner arm to said case at an opposite side thereof, the free end of the inner arm being formed immediately adjacent said fixing means and on the axis with a throughgoing section-reducing hole;
an actuator movably mounted on said case and having a bearing surface engageable with said inner arm at a location between said hole and said double contact for causing said inner arm to bend substantially only at the hole and snap over from engagement of said double contact with one of said fixed contacts to engagement with the other of said fixed contacts;
a generally point-shaped bulge formed at the axis unitarily on said inner arm of the material thereof at said location and slidably engaging said surface, the bearing surface being engageable only with the bulge; and
a stiffening rib formed unitarily on said inner arm from material thereof and extending along the longitudinal axis of said inner arm between said bulge and said hole and spaced from said bulge and from said hole, the inner arm being substantially nonbendable by the bearing surface at the stiffening rib.

4,717,796

LOW VOLTAGE VACUUM CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 770,931, Aug. 30, 1985. This application Mar. 2, 1987, Ser. No. 21,363
Int. Cl.[4] H01H 33/66
U.S. Cl. 200—144 B 10 Claims



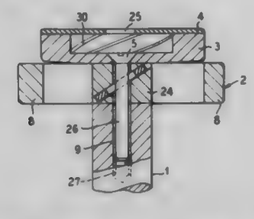
1. A vacuum circuit interrupter comprising:
a hermetically sealed closure;
separable contacts within said closure for interrupting current through an external circuit upon command;
contact separation means within said closure for separating said contacts in response to an electrical control signal;
said separation means comprising a piezoelectric driver element arranged for moving one of said contacts out of electric contact with the other of said contacts when said control signal is applied to said piezoelectric element.

4,717,797

CONTACT ARRANGEMENT FOR A VACUUM SWITCHING TUBE

Ernst-Ludwig Hoene, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,570
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446170
Int. Cl.[4] H01H 33/66
U.S. Cl. 200—144 B 8 Claims



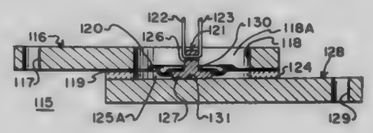
1. In a contact arrangement of a vacuum switching tube wherein two contact members contacting one another at their end faces and wherein at least one conductor loop which lies at the side of a contact member facing away from the cooperating contact are traversed by a part of the current to be switched and thereby generate a magnetic field in the direction of the contact axis, said current being conducted by corresponding webs from the stud to a ring-shaped part and being conducted from said ring-shaped part via a further web to a contact surface of the contact member close to the axis, a respective terminal of the conductor loops being connected electrically conductive in low resistant fashion to the stud or to the contact surface of the contact member, but being supported in axial direction at the respectively opposite side by a supporting part of electrically poorly conductive material, and said supporting part representing a shunt to the conductor loop, the improvement comprising a conductance of the supporting part amounting to at least ½ of the conductance of the conductor loop.

4,717,798

LOW VOLTAGE VACUUM CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 770,931, Aug. 30, 1985, Pat. No. 4,667,071.
This application Mar. 2, 1987, Ser. No. 20,430
Int. Cl.[4] H01H 33/66
U.S. Cl. 200—144 B 6 Claims



1. A single break vacuum interrupter comprising:
closure means including a first apertured metal bar having first means for connection with an external electric circuit and forming a top half of said closure means;
a flexible metal diaphragm having a contact attached to a bottom surface for interrupting current through said external circuit and for hermetically sealing said first metal bar aperture from the atmosphere; and
a dielectric disc having a first surface arranged on a second metal bar having second means for connection with said external circuit said second metal bar forming a bottom half of said closure means;
said first apertured metal bar being arranged on said metal diaphragm and said metal diaphragm being arranged on an opposite surface of said dielectric disc for defining an enclosed space which surrounds said contact and an underlying surface on said second metal bar whereby electrical connection is made with said first and second metal bars and said electric circuit when said contact abuts said underlying surface and electrical connection is interrupted between said first and second metal bars and said electric circuit when said contact is away from said underlying surface.

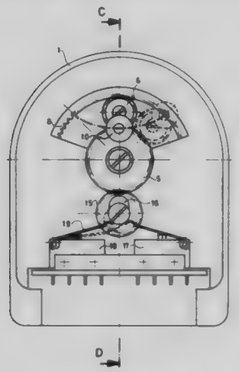
4,717,799

SWITCH DRIVE FOR A ROTARY SWITCH

Georg Spinner, Am Eichberg 12, 8152 Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,480
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431252
Int. Cl.[4] H01H 3/42
U.S. Cl. 200—153 P 5 Claims

1. A switch drive for a rotary switch, comprising:
a toothed gearing;
driving means including a shaft for driving said toothed gearing;
a switch drive shaft extending coaxially to said shaft;
and
transferring means for transmitting movement of said toothed gearing onto said switch drive shaft and including an eccentric engaging member supported by said toothed gearing and a switch arm fixedly connected to said switch drive shaft and cooperating with said engaging member so as to be movable between two defined end positions along a circular arc and rotating said switch drive shaft about an operating angle of about 90° such that said switch drive shaft is initially accelerated in a smooth manner from one of said end positions and smoothly decelerated when reaching the other one of said end positions, wherein said engaging member describes a hypocycloid thereby causing movement of said switch arm along said circular arc, and moves radially with respect to said switch drive shaft



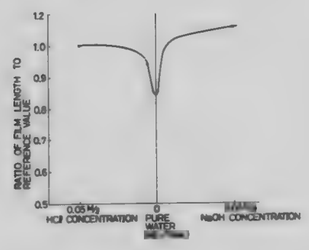
when the latter reaches said end positions so as to prevent a further rotation of said switch drive shaft.

4,717,800

EXPANSIBLE MACROMOLECULAR MATERIAL AND POROUS MACROMOLECULAR MEMBRANE

Makoto Suzaki, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,675
Claims priority, application Japan, Nov. 10, 1986, 61-268019
Int. Cl.[4] B01D 39/14
U.S. Cl. 210—500.42 7 Claims



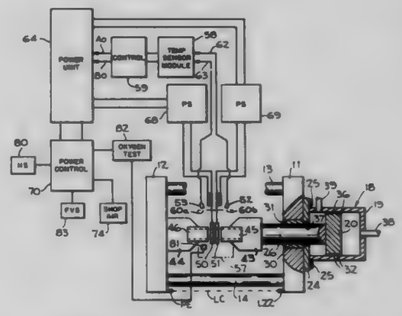
1. A reversibly expansible macromolecular material obtained by mixing an aqueous solution of 10 to 50 wt % of a polyvinyl alcohol having a molecular weight of at least 30,000 with an aqueous solution of 10 to 50 wt % of an acidic macromolecular electrolyte having a molecular weight of at least 50,000 and an aqueous solution of 10 to 50 wt % of a basic macromolecular electrolyte having a molecular weight of at least 50,000 and subjecting the resulting mixture to between 1 and 20 cycles of alternate freezing and defrosting treatments, said freezing treatment being effected at a temperature in the range of −10° C. to −200° C. and said defrosting treatment being effected at normal room temperature.

4,717,801

DUAL INDUCTION HEATING PRESSURE WELDING APPARATUS HAVING A CONTROL CIRCUIT

Charles A. Brolin, Cedar Rapids; Ronald L. Pike, West Liberty, and Dennis A. Jennerjohn, Cedar Rapids, all of Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 11, 1986, Ser. No. 896,904
Int. Cl.[4] B23K 13/00
U.S. Cl. 219—9.5 17 Claims



8. A control system for an induction heating pressure welding apparatus having an induction coil movable into and out of an operable position between two interfacing surfaces to be welded, and a pressing means for pressing the two interfacing surfaces together, said control system comprising:
a power supply connectable to the coil through a first switch means,
an actuator for moving the inductive coil into and out of the operative position, and which is operably connected to a second switch means,
a temperature sensor for monitoring the temperature of the interfacing surfaces to be welded,
a first contact for sensing when the coil is in an operative position and which connects and disconnects the coil with the power supply,
time and temperature dependent switches for determining respectively the length of time for, or the temperature to which, said interfacing surfaces are heated, and which are operatively connected to the temperature sensor so as to operate said actuator when a predetermined welding temperature is reached, or after a predetermined welding time has lapsed to remove the coil from its operative position by operation of the second switch means.
a control means connected to the temperature sensors for control of the power supply to the coil,
a second contact means for sensing when the coil is in the non-operative position, and which is operably connected to said first switch,
the pressing means for pressing the heated surfaces together being operatively connected to the first contact for pressing the welded surfaces together when the coil is removed from its operative position.

4,717,802

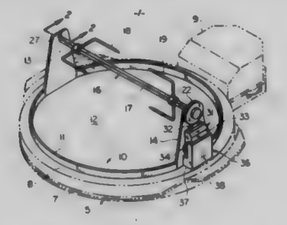
MICROWAVE OVEN ROTISSERIE ASSEMBLY

Albert E. Colato, Woodbury, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Jun. 11, 1979, Ser. No. 47,013
Int. Cl.[4] H05B 6/78
U.S. Cl. 219—10.55 E 3 Claims

1. In portable apparatus for moving food within the heating cavity of a microwave oven: a base of microwave transparent material resting on a supporting surface in the oven cavity and being freely removable therefrom, a horizontally extending table of microwave transparent material mounted on the base

and in close proximity thereto for rotation about a vertically extending axis, a second base of microwave transparent material resting upon the horizontally extending table and being freely removable therefrom, a food-supporting rotor having a horizontally extending axis mounted on the second base and



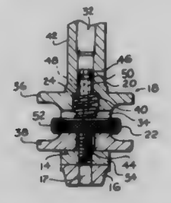
positioned above the table for rotation about the vertically extending axis with said table, and drive means for rotating the table and the rotor about their respective axes whereby food supported by the rotor is turned simultaneously about the vertically extending axis and the horizontally extending axis.

4,717,803

ELECTRODE HOLDER FOR ELECTRIC DISCHARGE MACHINES

Johnny Alexandersson, 821 Thorton Ct., Schaumberg, Ill. 60193

Filed Nov. 1, 1985, Ser. No. 793,837
Int. Cl.[4] B23H *7/26*
U.S. Cl. 219—69 E **7 Claims**



1. An electrode holder for attaching an electrode having a fluid passage to the end of an electric discharge machine, said electrode holder comprising:

an elongated housing provided with a central bore and a transverse slot, said housing having a first end and a second end;

means for attaching a first end of said housing to an end of an electric discharge machine such that said central bore communicates with said electric discharge machine;

a shaft having a first end, a second end, and a longitudinal bore, said shaft being disposed within said central bore of said housing, said shaft loosely held within at least a portion of said central bore to permit movement of said shaft relative to said housing, said first end of said shaft being provided with first fastening means, said longitudinal bore extending between said first end and said second end of said shaft, said first end of the shaft having external threads, said longitudinal bore in fluid communication with said central bore at said first end of said housing;

means disposed within said housing for biasing said shaft towards a second end of said housing such that at least a portion of said first end of said shaft protrudes from said central bore;

knob means disposed within said slot and attached to a midlength portion of said shaft, wherein the engagement of said knob means with opposed extremities of said slot limits the longitudinal movement of said shaft;

means for coupling said first end of said shaft to an electrode such that said longitudinal bore is in fluid commmunication with a fluid passage of said electrode, said means for coupling including said external threads of the first end of the shaft; and

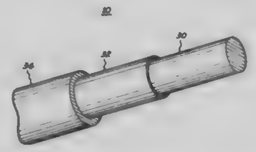
alignment means for coupling said second end of said housing for communication with said electrode, said alignment means having a plurality of alignment pins projecting from the second end of the housing parallel said central bore.

4,717,804

EDM WIRE ELECTRODE

D. S. Tomalin, Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 24, 1986, Ser. No. 888,680
Int. Cl.[4] B23H *1/06, 7/08*
U.S. Cl. 219—69 W **10 Claims**



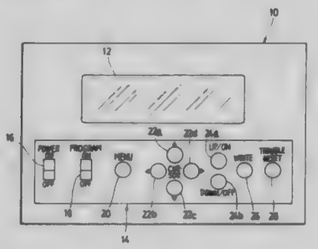
1. An electrical discharge machining electrode which comprises a composite member having an electrically conductive entirely metal wire length of ferrous alloy metal for its core and with said core being clad with a layer of copper whose outer surface is oxidized and coated with graphite.

4,717,805

RESISTANCE WELDING CONTROL WITH MENU TYPE USER INTERFACE

Kimio Miyagawa, Kashiwa, Japan, assignor to Miyachi Electronic Company, Noda, Japan

Filed Sep. 15, 1986, Ser. No. 907,681
Claims priority, application Japan, Dec. 10, 1985, 60-277305
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—108 **5 Claims**



1. A resistance welding control for setting welding conditions, indicating measured values of welding current, welding time and other welding properties, and for providing predetermined warnings, comprising:

a display means for visually displaying characters in a number of lines frame by frame;

a memory means for storing character data of welding conditions, objects for measurements, warning messages and other data;

a cursor key means for moving a screen cursor to any one of a number of predetermined positions on a two-dimensional screen of said display means;

a first key means for calling a menu frame for providing a list of predetermined frame items on said screen of said display means;

a second key means for selecting any one of said frame items hit by said screen cursor;

a third key means for incrementing or decrementing numeric values at a position on said screen hit by said screen cursor so as to set data representing welding conditions;

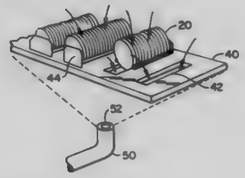
a control means which is responsive to actuations of each of said first, second and third key means for reading out character data associated with a selected frame item from said memory means so as to pass said character data to said display means for visual presentation thereof, and for writing data representing welding conditions input by said third key means into said memory means.

4,717,806

PLASMA REACTOR AND METHODS FOR USE

James F. Battey, 66 Yerba Buena Ave., Los Altos, Calif. 94022, and Perry A. Diederich, 243 MacKintosh St., Fremont, Calif. 94538

Continuation-in-part of Ser. No. 698,357, Feb. 5, 1985. This application May 22, 1986, Ser. No. 866,168
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PE **37 Claims**



1. A plasma reactor, comprising

a working chamber having at least one entry port for receiving a working gas into said working chamber, and at least one exit port for exhausting gas from said working chamber, said working chamber adapted to receive at least one article;

an electrical energy generator;

at least one pair of electrodes positioned about said working chamber, said electrodes, which are connected to said generator, create an electric field that converts said working gas into a working plasma;

a plasma flow constraint member, positioned within said working chamber, said member being a planar, board-like platform having at least one article-receiving opening whereby said articles are disposed upon said platform and whereby said constraint member permits the flow of said working plasma from said entry port to said exit port only through itself such that substantially all of the working plasma passes onto the articles and through the constraint member openings so as to enhance the interaction of said working plasma with a material of said article.

4,717,807

METHOD AND DEVICE FOR CONTROLLING A SHORT CIRCUITING TYPE WELDING SYSTEM

John M. Parks, Solon, and Elliott K. Stava, Brecksville, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

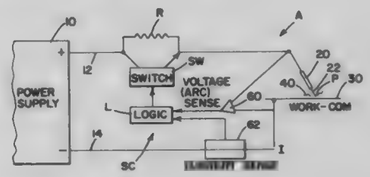
Filed Dec. 11, 1986, Ser. No. 940,580
Int. Cl.[4] B23K *9/09*
U.S. Cl. 219—130.21 **29 Claims**

1. A device for reducing spatter when a welding power supply is employed for depositing metal from a welding wire onto a workpiece by the short circuiting transfer mode wherein a welding current causes the welding wire to alternate between a short circuit condition and an arc condition, with metal transfer during a short circuit condition requiring a transfer time T_P during which transfer time the welding current rises and then falls as a melted portion of said wire is transferred to said workpiece, said device comprising:

(a) means for sensing a control voltage indicative of the voltage between the welding wire and the workpiece;

(b) comparator means for creating a short signal when said control voltage decreases to a value less than a preselected voltage indicative of a short circuit condition and an arc signal when said control voltage increases to a value greater than said preselected voltage;

(c) switching means having a first switched conductive condition wherein said welding current is a high current allowed to reach the normal unimpeded current level controlled by said power supply and a second switched non-conductive condition wherein said welding current is forced to flow through a low resistance resistor to limit the welding current to a low level background current, said switching means having low stored energy when shifted into either of said conditions;



(d) first shift means responsive to said short signal for shifting said switch means into said second switched condition to start said short circuit condition with said background current and second shift means for shifting said switch means into said first condition whenever said control voltage exceeds said preselected voltage;

(e) means responsive to said first shift means for holding said switch means in said second, low current condition for a cycle T_1 at the start of said short circuit condition, wherein cycle T_1 has a duration with a maximum time substantially less than said transfer time T_P and,

(f) means separate from said second shift means operable during said short circuit codition for shifting said switch means to said first condition for the remainder of a short circuit condition whereby said welding current is allowed to reach the normal unimpeded current level in an unrestricted manner unless said arc condition is established during a short circuit condition.

4,717,808

CARBURETOR DEICER

Kenneth M. Cyll, W. Buxton, and Mason G. Ide, Gorham, both of Me., assignors to GTE Products, Stamford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,547
Int. Cl.[4] F02M *15/02, 31/02;* **B60L** *1/02*
U.S. Cl. 219—207 **16 Claims**

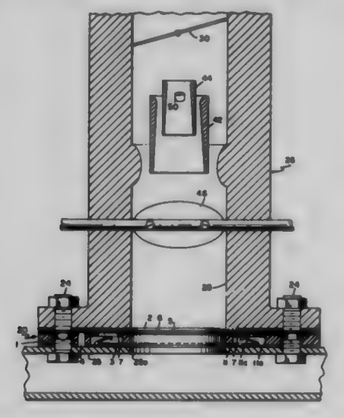
1. A heater for fuel supply systems, said heater comprising:

an electrically inert core having an aperture therein for the passage of a fuel-air mixture therethrough; and

at least one PTC heater disposed within a cavity in said core, said PTC heater being disposed upon an electrically conductive heat transmitting metal stratum, whereby to conduct current from one side of a power supply to one side of said PTC heater; and

means connecting the other side of said PTC heater to the source of the electricity and means electrically insulating said connecting means from the other elements of said heater; and

a graphite stratum disposed against said electrically conductive heat transmitting metal stratum whereby to act as a



heat transmitting gasket for attachment of the heater to a carburetor.

4,717,809

FLAT ELECTRIC HEATING BODY AND DEEP FRYER WITH TUB, TROUGH AND SUMP

Anton Schwizer, Pfaffnau, Switzerland, assignor to Niro Plan AG, Zug, Switzerland

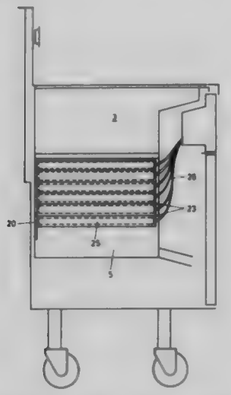
PCT No. PCT/CH85/00136, § 371 Date May 22, 1986, § 102(e) Date May 22, 1986, PCT Pub. No. WO86/01701, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 24, 1985, Ser. No. 879,114

Claims priority, application Switzerland, Sep. 24, 1984, 4363/84

Int. Cl.⁴ F27D *11/00*

U.S. Cl. 219—438 **4 Claims**



1. A deep fryer comprising an oil container Having substantially upright sheet metal side walls, and means for electrically heating one of said side walls for thus heating oil in said container that is in contact with interior surfaces of said side walls, said deep fryer being characterized by:

A. said side walls being substantially unbent to have substantially planar interior and exterior surfaces;

B. a sheet metal channel member at the exterior of said one side wall, said channel member

(1) having an elongated portion of U-shaped cross-section that projects outwardly from said exterior surface and cooperates therewith to define an elongated tubular pocket which is open at one of its ends, and

(2) having elongated flange portions which are connected with said portion of U-shaped cross-section at laterally opposite sides thereof, extend lengthwise along the same, and flatwise overlie and are secured to said exterior surface of said one side wall; and

C. said means for heating said one side wall comprising an electric heating element enclosed in an elongated heating body of electrically insulating material of essentially the same size and shape as said tubular pocket, said heating body being lengthwise slidably received to provide a close fit on all sides in said tubular pocket, to be insertable thereinto and removable therefrom through said open end thereof, said heating means being thus completely enclosed by said pocket so as to retain heat from said heating means and directing it to said side wall to which said pocket is attached.

4,717,810

ELECTRIC HOTPLATE

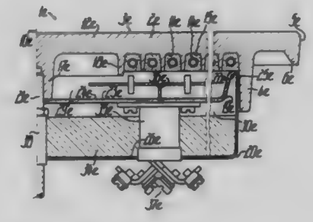
Felix Schroder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 892,184

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527533

Int. Cl.⁴ H05B *3/70*

U.S. Cl. 219—457 **29 Claims**



1. An electric hotplate, comprising;

a hotplate body (2) formed by a solid body of metallic material, said hotplate body (2) having a top surface defining a cooking surface (3) and having a bottom side provided with a downwardly projecting outer flange (4) arranged around an annular heating zone and having an underside (8),

at least one electric heating element (14) located within said outer flange (4), in the annular heating zone;

a seal (31) on a lower side of the hotplate, the seal being provided below said heating element (14), said seal (31) incorporating the outer flange (4) and comprising at least two superimposed sealing parts (19, 20) forming an upper sealing part and a lower sealing part;

at least the upper sealing part (19) providing a reflector (24) located within the outer flange (4) and directed toward the bottom side (16) of the hotplate body (2), said reflector (24) extending substantially at most down to the underside (8) of the outer flange (4);

an insulating zone (30) being provided below the reflector (24) and extending substantially from the outer flange (4) across the heating zone, said insulating zone shielding the reflector (24) and being bounded by the lower sealing part (20);

a connecting member (35) electrically connected to the heating element (14), provided in the vicinity of the seal (31), wherein the connecting member (35) is supportedly mounted on the upper sealing part (19c, 19e) of said seal (31c).

4,717,811

DIFFERENTIAL RESISTANCE HUMIDITY DETECTOR

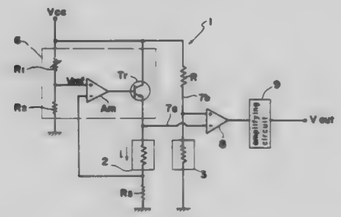
Masanobu Fujii, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1986, Ser. No. 913,251

Claims priority, application Japan, Sep. 30, 1985, 60-150666[U]

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—497 **6 Claims**



1. A humidity sensor comprising:

a first heat sensing element having a first resistance;

means for heating said first heat sensing element above the boiling point of steam to be detected;

a second heat-sensing element having a second resistance;

said first and second heat sensing elements having first and second resistances which vary with respect to humidity at different rates;

differential detecting means for monitoring the difference between said first and second resistances of said first and second heating elements and developing a difference signal in response thereto, said difference signal being representative of sensed humidity.

4,717,812

PLANAR HEAT GENERATOR

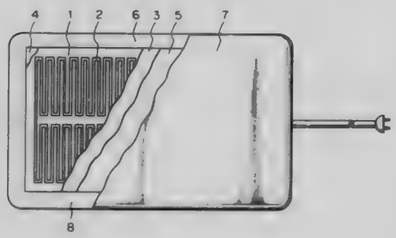
Hajime Makita, Tokyo, Japan, assignor to Shigma, Inc., Elk Grove Village, Ill.

Filed May 20, 1986, Ser. No. 865,030

Claims priority, application Japan, May 21, 1985, 60-75568

Int. Cl.⁴ H05B *3/34*; H01C *3/06*

U.S. Cl. 219—528 **2 Claims**



1. A planar heat generator comprising:

a heating element of metallic foil;

a first pair of sheets made of a plastic material having a characteristic of high heat resistance which are equal in shape and size to each other, one of the sheets being provided with said heating element on one surface thereof and being bonded to the other sheet so that the heating element is interposed between the two sheets;

a second pair of sheets made of a plastic material having a melting point lower than that of the material of the first pair of sheets, which are equal in shape and size to the first pair of sheets and which are bonded to the outer surfaces of the first pair of sheets, respectively; and

a pair of protective covers which are equal in shape and size to each other and which are made of a plastic material having a melting point at least approximate to that of the material of the second pair of sheets, the protective covers being larger in area than the second pair of sheets and being bonded by fusion in an airtight condition not only to the outer surfaces of the second pair of sheets, respectively, but also to each other at peripheral areas which extend beyond the peripheral margins of the second pair of sheets.

4,717,813

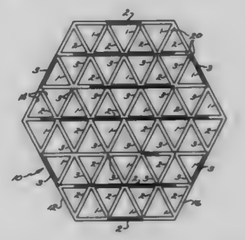
MULTIPASSAGE, MULTIPHASE ELECTRICAL HEATER

Peter G. Berg, Attleboro Falls; Leo Marcoux, Reboboth, and Bernard M. Kulwicki, Foxboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1986, Ser. No. 852,478

Int. Cl.⁴ H01C *7/02*; H05B *3/08*

U.S. Cl. 219—541 **16 Claims**



1. A resistor device comprising a body of resistor material of positive temperature coefficient of resistivity having a plurality of sets of passages extending through the body in spaced side by side relation to each other in a selected pattern defining thin webs of the resistor body material which are of substantially uniform thickness between adjacent passages from end to end of the resistor body, electrically conductive contact means on inner walls of the body passages and electrically conducting interconnecting means disposed on the body electrically connecting the electrically conductive contact means on the inner walls of the passages within each set together, the electrically conducting interconnecting means including at least three portions electrically separated from each other for connection to a power supply, whereby when the electrically conducting interconnecting means are connected in a multiphase circuit, current is directed through thin webs of resistor body material between conductive contact means of one set and conductive contact means of another set in adjacent body passages.

4,717,814

SLOTTED AUTOREGULATING HEATER

John F. Krumme, Woodside, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 507,919, Jun. 27, 1983, abandoned. This application Mar. 6, 1984, Ser. No. 586,711

Int. Cl.⁴ H05B *3/58*

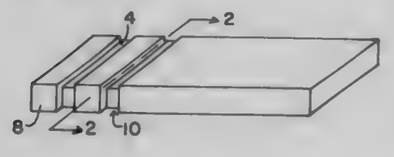
U.S. Cl. 219—553 **15 Claims**

1. A Curie temperature autoregulating heater comprising an outer conductor having a plurality of surfaces

and at least one slot in a specified region of at least one of said surfaces, which slot is less in length than said surfaces and is positioned to interrupt current flow through at least a length of said outer conductor,

ferromagnetic material disposed adjacent and in electrical

and thermal contact with a surface of said outer conductor other than said region in said one of said surfaces,



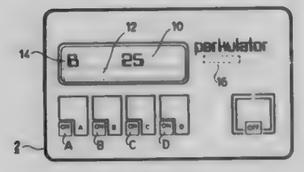
a return conduductor electrically connected in series with said ferromagnetic material.

4,717,815

TIME METERING DEVICE PARTICULARLY USEFUL AS A PARKING CARD

Natan Tomer, 80 Ben Gurion Blvd., Tel Aviv 64515, Israel

Continuation-in-part of Ser. No. 679,572, Dec. 7, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,323
Claims priority, application Israel, Aug. 29, 1984, 72802
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—378 **15 Claims**



1. A time metering device particularly useful as a parking card, comprising:

a time storage device for storing data representing a total pre-purchased time;

a time measuring device;

time-selector key means for manually selecting a predetermined time interval;

a predetermined interval storage device for storing data representing the predetermined time interval selected;

display means;

and an electrical circuit including:

decrementing means for decrementing said pre-purchased time storage device and said predetermined interval storage device according to the time measured by said time measuring device beginning at a predetermined time from the manual operation of said time-selector key means;

device which terminates the operation of said decrementing means to decrement said pre-purchased time storage device and said predetermined interval storage device;

and means for connecting said display means to display the time in said pre-purchased time storage device as decremented by said decrementing means.

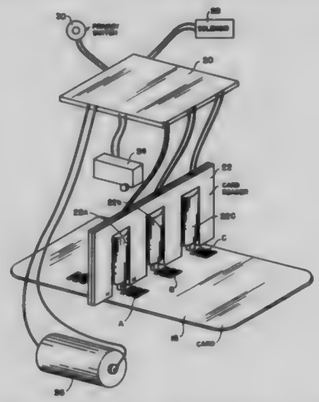
4,717,816

ELECTRONIC LOCK AND KEY SYSTEM FOR HOTELS AND THE LIKE

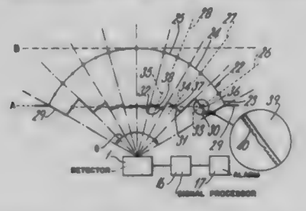
James W. Raymond, 104 Via Lido Soud, Newport Beach, Calif. 92663, and James A. Millet, 1020 W. 17th St., Costa Mesa, Calif. 92627

Continuation-in-part of Ser. No. 579,648, Feb. 13, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 887,937
Int. Cl.[4] G06K *7/01*
U.S. Cl. 235—382.5 **19 Claims**

1. An electronic lock control system to be mounted in a door including: microcomputer means having means for storing a predetermined multi-bit binary number access code; a first key member having multi-bit binary data stored thereon corresponding to an access code; key reading means connected to said microcomputer means for reading the binary data stored on said key member and for introducing inputs corresponding to such data into said microcomputer, said microcomputer responding to a match between the access code of said key member and the binary data access code stored therein for producing an access output, and said microcomputer also responding to a match between the access code of a second key



of arcuately displaced directions onto a single point-like image region, characterized in that the lenses are angled facets formed as deformations in a quasi-flat sheet of radiation transmissive material, in that each facet is substantially normal to the optical axis of its respective lens, the optical axis of each lens passing through the image region, and in that the poles of said lenses lie substantially in a single plane.

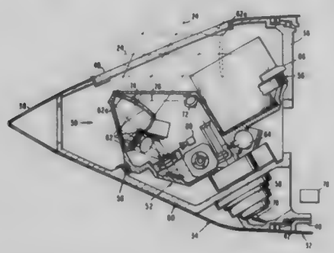


4,717,822

ROSETTE SCANNING SURVEILLANCE SENSOR

Robert W. Byren, Hermosa Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 4, 1986, Ser. No. 892,558
Int. Cl.[4] G02B *27/17*; G01J *1/20*
U.S. Cl. 250—236 **16 Claims**



1. In an aircraft having a roll axis and including a window, a rosette scan surveillance and tracking apparatus providing a hyper-hemispherical field-of-regard, comprising:

first means rotatable about a precession axis which is coaxial with the roll axis;

second means rotatable about a nutation axis which is angled from the precession axis at a first angle;

a sensor having a field-of-view rotatable with said second means and having a line-of-sight on a line-of-sight axis which intersects with the nutation axis at an intersection and is angled therefrom by an angle equal to the first angle; and

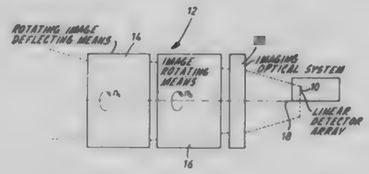
means positioning the intersection of the line-of-sight axis and the nutation axis with respect to the window for minimizing the size thereof.

4,717,823

DETECTOR DEVICE HAVING AN ARRAY OF DETECTOR ELEMENTS FOR SCANNING A FIELD OF VIEW

Johannes Steimel, Constance; Hans Kordulla, and Hans Oppelt, both of Überlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Gerätetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 828,433
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505198
Int. Cl.[4] G02B *26/10*
U.S. Cl. 250—236 **11 Claims**



1. Device for scanning a field of view by means of a detector (10) having a substantially linear array of detector elements, and of an imaging and scanning optical system means having movable optical elements, said optical system being adapted to form an image of the field of view in the plane of the detector (10) and to move said image relative to the detector, wherein

(a) said imaging and scanning optical system means (12) comprises image rotating means (16) which rotate about an axis of rotation (18) at a first rotary speed (n_2) and which are adapted to rotate the image of the field of view at twice this first rotary speed,

characterized in that

(b) the imaging and scanning optical system means (12) comprises rotating, image deflecting means (14) for generating a nutating movement of the image of the field of view at a second rotary speed (n_1),

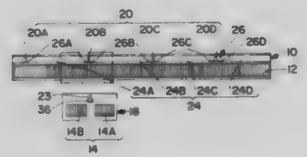
(c) said detector (10) is arranged eccentric to said axis of rotation (18).

4,717,824

PHOTOELECTRIC DISPLACEMENT DETECTING APPARATUS

Hitoshi Sakamoto, Kashiwa; Etsuo Nagashima, Machida, and Ryoo Nagai, Yokohama, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Japan

PCT No. PCT/JP84/00573, § 371 Date Jul. 25, 1985, § 102(e) Date Jul. 25, 1985, PCT Pub. No. WO85/02459, PCT Pub. Date Jun. 6, 1985
PCT Filed Dec. 3, 1984, Ser. No. 767,269
Claims priority, application Japan, Dec. 2, 1983, 58-227860
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—237 G **12 Claims**



1. A photoelectric displacement detecting apparatus comprising: a main scale provided thereon with a length-measuring slit row having length-measuring slits thereon at regular pitches; an index scale provided thereon with a length-measuring gate slit row being equal in pitch to the length-measuring slit row of said main scale and disposed in a manner to be in parallel to the direction of the length-measuring slit row and movable relative to said main scale; and a length-measuring photo-electric transducer for receiving light transmitted through or reflected by said main scale and said index scale, and producing a length-measuring signal from the number of repeated bright and dark portions of the light formed by the repetitions of overlappings of respective slits during a relative movement between said main scale and said index scale; wherein length-measuring slit lacking sections are provided on several intermediate portions of said length-measuring slit row at irregular intervals longer than said length-measuring gate slit row, each of said slit lacking sections has a length shorter than said length-measuring gate slit row, the length of each of said slit lacking sections is within such a range of length that a variation in the quantity of the light to said length-measuring photo-electric transducer does not affect the measuring accuracy, and said length-measuring slits are lacking from portions where said slit lacking sections are provided, whereby said length-measuring slit row is broken off and divided into length-measuring slit groups being different in slit number from one another;

reference marks formed on said slit lacking sections;

mark detecting means provided on said index scale for detecting said reference marks;

slit group reading means actuated in response to a mark detection signal of said mark detecting means to read the number of slits of said length-measuring groups;

length-measuring slit group ascertaining means for comparing the number of slits read by said slit group reading means with the number of slits preset by a slit group selecting-setting device to ascertain whether both slit numbers coincide with each other or not and outputting a coincidence signal; and

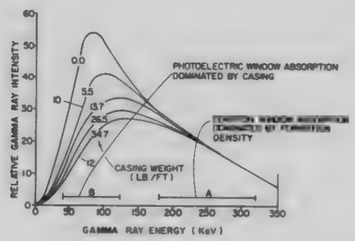
origin setting means for making the position of said detected reference mark to be a length-measuring origin on condition of the coincidence signal from said length-measuring slit group ascertaining means and the mark detection signal from said mark detecting means immediately after the input of said coincidence signal.

4,717,825

METHOD AND APPARATUS FOR ANOMALOUS RADIOACTIVE DEPOSITION COMPENSATION IN SPECTRAL GAMMA RAY WELL LOGGING

Harry D. Smith, Jr., and Larry L. Gadeken, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 23, 1986, Ser. No. 888,602
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—256 **60 Claims**



1. A method for compensating for anomalous radioactive deposition in the region of a borehole in determining subsurface earth formation natural radioactivity elemental concentrations, comprising:

measuring a first reference spectrum of a first radioactive material simulating deposition of said first material in the borehole region;

measuring second and third reference spectra simulating deposition of second and third radioactive materials in the said formation, respectively;

deriving a set of elemental determination sensitivity matrix elements based on each of said first, second, and third reference spectra;

measuring from within said borehole a downhole natural gamma ray energy spectrum of gamma rays originating in and traversing said borehole and formation;

determining a condition of anomalous deposition of said first material in said borehole region; and

calculating compensated elemental concentrations of said first, second, and third materials from said downhole gamma ray spectrum,a nd said sensitivity matrix element sets for said first, second, and third materials.

4,717,826

METHOD FOR DETERMINING INTRACELLULAR MINERAL LEVELS

Burton B. Silver, Foster City, Calif., assignor to Spectro-Scan, Inc., San Bruno, Calif.

Filed Jun. 26, 1986, Ser. No. 878,936
Int. Cl.[4] H01J *3/14, 3/26*; G01N *23/00*
U.S. Cl. 250—307 **23 Claims**

1. A method for determining the intracellular concentration of a mineral, said method comprising:

exposing a tissue specimen to excitation radiation consisting of an electron beam or x-rays at a first preselected energy, said radiation being individually directed at non-damaged cells other than lymphocytes and erythrocytes;

measuring the intensity of fluorescence from the individual cells of the tissue specimen within at least one energy band characteristic of a particular mineral; and

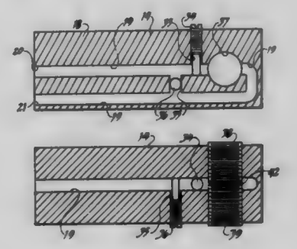
determining the intracellular concentration of the mineral by comparing the measured intensity of fluorescence with a measure of background fluorescence at a second energy band.

4,717,827

APPARATUS FOR ON-LINE SPECTROPHOTOMETRIC CHEMICAL ANALYSIS OF MATERIAL IN MOVING PROCESS STREAM

Robert J. Harvey, Charlotte, N.C., assignor to Automatik Machinery Corporation, Charlotte, N.C.

Filed Feb. 20, 1986, Ser. No. 831,296
Int. Cl.[4] G01N *21/09*
U.S. Cl. 250—343 **4 Claims**



1. A sample cell for chemical analysis of material in a moving process stream by spectrophotometric means, said sample cell comprising:

(a) a housing;

(b) a through bore formed in said housing;

(c) a first radiation transmissible window movably positioned in said bore;

(d) a second radiation transmissible window movably positioned in said bore in opposed, variable, spaced-apart relation to said first radiation transmissible window and

defining therebetween an observation chamber having a path length which is varied by movement of said first and second windows relative to each other;

(e) an inlet conduit formed in said housing and communicating for fluid flow with said observation chamber for admitting material in a process stream into the observation chamber;

(f) an outlet conduit in said housing and communicating for fluid flow with said observation chamber for discharging material from the observation chamber;

(g) said inlet conduit and said outlet conduit being axially aligned in a common vertical plane on an upstream and a downstream side of the observation chamber, respectively, to permit an axially direct flow of material into and out of the observation chamber; and

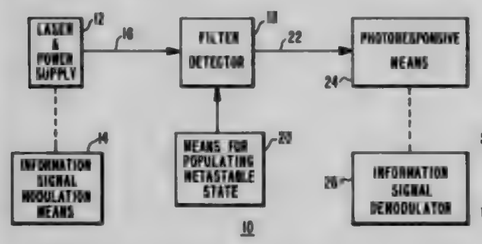
(h) said first and second windows being variably adjustable by symmetrical movement with respect to each other and to the inlet conduit and outlet conduit to define the observation chamber as having an adjustable pathlength relative to the inlet conduit and outlet conduit whereby material may flow directly through the inlet conduit into said observation chamber, past said first and second windows and out of said observation chamber through the outlet conduit thereby minimizing turbulence and shear in the material.

4,717,828

LASER COMMUNICATION SYSTEM

Chi-Sheng Liu, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1985, Ser. No. 780,341
Int. Cl.[4] F21V *9/16*
U.S. Cl. 250—458.1 9 Claims



1. A laser communication system in which a laser transmitter having a predetermined output wavelength is modulated with a communication signal, and wherein a filter-detector receiver is operative to selectively detect the laser output wavelength, wherein the filter-detector receiver comprises:

(a) a hermetically sealed chamber with a high acceptance angle input portion, which chamber contains a predetermined amount of vapor of selected atomic species or selected molecular composition which is dissociable to the selected atomic species wherein the selected atomic species is one of the group of thallium, barium strontium, bismuth, and copper; and which selected species ground state does not absorb the laser output wavelength, and which selected atomic species exhibits a metastable or long-lived energy state which when populated efficiently absorbs the laser output wavelength and undergoes a transition to an excited state form which radiative transition to a lower energy state occurs which fluorescence is detectable as a function of absorption of the laser output;

(b) means for populating the metastable energy state or long-lived energy state of the selected atomic species; and

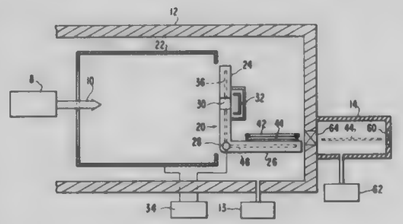
(c) detector means coupled to the chamber for collecting the radiation output from the selected atomic or molecular species.

4,717,829

PLATEN AND BEAM SETUP FLAG ASSEMBLY FOR ION IMPLANTER

Norman L. Turner, Gloucester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 711,687, Mar. 14, 1985, abandoned. This application May 4, 1987, Ser. No. 51,269
Int. Cl.[4] H01J *37/00*
U.S. Cl. 250—492.2 8 Claims



1. Apparatus for ion beam processing of a workpiece comprising:

means for generating an ion beam;

a first stationary current collection means;

an assembly comprising means for mounting said workpiece and a second current collection means angularly displaced from said means for mounting about a shaft perpendicular to said ion beam, said assembly being rotatable about the axis of said shaft between at least a first position wherein a workpiece mounted on said means for mounting is exposed to said ion beam and a second position wherein said second current collection means is exposed to said ion beam; and

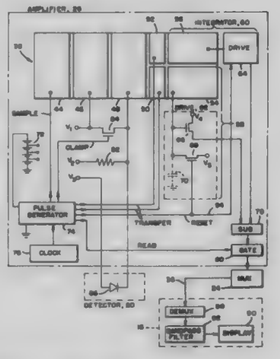
means for measuring the total current collected by said first and said second current collection means.

4,717,830

CORRELATED SAMPLING AMPLIFIER

Steven E. Botts, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 18, 1986, Ser. No. 886,708
Int. Cl.[4] H04N *3/14*
U.S. Cl. 250—578 12 Claims



1. An amplifier comprising:

a charge-coupled device formed of a semiconductor material and having an input terminal, and a controlled terminal;

means coupled to said input terminal for pulsing said device with a sequence of pulses;

switch means coupling an input signal to said control terminal, said switch means operating in synchronism with said pulsing means for connecting and disconnecting said input signal from said control terminal with successive ones of said pulses of said pulsing means;

each of said pulses including a charge which propagates along said charge-coupled device from said input terminal past said control terminal, the magnitude of each such charge being dependent on the magnitude of an input signal applied to said control terminal by said switching means; alternating action of said switching means resulting in two interleaved sequences of charges wherein the charges of one of said charge sequences have a reference value, and the charges of a second of said charge sequences have a value equal to the sum of said reference value plus an increment induced by said input signal;

first integration means;

second integration means;

gate means synchronized with said pulsing means for gating charges of said first and said second charge sequences respectively to said first and said second integration means, said first integration means integrating values of charge of said first sequence to provide a first integrated signal, said second integration means integrating values of charge of said second sequence to provide a second integration signal; and

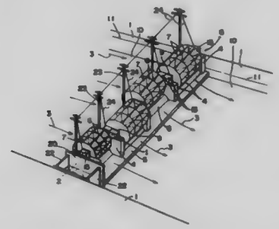
substraction means coupled between said first and said integration means for providing a difference between said first and said second integration signals, said difference having data carried by said input signal and being substantially free of drift associated with said semiconductor material of said charge-coupled device.

4,717,831

OCEAN AND RIVER POWER GENERATOR

Naomi Kikuchi, 206 Kamiyachi, Niigata 951, Japan

Filed Feb. 24, 1986, Ser. No. 831,826
Int. Cl.[4] F03B *13/10*
U.S. Cl. 290—53 1 Claim



1. An ocean and river water power generator composed of a plurality of water wheel power generators, said water wheel power generator comprising:

(a) a common concrete base having an upstream inlet end and a downstream concave arched portion, said inlet end being inclined downwwardly toward said arched portion,

(b) a water wheel disposed above said inlet end and said concave arched portion, said water wheel including a main shaft and a plurality of water wheel impellers fixedly and radially attached to said main shaft for transforming potential energy of water in the ocean or a river to rotation energy thereof, said concave arched portion of the conrete base disposed beneath the main shaft of said water wheel, said water wheel having a plurality of radially extending plate frames connected to side edges of said water wheel impellers and at spaced apart intervals therebetween, said plate frames and said water wheel impellers being substantially radially coextensive,

(c) a speed-up gear means having an input shaft thereof connected with one end of said main shaft for increasing the number of RPM of the main shaft for increasing said rotation energy, said speed-up gear means having an output shaft, and

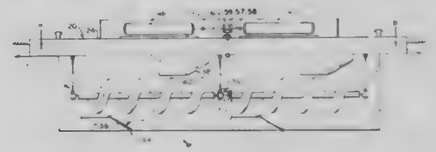
(d) a plurality of power generators connected with the output shaft of said speed-up gear means for generating electricity.

4,717,832

TIDAL AND RIVER TURBINE

Charles W. Harris, 1614 Alston Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 776,916, Sep. 17, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,438
Int. Cl.[4] E02B *9/08;* F03B *9/00*
U.S. Cl. 290—43 2 Claims



1. A system for hydroelectric generation of power from flow of water along an auger-type drive for generator equipment mounted adjacent thereto, characterized by: a vessel in the form of an inverted drydock and having a deck and longitudinal parallel-spaced first and second sidewalls defining open ends and bottom, means for mounting said auger-type drive on said vessel beneath said deck and between said sidewalls, means for directing flow of water between said sidewalls for increasing said flow of water onto said auger-type drive, including a plurality of deflectors, respective deflectors of said plurality of deflectors mounted above and respective of said deflectors mounted below said auger-type drive, each deflector extending from the first sidewall to the second sidewall and pivotally mounted to the sidewalls about an axis transverse to said sidewalls, causing it to rotate in a first direction in response to tidal flow of water past it in said first direction and in a second direction in response to tidal flow past it in said second direction; each deflector having an open "V"-shape with first and second arms and with said axis being along the apex of the open "V"-shape; each of said deflectors mounted above the auger-type drive having said apex downward and each of said deflectors mounted below the auger-type drive having said apex upward, bumper stop means on said vessel for limiting pivoting of the deflectors so that a first arm of the open "V"-shape will respectively lie adjacent to the auger-type drive with the flow of water in said first direction therealong and so that a second arm of the open "V"-shape will respectively lie adjacent to the auger-type drive with the flow of water in said second direction therealong.

4,717,833

SINGLE WIRE CURRENT SHARE PARALLELING OF POWER SUPPLIES

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Inc., Milpitas, Calif.

Continuation of Ser. No. 605,503, Apr. 30, 1984, Pat. No. 4,609,828. This application May 19, 1986, Ser. No. 865,318
Int. Cl.[4] H02J *3/46*
U.S. Cl. 307—44 10 Claims

1. A first power supply adapted to be coupled in parallel with at least one other power supply, said first power supply providing an output voltage at an output terminal, said first power supply comprising:

a first output lead;

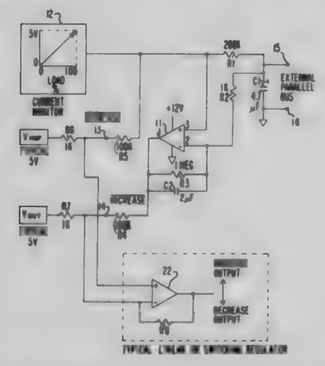
means for providing a first signal on said first output lead indicative of the output current of said first power supply;

a lead for receiving a signal indicative of an average of the output current provided by said first power supply and

any power supplies coupled in parallel with said first power supply;

a differential amplifier having a first input lead coupled to said first output lead and a second input lead coupled to said lead for receiving, said differential amplifier providing an error signal indicative of the difference between said output current of said first power supply and said average of the output current;

means for providing a reference voltage on a reference voltage lead, said reference voltage increasing in response to an increase in the output current of said first power supply;



means for providing a second voltage having a first component proportional to the voltage at said output terminal of said first power supply and a second component proportional to said error signal; and

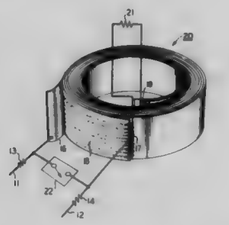
means for providing an adjust signal in response to the difference between said reference voltage and said second voltage, the output current of said first power supply being responsive to said adjust signal, so that if operating in parallel with any other power supplies, said first power supply output current tends to match that of said any other power supplies, but if operating alone, the output voltage of first said power supply tends to remain independent of said first signal.

4,717,834

STRIPLINE TRANSFORMER ADAPTED FOR INEXPENSIVE CONSTRUCTION

Stephen Levy, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 27, 1983, Ser. No. 517,607
Int. Cl.⁴ H03K *3/00*
U.S. Cl. 307—106 **7 Claims**



1. A stripeline transformer pulse generator comprising a coil for storing energy, said coil including a flat ribbon cable having a plurality of parallel spaced conductors extending the length of said cable and a flat longitudinal strip of dielectric material enclosing said conductors, said conductors being individually surrounded and separated from each other by said dielectric material, at least two of said conductors being connected together in parallel at the respective opposite ends to form first and second junctions providing a pair of output terminals;

a flat ground plane longitudinal strip of electrically conductive material positioned along one flat side of said dielectric strip and substantially equal in width and length to said ribbon cable, said ribbon cable with said enclosed conductors and said ground plane being wound together to form a spiral having a plurality of turns such that said ribbon cable and said ground plane form alternating layers of said spiral, one end of said ground plane and said first juction providing a pair of input terminals;

load means connected between said first and second junctions;

a source of low potential connected between said one end of said ground plane and said first junction input terminals for charging said coil; and

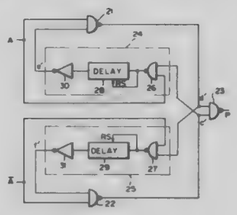
switching means connected across said input terminals for shorting out said source and discharging said coil to supply a high potential short duration output pulse to said load means.

4,717,835

SEMICONDUCTOR INTEGRATED CIRCUIT WITH DETECTION CIRCUIT FOR ADDRESS SIGNAL CHANGE

Atsushi Takeuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 16, 1987, Ser. No. 3,898
Claims priority, application Japan, Jan. 28, 1986, 61-16051
Int. Cl.⁴ H03K *5/153;* **G11C** *8/00*
U.S. Cl. 307—265 **4 Claims**



1. A semiconductor integrated circuit with a detection circuit for detecting a change of an input signal comprising:

a first gate circuit for receiving an input signal at one input thereof;

a second gate circuit for receiving an inverted input signal at one input thereof;

a third gate circuit for receiving outputs of said first gate circuit and said second gate circuit;

a first resettable delay circuit for receiving an output of said second gate circuit, to delay said output of said second gate circuit for a predetermined time interval, and to supply an output thereof to another input of said first gate circuit; and

a second resettable delay circuit for receiving an output of said first gate circuit, to delay said output of said first gate circuit for a predetermined time interval, and to supply an output thereof to another input of said second gate circuit;

said first resettable delay circuit receiving the input signal at a reset input and being reset in response to a change of the input signal;

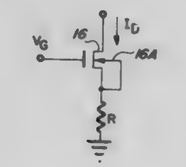
said second resettable delay circuit receiving the inverted input signal at a reset input and being reset in response to a change of the inverted input signal.

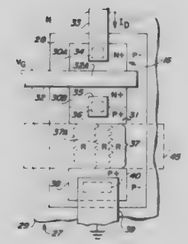
4,717,836

CMOS INPUT LEVEL SHIFTING CIRCUIT WITH TEMPERATURE-COMPENSATING N-CHANNEL FIELD EFFECT TRANSISTOR STRUCTURE

James T. Doyle, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 4, 1986, Ser. No. 825,863
Int. Cl.⁴ H03K *17/14*
U.S. Cl. 307—310 **9 Claims**





8. An insulated gate field effect transistor circuit for producing a drain current compensated for changes due to temperature and/or manufacturing parameter variations, comprising in combination:

(a) an N-channel insulated gate field effect transistor having an N-type drain region through which the drain current flows and an N-type source region both disposed in a relatively lightly doped P-type region, and a gate electrode for receiving a control signal; and

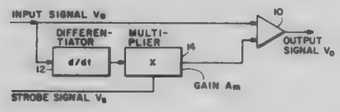
(b) resistive means coupled between the source region and a reference voltage conductor for producing a first voltage in response to current flowing through the field effect transistor and applying the first voltage to both the source region and the lightly doped P-type region in order to reduce an effective threshold voltage, at which effective threshold voltage a predetermined drain current flows, of the field effect transistor circuit by an amount corresponding to the product of the drain current and resistance of the resistive means.

4,717,837

SAMPLE AND HOLD NETWORK

Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 18, 1986, Ser. No. 886,703
Int. Cl.⁴ G11C *27/02*
U.S. Cl. 307—353 **3 Claims**



1. A sample and hold network responsive to an input data signal comprising:

(a) differentiator means for differentiating said input data signal;

(b) a multiplier for multiplying the differentiated input signal by a strobe signal without introducing higher order frequency components wherein said strobe signal is generated independently of said input data signal and has a frequency higher than that of the highest frequency in said input data signal; and

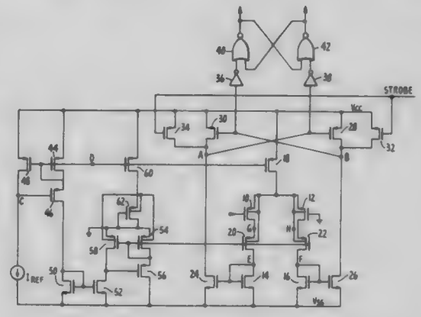
(c) differential output means for combining the output of said multiplier with said data input signal to provide an output wave form whose slope is substantially equal to zero for periods of time which are predetermined fractions of the wavelength of the input data signal corresponding to 20–30% of the period of the strobe signal.

4,717,838

HIGH INPUT IMPEDANCE, HIGH GAIN CMOS STROBED COMPARATOR

Kevin E. Brehmer, San Jose, and Wieser James B., Union City, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 14, 1986, Ser. No. 931,339
Int. Cl.⁴ H03K *5/24, 3/356*
U.S. Cl. 307—355 **7 Claims**



1. A high gain strobed comparator comprising:

an input stage which receives a first input signal and a second input signal and generates a differential output signal having a current value which is related to the voltage difference between the input signal and the output signal;

current mirror means which receives the differential ouput current and generates a corresponding current signal;

a first latch which receives the current signal from the current mirror means at first and second latch inputs and which includes means for providing a positive feedback signal to the first and second latch inputs such that the first latch provides a differential output voltage which is enhanced over the voltage differential at the first and second latch inputs;

means for storing the differential output voltage received from the first latch; and

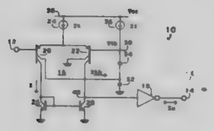
clamping means coupled to the first latch and responsive to a strobe signal for removing the positive feedback signal from the first latch such that the differential output voltage is removed from the first latch to enable the first latch to receive a subsequent current signal from the current mirror means.

4,717,839

TRANSISTOR COMPARATOR CIRCUIT HAVING SPLIT COLLECTOR FEEDBACK HYSTERESIS

Ira Miller, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 2, 1987, Ser. No. 3
Int. Cl.[4] H03K *5/24, 5/153*
U.S. Cl. 307—359 **4 Claims**



1. A threshold detector circuit for generating output signal transition in response to an applied input signal passing through a threshold voltage level, comprising:

circuit means for providing a controllable threshold voltage at an output:

comparing means for providing signal transitions at an output thereof, said comparing means having a first input to which the input signal is applied, a second input coupled to said output of said circuit means and including a first multi-collector transistor having a first collector coupled to said circuit means for sourcing a current when said first transistor is rendered conductive;

said circuit means being responsive to said current from said first transistor for varying the magnitude of said controllable threshold voltage;

said comparing means including;

a second multi-collector transistor having a first collector coupled to a first supply conductor to which is supplied ground reference potential, a base coupled to said second input of said comparing means, an emitter and at least a second collector;

said first transistor having a base coupled to said first input of said comparing means, an emitter coupled to said emitter of said second transistor and at least a second collector;

a current mirror circuit coupled between said second collectors of said first and second transistors and said output of said comparing means; and

a current source for providing current to said emitters of said first and second transistors.

4,717,840

VOLTAGE LEVEL SENSING POWER-UP RESET CIRCUIT

Kenneth W. Ouyang, Huntington Beach, and Melvin Marmet, Norco, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Mar. 14, 1986, Ser. No. 839,501
Int. Cl.[4] H03K *17/22*
U.S. Cl. 307—594 **4 Claims**

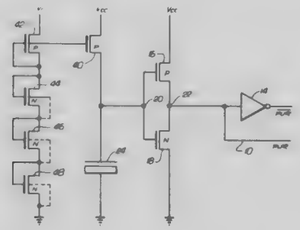
1. A power-up reset circuit for providing a reset signal upon the application of power to the circuit, comprising:

a power supply;

an output section including (a) a first transistor having a first terminal connected to the power supply, an output terminal and a control terminal and (b) a second transistor having a first terminal connected to ground, an output terminal connected to the output terminal of the first transistor and a control terminal connected to the control terminal of the first transistor, wherein when the power supply is turned on, its voltage will increase and render the first transistor conductive;

a capacitor having a first terminal connected to ground and a second terminal connected to the control terminals of the first and second transistors; and

charging control means connected to the capacitor for causing the voltage at the second terminal of the capacitor to remain below a switching voltage which would render the first transistor non-conductive and the second transistor conductive until the power supply reaches a predetermined voltage and charging the capacitor after the power supply voltage exceeds the predetermined voltage so that the voltage at the second terminal exceeds the switching voltage, thereby rendering the first transistor non-conductive and the second transistor conductive to change the signal level at the output terminal;



wherein the charging control means includes a control transistor connected to the capacitor, wherein the control transistor is switched from a first state to a second state to initiate the charging of the capacitor; and

switching control means connected to the control transistor for causing the control transistor to switch from the first state to the second state when the power supply reaches a predetermined voltage,

wherein the control transistor has a supply terminal connected to the power supply and an output terminal connected to the capacitor, and wherein the switching control means includes a plurality of transistors connected in series between the power supply and ground, each transistor having a control terminal and a supply terminal interconnected, wherein the control terminal of one of the transistors is connected to the control terminal of the control transistor, said transistors of the switching control means being rendered conductive when the voltage of the power supply reaches the sum of the threshold voltages of the transitors, which in turn will cause the control transistor to be rendered conductive to charge the capacitor.

4,717,841

STATIC POWER SWITCH APPARATUS

Bernard Dumortier, Mareil Marly; Jean-Noël Gast, Rueil Malmaison, and Francois Sauvel, Chatou, all of France, assignors to La Telemecanique Electrique, France

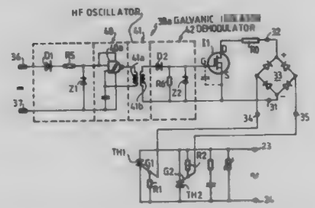
PCT No. PCT/FR85/00339, § 371 Date Aug. 5, 1986, § 102(e) Date Aug. 5, 1986, PCT Pub. No. WO86/03631, PCT Pub. Date Jun. 19, 1986
PCT Filed Nov. 29, 1985, Ser. No. 899,371
Claims priority, application France, Dec. 5, 1984, 84 18520
Int. Cl.[4] H03K *17/72*
U.S. Cl. 307—646 **4 Claims**

1. A static power switch apparatus comprising:

i. first and second alternating current power supply leads;

ii. first and second thyristors each having an anode, a cathode and a gate, the anode of the first thyristor and the cathode of the second thyristor being connected to the first power supply lead while the cathode of the first thyristor and the anode of the second thyristor are connected to the second power supply lead;

iii. a full wave rectifier bridge having first and second alternating current terminals and first and second direct current terminals; the first and second alternating current terminals being respectively connected to the respective gates of the first and second thyristors;



iv. a MOS transistor having a gate and a source-drain current path and means comprising current limiter means, connecting said current path to the direct current terminals of said rectifier bridge;

v. control means connected to the gate of the MOS transistor and responsive to a control signal for switching ON the MOS transistor and

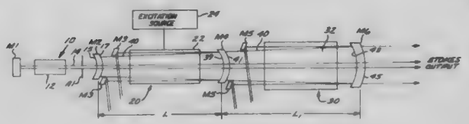
vi. first resistor means connecting the gate of the first thyristor to the second power supply lead and second resistor means connecting the gate of the second thyristor to the first power supply lead.

4,717,842

MODE-MATCHED LASER/RAMAN COUPLED UNSTABLED RESONATORS

Hiroshi Komine, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 23, 1986, Ser. No. 821,647
Int. Cl.[4] G02F *1/35;* **H01S** *3/30*
U.S. Cl. 307—426 **14 Claims**



1. A device having an optical axis utilizing Stokes-Raman scattering for converting a beam of radiation from a laser into Stokes radiation at another frequency comprising:

first laser means aligned along said optical axis for generating a first beam of a first frequency, said first laser means having a first optic member for transmitting a substantial portion of said first radiation beam along said optical axis;

an unstable resonator aligned along said optical axis and comprising a laser medium capable of supporting radiation of said first frequency, the output of said first laser means being injected into said unstable resonator through said first optic member, siad first optic member and a second optic member and said laser medium comprising said unstable resonator; and

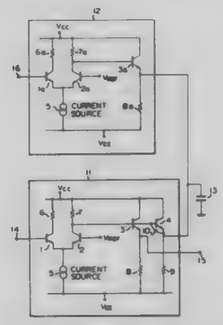
a Raman converter aligned along said optical axis and positioned to receive amplified radiation generated by said unstable resonator, said Raman converter comprising a Raman medium, said second optic member positioned on one side of said Raman medium and a third optic member positioned on the other side of said Raman medium, said third optic member transmitting said Stokes radiation.

4,717,843

PHASE CHANGING CIRCUIT

Tatsuro Yoshimura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 24, 1985, Ser. No. 758,391
Claims priority, application Japan, Jul. 28, 1984, 59-158208
Int. Cl.[4] H03K *19/086, 5/13, 5/159*
U.S. Cl. 307—455 **6 Claims**



1. A phase changing circuit in a logic circuit, said phase changing circuit, connectable to a fixed voltage, receiving input and control signals and outputting an output signal, comprising:

an output ECL circuit operatively conencted to receive the input signal, comprising:

a buffer circuit, operatively connected to receive the input signal, for generating an internal signal in dependence upon the input signal;

a first emitter output circuit, having an input operatively connected to said buffer circuit, for outputting the output signal in dependence upon the internal signal; and

a second emitter output circuit having an input operatively connected to said buffer circuit and having an output producing a controlled signal;

a first capacitor having a first end operatively connected to the output of said second emitter output circuit and a second end connectable to said fixed voltage; and

a first control ECL circuit operatively connected to the first end of said first capacitor and to receive a first control signal, the controlled signal output by said second emitter output circuit being held at a first output level when the first control signal has a first control level and having either the first output level or a second output level in dependence upon the internal signal when the first control signal has a second control level, changes of the output signal in response to changes in the input signal being delayed when the control signal has the second control level.

4,717,844

PROGRAMMABLE LOGIC ARRAY CIRCUIT WITH A DECREASED NUMBER OF PRODUCT TERMS

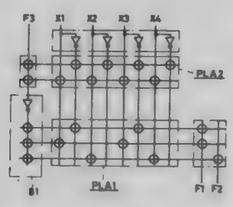
Kazumasa Shima, Tokyo; Syunpei Kawasaki, Nakano, and Takashige Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,266
Claims priority, application Japan, Mar. 4, 1985, 60-41120
Int. Cl.[4] G06F *7/38;* **H04Q** *19/00*
U.S. Cl. 307—465 **5 Claims**

1. A programmable logic array circuit comprising:

a first AND array, a first OR array, a second AND array, and a second OR array, wherein the output of the first

AND array is connected to the input of the first OR array, the output of the second AND array is connected to the input of the second OR array, the input of the first AND array is connected to the input of the second AND array; and



logic circuit means responsive to the output of the second OR array having a positive logic value for causing the output of the first AND array or the first OR array to have a negative logic value.

4,717,845

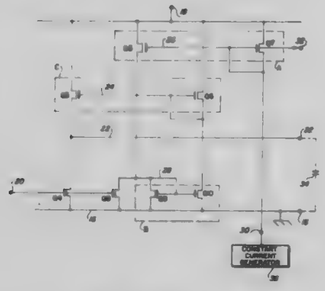
TTL COMPATIBLE CMOS INPUT CIRCUIT

William C. Dunn, Scottsdale, Ariz., assignor to SGS Semiconductor Corporation, Phoenix, Ariz.

Filed Jan. 2, 1987, Ser. No. 192

Int. Cl.[4] H03K *19/092, 17/687, 19/094;* **G05F** *3/16*

U.S. Cl. 307—475 **5 Claims**



1. A TTL compatible CMOS input circuit for providing a charging and a discharging current to an essentially capacitive load connected to an output terminal of the CMOS input circuit, the CMOS input circuit comprising in combination:

a plurality of current mirror transistor pair means for providing a charging current to the capacitive load, each of said plurality of current mirror transistor pair means having a constant current input terminal and a mirror current terminal, said constant current input terminal of a first of said plurality of current mirror transistor pair means being connected for accepting a reference current from a constant current generator, said constant current input terminal of a second of said plurality of current mirror transistor pair means being connected to said mirror current terminal of said first of said plurality of current mirror transistor pair means, said mirror current terminal of said second of said plurality of current mirror transistor pair means being connected to said constant current input terminal of a third of said plurality of current mirror transistor pair means, said mirror current terminal of said third of said plurality of current mirror transistor pair means being connected to said load capacitance; and

means for switching at least one of said plurality of current mirror transistor pair means from a first state to a second state in response to a TTL logic level shift at an input terminal of said means for switching, wherein said first state is one of an "off" and "on" state and said second state is the other of said "off" and "on" state, said means for switching having a first and a second output terminal, said first output terminal of said switching means being connected to said constant current input terminal of said second of said plurality of said current mirror transistor pair means, said second output terminal of said switching means being connected to said current mirror terminal of said third of said plurality of said current mirror transistor pair means for discharging said capacitive load.

4,717,846

TRI-STATE OUTPUT CIRCUIT PROVIDED WITH MEANS FOR PROTECTING AGAINST ABNORMAL VOLTAGE APPLIED TO OUTPUT TERMINAL

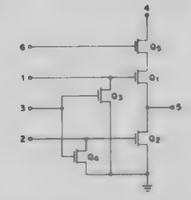
Manabu Ando, Tokyo, Japan, assignor to Nippon Electric Co. Ltd., Japan

Continuation of Ser. No. 700,339, Feb. 12, 1985, abandoned, which is a continuation of Ser. No. 366,778, Apr. 8, 1982, abandoned. This application Sep. 25, 1986, Ser. No. 912,197

Claims priority, application Japan, Apr. 8, 1981, 56-52664

Int. Cl.[4] H03K *19/00, 19/20*

U.S. Cl. 307—473 **9 Claims**



1. An output circuit comprising a first voltage terminal, a second voltage terminal, an output terminal, a first field effect transistor connected between said first voltage terminal and said output terminal, a second field effect transistor connected between said second voltage terminal and said output terminal, means for supplying a first signal to a gate of said first field effect transistor, means for supplying to a gate of said second filed effect transistor a second signal having a phase which is opposite to the phase of said first signal, said first and second field effect transistors being of the same conductivity type, a third field effect transistor connected between the gate of said first field effect transistor and said second voltage terminal, a fourth field effect transistor connected between the gate of said second field effect transistor and said second voltage terminal, said third and fourth field effect transistors being made conductive in response to a control signal supplied to the gates thereof, and making said first and second field effect transistors non-conductive to bring said output terminal into a high impedance state, means coupled between said first voltage terminal and said first field effect transistor for suppressing an increase in drain-source potential different of said first field effect transistor due to an abnormal voltage which is applied to said output terminal when said output terminal is in said high impedance stage and for prohibiting an occurrence of impact ionization in said first field effect transistor to prevent said first field effect transistor from being broken down, said suppressing means including a fifth field effect transistor coupled between said first voltage terminal and said first field effect transistor, and means coupled to a gate of said fifth field effect transistor and responsive to said control signal for holding a voltage of the gate of said fifth field effect transistor at a level which makes said fifth field effect transistor assume a high internal resistance irrespective of a voltage at said output terminal when said third and fourth field effect transistors are made conductive, said fifth field effect transistor assuming a low internal resistance at least when said first transistor is made conductive by said first signal.

4,717,847

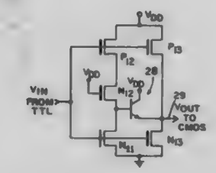
TTL COMPATIBLE CMOS INPUT BUFFER

Joseph G. Nolan, Willow Grove, Pa., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 29, 1985, Ser. No. 728,271

Int. Cl.[4] H03K *19/02, 19/094, 17/60*

U.S. Cl. 307—475 **9 Claims**



1. A TTL to CMOS level conversion buffer circuit including a first field effect transistor of one conductivity type and a second field effect transistor of the other conductivity type, each of said first and second transistors having a main current conducting path with a first and second end, a third field effect transistor having a main current conducting path, means for coupling the first and second ends of the main current conducting path of the third transistor in series between the first ends of the main current conducting paths of the first and second transistors, respectively, and means for coupling the second ends of the main current conducting paths of the first and second transitors to first and second terminals of a power supply, each of the first, second and third transistors including a control electrode, the signal level on which controls current flow through the main current conducting path thereof, means for coupling the control electrodes of the first and second transistors to an output of a TTL circuit, an output signal of which is to be converted to CMOS logic level, means for coupling the main current conducting path of the third transistor to an output of the buffer circuit, and means for coupling the control electrode of the third transistor to a voltage source having an absolute magnitude which is greater than the voltage on the control electrodes of the first and second transistors, and further including a fourth field effect transistor of one conductivity type and a fifth field effect transistor of the other conductivity type, each of said fourth and fifth transistors having a main current conducting path with first and second ends and a control electrode, means for coupling the first ends of the fourth and fifth transistors to each other and to the output of the buffer circuit and means for coupling the second ends of the main current conducting paths of the fourth and fifth transistors to the first and second terminals of the power supply, respectively, means for coupling the control electrodes of the fourth and fifth transistors to the output of the TTL circuit, and wherein said means for coupling the main current conducting path of the third transistor to the output of the buffer circuit comprises a bipolar transistor having a main current conducting path and a control electrode, wherein said control electrode of the bipolar transistor is coupled to the second end of the main current conducting path of the third transistor and the main current conducting path of the bipolar transistor is connected between a source of voltage and the output of the buffer circuit.

4,717,848

ELECTRONIC CIRCUITS AND SIGNAL GENERATOR USING THEM

Cornelius Rabaey, Borgerhout, and Didier R. Haspeslagh, Harelbeke, both of Belgium, assignors to ALCATEL N.V., Amsterdam, Netherlands

Filed Sep. 13, 1984, Ser. No. 650,337

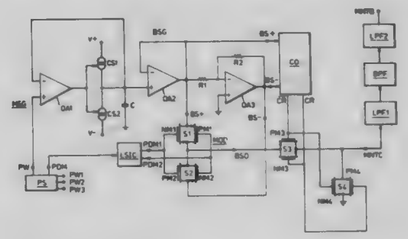
Int. Cl.[4] H03K *5/08*

U.S. Cl. 307—849 **13 Claims**

1. A signal generator for generating a pulse wavetrain signal with each pulse having slopes at both the leading and trailing edges where the signal generated has a predetermined amplitude between pulses, comprising:

means for generating first and second pulse signals with said signals varying between first and second reference levels and with said second signal being inverted with respect to said first, with each signal having corresponding sloping leading and trailing edges,

means for comparing said first and second pulse signals to derive a first control signal indicative of the presence of a



pulse and a second control signal indicative of the period between pulses,

switching means connected to receive a signal containing said first and second pulse signals and controlled by said first and second control signals to provide at an output a pulse during said first control signal and a predetermined reference level during said second control signal, whereby said predetermined reference level between pulses is always known.

4,717,849

SEMICONDUCTOR DEVICE FOR CONDUCTING PRIMARY CURRENT UPON RECEIPT OF A CONTROL SIGNAL

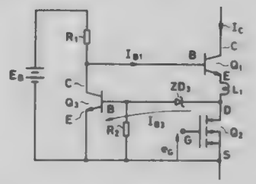
Hisao Shigekane, Kanagawa, Japan, assignor to Fuji Electric Company Ltd., Japan

Filed Jan. 17, 1986, Ser. No. 875,076

Claims priority, application Japan, Jan. 17, 1985, 60-131295

Int. Cl.[4] H03K *17/60, 21/00;* **G05F** *1/573;* **G06M** *1/10*

U.S. Cl. 307—570 **10 Claims**



1. A semiconductor device for conducting primary current upon receipt of a control signal, comprising:

(a) a first transistor having a control electrode and a primary current path;

(b) a second transistor having a control electrode coupled to receive said control W signal and having a primary current path coupled in series with said primary current path of said first transistor, said series current paths including a common junction between said first and second transistors, the resultant series connected primary current paths being coupled to receive said primary current:

(c) a secondary current source for providing a secondary current coupled to said control electrode of said first transistor:

(d) a third transistor having a control electrode and having

a current path coupled to said secondary current source to conduct said secondary current from said control electrode of said first transistor upon conduction of said third transistor; and

(e) a zener diode coupled between said control electrode of the said third transistor and the common junction of said first and second transistors, said zener diode having a polarity oriented to oppose current flow through said control electrode of said third transistor until the breakdown voltage of said zener diode is exceeded at said common junction of said first and second transistors.

4,717,850

TWO-PULSE BRUSHLESS D.C. MOTOR WITH AUXILIARY ROTOR POLES

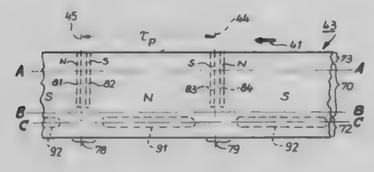
Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,132

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418773

Int. Cl.⁴ H02K *21/22*

U.S. Cl. 310—156 **20 Claims**



1. An improved two-pulse brushless d.c. motor of the type comprising

(a) a wound stator provided with at least one conductor, each conductor being wound to form at least one concentrated coil,

(b) a permanent-magnet rotor,

(c) mounting means mounting said rotor for rotation relative to said stator about a predetermined rotation axis,

(d) said rotor being provided with a circumferential succession of permanently magnetic north-polarity and south-polarity main poles which alternate with each other proceeding circumferentially about the rotor,

(e) said at least one coil and said main poles of said rotor being relatively positioned in such a manner that said rotor generates in each coil an induced voltage formed by positive half-cycles and negative half-cycles which alternate with each other and which result from exposure of the coil to transitions from rotor flux of one polarity to rotor flux of the opposite polarity, these transitions occurring as the rotor continually assumes successive angular positions during rotor rotation,

(f) the induced voltage in each coil exhibiting transitional intervals, equal in number to the number of main poles of said rotor, during each one of which the voltage induced in each coil undergoes a respective transition from one voltage polarity to the opposite voltage polarity, the shape of each such induced voltage transition being dependent upon the manner in which said transitions from rotor flux of one polarity to rotor flux to the opposite polarity occur, and accordingly being dependent upon the particular manner in which the magnetization exhibited by said permanent-magnet rotor changes at each transition from a north to a south main pole thereof and at each transition from a south to a north main pole thereof,

(g) the manner in which said transitions from rotor flux of one polarity to rotor flux of the opposite polarity occur being such that the induced voltage in each coil undergoes, during a major part of each transitional interval, a respective gradual change from one voltage polarity to the opposite voltage polarity but with a slope of comparatively high absolute value, such that the voltage induced in each coil contributes to form a total induced voltage the absolute value of which has during each such transitional interval the shape of an induced voltage valley,

(h) whereby any electromagnetically generated torque produced during such induced voltage valleys will likewise be, at the lower regions of such valleys where the induced voltage is of relatively low absolute value, of relatively low absolute value and therefore be unable to maintain rotor rotation under high load, especially during motor start-up,

(i) the brushless d.c. motor being provided with means operative during the induced voltage valleys for furnishing a not electromagnetically generated auxiliary torque, exerted in a predetermined direction constituting the desired rotation direction, whereby to compensate for relatively low values of electromagnetically generated torque produced during the induced voltage valleys,

the improvement wherein:

(j) said permanent-magnet rotor is configured and magnetized, at each transition from a main pole of one polarity to a main pole of the opposite polarity, to form means operative in such a manner that during each of said transitional intervals of induced voltage said total induced voltage has, during an intermediate minor part of such transitional interval, a slope of comparatively low absolute value at least approximately equal to zero, a magnitude at least approximately equal to zero, and at one point a value exactly equal to zero, wherein said point is located intermediate the start and end of said intermediate minor part of the transitional interval and constitutes a zero-crossover point at which said total induced voltage changes from one voltage polarity to the opposite voltage polarity,

(k) whereby to assure that electromagnetically generated torque produced by the motor during motor operation will have an absolute value at least approximately equal to zero within said intermediate minor part of the transitional interval,

(l) so that a commutation intended to occur at a rotor angular position in the vicinity of said zero-crossover point but occurring earlier or later than intended will, if the commutation at worst occurs within said intermediate minor part of the transitional interval, not cause electromagnetically generated torque to be exerted opposite to said desired rotation direction and thus undesirably counteract said auxiliary torque.

4,717,851

ADAPTATION LAYER FOR AN ULTRASOUND APPLICATOR

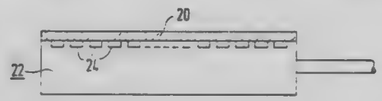
Ernst Fenner, Erlangen, and Martina Vogt, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,045

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 8611844[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—334 **20 Claims**



1. In an ultrasound signal applicator, an adaptation layer is provided for the adaptation of the acoustic impedance of an ultrasound signal source to the acoustic impedance of a body to be scanned by use of said applicator, said acoustic impedance of said body being significantly lower than said acoustic impedance of said ultrasound signal source and said acoustic impedance of said adaptation layer being in the range between said acoustic impedance of said signal source and said body, wherein said improvement comprises:

said adaptation layer comprising a mixture of a synthetic resin and a ceramic powder.

4,717,852

LOW-POWER, HIGH-PRESSURE DISCHARGE LAMP

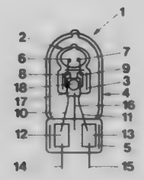
Alexander Dobrusskin, Taufkirchen; Jürgen Heider, and Achim Gessler, both of Munich, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 515,387, Jul. 20, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 802,073

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232207

Int. Cl.⁴ H01J *61/34*

U.S. Cl. 313—25 **20 Claims**



1. Low-power, high pressure single based discharge lamp (1,1') having

an outer envelope (4) consisting of a single closed envelope wall having a first end facing in a first direction and a second end facing in an opposite direction;

an arc tube (2) of highly heat-resitant material located within the single envelope wall having a first end facing in said first direction and a second end facing in said opposite direction;

a filling, within the arc tube, including mercury and additives comprising at least one metal halide and at least one noble gas;

a single arc tube pinch or press seal (3) formed on the arc tube;

two electrodes (6,7) tightly sealed in the arc tube;

two electrode current supply metal leads (8, 10, 12, 14; 9, 11, 13, 15) each lead being connected to an electrode, said leads being melted through the single arc tube pinch or press seal of the arc tube and sealed therein, said electrode current supply leads comprising highly heat-resistant material; and wherein

the outer envelope (4) includes a single envelope pinch or press eal (5), forming a base for said single base lamp;

the arc tube pinch or press seal (3) and the single envelope pinch or press seal (5) both being located at the first end of the arc tube and envelope respectively and both being outwardly directed from the arc tube and envelope respectively;

the electrode current supply leads (8, 10; 9, 11) extending outwardly through the arc tube pinch or press seal (3) and directly into said envelope pinch or press seal (5) and are sealed therein, and have portions (14, 15) which extend outwardly of the envelope pinch or press seal (5);

the single closed envelope wall of the outer envelope (4) is of hgh heat resistant glass and surrounds the arc tube with a spacing which is so small that heat radiated from the arc tube to the envelope is effectively reflected to the arc tube without substantial heat radiation outwardly from the envelope; and

said outer envelope (4) is tipped off at an end of said single based lamp remote from said envelope pinch or press seal (5).

4,717,853

PROJECTION TUBE WHOSE COOLANT CONTAINS AN ETHYLENE OLIGOMER

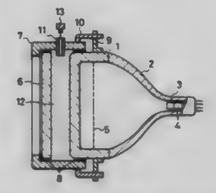
Masayoshi Ezawa; Hiroko Wakui; Shigeru Wakasa; Toshikazu Morishita, and Akira Misumi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 836,822

Claims priority, application Japan, Mar. 6, 1985, 60-42656

Int. Cl.⁴ H01J *29/89*

U.S. Cl. 313—35 **3 Claims**



1. A projection tube containing a coolant comprising a liquid mixture of ethylene glycol and water filled in the space between a phosphor screen panel and a transparent face panel which is set up at a predetermined distance in front thereof, wherein the coolant is incorporated with 10 ppm to 20 wt. % of an ethylene oligomer having a degree of polmerization of 4 to 8.

4,717,854

IMAGE PICK-UP TUBE TARGET

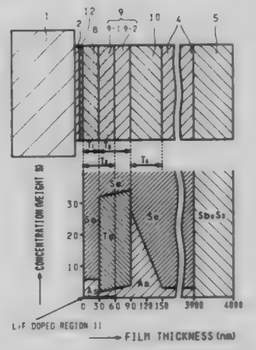
Masano Yamamoto; Eisuke Inoue, both of Mobara; Keiichi Shidara, Tame, and Eikyu Hiruma, Komae, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,714

Claims priority, application Japan, Feb. 20, 1985, 60-30392

Int. Cl.⁴ H01J *31/26, 31/38*

U.S. Cl. 313—366 **4 Claims**



1. An image pick-up tube target comprising an N-type conductive film formed on a transparent substrate, and a P-type photoconductive film in rectifying contact with said N-type conductive film and comprising a first layer containing As, fluoride and Se, a second layer containing As, Te and Se, a portion of said second layer containing fluoride, a third layer containing As and Se, the composition of said third layer being different along the direction of thickness thereof, a fourth layer containing As and Se, the improvement wherein the concen-

VOL 1086 ISS 1 JA 5 1988 UMI

tration of As in said second layer varies continuously along the direction of thickness thereof, and in said second layer the minimum As concentration is located on the said first layer side of the second layer and the maximum As concentration is located on the said third layer side of the second layer.

4,717,855

DUAL-CATHODE ELECTRON EMISSION DEVICE

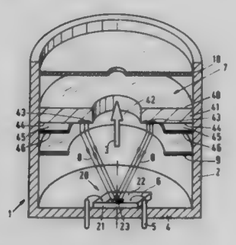
Jan Zwier, Eindhoven, and Johannes H. A. Vasterink, Almelo, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1986, Ser. No. 832,952

Claims priority, application Netherlands, Mar. 4, 1985, 8500596

Int. Cl.⁴ H01J *19/24*

U.S. Cl. 313—409 **20 Claims**



1. A structure comprising a housing, the interior of said housing having one of an evacuated space and an inert protective gas-filled space, a semiconductor device within said housing for producing an electron beam and having a first cathode comprising a semiconductor body, said semiconductor body having at least one region for emitting electrons in the operating condition, a second cathode located in the vicinity of said first cathode and having an electron source for emitting electrons in the operating condition, and means for directing the electrons emitted from said second cathode electron source to strike said at least one region for emitting electrons in the semiconductor body of the first cathode.

4,717,856

CATHODE RAY TUBE HAVING AN ALUMINUM OXIDE FILM OVER A BLACK MATRIX

Hiroshi Kato, Shinagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

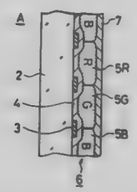
PCT No. PCT/JP85/00332, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO86/00467, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 13, 1985, Ser. No. 833,393

Claims priority, application Japan, Jun. 28, 1984, 59-133657

Int. Cl.⁴ H01J *29/28, 29/10*

U.S. Cl. 313—466 **4 Claims**



1. A color television face plate for a color cathode ray tube comprising:

a matrix carbon layer composed of a discrete pattern of individual carbon deposits formed on the inner surface of said face plate,

a transparent film composed primarily of aluminum oxide covering the entire said inner surface and covering said matrix carbon layer said film being of sufficient thickness to protect said matrix carbon layer against baking temperatures,

a luminescent material layer formed on said film, and

a metal backing layer formed on said luminescent material layer.

4,717,857

FLUORESCENT LAMP PRODUCING WHITE COLOR ILLUMINATION WITH MULTIPLE PHOSPHOR COMBINATION

Michael J. Wozniak, Mayfield Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,790

Int. Cl.⁴ H01J *61/44*

U.S. Cl. 313—487 **10 Claims**



1. In a fluorescent lamp comprising a glass envelope having electrodes at its ends, a mercury and inert gas filling within said envelope which produces ultraviolet radiation, and a phosphor coating which converts a substantial portion of said ultraviolet radiation to visible illumination having a white color, the improvement wherein said phosphor coating comprises a combination of a blue color emission phosphor selected from strontium haloapatite phosphor coactivated with antimony and manganese ions or calcium haloapatite phosphor activated with antimony ion, a strontium haloapatite phosphor coactivated with antimony and manganese ions to provide green color emission, a strontium magnesium orthophosphate phosphor activated with tin ion to produce red color emission, and a calcium haloapatite phosphor coactivated with antimony and manganese ions to provide white color emission at the desired white color point, all said blue color emission, green color emission, and red color emission phosphors being combined in weight proportions to achieve approximately the same desired white color point.

4,717,858

THIN FILM ELECTROLUMINESCENCE DEVICE

Koichi Tanaka; Takashi Ogura, both of Tenri; Koji Izuniguchi, Nara; Akiyoshi Mikami, Yamatotakada, and Masaru Yoshida, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

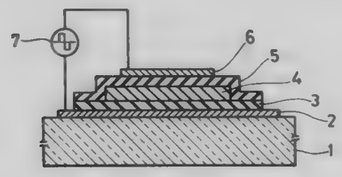
Filed Jan. 15, 1986, Ser. No. 819,217

Claims priority, application Japan, Jan. 22, 1985, 60-10074; Mar. 28, 1985, 60-68326; Jun. 28, 1985, 60-142749; Jul. 9, 1985, 60-151706

Int. Cl.⁴ H05B *33/18, 33/22*

U.S. Cl. 313—503 **3 Claims**

1. A thin film electroluminescene device comprising an electrode layer, an emitting layer and an electrode layer formed on a substrate one over another, and an insulating layer interposed between the three layers, the emitting layer being made of CaS serving as host material and doped with Eu^{2+}



providing luminescent centers, said host material being doped with 0.05 to 0.8 atm. percent of Eu^{2+} and being oriented in a direction of the (222) axis.

4,717,859

POLYCHROMATIC ELECTRO LUMINESCENCE DISPLAY DEVICE

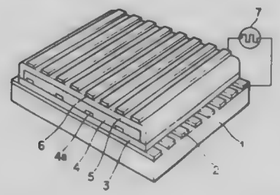
Sang H. Sohn, Kumi-si, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 13, 1985, Ser. No. 808,816

Claims priority, application Rep. of Korea, Dec. 14, 1984, 7950/1984

Int. Cl.⁴ H05B *33/14, 33/26*

U.S. Cl. 313—505 **3 Claims**



1. An electroluminescence plane display device comprising in combination, sequentially:

a glass substrate;

transparent electrodes in the shape of rows of stripes formed in a first direction on said glass substrate;

a first lower insulation layer overlying said transparent electrodes;

photon luminous layers in the shape of rows of stripes formed on said first insulation layer in a second direction perpendicular to said first direction of said transparent electrodes;

a fluorescent layer superimposed over and between said photon luminous layers;

a second upper insulation layer overlying said fluorescent layer; and

rear electrodes in the shape of rows of stripes formed in said second direction parallel to said rows of photon luminous layers and perpendicular to said first direction of said rows of transparent electrodes, said rows of photon luminous layers being spaced alternately with respect to said rear electrodes opposite each space which exists between the rows of stripes of said rear electrodes.

4,717,860

MOUNTING FOR AN OUTPUT WINDOW OF AN X-RAY IMAGE INTENSIFIER

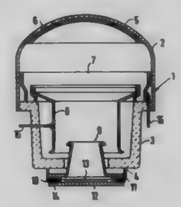
Hermann Christgau, Fuerth; Norbert Mika, Buckenhof; Heinz Roehrich, Hoechstadt, and Guenther Scholz, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 806,818

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3445007

Int. Cl.⁴ H01J *43/28, 9/26, 9/40*

U.S. Cl. 313—525 **14 Claims**



1. In an x-ray image intensifier having a tube bulb and an output window being mounted in a metal frame, said frame being inserted into the tube bulb and attached to the tube bulb in the region of the output window, the improvements comprising the output window being a glass window pane having a luminophor layer applied thereto with a peripheral edge of the window pane being free of said luminophor layer, said output window being connected to the frame by only a single metal solder connection of soft solder with at least one adhesive layer being deposited on said peripheral edge at the location for the solder connection so that a pane having the luminophor layer can be soldered to the frame without damaging the luminophor layer.

4,717,861

ELECTRONIC FLASH DEVICE

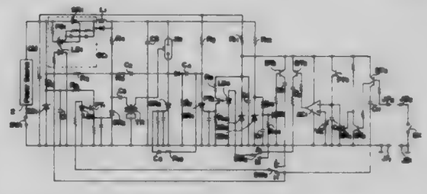
Yoshio Yuasa, Osaka; Kazuhiko Naruse, Nabari, and Masahito Inaba, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 511,509, Jul. 5, 1983, Pat. No. 4,608,522. This application Mar. 17, 1986, Ser. No. 840,610

Claims priority, application Japan, Jul. 6, 1982, 57-118243; Sep. 18, 1982, 57-162831

Int. Cl.⁴ H05B *41/34*

U.S. Cl. 315—241 P **3 Claims**



1. An electronic flash device comprising:

a power source circuit for generating a high voltage;

a main capacitor connected with said power source circuit to be charged by the high voltage;

a first flash tube coupled with the main capacitor;

a first switch element connected in series with the first flash tube;

a commutation capacitor;

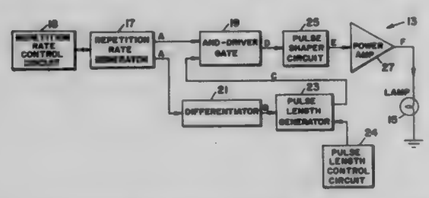
a charge circuit for charging the commutation capacitor;

a second flash tube connected in parallel with the charge circuit;

a second switch element capable of bringing the first switch

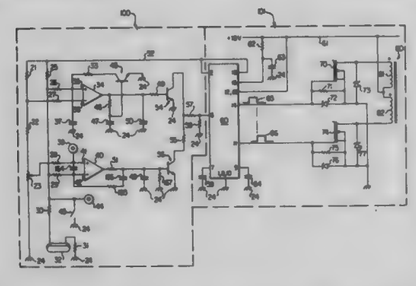
element into a nonconductive state when made conductive;
selecting means for selectively bringing the first and second flash tubes into a condition in which the selected flash tube is capable of emitting light; and
control means for, in a first condition, simultaneously actuating the first flash tube and the first switch element, and actuating the second switch element when a predetermined light amount has been emitted, and in a second condition, alternatively actuating both of the first flash tube and the second switch element, and both of the second flash tube and the first switch element.

4,717,862
PULSED ILLUMINATION PROJECTOR
William B. Anderson, Port Ludlow, Wash., assignor to The United States Government as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 19, 1984, Ser. No. 672,728
Int. Cl.[4] H05B *41/16*
U.S. Cl. 315—246 **6 Claims**



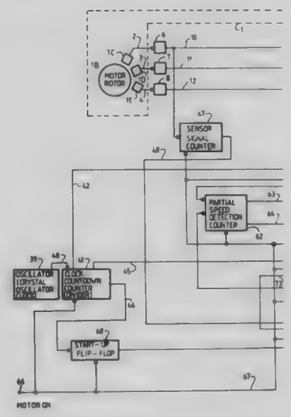
3. Apparatus for providing improved illumination visibility in an illuminated medium having particulate matter suspended therein by reducing luminous reverberation backscatter from said particulate matter, which comprises:
(a) a lamp for providing illumination; and
(b) control means for energizing said lamp to provide illumination in a series of light pulses,
(c) said control means having means for selecting the pulse repetition rate of said light pulses,
(d) said control means having means for selecting the pulse length of said light pulses, said pulse repetition rate and pulse length being adjustable during operation to reduce reverberation backscatter.

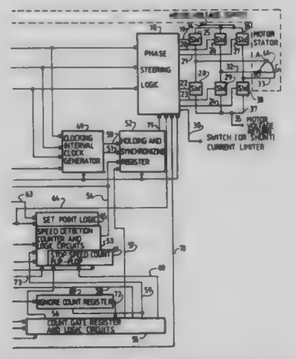
4,717,863
FREQUENCY MODULATION BALLAST CIRCUIT
Kenneth T. Zeiler, 526 Park La., Richardson, Tex. 75081
Filed Feb. 18, 1986, Ser. No. 830,564
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—307 **24 Claims**



1. A ballast circuit for a gas discharge lamp, comprising:
a direct current power source;
means for producing a variable frequency control signal;
means responsive to said control signal for producing a switched output from said direct current power source, said switched output having a frequency proportional to said control signal;
an inductor connected to provide said switched output to drive said lamp wherein greater power is applied to said lamp when the frequency of said control signal is decreased and less power is supplied to said lamp when the frequency of said control signal is increased; and
means for detecting when said lamp is not producing light for driving said control signal to a predetermined high frequency state to provide starting power for said lamp.

4,717,864
SPEED CONTROL METHOD AND APPARATUS FOR ELECTRONICALLY COMMUTATED MOTORS
Jack V. Fultz, Thousand Oaks, Calif., assignor to Pertec Peripherals Corporation, Chatsworth, Calif.
Filed Jul. 5, 1985, Ser. No. 752,400
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **14 Claims**





1. In combination with an electronically commutated motor having a plurality of stator windings, a rotor mounted for rotation with respect to said windings, a plurality of switching means for individually energizing said windings, and phase steering means responsive to the rotational position of said rotor and operable to close said switching means to sequentially energize said windings at appropriate times, a system for controlling the speed of said rotor comprising:
means for defining successive speed measurement cycles;

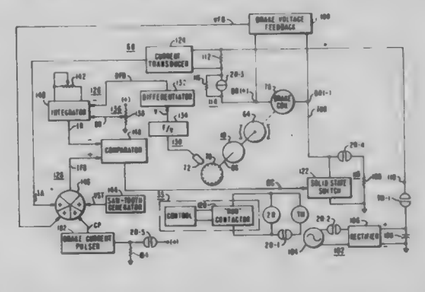
means for defining a speed set-point;
means for measuring rotor speed during each successive speed measurement cycle;
means for comparing each rotor speed measurement with said speed set-point for producing a speed state signal having a first state if said measured rotor speed exceeds said set-point and a second state if said measured rotor speed is less than said set-point;
means for enabling said phase steering means to close said switching means in response to said speed state signal second state;
said means for measuring rotor speed including a source of clock signals; and
means for counting the clock signals occurring within a predefined portion of each measurement cycle.

8. In combination with an electronically commutated motor having a plurality of stator windings, a rotor mounted for rotation with respect to said windings, a plurality of switching means for individually energizing said windings, and phase steering means responsive to the rotational position of said rotor and operable to close said switching means to sequentially energize said windings at appropriate times, a system for controlling the speed of said rotor comprising:
means for defining successive speed measurement cycles;
means for defining a speed set-point;
means for measuring rotor speed during each successive speed measurement cycle;
means for comparing each rotor speed measurement with said speed set-point for producing a speed state signal having a first state if said measured rotor speed exceeds said set-point and a second state if said measured rotor speed is less than said set-point;
means for enabling said phase steering means to close said switching means in response to said speed state signal second state;
synchronizing means for applying said speed state signal to said phase steering means;
said synchronizing means including means for moitoring the position of said rotor for applying said speed state signal to said phase steering means at the appropriate time.

12. A method of controlling the rotor speed of an electronically commutated motor having a plurality of stator windings, a rotor mounted for rotation with respect to said windings, a plurality of switching means for individually energizing said windings, and phase steering means responsive to the rotational position of said rotor and operable to close said switching means to sequentially energize said windings at appropriate times, comprising:
monitoring the rotational position of said rotor and initiating a speed measurement cycle at the same position during each rotor rotation;
defining a speed set-point;
measuring the speed of said rotor during each measurement cycle;
comparing said measured rotor speed with said speed set-point to produce a speed increase command if said measured speed is less than said speed set-point; and
enabling said phase steering means to close said switching means in response to said speed increase command.

4,717,865
TRANSPORTATION APPARATUS
William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 29, 1987, Ser. No. 55,582
Int. Cl.[4] B60T *13/04*; H02P *3/04*
U.S. Cl. 318—362 **14 Claims**

8. In transportation apparatus having a conveyor driven by an electrical motor, an electrically released, magnetically set brake having a brake coil and permanent magnets, and a servo loop for regulating the brake coil current, wherein the brake has hysteresis caused by overlapping first and second brake current release ranges for increasing and decreasing values, respectively, of the brake current, with the overlapping portions defining a narrow brake current release window which will cause release of the brake notwithstanding a momentary brake current excursion into a brake setting value outside either brake current release range, and wherein the brake coil and permanent magnets have temperature dependent characteristics which cause the upper and lower limits of the narrow brake current release window to shift with brake temperature, the improvement comprising:
means for compensating the servo loop for the temperature characteristic of the brake while the electrical motor is driving the conveyor to cause the regulated brake coil current to change with the shifting brake current window,
said compensating means including means for providing brake voltage feedback and means for providing brake current feedback,
with the values of the brake voltage feedback and the brake current feedback being selected to cause the electromagnetic flux provided by the brake current to substantially cancel the permanent magnet flux over the operating temperature range of the brake.



12. In transportation apparatus having a conveyor driven by an electrical motor, and an electrically released, magnetically set brake having a brake coil, and a servo loop for regulating brake coil current to a desired regulated value, wherein the brake has hysteresis caused by overlapping first and second brake current release ranges for increasing and decreasing values, respectively, of the brake current, with the overlapping portions defining a narrow brake current release window which will cause release of the brake notwithstanding a momentary brake current excursion into a brake setting value outside either brake current release range, the improvement comprising:
means for continuously pulsing the brake current while the electric motor is driving the conveyor to enable the average value of the regulated brake current to operate outside the narrow brake current release window, without transient excursions of the brake current initiating and sustaining partial setting of the brake due to the brake current hysteresis, when the average value of the brake current is sufficiently close to the brake current release window that a brake current pulse will enter the narrow brake current release window following such an excursion.

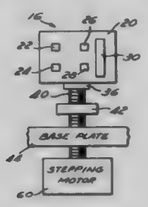
4,717,866
STEPPING MOTOR EXCITATION SEQUENCES
Roger M. Gray, Lewisville, Tex., assignor to Archive Corporation, Costa Mesa, Calif.
Filed Apr. 23, 1986, Ser. No. 855,608
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **33 Claims**

1. An apparatus for finely positioning a magnetic read/write head in a cartridge tape drive by moving said magnetic head a single step, said apparatus comprising:
a magnetic head;
a stepping motor with a rotor;
means coupled to said magnetic head and said motor for

translating an angular displacement of said rotor to a linear displacement of said magnetic head;

means for generating a reverse excitation tending to cause said rotor to occupy a first angular position within said motor;

means for generating a forward excitation tending to cause said rotor to occupy a second angular position within said motor; and



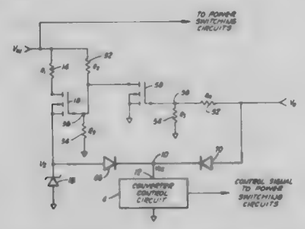
means for causing said rotor to rotate a single step starting from said first position and ending at said second position by supplying to said motor a sequence of excitations comprising a first forward excitation, a first reverse excitation, a second forward excitation, a second reverse excitation, and a final forward excitation, the ratio of the duration of each of said forward excitations except said final forward excitation to the duration of the following reverse excitation being substantially in the range of one and one-fourth to two.

4,717,867

APPARATUS FOR CONSERVING POWER IN OPERATING A LOAD

Gilbert H. Forehand, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 31, 1986, Ser. No. 948,266
Int. Cl.⁴ G05F *1/44*
U.S. Cl. 323—223 **17 Claims**



1. An apparatus for providing electric power relative to a first voltage until a second voltage reaches a predetermined magnitude, comprising:

first electrical circuit means for providing to an output terminal, in response to the first voltage, a voltage substantially equal to the predetermined magnitude and less than the first voltage so that a current flows through said first electrical circuit means and said output terminal when an electrical load is connected to said output terminal and the first voltage is applied to said first electrical circuit means; and

second electrical circuit means for enabling said first electrical circuit means to provide said voltage substantially equal to the predetermined magnitude until the second voltage reaches the predetermined magnitude and for thereafter providing the second voltage to said output terminal so that said current ceases flowing through said first electrical circuit means, said second electrical circuit means including:

switch means for switchably connecting said first electrical circuit means relative to the first voltage;

first switch control means, responsive to the first voltage, for actuating said switch means to a first switch state wherein said first electrical circuit means responds to the first voltage; and

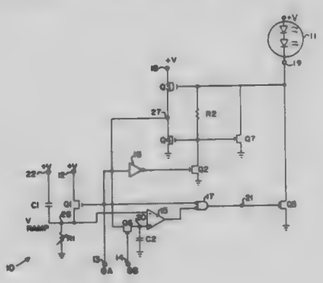
second switch control means, responsive to the second voltage, for actuating said switch means to a second switch state wherein said first electrical circuit means is prevented from responding to the first voltage.

4,717,868

UNIFORM INTENSITY LED DRIVER CIRCUIT

Steven C. Peterson, Pocatello, Id., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 618,615, Jun. 8, 1984, abandoned. This application Jun. 11, 1986, Ser. No. 873,239
Int. Cl.⁴ G05F *1/56*
U.S. Cl. 323—288 **6 Claims**



1. An electronic circuit for providing drive to a driven element, said driven element having a first lead and having a second lead connected to a first power source, said electronic circuit comprising:

a driving terminal connected to said first lead of said driven element;

a second terminal connected to a second power source;

means for carrying current from said driving terminal to said second terminal;

means for sensing the impedance of said driven element; and

means for providing that for a given different between voltage levels of said first and second power sources, the average value of current flowing between said driving terminal and said second terminal remains approximately constant for a range of said impedance of said driven element, comprising:

switch means connected between said driving terminal and said second terminal; and

means for operating said switch means in response to said impedance of said driven element such that said switch means is closed for a duty cycle proportional to said impedance of said driven element, said means for operating comprising:

means for providing a sense signal having a sense voltage lower than the voltage of said first power source by an amount approximately proportional to said impedance of said driven element; and

means responsive to said sense signal for controlling said duty cycle of said switch means to be proportional to said sense voltage comprising:

means for generating a ramp voltage; and

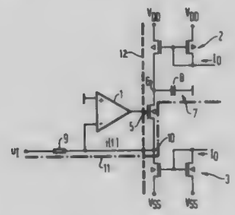
means for comparing said sense voltage to said ramp voltage and providing to said switch means a drive signal when said ramp voltage is greater than said sense voltage.

4,717,869

CONTROLLED CURRENT SOURCE APPARATUS FOR SIGNALS OF EITHER POLARITY

Rudolf Koch, Unterhaching, and Eberhard Schmid, Reutlingen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,487
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1985, 3531323
Int. Cl.⁴ G05F *3/26*
U.S. Cl. 323—316 **7 Claims**



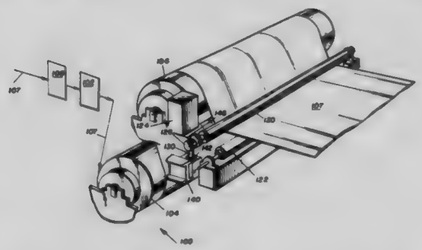
1. Controlled current source apparatus for input signals of either polarity comprising at least two terminals for connection to a power source; an input terminal for receiving an input signal having signal current and signal voltage; a voltage/current converter including a resistor, a transistor and an operational amplifier with negative feedback, connected to the input terminal; an output terminal for supplying an output signal current; a load for receiving the output signal current; a first current source for supplying a first dc-current; a second current source in parallel connection with the load for supplying a second dc-current, means for summing the first dc-current with the input signal current; and means for subtracting the second dc-current from the dc-current flowing into the load.

4,717,870

SLASHER MOISTURE MONITORING SYSTEM

James W. Vuncannon, Randleman, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 26, 1982, Ser. No. 362,521
Int. Cl.⁴ G01R *27/22*
U.S. Cl. 324—65 R **3 Claims**



1. A system for monitoring the moisture content of a web substantially across the entire width thereof, comprising:

roll means disposed substantially across the width of a web for detecting the moisture content thereof as the web continuously moves in contact with a predetermined portion of said roll means;

means for moving said web continuously in contact with a predetermined portion of said roll means;

means for electrically isolating both ends of said roll means, said electrically isolating means comprising: first and second bearing means, one operatively mounted to each end of said roll means, for providing for rotation of said roll means about an axis, and with respect to a housing of each of said bearing means; first and second support rods, one extending radially outwardly from each of said first and second bearing means; first and second support sleeves for mounting each of said first and second support rods; and a sleeve of electrical isolation material operatively disposed between each of said first and second support rods and its respective support sleeves; and

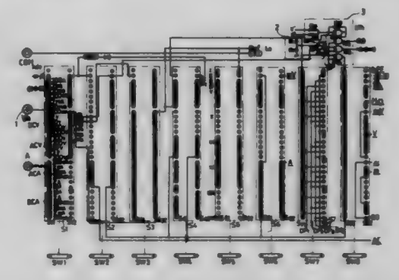
means for detecting the amount of liquid retained by the web at said roll means, said detecting means being electrically coupled to said roll means at one end thereof.

4,717,871

MEASURING SYMBOL DRIVING CIRCUIT FOR A DIGITAL MULTIMETER

Young J. Yoo, Seoul, Rep. of Korea, assignor to Gukil Digital Ind. Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 5, 1986, Ser. No. 826,381
Claims priority, application Rep. of Korea, Oct. 30, 1985, 85-14364
Int. Cl.⁴ G01R *1/38*; G09G *3/18*
U.S. Cl. 324—115 **9 Claims**



1. A circuit for driving the measuring range symbols of a display in a digital multimeter using a measuring range selection switch, said circuit comprising:

a display for displaying said measuring symbols, said display including a plurality of symbol control electrodes, each associated with a measuring symbol to be displayed;

control signal generating means, receiving a backplane pulse signal for developing a control signal opposite in phase to said backplane pulse signal; and

measuring range display selection switch means, formed as part of said measuring range selection switch and operatively connected for movement therewith; for selectively directing said control signal developed by said control signal generating means to one or more of said symbol control electrodes to thereby drive one or more selected measuring range symbols associated with a selected measuring range.

4,717,872

DEVICE FOR MONITORING CONSUMPTION OF ELECTRICAL POWER

Charles G. Wagner, Milton, and John S. Ferguson, Georgetown, both of Del., assignors to Watt Watcher Inc., Milton, Del.

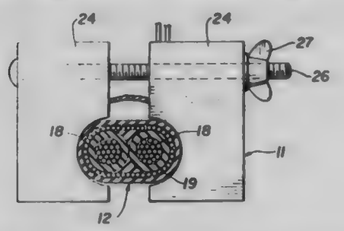
Continuation of Ser. No. 695,293, Jan. 28, 1985, abandoned, which is a continuation of Ser. No. 413,747, Sep. 1, 1982, abandoned. This application May 1, 1986, Ser. No. 858,128
Int. Cl.⁴ G01R *21/00, 21/08*
U.S. Cl. 324—127 **11 Claims**

9. An A.C. current sensing device for use on an insulated cable assembly having at least one pair of insulated parallel conductors occupying a common plane, comprising:

(a) means for simultaneously sensing current flowing in said

two parallel conductors, said current sensing means including;

(i) two separate spaced opposing cores of high magnetic permeability disposed in said common plane on oppo-



site sides of said parallel conductors in close non-penetrating relationship thereto, and

(ii) an air space provide between said magnetic cores adapted to receive the insulated diameter of said pair of parallel conductors therebetween.

4,717,873

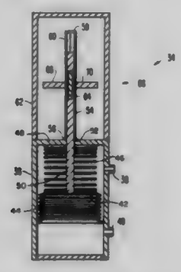
MAGNETIC DISPLACEMENT TRANSDUCER SYSTEM HAVING A MAGNET THAT IS MOVABLE IN A TUBE WHOSE INTERIOR IS EXPOSED TO A FLUID AND HAVING AT LEAST ONE MAGNETOMETER OUTSIDE THE TUBE

Walter J. Carr, Jr., Wilkins Township, Allegheny County; Robert C. Miller, Penn Hills; John B. Lipchak, Forest Hills, and Thomas P. Weldon, Pleasant Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,332

Int. Cl.[4] G01L *9/14*; G01B *7/14*; G21C *17/00*; G01R *33/04*

U.S. Cl. 324—207 **14 Claims**



1. A magnetic displacement transducer system for measuring the position of a movable member that is exposed to a fluid, comprising:

an elongated permanent magnet having an axis;

means connecting said magnet and the movable member for moving said magnet along its axis in response to movement of the member, said means including a rod having one end thereof operationally connected to said member, said magnet being mounted on said rod;

a tube having one end that is closed and another end that is exposed to the fluid, said magnet and a portion of said rod being slidably disposed in said tube through the end thereof that is exposed to the fluid;

an electrically operated magnet-position sensor assembly with a pair of terminals which convey all electrical current flowing though the assembly and with at least one magnetometer adjacent said magnet to sense the position thereof, each said at least one magnetometer being electrically connected to said terminals and including an elongated ferromagnetic core having an axis and a coil around the core, the axis of the core of each said at least one magnetometer being disposed at substantially right angles to the axis of said magnet, said magnet position sensor assembly being mounted outside said tube so that it is not exposed to the fluid; and

means connected to said terminals for conveying a sinusoidal excitation current to said at least one coil to drive said at least one core into saturation, for conveying even harmonics from said at least one coil in response to assymetrical saturation of said at least one core, and for conveying a DC biassing current to null the component of the permanent magnet's field that lies along the axis of said at least one core, the magnitude of the biassing current corresponding to the relative position of said magnet.

4,717,874

RELUCTANCE TYPE LINEAR POSITION DETECTION DEVICE

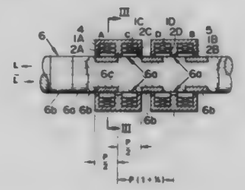
Wataru Ichikawa, and Yuji Matsuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 698,078

Claims priority, application Japan, Feb. 10, 1984, 59-21902; Feb. 16, 1984, 59-26141; Dec. 7, 1984, 59-257639

Int. Cl.[4] G08C *19/06*; G01B *7/14*

U.S. Cl. 324—208 **26 Claims**



1. A linear position detection device including a coil section and a rod section being disposed in such a manner that it is capable of relative linear displacement with respect to said coil section, said coil section having at least two primary coils and secondary coil means corresponding to said primary coils, respective primary coils being excited by primary AC signals which are out of phase with one another so as to obtain, on the secondary coil means side, an output signal which is produced by phase-shifting one of said primary AC signals in accordance with the relative linear position of said rod section wherein the rod section is generally of a bar configuration and said rod section comprises:

a magnetic substance portion changing the reluctance of a magnetic circuit passing through said coil section in accordance with said relative linear displacement; and

a conductive substance portion provided in part of the rod section where the reluctance is caused to increase relatively in such a manner that an eddy current path will be formed relative to flux and made of substance which is relatively weak magnetic or non-magnetic and relatively conductive as compared with said magnetic substance portion, a plurality of said magnetic substance portions and said conductive substance portions being provided alternately,

wherein the amount of the phase shift of the primary AC signals corresponds to 360 degrees electrical angle with respect to an amount of displacement corresponding to one cycle of the alternation of said magnetic and conductive substance portions in said rod section.

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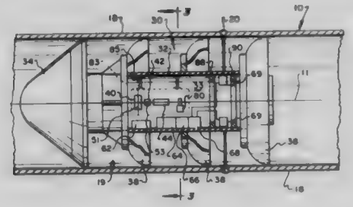
METHOD AND SYSTEM FOR DETERMINING CURVATURE IN FLUID TRANSMISSION PIPELINES

Pedro F. Lara, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 19, 1986, Ser. No. 831,228

Int. Cl.[4] E21B *47/02*; G01C *7/06*; G01B *7/28*

U.S. Cl. 324—220 **14 Claims**



8. Apparatus for determining a change in curvature of a section of generally cylindrical fluid transmission pipeline having a central longitudinal axis, said apparatus comprising:

a pipeline pig including a housing and means for supporting said housing in said section of pipeline, said pig including accelerometer means mounted in said housing for sensing accelerations along axes substantially normal to said longitudinal axis and means for generating signals indicating the longitudinal velocity of said pig along said section of pipeline; and

said means for supporting said housing comprising a plurality of spaced apart resilient support members having a stiffness such that the natural modes of vibration of said pig laterally with respect to said longitudinal axis, as said pig traverses said section of pipeline, are of a frequency substantially greater than the measured signal frequencies of a said accelerometer means and said means for indicating velocity to indicate a change in curvature of said section of pipeline.

9. Apparatus for measuring the curvature or displacement of at least a section of fluid transmission pipeline, said section of pipeline comprising a plurality of end-to-end connected generally cylindrical pipe sections, said apparatus comprising:

a pipeline pig including a housing having an interior space, means for supporting said housing in said section of pipeline for traversal therethrough in a predetermined position with respect to the longitudinal axis of said section of pipeline and means for propelling said pig through said section of pipeline;

displacement sensing means mounted within said housing and with respect to said longitudinal axis of said section of pipeline and nonresponsive to the roll attitude of said pig during traversal through said section of pipeline for generating a signal indicating a change in curvature of said section of pipeline, said displacement sensing means comprising at least two accelerometers mounted for sensing accelerations along respective axes forming an angle with each other, said axes being substantially normal to the longitudinal axis of said section of pipeline, said accelerometers being mounted substantially coaxial with respect to said longitudinal axis of said section of pipeline;

means for measuring the velocity of said pig along said longitudinal axis of said section of pipeline;

means for determining the longitudinal position of said pig in said section of pipeline; and

means for recording signals generated by said displacement sensing means, said velocity measuring means and said means for determining the longitudinal position of said pig, whereby the location of and degree of change in curvature or displacement of said section of pipeline may be determined.

4,717,876

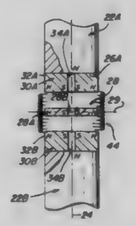
NMR MAGNET SYSTEM FOR WELL LOGGING

Charles G. Masi, Newbury, Mass., and Melvin N. Miller, Wynnewood, Pa., assignors to Numar, Malvern, Pa.

Filed Aug. 13, 1986, Ser. No. 896,357

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—303 **46 Claims**



1. Apparatus comprising at least first magnet means magnetized in a direction extending along a first predetermined axis and second magnet means magnetized in at least one direction extending at an angle to said first axis, said apparatus being arranged and structured to produce a substantially uniform magnetic field in a region external to said apparatus, said field have a predetermined magnitude but with its first order partial derivative with respect to spatial coordinates being respective predetermined values at preselected points within said region.

4,717,877

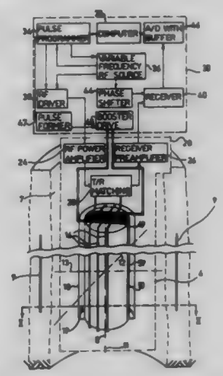
NUCLEAR MAGNETIC RESONANCE SENSING APPARATUS AND TECHNIQUES

Zvi Taicher; Shmuel Shtrikman; Zvi Paltiel, and Mordechai Shporer, all of Rehovot, Israel, assignors to Numar Corporation, Malvern, Pa.

Filed Sep. 25, 1986, Ser. No. 911,576

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—303 **25 Claims**



1. Nuclear magnetic resonance sensing apparatus comprising:

at least one magnet operative to generate a static magnetic field in a region remote therefrom containing materials sought to be analyzed, said at least one magnet defining a longitudinal axis and being magnetized in magnetization directions extending generally perpendicular to said longitudinal axis;

at least one electro-magnet operative to generate a variable magnetic field in said remote region;

means for generating a radio frequency (RF) magnetic field

in said remote region for exciting nuclei of the materials sought to be analyzed; and

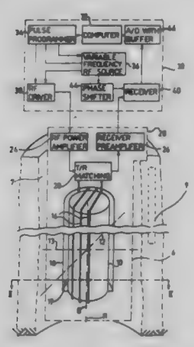
receiving apparatus for receiving nuclear magnetic resonance signals from the excited nuclei and for providing an output indication of the properties of the materials sought to be analyzed, and wherein said at least one magnet comprises at least one permanent magnet having substantially uniform magnetization in a magnetization direction extending generally along an axis perpendicular to said longitudinal axis.

4,717,878

NUCLEAR MAGNETIC RESONANCE SENSING APPARATUS AND TECHNIQUES

Zvi Taicher, and Shmuel Shtrikman, both of Rehovot, Israel, assignors to Numar Corporation, Malvern, Pa.

Filed Sep. 26, 1986, Ser. No. 912,459
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—303 **15 Claims**



1. Nuclear magnetic resonance sensing apparatus comprising:

a magnet assembly including at least three magnets operative to generate a static magnetic field in a region remote therefrom containing materials sought to be analyzed, the at least three magnets being arranged along a longitudinal axis in side to side arrangement and having generally uniform cross sections, which, when joined, together define a circular cross section, the at least three magnets being magnetized in magnetization directions extending generally perpendicular to the longitudinal axis, at least one of the at least three magnets having a magnetization direction opposite to the magnetization direction of at least another one of the at least three magnets;

means for generating a radio frequency (RF) magnetic field in said remote region of exciting nuclei of the materials sought to be analyzed; and

receiving means for receiving nuclear magnetic resonance signals from the excited nuclei and for providing an output indication of the properties of the materials sought to be analyzed.

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PULSE SEQUENCE FOR NMR IMAGE ACQUISITION

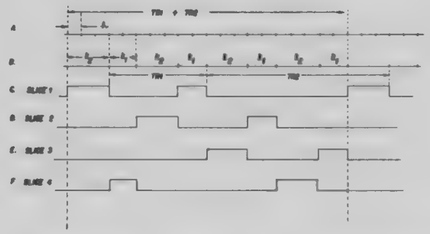
Stephen J. Riederer, and Farhad Farzaneh, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed May 5, 1986, Ser. No. 859,693
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**

1. An improved method of Nuclear Magnetic Resonance (NMR) scanning by which images from multiple slices, multiple repetition times TR and multiple echo times TE are obtained in a single scan of a body, comprising the steps of:

subjecting said body to magnetic fields in accordance with a NMR technique using a multiple spin-echo multi-slice pulse sequence at a plurality (n) of different predetermined stored pulse repetition times TR(n);

measuring a plurality of sets of signals wherein each of said sets corresponds to one of said multiple slices and wherein each one signal of each of said sets corresponds to each of



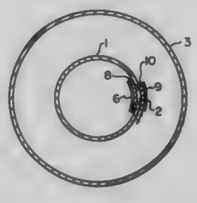
said plurality of predetermined stored pulse repetition times TR(n) wherein each signal of each of said sets begins at a corresponding one of said plurality of pulse repetition times and wherein the length of each of said measuring of each one of said signals of said set of signals is a predetermined time interval k.

4,717,880

ESR SPECTROMETER HAVING SPLIT-RING RESONATOR

Mitsuhiro Ono; Kokusho Sha; Michiya Suzuki; Tateaki Ogata, all of Yamagata, and Ekuo Yoshida, Tokyo, all of Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,219
Claims priority, application Japan, Aug. 23, 1985, 60-185177; Aug. 23, 1985, 60-185178; Mar. 10, 1986, 61-52189; Mar. 10, 1986, 61-52190
Int. Cl.[4] G01V *33/24*
U.S. Cl. 324—316 **4 Claims**



1. An ESR spectrometer equipped with a split-ring resonator, the said resonator comprising:

a circular cylinder made from an electrically conductive material and provided with a slit that extends along the central axis of the cylinder;

a first shielding member made from an electrically conductive material so as to be wider than the slit, the shielding member shielding the slit from the inside of the cylinder;

a second shielding member made from an electrically conductive material and shielding the slit from the outside of the cylinder;

a dielectric spacer interposed between the second shielding member and the cylinder; and

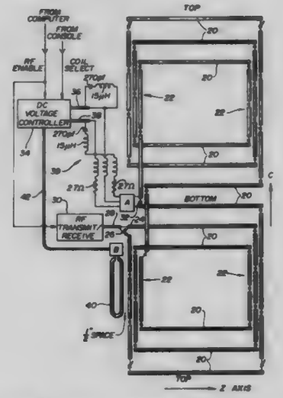
a means for moving the second shielding member and the dielectric spacer across the slit.

4,717,881

RADIO FREQUENCY COILS FOR NUCLEAR MAGNETIC RESONANCE IMAGING SYSTEMS

David C. Fugua, Hudson, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Nov. 15, 1985, Ser. No. 798,669
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **5 Claims**



1. In a magnetic resonance system, radio frequency (r.f.) apparatus for generating magnetic resonance in a subject at a given frequency in a magnetic field, and thereafter receiving NMR signals from said subject comprising:

an r.f. coil arrangement; and

means, coupled to said r.f. coil arrangement, for controllably causing said r.f. coil arrangement to exhibit relatively moderate sensitivity to a relatively broad band of frequencies including said given frequency during the generation of magnetic resonance, and to exhibit relatively high sensitivity to a relatively narrow band of frequencies including said given frequency during the reception of NMR signals.

4,717,882

SNAP OVER LENS ASSEMBLY

David L. Billings, Brockport, and Raymond T. Blythe, Rochester, both of N.Y., assignors to Qualitrol Corporation, Fairport, N.Y.

Filed Sep. 25, 1985, Ser. No. 779,950
Int. Cl.[4] G01D *13/26*; H01F *7/08*
U.S. Cl. 324—415 **2 Claims**

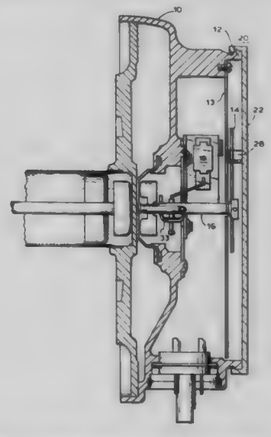
1. A one piece snap-on lens assembly for mounting on an instrument housing have a dial, pointer and pointer shaft-operated switch comprising,

a round flat surface through which the dial and pointer may be viewed,

a curved bezel portion at the periphery of the round flat surface, said bezel being extended to flexibly engage the instrument housing.

a boss portion integrally formed with the flat surfaoe of the lens, and

securing means operative to alternatively secure the lens assembly to the instrument case or permit rotation of the lens assembly so as to move the boss in an arcuate path to



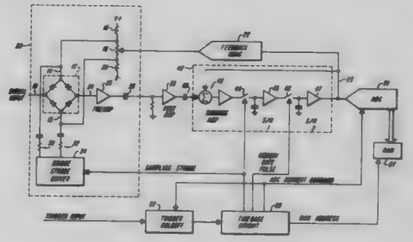
engage the pointer so as to move it to activate the pointer shaft-activated switch to test the switch.

4,717,883

METHOD AND APPARATUS FOR REDUCING ERRORS IN A SAMPLING SYSTEM UTILIZING AN ERROR-SAMPLED FEEDBACK LOOP

Carl Browning, Wilmington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Aug. 4, 1986, Ser. No. 892,940
Int. Cl.[4] G11C *27/02*
U.S. Cl. 328—151 **6 Claims**



1. Apparatus for sampling a repetitive test input signal comprising:

sampling means responsive to a sampling strobe signal for sampling the input signal at an equivalent time point during successive cycles thereof and providing input signal samples;

error-sampled feedback loop means responsive to the input signal samples for providing a sampling loop output signal representative of the input signal sample amplitude, said feedback loop means including attenuator means for attenuating said loop output signal and providing an attenuated loop output, said feedback loop means providing said output signal by determining and storing the difference between each input signal sample and the attenuated loop output; and

timebase means for generating said sampling strobe signal, synchronized to occur at progressively later equivalent time points during successive cycles of the input signal, so that the input signal is sampled at equivalent time points

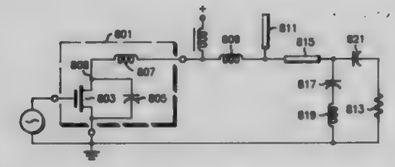
through at least a portion of its cycle, said timebase means including means for repeating said sampling strobe signal at least twice in succession to obtain at least two samples at each equivalent time point during successive cycles of the input signal for reducing errors in the sampling loop output.

4,717,884

HIGH EFFICIENCY RF POWER AMPLIFIER

James E. Mitzlaff, Carpentersville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 14, 1986, Ser. No. 852,045
Int. Cl.⁴ H03F *3/217, 3/60*
U.S. Cl. 330—251 **11 Claims**



1. A high efficiency power amplifier for amplifying radio frequency (RF) signals from a signal source at a fundamental frequency and coupling the amplified signal to a load, comprising:

an active device having an output terminal, disposed on a semiconductor die having interconnecting means each having inherent reactances, and being operated in class F operation;

first means, including said interconnecting means and die reactances, for creating a substantially open circuit impedence at an odd harmonic of said fundamental frequency at said active device output terminal and for creating a substantially short circuit impedance at an even harmonic of said fundamental frequency at said active device output terminal; and

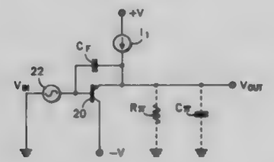
second means, including at least a part of said first means for creating, for creating an active device to load impedance match having increasing impedance magnitude values from said semiconductor die to said load at the fundamental frequency and providing isolation from load mismatch at said even harmonic and said odd harmonic of said fundamental frequency.

4,717,885

OPERATIONAL AMPLIFIER UTILIZING FET FOLLOWERS AND FEED-FORWARD CAPACITORS

David M. Swank, Mesa, and Robert L. Vyne, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 22, 1986, Ser. No. 909,808
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—151 **4 Claims**



1. An improved operational amplifier circuit of the type wherein there is provided first and second emitter coupled transistors each characterized by an equivalent input capacitance C_{IN}, each of said first and second transistors having a collector electrode coupled to a load, and each having a base electrode, the improvement comprising:

first and second input circuits coupled respectively to the base electrodes of said first and second transistors, each input circuit including:

a first field effect transistor having a gate electrode for coupling to a source of an input potential, a first current conducting electrode for coupling to a first potential, and a second current conducting electrode for coupling to a second potential; and

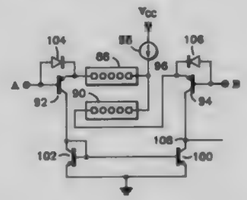
a capacitor C_F connected directly between said gate electrode and said second current conducting electrode.

4,717,886

OPERATIONAL AMPLIFIER UTILIZING RESISTORS TRIMMED BY METAL MIGRATION

William F. Davis, Tempe; David M. Swank, Mesa, and Robert L. Vyne, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1986, Ser. No. 880,537
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—252 **8 Claims**



1. An improved operational amplifier integrated circuit formed in a semiconductor substrate of the type wherein a current source supplies current to first and second differentially coupled input transistors each having a base electrode coupled to first and second input terminals and each of said first and second input transistor coupled to a current mirror circuit, the improvement comprising:

a first RTMM resistor coupled between said current source and said first input transistor;

a second RTMM resistor coupled between said current source and said second input transistor;

first diode means coupled to said first input terminal and to said first input transistor for conducting current from said first input terminal, around said first input transistor and through said first and second RTMM resistor; and

second diode means coupled to said second input terminal and to said second input transistor for conducting current from said second input terminal, around said second input transistor, and through said second and first RTMM resistors;

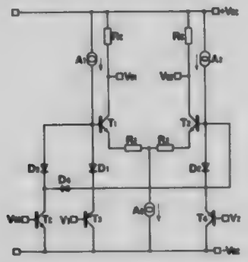
said first and second resistors being directionally oriented on said substrate such that conventional current flowing from said first input terminal toward said second input terminal will reduce the resistance of said first RTMM resistor, and current flowing from said second input terminal towards said first input terminal will reduce the resistance of said second RTMM resistor.

4,717,887

DIFFERENTIAL AMPLIFIER STAGE HAVING CIRCUIT ELEMENTS FOR SETTING THE GAIN TO ZERO

Fabrizio Stefani, Cardano Al Campo, and Edoardo Botti, Mortara, both of Italy, assignors to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Oct. 8, 1986, Ser. No. 916,737
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—261 **8 Claims**



1. A differential amplifier stage, having a first input terminal and a second input terminal and a first output terminal and a second output terminal and an inhibit terminal, comprising:

a voltage source having first and second terminals;

a first transistor and a second transistor, both having a first terminal, a second terminal, and a control terminal, and having the same type of conductivity, said control terminal of said first transistor and said control terminal of said second transistor being respectively coupled to said first terminal of said voltage source by means of a first current generator and a second current generator, said first terminals of said transistors both being coupled to said second terminal of said voltage supply generator by means of at least one third current generator, said second terminal of said first transistor and said second terminal of said second transistor respectively forming said first output terminal and said second output terminal, said control terminal of said first transistor and said control terminal of said second transistor being respectively soupled to said first input terminal and to said second terminal by means of a first biasing circuit and a second biasing circuit, wherein the control terminals of said first and second transistors are both connected to a third biasing circuit, which is activated by means of a signal applied to said inhibit terminal, said third biasing circuit being imposing between said control terminals of said first and second transistors a potential difference equal to that prevailing between said control terminals where the difference between said control terminals where the difference between potential values respectively applied to said first input terminal and said second input terminal is zero when activated by said signal applied to said inhibit terminal.

4,717,888

INTEGRATED CIRCUIT OFFSET VOLTAGE ADJUSTMENT

Charles L. Viss, Milpitas, and David C. Stegmeir, Sunnyvale, both of Calif., assignors to Raytheon Company, Lexington, Mass.

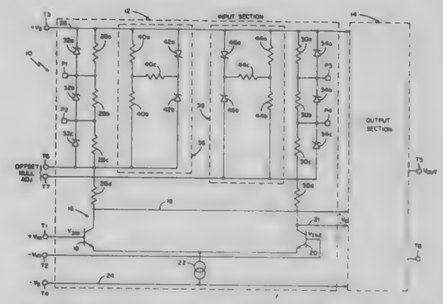
Filed May 22, 1986, Ser. No. 866,432
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—261 **29 Claims**

1. In combination:

a package comprising electrical interconnection lead means for receiving a control signal during a first mode of operation and for receiving an input signal during a second mode of operation;

an integrated circuit disposed in said package, such integrated circuit comprising a differential amplifier having a nominal offset voltage; and

wherein the integrated circuit includes means, coupled to the electrical interconnection lead means, for adjusting



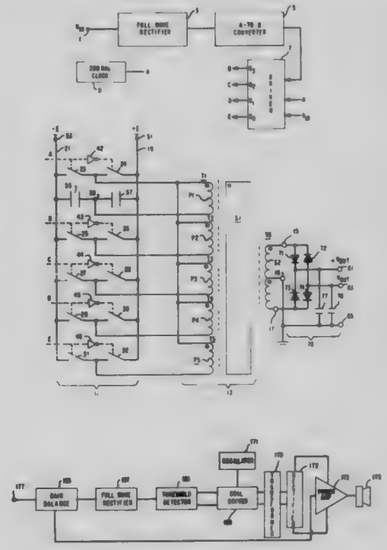
the offset voltage of the differential amplifier from the nominal offset voltage in response to the control signal, said adjusting means being unresponsive to the input signal.

4,717,889

POWER CONTROL SYSTEM FOR PERIODICALLY AND SELECTIVELY ENERGIZING OR SHORTING PRIMARY WINDINGS OF TRANSFORMERS FOR CONTROLLING THE OUTPUT VOLTAGE ACROSS A COMMON SECONDARY WINDING

Rudolph H. Engelmann, Ann Arbor, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Sep. 2, 1986, Ser. No. 902,934
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.⁴ H03F *1/02*
U.S. Cl. 330—297 **19 Claims**



1. A method for processing an electrical quantity in a system

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including a plurality of transformers each having a primary winding, each sharing a common secondary winding, comprising the steps of:

A. selectively shorting given ones of said primary windings; and

B. periodically connecting the remaining ones of said primary windings in parallel across a source of current for passing pulses of current through each one of these said primary windings in a given direction, for inducing an electrical quantity of desired value and waveshape in said secondary winding.

5. An amplitude modulated power supply comprising:

a source of direct voltage

a plurality of transformers each having a primary winding, and each sharing a common secondary winding;

switching means for (1) selectively shorting either one or a combination of said plurality of primary windings, and (2) periodically connecting in parallel with one another and with said source of direct voltage the remaining ones of said plurality of primary windings for causing pulses of current to flow through these windings in a given direction, thereby causing voltage pulses of desired amplitude, polarity, and duration to be induced into said secondary winding; and

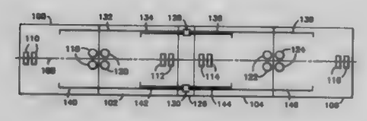
wherein said control means includes ROM based waveform generator means for producing said AC command signal.

4,717,890

SYMMETRIC LAYOUT FOR QUAD OPERATIONAL AMPLIFIER

William F. Davis, Tempe, and David M. Susak, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 7, 1986, Ser. No. 849,090
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—307 5 Claims



1. An improved operational amplifier circuit of the type wherein a plurality operational amplifier cells, each including power devices and devices which must be matched, are implemented on a single semiconductor die, the improvement comprising

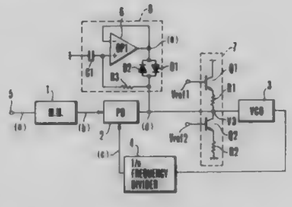
first, second, third and fourth operational amplifier cells arranged in a linear array on said die such that the power devices and the devices which must be matched are symmetrically positioned about the same axis of symmetry.

4,717,891

PHASE LOCKED LOOP CIRCUIT HAVING TEMPERATURE COMPENSATED VCO CONTROL VOLTAGE

Toshihiko Ichise, Kanagawa; Tsuguhide Sakata, Tokyo, and Hisashi Kawai, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,972
Claims priority, application Japan, Jun. 25, 1985, 60-136993
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—17 11 Claims



1. A phase locked loop circuit comprising:

(a) a controllable oscillator;

(b) phase difference detection means for detecting a phase difference between an output signal of said oscillator and an incoming signal; and

(c) control signal generating means for generating a control signal to control an oscillation frequency of said oscillator on the basis of an output of said phase difference detection means, and wherein:

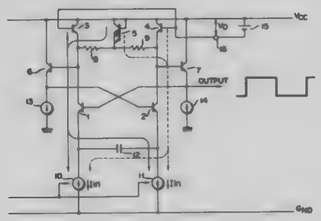
said control signal is arranged to bring the oscillator frequency of said oscillator to a predetermined frequency, and said control signal is arranged to be generated at one of three levels including a first level, a second level which is higher than the first level and a third level which is lower than the first level; and said control signal generating means includes adjusting means for adjusting said first level to a value required for compensating for a temperature characteristic of said oscillator, and means for determining said second and third levels according to said first level which is adjusted by said adjusting means.

4,717,892

CURRENT-CONTROLLED MULTIVIBRATOR WITH TEMPERATURE COMPENSATION

Hisakazu Hitomi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 24, 1986, Ser. No. 910,987
Claims priority, application Japan, Sep. 25, 1985, 60-211406
Int. Cl.[4] H03K *3/283*
U.S. Cl. 331—113 R 8 Claims



1. A current-controlled multivibrator with temperature compensation, comprising:

a control current source for changing a control current;

first and second transistors, the emitters of which are coupled to said control current source, the bases and collectors of which are cross-coupled, and which are turned on and off at given intervals in accordance with said control current;

a capacitor, connected between the emitters of said first and second transistors, to be charged and discharged such that the charging polarity of said capacitor is alternately inverted upon the turning ON/OFF of said first and second transistors;

third and fourth transistors, the emitters of which are respectively connected to the collectors of said first and second transistors, the bases of which are connected to a voltage source constituting a bias circuit, and the collectors of which are connected to a power source circuit to have a predetermined potential difference from the base potentials of said third and fourth transistors;

a fifth transistor, the base and the collector of which are connected to the power source circuit and having an emitter current density different from that of at least one of said third and fourth transistors; and

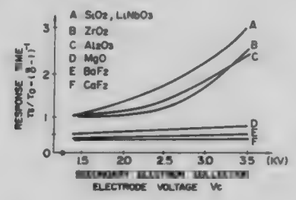
first and second impedance elements connected between the emitter of said fifth transistor and the emitters of said third and fourth transistors, respectively.

4,717,893

SPATIAL LIGHT MODULATOR

Yoshiharu Ooi, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 25, 1985, Ser. No. 727,250
Claims priority, application Japan, May 4, 1984, 59-89637; Sep. 14, 1984, 59-193136
Int. Cl.[4] H01S *3/00*
U.S. Cl. 332—7.51 2 Claims



1. A spatial light modulator comprising

an evacuated envelope;

an electron beam source positioned within said envelope, said electron beam source emitting electrons in response to light incident thereon; and

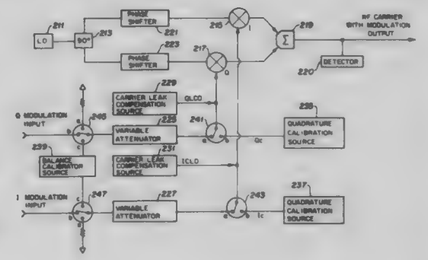
an electro-optical crystal having a charge storage surface constituting a dielectric multilayer mirror, said electro-optical crystal being made of $LiNbO_3$, and said dielectric multilayer mirror being made of a first plurality of films having a first refractive index and a second plurality of films have a second index which is low compared to that of said first plurality of films, said first plurality of film being selected from the group consisting of ZrO_2, HfO_2, Ta_2O_5 and Nb_2O_5, and said second plurality of films being made of SiO_2, whereby said dielectric multilayer mirror has a surface resistance which is stable enough to store said charge at an elevated temperature under elevated vacuum conditions.

4,717,894

CALIBRATION OF VECTOR MODULATORS USING A SCALAR DETECTOR

Allen P. Edwards, Palo Alto; David R. Gildea, Menlo Park, and Chung Y. Lau, Foster City, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 23, 1986, Ser. No. 922,383
Int. Cl.[4] G01R *35/00*; H03C *5/00*
U.S. Cl. 332—20 3 Claims



1. A method of calibrating a vector modulator having an input RF source connected to an input power divider providing two outputs, each connected to an adjustable phase shifter, the output of each adjustable phase shifter is independently connected to a mixer, one of the mixers is connected to an in-phase (I) signal path and the other mixer is connected to a quadrature (Q) signal path, the outputs from the mixers are connected to a power combiner, the power combiner produces an output RF signal having an amplitude, the method of calibrating requiring only the measuring of the amplitude of the output RF signal with a scalar detector connected to the RF output signal, the method comprising the following steps:

(a) minimizing quadrature phase error;

(b) minimizing carrier leakage;

(c) balancing amplitudes of I and Q modulated signals;

(d) balancing the amplitudes of quadrature calibration signals comprising:

a positive quadrature DC reference signal (Qc+);

a negative quadrature DC reference signal (Qc−);

a positive in-phase DC reference signal (Ic+);

a negative in-phase DC reference signal (Ic−); and

(e) repeating steps (a) through (d) until no further changes are observed.

4,717,895

HIGH-FREQUENCY, HIGH-POWER WAVEGUIDE JUNCTION CIRCULATOR

Erich Pivit, Allmersbach im Tal; Wolfgang Hauth, Backnang; Günter Mörz, Ludwigsburg, and Sigmund Lenz, Aspach, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,452
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527189
Int. Cl.[4] H01P *1/39*
U.S. Cl. 333—1.1 8 Claims

1. A waveguide junction circulator for a high power application at a high operating frequency, comprising:

a plurality of connecting waveguides each of which has a standard height dimension corresponding to the operating frequency;

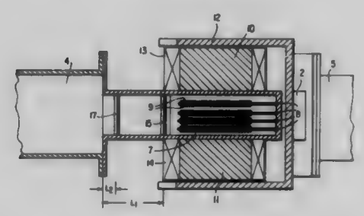
a resonance cavity;

a plurality of spaced and cooled, superposed metal plates and ferrite discs covering said plates disposed in said cavity;

magnet means disposed outside said cavity for generating a magnetic field oriented perpendicular to said ferrite discs and penetrating said cavity;

a plurality of junction arms each having one end communi-

cating with said cavity and another end forming a connection with a respective one of said plurality of connecting waveguides, said circulator having a height dimension in its region penetrated by the magnetic field that is reduced by at least 20% compared to the standard height dimension of said connecting waveguides, each said connection



presenting a transition from connecting waveguide to junction arm that has a sudden change in cross section from the reduced height dimension of said circulator to the standard height dimension of said connecting waveguide; and

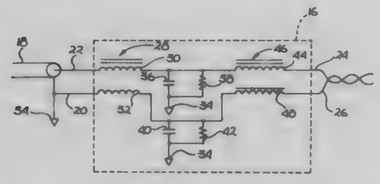
reactance elements provided in said junction arms which form multi-section filters.

4,717,896

BALUN

Martin H. Graham, Berkeley, Calif., assignor to And Yet, Inc., Berkeley, Calif.

Filed Mar. 21, 1985, Ser. No. 715,129
Int. Cl.[4] H03H *7/42*
U.S. Cl. 333—25 **2 Claims**



1. A balun for coupling a signal of a predetermined bandwidth between an at least partially unbalanced two-conductor line having a first and a second conductor and a balanced two-conductor line having a first and second conductor, comprising:

a first inductance adapted to have a first lead coupled to the first conductor of said unbalanced line;

a second inductance adapted to have a first lead coupled to the second conductor of said unbalanced line, said second inductance sharing a common core with said first inductance and having a substantially equal value to said first inductance;

a third inductance having a first lead coupled to a second lead of said first inductance and adapted to have a second lead coupled to a first conductor of said balanced line;

a fourth inductance having a first lead coupled to a second lead of said second inductance and adapted to have a second lead coupled to a second conductor of said balanced line, said fourth inductance sharing a common core with said third inductance and having a substantially equal value to said third inductance;

a first capacitance coupling said second lead of said first inductance to ground;

a second capacitance coupling said second lead of said second inductance to ground, said second capacitance being substantially equal in value to said first capacitance;

a first resistance coupled in parallel with said first capacitance; and

a second resistance coupled in parallel with said second capacitance, said second resistance being substantially equal in value to said first resistance;

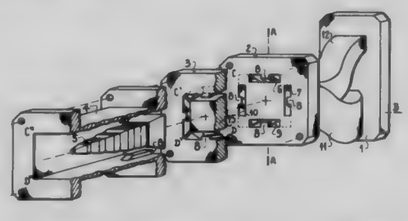
the combined parallel impedance of said first and second resistances and said first and second capacitance being lower than the open circuit impedance of said first and second inductances, and said third and fourth inductances over said predetermined bandwidth, and the series impedance of said first resistance and capacitance, and said second resistance and capacitance being higher than the impedance of said lines.

4,717,897

WIDE BAND POLARIZATION DIPLEXER DEVICE AND AN ANTENNA ASSOCIATED WITH A RADAR OR A COUNTER-MEASURE

Claude Gehin, and Jacky Tourneur, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Jul. 11, 1980, Ser. No. 167,784
Claims priority, application France, Jul. 24, 1979, 79 19084
Int. Cl.[4] H01P *5/12, 1/161*
U.S. Cl. 333—125 **8 Claims**



1. A polarization diplexer device fed by two rectangular section wave guides in which two electromagnetic waves rectilinearly polarized at the same frequency propagate, characterized by the fact that it contains a power divider whose input has two rectangular section wave guides and whose output has four rectangular section wave guides, a square section wave guide containing an impedance matching device and a transition element, which makes it possible to pass from the four rectangular section wave guides to the square section wave guide.

4,717,898

POWER COMBINER, POLARIZER AND STRUCTURE INCLUDING A WAVEGUIDE SECTION ROTATED BY A STEPPER MOTOR ARRANGEMENT

Guido Cappelli, Dollard-des-Ormeaux, Canada, assignor to MITEC Electronics Ltd., Montreal, Canada

Filed Jun. 26, 1986, Ser. No. 879,045
Int. Cl.[4] H01P *1/165*
U.S. Cl. 333—137 **12 Claims**

1. A microwave polarizer comprising:

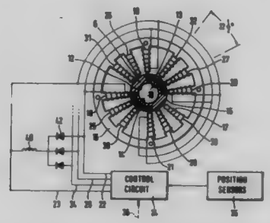
a waveguide section rotatable about a longitudinal axis thereof and including an inner, waveguide surface;

microwave tuning means fixed to the waveguide section and positioned inside of said inner, waveguide surface;

an electric stepper motor arrangement including (a) rotor means fixedly mounted on the waveguide section but positioned outside of said inner, waveguide surface, which rotor means having a rotation axis which coincides with said longitudinal axis and being therefore rotatable with the waveguide section about said longitudinal axis, (b) stator means associated with the rotor means and also positioned outside of said inner, waveguide surface, and

(c) windings mounted on at least one of said rotor and stator means, which windings can be energized to cause rotation of the rotor means about said longitudinal axis, and consequently rotation of the waveguide section and microwave tuning means about said longitudinal axis;

control means for energizing said windings of the stepper



motor arrangement so as to rotate the waveguide section about its longitudinal axis in either one of the two directions of rotation in order to move said microwave tuning means from any one of a plurality of angular positions to any other one of said angular positions; and

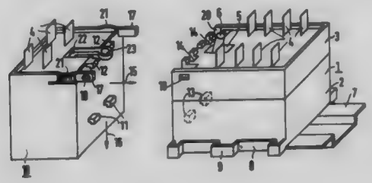
means for locking said waveguide section with said microwave tuning means in said other angular position.

4,717,899

CONTACTOR WITH ADDITIONAL SWITCHBLOCK

Johann Drexler, Schwandorf, and Erwin Flieri, Kümmersbruck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 40,240
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 8611138[U]
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—131 **4 Claims**



1. A switching apparatus, comprising:

(a) a contactor having a first side adapted to be connected to a mounting surface, said contactor having a second side opposite said first side and a third side surface transverse to said first side;

(b) contacts integrally arranged inside said contactor, said contacts having an actuation direction parallel to said mounting surface;

(c) a contactor actuating element located in said contactor;

(d) a switch position indicator coupled to said contactor actuating element extending from said first side;

(e) terminals for said integral contacts disposed at said first side of said contactor;

(f) an additional switchblock containing additional contacts therein having a top surface and a side switchblock surface transverse to said top surface;

(g) means for coupling said side switchblock surface to said third side of said contactor including a plurality of hook connections and cooperating recesses located on said side switchblock surface and said third side respectively, said hook connections being inserted in said recesses transversely to said actuating direction;

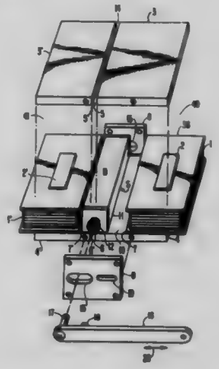
(h) a switchblock actuating element for actuating said additional contact extending through said top surface, said switchblock actuating element surrounding said switch position indicator in a ring-like fashion and making a form locking connection at the second side of said contactor.

4,717,900

LOW PROFILE ELECTROMAGNETIC LINEAR MOTION DEVICE

Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 30, 1984, Ser. No. 595,482
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—230 **14 Claims**



1. An electromagnetic linear motion device, said device comprising:

first and second spaced electromagnetic units, each of said units having a pair of spaced plates with an electromagnetic coil mounted therebetween, the end of said coil being mounted away from the end of each of said plates to define an armature receiving cavity between said plates and said coil, said armature receiving cavities of said electromagnetic units being positioned adjacent one another whereas the end of the plates of one of said units is spaced from the end of the plates of the other of said units to define a gap between the adjacent plates of said units; and

an armature formed solely of a permanent magnet and being disposed between said plates and movable longitudinally within said armature receiving cavities between said first and second coils upon the selective energization of said coils, said gap being sufficiently small to minimize the flow of magnetic flux through said armature and being sufficiently large to prevent saturation of said electromagnetic coil.

4,717,901

ELECTRONIC COMPONENT, ESPECIALLY FOR A CHIP INDUCTANCE

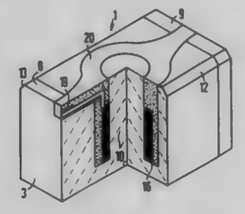
Lothar Autenrieth, Hainsacker; Kurt Marth, and Josef Schindler, both of Regensburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 711,606, Mar. 14, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,191

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410811

Int. Cl.[4] H01F *15/02, 15/10*

U.S. Cl. 336—83 34 Claims



1. Chip inductance comprising a solid core part having a perpendicular prismatic spatial shape; the core part having a hollow-cylindrical recess therein shaped for receiving a winding, said recess surrounding a pad being contiguous in one piece with the core part and canals connecting the lateral surfaces of the core part with the recess; the canals being open in direcion facing away from the core part; electrical contact surfaces being supported by said lateral surfaces; and at least one winding wound onto the pad; the ends of the winding being guided through the canals to the electric contact surfaces and connected therewith.

4,717,902

ELECTRICAL COMPONENTS INCORPORATING A TEMPERATURE RESPONSIVE DEVICE

Kenneth S. James, Frome, Great Britain, assignor to Dubilier PLC, Abingdon, Great Britain

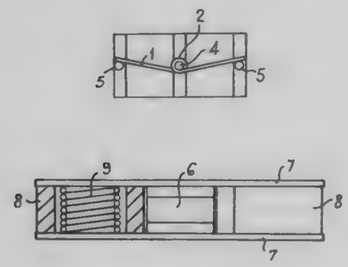
PCT No. PCT/GB85/00485, § 371 Date Jul. 16, 1986, § 102(e) Date Jul. 16, 1986, PCT Pub. No. WO86/02773, PCT Pub. Date May 9, 1986

PCT Filed Oct. 21, 1985, Ser. No. 878,888

Claims priority, application United Kingdom, Oct. 24, 1984, 8426904

Int. Cl.[4] H01H *39/00;* H02H *7/24*

U.S. Cl. 337—32 9 Claims



1. An excess voltage arrestor comprising at least two spaced electrodes defining a spark gap arranged in a gas filled enclosure, and a protective temperature responsive device comprising an electrically conducting member of spring temper and a thin insulating coating of a substance which thermally decomposes on being subject to an elevated temperature, said temperature responsive device being urged by said spring temper into physical contact with said electrodes such that upon thermal decomposition of said insulating coating at an elevated temperature, said electrically conducting member effects a short circuit across said electrodes.

4,717,903

TRIMMING RESISTOR

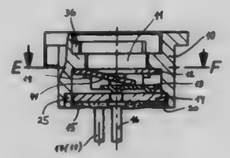
Leopold Hinterberger, Höhenkirchen, Fed. Rep. of Germany, assignor to Wilhelm Ruf Kg, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,914

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3500771

Int. Cl.[4] H01C *10/32*

U.S. Cl. 338—162 6 Claims



1. A trimming resistor construction particularly adapted for incorporation in a miniature trimming resistor, comprising a housing; a resistance plate including a brush track mounted on one resistance plate surface portion; a brush resiliently biased against the brush track; a rotary driver for rotatably driving said brush and supported in the housing; said brush being in the form of a substantially planar, small contact plate arranged parallel to said one resistance plate surface portion; a separate spring ring having a resilient tongue for biasing the small contact plate against the resistance plate; said rotary driver including two slots at right angles with respect to each other which define four engaging fingers; said fingers being disposed in a rotary driver end facing the resistance plate; said resilient tongue being disposed in one of said two slots, and said small contact plate having projecting arms retained in the other of said two slots.

4,717,904

COLLISION RESPONSIVE SIGNAL EMITTER FOR A VEHICLE

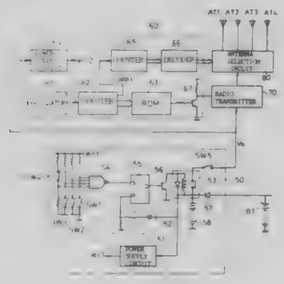
Yuichi Murakami, Ikenohata, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 29, 1986, Ser. No. 890,261

Claims priority, application Japan, Jul. 30, 1985, 60-168400

Int. Cl.[4] B60Q *9/00*

U.S. Cl. 340—52 H 1 Claim



1. An automatic signal emitter on a vehicle comprising:

at least two of three detecting means mounted on a vehicle including first detecting means which produces a signal responsive to an acceleration of the vehicle in a fore-and-aft direction and in a lateral direction, second detecting means which produces a signal responsive to an inclination of the vehicle and a third detecting means which produces a signal responsive to a presence or absence of water within the vehicle;

signal transmitting means for transmitting a radio wave and including a plurality of antennae which are disposed at mutually different locations on the vehicle; and

control means for energizing the signal transmitting means whenever at least one of the first to the third detecting means has produced a signal indicating the occurrence of an abnormality, wherein the control means repeats a given signal transmission and selects one of the plurality of antennae for connection to the output terminal of the signal transmitting means and sequentially changes the antenna which is connected to the output terminal of the signal transmitting means upon each completion of the signal transmission.

4,717,905

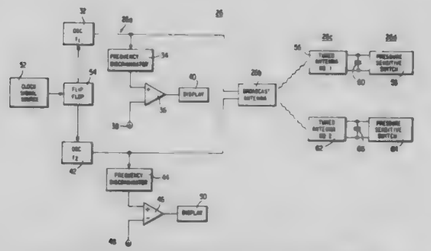
WARNING SYSTEM INCLUDING MEANS FOR REMOTELY ENERGIZING CONDITION SENSING DEVICE

Charles F. Morrison, Jr., and A. J. Mims, both of Boulder, Colo., assignors to Roger W. Vernon, Georgetown, Colo.

Filed May 24, 1985, Ser. No. 737,424

Int. Cl.[4] B60C *23/06, 23/02*

U.S. Cl. 340—58 25 Claims



1. Tire pressure monitoring apparatus comprising:

a tire pressure monitoring means including an energy detector disposed outside the tire and selected from the group consisting of an infra-red detector and an ultrasound detector, said energy detector having directivity such that the detector is normally pointed toward the ground so that detected energy normally passes by a point on the peripheral portion of the tire whereby if a significant change in the tire pressure occurs, the circumferential portion of the tire will be interposed in the said path the detected energy follows to thereby effect a substantial change in the level of said detected energy and thus detect said substantial change in the tire pressure; and

means for transmitting a signal to a remote location representative of said substantial change in the tire pressure and for alerting of an operator thereof.

4,717,906

ELECTRIC HORN WITH IMPROVED POLE PIECE AND ADJUSTING CAP

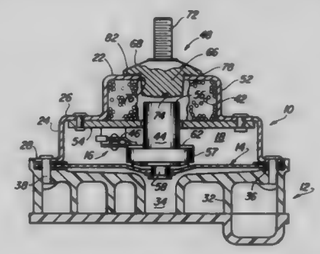
Robert E. Smith, Rinard, Ill., assignor to Sparton Corporation, Jackson, Mich.

Filed Oct. 22, 1986, Ser. No. 922,005

Int. Cl.[4] G08B *3/00;* G10K *9/00*

U.S. Cl. 340—388 6 Claims

1. In a vehicle horn of the type comprising a housing, a linear electromagnetic motor disposed in said housing and a sound generator including a diaphragm coupled with said motor for actuation thereby, said motor including an annular field coil in said housing, a pole piece/adjusting cap mounted coaxially of said coil on a wall of said housing and extending therethrough, an armature disposed coaxially of said coil and mounted on said diaphragm for reciprocating motion along the axis of said coil with an axial air gap between the armature and the pole piece/adjusting cap, whereby a magnetic flux path extends



through said pole piece/adjusting cap, housing, diaphragm, armature and air gap, the improvement comprising:

said pole piece/adjusting cap having a shank and an enlarged head, the head having an annular rim in engagement with said wall of the housing, the shank having a pole face disposed opposite said armature, said pole piece/adjusting cap having a flux path therethrough with a cross-sectional area that is not substantially smaller at any location than the area of said pole face.

4,717,907

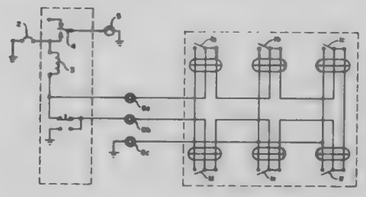
REMOTE PARAMETER MONITORING SYSTEM WITH LOCATION-SPECIFIC INDICATORS

Stephen R. Troy, Severna Park, Md., assignor to Arinc Research Corporation, Annapolis, Md.

Filed Mar. 10, 1986, Ser. No. 837,961

Int. Cl.[4] G01M *5/00;* B64C *27/04*

U.S. Cl. 340—544 18 Claims



1. A system for monitoring at least one parameter at at least two spaced locations, said system comprising:

alternating current power means;

condition responsive switching means for each one of said at least two spaced locations for producing an output in response to a predetermined condition of said at least one parameter;

means situated at a remote location from said at least two spaced locations for indicating the existence of said output from each said switching means;

means for electrically connecting said switching means to said indicating means and said power means, said electrical connecting means comprising at least two overlapping wire loops each serving at least two switching means, a first leg of each wire loop connecting the power means to indicating means corresponding respectively with said at least two switching means, a second leg of each wire loop connecting said at least two switching means to their respective corresponding indicating means, and a third leg

of each wire loop connecting said at least two switching means with the power means, wherein the second leg of each wire loop serves as the third leg of another of the wire loops; and

gating means further electrically connected by said electrical connecting means to said switching means, indicating means and power means for correlating the output of a particular switching means to a corresponding particular response by said indicating means;

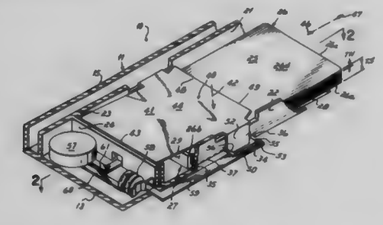
whereby upon an output from a particular switching means in response to a predetermined condition of said parameter at one of said spaced locations, the indicating means identifies both the existence of said output and the particular switching means producing said output.

4,717,908

CREDIT CARD CASE WITH ALARM SYSTEM

Bradford E. Phillips; Roy J. Bertacchi, and John E. Busse, all of Cincinnati, Ohio, assignors to 'totes', Incorporated, Loveland, Ohio

Filed Nov. 21, 1986, Ser. No. 930,401
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 **38 Claims**



1. A credit card case comprising

a housing adapted to receive a series of credit cards in stacked relation interiorly thereof in a storage position,

a card sensor that responds to the thickness of said credit card stack for determining whether all cards are present in said stack or whether one or more cards are absent from said stack, and

a first signal device connected with said card sensor, said first signal device being adapted to signal the case's owner when one or more cards are absent from said case.

4,717,909

INDICATOR SYSTEM FOR A DOOR WITH SLIDING BOLT LOCK

Jack D. Davis, 4452 Scenic Dr., Eugene, Oreg. 97404

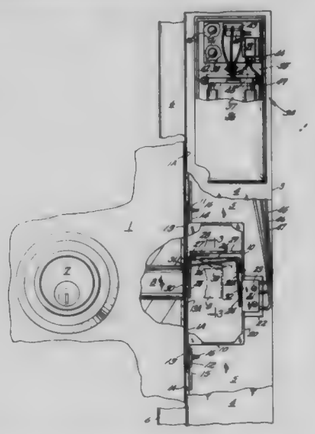
Filed Aug. 23, 1985, Ser. No. 768,799
Int. Cl.[4] G08B *21/00*; H01H *27/06*
U.S. Cl. 340—686 **8 Claims**

1. An indicator system for a door having a sliding bolt lock for travel into and out of a door frame, said system comprising,

a housing for securement to the door frame and into which the sliding bolt may travel, said housing including flange means for attachment to the door frame,

switch means carried by said housing and including a switch, a first switch member and a second member within said housing, hinge means on said housing supporting sad first switch member so as to locate same immediately forward of the sliding bolt when the bolt is retracted into the door, said first switch member inwardly displaceable upon initial entry of the bolt into the door frame opening, said second switch member displaceable by said first switch member upon said initial entry of the bolt into the door frame opening to actuate said switch,

an indicator unit including signal means indicating the locked-unlocked status of the door, and



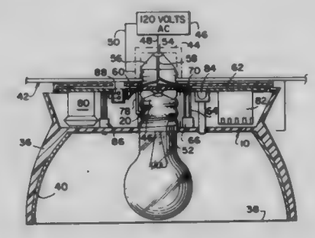
means for electrically interconnecting said switch and said signal means.

4,717,910

DETECTOR AND LIGHT ASSEMBLY

Keith A. Scripps, 4301 Massachusetts Ave., NW., Washington, D.C. 20016, and Thomas C. Driggers, 1836 Griffith Rd., Falls Church, Va. 22043

Continuation-in-part of Ser. No. 797,008, Nov. 12, 1985. This application Nov. 26, 1986, Ser. No. 935,219
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—693 **14 Claims**



1. A detector and light assembly adapted to be removably secured to an incandescent light socket and operative simultaneously as a manually controlled light fixture and an alarm source responsive to a detected alarm condition comprising:

support means,

electrically powered alarm circuit means mounted upon said support means,

detector means mounted upon said support means, said detector means being connected to said alarm circuit means and operating in response to an alarm condition to activate said alarm circuit means,

a socket mounting means secured to said support means and extending outwardly therefrom, said socket mounting means being removably engageable in an incandescent light socket and being operative to complete an electric circuit therewith,

light bulb receiving socket means mounted upon said support means, said light bulb receiving socket means being operative to receive and provide power to an electric light bulb, and

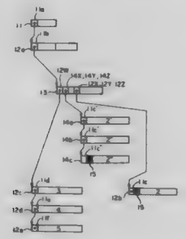
first power circuit means operative to complete a circuit between said light bulb receiving socket means and said socket mounting means to provide power from said socket mounting means to a light bulb mounted in said light bulb receiving socket means when said socket mounting means completes an electric circuit with an incandescent light socket.

4,717,911

TECHNIQUE FOR CHAINING LINES OF A DOCUMENT TOGETHER TO FACILITATE EDITING OR PROOFREADING

Kazuo Matsuura, and Masami Chikauchi, both of Hamuramachi, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,773
Claims priority, application Japan, Feb. 4, 1984, 59-18809
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—724 **12 Claims**



1. An apparatus for editing and proofreading a document having rows of data thereon, comprising:

means for storing the document data in a memory by assigning one row of the document data to one memory block, and for chaining each row of document data into an initial chain construction by using a pointer in the memory block;

means for providing pointer data when editing or proofreading said document data to enable the pointer to manage the chain construction of each row after editing or proofreading is conducted;

selection means including,

means for releasing the management of said pointer data and returning the document data to said initial chain construction in the memory when the document data is returned to the status it was before the editing and proofreading; and

means for refreshing the document data based on the chain construction of each row after the editing or proofreading when the document data is not returned to the status before the editing or proofreading.

4,717,912

APPARATUS FOR PRODUCING ANY ONE OF A PLURALITY OF SIGNALS AT A SINGLE OUTPUT

Paul W. Harvey, Santa Clara; Bradford S. Kitsoo, Castro Valley, and Warren K. Miller, Jr., Hayward, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 7, 1982, Ser. No. 433,253
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.83 **35 Claims**

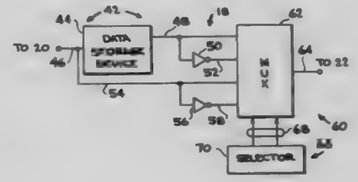
1. An output structure for connection between a logic circuit producing a logic signal and a pin of a package, comprising:

(a) first means, responsive to the logic signal, for providing a stored non-inverted first signal;

(b) second means, responsive to the logic signal, for providing a non-stored non-inverted second signal;

(c) first programmable means for coupling therethrough said first signal or said second signal;

(d) third means, having an output connectable to the pin, for providing at said output said coupled first signal or said coupled second signal or a third signal being inverted of



said coupled first signal or a fourth signal being inverted of said coupled second signal; and

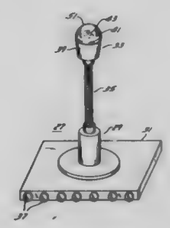
(e) second programmable means for controlling said third providing means to provide at said output said coupled first signal or said coupled second signal or said third signal or said fourth signal.

4,717,913

DATA TELEMETRY SYSTEM USING DIFFUSED INFRARED LIGHT

Rodney R. Elger, Brookfield, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 29, 1985, Ser. No. 770,680
Int. Cl.[4] H04Q *9/00*; G02F *1/00*; H04B *9/00*
U.S. Cl. 340—825.54 **2 Claims**



1. A data telemetry system for process control comprising:

a plurality of point transponders for receiving digitally coded interrogation signals, each of said transponders including a first group of PIN diodes disposed thereon for omnidirectionally detecting said interrogation signals and a second group of IR emitting diodes disposed thereon for generating digitally coded signals responsive to said interrogation signals;

said first group and said second group defining a first array of diode nodes, each of said first array nodes being mounted upon a generally planar surface and including at least one diode of said first group and at least one diode of said second group;

each of said point transponders further including an element defined by at least three planar surfaces arranged in a polyhedran configuration, said element having a dome disposed thereover for protecting said element, wherein said dome is configured of a material to act as an optical band pass filter;

a transceiver including a generally hemispherical reflective member having a third group of IR emitting diodes disposed thereon for generating said interrogation signals and a fourth group of PIN diodes disposed thereon for receiving said responsive signals;

said third group and said fourth group defining a second

array of diode nodes, each of said second array nodes including at least one diode of said third group and at least one diode of said fourth group;

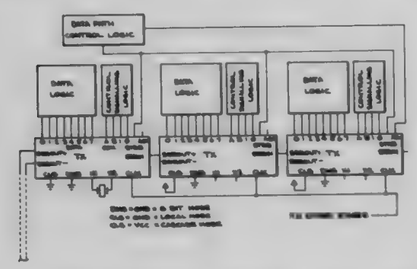
each of said IR emitting diodes including a dedicated driver physically closely coupled thereto, each of said drivers comprising an integrated circuit of the MOSFET type and being powered by a pulse position modulator.

4,717,914

METHODS FOR RECEIVING AND CONVERTING HIGH SPEED SERIAL DATA PATTERN INPUT SIGNALS TO PARALLEL DATA PATTERN OUTPUTS

Paul H. Scott, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1985, Ser. No. 810,820
Int. Cl.[4] H04Q 9/00; H04J 3/08
U.S. Cl. 340—825.060 **12 Claims**



1. A method for utilizing a plurality of receiver means to transfer serial data pattern signals off a high speed synchronous serial transmission media, comprising the steps of:

(a) inputting a catch authorization signal to a first of said plurality of receiver means;

(b) transferring a serial data pattern signal from said media into said first receiver means in response to said catch signal input;

(c) generating an output signal from said first receiver means indicative of the capture of data wherein said signal indicating the capture of data is also used as the catch authorization signal for a second of said plurality of receiver means; and

(d) enabling the output of data from a cascaded chain or receiver devices synchronously upon the detection of a transmitted synchronization pattern from said media.

4,717,915

METHOD AND APPARATUS FOR THE GRAPHIC REGISTRATION OF MOVING VEHICLES

Simon Goede, Wetzikon, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed Nov. 22, 1985, Ser. No. 800,790
Claims priority, application Switzerland, Nov. 30, 1984, 05721/84
Int. Cl.[4] G01S 13/58
U.S. Cl. 342—66 **16 Claims**

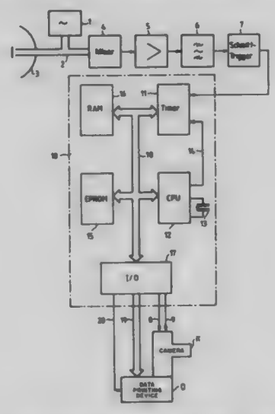
8. An apparatus for registering oncoming vehicles, comprising:

a radar speed measuring device for determining a measured speed value of an oncoming vehicle during a measuring stage after a vehicle enters a measuring beam of said radar speed measuring device;

recording means for producing a frontal record of said vehicle when said measured speed value exceeds a predetermined threshold value;

means for checking said measured speed value to verify an accurate speed measurement said checking means verifying said speed measurement on the basis of measurements from said radar speed measuring device as said vehicle travels through a verification distance; and

means for indicating said measured speed on said frontal



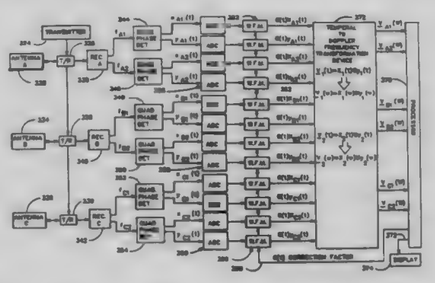
record, said indicating means indicating said measured speed value on said frontal record only after said checking means verifies said speed measurement.

4,717,916

HIGH RESOLUTION IMAGING DOPPLER INTERFEROMETER

Gene W. Adams, Richmond, Utah, and John W. Brosnahan, Longmont, Colo., assignors to Holodyne Ltd., 1986, Longmont, Colo.

Filed May 16, 1986, Ser. No. 864,436
Int. Cl.[4] G01S 13/48, 13/89, 15/89; G01N 29/00
U.S. Cl. 342—107 **41 Claims**



1. A process of locating and distinguishing targets comprising the steps of:

transmitting a temporal series of pulses to illuminate said targets;

detecting said temporal series of pulses reflected from said targets by at least three independent sensors;

producing complex voltage temporal functions at each of said independent sensors;

transforming said complex voltage temporal functions to complex voltage doppler functions which vary with a doppler frequency (w) indicative of relative movement between said targets and said sensors;

generating phase value functions from said complex voltage doppler frequency functions which vary as a function of doppler frequency (w);

analyzing said phase value functions to distinguish said targets from noise and locate said targets in zenith angle by comparing differences in phase amplitudes of said phase value functions as a function of spatial separation of said

independent sensors such that a common locational source of said temporal series of pulses returned from said targets can be identified;

generating at least one correction factor function which varies with the rate of change of said doppler frequency (w);

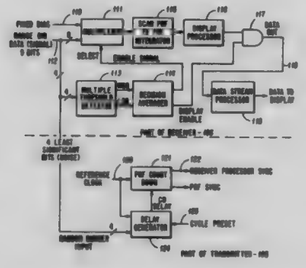
modifying said complex voltage temporal functions by a previously generated correction factor function to correct said complex voltage temporal functions for spectral smearing.

4,717,917

ALIEN RADAR SUPPRESSION CIRCUIT

Orville J. Alitz, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 26, 1985, Ser. No. 749,147
Int. Cl.[4] G01S 13/22
U.S. Cl. 342—137 **1 Claim**



1. A pulsed Doppler radar apparatus comprising:

a. circuitry for generating a series of substantially random signals, within a one-to-sixteen range of values;

b. pulsed repetition rate control circuitry coupled thereto, and operable to vary said pulse repetition rate within said specified one-to-sixteen range as a function of said substantially random signals; and

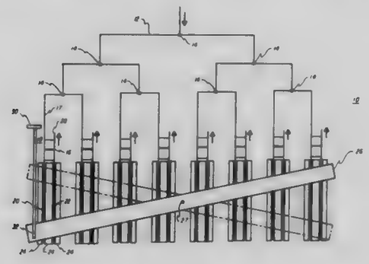
c. tracking circuitry for factoring appropriate timing considerations including a two-out-of-three range filter data processor having a hysteresis characteristic.

4,717,918

PHASED ARRAY ANTENNA

Kenneth R. Fiakes, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 23, 1985, Ser. No. 768,597
Int. Cl.[4] H01Q 3/22
U.S. Cl. 342—368 **16 Claims**



1. A steerable beam phased array antenna comprising:

a plurality of antenna elements;

a transmission path associated with each antenna element, said transmission being adapted to carry an incident signal; and

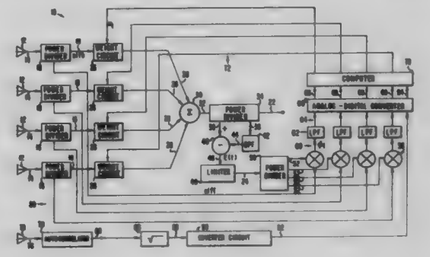
adjustable means for changing the effective length of each transmission path by establishing the termination point of each transmission path so as to form a reflected signal at the termination point, wherein said reflected signal is time delayed with respect to said incident signal as determined by the location of the termination point, to achieve forming and steering of the steerable beam phased array antenna.

4,717,919

FEEDBACK LIMITED ADAPTIVE ANTENNA WITH SIGNAL ENVIRONMENT POWER LEVEL COMPENSATION

Alan R. Cherrette, Hawthorne, and Donald C. D. Chang, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 28, 1985, Ser. No. 737,767
Int. Cl.[4] G01S 3/16, 3/28
U.S. Cl. 342—383 **14 Claims**



1. An adaptive antenna comprising:

at least two first sensors for receiving electromagnetic signals from a far filed and for producing respective first signals;

first divider means for dividing each first signal into a respective second and a respective third signal;

means for modifying each respective second signal according to a quantized variable weighting function;

means for summing said modified second signals to provide a fourth signal;

means for providing a system feedback signal in response to said fourth signal;

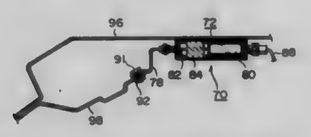
means for limiting said system feedback signal to prevent the feedback signal amplitude from exceeding a predetermined value;

means for correlating said respective third signals with said limited system feedback signal to produce respective correlator output signals;

means for determining the signal power level of the field sensed by said at least two sensors and for providing a fifth signal substantially corresponding to $1/\sqrt{F}$, wherein F is the signal power level of the far field; and

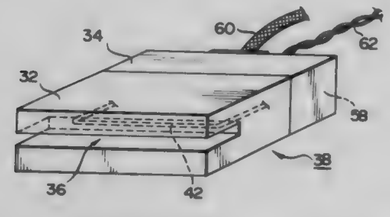
means for executing an algorithm utilizing the correlator output signals and said fifth signal and also for modifying said variable weighting function in response to said correlator output signals and said fifth signal and thereby substantially removing the dependence of the algorithm upon the signal power level.

4,717,920
AUTOMOBILE ANTENNA SYSTEM
Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Nov. 26, 1985, Ser. No. 801,770
Claims priority, application Japan, Nov. 27, 1984, 59-251245; Nov. 28, 1984, 59-252286
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—712 3 Claims



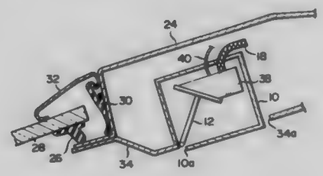
1. An automobile antenna system comprising:
high-frequency pickup means having a loop antenna longitudinally disposed along and in close proximity to an end surface of a marginal edge portion of a vehicle body, a core being formed of a material having a high permeability constant value and around which said loop antenna being wound, and a casing having an opening opposite to one side of said loop antenna; said high-frequency pickup means being provided for detecting high-frequency surface currents which are induced by broadcast waves on the vehicle body and which are concentrated on the marginal edge portion of the vehicle body; and
fixture means for securing said high-frequency pickup means to a predetermined position of said vehicle body.

4,717,921
AUTOMOBILE ANTENNA SYSTEM
Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Nov. 14, 1985, Ser. No. 798,022
Claims priority, application Japan, Nov. 15, 1984, 59-242098; Dec. 7, 1984, 59-258949
Int. Cl.[4] H01Q *1/32, 7/08, 1/48, 1/40*
U.S. Cl. 343—712 6 Claims



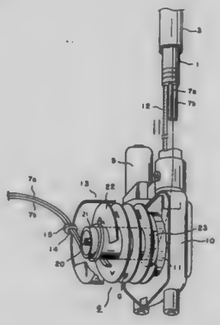
1. An automobile antenna system for use on a vehicle body, said system comprising:
high-frequency pickup means for detecting high-frequency surface currents induced on the vehicle body, by broadcast waves, and concentrated on a marginal edge portion of the vehicle body, the marginal edge portion being a peripheral edge portion of a metal plate which forms the vehicle body, said high-frequency pickup means comprising a loop antenna and circuit means for processing a signal detected by the loop antenna; and
casing means for housing the high-frequency pickup means and having an opening for guiding and positioning the marginal edge portion of the vehicle body partially into said casing, the loop antenna of said high-frequency pickup means extending along an interior side of the opening of said casing so as to be disposed in parallel to, opposed to and in close proximity to the marginal edge portion of the vehicle body.

4,717,922
AUTOMOBILE ANTENNA SYSTEM
Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Nov. 4, 1985, Ser. No. 794,848
Claims priority, application Japan, Nov. 6, 1984, 59-234360; Nov. 28, 1984, 59-252233
Int. Cl.[4] H01Q *1/27, 7/04, 1/32, 1/48*
U.S. Cl. 343—712 12 Claims



1. An automobile antenna system for detecting surface currents induced on a vehicle body by broadcast waves, said system comprising:
electrostatic shielding case means mounted on the vehicle body and having an opening formed therein to be opposed to an edge portion of a metallic plate forming the vehicle body; and
high-frequency pickup means for detecting the surface currents induced on the vehicle body and including a rectangular loop antenna housed within said electrostatic shielding case means and positioned in close proximity to said opening, said loop antenna including a plane of the loop arranged relative to the surface of said metallic plate of said vehicle body at an angle in the range of 90 degrees to 135 degrees or 225 degrees to 270 degrees.

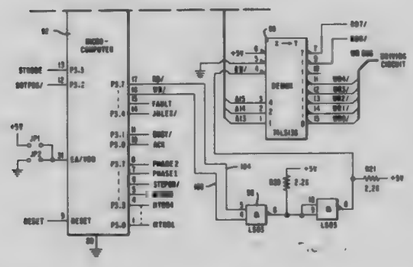
4,717,923
AUTOMOBILE ANTENNA
Misao Kimura, Yokosuka, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 5, 1985, Ser. No. 762,924
Claims priority, application Japan, Oct. 4, 1984, 59-150483[U]
Int. Cl.[4] H01Q *1/10*
U.S. Cl. 343—903 1 Claim



1. An automobile antenna comprising:
a cylindrical housing for storing an antenna element;
an antenna extension wire for extending and retracting the antenna element through the cylindrical housing by a motor;
a pair of feeder cables connected at one end to the antenna element and at the other to a communication equipment; and

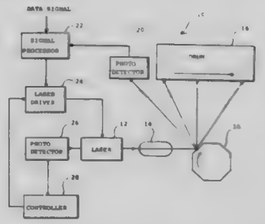
a cable chamber non-rotatably coupled to the cylindrical housing for storing therein intermediate portions of the pair of feeder cables, the cable chamber comprising:
a wind-up shaft non-rotatably coupled to the cylindrical housing; and
a spiral fin of a plurality of turns extending radially from and formed coaxially around an outer circumference of the wind-up shaft defining with the wind-up shaft a deep spiral groove for locating the pair of feeder cables therein, said deep spiral groove being deeper than a diameter of one of said pair of feeder cables and a cable chamber cover coaxially surrounding and covering the entire spiral fin and the wind-up shaft whereon one end of the intermediate portions of the pair of feeder cables are fixed thereto whereby diameters of coils of the pair of feeder cables around the wind-up shaft in the deep spiral groove reduced or increased along the spiral fin on the wind-up shaft respectively during extension or retraction of the antenna element.

4,717,924
THERMAL PRINTING CONTROL SYSTEM
Richard G. Bangs, and Sik P. Kwan, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed Aug. 18, 1986, Ser. No. 897,579
Int. Cl.[4] G01D *15/10;* H05B *3/02;* B41J *3/20*
U.S. Cl. 346—76 PH 28 Claims



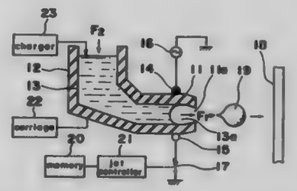
1. A thermal printing control system for a print head having a plurality of printing elements positioned in offset manner and isolated from each other, said control system including a
voltage source for energizing the printing elements, a
driving circuit including a plurality of drivers connected to the voltage source and operable to turn the printing elements on and off, a
decision-making circuit programmed to accommodate changes in temperature of the print head during printing operations, the decision-making circuit including programmable memory means for storing predetermined temperature control code values of the printing elements, the temperature control code values being written to change the time for energizing the print element drivers during such printing operations relevant to the resistance values of the particular print elements utilized during such prnting operations, and
processor means coupled to the driving circuit and the decision-making circuit and responsive to the temperature control code values for sending dot pattern signals one at a time in sequential manner to selected print element drivers for operating the driving circuit.

4,717,925
OPTICAL SCANNER WITHOUT EXTRA CONVERGENT LENS
Isamu Shibata, and Kazuyuki Shimada, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 7, 1986, Ser. No. 848,466
Claims priority, application Japan, Apr. 19, 1985, 60-84799
Int. Cl.[4] G01D *9/42, 15/14;* H04H *1/21*
U.S. Cl. 346—108 6 Claims



1. An optical scanner comprising:
converging means for focusing a light beam issuing from a light source onto an object to be scanned as a minute spot;
optical deflecting means interposed between said converging means and said object for deflecting the light beam to scan the object with there being no converging lens between said deflecting means and said object to be scanned; and
frequency varying means supplied with an information signal for generating an image scanning clock in order to transfer the information signal to the light source and continuously varying frequency of the image scanning clock in proportion to a scanning speed at which the deflecting means scans the object with a scanning spot, thereby compensating for scanning distortion.

4,717,926
ELECTRIC FIELD CURTAIN FORCE PRINTER
Hideo Hotomi, Suita, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 5, 1986, Ser. No. 927,104
Claims priority, application Japan, Nov. 9, 1985, 60-251687; Nov. 9, 1985, 60-251688
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 30 Claims



1. A printer for ejecting toning material selectively toward a recording member, comprising:
a nozzle means which is insulated electrically and has an aperture of narrow size;
a means for supplying toning material into the nozzle means;
a means for applying the electric field curtain force on toning material near the aperture of the nozzle means which includes at least one pair of electrodes for generating the electric field curtain force, said electrodes being arranged near the aperture so as to oppose to each other with respect to the direction of ejection of the toning material;
an electric power source which applies alternating voltage to the electrodes; and

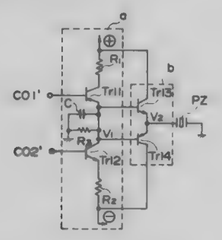
a control means for controlling the application of the alternating voltage by the electric power source selectively according to image signal.

4,717,927

LIQUID INJECTION RECORDING APPARATUS

Eiichi Sato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,345
Claims priority, application Japan, May 15, 1985, 60-103073
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **1 Claim**



1. A liquid injection recording apparatus including:
an injection head;
electro-mechanical converting means for effecting the discharge of liquid droplets by said injection head;
a wave form shaping circuit for shaping the wave form of a signal to be applied to said electro-mechanical converting means, wherein said wave form shaping circuit has a time constant circuit for setting an attenuation time of the signal; and
an impedance converting circuit for impedance-converting said wave form shaped signal and applying the converted signal to said electro-mechanical converting means.

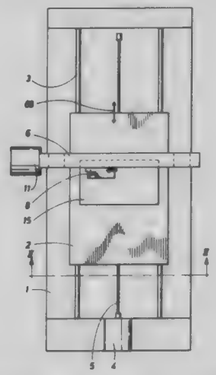
4,717,928

ARRANGEMENT FOR PRODUCING A PATTERN ON A LIGHT-SENSITIVE SURFACE

Hakan Lans, Saltsjöbaden, Sweden, and Jean Cano, Geneva, Switzerland, assignors to Inrad S.A., Geneva, Switzerland

PCT No. PCT/SE85/00336, § 371 Date Jul. 10, 1986, § 102(e) Date Jul. 10, 1986, PCT Pub. No. WO86/01921, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 10, 1985, Ser. No. 893,325
Claims priority, application Sweden, Sep. 10, 1984, 8404515
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—160 **4 Claims**

1. An arrangement for producing a pattern on a light-sensitive surface (15) by means of a spot of light (16) capable of being moved over the surface generated by means of a beam of light emitted by a lighintg unit (8), which is directed at the light-sensitive surface and is caused to strike the surface intermittently in the form of flashes of light as the beam of light is moved over the surface in accordance with specific instructions from a control unit (70), for which purpose the pattern is made up of lines (29, 33) running not only in a selected reference direction, but also at right-angles to the selected reference direction, and also at at least one further fixed angle to the reference direction, in conjunction with which the lighting unit contains an aperture (14) by means of which certain dimensions of the pattern, such as the width of the aforementioned line, can be set, characterized in that the aperture (14) is so arranged as to produce the aforementioned spot of light (16) on the light-sensitive surface (15) in the form of an isogonal polygon having at least six sides and with a first pair of sides (17, 21) which lie opposite one another and are essentially parallel to one another, and a second pair of sides (19, 23) which lie opposite one another, are essentially parallel to one another and are essentially perpendicular to the first-mentioned pair, and at least a third pair of sides (18, 20, 22, 24) which lie opposite one another, are parallel to one another and lie at an angle to the first-mentioned pair of sides at the aforementioned fixed angle, in conjunction with which the beam of light is so arranged as to move for each flash of light over a distance which is not more than the length of each of the sides which extend in the direction of movement.



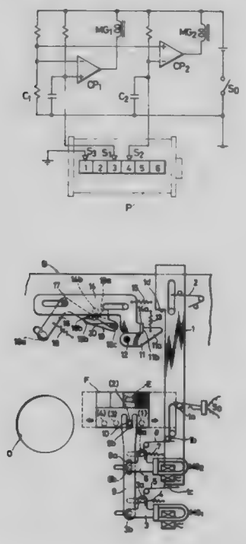
4,717,929

CAMERA AUTO SENSING SYSTEM FOR ISO SPEED

Norifumi Nakagawa; Toyonori Sasaki, and Kunio Matsumoto, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,629
Claims priority, application Japan, Mar. 25, 1985, 60-42763[U]
Int. Cl.⁴ G03B *7/24*
U.S. Cl. 354—21 **9 Claims**

1. A camera auto sensing system for ISO speed, comprising:
a controlling circuit including switch means provided on a film cartridge mounted for use and set to either a conduction state or a non-conduction state in cooperation with at most two zones selected among a plurality of zones of a digital code pattern indicative of film sensitivity information, electromagnet means connected to said switch means, and a power supply switch connected across said switch means and said electromagnet means via a power supply so as to be closed by a shutter release;
an armature member disposed in association with said electromagnet means so as to move between a first position engaging said electromagnet means and a second position detached from said electromagnet means; and
a film sensitivity changing lever coupled to said armature member which is moved to mutually different positions in accordance with a movement of said armature member, wherein information concerning sensitivity of a film to be used is introduced to an exposure controlling system by operating said film sensitivity changing lever via said switch means, said electromagnet means and said armature member whenever a shutter release is performed.

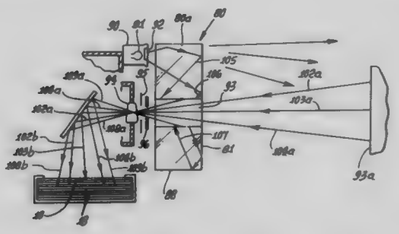


4,717,930

INSTANT PHOTOGRAPHY WITH SUPERIMPOSED GRAPHICS

Alton D. Wheeler, 3940 Fox Meadow La., Pasadena, Calif. 77504

Filed Oct. 14, 1986, Ser. No. 918,718
Int. Cl.⁴ G03B *15/03, 17/24*
U.S. Cl. 354—108 **23 Claims**



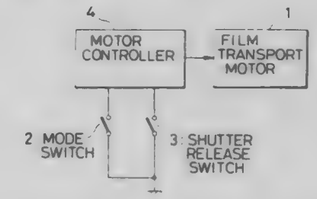
1. In the method of instant photography wherein graphics on a template are reproduced on a photographic print along with the image of an object whose photograph is taken using a camera, the improvement comprising the steps
(a) producing a light flash,
(b) and channeling at least some of the light to a zone proximate the camera lens and defining a light diffusing wall extending about an open space forming the direct path of light that travels from said object through said lens to film in the camera,
(c) whereby light channeled to said zone and through said wall also passes through the lens and operates to illuminate the film forming a light modulated background to the image of said object and also to said reproduced graphics,
(d) and locating the template to pass said light channeled through said diffusing wall.

4,717,931

FAIL-SAFE FILM PREWINDER FOR CAMERAS

Keiji Hinuro, Kanagawa, and Akira Ueno, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,398
Claims priority, application Japan, Jun. 26, 1985, 60-139830
Int. Cl.⁴ G03B *1/00*
U.S. Cl. 354—173.1 **4 Claims**



1. A fail-safe film prewinder for a camera in which film is continuously prewound from a loaded film cartridge in a film prewinding mode and thereafter is successively exposed in a photographing mode whiie the film is rewound one frame at a time into the film cartridge, said fail-safe film prewinder comprising:
a film transport motor rotatable in opposite directions for selectively transporting the film out of and into the film cartridge;
a mode switch for switching to the photographing mode upon completion of the prewinding mode;
a release switch actuatable in response to the depression of a shutter release button; and
a motor controller for controlling said film transport motor by producing a first signal in controlling the motor to rotate in the direction to prewind the film out of the film cartridge when said mode switch is in a prewinding position and a second signal controlling said motor to rotate in the direction to rewind the film into the film cartridge when the mode switch has been switched to the photographing mode; said motor controller also producing said first signal in response to an interruption in the prewinding and said shutter release switch being actuated by said shutter release button.

4,717,932

FOCAL LENGTH SWITCHING TYPE CAMERA

Yasushi Hoshino, Tokyo, and Makino Masamori, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 7, 1986, Ser. No. 860,647
Claims priority, application Japan, May 14, 1985, 60-100381; May 14, 1985, 60-100384
Int. Cl.⁴ G03B *3/10, 17/38*
U.S. Cl. 354—195.12 **7 Claims**

1. In a focal length switching type camera having shutter means, release operating means, and a lens unit which is selectively moved to one of at least two photographic positions, wherein the photographing is carried out when the lens unit is moved to one of said positions, which is a normal photographic position, the improvement which comprises a first detecting means for detecting that said release operating means has been operated, a driving source for driving said lens unit, a second detecting means for detecting that said lens unit is in said normal photographic position, and control means having judgment means for judging by a signal from said second detecting

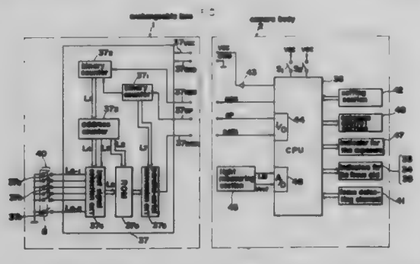
means whether said lens unit is in said normal photographic position, actuator means for said lens unit operating said driving source when said release operating means has been operated and said judgment means has determined that no detecting signal is obtained from said second detecting means, and said driving source is effected in an inoperated state according to the detecting signal from said second detecting means.



4,717,933
EXCHANGEABLE LENS FOR USE IN A FOCUS DETECTING DEVICE

Makoto Ando, Sakai; Tsuneyo Metabi, Izumi, and Toshihiko Ishimura, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1985, Ser. No. 775,250
Claims priority, application Japan, Sep. 12, 1984, 59-190995
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—409 **5 Claims**



1. An exchangeable lens for use with a lens exchangeable camera having a focus detecting means which receives light coming from a target object on which said exchangeable lens is focused and passing through said exchangeable lens and determines the focus conditon and the direction of defocus, and means for indicating the determined focus condition and direction of focus adjustment, said exchangeable lens comprising:

a lens system for forming an image of the object, said lens system including a movable element for the focusing of said lens system;

a focus adjusting means manually operable for moving said movable element;

a direction signal means for determining and indicating the direction of focus adjustment, said direction signal means generating two direction signals each representing a relationship between the direction of operation of said focus adjusting means and the change of the camera-to-object distance to be focused on by said lens system, said direction signals respectively representing relationships that are opposite to each other;

means for generating a selection signal;

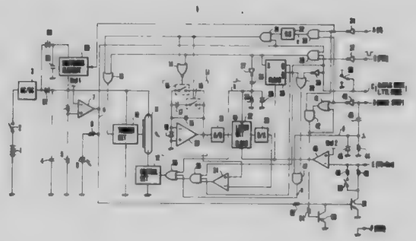
means for selecting either one of said direction signals in response to the selection signal; and

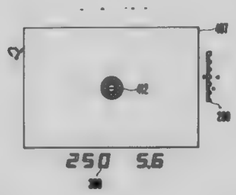
means for transmitting the selected direction signal to said focus detecting means of said camera, said focus detecting means being responsive to said selected signal when determining the direction of the focus adjustment.

4,717,934
CAMERA SYSTEM

Ryuichi Kobayashi; Yoshihito Harada; Masaharu Kawamura, all of Kanagawa; Hiroyuki Katsuka, Tokyo, and Toshiyuki Kumakura, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,609
Claims prior.ty, application Japan, Dec. 28, 1984, 59-276498; Dec. 28, 1984, 59-276499; Dec. 28, 1984, 59-276500; Dec. 28, 1984, 59-276501; Dec. 28, 1984, 59-276502
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—415 **17 Claims**





1. A camera system including a flash device and a camera, comprising:

(a) means for causing said flash device to perform pre-flashing prior to commencement of an exposure;

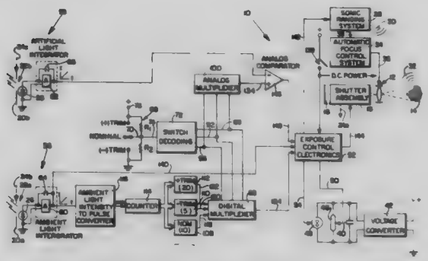
(b) a computing circuit arranged to detect the quantity of a reflection light coming from a photographing object as a result of said pre-flashing, to determine whether said reflection light quantity has reached an adequate flash light quantity required for an apposite exposure and, if not, to obtain a degree of difference between said detected quantity and said adequate flash light quantity; and

(c) a display circuit arranged to display on the basis of the output of said computing circuit a prediction of an adequate exposure light quantity when said detected light quantity becomes said flash light quantity required for an apposite exposure and to display a state of deviation when said degree of difference is obtained.

4,717,935
ELECTRONIC TRIM CONTROL FOR DUAL-PHOTODETECTOR EXPOSURE CONTROL SYSTEM

Robert V. Anacreon, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 9, 1985, Ser. No. 764,205
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—417 **11 Claims**



5. An electronic trim control for regulating film exposure in photographic apparatus of the type having means for defining a film plane and an optical path for transmitting light from a scene along the optical path to expose photosensitive film located in the film plane together with a system for controlling the firing of an electronic flash of the quench type, said apparatus comprising:

means for controlling the amount of scene light incident on the film plane, said scene light controlling means including a blade assembly movable along a predetermined path to define a range of apertures through which scene light must pass in reaching the film plane;

actuatable drive means for displacing said blade assembly between scene light blocking and unblocking positions to define an exposure interval;

first and second means for detecting and integrating scene light in correspondence with the scene light admitted to the film plane by said blade assembly during an exposure interval;

digital control means responsive to said first scene light detecting and integrating means for actuating said drive means to displace said blade assembly from its said unblocking position to its said blocking position so as to terminate said exposure interval and/or for firing said electronic flash;

analog control means reponsive to said second scene light detecting and integrating means to a selected light level for quenching the artificial light from said electronic flash; and

manually actuatable means for simultaneously changing the light level at which the blade assembly drive means is actuated to its said blocking position and/or said electronic flash is fired, and the light level at which the artificial light from said electronic flash is quenched.

4,717,936
DISPLAY DEVICE FOR CAMERA

Masami Shimizu, Tokyo, and Nobuyuki Suzuki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,625
Claims priority, application Japan, May 2, 1983, 58-76215; May 2, 1983, 58-76216; May 4, 1983, 58-77519; May 4, 1983, 58-77520; May 7, 1983, 58-78914; May 9, 1983, 58-79441; May 9, 1983, 58-79442; May 10, 1983, 58-80062
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—471 **12 Claims**

1. A display device for a camera, comprising:

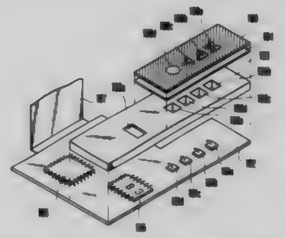
an external display arrangement for displaying an exposure information setting value;

a view finder display arrangement for displaying a computed exposure value;

an eyepiece shutter for closing a view finder;

photographic information computing means;

first driving means for displaying a signal produced from said photographing information computing means by means of said view finder display arrangement;



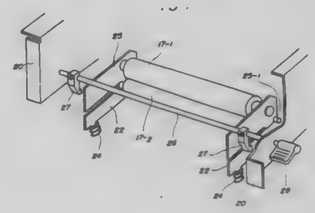
stopping means for stopping the operation of said view finder display arrangement in response to the operation of said eyepiece shutter; and

second driving means for displaying the signal of said photographic information computing means at said external display arrangement in response to the operation of said stopping means.

4,717,937
PRESSURE DEVICE OF FIXING ROLLER

Takahiro Fukunaga, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1985, Ser. No. 787,758
Claims priority, application Japan, Oct. 15, 1984, 59-217042; Oct. 15, 1984, 59-217043
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—3 FU **11 Claims**



1. A device for applying pressure to toner fixation rollers of a picture image generation unit comprising:

a locking mechanism that divides a picture image generation unit into upper and lower frames, supports said upper frame with a hinge shaft means so as to allow for free movement of said upper frame, couples said upper and lower frames together and applies pressure to upper and lower toner fixation rollers of said picture image generation unit when said upper and lower frames are coupled together,

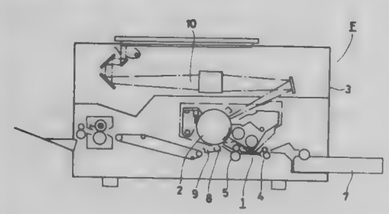
wherein said locking mechanism includes a cylindrical pressure shaft means for applying pressure on said upper toner fixation roller and a spring means for applying pressure to said lower toner fixation roller.

4,717,938

PAPER TRANSFERRING APPARATUS FOR A COPYING MACHINE

Toru Tanjo, Toyonaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1986, Ser. No. 929,995
Claims priority, application Japan, Nov. 15, 1985, 60-257260
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—3 SH 12 Claims



1. A paper transferring apparatus for a copying machine comprising a pair of upper and lower resist rollers installed in a copy machine main unit to transfer a copy paper to a photoreceptor-drum and a pair of upper and lower pre-transfer rollers located at the photoreceptor-drum side from said resist rollers, wherein

the upper roller out of the paired upper and lower resist rollers has a substantially larger roller diameter at the center part in the axial direction of the roller in comparison with that at the both end parts, and the lower roller has a uniform roller diameter throughout the roller, and

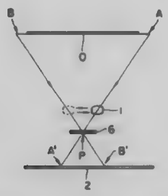
the upper roller out of the paired upper and lower pre-transfer rollers has a substantially smaller roller diameter at the center part in the axial direction of the roller in comparison with that at the both end parts, and the lower roller has a uniform roller diameter throughout the roller.

4,717,939

SLIT-SCANNING TYPE IMAGE EXPOSING SYSTEM

Nobuyuki Yanagawa, 4-15-16, Nakakaigan, Chigasaki-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 461,740, Jan. 28, 1983, abandoned. This application Aug. 7, 1985, Ser. No. 763,760
Claims priority, application Japan, Feb. 2, 1982, 57-14660; Feb. 5, 1982, 57-17043
Int. Cl.[4] G03B 27/48, 27/50
U.S. Cl. 355—50 9 Claims



1. An exposing system for slit-exposing an original image placed in a stationary frame of reference to a photosensitive member, which is placed substantially in parallel with said original image and is being moved in a predetermined direction with respect to said original image at constant speed, said system comprising:

an exposure optical unit including focusing means for focusing at least a part of said original image onto said photosensitive member, said focusing means being reciprocatingly moved between respective first and second positions, thereby moving a slit-scanned image portion formed on said photosensitive member in the direction opposite to the moving direction of said photosensitive member with respect to said stationary frame of reference during slit-exposure operation, whereby a substantially stationary point of a light path between said original image and said photosensitive member is defined in between and spaced apart from said focusing means and said photosensitive member; and

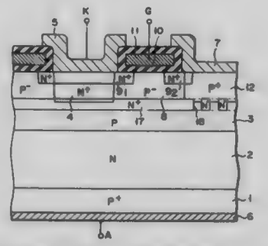
an exposure control unit disposed at said stationary point for controlling the passage of light from said original to said photosensitive member through said exposure optical unit.

4,717,940

MIS CONTROLLED GATE TURN-OFF THYRISTOR

Takashi Shinohe; Katsuhiko Takigami; Hiromichi Ohashi, all of Yokohama, and Akio Nakagawa, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1987, Ser. No. 14,608
Claims priority, application Japan, Mar. 11, 1986, 61-53103; Nov. 21, 1986, 61-277952
Int. Cl.[4] H01L 29/74
U.S. Cl. 357—38 11 Claims



1. An MIS controlled gate turn-off thyristor comprising:

a first emitter layer of a first conductivity type;

a first base layer of a second conductivity type forming a pn junction relative to the first emitter layer;

a second base layer of the first conductivity type forming a pn junction relative to the first base layer;

a low impurity concentration layer formed on the second base layer;

a second emitter layer of the second conductivity type formed such that it extends, through the low impurity concentration layer, into the second base layer;

first and second ohmic electrodes in contact with the first and second emitter layers, respectively; and

an MIS transistor formed in the surface portion of the low impurity concentration layer and having source and drain regions, one of which is connected to the second ohmic electrode and the other of which is connected through a low resistance layer to the second base layer to allow the second base layer to be short-circuited to the second emitter layer.

4,717,941

SIDEWALL MULTIPLE-GATE IGFET

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Division of Ser. No. 304,882, Sep. 23, 1981, Pat. No. 4,654,680. This application Aug. 26, 1985, Ser. No. 769,383
Claims priority, application Japan, Sep. 24, 1980, 55-132528; Sep. 24, 1980, 55-132529; Sep. 24, 1980, 55-132530
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] H01L 29/78, 29/04, 27/04
U.S. Cl. 357—23.3 5 Claims

1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

a layer member formed in a predetermined pattern on the major surface of the semiconductor substrate, the layer member including a first conductive layer formed on the major surface of the semiconductor substrate contained an impurity imparting a second conductivity type reverse from the first conductivity type, first and second insulating layer formed on first and second opposite side surfaces of the first conductive layer to form first and second opposite insulating side surfaces of the layer member, respectively and a third insulating layer formed on a top surface of the first conductive layer in contiguous to the first and second insulating layer and having a window exposing therethrough the first conductive layer;

fourth and fifth insulating layers formed on the major surface of the semiconductor substrate extending from the first and second insulating side surfaces of the layer member, respectively;

a second and third conductive layers formed on the surface of the fourth and fifth insulating layer in contact with only the fourth and fifth insulating layers, respectively and the first and second insulating side surfaces of the layer member, respectively, said second and third conductive layers having marginal edges extending upwardly from said fourth and fifth insulating layers, respectively;

a fourth conductive layer connected to the first conductive layer through the window;

first and second semiconductor regions of the second conductivity type formed in the semiconductor substrate from the side of its major surface by a implantation of an impurity imparting the second conductivity type using the second and third conductive layers and the layer member

as mask and having marginal edges extending downwardly from the major surface such that the latter marginal edges are substantially aligned with the marginal edges of the second and third conductive layers, respectively, the first and second semiconductor regions extending from its marginal edges away from the second and third conductive layers, respectively; and

a third semiconductor region of the second conductivity type formed in the seminconductor substrate from the side of its major surface by a diffusion of the impurity imparting the second conductivity type from the first conductive layer and underlying the first conductive layer in contact therewith;

wherein a first insulating gate field effect transistor is constituted using that region of the second conductive layer overlying the semiconductor substrate as it gate electrode, that region of fourth insulating layer underlying the gate electrode as it gate insulating layer, the first and third semiconductor regions as one and the other of its source and drain regions;

wherein a second insulating gate field effect transistor is constituted using that region of the third conductive layer overlying the semiconductor substrate as it gate electrode, that region of fifth insulating layer underlying the gate electrode as it gate insulating layer, the second and third semiconductor regions as one and the other of its source and drain regions; and

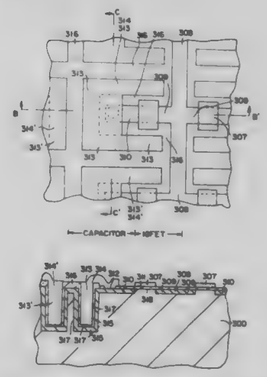
wherein the fourth conductive layer is constituted a lead connected to the either one of source and drain regions of the first and second insulating gate effect transistors through the first conductive layer.

4,717,942

DYNAMIC RAM WITH CAPACITOR GROOVE SURROUNDING SWITCHING TRANSISTOR

Kunio Nakamura, and Yukinori Kuroki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,538
Claims priority, application Japan, Jul. 29, 1983, 58-139007; Sep. 12, 1983, 58-167785
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.6 11 Claims



1. A semiconductor memory device having a memory cell comprising a single insulated gate type field effect transistor and a single capacitor, said device including a semiconductor substrate of one conductivity type and having a major surface, a groove partially surrounding an area of said major surface of said substrate and extending from said major surface of said substrate towards the interior of said substrate, said groove having a bottom, a first side wall surface extending from said area of said major surface to said bottom, and a second side wall surface opposite said first side wall surface, an source or drain region of said transistor having the opposite conductivity type and formed in said major surface of said substrate, a first surface layer of said opposite conductivity type formed in said area of said major surface of said substrate and coupled to said transistor through the unsurrounded part of said area, said first surface layer having a depth less than the depth of said source or drain region of said transistor, a second surface layer of said opposite conductivity type formed along said first side wall surface of said groove and connected to said first surface layer, a first dielectric film formed on said area of said major surface, a second dielectric film formed on said first side wall surface of said groove, and a conductor layer formed on said first dielectric film above said major surface and on said second dielectric film within said groove, whereby said single capacitor of said memory cell includes a first MOS type capacitor comprising said first surface layer, said first dielectric film and said conductor layer, and a secnd MOS type capacitor comprising said second surface layer, said second dielectric film and said conductor.

4,717,943

CHARGE STORAGE STRUCTURE FOR NONVOLATILE MEMORIES

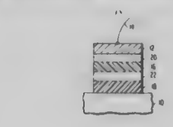
Hans P. Wolf, Zurich, Switzerland, and Donald R. Young, Ossining, N.Y., assignors to International Business Machines, New York, N.Y.

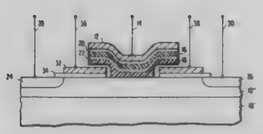
Continuation of Ser. No. 624,432, Jun. 25, 1984. This application Jul. 16, 1986, Ser. No. 884,671
Int. Cl.[4] H01L 29/76, 29/12, 29/14
U.S. Cl. 357—23.5 13 Claims

1. A charge storage structure comprising:

a silicon substrate;

a four layer sandwich on said silicon substrate layer comprising in order, a first silicon dioxide layer, a first silicon-rich silicon dioxide layer, a second silicon dioxide layer and a second silicon-rich silicon dioxide layer, said first silicon-rich silicon dioxide layer acting as an enhanced Fowler-Nordheim injector and also storing charges as a deep trap





region and the second silicon-rich silicon dioxide layer acting as an enhanced Fowler-Nordheim injector;

said silicon-rich silicon dioxide in said first and second layers comprising a multi-phase material hving a non-ohmic conductivity; and

a conductive layer disposed on said four layer sandwich.

4,717,944

SEMICONDUCTOR DEVICE HAVING A FIELD EFFECT TRANSISTOR WITH IMPROVED LINEARITY

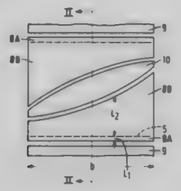
Petrus J. A. M. Van de Wiel, and Leonard J. M. Esser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 668,236, Nov. 5, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,791

Claims priority, application Netherlands, Nov. 8, 1983, 8303834

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.14 **8 Claims**



1. A semiconductor device having a semiconductor body comprising at least one field effect transistor having surface-adjoining source and drain zones and a channel region bounded by the source and drain zones, adjoining the surface and comprising a first channel zone adjoining the source zone and a second channel zone adjoining the drain zone, an insulating layer on said channel region, a first gate electrode part on said insulating layer and extending from the source zone above the first channel zone, and a separate second gate electrode part on said insulating layer, electrically isolated from said first gate electrode part and extending above the second channel zone as far as the drain zone, the first and second gate electrode parts together covering substantially the whole channel region, the ratio L_1/L_2 between the length L_1 of the first gate electrode part and the length L_2 of the second gate electrode part being variable and less than unity over at least 80% of the total channel width in a direction at right angles to the direction of the source-drain current.

4,717,945

SOLID STATE IMAGE PICK-UP DEVICE WITH A SHUTTER FUNCTION

Atsushi Yusa, Ina; Toshimasa Akagi, Hachioji; Tomoji Ishii, and Yoshinori Ohta, both of Nagano, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

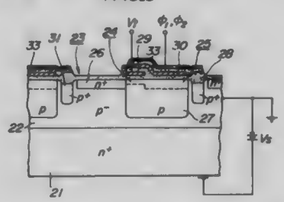
Continuation of Ser. No. 515,863, Jul. 21, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 879,507

Claims priority, application Japan, Jul. 26, 1982, 57-128877

Int. Cl.⁴ H01L *29/78, 27/14*

U.S. Cl. 357—24 **11 Claims**

FIG. 5



1. A solid state image pick-up device with a shutter function comprising:

a semiconductor substrate of a first conductivity type;

an epitaxial layer of a second conductivity type provided on a main surface of the substrate;

a plurality of surface regions of the first conductivity type formed in a surface of the epitaxial layer, each surface region, together with a portion of the epitaxial layer situated underneath the surface region, constituting a light receiving region of a charge coupled device of vertical overflow drain type;

a plurality of well regions of the second conductivity type formed in the epitaxial layer, each well region formed adjacent to respective surface regions for transferring a signal charge stored in the respective surface region;

a plurality of control gates of the second conductivity type having an impurity concentration higher than that of the well regions and formed in the epitaxial layer in the vicinity of respective surface regions, the control gates extending deeper into said epitaxial layer than the surface regions;

means for applying a variable bias voltage across said substrate and said epitaxial layer; and

means for applying a variable control voltage, having a magnitude different from said bias voltage, to said control gates to control a potential barrier between the surface regions and epitaxial layer in a static induction mode whereby during a first time period corresponding to a shutter-closed time the signal charge stored in the surface region flows into the substrate, and during a second time period corresponding to a shutter-open time the signal charge is stored in the surface region.

4,717,946

THIN LINE JUNCTION PHOTODIODE

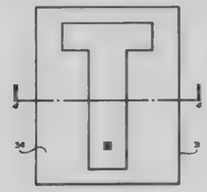
Lawrence A. Godfrey, Rowland Heights, Calif., assignor to Applied Solar Energy Corporation, City of Industry, Calif.

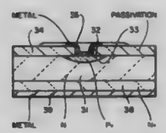
Continuation of Ser. No. 486,732, Apr. 20, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 801,495

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 357—30 **12 Claims**

1. A photodiode structure comprising a substrate of a first conductivity-type material having a light receiving surface, a region of a second conductivity-type material positioned near the light receiving surface and forming with the first conductivity-type material a thin line diode junction across which a current flows in response to light impinging upon the light receiving surface, said diode junction having a width no greater than about 50–100 microns and a length substantially





greater than the width, and electrically conductive contacts connected to the substrate and to the region of second conductivity-type material.

4,717,947

SEMICONDUCTOR DEVICE TURNED ON AND OFF BY LIGHT

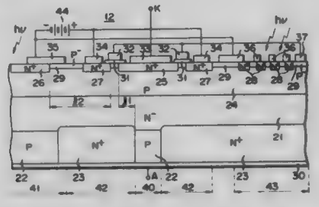
Hideo Matsuda, Yokohama; Yoshiaki Tsunoda, Kawasaki; Takashi Fujiwara, Yokohama, and Yasunori Usui, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1984, Ser. No. 675,150

Claims priority, application Japan, Nov. 28, 1983, 58-223578

Int. Cl.⁴ H01L *29/74, 27/02, 29/78, 27/14*

U.S. Cl. 357—38 **11 Claims**



1. A semiconductor device which is turned on and off by first and second optical signals, respectively, comprising:

a main GTO thyristor section which is turned on or off by a gate signal supplied to a gate terminal in accordance with the direction in which a current corresponding to the gate signal flows;

an auxiliary GTO thyristor section, connected between the anode and gate of said main GTO thyristor section, for turning on said main GTO thyristor section in response to the first optical signal; and

a MOS transistor section, connected between the cathode and gate of said main GTO thyristor, for turning off said main GTO thyristor section in response to the second optical signal.

4,717,948

SEMICONDUCTOR DEVICE

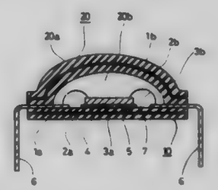
Kunito Sakai; Akinobu Tanaki, and Takashi Takahama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 3, 1984, Ser. No. 576,882

Claims priority, application Japan, Mar. 18, 1983, 58-46153

Int. Cl.⁴ H01L *23/02, 23/12*

U.S. Cl. 357—74 **5 Claims**



1. A semiconductor device comprising:

first packing means comprising a first structure having at least a first metallic layer and at least a first insulating layer, at least one end surface of said first structure being said first insulating layer, said first insulating layer being a glass fiber material and thermosetting epoxy resin, said first metallic layer being aluminum,

second packing means comprising a second structure having at least a second metallic layer of aluminum and at least a second insulating layer, at least one end surface of said second structure being said second insulating layer, said second insulating layer being a glass fiber material and thermosetting epoxy resin, said first insulating layer and said second insulating layer positioned respectively in said end surfaces of said first and second structures being drawn out and opposed to each other and the respective peripheral portions thereof being connected with each other in an airtight manner, so that said first packing means and said second packing means are connected in a state where an airtight hollow portion is formed therebetween,

an electronic component comprising a semiconductor element provided inside said hollow portion, and

at least one lead means interposed in the boundary of connection between said first insulating layer and said second insulating layer positioned respectively in said end surfaces of said first and second structures, one end of said lead means extending into said hollow portion so as to be electrically connected to said electronic component and the other end thereof extending from said boundary of connection to the exterior.

4,717,949

AUTOSTEREOSCOPIC DISPLAY WITH ILLUMINATING LINES AND LIGHT VALVE

Jesse B. Eichenlaub, Rochester, N.Y., assignor to Dimension Technologies, Inc., Rochester, N.Y.

Filed Mar. 7, 1986, Ser. No. 837,279

Int. Cl.⁴ H04N *15/00, 13/04*; G04G *3/02*

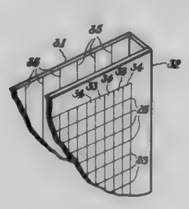
U.S. Cl. 358—3 **11 Claims**

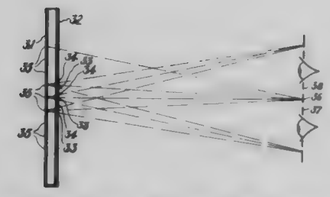
1. In an autostereoscopic display unit the improvement which comprises

(a) a flat surface screen displaying a multiplicity of thin parallel vertical light emitting lines across its surface, said screen remaining dark between said emitting lines, and

(b) a light valve parallel to and in front of said screen, said light valve having individual picture elements arranged in

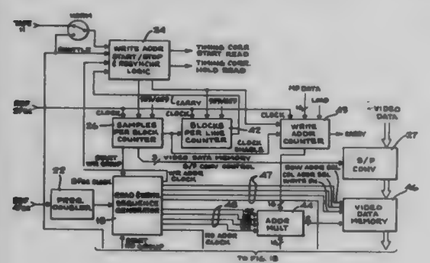
a grid pattern across its surface, there being at least one pair of vertical columns of individual picture elements for

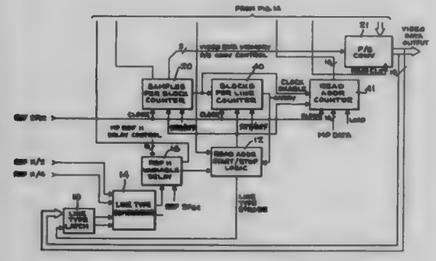




each light emitting line, said light emitting line being located behind and between said pair.

4,717,950
SIGNAL PHASE CONTROL BY MEMORY CYCLE READ/WRITE GROUPS UNLOCK
Jan S. Wesolowski, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Oct. 17, 1985, Ser. No. 788,354
Int. Cl.[4] H04N *9/44, 9/89*
U.S. Cl. 358—18 **22 Claims**





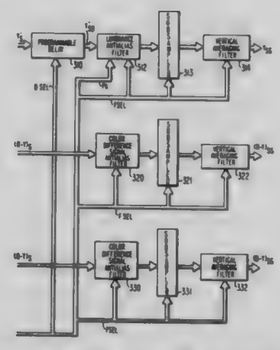
11. A method for changing the phase of a video data signal, wherein the video data are written into and read from a data memory during a memory read/write cycle, comprising:

providing line type information indicative of successive line types of the video data siganl;

comparing the line type information to reference line type information to generate a shift enable signal; and

shifting the timing of reading the video data from said data memory by a fraction of the memory read/write cycle determined by said shift enable signal, and without shifting the timing of writing the video data into said memory, to change the phase of the video data signal.

4,717,951
ADAPTIVE DIGITAL FILTER
Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.
Filed Oct. 31, 1985, Ser. No. 793,147
Int. Cl.[4] H04N *5/262*
U.S. Cl. 358—22 **6 Claims**



1. An adaptive filtering system for attenuating components of a sampled data input signal having frequencies within a selected band of frequencies relative to other components of said input signal having frequencies not within said selected band of frequencies, said adaptive filtering system comprising:

a source of said sampled data input signal;

a variable delay element for delaying the signals applied to the input terminal of said filter by an amount of time which may be represented by the equation $T_D=K_2\tau+PK_1\tau$, where τ is a predetermined time period, K_2 is a predetermined integer value greater than or equal to zero, K_1 is a predetermined integer value greater than zero and P is a digital signal the instantaneous value of which is greater than or equal to zero, said variable delay element including:

a first delay element for delaying samples of said sampled input signal by a predetermined amount of time, $K_1\tau$;

first signal switching means coupled to the source of sampled data input signal and to said first delay element and being controlled by a first control signal to selectively provide delayed samples from said first delay element or undelayed samples of said sampled data input signal;

a second delay element for delaying the samples provided by said first signal switching means by an amount of time, $NK_1\tau$, where N is a positive integer;

second signal switching means coupled to said first signal switching means and to said second delay element and being controlled by a second control signal to selectively provide the samples from said second delay element or the samples provided by said first signal switching means;

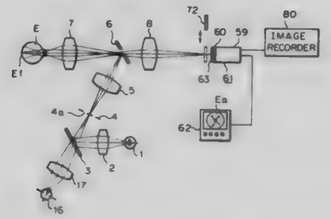
means for developing said first control signal from a first bit of the digital signal P; and

means for developing said second control signal from a second bit of the digital signal P, said second bit being different from said first bit;

arithmetic circuitry for combining the signals provided by said variable delay element with the undelayed signals provided by said source to produce filtered output signals; and

means coupled to said variable delay element for changing the value of the signal P to define said selected band of frequencies.

4,717,952
MEDICAL TELEVISION SYSTEM
Yoshimi Kobayakawa; Kazunobu Kobayashi, both of Yokohama; Shinya Tanaka, Tokyo; Haruhisa Madate, Kawasaki, and Takeshi Kitamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 6, 1986, Ser. No. 871,291
Claims priority, application Japan, Jun. 14, 1985, 60-129401; Oct. 18, 1985, 60-232801; Oct. 18, 1985, 60-232803
Int. Cl.[4] H04N *7/18, 5/33*
U.S. Cl. 358—113 **9 Claims**



7. An ophthalmologic system including a medical television apparatus, comprising:

an illumination optical system for illuminating a fundus of an eye to be examined;

a focusing optical system for focusing a fundus image on a predetermined plane;

a television camera including a filter for separating visible light into three wavelength regions and transmitting near-infrared rays, and including an image pickup element located on the predetermined plane and having sensitivity to both visible light and near-infrared rays; and

selecting means for selectively supplying the visible light or the near-infrared rays, which are reflected by the fundus, to said television camera.

4,717,953
BRIGHTNESS CONTROL CIRCUIT FOR A TELEVISION RECEIVER
Albert Y. Chang, Taipei, Taiwan, and Yoji Miyasako, Yokohama, Japan, assignors to RCA Corporation, Princeton, N.J.
Filed Dec. 23, 1986, Ser. No. 945,727
Claims priority, application United Kingdom, May 8, 1986, 8611235
Int. Cl.[4] H04N *5/57, 9/72, 9/77*
U.S. Cl. 358—34 **8 Claims**

1. In a system for processing and displaying information contained in a color image representative video signal, apparatus comprising:

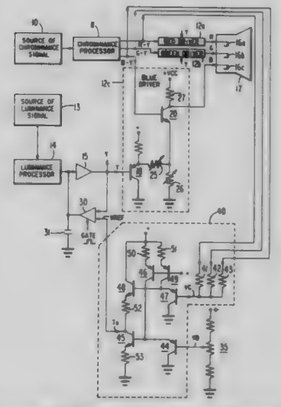
a video signal channel;

an adjustable control for providing a first signal with a magnitude determinative of the brightness of a displayed image;

means for providing a second signal with a magnitude related to the magnitude of the DC content of a color information component of said video signal;

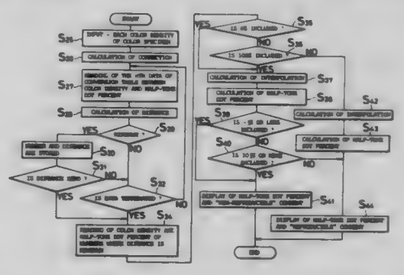
means for combining said first and second signals to produce a reference signal; and

control means responsive to said video signal and to said reference signal for controlling the image brightness rep-



resentative DC level of said video signal in accordance with the magnitude of said reference signal.

4,717,954
METHOD AND APPARATUS USING A CONVERSION TABLE BASED ON PRE-PRINTED COLOR CHARTS FOR DETERMINING HALF/TONE DOT PERCENTS REQUIRED TO REPRODUCE THE COLOR OF A COLOR SPECIMEN
Toshiji Fujita, Niiza; Kazuo Yarita; Toshihiro Hashimoto, both of Tokyo, and Masaki Nojima, Urawa, all of Japan, assignors to Toppan Printing Co., Ltd., Japan
Filed May 8, 1984, Ser. No. 608,230
Claims priority, application Japan, May 10, 1983, 58-81561
Int. Cl.[4] G03F *3/08;* **B41F** *00/00;* **B41M** *1/14;* **G01J** *3/52*
U.S. Cl. 358—80 **34 Claims**



1. A method of obtaining half-tone dot percents of color separations necessary for reproducing a color designated by a color specimen, comprising the steps of:

providing a plurality of color charts on which colors are printed using predetermined combinations of half-tone dot percents;

optically measuring said plurality of color charts to obtain color chart color information for each of said colors printed on said color charts;

inputting into a memory means for each of said colors said obtained color chart color information together with the corresponding predetermined combination of half-tone dot percent used to print said each of said colors to thereby create in said memory means a conversion table of color chart color information and a corresponding combi-

nation of half-tone dot percents for each of said colors printed on said color charts;

optically measuring a color specimen designating a color to be reproduced to obtain color information for said color to be reproduced;

successively comparing said color information obtained from said color specimen with said color chart color information in said conversion table and selecting the color chart color information from said conversion table which most closely corresponds to said color information obtained from said color specimen;

selecting the combination of half-tone dot percents corresponding to said selected color chart color information from said conversion table; and

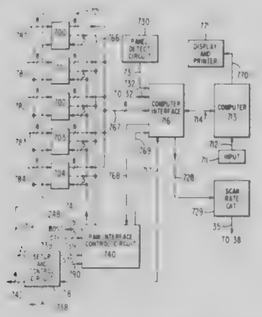
using the selected combination of half-tone dot percents for reproducing the color designated by said color specimen.

4,717,955

RAM INTERFACE CONTROL CIRCUIT

Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 31, 1987, Ser. No. 33,124
Int. Cl.⁴ N04N *7/18*
U.S. Cl. 358—107 **20 Claims**



1. A RAM (Random Access Memory) interface control circuit used for measuring spaces in a periodic matrix by controlling a RAM memory circuit coupled between a photodetector array interface circuit and a computer comprising:

first logic means for producing a data strobe (BDST) signal for transmission to said photodetector array interface circuit, said first logic means having the output thereof connected to a first output terminal and the input thereof connected to a first input terminal for receiving a CTF signal from said photodetector array interface circuit;

second logic means having the input thereof connected to said first output terminal, the output of said second logic means being connected to one input of a first OR gate for producing a DEC signal for transmission to said RAM memory circuit;

a NOR gate having three inputs connected, respectively, to the output of said second logic means, said first input terminal, and a second input terminal for receiving a COUT signal from said RAM memory circuit;

a first flip-flop having the clock input thereof connected to the output of said NOR gate, the Q output thereof coupled to said second logic means, and the $\overline{Q}$ output thereof coupled to said first logic means;

a second flip-flop having the D input thereof coupled to said second input terminal, the Q output thereof producing a CMPUT signal for transmission to said RAM memory circuit;

a first AND gate having the output thereof connected to the other input of said first OR gate, said first AND gate having three inputs, the first input thereof being connected to the $\overline{Q}$ output of said second flip-flop;

a second AND gate having the output thereof coupled to the second and third inputs of said first AND gate, said second AND gate having three inputs, two inputs of said second AND gate being coupled to a third input terminal for receiving a DST signal from said computer;

third logic means having the input thereof connected to the output of said second AND gate, the output of said third logic means being coupled to the clock input of said second flip-flop;

fourth logic means having the input thereof connected to the $\overline{Q}$ output of said first flip-flop, the output of said fourth logic means being coupled to both the first input of said second AND gate and the reset input of said second flip-flop; and

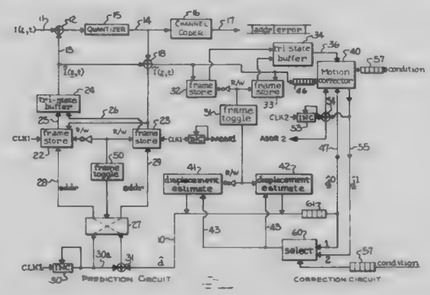
a second OR gate having one input thereof coupled to said third input terminal for producing a FLAG signal for transmission to said computer, the other input of said second OR gate being coupled to said third logic means.

4,717,956

IMAGE-SEQUENCE COMPRESSION USING A MOTION-COMPENSATION TECHNIQUE

Robert J. Moorhead, Mahopac, N.Y., and Sarah A. Rajala, Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Aug. 20, 1985, Ser. No. 767,471
Int. Cl.⁴ H04N *7/12, 7/18*
U.S. Cl. 358—135 **9 Claims**



1. A method for predicting the displacement of an object point in a video scene occurring between the present frame and the following frame, said method comprising

calculating an initial estimate of the displacement of the object point and recursively updating said initial displacement estimate, and wherein said step of calculating an initial displacement estimate comprises projecting the displacement forward along the trajectory of motion of the object point from the present frame to the following frame.

4,717,957

VIDEO COMPRESSION METHOD

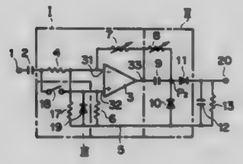
Harry Santamäki, Espoo; Juha Leppänen, Helsinki; Pentti Haikonen, and Ilkka Koribonen, both of Espoo, all of Finland, assignors to Valtion teknillinen tutkimuskeskus, Finland

PCT No. PCT/FI85/00097, § 371 Date Aug. 13, 1986, § 102(e) Date Aug. 13, 1986, PCT Pub. No. WO86/03922, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 5, 1985, Ser. No. 899,291
Claims priority, application Finland, Dec. 14, 1984, 844970
Int. Cl.⁴ H04N *7/13*
U.S. Cl. 358—136 **14 Claims**

1. A device for the compressive transmission of a video signal having plural pictures with picture areas that change with respect to a previous picture, and picture areas that form

a reference image that is the same for more than one picture, comprising:

a transmitter for receiving the video signal, said transmitter having a first picture memory for storing each picture in sequence, a change detector connected to said first picture memory for detecting any changes in the picture with respect to a previous picture, a second picture memory for storing a previous picture to that stored in said first picture memory, a reference circuit connected to said change detector for receiving signals corresponding to changes in the picture areas, a reference memory for storing the reference image, said reference memory being connected to said reference circuit and being connectable to said second picture memory for applying said reference image to be stored in said second picture memory, a replenishment circuit connected between an output of said reference circuit and an input of said reference memory for applying a replenished image as a new reference image to said reference memory, and a switch having two inputs and one output, one of said inputs being connected to said reference memory and one of said inputs being connected to the output of said reference circuit, the output said switch being connected to said second picture memory, said reference circuit being connected to said switch for switching said output of said switch between its two inputs based on whether said change detector has detected



a change in a picture area which is different from or which corresponds to picture areas of said reference image, said reference circuit including means for producing a code word when said change detector detects changes that correspond to picture areas of said reference image, said code word corresponding to locations of said picture areas of said reference image, said reference circuit transmitting said code word when the changes correspond to picture areas of said reference image and transmitting the detected changes when the changes do not correspond to picture areas of said reference image;

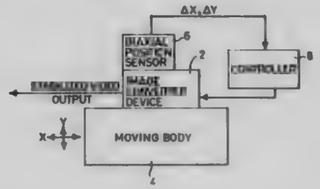
and a receiver for receiving the changes and the code words from said reference circuit, said receiver including a code word identification circuit for identifying the code word, a further switch connected to further identification circuit and having a first input connected to said reference memory and a second input connected to receive the detected changes transmitted by said reference circuit, said further switch having a output, and a display memory connected to said output for storing signals to be used in reproducing the pictures transmitting by said transmitter, said further switch being switched to said further reference memory by said identification circuit when said identification circuit identifies a code word for applying picture areas of said reference image to said display memory, and being switched to receive said detected changes when said identification circuit does not detect a code word.

4,717,958

POSITION-STABILIZED IMAGE CONVERTER SYSTEM

Eliyahu Gal, Ramat-Gan, and Naftaly Fontyn, Necher, both of Israel, assignors to Elbit Computers Ltd., Haifa, Israel

Filed May 27, 1986, Ser. No. 866,752
Claims priority, application Israel, Jul. 5, 1985, 75728
Int. Cl.⁴ H04N *5/21*
U.S. Cl. 358—222 **19 Claims**



1. An image converter system comprising:

an image sensor mountable on a moving body and including an array of light sensing elements each producing an electrical signal corresponding to the light intensity sensed thereby, and means for producing an electrical output corresponding to the light image sensed by said image sensor;

a change-in-position sensor physically coupled to said image sensor and mountable therewith on the moving body so as to directly sense movements in space of said moving body and thereby of said image sensor, and to produce output signals corresponding to the changes in position in space of said image sensor;

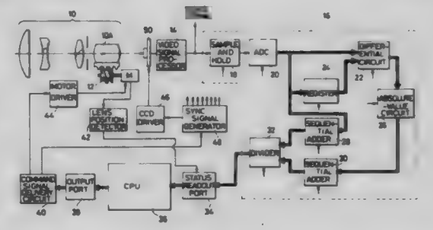
and control means for shifting the electrical signals produced by said image sensing elements according to the changes in position of said image sensor as sensed by said change-in-position sensor, to compensate for said changes in position and thereby to position-stabilize the electrical output of said image sensor.

4,717,959

AUTOMATIC FOCUSING DEVICE FOR VIDEO CAMERA OR THE LIKE

Koki Isago, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,169
Claims priority, application Japan, May 16, 1985, 60-104,695
Int. Cl.⁴ H04N *5/38*
U.S. Cl. 358—227 **1 Claim**



1. An automatic focusing device for use with a solid-state self-scanned image sensor having a rectangular light detecting area for scanning an object image and converting the same to a video signal, said image sensor being associated with an image-forming lens system including a focusing lens group, said automatic focusing device comprising:

focus detecting means for producing a focus signal from the video signal;

driver means for moving the focusing lens group along an optical axis thereof in increments each equal to a distance Wx; and

control means for effecting a focusing operation by moving the focusing lens group with said driver means, producing focus signals at three adjacent positions that are Wx spaced from adjacent ones, determining the distance for which, and the direction in which, to move the focusing lens group based on the magnitude relationship between these three focus signals, and effecting a process required to displace the focusing lens group to a position where a maximum focus signal is generated, and for effecting a focusing-process resuming operation by generating a focus signal even after the focusing lens group has been moved to the position of the maximum focus signal, and resuming said focusing operation when the focus signal varies beyond a certain value;

said focus detecting means comprising a sample and hold circuit for sampling and holding the focus signal, an A/D converter for converting the focus signal to a digital signal, a register circuit for delaying said digital signal, a differential circuit for determining the difference between said digital signal and said delayed digital signal, an absolute-value circuit for producing the absolute value of said difference, a first sequential adder for adding sequentially applied values of said digital signal, a second sequential adder for adding sequentially applied values of absolute value, and a divider for dividing the sum produced from said first sequential adder by the sum produced from said second sequential adder;

said driver means comprising a mechanism for moving said focusing lens group, a motor for driving said mechanism, and a driver circuit for driving said motor; and

said control means comprising a lens postion detector for detecting the position of the focusing lens group, a status readout port for reading the position of the focusing lens group from said lens position detector and an output signal from said divider, an image sensor driver for driving said image sensor, a synchronizing signal generator for applying synchronizing signals to said driver and said focusing detecting means, a CPU responsive to an output signal from said status readout port for generating a command signal, an output port for issuing the command signal from said CPU, and a command signal delivery circuit for delivering the command signal to said driver circuit and said synchronizing signal generator.

4,717,960

AUTOMATIC DIAPHRAGM CONTROL DEVICE OF VARIABLE PHOTOMETRY TYPE USED IN OBJECTIVE FOR TELEVISION CAMERA

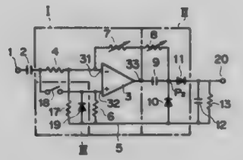
Tohru Shikano, and Terumi Ogasawara, both of Tokyo, Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1986, Ser. No. 906,546

Claims priority, application Japan, Sep. 12, 1985, 60-202172

Int. Cl.⁴ H04N *5/238*

U.S. Cl. 358—228 **5 Claims**



1. An automatic diaphragm control device for objective of television camera utilizing a video signal coming from the television camera to effect the diaphragm control, said automatic diaphragm control device comprising:

first means consisting of sensitivity adjusting means principally to adjust a video output signal in a low contrast condition;

second means consisting of variable photometric adjusting means principally to adjust a video output signal in a high contrast condition;

third means for photometric adjustment of a video output signal in a drastic peak mode independently of the photometric adjustment by said second means; and

means permitting said third means to be selectively used as desired by switching.

4,717,961

ELECTRONIC STILL CAMERA PREVENTING PREMATURE REMOVAL OF RECORDING DISK

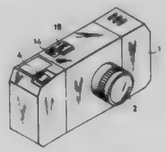
Izumi Miyake; Kiyotaka Kaneko, and Kazuya Oda, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

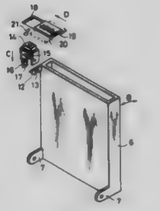
Filed Aug. 1, 1986, Ser. No. 893,063

Claims priority, application Japan, Aug. 2, 1985, 60-169681; Aug. 2, 1985, 60-169682

Int. Cl.⁴ H04N *5/225, 5/76*

U.S. Cl. 358—229 **8 Claims**





1. An electronic camera, comprising:

a camera body;

a lens mounted on said camera body;

a receptacle for selective holding of a recording medium;

means for disengaging said receptacle from said camera body to allow removal of said recording medium;

means for electrically recording an image external of said camera received through said lens onto said recording medium; and

means for inhibiting said disengaging means during operation of said recording means.

4,717,962

METHOD FOR COMPRESSING AND RECONSTRUCTING A DATA REPRESENTATION OF A PICTURE

John F. Moore, Lake Bluff, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 17, 1986, Ser. No. 942,691

Int. Cl.⁴ H04N *1/415*

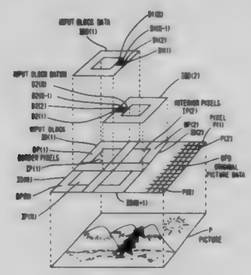
U.S. Cl. 358—260 **6 Claims**

1. A method for compressing and reconstructing a data representation of original picture data of a picture comprising a plurality of pixels, with each of said pixels corresponding to a location in said picture, and with each of said pixels having a value corresponding to the brightness of said picture at said corresponding location, comprising the steps of:

(a) partitioning said original picture data into a plurality of incompletely overlapping input blocks, with each of said input blocks comprising input block data representatives of border pixels shared with adjacent input blocks and unshared interior pixels surrounded by said border pixels;

(b) weighting, for said each input block, said input block data representative of said border pixels while leaving said input block data representative of said unshared interior pixels unweighted to obtain weighted input block data for said each input block;

(c) transforming, for said each input block, said weighted input block data representative of both said border pixels and said interior pixels to obtain transformed weighted input block data, and suppressing data from said transformed weighted input block data to obtain compressed transformed weighted input block data for each input block;



(d) decoding said compressed transformed weighted input block data to obtain output block data corresponding to the border pixels and the unshared interior pixels of corresponding ones of said input blocks;

(e) assembling said output block data according to the location of the corresponding ones of said input blocks in said original picture data while overlapping said output block data to the extent such data corresponds to the border pixels of said corresponding ones of said input blocks to obtain overlapping output block data; and

(f) summing all said overlapping output block data corresponding to a particular one of said border pixels to obtain reconstructed picture data representative of that particular pixel while leaving said output block data corresponding to said unshared interior pixels unchanged to obtain reconstructed picture data representative of said unshared interior pixels.

4,717,963

IMAGE INFORMATION READ APPARATUS

Shigeru Kotsumi, Yono, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 804,240, Dec. 3, 1985, abandoned, which is a continuation of Ser. No. 590,952, Mar. 19, 1984, abandoned. This application Jun. 4, 1986, Ser. No. 873,066

Claims priority, application Japan, Mar. 25, 1983, 58-48997; Dec. 7, 1983, 58-229091

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—282 **22 Claims**

1. An image information read apparatus comprising:

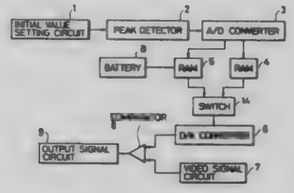
illumination means for illuminating an original document;

reflection means arranged in a path of said original document for reflecting a light from said illumination means;

photoelectric conversion means for converting an optical image information reflected from said original document or an optical intensity distribution data reflected from said reflection means to an electrical signal;

a plurality of memory means for storing the optical intensity distribution data at a position of said reflection means;

selection means for reading the optical intensity distribution data from one of said plurality of memory means depending on the presence or absence of said original document; and



comparison means for comparing the optical intensity distribution data from said selection means with the image information from said photoelectric conversion means.

4,717,964

IMAGE PROCESSING APPARATUS

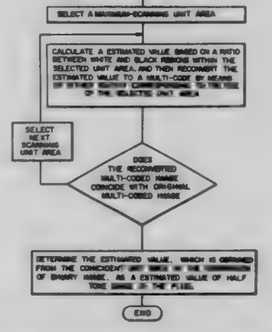
Yoshinori Abe; Masahiko Matsunawa, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,630

Claims priority, application Japan, Nov. 15, 1985, 60-257491; Nov. 15, 1985, 60-257496; Nov. 15, 1985, 60-257497

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—283 **12 Claims**



9. An image processing apparatus comprising;

halftone image estimation means for obtaining an estimation value based on a ratio between white regions and black regions per a plurality of unit areas, in which the plural unit areas are set on a binary image having white regions and black regions per a pixel of halftone image to be estimated,

reconverting means for converting the estimation value into a binary image by using a dither matrix corresponding to the size of the unit area, and

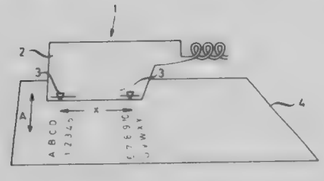
selection means for comparing the binary image within the unit area with the reconverted binary image and determining the estimation value of the unit area, in which the both binary images are coincident with each other, as the halftone image.

VOL 1086 ISS 1 JA 5 1988 UMI

4,717,965
PORTABLE IMAGE FORMING DEVICE

Harumitsu Mashiko, Yokohama; Yoshihiro Sakai, Tokyo; Syoji Hayashi, Kawasaki; Yoshihiro Ogata, Yokohama; Tsuyoshi Yoshimura, Tokyo; Hisashi Kuroda, Tokyo, and Shigeru Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 818,197
Claims priority, application Japan, Jan. 17, 1985, 60-004892; Jun. 20, 1985, 60-132945; Jun. 20, 1985, 60-132946; Jun. 20, 1985, 60-132947
Int. Cl.[4] H04N *1/028*
U.S. Cl. 358—285 20 Claims

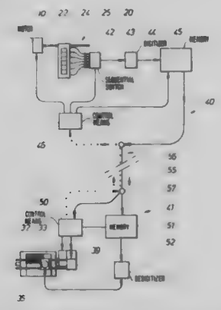


1. A portable image forming device which is moved on an original in a direction perpendicular to a primary scan direction to perform a subscan, and divides reflection light beams from the original into pickup picture elements in the primary scan direction through an image forming optical system to form an image of the picture elements on a pickup device for reading, and which comprises:
a pickup device having a pickup range which is variable in the primary scan direction; and
means for selectively setting said pickup range.

4,717,966
DEVICE FOR LONG-DISTANCE TRANSMISSION OF IMAGES

Folke Bergquist, Hindås, Sweden, assignor to Victor Hasselblad AB, Göteborg, Sweden

Filed Sep. 10, 1986, Ser. No. 905,348
Claims priority, application Sweden, Sep. 10, 1985, 8504181
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—286 5 Claims



1. A device for long-distance transmission of images including
a transmitter;
a receiver;
a bidirectional communications line connecting the transmitter and the receiver;
scanning means, included in the transmitter, including an array of photosensitive elements;
scan drive means, included in the transmitter, for moving the array of photosensitive elements linearly and immediately adjacent to the surface of a picture for scanning the picture as a sequence of scan lines, each scan line consisting of a series of adjacent picture points, whereupon each photosensitive element produces a first analog electric signal correspanding to the incident light from the picture point to which it is immediately adjacent;
analog-to-digital conversion means, included in the transmitter, converting each first analog electric signal to a corresponding digital data signal;
a sequential switch, provided to sequentially place the photosensitive elements in electrical contact with the analog-to-digital conversion means;
transmission means for transmitting data blocks via the communications line;
receiving means for receiving the data blocks;
a supporting surface provided to support a printing surface on which a fascimile of the picture is to be produced;
digital-to-analog conversion means, included in the receiver, converting each data block to a corresponding second analog electric signal; picture reproduction means, included in the receiver, including a printing element for printing patterns on the printing surface corresponding to the second analog electric signals;
print drive means for moving the printing element linearly over the printing surface for printing a reproduction of the picture as a sequence of print lines, each print line consisting of a series of adjacent printing points, said print lines corresponding to said scan lines and said printing points corresponding to said picture points;
characterized by comprising:
first memory means in the transmitter, provided for temporarily storing said data blocks,
first control means in the transmitter, connected to the scanning means, to the sequential switch, to the first memory means and to the communications line and provided to group the digital data signals into said data blocks, each data block preferably corresponding to one scan line, to transfer said data blocks from the first memory means to the transmission means for transmission via the communications line, to sense a retransmission signal and, upon sensing said retransmission signal, to direct the first memory means and the transmission means to retransmit to the receiver the data block, temporarily stored in the first memory means, which was most recently transmitted to the receiver;
second memory means, included in the receiver, provided for temporarily storing the received data blocks;
second control means, included in the receiver, connected to the picture reproduction means, to the second memory means, to the digital-to-analog conversion means and to the communications line and provided to detect errors in the received data blocks and, upon the detection of an error, to generate said retransmission signal and, if no error is detected, to transfer the received data blocks stored in the second memory means to the picture reproduction means via said digital-to-analog conversion means.

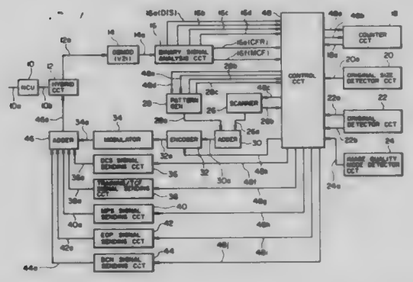
4,717,967
IMAGE RECORDING APPARATUS WITH RECORDING MEDIUM QUANITY DETECTING MEANS

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 702,681, Feb. 9, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 9,071
Claims priority, application Japan, Feb. 24, 1984, 59-32599; Mar. 2, 1984, 59-38643; Apr. 26, 1984, 59-83021
Int. Cl.[4] H04N *1/21, 1/23, 1/40*; G06F *15/40*
U.S. Cl. 358—296 13 Claims

1. An image recording apparatus comprising:
first recording means for recording an image on a recording medium in accordance with input image information;

detecting means for detecting that a quantity of remaining recording medium has reached a predetermined quantity;
control means responsive to an output from said detecting means for interrupting a recording operation of said first recording means according to the input image information; and

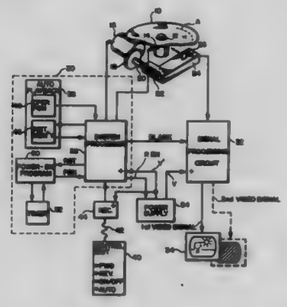


second recording means for recording specific information on a recording medium, the specific information indicating that the recording operation of said first recording means according to the input image information is interrupted.

4,717,968
VIDEO PLAYER WITH POWER-DOWN CAPABILITY

Richard C. Palston, Webster; Jay D. Marchetti, Rochester; John J. Acello, East Rochester; John J. Bradley, Rochester, and Richard H. Bolton, East Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,239
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—310 15 Claims

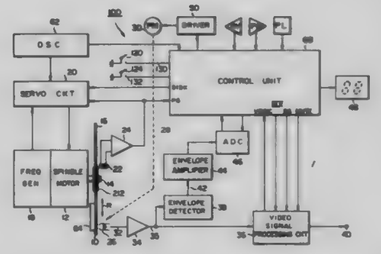


3. A video player for producing still pictures on a video display from signals recorded on circular tracks on a magnetic medium, said player comprising:
a playback head for sensing the signals recorded on the medium;
means for positioning said playback head in contact with a selected circular track;
a control unit for entering user selections to the player regarding selected tracks;
means for supporting the medium for rotation relative to said playback head so that said head repeatedly senses a selected track and accordingly generates a playback signal representative of a selected still picture;
means for generating a power-down signal after a predetermined interval has elapsed without any selections from said control unit; and
means responsive to said power-down signal for arresting said rotation of the medium and discontinuing generation of said playback signal.

4,717,969
APPARATUS FOR DETECTING SERVO-LOCK STATE IN ROTATION OF ROTARY RECORDING MEDIUM

Izumi Miyake, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1985, Ser. No. 738,309
Claims priority, application Japan, May 28, 1984, 59-106536
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—322 14 Claims

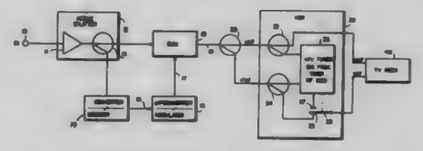


1. A servo lock detecting apparatus for indicating that a rotary recording medium is driven at a constant rotational velocity comprising:
servo control driving means for driving a rotary recording medium at a predetermined rotational speed;
signal produing means for producing timing signals in synchronism with the rotation of said rotary recording medium;
oscillation means for developing a periodic clock period signal;
signal processing means for processing information collected from said rotary recording medium; and
control means, responsive to said signal producing means and said oscillator means, for controlling said signal processing means by counting the number of said clock period signals between sucessive said timing signals;
said control means, when said number of cloak pulse signals is within a predetermined range greater than one for a predetermined number of times, developing a servo lock signal indicating that the servo lock condition is established in said driving means and that said recording medium rotates at said predetermined rotational speed.

4,717,970
VIDEO SYSTEM WITH PROGRAMMABLE VCR

Michael E. Long, Western Springs, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 622,929, Jun. 21, 1984, abandoned. This application Jan. 28, 1987, Ser. No. 9,650
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 10 Claims



1. A video system comprising:
a VCR having television signal input terminals;

decoder means for receiving one or more television signals and for supplying a single television signal output at base band frequency;

modulation means for modulating said single television signal on a carrier corresponding to an unused UHF channel frequency;

summation means for receiving multiple inputs of different television signals including said unused UHF channel frequency and for supplying all of the received signals to a common output terminal;

means for supplying a plurality of television signals to said signal translation means and to said summation means; and

means coupling said common output terminal of said summation means to said VCR.

4,717,971

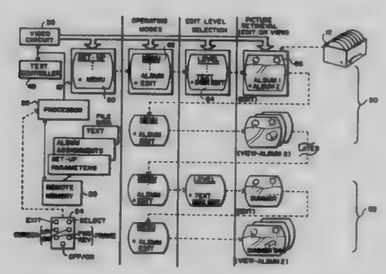
PARTITIONED EDITING METHOD FOR A COLLECTION OF VIDEO STILL PICTURES

Edward G. Sawyer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 644,166, Aug. 24, 1984, abandoned. This application Apr. 9, 1987, Ser. No. 45,262

Int. Cl.[4] G11B *27/02*; H04N *5/781*

U.S. Cl. 358—342 **5 Claims**



1. An editing method divided into separate levels for organizing a predetermined sequence of prerecorded video pictures into an electronic picture file having a modified display sequence, the video pictures being prerecorded on a plurality of video disks arranged in a predetermined order in a removable magazine disposed in a video player, said picture organization being (1) distinct from the pictures in a memory appended to the magazine, and (2) dependent upon different types of picture-related data that identify such characteristics as subject-matter category, picture display order and picture description, said editing method comprising the steps of:

displaying a plurality of mutually independent editing levels, each level devoted to specifying at least one particular type of picture-related data;

selecting a first editing level;

transferring a disk from the magazine into the player;

displaying a prerecorded picture from the disk;

generating picture-related data defining the corresponding characteristic for the displayed picture;

storing said picture-related data in the memory appended to the magazine; and

replacing the disk in the magazine according to the predetermined order whereby the picture on the disk is prepared for display according to the organization dictated by said picture-related data stored in the memory.

4,717,972

PROCESS FOR STORING DIGITALLY CODED VIDEO SYNCHRONOUS SOUND SIGNALS THROUGH TIME COMPRESSION BY DUPLICATING SOUND DATA DURING RECORDATION

Jürgen Heitmann, Aichach-Hilfalein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

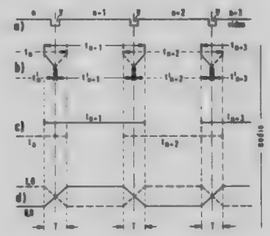
PCT No. PCT/DE85/00212, § 371 Date Jan. 17, 1986, § 102(e) Date Jan. 17, 1986, PCT Pub. No. WO86/00772, PCT Pub. Date Jan. 30, 1986

PCT Filed Jun. 25, 1985, Ser. No. 840,572

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424816

Int. Cl.[4] G11B *27/02*; H04N *5/78*

U.S. Cl. 360—8 **6 Claims**



1. A process for storing a plurality of digitally coded sound signals that are synchronous with video signals, the process comprising steps of:

providing a plurality of successive sound data signal segments associated with a successive plurality of video data signal segments, each of the sound data signal segments being digitally coded with sound data synchronously associated with a time cycle of a respective one of the video data signal segments, the video data signal segments constituting a plurality of immediately preceding and succeeding video data segments relative to each other, the sound data associated with the video data segments constituting a first and second half of the sound data;

time compressing the sound data; and

editing into a time period corresponding to the time cycle of the respective one of the video data signal segments, a reproduction of a second half of the time compressed sound data associated with the immediately preceding video data signal segment and a reproduction of a first half of the time compressed sound data associated with the immediately succeeding video data signal segment in addition to the time compressed sound data synchronously associated with the respective one video data signal segment so as to store a 100% redundancy of the sound data during the time period.

4,717,973

RECORDED INFORMATION VERIFICATION SYSTEM

Ian C. McWhirter, Hornsby, Australia, assignor to McWhirter Holdings PTY. Limited, Hornsby, Australia

PCT No. PCT/AU85/00130, § 371 Date Mar. 11, 1986, § 102(e) Date Mar. 11, 1986, PCT Pub. No. WO86/00745, PCT Pub. Date Jan. 30, 1986

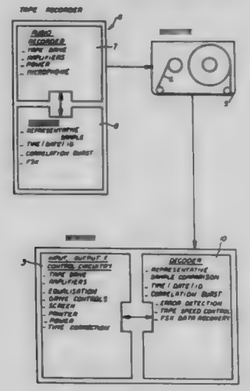
PCT Filed Jun. 14, 1985, Ser. No. 847,904

Claims priority, application Australia, Jul. 16, 1984, PG6017

Int. Cl.[4] G11B *27/36, 5/02, 15/04*

U.S. Cl. 360—31 **16 Claims**

1. A system for recording on, and reproducing from, a recording medium message information intended for faithful reproduction, and for detecting any alteration to the recorded message information; said system comprising means for deriving a message information signal representative of said message information; an encoder for producing a first data signal including data indicative of a representative sample of one or more characteristics of the message information signal; means for deriving a correlation signal based at least in part on said first data signal; transducer means for recording said message information signal, said first data signal and said correlation signal upon at least one track of a recording medium; means for recovering at least the message information signal and the correlation signal from the recording medium; an encoder for producing a second data signal, including dta indicative of a



representative sample of said one or more characteristics of the recovered message information signal; means for reproducing the message information contained in the recovered message information signal; and means responsive to the content of said second data signal for predicting a characteristic of said recovered correlation signal, and to indicate that at least some of the signals recovered from said recording medium do not faithfully protray at least some of the signals originally recorded whenever the characteristic of said recovered correlation signal is other than predicted.

4,717,974

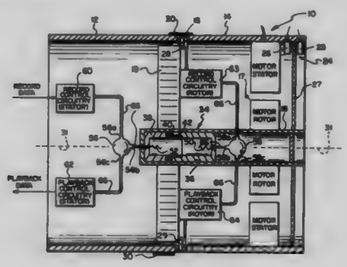
WAVEGUIDE APPARATUS FOR COUPLING A HIGH DATA RATE SIGNAL TO AND FROM A ROTARY HEAD SCANNER

Hans P. Baumeister, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1986, Ser. No. 864,375

Int. Cl.[4] G11B *15/14*

U.S. Cl. 360—64 **7 Claims**



1. In rotary scanner apparatus having a stationary portion, and a rotating portion including a headwheel having a central axis of rotation, said headwheel having at least one magnetic head arranged for making successive operative sweeps across a magnetic storage medium for effecting a magnetic transducer operation, the improvement comprising:

a unitary microwave transmission link including fixed waveguide means operatively associated with said stationary portion of said scanner apparatus and cooperating rotary waveguide means operatively associated with said rotating portion of said scanner apparatus, said fixed waveguide means and said rotating waveguide means being coaxially arranged along the rotational axis of said headwheel for directing (1) a microwave signal, corresponding to a signal to be recorded, from said stationary portion to said rotating portion of said scanner apparatus when said magnetic head is a record head, and (2) a microwave signal, corresponding to a playback signal, from said rotating portion to said stationary portion when said magnetic head is a playback head.

4,717,975

ERASING DEVICE

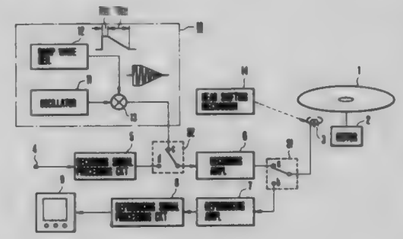
Tokihiko Ogura, Kanagawa; Tsuguhide Sakata, Tokyo; Kazuhiko Ito, Tokyo, and Masahiko Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,421

Claims priority, application Japan, Feb. 14, 1984, 59-25913; Feb. 18, 1984, 59-29278

Int. Cl.[4] G11B *5/03*

U.S. Cl. 360—66 **14 Claims**



1. A device for erasing a recorded signal from a record bearing medium, comprising:

(A) a head;

(B) means for relatively rotating said head and said record bearing medium at least a plurality of times; and

(C) means for supplying said head with an alternating erase signal to cause the head to generate an alternating erasing magnetic field while said head and said record bearing medium are relatively rotated at least said plurality of times by said rotating means, wherein the relationship between the frequency of relative rotation of said head and said record bearing medium and the frequency of said erase signal is determined so that at any point on a recording track of said record bearing medium no fixed nodes of said erasing magnetic field are occurring during a plurality of relative rotations of said head and said record bearing medium.

4,717,976

APPARATUS USING DISC-SHAPED RECORD BEARING MEDIUM

Akimasa Nishimura, and Nobuo Tezuka, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,862

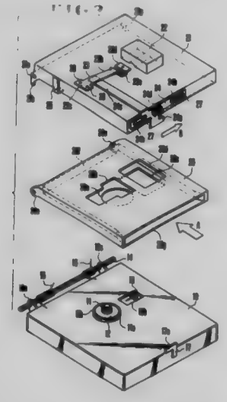
Claims priority, application Japan, Aug. 12, 1983, 58-147804

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 **15 Claims**

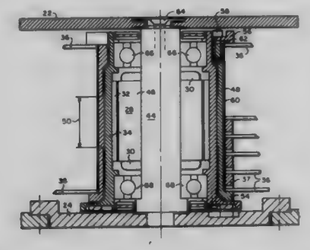
1. An apparatus using a disc-shaped record bearing medium having an engaging portion and at least one rotation indication portion, comprising:

(A) rotation means for retaining and rotating the medium;
(B) pressing means for pressing the medium to load the medium on said rotation means at the engaging portion of the medium, said pressing means ceasing the pressing of the medium while said medium is rotating; and



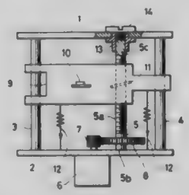
(C) detection means for detecting the rotation indication portion of the medium while said medium rotates, at least a portion of said detection means being provided on a portion of said pressing means.

4,717,977
HIGH CAPACITY WINCHESTER DISK DRIVE
Kenneth H. Brown, Simi Valley, Calif., assignor to Micropolis Corporation, Chatsworth, Calif.
Filed Sep. 25, 1986, Ser. No. 911,637
Int. Cl.[4] G11B *17/02*
U.S. Cl. 360—98 **18 Claims**



1. A high capacity digital storage system of the Winchester or hard disk type, comprising:
an inner motor including an outer cylindrical steel member forming part of the motor rotor;
an aluminum disk mounting sleeve having a substantial length which is coextensive with said steel member, said aluminum sleeve making a thermal shrink fit engagement with said cylindrical steel member toward the center of their overlapping areas, and having clearance between the sleeve and member at their two ends;
a plurality of aluminum storage disks; and
means for mounting said storage disks from the upper and lower ends of said aluminum mounting sleeve, with the storage disks being aligned with and spaced from one another and with a clearance from the periphery of said aluminum mounting sleeve.

4,717,978
SCREW SHAFT ADJUSTMENT MEANS FOR A MAGNETIC DISK DRIVE UNIT
Harunobu Ichinose, Itabashi, Japan, assignor to Copal Company Limited, Japan
Filed Feb. 24, 1986, Ser. No. 832,220
Claims priority, application Japan, Feb. 28, 1985, 60-28664[U]
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **3 Claims**

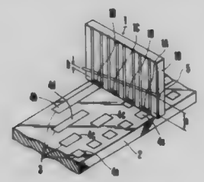


1. A magnetic disk driving device comprising:
a carriage having a magnetic head mounted thereon, said carriage being adapted for substantially linear movement in the radial direction of a magnetic disk inserted into said magnetic disk driving device;
a pair of substantially parallel guide shafts, said guide shafts supporting said carriage for movement in said radial direction;
a screw shaft having threads formed thereon, said screw shaft having an axial centerline extending substantially parallel to said guide shafts and having a first end which is adapted to be rotated by a motor;
a straight pin fixed on said carriage, said straight pin having an axis extending in a direction which is substantially perpendicular to said screw shaft axis, and said straight pin engaging sidewalls of said threads formed on said screw shaft;
spring means biassing said carriage in said radial direction against one side wall of said screw shaft threads;
a first support means, said first support means fixedly supporting said first end of said screw shaft for rotation;
a bearing member supporting a second end of said screw shaft for rotation;
a second support means, said second support means comprising a slot extending in a transverse direction which is substantially perpendicular to the axes of said screw shaft and said straight pin, said bearing member being movable within said slot such that said slot guides said bearing member for movement in said transverse direction; and
fastening means for fixing selectively said bearing member to said second support means;
wherein movement of said bearing member in said transverse direction alters the position of the centerline of said screwshaft relative to said pin thereby adjusting the traveling pitch of said carriage.

4,717,979
MAGNETIC SENSOR DEVICE
Koichi Washisu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1985, Ser. No. 790,042
Claims priority, application Japan, Oct. 24, 1984, 59-224837
Int. Cl.[4] G11B *5/27, 5/33, 5/265;* **G01R** *33/02*
U.S. Cl. 360—113 **8 Claims**

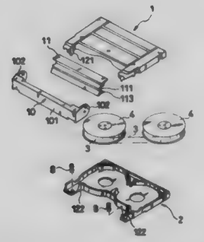
1. A magnetic sensor device for reading signals impressed in a plurality of channels on a recording medium comprising a plurality of magnetic resistive effect type elements arranged

side by side in alignment with respective reading channels having respectively different magnetic intensities, and means



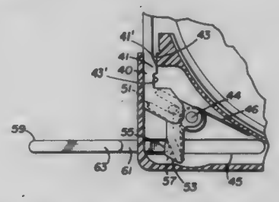
for generating respective bias magnetic fields for each element to give different bias magnetic fields to said different elements.

4,717,980
TAPE CASSETTE WITH LOW FRICTION SLIDE MEMBER FOR GUIDING MOVEMENT OF A LID THEREON
Haruo Shibe; Kenji Hashizume, and Masatoshi Okamura, all of Nagano, Japan, assignors to TDK Corporation, Japan
Filed Nov. 5, 1985, Ser. No. 795,184
Claims priority, application Japan, Nov. 7, 1984, 59-169693[U]; Nov. 7, 1984, 59-169694[U]
Int. Cl.[4] G11B *23/08*
U.S. Cl. 360—132 **17 Claims**



1. A tape cassette having a case, a magnetic tape in the case, and a pair of reels in the case for winding the magnetic tape, said case having a passage through which the magnetic tape is stretched, said tape cassette comprising
an outer lid pivotally mounted on said case to open and close the outside of said passage;
an inner lid pivotally mounted on the inside of said outer lid to open and close the inside of said passage;
a pair of slide members formed on opposite sides of said inner lid; and
guide means formed in said case to guide said pair of slide members, said guide means comprising a pair of guiding components with each component situated adjacent a respective slide member with said slide members being made of polyacetal resin, polycarbonate resin, polyamide resin, Teflon Resin, or metallic material and said guide means being made of ABS resin,
whereby white dust formation and contamination of the running tape are prevented.

4,717,981
HARD DISC CARTRIDGE ARRANGEMENT WITH AN AUTOMATICALLY ACTIVATED DOOR
Anil Nigam, Cupertino, and Dominic Mercurio, San Jose, both of Calif., assignors to SyQuest Technology, Fremont, Calif.
Continuation of Ser. No. 520,319, Aug. 4, 1983, abandoned. This application Apr. 9, 1987, Ser. No. 40,741
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.[4] G11B *23/02, 5/82*
U.S. Cl. 360—133 **3 Claims**



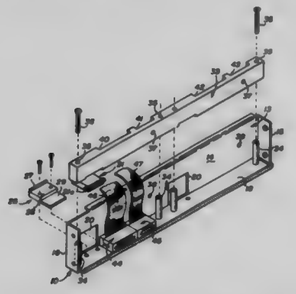
1. A cartridge with a data storage medium comprising:
a housing;
said housing defining a aperture for allowing access through said housing to said disc;
door means for selectively covering and uncovering said aperture with a first position for covering said aperture and a second position for uncovering said aperture, said door means includes a cover and an arm projecting therefrom;
means for selectively locking said door in said first position, said means for selectively locking said door includes a recess defined by said housing, and a projection defined by said arm, said projection being received in said recess for locking said door in the first position;
means for selectively unlocking said door means from said first position and urging said door means into said second position, said means for selectively unlocking said door means being pivotally mounted in said housing, and including lever means for engaging said arm, and a first cam means for urging said projection up and out of said recess and urging said door means toward said second position and a second cam means for further urging said door means into said second position whereby a two step member is adapted to engage and displace said first cam means and said second cam means in order to urge said door means from the first to the second position.

4,717,982
ELECTRICAL CONNECTOR RETAINING ASSEMBLY FOR FACILITATING REMOVABLE MOUNTING OF A RIGID DISK DRIVE
James S. Toreson, Mountain View, Calif., and Jeffrey G. Lessner, Clinton, Md., assignors to Xebec, Carson City, Nev.
Continuation of Ser. No. 646,588, Aug. 31, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,165
Int. Cl.[4] G11B *33/00, 33/06*
U.S. Cl. 360—137 **5 Claims**

1. An electrical innerconnection assembly for removably mounting a rigid disk drive within a housing comprising:
a. a bulkhead bracket fixed secured within a rigid disk drive housing, the bulhead bracket having a planar face oriented to be parallel to a panel containing electrical innerconnect means of a rigid disk drive when said disk drive is in an operative position in said housing and said electrical innerconnect means are electrically connected to electrical connector members, and a shelf projecting perpendicularly from said face to provide support for said electrical connector members, said electrical connector members having strip like cables connected thereto, said electrical connector members abutting said planar face and said

shelf and oriented to face said panel of said disk drive positioned to receive said electrical innerconnect means of said rigid disk drive, and guide pin members fixed in parallel spaced-apart relationship and projecting perpendicularly from said shelf; and

b. a retaining rail removably mounted on the bulkhead bracket to secure said electrical connector members in place on the bulkhead bracket against said shelf and said planar face, with said strip-like cables held between the retaining rail and said planar face, the surface of the retaining rail adjacent said planar face of the bulkhead bracket has spaced-apart slots to receive said strip-like cables



between the retaining rail and said planar face such that said strip-like cables are held flush against said planar face, the widths of said slots corresponding to the widths of said strip-like cables such that the lateral movement of the strip-like cables is restricted, guide bores formed through said retaining rail at spaced-apart locations similar to the spaced-apart relationship of said guide pin members to receive said repective guide pin members so that the retaining rail may be slidably positioned on said guide pin members adjacent said planar face of the bulkhead bracket, whereby said storage disk unit is readily removable from the bulkhead bracket by disengaging the unit from said electrical connector member.

4,717,983

DEVICE FOR OPERATING A PLUNGER IN A TAPE PLAYER

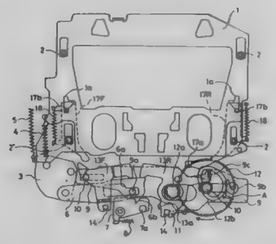
Yukio Ito, and Shigeo Kinoshita, both of Tokyo, Japan, assignors to Clarion Co., Ltd, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,215

Claims priority, application Japan, Apr. 6, 1984, 59-68864; Apr. 6, 1984, 59-68865; Jun. 8, 1984, 59-117652

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—137 **8 Claims**



1. A plunger operating mechanism in a tape player which can be selectively operated in a plurality of modes, including a fast-forwarding mode and a rewinding mode, comprising:

a stop mode biasing element;

a head plate supported for movement between an advance position and a withdrawal position, said head plate moving through a fast-forwarding and rewinding position as it moves in an advancing direction to said advance position from said withdrawal position, said head plate being yieldably biased by said stop mode biasing element toward its withdrawal position;

a head lock plate operatively linked to said head plate;

drive means engageable with said head lock plate for moving it to an ahead position in a direction which effects movement of said head plate toward said advance position;

first lock means engageable with said head lock plate when said head lock plate has been moved to its ahead position by said drive means for releasably locking said head lock plate in said ahead position in order to releasably prevent said head plate from returning to its withdrawal position;

first and second attractive plungers, said first plunger being respectively energized and de-energized and said second plunger being respectively de-energized and energized during said fast-forwarding and rewinding modes, respectively;

two movably supported stress plates each cooperable with a respective one of said plungers so as to be releasably locked thereby in a predetermined position when such plunger is energized;

fast-forwarding and rewinding control plates which are each moveable between first and second positions and are each engageable with a respective one of said stress plates;

means which includes said stress plates for positioning said fast-forwarding control plate in its second position and said rewinding control plate in its first position in the fast-forwarding mode when said first of said plungers is energized, for positioning said fast-forwarding control plate in its first position and said rewinding control plate in its second position in the rewinding mode when said second of said plungers is energized, and for positioning both of said control plates in their first positions for modes other than the fast-forwarding and rewinding modes; and

position control means which includes said control plates for limiting movement in said advancing direction of said head plate to its fast-forwarding and rewinding position in the fast-forwarding mode and in the rewinding mode.

4,717,984

DEVICE FOR DIGITALLY DETERMINING AND SAFEGUARDING A THERMAL IMAGE

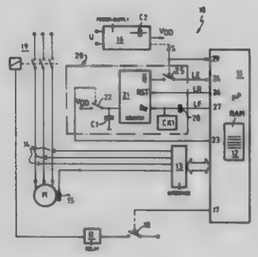
Gilles Heary, Paris, and Christian Cadet, Taverny, both of France, assignors to La Telemecanique Electrique, France

Filed Aug. 21, 1986, Ser. No. 898,545

Claims priority, application France, Aug. 23, 1985, 85 12663

Int. Cl.[4] H02H *5/04*

U.S. Cl. 361—25 **4 Claims**



1. A device for digitally determining and safeguarding a thermal image, connected to a voltage source and including a processor connected vin an interface to at least one sensor and capable of forming a digital image of the thermal state of an

apparatus or of a load in the occurence of a power-cut having a predetermined maximum duration, a random access memory associated with the processor and containing the thermal image formed by the processor, and safeguard means including a programmable digital counter unit connected to the processor and to a capacity determined for ensuring the power supply of said counter unit during said maximum duration, and having at least one counter equipped with a clock which modifies its counting state during the time when the voltage is absent, the processor having means for reading the state of the counter after restoration of the voltage, the counter being programmable and loaded by the processor in response to a cut-off signal with an initial counting state which is a function of the instantaneous thermal image contained in the random access memory on the occurence of the lack of voltage.

4,717,985

CIRCUIT BREAKER WITH DIGITIZED SOLID-STATE TRIP UNIT WITH INVERSE TIME TRIPPING FUNCTION

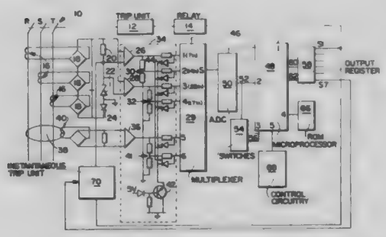
Pierre Demeyer, Uriage, France, assignor to Merlin Gerin S.A., France

Filed Feb. 10, 1986, Ser. No. 827,536

Claims priority, application France, Feb. 25, 1985, 85 03160

Int. Cl.[4] H02H *3/08*

U.S. Cl. 361—96 **3 Claims**



1. A digital solid-state trip-unit for an electrical circuit-breaker comprising:

current sensor means for generating analog signals porportional to currents flowing through conductors protected by the circuit-breaker;

rectifier circuit means for rectifying said signals, said rectifier circuit means delivering a continuous analog signal representative of a maximum value of said currents;

analog-to-ditigal converter means having an input receiving said continuous analog signal, said analog-to-digital convertor means delivering a corresponding sampled digitized current signal;

digital processing unit means, comprising a microprocessor, to which the sampled digitized current signal is applied, for providing a long delay trip function and a short delay trip function, said digital processing unit means generating a circuit-breaker tripping order after said long delay or said short delay;

circuit-breaker trip means activated by said circuit-breaker tripping order;

said digital processing unit means including means for computing a actor proportional to a square of the current represented by said sampled digitized current signal, means for recording a digital value representative of a thermal image of the heating of a bimetallic strip or of an equipment item protected by the circuit-breaker, means for selecting said long delay trip function or said short delay trip function, means for comparing said digitized current signal with a predetermined limit value corresponding to the selected trip function, means for adding sasid factor to the recorded digital value representative of the thermal image when the digitized current signal is greater than said limit value, means for multiplying the recorded digital value representative or the thermal image by a predetermined reduction factor when the digitized current signal is lower than said limit value, whereby said recorded digital value representative of the thermal image is incremented and decremented by a value representative of heating and cooling of said bimetallic strip or of said equipment, said digital processing unit means further including means for delivering a tripping order when the recorded digital value representative of the thermal image exceeds a predetermined thermal level.

4,717,986

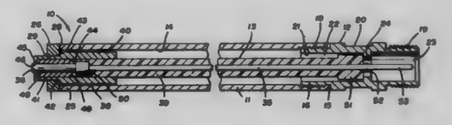
IGNITOR PROBE HAVING REPLACEABLE TIPS

Raymond L. Collins, Jr., 373 Atterbury Blvd., Hudson, Ohio 44236; Joseph J. Kucharski, Macedonia, and Stephen A. Bryk, Akron, both of Ohio, assignors to Raymond L. Collins, Jr., Hudson, Ohio

Filed Oct. 14, 1986, Ser. No. 917,918

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 361—253 **14 Claims**



1. An ignitor probe comprising:

an elongate shaft having an internal bore passing therethrough and first and second ends;

means for coupling said probe to a power source;

wherein said means for coupling provides at least a first internal chamber and a shoulder communicating with said electrode assembly, and is removably affixed to one of said shaft ends; and

wherein said other of said ends is provided with a cap, said cap having a bore communicating with said internal bore of said elongate shaft; and

an electrode assembly carried within said internal bore and providing a centering couple, said centering couple communicating with one of said ends;

wherein said centering couple comprises

a body;

a neck smaller than said body, said body and neck having a continuous bore passing axially therethrough and said neck being partially closed by a rim having an opening to said continuous bore.

4,717,987

COMPACT NON-METALLIC LOAD CENTER ENCLOSURE

Larry J. Newmark, Avon, and David A. Hibbert, Tolland, both of Conn., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 907,250, Sep. 15, 1986. This application Mar. 16, 1987, Ser. No. 26,503

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—351 **6 Claims**

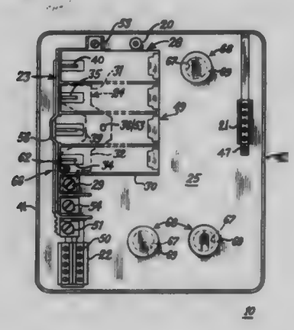
3. A molded plastic enclosure comprising:

a plastic cover removably attached to a plastic case;

means integrally formed within said case for supporting a plurality of electrical components therein;

electrical access means formed within said case for providing electrical access to said components when said cover is closed against said case;

attachment access means formed within a bottom of said case; and



shaped metal support caps within said attachment access means allowing explosively driven nails through said support caps to hold said enclosure to a support wall.

4,717,988

UNIVERSAL WAFER SCALE ASSEMBLY

Richard C. Landis, Shelton, Conn., assignor to ITT Defense Communications Division of ITT Corporation, Nutley, N.J.

Filed May 5, 1986, Ser. No. 860,151
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—403 **9 Claims**

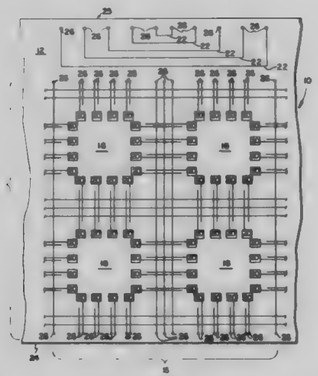


FIG. 1

1. A semiconductor wafer scale assembly substrate comprising:

a matrix of electrically conductive paths;

means for defining a plurality of chip sites, each said defined site being adapted to receive a chip and including a first plurality of termination pads, each said termination pad being conductively connected to one of said electrically conductive paths, said conductive paths between adjacent defined chip sites being interdigitated whereby each said chip received can be interconnected to said matrix; and

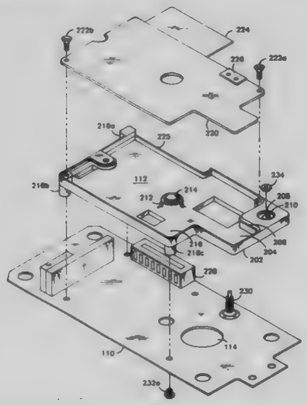
a plurality of discrete electrical connections, each said connection being connected, on one end thereof, to one of said first plurality of termination pads.

4,717,989

HEAT SINK, EMI SHIELD AND CONTROLLER MODULE ASSEMBLY FOR A PORTABLE RADIO TRANSCEIVER

Leonardo G. De Barros, Plantation, Fla.; Thomas E. Buss, Singapore, Singapore; Adrian T. G. How, Singapore, Singapore, and Jolene L. S. Tia, Singapore, Singapore, assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 30, 1987, Ser. No. 31,963
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **6 Claims**



1. A module for a portable radio, said module comprising in combination:

an electrically conductive cover plate having inside and outside surfaces;

a thermally and electrically conductive module base having a recess sized and shaped to receive said cover plate, said recess including a ledge for supporting said cover plate above the floor of said module recess, said cover plate being attached and electrically connected to said module base over said recess;

a flexible circuit including a substrate layer having first and second electrical circuit patterns on opposite sides of said substrate layer, a cover layer adhesively bonded over said first electrical circuit pattern, and a solder resist layer over a portion of said second electrical circuit pattern, said flexible circuit being attached to the inside surface of said cover plate;

whereby said flexible circuit is electromagnetically shielded by said module base and cover plate.

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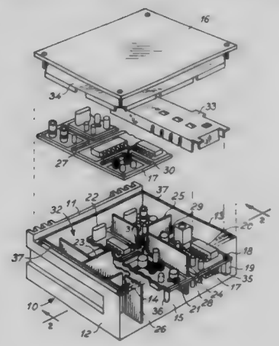
DOUBLE-SHIELDED HOUSING FOR RF CIRCUITRY

Mehmet Tugcu, Kastrup, Denmark, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1986, Ser. No. 869,154
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **12 Claims**

1. An electronic apparatus comprising a housing, said housing being an integrally cast housing and being of an electrically conductive material, said housing having outer walls including a base wall and side walls and further having at least one partition wall, said outer walls together defining an inner space of said housing, an electronic circuit board, said circuit board being removably fastened within said inner space and including at least two electronic circuits located at different sections of said circuit board, said circuit board further being provided with at least one aperture separting said sections from each other, at least one partition wall extending from one of said outer walls into said inner space through said aperture, so as to

subtantially divide said inner space into two individual compartments each containing one of said sections of said circuit board, and a first shielding component of an electrically conductive material, said first shielding component being arranged in electrical contact with said housing, so as to substantially



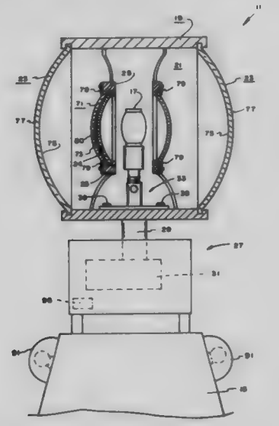
close only one of said individual compartments in relation to the other compartment an in relation to the environment, and further provide a shielding of one electronic circuit when the substantially closed compartment in relation to the other electronic circuit and in relation to the environment.

4,717,991

AIRPORT BEACON LIGHT

Leo Murphree, Jr., P.O. Box 1997, Greenwood, Miss. 38930

Continuation of Ser. No. 734,462, May 15, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,657
Int. Cl.[4] F21V *21/30*
U.S. Cl. 362—35 **4 Claims**



1. An airport beacon light for use with a source of electrical energy, said light comprising, in combination:

(a) a lamp;

(b) a hollow housing member including a lens;

(c) lamp holder means positioned within the interior of said housing member for holding said lamp in a specific location relative to said lens, said lamp holder means including a base member fixedly attached to said housing member within the interior thereof and including a lamp socket member for removably holding said lamp, said lamp socket member being adjustable relative to said base member for allowing the position of said lamp relative to said lens to be adjusted;

(d) circuit means for electrically coupling said lamp to said source of electrical energy, said circuit means including a transformer and a capacitor mounted within the interior of said housing member; and

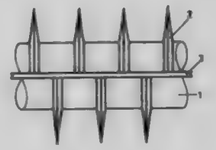
(e) a heat shield means mounted in the interior of said housing member for shielding said transformer from heat generated by sunlight, said heat shield means including a bracket member fixedly attached relative to said housing member within the interior thereof, said transformer and said capacitor being attached to said bracket member.

4,717,992

LUMINAIRE WITH A RODLIKE LAMP AND LAMELLA SEGMENT THEREFORE

Christian Bertenbach, Munich, Fed. Rep. of Germany, and Torkild Thage-Jørgensen, Nivå, Denmark, assignors to Solar Armaturproduktion A/S, Vejen, Denmark

PCT No. PCT/DK84/00122, § 371 Date Dec. 17, 1985, § 102(e) Date Dec. 17, 1985, PCT Pub. No. WO85/03760, PCT Pub. Date Aug. 29, 1985
PCT Filed Dec. 21, 1984, Ser. No. 798,069
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406447
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—217 **14 Claims**



1. A glare protector for use with a rodlike lamp, such as a fluorescent tube, said glare protector acting in the longitudinal direction of the lamp and comprising reflective lamellas arranged adjacent to and around the surface of said rodlike lamp and forming axially spaced reflector surfaces extending generally radially outwardly from the surface of said lamp, said lamellas, when seen in profile section along an axial plane of the lamp, being in the shape of a narrow wedge with a tip of the wedge pointing away from the lamp and with the wedge having concave flanks, said glare protector being mountable to said lamp.

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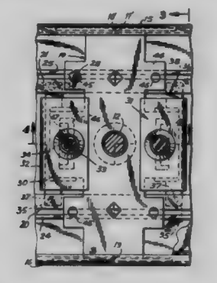
ALIGNING JOINING MECHANISM FOR LUMINAIRES

Horst Bernhart, Ontario, and Kingsley Chan, Rolling Hills Estate, both of Calif., assignors to Lightolier Incorporated, Secaucus, N.J.

Filed May 5, 1987, Ser. No. 46,105
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—219 **8 Claims**

5. In a lighting assembly comprising two fluorescent luminaire fixtures each said fixture comprising an elongate u-shaped housing member having a central web and a spaced pair of upstanding arms, said arms including longitudinally extending channel portions, an aligning clamp device adapted to connect said fixtures in intimate end to end abutting relation comprising a generally u-shaped spanner member including a central base portion having a pair of upstanding flanges at the distal ends thereof, said flanges being sized to be slidably receivable in said channels of said arms, fastener means on one said housing for securing said spanner to said one housing with portions of said base portion and said flanges projecting beyond an end of said one housing, a longitudinal extending cam

surface formed on said base portion and projecting beyond said end of said one housing, said cam surface being inclined toward said web of said end portion of said one housing, and a receiver member mounted on said other fixture adjacent an end thereof, said receiver member including a locking plate in spaced parallel relation to said web of said other fixture, a



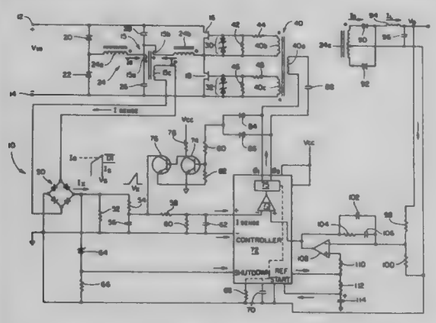
threaded member mounted on said plate for movement toward and away from said web, said threaded member being positioned to register with said cam surface in the end to end abutting position of said fixtures, whereby said other fixture is axially shifted into end to end abutting relation to said one fixture responsive to movements of said threaded member against said cam surface.

4,717,994

CURRENT MODE CONTROL FOR DC CONVERTERS OPERATING OVER 50% DUTY CYCLE

Boniface Diaz, Chicago, and Anand K. Upadhyay, Mount Prospect, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 11, 1986, Ser. No. 940,699
Int. Cl.[4] H02M 3/337
U.S. Cl. 363—21 **14 Claims**



1. In a DC converter wherein an input DC voltage is converted to an output DC voltage, said converter including an output transformer having a primary winding for conducting a first input current in response to said input DC voltage, a secondary winding electromagnetically coupled to said primary winding and responsive to said first input current for conducting a seocnd output current in generating said output DC voltage, and a current equalizing winding coupled to said primary winding for reflecting said first input current, said converter further including first and second switch means operating at a duty cycle in excess of 50% and coupled to said primary winding and alternately rendered conductive during an operating cycle of the converter for providing said first input current thereto, a current mode control arrangement comprising:

current sensing mean including a current sensing transformer coupled in circuit with said output transformer for sensing the first input current in the primary winding of said output transformer, said current sensing transformer including first and second windings respectively coupled to the output transformer's primary and current equalizing windings, said current sensing transformer further including a third winding electromagnetically coupled to said first and second windings for detecting the difference in current in said first and second windings, wherein the difference in current in said first and second windings corresponds to the first input current and represents said second output current;

integration means coupled to said current sensing means for integrating said first input current in providing a third current representing an average of said second output current; and

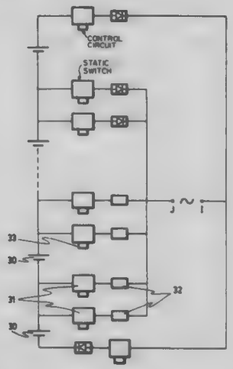
control means coupled to said first and second switch means and to said integration means and responsive to said third current for alternately providing first and second drive signals to said first and second switch means in a balanced manner such that said first and said second switch means provide an equal charge to the primary winding during an operating cycle of the DC converter.

4,717,995

PROCEDURE FOR CONVERTING DIRECT ELECTRICAL ENERGY INTO ALTERNATING ELECTRICAL ENERGY

Juan O. Garcia, 39, Castello Street, 28001, Madrid, Spain

Filed Jun. 16, 1986, Ser. No. 874,677
Claims priority, application Spain, May 17, 1986, 555.077
Int. Cl.[4] H02M 7/48
U.S. Cl. 363—43 **19 Claims**



1. A method of converting direct current into alternating current comprising the steps of:

(a) connecting a first voltage through a uni-directional barrier to a first output terminal;

(b) connecting a second variable voltage, having an initial value greater than said first voltage, through a uni-directional barrier to a second output terminal;

(c) incrementally increasing said second voltage towards a predeteermined maximum voltage;

(d) incrementally decreasing said second voltage towards said initial valiue of said second voltage;

(e) connecting a third voltage through a uni-directional barrier to said first output terminal;

(f) connecting a fourth variable voltage, having an initial value less than said third voltage, through a uni-directional barrier to said second output terminal;

(g) incrementally decreasing said fourth voltage towards a predetermined minimum voltage;

(h) incrementally increasing said fourth voltage towards said initial value of said fourth voltage;

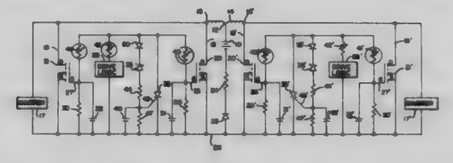
(i) repeating steps (a) through (h).

4,717,996

GATED PARALLEL POWER SWITCHING DEVICES PROTECTION CIRCUIT

Robert F. Bourke, Fairchild; David L. Layden, New Lisbon, and Richard I. Cook, Wisconsin Rapids, all of Wis., assignors to Best Power Technology, Inc., Necedah, Wis.

Filed Jan. 14, 1987, Ser. No. 3,066
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **23 Claims**



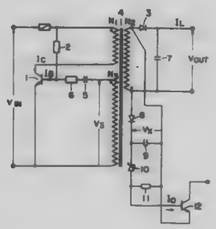
1. In a power switching apparatus having a power circuit and a drive logic circuit, said power circuit operating at a higher voltage than said drive logic circuit, the improvement comprising two or more power switches in parallel in said power circuit, each of said power switches being of the type having a gate and subject to failure wherein the power switch gate shorts to said power circuit, said power switch gates being connected in common, said drive logic circuit being connected to said power switch gates, sensing means connected to said power switch gates for sensing the occurance of a power switch gate short, current carrying means for carrying away excess current from said power switch gates, said current carrying means being connected to said power switch gates, said sensing means operting said current carrying means when a power switch gate short occurs, and variable impedance means connected to said power switch gates for increasing the impedance of the power switch gates from a low value to at least an order of magnitude higher upon the occurrence of said power switch gate short, whereby should one of the gates of said power switches short, the other power switch will be protected from failure.

4,717,997

ABNORMAL CONDITION DETECTIVE CIRCUIT FOR A SWITCHING REGULATOR

Yoshitaka Hata, Higashi-Murayama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasawa, Japan

Filed Oct. 20, 1986, Ser. No. 920,591
Claims priority, application Japan, Oct. 23, 1985, 60-161331[U]
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **5 Claims**



1. A system, comprising:

a switching regulator of a flyback system, said switching regulator comprising:

a transformer having a primary winding and a secondary winding,

a diode connected in series with said secondary winding of said transformer, and

a capacitor for delivering a dc voltage, said capacitor being connected in parallel with said secondary winding and said diode, and

an abnormal condition detection circuit for said switching regulator which detects an abnormal condition of an input voltage of the switching regulator of the flyback system, said abnormal condition detection circuit comprising:

a peak voltage sensing circuit for sensing a peak voltage value produced across said transformer secondary winding in a direction opposite to the forward direction of said diode, and

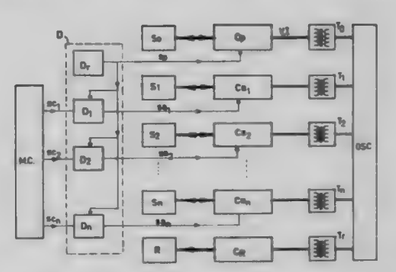
a voltage comparator for comparing said peak voltage value with a setting value to output an on-off signal depending upon the difference therebetween.

4,717,998

STATIC DEVICE FOR CONTROL OF ENERGY-EXCHANGE BETWEEN ELECTRICAL GENERATING AND/OR RECEIVING SYSTEMS

Yves Cheron, Toulouse; Pierre Jacob, and Jacques Salesse, both of Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (A.N.V.A.R.), Paris, France

Filed Jul. 22, 1986, Ser. No. 887,929
Claims priority, application France, Jul. 22, 1985, 85 11291
Int. Cl.[4] H02M 7/00; H02J 3/38
U.S. Cl. 363—71 **24 Claims**



1. A control for regulating the exchanges of energy between at least two generating and/or receiving electrical systems (S_0, S_1, ... S_n) for controlling the power delivered to or absorbed by said systems according to predetermined conditions, said control comprising

at least one static electric energy converter (C_p, C_a, ... C_n) connected to each of said electrical systems and having a control input for receiving a control signal, each said energy converter being capable of converting the electric values of said systems into electrical frequency and phase values as a function of the control signals,

a control phase-shifting circuit (D) connected to the control inputs of said static converters and capable of generating control signals (s_p, s_a, ... s_n) for producing at the outputs of said static converters electrical values having a common frequency (f) and relative phases as a function of the control signals received by said phase-shifting circuit, said common frequency being higher than the higher than the highest frequency of any of said systems,

said phase-shifting circuit including a reference unit (D_r) connected to the control input of one of said converters (C_p) comprising a master converter for imposing said common frequency (f) and generating a master control signal (sp) bearing common frequency information (f); and a phase control unit (D_1, D_2, ... D_n) connected to the other of said converters (Ca ... C_n) comprising slave converters for imposing phase shifts at the outputs of said slave converters with respect to said master converter and

generating slave control signals (S_a, . . . S_n) bearing common frequency data and relative phase data
an oscillation circuit (OSC) connected to the output of each of said converters and capable of temporarily storing energy and oscillating at said common frequency (f), and
control means for said phase shifting circuit for delivering said control signals to said phase shifting circuit as a function of said energy exchanges.

4,717,999

IMAGE FORMING APPARATUS

Shuso Kaneko, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,444
Claims priority, application Japan, Apr. 10, 1985, 60-075894
Int. Cl.⁴ G01D *13/14*; G03G *15/06*
U.S. Cl. 346—160 **18 Claims**

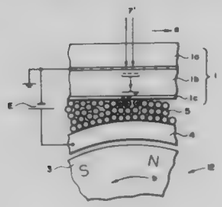
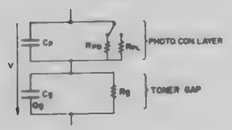


FIG. 5v



1. An image forming apparatus, comprising:
an image bearing member having a conductive layer and a surface layer capable of retaining electric charge;
driving means for moving said image bearing member;
toner supplying means for supplying toner having a low electrical resistance to said surface layer of said image bearing member;
means for driving said toner supplying means;
electric power source for applying a bias voltage between the toner and the conductive layer of said image bearing member; and
setting means for setting the bias voltage application to provide gradually increasing voltage at the start of the bias voltage application.

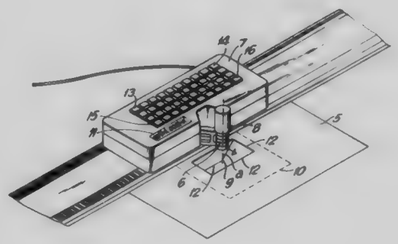
4,718,000

NUMERICALLY CONTROLLED WRITING INSTRUMENT

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 498,236, May 26, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 873,969
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220568
Int. Cl.⁴ B43L *13/00*; G05D *3/00*
U.S. Cl. 364—167 **11 Claims**

1. Numerically controlled writing instrument comprising an instrument control for providing path information, a carriage movable on a writing surface, said carriage includes an alphanumeric display, a keyboard for operating the instrument control, a stylus holder arranged to receive a stylus for writing on the writing surface, a pair of drives connected to said holder and controlled by said instrument control and each said drive arranged to move said holder along a different coordinate with the coordinates extending transversely of one another with the movement of said holder being based on the path information received from said instrument control so that a stylus mounted in said stylus holder can effect writing movement, wherein the improvement comprises that said instrument control includes a unit for programming self-defined characters and symbols, memory means arranged to receive the program from said unit,



said memory means comprises a first memory and a second memory with the second memory being arranged to store the programmed characters and symbols, said second memory is electrically encodeable and receives the characters and symbols programmed into the first memory, said instrument control comprises means for selectively connecting said second memory to said instrument control.

4,718,001

APPARATUS FOR CONTROLLING A MACHINE TOOL

Friedrich Wetzel, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,326
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445511
Int. Cl.⁴ G05B *19/403*
U.S. Cl. 364—169 **16 Claims**

1. Apparatus for the simultaneous control of the axes of a machine tool in accordance with predetermined parts programs, each of which contains a sequence of sets which can be subdivided into a number of chords specific to a set which serve for controlling a predetermined axis of the machine tool, comprising:
(a) at least one working memory having a plurality of memory areas, each area assigned to a particular parts program;
(b) means for loading in a queue fashion the sets of each parts program into the respective corresponding memory area one set at a time;
(c) means for cyclically interpolating the currently stored set of a respective parts program for a predetermined number of cycles so as to subdivide said set into a number of chords, equal to the number of cycles, specific to the set;
(d) means for controlling the loading of a subsequent set of a respective parts program into the respective corresponding memory area of the working memory after the completion of the predetermined number of cycles for the interpolation of the currently stored set; and

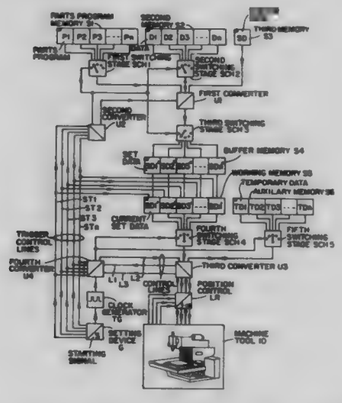


FIG. 1

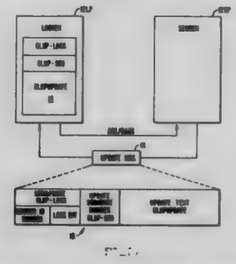
(e) means for controlling the axes of the machine tool by utilizing the chords determined by the interpolation of the sets of each parts program.

4,718,002

METHOD FOR MULTIPROCESSOR COMMUNICATIONS

Richard W. Carr, Palo Alto, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jun. 5, 1985, Ser. No. 741,659
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **26 Claims**



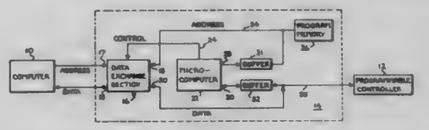
1. A method for communicating updated information among processors in a distributed data processing system comprising a plurality of distributed, interconnected processors each having a memory, including the steps of:
a. prioritizing the processors into a predetermined order;
b. establishing one of the processors as a control processor for the broadcast of update messages;
c. developing an update message having a plurality of bit positions in at least one of the processors;
d. the one processor broadcasting the update message to each of the processors in the following manner:
(1) sending the update message first to the control processor with at least one bit position set to a first state, the control processor acknowledging the update message if no other update message is in the broadcast process;
(2) sending the update message to each of the other processors with the one bit position set to a second state;
(3) sending the update message again to the control processor with the one bit position set to the second state to indicate completion of the broadcast; and
e. causing, in the event the control processor fails, the next processor in order to be selected as the control processor.

4,718,003

METHOD AND APPARATUS FOR EXCHANGING DATA BETWEEN DATA PROCESSING UNITS

Wayne A. Anderson; Gregory H. Faust, both of Charlottesville, and Gary L. Stirk, Dyke, all of Va., assignors to General Electric Co., Charlottesville, Va.

Filed Feb. 15, 1985, Ser. No. 702,287
Int. Cl.⁴ G06S *15/16*
U.S. Cl. 364—200 **10 Claims**



1. In interfacing apparatus between first and second data processing units (DPUs), a data exchange device into which the DPUs can read and write data simultaneously for thus exchanging data between said DPUs, such device comprising:
(a) first and second random access memories (RAMs), each RAM having a data port and an address port;
(b) control logic means for receiving from the first DPU control signals indicative of the operative state of each DPU, said control logic means being responsive to said control signals to generate gate control signals;
(c) a first gating means connected to control access by said first DPU to the data and address ports of said first RAM and to control access by said second DPU to the data and address ports of said second RAM, said gating means being responsive to said gate control signals to control such access;
(d) a second gating means connected to control access by said first DPU to the data and address ports of said second RAM and to control access by said second DPU to the data and address ports of said first RAM, said gating means being responsive to said gate control signals to control such access; and
(e) handshake logic means receiving data from each of said DPUs, which data defines the respective states of said DPUs, for generating commands indicative of said states and providing said commands to the first DPU, said first DPU being responsive thereto to generate said control signals to determine access of said first and second DPUs to said first and second RAMs depending on the operative state of each DPU and thereby allowing one DPU to read and write simultaneously with the other.

4,718,004

SAMPLE DATA ACQUISITION SYSTEM USING MICROPROCESSOR CONTROLLED SEQUENCE HAVING FIFO BUFFER, DAM CONTROLLER

Samir K. Dalal, Monument, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

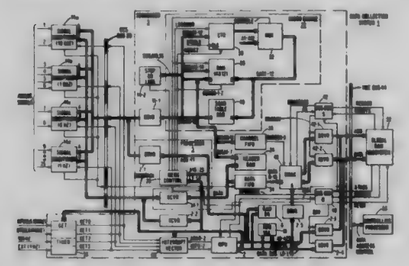
Filed Feb. 25, 1985, Ser. No. 705,164
Int. Cl.⁴ G06F *3/05*
U.S. Cl. 364—200 **2 Claims**

1. A data acquisition system comprising:
timing means for generating a plurality of timing signals;
a plurality of signal conditioner means coupled to said timing means, each of said plurality of signal conditioner means receiving a plurality of analog signals and being responsive to one of said plurality of timing signals for sampling each of said plurality of analog signals at the rate determined by said one of said plurality of timing signals and generating digitized data words representative of the sampled value of said each of said analog signals;
interrupt means coupled to said timing means and responsive

to said timing signals for generating first coded interrupt signals indicating a highest priority of said plurality of signal conditioner means requiring service;

microprocessor means coupled to said interrupt means and responsive to said first coded interrupt signals for generating a plurality of bus signals and coded acknowledge signals, said interrupt means being responsive to said coded acknowledge signals for generating second coded interrupt signals indicating the next highest priority of said plurality of signal conditioner means requiring service;

microengine means coupled to said microprocessor means and responsive to said plurality of bus signals for generating a sequence of address signals, said highest priority of said plurality of signal conditioner means being responsive to said sequence of address signals for generating a sequence of said digitized data words, each of said sequence of said digitized data words being representative of the sampled value of said each of said analog signals;



first in-first out buffer means coupled to said plurality of signal conditioner means for receiving said sequence of said digitized data words and generating data word signals;

direct memory access controller means coupled to said first in-first out means for receiving said data word signals, and generating memory address signals and an address strobe signal;

first bus controller means coupled to said direct memory access controller means and responsive to said address strobe signal for generating a request signal; and

memory means coupled to said first bus controller means and responsive to said request signal for generating a grant signal; and

bus means coupling said direct memory access controller means and said memory means, said first bus controller means being responsive to said grant signal for enabling said memory address signals and said data word signals to be transferred to said memory means.

4,718,005

DISTRIBUTED CONTROL OF ALIAS NAME USAGE IN NETWORKS

Barry A. Feigenbaum, Deerfield Beach; Dennis D. Gibbs, Lighthouse Point, and Robert Sachsenmaier, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

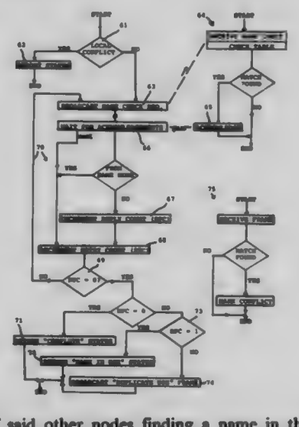
Filed May 3, 1984, Ser. No. 604,684
Int. Cl.⁴ G06F *15/16*
U.S. Cl. 364—200 **9 Claims**

1. For a data communication network comprising multiple computing nodes linked by communication media and/or channels, each node serving one or more entities, a method of establishing logical name associations between nodes and their respectively served entities, for permitting programs and/or operators at said nodes to share entities dispersed across said network and initiate communications with said entities by associated names without having to determine physical locations of said entities, comprising:

maintaining name association tables at said nodes indicating names adopted at said nodes for respectively served entities;

at any node seeking to adopt a new name association, broadcasting a Name Check request message over said network indicating the name to be adopted and the physical address location in said network of the node proposing the adoption;

receiving said request at other nodes, and comparing the proposed name with names stored in the name association tables at said other nodes;



at any of said other nodes finding a name in their table matching the proposed name, transmitting an acknowledgment message over said network addressed specifically to the node which originated said Name Check request; and

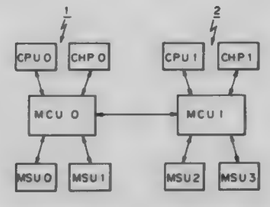
at the node which originated said Name Check, adopting or rejecting said name conditional upon the number of said acknowledgments received in response to said Name Check.

4,718,006

DATA PROCESSOR SYSTEM HAVING IMPROVED DATA THROUGHPUT IN A MULTIPROCESSOR SYSTEM

Hidehiko Nishida, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 17, 1984, Ser. No. 682,316
Claims priority, application Japan, Dec. 26, 1983, 58-247391; Dec. 27, 1983, 58-251923; Feb. 25, 1984, 59-34964
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **13 Claims**



1. A data processor system comprising a plurality of multiprocessor systems each having a memory control unit, each multiprocessor system being connected to the other multiprocessor systems through the memory control unit of each multiprocessor system, each said multiprocessor system comprising:

a memory control unit operatively connected to the other multiprocessor systems for data transmission therebetween;

at least one central processing unit operatively connected to said memory control unit; and

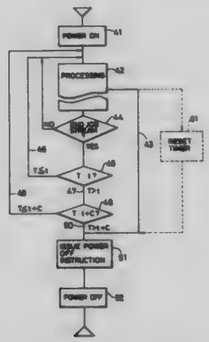
at least one main memory unit operatively connected to said memory control unit and synchronously operated with said memory control unit and each central processing unit.

4,718,007

POWER CONTROL METHOD AND APPARATUS FOR DATA PROCESSING SYSTEMS

Eichi Yukino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 745,232
Claims priority, application Japan, Jun. 19, 1984, 59-125683
Int. Cl.⁴ G06F *7/02*
U.S. Cl. 364—200 **15 Claims**



8. A power control method for controlling a power ON/OFF control means to timely ON and OFF a power supply of a data processing system carrying out data processing in accordance with a program stored in a memory wherein at least one of said system and power ON/OFF control unit include a timer means and said system further includes means for holding a power ON reservation time schedule for respective job streams to be performed, said power control method comprising the steps of:

determining whether or not a particular job stream, scheduled to have begun earlier, has ended;

if it is determined that said particular job stream has ended reading the present time from said timer means, corresponding to the time said particular job ends, and the power ON reservation time, corresponding to a next scheduled job stream, from said holding means;

detecting whether or not said present time corresponds to an actual time prior to said power ON reservation time by a time period equal to or greater than a predetermined period of time; and

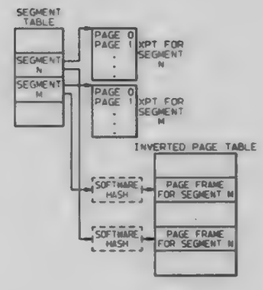
deactivating said power supply by said power ON/OFF control means when the result of said detection is positive, indicating that said present time is earlier than said power ON reservation time by at least said predetermined period of time, and maintaining said power supply active when the result of said detection is negative, indicating that said present time is not earlier than said power ON reservation time by at least said predetermined period of time.

4,718,008

METHOD TO CONTROL PAGING SUBSYSTEM PROCESSING IN A VIRTUAL MEMORY DATA PROCESSING SYSTEM DURING EXECUTION OF CRITICAL CODE SECTIONS

Albert Chang, Yorktown Heights; Mark F. Mergen, Mt. Kisco, both of N.Y.; John T. O'Quin, II, Austin, Tex.; John C. O'Quin, III, Chappaqua, N.Y., and Mark D. Rogers, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 16, 1986, Ser. No. 819,459
Int. Cl.⁴ G06F *1/00*
U.S. Cl. 364—300 **9 Claims**



1. In a virtual memory data processing system having a real memory containing a plurality of addressable locations each of which has a different physical address and each of which is capable of storing a page of data, said system further including a plurality of pageable data structures, each of which includes a plurality of entries, each entry containing an address field and a related status field to indicate the current status of a page of data stored at said location having the physical address contained in said related address field of said entry, said status field being updatable by said system to reflect said current status of said related page whenever the status of said related page of data is changed, a method to serialize a plurality of different type system events which operate to change the status of a page of data, and to update said status field of said corresponding entry of said pageable data structure to reflect said change in order to insure the integrity of said data structures, said method comprising the steps of;

(1) coding a first section of code that is executed in response to a first page fault to permit an interrupt for a second page fault and to request an I/O paging operation, said first section of code including a critical section,

(2) executing said first section of code to completion prior to a section of code having a lower priority being executed by restarting said first section of code at its critical section after said second page fault is serviced in order to service said first page fault,

(3) coding a second section of code that is executed in response to the completion of an I/O operation initiated in response to a page fault,

(4) enqueueing on a list an indication of said completion of each said I/O operation, and

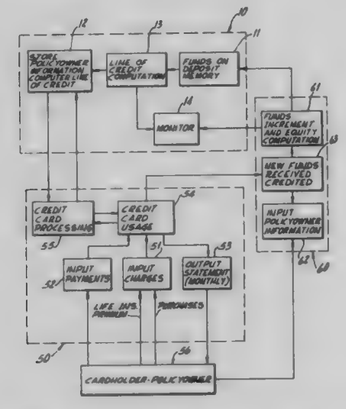
(5) executing said second section of code after said first section completes executing.

4,718,009

DEFAULT PROOF CREDIT CARD METHOD SYSTEM

Vincent Cservo, Dade County, Fla., assignor to Default Proof Credit Card System, Inc., Coral Gables, Fla.

Continuation-in-part of Ser. No. 583,591, Feb. 27, 1984, abandoned. This application May 31, 1985, Ser. No. 739,690
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—408 4 Claims



1. A method for providing line of credit information to participating banks that issue charge cards to owners of life insurance policies wherein the cash surrender value of said life insurance policies has been assigned to a system, which provides credit information to said participating bank, by said owner to secure a charge card line of credit to the owner of the life insurance policies, comprising the steps of:

A. providing a system for storing and periodically updating the cash surrender values of the assigned life insurance policies in a computer memory;

B. computing said line of credit for a charge card holder based on said cash surrender values stored for each policy owner;

C. transmitting said line of credit information from said system to participating banks; and

D. monitoring periodically the assigned life insurance policies with said system for any incremental increase of said cash surrender values so that the line of credit for the charge card holder may be automatically upgraded.

4,718,010

CT SYSTEM FOR CREATING IMAGE DATA FROM HIGH AND LOW ENERGY RADIATION

Masashi Fujii, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1985, Ser. No. 812,892
Claims priority, application Japan, Dec. 28, 1984, 59-276235
Int. Cl.[4] G01N *23/04, 23/06;* A61B *6/03*
U.S. Cl. 364—414 8 Claims

7. An operating method for a CT apparatus in which radiation rays are radiated from a radiation ray source in many directions for each slice of an object under inspection, in which projection data of the object slice is detected and acquired, with a given spatial resolution, by a radiation detector, and in which an image of the object slice is reconstructed from the acquired projection data, said operating method comprising the steps of:

(a) subjecting the object slice to a high energy radiation which is provided for obtaining projection data of high radiation absorption coefficient portions, and arranging the obtained projection data of said high radiation absorption coefficient portions in a first sinogram;

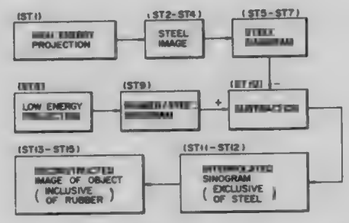
(b) reconstructing the arranged projection data in said first sinogram to provide first image data;

(c) slicing a signal level defined by said first image data to obtain position data of said high radiation absorption coefficient portions;

(d) reprojecting the position data of said high radiation absorption coefficient portions to reproduce said first sinogram;

(e) subjecting said object slice to a low energy radiation which is provided for obtaining projection data of low radiation absorption coefficient portions;

(f) arranging the obtained projection data of said low radiation absorption coefficient portions in a second sinogram, said second sinogram containing not only the data of said low radiation absorption coefficient portions, but also containing the data of said high radiation absorption coefficient portions, the location or arrangement of data in said second sinogram corresponding to that in said first sinogram;



(g) eliminating the data in said first sinogram from the corresponding data in said second sinogram;

(h) filling the subtracted data portion in said second sinogram with given data; and

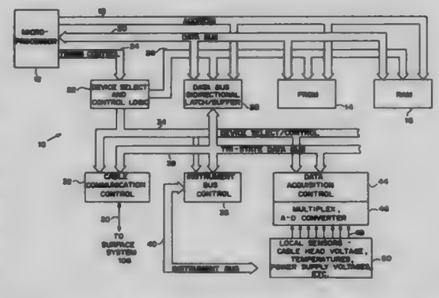
(i) constructing the arranged projection data in said second sinogram to provide image data of said object slice.

4,718,011

WELL LOGGING DATA ACQUISITION, TELEMETRY AND CONTROL METHOD AND SYSTEM

Henry B. Patterson, Jr., Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 438,065, Nov. 1, 1982. This application Nov. 24, 1986, Ser. No. 934,060
Int. Cl.[4] G01V *1/40*
U.S. Cl. 364—422 10 Claims



1. A method for surface-controlled generation of the number, order and frequency of geophysical measurements from at least one of a plurality of logging tools of a logging sonde transversing within a borehole, comprising the steps of:

storing a plurality of tables comprised of digital words in said sonde, each of said digital words corresponding to a different function to be performed by said at least one of said plurality of logging tools, each of said digital words comprising an address field corresponding uniquely to each of said plurality of logging tools and a command field corresponding uniquely to one of said different function

wherein the step of storing said plurality of tables comprises:

storing on said surface said plurality of tables;

transmitting a first of said tables of said sonde;

storing in said sonde said first table;

retrieving sequentially from said sonde in the order stored digital words comprising said first table;

transmitting said retrieved digital words to said surface;

comparing at said surface said retrieved and transmitted digital words with corresponding digital words from said first table stored at said surface;

transmitting a second of said tables to said sonde when a match is detected between said retrieved and transmitted digital words and corresponding digital words; and

transmitting said first table to said sonde in absence of said detected match;

generating at said surface in response to a first borehole depth location a first sequence command corresponding to a first of said tables;

transmitting said first sequence command to said sonde;

retrieving from storage within said sonde said first of said tables in response to said first sequence command;

sequentially delivering each of said digital words of said first table to said at least one logging tool;

activating said at lease one logging tool in response to said sequential delivery of said digital words of said first table to perform each of said different functions corresponding to each of said digital words of said first table;

generating at said surface in response to a second borehole depth location, a second sequence command corresponding to a second of said tables, said second of said tables having at least some digital words different from said digital words of said first table;

transmitting said second sequence command to said sonde;

retrieving from storage within said sonde said second of said tables in response to said second sequence command;

sequentially delivering each of said digital words of said second table to said at least one logging tool; and

activating said at least one logging tool in response to said sequential delivery of said digital words of said second table to perform each of said different function corresponding to each of said;

wherein each of said digital words of said first and second tables further include a multiplexer channel select field and wherein said activating of said at least one tool further includes selecting as a function of said multiplexer field one of a plurality of analog input measurements derived by said sonde for delivery to said surface.

4,718,012

CONTROL SYSTEM FOR DRIVE TRAIN INCLUDING CONTINUOUSLY VARIABLE TRANSMISSION

Katsunori Ochiage, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 22, 1985, Ser. No. 737,021
Claims priority, application Japan, May 23, 1984, 59-102641
Int. Cl.[4] B60K *41/18;* G05B *11/42;* G06G *7/25*
U.S. Cl. 364—424.1 12 Claims

1. A control system for a motor vehicle drive train including an engine and a continuously variable transmission drivingly connected to the engine, the continuously variable transmission having a shift actuator and being shiftable to a reduction ratio corresponding to an operating position of the shift actuator, comprising:

means for determining a target value of a predetermined representative parameter which varies with the reduction ratio of the continuously varaible transmission;

means for detecting an actual value of said predetermined representative parameter;

means for determining a deviation of the actual value from the target value and generating a devintion indicative signal;

means for integrating said deviation indicative signal to determine an integral control factor and generating an integral control factor indicative signal indicative of the integral control factor;

means for producing a proportional control factor indicative signal which is proportional to said deviation indicative signal;

means for generating a command signal in response to said integral control factor indicative signal and said proportional control factor indicative signal, said command signal having a first component based on said integral control factor indicative signal and having a second component based on said proportional control factor indicative signal and controlling the shift actuator in response to the command signal; and

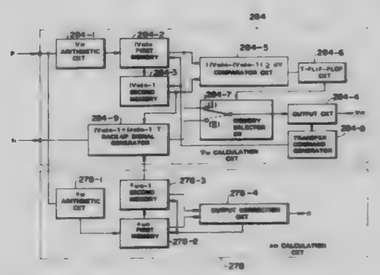
means responsive to said deviation indicative signal for adjusting said first component of said command signal such that said first component has a lower value when said deviation indicative signal has an absolute value which is greater than a predetermined value than when said deviation indicative signal absolute value is smaller than said predetermined value.

4,718,013

METHOD AND SYSTEM FOR DERIVING WHEEL ROTATION SPEED DATA FOR AUTOMOTIVE ANTI-SKID CONTROL

Kubo, Jun, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,327
Claims priority, application Japan, May 16, 1983, 58-84081
Int. Cl.[4] B60K *8/34*
U.S. Cl. 364—426 18 Claims



1. An anti-skid brake control system for a hydraulic automotive brake system, comprising:

hydraulic circuit including wheel cylinder for applying braking force;

a pressure control valve disposed within said hydraulic circuit and controlling fluid pressure to be applied to said wheel cylinder, said pressure control valve being operative to increase said fluid pressure in said wheel cylinder in a first position thereof, to decrease the fluid pressure in

said wheel cylinder in a second position thereof, and to hold the fluid pressure in said wheel cylinder at a substantially constant level in a third position thereof;
a wheel speed sensor producing sensor signal pulses separated by intervals, said intervals corresponding to wheel speed;
a timer means for producing timer signals;
a first means for sampling values of the timer signals in response to said sensor signal pulses;
a second means for periodically deriving a wheel speed value from said sampled timer signal values;
a memory means for storing at least a first wheel speed value most recently derived and a second wheel speed value derived immediately preceding a wheel speed derivation cycle by said second means;
a third means connected to said memory means for receiving said first and second wheel speed values, comparing the first and second wheel speed values for deriving a difference therebetween and for producing a fault signal when the difference therebetween is greater than a predetermined value;
a memory control means, associated with said third means and said memory means, for updating said memory means every time a new first wheel speed value is derived to replace said second wheel speed value with the former first wheel speed value, said memory control means being responsive to said fault signal for clearing said first wheel speed value to disable updating of said second wheel speed value and maintaining the already stored second wheel speed value, said memory control means further setting a fault flag for updating said second wheel speed value with a fresh first wheel speed value and resetting said fault flag when said fresh first wheel speed value is derived under the presence of said set fault flag;
a fourth means for normally outputting a wheel speed value corresponding to said first wheel speed value stored in said memory means, and responsive to said fault signal, for reading said second wheel speed value for producing a back-up signal corresponding to said second wheel speed value, and responsive to the presence of said fault flag to output said fresh first wheel value as said back-up signal, which is stored as said second wheel speed value; and
a fifth means for deriving anti-akid control parameters from said sampled timer signal values and derived wheel speed values and producing a control signal which actuates said pressure control valve to one of said first, second and third positions so as to adjust wheel speed toward a predetermined optimal relationship with vehicle speed.

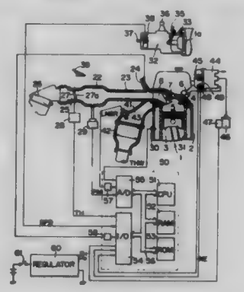
4,718,014

APPARATUS FOR CONTROLLING IGNITION TIMING IN AN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi; Takashi Hattori, and Kazuhiko Norota, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 2, 1985, Ser. No. 729,853
Claims priority, application Japan, May 7, 1984, 59-91594
Int. Cl.[4] F02P 5/08
U.S. Cl. 364—431.03 11 Claims

1. An apparatus for controlling an ignition timing in a spark ignition internal combustion engine for a vehicle having a manually operated type transmission device, speed apparatus comprising:
first detecting means for detecting an engine speed;
first calculating means, connected to said first detecting means, for calculating a second order differentiation on said engine speed sensed by the first detecting means, to detect a reduction in said engine speed;
second detecting means for detecting an initial movement of the vehicle;
second calculating means for calculating a basic ignition timing in accordance with at least one engine operating condition;
gate means for issuing a signal which is indicative of a rapid engagement of said manually operated transmission device, upon a detection of said reduction in engine speed and a detection of said initial movement of the vehicle;
correction means responsive to said signal from said gate means for correcting said basic ignition timing calculated by the second calculating means to obtain an advanced



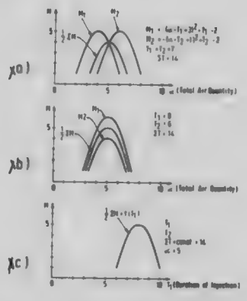
ignition timing value which is advanced with respect to said basic ignition timing to increase engine torque under such conditions and enable a smooth initial movement of the vehicle; and
means for generating a spark arc at the calculated ignition timing in order to cause the ignition to take place at the proper timing.

4,718,015

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Ferdinand Grob, Besigheim, and Josef Wahl, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,973
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429525
Int. Cl.[4] F02M 51/00
U.S. Cl. 364—431.05 22 Claims



1. Method for controlling operating characteristic quantities of a multi-cylinder internal combustion engine with a control strategy for optimizing the efficiency of the engine, the method and control strategy comprising:
a first step of generating time dependent signals for modifying the air ratio lambda of the operating mixture conducted to at least any two desired groups of cylinders wherein each group includes at least one cylinder, said air ratio lambda being modified for one cylinder group in a direction so as to lean the operating mixture and said air ratio lambda being modified for an other cylinder group in a direction so as to enrich the operating mixture while at the same time holding the mean air ratio of the operating mixture conducted to all cylinders at least approximately constant;
a second step of detecting the reaction of the engine to said signals as manifested by a change of an output quantity; and,
a third step of influencing the efficiency of the individual cylinder groups of the engine pursuant to the results of the second step.

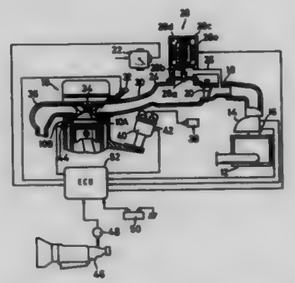
22. Apparatus for carrying out a method of controlling operating characteristic quantities of a multi-cylinder internal combustion engine with a control strategy for optimizing the efficiency of the engine, the apparatus comprising:
microcomputer and peripheral equipment means for optimizing the efficiency of the engine;
first function means for generating time-dependent signals for modifying the air ratio lambda of the operating mixture conducted to at least any two desired groups of cylinders wherein each group includes at least one cylinder, said first function means including means for modifying said air ratio lambda for one cylinder group in a direction so as to lean the operating mixture and said air ratio lambda being modified for another cylinder group in a direction so as to enrich the operating mixture while at the same time holding the mean air ratio of the operating mixture conducted to all cylinders at least approximately constant;
second function means for detecting the reaction of the engine to said signals of said first function means as manifested by a change of an output quantity; and,
third function means for influencing the efficiency of the individual cylinder groups of the engine pursuant to the results obtained from said second function means.

4,718,016

METHOD OF AND SYSTEM FOR CONTROLLING IDLING SPEED IN ELECTRONICALLY CONTROLLED ENGINE

Toshiaki Sado, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 547,926, Nov. 2, 1983, abandoned. This application Jul. 14, 1986, Ser. No. 884,905
Claims priority, application Japan, May 10, 1983, 58-81288
Int. Cl.[4] F02D 33/00
U.S. Cl. 364—431.07 9 Claims



1. In a system of the type including an internal combustion engine, means for converting rotational energy produced by said engine to movement of a vehicle, and means for automatically controlling said engine to idle at a predetermined idle speed whenever said vehicle is stationary, an improvement comprising:
means for sensing the velocity of said vehicle;
means for sensing at least one engine operating parameter including air sensing means for sensing the amount of air delivered to said engine and angular velocity sensing means for sensing the angular velocity of the rotational energy produced by said engine; and
further automatic control means for inhibiting said automatic idle control means from operating whenever the velocity of said vehicle sensed by said velocity sensing means is zero and a vehicle moving condition is determined from the amount of air sensed by said air sensing means, said amount of air exceeding a predetermined amount, and the angular velocity sensed by said angular velocity sensing means, said angular velocity falling within a predetermined range.

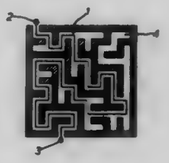
4. In a system of the type including an internal combustion engine, means for converting rotational energy produced by said engine to the transmission of a vehicle, and means for automatically controlling said engine to idle at a predetermined idle speed whenever said vehicle is stationary, a method comprising the steps of:
(1) sensing the velocity of said vehicle;
(2) determining, in response to said sensing at step (1), whenever the velolity of said vehicle is zero;
(3a) sensing the amount of air delivered to said engine;
(3b) sensing the angular velocity of the rotational energy produced by said engine;
(4) determining that said vehicle is moving whenever the amount of air sensed at step (3a) exceeds a predetermined amount and the angular velocity sensed at step (3b) falls within a predetermined range; and
(5) inhibiting said automatic idle control means from operating whenever said determining step (2) determines that said vehicle velocity is zero and said determining step (4) determines that said vehicle is moving.

4,718,017

METHOD OF PRODUCING A PATTERN-BEARING ARTICLE

Geoffrey Hutton, and Robert Rostron, both of 42 Claremont Road, Surbiton, Surrey, BA1 6LX, Great Britain

PCT No. PCT/GB84/00364, § 371 Date Aug. 28, 1985, § 102(e) Date Aug. 28, 1985, PCT Pub. No. WO85/02043, PCT Pub. Date May 9, 1985
PCT Filed Oct. 29, 1984, Ser. No. 754,332
Claims priority, application United Kingdom, Oct. 28, 1983, 8328909
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—470 18 Claims



1. A method of producing a maze-like pattern, said method comprising the steps of,
a. defining an array of location,
b. defining a starting location within the array,
c. randomly or pseudo-randomly defining the directions of successive incremental steps of a continuous solution path extending from said starting location, and storing said directions in corresponding cells of the array,
d. driving an output device in response to the contents of cells of the array whereby a maze-like pattern is generated, each of the cells of which is configured as a result of testing the contents of a corresponding array cell and its neighbours on two orthogonal sides.

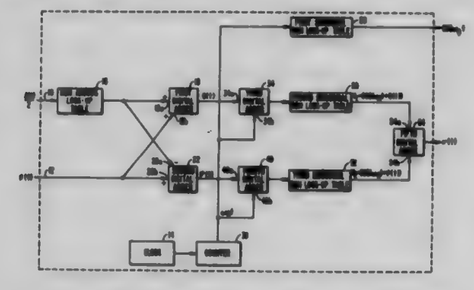
VOL 1086 ISS 1 JA 5 1988 UMI

4,718,018

DIGITAL METHOD FOR SYNTHESIZING COMPOSITE VIDEO SIGNALS

Edwin A. Sloane, Los Altos; Kai Y. Chan, Milpitas, and David D. Yau, San Jose, all of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Nov. 21, 1985, Ser. No. 800,472
Int. Cl.[4] G06F *15/20*; H04N *17/00*
U.S. Cl. 364—480 5 Claims



5. A system for generating a digital test signal that receives first and second input digital data signals $A(t_n)/2$ and $\phi(t_n)$, said system comprising:

a first system input port for accepting said first input digital data signal;

a second system input port for accepting said second input digital data signal;

an inverse sinusoidal transformation ROM look-up table having an input port connected to said first system input port for accepting said first input digital data signal, for utilizing said first input digital data signal to address a storage location with the value inv sinusoid $(A(t_n)/2)$ stored therein, and for transferring the value inv sinusoid $(A(t_n)/2)$ to an output port to form an output digital data signal equal to inv sinusoid $(A(t_n)/2)$;

a first digital adder, with a first addition input port connected to the output port of said inverse sinusoidal transformation ROM look-up table and with a second addition input port connected to said second system input port, for generating first digital phase signal equal to a sum of the signals at its first and second addition input ports, and for transferring said first digital phase signal to an output port;

a digital subtracter having a first input port connected to the output of said inverse sinusoidal transformation ROM look-up table and a second input port connected to said second system input port for generating a second digital phase signal equal to a difference of the signals at its first and second input ports, and for transferring said second digital phase signal to an output port;

a digital counter for providing a digital linear ramp signal equal to $\omega_o t_n$ at an output port;

a third digital adder having a first addition input port connected to the output port of said first digital adder and a second addition input connected to the output of said digital counter for generating a first digital argument signal equal to a sum of the signals at its first and second addition input ports, and for transferring said first digital argument signal to an output port;

a fourth digital adder having a first addition input port connected to the output port of said digital subtractor and a second addition input connected to the output of said digital counter, for generating a second digital argument signal equal to a sum of the signals at its first and second addition input ports, and for transferring said second digital argument signal to an output port;

a first sinusoidal ROM lookup table having its input connected to the output port of said third digital adder, for accepting the digital output signal from said third digital adder at an input port, and for utilizing this output signal to address a storage location with the value sinusoid $(\omega_o t_n+\theta(t_n))$ stored therein, and for transferring the value sinusoid $(\omega_o t_n+\theta(t_n))$ to an output port to generate a first digital sinusoid data signal;

a second sinusoidal ROM look-up table having its input port connected to the output port of said fourth digital adder, for accepting the digital output signal from said fourthe digital adder at an input port, and for utilizing this output signal to address a storage element location with the value sinusoid $(\omega_o t_n+\psi(t_n))$ stored therein, and for transferring the value sinusoid $(\omega_o t_n+\psi(t_n))$ to an output port to generate a second sinusoid; and

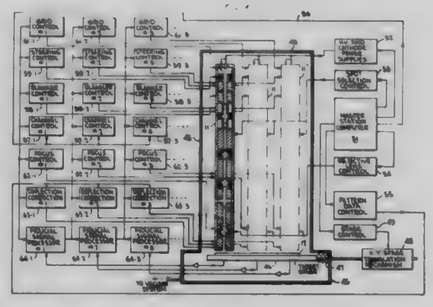
a digital combiner with a first input port connected to the output port of said first sinusoidal ROM look-up table and having a second input port connected to the output port of said second sinusoidal ROM look-up table, for combining said first and second digital sinusoidal data signals to generate a digital test signal equal to $V(t_n)=A(t_n)\cdot$ $\cdot$sinusoid$(\omega_o t_n+\phi(t_n))$.

4,718,019

ELECTION BEAM EXPOSURE SYSTEM AND AN APPARATUS FOR CARRYING OUT A PATTERN UNWINDER

Timothy I. Fillion, Burlington; Marc L. Bergeron, Bedford, and Andrey Varpahovsky, Brookline, all of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 749,644
Int. Cl.[4] H01J *37/00*; G06F *15/40*
U.S. Cl. 364—491 15 Claims



1. A method of exposing a predetermined pattern at a target plane to an electron beam that is momentarily flashed on at each of plural exposure locations within the predetermined pattern until the predetermined pattern is entirely exposed, said method comprising the steps of:

(a) storing pattern data representing said predetermined pattern, said pattern data specifying the location, size and shape of the predetermined pattern on the target plane;

(b) in response to the pattern data for said predetermined pattern, determining the beam spot sizes, shaped and exposure locations on the target plane required to expose the predetermined pattern;

(c) sequentially deflecting the electron beam to each of said exposure locations in turn; and

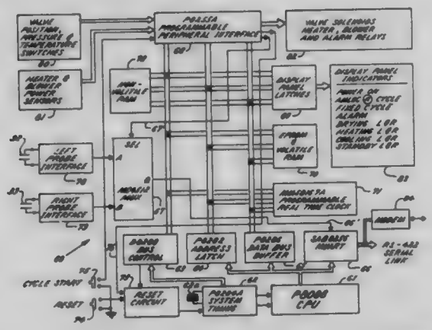
(d) at each exposure location attained in step (c), momentarily exposing the beam on said target surface and shaping the beam top expoee only the beam spot shape determined in step (b) for that exposure location.

4,718,020

FAULT RECOVERY PROCEDURE FOR HEAT-REACTIVATED DRYER

Michael B. Duich, Bellview; Bradley T. Overton, and Marcel G. Verrando, III, both of Ocala, all of Fla., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 30, 1985, Ser. No. 739,567
Int. Cl.[4] B01D *53/04*
U.S. Cl. 364—500 23 Claims



1. A method of operating a microcomputer for controlling a gas adsorber of the kind having a first desiccant bed and a second desiccant bed, gas including vapor to be adsorbed being alternately directed by valves to pass through one of the beds providing adsorption of said vapor until its adsorption capacity is reached while the other desiccant bed is regenerated by the application of heat and purge gas for at most a predetermined regeneration time interval and is thereafter placed in an idle condition, said microcomputer executing a stored program for controlling said adsorber and having a watchdog timer for resetting the microcomputer to restart execution at an initial point in said program in the event that execution is disrupted, and having a non-volatile memory,

said method providing recovery in the event that the execution is disrupted and including the steps of:

during the execution of said stored program, storing in said non-volatile memory an indication of which bed is providing adsorption of vapor and the time elapsed during regeneration, and

after said initial point in said program and in response to said resetting of the microcomputer, reading the non-volatile memory to obtain said indication of the bed providing adsorption of vapor and baed on said indication of which bed is providing adsorption setting said valves to resume adsorption in the indicated bed, reading the non-volatile memory to obtain said time elapsed during regeneration, and based on said elapsed time selectively applying said heat and applying said purge gas in the event that said elapsed time does not exceed said regeneration time interal and removing the application of heat and the application of said purge gas in the event that said elapsed time exceeds said regeneration time.

4,718,021

TECHNIQUE FOR FAN CYCLING TO MAINTAIN TEMPERATURE WITHIN PRESCRIBED LIMITS

Stanley W. Timblin, #4 Forest Hill Ct., Greensboro, N.C. 27410

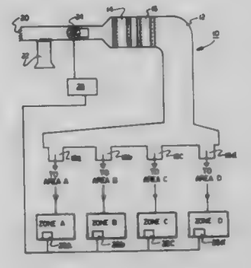
Filed Sep. 20, 1985, Ser. No. 778,602
Int. Cl.[4] G06F *15/20*; G06G *7/68*; G05D *23/00*; F24F *3/00*
U.S. Cl. 364—505 8 Claims

5. Method for maintaining the temperature of a serviced zone within prescribed limits with HVAC equipment of the type including an air supply fan which provides a controlled, variable air input to a set of cooling/heating coils or to an air washer comprising the steps of:

(a) setting prescribed cycle periods within which periods said fan is operative and inoperative, said cycle periods having a minimum fan run time to maintain fresh air within said serviced zone;

(b) setting a prescribed limit temperature and a balance temperature for a served by the HVAC system;

(c) measuring the average temperature in said zone during a prescribed current cycle to determine an actual temperature for said current cycle;



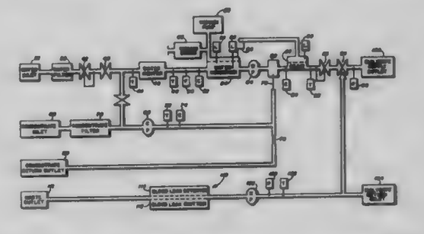
(d) comparing said actual temperature in said current cycle with said balance temperature; and, automatically adjusting by a computer the amount of time during the succeeding cycle that said fan is operative responsive in direct proportion to the difference between said actual temperature for said current cycle and said prescribed balance temperture.

4,718,022

DIALYSIS MACHINE WHICH ANTICIPATES CONCENTRATION CHANGES

Michael J. Cochran, 16178 Greenwood Rd., Monte Sereno, Calif. 95030

Filed Feb. 21, 1985, Ser. No. 704,053
Int. Cl.[4] G01F *25/00*; B01D *13/00*
U.S. Cl. 364—510 16 Claims



1. In a dialysis machine for supplying dialysate to an artificial kidney at a selected flow rate, comprising:

water supply means for supplying water at a water flow rate related to the selected flow rate;

concentrate supply means for supplying dialysate concentrate at a rate proportional to a concentrate flow rate signal;

mixing means for supplying the dialysate to the artificial kidney by mixing the water supplied by the water supply means with the concentrate supplied by the concentrate supply means;

dialysate conductivity sensing means for providing a dialysate conductivity signal having a value proportional to the conductivity of the dialysate supplied to the artificial kidney by the mixing means; and

concentrate flow rate control means for providing the concentrate flow rate signal to the concentrate supply means in proportion to a concentrate flow rate control signal the value of the concentrate flow rate control signal being

selectively varied in response to changes in the value of the dialysate conductivity signal;

the improvement comprising:

concentrate conductivity sensing means for providing a concentrate conductivity signal having a value proportional to the conductivity of the concentrate supplied by the concentrate supply means; and

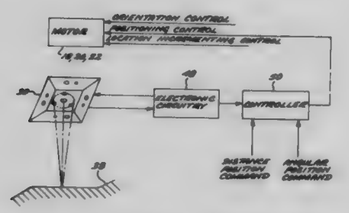
conductivity compensation means for selectively varying the value of the dialysate conductivity signal provided to the concentrate flow rate control means by the dialysate conductivity sensing means in proportion to the value of the concentrate conductivity signal.

4,718,023

ULTRASONIC APPARATUS FOR POSITIONING A ROBOT HAND

Arvind Arora, Moorpark, Calif., assignor to Photo Acoustic Technology, Inc., Newbury Park, Calif.

Filed Nov. 27, 1984, Ser. No. 675,424
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—513 **1 Claim**



1. Apparatus for positioning a movable portion of a robot device with respect to a surface, comprising:

an approximate positioning subsaystem, including,

means for emitting at least two non-colinear approximate positioning signals,

means for receiving a response signal, if any, resulting from the striking of the approximate positioning signals on the surface, said means for receiving being mounted on the movable portion of the robot device,

means for detecting the presence of a first received response signal,

means for adjusting the movable portion of the robot device into an approximate facing relationship to the detected first received response signal; and

a precision positioning subsystem operable when the movable portion is in an approximate facing relationship to the surface, including,

means for emitting a precise positioning signal toward the surface;

means for receiving a return signal originating at the surface as a result of the precise positioning signal striking the surface, said means for receiving being mounted on the movable portion of the robot device and including at least two signal receivers,

means for comparing the times of flight of the return signals received by said signal receivers on a pair-wise basis to create a comparison signal, and

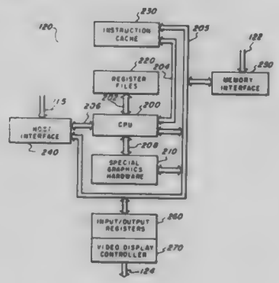
means for adjusting the movable portion of the robot device to maintain predetermined values of the comparison signal.

4,718,024

GRAPHICS DATA PROCESSING APPARATUS FOR GRAPHIC IMAGE OPERATIONS UPON DATA OF INDEPENDENTLY SELECTABLE PITCH

Kari Guttag, Houston; Mike Asal, Sugarland, both of Tex., and Mark Novak, Colorado Springs, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1985, Ser. No. 795,158
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—518 **33 Claims**



1. A graphics data processing apparatus comprising:

an image memory for storing an image represented by an array of pixels stored at selected memory addresses within said image memory and arranged in a plurality of sequences of memory addresses, the pixels in each sequence corresponding to positions within a row of said image;

a source pitch register memory for storing a number corresponding to the number of memory addresses in said image memory from the start of one of said sequences to the start of the next sequence;

a display memory storing a display represented by an array of pixels stored at selected memory addresses within said display memory and arranged in a pluralty of sequences of memory addresses, the pixels in each sequence corresponding to positions within a row of said display;

a destination pitch register memory for storing a number corresponding to the number of memory addresses in said display memory from the start of one of said sequences to the start of the next sequence; and

an array image operator connected to said image memory, said source pitch register memory, said display memory and said destination pitch register memory for (a) calculating the memory address of a pixel stored in said image memory and the memory address of a corresponding pixel stored in said display memory, (b) recalling the contents of the pixel of said image memory and the contents of the corresponding pixel of said display memory, (c) combining said recalled contents according to a selected operation, (d) storing the results of said operation in said memory address of said corresponding pixel of said display memory, and (e) if said pixel of said image memory is at the end of a sequence, calculating the next memory address of said image memory and of said display memory using the values stored in said source pitch register memory and said destination pitch register memory, respectively.

4,718,025

COMPUTER MANAGEMENT CONTROL SYSTEM

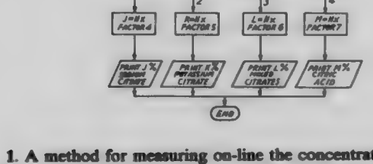
Paul S. Minor, and Charles S. Matheny, both of Fairfax County, Va., assignors to Centec Corporation, Reston, Va.

Filed Apr. 15, 1985, Ser. No. 723,496
Int. Cl.⁴ G01F *15/06*
U.S. Cl. 364—550 **30 Claims**

1. A monitoring system for recording and maintaining records of operation conditions sensed by a plurality of sensors that detect various states relating to a process being monitored, said monitoring system comprising:

input means arranged to be coupled to a plurality of sensors for monitoring the states of such sensors;

logging means for periodically reading the states of various sensors and storing information relating to each such sensor state in a database storage means both as direct sensor readings and as derived sensor information calculated from readings of the sensor states of certain of the sensors;



database storage means for storing information received from said logging means relating to the reading of each sensor state;

display generating means for generating information to be displayed from the database storage means on a display means; and

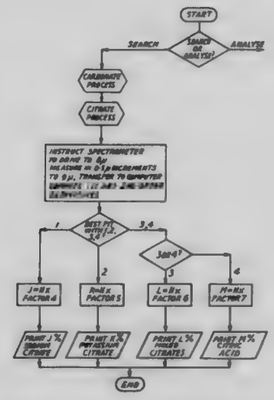
control means for controlling operation of said logging means for selecting which of the sensors should be read, determining when said selected sensor should be read and deciding whether the readings from each selected sensor should be stored as a direct value or used for calculating a derived value that should be stored in said database storage means.

4,718,026

MONITORING SHEET MATERIAL

Terence M. Long; David J. Newman, and Peter D. Thomas, all of Bristol, England, assignors to Imperial Group, PLC, London, England

Filed May 25, 1984, Ser. No. 614,171
Int. Cl.⁴ G06F *15/20, 15/353*
U.S. Cl. 364—550 **5 Claims**



1. A method for measuring on-line the concentration of an additive selected from the group consisting of calcium carbonate, sodium citrate, potassium citrate and calcium citrate in a web of cigarette paper, the method comprising the steps of:

passing first and second beams of radiation at respective first and second wavelengths in the mid-infra red spectral range through the web, the first and second wavelengths being wavelengths at which the infra red absorbance of the additive is at a maximum and a minimum, respectively,

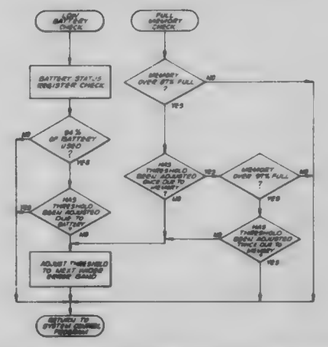
measuring the infra red optical densities of the web at the first and second wavelengths, and generating first and second signals indicative of the respective optical densities at the first and second wavelengths, the difference between the first and second signals being indicative of the concentration of the additive in the web.

4,718,027

DYNAMICALLY ADJUSTABLE LINEAR DATA DISCRIMINATOR

John M. Richardson, and Richard L. Duncan, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 28, 1985, Ser. No. 792,100
Int. Cl.⁴ G01V *1/40, 1/24;* G06F *15/00*
U.S. Cl. 364—554 **12 Claims**



1. A method of selecting, for storage in a memory, data representing nonlinear changes in a monitored parameter, comprising:

monitoring a parameter to obtain a signal representing a measurement of the parameter;

converting the signal into a measurement response, Z, representing the deviation of the measurement of the parameter from a hypothetical straight line;

determining a linear region within an allowable variation from the hypothetical straight line, including:

selecting a relative cost, C, between a false alarm event, wherein a measurement response resulting from inherent randomness would be saved, and a miss event, wherein a measurement response resulting from a true nonlinear change in the monitored parameter would not be saved;

defining a first probability, P_{H0}, that a measurement response is the result of inherent randomness;

defining a second probability, P_{H1}, that a measurement response is the result of a true change in the monitored parameter; and

defining from the relative cost, the first probability and the second probability an offset value, X, as the allowable variation by which the linear region is determined;

comparing the measurement response Z and the offset value X to determine when Z is greater than X and thus to determine when Z is outside the linear region so that Z then represents a nonlinear change in the monitored parameter; and

storing Z in the memory when Z is greater than X.

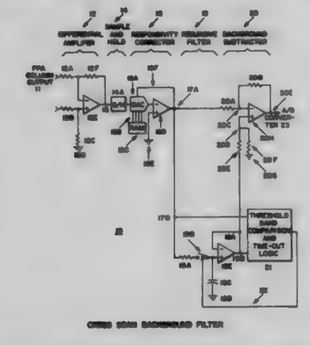
VOL 1086 ISS 1 JA 5 1988 UMI

4,718,028

EXTREMELY HIGH SPEED, REAL-TIME BACKGROUND FILTER FOR RADIATION DETECTORS

Edward L. Gassia, Agoura; Richard E. Barney, Anaheim; J. Brian Murphy, Marina Del Rey; Carl G. Pfeiffer, Hermosa Beach, and Richard L. Hedden, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 18, 1986, Ser. No. 830,392
Int. Cl.[4] H03H *9/46*
U.S. Cl. 364—572 11 Claims



CRBB SOAR BACKGROUND FILTER

3. Apparatus for providing an extremely high speed, real-time background filter for a plurality of radiation detectors comprising:

interface means for receiving a plurality of signals from a plurality of radiation detectors and amplifying said plurality of signals to produce an interface means output signal;

recursive extraction and temporary storage means coupled to said interface means output signal for repetitively and periodically eliciting and maintaining a signal level from said interface means and for defining an interval of time related to each one of a plurality of evaluation cycles;

normalization means having an input coupled to said recursive extraction and temporary storage means for generating a plurality of compensated signals by compensating each of said plurality of signals for disparities among said plurality of signals due to systemic variations within said plurality of detectors;

disjunction means coupled to said normalization means for generating a disjunction means output signal expressive of an undesired background radiation signal component of said compensated signals;

threshold window means coupled to said normalization means and to said disjunction means for sensing operative values of said plurality of compensated signals and for disengaging said disjunction means if one of said compensated signals has a value outside of a preselected range of values defining a threshold window;

cyclical reset means coupled to said threshold window means and to said disjunction means for re-engaging and resetting said disjunction means when one of said plurality of compensated signals falls outside of said threshold window and also when said recursive extraction and temporary storage means cycles through a predetermined number of said evaluation cycles; and

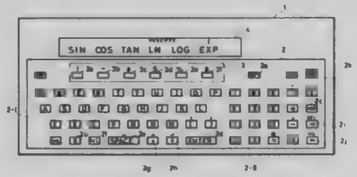
output signal generation means comprising a signal subtraction means coupled to an output of said normalization means, to an output of said disjunction means, and to said threshold window means, said subtraction means being operable for producing an output signal that does not include said undesired background radiation signal portion of said plurality of compensated signals, said undesired background radiation portion being removed from each of said compensated signals by said signal subtraction means subtracting said disjunction means output signal from each of said compensated signals.

4,718,029

DISPLAY DEVICE FOR A PROGRAMMABLE ELECTRONIC CALCULATOR

Masuaki Morino, Kyoto; Yoshiyuki Fujikawa; Isamu Haneda, both of Nara, and Tetsuo Myoi, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 442,232, Nov. 16, 1982, abandoned.
This application Jan. 6, 1986, Ser. No. 816,688
Claims priority, application Japan, Nov. 18, 1981, 56-186207; Nov. 25, 1981, 56-189506
Int. Cl.[4] G06F *3/147*
U.S. Cl. 364—710 4 Claims



1. A programmable electronic calculator having a plurality of operational modes including a reserve mode, a program mode and a run mode, said program mode permitting input of a program consisting of program information, said run mode permitting operation of the program of the calculator;

mode selection means for permitting an operator to select one of the plurality of operational modes for said calculator;

keyboard means containing a plurality of key switches for inputting specific items of reserve information associated with the operation of the program of the calculator, said reserve information being input in the reserve mode, said key switches also inputting said program information during the program mode, said information input depending upon the mode selected by the mode selection means;

reserve keys associated with each specific item of reserve information, each specific item of reserve information consisting of a selected sequence of said key switches;

display means for selectively displaying a plurality of at least one of said specific items and representations of said specific items of reserve information when said calculator is in the reserve mode, said display means additionally displaying at least a portion of said program information when said calculator is in said program mode; and

display controller means for enabling said display means to display at least one of said specific items and said representations of said specific items of said reserve information when said calculator is in the program mode.

4,718,030

INTERPOLATED VALUE COMPUTING DEVICE FOR A WAVEFORM GENERATED IN AN ELECTRONIC DEVICE

Kenichi Tsutsumi, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

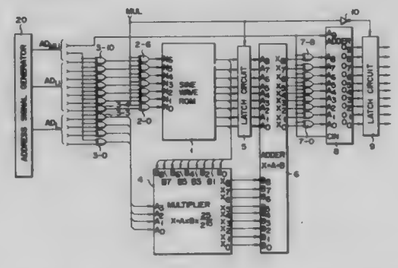
Filed Dec. 21, 1984, Ser. No. 684,706
Claims priority, application Japan, Jan. 7, 1984, 59-1104
Int. Cl.[4] G06F *1/02, 7/38*
U.S. Cl. 364—721 13 Claims

1. A device for computing interpolated values of a waveform generated in an electronic device, comprising:

means for generating an address signal containing upper bits and lower bits;

memory means for outputting first type wave data representing at least ¼ period of one of two periodic sinusoidal waves comprising a sine wave and a cosine wave, upon receipt of an upper bit signal of said address signal from said address signal generating means, and for outputting second type wave data representing at least ¼ period of the other periodic sinusoidal wave upon receipt of a bit signal obtained by a predetermined operation on said upper bit signal;

interpolated data computing means, connected to said address signal generating means and said memory means, for computing interpolated data by multiplying the lower bit signal from said address signal generating means and said second type wave data outputted from said memory means; and



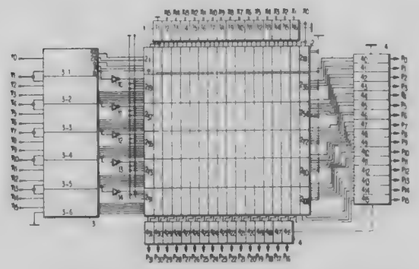
amplitude value computing means, connected to said memory means and said interpolated data computing means, for computing an amplitude value of the sinusoidal wave, corresponding to an address signal from said address signal generating means, upon receipt of said first type wave data outputted from said memory means and the interpolated data computed by said interpolated data computing means according to said second type wave data outputted from said memory means.

4,718,031

MULTIPLYING CIRCUIT

Tomoji Nukiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,652
Claims priority, application Japan, Feb. 2, 1984, 59-17341
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—754 4 Claims



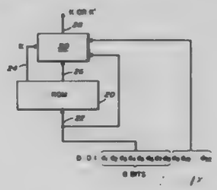
1. A multiplying circuit comprising a first means receiving a multiplicand X, a second means coupled to said first means and producing 3X correaponding to three times said multiplicand X in response to the reception of said multiplicand X, a third means receiving a multiplier Y, a fourth means coupled to said third means and generating at least five signals by decoding said mulltiplier Y, a first signal designating zero, a second signal designating X, a third signal designating 2X, a fourth signal designating 3X, a fifth signal designating 4X, a fifth means coupled to said first and fourth means and producing data 0, X, 2X and 4X according to said first, second, third and fifth signals, a sixth means producing a total sum according to said data 0, X, 2X, 3X and 4X, and seventh means coupled to said second, fourth and sixth means for applying said data 3X to said sixth means when said fourth signal is generated from said fourth means.

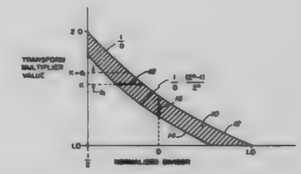
4,718,032

METHOD AND APPARATUS FOR EFFECTING RANGE TRANSFORMATION IN A DIGITAL CIRCUITRY

Suren Irukulla, Holliston, and Bimal V. Patel, Framingham, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1985, Ser. No. 701,573
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—765 22 Claims





22. Apparatus for effecting a range transformation of a divisor D of a division calculation, the divisor having a normalized representation, to a range transformed value X, where the magnitude of (X−1) is less than 2^{-n} where n is the number of ones following the decimal point when X has the form 0.111—1 and where n is the number of zeros following the decimal point when X has the form 1.000—0, said apparatus comprising

read-only-memory means for generating at least one transform multiplier value K from a first high order "q" digits of D, K having a precision of "p" bits,

said read-only-memory means further including means for generating an out-of-range indicator signal from said at least first, high order "q" digits of D,

means for modifying said generated transform multiplier value K in response to said out-of-range indicator signal when an out-of-range condition is indicated, by selecting a value K which is different than said generated value K by a selected predetermined incremental quantity,

said modifying means further being responsive to a plurality of lower order digits of said divisor for generating a selection signal for selecting between the generated multiplier value K and the value K, and

wherein "q" satisfies the equation $(n+2) \leqq q \leqq 2n$ and $p=n$.

4,718,033

INTERMEDIATE DECIMAL CORRECTION FOR SEQUENTIAL ADDITION

Terrence C. Miller, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 28, 1985, Ser. No. 750,116
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—771 1 Claim

1. Apparatus for performing a sequence of repeated addition operations on a multiplicity of binary coded operands, said apparatus comprising:

addition means for receiving the multiplicity of operands, one at a time, in serial fashion and for receiving a prebiasing value, each operand comprising a plurality of binary coded digits, said addition means including a plurality of units, each unit corresponding to one digit of said plurality of digits.

Input means for inputting a multiplicity of add signals, each unit of said plurality of units responsive to a first add signal of said multiplicity of add signals for receiving one digit of said plurality of digits comprising a first operand of said multiplicity of operands and for receiving a binary coded digit representing said prebiasing value and for adding said received digits to produce and retain one digit of a first intermediate resultant, and each unit receiving one digit of a second operand of said multiplicity of operands for adding said digit to the digit of the first intermediate resultant to produce and retain one digit of a subsequent intermediate resultant.

each unit of said plurality of units responsive to subsequent add signals of said multiplicity of add signals to receive one digit from a subsequent operand of said multiplicity of



II

operands for adding said digit to the digit of the intermediate resultant contained within each of said units to provide and retain one digit of a subsequent intermediate result;

a plurality of output means, each of said plurality of output means coupled to and associated with one unit of said plurality of units, each of the output means for providing a carry signal, said carry signal indicative of a carry from the associated unit into an adjacent unit;

register means coupled to said plurality of output means including a plurality of storage cells, each storage cell coupled to one of the output means for storing the carry signal from the associated unit; and

feedback means coupled to said register means and to said addition means for providing a control signal, said addition means responsive to the control signal for selectively adding a binary coded digit representing said prebiasing value to each digit of the intermediate resultant contained in the units which carried to an adjacent unit during the immediately previous addition operation, said control signal derived from said carry signals stored in the register means.

4,718,034

CARRY-SAVE PROPAGATE ADDER

Nabil Takla, San Jose, Calif.; Mark Hecker, Northborough, Mass.; Robert Murdoch, Sacramento, Calif.; Raymond Chu, Milpitas, Calif., and Rajesh Parekh, San Jose, Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 8, 1984, Ser. No. 670,401
Int. Cl.[4] G06F *7/50, 7/52*
U.S. Cl. 364—784 **10 Claims**

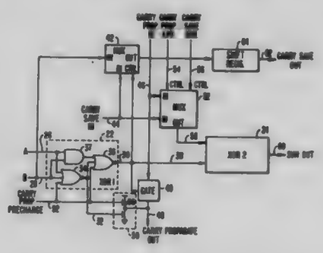
1. A binary adder for adding a first bit, a second bit, and a carry bit of binary data to provide a sum output and a carry propagate output, comprising

first logic means receiving the first and second bits of binary data for providing an output which is the logical exclusive-OR thereof, wherein the first logic means include

third logic means responsive to the first and second bits of binary data for providing an output which is a logical NOR thereof;

second logic means receiving the carry bit and coupled to the output of the first logic means for providing the sum output, wherein the sum output is the logical exclusive-OR of the carry bit and the output of the first logic means;

switch means receiving the carry bit and coupled to the first logic means for propagation the carry bit as a function of the logic state of the output of the first logic means; and



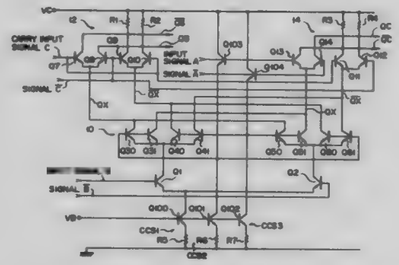
propagate output means coupled to the switch means and to the third logic means for providing the carry propagate output wherein the switch means propagates the carry bit as a function of the logic state of the output of the first logic means and as a function of the logic state of the output of the third logic means.

4,718,035

LOGIC OPERATION CIRCUIT HAVING AN EXCLUSIVE-OR CIRCUIT

Hiroyuki Hara, Tokyo, and Yasuhiro Sugimoto, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 15, 1985, Ser. No. 734,078
Claims priority, application Japan, May 24, 1984, 59-105116
Int. Cl.[4] G06F *7/50;* **H03K** *19/21*
U.S. Cl. 364—784 **4 Claims**



1. A logic operation circuit comprising:

an exclusive-OR circuit for generating first and second output signals which are inverted to each other in accordance with first and second input signal;

a sum signal selection circuit having first and second differential amplifier circuits which each include a plurality of transistors having emitter-collector paths connected between a power source terminal and the output terminals of said exclusive OR circuit and are driven by the first and second output signals from said exclusive-OR circuit to generate a sum signal in accordance with a carry input signal; and

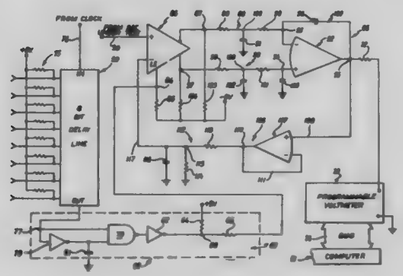
a carry output signal selection circuit including a third differential amplifier circuit driven by the first output signal from said exclusive-OR circuit to generate a carry output signal in accordance with the first input signal, and a fourth differential amplifier circuit driven in accordance with the second output signal from said exclusive-OR circuit to generate the carry output signal in accordance with the carry input signal, each of said third and fourth differential amplifier circuits including a plurality of transistors having emitter-collector paths connected between the power source terminal and the output terminals of said exclusive-OR circuit.

4,718,036

COMPARATOR-INTEGRATOR LOOP FOR DIGITIZING A WAVEFORM

Joel M. Halbert, and Myron J. Koen, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Division of Ser. No. 543,853, Oct. 20, 1983, Pat. No. 4,641,246.
This application Oct. 28, 1985, Ser. No. 792,177
Int. Cl.[4] G06G *7/18;* **H03M** *3/02;* **H04B** *14/06*
U.S. Cl. 364—829 **9 Claims**



1. A comparator-integrator loop comprising:

a latching comparator with a signal input adapted for connection to the output of a device under test;

an operational amplifier with its output coupled to a reference input of said comparator;

an integrating capacitor that couples said amplifier output to the inverting input of said amplifier, whereby said amplifier and capacitor form an integrator;

filter means disposed between an output of said comparator to the inverting input of said amplifier for rounding off signal spikes;

means for clocking a latch enable input of said comparator until the output of said amplifier is in an equilibrium state; and

means for establishing a current that flows into the input of said integrator.

4,718,037

MICROCOMPUTER CONTAINING EPROM WITH SELF-PROGRAM CAPABILITY

Robert C. Thaden, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 808,221, Dec. 12, 1985, abandoned, which is a continuation of Ser. No. 365,828, Apr. 5, 1982, abandoned. This application Mar. 26, 1987, Ser. No. 32,938
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **6 Claims**

1. An electronic digital processor system, comprising a microcomputer formed on a single integrated circuit, wherein said microcomputer comprises:

an electrically programmable read only memory means having a plurality of address locations, each such location for storage of data, or of an instruction which defines an operation upon data;

a data path connected to said electrically programmable memory means for transfer of data, commands and addresses;

external terminals, connected to said data path, for transfer of data to and from circuits external to said electronic digital processor system;

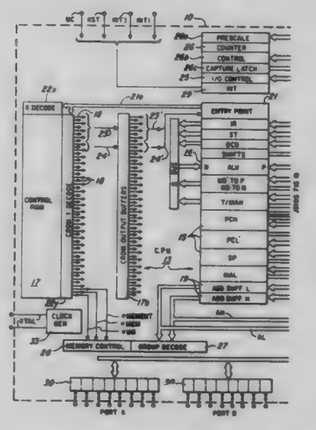
a register means connected to said data path having a plurality of separate registers for temporary storage of data and temporary storage of addresses for accessing a corresponding address location of said electrically programmable memory means;

storage means for storing microcode commands, said microcode commands comprising:

a first microcode sequence of microcode commands for controlling the connecting of said electrically programmable memory means to said external terminals via said data path so that it may be programmed with data presented to said external terminals; and

a second microcode sequence of microcode commands for controlling the programming of said electrically programmable memory means with the data stored in a first register of said register means;

arithmetic and logic means, connected to said data path and to said storage means, for performing operations upon



data received via said data path in accordance with instructions received from said electrically programmable memory means, for connecting said electrically programmable memory means to said external terminals so that it may be programmed with data presented to said external terminals in accordance with said first microcode sequence, and for programming said electrically programmable memory means with said data stored in said first register of said register means in accordance with said second microcode sequence; and

interrupt means, connected to said external terminals and to said arithmetic and logic means, for causing said arithmetic and logic means to begin execution of said first microcode sequence responsive to a first reset signal received at said external terminals, and for causing said arithmetic and logic means to begin execution of said second microcode sequence responsive to a second reset signal received at said external terminals.

4,718,038

DATA SECURITY DEVICE FOR STORING DATA AT A PERIPHERAL PART OF THE DEVICE DURING POWER DOWN THUS PREVENTING IMPROPER RETRIEVAL

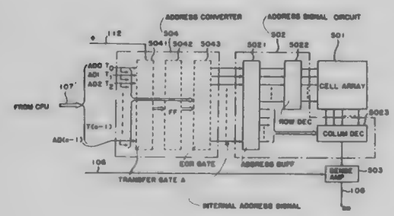
Masamoto Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

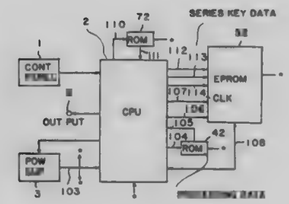
Filed Feb. 11, 1985, Ser. No. 700,176
Claims priority, application Japan, Feb. 23, 1984, 59-033018
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **14 Claims**

1. A memory system for storage protection comprising:

non-volatile memory means for storing key data;

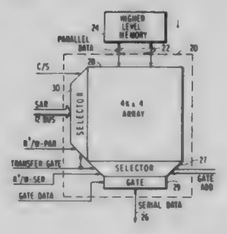
a programmable read only memory device connected to said non-volatile memory means, comprising:
a plurality of address input terminals for receiving external address data and key data;
a plurality of non-volatile memory cells for storing principal data;
volatile memory means, connected to said address input terminals, for storing key data;
address converting means, connected to said volatile memory means, for converting external address data received at said plurality of input terminals to internal address data in accordance with a logical operation between the key data and the external address data; and
means responsive to the internal address data, connected between said address converting means and said non-volatile memory means, for accessing said non-volatile memory cells to read out principal data stored therein; and
processing means, connected to said non-volatile memory means and said programmable read only memory device including said non-volatile memory cells, for processing





the reading of principal data from said non-volatile memory cells, comprising:
means responsive to initial power turn-on of said memory system, connected to said non-volatile memory means and said volatile memory means, for reading stored key data from said non-volatile memory means and supplying same to said volatile memory means for storage therein, said volatile memory means maintaining the storage of key data therein during continuous supply of power thereto, and the key data stored therein terminating upon cessation of the supply of power thereto; and
conversion means, connected to said address input terminals, for supplying external address data to said plurality of address input terminals in accordance with a selected sequence, said address converting means of said programmable read only memory device converting said external address data to internal address data, and for reading out principal data from said plurality of non-volatile memory cells, in accordance with the selected sequence.

4,718,039
INTERMEDIATE MEMORY ARRAY WITH A PARALLEL PORT AND A BUFFERED SERIAL PORT
Frederick J. Aichelmann, Jr., Hopewell Junction; William F. Shutler, Wappingers Falls, and Vincent F. Sollitto, Jr., Rhinebeck, all of N.Y., assignors to International Business Machines, Armonk, N.Y.
Filed Jun. 29, 1984, Ser. No. 626,564
Int. Cl.[4] G06F *13/00*; G11C *13/00*
U.S. Cl. 364—900 **7 Claims**

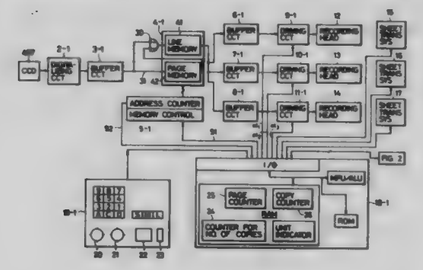


1. A memory chip for a hierarchical memory system, comprising;
a read/write memory array of a plurality of locations, each location consisting of a plurality of bits of number n;
means for addressing any of said locations;
a parallel bus connected between said read/write memory array and a next higher level of said hierarchical memory system then a level of said read/write memory array, said bus having a width n;
means for transferring data bidirectionally between said parallel bus and any addressed location in said memory array;
a buffer register having a plurality of bits of number n;
means for transferring data bidirectionally between any addressed location in said memory array and said buffer register; and
means for serializing and transferring data from said buffer register to a serial line to a lower level in said hierarchical memory system and for deserializing and transferring data from said serial line to said register.

4,718,040
PRINTING APPARATUS OR SYSTEM FOR RECORDING A COLOR IMAGE
Naoki Ayata, Machida; Seiji Saito, Yokosuka; Hidetoshi Suzuki; Kunitaka Ozawa, both of Tokyo, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 671,025, Nov. 14, 1984, abandoned, which is a continuation of Ser. No. 618,460, Jun. 8, 1984, abandoned, which is a continuation of Ser. No. 370,463, Apr. 21, 1982, abandoned. This application Nov. 12, 1986, Ser. No. 930,046
Claims priority, application Japan, Apr. 27, 1981, 56-62543; Apr. 27, 1981, 56-62544; Jul. 16, 1981, 56-109951; Jul. 16, 1981, 56-109952
Int. Cl.[4] G06F *15/62*; G03G *15/01*
U.S. Cl. 364—900 **11 Claims**

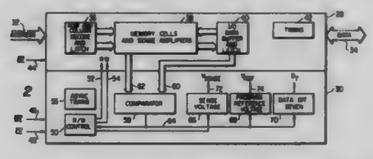
1. A printing apparatus or system, comprising:
generating means for generating color image data representing a color image including a number of colors;
forming means connected to said generating means for forming a color image on a recording medium in plural image quality modes different from each other on the basis of the color image data from said generating means; and

selecting menas connected to said forming means for selecting one of said image quality modes, each corresponding



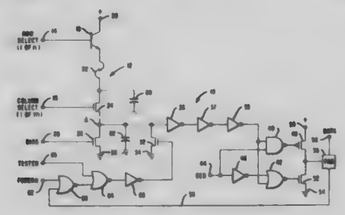
to a color included in the color image represented by the color image data generated by said generating means.

4,718,041
EEPROM MEMORY HAVING EXTENDED LIFE
David A. Baglee, Houston, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 9, 1986, Ser. No. 817,382
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—185 **21 Claims**



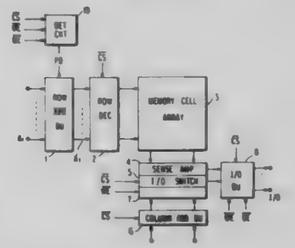
1. A method of extending the programmable life of a read/-write memory of the type having memory cells, said memory cells having a capacity for storing voltage which deteriorates in response to the writing of information therein, comprising the steps of:
determining the amount of deterioration of a stored voltage for a memory cell; and
thereafter increasing the voltage which is utilized for storing voltage in the deteriorated memory cell.

4,718,042
NON-DESTRUCTIVE METHOD AND CIRCUIT TO DETERMINE THE PROGRAMMABILITY OF A ONE TIME PROGRAMMABLE DEVICE
Maurice M. Moll, and Daniel L. Ellsworth, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 23, 1985, Ser. No. 811,983
Int. Cl.[4] G11C *29/00, 17/00*
U.S. Cl. 365—201 **7 Claims**



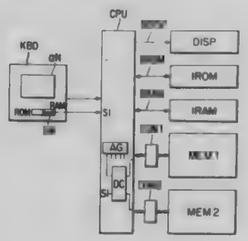
1. In a one time programmable memory device having a memory cell which includes an inherent capacitance, programmable means in the memory cell having a high initial resistance which is coupled with the inherent capacitance and has an RC time constant therewith, and user readable means for reading the condition of the programmable means, a circuit for non-destructively testing the programmability of the programmable means comprising:
switch means in the user readable means and connected to the inherent capacitance of said memory cell, said switch means having a first condition for discharging said inherent capacitance and a second condition for allowing said inherent capacitance to charge through said programmable means;
output means in the user readable means for indicating when the charge on the inherent capacitance reaches a predetermined threshold;
test enabling means responsive to a test enable signal for selectively changing said switch means between its second condition and its first condition to conduct a test for measuring the RC time constant, thereby testing the programmability of the programmable means.

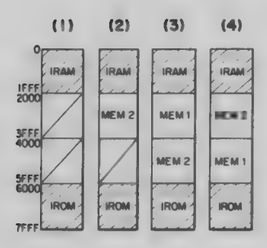
4,718,043
MEMORY CIRCUIT WITH IMPROVED POWER-DOWN CONTROL
Yasuo Akatsuka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 29, 1985, Ser. No. 792,401
Claims priority, application Japan, Oct. 29, 1984, 59-227303
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—227 **9 Claims**



9. A memory circuit comprising:
an array of memory cells;
first means for receiving a chip selection signal having an active level and an inactive level;
a detection circuit coupled to said first means for generating a detection signal of a first level when said chip selection signal has been at the inactive level for longer than a predetermined period and a detection signal of a second level otherwise;
a peripheral circuit coupled to said first means, said array and said detection circuit, said peripheral circuit being enabled to perform an access operation to said array when said chip selection signal is at the active level and said detection signal is at said second level, and disabled otherwise; and
a switch circuit coupled to a part of said peripheral circuit and said detection circuit, said switch circuit being enabled to supply a power voltage to a part of said peripheral circuit when said detection signal is at said second level and disabled to isolate said pwer voltage from said part of said peripheral circuit when said detection signal is at said first level.

4,718,044
ELECTRONIC APPARATUS HAVING PLURAL DETACHABLE MEMORIES
Shigeru Matsuyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 20, 1984, Ser. No. 572,371
Claims priority, application Japan, Jan. 27, 1983, 58-10589
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—230 8 Claims

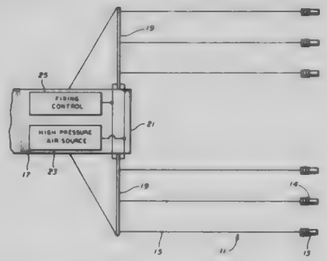




1. In an information processing apparatus having a central processing unit including input means and an addressable read-write memory, an address designator for plural detachable memories enabling said apparatus to handle different types of read-write or read only addressable memory means, comprising:
addressable read-write memory means;
reception means for receiving a different type of detachable memory means to be detachably disposed with respect to the information processing apparatus;
discrimination means for discriminating the type of the detachable memory means; and
allotment means for allotting the next succeeding address of said read-write memory means, to the detachable memory received by said reception means when said discrimination means determines it is a read-write memory, and for allotting an address not succeeding the address of said read-write memory, to the detachable memory means received by said reception means when said discrimination means determines it is a read only memory.

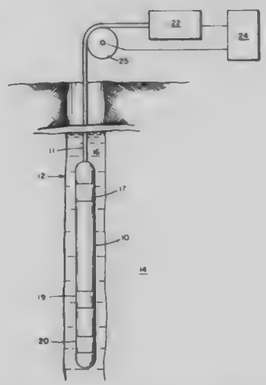
4,718,045
UNDERWATER SEISMIC ENERGY SOURCE
James F. Desler, 3303 Redwood Lodge, Kingwood, Tex. 77339
Filed Dec. 20, 1982, Ser. No. 451,267
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—24 10 Claims

1. A method of generating underwater seismic impulses in which the primary pulses interfere constructively with one another and the bubble pulses interfere destructively with one another, which comprises the steps of:
positioning a plurality of airguns in laterally and linearly spaced apart locations, each of said airguns having substantially the same size, weight and external configuration;
connecting each of said airguns to an individual tow line, each of said tow lines having substantially equal length and extending rearward from the stern of a moving vessel such that said tow lines are substantially parallel;



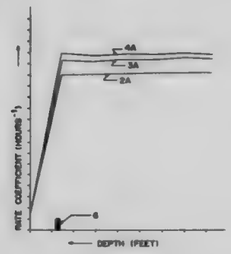
towing said tow lines through the water at a predetermined speed, thereby to maintain all of said airguns at the same depth;
and firing the airguns.

4,718,046
METHOD FOR DRIVING A BENDER-TYPE TRANSMITTER OF A BOREHOLE LOGGING TOOL TO SEQUENTIALLY PRODUCE ACOUSTIC COMPRESSIONAL AND TUBE WAVES
William L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Nov. 22, 1985, Ser. No. 800,924
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—31 2 Claims



1. An acoustic well logging method, comprising the steps of:
(a) traversing a borehole with a well logging tool containing a coupling liquid and an acoustic transmitter of the bender-type having unrestricted piezoelectric planar surfaces oriented along the longitudinal axis of said tool which are exposed to said coupling liquid,
(b) exciting said transmitter with a first sine wave tone burst that is swept between about 10 kHz and 1.5 kHz so as to generate a constant frequency compressional wave and
(c) exciting said transmitter with a second sine wave tone burst that is swept between about 1.5 kHz and a few hundred Hz so as to generate a variable frequency tube wave of about the same frequency as said tone burst.

4,718,047
ANALYSIS OF CEMENT BONDING UTILIZING TEMPERATURE PROFILES
Norman R. Carlson, Houston; Edward W. Lanuke, Spring, and James C. Barnette, Houston, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.
Filed Feb. 11, 1985, Ser. No. 700,230
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 8 Claims

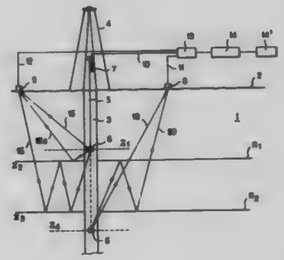


1. A method of detecting a channel in the cement behind a well casing within a well, said channel being in communication with a perforated zone of said well casing, comprising the steps of:
determining rate coefficients over a zone of investigation for at least one preselected time interval following the shutting-in of said well, said rate coefficients being indicative of the rate of temperature change along said zone of investigation wherein said step of determining rate coefficients over said zone of investigation comprises the steps of:
measuring the geothermal gradient over said zone of investigation;
measuring the flowing temperature profile over said zone of investigation;
measuring at least one shut-in temperature profile over said zone of investigation;
calculating a set of rate coefficients for each shut-in temperature profile from said geothermal gradient, flowing temperature profile and shut-in temperature profile values, wherein said step of calculating said set of rate coefficients further comprises the step of calculating said rate coefficients in accordance with the relationship:

$$c(D) = \frac{\ln \frac{T_{inj}(D) - T_g(D)}{T_s(D) - T_g(D)}}{dt}$$

wherein c(D) is said rate coefficient at depth D, $T_{inj}(D)$ is the flowing temperature profile value at depth D, $T_g(D)$ is the geothermal gradient value at depth D, $T_s(D)$ is the shut-in temperature profile value at depth D, and dt is said corresponding preselected time interval; and
locating values of said rate coefficients indicative of channels in said cement behind said well casing.

4,718,048
METHOD OF INSTANTANEOUS ACOUSTIC LOGGING WITHIN A WELLBORE
Philippe Staron, Meaucy; Georges Arens, Croissy sur Seine, and Pierre Gros, Buc, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France
PCT No. PCT/FR85/00119, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO85/05696, PCT Pub. Date Dec. 19, 1985
PCT Filed May 20, 1985, Ser. No. 837,550
Claims priority, application France, May 25, 1984, 84 08207
Int. Cl.[4] G01V *1/00, 1/40*
U.S. Cl. 367—40 9 Claims

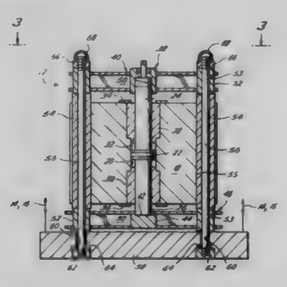


1. A method of instantaneous logging within a wellbore comprising the steps of:
disintegrating rocks within the wellbore with a drilling tool so that elastic waves are produced by the lower portion of said drilling tool;
receiving a first series of waves propagated within said drilling tool on at least a first sensor mounted at the upper end of said drilling tool in order to produce at least a first recording designated as a drill-pipe recording;
receiving a second series of waves propagated from the lower portion of said drilling tool to the ground surface of the wellbore and through the ground strata surrounding the wellbore on at least a second sensor in order to produce at least a second recording designated as a ground recording;
locating on each of said first and second recordings the portions of signals corresponding to one and the same position of the lower portion of the tool within the wellbore, each of said portions thus constituting elementary recordings;
grouping the elementary recordings in pairs, each pair comprising a drill-pipe elementary recording and a ground elementary recording;
intercorrelating the elementary recordings of each pair with each other, wherein for each pair a correlated signal is produced which is representative of the acoustic energy generated by the lower portion of the drilling tool and of the difference in travel times of the waves received on the sensors from which the pair of recordings has been obtained;
determining with respect to each position of the lower portion of the tool within the wellbore, the travel time of the waves which propagate between the lower portion of the tool and the sensor which is mounted to the upper end of said drilling tool, said travel time being determined from a measurement of the velocity of propagation of a vibration within the drilling tool when it is stationary; and
shifting the correlated signal corresponding to the position of the lower portion of the tool by a quantity equal to said travel time.

4,718,049
PRE-LOADED VIBRATOR ASSEMBLY WITH MECHANICAL LOCK

John M. Crowell, Friendswood, and James E. Teske, Arcadia, both of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jan. 23, 1986, Ser. No. 821,905
Int. Cl.[4] H04R 11/00
U.S. Cl. 367—189 6 Claims

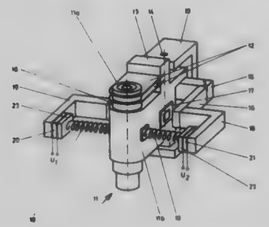


1. A prestressed vibrator assembly including a linear actuator having a dual-ended piston rod, at least one end of said piston rod having a spider attached thereto, and a baseplate disposed below said linear actuator and said spider, comprising:
(a) a plurality of legs radially disposed around and parallel to said linear-actuator piston rod;
(b) means for interconnecting said spider to said base plate, said means also placing said leg under a compressive preload;
(c) means disposed between one end of said linear actuator and said spider for preloading said piston rod; and
(d) annular means disposed within said legs for fixing said interconnecting means therein.

4,718,050
OPTICAL SCANNER AND READER FOR INFORMATION CONTAINED IN LIGHT REFLECTED FROM MOVING OPTICAL RECORDS

Arthur Kurz, VS-Pfaffenweiler, and Hans-Robert Kühn, St. Georgen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH., Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,770
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324661
Int. Cl.[4] G11B 7/00, 21/10
U.S. Cl. 369—44 14 Claims

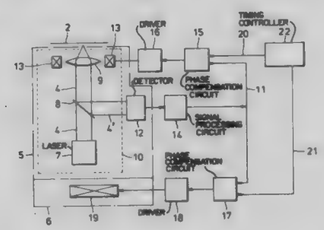


1. A reading provision for optical scanning of information recorded on the light reflecting surface of a moving plate-shaped carrier comprising
a casing;
an arm movably attached to the casing;
a scanning head movably mounted to the arm;
a light source attached to the scanning head;
an optical system incorporated into the scanning head for generating at least one light spot on a surface of the plate-shaped carrier;
detection means for converting the reflected light coming from the light spot into electrical signals;
an elastically springing restoring force member disposed between the arm and the scanning head;
a coarse control mechanism for adjusting the arm position;
fine control for adjusting the pivotably disposed scanning head against the effect of the elastically springing restoring force member;
an electromechanical converter serving as a threshold provision disposed in the force flow between the scanning head, the elastic restoring force member and the spring support and having an output; and
a threshold control circuit connected to the output of the electromechanical converter for generating a signal effecting a control change from a fine control to a coarse control and vice versa if the lateral excursion of the following scanning head motion exceeds a preset threshold value.

4,718,051
OPTICAL BEAM TRACKING SYSTEM FOR USE IN OPTICAL INFORMATION RECORDING AND/OR REPRODUCING APPARATUS

Ken Ohshima, Hachioji; Jun Sakashita, Nagano, and Hiroo Okada, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,218
Claims priority, application Japan, Dec. 28, 1983, 58-251678
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—44 12 Claims

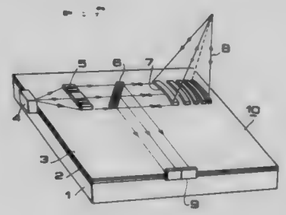


1. In a beam tracking system for use in an optical data recording and/or reproducing apparatus with a memory medium of the type having detecting means for producing a tracking signal representative of a beam irradiating spot relative to a track on said memory medium, tracking means for moving said beam irradiating spot to correct the same according to the said tracking signal, carrying means for carrying at least a pair of said tracking means thereon to effect the movement of the beam in the radial direction of said memory medium, and control means for controlling said carrying means so that said tracking means and said carrying means are controlled according to said tracking signal, and tracking is performed by means of said tracking means and/or said carrying means, the improvement comprising:
command means for producing a command signal effective to determine a tracking timing such that said carrying means is enabled after said tracking means is enabled.

4,718,052
HEAD ASSEMBLY FOR OPTICAL DISC

Mitsuhige Kondo; Shinsuke Shikama; Keizo Kono, and Teruo Fujita, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,993
Claims priority, application Japan, Oct. 1, 1984, 59-205788; Oct. 1, 1984, 59-205789; Oct. 12, 1984, 59-213801; Feb. 19, 1985, 60-30842
Int. Cl.[4] G11B 7/095
U.S. Cl. 369—44 14 Claims



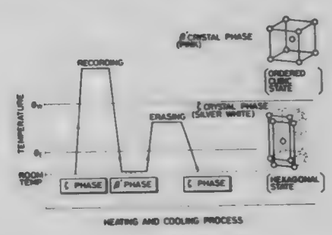
11. An optical head assembly used for recording information on an optical disc along a predetermined track or for taking out information already recorded, said optical head assembly comprising:
a substrate;
a light conducting layer of a dielectric thin film formed on said substrate by a dielectric thin film;
a laser beam source provided for introducing a diverging laser beam into said light conducting layer;
said light conducting layer including a collimator lens means for collimating said diverging laser beam, a beam splitter, a converging grating coupler for converging the beam which has passed through said beam splitter onto said optical disc to form a beam spot and converting the beam reflected by the surface of said optical disc into a collimated beam advancing toward said beam splitter, and a beam dividing/converging element for dividing and converging the collimated beam which has been bent by said beam splitter into two converged beams;
two photo detectors disposed in focused positions of said two beams from said beam dividing/converging element.

4,718,053
OPTICAL INFORMATION APPARATUS AND METHOD OF RECORDING AND ERASING INFORMATION

Yoshio Sato; Satoshi Shimada; Hiroshi Sasaki; Noritami Miyamoto, all of Hitachi; Nobuyoshi Tsuboi, Ibaraki; Hideki Nihei, Hitachi; Ryuji Watanabe, Ibaraki; Atsumi Watanabe, Hitachi; Tetsuo Ito, Mito, and Hiroaki Koyanagi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,313
Claims priority, application Japan, Nov. 9, 1984, 59-234988; Dec. 3, 1984, 59-255315; Dec. 3, 1984, 59-255320; Dec. 3, 1984, 59-255319
Int. Cl.[4] G11B 7/095, 7/24
U.S. Cl. 369—44 21 Claims

1. In an optical information apparatus wherein information signals are written on a recording medium and read and erased therefrom by the use of a light beam; an optical information apparatus characterized in that the recording medium includes at least one memory layer made of a metal or alloy which, when heated by the light beam, performs an intercrystalline phase transition between first and second crystal states thereof to write or erase information, and that the light beam is projected at a wavelength at which a reflection rate of light from

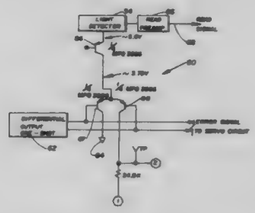


said metal or alloy becomes larger than said metal or alloy is irradiated with an information writing light beam.

4,718,054
SERVO ERROR WRITE BLANKING CIRCUIT FOR AN OPTICAL RECORDING DISK

David L. Schell; Henk A. Van der Put, both of Colorado Springs, Colo., and Johannes J. Verboom, Bergeijk, Netherlands, assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed May 28, 1986, Ser. No. 869,012
Int. Cl.[4] G11B 3/82, 21/10
U.S. Cl. 369—54 7 Claims



1. A blanking circuit used with an optical recording disk system having a read and write mode and means to generate read and write pulses and connected between the systems light detector with photo diodes and a differential amplifier, the blanking circuit also connected to the systems signal source, the circuit comprising:
a first switching transistor connected to the light detector;
a second switching transistor connected to the light detector and the first switching transistor; and
a differential output one-shot connected to the first and second switching transitor, the one-shot diverting currents from the photodiodes to a ground connected to the transistors during write pulses.

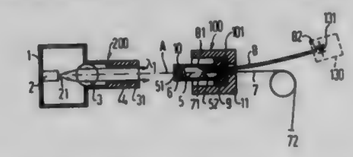
4,718,055
WAVE-DIVISION MULTIPLEX COMPONENT FOR AN OPTICAL NETWORK COMPRISING MONOMODE TRANSMISSION FIBERS

Gerhard Winzer, Putzbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,194
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533148
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—3 18 Claims

1. A component for a wave-division multiplex and for optical communications transmission networks operating with various wavelengths, said network including monomode trans-

mission fibers such as used for broadband ISDN networks, said component including an optical lens having a front surface and a back surface, a wavelength-selective filter being arranged adjacent the front surface of said lens, a plug member surrounding the lens and the filter and acceptable in a plug socket, said filter being transmissive for light of at least one wavelength, said plug member having a portion covering the filter and being of a material which is transparent for said one wavelength, means for mounting a monomode light waveguide and



a multimode light waveguide in said plug member with the ends of said light waveguides being adjacent the back surface of the lens and facing the lens so that light having a second wavelength emerging from the monomode light waveguide passes through the lens to be reflected by said filter and focussed by the lens at a point adjacent the lens-proximate end of the multimode light waveguide, said multimode light waveguide being coupled to an optical detector and the monomode light waveguide being coupled at its lens distal end to a transmission fiber.

4,718,056

OPTICAL MULTIPLEXER DEVICE

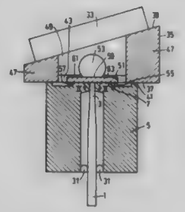
Nicolaas G. Schultheiss, Gouda, Netherlands, assignor to NKF Groep Nederlandsch Octrooibureau, The Hague, Netherlands

Filed Mar. 18, 1986, Ser. No. 841,133

Claims priority, application Netherlands, Mar. 20, 1985, 8500806

Int. Cl.⁴ H04B 9/00

U.S. Cl. 370—3 **9 Claims**



1. An optical multiplexer comprising:

a first optical fiber having an end face, said first optical fiber arranged to conduct two or more light signals of different wavelengths;

at least two second optical fibers having end faces, each second optical fiber arranged to conduct a light signal in a single waveband, the end faces of the first and second optical fibers being arranged in a first plane;

a transparent plate having first and second opposite planar surfaces, the first and second surfaces being parallel to each other, the first surface being arranged against the end faces of the first and second optical fibers;

a spherical lens having a planar flattened portion, said flattened portion being arranged against the second surface of the plate opposite the end faces of the fibers; and

a wavelength-selective element arranged on a side of the lens opposite the plate so that low attenuation wavelength-dependent optical paths are formed between the first optical fiber and the second optical fibers.

4,718,057

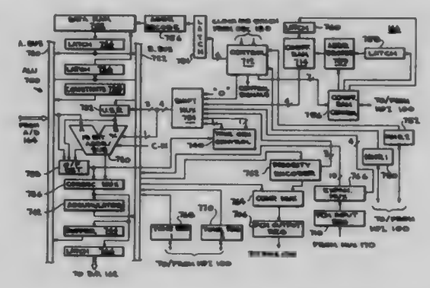
STREAMLINED DIGITAL SIGNAL PROCESSOR

P. Venkitakrishnan; Gururaj Singh, both of Sunnyvale, and Ronald C. Laugesen, Los Gatos, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 30, 1985, Ser. No. 771,339

Int. Cl.⁴ H04J 1/10, 3/02

U.S. Cl. 370—55 **9 Claims**



1. A processor connected to a source of time-division multiplexed (TDM) digital signals, a destination of TDM digital signals and a dual PCM channel, having a central control responsive to signals received from an external device, said central control cyclically processes instructions and generates control signals therefrom, said processor further comprising:

an arithmetic logic unit (ALU) responsive to said control signals;

a first bidirectional data bus connected to said ALU and said source of TDM digital signals; and

a second bidirectional data bus connected to said ALU and said PCM channel;

whereby said TDM signals are received from said source by said ALU via said first data bus and processed by said ALU in response to said signals received from said external device and transmitted by said ALU via said second data bus over said dual PCM channel.

4,718,058

DIGITAL SWITCHING NETWORK FOR SWITCHING SIGNALS OF DIFFERENT BIT RATES

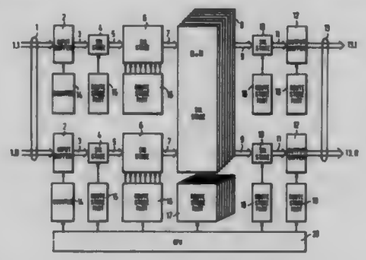
Franciscus J. van Vugt, Zoetermeer, Netherlands, assignor to Staat der Nederlanden, The Hague, Netherlands

Filed Feb. 15, 1985, Ser. No. 702,122

Claims priority, application Netherlands, Feb. 24, 1984, 8400588

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—63 **4 Claims**



1. A multi-rate digital switching network for handling data transferred in multibit time slots each containing a predetermined number of bit positions for transmission of a multibit

word and carrying bits of channels having different rates, namely a lowest rate and higher rates which are a plurality of integral multiples thereof, comprising:

input switching means having an entrance side and an exit side, for switching bits from any said bit position in a word time slot at said entrance side to any bit position in a word time slot, not necessarily the same word time slot, at said exit side, said input switching means including first auxiliary switching means for switching individual bits from one word time slot to another, including switching of bits having the same bit positions from different word time slots at said entrance side to one and the same word time slot;

intermediate switching means having several entries coupled to said exit side of said input switching means, and several exits, for switching bits at any of said entries from one and the same entry to different exits;

and output switching means having an input side coupled to said several exits of said intermediate switching means, and an output side, for switching bits from any bit position at said input side to any bit position of an outgoing word time slot at said output side, said output switching means including second auxiliary switching means at said input side coupled to said several exits of said intermediate switching means for switching bits in any word time slot from one and the same incoming word time slot to the same bit position of different outgoing word time slots,

all of said switching means beng constituted to switch bits simultaneously in sets of said predetermined number of bits.

4,718,059

METHOD OF TRANSMITTING INFORMATION IN A DIGITAL TRANSMISSION SYSTEM

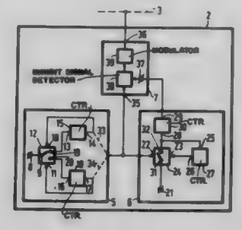
Bocke Zwaga, and Hendrik J. Haveman, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,858

Claims priority, application Netherlands, Nov. 2, 1984, 8403374

Int. Cl.⁴ H04J 3/02

U.S. Cl. 370—85 **6 Claims**



1. A method of transmitting information in time division multiplex in a digital transmission system which comprises a plurality of transmitters and a receiver; each transmitter generating, at time repetition intervals of a given duration, time slots for information to be transmitted in time-division multiplex to the receiver; such method being characterized in that: the duration of the time repetition intervals for each transmitter is set in accordance with a unique identification number assigned to such transmitter; each transmitter generates inhibit signals for preventing transmission of information to the receiver in time slots during such inhibit signals, such inhibit signals being derived from the relative durations of the time repetition intervals of the respective transmitters; and the inhibit signals are generated more frequently in transmitters having shorter time repetition intervals, thereby keeping the average probability of transmission of information by each transmitter substantially equal for all of the transmitters.

4,718,060

STATION ARRANGEMENT IN DATA TRANSMISSION NETWORK

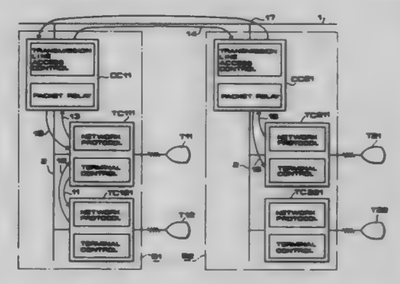
Kimio Oguchi, and Akira Watanabe, both of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Corp. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,758

Claims priority, application Japan, Mar. 4, 1985, 60-42313

Int. Cl.⁴ H04J 3/02

U.S. Cl. 370—85 **5 Claims**



1. A station arrangement including a plurality of terminal controllers each connected with a user unit, and a central controller connected through an intra-system bus with said terminal controllers and also connected to an inter-system bus, for implementing data transmission through said inter-system bus with one or more other stations connected commonly on said inter-system bus; each of said terminal controllers comprising:

(a) means for forming data sent from said user unit into a data packet:

(b) first transmission means for transmitting said data packet onto said intra-system bus in accordance with network protocol conformable to the procedure for layer 3 or layer 4 of the seven layers of the Open Systems Interconnection (OSI) model (IS 7498) stated by the International Organization for Standardization (ISO);

(c) means for receiving a data packet sent over said intra-system bus from another station, in accordance with the network protocol;

(d) means for reforming the data packet received by said reception means to have a format suitable for said user unit; and

(e) second transmission means for transmitting the reformed data to said user unit; said central controller comprising:

(f) bus access means for transmitting the data packet from said first transmission means onto said inter-system bus by a procedure conformable to layer 1 and layer 2 of the seven layers of the OSI model and

(g) means for taking in a data packet destined to the self station from said inter-system bus and sending the data packet onto said intra-system bus.

4,718,061

COMMUNICATIONS NETWORK HAVING BIT-MAPPED REFRESH CYCLE

Robert C. Turner, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

Filed Jul. 7, 1986, Ser. No. 882,715

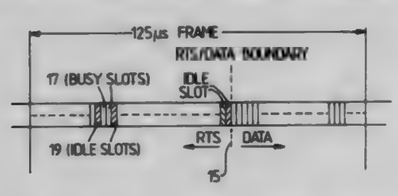
Claims priority, application United Kingdom, Jul. 18, 1985, 8518133

Int. Cl.⁴ H04J 3/00, 3/16

U.S. Cl. 370—99 **14 Claims**

1. A communications network comprising a plurality of stations and a link for communication between the stations in which encoded information is carried in frames; each of said frames having a real-time portion with time slots for real-time calls, and a data portion for signalling information: character-

ined in that a bit map is transferred between the stations indicating whether each real-time time slot is free or in use, and said frames are transmitted in cycles consisting of one or more frames; said cycles comprising a refresh cycle during which

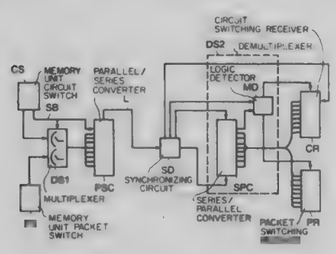


new seizures of real-time slots are prevented, said bit map is reset and stations transmitting real-time calls sequentially reclaim previously seized slots, and a bidding cycle in which stations are allowed to sequentially set up new real-time calls by seizing free time slots in said real time portion.

4,718,062
TELECOMMUNICATION SYSTEM FOR ALTERNATINGLY TRANSMITTING CIRCUIT-SWITCHED AND PACKET-SWITCHED INFORMATION

Ib N. Andersen, Trångsund, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 29, 1986, Ser. No. 857,057
Claims priority, application Sweden, Apr. 30, 1985, 8502115
Int. Cl.⁴ H04J *3/24*
U.S. Cl. 370—94 **6 Claims**



1. A telecommunication system in which circuit-switched and packet-switched information is transmitted, comprising:

(a) transmitting equipment including

a first memory having channels corresponding to respective time slots, each channel containing status information indicating whether that channel is in an occupied state or an idle state,

a second memory,

a multiplexing means sequentially scanning the channels in said first memory during respective time slots and being responsive to the status information in each channel to retrieve data from said first memory during a time slot when the status information indicates that a channel is occupied and to retrieve data from said second memory during a time slot when the status information indicates that a channel is idle, and

a parallel to serial converter for receiving and converting data retrieved by said multiplexing means;

(b) receiving equipment including

detection means for detecting data and synchronizing information from said transmitting equipment,

a demultiplexer including a serial to parallel converter for receiving information detected by said detecting means and converting the received information to parallel data,

a first receiver,

a second receiver, and

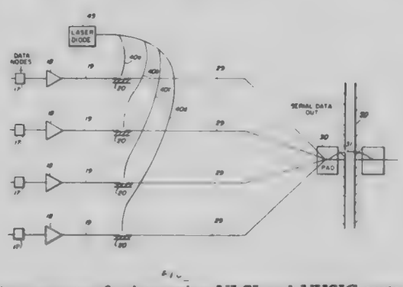
detector logic responsive to status information in data received from said transmitting equipment for sending information from said demultiplexer to one of said first and second receivers; and

(c) a transmission line connecting said transmitting equipment to said receiving equipment.

4,718,063
OPTOELECTRONIC INTEGRATED CIRCUIT MULTIPLEX

Ronald E. Reedy; Jay H. Harris, and Donald J. Albares, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1985, Ser. No. 746,704
Int. Cl.⁴ H04J *3/04*
U.S. Cl. 370—112 **9 Claims**



1. An apparatus for improving VLSI and VHSIC system data transmission comprising:

at least one integrated circuit chip having a plurality of parallel output data nodes;

a plurality of optoelectronic switches mounted in the integrated circuit chip, each having an input and an output microstrip extending therefrom and being serially disposed therebetween, each of the input microstrips extending to a separate one of the parallel output data nodes;

at least one bonding pad on the chip coupled to the output microstrips extending from a like number of the plurality of optoelectronic switches to receive the outputs of a like number of parallel output data nodes therefrom;

a light source emitting pulses of light;

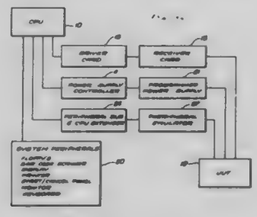
a plurality of optical fibers each having one end located to receive pulsed light from the source and the other end of each fiber is located adjacent an optoelectronic switch to activate a discrete optoelectronic switch, the fibers are longitudinally dimensioned to have lengths, different one from the other to create a sequence of actuation light pulses for the plurality of optoelectronic switches each time the light source is pulsed, the optoelectronic switches thereby providing time division multiplexed serial data from the plurality of parallel output data nodes at the bonding pad; and

a line driver serially connected to each of the parallel output data nodes and the optoelectronic switches, metallic microstrips connect the serially coupled output data nodes, line drivers and optoelectronic switches to the bonding pad in parallel and the light source is a laser diode emitting pulses in the picosecond range at 100–500 MHz rates and the plurality of optical fibers have lengths to space the sequence of actuation light pulses between successive pulses from the laser diode.

4,718,064
AUTOMATIC TEST SYSTEM

David J. Edwards, Yorba Linda; John M. Tillson, and James K. Benning, both of Mission Viejo, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Feb. 28, 1986, Ser. No. 834,902
Int. Cl.⁴ G01R *31/28*; G06F *11/00*
U.S. Cl. 371—20 **6 Claims**



1. An automatic test system for testing controllers for computer peripherals, comprising:

processing means for generating data and control signals directing a controller-under-test to initiate a plurality of predetermined actions;

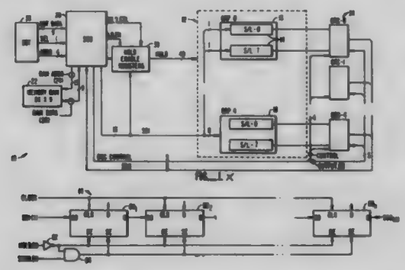
receiver means, removably attached to the test system, for communicating the data and control signals from the processor means to the controller-under-test, said receiver means being configured for use with a specific type of peripheral controller; and

emulator means, connected to the processor means and detachably coupled to the controller-under-test, for emulating a peripheral device to be controlled by the controller, said emulator means for receiving data, status, and control signals from the processor means and the controller-under-test, wherein the emulator means receives data and commands from the controller-under-test and makes data and status signals available to the controller under direction of the processor means to test the performance of the controller-under-test.

4,718,065
IN-LINE SCAN CONTROL APPARATUS FOR DATA PROCESSOR TESTING

Richard F. Boyle, San Jose, and Leonard E. Overhouse, Los Gatos, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Mar. 31, 1986, Ser. No. 845,918
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—25 **11 Claims**



1. In-line scan control apparatus for testing a digital system of the type including a plurality of elemental memory units, certain of the memory units being selectively configurable in response to assertion of a scan signal to form a number of extended serial shift register means, each extended shift register means having an input terminal and an output terminal, the scan control apparatus comprising:

memory means for storing high level instructions and data;

scan control means coupled to the memory means by a high level data bus and operable in response to high level instructions received from the memory means to produce a number of test signals, including the scan signal, the scan control means including pattern generating means having n bit locations for sequentially generating test patterns;

first bit level means coupling at least individual ones of the n bit locations of the pattern generating means to the input terminals of corresponding extended shift register means; and

second bit level means coupling the output terminals of the extended shift register means to the scan control means;

wherein the scan control means operates to cause the extended shift register means to conduct the bit patterns generated by the pattern generating means from the input terminals to the output terminals, and to store data received from the second means in the memory means.

4,718,066
SELF-ADAPTIVE HYBRID DATA TRANSMISSION

Roger Rogard, Lisse, Netherlands, assignor to Agence Spatiale Europeenne, France

Filed Feb. 21, 1986, Ser. No. 831,497
Claims priority, application France, Mar. 5, 1985, 85 03215
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—35 **5 Claims**



1. A method of self-adaptive, hybrid data transmission comprising the steps of:

(a) encoding a message into data blocks, each block including check symbols for error detection and correction;

(b) grouping the data blocks in sets and encoding each set to include redundant blocks for error detection and correction;

(c) sequentially and continuously transmitting a set of data blocks;

(d) sequentially receiving said transmitted set of data blocks;

(e) correcting detected errors in the received blocks;

(f) erasing received blocks for which correction is impossible;

(g) receiving a redundant block for each data block erased in the set;

(h) transmitting a return signal when the number of redundant blocks equals the number of erased blocks;

(i) interrupting sequential transmission of the set of blocks upon receiving the return signal; and

(j) repeating steps (c)–(i).

4,718,067
DEVICE FOR CORRECTING AND CONCEALING ERRORS IN A DATA STREAM, AND VIDEO AND/OR AUDIO REPRODUCTION APPARATUS COMPRISING SUCH A DEVICE

Joseph H. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1985, Ser. No. 758,591
Claims priority, application Netherlands, Aug. 2, 1984, 8402411
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—38 **7 Claims**

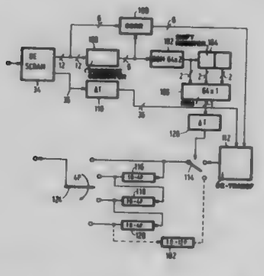
1. A device for correcting and concealing errors in a data stream which is organized in a succession of data blocks, each

data block being converted into a code block consisting of code elements which are grouped according to an error protection code having at least error-correcting properties by addition of redundancy, the code elements being received from a medium as being systematically distributed over an interval which corresponds to the length of several data blocks, said device comprising:

(a) an input means which includes a regrouping element for regrouping the code elements in code blocks;

(b) a correction means coupled to said input means for reconstructing the associated data block from a regrouped code block while performing a correction, and forming a correction signal via a correction means signal output;

(c) a concealing means for concealing, under the control of said correction signalling received by said correction



means from said correction means signal output, a data element by replacing said data element with a supplementary data element; and

(d) an output means coupled to outputs of said correction means and said concealing means for converting the corrected or substitute data elements into a continuous signal stream, wherein said concealing means supplements a data element for a code block having a predetermined sequence number within a succession of code blocks when the total number of corrections to be performed within said succession exceeds a predetermined limit corresponding to a maximum number of corrections capable utilizing said code, said concealing means remains inactive below said predetermined limit, and said correction means applies a corrected data element to the output device below said predetermined limit.

4,718,068

STABILIZED LASER DEVICE OF OPTICAL INFORMATION RECORDING/REPRODUCTION APPARATUS

Shozi Yoshikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,616
Claims priority, application Japan, Jan. 17, 1985, 60-6122
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—31 **10 Claims**

1. A stabilized laser device of an optical information recording/reproduction apparatus, comprising:

laser means;

setting means for setting first and second reference signals;

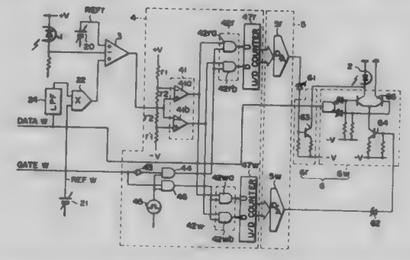
photodetecting means for photoelectrically converting laser light emitted from said laser means and for generating a detection signal;

first signal generating means for generating, during a reproduction mode, a first signal corresponding to a difference between the first reference signal and the detection signal from said photodetecting means;

memory means for storing the first signal during a recording mode;

second signal generating means for generating, during a recording mode, a second signal corresponding to a difference between the detection signal from said photodetecting means and a sum of the first and second reference signals; and

switching means for supplying to said laser means, in a reproduction mode, a first drive signal corresponding to



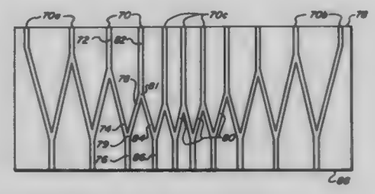
the first signal generated from said first signal generating means and for supplying, in a recording mode, to said laser means selectively varied in accordance with recording data a second drive signal corresponding to the first signal stored in said means and the second signal generated from said second signal generating means.

4,718,069

SEMICONDUCTOR LASER ARRAY WITH SINGLE LOBED OUTPUT

William Streifer, Palo Alto, and Donald R. Scifres, San Jose, both of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Filed Oct. 27, 1986, Ser. No. 924,195
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **23 Claims**



1. A semiconductor laser array comprising,

a plurality of semiconductor layers disposed over a substrate, at least one of said layers forming an active region for lightwave generation and propagation under lasing conditions,

means for applying an electrical forward bias to said layers thereby generating lightwaves in said active region,

means for guiding said lightwaves in a plurality of spaced apart optical waveguides, said waveguides extending between reflective facets, and

interconnecting waveguide means optically communicating between adjacent optical waveguides for coupling lightwaves propagating in each of said optical waveguides into adjacent optical waveguides,

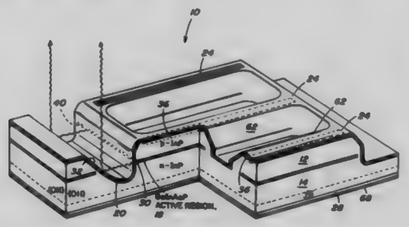
said plurality of adjacent spaced apart optical waveguides being characterized by separations between adjacent waveguides that at said light emitting facet are substantially unequal whereby light emitted from said optical waveguides at said light emitting facet has a single far field lobe radiating from said light emitting facet.

4,718,070

SURFACE EMITTING DIODE LASER

Zeng-Long Liau, Arlington, and James N. Walpole, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 22, 1985, Ser. No. 693,207
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **13 Claims**



1. A device for emitting laser radiation comprising:

(a) a semiconductor substrate having a planar extending surface;

(b) a first layer of semiconductive material formed over said planar substrate surface;

(c) a second layer of semiconductor material formed on said first layer and wherein a planar p-n junction is formed within the first layer parallel said surface and wherein the semicondutor material of said first layer is removed on four sides perpendicular to said surface to form a narrow elongate strip of active material with narrow end edges and long side edges forming the active region of a resonant laser cavity which is embedded in said semiconductor material and wherein light is emitted from a narrow edge of said strip;

(d) reflector means formed in said layers adjacent said light emitting end edge for reflecting the emitted light in a direction perpendicular to the plane of said p-n junction; and

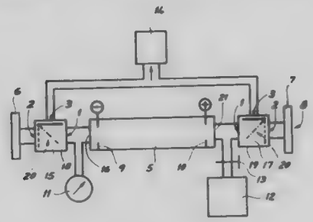
(e) electrode contacts electrically coupled to said p-n junction.

4,718,071

GAS LASER EQUIPPED WITH TRIPLE FUNCTION VALVES

Jürg Steffen, Sigriswil, Switzerland, assignor to Asulab S.A., Switzerland

Filed Dec. 15, 1986, Ser. No. 941,465
Claims priority, application France, Dec. 16, 1985, 85 18745
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **9 Claims**



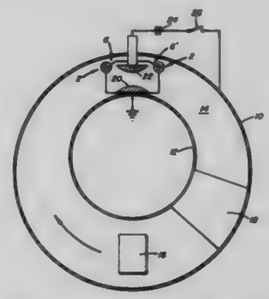
1. A gas laser including a resonant cavity terminated by a first and a second mirror, a discharge tube located between said mirrors for producing a luminous beam, a gas source the discharge rate of which is controllable, a manometer to measure the gas pressure prevailing within the cavity, pumping means for removing air or gas from within the cavity, a first valve placed between the first end of the tube and the first mirror and a second valve placed between the second end of the tube and the second mirror, said valves selectively enabling communication at least between the pumping means and the resonant cavity, each said valve including a body pierced with orifices and a movable element fitted within said body and movable between a first working position in which the luminous beam produced in the discharge tube traverses the valves to reach the mirrors, the pumping means being isolated from the cavity, a second position for permitting mirror access in which said mirrors are isolated from the discharge tube and the pumping means and a third position for changing gas in which the cavity is placed in communication with the pumping means thereby to remove the gas contained in said cavity.

4,718,072

CORONA DISCHARGE PREIONIZER FOR GAS LASER

Renato Marchetti; Eugenio Peace, and Giancarlo Salvetti, all of Rome, Italy, assignors to Enea - Comitato Nazionale per la Ricerca e Lo Sviluppo Della Energia Nucleare e Delle Energie Alternative and Selenia - Industrie Elettroniche Associate S.p.A., both of Rome, Italy

Continuation of Ser. No. 686,388, Dec. 26, 1984. This application May 15, 1987, Ser. No. 51,161
Claims priority, application Italy, Dec. 29, 1983, 49600 A/83
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—86 **1 Claim**



1. A sealed-off gas laser for long life high repetition operation comprising a pair of main discharge electrodes and a pair of high repetition corona discharge generators; each of said high repetition corona discharge generators comprising a dielectric material tube, a conducting rod received into said tube, which rod extends for the whole length of the tube characterized by the fact that said dielectric material tube is in contact with the edge of one of the two main electrodes, said conducting rod connecting the other main discharge electrode.

4,718,073

DEMODULATOR FOR FACSIMILE EQUIPMENT

Kazuhiko Takaoka, Kanagawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 3, 1986, Ser. No. 881,959
Claims priority, application Japan, Jul. 9, 1985, 60-149215
Int. Cl.[4] H03H *7/30*
U.S. Cl. 375—14 **2 Claims**

1. a demodulator for facsimile equipment, comprising:

a demodulating means for demodulating an imput signal;

an automatic equalizer means for automatically equalizing an output signal provided from said demodulating means;

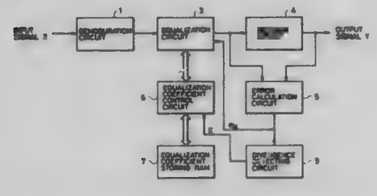
a decision means for making an area decision on an output signal provided from said automatic equalizer means;

an eror calculating means for performing an error calculation between an output signal provided from said decision

means and an output signal from said automatic equalizer means;

a memory means for storing equalizer coefficients of said automatic equalizer means;

a divergence detecting means for detecting divergence of said sutomatic equalizer means based on the claculation performed by said error calculating means; and



an equalizer coefficient controlling means which, upon detection of divergence of said automatic equalizer means by said divergence detecting means, transfers the equalizer coefficients stored in said memory means to said automatic equalizer means to re-set the equalizer coefficients of the automatic equalizer means.

4,718,074

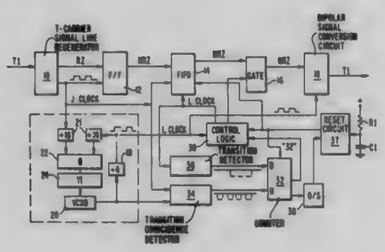
DEJITTERIZER METHOD AND APPARATUS

Earl L. Mannas, Laurel, and Thomas H. Johnson, Jr., Westminster, both of Md., assignors to SOTAS, Inc., Va.

Filed Mar. 25, 1986, Ser. No. 843,668

Int. Cl.⁴ H04L *7/00*

U.S. Cl. 375—118 **7 Claims**



1. Dejitterizer apparatus comprising:

means for separating a stream of given data bits and a given clock pulse signal associated therewith from a given signal;

means for producing a local clock pulse signal;

a buffer for storing said given data bits in response to the pulses of said given clock pulse signal and outputting said given data bits in response to the pulses of said local clock pulse signal;

a counter for detecting the pulses of said given and local clock pulse signals to determine the number of given data bits stored in said buffer as a function of the difference between the number of said given clock pulses and said local clock pulses that are supplied to said buffer;

means for controlling the time at which said given and local clock pulses are detected by said counter to prevent simultaneously detecting a local clock pulse and a given clock pulse, to provide an accurate determination of the number of given data bits in said buffer; and

means for varying the frequency of said local clock pulse signal as a function of the phase relation between said local clock pulse signal and said given clock pulse signal, whereby buffer overflow is prevented.

4,718,075

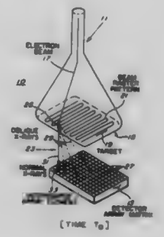
RASTER SCAN ANODE X-RAY TUBE

Michael Horn, Selden, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 28, 1986, Ser. No. 845,642

Int. Cl.⁴ H05G *1/08*

U.S. Cl. 378—91 **28 Claims**



1. An x-ray imaging device for selective imaging of an object comprising:

an X-ray source having means to variably dispose a point source of X-rays about a first surface of the X-ray source:

a detector spaced from said X-ray source opposite the object to be imaged, said X-rays being incident upon a surface of said detector; and

an output control circuit connected to said detector and said X-ray source, said output control circuit having means to selectively enable an output from said detector based upon the value of incidence of said X-rays upon said detector surface so that said detector output is enabled only when the X-rays strike the detector surface at a desired angle of incidence, said output control circuit including circuitry for varying said desired angle of incidence.

4,718,076

X-RAY IMAGING APPARATUS

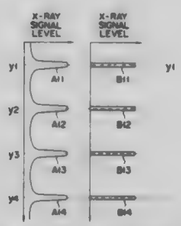
Kunio Doi, Tokyo; Hideki Matsui, and Katsuhiro Ono, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 602,422, Apr. 20, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,573

Claims priority, application Japan, Apr. 22, 1983, 58-69990; Nov. 11, 1983, 58-210921

Int. Cl.⁴ G21K *5/10*

U.S. Cl. 378—146 **9 Claims**



1. An X-ray imaging apparatus comprising:

means for generating X-rays, including electron gun means for emitting an electron beam, anode target means for receiving the electron beam emitted by said electron gun means, and for irradiating X-rays at an X-ray focal spot on said anode target means, and means for moving said X-ray focal spot in a first direction by a first distance on said anode target means;

a slit plate, separated from said X-ray generator means by a second distance, and disposed substantially parallel to said first direction in which said X-ray focal spot moves, said slit plate formed with a plurality of elongated slits which allow X-rays to pass therethrough, and which are arranged side-by-side, each extending in a second direction substantially perpendicular to said first direction in which the X-ray focal spot moves on said anode target means, said slits being adjacent to each other and separated from each other by a third distance;

means for detecting X-rays, having a two-dimensional input plane, including a projected area, arranged opposite to said slit plate, so as to accommodate a subject to be imaged between said slit plate and said detcting means, said X-ray detecting means being separated from said slit plate by a fourth distance, said X-ray detecting means for detecting X-rays having passed through said slits and the subject and impinged on said two-dimensional input plane, and converting said X-rays into electrical signals indicative thereof, the detected x-rays being comprised of scattered components and fundamental components, where the fundamental components comprise x-rays which pass directly through the subject without scattering,

said first, second, third and fourth distances having a relation such that, when the X-ray focal spot moves on said anode target by said first distance, those areas on said two-dimensional input plate of said X-ray detecting means, on which X-rays having passed through adjacent slits impinge, partially overlap;

data processing means for processing said electrical signals converted by said X-ray detecting means, said data processing means providing processed electrical signals corresponding to said fundamental components of the X-rays having passed through said slits and the subject, including: (1) means for dividing said projected area into a plurality of portions which extend parallel to said second direction in which said slits extend, and (2) means for acquiring electrical signals corresponding to the fundamental components from each of said portions, said fundamental components being those of the X-rays which impinge onto that area on said two-dimensional input plate which are projected from said x-ray focal spot through said slits, said data processing means comprises means for reconstructing an X-ray image based on said electrical signals corresponding to said fundamental components; and

image display means for displaying the image reconstructed by said data processing means.

4,718,077

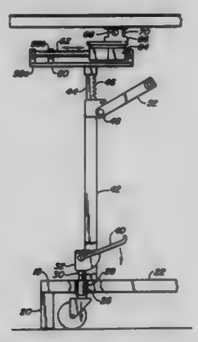
RADIOLUCENT TABLE FOR MEDICAL RADIOGRAPHY

Robert R. Moore, 4010 East Ave., Hayward, Calif. 94545, and Steve R. Lamb, 2272 Sydney Way, Castro Valley, Calif. 94546

Filed Mar. 14, 1985, Ser. No. 711,671

Int. Cl.⁴ A61B *6/04*

U.S. Cl. 378—209 **3 Claims**



1. A radiolucent table for radiography comprising:

an elongated table top having a horizontally positioned radiolucent panel adapted to support a patient thereon for radiographic treatment or examination;

a support structure constructed to support said table top, said support structure having a base with means for supporting said table top in an elevated position above a floor surface, and elevating means for raising and lowering said table top;

a dual carriage mechanism interconnecting said table top and said support structure, said dual carriage mechanism having means for movement in two perpendicular directions for bidirectional movement of said table top in a horizontal plane relative to said support structure wherein said dual carriage mechanism comprises a first set of guide elements mounted on said support structure and a first set of slide elements slidably engaging said guide elements for coordinated movement of said slide elements in a first direction, and, a second set of slide elements and a second set of guide elements oriented transverse to said first set of guide elements and mounted to said first set of slide elements for coordinated movement of said slide elements in a second direction transverse to said first direction wherein said second set of slide elements are mounted to said table top; and

locking means for locking said table top in a selected position relative to said support structure wherein said locking means includes a pair of manually operated hand knobs arranged along a common side of the table top, each knob selectively controlling the locking of the table top in one of the two directions of bidirectional movement, the arrangement positioning the knobs for convenient access to an operator adjusting and fixing the location of the table top on the support structure, wherein said locking means includes a stationary contact member mounted on said support structure and a moveable contact member mounted on at least one of said slide elements and means connected to one of said hand knobs for selectively engaging said stationary and moveable contact members to inhibit movement in the first direction, and wherein said locking means includes a table top connected contact device having a friction pad engageable with at least one of said guide elements, and means for urging said friction pad into engagement with said guide element to inhibit movement in said second direction.

4,718,078

SYSTEM FOR CONTROLLING MOTION OF A ROBOT

Werner-Wilhelm Bleidorn, Erlangen, and Norbert Krause, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,975

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529609

Int. Cl.⁴ G05B *19/42*

U.S. Cl. 318—568 **17 Claims**

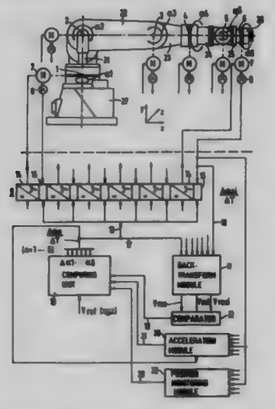
1. A system for controlling the motion of a robot having a multiplicity of parts connected to each other for rotation relative to each other about respective axes of rotation, said system comprising:

drive means operatively connected to said parts for rotating same about respective ones of said axes;

converter means operatively coupled to said drive means for transforming a velocity reference value defined in terms of fixed spatial coordinates into command signals transmitted to said drive means for modifying angular velocities of said parts about said axes so that an actual velocity of a point on said robot approaches said velocity reference value; and

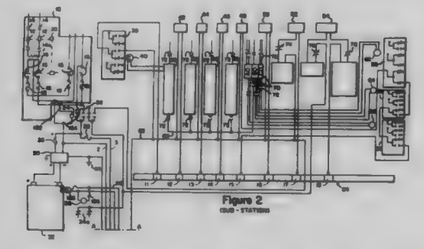
velocity monitoring means operatively connected to said drive means for terminating operation of said drive means upon detecting an impermissibly high motion parameter, said velocity monitoring means including means operatively connected to at least one of said converter means and said drive means for calculating from a plurality of

velocity values a resultant vectorial velocity defined with respect to said fixed spatial coordinates and for comparing



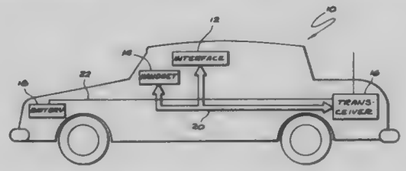
said resultant vectorial velocity with a predetermined maximum value.

4,718,079
REMOTE UNIT MONITORING SYSTEM
Giuseppe Rabito, 1350 Admiral La., Uniondale, N.Y. 11553
Filed Jun. 30, 1986, Ser. No. 880,282
Int. Cl.[4] H04M *3/24, 11/04*
U.S. Cl. 379—2 11 Claims



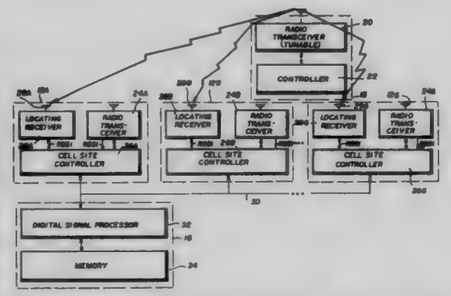
1. A remote unit monitoring system, comprising:
(a) a substation which monitors fault conditions in an electrical generating facility; wherein said substation transmits the presence of said fault conditions over communications channels;
(b) a central station which monitors said communications channels, interprets data received via said channels; and queries said substation to determine the operating status of said substation;
(c) substation means for detecting the integrity of each of said communications channels and selecting a working channel;
(d) substation means for providing power to said unit monitoring system when the ac mains source fails;
(e) substation means for converting operational faults into electrical signals which said substation interprets as one of said fault conditions, said substation means including a transformer secondary circuit breaker which activates a relay whose contact closure outputs an electrical signal, and
(f) substation means for isolating monitored subsystems from said unit monitoring system such that adjustments to said systems are not interpreted as faults.

4,718,080
MICROPROCESSOR CONTROLLED INTERFACE FOR CELLULAR SYSTEM
Arthur L. Serrano, 23660 Armista St., and Andrew W. Holman, 24230 Archwood, both of Canoga Park, Calif. 91304
Filed Dec. 16, 1985, Ser. No. 809,222
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—59 13 Claims



1. Apparatus for interfacing a standard telephone outlet with a cellular system, said cellular system being characterized by a radio transceiver adapted to communicate directly with a handset of compatible design so that audio is transmitted between said handset and a central office, said apparatus comprising, in combination:
(a) means for observing the state of the logic bus of said transceiver;
(b) means for observing the status of said outlet;
(c) means for generating at least one signal for controlling said outlet in response to the state of said logic bus of said transceiver and the status of said outlet; and
(d) means including a microprocessor in communication with said logic bus of said transceiver and with said outlet, said means being arranged to identify the protocol of said transceiver and to communicate the state of said outlet in said identified protocol to said logic bus.

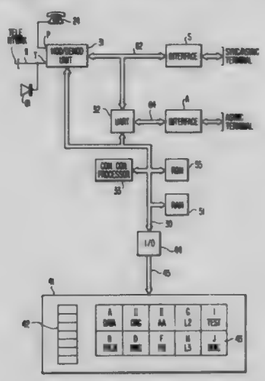
4,718,081
METHOD AND APPARATUS FOR REDUCING HANDOFF ERRORS IN A CELLULAR RADIO TELEPHONE COMMUNICATIONS SYSTEM
Theodore Brenig, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Nov. 13, 1986, Ser. No. 929,859
Int. Cl.[4] H07Q *7/01*
U.S. Cl. 379—60 22 Claims



1. In a cellular radio communications system of the type including plural stationary radio frequency receivers serving corresponding plural geographical cells, a mobile radio frequency communications apparatus including:
radio frequency transmitting means for transmitting radio frequency signals to said plural stationary receivers; and
control means, connected to and controlled by said transmitting means and operatively connected to said plural stationary receivers, for controlling said transmitting means

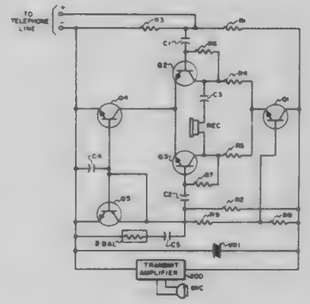
to transmit radio signals to a stationary receiver selected in response to a value calculated from (a) the amplitude of a radio frequency signal transmitted by said transmitting means and received by said selected stationary receiver, and (b) the amplitude of said transmitted radio frequency signal received by at least one further stationary receiver serving a geographical cell in proximity to the geographical cell served by said selected stationary receiver.

4,718,082
MODEM FOR EFFECTING FULL DUPLEX ASYNCHRONOUS/SYNCHRONOUS DIGITAL DATA COMMUNICATIONS OVER VOICE GRADE TELEPHONE LINK
Scott S. Parker, Melbourne; Timothy H. Scheffler, Indialantic, and Paul W. Schirmer, Melbourne Beach, all of Fla., assignors to Ark Electronics, Melbourne, Fla.
Filed Sep. 18, 1985, Ser. No. 777,450
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—98 38 Claims



1. For use in a data communications network wherein messages originating from or intended for delivery to a data handling device are transmitted over a communications link, an apparatus for carrying out the transmission and reception of said messages comprising:
a first data communications port adapted to be coupled to said communications link;
second and third data communications ports, each of which is adapted to be coupled to a respective data handling device and is capable of interfacing asynchronous data communication signals;
a modulator/demodulator unit, coupled to said first and second data communications ports, for transmitting synchronous data communication signals that are coupled to said second port from a data handling device over said communications link via said first data communications port, and for receiving synchronous data communication signals that are received from said data communications link at said first data communications port and coupling said synchronous data communications signals to said second port for delivery to a data handling device coupled thereto; and
a communications control unit, coupled to each of said second and third ports and to said modulator/demodulator unit, for controlling the transmission by said modulator/demodulator unit, via said first port to said communications link, of asynchronous data communication signals that are coupled to either of said second and third ports by a data handling device, and for controlling the delivery of asynchronous data communication signals, received from said communications link at said first port by said modulator/demodulator unit, to a data handling device coupled to one of said second and third ports.

4,718,083
DIFFERENTIAL RECEIVE BOOSTER AMPLIFIER FOR TELEPHONE INSTRUMENTS
Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Sep. 23, 1985, Ser. No. 778,992
Int. Cl.[4] H04M *1/58*
U.S. Cl. 379—392 7 Claims

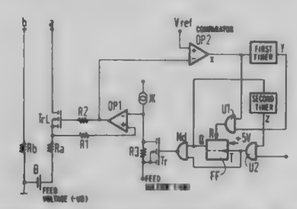


1. A subscriber's telephone instrument circuit connected to a telephone line and including, a microphone connected to a transmit amplifier, a receiver connected to a receive amplifier and interface means connecting said amplifiers to said telephone line said interface means comprising:
a bridge circuit including first, second, third and fourth arms;
said fourth arm including said telphone line;
said transmit amplifier including a first output circuit connection to a juncture between said first and second bridge arms and a second output circuit connection to a juncture between said third and fourth bridge arms;
said receive amplifier being of the differential type including first and second transistors, the characteristics of each one of said transistors being matched to the other; and
said receive amplifier further including a first input circuit connection to a juncture between said first and fourth bridge arms and second input circuit connection to a juncture between said second and third bridge arms; wherein
signals transmitted from said microphone and amplified by said transmit amplifier appear on said transmit amplifier first and second circuit connections to said receive amplifier in the same phase and therefore rejected by said receive amplifier as a common mode signal; and
signals received from said telephone line appearing at said first and second circuit connections to said receive amplifier are of opposite phase and therefore amplified by said receive amplifier and then transmitted to said receiver for reproduction thereby.

4,718,084
OVERLOAD PROTECTION CIRCUIT FOR A TELEPHONE SUBSCRIBER LINE FEED CIRCUIT
Alexander Dragotin, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 5, 1985, Ser. No. 806,163
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446391; Dec. 19, 1984, 3446362
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—412 5 Claims

1. A circuit arrangement for protecting a subscriber line feed circuit from overload as a result of a short-circuit or a low-ohmic shunt between the wires of a subscriber telephone line, characterized by a current limiting element which is located in a battery feed circuit of the subscriber line feed circuit and which, when the load of the subscriber line feed circuit is higher than a predetermined value, limits the feed current to a

desired value and, when the duration of said current limitation exceeds a given first time interval or re-occurs during a second longer time interval with respect to and following the first time interval, interrupts the current flow through the feed circuit,



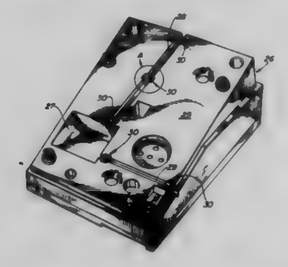
and means for releasing said interruption only on the elapse of a third time interval substantially equal in duration to the second time interval and which commences at the start of the interruption of said current flow through said feed circuit.

4,718,083

TELEPHONE CORD GROOVE AND CORD RETAINING MEANS

Steve W. Haskins, Mt. Juliet, Tenn., assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1986, Ser. No. 925,222
Int. Cl.[4] H04M *1/15*; F16L *3/10*; H01R *13/58*
U.S. Cl. 379—438 **7 Claims**



1. A telephone set base comprising a back surface, and at least one cord receiving and retaining groove in said back surface, said groove having a U-shaped section open at said back surface and at least one cord retaining formation situated intermediate a pair of ends of said groove, said cord retaining formation comprising two parallel walls extending from said groove in a direction away from said back surface, a cantilever member formed in each wall, said cantilever members in opposition, each said cantilever member having a fixed end integral with said wall at a position remote from said back surface, and a free end positioned in said groove adjacent to said back surface, each said cantilever member having a projection at its free end, said projections extending towards each other, such that a cord being pushed into said groove deflects said cantilever members as the cord is pushed past said projections, and said projections snap back over the cord when the cord is fully in said groove.

4,718,086

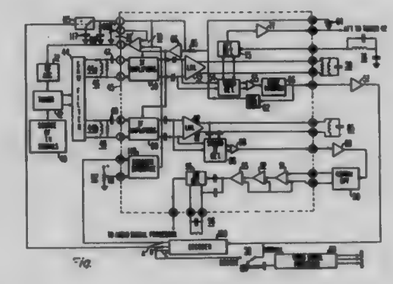
AGC IN SOUND CHANNEL OF SYSTEM FOR PROCESSING A SCRAMBLED VIDEO SIGNAL

Mark F. Rumreich; Gary A. Whitledge, and William A. Lagoni, all of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 27, 1986, Ser. No. 844,542
Int. Cl.[4] H04N *7/167, 5/52, 5/44, 5/60*
U.S. Cl. 380—20 **6 Claims**

1. In a video signal processing system with a quasi-parallel IF network including a video IF channel for reproducing sound information and having a signal input and a gain control input, and including a sound IF channel gain control input, apparatus comprising:

means for generating a gain control signal with a magnitude related to the magnitude of a video signal processed by said system;



means for coupling said gain control signal to said gain control input of said video IF channel for controlling the gain thereof; and

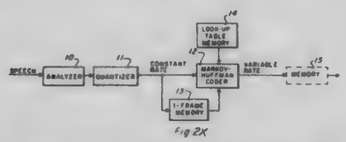
means for coupling said gain control signal to said gain control input of said sound IF channel for controlling the gain thereof.

4,718,087

METHOD AND SYSTEM FOR ENCODING DIGITAL SPEECH INFORMATION

Panagiotis E. Papamichalis, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 11, 1984, Ser. No. 609,155
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—34 **18 Claims**



1. A method of encoding digital speech information to characterize spoken human speech with an optimally reduced speech data rate while retaining speech quality in the audible reproduction of the encoded digital speech information, said method comprising:

storing digital speech information as digital speech data in the form of quantized speech parameter values comprising a plurality of speech data frames;

determining the transition probabilities for corresponding quantized speech parameter values in the next successive speech data frame in relation to the current speech data frame;

establishing the conditional probabilities as to the quantization values of the speech parameters of successive speech data frames based upon the determination of the transition probabilities; and

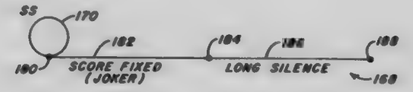
representing the respective quantization values of the speech parameters after the conditional probabilities have been established by a digital code wherein digital codewords of variable length represent quantization values in accordance with their probability of occurrence such that more probable quantization values are assigned digital codewords of a shorter bit length while less probable quantization values are assigned digital codewords of a longer bit length.

4,718,088

SPEECH RECOGNITION TRAINING METHOD

James K. Baker, West Newton; John W. Klovstad, Dorchester, both of Mass.; Chin-Hui Lee, Santa Barbara, Calif., and Kalyan Ganesan, Burlington, Mass., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 27, 1984, Ser. No. 593,891
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **7 Claims**



1. In a speech recognition apparatus wherein speech units are each characterized by a sequence of template patterns, and having

means for processing a speech input signal for repetitively deriving therefrom, at a frame repetition rate, a plurality of speech recognition acoustic parameters, and

means responsive to said acoustic parameters

for generating likelihood costs between said acoustic parameters and said speech template patterns, and

for processing said likelihood costs for determining the speech units in said speech input signal,

a method for generating said template patterns comprising the steps of

finding the beginning and end of an input speech unit surrounded by silence for which template patterns are to be generated, and

generating in accordance with a known procedure, template patterns representing said speech unit,

said finding step comprising

modelling silence as a template pattern,

for each frame, comparing said silence template pattern likelihood cost with a fixed reference threshold value, and

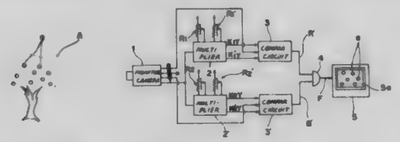
declaring the beginning of said speech unit when the score for the silence template pattern crosses the threshold value.

4,718,089

METHOD AND APPARATUS FOR DETECTING OBJECTS BASED UPON COLOR SIGNAL SEPARATION

Masahiko Hayashi, Toyonaka; Yasuo Fujii, Sakai, and Shigeaki Okuyama, Kawachi-nagano, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 661,991, Oct. 18, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 16,498
Claims priority, application Japan, Dec. 8, 1983, 58-231948
Int. Cl.[4] G06K *9/00*; H04N *9/75*
U.S. Cl. 382—17 **12 Claims**



1. An object detecting system for detecting an article of produce ripened to a desired degree comprising,

a monitor camera for detecting the object and providing a composite image signal including color component signals and a luminance signal to a reception means,

said reception means being adapted to discriminate from among said color component signals and to select that color component signal corresponding to a particular color of the article of produce desired to be harvested and further to product a digital image of said article of produce having the particular color,

a first multiplier (2) for receiving the luminance signal (Y), multiplying the luminance signal by a first gain (K1) and a second gain (K1'), and outputting resulting values as a first and a second multiplication signals (K1*Y, K1'*Y),

a second multiplier (2') for receiving the luminance signal (Y), multiplying the luminance signal by a third gain (K2) and a fourth gain (K2'), and outputting resulting values as a third and fourth multiplication signals (K2*Y, K2'*Y),

gain setting means including first, second, third, and fourth control means (C1, C1', C2, C2') for setting the first, second, third and fourth gains, respectively, the first and second gains being set so that the first and second multiplication signals correspond to upper and lower limits of a first color component (R) of the article of produce to be harvested, the third and fourth gains being set so that the third and fourth multiplication signals correspond to upper and lower limits of a second color component (B) of the article of produce harvested,

a first comparator (3) for receiving the first color component signal from the monitor camera and for receiving the first and second multiplication signals as threshold values from the first multiplier and further for outputting a first digital signal determined by whether the first color component signal is in a range having the first multiplication signal as an upper limit and the second multiplication signal as a lower limit,

a second comparator (3') for receiving the second color component signal from the monitor camera and the third and fourth multiplication signals as threshold values from the second multiplier, and further for outputting a second digital signal determined by whether the second color component signal is in a range having the third multiplication signal as an upper limit and the fourth multiplication signal as a lower limit,

a gate circuit (4) for carrying out an AND operation on the first and second digital signals and producing an output signal,

a frame memory (5) for receiving the output signal of the gate circuit as a digital image signal (F) and storing a digital image of the article of produce,

the first, second, third, and fourth control means being associated with a color-coded control panel (6a) for movement thereon along X-Y axes thereof, one pair of said control means serving to define X-axes limits of said gains and another pair of said control means serving to define Y-axis limits of said gains, the X-axis and Y-axis limits thus serving to define a section (f) of the control panel having a color substantially corresponding to said particular color of the article of produce stored in the frame memory as the digital image.

4,718,090

METHOD AND APPARATUS FOR HIGH-SPEED PROCESSING OF VIDEO IMAGES

James E. Cooper, Jr., 367 Charlotte Dr., San Marcos, Calif. 92069

Filed Apr. 14, 1986, Ser. No. 851,798
Int. Cl.[4] G06K *9/46*
U.S. Cl. 382—26 **16 Claims**

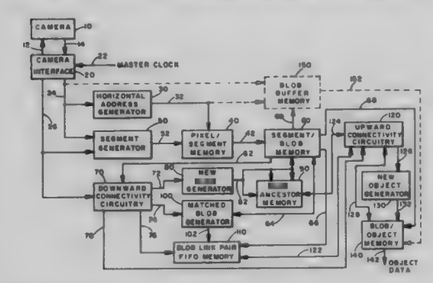
1. An apparatus for identifying each pixel, in lines of bicolored pixels of a raster scanned video image of a scene containing at least one object, to the object of which the pixel corresponds, comprising:

means for grouping adjacent bicolored pixels of the same color across a line into corresponding numbered pixel groups,

means for downwardly grouping pixel groups of the same color into numbered blobs of pixel groups, when a next line pixel group occurs which is of the same color with more than one previous line pixel group the next line pixel

group is grouped as part of the first occurring previous line blob,

means for upwardly grouping additional pixel group matches occurring between pixel groups of previous and a next line to provide a common ancestor blob number to



each blob of the pixel group in each additional pixel group match; and

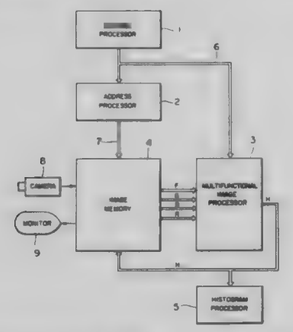
means for grouping blobs having common ancestor blob numbers into numbered objects, each blob belonging to an object so that each pixel, through a blob number, corresponds to an object number.

4,718,091

MULTIFUNCTIONAL IMAGE PROCESSOR

Yoshiki Kobayashi; Tadashi Fukushima; Yoshiyuki Okuyama; Kotaro Hirasawa; Takeshi Katoh, and Yutaka Kubo, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,108
Claims priority, application Japan, Jan. 19, 1984, 59-6308
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **6 Claims**



1. A multifunctional image processor for inputting image data and for programmably performing various kinds of image processing in accordance with an external control signal supplied from a control processor, comprising image data distribute means and parallel image data processing means wherein;

(a) said image data distribute means for distributing image data includes:

a plurality of input means capable of inputting binary image data, gray-scale image data and color image data, each constituting image data;

binary image data delay means for delaying the binary image data to thereby generate a plurality of delayed binary image data successively delayed by one line of pixels;

gray-scale image data delay means for delaying the gray-scale image data to thereby generate a plurality of delayed gray-scale image data successively delayed by one line of pixels; and

select means connected to receive at least said delayed binary image data, said gray-scale image data, said delayed gray-scale image data and said color image data, for selecting image data to be distributed to said parallel image data processing means in accordance with said external control signal; and

(b) said parallel image data processing means includes

a plurality of image signal processor juxtaposed and connected in cascade to each other for parallel processing of image data, each of said image signal processors having means for storing weighting coefficients for use in spatial convolution and color image processing operations, a plurality of input ports connected to receive image data from said image data distribute means, shift register means connected to said input ports and having a plurality of shift stages for shifting image data received from at least one of said ports through said shift stages, a plurality of processor elements each connected to said storage means and to a respective shift stage of said shift register means for parallelly processing the image data inputted thereto to perform processing operations on said image data in accordance with said external control signal, arithmetic means connected to said plurality of processor elements for combining processed image data received therefrom to produce output image data, internal control means responsive to an external function specifying signal from said control processor for controlling the operations of said processor elements, and linkage means for combining the output image data from said arithmetic means with image data received from said control processor or another parallel image data processing means to supply combined image data to an output port; and

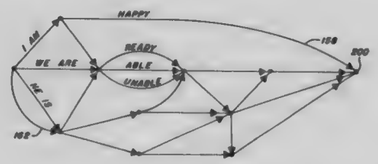
(c) said image data distribute means is connected to said parallel image data processing means so as to distribute the image data to said image signal processors, whereby said image signal processors can selectively process in parallel one of at least spatial convolution, color image processing and binary pattern matching processing operations in accordance with said external control signal.

4,718,092

SPEECH RECOGNITION ACTIVATION AND DEACTIVATION METHOD

John W. Klovstad, Dorchester, Mass., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 27, 1984, Ser. No. 593,893
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **3 Claims**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 216 Pages)



1. In a speech recognition apparatus wherein speech units are each characterized by a sequence of template patterns, and having

means for processing a speech input signal for repetitively deriving therefrom, at a frame repetition rate, a plurality of speech recognition acoustic parameters, and

means responsive to said acoustic parameters

for generating likelihood costs between said acoustic parameters and said speech template patterns, and

for processing said likelihood costs for determining the speech units in said speech input signal,

a method of template matching and cost processing for recognizing the correspondence of said speech input signal and said template patterns, said method comprising the steps of

characterizing the allowable possible sequences of speech units as a grammar graph, said graph having a plurality of grammar nodes connected by a plurality of connecting arcs, each said arc having associated therewith at least one word, each word having at least one kernel, and each kernel having one template pattern,

deactivating kernels of each said word having a plurality of kernels when a minimum cumulative score associated therewith exceeds a deactivation threshold, kernels which have not been deactivated being called active kernels,

generating likelihood costs representing the similarity of said acoustic parameters and ones of said active kernels,

determining, at each frame time, cumulative scores associated with said nodes,

generating a speech recognition decision, and

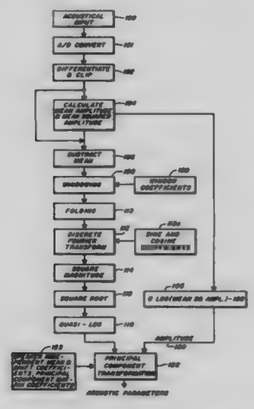
determining from said cumulative scores the identity of the speech units in said speech input signal.

4,718,093

SPEECH RECOGNITION METHOD INCLUDING BIASED PRINCIPAL COMPONENTS

Peter F. Brown, Pittsburgh, Pa., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 27, 1984, Ser. No. 593,894
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **1 Claim**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 216 Pages)



1. In a speech recognition apparatus wherein speech units are each characterized by a sequence of template patterns, and having

means for processing a speech input signal for repetitively deriving therefrom, at a frame repetition rate, a plurality of speech recognition acoustic parameters, and

means responsive to said acoustic parameters

for generating likelihood costs between said acoustic parameters and said speech template patterns, and

for processing said likelihood costs for determining the speech units in said speech input signal,

the method for generating said acoustic parameters comprising the steps of

digitally sampling said speech input signal,

processing said sampled signal for repetitively determining the discrete spectrum of time windowed durations of said signal, at a selected plurality of frequencies, said spectrum values corresponding to a vector of parameter components,

reducing the number of parameter components, in said vector by performing a biased principal component transformation upon said vector optimizing the across class variance while maintaining a constant within class variance of said components,

selecting a number of said components, less than the number of said parameters, as said acoustic parameters, and

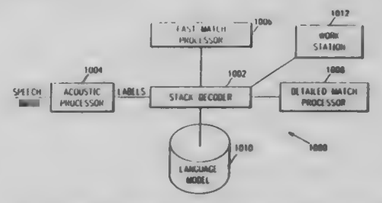
processing said selected components for generating a speech recognition decision identifying the speech units in said speech input signal.

4,718,094

SPEECH RECOGNITION SYSTEM

Lalit R. Bahl, Amawalk; Peter V. deSouza, Yorktown Heights; Steven V. DeGennaro, Pawling, and Robert L. Mercer, Yorktown Heights, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation-in-part of Ser. No. 672,974, Nov. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 738,930, May 29, 1985, abandoned. This application Mar. 27, 1986, Ser. No. 845,155
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **97 Claims**



1. In a speech recognition system which represents each vocabulary word or a portion thereof by at least one sequence of phones wherein each phone corresponds to a respective phone machine, each phone machine having associated therewith (a) a plurality of transitions and (b) actual label output probabilities, each actual label probability representing the probability that a subject label is generated at a given transition in the phone machine, a method of performing an acoustic match between phones and a string of labels produced by an acoustic processor in response to a speech input, the method comprising the steps of:

forming simplified phone machines which includes the step of replacing by a single specific value the actual label probabilities for a given label at all transitions at which the given label may be generated in a particular phone machine; and

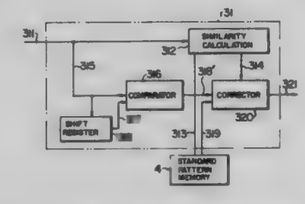
determining the probability of a phone generating the labels in the string based on the simplified phone machine corresponding thereto.

4,718,095

SPEECH RECOGNITION METHOD

Yoshiaki Asakawa, Kawasaki; Akio Komatsu, Kodaira; Nobuo Hataoka, Hachioji; Akira Ichikawa, Musashino, and Kiyoshi Nagasawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 554,960
Claims priority, application Japan, Nov. 26, 1982, 57-206149
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 381—43 **8 Claims**



1. A speech recognition method, comprising the steps of:
inputting a speech signal;
analyzing said input speech signal and outputting feature parameters for each of a plurality of successive analysis frame periods of the speech represented by said speech signal;
generating information of a power difference indicating whether the speech power of said speech is increasing or decreasing for each analysis frame;
calculating the similarity between frames of said speech and a standard pattern stored beforehand by using said feature parameters and further feature parameters obtained from said standard pattern;
correcting said calculated similarity based on said power difference information and further power difference information of said standard pattern, which is stored beforehand; and
matching said speech and said standard pattern by using said corrected calculated similarity and recognizing said speech from the result of said matching.

4,718,096

SPEECH RECOGNITION SYSTEM

William S. Meisel, Encino, Calif., assignor to Speech Systems, Inc., Tarzana, Calif.

Continuation of Ser. No. 698,577, Feb. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 495,674, May 18, 1983, abandoned. This application Nov. 5, 1986, Ser. No. 928,643
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 381—43 **20 Claims**



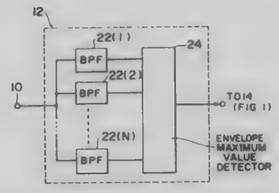
1. In combination in a speech recognition system for processing the speech of a speaker,
first means for detecting acoustic sounds substantially emanating from the mouth of the speaker and for producing signals representing such sounds,
second means for detecting acoustic sounds substantially emanating from the nose of the speaker and for producing signals representing such sounds,
identification means responsive to the signals produced by the first and second detecting means for dynamically identifying the signal from a particular one of the first and second detecting means having at least one predetermined dominant characteristic relative to the other signal.

4,718,097

METHOD AND APPARATUS FOR DETERMINING THE ENDPOINTS OF A SPEECH UTTERANCE

Tadashi Uemoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,742
Claims priority, application Japan, Jun. 22, 1983, 58-112036
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 381—46 **3 Claims**



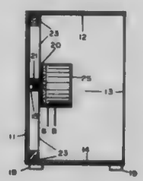
1. Apparatus for determining endpoints of speech utterances in a speech signal comprising:
a plurality of band-pass filters, each band-pass filter receiving said speech signal and providing a filtered output signal;
maximum value detector means connected to receive the filtered output signal of each band-pass filter for generating a maximum envelope speech signal corresponding to a maximum amplitude envelope output from among the filtered output signals;
comparator means connected to receive said maximum envelope speech signal from said maximum value detector means and a reference signal corresponding to a threshold value of speech utterances for generating a threshold maximum envelope speech signal; and
endpoint determining means connected to receive said threshold maximum envelope speech signal for determining said speech utterance endpoints.

4,718,098

MULTI-DIAPHRAGM ARTIFICIAL REVERBERATION DEVICE

William J. Ashworth, 1012 W. Lake Brantley, Altamonte Springs, Fla. 32714

Filed Jul. 22, 1986, Ser. No. 888,125
Int. Cl.⁴ H03G *3/00*
U.S. Cl. 381—64 **2 Claims**



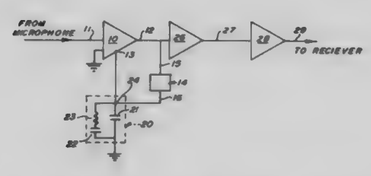
1. An acoustic device for the production of artificial reverberation comprising a vibrational audio sound radiating structure with vibratory means for impressing mechanical vibrations on said sound radiating structure with said sound radiating structure being constructed of a thin material that will easily vibrate, with said sound radiating structure consisting of a back, top, side, and bottom members, whereby said back member is firmly attached to the rearward areas of other said members with said top, side, and bottom members being firmly connected together where they join one another with said back, top, side, and bottom members forming a multi-diaphragm sound radiating device with the forward portions of said top, side, and bottom members being open ended and substantially undamped where a portion of said mechanical vibrations impressed on said radiating structure is sustained by said sound radiating structure with said sustained vibrations being discharged gradually as audible sound when said sound structure is set in motion by said vibratory means, and wherein said sound radiating structure is constructed from a magnetizable material and is vibrated magnetically by electro-magnetic means, whereby the magnetic energy produced by said electro-magnetic means is imposed directly on said magnetizable sound radiating structure, causing said sound radiating structure to vibrate and produce audible sound.

4,718,099

AUTOMATIC GAIN CONTROL FOR HEARING AID

David A. Hotvet, Savage, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Jan. 29, 1986, Ser. No. 823,668
Int. Cl.⁴ H03G *11/00*; H04R *27/02*
U.S. Cl. 381—68.4 **20 Claims**



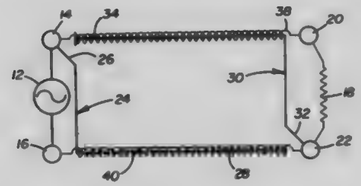
1. In a hearing aid, a signal processor responsive to the frequency, and energy content of a signal to be processed for compressing a signal when the amplitude is above a predetermined threshold level, comprising in combination; a terminal for connection to a compression amplifier; and a plurality of time constant means connected to said terminal, said time constant means being characterized to provide individual time constants of a diverse character for providing a compression amplifier control signal having a short attach and relatively longer release time, said release time being proportional to the duration of an input signal when the amplitude of said input signal is above said predetermined threshold level.

4,718,100

HIGH CURRENT DEMAND CABLE

Bruce A. Brisson, 40391 Dolerita Ave., Fremont, Calif. 94539

Filed Mar. 15, 1985, Ser. No. 712,276
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 381—77 **14 Claims**



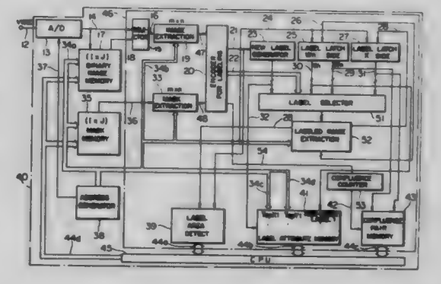
1. Cabling for interconnecting a source having a positive side and a return side to a load having a positive side and a return side, comprising:
a first open circuited conductor having a first end connected to a selected one of said source positive side and said source return side and having a second end extending towards and terminating free from connection to said load;
a second open circuited conductor having a first end connected to a respective one of said load positive side and said load return side, said respective one being of a different polarity than the polarity of said selected one of said source positive side and source return side to which said first open circuited conductor is connected, and having a second end extending towards and terminating free from connection to said source;
first source-load connecting means for electrically connecting said source positive side to said load positive side, said first connecting means being wound about at least a portion of the length of a selected one of said first and second open circuited conductors; and
second source-load connecting means for electrically connecting said source return side to said load return side, said second connecting means being wound about at least a portion of the length of a selected other of said first and second open circuited conductors.

4,718,101

IMAGE PROCESSING SEGMENTATION APPARATUS

Makoto Ariga, Yokohama; Seiji Hata, Fujisawa; Yoshikazu Suzumura, Chofu; Masaaki Nakagima, Hitachi, and Michio Takahashi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,795
Claims priority, application Japan, Mar. 26, 1984, 59-56046
Int. Cl.⁴ G06K *9/34*
U.S. Cl. 382—9 **5 Claims**



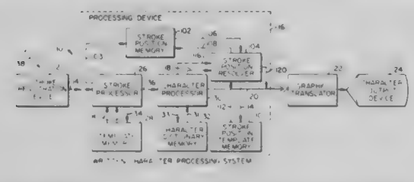
1. A segmentation apparatus in an image processing system for recognizing a pattern in an image input as a binary signal having two logics and which is obtained by converting an electric signal having image information or input as the binary signal once stored in store means, comprising:
binary image separate circuit means for separating an m by n pixel image from the binary signal obtained by converting the electric signal immediately after the input thereof or from the stored binary signal and for outputting all the logic values of the m by n pixels;
area assign memory circuit means for discriminating a portion of an area having an aritrary shape in the input image to be subjected to a recognition processing from a portion thereof not to he subjected to the recognition processing;
mask image separate circuit means for conducting a local separate operation on an area assign signal read from said area assign memory circuit means to provide a mask signal by sustaining an image size and a positional relationship

each identical to that of the binary signal, respectively and for outputting logical values of the m by n pixels;
encode circuit means for outputting:
a first signal code indicating which set of pixels in the vicinity of the binary pixel data separated is identical to an objective pixel;
a second signal code indicating a set of pixels completely different from the objective pixel; and
a third signal code indicating that the objective pixel overlaps with a set of pixels and that these overlapped pixels must be integrated;
label data extract circuit means for determining whether the object pixel is either identical to a set of images already specified or is a new set, or the sets must be integrated based on the signal code outputted from said encode circuit means and for extracting label data items already determined and $m \times n - 2$ in number for the objective pixel like said binary image separate circuit so as to label a set obtained;
selector circuit means for assigning each label data obtained from new label generate circuit means outputting new label data to the objective pixel in accordance with a labelling code from said encode circuit means based on a new label generate code outputted from said encode circuit means;
image address generate circuit means for enabling all said circuit means in synchronism with each other according to an image address;
label attribute memory circuit means for storing therein, when a labelled pixel is a new label, a vertex coordinate address of the pixel and a high-order label for a high-order pixel placed at a position exactly above thereof in a preceding scanning line;
detect circuit means for counting the number of label data items appearing in each label subjected to a labelling operation and for detecting an area of each label; and
store circuit means for storing therein label data of the items to be integrated in accordance with a signal code indicating a label integration and which is outputted from said encode circuit means;
characterized by that when the image signals inputted complete scanning a screen, a labelling operation is simultaneously conducted with an m by n pixel separation being executed as the primary processing so as to realize the labelling operation, the detection of the label area, label integration relationships, and label vertex coordinates, and the recognition of the label inclusion/exclusion relationships.

4,718,102
PROCESS AND APPARATUS INVOLVING PATTERN RECOGNITION

Hewitt D. Crane, Portola Valley, and John S. Ostrem, Palo Alto, both of Calif., assignors to Communication Intelligence Corporation, Menlo Park, Calif.

Continuation of Ser. No. 531,305, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 459,282, Jan. 19, 1983, Pat. No. 4,561,105. This application Apr. 3, 1987, Ser. No. 35,278
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—13 **62 Claims**



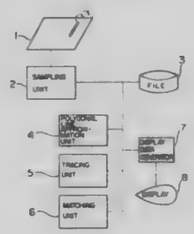
1. Apparatus for pattern processing, said apparatus comprising means for receiving first signal information derived from information comprising handwritten patterns, and data processing means provided with prestored second signal information for uniquely differentiating said handwritten patterns from patterns within a pattern vocabulary, said vocabulary being made up of one or more vocabulary sets with a set defining patterns with at least one common characteristic within which differentiation is restricted during at least a portion of processing, said second signal information being arranged to accomplish pattern processing by routines comprising algorithmic routines in which all patterns within at least a vocabulary set are processed similarly and disambiguation routines in which patterns are processed in terms of characteristics of specific patterns, in which use of algorithmic routines alone without disambiguation routines would yield confusion sets, said sets consisting of patterns confused with each other and in which use of both algorithmic routines and disambiguation routines yields uniquely differentiated patterns and second signal information including a dictionary containing the vocabulary and provision for matching information derived from said first signal information with dictionary entries within the appropriate set,

characterized in that said algorithmic routines if used alone without any disambiguation routines results in at least 50 percent of all patterns within the pattern vocabulary being in confusion sets, each said set containing an averave of at least two patterns, and in which the said disambiguation routines include non-uniform, customized routines selected to distinguish members within confusion sets, while at the same time surviving handwriting variations, whereby said data processing means comprises means for producing unique character recognition.

4,718,103
METHOD AND APPARATUS FOR ON-LINE RECOGNIZING HANDWRITTEN PATTERNS

Hiroshi Shojima; Toshimi Mifune; Junko Mori, all of Hitachi, and Soshiro Kuzunuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,071
Claims priority, application Japan, Oct. 8, 1985, 60-222816
Int. Cl.[4] G06K *9/62*
U.S. Cl. 382—13 **11 Claims**



1. A method of recognizing handwritten patterns comprising the steps of:
(a) sampling strokes of a handwritten pattern to produce a series of sampled plots on a plane of coordinates;
(b) segmenting the series of sampled plots to a series of polygonal lines, which approximate the handwritten pattern, consisting of segments;
(c) evaluating the angular variation between adjoining segments by tracing the series of polygonal lines in a certain direction so as to determine a series of input angular variation values;
(d) reading out a candidate pattern from a dictionary storage which stores a plurality of dictionary patterns, each of which is expressed in terms of a series of reference angular variation values determined as angular variations of adjoining segments by tracing the series of segments of the pattern in said direction;
(e) comparing an input angular variation value selected from said series of input angular variation values with a reference angular variation value selected from said series of reference angular variation values;
(f) if the comparison result is outside of a certain range, adding input angular variation values of said series of input angular variation values to the selected input angular variation value one by one so that the comparison result is inside of said range;
(g) if the comparison result in step (e) or (f) is inside of said range, determining a partial difference between the input pattern and the candidate pattern in accordance with the comparison result, and thereafter repeating said steps (e), (f) and (g) for comparing a next input angular variation value selected from said series of input angular variation values with a next reference angular variation value selected from said series of reference angular variation values; and
(h) determining an ultimate difference between the input pattern and the candidate pattern upon completion of comparison for at least one of said series of input angular variation values and said series of reference angular variation values.

4,718,104
FILTER-SUBTRACT-DECIMATE HIERARCHICAL PYRAMID SIGNAL ANALYZING AND SYNTHESIZING TECHNIQUE

Charles H. Anderson, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

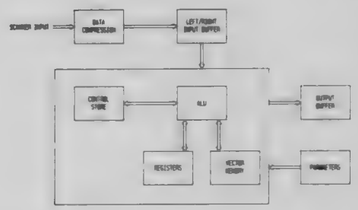
Continuation of Ser. No. 774,984, Sep. 11, 1985, abandoned. This application May 15, 1987, Ser. No. 51,210
Claims priority, application United Kingdom, Nov. 27, 1984, 8429879
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **13 Claims**

1. A filter-subtract-decimate (FSD) method for analyzing the frequency spectrum of an n-dimensional information component, defined by respective level-values of certain samples of an applied temporal-signal sample stream, into at least one bandpass sub-spectrum and a remnant sub-spectrum, where n is a given integer having a value of at least one, said certain samples of said applied sample stream defining each of said n-dimensions of said information component with a particular relatively high sample density; said FSD method comprising the steps of:
(a) convolving said certain samples of said sample stream with a symmetrical, localized, equal-contribution, low-pass filter, n-dimensional kernel function having a low-ass transmission characteristic to derive a convolved sample stream, said convolved sample stream including filtered samples that individually correspond to each and every one of said certain samples;
(b) subtracting a level-value of each of said filtered samples from a level-value of that individual certain sample with which it corresponds to derive a first output sample stream that includes information-component samples corresponding to said certain samples that define said band-pass sub-spectrum with said particular relatively high sample density, and
(c) decimating said convolved sample stream to derive a second output sample stream that includes information-component samples corresponding to only a given sub-multiple of said certain samples that define said remnant sub-spectrum with a relatively lower sample density in each dimension than said particular relatively high sample density.

4,718,105
GRAPHIC VECTORIZATION SYSTEM

Curtis A. Lipkie, Littleton, and Eugene A. Kleca, Broomfield, both of Colo., assignors to ANA Tech Corporation, Littleton, Colo.

Continuation-in-part of Ser. No. 475,037, Mar. 14, 1983, Pat. No. 4,603,431. This application Mar. 1, 1984, Ser. No. 585,258
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—56 **45 Claims**



1. An apparatus, operative on input signals representative of coordinates of intercepts along substantially parallel scans of a two-dimensional image, for encoding the graphic information therein by generation of a series of output records representative of significant graphic data, such data including branch junction type and coordinate data, the apparatus comprising:
data compression means for extracting coordinates of a run of like-valued signals along a scan line;
correlating means for correlating coordinates for a given run from the data compression means with a new or previously scanned vector;
vector memory means (i) for storing data pertaining to each vector with respect to which the correlating means has correlated run data and (ii) for storing in an ordered sequence during encoding, vector records, each record containing data representative of the image scanned on at least one preceding scan line;
processing means, operative on coordinates of the given run and on data read from the vector memory means related to a correlated vector, for determining whether the given run's coordinates define a continuation of the correlated vector to within a prescribed degree of accuracy;
clearing means for clearing the data related to the correlated vector from the vector memory means when the processing means determines that the given run's coordinates do not represent a continuation of the vector to within the prescribed degree of accuracy and for causing data corresponding to the correlated vector to be given as an output;
arithmetic logic means, for comparing the data output from the clearing means with data from corresponding vector records to determine the occurrence of branch junctions and generate data representative thereof;
control means, in communication with the arithmetic logic means and with the vector memory means, for causing the outputs of output records, including data from vector records and branch junction data, when the arithmetic logic means has determined the occurrence of a branch junction; and

artifact removal means, in communication with the arithmetic logic means, for removing artifact irregularities in the graphic image having at least one dimension smaller than a threshold, so that information derived from scanning such irregularities does not appear in the output records;

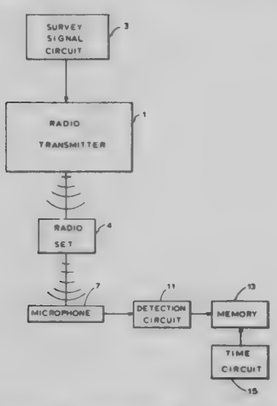
fuzz elimination means, for suppressing from being output data representative of a graphic feature which branches out from another scanned feature for less than a number of scan lines corresponding to the threshold.

4,718,106

SURVEY OF RADIO AUDIENCE

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Filed May 12, 1986, Ser. No. 862,107
Int. Cl.[4] H04B *17/00*
U.S. Cl. 455—2 **10 Claims**



1. Apparatus for surveying an audience to determine whether a listener is tuned to a given radio station transmitting designated programming signals on a predetermined frequency along with a survey signal characteristic of said given radio station, said programming signals and said survey signal being detected by a radio set to provide audibly reproduced programming signals and an audibly reproduced survey signal, the apparatus comprising:

first means for detecting audible sounds reproduced by said radio set to generate a control signal corresponding to said audibly reproduced survey signal;

second means coupled to said first means for responding only to said control signal to generate a store signal in response thereto; and

memory means coupled to said second means for storing a signal indicative of each detection of said control signal.

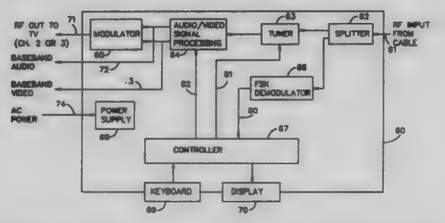
4,718,107

PARENTAL CONTROL FOR CATV CONVERTERS

John J. Hayes, Chesapeake, Va., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 14, 1986, Ser. No. 829,242
Int. Cl.[4] H04H *1/02*; H04N *7/00*
U.S. Cl. 455—4 **9 Claims**

4. A three state controller for an addressable CATV converter for controlling the channels which may be viewed by a subscriber identified by an address assigned to the converter, said three state controller being responsive to addressed commands from a CATV system to which it is connected and to user inputs for generating control signals for the converter, said three state controller means including memory means for storing a user entered access code and a list of user designated blocked channels, said three state controller having a family viewing mode in which authorized channels which have not been locked out may be viewed, an enter access code mode, and a parental control mode in which all authorized channels may be viewed, said three state controller being in the family viewing mode when said converter is turned off and then on, or a user input mode command is received while in either the enter access code mode or the parental control mode or a clear parental control command is received from the CATV system, said three state controller means being responsive to said clear



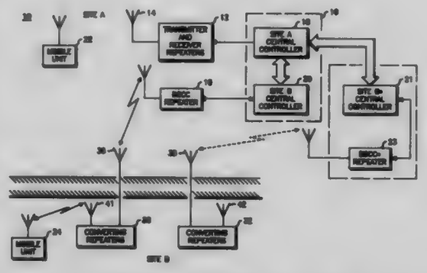
parental control command for clearing said user entered access code and deleting said list of user designated blocked channels in said memory means, said three state controller being in the enter access code mode when a user input mode command is received while in the family viewing mode, and said three state controller being in the parental control mode when either a correct access code or a new code is created while in the enter access code mode.

4,718,108

IMPROVED MULTIPLE SITE COMMUNICATION SYSTEM

Allen L. Davidson, Crystal Lake, and Steve Dunkerton, Riverwoods, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 19, 1986, Ser. No. 864,688
Int. Cl.[4] H04B *7/26*
U.S. Cl. 455—17 **38 Claims**



1. In a communication system of the type adapted to communicate a message substantially simultaneously between a plurality of fixed location sites having respective radio coverage areas, an arrangement for providing communication to units within said coverage areas comprising:

first radio frequency transmission means at a first one of said sites for transmitting to units on selected ones of a first set of frequencies;

second radio frequency transmission means at a second one of said sites for transmitting on selected ones of a second set of frequencies different than said first set of frequencies, said second radio frequency transmission means having means for receiving selected ones of said first set of frequencies and means for converting selected ones of said first set of frequencies to ones of said second set of frequencies; and

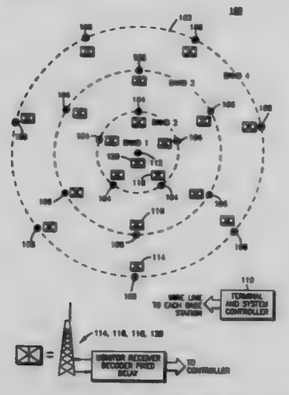
control means at said first site and coupled to said first radio frequency transmission means for selecting among said first and second set of frequencies to communicate on channels at said first and second sites whereby said message may be substantially simultaneously communicated at said respective sites.

4,718,109

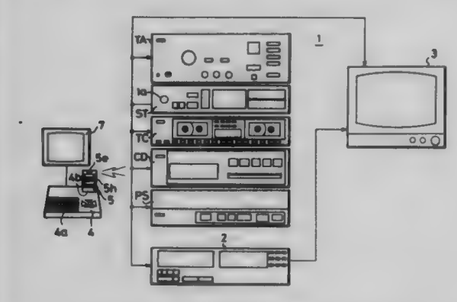
AUTOMATIC SYNCHRONIZATION SYSTEM

Robert L. Breeden, Boynton Beach, and William V. Braun, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1986, Ser. No. 815,473
Int. Cl.[4] H04B *1/00, 7/00*
U.S. Cl. 455—51 **12 Claims**

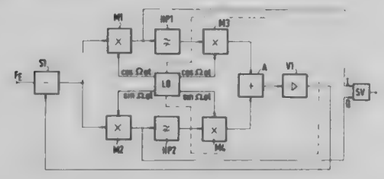


4,718,112
REMOTE CONTROL APPARATUS
Hatsuhiko Shinoda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 1, 1985, Ser. No. 782,538
Claims priority, application Japan, Oct. 5, 1984, 59-206915
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—151 **6 Claims**



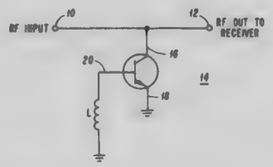
1. Apparatus for remotely controlling the operation of at least one electronic device; said apparatus comprising:
a remote-control unit removeably attachable to a personal computer having a keyboard, said unit including a read-only memory for storing a data table, means for generating a program of events to be executed at predetermined future times, a random-access memory for storing said program, a central processing unit jointly interactive with said read-only memory and said random-access memory, and a transmitter controlled by said central processing unit for producing remote-control signals corresponding to said events and being based upon said data table and said program;
a receiver responsive to said remote-control signals for controlling said device in accordance therewith; and
simulation means for producing said remote-control signals and causing the respective events to occur before said predetermined future times in response to operations of said keyboard of the personal computer;
whereby at least a portion of said program is pre-executed as a test of its validity.

4,718,113
ZERO-IF RECEIVER WIH FEEDBACK LOOP FOR SUPPRESSING INTERFERING SIGNALS
Dietrich Rother, Tamm; Dieter Wiechert, Neuenburg-Arnbach, and Manfred Moster, Niefern, all of Fed. Rep. of Germany, assignors to Alcatel NV, Amsterdam, Netherlands
Filed Apr. 21, 1986, Ser. No. 854,278
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516492
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—209 **7 Claims**



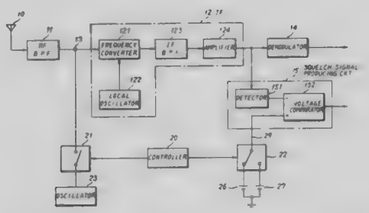
1. A radio receiver for receiving an incoming input signal having an associated carrier frequency, said receiver comprising
an oscillator for producing first and second oscillator signals differing in phase by 90° and having the same frequency as the carrier of the input signal;
a subtractor having subtractor first and second inputs and a subtractor output, said incoming signal being coupled to said first subtractor input;
first and second primary mixers each having primary mixer first and second inputs and a primary mixer output, the primary mixer first inputs being coupled to the subtractor output and the respective first and second primary mixer second inputs being coupled to the respective first and second oscillator signals;
first and second high-pass filters each having a high-pass filter input and high-pass filter output, the respective first and second high-pass filter inputs being coupled to the respective first and second primary mixer outputs;
first and second secondary mixers each having secondary mixer first and second inputs and a secondary mixer output, the respective first and second secondary mixer first inputs being coupled to the respective first and second oscillator signals and the respective first and second secondary mixer second inputs being coupled to the respective first and second high-pass filter outputs;
an adder having adder first and second inputs respectively coupled to the respective first and second secondary mixer outputs, said adder also having an adder output coupled to said subtractor second input, said subtractor subtracting the error signal output by said adder from the incoming signal to form the input signal to said primary mixers; and a signal processor for further signal processing of the signals output by the first and second primary mixers.

4,718,114
AC OVERLOAD PROTECTIVE CIRCUIT
Robert L. Brandt, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 27, 1986, Ser. No. 845,162
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—217 **2 Claims**



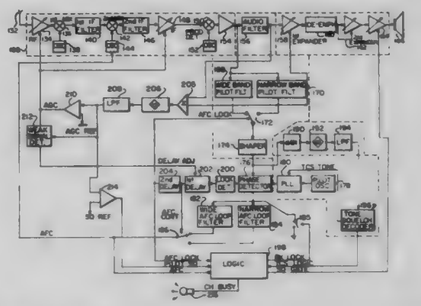
1. An RF system comprising:
an antenna providing a received RF signal as an input signal;
a first capacitor having a first terminal coupled to receive said RF signal and a second terminal;
a PIN diode having an anode terminal coupled to the second terminal of said first capacitor and a cathode terminal;
a second capacitor having a first terminal coupled to the cathode terminal of said diode and a second terminal;
a radio receiver coupled to said second terminal of said second capacitor for receiving RF signals;
a transistor having a collector coupled to the second terminal of said first capacitor, a base terminal, and an emitter terminal coupled to a current return path;
an inductor having a first terminal coupled to the base terminal of said transistor and a second terminal coupled to said current return path, said inductor having a value such that said transistor turns on in response to an RF input signal exceeding a predetermined value;
a second inductor having one terminal coupled to the anode of said diode and a second terminal;
a first resistor having a first terminal coupled to the second terminal of said second inductor and a second terminal coupled to receive a voltage;
a third capacitor having a first terminal coupled to the second terminal of said inductor and a second terminal coupled to said current return path;
a second resistor having a first terminal coupled to the cathode of said diode and a second terminal coupled to said current return path, said voltage source being selected to provide a DC voltage to bias the anode of said diode to conduct and to prevent said diode from conducting upon the removal of the voltage at said anode.

4,718,115
RADIO RECEIVER FOR CARRYING OUT SELF DIAGNOSIS WITHOUT INTERFERENCE
Taketoshi Inoue, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Aug. 7, 1986, Ser. No. 893,985
Claims priority, application Japan, Aug. 9, 1985, 60-174243
Int. Cl.[4] H04B 1/10
U.S. Cl. 455—218 **3 Claims**



1. A circuit arrangement which is selectively operable in a normal mode and a diagnosis mode in response to a circuit input signal and a diagnosis input signal generated in said circuit arrangement, respectively, and comprises a controller for producing a control signal selectively indicative of said normal and said diagnosis modes, processing means responsive to said control signal for processing said circuit and said diagnosis input signals into a processed signal of a processed level when said control signal indicates said normal and said diagnosis modes, respectively, and squelch signal producing means responsive to said processed signal and a reference signal of a reference level for producing a squelch signal when said processed and said reference levels have a predetermined relationship, wherein the improvement comprises:
first threshold signal generating means for generating a first threshold signal of a first threshold level;
second threshold signal generating means for generating a second threshold signal of a second threshold level which is lower than said first threshold level;
selecting means responsive to said control signal for selecting said first and said second threshold signals as a selected threshold signal when said control signal indicates said normal and said diagnosis modes, respectively; and
means for supplying said selected threshold signal to said squelch signal producing means as said reference signal, said squelch signal producing means using said first threshold level as said reference level when said control signal indicates said normal mode, said squelch signal producing means using said second threshold level as said reference level when said control signal indicates said diagnosis mode.

4,718,116
METHOD AND APPARATUS FOR RECEIVING A COMPRESSED COMPOSITE SIGNAL
Paul H. Jacobs, Fairport, and Douglas P. Collette, Stafford, both of N.Y., assignors to Aerotron, Inc., Raleigh, N.C.
Continuation-in-part of Ser. No. 558,046, Jan. 26, 1984, Pat. No. 4,573,208, which is a division of Ser. No. 384,148, Jun. 1, 1982, Pat. No. 4,539,707. This application Dec. 11, 1985, Ser. No. 807,641
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—245 **18 Claims**



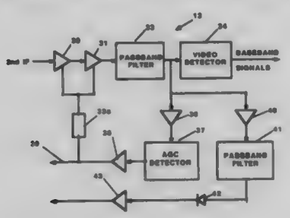
15. A receiver having a radio frequency and intermediate frequency amplifiers with enhanced reception of a composite radio frequency signal including an audio frequency component and a pilot tone component comprising,
means for detecting the pilot tone component of a received signal by a pilot filter and rectifier means,
means for extracting the audio frequency component of the received signal by an audio filter,
means for combining the amplitude of said detected pilot tone component and said detected audio frequency component to control the gain of said radio frequency amplifier and intermediate frequency amplifier within the receiver,
means for de-emphasizing the audio frequency component for application to a speaker,
means for locally generating a pilot tone,
means for receiving in a phase lock loop responsive to said detected pilot tone component and said locally generated pilot tone and for adjusting said radio frequency oscillator for frequency errors in said detected pilot tone, and
means for selectively varying the frequency response characteristics of said pilot filter as a function of lock-on by said phase lock loop.

4,718,117
TVRO RECEIVER SYSTEM WITH LOW-COST VIDEO-NOISE REDUCTION FILTER
John Y. Ma, Milpitas, and Albert C. Houston, Santa Cruz, both of Calif., assignors to Capetronic (BSR) Ltd., Kowloon, Hong Kong
Filed Oct. 30, 1985, Ser. No. 792,767
Int. Cl.[4] H04B 1/26
U.S. Cl. 455—314 **21 Claims**

1. A TVRO receiver for receiving frequencymodulated video signals centered within a frequency range having a nominal center frequency, the receiver comprising:
a tuner including a superheterodyne circuit having a voltage-controlled oscillator (VCO), means for supplying a controlling input voltage to said VCO, and a mixer for combining incoming 1st IF signals within a predetermined IF frequency range with the output of said VCO to reduce the frequency of the 1st IF signals to within a 2nd IF frequency range having a predetermined nominal center frequency which permits the output frequencies of said

VCO to be above the frequency range of the 1st IF signals, thereby preventing the output of the VCO from the interfering with the 1st IF signals, and

a single linear phase passband filter for passing a single video



channel in the 2nd IF output from said mixer, said filter having adjustable passband characteristics for producing an output which is at least about 10 dB down from its peak at both +10 MHz and −10 MHz from the center of the passband of said filter.

4,718,118

TRANSPARENT LASER DRIVE CURRENT UPDATE FOR BURST MODE FIBER OPTIC COMMUNICATION SYSTEM

Jeffrey P. Viola, Brookhaven, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 24, 1986, Ser. No. 832,532
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—613 **12 Claims**

1. A bias control circuit for a light emitting device for a data transmitter adapted for burst communications in a fiber optic communications systems, wherein said light emitting device has a light-versus-drive-current characteristic including a first portion in which the light emitted as a function of drive current increases relatively slowly from zero to a first level which occurs at a knee point, and also including a second portion in which the light emitted as a function of drive current increases relatively quickly for drive currents exceeding the drive current corresponding to said knee point, said circuit comprising:

a controllable drive current source coupled to the light emitting device for applying drive current thereto, said controllable drive current source being enabled in response to an enable control signal applied to an enable input terminal for supplying said drive current, the magnitude of which is established in response to a magnitude control signal applied to a magnitude input terminal;

a source of burst data signals;

enable control signal generating means coupled to said source of burst digital data signals and to said controllable drive current source for generating said enable control signal during an enabled interval at least equal to the duration of one burst of said burst digital data and for applying said enable control signal to said enable input terminal of said controllable drive current source, whereby said drive current is applied to said light emitting device during at least part of the time said burst digital data signals are transmitted but said drive current is not applied to said light emitting device during at least most of the time between bursts of said burst digital data signal, which reduces residual light in said fiber optic communications system and noise resulting therefrom;

first memory means coupled to said controllable drive current source for storing said magnitude control signal and for applying said magnitude control signal to said magnitude input terminal, said first memory means including word input terminals and also including a write control input terminal to which a write control word may be applied for causing said first memory means to store a new magnitude control signal applied to said word input terminals;

photoelectric conversion means coupled to said light emitting device for generating a photoelectic signal representative of the light output of said light emitting device;

control signal processing means coupled to said photoelectric means for comparing said photoelectric signal with a reference signal representative of a desired light output from said light emitting device, and for generating said new magnitude control signal; and

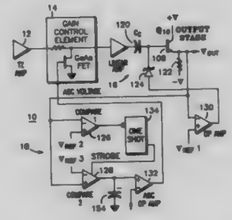
timing means coupled to said enable control signal generating means, to said control signal processing means and to said write control input terminal and word input terminals of said first memory means for generating said write control word and for storing said new magnitude control signal in said first memory means at a time other than said time during which said enable control signal causes drive current to be applied to said light emitting device, whereby said magnitude control signal is not updated during said burst signals and said burst signals are not perturbed.

4,718,119

AGC CIRCUIT INCLUDING A PRECISION VOLTAGE CLAMP AND METHOD

William E. Salzer, Gilbert, and Jay W. Gustin, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 27, 1984, Ser. No. 644,587
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—619 **11 Claims**



1. An AGC circuit for a receiver including a gain control element and an output amplifier for producing an output signal comprising:

a first amplifier having as inputs a first reference voltage level and said output signal, said first amplifier producing a clamping signal in response thereto;

clamping means coupled to said first amplifier and to said output amplifier for clamping said output signal in response to said clamping signal;

a first comparator having as inputs said output signal and a second reference voltage level, said first comparator for producing an enable signal in response thereto;

a fixed duration pulse producing circuit operable in response to said enable signal for producing a strobe signal in response thereto;

a second comparator having as inputs said output signal and a third reference voltage level for producing an intermediate signal in response thereto upon enablement by said strobe signal; and

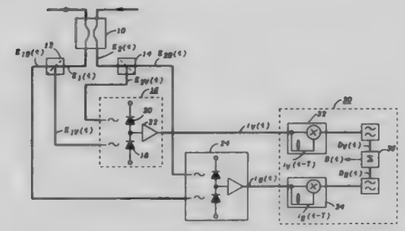
a second amplifier having as an input said intermediate signal for producing an AGC signal to said gain control element in response thereto.

4,718,120

POLARIZATION INSENSITIVE COHERENT LIGHTWAVE DETECTOR

Liang Tzeng, Fogelsville, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 24, 1986, Ser. No. 933,827
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—619 **5 Claims**



1. A coherent lightwave demodulator which is capable of recovering a message signal from a received lightwave signal ($E_R(t)$) without determining the polarization state β of said received lightwave signal, said demodulator comprising

coupling means responsive to both said transmitted lightwave signal and a locally generated lightwave oscillating signal of a known polarization state ($E_L(t)$), said coupling means generating as separate outputs a first signal ($E_1(t)$) and a second signal ($E_2(t)$) comprising portions of both said transmitted message signal and said locally generated lightwave oscillating signal;

a first polarization-selective beam splitter aligned with said known polarization state of said local oscillating signal for receiving as an input the first signal generated by said coupling means, said first beam splitter for evenly dividing the power of said locally generated lightwave oscillating signal and providing as separate outputs a first horizontally polarized lightwave signal ($E_{1H}(t)$) and a first vertically polarized lightwave signal ($E_{1V}(t)$);

a second polarization-selective beam splitter aligned with said known polarization state of said local oscillating signal for receiving as an input the second signal generated by said coupling means, said second beam splitter for evenly dividing the power of said locally generated lightwave oscillating signal and providing as separate outputs a second horizontally polarized lightwave signal ($E_{2H}(t)$) and a second vertically polarized lightwave signal ($E_{2V}(t)$);

a first balanced optical receiver responsive to said first and said second vertically polarized lightwave signals for providing as an output a first photocurrent ($i_V(t)$) related to the difference between said first and said second vertically polarized lightwave signals; a second balanced optical receiver responsive to said first and second second horizontally polarized lightwave signals for providing as an output a second photocurrent ($i_H(t)$) related to the difference between said first and second second vertically polarized lightwave signals;

first squaring means responsive to said first photocurrent output from said first balanced receiver for generating a squared representation ($D_V(t)$) of said first photocurrent;

second squaring means responsive to said second photocurrent output from said second balanced receiver for generating a squared representation ($D_H(t)$) of said second photocurrent; and

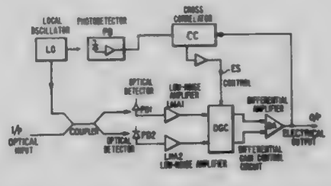
summing means responsive to both said first and said second squaring means for adding together said squared representations of said first and said second photocurrents to provide as an output the recovered message signal (D(t)).

4,718,121

BALANCED COHERENT RECEIVER

Richard E. Epworth, Stortford, Great Britain, assignor to STC PLC, London, England

Filed Mar. 6, 1986, Ser. No. 836,795
Claims priority, application United Kingdom, Mar. 7, 1985, 8505937
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—619 **6 Claims**



1. A coherent optical receiver having an electrical signal output, an optical information signal input, an optical local oscillator, first means coupled to the optical input and the local oscillator and arranged to produce out-of-phase signals in respective channels accompanied by in-phase signals and to derive the electrical output signal therefrom, and second means coupled to the signal output and arranged to derive an error signal representative of the imbalance of the in-phase signals, and a feedback control circuit connected to receive the error signal and which is used to adjust the balance of said in-phase signals.

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DESIGN PATENTS

GRANTED JAN. 5, 1988

ERRATA

For CLASS	See PATENT NO.
D16-107	293,503
D07-416	293,603

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UMI

293,500
SHOE COLLAR
James K. Toag, Portland, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to PENSA, Inc., Portland, Oreg.
Filed Apr. 17, 1986, Ser. No. 855,763
Term of patent 14 years
U.S. Cl. D2—314



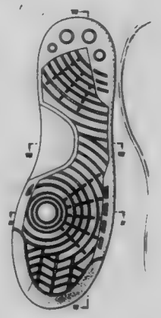
293,501
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Japan
Filed Sep. 4, 1985, Ser. No. 772,955
Claims priority, application Japan, Mar. 8, 1985, 60-9443
Term of patent 14 years
U.S. Cl. D2—320



293,502
SHOE SOLE
Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Japan
Filed Sep. 4, 1985, Ser. No. 772,625
Claims priority, application Japan, Mar. 27, 1985, 60-12291
Term of patent 14 years
U.S. Cl. D2—320

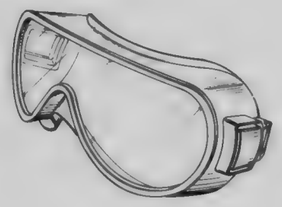


293,503
SHOE SOLE
Shigeyuki Mitsui, Kobe, and Yoshiaki Hase, Akashi, both of Japan, assignors to Asics Corporation, Japan
Filed Sep. 4, 1985, Ser. No. 772,601
Claims priority, application Japan, Mar. 8, 1985, 60-9444
Term of patent 14 years
U.S. Cl. D2—320



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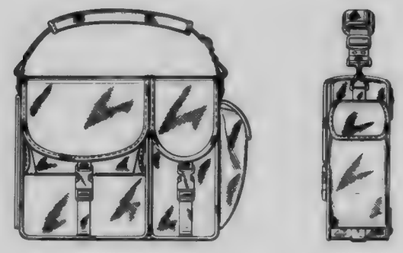
293,504
VENTILATED SPLASH GOGGLES
Paul B. Specht, Wilmette, Ill., and Charles D. Hewitt, Houston, Tex., assignors to Encon Manufacturing, Inc., Houston, Tex.
Filed Jun. 7, 1984, Ser. No. 618,334
Term of patent 14 years
U.S. Cl. D16—107

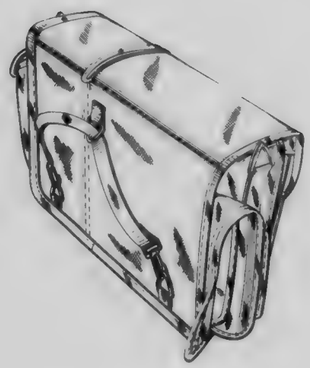


293,505
TEXTILE YARN CARRIER
Karl H. Rost, and Samuel F. Adams, both of Greenville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.
Filed Jun. 14, 1985, Ser. No. 744,918
Term of patent 14 years
U.S. Cl. D3—26

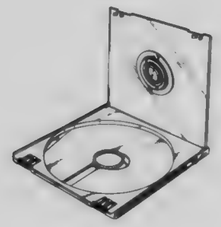


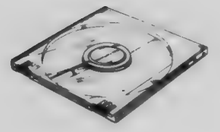
293,506
CARRYING CASE FOR A VIDEO CASSETTE RECORDER
Joseph Kappel, Hewlett, and Richard Goldberg, Scarsdale, both of N.Y., assignors to Coast Manufacturing Co., Inc., Mount Vernon, N.Y.
Filed Dec. 18, 1984, Ser. No. 683,116
Term of patent 14 years
U.S. Cl. D3—33





293,507
DISC MAGAZINE CASE
Mikio Ogasa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Jan. 18, 1985, Ser. No. 692,677
Claims priority, application Japan, Jul. 25, 1984, 59-31200
Term of patent 14 years
U.S. Cl. D3—35

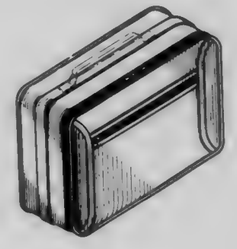




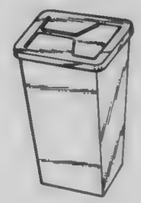
293,508
DIAPER BAG
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,489
Term of patent 14 years
U.S. Cl. D3—48



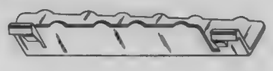
293,509
LUGGAGE CASE
Hyun S. Kim, Newcastle, Pa., assignor to Airway Industries, Inc., Elwood City, Pa.
Filed May 8, 1985, Ser. No. 731,939
Term of patent 14 years
U.S. Cl. D3—48



293,510
TOOTHBRUSH COVER
Martin E. Rudnick, 2353 Rupert Dr., San Jose, Calif. 95124
Filed Aug. 13, 1985, Ser. No. 765,409
Term of patent 14 years
U.S. Cl. D4—199

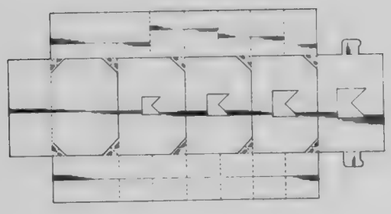


293,511
CONNECTOR FOR A PICTURE FRAME
Takeo Komamura, Matsudo, Japan, assignor to Japan Art Kikaku Co., Ltd., Saitama, Japan
Division of Ser. No. 630,972, Jul. 16, 1984. This application Feb. 2, 1987, Ser. No. 10,143
Term of patent 14 years
U.S. Cl. D6—300

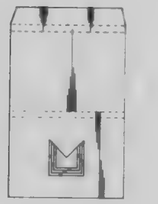




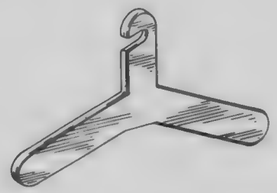
293,512
COMBINATION PHOTOGRAPHY AND ART MOUNT
Paul Fargis, c/o The Stonesong Press, 200 Haines Rd., Bedford Hills, N.Y. 10507, and Philip Lief, 319 E. 52nd St., New York, N.Y. 10022
Filed Dec. 21, 1984, Ser. No. 655,412
Term of patent 14 years
U.S. Cl. D6—302



293,513
PAPER BUNDLING TABLE
David W. Hosmer, 318 Magnolia Dr., Modesto, Calif. 95354
Filed Jul. 11, 1985, Ser. No. 753,931
Term of patent 14 years
U.S. Cl. D6—400



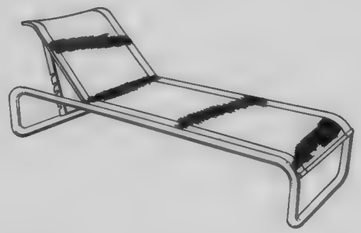
293,514
COAT HANGER
Harold K. Hurrelbrink, Hinsdale, Ill., assignor to Magnuson Group, Burr Ridge, Ill.
Filed Aug. 13, 1985, Ser. No. 765,380
Term of patent 14 years
U.S. Cl. D6—318



293,515
OTTOMAN
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company Limited Partnership, El Monte, Calif.
Filed Jul. 3, 1985, Ser. No. 752,162
Term of patent 14 years
U.S. Cl. D6—349



293,516
ADJUSTABLE CHAISE LOUNGE
Moses R. Schultz, R.D. Box 52, Barto, Pa. 19504
Division of Ser. No. 510,872, Jul. 5, 1983. This application Feb. 26, 1986, Ser. No. 836,175
Term of patent 14 years
U.S. Cl. D6—361



293,517
CHAIR
Mario Bellini, 11 Corso Venezia, I-16126 Milano, Italy
Filed Jan. 11, 1985, Ser. No. 690,688
Claims priority, application Hague, Jul. 13, 1984, 74205
Term of patent 14 years
U.S. Cl. D6—366



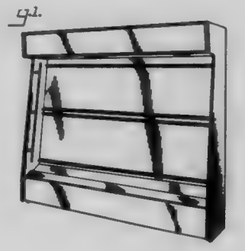
293,518
CHAIR
Sandro Tonon, Manzano, Italy, assignor to Tonon & C. S.p.A., Manzano, Italy
Filed Apr. 16, 1985, Ser. No. 723,925
Claims priority, application Italy, Oct. 23, 1984, 60485/84[U]
Term of patent 14 years
U.S. Cl. D6—370



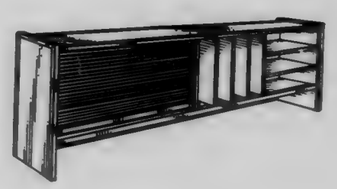
293,519
CHAIR FRAME OR THE LIKE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Apr. 22, 1985, Ser. No. 725,479
Term of patent 14 years
U.S. Cl. D6—373



293,520
SAMPLE DISPLAY BOOTH FOR CARPET, TILE AND THE LIKE
Ernest G. Ovitz, III, Galva, Ill., assignor to John H. Best & Sons, Inc., Galva, Ill.
Filed Feb. 22, 1985, Ser. No. 704,556
Term of patent 14 years
U.S. Cl. D6—409



293,521
CABINET
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Jun. 24, 1985, Ser. No. 747,969
Term of patent 14 years
U.S. Cl. D6—433

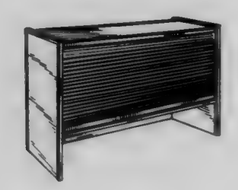


293,522
DISPLAY STAND
Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
Filed May 14, 1985, Ser. No. 733,916
The portion of the term of this patent subsequent to Dec. 11, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—436



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293,523
COMBINED CABINET AND SHELF UNIT
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Jun. 24, 1985, Ser. No. 747,967
Term of patent 14 years
U.S. Cl. D6—436



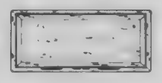
293,524
DISPLAY STAND
Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
Filed Apr. 15, 1985, Ser. No. 723,481
The portion of the term of this patent subsequent to Dec. 11, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—436

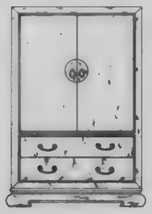


293,525
DISPLAY STAND
Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
Filed May 14, 1985, Ser. No. 733,914
The portion of the term of this patent subsequent to Dec. 11, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—436



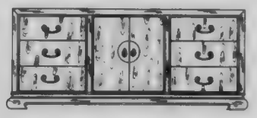
293,526
CHEST
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Industries, Lenoir, N.C.
Filed Apr. 15, 1985, Ser. No. 723,514
Term of patent 14 years
U.S. Cl. D6—446



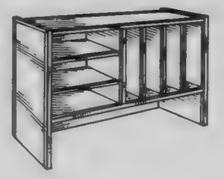


293,527
DRESSER
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Industries, Lenoir, N.C.
Filed Apr. 15, 1985, Ser. No. 723,513
Term of patent 14 years
U.S. Cl. D6—446





293,528
SHELF UNIT
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Jun. 24, 1985, Ser. No. 747,968
Term of patent 14 years
U.S. Cl. D6—449

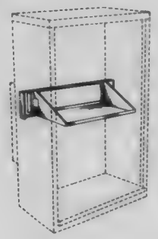


293,529
CHAIR PANEL
Arthur O. Ross, Los Angeles, Calif., assignor to Ross Trading Co., Inc., Los Angeles, Calif.
Filed Jul. 1, 1985, Ser. No. 750,506
Term of patent 14 years
U.S. Cl. D6—494

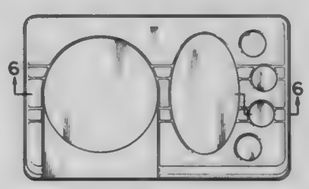


293,530
KEYBOARD SUPPORT DRAWER FOR COMPUTER WORKSTATION
David Wright, Shrewsbury, and Richard M. Latino, Holden, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Feb. 4, 1985, Ser. No. 697,679
Term of patent 14 years
U.S. Cl. D6—510

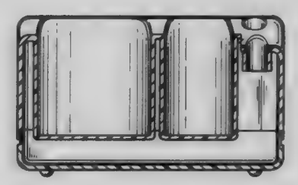
293,531
ELECTRONIC EQUIPMENT SUPPORT SHELF
David Wright, Shrewsbury, and Richard M. Latino, Holden, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Feb. 4, 1985, Ser. No. 697,658
Term of patent 14 years
U.S. Cl. D6—511



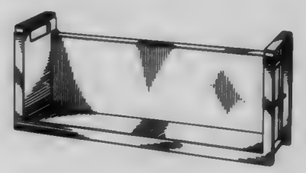
293,532
COMBINED TOOTHBRUSH, TUMBLER AND TOOTHPASTE HOLDER
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069
Filed Aug. 22, 1985, Ser. No. 768,191
Term of patent 14 years
U.S. Cl. D6—531







293,533
SHELF
Frank J. DiSess, Lunenburg, Mass., assignor to Tucker Housewares, Inc, Leominster, Mass.
Filed May 10, 1985, Ser. No. 733,234
Term of patent 14 years
U.S. Cl. D6—574



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293,534
BEVERAGE STEIN
Donald L. Bolich, 1136 Birdie Rd., Broomfield, Colo. 80020
Filed Nov. 9, 1984, Ser. No. 669,834
Term of patent 14 years
U.S. Cl. D7—5

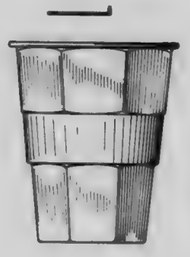


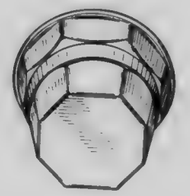
293,535
CUP
Bjorn Wiinblad, Lausanne, Switzerland, assignor to Rosenthal Aktiengesellschaft Rechtsabteilung, Fed. Rep. of Germany
Filed Aug. 21, 1985, Ser. No. 767,953
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 7477
Term of patent 14 years
U.S. Cl. D7—9



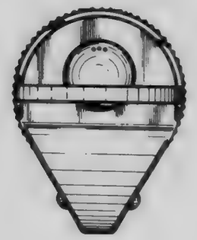


293,536
TUMBLER OR SIMILAR ARTICLE
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Jan. 7, 1985, Ser. No. 689,484
Claims priority, application Hague, Jul. 20, 1984, DM/004 000
The portion of the term of this patent subsequent to Aug. 5, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—14



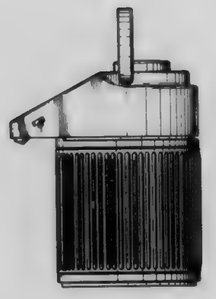


293,537
ELECTRIC INSULATED BEVERAGE DISPENSER OR THE LIKE
Seishin Seike, Osaka, Japan, and Mario Bellini, Rotterdam, Netherlands, assignors to Zojorushi Vacuum Bottle, Co., Ltd., Osaka, Japan
Filed Nov. 1, 1984, Ser. No. 667,310
Claims priority, application Japan, May 1, 1984, 59-017977
The portion of the term of this patent subsequent to Dec. 29, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—313

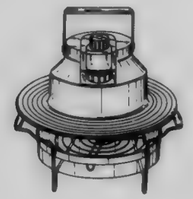


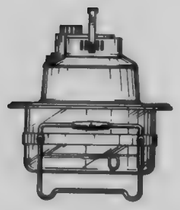
293,538
INSULATED JUG OR THE LIKE
Asso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Asso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Apr. 16, 1985, Ser. No. 723,662
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 8 AR 166/84
Term of patent 14 years
U.S. Cl. D7—317

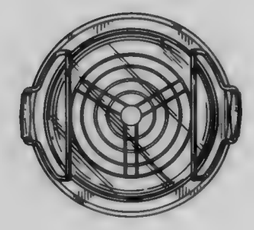




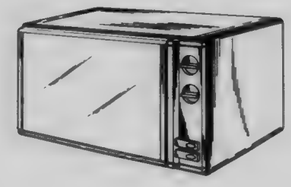
293,539
BROILER
Hideo Nishikawa, Higashi Osaka, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Oct. 17, 1984, Ser. No. 661,840
Term of patent 14 years
U.S. Cl. D7—337





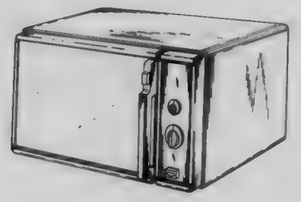


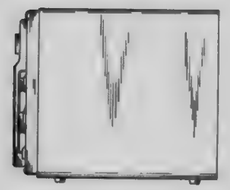
293,540
MICROWAVE OVEN
Jong S. Choi, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1985, Ser. No. 706,125
Claims priority, application Rep. of Korea, Nov. 23, 1984, 13975/1984
Term of patent 14 years
U.S. Cl. D7—351





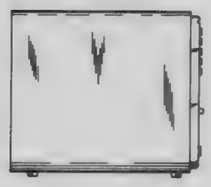
293,541
MICROWAVE OVEN
Bong H. Song, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1985, Ser. No. 706,169
Claims priority, application Rep. of Korea, Nov. 24, 1984, 14023/1984
Term of patent 14 years
U.S. Cl. D7—351



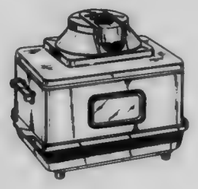


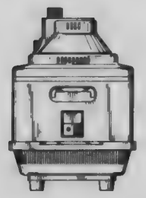
293,542
MICROWAVE OVEN
Seung H. Yoo, Kyungki-do, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1985, Ser. No. 706,081
Claims priority, application Rep. of Korea, Nov. 23, 1984, 13973/1984
Term of patent 14 years
U.S. Cl. D7—351



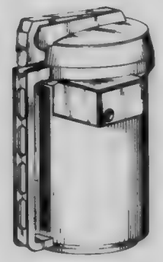


293,543
BROILER
Hideo Nishikawa, Higashi Osaka, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Nov. 16, 1984, Ser. No. 672,526
Term of patent 14 years
U.S. Cl. D7—360





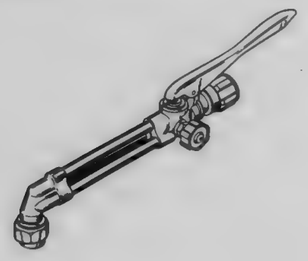
293,544
CARBONATOR UNIT FOR A HOME BEVERAGE DISPENSER
Charles M. Dole, Purdys, N.Y.; Gary L. Webster, Fairfield, Conn.; Walter Koda, Newtown, Conn., and Robert G. Karlis, Fairfield, Conn., assignors to Cadbury Schweppes, PLC, London, England
Filed Nov. 20, 1985, Ser. No. 805,921
Term of patent 14 years
U.S. Cl. D7—397



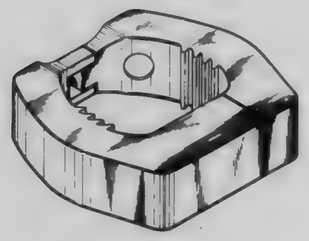
293,545
NUT HARVESTER OR THE LIKE
Charles F. Rodgers, 9007 Norcad, Jacksonville, Fla. 32210, and Herman R. Rodgers, P.O. Box 43, Ellerslie, Ga. 31807
Filed May 20, 1985, Ser. No. 735,653
Term of patent 14 years
U.S. Cl. D8—1



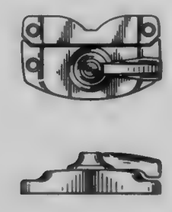
293,546
TORCH
Larry R. Turney, Denton, and Roger D. Zwicker, Arlington, both of Tex., assignors to Victor Equipment Company, Denton, Tex.
Filed Apr. 5, 1984, Ser. No. 597,184
Term of patent 14 years
U.S. Cl. D8—30



293,547
BOOT FOR SECURING A MOTORCYCLE TIRE AGAINST ROTATION
M. Eugene Owen, 2913 E. Mitchell St., Arlington, Tex. 76010
Filed Jun. 6, 1986, Ser. No. 871,600
Term of patent 14 years
U.S. Cl. D8—333



293,548
SASH LOCK
Wayne C. Bates, and LaVerne E. Clayton, both of Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Sep. 16, 1985, Ser. No. 776,284
Term of patent 14 years
U.S. Cl. D8—337



293,549
KEY BOW COVER
Phillip D. Stinson, Sikeston, Mo., assignor to Amerock Corporation, Rockford, Ill.
Filed Nov. 3, 1986, Ser. No. 926,249
Term of patent 14 years
U.S. Cl. D8—347



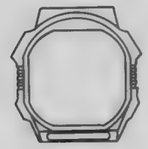
293,550
BOTTLE OR SIMILAR ARTICLE
Hermann H. Rohrer, Terrassenweg 69, Münsingen, Switzerland CH-3110
Division of Ser. No. 615,011, May 29, 1984. This application Aug. 8, 1986, Ser. No. 878,912
Claims priority, application Switzerland, Nov. 30, 1983, 113386
Term of patent 14 years
U.S. Cl. D9—374



293,551
BOTTLE
William J. Britt, Greenville, S.C., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 4, 1984, Ser. No. 646,714
Term of patent 14 years
U.S. Cl. D9—378



293,552
WATCH CASE
Yasuyuki Sakamaki, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 17, 1985, Ser. No. 735,804
Term of patent 14 years
U.S. Cl. D10—30



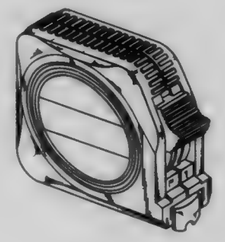
293,553
WATCH CASE
Yasuyuki Sakamaki, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 17, 1985, Ser. No. 735,813
Term of patent 14 years
U.S. Cl. D10—30



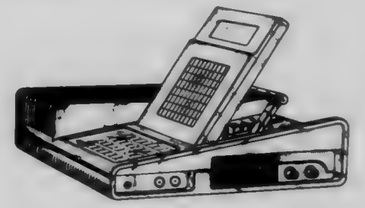
293,554
WATCH CASE
Yasuyuki Sakamaki, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 17, 1985, Ser. No. 735,802
Term of patent 14 years
U.S. Cl. D10—30



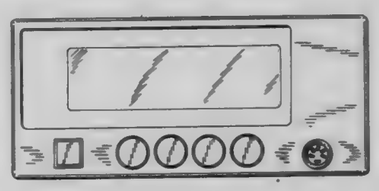
293,555
MEASURING TAPE
Ping-Hwang Lin, No. 542, Far Chau Rd., Shiu Jeun City, Taipei Hsien, Taiwan
Filed Apr. 25, 1985, Ser. No. 727,070
Term of patent 14 years
U.S. Cl. D10—72



293,556
OSCILLOSCOPE
Ljuban Klojcnik, Kranj, Yugoslavia, assignor to Iskra-Semi Elektrokovinske Industrije, Yugoslavia
Filed Apr. 2, 1984, Ser. No. 595,701
Claims priority, application Yugoslavia, Oct. 3, 1983, 439/83
Term of patent 14 years
U.S. Cl. D10—76



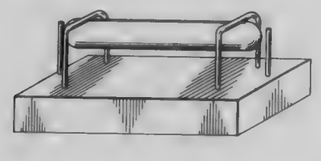
293,557
TAXIMETER
Gunther Bartholomäi; Jürgen Adams, and Hans-Peter Scholl, all of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
Filed Nov. 16, 1984, Ser. No. 672,288
Claims priority, application Fed. Rep. of Germany, May 17, 1984, MR 1223
Term of patent 14 years
U.S. Cl. D10—97



293,558
LIQUID LEVEL GAUGE
Jan Andreasson, Mullajo, Sweden, assignor to Skandiafabriken, Mullajo, Sweden
Filed May 13, 1985, Ser. No. 733,181
Claims priority, application Sweden, Nov. 13, 1984, 843020
Term of patent 14 years
U.S. Cl. D10—101



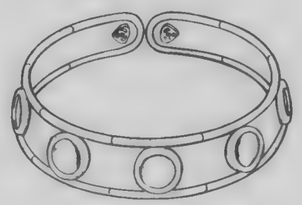
293,559
MAGNETIC NOVELTY SCULPTURE
Lewis E. Massie, 2218-13th St., Olivenhain, Calif. 92024
Filed May 14, 1985, Ser. No. 734,087
Term of patent 14 years
U.S. Cl. D11—131



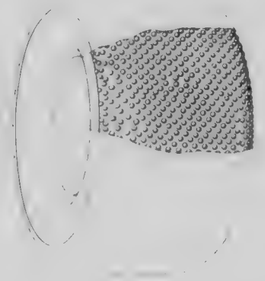
293,560
TABLE ORNAMENT
Doreen N. Roberts, Gwynedd, Wales, assignor to Pendelfin Studios Limited, England
Filed Jun. 3, 1985, Ser. No. 740,621
Claims priority, application United Kingdom, Mar. 7, 1985, 1024897
Term of patent 14 years
U.S. Cl. D11—158



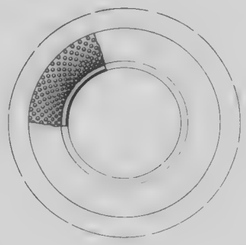
293,561
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Jun. 4, 1985, Ser. No. 741,146
Term of patent 14 years
U.S. Cl. D11—3



293,562
TIRE
Keizi Fuzioka, and Hitoo Umemoto, both of Kishiwada, Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Mar. 7, 1985, Ser. No. 709,151
Term of patent 14 years
U.S. Cl. D12—139



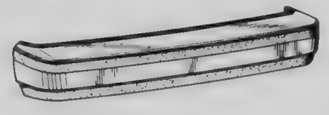
293,563
TIRE SIDEWALL
Keizi Fuzioka, and Hitoo Umemoto, both of Kishiwada, Japan, assignors to The Ohtsu Tire & Rubber Co., Osaka, Japan
Filed Mar. 7, 1985, Ser. No. 709,153
Term of patent 14 years
U.S. Cl. D12—152



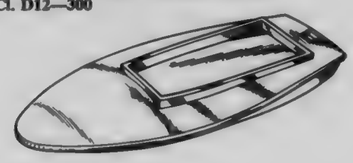
293,564
AUTOMOBILE FRONT BUMPER
Fred C. Mayhew, Birmingham; David C. Turner, and Frederick T. Finney, both of Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Ill.
Filed Dec. 20, 1985, Ser. No. 811,547
Term of patent 14 years
U.S. Cl. D12—169



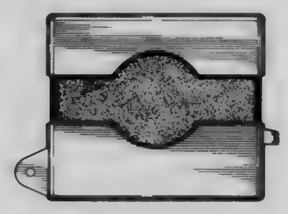
293,565
REAR BUMPER FOR AN AUTOMOBILE
Mituru Shirai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 5, 1985, Ser. No. 762,539
Term of patent 14 years
U.S. Cl. D12—169



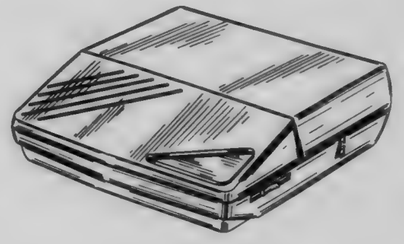
293,566
DUCK BOAT
Thom Lindheimer, Rte. 1, Box 240, Castle Hayne, N.C. 28429
Filed May 31, 1985, Ser. No. 739,641
Term of patent 14 years
U.S. Cl. D12—300



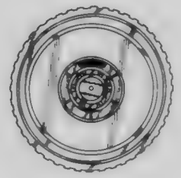
293,567
BATTERY COVER
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Jun. 27, 1985, Ser. No. 749,511
Term of patent 14 years
U.S. Cl. D13—10

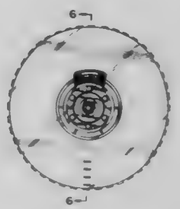


293,568
TELEPHONE ANSWERING UNIT
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel Corporation, Compton, Calif.
Filed Sep. 25, 1985, Ser. No. 779,881
Term of patent 14 years
U.S. Cl. D14—4



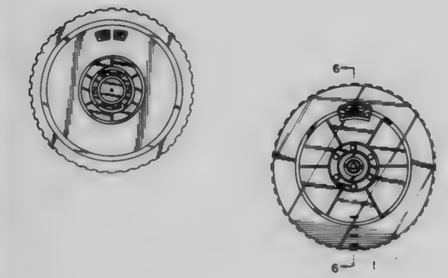
293,569
REEL FOR A VIDEO TAPE CASSETTE
Tadao Igarashi, Tagajo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 22, 1985, Ser. No. 714,895
Claims priority, application Japan, Sep. 26, 1984, 59-39919
Term of patent 14 years
U.S. Cl. D14—11





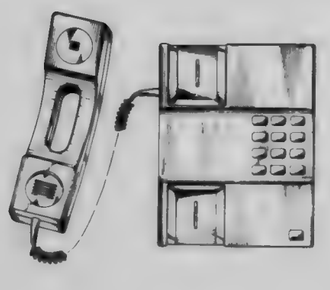
VOL 1086 ISS 1 JAN 5 1988 UMI

293,570
REEL FOR A VIDEO TAPE CASSETTE
Tadao Igarashi, Tagajo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 4, 1985, Ser. No. 719,816
Claims priority, application Japan, Oct. 12, 1984, 59-42205
Term of patent 14 years
U.S. Cl. D14—11

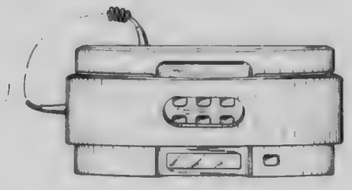


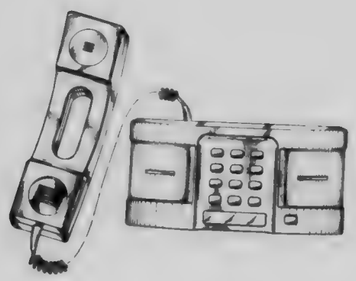
293,571
TELEPHONE APPARATUS
Karl Büchin, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany
Filed Dec. 5, 1985, Ser. No. 805,844
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 95 MR 5491 NZ
Term of patent 14 years
U.S. Cl. D14—53



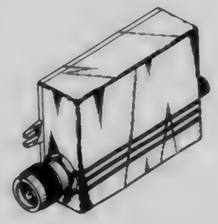


293,572
TELEPHONE APPARATUS
Karl Büchin, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany
Filed Dec. 9, 1985, Ser. No. 806,438
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 95 MR 5511 NZ
Term of patent 14 years
U.S. Cl. D14—53

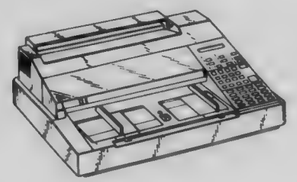




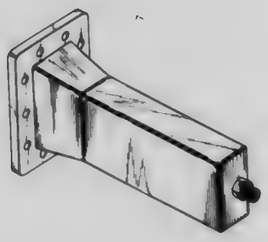
293,573
DOWN CONVERTER FOR A SATELLITE RECEIVER
Kazuyoshi Nakayama, Anagoya, Japan, assignor to Masprodenkoh Kabushikikaisha, Japan
Filed Nov. 21, 1985, Ser. No. 805,180
Claims priority, application Japan, Aug. 23, 1985, 60-36316
Term of patent 14 years
U.S. Cl. D14—90



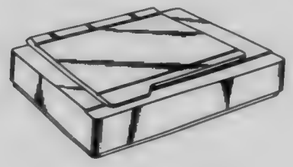
293,574
FACSIMILE
Masahiro Kando, Tokyo; Takashi Yomo, Yokohama, and Noriyuki Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1985, Ser. No. 720,673
Claims priority, application Japan, Oct. 11, 1984, 59-42129
Term of patent 14 years
U.S. Cl. D14—94



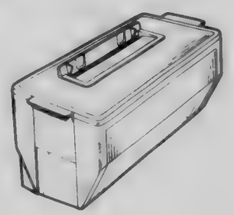
293,575
FREQUENCY CONVERTER FOR AN ANTENNA
Toshihiro Sugiura, Aichi, Japan, assignor to Masprodenkoh Kabushikikaisha, Japan
Filed Nov. 19, 1985, Ser. No. 806,170
Claims priority, application Japan, Aug. 20, 1985, 60-35226
Term of patent 14 years
U.S. Cl. D14—90



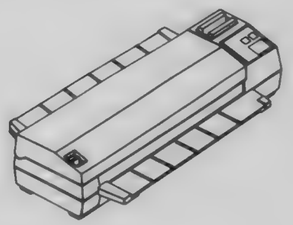
293,576
IMAGE SCANNER FOR ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 31, 1985, Ser. No. 793,299
Claims priority, application Japan, May 2, 1985, 60-17878
Term of patent 14 years
U.S. Cl. D14—107



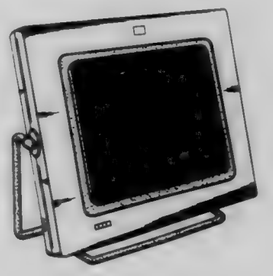
293,577
PRINTER FOR DATA TERMINALS
Stig Grauffin, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed May 10, 1985, Ser. No. 732,839
Claims priority, application Sweden, Nov. 22, 1984, 84-3107
Term of patent 14 years
U.S. Cl. D14—111



293,578
PRINTER
Nobuki Matsumoto, Kanagawa, and Kozo Sakino, Tokyo, both of Japan, assignors to Ricoh Company Ltd., Japan
Filed Mar. 13, 1985, Ser. No. 711,274
Claims priority, application Japan, Sep. 13, 1984, 59-38100
Term of patent 14 years
U.S. Cl. D14—111

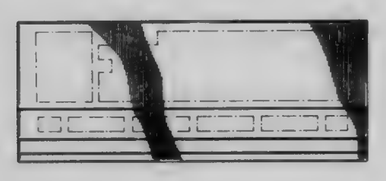


293,579
DISPLAY TERMINAL FOR DATA PROCESSING APPARATUS
Arnold M. Davis, Bloomington, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 23, 1984, Ser. No. 663,802
Term of patent 14 years
U.S. Cl. D14—113

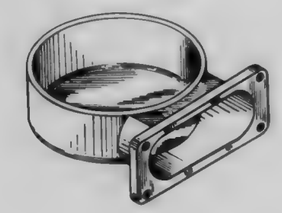


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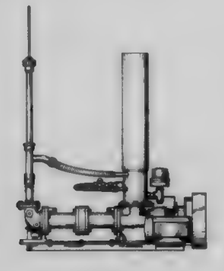
293,580
TOP PANEL FOR A KEYBOARD
Michel D. Arney, Lowell, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Nov. 27, 1985, Ser. No. 807,059
Term of patent 14 years
U.S. Cl. D14—115



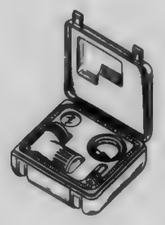
293,581
CONNECTING ADAPTER FOR A GASEOUS FUEL CARBURETOR
Alan G. Brown, Hamilton, New Zealand, assignor to Impco Carburetion, Inc., Cerritos, Calif.
Filed Jul. 15, 1985, Ser. No. 754,469
Term of patent 14 years
U.S. Cl. D15—6



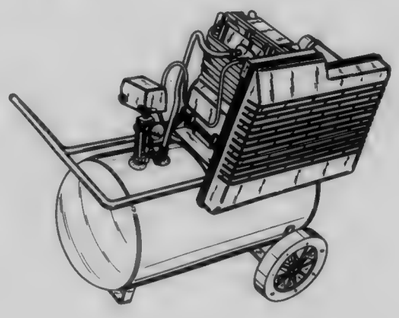
293,582
COMBINED MIXER AND PUMP FOR HOG FEED SLURRY
Peter J. Christianson, P.O. Box 2005, Elbow Lake,, Minn. 56531
Filed Mar. 25, 1985, Ser. No. 715,376
Term of patent 14 years
U.S. Cl. D15—7



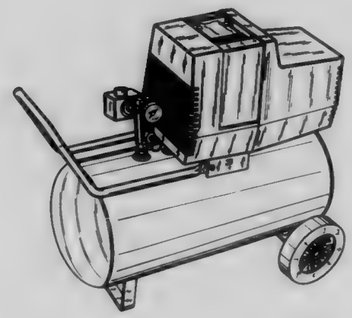
293,583
PACKAGED AIR INFLATOR SET
Jerald V. Dunlap, Pacific Palisades, Calif., assignor to M-D & Co., Mammoth Lakes, Calif.
Filed Feb. 4, 1985, Ser. No. 698,092
Term of patent 14 years
U.S. Cl. D15—7



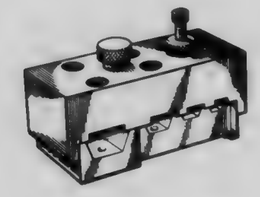
293,584
AIR COMPRESSOR
Frederick M. Morgan, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Oct. 22, 1986, Ser. No. 922,449
Term of patent 14 years
U.S. Cl. D15—9

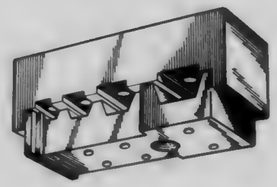


293,585
AIR COMPRESSOR
Frederick M. Morgan, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Oct. 22, 1986, Ser. No. 922,450
Term of patent 14 years
U.S. Cl. D15—9

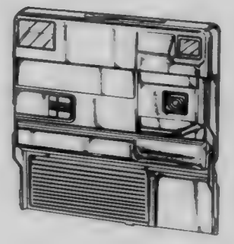


293,586
BELT JOINTING DEVICE
Peter J. N. Harvey, Swanpool, England, assignor to J. H. Fenner & Co. Limited, Hull, England
Filed Jan. 25, 1985, Ser. No. 694,789
Claims priority, application United Kingdom, Jul. 28, 1984, 1071181
Term of patent 14 years
U.S. Cl. D15—138





293,587
CAMERA
Bruce A. Leonard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 24, 1985, Ser. No. 747,735
Term of patent 14 years
U.S. Cl. D16—6



293,588
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Jul. 11, 1986, Ser. No. 884,784
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 11AR253/86
Term of patent 14 years
U.S. Cl. D16—116

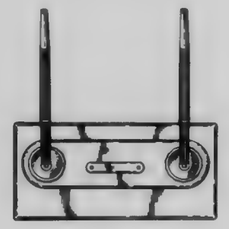


293,589
GUITAR CONTROLLER FOR A MUSIC SYNTHESIZER
Carmine J. Bonanno, Mamaroneck, N.Y., assignor to Voyetra Technologies, Mamaroneck, N.Y.
Filed Oct. 30, 1985, Ser. No. 792,812
Term of patent 14 years
U.S. Cl. D17—14

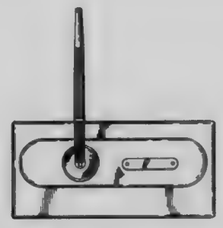


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293,590
DOUBLE PEN DESK SET
Akira Mimaki, Tokyo, Japan, assignor to Parker Pen Ltd., East Sussex, England
Filed Mar. 6, 1985, Ser. No. 708,725
Claims priority, application Japan, Sep. 19, 1984, 59-39015
Term of patent 14 years
U.S. Cl. D19—75



293,591
SINGLE PEN DESK SET
Akira Mimaki, Tokyo, Japan, assignor to Parker Pen Ltd., East Sussex, England
Filed Mar. 6, 1985, Ser. No. 708,724
Claims priority, application Japan, Sep. 19, 1984, 59-39014
Term of patent 14 years
U.S. Cl. D19—75



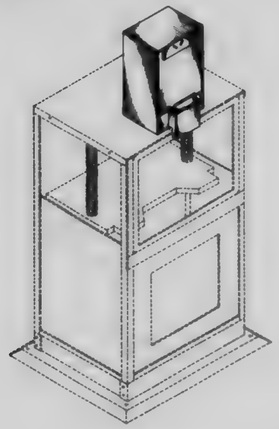








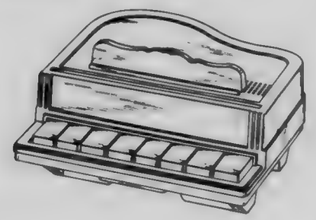
293,592
COIN OPERATED DOOR LOCK FOR VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Co., Inc., Gardena, Calif.
Filed Mar. 18, 1985, Ser. No. 713,330
Term of patent 14 years
U.S. Cl. D20—9



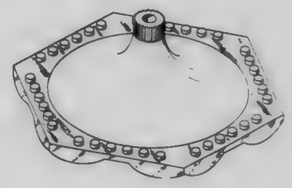
293,593
SIGN
Bruce K. Garnant, and Elizabeth A. Garnant, both of 3941 Baltimore St., Kensington, Md. 20895-3913
Filed Apr. 29, 1985, Ser. No. 728,614
Term of patent 14 years
U.S. Cl. D20—31



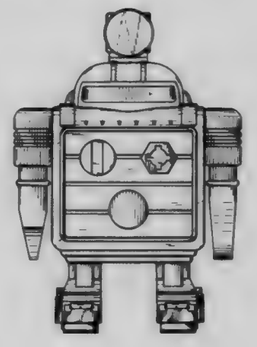
293,594
TOY PIANO
Gary G. Lenihan, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1985, Ser. No. 794,068
Term of patent 14 years
U.S. Cl. D21—64



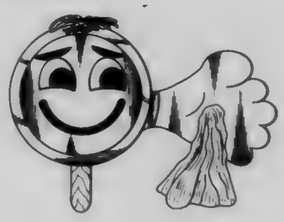
293,595
TOY MERRY-GO-ROUND TOP
Ib H. Berggreen, Vedbaek, Denmark, assignor to Interlego A.G., Baar, Denmark
Filed Dec. 4, 1985, Ser. No. 805,335
Term of patent 14 years
U.S. Cl. D21—108



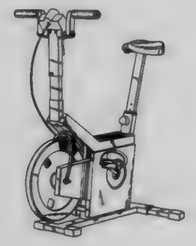
293,596
TOY ROBOT
Mak C. Hang, Hong Kong, Hong Kong, assignor to F. J. Strauss Co., Inc., North Bergen, N.J.
Filed Oct. 21, 1985, Ser. No. 789,460
Term of patent 14 years
U.S. Cl. D21—150



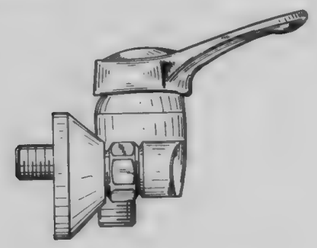
293,597
PUPPET FIGURE
Jeffrey L. Peyton, P.O. Box C-32000, Richmond, Va. 23261
Filed Apr. 12, 1985, Ser. No. 722,526
Term of patent 14 years
U.S. Cl. D21—154

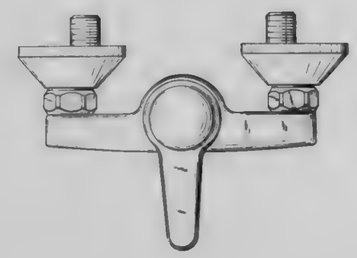


293,598
BICYCLE ERGOMETER
Heikki Kiiski, Turku, Finland, assignor to Tunturipyörä Oy, Turku, Finland
Filed Jul. 19, 1985, Ser. No. 756,719
Claims priority, application Finland, May 22, 1985, 402/85
Term of patent 14 years
U.S. Cl. D21—194

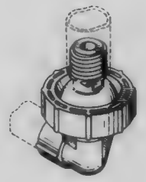


293,599
WATER CONTROL UNIT FOR A HAND SHOWER
Konrad Bergmann, Wittlich, and Wolfgang Fabian, Mannheim, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.
Division of Ser. No. 777,478, Sep. 18, 1985. This application Apr. 6, 1987, Ser. No. 35,311
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 20MR2050
Term of patent 14 years
U.S. Cl. D23—233

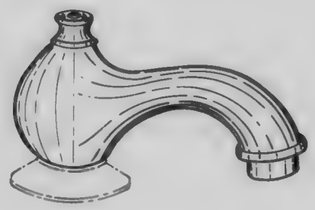




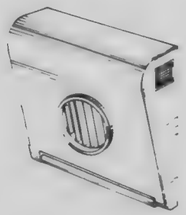
293,600
ADJUSTABLE PIPE JOINT
Freddie E. Hunt, Cucamonga, and John E. Ronquillo, Baldwin Park, both of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.
Filed Apr. 16, 1984, Ser. No. 600,801
Term of patent 14 years
U.S. Cl. D23—264



293,601
SPOUT
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Oct. 11, 1985, Ser. No. 786,679
Term of patent 14 years
U.S. Cl. D23—255



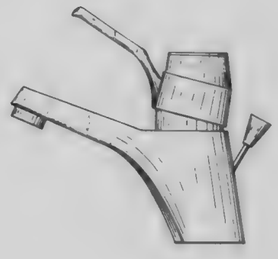
293,602
HAND DRYER
Barbara S. Levine, 4 Dickson Rd., Marlboro, N.J. 07746, assignor to Barbara Sue Levine, Marlboro, N.J.
Filed Apr. 15, 1985, Ser. No. 723,489
Term of patent 14 years
U.S. Cl. D28—54.1



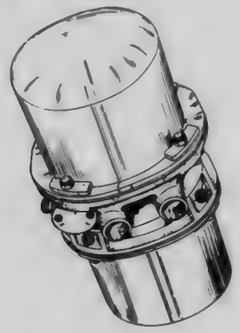
293,603
GAS IGNITER OR THE LIKE
Takashi Matsumaru, Tokyo, Japan, assignor to Tanita Corporation, Tokyo, Japan
Filed Nov. 18, 1985, Ser. No. 805,926
Claims priority, application Japan, Jun. 12, 1985, 60-24400
Term of patent 14 years
U.S. Cl. D7—416



293,605
COMBINED WATER CONTROL HANDLE AND ESCUTHEON
Konrad Bergmann, Wittlich, and Wolfgang Fabian, Mannheim, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.
Division of Ser. No. 777,479, Sep. 18, 1985. This application Apr. 13, 1987, Ser. No. 37,651
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 20MR2050
Term of patent 14 years
U.S. Cl. D23—254



293,604
COMPRESSED AIR DRIER FOR VEHICLES OR FOR STATIONARY USE
Sten Andersson, Landskrona, Sweden, assignor to Haldex AB, Landskrona, Sweden
Filed Apr. 18, 1984, Ser. No. 600,610
Term of patent 14 years
U.S. Cl. D23—365



293,606
SANITARY NAPKIN
Richard P. James, Norwood, Mass., assignor to Personal Products Company, Milltown, N.J.
Filed Jul. 29, 1985, Ser. No. 760,016
Term of patent 14 years
U.S. Cl. D24—51



293,607
NIGHTLIGHT
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Jul. 22, 1985, Ser. No. 757,812
Term of patent 14 years
U.S. Cl. D26—26



293,609
PERMANENT WAVE ROD HOLDER AND DISPENSER
Robert F. Risha, 6128 Columbia, St. Louis, Mo. 63139
Filed May 28, 1985, Ser. No. 737,708
Term of patent 14 years
U.S. Cl. D28—11



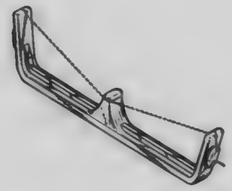
293,608
HUMIDOR
Walter G. Fitzgerald, Wayne; Herbert H. Middleton, Jr., Bryn Mawr, and Clinton O. Price, King of Prussia, all of Pa., assignors to John Middleton, Inc., King of Prussia, Pa.
Filed Aug. 19, 1985, Ser. No. 766,495
Term of patent 14 years
U.S. Cl. D27—45



293,610
CURLING IRON
Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Jul. 23, 1985, Ser. No. 758,187
Term of patent 14 years
U.S. Cl. D28—35



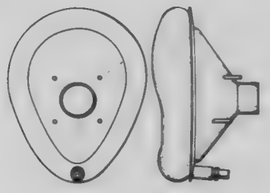
293,611
DENTAL FLOSS HOLDER
Dale E. Tenny, Sunnyvale, Calif., assignor to Home Health and Safety, Sunnyvale, Calif.
Filed Aug. 15, 1985, Ser. No. 765,804
Term of patent 14 years
U.S. Cl. D28—64



293,612
COSMETIC KIT
Helen C. Bulwik, Hayward, Calif., assignor to Seneca International Inc., San Francisco, Calif.
Filed Dec. 3, 1985, Ser. No. 804,175
Term of patent 14 years
U.S. Cl. D28—83



293,613
ANESTHESIA AND RESPIRATORY FACE MASK
Harry L. Wingler, Indianapolis, Ind., assignor to Anesthesia Respiratory Technology, Inc., Noblesville, Ind.
Filed Nov. 18, 1985, Ser. No. 799,267
Term of patent 14 years
U.S. Cl. D29—7



293,614
HARNESS FOR PREVENTING CONCEPTION IN FEMALE ANIMALS
Richard Taper, 2288 Dirby, Memphis, Tenn. 38114
Filed Nov. 27, 1984, Ser. No. 675,088
Term of patent 14 years
U.S. Cl. D30—144



VOL
1086
ISS
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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JANUARY, 1988

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Ward, Bennett C., 4,717,764, Cl. 528-337.000.
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Cherrette, Alan R.; and Chang, Donald C. D., 4,717,919, Cl. 342-383.000.
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Chevreux, Pierre; and Chevreux, Christiane A. R., 4,717,739, Cl. 522-79.000.
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Salentine, Christopher G., 4,717,490, Cl. 252-32.70E.
Chiao, Cherry C., to Dow Chemical Company, The. Gas separations using membranes comprising sulphonated polyether sulphone. 4,717,395, Cl. 55-16.000.
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Winkler, Hans-Henning; and Rutschle, Eugen, 4,716,647, Cl. 29-568.000.
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Fujimura, Isao; and Terakawa, Taiju, 4,717,325, Cl. 425-131.500.
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Choksi, Pradip V., to SpaceLabs, Inc. Liquid trap for medical application. 4,717,403, Cl. 55-429.000.
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Walsh, Michael J.; and Churches, Alexander E., 4,717,133, Cl. 269-328.000.
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Ravichandran, Ramanathan; and Snead, Thomas E., 4,717,748, Cl. 524-236.000.
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Sterwerf, Lester J., Jr., 4,717,206, Cl. 299-82.000.
Ciuffetelli, Andrew J. Apparatus for supplying compost to mushroom growing beds. 4,717,307, Cl. 414-300.000.
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Hayashi, Hideki, 4,716,783, Cl. 74-527.000.
Clarion Co., Ltd: *See*—
Ito, Yukio; and Kinoshita, Shigeo, 4,717,983, Cl. 360-137.000.
Clauss, Harry G., to General Signal Corporation. Oxygen sensor. 4,717,463, Cl. 204-422.000.
Clemens, R. Michael; and Zseltvay, Kenneth A., to Emergency Management Products, Inc. Noninvasive apparatus for treating a sucking chest wound. 4,717,382, Cl. 604-122.000.

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Webster, James A., 4,716,693, Cl. 52-64.000.
Cobern, Martin E., to Teleco Oilfield Services Inc. Method for evaluation of formation invasion and formation permeability. 4,716,973, Cl. 175-50.000.
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Cochran, Michael J. Dialysis machine which anticipates concentration changes. 4,718,022, Cl. 364-510.000.
Coda, Alfred. Display stand. 4,716,670, Cl. 40-152.100.
Codos, Richard N., to Pathe Computer Control Systems, Inc. Sewing machine having rotatable and axially movable frame. 4,716,845, Cl. 112-118.000.
Coerper, Philip R., Jr.; and Parish, Mark G., to Aqua-Chem, Inc. Waste fuel combustion system. 4,716,843, Cl. 110-234.000.
Cognion, Jean-Marie; and Letray, Gerard, to Atochem. Process for making ethylene oxide catalyst. 4,717,703, Cl. 502-348.000.
Cohen, Mordehy; and Kezar, David A., to Sundstrand Corporation. Ram air turbine indexing mechanism. 4,717,095, Cl. 244-58.000.
Colato, Albert E., to Plastics, Inc. Microwave oven rotisserie assembly. 4,717,802, Cl. 219-10.55E.
Coleman, John D.; and Obst, Donald L., to Siecor Corporation. Elevator compensating cable. 4,716,989, Cl. 187-1.00R.
Collette, Douglas P.: *See*—
Jacobs, Paul H.; and Collette, Douglas P., 4,718,116, Cl. 455-245.000.
Collier Metal Specialties, Inc.: *See*—
Youngs, Wilbur R., 4,716,754, Cl. 72-178.000.
Collingwood, David, to Renishaw plc. Machine having a self powered tool or measuring probe. 4,716,657, Cl. 33-561.000.
Collins, Raymond L., Jr.; Kucharski, Joseph J.; and Bryk, Stephen A., to Collins, Raymond L., Jr. Ignitor probe having replaceable tips. 4,717,986, Cl. 361-253.000.
Colt Industries Operating Corp.: *See*—
Wozniak, Edmund T., 4,716,751, Cl. 72-88.000.
Colvin, David S. Screwdriver with concave blade. 4,716,797, Cl. 81-416.000.
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Whitehead, Charles L.; and Colvin, Lenwood C., 4,716,615, Cl. 15-210.00B.
Combs, Kenneth, to General Electric Company. Octagonal-shaped shipping container. 4,717,022, Cl. 206-418.000.
Cominco Ltd.: *See*—
McRae, Dale L.; Willans, Robert D. H.; and Mawer, Eric L., 4,717,540, Cl. 420-513.000.
Commins, Alfred D., to Simpson Strong-Tie Company, Inc. Bucket hanger. 4,717,279, Cl. 403-187.000.
Commissariat a l'Energie Atomique: *See*—
Vayra, Jean, 4,716,927, Cl. 137-490.000.
Communication Intelligence Corporation: *See*—
Crane, Hewitt D.; and Ostrem, John S., 4,718,102, Cl. 382-13.000.
Communications Patents Limited: *See*—
Cutler, Albert E., 4,717,229, Cl. 350-96.150.
Compact Spindle Bearing Corporation: *See*—
Phillips, Edward H., 4,717,263, Cl. 384-12.000.
Companhia Brasileira de Metalurgia e Mineracao: *See*—
Betz, Eurico W.; and Takano, Cyro, 4,717,537, Cl. 420-129.000.
Comstock, Robert J.; Jacobsen, William A.; Cellier, Francis; and Sabol, George P., to Westinghouse Electric Corp. Annealing of zirconium based articles by induction heating. 4,717,428, Cl. 148-11.50F.
Conn, Andrew F.; and Johnson, Virgil E., Jr., to Tracor Hydronautics, Inc. Erosive-jet diver tool. 4,716,849, Cl. 114-222.000.
Constance, Patricia; and Polizzano, Robert A., to Nabisco Brands, Inc. Producing multi-textured cookies containing gum. 4,717,577, Cl. 426-549.000.
Container Corporation of America: *See*—
Everman, Wayne F.; Klug, Randy J.; and Russell, Raymond L., 4,717,371, Cl. 493-96.000.
Control Data Corporation: *See*—
Fillion, Timothy I.; Bergeron, Marc L.; and Varpahovsky, Andrey, 4,718,019, Cl. 364-491.000.
Control Resource Systems, Inc.: *See*—
Lutterbach, Rickey S.; and Marsh, Ronald W., 4,717,402, Cl. 55-269.000.
Cook, Bruce M.: *See*—
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Cook, Edward H., Jr.: *See*—
Beck, Steven M.; and Cook, Edward H., Jr., 4,717,558, Cl. 423-322.000.
Cook, John E., to Bendix Electronics Limited. Vacuum valve using improved diaphragm. 4,717,117, Cl. 251-61.100.
Cook, Richard I.: *See*—
Bourke, Robert F.; Layden, David L.; and Cook, Richard I., 4,717,996, Cl. 363-56.000.
Cooke, Claude E., Jr.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,716,964, Cl. 166-284.000.
Cooper, James E., Jr. Method and apparatus for high-speed processing of video images. 4,718,090, Cl. 382-26.000.
Copal Company Limited: *See*—
Ichinose, Harunobu, 4,717,978, Cl. 360-106.000.
Nakagawa, Norifumi; Sasaki, Toyonori; and Matsumoto, Kunio, 4,717,929, Cl. 354-21.000.
Copper Development Association, Inc.: *See*—
Beal, Roy E., 4,717,430, Cl. 148-24.000.
Coppola, Peter J., to Jet Spray Corp. Syrup sensor for dispensing machine. 4,717,045, Cl. 222-64.000.
Coquard, Jean; and Goletto, Jean, to Rhone-Poulenc Specialites Chimiques. Block copolyetheramides flexible at low temperatures. 4,717,763, Cl. 528-324.000.
Cordis Corporation: *See*—
Wesner, Walter H., 4,716,888, Cl. 128-785.000.
Corfine Inc.: *See*—
O'Connor, Barry J.; and Vigder, Robert B., 4,716,802, Cl. 83-313.000.
Cornet, Michel: *See*—
Thery, Pierre; Ravalitera, Guy; and Cornet, Michel, 4,717,786, Cl. 136-212.000.
Corona, Antonio; and Corona, Franco O. Multi-object hand held implement. 4,716,795, Cl. 81-177.400.
Corona, Antonio; and Corona, Franco O. Multibit hand tool with improved chuck arrangement. 4,716,796, Cl. 81-177.400.
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Corona, Antonio; and Corona, Franco O., 4,716,795, Cl. 81-177.400.
Corona, Antonio; and Corona, Franco O., 4,716,796, Cl. 81-177.400.
Cortese, Richard: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,717,566, Cl. 424-438.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,717,568, Cl. 424-469.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,717,718, Cl. 514-30.000.
Cosco, Inc.: *See*—
Moore, Donald L.; Spilman, Raymond; and Pendleton, Thomas, 4,717,214, Cl. 312-107.000.
Cosentino, Stephen J.: *See*—
Parrillo, Louis C.; Cosentino, Stephen J.; and Bergami, Bridgette A., 4,717,683, Cl. 437-34.000.
Cotta, Gilbert A., to Senco Products, Inc. Self-contained internal combustion fastener driving tool. 4,717,060, Cl. 227-10.000.
Cox, Randy D.; Israel, Arthur B.; and Payne, Edward H., to International Business Machines Corporation. Reactive ion etch chemistry for providing deep vertical trenches in semiconductor substrates. 4,717,448, Cl. 156-643.000.
CPC International Inc.: *See*—
Biller, Florian; and Klukowski, Horst, 4,717,578, Cl. 426-589.000.
Crane, Denis P., to Ofrex Group Holdings Plc. Document shredding machines. 4,717,085, Cl. 241-236.000.
Crane, Hewitt D.; and Ostrem, John S., to Communication Intelligence Corporation. Process and apparatus involving pattern recognition. 4,718,102, Cl. 382-13.000.
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Cremonesi, Pietro: *See*—
Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, 4,717,719, Cl. 514-56.000.
Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., to Naturin-Werk Becker & Co. Method and apparatus for forming netted meat products wrapped in an edible collagen film. 4,716,713, Cl. 53-530.000.
Cross, Lindsay E.: *See*—
Warner, Richard B.; Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Cross, Lindsay E.; and Farquharson, Graeme J., 4,717,418, Cl. 71-98.000.
Crossman, Philip E.; and Mitchell, Terry L., to Rostec Industries. Wall panels with single load-bearing connector posts. 4,716,699, Cl. 52-239.000.
Crotti, Aldo, to Italtractor ITM S.p.A. Unit comprising a shaft and rotatable body in rolling contact, serving as roller or wheel in earth-moving vehicles, and relative method of assembly. 4,716,644, Cl. 29-525.000.
Crow, John Q. Spool rewinder. 4,717,086, Cl. 242-47.000.
Crowell, John M.; and Teske, James E., to Western Atlas International, Inc. Pre-loaded vibrator assembly with mechanical lock. 4,718,049, Cl. 367-189.000.
Crowley, H. W.: *See*—
Wales, R. Langdon; and Crowley, H. W., 4,716,978, Cl. 177-25.000.
Crute, Billy G., to Stant Inc. Roll over fuel cap. 4,716,920, Cl. 137-39.000.
Cubic Corporation: *See*—
Wells, Leon W.; Mimmack, William E.; and Hauschild, Werner, 4,717,251, Cl. 356-4.000.
Cuervo, Vincent, to Default Proof Credit Card System, Inc. Default proof credit card method system. 4,718,009, Cl. 364-408.000.
Cummings, Carl S.; and Hudson, J. Richard, to E.C.C. America Inc. Kaolin calciner waste heat and feed recovery system and method. 4,717,559, Cl. 423-328.000.
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Gordon, Herman B.; and Cunnane, Jeff, 4,717,345, Cl. 439-67.000.
Curran, Patrick A., to Texas Instruments Incorporated. Method of making a heterojunction bipolar transistor with SIPOS. 4,717,681, Cl. 437-31.000.
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Grasser, William M., 4,717,294, Cl. 409-81.000.
Cutler, Albert E., to Communications Patents Limited. Bi-directional optical fiber coupler. 4,717,229, Cl. 350-96.150.

CV International, Inc.: *See*—
Tatge, Robert J.; and Pfenning, Thomas E., 4,716,738, Cl. 62-55.000.
Cyll, Kenneth M.; and Ide, Mason G., to GTE Products. Carburetor deicer. 4,717,808, Cl. 219-207.000.
Czaja, Edwin E., to Zenith Electronics Corporation. Modular electrical connector. 4,717,360, Cl. 439-710.000.
D. S. Brown Company: *See*—
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Daghe, Joseph L.; Bouc, Gary L.; and Floren, Carl E., to Mueller Co. Frangible coupling for barrel sections of a fire hydrant. 4,717,178, Cl. 285-4.000.
Dahmen, Theo: *See*—
Kowalski, Werner; Haas, Hans; Dahmen, Theo; and Erpenbach, Markus, 4,717,557, Cl. 423-315.000.
Daifuku, Hideharu; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Toyosawa, Shinichi; and Fujio, Ryota, to Bridgestone Corporation. Electric cells utilizing polyaniline as a positive electrode active material. 4,717,634, Cl. 429-213.000.
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Igarashi, Yoshiaki; Ohtsuka, Hiroo; and Hara, Osamu, 4,717,361, Cl. 439-856.000.
Daimler-Benz Aktiengesellschaft: *See*—
Bernauer, Otto; and Ziegler, Klaus, 4,717,551, Cl. 423-219.000.
Dalal, Samir K., to Honeywell Inc. Sample data acquisition system using microprocessor controlled sequence having FIFO buffer, DAM controller. 4,718,004, Cl. 364-200.000.
D'Alba, Anthony R., to Trico Products Corp. Wiper arm assembly. 4,716,612, Cl. 15-250.230.
Dalgleish, James M. Package for ingredients. 4,717,016, Cl. 206-0.500.
D'Alterio, Joseph C. Slitter-corrugator apparatus for pasta. 4,717,328, Cl. 425-290.000.
Dangelmaier, Karl: *See*—
Bareis, Alfred; Dangelmaier, Karl; and Pfisterer, Horst, 4,716,800, Cl. 83-91.000.
Daniel, Vernon T.; and Gettliffe, Jessie, to Burlington Industries, Inc. Method for spraying of dyes from high-boiling solvent dispersions onto open width fabric with heat setting. 4,717,391, Cl. 8-489.000.
d'Aniello, Rene S. Disposable litter for cats or other domestic animals. 4,716,853, Cl. 119-1.000.
Data General Corporation: *See*—
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Dathe, Joachim, to Siemens Aktiengesellschaft. Method for the passivation of silicon components. 4,717,617, Cl. 428-209.000.
David, Agoston; Pogany, Janos; and Ronkos, Laszlo , to Richter Gedeon Vegyeszeti Gyar Rt. Process and apparatus for determining and influencing the flow properties of solid granular material. 4,716,768, Cl. 73-861.000.
Davidson, Allen L.; and Dunkerton, Steve, to Motorola, Inc. Improved multiple site communication system. 4,718,108, Cl. 455-17.000.
Davis, Duane A.: *See*—
Bondoc, Alfredo A.; Davis, Duane A.; Frankoski, Stanley P.; and Magnus, Bruno E., 4,717,614, Cl. 428-143.000.
Davis, J. Stanley: *See*—
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Davis, Jack D. Indicator system for a door with sliding bolt lock. 4,717,909, Cl. 340-686.000.
Davis, Willard F.; and Bullard, Douglas G., to Morton Thiokol, Inc. Inertia safety and arming device. 4,716,830, Cl. 102-248.000.
Davis, William F.; Susak, David M.; and Vyne, Robert L., to Motorola, Inc. Operational amplifier utilizing resistors trimmed by metal migration. 4,717,886, Cl. 330-252.000.
Davis, William F.; and Susak, David M., to Motorola, Inc. Symmetric layout for quad operational amplifier. 4,717,890, Cl. 330-307.000.
Deal, Philip A.; and Leonard, Gerard E., to R. J. Reynolds Tobacco Company. Cigarette pack accumulator assembly. 4,717,010, Cl. 198-347.000.
De Barros, Leonardo G.; Buss, Thomas E.; How, Adrian T. G.; and Tin, Jolene L. S., to Motorola Inc. Heat sink, EMI shield and controller module assembly for a portable radio transceiver. 4,717,989, Cl. 361-424.000.
Debray, Gilles: *See*—
Labarre, Michel; Debray, Gilles; and Cantelaube, Jean, 4,717,096, Cl. 244-137.200.
DeBruyn, William, to Amerock Corporation. Concealed self-closing hinge. 4,716,622, Cl. 16-297.000.
de Concini, Roberto, to Weber S.p.A. Fuel metering valve for internal combustion engine supply device. 4,717,079, Cl. 239-585.000.
Default Proof Credit Card System, Inc.: *See*—
Cuervo, Vincent, 4,718,009, Cl. 364-408.000.
DeGennaro, Steven V.: *See*—
Bahl, Lalit R.; deSouza, Peter V.; DeGennaro, Steven V.; and Mercer, Robert L., 4,718,094, Cl. 381-43.000.
Degussa Aktiengesellschaft: *See*—
Freppon, Willi; Heilmann, Paul; and van Heijst, Theo, 4,717,787, Cl. 136-226.000.
Jansen, Martin; and Standke, Burkhard, 4,717,562, Cl. 423-604.000.
Kunst, Helmut; and Scondo, Christian, 4,717,429, Cl. 148-15.000.
DeGuvera, Emmett W., to Detroit Punch & Retainer Corporation. Self-contained armor assembly. 4,716,810, Cl. 89-36.020.
Deigner, Paul: *See*—
Schoettle, Klaus; Deigner, Paul; Dietze, Herbert; Frank, Volker; and Waidele, Oswald, 4,717,091, Cl. 242-199.000.
Deleage, Charles: *See*—
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Delgado, Daniel, Jr., to Scamardo, Dennis M. Apparatus for imparting rotational movement to a work object and the like. 4,717,187, Cl. 294-17.000.
Delphin, Rene ; and Regnaut, Bernard, to Occidental Chemical Corporation. Electrically conductive thermoplastic material. 4,717,505, Cl. 252-511.000.
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Chevreux, Pierre; and Chevreux, Christiane A. R., 4,717,739, Cl. 522-79.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Ikekawa, Nobuo; and Ostrem, Voula, to Howard W. Bremer. Sidechain homo-vitamin D compounds with preferential anti-cancer activity. 4,717,721, Cl. 514-167.000.
DeMartino, Ronald N., to Hoechst Celanese Corporation. Organic nonlinear optical substrates. 4,717,508, Cl. 252-583.000.
De Mendez, Michel; Bargain, Raymond; Dohan, Yves; and Herubel, Guy, to Souriau & Cie. Connection element between an electric connector and a connector contact. 4,717,352, Cl. 439-161.000.
Demeyer, Pierre, to Merlin Gerin S.A. Circuit breaker with digitized solid-state trip unit with inverse time tripping function. 4,717,985, Cl. 361-96.000.
Denick, John, Jr., to Warner-Lambert Company. Process for the preparation of medicament adsorbates. 4,717,565, Cl. 424-155.000.
Denison, William J.: *See*—
Smith, Lancing G.; Walker, Lonnie R.; and Denison, William J., 4,716,848, Cl. 114-75.000.
Denizou, Jean P., to Framatome et Cogema. Grid for nuclear fuel assembly. 4,717,533, Cl. 376-441.000.
Dennis, Mahlon D., to Strata Bit Corporation. Cutting element having a stud and cutting disk bonded thereto. 4,716,975, Cl. 175-329.000.
Dennison, William T., to United Technologies Corporation. Composite disk for supporting fan blades. 4,717,610, Cl. 428-65.000.
Denny, Patrick J.: *See*—
Carnell, Peter J. H.; and Denny, Patrick J., 4,717,552, Cl. 423-230.000.
Densky, Alan B. Method of changing a person's behavior. 4,717,343, Cl. 434-236.000.
De Rees, Delbert D., to American Motors Corporation. Modular door structure. 4,716,682, Cl. 49-352.000.
De Roo, Petrus C.: *See*—
Bol, Gerardus M.; Meijs, Franciscus H.; Schouten, Fredericus C.; Stewart, Robert B.; and De Roo, Petrus C., 4,716,965, Cl. 166-292.000.
Desler, James F. Underwater seismic energy source. 4,718,045, Cl. 367-24.000.
DeSoto, Inc.: *See*—
Brown, Wallace H.; Anderson, Dennis G.; and Vandeberg, John T., 4,717,623, Cl. 428-409.000.
Newman, Anthony W.; and Bishop, Michael L., 4,717,555, Cl. 423-268.000.
deSouza, Peter V.: *See*—
Bahl, Lalit R.; deSouza, Peter V.; DeGennaro, Steven V.; and Mercer, Robert L., 4,718,094, Cl. 381-43.000.
Detroit Punch & Retainer Corporation: *See*—
DeGuvera, Emmett W., 4,716,810, Cl. 89-36.020.
Dettling, Hubert; Leonhard, Rolf; and Projahn, Ulrich, to Robert Bosch GmbH. Apparatus for burning solid particles in the exhaust gas of internal combustion engines. 4,716,725, Cl. 60-303.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Ensemble effect for a musical tone generator using stored waveforms. 4,716,805, Cl. 84-1.240.
Deutsche Forschungs—und Versuchsanstalt fur Lift—und Raumfahrt E.V.: *See*—
Neuhaus, Dietmar, 4,717,309, Cl. 414-735.000.
Deutsche Thomson-Brandt GmbH.: *See*—
Kurz, Arthur; and Kuhn, Hans-Robert, 4,718,050, Cl. 369-44.000.
Devic, Michel; and Schirmann, Jean-Pierre, to Atochem. Process for the preparation of anthraquinone dispersions and their use in alkaline wood digestion processes. 4,717,451, Cl. 162-72.000.
Devine, Gregory P.: *See*—
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,717,596, Cl. 427-248.100.
Dew, James T.: *See*—
Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., 4,717,561, Cl. 425-335.000.
Dewez, Vincent; Michaux, Jean-Pierre; and Mouliac, Daniel M. Interconnecting and distributing box for optical fibers. 4,717,231, Cl. 350-96.200.
Dewing, John, to STC, PLC. Optical fiber cable having a hydrogen-absorbing zeolite. 4,717,230, Cl. 350-96.230.
Diaz, Bonifacio; and Upadhyay, Anand K., to Zenith Electronics Corporation. Current mode control for DC converters operating over 50% duty cycle. 4,717,994, Cl. 363-21.000.
DIC-Hercules Chemicals, Inc.: *See*—
Ogawa, Masatomi; and Narushima, Mayumi, 4,717,758, Cl. 526-307.000.
Dickson, J. Douglas, to American Metal Door Company, Inc. Edge-to-edge panel connection. 4,716,702, Cl. 52-582.000.
Didier-Werke AG: *See*—
Bruckner, Raimund; Plath, Jurgen; and Luhrsen, Ernst, 4,717,128, Cl. 266-287.000.

Diederich, Perry A.: *See*—
Battey, James F.; and Diederich, Perry A., 4,717,806, Cl. 219-121.0PH.
Diehl, Christian; and Kirsche, Horst, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Laser scanning device for fastest possible deflection or sweep velocities. 4,717,224, Cl. 350-6.900.
Dieleman, Jan; and Sanders, Franciscus H. M., to U.S. Philips Corporation. Method of manufacturing a semiconductor device by means of plasma etching. 4,717,447, Cl. 156-643.000.
Dien, Michel, to Sandoz Ltd. Method for dyeing leather with water-soluble sulpho group-containing sulphur dyes. 4,717,390, Cl. 8-436.000.
Diesel Kiki Co., Ltd.: *See*—
Shibuya, Tsuzenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,717,321, Cl. 418-76.000.
Dieterich Standard Corp.: *See*—
Alston, Norman A.; and Kalin, Horst W., 4,717,159, Cl. 277-1.000.
Dietze, Herbert: *See*—
Schoettle, Klaus; Deigner, Paul; Dietze, Herbert; Frank, Volker; and Waidele, Oswald, 4,717,091, Cl. 242-199.000.
Diller, Charles E., to Dresser Industries, Inc. Tube expanding and flaring tool. 4,716,752, Cl. 72-118.000.
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Eichenlaub, Jesse B., 4,717,949, Cl. 358-3.000.
di Ricco, Leo: *See*—
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,717,493, Cl. 252-62.540.
Dirkis, William; and Lund, Charles, to Pneumo Abex Corporation. End closure for composite pressure vessels. 4,717,035, Cl. 220-3.000.
Ditgens, Klaus; Heinemann, Ulrich; Lunkenheimer, Winfried; Riebel, Hans-Jochem; Stetter, Jorg; Thomas, Rudolf; and Fedtke, Carl, to Bayer Aktiengesellschaft. Herbicidal compositions of triazinone or triazinedione derivatives and haloalkanoic acid amide synergists. 4,717,415, Cl. 71-93.000.
Dittmar, Walter: *See*—
Schaper, Wolfgang; Blume, Ernst; Raether, Wolfgang; and Dittmar, Walter, 4,717,724, Cl. 514-278.000.
Dittner, Adam, to FAG Kugelfischer Georg Schafer (KGa). Method and apparatus for the anti-locking braking of an automotive vehicle. 4,717,211, Cl. 303-119.000.
Ditto, David H.: *See*—
Meyer, Charles E.; Cook, Bruce M.; Ditto, David H.; and Kaufmann, John W., 4,717,528, Cl. 376-237.000.
Ditzig, Albert. Video cassette container display. 4,717,021, Cl. 206-387.000.
Diversified Products Corp.: *See*—
Chininis, Steve P., 4,717,145, Cl. 272-72.000.
Djerf, Tobin: *See*—
Shepherd, Kathleen P.; and Djerf, Tobin, 4,717,281, Cl. 404-16.000.
Djezovic, Vasa. Home and travel organizer. 4,717,024, Cl. 206-581.000.
Dobhan, Herbert: *See*—
Walter, Lothar; Mayer, Uwe; Winkler, Otmar; and Dobhan, Herbert, 4,717,264, Cl. 384-43.000.
Dobkin, Milton B., to Miles Laboratories, Inc. High titer varicella-zoster immune globulin for intravenous administration. 4,717,564, Cl. 424-88.000.
Dobkin, Milton B., to Miles Laboratories, Inc. Method of preparing high titer anti-respiratory syncytial virus intravenous immune globulin. 4,717,766, Cl. 530-387.000.
Dobrunskin, Alexander; Heider, Jurgen; and Gosalar, Achim, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Low-power, high-pressure discharge lamp. 4,717,852, Cl. 313-25.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Ampferer, Herbert, 4,716,638, Cl. 29-156.40R.
Binder, Robert, 4,716,864, Cl. 123-90.310.
Doench, Thomas K.: *See*—
Bebow, David A.; Doench, Thomas K.; and Angeleri, Angelo V., 4,717,347, Cl. 439-72.000.
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De Mendez, Michel; Bargain, Raymond; Dohan, Yves; and Herubel, Guy, 4,717,352, Cl. 439-161.000.
Doherty, James B.; and Hagmann, William K., to Merck & Co., Inc. Substituted 1-oxa-dethiacephalosporins as anti-inflammatory and antidegenerative agents. 4,717,722, Cl. 514-210.000.
Dobo, Tamenari: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Dobo, Tamenari, 4,716,687, Cl. 51-131.100.
Doi, Kunio; Matsui, Hideki; and Ono, Katsuhiro, to Kabushiki Kaisha Toshiba. X-ray imaging apparatus. 4,718,076, Cl. 378-146.000.
Doi, Yoshihara; Soga, Kazuo; Ueki, Satoshi; and Miyazaki, Makoto, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing propylene polymer. 4,717,755, Cl. 525-333.700.
Dolby, Steven C.: *See*—
Charles, Robert L.; Dolby, Steven C.; Patel, Chimanbhai P.; and Shetty, Jayarama K., 4,717,665, Cl. 435-198.000.
Dom Holdings PLC: *See*—
Phillips, John A., 4,717,292, Cl. 408-226.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Kawai, Seiji, 4,717,303, Cl. 414-4.000.
Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel B.V.: *See*—
van Overbruggen, Garardus J. J.; van Beaumont, Richard A.; and Thijssen, Hearicus A. C., 4,717,047, Cl. 222-207.000.
Dow Chemical Company, The: *See*—
Chiao, Cherry C., 4,717,395, Cl. 55-16.000.
Dubois, Robert A.; and Schrock, Richard R., 4,717,783, Cl. 585-511.000.
Garces, Juan M.; and Robinson, John W., 4,717,777, Cl. 568-806.000.
Hahnfeld, Jerry L.; Platt, Alan E.; and Habermann, David A., 4,717,741, Cl. 522-116.000.
Kotoye, Femi O.; and Kernstock, John M., 4,717,582, Cl. 427-8.000.
Makati, Ashok C.; Lee, Do I.; and Ash, Mezzie L., 4,717,750, Cl. 524-458.000.
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Rogers, Richard B.; and Herrero, Maria P., 4,717,732, Cl. 514-333.000.
Rogers, Richard B.; and Herrero, Maria P., 4,717,733, Cl. 514-333.000.
Rogers, Richard B.; and Herrero, Maria P., 4,717,734, Cl. 514-359.000.
Tang, Raymond W.; and Tung, Lu H., 4,717,749, Cl. 524-271.000.
Tobol, Helen K., 4,717,726, Cl. 514-348.000.
Dowty Rotol Limited: *See*—
Seeley, Roger W., 4,717,312, Cl. 416-145.000.
Doyle, James T., to Burr-Brown Corporation. CMOS input level shifting circuit with temperature-compensating n-channel field effect transistor structure. 4,717,836, Cl. 307-310.000.
Dragotin, Alexander, to Siemens Aktiengesellschaft. Overload protection circuit for a telephone subscriber line feed circuit. 4,718,084, Cl. 379-412.000.
Drain, Kieran F.; and Dunn, David J., to Loctite Corporation. Compositions curable by in situ generation of cations. 4,717,440, Cl. 156-310.000.
Dresser Industries, Inc.: *See*—
Diller, Charles E., 4,716,752, Cl. 72-118.000.
Huffstutler, Alan D., 4,716,977, Cl. 175-410.000.
Martin, Paul W., 4,716,753, Cl. 72-122.000.
Drewitz, Hans J.: *See*—
Hagin, Faust; Martini, Stefan; and Drewitz, Hans J., 4,716,730, Cl. 60-456.000.
Drexler, Johann; and Flierl, Erwin, to Siemens Aktiengesellschaft. Contactor with additional switchblock. 4,717,899, Cl. 335-131.000.
Driggers, Thomas C.: *See*—
Scripps, Keith A.; and Driggers, Thomas C., 4,717,910, Cl. 340-693.000.
Dryer, Frederick L.: *See*—
Green, Gary J.; Dryer, Frederick L.; and Walsh, Dennis E., 4,717,049, Cl. 222-420.000.
Drzewiecki, Tadeusz M.: *See*—
Srour, Nassy; and Drzewiecki, Tadeusz M., 4,716,935, Cl. 137-625.000.
Dubach, Werner F., to Alfatechnic AG. Plastic closure with safety band. 4,717,033, Cl. 215-245.000.
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James, Kenneth S., 4,717,902, Cl. 337-32.000.
Dubin, Alan S.; McMillen, Robert A.; and Mitchell, R. David, to Du Pont de Nemours, E. I., and Company. Process for preparation of a stencil or resist image. 4,717,639, Cl. 430-124.000.
DuBois, Craig R. Grip for game racquets. 4,717,151, Cl. 273-75.000.
Dubois, Jean C.; Ravaux, Gilles; and Le Barny, Pierre, to Thomson-CSF. Mesomorphic side-chain polymers having high dielectric anisotropy and a method for producing said polymers. 4,717,757, Cl. 526-246.000.
Dubois, Robert A.; and Schrock, Richard R., to Dow Chemical Company, The. Tantalum catalysts for the dimerization of olefins. 4,717,783, Cl. 585-511.000.
Duerksen, Walter K., to United States of America, Energy. Method for converting uranium oxides to uranium metal. 4,717,420, Cl. 75-84.10R.
Dugas, David. Welding clamp. 4,717,131, Cl. 269-41.000.
Duich, Micheal B.; Overton, Bradley T.; and Verrando, Marcel G., III, to Pall Corporation. Fault recovery procedure for heat-reactivated dryer. 4,718,020, Cl. 364-500.000.
Duke, Jay T.: *See*—
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Riederer, Stephen J.; and Farzaneh, Farhad, 4,717,879, Cl. 324-309.000.
Dulevo S.p.A.: *See*—
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Dumortier, Bernard; Gast, Jean-Noel; and Sauvel, Francois, to La Telemecanique Electrique. Static power switch apparatus. 4,717,841, Cl. 307-646.000.
Duncan, Richard L.: *See*—
Richardson, John M.; and Duncan, Richard L., 4,718,027, Cl. 364-514.000.
Dunckley, Ian: *See*—
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Dundas, Richard E.; and Visser, Gerald H., to Plymouth Tank of West Michigan, Inc. Liquid tank spillage control system. 4,717,036, Cl. 220-18.000.
Dunkerton, Steve: *See*—
Davidson, Allen L.; and Dunkerton, Steve, 4,718,108, Cl. 455-17.000.
Dunn, David J.: *See*—
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Dunn, William C., to SGS Semiconductor Corporation. TTL compatible CMOS input circuit. 4,717,845, Cl. 307-475.000.

Du Pont de Nemours, E. I., and Company: *See*—
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Hayes, Richard A., 4,717,393, Cl. 55-16.000.
Hayes, Richard A., 4,717,394, Cl. 55-16.000.

Duret, Pierre, to Institut Francais du Petrole; Automobiles Peugeot; and Automobiles. Device and method for injecting fuel into an engine, assisted by compressed air or gas. 4,716,877, Cl. 123-531.000.

Dussault, Jean-Paul. Universal emergency brake for vehicle. 4,716,781, Cl. 74-501.00R.

Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Valve guide for an internal combustion engine. 4,716,869, Cl. 123-188.0GC.

Dyllick-Brenzinger, Rainer; Mayer, Udo; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Mixtures of dye precursors, and pressure-sensitive recording material containing these mixtures. 4,717,423, Cl. 106-21.000.

E.C.C. America Inc.: *See*—
Cummings, Carl S.; and Hudson, J. Richard, 4,717,559, Cl. 423-328.000.

E.C.H. Will (GmbH & Co.): *See*—
Reissmann, Klaus; and Herrig, Friedhelm, 4,717,013, Cl. 198-461.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Schreder, Felix, 4,717,810, Cl. 219-457.000.

E. R. Squibb & Sons, Inc.: *See*—
Eaton, Stephen M.; Tsay, Horng-Mou; Hagan, James J.; and Yost, Frederick J., 4,717,657, Cl. 435-18.000.
Steer, Peter L.; and Edwards, John V., 4,717,388, Cl. 604-323.000.

E.W. Buschman Company, The: *See*—
Yu, Thomas C.; and Vogt, Robert K., 4,717,011, Cl. 198-365.000.

E-Z Trail, Inc.: *See*—
Kuhns, Abe B., 4,717,308, Cl. 414-307.000.

Eagens, Jeffrey D.: *See*—
Prunty, John E., II; and Eagens, Jeffrey D., 4,716,953, Cl. 164-200.000.

Eastlick, David T.: *See*—
Robinson, Colin; Eastlick, David T.; and Bownass, Audrey J., 4,717,768, Cl. 540-222.000.

Eastlund, Bernard J.; Schmitt, Kenneth J.; Bass, Ronald M.; and Harrison, John M., to Production Technologies International, Inc. Method and system for introducing electric current into a well. 4,716,960, Cl. 166-60.000.

Eastman Christensen Co: *See*—
Radford, Steven R.; and Davis, J. Stanley, 4,716,974, Cl. 175-59.000.

Eastman Kodak Company: *See*—
Baumeister, Hans P., 4,717,974, Cl. 360-64.000.
Hall, Jeffrey L.; and Hastreiter, Jacob J., Jr., 4,717,649, Cl. 430-491.000.
Harrison, Daniel J.; Vanier, Noel R.; and Kan, Hsin-Chia, 4,717,712, Cl. 503-227.000.
Painton, Richard C.; Marchetti, Jay D.; Acello, John J.; Bradley, John J.; and Bolton, Richard H., 4,717,968, Cl. 358-310.000.
Sawyer, Edward G., 4,717,971, Cl. 358-342.000.
Spaller, Albert E., Jr., 4,716,801, Cl. 83-286.000.
Vanier, Noel R.; Harrison, Daniel J.; and Kan, Hsin-Chia, 4,717,711, Cl. 503-227.000.
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Eastway Holdings Limited: *See*—
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Eaton, Stephen M.; Tsay, Horng-Mou; Hagan, James J.; and Yost, Frederick J., to E. R. Squibb & Sons, Inc. Predictive test for adverse reactions to iodinated radiographic contrast media. 4,717,657, Cl. 435-18.000.

Ebata, Sakae; and Inoue, Seiichi, to Hitachi, Ltd. Turbine building equipped with overhead traveling cranes. 4,717,030, Cl. 212-205.000.

Ebihara, Yoshiyuki. Stapler. 4,717,062, Cl. 227-120.000.

Ebihara, Yoshiyuki, to Etona Company, Limited. Stapler anvil. 4,717,063, Cl. 227-155.000.

Ebright, Thomas W.: *See*—
Hoffman, William H.; and Ebright, Thomas W., 4,716,956, Cl. 166-480.000.

Echizen, Hiroshi; and Omata, Takashi, to Canon Kabushiki Kaisha. Illumination optical system. 4,717,242, Cl. 350-276.00R.

Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Dosage system and method of using same. 4,717,566, Cl. 424-438.000.

Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to Alza Corporation. Laminar arrangement for increasing delivery of beneficial agent from dispenaer. 4,717,568, Cl. 424-469.000.

Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Device for the controlled delivery of a beneficial agent. 4,717,718, Cl. 514-30.000.

Eckhardt, Thomas G.: *See*—
Brawner, Mary E.; Eckhardt, Thomas G.; and Fare, Louis R., 4,717,666, Cl. 435-253.000.

Edens, P. Clifton. Flame retention burner apparatus and method. 4,717,332, Cl. 431-8.000.

Edouard, Fritzbert, to Stauffer Chemical Company. Alkyl zirconate color improvement. 4,717,772, Cl. 556-54.000.

Edwards, Allen P.; Gildea, David R.; and Lau, Chung Y., to Hewlett-Packard Company. Calibration of vector modulators using a scalar detector. 4,717,894, Cl. 332-20.000.

Edwards, David J.; Tillson, John M.; and Benning, James K., to Western Digital Corporation. Automatic test system. 4,718,064, Cl. 371-20.000.

Edwards, John D. Self-service apparatus. 4,717,305, Cl. 414-134.000.

Edwards, John V.: *See*—
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EEE Co., Inc.: *See*—
Martin, Harold B., 4,717,113, Cl. 249-63.000.

Eggers, Mark L., to KW Battery Company. Tubular plate electrode slurry filling process and apparatus for lead-acid cells. 4,716,944, Cl. 141-1.000.

EIC Laboratories, Inc.: *See*—
Robblee, Lois S., 4,717,581, Cl. 427-2.000.

Eichenlaub, Jesse B., to Dimension Technologies, Inc. Autostereoscopic display with illuminating lines and light valve. 4,717,949, Cl. 358-3.000.

Eickmann, Karl. Combustion engine with exterior combustion chamber. 4,716,720, Cl. 60-39.600.

Eiermann, Dankwart, to Wankel GmbH. Housing of a rotary piston internal combustion engine. 4,717,319, Cl. 418-60.000.

Ekelund, Ake, to AB Siwertell. Screw conveyor. 4,717,014, Cl. 198-518.000.

Ekholmer, Erik, to Mediplast AB. Catheter, probe or similar device. 4,717,379, Cl. 604-43.000.

Elbit Computers Ltd.: *See*—
Gal, Eliyahu; and Fontyn, Naftaly, 4,717,958, Cl. 358-222.000.

Elderfield, Keith C. Multiple paper holder and method for a computer printer. 4,717,273, Cl. 400-613.200.

Electricite de France: *See*—
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Electro-Voice, Incorporated: *See*—
Engelmann, Rudolph H., 4,717,889, Cl. 330-297.000.

Elexpuru, Manuel A., to Radar, S. Coop. Pressure cooker with bayonet closure and weight valve. 4,717,041, Cl. 220-316.000.

Elger, Rodney R., to Johnson Service Company. Data telemetry system using diffused infrared light. 4,717,913, Cl. 340-825.540.

Eli Lilly and Company: *See*—
Boeck, LaVerne D.; Marconi, Gary G.; and Hoehn, Marvin M., 4,717,714, Cl. 514-10.000.

Elias, Thomas C., to Sonoco Products Company. Method for forming a composite container with high barrier liner layer. 4,717,374, Cl. 493-292.000.

Ellert, Roger H.: *See*—
Fremow, W. Douglas; Russell, Franklin E., Sr.; and Ellert, Roger H., 4,717,120, Cl. 251-144.000.

Ellinger, Karl-Werner: *See*—
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,716,859, Cl. 123-3.000.

Ellison, Frank M.; Gencsoy, Hasan T.; and Smith, Nelson S., Jr., to Ellison, Frank M. Automatic coin feeder with winding mechanism. 4,717,008, Cl. 194-343.000.

Ellsworth, Daniel L.: *See*—
Moll, Maurice M.; and Ellsworth, Daniel L., 4,718,042, Cl. 365-201.000.

Elpern, David G., to Garrett Corporation, The. Turbocharger heat transfer control method and apparatus. 4,717,318, Cl. 417-407.000.

Emde, Herbert: *See*—
Blank, Heinz U.; Emde, Herbert; and Schimpf, Rolf, 4,717,514, Cl. 360-508.000.

Emergency Management Products, Inc.: *See*—
Clemens, R. Michael; and Zseltvay, Kenneth A., 4,717,382, Cl. 604-122.000.

Emhart Industries, Inc.: *See*—
Kulig, Constantine W., 4,717,412, Cl. 65-327.000.

Endo, Yukio: *See*—
Groover, Phillip B.; Batlle, Jose; Tatsuke, Saburo; Kozukue, Masaaki; and Endo, Yukio, 4,717,043, Cl. 221-7.000.

Enea - Comitato Nazionale per la Ricerca e Lo Sviluppo Della Energia Nucleare e Delle Energie Alternative: *See*—
Marchetti, Renato; Penco, Eugenio; and Salvetti, Gianemilio, 4,718,072, Cl. 372-86.000.

Engelmann, Rudolph H., to Electro-Voice, Incorporated. Power control system for periodically and selectively energizing or shorting primary windings of transformers for controlling the output voltage across a common secondary winding. 4,717,889, Cl. 330-297.000.

Enkel Corporation: *See*—
Keene, John F.; Kuller, Bengt L.; and Kemmeter, Robert G., 4,717,087, Cl. 242-75.400.

Ensign-Bickford Company, The: *See*—
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Enthone, Incorporated: *See*—
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McCormick, Peter E.; and Autry, Walter D., Jr., 4,717,003, Cl. 192-56.00F.

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Stanton, William H., 4,717,040, Cl. 220-306.000.

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Erie, David G.; Roberts, Jon A.; and Lee, Eddie C., to Honeywell Inc. Dielectric barrier material. 4,717,449, Cl. 437-195.000.

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Kowalski, Werner; Haas, Hans; Dahmen, Theo; and Erpenbach, Markus, 4,717,557, Cl. 423-315.000.

ESCO Corporation: *See*—
Farmer, Stanley, 4,717,191, Cl. 294-119.400.
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Van de Wiel, Petrus J. A. M.; and Esser, Leonard J. M., 4,717,944, Cl. 357-23.140.

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Justus, Paul E., 4,717,604, Cl. 427-434.700.

Ethicon, Inc.: *See*—
Finkenaur, Amy L., 4,717,717, Cl. 514-21.000.

Ethyl Corporation: *See*—
Brackenridge, David R.; and McKinnie, Bonnie G., 4,717,776, Cl. 568-617.000.

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Ebihara, Yoshiyuki, 4,717,063, Cl. 227-155.000.

Ets Anselme S.A.: *See*—
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Rosenberger, Mark A.; and Ettinger, John J., 4,717,093, Cl. 244-49.000.

Eue, Ludwig: *See*—
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Chauve, Jean-Yves; Leguin, Jean M.; Loquet, Jacques; and Eugene, Leroux, 4,716,898, Cl. 128-329.00A.

European Body Wrap, Inc.: *See*—
Strem, Richard C., 4,717,735, Cl. 424-447.000.

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Finn, Lyle D.; and Power, Leonard D., 4,717,288, Cl. 405-202.000.

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Baker, James K.; Klovstad, John W.; Lee, Chin-Hui; and Ganesan, Kalyan, 4,718,068, Cl. 381-43.000.
Brois, Stanley J.; and Gutierrez, Antonio, 4,717,754, Cl. 525-331.800.
Brown, Peter F., 4,718,093, Cl. 381-43.000.
Klovstad, John W., 4,718,092, Cl. 381-43.000.
Vaughan, David E. W., 4,717,560, Cl. 423-328.000.
Venkatram, Ramdas; Roarty, John C.; Wortel, Theodorus M.; and Carter, James L., 4,717,700, Cl. 502-85.000.

Eynard, Denis H., to Jaeger. Level sensor for use with an electrically insulating liquid. 4,716,762, Cl. 73-295.000.

Ezawa, Masayoshi; Wakui, Hiroko; Wakana, Shigeru; Morishita, Toshikazu; and Misumi, Akira, to Hitachi, Ltd. Projection tube whose coolant contains an ethylene oligomer. 4,717,853, Cl. 313-35.000.

FAG Kugelfischer Georg Schafer (KGa): *See*—
Dittner, Adam, 4,717,211, Cl. 303-119.000.

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Sloane, Edwin A.; Chan, Kai Y.; and Yau, David D., 4,718,018, Cl. 364-480.000.

Falt, Vilho, to Oy Partek Ab. Hydraulic motor. 4,716,816, Cl. 91-491.000.

Fan, Wen-Yuan. Two-piece reinforced clothes peg. 4,716,634, Cl. 24-545.000.

Faneuf, Daniel. Injection molding apparatus. 4,717,327, Cl. 425-190.000.

Fare, Louis R.: *See*—
Brawner, Mary E.; Eckhardt, Thomas G.; and Fare, Louis R., 4,717,666, Cl. 435-253.000.

Farmer, Stanley, to ESCO Corporation. Swivel head for grapple. 4,717,191, Cl. 294-119.400.

Farquharson, Graeme J.: *See*—
Warner, Richard B.; Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Cross, Lindsay E.; and Farquharson, Graeme J., 4,717,418, Cl. 71-98.000.

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Catena, Nicola, 4,716,839, Cl. 105-153.000.

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Andersen, Wayne A.; Faust, Gregory H.; and Stirk, Gary L., 4,718,003, Cl. 364-200.000.

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Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,717,106, Cl. 248-309.200.

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Ditgens, Klaus; Heinemann, Ulrich; Lunkenheimer, Winfried; Riebel, Hans-Jochem; Stetter, Jorg; Thomas, Rudolf; and Fedtke, Carl, 4,717,415, Cl. 71-93.000.

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Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,716,869, Cl. 123-188.0GC.

Felix, Ernst, to Zellweger Uster., Ltd. Method and device for determining the cross-section of elongated objects using a sound field. 4,716,764, Cl. 73-571.000.

Fenner, Ernst; and Vogt, Martina, to Siemens Aktiengesellschaft. Adaptation layer for an ultrasound applicator. 4,717,851, Cl. 310-334.000.

Feres, Vaclav; and Roubicek, Rudolph V. Centrifugal film fermenter. 4,717,669, Cl. 435-315.000.

Ferguson, John S.: *See*—
Wagner, Charles G.; and Ferguson, John S., 4,717,872, Cl. 324-127.000.

Feth, John R.; Chang, Chin-Lung; and Furlong, Steven C., to Litton Systems, Inc. Form polarizing fibers and method of fabrication. 4,717,225, Cl. 350-96.330.

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Ficke, John D., to National Steel Corporation. Metallurgical ladle with improved tilting lug. 4,717,125, Cl. 266-143.000.

Fieselman, Troy W.: *See*—
Forsyth, Robert H.; and Fieselman, Troy W., 4,717,515, Cl. 261-122.000.

Fillion, Timothy I.; Bergeron, Marc L.; and Varpahovsky, Andrey, to Control Data Corporation. Election beam exposure system and an apparatus for carrying out a pattern unwinder. 4,718,019, Cl. 364-491.000.

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Finken, Kenneth R., to Harris Corporation. Phased array antenna. 4,717,918, Cl. 342-368.000.

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Finley, Hugh: *See*—
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Schulte-Elte, Karl-Heinrich; and Kastner, Dietrich, 4,717,771, Cl. 549-548.000.

Fisch, Herbert A.; Palsha, Edward M.; and Skotko, Sandra L., to Union Carbide Corporation. Getter device for frit sealed picture tubes. 4,717,500, Cl. 252-181.400.

Fischer, Artur; and Kramer, Wolfgang, to Fischer, Artur. Bone fastener. 4,716,893, Cl. 128-92.0YF.

Fischer, Bernard D. Diving mask with auxiliary lens. 4,717,249, Cl. 351-43.000.

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Fischer, Heinrich: *See*—
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Hercamp, Richard D.; and Hudgens, Roy D., 4,717,495, Cl. 252-75.000.
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Flierl, Erwin: *See*—
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Fling, Russell T., to RCA Corporation. Adaptive digital filter. 4,717,951, Cl. 358-22.000.
Flint, William L. Can holder and opener. 4,716,798, Cl. 83-13.000.
Flocchini, Andrew J. Mechanical fuse. 4,716,635, Cl. 24-588.000.
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Flowtec AG: *See*—
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Flugan, David C., to Technicare Corporation. Radio frequency coils for nuclear magnetic resonance imaging systems. 4,717,881, Cl. 324-322.000.
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Schmued, Laurence C., 4,716,905, Cl. 128-654.000.
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Provonchee, Richard B., 4,717,667, Cl. 435-292.000.
Fohl, Artur, to TRW Repa GmbH. Belt webbing clamping device. 4,717,088, Cl. 242-107.200.
Fohrman, Scott R. Adjustable signage system. 4,717,110, Cl. 248-545.000.
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Bacchio, Giovanni, 4,716,628, Cl. 19-106.00R.
Fonteneau, Gilles: *See*—
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Fore, Earl, to L.A. Dreyfus Company. Dust separator. 4,717,404, Cl. 55-444.000.
Forehand, Gilbert H., to Halliburton Company. Apparatus for conserving power in operating a load. 4,717,867, Cl. 323-223.000.
Formanek, James L.; and Formanek, Larry J. Natural wood surface treatment for an insulated door. 4,716,705, Cl. 52-785.000.
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Forrest, Frank D. Musical indicating apparatus. 4,716,806, Cl. 84-474.000.
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, to Scottish & Newcastle Breweries plc. Method of enhancing the bitterness of beer. 4,717,580, Cl. 426-600.000.
Forsyth, Robert H.; and Fieselman, Troy W., to Wilfley Weber, Inc. Apparatus for dispersing fluids in liquids. 4,717,515, Cl. 261-122.000.
Fort Lock Corporation: *See*—
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Frank, Volker: *See*—
Schoettle, Klaus; Deigner, Paul; Dietze, Herbert; Frank, Volker; and Waidele, Oswald, 4,717,091, Cl. 242-199.000.
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Frankoski, Stanley P.: *See*—
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Frantz, Robert H.; Paulo, James A.; and Whiteman, Robert N., Jr., to AMP Incorporated. Electrical connector and assembly eyelets. 4,717,219, Cl. 439-82.000.
Freisale, Manfred F. A., to Screenex Wire Weaving Manufactures (Proprietary) Limited. Wear resistant panel arrangement. 4,716,694, Cl. 52-127.600.
Fremow, W. Douglas; Russell, Franklin E., Sr.; and Ellert, Roger H., to Boise Cascade Corporation. Discharge valve for bulk containers. 4,717,120, Cl. 251-144.000.
Freppon, Willi; Heilmann, Paul; and van Heijst, Theo, to Degussa Aktiengesellschaft. Thermoelement for measurement of temperature in vacuum furnaces. 4,717,787, Cl. 136-226.000.
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, to Unisys Corporation. Preparation of magnetic coating. 4,717,493, Cl. 252-62.540.
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Frisby, C. Richard; and Page, Billie I., to McGean-Rohco, Inc. Solid tin-palladium catalyst for electroless deposition incorporating stannous salts of organic acids. 4,717,421, Cl. 106-1.110.
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Fujii, Masanobu, to Sharp Kabushiki Kaisha. Differential resistance humidity detector. 4,717,811, Cl. 219-497.000.
Fujii, Masashi, to Kabushiki Kaisha Toshiba. CT system for creating image data from high and low energy radiation. 4,718,010, Cl. 364-414.000.
Fujii, Yasuo: *See*—
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Fujikawa, Tetsuzo; Tambe, Shinichi; and Ueki, Noriyuki, to Kawasaki Jukogyo Kabushiki Kaisha. 4-Cycle engine. 4,716,861, Cl. 123-90.200.
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Fujimura, Isao; and Terakawa, Taiju, to Chisso Corporation. Spinneret assembly. 4,717,325, Cl. 425-131.500.
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Daifuku, Hideharu; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Toyosawa, Shinichi; and Fujio, Ryota, 4,717,634, Cl. 429-213.000.
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Fujitsu Limited: *See*—
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Fukasawa, Hiromichi, to Terumo Kabushiki Kaisha. Blood circulating circuit for membrane-type artificial lung, and reservoir for use in blood circulating circuit. 4,717,377, Cl. 604-4.000.
Fukuda, Masao; and Kumata, Koji, to Sanyo Chemical Industries, Ltd. Polyurethane based on hydroxyl-containing polymer polyol and process for making the same. 4,717,738, Cl. 521-137.000.
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Fukuoka, Yoshikazu: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.
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Fultz, Jack V., to Pertec Peripherals Corporation. Speed control method and apparatus for electronically commutated motors. 4,717,864, Cl. 318-254.000.
Fulwyler, Mack J., to Becton, Dickinson and Company. Method and apparatus for distinguishing multiple subpopulations of cells. 4,717,655, Cl. 435-7.000.
Funk, Gary L., to Phillips Petroleum Company. Distillation process control for maximum recovery using minimum energy. 4,717,468, Cl. 208-356.000.
Furlong, Stevea C.: *See*—
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Furukawa Electric Co., Ltd., The: *See*—
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Morino, Masaaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,718,029, Cl. 364-710.000.

Hankey, Dana L.; and Sutterlin, Robert C., to Heraeus, Inc. Cermalloy Division. Overglaze inks. 4,717,690, Cl. 501-20.000.

Hansbauer, Hermann: *See*—
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Hansen, James C.; Nappholz, Tibor A.; and Whigham, Robert H., to Telectronics N.V. Storage in a pacemaker memory. 4,716,903, Cl. 128-419.0PG.

Hara, Hiroyuki; and Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Logic operation circuit having an exclusive-OR circuit. 4,718,035, Cl. 364-784.000.

Hara, Osamu: *See*—
Igarashi, Yoshiaki; Ohtsuka, Hiroo; and Hara, Osamu, 4,717,361, Cl. 439-856.000.

Hara, Shigeo: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.

Hara, Yasuhiro; and Suga, Chuzo, to Mitsui Petrochemical Industries, Ltd. Method for producing secondary metabolites of plants. 4,717,664, Cl. 435-133.000.

Harada Kogyo Kabushiki Kaisha: *See*—
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Harada, Takeshi: *See*—
Shiraki, Hisashi; Nagahisa, Toshio; Takeda, Kiyonori; and Harada, Takeshi, 4,717,478, Cl. 210-360.200.

Harada, Yoshihito: *See*—
Kobayashi, Ryuichi; Harada, Yoshihito; Kawamura, Masaharu; Kataoka, Hiroyuki; and Kumakura, Toshiyuki, 4,717,934, Cl. 354-415.000.

Harakawa, Michiharu: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.

Harasaki, Hayatsugu, to Mazda Motor Corporation. Automobile body side structure. 4,717,197, Cl. 296-187.000.

Hardin, Roy T., Jr., to Westinghouse Electric Corp. Fuel transfer system upender using translation drive. 4,717,531, Cl. 376-261.000.

Hardt, Robert C., to H. A. Schlatter AG. Suspended rail welder. 4,716,836, Cl. 104-15.000.

Harmon, Albert D.; and Koella, Ernest, III, to Rockford Manufacturing Company. Shippable, sheet like fabric useful in making mop heads. 4,717,616, Cl. 428-195.000.

Harper, Thomas; Langham, James; and Idol, Francis J., to Alma Desk Company. Locking system for interconnecting panels. 4,716,692, Cl. 52-36.000.

Harris, Charles W. Tidal and river turbine. 4,717,832, Cl. 290-43.000.

Harris Corporation: *See*—
Finken, Kenneth R., 4,717,918, Cl. 342-368.000.
Nolan, Joseph G., 4,717,847, Cl. 307-475.000.
Piotrowski, Leo R., 4,717,680, Cl. 437-31.000.

Harris, Jay H.: *See*—
Reedy, Ronald E.; Harris, Jay H.; and Albares, Donald J., 4,718,063, Cl. 370-112.000.

Harris, Samuel; and Lovegrove, John R., to 501 Shipping Corporation of New Zealand, The. Carriage of comestibles and in particular to containers and related means and methods suitable for such purposes. 4,716,739, Cl. 62-78.000.

Harrison, Daniel J.; Vanier, Noel R.; and Kan, Hsin-Chia, to Eastman Kodak Company. Lubricant slipping layer for dye-donor element used in thermal dye transfer. 4,717,712, Cl. 503-227.000.

Harrison, Daniel J.: *See*—
Vanier, Noel R.; Harrison, Daniel J.; and Kan, Hsin-Chia, 4,717,711, Cl. 503-227.000.

Harrison, John M.: *See*—
Eastlund, Bernard J.; Schmitt, Kenneth J.; Bass, Ronald M.; and Harrison, John M., 4,716,960, Cl. 166-60.000.

Harrison, Paul J.; Langridge, John R.; and Potter, Christopher J., to Sterling Drug Inc. Unit dosage form of sparingly soluble medicaments. 4,717,569, Cl. 424-494.000.

Harrod, Andrew S. Adjustable backing board bracket. 4,717,101, Cl. 248-200.100.

Harsco Corporation: *See*—
Johnson, Bruce S., 4,716,811, Cl. 89-40.120.

Hart, Edward E., Jr.; and Patten, Joseph G., to Spectra-Physics, Inc. Low friction ferrofluid bearing arrangement. 4,717,266, Cl. 384-100.000.
Hart, Shane P.: *See*—
Reynolds, Carl D.; Carter, Thurman B., Jr.; and Hart, Shane P., 4,717,290, Cl. 407-34.000.
Hartley, Richard A. Security striker plate. 4,717,185, Cl. 292-340.000.
Hartmann, Dirck T. Multiple speed transmission for pedal powered vehicles. 4,716,777, Cl. 74-369.000.
Hartmann, Donald, to Syntech International, Inc. Ticket dispensing machine and method. 4,716,799, Cl. 83-42.000.
Hartung, Winfried; and Gensheimer, Valentin, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Resilient sheet gripper for a sheet-fed rotary printing press. 4,716,828, Cl. 101-415.100.
Harvey, Paul W.; Kitson, Bradford S.; and Miller, Warren K., Jr., to Advanced Micro Devices, Inc. Apparatus for producing any one of a plurality of signals at a single output. 4,717,912, Cl. 340-825.830.
Harvey, Robert J., to Automatik Machinery Corporation. Apparatus for on-line spectrophotometric chemical analysis of material in moving process stream. 4,717,827, Cl. 250-343.000.
Hasco International, Inc.: *See*—
Huenefeld, Joseph M.; and Haas, James R., 4,716,899, Cl. 128-330.000.
Hasebe, Masahiro: *See*—
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Hasegawa, Hisao: *See*—
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Hashimoto, Yasuhiko; and Katayama, Kaneo, to Mitsubishi Denki Kabushiki Kaisha. Damper system for air conditioner. 4,717,121, Cl. 251-294.000.
Hashizume, Kenji: *See*—
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Haskins, Steve W., to Northern Telecom Limited. Telephone cord groove and cord retaining means. 4,718,085, Cl. 379-438.000.
Hasler, Juerg: *See*—
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Haspeslagh, Didier R.: *See*—
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Hastreiter, Jacob J., Jr.: *See*—
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Hata, Yoshitaka, to Kabushiki Kaisha Toshiba. Abnormal condition detective circuit for a switching regulator. 4,717,997, Cl. 363-56.000.
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Hathaway, John M., to Kimberly-Clark Corporation. Apparatus and process for automatically interfolding sheets and separating them into bundles. 4,717,135, Cl. 270-39.000.
Hattori, Hiroshi: *See*—
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Hattori, Takashi: *See*—
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Haugen, David M.: *See*—
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Wells, Leon W.; Mimmack, William E.; and Hauschild, Werner, 4,717,251, Cl. 356-4.000.
Hauser, Eric. Electrode structure for lightweight storage battery. 4,717,633, Cl. 429-209.000.
Hauth, Wolfgang: *See*—
Pivit, Erich; Hauth, Wolfgang; Morz, Gunter; and Lenz, Sigmund, 4,717,895, Cl. 333-1.100.
Haveman, Hendrik J.: *See*—
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Haworth, Inc.: *See*—
Wilson, Harold; Lim, Bin; and Gingrich, Brian, 4,716,698, Cl. 52-239.000.
Hay, George M.: *See*—
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Hayabuchi, Masahiro: *See*—
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Hayashi, Hideki, to Clarion Co., Ltd. Intermittent gear lock mechanism. 4,716,783, Cl. 74-527.000.
Hayashi, Kanji: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Hayashi, Kiyotaka: *See*—
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Hayashi, Masahiko; Fujii, Yasuo; and Okuyama, Shigeaki, to Kubota, Ltd. Method and apparatus for detecting objects based upon color signal separation. 4,718,089, Cl. 382-17.000.
Hayashi, Seizo; Kitamura, Hidenori; and Shimizu, Yuichi, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 4,716,620, Cl. 15-327.00F.
Hayashi, Syoji: *See*—
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Hayashida, John P.; and Bowman, Roger P., to Canada, Her Majesty the Queen in right of. Tent. 4,716,918, Cl. 135-93.000.
Hayes, John H. Controller apparatus and method for heat exchange system. 4,716,740, Cl. 62-99.000.
Hayes, John J., to RCA Corporation. Parental control for CATV converters. 4,718,107, Cl. 455-4.000.
Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Polyimide gas separation membranes. 4,717,393, Cl. 55-16.000.
Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Polyimide gas separation membranes. 4,717,394, Cl. 55-16.000.
Hayner, Mark A.: *See*—
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Heard, Richard A. Pre-grown lawn turf product and method of growing. 4,716,679, Cl. 47-56.000.
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Hector, Dwight H. Tire repair tool means. 4,716,792, Cl. 81-15.700.
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Hegel, Robert W.; and Appledorn, William V., to Prince Corporation. Means for squaring tie bars for die casting machines. 4,716,952, Cl. 164-154.000.
Hehn, Bruce A., to Alpha Enterprises, Inc. Video cassette security device. 4,716,745, Cl. 70-58.000.
Heideman, Torsten: *See*—
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Heilmann, Paul: *See*—
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Heindel, Friedrich; and Hellmann, Wolf D., to Battenfeld Kunststoff maschinen Ges. m.b.H. Apparatus for removing molded articles from injection molding machines. 4,717,310, Cl. 414-753.000.
Heinemann, Ulrich: *See*—
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Heitmann, Jurgen, to Robert Bosch GmbH. Process for storing digitally coded video synchronous sound signals through time compression by duplicating sound data during recordation. 4,717,972, Cl. 360-8.000.
Held, Kurt. Numerically controlled writing instrument. 4,718,000, Cl. 364-167.000.
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Helmes, Jimmy D. Combine. 4,716,908, Cl. 130-27.00T.
Hendrickson, Donald W. Flow limiting assembly having breakaway features. 4,716,937, Cl. 138-45.000.
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Henning, Freddie L. Oil or gas well workover technique. 4,716,970, Cl. 166-372.000.
Henriksson, Soren N.; and Karreman, Lars-Olof, to AB Electrolux. Arrangement for inlet of cooling and combustion air. 4,716,860, Cl. 123-41.050.
Henry, Gilles; and Cadet, Christian, to La Telemecanique Electrique. Device for digitally determining and safeguarding a thermal image. 4,717,984, Cl. 361-25.000.
Henry, James W.: *See*—
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Heraeus, Inc. Cermalloy Division: *See*—
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Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Multiple riser fluidized catalytic cracking process utilizing hydrogen and carbon-hydrogen contributing fragments. 4,717,466, Cl. 208-113.000.
Hercamp, Richard D.; and Hudgens, Roy D., to Fleetguard, Inc. Diesel engine cooling system compositions. 4,717,495, Cl. 252-75.000.
Hercules Incorporated: *See*—
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Herzog, Michael, to Flowtec AG. Vortex flow meter. 4,716,770, Cl. 73-861.240.
Hetz, G. Brian. Polymeric belt cutting apparatus and method of making same. 4,717,295, Cl. 409-132.000.
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Edwards, Allen P.; Gildea, David R.; and Lau, Chung Y., 4,717,894, Cl. 332-20.000.
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Hewson, C. Bruce, to Brewmaster Systems Ltd. Fermentation vessel. 4,717,031, Cl. 215-1.00C.
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Hiblen, Christopher R.: *See*—
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Hill, Fred W.; and Vince, Michael R., to Hughes Aircraft Company. Method for making high-purity, essentially crack-free crystals. 4,717,444, Cl. 156-624.000.
Hilliard, John C.; and Chan, Anthony K. F., to Champion Spark Plug Company. Control for spark ignited internal combustion engine. 4,716,874, Cl. 123-425.000.
Hilsum, Cyril; and Van de Poel, Rene J., to General Electric Company, p.l.c., The. Active matrix addressed liquid crystal display wherein the number of overlap regions of the address line is reduced. 4,717,244, Cl. 350-333.000.
Himuro, Keiji; and Ueno, Akira, to Ricoh Company, Ltd. Fail-safe film prewinder for cameras. 4,717,931, Cl. 354-173.100.
Hinterberger, Leopold, to Wilhelm Ruf Kg. Trimming resistor. 4,717,903, Cl. 338-162.000.
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Hirama, Makoto, to Kabushiki Kaisha Toshiba. Ultrasonic measuring apparatus. 4,716,765, Cl. 73-626.000.
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Hirano, Takuji: *See*—
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Hirao, Mamoru; Hijiya, Hiromi; and Miyaka, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Anhydrous crystals of maltitol and whole crystalline hydrogenated starch hydrolyzate mixture solid containing the crystals, and process for the production and uses thereof. 4,717,765, Cl. 536-124.000.
Hirasawa, Kotaro: *See*—
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Yukino, Eichi, 4,718,007, Cl. 364-200.000.
Hitomi, Hisakazu, to Kabushiki Kaisha Toshiba. Current-controlled multivibrator with temperature compensation. 4,717,892, Cl. 331-113.00R.
Hoashi, Akira: *See*—
Hagiya, Naoyuki; Matsubara, Yuji; Miyake, Katsuya; Akima, Hideo; and Hoashi, Akira, 4,717,209, Cl. 303-111.000.
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Hoch, Robert L.; Kessler, James J.; and Long, Thomas J., to McDonnell Douglas Corporation. Mechanical launch sequencer for a missile. 4,716,808, Cl. 89-1.812.
Hodge, Robert J., to Grace-Lee Products, Inc. Vehicle cleansing. 4,716,916, Cl. 134-123.000.
Hoechst AG: *See*—
Kowalski, Werner; Hass, Hans; Dahmen, Theo; and Erpenbach, Markus, 4,717,557, Cl. 423-315.000.

Hoechst Aktiengesellschaft: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; and Kohl, Georg, 4,717,454, Cl. 203-29.000.
Gunzler, Volkmar; Hanauske-Abel, Hartmut; Mohr, Jurgen; Tschank, Georg; Kivirikko, Kari; Majamaa, Kari; and Brocks, Dietrich, 4,717,727, Cl. 514-354.000.
Schaper, Wolfgang; Blume, Ernst; Raether, Wolfgang; and Dittmar, Walter, 4,717,724, Cl. 514-278.000.
Stahlhofen, Paul, 4,717,640, Cl. 430-192.000.

Hoechst Celanese Corporation: *See—*
DeMartino, Ronald N., 4,717,508, Cl. 252-583.000.
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,717,624, Cl. 428-423.100.
Letinski, John S., 4,717,619, Cl. 428-287.000.

Hoehn, Marvin M.: *See—*
Boeck, LaVerne D.; Marconi, Gary G.; and Hoehn, Marvin M., 4,717,714, Cl. 514-10.000.

Hoene, Ernst-Ludwig, to Siemens Aktiengesellschaft. Contact arrangement for a vacuum switching tube. 4,717,797, Cl. 200-144.00B.

Hofer, Robert; and Steiger, Anton, to Sulzer Brothers Limited. Reciprocating pump. 4,717,317, Cl. 417-392.000.

Hoffman, William H.; and Ebright, Thomas W., to Aluminum Company of America. Roll caster feed tip and method. 4,716,956, Cl. 164-480.000.

Hoffner, Glenn I.: *See—*
Bocchicchio, Keith A.; Hoffner, Glenn I.; and Letsch, Karl H., 4,717,304, Cl. 414-126.000.

Hofman, Velimir. Garments. 4,716,596, Cl. 2-69.000.

Hokuetsu Paper Mills, Ltd.: *See—*
Yoshioka, Shigehiko; Yoshida, Tsuneo; Sato, Hisatake; Yamada, Hideto; and Adachi, Yoshio, 4,717,452, Cl. 162-158.000.

Holbrook, David L.: *See—*
Staehle, Bruce E.; and Holbrook, David L., 4,717,481, Cl. 210-649.000.

Hollandse Signaalapparaten B.V.: *See—*
Jongsma, Wiegard, 4,718,111, Cl. 455-105.000.

Hollinger, Jeffrey O.: *See—*
Schmitz, John P.; and Hollinger, Jeffrey O., 4,717,115, Cl. 249-112.000.

Holman, Andrew W.: *See—*
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Holodyne Ltd., 1986: *See—*
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Holz, Uwe D.: *See—*
Andersson, Gunter; Holz, Uwe D.; and Margieciok, Frank J., 4,716,855, Cl. 119-61.000.

Homco International, Inc.: *See—*
Reynolds, Carl D.; Carter, Thurman B., Jr.; and Hart, Shane P., 4,717,290, Cl. 407-34.000.

Homma, Yoshio; Tsunekawa, Sukeyoshi; and Sasabe, Shunji, to Hitachi, Ltd. Sputtering apparatus. 4,717,462, Cl. 204-298.000.

Hommelwerke GmbH: *See—*
Ulbers, Gerd, 4,717,255, Cl. 356-345.000.

Honda Giken Kogyo K.K.: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,717,235, Cl. 350-96.230.
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, 4,716,791, Cl. 74-867.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Kami, Yozo; Taki, Keinosuke; and Yamamoto, Toshihumi, 4,717,171, Cl. 280-688.000.
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Ogano, Takeo; Toda, Yoshihiro; Mukainakano, Masato; and Shoji, Mikio, 4,716,717, Cl. 56-255.000.
Tanaka, Akira, 4,716,759, Cl. 73-115.000.
Tsukiji, Kensuke, 4,717,163, Cl. 280-5.00H.

Honeywell Inc.: *See—*
Bartels, James I., 4,716,858, Cl. 122-448.00R.
Dalal, Samir K., 4,718,004, Cl. 364-200.000.
Erie, David G.; Roberts, Jon A.; and Lee, Eddie C., 4,717,449, Cl. 437-195.000.
Jenekhe, Samson A., 4,717,762, Cl. 528-251.000.

Honorati, Giorgio: *See—*
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Hoodlebrink, Merlin P.: *See—*
Brandt, Robert H.; and Hoodlebrink, Merlin P., 4,717,475, Cl. 210-237.000.

Hopewell, Richard B., to Koch Process Systems, Inc. Process for prevention of water build-up in cryogenic distillation column. 4,717,408, Cl. 62-20.000.

Hopkins, Larry: *See—*
Fischer, Gregory J.; and Hopkins, Larry, 4,717,026, Cl. 209-539.000.

Hopson, Eric C., to Metal Box Public Limited Company. Apparatus for removing labels or carriers from containers. 4,717,442, Cl. 156-584.000.

Horie, Takeo: *See—*
Muramatsu, Shigeru; Shida, Shigeru; Horie, Takeo; and Yamada, Masashi, 4,717,316, Cl. 417-372.000.

Horii, Yasuyuki; Nishikawa, Takao; Yamanishi, Isamu; and Umemoto, Tomeo, to Kubota, Ltd. Transmission having cassette type supplementary change speed apparatus. 4,716,775, Cl. 74-15.860.

Horkans, Wilma J.: *See—*
Acosta, Raul E.; Horkans, Wilma J.; Mukherjee, Ruby; and Olsen, Judith D., 4,717,591, Cl. 427-96.000.

Horn, Michael, to Grumman Aerospace Corporation. Raster scan anode X-ray tube. 4,718,075, Cl. 378-91.000.

Hornak, Andrew J., to General Datacomm, Inc. Multi circuit board card enclosure. 4,717,216, Cl. 312-257.00R.

Hornbuckle, Charles R.: *See—*
Turner, James K.; Sturkey, William C.; and Hornbuckle, Charles R., 4,716,744, Cl. 68-62.000.

Horstermann, Peter: *See—*
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Hoshi, Akimitsu: *See—*
Iida, Noriyoshi; Uto, Nobutaka; Hiroi, Masakazu; and Hoshi, Akimitsu, 4,717,134, Cl. 270-39.000.

Hoshina, Noriyuki: *See—*
Utsui, Masaaki; Shimizu, Makoto; Hoshina, Noriyuki; Adachi, Nobuyuki; Kurihara, Takashi; and Shiino, Tatsuo, 4,716,650, Cl. 29-430.000.

Hoshino, Yasushi; and Makino Masamori, to Konishiroku Photo Industry Co., Ltd. Focal length switching type camera. 4,717,932, Cl. 354-195.120.

Hosoda, Naoyuki; Morikawa, Masaki; Uchiyama, Naoki; Yoshida, Hideaki; and Ono, Toshiaki, to Mitsubishi Kinzoku Kabushiki Kaisha. Wire for bonding a semiconductor device. 4,717,436, Cl. 148-432.000.

Hosoda, Seiichi: *See—*
Noguchi, Toshiaki; Hosoda, Seiichi; and Nakamura, Ichiro, 4,716,897, Cl. 128-303.150.

Hosokai, Tetsushi: *See—*
Sakamoto, Katsuhiko; Hosokai, Tetsushi; and Shiraishi, Hideo, 4,716,871, Cl. 123-339.000.

Hotomi, Hideo, to Minolta Camera Kabushiki Kaisha. Electric field curtain force printer. 4,717,926, Cl. 346-140.00R.

Hotvet, David A., to Telex Communications, Inc. Automatic gain control for hearing aid. 4,718,099, Cl. 381-68.400.

Houston, Albert C.: *See—*
Ma, John Y.; and Houston, Albert C., 4,718,117, Cl. 455-314.000.

How, Adrian T. G.: *See—*
De Barros, Leonardo G.; Buss, Thomas E.; How, Adrian T. G.; and Tin, Jolene L. S., 4,717,989, Cl. 361-424.000.

Howard City Paper Company: *See—*
Lamb, Vernon L., Sr.; and Helmer, Stanley A., 4,716,709, Cl. 53-399.000.

Howard W. Bremer: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Ikekawa, Nobuo; and Ostrem, Voula, 4,717,721, Cl. 514-167.000.

Howell, Edward K., to General Electric Company. Low voltage vacuum circuit interrupter. 4,717,796, Cl. 200-144.00B.

Howell, Edward K., to General Electric Company. Low voltage vacuum circuit interrupter. 4,717,798, Cl. 200-144.00B.

Howells, Geoffrey: *See—*
Chapman, Colin K. L.; and Howells, Geoffrey, 4,717,006, Cl. 194-318.000.

Hoyle, Edgar. Self-adjusting clutch mechanism. 4,717,004, Cl. 192-111.00A.

Hubbard, George R. Fire sprinkler alignment bracket. 4,717,099, Cl. 248-57.000.

Huckestein, Edgar A.: *See—*
Gjertsen, Robert K.; Bassler, Elmer A.; Huckestein, Edgar A.; Salton, Robert B.; and Tower, Stephen N., 4,717,527, Cl. 376-209.000.

Hudgens, Roy D.: *See—*
Hercamp, Richard D.; and Hudgens, Roy D., 4,717,495, Cl. 252-75.000.

Hudson, J. Richard: *See—*
Cummings, Carl S.; and Hudson, J. Richard, 4,717,559, Cl. 423-328.000.

Huenefeld, Joseph M.; and Haas, James R., to Hasco International, Inc. Device for attaching an identification tag to an ear or the like of an animal. 4,716,899, Cl. 128-330.000.

Huffstutler, Alan D., to Dresser Industries, Inc. Specially shaped cutting element for earth boring apparatus. 4,716,977, Cl. 175-410.000.

Hughes Aircraft Company: *See—*
Byren, Robert W., 4,717,822, Cl. 250-236.000.
Cherrette, Alan R.; and Chang, Donald C. D., 4,717,919, Cl. 342-383.000.
Gussin, Edward L.; Burney, Richard E.; Murphy, J. Brian; Pfeiffer, Carl G.; and Hedden, Richard L., 4,718,028, Cl. 364-572.000.
Hill, Fred W.; and Vince, Michael R., 4,717,444, Cl. 156-624.000.

Hughes, Henry G.: *See—*
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Hummel, Kurt M., to Hermann Hemschedit Maschinenfabrik GmbH & Co. Hydraulic rotation damper. 4,716,996, Cl. 188-306.000.

Hung, Paul L. K.; and Tseng, Kenneth K. S., to M&T Chemicals Inc. Aqueous alkaline developable, UV curable urethane acrylate compounds and compositions useful for forming solder mask coatings. 4,717,740, Cl. 522-96.000.

Hunt, David A., to PPG Industries, Inc. Herbicidally active imidazopyrrolo-pyridine (or benzene) derivatives. 4,717,414, Cl. 71-92.000.

Huon De Kermadec, Jean; and Thomas, Guy M. C. M., to Soule. Transport installation comprising a guide track and a car provided with gripping means cooperating with a drive cable. 4,716,838, Cl. 104-173.100.

Husky Injection Molding Systems, Inc.: *See—*
Schad, Robert D.; and Brown, Paul P., 4,717,324, Cl. 425-130.000.

Husted, Royce: *See—*
Husted, Royce H., 4,717,369, Cl. 474-49.000.

Husted, Royce H., to Husted, Royce; and Shiber, Samuel. Incrementally variable transmission. 4,717,369, Cl. 474-49.000.

Hutt, Radi. Writing point and method for the production thereof. 4,717,277, Cl. 401-216.000.

Hutton, Geoffrey; and Rostron, Robert. Method of producing a pattern-bearing article. 4,718,017, Cl. 364-470.000.

Hydrogeo S.A.: *See—*
Gress, Jean-Claude, 4,717,284, Cl. 405-50.000.

Hytork Actuators Limited: *See—*
Stewart, Duncan R., 4,716,815, Cl. 91-464.000.

Iacobucci, Paul A.: *See—*
Cheng, Chung-Ping; and Iacobucci, Paul A., 4,717,708, Cl. 502-233.000.

Ianiguchi, Koji: *See—*
Tanaka, Koichi; Ogura, Takashi; Ianiguchi, Koji; Mikami, Akiyoshi; and Yoshida, Masaru, 4,717,858, Cl. 313-503.000.

Ibuthi, Junichi: *See—*
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsusetaka; Oya, Masaaki; Ibuthi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Dobo, Tamenari, 4,716,687, Cl. 51-131.100.

Ichikawa, Akira: *See—*
Asakawa, Yoshiaki; Komatsu, Akio; Hatsoka, Nobuo; Ichikawa, Akira; and Nagasawa, Kiyoshi, 4,718,095, Cl. 381-43.000.

Ichikawa, Hiroshi: *See—*
Ishikawa, Toshikatsu; Teranishi, Haruo; Ichikawa, Hiroshi; Imai, Yoshikazu; and Umezawa, Masanobu, 4,717,589, Cl. 427-57.000.

Ichikawa, Wataru; and Matsuki, Yuji, to Kabushiki Kaisha SG. Reluctance type linear position detection device. 4,717,874, Cl. 324-208.000.

Ichinose, Harunobu, to Copal Company Limited. Screw shaft adjustment means for a magnetic disk drive unit. 4,717,978, Cl. 360-106.000.

Ichise, Toshihiko; Sakata, Tsuguhide; and Kawai, Hisashi, to Canon Kabushiki Kaisha. Phase locked loop circuit having temperature compensated VCO control voltage. 4,717,891, Cl. 331-17.000.

Ichiyanagi, Toshikazu; Sudo, Kazuburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, to Kabushiki Kaisha; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for producing white cement clinker. 4,717,337, Cl. 432-14.000.

ICI Australia Limited: *See—*
Warner, Richard B.; Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Cross, Lindsay E.; and Farquharson, Graeme J., 4,717,418, Cl. 71-98.000.

Ide, Mason G.: *See—*
Cyll, Kenneth M.; and Ide, Mason G., 4,717,808, Cl. 219-207.000.

IDN Inventions and Development of Novelties AG: *See—*
Ackeret, Peter, 4,717,019, Cl. 206-307.000.
Bohnet, Klaus; and Ackeret, Peter, 4,717,213, Cl. 312-12.000.

Idol, Francis J.: *See—*
Harper, Thomas; Langham, James; and Idol, Francis J., 4,716,692, Cl. 52-36.000.

Igarashi, Akira; and Nakamura, Sukenori, to Fuji Photo Film Co., Ltd. Heat-sensitive recording sheet. 4,717,593, Cl. 427-150.000.

Igarashi, Hideo: *See—*
Thompson, Peter; Otsuka, Nobuo; Yamazaki, Kisuke; and Igarashi, Hideo, 4,716,957, Cl. 165-12.000.

Igarashi, Yoshiaki; Ohtsuka, Hiroo; and Hara, Osamu, to Daiichi Denshi Kogyo Kabushiki Kaisha; and Iwatsu Electronic Co., Inc. Contact for connector. 4,717,361, Cl. 439-856.000.

Iida, Noriyoshi; Uto, Nobutaka; Hiroi, Masakazu; and Hoshi, Akimitsu, to Canon Kabushiki Kaisha. Sheet folding apparatus. 4,717,134, Cl. 270-39.000.

Iizuka, Takao; and Ota, Akiho, to Yoshino Kogyosho Co., Ltd. Method for forming plastic containers. 4,717,525, Cl. 264-521.000.

Ikeda Bussan Co., Ltd.: *See—*
Ota, Toshihiko; and Yokokura, Chiyokatsu, 4,717,194, Cl. 296-65.00R.

Ikeda, Tadashi; Takei, Haruo; Okazaki, Masaki; and Kimura, Keizo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,717,650, Cl. 430-494.000.

Ikeguchi, Nobuyuki: *See—*
Gaku, Morio; Ikeguchi, Nobuyuki; and Kimbara, Hidenori, 4,717,609, Cl. 428-40.000.

Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Ikekawa, Nobuo; and Ostrem, Voula, 4,717,721, Cl. 514-167.000.

Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, to Hoechst Celanese Corporation. Method of manufacturing a molded article having good dimensional stability. 4,717,624, Cl. 428-423.100.

Ikeya, Takao; and Katsuoka, Norio, to Furukawa Electric Co., Ltd., The. Method of laying optical cable in aerial line. 4,717,122, Cl. 254-134.30R.

Ikezue, Tatsuya: *See—*
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,717,637, Cl. 430-65.000.

Imagawa, Kyoshiro: *See—*
Sakuragi, Shiro; and Imagawa, Kyoshiro, 4,717,238, Cl. 350-96.340.

Imagawa, Masami. Insect killing system. 4,716,676, Cl. 43-130.000.

Imai, Hideaki: *See—*
Nomura, Junji; Imai, Hideaki; Ishibashi, Yuzuru; and Konishi, Tokuzo, 4,717,554, Cl. 423-263.000.

Imai, Tamotsu; Bricker, Jeffery C.; Chao, Tai-Hsiang; and Bricker, Maureen L., to UOP Inc. Process for the dehydrogenation of dehydrogenatable hydrocarbons. 4,717,781, Cl. 585-441.000.

Imai, Tamotsu: *See—*
Bricker, Jeffery C.; Imai, Tamotsu; and Mackowiak, David E., 4,717,779, Cl. 585-443.000.

Imai, Yoshikazu: *See—*
Ishikawa, Toshikatsu; Teranishi, Haruo; Ichikawa, Hiroshi; Imai, Yoshikazu; and Umezawa, Masanobu, 4,717,589, Cl. 427-57.000.

Imaizumi, Hiroyuki: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.

Imperial Chemical Industries PLC: *See—*
Bowen, Thomas N. E.; Graystone, Jonathan A.; and Hobbs, Andrew J. W., 4,717,620, Cl. 428-323.000.
Carnell, Peter J. H.; and Denny, Patrick J., 4,717,552, Cl. 423-230.000.
Staniland, Philip A., 4,717,761, Cl. 528-125.000.

Imperial Group, PLC: *See—*
Long, Terence M.; Newman, David J.; and Thomas, Peter D., 4,718,026, Cl. 364-550.000.

INA Walzlager Schaeffler KG: *See—*
Rohrig, Harald, 4,717,370, Cl. 474-161.000.

Inaba, Masahito: *See—*
Yuasa, Yoshio; Naruse, Kazuhiko; and Inaba, Masahito, 4,717,861, Cl. 315-241.00P.

Inaba, Takihiro: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.

Inamoto, Tadayoshi: *See—*
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Indian Industries, Inc.: *See—*
Smith, Max D., 4,717,157, Cl. 273-411.000.

Industrial Polychemical Service, Inc.: *See—*
Prather, Charles R., 4,716,925, Cl. 137-360.000.

Industrial Precision Products Company: *See—*
Anders, Gary P., 4,717,038, Cl. 220-94.00R.

Inoue, Eisuke: *See—*
Yamamoto, Masanao; Inoue, Eisuke; Shidara, Keiichi; and Hiruma, Eikyuu, 4,717,854, Cl. 313-366.000.

Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, to Sumitomo Electric Industries Ltd. Catheter. 4,717,387, Cl. 604-264.000.

Inoue, Seiichi: *See—*
Ebata, Sakae; and Inoue, Seiichi, 4,717,030, Cl. 212-205.000.

Inoue, Takashi: *See—*
Orikasa, Yuichi; Kojima, Shinji; Inoue, Takashi; Yamamoto, Kaoru; Sato, Atsushi; and Kawakami, Shigenobu, 4,717,759, Cl. 526-316.000.

Inoue, Taketoshi, to NEC Corporation. Radio receiver for carrying out self diagnosis without interference. 4,718,115, Cl. 455-218.000.

Inrad S.A: *See—*
Lans, Hakan; and Cano, Jean, 4,717,928, Cl. 346-160.000.

Institut Francais du Petrole: *See—*
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Institut-Merieux: *See—*
Galy, Michel; and Genet, Alain, 4,716,710, Cl. 53-432.000.

Integrated Genetics, Inc.: *See—*
Beck, Anton K., 4,717,670, Cl. 435-320.000.

Intelitec Corporation: *See—*
Border, John; and Ford, Russell B., 4,717,521, Cl. 264-219.000.

Inter Innovation AB: *See—*
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International Business Machines: *See—*
Aichelmann, Frederick J., Jr.; Shutler, William F.; and Sollitto, Vincent F., Jr., 4,718,039, Cl. 364-900.000.
Wolf, Hans P.; and Young, Donald R., 4,717,943, Cl. 357-23.500.

International Business Machines Corporation: *See—*
Acosta, Raul E.; Horkans, Wilma J.; Mukherjee, Ruby; and Olsen, Judith D., 4,717,591, Cl. 427-96.000.
Bahl, Lalit R.; deSouza, Peter V.; DeGennaro, Steven V.; and Mercer, Robert L., 4,718,094, Cl. 381-43.000.
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,717,596, Cl. 427-248.100.
Broockman, Eric C.; and Stokes, Olen L., Jr., 4,717,818, Cl. 235-462.000.
Chang, Albert; Mergen, Mark F.; O'Quin, John T., II; O'Quin, John C., III; and Rogers, Mark D., 4,718,008, Cl. 364-300.000.
Cox, Randy D.; Israel, Arthur B.; and Payne, Edward H., 4,717,448, Cl. 156-643.000.
Feigenbaum, Barry A.; Gibbs, Dennis D.; and Sachsenmaier, Robert, 4,718,005, Cl. 364-200.000.
Goth, George R., 4,717,678, Cl. 437-27.000.
Jones, Fletcher; and Voelker, Henry R., 4,717,644, Cl. 430-296.000.

Interplastic Corporation: *See—*
Hand, George E.; and Kramer, Roman A., 4,716,824, Cl. 99-516.000.

Iritani, Eiji: *See—*
Shirato, Monpei; Iritani, Eiji; Yagishita, Aisaburo; and Yagishita, Kazuhiko, 4,717,486, Cl. 210-785.000.

Irukulla, Suren; and Patel, Bimal V., to Prime Computer, Inc. Method and apparatus for effecting range transformation in a digital circuitry. 4,718,032, Cl. 364-765.000.

Irwin, Lawrence F. Pipe cleaning machine. 4,716,613, Cl. 15-104.330.

Isago, Koki, to Ricoh Company, Ltd. Automatic focusing device for video camera or the like. 4,717,959, Cl. 358-227.000.

Isaka, Tsutomu; and Nagano, Hiroshi, to Toyo Boseki Kabushiki Kaisha. Production of polyester shaped product. 4,717,516, Cl. 264-22.000.

Isakov, Edmund, to Kennametal Inc. Rotary percussion drill bit. 4,716,976, Cl. 175-410.000.

Ishibashi, Yuzuru: *See*—
Nomura, Junji; Imai, Hideaki; Ishibashi, Yuzuru; and Konishi, Tokuzo, 4,717,554, Cl. 423-263.000.

Ishida, Masaharu, to Yazaki Corporation. Solar heat collector. 4,716,882, Cl. 126-441.000.

Ishida, Takao; and Tsuneeda, Kenichi, to Kabushiki Kaisha Toshiba. Optical deflector. 4,717,223, Cl. 350-6.800.

Ishigaki, Tsuneo, to SMC Corporation. Pilot mode two-port solenoid valve. 4,717,116, Cl. 251-30.020.

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Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,717,337, Cl. 432-14.000.
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Ando, Makoto; Metabi, Tsuneyo; and Ishimura, Toshihiko, 4,717,933, Cl. 354-409.000.

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Ishizawa, Tadao: *See*—
Miki, Masaharu; Ishizawa, Tadao; and Urano, Chiaki, 4,717,315, Cl. 417-365.000.

Ishizuka, Yutaka: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,717,321, Cl. 418-76.000.

Isoda, Shinichi: *See*—
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Israel, Arthur B.: *See*—
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Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, 4,717,719, Cl. 514-56.000.

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Crotti, Aldo, 4,716,644, Cl. 29-525.000.

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Ogura, Tokihiko; Sakata, Tsuguhide; Ito, Kazuhiko; and Ogawa, Masahiko, 4,717,975, Cl. 360-66.000.

Ito, Shigenori; and Machida, Minoru, to NGK Insulators, Ltd. Method and jig for dynamically balancing an assembly of the jig and rotor. 4,716,761, Cl. 73-118.100.

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Sato, Yoshio; Shimada, Satoshi; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.

Ito, Yukio; and Kinoshita, Shigeo, to Clarion Co., Ltd. Device for operating a plunger in a tape player. 4,717,983, Cl. 360-137.000.

Itoh, Hajime; and Mitani, Kazutami, to Mitsubishi Rayon Co., Ltd. Hydrophilized porous polyolefin membrane and production process thereof. 4,717,479, Cl. 210-490.060.

Itoh, Masumi: *See*—
Makino, Yoshio; Kakinuma, Toshiaki; Iwata, Tomio; Itoh, Masumi; and Hirose, Takayoshi, 4,717,503, Cl. 252-350.000.

ITT Defense Communications Division of ITT Corporation: *See*—
Landis, Richard C., 4,717,988, Cl. 361-403.000.

ITW de France: *See*—
Rizo, Leandre, 4,716,633, Cl. 24-453.000.

ITW Fastex Italia S.p.A.: *See*—
Oddenino, Manrico, 4,717,301, Cl. 411-373.000.

ITW New Zealand Limited: *See*—
Wrigley, Andrew N., 4,717,123, Cl. 256-43.000.

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Iwamoto, Tadashi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Disc brake. 4,716,994, Cl. 188-72.200.

Iwamura, Tooru; and Yoshikawa, Hirokazu, to Toyota Jidosha Kabushiki Kaisha. Unit for storing demountable roof panel. 4,717,192, Cl. 296-37.100.

Iwasa, Tadanobu: *See*—
Yasukawa, Takemasa; Sugita, Hiroshi; Iwasa, Tadanobu; and Aritake, Masanori, 4,716,618, Cl. 15-250.360.

Iwasaki, Kenji; Shimizu, Susumu; and Ono, Hidenosuke, to Kabushiki Kaisha Toshiba. Optical scanning type system. 4,717,222, Cl. 350-6.500.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Low profile electromagnetic linear motion device. 4,717,900, Cl. 335-230.000.

Iwase, Takahiro: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.

Iwata, Kunio; and Hagimoto, Kenya, to Kanai Juyo Kogyo Co., Ltd. Combining cylinder of a comber in spinning machinery. 4,716,629, Cl. 19-114.000.

Iwata, Tomio: *See*—
Makino, Yoshio; Kakinuma, Toshiaki; Iwata, Tomio; Itoh, Masumi; and Hirose, Takayoshi, 4,717,503, Cl. 252-350.000.

Iwatsu Electronic Co., Inc.: *See*—
Igarashi, Yoshiaki; Ohtsuka, Hiroo; and Hara, Osamu, 4,717,361, Cl. 439-856.000.

J. D. Phillips Corporation: *See*—
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J. I. Case Company: *See*—
Johnson, Richard S.; and Youngers, Stephen A., 4,716,665, Cl. 37-85.000.
Stoever, Guy T.; and Swaim, David W., 4,716,933, Cl. 137-596.200.

Jackson, Joseph F.; and Gill, Steven S., to Pratt Burnerd International Limited, a part interest. Surgical appliance for forming an opening through the skin. 4,716,901, Cl. 128-343.000.

Jacob, Pierre: *See*—
Cheron, Yvon; Jacob, Pierre; and Salesse, Jacques, 4,717,998, Cl. 363-71.000.

Jacobi, Cecil T., Jr., to Amjo Infra Red Dryers, Inc. Heat lamp assembly. 4,716,658, Cl. 34-4.000.

Jacobs, Erwin P.; and Winnerl, Josef, to Siemens Aktiengesellschaft. Method for the simultaneous manufacture of bipolar and complementary MOS transistors on a common silicon substrate. 4,717,686, Cl. 437-56.000.

Jacobs, Ludwig. Housing for heat insulating armatures and/or flange connectors. 4,716,926, Cl. 137-375.000.

Jacobs, Paul H.; and Collette, Douglas P., to Aerotron, Inc. Method and apparatus for receiving a compressed composite signal. 4,718,116, Cl. 455-245.000.

Jacobsen, William A.: *See*—
Comstock, Robert J.; Jacobsen, William A.; Cellier, Francis; and Sabol, George P., 4,717,428, Cl. 148-11.50F.

Jaeger: *See*—
Eynard, Denis H., 4,716,762, Cl. 73-295.000.

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Jaillet, Andre , to Airax. Tube with welded bottom design in particular for making high-pressure gas springs. 4,717,129, Cl. 267-113.000.

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James, Kenneth S., to Dubilier PLC. Electrical components incorporating a temperature responsive device. 4,717,902, Cl. 337-32.000.

Jansen, Martin; and Standke, Burkhard, to Degussa Aktiengesellschaft. Pure silver (III) oxide. 4,717,562, Cl. 423-604.000.

Jany, John R.: *See*—
Griffith, Edward J.; Jany, John R.; Nathan, Vaidy R.; and Ngo, Toan M., 4,717,487, Cl. 252-1.000.

Japan Steel Works: *See*—
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Jarreby, Karl A. B., to Skandinaviska Apparatindustri AB Saiap. Apparatus for automatized handling of tubular sleeves. 4,716,646, Cl. 29-564.100.

Jenekhe, Samson A., to Honeywell Inc. Electroactive polymers having aromatic and quinonoid bonding structures. 4,717,762, Cl. 528-251.000.

Jennerjohn, Dennis A.: *See*—
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Jensen, Borge R.; and Sierens, Willy M. D., to Picanol N.V. Optical weft stop motion for looms with a U-shaped reed. 4,716,942, Cl. 139-370.200.

JEOL Ltd.: *See*—
Ono, Mitsuhiro; Sha, Kokusho; Suzuki, Michiya; Ogata, Tateshi; and Yoshida, Ekuo, 4,717,880, Cl. 324-316.000.

Jepson, Robert: *See*—
Alexander, Theodore G.; Baker, Claude V.; and Jepson, Robert, 4,716,695, Cl. 52-167.000.

Jet Research Center, Inc.: *See*—
Regalbuto, John A., 4,716,833, Cl. 102-320.000.

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Coppola, Peter J., 4,717,045, Cl. 222-64.000.

Jidosha Kiki Co., Ltd.: *See*—
Yamakoshi, Mutsuro, 4,716,814, Cl. 91-376.00R.

Johansson, Paul J. Patient transfer mat. 4,716,607, Cl. 5-81.00R.

John Wyeth & Brother Limited: *See*—
White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., 4,717,731, Cl. 514-291.000.

Johnson, Arthur C. W. High efficiency infrared radiant energy heating system and method of operation thereof. 4,716,883, Cl. 126-116.00A.

Johnson, Brian G.: *See*—
Readman, John; and Johnson, Brian G., 4,716,639, Cl. 29-157.00C.

Johnson, Bruce S., to Harsco Corporation. Double toggle gripping apparatus. 4,716,811, Cl. 89-40.120.

Johnson Enterprises, Inc.: *See*—
Stenger, Donald R., 4,717,048, Cl. 222-400.800.

Johnson, Eric S.; and Mellen, Neal J., to Motorola Inc. Method for providing impurities into a carrier gas line. 4,717,597, Cl. 437-81.000.

Johnson, Gale, to Fort Lock Corporation. High security pin tumbler lock. 4,716,749, Cl. 70-363.000.

Johnson, Gregory R.: *See*—
Shepherd, Philip E.; and Johnson, Gregory R., 4,716,605, Cl. 4-544.000.

Johnson, Hugh G., to Creek Electronics, Inc. Electrical grounding accessory. 4,717,349, Cl. 439-92.000.

Johnson, Lawrence N. Boat trailer. 4,717,165, Cl. 280-414.100.

Johnson, Naomi H. Teaching saddle. 4,716,715, Cl. 54-44.000.

Johnson, Richard S.; and Youngers, Stephen A., to J. I. Case Company. Folding trencher boom. 4,716,665, Cl. 37-86.000.

Johnson Service Company: *See*—
Elger, Rodney R., 4,717,913, Cl. 340-825.540.

Johnson, Thomas H., Jr.: *See*—
Mannas, Earl L.; and Johnson, Thomas H., Jr., 4,718,074, Cl. 375-118.000.

Johnson, Virgil E., Jr.: *See*—
Coan, Andrew F.; and Johnson, Virgil E., Jr., 4,716,849, Cl. 114-222.000.

Johnston, Richard H., to Allegheny Ludlum Corporation. Coil protector for "C" hooks. 4,717,188, Cl. 294-67.200.

Johnston, Walter G. Adjustable traveling mahl and magnetic support for mounting artist's canvases. 4,717,109, Cl. 248-441.100.

Jones, Arthur R.; and Jones, John D. Device for monitoring the process of toothbrushing. 4,716,614, Cl. 15-105.000.

Jones, Fletcher; and Voelker, Henry R., to International Business Machines Corporation. Hybrid electron beam and optical lithography method. 4,717,644, Cl. 430-296.000.

Jones, Frederick L. Coin operated watercraft winches/capstans. 4,717,005, Cl. 194-208.000.

Jones, J. D. Pull loop safety handle for motorcycles. 4,716,782, Cl. 74-501.00R.

Jones, John D.: *See*—
Jones, Arthur R.; and Jones, John D., 4,716,614, Cl. 15-105.000.

Jongsma, Wiegard, to Hollandse Signaalapparaten B.V. Arrangement for combining the output signals from a plurality of transmitters tuned to the same frequency. 4,718,111, Cl. 455-105.000.

Jonovic, John A.: *See*—
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Jonsson, Bert O. Device for detecting movable objects. 4,717,820, Cl. 250-209.000.

Jordan, George: *See*—
Perrault, James J.; and Jordan, George, 4,717,378, Cl. 604-20.000.

Jourdain, Gerard E. A.; and Marlin, Francois, M. B., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation-S.N.E.C.-M.A. Method for manufacturing a burner ring for a turbojet engine. 4,716,640, Cl. 29-157.00C.

Journee, Maurice A., to Paul Journee, S.A. Key operated lock mechanism lockable in the absence of a key. 4,716,746, Cl. 70-161.000.

Joyce, James W.: *See*—
Mon, George; and Joyce, James W., 4,716,936, Cl. 137-833.000.

Juhl, Mark J. Free throw shooting practice device. 4,717,149, Cl. 273-1.50A.

Justus, Paul E., to Essex Group, Inc. Die bar carrier and method. 4,717,604, Cl. 427-434.700.

K-Flow Division of Kane Steel Co., Inc.: *See*—
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Kabushiki Kaisha Daikin Seisakusho: *See*—
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Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
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Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
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Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., to RCA Corporation. Silicon oxynitride passivated semiconductor body and method of making same. 4,717,631, Cl. 148-33.300.

Kahn, David A., to Northern Telecom Limited. Arrangement for diverting light. 4,717,247, Cl. 350-617.000.

Kakeya, Mitsuo, to Kabushiki Kaisha Kobe Seiko Sho. Hydraulic drive system for counterweight dolly in counterbalance type crane. 4,716,728, Cl. 60-426.000.

Kakeya, Mitsuo, to Kabushiki Kaisha Kobe Seiko Sho. Hydraulic drive system for a counterweight dolly in counterbalance type crane. 4,716,729, Cl. 60-426.000.

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Kami, Yozo; Taki, Keinosuke; and Yamamoto, Toshihumi, to Honda Giken Kogyo Kabushiki Kaisha. Wheel suspension for road vehicles. 4,717,171, Cl. 280-688.000.

Kammerad, James A., to K-Line Industries, Inc. Rod holder adapter. 4,716,674, Cl. 43-27.400.

Kan, Hsin-Chia: *See*—
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Vanier, Noel R.; Harrison, Daniel J.; and Kan, Hsin-Chia, 4,717,711, Cl. 503-227.000.

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Ishihara, Shunichi; Ohno, Shigeru; Kansai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,717,586, Cl. 427-39.000.
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Kaneko, Shuzo, to Canon Kabushiki Kaisha. Image forming apparatus. 4,717,999, Cl. 346-160.000.
Kaneta, Minoru; and Ishiyama, Ichiro, to Canon Kabushiki Kaisha. Alignment device. 4,717,257. Cl. 356-400.000.
Kanoe, Toshio: *See*—
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Takada, Hiroshi; Masuda, Shin'ichi; and Nakajima, Motoki, 4,717,506, Cl. 512-11.000.
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Kashima, Mikito: *See*—
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Kuroiwa, Katsumasa; Katayama, Katsuhiro; Takabayashi, Katsuyuki; and Nagasawa, Takeshi, 4,717,659, Cl. 435-20.000.
Kato, Akihiko: *See*—
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,717,629, Cl. 428-566.000.
Kato, Fumio: *See*—
Wakabayashi, Hiroyuki; Kato, Fumio; Matsubara, Tamotsu; and Ishikawa, Yasuo, 4,717,743, Cl. 524-13.000.
Kato, Hiroshi, to Sony Corporation. Cathode ray tube having an aluminum oxide film over a black matrix. 4,717,856, Cl. 313-466.000.
Kato, Osamu: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, to Sumitomo Chemical Company, Limited. Process for preparing methacrylate polymer. 4,717,756, Cl. 526-146.000.
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for forming resist pattern. 4,717,645, Cl. 430-296.000.
Katoh, Takeshi: *See*—
Kobayashi, Yoshiki; Fukushima, Tadashi; Okuyama, Yoshiyuki; Hirasawa, Kotaro; Katoh, Takeshi; and Kubo, Yutaka, 4,718,091, Cl. 382-41.000.
Katsuoka, Norio: *See*—
Ikeya, Takao; and Katsuoka, Norio, 4,717,122, Cl. 254-134.30R.
Katto, Hisao; and Okuyama, Kousuke, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,717,684, Cl. 437-34.000.
Kauffer, Karl C. Process for completing circulatory systems used to purify water and sewage. 4,717,484, Cl. 210-711.000.
Kaufmann, John W.: *See*—
Meyer, Charles E.; Cook, Bruce M.; Ditto, David H.; and Kaufmann, John W., 4,717,528, Cl. 376-237.000.
Kawabata, Susuma: *See*—
Yoshida, Kazunori; Suzuki, Fujio; Tanaka, Hidehiko; and Kawabata, Susuma, 4,716,943, Cl. 139-452.000.
Kawai, Hisashi: *See*—
Ichise, Toshihiko; Sakata, Tsuguhide; and Kawai, Hisashi, 4,717,891, Cl. 331-17.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,716,805, Cl. 84-1.240.
Kawai, Seiji, to Kabushiki Kaisha Meidensha; and Doryokuro Kakuenryo Kaihatsu Jigyodan. Joint mechanism for manipulators. 4,717,303, Cl. 414-4.000.
Kawai, Zenzaburo: *See*—
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,717,337, Cl. 432-14.000.
Kawakami, Shigenobu: *See*—
Orikasa, Yuichi; Kojima, Shinji; Inoue, Takashi; Yamamoto, Kaoru; Sato, Atsushi; and Kawakami, Shigenobu, 4,717,759, Cl. 526-326.000.
Kawamura, Masaharu: *See*—
Kobayashi, Ryuichi; Harada, Yoshihito; Kawamura, Masaharu; Katsoka, Hiroyuki; and Kumakura, Toshiyuki, 4,717,934, Cl. 354-415.000.
Kawamura, Sukezo; and Toriyama, Motohiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for producing of β-tricalcium phosphate. 4,717,556, Cl. 423-311.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueki, Noriyuki, 4,716,861, Cl. 123-90.200.
Matsui, Shigetomo; and Hasegawa, Hisao, 4,717,065, Cl. 228-147.001.
Kawasaki, Syunpei: *See*—
Shima, Kazumasa; Kawasaki, Syunpei; and Kubo, Takashige, 4,717,844, Cl. 307-465.000.
Kawasaki, Yozo; Kusunoki, Katsuyuki; Nakazawa, Shizuo; and Yamazaki, Michio, to National Research Institute for Metals. Gamma-prime precipitation hardening nickel-base yttria particle-dispersion-strengthened superalloy. 4,717,435, Cl. 148-410.000.
Keem, John E.; Flasck, James D.; and Seguin, Richard W., to Ovonic Synthetic-Materials Company, Inc. Adhesion and composite wear resistant coating and method. 4,717,632, Cl. 428-698.000.
Keene, John F.; Kuller, Bengt L.; and Kemmeter, Robert G., to Enkel Corporation. Apparatus for continuously supplying a web of sheet material. 4,717,087, Cl. 242-75.400.
Keilman, Michael R.; and Symbol, Ronald P., to Baxter Travenol Laboratories, Inc. Plastic roller bottle for suspension cultures. 4,717,668, Cl. 435-296.000.
Kemeny, George. Container toothbrush. 4,717,278, Cl. 401-286.000.
Kemmeter, Robert G.: *See*—
Keene, John F.; Kuller, Bengt L.; and Kemmeter, Robert G., 4,717,087, Cl. 242-75.400.
Kemp, Richard A., to Shell Oil Company. Hydrotreating catalysts prepared from hydrogels. 4,717,698, Cl. 502-211.000.
Kemp, Richard A., to Shell Oil Company. Hydrotreating catalysts prepared from hydrogels. 4,717,704, Cl. 502-211.000.
Kemp, Richard A., to Shell Oil Company. Hydrotreating catalysts prepared from hydrogels. 4,717,705, Cl. 502-211.000.
Kemp, Richard A., to Shell Oil Company. Wide-pore hydrogel-derived catalysts. 4,717,706, Cl. 502-211.000.
Kemp, Richard A., to Shell Oil Company. Hydrotreating catalysts prepared from hydrogels. 4,717,707, Cl. 502-211.000.
Kennametal Inc.: *See*—
Isakov, Edmund, 4,716,976, Cl. 175-410.000.
Kenney, Malcolm E.; and Goodwin, George B. Silicate esters and organosilicon compounds. 4,717,773, Cl. 556-457.000.
Kern, Gerald N., to Kern, Gerald N. Anti-bacterial methods and agent. 4,717,737, Cl. 514-547.000.
Kernstock, John M.: *See*—
Kotoye, Femi O.; and Kernstock, John M., 4,717,582, Cl. 427-8.000.
Kerscher, Utto: *See*—
Buttgens, Walter; Kerscher, Utto; and Neukirchen, Ernst, 4,717,509, Cl. 252-609.000.
Kersting, Erik. Curing oven. 4,717,339, Cl. 432-125.000.
Kessler, Fred B. Racket grip. 4,717,152, Cl. 273-75.000.
Kessler, James J.: *See*—
Hoch, Robert L.; Kessler, James J.; and Long, Thomas J., 4,716,808, Cl. 89-1.812.
Kessler, Sebastian W., Jr., to Varian Associates, Inc. Diffusion bonded structure and method of making. 4,717,067, Cl. 228-193.000.
Kester, Eugene A.; Reeves, Scott P.; and Zemanek, Danny, to Photoflex Products. Clamp device for post members. 4,717,103, Cl. 248-231.300.
Keul, Willi: *See*—
Behrens, Uwe; and Keul, Willi, 4,717,182, Cl. 285-230.000.
Kezar, David A.: *See*—
Cohen, Mordehy; and Kezar, David A., 4,717,095, Cl. 244-58.000.
Kibby, Charles L.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,717,702, Cl. 502-303.000.
Kikuchi, Naomi. Ocean and river power generator. 4,717,831, Cl. 290-53.000.
Kimbara, Hidenori: *See*—
Gaku, Morio; Ikeguchi, Nobuyuki; and Kimbara, Hidenori, 4,717,609, Cl. 428-40.000.
Kimberly-Clark Corporation: *See*—
Hathaway, John M., 4,717,135, Cl. 270-39.000.
Kimura, Keizo: *See*—
Ikeda, Tadashi; Takei, Haruo; Okazaki, Masaki; and Kimura, Keizo, 4,717,650, Cl. 430-494.000.
Kimura, Misao, to Harada Kogyo Kabushiki Kaisha. Automobile antenna. 4,717,923, Cl. 343-903.000.

Kimura, Tetsuo, to Canon Kabushiki Kaisha. Printer. 4,717,274, Cl. 400-616.300.
Kinaga, Eiichi; and Shiraishi, Daiichi, to Toyota Jidosha Kabushiki Kaisha. Side door hinge mechanism in motor vehicle. 4,716,623, Cl. 16-371.000.
Kinoshita, Hiroshi: *See*—
Nakao, Masami; Iwaki, Masato; Kinoshita, Hiroshi; and Okamoto, Ikuo, 4,716,734, Cl. 60-599.000.
Kinoshita, Shigeo: *See*—
Ito, Yukio; and Kinoshita, Shigeo, 4,717,983, Cl. 360-137.000.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,717,477, Cl. 210-314.000.
Shimada, Mithuo; Yokocho, Yoetsu; and Nakayama, Yoshiki, 4,716,878, Cl. 123-540.000.
Kirita, Kei: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.
Kirsche, Horst: *See*—
Diehl, Christian; and Kirsche, Horst, 4,717,224, Cl. 350-6.900.
Kita, Kazunori; Shoji, Hideyuki; and Aihara, Toshihara, to Casio Computer Co., Ltd. Recording/reproducing apparatus including synthesized voice converter. 4,717,261, Cl. 368-63.000.
Kita, Yasuo, to Shimadzu Corporation. Acceleration control system for automobiles. 4,716,788, Cl. 74-858.000.
Kitagawa Iron Works Co., Ltd.: *See*—
Shiraki, Hisashi; Nagahisa, Toshio; Takeda, Kiyonori; and Harada, Takeshi, 4,717,478, Cl. 210-360.200.
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, to Honda Giken Kogyo K.K.; Kabushiki Kaisha Honda Rokku; and Kokoku Control Cable Kabushiki Kaisha. Flexible tying member for theftproof device. 4,717,235, Cl. 350-96.230.
Kitamura, Hidenori: *See*—
Hayashi, Seizo; Kitamura, Hidenori; and Shimizu, Yuichi, 4,716,620, Cl. 15-327.00P.
Kitamura, Masaru: *See*—
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Umada, Youichi; Ishii, Norio; and Tojima, Hideto, 4,717,769, Cl. 540-536.000.
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Tojima, Hideto; and Ishii, Norio, 4,717,770, Cl. 540-536.000.
Kitamura, Takeshi: *See*—
Kohayakawa, Yoshimi; Kobayashi, Kazunobu; Tanaka, Shinya; Madate, Haruhisa; and Kitamura, Takeshi, 4,717,952, Cl. 358-113.000.
Kitson, Bradford S.: *See*—
Harvey, Paul W.; Kitson, Bradford S.; and Miller, Warren K., Jr., 4,717,912, Cl. 340-825.830.
Kivirikko, Kari: *See*—
Gunzler, Volkmar; Hanauske-Abel, Hartmut; Mohr, Jurgen; Tschank, Georg; Kivirikko, Kari; Majamaa, Kari; and Brocks, Dietrich, 4,717,727, Cl. 514-354.000.
Klaiber, Eberhard; and Gerke, Dieter, to Krone GmbH. Apparatus for removing insulation and connecting electrical cables. 4,716,651, Cl. 29-750.000.
Kleca, Eugene A.: *See*—
Lipkie, Curtis A.; and Kleca, Eugene A., 4,718,105, Cl. 382-56.000.
Klein, Jean-Luc R. G., to TRW Carr France S.A. Fastener assembly. 4,717,100, Cl. 248-73.000.
Kloeckner-Humboldt-Deutz AG: *See*—
Reuter, Harald, 4,716,868, Cl. 123-185.00S.
Klovstad, John W., to Exxon Research and Engineering Company. Speech recognition activation and deactivation method. 4,718,092, Cl. 381-43.000.
Klovstad, John W.: *See*—
Baker, James K.; Klovstad, John W.; Lee, Chin-Hui; and Ganesan, Kalyan, 4,718,088, Cl. 381-43.000.
Klug, Randy J.: *See*—
Everman, Wayne F.; Klug, Randy J.; and Russell, Raymond L., 4,717,371, Cl. 493-96.000.
Klukowski, Horst: *See*—
Biller, Florian; and Klukowski, Horst, 4,717,578, Cl. 426-589.000.
Knaster, Mark B.; and Skowronek, William R., to Amchem Products, Inc. Nickel-free metal phosphating composition and method for use. 4,717,431, Cl. 428-628.000.
Knight, Charley R. Externally engaging swallow-resistant fishhooks. 4,716,675, Cl. 43-37.000.
Knud Simonsen Industries Ltd.: *See*—
Buller-Colthurst, Guy E., 4,717,572, Cl. 426-233.000.
Kobayashi, Hiroe: *See*—
Umemoto, Tadahiro; and Kobayashi, Hiroe, 4,716,986, Cl. 181-207.000.
Kobayashi, Kazunobu: *See*—
Kohayakawa, Yoshimi; Kobayashi, Kazunobu; Tanaka, Shinya; Madate, Haruhisa; and Kitamura, Takeshi, 4,717,952, Cl. 358-113.000.
Kobayashi, Nobuo: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.
Kobayashi, Nobuyuki; Hattori, Takashi; and Norota, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling ignition timing in an internal combustion engine. 4,718,014, Cl. 364-431.030.
Kobayashi, Ryuichi; Harada, Yoshihito; Kawamura, Masaharu; Katsoka, Hiroyuki; and Kumakura, Toshiyuki, to Canon Kabushiki Kaisha. Camera system. 4,717,934, Cl. 354-415.000.
Kobayashi, Tadashi, to NEC Corporation. Graphic input device. 4,717,793, Cl. 178-18.000.
Kobayashi, Yoshiki; Fukushima, Tadashi; Okuyama, Yoshiyuki; Hirasawa, Kotaro; Katoh, Takeshi; and Kubo, Yutaka, to Hitachi, Ltd. Multifunctional image processor. 4,718,091, Cl. 382-41.000.
Kobylinski, Thaddeus P.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,717,702, Cl. 502-303.000.
Koch, Christian. Process and device for the nitric oxide-free generation of steam with fossil fuels. 4,716,844, Cl. 110-341.000.
Koch Process Systems, Inc.: *See*—
Hopewell, Richard B., 4,717,408, Cl. 62-20.000.
Koch, Rudolf; and Schmid, Eberhard, to Siemens Aktiengesellschaft. Controlled current source apparatus for signals of either polarity. 4,717,869, Cl. 323-316.000.
Kochloefl, Karel: *See*—
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,716,859, Cl. 123-3.000.
Koehn, Jochen: *See*—
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, 4,717,018, Cl. 206-305.000.
Koella, Ernest, III: *See*—
Harmon, Albert D.; and Koella, Ernest, III, 4,717,616, Cl. 428-191.000.
Koen, Myron J.: *See*—
Halbert, Joel M.; and Koen, Myron J., 4,718,036, Cl. 364-829.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Germann, Albrecht J., 4,717,141, Cl. 271-183.000.
Wieland, Erich G.; and Spiess, Wolfgang C. J., 4,716,827, Cl. 101-216.000.
Koerner, Gerhard; Plettner, Horst; Lutz, Edelwald; Orth, Egon; and Weingaertner, Rudi, to BBC Aktiengesellschaft Brown, Boveri & Cie. Hydraulic drive. 4,716,812, Cl. 91-417.00R.
Kohayakawa, Yoshimi; Kobayashi, Kazunobu; Tanaka, Shinya; Madate, Haruhisa; and Kitamura, Takeshi, to Canon Kabushiki Kaisha. Medical television system. 4,717,952, Cl. 358-113.000.
Kohl, Georg: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; and Kohl, Georg, 4,717,454, Cl. 203-29.000.
Kohler, Rolf-Dieter: *See*—
Hagea, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Wuerzer, Bruno, 4,717,416, Cl. 71-94.000.
Kohlpaintner, Georg; and Bienert, Horst, to Webasto-Werk W. Baier GmbH & Co. Motor vehicle roof with improved headlining mounting arrangement. 4,717,199, Cl. 296-214.000.
Koizumi, Shigeru, to Canon Kabushiki Kaisha. Image information read apparatus. 4,717,963, Cl. 358-282.000.
Kojima, Shinji: *See*—
Orikasa, Yuichi; Kojima, Shinji; Inoue, Takashi; Yamamoto, Kaoru; Sato, Atsushi; and Kawakami, Shigenobu, 4,717,759, Cl. 526-326.000.
Kokoku Control Cable Kabushiki Kaisha: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,717,235, Cl. 350-96.230.
Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Watanuki, Yoshio; Mochida, Haruo; and Satou, Hidekazu, 4,716,748, Cl. 70-252.000.
Kolbenschmidt Aktiengesellschaft: *See*—
Baureis, Hans-Paul, 4,716,766, Cl. 73-827.000.
Kolek, Robert L.: *See*—
Blaugher, Richard D.; and Kolek, Robert L., 4,717,437, Cl. 156-52.000.
Komatsu, Akio: *See*—
Asakawa, Yoshiaki; Komatsu, Akio; Hatsoka, Nobuo; Ichikawa, Akira; and Nagasawa, Kiyoshi, 4,718,095, Cl. 381-43.000.
Komatsu, Nobuhiro, to Mazda Motor Corporation. Front structure of vehicle body. 4,717,198, Cl. 296-192.000.
Komatsubara, Hirofumi: *See*—
Nonomura, Yutaka; Sagiyama, Jun; Komatsubara, Hirofumi; and Takeuchi, Masaharu, 4,716,773, Cl. 73-862.360.
Komine, Hiroshi, to Northrop Corporation. Mode-matched laser/raman coupled unstabled resonators. 4,717,842, Cl. 307-426.000.
Komori Printing Machinery Co., Ltd.: *See*—
Saito, Nobuaki; and Osawa, Fumio, 4,717,142, Cl. 271-217.000.
Kondo, Hiroshi: *See*—
Ohe, Junzo; and Kondo, Hiroshi, 4,717,920, Cl. 343-712.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,717,921, Cl. 343-712.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,717,922, Cl. 343-712.000.
Kondo, Mitsushige; Shikama, Shinsuke; Kono, Keizo; and Fujita, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Head assembly for optical disc. 4,718,052, Cl. 369-44.000.
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, to Volkswagen AG; and Sud-Chemie AG. Process for treatment of liquids consisting primarily of methanol. 4,716,859, Cl. 123-3.000.
Koning, Gerrit; and Schroeppel, Edward A., to Telectronics N.V. Apparatus and method for adjusting heart/pacer rate relative to cardiac pCO_2 to obtain a required cardiac output. 4,716,887, Cl. 128-419.0PG.
Konishi, Tokuzo: *See*—
Nomura, Junji; Imai, Hideaki; Ishibashi, Yuzuru; and Konishi, Tokuzo, 4,717,554, Cl. 423-263.000.
Konishiroku Photo Industry Co.: *See*—
Abe, Yoshinori; Matsunawa, Masahiko; and Hiratsuka, Seiichiro, 4,717,964, Cl. 358-283.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hoshino, Yasushi; and Makino Masamori, 4,717,932, Cl. 354-195.120.
Kono, Keizo: *See*—
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Kontakta Alkatreszgyar: *See*—
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Korbach, William C.: *See*—
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Korbel, Kurt: *See*—
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,716,859, Cl. 123-3.000.
Kordulla, Hans: *See*—
Steimel, Johannes; Kordulla, Hans; and Oppelt, Hans, 4,717,823, Cl. 250-236.000.
Korhonen, Ilkka: *See*—
Santamaki, Harry; Leppanen, Juha; Haikonen, Pontti; and Korhonen, Ilkka, 4,717,957, Cl. 358-136.000.
Koroscil, Anthony, to American Cyanamid Company. Chemiluminescent composition. 4,717,511, Cl. 252-700.000.
Korostenski, Erwin: *See*—
Ruf, Max; and Korostenski, Erwin, 4,716,735, Cl. 60-605.300.
Kos Medical Technologies, Ltd.: *See*—
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Kosuge, Yutaka: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,717,235, Cl. 350-96.230.
Kotoye, Femi O.; and Kernstock, John M., to Dow Chemical Company, The. Method and apparatus for controlling the density of a foam. 4,717,582, Cl. 427-8.000.
Kotter, Wolfgang, to Robert Bosch GmbH. Hydraulic device. 4,716,727, Cl. 60-423.000.
Koumura, Noboru: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kusitaka; and Koumura, Noboru, 4,718,040, Cl. 364-900.000.
Kowalski, Werner; Hass, Hans; Dahmen, Theo; and Erpenbach, Markus, to Hoechst AG. Spheroidal alkali metal polyphosphates of low apparent density, and process for making them. 4,717,557, Cl. 423-315.000.
Koyanagi, Hiroaki: *See*—
Sato, Yoshio; Shimada, Satoshai; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.
Kozukue, Masaaki: *See*—
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Kraft, Urban. Lifesaving craft. 4,717,362, Cl. 441-82.000.
Kramer, Roman A.: *See*—
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Kramer, Wolfgang: *See*—
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Krause, Norbert: *See*—
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Krawchuk, Myron, to Foster Wheeler Energy Corporation. Rupture testing apparatus for boiler tubes. 4,716,767, Cl. 73-834.000.
Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., to PPG Industries, Inc. Precipitated silica carrier for vitamins. 4,717,561, Cl. 425-335.000.
Krohn, Ulrich: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,716,869, Cl. 123-188.0GC.
Krone GmbH: *See*—
Klaiber, Eberhard; and Gerke, Dieter, 4,716,651, Cl. 29-750.000.
Krufka, Frank S., to RCA Corporation. RAM interface control circuit. 4,717,955, Cl. 358-107.000.
Kruger, Peter. Sliding liner for a sliding roof for automobiles. 4,717,200, Cl. 296-214.000.
Krumme, John F., to Metcal, Inc. Slotted autoregulating heater. 4,717,814, Cl. 219-553.000.
Kubo, Jun, to Nissan Motor Company, Limited. Method and system for deriving wheel rotation speed data for automotive anti-skid control. 4,718,013, Cl. 364-426.000.
Kubo, Takashige: *See*—
Shima, Kazumasa; Kawasaki, Syunpei; and Kubo, Takashige, 4,717,844, Cl. 307-465.000.
Kubo, Yutaka: *See*—
Kobayashi, Yoshiki; Fukushima, Tadashi; Okuyama, Yoshiyuki; Hirasawa, Kotaro; Katoh, Takeshi; and Kubo, Yutaka, 4,718,091, Cl. 382-41.000.
Kubota, Hitoshi; and Ohno, Sachio, to Nissan Motor Co., Ltd. Booster unit for moving a vehicle on a slope and method of controlling the same. 4,717,207, Cl. 303-3.000.
Kubota, Hitoshi, to Nissan Motor Co., Ltd. Brake pressure control valve of a double piping hydraulic braking system. 4,717,208, Cl. 303-6.00C.
Kubota, Ltd.: *See*—
Hayashi, Masahiko; Fujii, Yasuo; and Okuyama, Shigeaki, 4,718,089, Cl. 382-17.000.
Horii, Yasuyuki; Nishikawa, Takao; Yamanishi, Isamu; and Umemoto, Tomeo, 4,716,775, Cl. 74-15.860.
Kucharski, Joseph J.: *See*—
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Mikami, Takeshi; and Maekawa, Masakazu, 4,717,638, Cl. 430-98.000.

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Bondoc, Alfredo A.; Davis, Duane A.; Frankoski, Stanley P.; and Magnus, Bruno E., 4,717,614, Cl. 428-143.000.

Maher, John M.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Maher, John M., 4,717,775, Cl. 568-454.000.

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Maier, Hans P., to Agintec AG. Elastic pipe connector. 4,717,181, Cl. 285-229.000.

Maier, Hans P.: *See*—
Haberstock, Rolf; Trissler, Heinrich; Vlaykowski, Nikolay; and Maier, Hans P., 4,717,179, Cl. 285-112.000.

Mainzer, Stanley E.: *See*—
Poulose, A. J.; and Mainzer, Stanley E., 4,716,911, Cl. 131-297.000.

Majamaa, Kari: *See*—
Gunzler, Volkmar; Hanauske-Abel, Hartmut; Mohr, Jurgen; Tschank, Georg; Kivirikko, Kari; Majamaa, Kari; and Brocks, Dietrich, 4,717,727, Cl. 514-354.000.

Makati, Ashok C.; Lee, Do I.; and Ash, Mezzie L., to Dow Chemical Company, The. Structure reinforced latex particles. 4,717,750, Cl. 524-458.000.

Makinen, Eero; and Heidemann, Torsten, to Oy Wartsila Ab. Floating drilling platform. 4,716,972, Cl. 175-8.000.

Makinen, Juho K.; Murden, Keith B.; and Saari, Heikki P., to Outokumpu Oy. Method for treating iron-bearing slags containing precious metals, particularly slags created in the smelting process of copper and nickel. 4,717,419, Cl. 75-24.000.

Makino Masamori: *See*—
Hoshino, Yasushi; and Makino Masamori, 4,717,932, Cl. 354-195.120.

Makino, Yoshio; Kakinuma, Toshiaki; Iwata, Tomio; Itoh, Masumi; and Hirose, Takayoshi, to Mitsubishi Mining & Co., Ltd.; and Fujisawa Pharmaceutical Co., Ltd. Demolition agent for brittle materials. 4,717,503, Cl. 252-350.000.

Makins, James E., Jr.; and Thompson, James E., to USX Engineers & Consultants, Inc. Rotary drive apparatus for downhold pump. 4,716,961, Cl. 166-68.500.

Makishima, Yutaka: *See*—
Shioda, Toshimi; Noda, Minoru; Nagai, Masahide; Higake, Masatoshi; Makishima, Yutaka; and Yokose, Kazutoshi, 4,717,265, Cl. 354-49.000.

Makita, Hajime, to Shigma, Inc. Planar heat generator. 4,717,812, Cl. 219-528.000.

Malafosse, Jean; Varlot, Gerard; and Pierre, Michel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Oxygen chemical generation respiration apparatus. 4,717,549, Cl. 422-122.000.

Mally, Timothy G.; Jonovic, John A.; and Borsuk, Alvin, to Oscar Mayer Foods Corporation. Line for assembling stuffed proteinaceous patties. 4,716,821, Cl. 99-450.100.

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Mandria, Charles, to Sulzer Brothers Limited. Apparatus and process for vaporizing a liquified hydrocarbon. 4,716,737, Cl. 62-52.000.

Manhart, Sigmund: *See*—
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Mannas, Earl L.; and Johnson, Thomas H., Jr., to SOTAS, Inc. Dejitterizer method and apparatus. 4,718,074, Cl. 375-118.000.

Manville Corporation: *See*—
Fowler, Samuel R., 4,717,411, Cl. 65-1.000.

Maple, M. Brian: *See*—
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, 4,717,627, Cl. 428-552.000.

Mar, Craig E.: *See*—
McGregor, Jean E.; Samson, Wilfred J.; and Mar, Craig E., 4,716,757, Cl. 72-387.000.

Marchetti, Jay D.: *See*—
Painton, Richard C.; Marchetti, Jay D.; Acello, John J.; Bradley, John J.; and Bolton, Richard H., 4,717,968, Cl. 358-310.000.

Marchetti, Renato; Penco, Eugenio; and Salvetti, Gianemilio, to Enea - Comitato Nazionale per la Ricerca e Lo Sviluppo Della Energia Nucleare e Delle Energie Alternative; and Selenia - Industrie Elletroniche Associate S.p.A. Corona discharge preionizer for gas laser. 4,718,072, Cl. 372-86.000.

Marconi, Gary G.: *See*—
Boeck, LaVerne D.; Marconi, Gary G.; and Hoehn, Marvin M., 4,717,714, Cl. 514-10.000.

Marcoux, Leo: *See*—
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Mardon, Jean-Paul: *See*—
Morel, Michel; and Mardon, Jean-Paul, 4,717,427, Cl. 148-11.50F.

Margiecick, Frank J.: *See*—
Andersson, Gunter; Holz, Uwe D.; and Margiecick, Frank J., 4,716,855, Cl. 119-61.000.

Markert, Juergen: *See*—
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Martin, Francois, M. B.: *See*—
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Marlor, Richard C.: *See*—
Pfizenmaier, Paul A.; and Marlor, Richard C., 4,717,607, Cl. 428-35.000.

Marmet, Melvin: *See*—
Ouyang, Kenneth W.; and Marmet, Melvin, 4,717,840, Cl. 307-594.000.

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Marques, Jean S.; and Marques, Ernesto D., 4,716,895, Cl. 123-94.000.

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Marsh, Ronald W.: *See*—
Latterbach, Rickey S.; and Marsh, Ronald W., 4,717,402, Cl. 55-269.000.

Marth, Kurt: *See*—
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Martin Design: *See*—
Martin, Harold B., 4,717,113, Cl. 249-63.000.

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Martin, Harry D., III: *See*—
Patrician, Thomas J.; Schaeffer, Gene T.; and Martin, Harry D., III, 4,717,538, Cl. 420-429.000.

Martin, Paul W., to Dresser Industries, Inc. Flexible tube expander extension assembly. 4,716,753, Cl. 72-122.000.

Martin, Sylvia; Herr, Roy W.; Wieczerniak, Walter J.; and Strom, Alice M., to OMI International Corporation. Zinc and zinc alloy electrolyte and process. 4,717,458, Cl. 204-44.200.

Martin, Wesley E., to GH Hensley Industries, Inc. Excavating tooth and wear cap assembly. 4,716,667, Cl. 37-142.00R.

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Sugihara, Masami; Ogura, Osamu; Arai, Hajime; and Maruyamano, Satoru, 4,716,733, Cl. 60-589.000.

Marvin Glass & Associates: *See*—
Andersen, Michael A.; Arias, Henry; and Kusa, Wayne A., 4,717,365, Cl. 446-230.000.
Stubenfoll, Leonard J.; Rasmussen, Russell G.; and Morrison, Howard J., 4,717,367, Cl. 446-437.000.

Mashiko, Harumitsu; Sakai, Yoshihiro; Hayashi, Syoji; Ogata, Yoshihiro; Yoshimura, Tsuyoshi; Kuroda, Hisashi; and Suzuki, Shigeru, to Ricoh Company, Ltd. Portable image forming device. 4,717,965, Cl. 358-285.000.

Masi, Charles G.; and Miller, Melvin N., to Numar. NMR magnet system for well logging. 4,717,876, Cl. 324-303.000.

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Pittman, Raymond H.; and Schultz, William J., 4,716,645, Cl. 29-527.100.

Massachusetts Institute of Technology: *See*—
Liau, Zong-Long; and Walpole, James N., 4,718,070, Cl. 372-50.000.
Pratt, George W., Jr., 4,717,253, Cl. 356-32.000.
Wrighton, Mark S.; White, Henry S., Jr.; and Thackeray, James W., 4,717,673, Cl. 436-68.000.

Massey, George W., Jr. Poultry cutting support. 4,716,624, Cl. 17-11.000.

Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takeo; Miyake, Takashi; and Kobayashi, Nobuo, to Toyota Jidosha Kabushiki Kaisha. Roots-type fluid machine. 4,717,322, Cl. 418-144.000.

Masuda, Shin'ichi: *See*—
Takada, Hiroshi; Masuda, Shin'ichi; and Nakajima, Motoki, 4,717,506, Cl. 512-11.000.

Masuda, Toshizo, to Ando Electric Co., Ltd. Stray-light suppressor for Littrow spectroscope. 4,717,254, Cl. 356-334.000.

Masuda, Yoshitomo: *See*—
Daifuku, Hideharu; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Toyosawa, Shinichi; and Fujio, Ryota, 4,717,634, Cl. 429-213.000.

Matheny, Charles S.: *See*—
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Mathur, Hemendra K., to Tektronix, Inc. Shield structure for limiting transmission of electromagnetic radiation. 4,717,791, Cl. 174-35.00R.

Matsubara, Tamotsu: *See*—
Wakabayashi, Hiroyuki; Kato, Fumio; Matsubara, Tamotsu; and Ishikawa, Yasuo, 4,717,743, Cl. 524-13.000.

Matsubara, Yuji: *See*—
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Matsuda, Shuichi: *See*—
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Matsui, Hideki: *See*—
Doi, Kunio; Matsui, Hideki; and Ono, Katsuhiro, 4,718,076, Cl. 378-146.000.

Matsui, Shigetomo; and Hasegawa, Hisao, to Kawasaki Jukogyo Kabushiki Kaisha. Method for manufacturing welded pipes. 4,717,065, Cl. 228-147.000.

Matsui Shikiso Chemical Co. Ltd.: *See*—
Shimizu, Goro; and Hayashi, Yoshimi, 4,717,710, Cl. 503-213.000.

Matsuki, Yuji: *See*—
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Matsumoto, Kunio: *See*—
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Matsumoto, Masakazu: *See*—
Takahashi, Hideyuki; Yamashita, Masataka; Matsumoto, Masakazu; and Mabuchi, Minoru, 4,717,636, Cl. 430-58.000.

Matsunawa, Masahiko: *See*—
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Matsuoka, Yoshio: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Aoki, Masaki; Torii, Hideo; Okinaka, Hideyuki; and Sakai, Masayuki, 4,717,584, Cl. 427-38.000.
Hayashi, Seizo; Kitamura, Hidenori; and Shimizu, Yuichi, 4,716,620, Cl. 15-327.00F.

Kurokawa, Hideo; Mitani, Tsutomu; and Yonezawa, Taketoshi, 4,717,622, Cl. 428-408.000.
Matsuura, Kaneo; and Chikauchi, Masami, to Casio Computer Co., Ltd. Technique for chaining lines of a document together to facilitate editing or proofreading. 4,717,911, Cl. 340-724.000.
Matsuyama, Shigeru, to Canon Kabushiki Kaisha. Electronic apparatus having plural detachable memories. 4,718,044, Cl. 365-230.000.
Matthews, Lowell. Booklet. 4,717,176, Cl. 281-15.00R.
Mattis, Donald J.: *See*—
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Mattis, John S., to Raychem Corp. Coaxial connector moisture seal. 4,717,355, Cl. 439-452.000.
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Matyczyk, George: *See*—
Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,717,106, Cl. 248-309.200.
Maurer, Donald J., to Raytheon Company. Shipping package adapted for mechanical handling and stacking. 4,717,025, Cl. 206-599.000.
Mawer, Eric L.: *See*—
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Maxon, Bartley D., to McIntyre Chemical Company. Dimethicone copolyol sulfosuccinates. 4,717,498, Cl. 252-174.150.
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Mayer, Uwe: *See*—
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Mazda Motor Corporation: *See*—
Harasaki, Hayatsugu, 4,717,197, Cl. 296-187.000.
Komatsu, Nobuhiro, 4,717,198, Cl. 296-192.000.
Motonaga, Takao; Fukuhara, Keizi; Tamura, Tadashi; and Yoshida, Toshiji, 4,717,326, Cl. 425-133.100.
Nakao, Masami; Iwaki, Masato; Kinoshita, Hiroshi; and Okamoto, Ikuo, 4,716,734, Cl. 60-599.000.
Sakamoto, Katsuhiko; Hosokai, Tetsushi; and Shiraishi, Hideo, 4,716,871, Cl. 123-339.000.
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Mazzullo, Raymond; and Van Zyl, Rowland B., to Mazzullo, Raymond. Multi-outlet electrical socket boxes. 4,717,348, Cl. 439-76.000.
McCleerey, Earl W., to AMP Incorporated. Solder cup connector. 4,717,354, Cl. 439-444.000.
McClung, James A.: *See*—
Bulso, Joseph D., Jr.; and McClung, James A., 4,716,755, Cl. 72-349.000.
McCollister, Jon: *See*—
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McCormick, Larry L., to G & H Technology, Inc. Redundant electrical connector release. 4,717,351, Cl. 439-153.000.
McCormick, Lonnie W.: *See*—
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McCormick, Patrick J.; and Scoville, John R., Jr., to Castle Company. Biological indicator for sterilization processes. 4,717,661, Cl. 435-31.000.
McCormick, Peter E.; and Autry, Walter D., Jr., to EOA Systems. Breakaway clutch for robot end-of-arm tooling. 4,717,003, Cl. 192-56.00F.
McDaniel, Max P., to Phillips Petroleum Company. Olefin polymerization. 4,717,701, Cl. 502-107.000.
McDermott Incorporated: *See*—
Block, Forest E., 4,717,353, Cl. 439-310.000.
McDonald, Kenneth P.: *See*—
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McDonald, Samuel G.; and Sabol, George P., to Westinghouse Electric Corp. Zirconium alloy products. 4,717,434, Cl. 148-407.000.
McDonnell Douglas Corporation: *See*—
Hoch, Robert L.; Kessler, James J.; and Long, Thomas J., 4,716,808, Cl. 89-1.812.
Walker, Laurence A.; and Stoudt, William F., 4,717,098, Cl. 244-223.000.
McGean-Rohco, Inc.: *See*—
Frisby, C. Richard; and Page, Billie I., 4,717,421, Cl. 106-1.110.
McGregor, Jean E.; Samson, Wilfred J.; and Mar, Craig E., to Advanced Cardiovascular Systems, Inc. Guide wire tip shaping tool and method. 4,716,757, Cl. 72-387.000.
McGrew, Stephen P. Diffractive color and texture effects for the graphic arts. 4,717,221, Cl. 350-3.700.
McIntosh, Billy R.; and Thisse, Thor R., to B. F. Goodrich Company, The. Spreader roll. 4,716,637, Cl. 29-129.000.
McIntyre Chemical Company: *See*—
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McKissick, Gregory L.; and Orcutt, James L. Material and process for retouching offset plates. 4,717,583, Cl. 427-11.000.
McLaughlin, John T., to Pyxis Corporation. Medicine dispenser for home health care. 4,717,042, Cl. 221-3.000.
McLaughlin, Kevin L.; and Birrittella, Mark S., to Motorola Inc. Fabricating a semiconductor device with buried oxide. 4,717,677, Cl. 437-24.000.
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McMillen, Robert A.: *See*—
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McNeal, Joseph R., to Scott USA Limited Partnership, a Washington Limited partnership. Tear-off lens system and method for goggles. 4,716,601, Cl. 2-434.000.
McRae, Dale L.; Willans, Robert D. H.; and Mawer, Eric L., to Cominco Ltd. Method and apparatus for dissolving nickel in molten zinc. 4,717,540, Cl. 420-513.000.
McWhirter Holdings PTY. Limited: *See*—
McWhirter, Ian C., 4,717,973, Cl. 360-31.000.
McWhirter, Ian C., to McWhirter Holdings PTY. Limited. Recorded information verification system. 4,717,973, Cl. 360-31.000.
Mead Corporation, The: *See*—
Suttles, James M., 4,716,841, Cl. 108-108.000.
Mediplast AB: *See*—
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Medtronic, Inc.: *See*—
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Meisel, William S., to Speech Systems, Inc. Speech recognition system. 4,718,096, Cl. 381-43.000.
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Meltsch, Hans-Juergen, to RXS Schrumpftechnik-Garnituren GmbH. Terminating part made of shrinkable material for closing open ends and cable fittings, conduits and sockets. 4,717,608, Cl. 428-35.000.
Meno, Frank, to University of Pittsburgh of The Commonwealth System of Higher Education. Heart output and circulatory impedance measuring method and apparatus. 4,716,904, Cl. 128-654.000.
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
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Christgau, Hermann; Mika, Norbert; Roehrich, Heinz; and Scholz, Gueather, 4,717,860, Cl. 313-525.000.
Mikami, Akiyoshi: *See*—
Tanaka, Koichi; Ogura, Takashi; Ianiguchi, Koji; Mikami, Akiyoshi; and Yoshida, Masaru, 4,717,858, Cl. 313-503.000.
Mikami, Takeshi; and Maekawa, Masakazu, to Fuji Photo Film Co., Ltd. Paper for electrostatography using encapsulated toner. 4,717,638, Cl. 430-98.000.
Miki, Masaharu; Ishizawa, Tadao; and Urano, Chiaki. Small size axial-flow molecular pump using a magnetic bearing. 4,717,315, Cl. 417-365.000.
Miles Inc.: *See*—
Hernicz, Ralph S., 4,717,504, Cl. 252-408.100.
Michaels, Angela A., 4,717,658, Cl. 435-19.000.
Morris, David A. N., 4,717,545, Cl. 422-56.000.
Miles Laboratories, Inc.: *See*—
Charles, Robert L.; Dolby, Steven C.; Patel, Chimanbhai P.; and Shetty, Jayarama K., 4,717,665, Cl. 435-198.000.
Dobkin, Milton B., 4,717,564, Cl. 424-86.000.
Dobkin, Milton B., 4,717,766, Cl. 530-387.000.
Montgomery, Curtis J.; Shetty, Jayarama K.; and Singley, Eric C., 4,717,662, Cl. 435-99.000.
Miller, David F. Dice game. 4,717,154, Cl. 273-243.000.
Miller, Edward G., Jr.: *See*—
Wu, Stephen H.; and Miller, Edward G., Jr., 4,717,567, Cl. 424-462.000.
Miller, Ira, to Motorola, Inc. Transistor comparator circuit having split collector feedback hysteresis. 4,717,839, Cl. 307-359.000.
Miller, Melvin N.: *See*—
Masi, Charles G.; and Miller, Melvin N., 4,717,876, Cl. 324-303.000.
Miller, Robert C.: *See*—
Carr, Walter J., Jr.; Miller, Robert C.; Lipchak, John B.; and Weldon, Thomas P., 4,717,873, Cl. 324-207.000.
Miller, Robert S.: *See*—
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,717,401, Cl. 55-208.000.
Miller, Terrence C., to Hewlett-Packard Company. Intermediate decimal correction for sequential addition. 4,718,033, Cl. 364-771.000.
Miller, Warren K., Jr.: *See*—
Harvey, Paul W.; Kitson, Bradford S.; and Miller, Warren K., Jr., 4,717,912, Cl. 340-825.830.
Millet, James A.: *See*—
Raymond, James W.; and Millet, James A., 4,717,816, Cl. 235-382.500.
Milo, George T.: *See*—
Waddington, Clive; Lagasse, Normand L.; and Milo, George T., 4,717,000, Cl. 184-61.000.
Mimmack, William E.: *See*—
Wells, Leon W.; Mimmack, William E.; and Hauschild, Werner, 4,717,251, Cl. 356-4.000.
Mims, A. J.: *See*—
Morrison, Charles F., Jr.; and Mims, A. J., 4,717,905, Cl. 340-58.000.
Minami, Shinzaburo: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Isabe, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.
Minigrip, Inc.: *See*—
Boeckmann, Hugo, 4,716,706, Cl. 53-117.000.
Ministry of International Trade & Industry: *See*—
Kawamura, Sukezo; and Toriyama, Motohiro, 4,717,556, Cl. 423-311.000.
Sakuragi, Shiro; and Imagawa, Kyoshiro, 4,717,238, Cl. 350-96.340.
Minolta Camera Kabushiki Kaisha: *See*—
Ando, Makoto; Metabi, Tsuneyo; and Ishimura, Toshihiko, 4,717,933, Cl. 354-409.000.
Hotomi, Hideo, 4,717,926, Cl. 346-140.00R.
Yuasa, Yoshio; Naruse, Kazuhiko; and Inaba, Masahito, 4,717,861, Cl. 315-241.00P.
Minor, Paul S.; and Matheny, Charles S., to Centec Corporation. Computer management control system. 4,718,025, Cl. 364-550.000.
Minoshima, Ryouichi; and Yamada, Osamu, to Nisshin Oil Mills, Ltd., The. Method of producing xanthan gum. 4,717,663, Cl. 435-104.000.
Minter, Mearl J., to Rolscreen Company. Door weatherstripping assembly. 4,716,683, Cl. 49-479.000.
Misumi, Akira: *See*—
Ezawa, Masayoshi; Wakui, Hiroko; Wakasa, Shigeru; Morishita, Toshikazu; and Misumi, Akira, 4,717,853, Cl. 313-35.000.
Mita Industrial Co., Ltd.: *See*—
Tanjo, Toru, 4,717,938, Cl. 355-3.0SH.
Mitani, Kazutami: *See*—
Itoh, Hajime; and Mitani, Kazutami, 4,717,479, Cl. 210-490.000.
Mitani, Tsutomu: *See*—
Kurokawa, Hideo; Mitani, Tsutomu; and Yonezawa, Taketoshi, 4,717,622, Cl. 428-408.000.
Mitani, Wataru: *See*—
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezne, Tatsuya, 4,717,637, Cl. 430-65.000.
Mitchell, R. David: *See*—
Dubin, Alan S.; McMillen, Robert A.; and Mitchell, R. David, 4,717,639, Cl. 430-124.000.
Mitchell, Robert J. C. S.: *See*—
Carter, David C. M.; Dunckley, Ian; Hierons, Kerry; and Mitchell, Robert J. C. S., 4,717,009, Cl. 198-347.000.
Mitchell, Terry L.: *See*—
Crossman, Philip E.; and Mitchell, Terry L., 4,716,699, Cl. 52-239.000.
Mitchell, Wayne A., to W. R. Grace & Co. Inhibiting corrosion of iron base metals. 4,717,542, Cl. 422-15.000.
MITEC Electronics Ltd.: *See*—
Cappelli, Guido, 4,717,898, Cl. 333-137.000.
Mito, Yoshiki: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hashimoto, Yasuhiko; and Katayama, Kaneo, 4,717,121, Cl. 251-294.000.
Kondo, Mitsushige; Shikama, Shinsuke; Kono, Keizo; and Fujita, Teruo, 4,718,052, Cl. 369-44.000.
Kunii, Kazushi, 4,716,992, Cl. 187-121.000.
Kuno, Kazuo; Takagi, Shigeyuki; Nagata, Daisaburo; and Fukumoto, Shintaro, 4,717,526, Cl. 376-142.000.
Muramatsu, Shigeru; Shida, Shigeru; Horie, Takeo; and Yamada, Masashi, 4,717,316, Cl. 417-372.000.
Oguchi, Kimio; and Watanabe, Akira, 4,718,060, Cl. 370-85.000.
Sakai, Kunito; Tamaki, Akinobu; and Takahama, Takashi, 4,717,948, Cl. 357-74.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,716,876, Cl. 123-480.003.
Thompson, Peter; Otsuka, Nobuo; Yamazaki, Kisuke; and Igarashi, Hideo, 4,716,957, Cl. 165-12.000.
Watakabe, Yaichiro; and Matsuda, Shuichi, 4,717,625, Cl. 428-432.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Gaku, Morio; Ikeguchi, Nobuyuki; and Kimbara, Hidenori, 4,717,609, Cl. 428-40.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Hosoda, Naoyuki; Morikawa, Masaki; Uchiyama, Naoki; Yoshida, Hideaki; and Ono, Toshiaki, 4,717,436, Cl. 148-432.000.
Mitsubishi Mining & Co., Ltd.: *See*—
Makino, Yoshio; Kakinuma, Toshiaki; Iwata, Tomio; Itoh, Masumi; and Hirose, Takayoshi, 4,717,503, Cl. 252-350.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Itoh, Hajime; and Mitani, Kazutami, 4,717,479, Cl. 210-490.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Hara, Yasuhiro; and Suga, Chuzo, 4,717,664, Cl. 435-133.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Sakamoto, Hitoshi; Nagashima, Etsuo; and Nagai, Ryou, 4,717,824, Cl. 250-237.00G.
Mitzlaff, James E., to Motorola, Inc. High efficiency RF power amplifier. 4,717,884, Cl. 330-251.000.
Miura, Masakazu; and Aoki, Hideyuki, to Aisin-Warner Kabushiki Kaisha. Automotic transmission mechanism. 4,716,787, Cl. 74-761.000.
Miyachi Electronic Company: *See*—
Miyagawa, Kimio, 4,717,805, Cl. 219-108.000.
Miyagawa, Kimio, to Miyachi Electronic Company. Resistance welding control with menu type user interface. 4,717,805, Cl. 219-108.000.
Miyaguchi, Kanehisa: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Miyaka, Toshio: *See*—
Hirao, Manoru; Hijiya, Hiromi; and Miyaka, Toshio, 4,717,765, Cl. 536-124.000.

Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, to Fuji Photo Film Co., Ltd. Electronic still camera preventing premature removal of recording disk. 4,717,961, Cl. 358-229.000.

Miyake, Izumi, to Fuji Photo Film Co., Ltd. Apparatus for detecting servo-lock state in rotation of rotary recording medium. 4,717,969, Cl. 358-321.000.

Miyake, Katsuya: *See*—
Hagiya, Naoyuki; Matsubara, Yuji; Miyake, Katsuya; Akima, Hideo; and Hoashi, Akira, 4,717,209, Cl. 303-111.000.

Miyake, Takashi: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.

Miyamoto, Norifumi: *See*—
Sato, Yoshio; Shimada, Satoshi; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.

Miyamoto, Shoji: *See*—
Yasunobu, Seiji; and Miyamoto, Shoji, 4,717,029, Cl. 212-132.000.

Miyasako, Yoji: *See*—
Chang, Albert Y.; and Miyasako, Yoji, 4,717,953, Cl. 358-34.000.

Miyazaki, Makoto: *See*—
Doi, Yoshiharu; Soga, Kazuo; Ueki, Satoshi; and Miyazaki, Makoto, 4,717,755, Cl. 525-333.700.

Mo och Domsjo Aktiebolag: *See*—
Lundmark, Einar, 4,717,375, Cl. 493-360.000.

Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,717,399, Cl. 55-72.000.
Cardis, Angeline B., 4,717,491, Cl. 252-46.700.
Catchman, Vernon C.; and Herrington, Fox J., 4,717,373, Cl. 493-193.000.
Chen, Nai Y.; and Garwood, William E., 4,717,465, Cl. 208-111.000.
Chibnik, Sheldon, 4,717,492, Cl. 252-51.50R.
Garwood, William E.; Kushnerick, John D.; and Tabak, Samuel A., 4,717,782, Cl. 585-531.000.
Green, Gary J.; Dryer, Frederick L.; and Walsh, Dennis E., 4,717,049, Cl. 222-420.000.
Haddad, James H.; and Owen, Hartley, 4,717,467, Cl. 208-113.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,717,466, Cl. 208-113.000.
Herrington, Fox J., 4,717,372, Cl. 493-193.000.
Medlin, William L., 4,718,046, Cl. 367-31.000.
Olson, David H.; Rodewald, Paul G.; and Valyocsik, Ernest W., 4,717,780, Cl. 585-467.000.
Shu, Paul, 4,716,966, Cl. 166-295.000.

Mochida, Haruo: *See*—
Watanuki, Yoshio; Mochida, Haruo; and Satou, Hidekazu, 4,716,748, Cl. 70-252.000.

Mochizuki, Hiroyuki: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.

Mochizuki, Noritaka: *See*—
Saito, Kenji; Mochizuki, Noritaka; and Nishimura, Yukuo, 4,716,851, Cl. 118-402.000.

Moffatt, E. Marston; and Swarts, Richard E., to United Technologies Corporation. Jet flow in an angular velocity sensor. 4,716,763, Cl. 73-505.000.

Mohaupt, Henry H. Stimulating subterranean formations in the open hole. 4,716,967, Cl. 166-305.100.

Mohr, Jurgen: *See*—
Gunzler, Volkmar; Hanauske-Abel, Hartmut; Mohr, Jurgen; Tschank, Georg; Kivirikko, Kari; Majamaa, Kari; and Brocks, Dietrich, 4,717,727, Cl. 514-354.000.

Moir, Michael: *See*—
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, 4,717,580, Cl. 426-600.000.

Molins Machine Co. Inc.: *See*—
Carter, David C. M.; Dunckley, Ian; Hieroas, Kerry; and Mitchell, Robert J. C. S., 4,717,009, Cl. 198-347.000.

Moll, Kenneth P.: *See*—
Goldenberg, Tavi; Greenberg, Lawrence A.; and Moll, Kenneth P., 4,717,066, Cl. 228-179.000.

Moll, Maurice M.; and Ellsworth, Daniel L., to NCR Corporation. Non-destructive method and circuit to determine the programmability of a one time programmable device. 4,718,042, Cl. 365-201.000.

Molnlycke Aktiebolag: *See*—
Reiner, Per L., 4,717,453, Cl. 162-312.000.

Momiyama, Kikuo; Fujibayashi, Kazuo; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Focus detecting device. 4,717,819, Cl. 250-204.000.

Mon, George; and Joyce, James W., to United States of America, Army. Fluidic system with noise filter for increasing operating range. 4,716,936, Cl. 137-833.000.

Monarch Marking Systems, Inc.: *See*—
Benge, S. Eugene; and Froning, Robert L., 4,717,438, Cl. 156-152.000.

Monier Limited: *See*—
Bratchell, Robert L., 4,717,114, Cl. 249-86.000.

Monsanto Company: *See*—
Griffith, Edward J.; Jany, John R.; Nathan, Vaidy R.; and Ngo, Toan M., 4,717,487, Cl. 252-1.000.

Montefibre S.p.A.: *See*—
Borgia, Roberto; and Honorati, Giorgio, 4,717,600, Cl. 427-393.100.

Montgomery, Curtis J.; Shetty, Jayarama K.; and Singley, Eric C., to Miles Laboratories, Inc. Thermal stabilization of alpha-amylase. 4,717,662, Cl. 435-99.000.

Moon, James R., Sr. Utility cart. 4,717,168, Cl. 280-641.000.

Moore, Donald L.; Spilman, Raymond; and Pendleton, Thomas, to Cosco, Inc. Modular dressing table and demountable modules therefor. 4,717,214, Cl. 312-107.000.

Moore, James E. Manual devices and methods for selective application of chemical substances to plants. 4,716,677, Cl. 47-1.500.

Moore, John F., to Kabushiki Kaisha Toshiba. Method for compressing and reconstructing a data representation of a picture. 4,717,962, Cl. 358-260.000.

Moore, Robert R.; and Lamb, Steve R. Radiolucent table for medical radiography. 4,718,077, Cl. 378-209.000.

Moorhead, Robert J.; and Rajala, Sarah A., to North Carolina State University. Image-sequence compression using a motion-compensation technique. 4,717,956, Cl. 358-135.000.

Moplefan S.p.A.: *See*—
Angelia, Franco; Grondona, Adriano; and Vittone, Andrea, 4,717,520, Cl. 264-147.000.

Moreau, Andre , to Electricite de France. Furnace wall comprising feed nozzles molded in two complementary parts. 4,716,857, Cl. 122-6.10A.

Morel, Michel; and Mardon, Jean-Paul, to "FRAGEMA". Method of manufacturing zirconium alloy plates. 4,717,427, Cl. 148-11.50F.

Mori, Hideo: *See*—
Ohno, Makoto; Mori, Hideo; Nasu, Toshihiko; and Watanabe, Hideki, 4,717,313, Cl. 417-269.000.

Mori, Junko: *See*—
Shojima, Hiroshi; Mifune, Toshimi; Mori, Junko; and Kuzunuki, Soshiro, 4,718,103, Cl. 382-13.000.

Mori, Kei. Photoradiator including light conducting rods with frusto-conical end portions. 4,717,226, Cl. 350-96.100.

Mori, Kei. Solar ray collecting device including protective cover and filter. 4,717,227, Cl. 350-96.100.

Morikawa, Masaki: *See*—
Hosoda, Naoyuki; Morikawa, Masaki; Uchiyama, Naoki; Yoshida, Hideaki; and Ono, Toshiaki, 4,717,436, Cl. 148-432.000.

Morikawa, Tuneo; and Kuze, Tetsuya, to Yokohama Rubber Co., Ltd., The. Radial tire for passenger car. 4,716,950, Cl. 152-526.000.

Morimoto, Keizi: *See*—
Okonogi, Shigeo; Yuguchi, Hiroya; Morimoto, Keizi; and Ohta, Minoru, 4,717,571, Cl. 426-104.000.

Morinaga Milk Industry Co., Ltd.: *See*—
Okonogi, Shigeo; Yuguchi, Hiroya; Morimoto, Keizi; and Ohta, Minoru, 4,717,571, Cl. 426-104.000.

Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, to Sharp Kabushiki Kaisha. Display device for a programmable electronic calculator. 4,718,029, Cl. 364-710.000.

Morisey, David P., to Phillips, Alma; and Finley, Hugh, part interest to each. Corrosion resistant alloys. 4,717,539, Cl. 420-457.000.

Morishita, Toshikazu: *See*—
Ezawa, Masayoshi; Wakui, Hiroko; Wakana, Shigeru; Morishita, Toshikazu; and Misumi, Akira, 4,717,853, Cl. 313-35.000.

Morita, Toshio, to Westinghouse Electric Corp. Nuclear fuel cladding containing a burnable absorber. 4,717,534, Cl. 376-419.000.

Moritani, Masahiko: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,717,756, Cl. 526-146.000.

Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Certain 2-pyridyloxyphenoxypropanoic acid esters having herbicidal activity. 4,717,417, Cl. 71-94.000.

Morris, David A. N., to Miles Inc. Device and method for chemical analysis of fluids with a reagent coated light source. 4,717,545, Cl. 422-56.000.

Morris Rod Weeder Company, Ltd.: *See*—
Popowich, Stanley; Barsi, Barry B.; and Henry, James W., 4,717,289, Cl. 406-122.000.

Morrison, Charles F., Jr.; and Mims, A. J., to Vernon, Roger W. Warning system including means for remotely energizing condition sensing device. 4,717,905, Cl. 340-58.000.

Morrison, Howard J.: *See*—
Stubenfoll, Leonard J.; Rasmussen, Russell G.; and Morrison, Howard J., 4,717,367, Cl. 446-437.000.

Mortimer, Richard D.: *See*—
Fleming, Bruce I.; and Mortimer, Richard D., 4,717,672, Cl. 436-55.000.

Morton Thiokol, Inc.: *See*—
Davis, Willard F.; and Bullard, Douglas G., 4,716,830, Cl. 102-248.000.

Morz, Gunter: *See*—
Pivit, Erich; Hauth, Wolfgang; Morz, Gunter; and Lenz, Sigmund, 4,717,895, Cl. 333-1.100.

Mosely, Roderick C.: *See*—
Strahl, Thomas L.; Lamont, Lawrence T., Jr.; Peterson, Carl T.; Brown, Hobart A.; McCormick, Lonnie W.; and Mosely, Roderick C., 4,717,461, Cl. 204-192.100.

Moster, Manfred: *See*—
Rother, Dietrich; Wiechert, Dieter; and Moster, Manfred, 4,718,113, Cl. 455-209.000.

Motomak Motorenbau, Maschinen- und Werkzeugfabrik, Konstruktionen GmbH: *See*—
Schaeffler, Georg, 4,716,865, Cl. 123-90.550.
Speil, Walter, 4,716,866, Cl. 123-90.550.
Speil, Walter, 4,716,867, Cl. 123-90.550.

Motonaga, Takao; Fukuhara, Keizi; Tamura, Tadashi; and Yoshida, Toshiji, to Mazda Motor Corporation; and Japan Steel Works. Extrusion molding equipment for multi-layer parison. 4,717,326, Cl. 425-133.100.

Motorola Inc.: *See*—
Belmont, Emanuel; and Hughes, Henry G., 4,717,641, Cl. 430-198.000.
Breeden, Robert L.; and Braun, William V., 4,718,109, Cl. 455-51.000.
Davidson, Allen L.; and Dunkerton, Steve, 4,718,108, Cl. 455-17.000.
Davis, William F.; Susak, David M.; and Vyne, Robert L., 4,717,886, Cl. 330-252.000.
Davis, William F.; and Susak, David M., 4,717,890, Cl. 330-307.000.
De Barros, Leonardo G.; Buss, Thomas E.; How, Adrian T. G.; and Tin, Jolene L. S., 4,717,989, Cl. 361-424.000.
Johnson, Eric S.; and Mellen, Neal J., 4,717,597, Cl. 437-81.000.
Leung, Howard K. H., 4,717,445, Cl. 156-626.000.
McLaughlin, Kevin L.; and Birritella, Mark S., 4,717,677, Cl. 437-24.000.
Miller, Ira, 4,717,839, Cl. 307-359.000.
Mitzlaff, James E., 4,717,884, Cl. 330-251.000.
Nagy, Andrew G.; Stemple, Donald K.; and Tracy, Clarence J., 4,717,446, Cl. 156-626.000.
Parrillo, Louis C.; Cosentino, Stephen J.; and Bergami, Bridgette A., 4,717,683, Cl. 437-34.000.
Salzer, William E.; and Gustin, Jay W., 4,718,119, Cl. 455-619.000.
Susak, David M.; and Vyne, Robert L., 4,717,885, Cl. 330-151.000.
Swapp, Mavin C.; and Frisbie, Milo W., 4,717,012, Cl. 198-425.000.
Tugcu, Mehmet, 4,717,990, Cl. 361-424.000.
Verma, Jaipal S., 4,717,687, Cl. 437-97.000.
Wilson, Syd R.; Paulson, Wayne M.; and Varker, Charles J., 4,717,588, Cl. 427-51.000.

Mouliac, Daniel M.: *See*—
Dewez, Vincent; Michaux, Jean-Pierre; and Mouliac, Daniel M., 4,717,231, Cl. 350-96.200.

Moulin, Blaise: *See*—
Bauer, Eric; and Moulin, Blaise, 4,717,271, Cl. 400-175.000.

Mounier-Poulat, Francois; Savoie, Marcel; and Berthon, Patrick, to Renault Vehicules Industriels. Axle-chassis connecting device. 4,717,170, Cl. 280-683.000.

Mueller Co.: *See*—
Daghe, Joseph L.; Bouc, Gary L.; and Florea, Carl E., 4,717,178, Cl. 285-4.000.

Mueller, Richard: *See*—
Spensberger, Johann; Fischer, Heinrich; and Mueller, Richard, 4,717,293, Cl. 409-9.000.

Mukainakano, Masato: *See*—
Ogano, Takeo; Toda, Yoshihiro; Mukainakano, Masato; and Shoji, Mikio, 4,716,717, Cl. 56-255.000.

Mukherjee, Ruby: *See*—
Acosta, Raul E.; Horkans, Wilma J.; Mukherjee, Ruby; and Olsen, Judith D., 4,717,591, Cl. 427-96.000.

Muller, Rolf, to Papst-Motoren GmbH & Co KG. Two-pulse brushless d.c. motor with auxiliary rotor poles. 4,717,850, Cl. 310-156.000.

Mumford, George V., to Owens-Illinois Closure Inc. One-piece thermoplastic closure having press-on screw off structure including spaced vertical ribs in the skirt of the closure. 4,717,034, Cl. 215-318.000.

Munson, Harry R., Jr.: *See*—
Alphin, Reevis S.; Smith, William L.; Munson, Harry R., Jr.; and Boswell, Robert F., 4,717,563, Cl. 424-10.000.

Murakami, Yoshiteru: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Katayama, Hiroyuki; Hirokane, Junji; and Ohta, Kenji, 4,717,628, Cl. 428-457.000.

Murakami, Yuichi, to Aisin Seiki Kabushiki Kaisha. Collision responsive signal emitter for a vehicle. 4,717,904, Cl. 340-52.00H.

Muramatsu, Shigeru; Shida, Shigeru; Horie, Takeo; and Yamada, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Rotary compressor. 4,717,316, Cl. 417-372.000.

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Murase, Takao: *See*—
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Murata Manufacturing Co., Ltd.: *See*—
Tamura, Hiroshi; and Sagala, Djunisdi A., 4,717,694, Cl. 501-135.000.
Watanabe, Koichi; Maesaka, Michinobu; and Murata, Michihiro, 4,717,595, Cl. 427-221.000.

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Murayama, Seiichi: *See*—
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, 4,716,852, Cl. 118-720.000.

Murden, Keith B.: *See*—
Makinen, Juho K.; Murden, Keith B.; and Saari, Heikki P., 4,717,419, Cl. 75-24.000.

Murdoch, Robert: *See*—
Takla, Nabil; Hecker, Mark; Murdoch, Robert; Chu, Raymond; and Parekh, Rajesh, 4,718,034, Cl. 364-784.000.

Murphree, Leo, Jr. Airport beacon light. 4,717,991, Cl. 362-35.000.

Murphy, J. Brian: *See*—
Gussin, Edward L.; Burney, Richard E.; Murphy, J. Brian; Pfeiffer, Carl G.; and Hedden, Richard L., 4,718,028, Cl. 364-572.000.

Murr, Henry F., to Armstrong World Industries, Inc. Fabric covered spline assembly. 4,716,704, Cl. 52-779.000.

Murray, Rex E.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Maher, John M., 4,717,775, Cl. 568-454.000.

Myoi, Tetsuo: *See*—
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,718,029, Cl. 364-710.000.

Myokan, Isao: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.

N.J. Phillips Pty. Limited: *See*—
Phillips, Ian R.; Lodge, Robert H.; and Bunyan, Glen W., 4,717,383, Cl. 604-135.000.

Nabisco Brands, Inc.: *See*—
Constance, Patricia; and Polizzano, Robert A., 4,717,577, Cl. 426-549.000.
Polizzano, Robert A., 4,717,570, Cl. 426-94.000.

Nagahisa, Toshio: *See*—
Shiraki, Hisashi; Nagahisa, Toshio; Takeda, Kiyosori; and Harada, Takeshi, 4,717,478, Cl. 210-360.200.

Nagai, Kineshiro; and Seda, Taiko, to Nihon University. Immunoregulator. 4,717,716, Cl. 514-19.000.

Nagai, Masahide: *See*—
Shioda, Toshimi; Noda, Minoru; Nagai, Masahide; Higake, Masatoshi; Makishima, Yutaka; and Yokose, Kazutoshi, 4,717,265, Cl. 384-49.000.

Nagai, Ryou: *See*—
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Nagai, Takashi: *See*—
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Nagano, Hiroshi: *See*—
Isaka, Tsutomu; and Nagano, Hiroshi, 4,717,516, Cl. 264-22.000.

Nagao, Makoto; Yamanaka, Fusao; Sano, Kunihiko; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Vertical magnetization type recording medium and manufacturing method therefor. 4,717,592, Cl. 427-128.000.

Nagasawa, Kiyoshi: *See*—
Asakawa, Yoshiaki; Komatsu, Akio; Hatsoka, Nobuo; Ichikawa, Akira; and Nagasawa, Kiyoshi, 4,718,095, Cl. 381-43.000.

Nagasawa, Takeshi: *See*—
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Takabayashi, Katsuyuki; and Nagasawa, Takeshi, 4,717,659, Cl. 435-20.000.

Nagashima, Akira, to Kioritz Corporation. Swingable filter. 4,717,477, Cl. 210-314.000.

Nagashima, Etsuo: *See*—
Sakamoto, Hitoshi; Nagashima, Etsuo; and Nagai, Ryou, 4,717,824, Cl. 250-237.000.

Nagata, Daisaburo: *See*—
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Nagy, Andrew G.; Stemple, Donald K.; and Tracy, Clarence J., to Motorola Inc. Method of detecting the endpoint of the etch of epitaxially grown silicon. 4,717,446, Cl. 156-626.000.

Nahara, Akira: *See*—
Nagao, Makoto; Yamanaka, Fusao; Sano, Kunihiko; and Nahara, Akira, 4,717,592, Cl. 427-128.000.

Nakagawa, Akio: *See*—
Shinohe, Takashi; Takigami, Katsuhiko; Ohashi, Hiromichi; and Nakagawa, Akio, 4,717,940, Cl. 357-38.000.

Nakagawa, Norifumi; Sasaki, Toyonori; and Matsumoto, Kunio, to Copal Company Limited. Camera auto sensing system for ISO speed. 4,717,929, Cl. 354-21.000.

Nakagima, Masaaki: *See*—
Ariga, Makoto; Hata, Seiji; Suzumura, Yoshikazu; Nakagima, Masaaki; and Takahashi, Michio, 4,718,101, Cl. 382-9.000.

Nakajima, Junya: *See*—
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Ueda, Shinji; Nakajima, Junya; Shishido, Tadao; and Shuto, Sadanobu, 4,717,648, Cl. 430-379.000.

Nakajima, Motoki: *See*—
Takada, Hiroshi; Masuda, Shin'ichi; and Nakajima, Motoki, 4,717,506, Cl. 512-11.000.

Nakajima, Shigeru, to Sumitomo Electric Industries, Ltd. Method for producing a metal semiconductor field effect transistor. 4,717,685, Cl. 437-44.000.

Nakamura, Ichiro: *See*—
Noguchi, Toshiaki; Hosoda, Seiichi; and Nakamura, Ichiro, 4,716,897, Cl. 128-303.150.

Nakamura, Kunio; and Kuroki, Yukinori, to NEC Corporation. Dynamic ram with capacitor groove surrounding switching transistor. 4,717,942, Cl. 357-23.600.

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Nakamura, Mitsuo: *See*—
Tezuka, Kazunari; and Nakamura, Mitsuo, 4,716,999, Cl. 192-3.290.
Nakamura, Sukenori: *See*—
Igarashi, Akira; and Nakamura, Sukenori, 4,717,593, Cl. 427-150.000.
Nakamura, Teruo: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,717,321, Cl. 418-76.000.
Nakao, Masami; Iwaki, Masato; Kinoshita, Hiroshi; and Okamoto, Ikuo, to Mazda Motor Corporation. Internal combustion engine equipped with a supercharger and an idling speed control system. 4,716,734, Cl. 60-599.000.
Nakayama, Yoshiki: *See*—
Shimada, Mithuo; Yokocho, Yoetsu; and Nakayama, Yoshiki, 4,716,878, Cl. 123-540.000.
Nakazawa, Masao; Nishiyama, Yoshirou; and Wakabayashi, Shinichi, to Shinko Electric Industries Co., Ltd. Electrolytic gold plating solution. 4,717,459, Cl. 204-44.300.
Nakazawa, Shizuo: *See*—
Kawasaki, Yozo; Kusunoki, Katsuyuki; Nakazawa, Shizuo; and Yamazaki, Michio, 4,717,435, Cl. 148-410.000.
Nappholz, Tibor A.: *See*—
Hansen, James C.; Nappholz, Tibor A.; and Whigham, Robert H., 4,716,903, Cl. 128-419.0PG.
Narayan, Thirumurti; and Kan, Peter T., to BASF Corporation. Process for the preparation of toluene diamines. 4,717,774, Cl. 564-422.000.
Naruse, Kazuhiko: *See*—
Yuasa, Yoshio; Naruse, Kazuhiko; and Inaba, Masahito, 4,717,861, Cl. 315-241.00P.
Narushima, Mayumi: *See*—
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Nasu, Toshihiko: *See*—
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Nathan, Vaidy R.: *See*—
Griffith, Edward J.; Jany, John R.; Nathan, Vaidy R.; and Ngo, Toan M., 4,717,487, Cl. 252-1.000.
National Research Institute for Metals: *See*—
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National Semiconductor Corporation: *See*—
Brehmer, Kevin E.; and Wieser James B., 4,717,838, Cl. 307-355.000.
National Steel Corporation: *See*—
Ficke, John D., 4,717,125, Cl. 266-143.000.
Naturin-Werk Becker & Co.: *See*—
Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., 4,716,713, Cl. 53-530.000.
Navistar International Transportation Corp.: *See*—
Tordoff, Robert L., 4,716,732, Cl. 60-584.000.
Navon, Gil, to Ramot University Authority for Applied Research & Industrial Development Ltd. Liquid optical filter and method for the near infrared light. 4,717,220, Cl. 350-1.500.
NCR Corporation: *See*—
Bangs, Richard G.; and Kwan, Sik P., 4,717,924, Cl. 346-76.0PH.
Moll, Maurice M.; and Ellsworth, Daniel L., 4,718,042, Cl. 365-201.000.
NEC Corporation: *See*—
Akatsuka, Yasuo, 4,718,043, Cl. 365-227.000.
Inoue, Taketoshi, 4,718,115, Cl. 455-218.000.
Kobayashi, Tadashi, 4,717,793, Cl. 178-18.000.
Nakamura, Kunio; and Kuroki, Yukinori, 4,717,942, Cl. 357-23.600.
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Uenoyama, Tadashi, 4,718,097, Cl. 381-46.000.
Necker, William J.: *See*—
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Nel, Gert, to Eastway Holdings Limited. Methods of securing a stator in an electrical machine. 4,716,648, Cl. 29-596.000.
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, to United States of America, Energy. Dynamic high pressure process for fabricating superconducting and permanent magnetic materials. 4,717,627, Cl. 428-552.000.
Neri, Armando: *See*—
Belvederi, Bruno; and Neri, Armando, 4,716,909, Cl. 131-84.100.
Neste Oy: *See*—
Pulkkinen, Jorma, 4,717,285, Cl. 405-55.000.
Neuhaus, Dietmar, to Deutsche Forschungs—und Versuchsanstalt fur Lift—und Raumfahrt E.V. Apparatus for positioning a specimen. 4,717,309, Cl. 414-735.000.
Neukirchen, Ernst: *See*—
Buttgens, Walter; Kerscher, Utto; and Neukirchen, Ernst, 4,717,509, Cl. 252-609.000.
Newman, Anthony W.; and Bishop, Michael L., to DeSoto, Inc. Anticaking and antidusting composition for ammonium nitrate. 4,717,555, Cl. 423-265.000.
Newman, David J.: *See*—
Long, Terence M.; Newman, David J.; and Thomas, Peter D., 4,718,026, Cl. 364-550.000.
Newman, Ray L., to GTE Products Corporation. Ceramic burner having high turndown ratio. 4,717,334, Cl. 431-187.000.
Newmark, Larry J.; and Hibbert, David A., to General Electric Company. Compact non-metallic load center enclosure. 4,717,987, Cl. 361-331.000.
Newsome, Reginald W.: *See*—
Sprinkel, Francis M., Jr.; and Newsome, Reginald W., 4,717,017, Cl. 206-264.000.
Newton, Arnold C., to Rolls-Royce plc. Gas turbine engine powerplant with flow control devices. 4,716,724, Cl. 60-226.200.
NGK Insulators, Ltd.: *See*—
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Oda, Isao, 4,717,695, Cl. 501-143.000.
Oshima, Norio; Murase, Takao; and Oki, Shuichiro, 4,717,464, Cl. 204-427.000.
Ngo, Toan M.: *See*—
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Nicholson, Myron D.; and Beckman, John H., to Viskase Corporation. Tar-depleted, concentrated, liquid smoke compositions and method for producing. 4,717,576, Cl. 426-533.000.
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Bruning, Paul; and Niemerg, Willi, 4,717,376, Cl. 494-40.000.
Nigam, Anil; and Mercurio, Dominic, to SyQuest Technology. Hard disc cartridge arrangement with an automatically activated door. 4,717,981, Cl. 360-133.000.
Nihei, Hideki: *See*—
Sato, Yoshio; Shimada, Satoshai; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.
Nihon University: *See*—
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Nii, Akira: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.
Nijhuis, Gerrit J., to Machinefabriek G. J. Nijhuis B.V. Process and device for stunning slaughter animals, in particular for stunning and subsequently sticking slaughter animals. 4,716,625, Cl. 17-45.000.
Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,717,366, Cl. 446-470.000.
Nilsson, Bo S. A.; and Ljung, Krister E., to SAB Nife AB. Parking brake arrangement for a rail vehicle brake unit. 4,716,995, Cl. 188-197.000.
Nilsson, Jan: *See*—
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Nippon Carbon Co. Ltd.: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Ichikawa, Hiroshi; Imai, Yoshikazu; and Umezawa, Masanobu, 4,717,589, Cl. 427-57.000.
Nippon Electric Co. Ltd.: *See*—
Ando, Manabu, 4,717,846, Cl. 307-473.000.
Nippon Flakt K.K.: *See*—
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Nippon Hoso Kyokai: *See*—
Yamamoto, Masanao; Inoue, Eisuke; Shidara, Keiichi; and Hiruma, Eikyuu, 4,717,854, Cl. 313-366.000.
Nippon Oil Company Limited: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.
Yoshioka, Shigehiko; Yoshida, Tsuneo; Sato, Hisatake; Yamada, Hideto; and Adachi, Yoshio, 4,717,452, Cl. 162-158.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Orikasa, Yuichi; Kojima, Shinji; Inoue, Takashi; Yamamoto, Kaoru; Sato, Atsushi; and Kawakami, Shigenobu, 4,717,759, Cl. 526-326.000.
Nippon Telegraph & Telephone Corp.: *See*—
Oguchi, Kimio; and Watanabe, Akira, 4,718,060, Cl. 370-85.000.
Nippondenso Co., Ltd.: *See*—
Wakabayashi, Hiroyuki; Kato, Fumio; Matsubara, Tamotsu; and Ishikawa, Yasuo, 4,717,743, Cl. 524-13.000.
Yasukawa, Takemasa; Sugita, Hiroshi; Iwasa, Tadanobu; and Aritake, Masanori, 4,716,618, Cl. 15-250.360.
Niro Plan AG: *See*—
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Nishida, Hidehiko, to Fujitsu Limited. Data processor system having improved data throughput in a multiprocessor system. 4,718,006, Cl. 364-200.000.
Nishida, Shigeto: *See*—
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Nishijima, Tsunemasa: *See*—
Takahashi, Koji; Nishijima, Tsunemasa; and Takihana, Seisaku, 4,716,719, Cl. 60-39.060.
Nishikawa, Masumi; Ishikawa, Masanobu; Yokoya, Yuji; and Takizawa, Sumio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Telescopic steering mechanism for automotive vehicle. 4,716,780, Cl. 74-493.000.
Nishikawa, Takao: *See*—
Horii, Yasuyuki; Nishikawa, Takao; Yamanishi, Isamu; and Umemoto, Tomeo, 4,716,775, Cl. 74-15.860.
Nishimura, Akimasa; and Tezuka, Nobuo, to Canon Kabushiki Kaisha. Apparatus using disc-shaped record bearing medium. 4,717,976, Cl. 360-97.000.

Nishimura, Iwao: *See*—
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruyo; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,717,629, Cl. 428-566.000.
Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Driving force transmitting structure for automatic seatbelt system. 4,717,174, Cl. 280-804.000.
Nishimura, Yukinobu: *See*—
Shimoanura, Setsuhiro; and Nishimura, Yukinobu, 4,716,876, Cl. 123-480.000.
Nishimura, Yukuo: *See*—
Saito, Kenji; Mochizuki, Noritaka; and Nishimura, Yukuo, 4,716,851, Cl. 118-402.000.
Nishiyama, Yoshirou: *See*—
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Nissan Motor Co., Ltd.: *See*—
Fujioka, Kazuyoshi; and Tani, Toshiro, 4,716,756, Cl. 72-353.000.
Ishii, Katsumi; Hirayama, Kanae; Matsuoka, Yoshio; and Takahashi, Kotei, 4,716,982, Cl. 180-140.000.
Kubo, Jun, 4,718,013, Cl. 364-426.000.
Kubota, Hitoshi; and Ohno, Sachio, 4,717,207, Cl. 303-3.000.
Kubota, Hitoshi, 4,717,208, Cl. 303-6.00C.
Okuyama, Hiroo; and Tsunoda, Katsuya, 4,717,195, Cl. 296-72.000.
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Shibamoto, Yutaka, 4,716,931, Cl. 137-558.000.
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, 4,717,173, Cl. 280-707.000.
Suzuki, Yutaka, 4,716,789, Cl. 74-866.000.
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Noack, Klauspeter; and Frohaska, Hans, to SWF Auto-Electric GmbH. Windshield wiper bearing. 4,716,617, Cl. 15-250.340.
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., to LeaRonal, Inc. Tin lead electroplating solutions. 4,717,460, Cl. 204-444.000.
Nobileau, Philippe C., to Vetco Offshore Industries, Inc. Conical thread configuration for rapid make-up connection. 4,717,183, Cl. 285-334.000.
Noda, Minoru: *See*—
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Noda, Yoichiro: *See*—
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Noguchi, Toshiaki; Hosoda, Seiichi; and Nakamura, Ichiro, to Olympus Optical Co., Ltd. Electrosurgical apparatus. 4,716,897, Cl. 128-303.150.
Nohara, Hatsue, to G O Giken Co., Ltd. Rotary health promoting exercise apparatus. 4,717,146, Cl. 272-73.000.
Nojima, Masaki: *See*—
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Nolan, Joseph G., to Harris Corporation. TTL compatible CMOS input buffer. 4,717,847, Cl. 307-475.000.
Nomura, Junji; Imai, Hideaki; Ishibashi, Yuzuru; and Konishi, Tokuzo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for adsorption treatment of dissolved fluorine. 4,717,554, Cl. 423-263.000.
Nonomura, Yutaka; Sugiyama, Jun; Komatsubara, Hirofumi; and Takeuchi, Masaharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Stress detector. 4,716,773, Cl. 73-862.360.
Noriega, Ernest. Shelf for vehicle cab. 4,717,193, Cl. 296-37.700.
Norman, Frederick A. Domicile for leaf cutter bees. 4,716,609, Cl. 6-1.000.
Norota, Kazuhiko: *See*—
Kobayashi, Nobuyuki; Hattori, Takashi; and Norota, Kazuhiko, 4,718,014, Cl. 364-431.030.
North Carolina State University: *See*—
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Carter, Anthony F.; Rushforth, Calvin; Brassert, Walter L.; and Heitmann, Arnold M., 4,717,075, Cl. 239-398.000.
Northern Telecom Limited: *See*—
Haskins, Steve W., 4,718,085, Cl. 379-438.000.
Kahn, David A., 4,717,247, Cl. 350-617.000.
Northrop Corporation: *See*—
Komine, Hiroshi, 4,717,842, Cl. 307-426.000.
Notkin, Yosef, to Plastro Gvat. Sprinkler device. 4,717,076, Cl. 239-467.000.
Novak, Mark: *See*—
Guttag, Karl; Asal, Mike; and Novak, Mark, 4,718,024, Cl. 364-518.000.
Nowaczyk, David J. Adjustable rotary vane pump. 4,716,726, Cl. 60-487.000.
Nukiyama, Tomoji, to NEC Corporation. Multiplying circuit. 4,718,031, Cl. 364-754.000.
Numari: *See*—
Masi, Charles G.; and Miller, Melvin N., 4,717,876, Cl. 324-303.000.
Numar Corporation: *See*—
Taicher, Zvi; Shtrikman, Shmuel; Paltiel, Zvi; and Shporer, Mordechai, 4,717,877, Cl. 324-303.000.
Taicher, Zvi; and Shtrikman, Shmuel, 4,717,878, Cl. 324-303.000.
NWM de Kruithoorn B.V., Poeldonkweg: *See*—
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Nyarady, Stefan A.: *See*—
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Oberg, Gordon D., 4,717,472, Cl. 210-90.000.
Oberg, Gordon D., to Oberg Enterprises, Inc. Oil filter assembly having multiple removable filter members and cooling fins. 4,717,472, Cl. 210-90.000.
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Riechers, Carl. Elevator guide shoe. 4,716,991, Cl. 187-95.000.
Riederer, Stephen J.; and Farzaneh, Farhad, to Duke University. Pulse sequence for NMR image acquisition. 4,717,879, Cl. 324-309.000.
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Ardito, Victor P.; and Riedl, James R., 4,716,954, Cl. 164-461.000.
Rifi, Mahmoud R., to Union Carbide Corporation. Chlorosulfonated alkylene-alkyl acrylate copolymers. 4,717,753, Cl. 525-330.400.
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Takaba, Tetsuro; Rikitake, Tomotsuga; Tabara, Yoshitaka; and Arima, Manabu, 4,716,873, Cl. 123-425.000.
Ripberger, Emil; and Bubeck, Eberhard, to Mahle GmbH. Piston, particularly for internal combustion engines. 4,716,817, Cl. 92-177.000.
Rizo, Leandre, to ITW de France. Fixing device, especially for panels. 4,716,633, Cl. 24-453.000.
Roach, Larry A. Cleaning and deburring of machined or cast parts. 4,716,684, Cl. 51-7.000.
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Venkatram, Ramdas; Roarty, John C.; Wortel, Theodorus M.; and Carter, James L., 4,717,700, Cl. 502-85.000.
Robbie, Roderick G.: *See*—
Allen, Christopher M.; and Robbie, Roderick G., 4,716,691, Cl. 52-6.000.
Robblee, Lois S., to EIC Laboratories, Inc. Iridium oxide coated electrodes for neural stimulation. 4,717,581, Cl. 427-2.000.
Robert Bosch GmbH: *See*—
Dettling, Hubert; Leonhard, Rolf; and Projahn, Ulrich, 4,716,725, Cl. 60-303.000.
Grob, Ferdinand; and Wahl, Josef, 4,718,015, Cl. 364-431.050.
Heitmann, Jurgen, 4,717,972, Cl. 360-8.000.
Kotter, Wolfgang, 4,716,727, Cl. 60-423.000.
Sauer, Rudolf, 4,717,080, Cl. 239-585.000.
Roberts, Jon A.: *See*—
Erie, David G.; Roberts, Jon A.; and Lee, Eddie C., 4,717,449, Cl. 437-195.000.
Roberts, Kent S., to Roberts Mfg., Inc. Sewing machine cabinet with power lift. 4,717,212, Cl. 312-21.000.
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Robinson, Colin; Eastlick, David T.; and Bownass, Audrey J., to Glaxo Group Limited. Process for separation of syn and anti oxime isomers of cephalosporin-compounds. 4,717,768, Cl. 540-222.000.
Robinson, John W.: *See*—
Garces, Juan M.; and Robinson, John W., 4,717,777, Cl. 568-804.000.
Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., 4,717,631, Cl. 148-33.300.
Rochelle, Richard D. Weight lifting device. 4,717,147, Cl. 272-117.000.
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Harmon, Albert D.; and Koella, Ernest, III, 4,717,616, Cl. 428-195.000.
Rockwell International Corporation: *See*—
Alitz, Orville J., 4,717,917, Cl. 342-137.000.
Brandt, Robert L., 4,718,114, Cl. 455-217.000.
Hale, Leonard G., 4,717,606, Cl. 428-1.000.
Weisert, Edward D.; and Schulz, David W., 4,717,433, Cl. 148-20.300.
Rodewald, Paul G.: *See*—
Olson, David H.; Rodewald, Paul G.; and Valyocsik, Ernest W., 4,717,780, Cl. 585-467.000.
Roehrich, Heinz: *See*—
Christgau, Hermann; Mika, Norbert; Roehrich, Heinz; and Scholz, Guenther, 4,717,860, Cl. 313-525.000.
Roen, Ralph M.; and Gebhardt, Terry D., to T.C. Manufacturing Company, Inc. Flat bottom plastic bag and method of making same. 4,717,262, Cl. 383-120.000.
Rogard, Roger, to Agence Spataile Europeenne. Self-adaptive hybrid data transmission. 4,718,066, Cl. 371-35.000.
Rogers Corporation: *See*—
Gordon, Herman B.; and Cunnane, Jeff, 4,717,345, Cl. 439-67.000.
Rogers, Mark D.: *See*—
Chang, Albert; Mergen, Mark F.; O'Quin, John T., II; O'Quin, John C., III; and Rogers, Mark D., 4,718,008, Cl. 364-300.000.
Rogers, Richard B.; and Herrero, Maria P., to Dow Chemical Company, The. Aryl(aryloxy or arylthio)azolomethanes and their use as pesticides. 4,717,732, Cl. 514-333.000.
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Rohrig, Harald, to INA Walzlager Schaeffler KG. Novel pulley with dampening element. 4,717,370, Cl. 474-161.000.
Rokach, Joshua; and Young, Robert N., to Merck Frosst Canada, Inc. Antagonists of slow reacting substances of anaphylaxis. 4,717,736, Cl. 514-539.000.
Rolls-Royce plc: *See*—
Newton, Arnold C., 4,716,724, Cl. 60-226.200.
Pask, George; and Shaw, Peter A., 4,716,721, Cl. 60-39.320.
Rolscreen Company: *See*—
Hagemeyer, Bruce A., 4,716,700, Cl. 52-456.000.
Minter, Mearl J., 4,716,683, Cl. 49-479.000.
Roman, Gianfranco, to Claber S.p.A. Watertight joint for rigid piping, in particular for the articulation of a washing brush fed with water. 4,717,180, Cl. 285-175.000.
Romanowski, Chester J.: *See*—
Guido, Paul V.; Romanowski, Chester J.; and Stevens, William D., 4,717,082, Cl. 241-121.000.
Ronkos, Laszlo : *See*—
David, Agoston; Pogany, Janos; and Ronkos, Laszlo , 4,716,768, Cl. 73-861.000.
Rontey, Daniel C.: *See*—
Bartholomew, Stephen W.; Rontey, Daniel C.; and Necker, William J., 4,716,831, Cl. 102-275.300.
Rosenberger, Mark A.; and Ettinger, John J., to Grumman Aerospace Corporation. Penguin missile folding wing configuration. 4,717,093, Cl. 244-49.000.
Rosengren, Rolf, to Inter Innovation AB. Arrangement for collecting sequentially transported sheet-like objects. 4,717,144, Cl. 271-307.000.
Roskam, Abram K.: *See*—
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,716,649, Cl. 29-602.00R.
Rossini, Angela: *See*—
Leoni, Roberto; Rossini, Angela; and Taccani, Massimo, 4,717,746, Cl. 524-100.000.
Rostec Industries: *See*—
Crossman, Philip E.; and Mitchell, Terry L., 4,716,699, Cl. 52-239.000.
Rostron, Robert: *See*—
Hutton, Geoffrey; and Rostron, Robert, 4,718,017, Cl. 364-470.000.
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Spitzer, Donald P.; Lipp, David W.; Rothenberg, Alan S.; and Panzer, Hans P., 4,717,550, Cl. 423-121.000.
Rother, Dietrich; Wiechert, Dieter; and Moster, Manfred, to Alcatel NV. Zero-IF receiver wih feedback loop for suppressing interfering signals. 4,718,113, Cl. 455-209.000.
Rothmans of Pall Mall Limited: *See*—
Brackmann, Warren A., 4,716,913, Cl. 131-364.000.
Roubicek, Rudolph V.: *See*—
Feres, Vaclav; and Roubicek, Rudolph V., 4,717,669, Cl. 435-315.000.
Rudbach, Jon A.: *See*—
Babb, James L.; Bloomster, Timothy G.; and Rudbach, Jon A., 4,717,652, Cl. 435-4.000.
Ruf, Max; and Korostenski, Erwin, to Audi AG. Exhaust gas turbosupercharger for a vehicle engine. 4,716,735, Cl. 60-605.300.
Ruff, Gray E., to SpaceLabs, Inc. Blood pressure cuff. 4,716,906, Cl. 128.686.000.
Ruff, Lawrence E.: *See*—
Bubeck, Kenneth B.; and Ruff, Lawrence E., 4,716,772, Cl. 73-862.230.
Rumreich, Mark F.; Whitledge, Gary A.; and Lagoni, William A., to RCA Corporation. AGC in sound channel of system for processing a scrambled video signal. 4,718,086, Cl. 380-20.000.
Rundell, Herbert A., to Texaco Inc. Stripping gland. 4,716,962, Cl. 166-84.000.
Rushforth, Calvin: *See*—
Carter, Anthony F.; Rushforth, Calvin; Brassert, Walter L.; and Heitmann, Arnold M., 4,717,075, Cl. 239-398.000.

Russell, Franklin E., Sr.: *See*—
Fremow, W. Douglas; Russell, Franklin E., Sr.; and Ellert, Roger H., 4,717,120, Cl. 251-144.000.
Russell, Raymond L.: *See*—
Everman, Wayne F.; Klug, Randy J.; and Russell, Raymond L., 4,717,371, Cl. 493-96.000.
Russo, Onofrio N., to Gas Energy, Inc. Top locking plug valve. 4,716,747, Cl. 70-179.000.
Rutishauser, Albert. Process and apparatus for feeding in of recording carriers to the writing roller of an office machine. 4,717,136, Cl. 271-9.000.
Rutschle, Eugen: *See*—
Winkler, Hans-Henning; and Rutschle, Eugen, 4,716,647, Cl. 29-561.000.
RXS Schrumpftechnik-Garnituren GmbH: *See*—
Meltsch, Hans-Juergen, 4,717,608, Cl. 428-35.000.
Saari, Heikki P.: *See*—
Makinen, Juho K.; Murden, Keith B.; and Saari, Heikki P., 4,717,419, Cl. 75-24.000.
SAB Nife AB: *See*—
Nilsson, Bo S. A.; and Ljung, Krister E., 4,716,995, Cl. 188-197.000.
Sabol, George P.: *See*—
Comstock, Robert J.; Jacobsen, William A.; Cellier, Francis; and Sabol, George P., 4,717,428, Cl. 148-11.50F.
McDonald, Samuel G.; and Sabol, George P., 4,717,434, Cl. 148-407.000.
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, to Boehringer Mannheim GmbH. Container for longitudinally extending diagnostic test strips. 4,717,018, Cl. 206-305.000.
Sachsenmaier, Robert: *See*—
Feigenbaum, Barry A.; Gibbs, Dennis D.; and Sachsenmaier, Robert, 4,718,005, Cl. 364-200.000.
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. 7-amino-3-(pyrazinylmethyl) or (pyridaziylmethyl)-cephalosporins. 4,717,767, Cl. 540-222.000.
Safety Socket Screw Corporation: *See*—
Tauber, Michael, 4,716,793, Cl. 81-53.200.
Sagala, Djuniadi A.: *See*—
Tamura, Hiroshi; and Sagala, Djuniadi A., 4,717,694, Cl. 501-135.000.
Sagami, Koji. Method for producing a string-shaped bacteria bed for sewage or wastewater treatment. 4,717,519, Cl. 264-103.000.
Saikawa, Isamu: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.
Saito, Kenji; Mochizuki, Noritaka; and Nishimura, Yukuo, to Canon Kabushiki Kaisha. Curved surface shaping apparatus and curved surface shaping method using the same. 4,716,851, Cl. 118-402.000.
Saito, Mitsuru: *See*—
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, 4,716,791, Cl. 74-867.000.
Saito, Nobuaki; and Osawa, Fumio, to Komori Printing Machinery Co., Ltd. Sheets aligner for use in a printing press. 4,717,142, Cl. 271-217.000.
Saito, Seiji: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,718,040, Cl. 364-900.000.
Saito, Siro, to Tokai Rubber Industries, Ltd. Fluid-filled resilient engine mount. 4,717,111, Cl. 248-562.000.
Sakaguchi, Keizo: *See*—
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,717,629, Cl. 428-566.000.
Sakaguchi, Takahiro, to Teac Corporation. Rotary to linear converter with lead screw. 4,716,776, Cl. 74-89.150.
Sakai, Kunito; Tamaki, Akinobu; and Takahama, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,717,948, Cl. 357-74.000.
Sakai, Masayuki: *See*—
Aoki, Masaki; Torii, Hideo; Okinaka, Hideyuki; and Sakai, Masayuki, 4,717,584, Cl. 427-38.000.
Sakai, Toshikazu; and Higomura, Makoto, to Canon Kabushiki Kaisha. Actuator of shape memory effect material. 4,716,731, Cl. 60-527.000.
Saksi, Yoshihiro: *See*—
Mashiko, Harumitsu; Sakai, Yoshihiro; Hayashi, Syoji; Ogata, Yoshihiro; Yoshimura, Tsuyoshi; Kuroda, Hisashi; and Suzuki, Shigeru, 4,717,965, Cl. 358-285.000.
Sakakibara, Shiro, to Aisin-Warner Kabushiki Kaisha. Automatic transmission for motor vehicles. 4,716,786, Cl. 74-695.000.
Sakamoto, Hitoshi; Nagashima, Etsuo; and Nagai, Ryou, to Mitutoyo Mfg. Co., Ltd. Photoelectric displacement detecting apparatus. 4,717,824, Cl. 250-237.00G.
Sakamoto, Katsuhiko; Hosokai, Tetsushi; and Shiraishi, Hideo, to Mazda Motor Corporation. Intake system for engine. 4,716,871, Cl. 123-339.000.
Sakamoto, Shizuo: *See*—
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,717,629, Cl. 428-566.000.
Sakashita, Jun: *See*—
Ohshima, Ken; Sakashita, Jun; and Okada, Hiroo, 4,718,051, Cl. 369-44.000.
Sakata, Tsuguhide: *See*—
Ichise, Toshihiko; Sakata, Tsuguhide; and Kawai, Hisashi, 4,717,891, Cl. 331-17.000.
Ogura, Tokihiko; Sakata, Tsuguhide; Ito, Kazuhiko; and Ogawa, Masahiko, 4,717,975, Cl. 360-66.000.
Sakuma, Tadashi. Ornamental compass. 4,716,655, Cl. 33-355.00R.
Sakuragi, Shiro; and Imagawa, Kyoshiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Infrared optical fiber. 4,717,238, Cl. 350-96.340.
Salazar, Michael J.: *See*—
Shaffer, Willis G., 4,717,169, Cl. 280-648.000.
Salentine, Christopher G., to Chevron Research Company. Synergistic combination of alkali metal borates, sulfur compounds, phosphites and neutralized phosphates. 4,717,490, Cl. 252-32.70E.
Salesse, Jacques: *See*—
Cheron, Yvon; Jacob, Pierre; and Salesse, Jacques, 4,717,998, Cl. 363-71.000.
Salton, Robert B.: *See*—
Gjertsen, Robert K.; Bassler, Elmer A.; Huckestein, Edgar A.; Salton, Robert B.; and Tower, Stephen N., 4,717,527, Cl. 376-209.000.
Salvetti, Gianemilio: *See*—
Marchetti, Renato; Penco, Eugenio; and Salvetti, Gianemilio, 4,718,072, Cl. 372-86.000.
Salzer, William E.; and Gustin, Jay W., to Motorola Inc. AGC circuit including a precision voltage clamp and method. 4,718,119, Cl. 455-619.000.
Sammic, S.A.: *See*—
Capdevila, Guillermo, 4,716,823, Cl. 99-510.000.
Samson, Wilfred J.: *See*—
McGregor, Jean E. Samson, Wilfred J.; and Mar, Craig E., 4,716,757, Cl. 72-387.000.
Sanden Corporation: *See*—
Aoki, Hisao, 4,716,959, Cl. 165-152.000.
Sato, Tadashi; Mabe, Atsushi; and Terauchi, Kiyoshi, 4,717,314, Cl. 417-310.000.
Sanders Associates, Inc.: *See*—
Richmond, Martin R.; and Hayner, Mark A., 4,716,930, Cl. 137-514.500.
Sanders, Franciscus H. M.: *See*—
Dieleman, Jan; and Sanders, Franciscus H. M., 4,717,447, Cl. 156-643.000.
Sandoz Ltd.: *See*—
Dien, Michel, 4,717,390, Cl. 8-436.000.
Schmid, Hans-Rudolf, 4,717,502, Cl. 252-301.230.
Seitz, Rudolf, 4,717,389, Cl. 8-436.000.
Sanjoh, Akira: *See*—
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,717,637, Cl. 430-65.000.
San Juan, Alex. Bracket for truck mounting ski or surfboard rack. 4,717,055, Cl. 224-42.45R.
Sano, Kunihiko: *See*—
Nagao, Makoto; Yamanaka, Fusao; Sano, Kunihiko; and Nahara, Akira, 4,717,592, Cl. 427-128.000.
Sanrio Company, Ltd.: *See*—
Shimizu, Goro; and Hayashi, Yoshimi, 4,717,710, Cl. 503-213.000.
Santa Barbara Research Center: *See*—
Botts, Steven E., 4,717,830, Cl. 250-578.000.
Santamaki, Harry; Leppanen, Juha; Haikonen, Pontti; and Korhonen, Ilkka, to Valtion teknillinen tutkimuskeskus. Video compression method. 4,717,957, Cl. 358-136.000.
Sanyo Chemical Industries, Ltd.: *See*—
Fukuda, Masao; and Kumata, Koji, 4,717,738, Cl. 521-137.000.
Sarh, Branko, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for making a structural component. 4,717,330, Cl. 425-403.000.
Saringer, John H., to Toronto Medical Corp. Device for imparting continuous passive motion to human joints. 4,716,889, Cl. 128-25.00R.
Sasabe, Shunji: *See*—
Hoenma, Yoshio; Tsunekawa, Sukeyoshi; and Sasabe, Shunji, 4,717,462, Cl. 204-298.000.
Sasage, Norio. Cutter. 4,717,205, Cl. 299-39.000.
Sasaki, Hiroshi: *See*—
Sato, Yoshio; Shimada, Satoshi; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.
Sasaki, Manji: *See*—
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Okamura, Haruki; and Shioноya, Masahisa, 4,717,745, Cl. 524-91.000.
Sasaki, Shinichi: *See*—
Sootome, Sumitoshi; Toriumi, Mototada; Tanaka, Sohei; and Sasaki, Shinichi, 4,717,139, Cl. 271-116.000.
Sasaki, Toyonori: *See*—
Nakagawa, Norifumi; Sasaki, Toyonori; and Matsumoto, Kunio, 4,717,929, Cl. 354-21.000.
Sasamura, Ross, to Paccar, Inc. Universal power assist arrangement for use with a vehicle transmission clutch linkage. 4,717,002, Cl. 192-99.000.
Sasib S.p.A.: *See*—
Gherardi, Gian L., 4,716,910, Cl. 131-94.000.
SAT (Societe Anonyme de Telecommunications): *See*—
Germain-Lecour, Michel M. E.; and Loiseau, Joseph M. A., 4,716,742, Cl. 62-514.00R.
Satake, Eishin, to Tsudakoma Kogyo Kabushiki Kaisha. Hand-operated pallet changer. 4,717,306, Cl. 414-222.000.

Satake, Hiroshi: *See—*
Esaley, Donald; and Satake, Hiroshi, 4,717,256, Cl. 356-350.000.

Sato, Atsushi: *See—*
Orikasa, Yuichi; Kojima, Shinji; Inoue, Takashi; Yamamoto, Kaoru; Sato, Atsushi; and Kawakami, Shigenobu, 4,717,759, Cl. 526-326.000.

Sato, Eiichi, to Canon Kabushiki Kaisha. Liquid injection recording apparatus. 4,717,927, Cl. 346-140.00R.

Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Umada, Youichi; Ishii, Norio; and Tojima, Hideto, to Sumitomo Chemical Co., Ltd. Production of epsilon-caprolactam. 4,717,769, Cl. 540-536.000.

Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Tojima, Hideto; and Ishii, Norio, to Sumitomo Chemical Co., Ltd. Process for producing epsilon-caprolactam. 4,717,770, Cl. 540-536.000.

Sato, Hisatake: *See—*
Yoshioka, Shigehiko; Yoshida, Tsuneo; Sato, Hisatake; Yamada, Hideto; and Adachi, Yoshio, 4,717,452, Cl. 162-158.000.

Sato, Makoto: *See—*
Furukawa, Minoru; and Sato, Makoto, 4,717,728, Cl. 514-210.000.

Sato, Tadashi; Mabe, Atsushi; and Terauchi, Kiyoshi, to Sanden Corporation. Scroll compressor with control device for variable displacement mechanism. 4,717,314, Cl. 417-310.000.

Sato, Tomosaburo: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; Noda, Yoichiro; and Sato, Tomosaburo, 4,717,235, Cl. 350-96.230.

Sato, Tsunehiko: *See—*
Chino, Naoyoshi; Hiraki, Yasuhito; Sato, Tsunehiko; Chikamasa, Hiroshi; and Shibata, Norio, 4,717,603, Cl. 427-434.300.

Sato, Yoshio; Shimada, Satoshai; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, to Hitachi, Ltd. Optical information apparatus and method of recording and erasing information. 4,718,053, Cl. 369-44.000.

Satoh, Kenji: *See—*
Ozeki, Toshiaki; and Satoh, Kenji, 4,717,400, Cl. 55-186.000.

Satou, Hidekazu: *See—*
Watanuki, Yoshio; Mochida, Haruo; and Satou, Hidekazu, 4,716,748, Cl. 70-252.000.

Sauer, Rudolf, to Robert Bosch GmbH. Electromagnetically actuatable fuel injection valve. 4,717,080, Cl. 239-585.000.

Sauro, Gastone. Oleodynamic distribution system, with separate control of the suction and exhaust valves, with continuous timing setting with running engine, for all four-stroke cycle engines. 4,716,862, Cl. 123-90.120.

Sauvel, Francois: *See—*
Dumortier, Bernard; Gast, Jean-Noel; and Sauvel, Francois, 4,717,841, Cl. 307-646.000.

Savoca, Kenneth V.; and Macdonald, Valerie E., to Akzo N.V. Process for solid phase platelet antibody assay. 4,717,654, Cl. 435-7.000.

Savoie, Marcel: *See—*
Mounier-Poulat, Francois; Savoie, Marcel; and Berthon, Patrick, 4,717,170, Cl. 280-683.000.

Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, to Toyota Jidosha Kabushiki Kaisha. Continuously variable transmission control system responsive to passenger compartment noise or vibration. 4,716,790, Cl. 74-866.000.

Sawada, Hitoshi: *See—*
Kunugiza, Kiyomitsu; Yamamoto, Tadaaki; and Sawada, Hitoshi, 4,717,697, Cl. 502-34.000.

Sawyer, Edward G., to Eastman Kodak Company. Partitioned editing method for a collection of video still pictures. 4,717,971, Cl. 358-342.000.

Scamardo, Dennis M.: *See—*
Delgado, Daniel, Jr., 4,717,187, Cl. 294-17.000.

Scarpati, Michael: *See—*
Petrella, Robert G.; and Scarpati, Michael, 4,717,611, Cl. 428/99.000.

Scarpino, Christopher. Manual, multi-ratio transmission. 4,716,778, Cl. 74-371.000.

Schad, Robert D.; and Brown, Paul P., to Husky Injection Molding Systems, Inc. Coinjection of hollow articles and preforms. 4,717,324, Cl. 425-130.000.

Schaefer, Andreas: *See—*
Fehr, Erwin; and Schaefer, Andreas, 4,717,246, Cl. 350-516.000.

Schaefer, Henry A., to General Electric Company. Portable two way radio with split universal device connector apparatus. 4,718,110, Cl. 455-90.000.

Schaefer, Robert F.: *See—*
Baker, George E.; and Schaefer, Robert F., 4,717,280, Cl. 403-338.000.

Schaeffer, Gene T.: *See—*
Patrician, Thomas J.; Schaeffer, Gene T.; and Martin, Harry D., III, 4,717,538, Cl. 420-429.000.

Schaeffler, Georg, to Motomak Motorenbau, Maschinen- und Werkzeugfabrik, Konstruktionen GmbH. Inner element for a hydraulic compensation element. 4,716,865, Cl. 123-90.550.

Schaper, Wolfgang; Blume, Ernst; Raether, Wolfgang; and Dittmar, Walter, to Hoechst Aktiengesellschaft. 1-(1,3-dioxolan-2-ylmethyl-)azoles, their salts and their use. 4,717,724, Cl. 514-278.000.

Schawbel Corporation, The: *See—*
Zaborowski, Thaddeus, 4,716,885, Cl. 126-413.000.

Scheffler, Timothy H.: *See—*
Parker, Scott S.; Scheffler, Timothy H.; and Schirmer, Paul W., 4,718,082, Cl. 379-98.000.

Schell, David L.; Van der Put, Henk A.; and Verboom, Johannes J., to Laser Magnetic Storage International Company. Servo error write blanking circuit for an optical recording disk. 4,718,054, Cl. 369-54.000.

Schempp, Otto; and Herold, Martin, to Litton Precision Products International GmbH. Connector for circuit boards. 4,717,344, Cl. 439-61.000.

Schering Aktiengesellschaft: *See—*
Suhr, Harald; Oehr, Christian; and Feurer, Ernst, 4,717,587, Cl. 427-39.000.

Scheve, Bernard J.; and Brungardt, Clement L., to Hercules Incorporated. No thermal cure dry film solder mask. 4,717,643, Cl. 430-264.000.

Schieman, Richard D., to Standard Oil Company. Heavy duty diesel engine oil blend. 4,717,489, Cl. 252-32.70E.

Schimpf, Rolf: *See—*
Blank, Heinz U.; Emde, Herbert; and Schimpf, Rolf, 4,717,514, Cl. 260-508.000.

Schindler, Josef: *See—*
Autenrieth, Lothar; Marth, Kurt; and Schindler, Josef, 4,717,901, Cl. 336-83.000.

Schipper, Paul H.: *See—*
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,717,466, Cl. 208-113.000.

Schippers, Norbert: *See—*
Gobbels, Heinz-Dieter; Lassmann, Manfred; Raasch, Hans; and Schippers, Norbert, 4,716,718, Cl. 57-263.000.

Schirmann, Jean-Pierre: *See—*
Devic, Michel; and Schirmann, Jean-Pierre, 4,717,451, Cl. 162-72.000.

Schirmer, Paul W.: *See—*
Parker, Scott S.; Scheffler, Timothy H.; and Schirmer, Paul W., 4,718,082, Cl. 379-98.000.

Schlotterer, Joseph C. Bicycle pedal for releasably connecting the shoe of the cyclist thereto. 4,716,784, Cl. 74-594.600.

Schmid, Eberhard: *See—*
Koch, Rudolf; and Schmid, Eberhard, 4,717,869, Cl. 323-316.000.

Schmid, Hans-Rudolf, to Sandoz Ltd. Aqueous optical brightener compositions. 4,717,502, Cl. 252-301.230.

Schmidgall, Earl R.: *See—*
Bill, James M., Sr.; Schmidgall, Earl R.; Schmidgall, Edward G.; and Schmidgall, Frank C., 4,716,642, Cl. 29-265.000.

Schmidgall, Edward G.: *See—*
Bill, James M., Sr.; Schmidgall, Earl R.; Schmidgall, Edward G.; and Schmidgall, Frank C., 4,716,642, Cl. 29-265.000.

Schmidgall, Frank C.: *See—*
Bill, James M., Sr.; Schmidgall, Earl R.; Schmidgall, Edward G.; and Schmidgall, Frank C., 4,716,642, Cl. 29-265.000.

Schmidt, Ernst L. Tank washing system. 4,716,917, Cl. 134-167.00R.

Schmidt, Robert R.: *See—*
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,717,417, Cl. 71-94.000.

Schmitt, Kenneth J.: *See—*
Eastlund, Bernard J.; Schmitt, Kenneth J.; Bass, Ronald M.; and Harrison, John M., 4,716,960, Cl. 166-60.000.

Schmitz, John P.; and Hollinger, Jeffrey O., to United States of America, Army. Adjustable mold for fabricating bone replacements. 4,717,115, Cl. 249-112.000.

Schmued, Laurence C., to Fluorochrome, Inc. Method of retrograde fluorescent labeling of neurons. 4,716,905, Cl. 128-634.000.

Schnee, Edward A.: *See—*
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,717,493, Cl. 252-62.540.

Schneider, Franz; Wenz, Herbert; and Link, Gunter, to Pfaff Industriemaschinen GmbH. Sewing machine with workpiece holder for securing initial seam stitches. 4,716,846, Cl. 112-239.000.

Schneider, John C. Burial vault lowering devices. 4,716,636, Cl. 27-32.000.

Schneider, Michael: *See—*
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,716,859, Cl. 123-3.000.

Schniter, Jorg, to R. R. Donnelley & Sons Company. Stream feeder apparatus for printed sheets. 4,717,140, Cl. 271-168.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Ikekawa, Nobuo; and Ostrem, Voula, 4,717,721, Cl. 514-167.000.

Schoettle, Klaus; Deigner, Paul; Dietze, Herbert; Frank, Volker; and Waidele, Oswald, to BASF Aktiengesellschaft. Tape cassette, in particular a video tape cassette, and a pressure spring therefor. 4,717,091, Cl. 242-199.000.

Scholz, Guenther: *See—*
Christgau, Hermann; Mika, Norbert; Roehrich, Heinz; and Scholz, Guenther, 4,717,860, Cl. 313-525.000.

Schouten, Fredericus C.: *See—*
Bol, Gerardus M.; Meija, Franciscus H.; Schouten, Fredericus C.; Stewart, Robert B.; and De Roo, Petrus C., 4,716,965, Cl. 166-297.000.

Schram, David N.: *See—*
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,717,460, Cl. 204-444.000.

Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate. 4,717,810, Cl. 219-457.000.

Schrock, Richard R.: *See—*
Dubois, Robert A.; and Schrock, Richard R., 4,717,783, Cl. 585-511.000.

Schroeder, George O.: *See—*
Tse, Samuel W.; and Schroeder, George O., 4,717,618, Cl. 428-213.000.

Schroeppel, Edward A.: *See—*
Koning, Gerrit; and Schroeppel, Edward A., 4,716,887, Cl. 128-419.0PG.

Schulman, Norman: *See—*
Schulman, Norman M.; and Raible, Donald, 4,716,886, Cl. 128-305.000.

Schulman, Norman M.; and Raible, Donald, to Schulman, Norman. Umbilical cord clamp and cutters. 4,716,886, Cl. 128-305.000.

Schulte-Elte, Karl-Heinrich; and Kastner, Dietrich, to Firmenich SA. Unsaturated aliphatic ketone [and use of same as perfuming ingredient]. 4,717,771, Cl. 549-548.000.

Schulte, Thomas H., to Becton, Dickinson and Company. Detection of bacteria by fluorescent staining in an expanded buffy coat. 4,717,660, Cl. 435-30.000.

Schultheiss, Nicolaas G., to NKF Groep Nederlandsch Octrooibureau. Optical multiplexer device. 4,718,056, Cl. 370-3.000.

Schultz, William J.: *See—*
Pittman, Raymond H.; and Schultz, William J., 4,716,645, Cl. 29-527.100.

Schulz, David W.: *See—*
Weinert, Edward D.; and Schulz, David W., 4,717,433, Cl. 148-20.300.

Schulze, Harry O.: *See—*
Wolfe, Robert W.; and Schulze, Harry O., 4,717,590, Cl. 427-48.000.

Schwab, John A., to Westinghouse Electric Corp. Pressure control system for a pressurized water nuclear reactor plant. 4,717,532, Cl. 376-283.000.

Schwadtke, Karl; Smulders, Eduard; and Andree, Hans, to Henkel Kommanditgesellschaft aft Aktien. Liquid detergent with fabric softening properties. 4,717,507, Cl. 252-548.000.

Schwarz, James A., to Syracuse University. Metal assisted carbon cold storage of hydrogen. 4,716,736, Cl. 62-48.000.

Schwirian, Richard E.: *See—*
Merkovsky, Daniel; and Schwirian, Richard E., 4,717,529, Cl. 376-245.000.

Schwizer, Anton, to Niro Plan AG. Flat electric heating body and deep fryer with tub, trough and sump. 4,717,809, Cl. 219-438.000.

Scifres, Donald R.: *See—*
Streifer, William; and Scifres, Donald R., 4,718,069, Cl. 372-50.000.

Scondo, Christian: *See—*
Kunst, Helmut; and Scondo, Christian, 4,717,429, Cl. 148-15.000.

Scot Young Service Systems Limited: *See—*
Young, Ronald A., 4,716,619, Cl. 15-262.000.

Scott, Colonel W. Water purification apparatus. 4,717,476, Cl. 210-266.000.

Scott, Paul H., to Advanced Micro Devices, Inc. Methods for receiving and converting high speed serial data pattern input signals to parallel data pattern outputs. 4,717,914, Cl. 340-825.060.

Scott USA Limited Partnership, a Washington Limited partnership: *See—*
McNeal, Joseph R., 4,716,601, Cl. 2-434.000.

Scott, Winston C., Jr. Crab cracker. 4,716,627, Cl. 17-73.000.

Scottish & Newcastle Breweries plc: *See—*
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, 4,717,580, Cl. 426-600.000.

Scoville, John R., Jr.: *See—*
McCormick, Patrick J.; and Scoville, John R., Jr., 4,717,661, Cl. 435-31.000.

Screenex Wire Weaving Manufactures (Proprietary) Limited: *See—*
Freisele, Manfred F. A., 4,716,694, Cl. 52-127.600.

Scripps, Keith A.; and Driggers, Thomas C. Detector and light assembly. 4,717,910, Cl. 340-693.000.

Seaton, James C.: *See—*
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, 4,717,580, Cl. 426-600.000.

Seeley, Gerard: *See—*
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,717,596, Cl. 427-248.100.

Seeley, Roger W., to Dowty Rotol Limited. Variable-pitch bladed rotors. 4,717,312, Cl. 416-145.000.

Seguin, Richard W.: *See—*
Keem, John E.; Flasck, James D.; and Seguin, Richard W., 4,717,632, Cl. 428-698.000.

Seheult, James M.; and Grebe, Ernest L., to Merck Co., Inc. Spacer fluid. 4,717,488, Cl. 252-8.551.

Seibert, Woffram: *See—*
Belart, Juan; Seibert, Woffram; and Ocvirk, Norbert, 4,717,210, Cl. 303-114.000.

Seiffarth, Ernst-August: *See—*
Halldorsson, Thorsteins; Langerholc, John; Manhart, Sigmund; and Seiffarth, Ernst-August, 4,717,252, Cl. 356-5.000.

Seiko Instruments & Electronics Ltd.: *See—*
Shioda, Toshimi; Noda, Minoru; Nagai, Masahide; Higake, Masatoshi; Makishima, Yutaka; and Yokose, Kazutoshi, 4,717,265, Cl. 384-49.000.

Seiko Kagaku Kogyo Co., Ltd.: *See—*
Yoshioka, Shigehiko; Yoshida, Tsuneo; Sato, Hisatake; Yamada, Hideto; and Adachi, Yoshio, 4,717,452, Cl. 162-158.000.

Seitz, Rudolf, to Sandoz Ltd. Hair-reserving dyeing of wool- and fur-bearing skins. 4,717,389, Cl. 8-436.000.

Seki, Fumio, to Yoshida Kogyo K. K. Button feeder for button applicator. 4,717,061, Cl. 227-119.000.

Seki, Mitsuhiro; and Hamamura, Fumio, to Somar Corporation. Laminator. 4,717,441, Cl. 156-521.000.

Sekine, Shoji: *See—*
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,717,337, Cl. 432-14.000.

Selenia - Industrie Ellettroniche Associate S.p.A.: *See—*
Marchetti, Renato; Penco, Eugenio; and Salvetti, Gianemilio, 4,718,072, Cl. 372-86.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,717,602, Cl. 427-53.100.
Yamazaki, Shunpei, 4,717,941, Cl. 357-23.300.

Senco Products, Inc.: *See—*
Cotta, Gilbert A., 4,717,060, Cl. 227-10.000.

Sepstrup, James L., to Boeing Company, The. Aircraft wings with aileron-supported ground speed spoilers and trailing edge flaps. 4,717,097, Cl. 244-217.000.

Serban, Alexander: *See—*
Warner, Richard B.; Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Cross, Lindsay E.; and Farquharson, Graeme J., 4,717,418, Cl. 71-98.000.

Sernetz, Heinz. Swimming pool cover. 4,716,603, Cl. 4-501.000.

Serrano, Arthur L.; and Holman, Andrew W. Microprocessor controlled interface for cellular system. 4,718,080, Cl. 379-59.000.

Servadio, Robert. Clothesline locking pole. 4,717,107, Cl. 248-353.000.

Service National Electricite de France: *See—*
Beuglot, Marcel, 4,717,530, Cl. 376-245.000.

SGS Microelettronica SpA: *See—*
Stefani, Fabrizio; and Botti, Edoardo, 4,717,887, Cl. 330-261.000.

SGS Semiconductor Corporation: *See—*
Dunn, William C., 4,717,845, Cl. 307-475.000.

Sha, Kokusho: *See—*
Ono, Mitsuhiro; Sha, Kokusho; Suzuki, Michiya; Ogata, Tateaki; and Yoshida, Ekuo, 4,717,880, Cl. 324-316.000.

Shackelford, James R., to B. F. Goodrich Company, The. Fasteners for honeycomb structures. 4,717,612, Cl. 428-116.000.

Shaffer, John W., to GTE Products Corporation. Flashed-lamp indicator. 4,717,336, Cl. 431-360.000.

Shaffer, Willis G., to Salazar, Michael J., a part interest. Convertible bed and wheelchair unit. 4,717,169, Cl. 280-648.000.

Shannon, Keith. Protective garment for protection against mosquitoes and other insects. 4,716,594, Cl. 2-4.000.

Sharp Kabushiki Kaisha: *See—*
Fujii, Masanobu, 4,717,811, Cl. 219-497.000.
Fukunaga, Takahiro, 4,717,937, Cl. 355-3.0FU.
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,718,029, Cl. 364-710.000.
Takahashi, Akira; Murakami, Yoshiteru; Katayama, Hiroyuki; Hirokane, Junji; and Ohta, Kenji, 4,717,628, Cl. 428-457.000.
Tanaka, Koichi; Ogura, Takashi; Taniguchi, Koji; Mikami, Akiyoshi; and Yoshida, Masaru, 4,717,858, Cl. 313-503.000.

Shaw, John M.; and Oloman, Colin W., to University of British Columbia. Removal of chloride from process solutions. 4,717,450, Cl. 162-29.000.

Shaw, Peter A.: *See—*
Pask, George; and Shaw, Peter A., 4,716,721, Cl. 60-39.320.

Shell Internationale Research Maatschappij BV: *See—*
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,717,702, Cl. 502-303.000.

Shell Oil Company: *See—*
Bol, Gerardus M.; Meija, Franciscus H.; Schouten, Fredericus C.; Stewart, Robert B.; and De Roo, Petrus C., 4,716,965, Cl. 166-297.000.
Kemp, Richard A., 4,717,698, Cl. 502-211.000.
Kemp, Richard A., 4,717,704, Cl. 502-211.000.
Kemp, Richard A., 4,717,705, Cl. 502-211.000.
Kemp, Richard A., 4,717,706, Cl. 502-211.000.
Kemp, Richard A., 4,717,707, Cl. 502-211.000.
Laureen, Nils K., 4,717,287, Cl. 405-169.000.
Lewis, Robert M.; Van Santen, Rutger A.; and Ott, Kevin C., 4,717,513, Cl. 534-9.000.
Paxson, Timm E., 4,717,785, Cl. 585-823.000.
Stem, Stephen C.; and Evans, Wayne E., 4,717,784, Cl. 585-738.000.

Shepherd, Kathleen P.; and Djerf, Tobin. Road marker system and method of installation. 4,717,281, Cl. 404-16.000.

Shepherd, Philip E.; and Johnson, Gregory R. Liquid sensor and touch control for hydrotherapy baths. 4,716,605, Cl. 4-544.000.

Shepherd, Robin G.: *See—*
White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., 4,717,731, Cl. 514-291.000.

Sherwood, Nancy S.; and Alfano, Nicholas J., to Calgon Corporation. Method of inhibiting the corrosion of copper and copper alloys. 4,717,543, Cl. 422-15.000.

Shetty, Jayarama K.: *See—*
Charles, Robert L.; Dolby, Steven C.; Patel, Chimanbhai P.; and Shetty, Jayarama K., 4,717,665, Cl. 435-198.000.
Montgomery, Curtis J.; Shetty, Jayarama K.; and Singley, Eric C., 4,717,662, Cl. 438-99.000.

Shiba, Haruo; Hashizume, Kenji; and Okamura, Masatoshi, to TDK Corporation. Tape cassette with low friction slide member for guiding movement of a lid thereon. 4,717,980, Cl. 360-132.000.

Shibamoto, Yutaka, to Nissan Motor Co., Ltd. Internal parts fixing structure for tank. 4,716,931, Cl. 137-558.000.

Shibasaki, Hiroshi: *See—*
Nakamura, Masatoshi; Shibasaki, Hiroshi; and Nishida, Shigeto, 4,716,907, Cl. 128-731.000.

Shibata, Isamu; and Shimada, Kazuyuki, to Ricoh Company, Ltd. Optical scanner without extra convergent lens. 4,717,925, Cl. 346-108.000.

Shibata, Norio: *See*—
Chino, Naoyoshi; Hiraki, Yasuhito; Sato, Tsunehiko; Chikamasa, Hiroshi; and Shibata, Norio, 4,717,603, Cl. 427-434.300.

Shiber, Samuel: *See*—
Husted, Royce H., 4,717,369, Cl. 474-49.000.

Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, to Diesel Kiki Co., Ltd. Vane compressor with vane back pressure adjustment. 4,717,321, Cl. 418-76.000.

Shida, Shigeru: *See*—
Muramatsu, Shigeru; Shida, Shigeru; Horie, Takeo; and Yamada, Masashi, 4,717,316, Cl. 417-372.000.

Shidara, Keiichi: *See*—
Yamamoto, Masanao; Inoue, Eisuke; Shidara, Keiichi; and Hiruma, Eikyuu, 4,717,854, Cl. 313-366.000.

Shigekane, Hisao, to Fuji Electric Company Ltd. Semiconductor device for conducting primary current upon receipt of a control signal. 4,717,849, Cl. 307-370.000.

Shigematu, Takashi: *See*—
Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, 4,716,790, Cl. 74-866.000.

Shigemitsu, Fumiaki: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.

Shigma, Inc.: *See*—
Makita, Hajime, 4,717,812, Cl. 219-528.000.

Shiino, Tatsuo: *See*—
Utsui, Masaaki; Shimizu, Makoto; Hoshina, Noriyuki; Adachi, Nobuyuki; Kurihara, Takashi; and Shiino, Tatsuo, 4,716,650, Cl. 29-430.000.

Shikama, Shinsuke: *See*—
Kondo, Mitsushige; Shikama, Shinsuke; Kono, Keizo; and Fujita, Teruo, 4,718,052, Cl. 369-44.000.

Shikano, Tohru; and Ogasawara, Terumi, to Asahi Seimitsu Kabushiki Kaisha. Automatic diaphragm control device of variable photometry type used in objective for television camera. 4,717,960, Cl. 358-228.000.

Shima, Kazumasa; Kawasaki, Syunpei; and Kubo, Takashige, to Hitachi, Ltd. Programmable logic array circuit with a decreased number of product terms. 4,717,844, Cl. 307-465.000.

Shimada, Hiroshi: *See*—
Maeda, Naoyuki; Kato, Osamu; Oshimi, Hirosaku; Nii, Akira; Shimada, Hiroshi; Harakawa, Michiharu; Hirano, Takuji; and Hara, Shigeo, 4,717,331, Cl. 425-467.000.

Shimada, Kazuyuki: *See*—
Shibata, Isamu; and Shimada, Kazuyuki, 4,717,925, Cl. 346-108.000.

Shimada, Mithuo; Yokocho, Yoetsu; and Nakayama, Yoshiki, to Kioritz Corporation. Device for mounting a carburetor having a body made of synthetic resin. 4,716,878, Cl. 123-540.000.

Shimada, Satoshai: *See*—
Sato, Yoshio; Shimada, Satoshai; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.

Shimadzu Corporation: *See*—
Kita, Yasuo, 4,716,788, Cl. 74-858.000.

Shimizu, Goro; and Hayashi, Yoshimi, to Matsui Shikiso Chemical Co. Ltd.; and Sanrio Company, Ltd. Thermochromic composition. 4,717,710, Cl. 503-213.000.

Shimizu, Isamu: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,717,585, Cl. 427-39.000.
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,717,586, Cl. 427-39.000.

Shimizu, Makoto: *See*—
Utsui, Masaaki; Shimizu, Makoto; Hoshina, Noriyuki; Adachi, Nobuyuki; Kurihara, Takashi; and Shiino, Tatsuo, 4,716,650, Cl. 29-430.000.

Shimizu, Masami; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Display device for camera. 4,717,936, Cl. 354-471.000.

Shimizu, Susumu: *See*—
Iwasaki, Kenji; Shimizu, Susumu; and Ono, Hidenosuke, 4,717,222, Cl. 350-6.500.

Shimizu, Yuichi: *See*—
Hayashi, Seizo; Kitamura, Hidenori; and Shimizu, Yuichi, 4,716,620, Cl. 15-327.00F.

Shimomura, Setsuhiro; and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection control system for internal combustion engine. 4,716,876, Cl. 123-480.000.

Shinko Electric Industries Co., Ltd.: *See*—
Nakazawa, Masao; Nishiyama, Yoshirou; and Wakabayashi, Shinichi, 4,717,459, Cl. 204-44.300.

Shinoda, Hatsuhiko, to Sony Corporation. Remote control apparatus. 4,718,112, Cl. 455-151.000.

Shinobe, Takashi; Takigami, Katsuhiko; Ohashi, Hiromichi; and Nakagawa, Akio, to Kabushiki Kaisha Toshiba. MIS controlled gate turn-off thyristor. 4,717,940, Cl. 357-38.000.

Shinozaki, Toshiaki: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.

Shioda, Toshimi; Noda, Minoru; Nagai, Masahide; Higake, Masatoshi; Makishima, Yutaka; and Yokose, Kazutoshi, to Seiko Instruments & Electronics Ltd. Supporting mechanism of a linearly movable bearing. 4,717,265, Cl. 384-49.000.

Shionoya, Masahisa: *See*—
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Okamura, Haruki; and Shionoya, Masahisa, 4,717,745, Cl. 524-91.000.

Shiraishi, Daiichi: *See*—
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,716,623, Cl. 16-371.000.

Shiraishi, Hideo: *See*—
Sakamoto, Katsuhiko; Hosokai, Tetsuhi; and Shiraishi, Hideo, 4,716,871, Cl. 123-339.000.

Shiraki, Hisashi; Nagahisa, Toshio; Takeda, Kiyonori; and Harada, Takeshi, to Kitagawa Iron Works Co., Ltd. Apparatus for improving characteristics of sand. 4,717,478, Cl. 210-360.200.

Shirato, Monpei; Iritani, Eiji; Yagishita, Aisaburo; and Yagishita, Kazuhiko, to Kabushiki Kaisha Sanshin Seisakusho. Method of filtering suspension. 4,717,486, Cl. 210-785.000.

Shiroki Kinzoku Kogyo Kabushiki Kaisha: *See*—
Tezuka, Takeshi, 4,717,204, Cl. 297-362.000.

Shishido, Tadao: *See*—
Ueda, Shinji; Nakajima, Junya; Shishido, Tadao; and Shuto, Sadanobu, 4,717,648, Cl. 430-379.000.

Shoji, Hideyuki: *See*—
Kita, Kazunori; Shoji, Hideyuki; and Aihara, Toshiharu, 4,717,261, Cl. 368-61.000.

Shoji, Mikio: *See*—
Ogano, Takeo; Toda, Yoshihiro; Mukainakano, Masato; and Shoji, Mikio, 4,716,717, Cl. 56-255.000.

Shojima, Hiroshi; Mifune, Toshimi; Mori, Junko; and Kuzunuki, Soshiro, to Hitachi, Ltd. Method and apparatus for on-line recognizing handwritten patterns. 4,718,103, Cl. 382-13.000.

Shporer, Mordechai: *See*—
Taicher, Zvi; Shtrikman, Shmuel; Paltiel, Zvi; and Shporer, Mordechai, 4,717,877, Cl. 324-303.000.

Shrimpton, Ronald J. Truck windshield moulding insertion tool. 4,716,641, Cl. 29-235.000.

Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International de Recherches Dermatologiques (C.I.R.D.). Benzonaphthalene derivatives and compositions. 4,717,720, Cl. 514-63.000.

Shtrikman, Shmuel: *See*—
Taicher, Zvi; Shtrikman, Shmuel; Paltiel, Zvi; and Shporer, Mordechai, 4,717,877, Cl. 324-303.000.
Taicher, Zvi; and Shtrikman, Shmuel, 4,717,878, Cl. 324-303.000.

Shu, Paul, to Mobil Oil Corporation. Amino resin modified xanthan polymer gels for permeability profile control. 4,716,966, Cl. 166-295.000.

Shutler, William F.: *See*—
Aichelmann, Frederick J., Jr.; Shutler, William F.; and Sollitto, Vincent F., Jr., 4,718,039, Cl. 364-900.000.

Shuto, Sadanobu: *See*—
Ueda, Shinji; Nakajima, Junya; Shishido, Tadao; and Shuto, Sadanobu, 4,717,648, Cl. 430-379.000.

Sibata, Takuo: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.

Siecor Corporation: *See*—
Coleman, John D.; and Obst, Donald L., 4,716,989, Cl. 187-1.00R.

Siemens Aktiengesellschaft: *See*—
Autenrieth, Lothar; Marth, Kurt; and Schindler, Josef, 4,717,901, Cl. 336-83.000.
Bleidorn, Werner-Wilhelm; and Krause, Norbert, 4,718,078, Cl. 318-561.000.
Christgau, Hermann; Mika, Norbert; Roehrich, Heinz; and Scholz, Guenther, 4,717,860, Cl. 313-525.000.
Dathe, Joachim, 4,717,617, Cl. 428-209.000.
Dragotin, Alexander, 4,718,084, Cl. 379-412.000.
Drexler, Johann; and Flierl, Erwin, 4,717,899, Cl. 335-131.000.
Fenner, Ernst; and Vogt, Martina, 4,717,851, Cl. 310-334.000.
Grassl, Erwin; and Hansbauer, Hermann, 4,717,817, Cl. 235-441.000.
Haertl, Christof, 4,716,985, Cl. 181-130.000.
Hoene, Ernst-Ludwig, 4,717,797, Cl. 200-144.00B.
Jacobs, Erwin P.; and Winnerl, Josef, 4,717,686, Cl. 437-56.000.
Jaentsch, Ottomar, 4,717,688, Cl. 437-120.000.
Koch, Rudolf; and Schmid, Eberhard, 4,717,869, Cl. 323-316.000.
Wetzel, Friedrich, 4,718,001, Cl. 364-169.000.
Winzer, Gerhard, 4,718,055, Cl. 370-3.000.

Sierens, Willy M. D.: *See*—
Jensen, Borge R.; and Sierens, Willy M. D., 4,716,942, Cl. 139-370.200.

Sievers Research, Inc.: *See*—
Sievers, Robert E.; and Nyarady, Stefan A., 4,717,675, Cl. 436-101.000.

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Signoretto, Roberto, to Photo Engineering International S.r.l. Apparatus for correlating wallets with processing envelopes in photographic laboratories. 4,716,711, Cl. 53-460.000.

Silicon Technology Corporation: *See*—
Steere, Robert E., 4,716,881, Cl. 125-15.000.

Silver, Burton B., to Spectro-Scan, Inc. Method for determining intracellular mineral levels. 4,717,826, Cl. 250-307.000.

Simmons, John. Safety device for a needle. 4,717,386, Cl. 604-192.000.

Simpson Strong-Tie Company, Inc.: *See*—
Commins, Alfred D., 4,717,279, Cl. 403-187.000.

Sims, David V.: *See*—
Sims, Loyie H., 4,717,474, Cl. 210-180.000.

Sims, Loyie H., to Sims, David V.; and Sims, Michael J., trustees for the David V. Sims and Michael J. Sims 1983 Revocable Estate Trust. Oil refiner with atomizing nozzle. 4,717,474, Cl. 210-180.000.

Sims, Michael J.: *See*—
Sims, Loyie H., 4,717,474, Cl. 210-180.000.

Sinclair, A. Richard: *See*—
Graham, John W.; and Sinclair, A. Richard, 4,717,594, Cl. 427-214.000.

Sinclair, Richard G.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,716,964, Cl. 166-284.000.

Singh, Gururaj: *See*—
Venkitakrishnan, P.; Singh, Gururaj; and Laugesen, Ronald C., 4,718,057, Cl. 370-55.000.

Singley, Eric C.: *See*—
Montgomery, Curtis J.; Shetty, Jayarama K.; and Singley, Eric C., 4,717,662, Cl. 435-99.000.

Sircar, Ila; and Bristol, James A., to Warner-Lambert Company. 4,5-dihydro-6-(substituted)phenyl-5-methyl-3-(2H)-pyridazinones and pharmaceutical compositions containing the compounds as active components. 4,717,730, Cl. 514-252.000.

Skandinaviska Apparatindustri AB Saiap: *See*—
Jarreby, Karl A. B., 4,716,646, Cl. 29-564.100.

SKF Linearsysteme GmbH: *See*—
Walter, Lothar; Mayer, Uwe; Winkler, Otmar; and Dobhan, Herbert, 4,717,264, Cl. 384-43.000.

Skid: *See*—
Bocquet, Jean-Pierre, 4,717,601, Cl. 427-421.000.

Skotko, Sandra L.: *See*—
Fisch, Herbert A.; Palaha, Edward M.; and Skotko, Sandra L., 4,717,500, Cl. 252-181.400.

Skowronek, William R.: *See*—
Knaster, Mark B.; and Skowronek, William R., 4,717,431, Cl. 428-428.000.

Skyba, Helmut K. Cam lock with positive release. 4,716,630, Cl. 24-134.00R.

Skyba, Helmut K. Tree saw with extension attachment. 4,716,653, Cl. 30-296.00R.

Sloane, Edwin A.; Chan, Kai Y.; and Yau, David D., to Fairchild Semiconductor Corporation. Digital method for synthesizing composite video signals. 4,718,018, Cl. 364-480.000.

Sloane, Thomas E., Jr.: *See*—
Ravo, Biagio; Sloane, Thomas E., Jr.; and Regan, Christine L., 4,716,900, Cl. 128-334.00R.

Small, Kenneth T., to Boechert Inc. Single wire current share paralleling of power supplies. 4,717,833, Cl. 307-44.000.

Smayling, Michael C.: *See*—
Baglee, David A.; and Smayling, Michael C., 4,718,041, Cl. 365-185.000.

SMC Corporation: *See*—
Ishigaki, Tsuneo, 4,717,116, Cl. 251-30.020.

Smith College: *See*—
Sutton, C. Sean, 4,717,258, Cl. 356-444.000.

Smith Corona Corporation: *See*—
Pawlak, Stephen M., 4,717,272, Cl. 400-232.000.

Smith, David E.; and Olmsted, Dennis R., to Aspen Peripherals. Device for restoring and removing a tape leader block to and from a tape cassette. 4,717,090, Cl. 242-197.000.

Smith, Harry D., Jr.; and Gadeken, Larry L., to Halliburton Company. Method and apparatus for anomalous radioactive deposition compensation in spectral gamma ray well logging. 4,717,825, Cl. 250-256.000.

Smith, Lancing G.; Walker, Lonnie R.; and Denison, William J., to Halliburton Company. Close tolerance pin connection. 4,716,848, Cl. 114-75.000.

Smith, Max D., to Indian Industries, Inc. Self-tensioning game net. 4,717,157, Cl. 273-411.000.

Smith, Nelson S., Jr.: *See*—
Ellison, Frank M.; Gencsoy, Hasan T.; and Smith, Nelson S., Jr., 4,717,008, Cl. 194-343.000.

Smith, Robert E., to Sparton Corporation. Electric horn with improved pole piece and adjusting cap. 4,717,906, Cl. 340-388.000.

Smith, William L.: *See*—
Alphin, Reevis S.; Smith, William L.; Munson, Harry R., Jr.; and Boswell, Robert F., 4,717,563, Cl. 424-10.000.

SmithKline Beckman Corporation: *See*—
Ali, Fadia E., 4,717,715, Cl. 514-11.000.
Brawner, Mary E.; Eckhardt, Thomas G.; and Fare, Louis R., 4,717,666, Cl. 435-253.000.

SMS Concast Inc.: *See*—
Fastert, Herbert P., 4,716,955, Cl. 164-475.000.

Smulders, Eduard: *See*—
Schwadtke, Karl; Smulders, Eduard; and Andree, Hans, 4,717,507, Cl. 252-548.000.

Snead, Thomas E.: *See*—
Ravichandran, Ramanathan; and Snead, Thomas E., 4,717,748, Cl. 524-230.000.

Snyder, Robert G. Movable door seal. 4,716,697, Cl. 52-173.0DS.

So, Philip K.; and Pine, John J., to Bemis Associates, Inc. Lettering material for fabric and the like. 4,717,621, Cl. 428-349.000.

Societa' Cavi Pirelli S.p.A.: *See*—
Priaroggia, Paolo G., 4,717,232, Cl. 350-96.200.

S.A. des Etablissements Staubli (France): *See*—
Palau, Joseph, 4,716,939, Cl. 139-79.000.

Societe Francaise de Stockage Geologique - GEOSTOCK: *See*—
Amantini, Eric, 4,716,758, Cl. 73-38.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation-S.N.E.C.M.A.: *See*—
Jourdain, Gerard E. A.; and Marlin, Francois, M. B., 4,716,640, Cl. 29-157.00C.
Rambach, Daniel, 4,716,722, Cl. 60-39.830.

Societe Nationale Elf Aquitaine (Production): *See*—
Baritiu, Georges-Michel; Gherardi, Jean-Claude; and Lecoate, Bernard, 4,717,547, Cl. 422-62.000.
Staroe, Philippe; Arens, Georges; and Gros, Pierre, 4,718,048, Cl. 367-40.000.

Soga, Kazuo: *See*—
Doi, Yoshiharu; Soga, Kazuo; Ueki, Satoshi; and Miyazaki, Makoto, 4,717,755, Cl. 525-333.700.

Sohn, Sang H., to Gold Star Co., Ltd. Polychromatic electro luminescence display device. 4,717,859, Cl. 313-505.000.

Solar Armaturproduktion A/S: *See*—
Bartenbach, Christian; and Thage-Jorgensen, Thorkild, 4,717,992, Cl. 362-217.000.

Sollitto, Vincent F., Jr.: *See*—
Aichelmann, Frederick J., Jr.; Shutler, William F.; and Sollitto, Vincent F., Jr., 4,718,039, Cl. 364-900.000.

Somar Corporation: *See*—
Seki, Mitsuhiro; and Hamamura, Fumio, 4,717,441, Cl. 156-521.000.

Sommargren, Gary E., to Zygo Corporation. Angle measuring interferometer. 4,717,250, Cl. 356-349.000.

Sonoco Products Company: *See*—
Elias, Thomas C., 4,717,374, Cl. 493-292.000.

Sony Corporation: *See*—
Kato, Hiroshi, 4,717,856, Cl. 313-466.000.
Shinoda, Hatsuhiko, 4,718,112, Cl. 455-151.000.

Sootome, Sumitoshi; Toriumi, Mototada; Tanaka, Sohei; and Sasaki, Shinichi, to Canon Kabushiki Kaisha. Sheet feeding apparatus. 4,717,139, Cl. 271-116.000.

SOTAS, Inc.: *See*—
Mannas, Earl L.; and Johnson, Thomas H., Jr., 4,718,074, Cl. 375-118.000.

Soule: *See*—
Huon De Kermadec, Jean; and Thomas, Guy M. C. M., 4,716,838, Cl. 104-173.100.

Soullard, Marcel: *See*—
Chiron, Gabriel; Soullard, Marcel; and Fradin, Maurice, 4,716,626, Cl. 17-46.000.

Souriau & Cie: *See*—
De Mendez, Michel; Bargain, Raymond; Dohan, Yves; and Herubel, Guy, 4,717,352, Cl. 439-161.000.

SpaceLabs, Inc.: *See*—
Choksi, Pradip V., 4,717,403, Cl. 55-429.000.
Ruff, Gray E., 4,716,906, Cl. 128-686.000.

Spaller, Albert E., Jr., to Eastman Kodak Company. Rapid cut-off apparatus for high speed moving yarn. 4,716,801, Cl. 83-286.000.

Sparton Corporation: *See*—
Smith, Robert E., 4,717,906, Cl. 340-388.000.

Spectra Diode Laboratories, Inc.: *See*—
Streifer, William; and Scifres, Donald R., 4,718,069, Cl. 372-50.000.

Spectra-Physics, Inc.: *See*—
Hart, Edward E., Jr.; and Patten, Joseph G., 4,717,266, Cl. 384-100.000.

Spectro-Scan, Inc.: *See*—
Silver, Burton B., 4,717,826, Cl. 250-307.000.

Speech Systems, Inc.: *See*—
Meisel, William S., 4,718,096, Cl. 381-43.000.

Speil, Walter, to Motomak Motorenbau Maschinen- und Werkzeugfabrik, Konstruktionen GmbH. Inner element for a hydraulic valve compensation element. 4,716,866, Cl. 123-90.550.

Speil, Walter, to Motomak Motorenbau, Maschinen- und Werkzeugfabrik, Konstruktionen GmbH. Inner element for a hydraulic value compensation element. 4,716,867, Cl. 123-90.550.

Spengler, Ernst M., to Staaztechnik GmbH R+S. System for transporting limp, flat sheet material. 4,717,143, Cl. 271-267.000.

Spensberger, Johann; Fischer, Heinrich; and Mueller, Richard, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Method for chamfering the axially facing ends of toothed workpieces, a meshing engagement aid manufactured according to this method, and an apparatus for performing the method. 4,717,293, Cl. 409-9.000.

Spiess, Wolfgang C. J.: *See*—
Wieland, Erich G.; and Spiess, Wolfgang C. J., 4,716,827, Cl. 101-216.000.

Spilman, Raymond: *See*—
Moore, Donald L.; Spilman, Raymond; and Pendleton, Thomas, 4,717,214, Cl. 312-107.000.

Spinner, Georg. Switch drive for a rotary switch. 4,717,799, Cl. 200-153.00P.

Spitzer, Donald P.; Lipp, David W.; Rothenberg, Alan S.; and Panzer, Hans P., to American Cyanamid Company. Process for purifying alumina. 4,717,550, Cl. 423-121.000.

Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, to Italfarmaco S.p.A. Modified glucosaminoglucans having antithrombotic activity. 4,717,719, Cl. 514-56.000.

Sprinkel, Francis M., Jr.; and Newsome, Reginald W., to Philip Morris Incorporated. Package with means for releasing aromatic substance on opening. 4,717,017, Cl. 206-264.000.

Srour, Nassy; and Drzewiecki, Tadeusz M., to United States of America, Army. Fluidic rectifier. 4,716,935, Cl. 137-825.000.
Staat der Nederlanden: *See—*
van Vugt, Franciscus J., 4,718,058, Cl. 370-63.000.
Staehle, Bruce E.; and Holbrook, David L., to UOP Inc. Apparatus for improving the separation of fluids of different densities. 4,717,481, Cl. 210-649.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive mixture, recording material prepared therefrom and process for use thereof. 4,717,640, Cl. 430-192.000.
Standard Oil Company: *See—*
Schieman, Richard D., 4,717,489, Cl. 252-32.70E.
Standard Telephones and Cables, PLC: *See—*
Greene, Peter D.; and Renner, Daniel S. O., 4,717,443, Cl. 437-228.000.
Standke, Burkhard: *See—*
Jansen, Martin; and Standke, Burkhard, 4,717,562, Cl. 423-604.000.
Staniland, Philip A., to Imperial Chemical Industries PLC. Thermoplastic aromatic polyetherketones. 4,717,761, Cl. 528-125.000.
Stanley-Bostitch, Inc.: *See—*
Prudencio, Canlas S., 4,716,813, Cl. 91-355.000.
Stanley Works, The: *See—*
Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,717,106, Cl. 248-309.200.
Stant Inc.: *See—*
Crute, Billy G., 4,716,920, Cl. 137-39.000.
Stanton, William H., to Equinox Industries Ltd. Rotationally moulded septic tank sleeves. 4,717,040, Cl. 220-306.000.
Stanztechnik GmbH R+S: *See—*
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Staron, Philippe; Arens, Georges; and Gros, Pierre, to Societe Nationale Elf Aquitaine (Production). Method of instantaneous acoustic logging within a wellbore. 4,718,048, Cl. 367-40.000.
Stauffer Chemical Company: *See—*
Baker, Don R.; and Tam Chow, Teresa M., 4,717,413, Cl. 71-88.000.
Cheng, Chung-Ping; and Iacobucci, Paul A., 4,717,708, Cl. 502-233.000.
Edouard, Fritzbert, 4,717,772, Cl. 556-54.000.
Stava, Elliott K.: *See—*
Parks, John M.; and Stava, Elliott K., 4,717,807, Cl. 219-130.210.
STC, PLC: *See—*
Dewing, John, 4,717,236, Cl. 350-96.230.
Epworth, Richard E., 4,718,121, Cl. 455-619.000.
Steenblik, Richard A., to Georgia Tech Research Corporation. Stereoscopic process and apparatus using diffractive optical elements. 4,717,239, Cl. 350-144.000.
Steer, Peter L.; and Edwards, John V., to E. R. Squibb & Sons, Inc. Bag and valve assembly for medical use. 4,717,388, Cl. 604-323.000.
Steere, Robert E., to Silicon Technology Corporation. Blade mount for inner diameter saw blade. 4,716,881, Cl. 125-15.000.
Stefani, Fabrizio; and Botti, Edoardo, to SGS Microelettronica SpA. Differential amplifier stage having circuit elements for setting the gain to zero. 4,717,887, Cl. 330-261.000.
Stefani, Samuel. Swaddling table. 4,717,105, Cl. 248-295.100.
Stefanini, Zorro: *See—*
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,717,493, Cl. 252-62.540.
Steffen, Jurg, to Asulab S.A. Gas laser equipped with triple function valves. 4,718,071, Cl. 372-61.000.
Stegmeir, David C.: *See—*
Vinn, Charles L.; and Stegmeir, David C., 4,717,888, Cl. 330-261.000.
Steiger, Anton: *See—*
Hofer, Robert; and Steiger, Anton, 4,717,317, Cl. 417-392.000.
Steimel, Johannes; Kordulla, Hans; and Oppelt, Hans, to Bodenseewerk Geratetechnik GmbH. Detector device having an array of detector elements for scanning a field of view. 4,717,823, Cl. 250-236.000.
Steinhauser, Oli. Climbing shoe. 4,716,663, Cl. 36-113.000.
Stem, Stephen C.; and Evans, Wayne E., to Shell Oil Company. Total isomerization process with mono-methyl-branched plus normal paraffin recycle stream. 4,717,784, Cl. 585-738.000.
Stemple, Donald K.: *See—*
Nagy, Andrew G.; Stemple, Donald K.; and Tracy, Clarence J., 4,717,446, Cl. 156-626.000.
Stenger, Donald R., to Johnson Enterprises, Inc. Beverage tap. 4,717,048, Cl. 222-400.800.
Stengle, Nancy K.; and Hobbs, James W., to Phillips Petroleum Company. Floating pressure control for a gas distribution system. 4,717,396, Cl. 55-20.000.
Stephens, Harold: *See—*
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Sterling Drug Inc.: *See—*
Harrison, Paul J.; Langridge, John R.; and Potter, Christopher J., 4,717,569, Cl. 424-494.000.
Sterritt, James L.; and Hay, George M. Sealed jointing apparatus. 4,717,792, Cl. 174-93.000.
Sterwerf, Lester J., Jr., to Cincinnati Mine Machinery Company, The. Endless chains comprised of interdigitated link elements having a Y-shaped configuration. 4,717,206, Cl. 299-82.000.
Stetter, Jorg: *See—*
Ditgens, Klaus; Heinemann, Ulrich; Lunkenheimer, Winfried; Riebel, Hans-Jochem; Stetter, Jorg; Thomas, Rudolf; and Fedtke, Carl, 4,717,415, Cl. 71-93.000.
Stevens, Udo: *See—*
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Stevens, William D.: *See—*
Guido, Paul V.; Romanowski, Chester J.; and Stevens, William D., 4,717,082, Cl. 241-121.000.
Stewart, Duncan R., to Hytork Actuators Limited. Fluid-pressure-operated actuators. 4,716,815, Cl. 91-464.000.
Stewart, Robert B.: *See—*
Bol, Gerardus M.; Meijs, Franciacus H.; Schouten, Fredericus C.; Stewart, Robert B.; and De Roo, Petrus C., 4,716,965, Cl. 166-297.000.
Stirk, Gary L.: *See—*
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Stokes, Olen L., Jr.: *See—*
Broockman, Eric C.; and Stokes, Olen L., Jr., 4,717,818, Cl. 235-462.000.
Stopinc Aktiengesellschaft: *See—*
Troxler, Beat, 4,717,127, Cl. 266-287.000.
Stoudt, William F.: *See—*
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Strahl, Thomas L.; Lamont, Lawrence T., Jr.; Peterson, Carl T.; Brown, Hobart A.; McCormick, Lonnie W.; and Mosely, Roderick C., to Machine Technology, Inc. System and method for processing workpieces. 4,717,461, Cl. 204-192.100.
Strata Bit Corporation: *See—*
Dennis, Mahlon D., 4,716,975, Cl. 175-329.000.
Streifer, William; and Scifres, Donald R., to Spectra Diode Laboratories, Inc. Semiconductor laser array with single lobed output. 4,718,069, Cl. 372-50.000.
Strem, Richard C., to European Body Wrap, Inc. Composition for body wrap. 4,717,735, Cl. 424-447.000.
Stremeckus, Mark W., to A. W. Chesterton Company. Multiple-lip seal for cylinder rod and the like. 4,717,161, Cl. 277-105.000.
Stringham, Robert R.: *See—*
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Strom, Alice M.: *See—*
Martin, Sylvia; Herr, Roy W.; Wieczerniak, Walter J.; and Strom, Alice M., 4,717,458, Cl. 204-44.200.
Stubenfoll, Leonard J.; Rasmussen, Russell G.; and Morrison, Howard J., to Marvin Glass & Associates. Toy vehicle with extendable section. 4,717,367, Cl. 446-437.000.
Stuck, Robert M. Baked goods cooking apparatus. 4,716,820, Cl. 99-443.00C.
Sturkey, William C.: *See—*
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Sud-Chemie AG: *See—*
Konig, Axel; Korbel, Kurt; Ellinger, Karl-Werner; Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,716,859, Cl. 123-3.000.
Suda, Taiko: *See—*
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Sudo, Kanzaburo: *See—*
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Sudo, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Method of and system for controlling idling speed is electronically controlled engine. 4,718,016, Cl. 364-431.070.
Suga, Chuzo: *See—*
Hara, Yasuhiro; and Suga, Chuzo, 4,717,664, Cl. 435-133.000.
Suga, Shigeru. Luster rating method and apparatus. 4,717,259, Cl. 356-446.000.
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, to Nissan Motor Company, Limited. Suspension control system for automotive vehicle suspension suppressing bouncing. 4,717,173, Cl. 280-707.000.
Sugden, Keith, to Reckitt & Colman Products Limited. Pharmaceutical compositions. 4,717,723, Cl. 514-224.000.
Sugihara, Masami; Ogura, Osamu; Arai, Hajime; and Maruyamano, Satoru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Clutch master cylinder. 4,716,733, Cl. 60-589.000.
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Sugita, Hiroshi: *See—*
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Suhr, Harald; Oehr, Christian; and Feurer, Ernst, to Schering Aktiengesellschaft. Method of producing metallic structures on non-conductors. 4,717,587, Cl. 427-39.000.
Sullivan, Michael J.: *See—*
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Sulzer Brothers Ltd.: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*
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Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,717,756, Cl. 526-146.000.
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Umada, Youichi; Ishii, Norio; and Tojima, Hideto, 4,717,769, Cl. 540-536.000.
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Sumitomo Electric Industries Ltd.: *See—*
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, 4,717,387, Cl. 604-264.000.
Nakajima, Shigeru, 4,717,685, Cl. 437-44.000.
Sumner, Cyril R., to Halliburton Company. High temperature high pressure detonator. 4,716,832, Cl. 102-275.600.
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Sunbeam Plastics Corporation: *See—*
Wright, David M., 4,717,050, Cl. 222-482.000.
Sundstrand Corporation: *See—*
Cohen, Mordehy; and Kezar, David A., 4,717,095, Cl. 244-58.000.
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Sung, Choag S. P. Method to characterize curing of epoxy with aromatic diamines. 4,717,674, Cl. 436-85.000.
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Sutterlin, Robert C.: *See—*
Hankey, Dana L.; and Sutterlin, Robert C., 4,717,690, Cl. 501-20.000.
Suttles, James M., to Mead Corporation, The. Shelving unit. 4,716,841, Cl. 108-108.000.
Sutton, C. Sean, to Smith College. 3-channel microdensitometer for analysis of plate spectra. 4,717,258, Cl. 356-444.000.
Suzuki, Akira, to Tomoegawa Paper Manufacturing Co., Ltd. Thermosensitive recording material. 4,717,709, Cl. 503-200.000.
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Suzuki, Hidetoshi: *See—*
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; and Koumura, Noboru, 4,718,040, Cl. 364-900.000.
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Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,717,629, Cl. 428-566.000.
Suzuki Kanshi Co., Ltd.: *See—*
Suzuki, Yasuyuki, 4,717,598, Cl. 427-374.100.
Suzuki, Makoto, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Expansible macromolecular material and porous macromolecular membrane. 4,717,800, Cl. 210-500.420.
Suzuki, Michiya: *See—*
Ono, Mitsuhiro; Sha, Kokusho; Suzuki, Michiya; Ogata, Tateaki; and Yoshida, Ekuo, 4,717,880, Cl. 324-316.000.
Suzuki, Morio; and Okada, Kenzi, to Laurel Bank Machines Co., Ltd. Apparatus for dispensing coin packages. 4,717,044, Cl. 221-130.000.
Suzuki, Nobuyuki: *See—*
Shimizu, Masami; and Suzuki, Nobuyuki, 4,717,936, Cl. 354-471.000.
Suzuki, Shigeru: *See—*
Mashiko, Harumitsu; Sakai, Yoshihiro; Hayashi, Syoji; Ogata, Yoshihiro; Yoshimura, Tsuyoshi; Kuroda, Hisashi; and Suzuki, Shigeru, 4,717,965, Cl. 358-285.000.
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Suzuki, Yutaka, to Nissan Motor Co., Ltd. Drive control device for vehicles. 4,716,789, Cl. 74-866.000.
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Ariga, Makoto; Hata, Seiji; Suzumura, Yoshikazu; Nakagima, Masaaki; and Takahashi, Michio, 4,718,101, Cl. 382-9.000.
Swaim, David W.: *See—*
Stoever, Guy T.; and Swaim, David W., 4,716,933, Cl. 137-596.200.
Swanljung, Carl G. P., to Vertrik Bioteknik AB. Device for chemical analyses and use thereof. 4,717,656, Cl. 435-7.000.
Swapp, Mavin C.; and Friabie, Milo W., to Motorola, Inc. Buffer apparatus for an integrated circuit handler. 4,717,012, Cl. 198-425.000.
Swarts, Richard E.: *See—*
Moffatt, E. Marston; and Swarts, Richard E., 4,716,763, Cl. 73-505.000.
Swartz, Barry E. Illuminated pacifier. 4,716,902, Cl. 128-360.000.
SWF Auto-Electric GmbH: *See—*
Noack, Klauspeter; and Prohaska, Hans, 4,716,617, Cl. 15-250.340.
Swiss Aluminium Ltd.: *See—*
Textor, Marcus; Werner, Martin; and Franschitz, Wilhelm, 4,717,455, Cl. 204-33.000.
Symbol, Ronald P.: *See—*
Keilman, Michael R.; and Symbol, Ronald P., 4,717,668, Cl. 435-296.000.
Syntech International, Inc.: *See—*
Hartmann, Donald, 4,716,799, Cl. 83-42.000.
SyQuest Technology: *See—*
Nigam, Anil; and Mercurio, Dominic, 4,717,981, Cl. 360-133.000.
Syracuse University: *See—*
Schwarz, James A., 4,716,736, Cl. 62-48.000.
Szkaradnik, Edmund J., to TRW Inc. Optical fiber splice system. 4,717,233, Cl. 350-96.210.
Szuca, Johan. Apparatus and method for cleaning stone and metal surfaces. 4,716,690, Cl. 51-321.000.
T.C. Manufacturing Company, Inc.: *See—*
Roen, Ralph M.; and Gebhardt, Terry D., 4,717,262, Cl. 383-120.000.
Tabak, Samuel A.: *See—*
Garwood, William E.; Kushnerick, John D.; and Tabak, Samuel A., 4,717,782, Cl. 585-531.000.
Tabara, Yoshitaka: *See—*
Takaba, Tetsuro; Rikitake, Tomotsuga; Tabara, Yoshitaka; and Arima, Manabu, 4,716,873, Cl. 123-425.000.
Taccani, Massimo: *See—*
Leoni, Roberto; Rosini, Angela; and Taccani, Massimo, 4,717,746, Cl. 524-100.000.
Taga, Yutaka: *See—*
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,716,998, Cl. 192-3.300.
Taha, Mohamed: *See—*
Boutevin, Bernard; Pietrasanta, Yves; Taha, Mohamed; and Lantz, Andre, 4,717,744, Cl. 524-17.000.
Taicher, Zvi; Shtrikman, Shmuel; Paltiel, Zvi; and Shporer, Mordechai, to Numar Corporation. Nuclear magnetic resonance sensing apparatus and techniques. 4,717,877, Cl. 324-303.000.
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Takaba, Tetsuro; Rikitake, Tomotsuga; Tabara, Yoshitaka; and Arima, Manabu, to Mazda Motor Corporation. Engine control system. 4,716,873, Cl. 123-425.000.
Takabayashi, Katsuyuki: *See—*
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Takabayashi, Katsuyuki; and Nagasawa, Takeshi, 4,717,659, Cl. 435-20.000.
Takada, Haruhiko: *See—*
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko, Nakamura, Teruo; and Takayama, Hidehiko, 4,717,321, Cl. 418-76.000.
Takada, Hiroshi; Masuda, Shin'ichi; and Nakajima, Motoki, to Kao Corporation. Pyran derivatives and perfume composition containing the same. 4,717,506, Cl. 512-11.000.
Takagi, Shigeyuki: *See—*
Kuno, Kazuo; Takagi, Shigeyuki; Nagata, Daisaburo; and Fukumoto, Shintaro, 4,717,526, Cl. 376-142.000.
Takahama, Takashi: *See—*
Sakai, Kunito; Tamaki, Akinobu; and Takahama, Takashi, 4,717,948, Cl. 357-74.000.
Takahashi, Akira; Murakami, Yoshiteru; Katayama, Hiroyuki; Hirokane, Junji; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Magnetooptical storage element. 4,717,628, Cl. 428-457.000.
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Takahashi, Katsuhiko: *See—*
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,717,624, Cl. 428-423.100.
Takahashi, Ken: *See—*
Suzuki, Tatsuo; Takahashi, Ken; Kabe, Kazuyuki; and Kaga, Yukio, 4,716,951, Cl. 152-535.000.
Takahashi, Koji; Nishijima, Tsunemasa; and Takihana, Seisaku, to Hitachi, Ltd. Method of and apparatus for controlling fuel of gas turbine. 4,716,719, Cl. 60-39.060.
Takahashi, Kotei: *See—*
Ishii, Katsumi; Hirayama, Kanae; Matsuoka, Yoshio; and Takahashi, Kotei, 4,716,982, Cl. 180-140.000.
Takahashi, Michio: *See—*
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Takahashi, Mitsuharu, to Kabushiki Kaisha Sato. Label positioning method and label feeder for continuous label printer. 4,717,099, Cl. 226-1.000.
Takahashi, Sadatoshi, to Canon Kabushiki Kaisha. High relative aperture Gauss type lens. 4,717,245, Cl. 350-463.000.
Takakura, Hideyuki: *See—*
Hamakawa, Yoshihiro; and Takakura, Hideyuki, 4,717,630, Cl. 428-612.000.
Takano, Cyro: *See—*
Betz, Eurico W.; and Takano, Cyro, 4,717,537, Cl. 420-129.000.

Takaoka, Kazuhiko, to Hitachi, Ltd. Demodulator for facsimile equipment. 4,718,073, Cl. 375-14.000.
Takasaki, Katsuaki: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Takata, Harry H., to Ag-Chem Equipment Co., Inc. Self-aligning coupler for fluid transmitting conduits. 4,717,077, Cl. 239-548.000.
Takayama, Hidehiko: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,717,321, Cl. 418-76.000.
Takayama, Teruo; and Yamauchi, Teruo, to Hitachi, Ltd. Fuel injection supply system for multi-cylinder internal combustion engine. 4,716,879, Cl. 123-590.000.
Takeda Chemical Industries, Ltd.: *See*—
Kunugiza, Kiyomitsu; Yamamoto, Tadaaki; and Sawada, Hitoshi, 4,717,697, Cl. 502-34.000.
Takeda, Kenji: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.
Takeda, Kiyonori: *See*—
Shiraki, Hisashi; Nagahisa, Toshio; Takeda, Kiyonori; and Harada, Takeshi, 4,717,478, Cl. 210-360.200.
Takegawa, Yujiro, to Tsudakoma Corp. Faulty picking diagnosing system for a fluid jet loom. 4,716,941, Cl. 139-336.000.
Takei, Haruo: *See*—
Ikeda, Tadashi; Takei, Haruo; Okazaki, Masaki; and Kimura, Keizo, 4,717,650, Cl. 430-494.000.
Takeshita, Hajime: *See*—
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.
Takeuchi, Atsushi, to Fujitsu Limited. Semiconductor integrated circuit with detection circuit for address signal change. 4,717,835, Cl. 307-265.000.
Takeuchi, Masaharu: *See*—
Nonomura, Yutaka; Sugiyama, Jun; Komatsubara, Hirofumi; and Takeuchi, Masaharu, 4,716,773, Cl. 73-862.360.
Takeuchi, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Hydraulic driving circuit for a forklift truck. 4,716,990, Cl. 187-9.00R.
Taki, Keinosuke: *See*—
Kami, Yozo; Taki, Keinosuke; and Yamamoto, Toshihumi, 4,717,171, Cl. 280-688.000.
Takigami, Katsuhiko: *See*—
Shinobe, Takashi; Takigami, Katsuhiko; Ohashi, Hiromichi; and Nakagawa, Akio, 4,717,940, Cl. 357-38.000.
Takihana, Seisaku: *See*—
Takahashi, Koji; Nishijima, Tsunemasa; and Takihana, Seisaku, 4,716,719, Cl. 60-39.060.
Takizawa, Sumio: *See*—
Nishikawa, Masumi; Ishikawa, Masanobu; Yokoya, Yuji; and Takizawa, Sumio, 4,716,780, Cl. 74-493.000.
Takla, Nabil; Hecker, Mark; Murdoch, Robert; Chu, Raymond; and Parekh, Rajesh, to Data General Corporation. Carry-save propagate adder. 4,718,034, Cl. 364-784.000.
Talbot, Michel. Roof system based on two tile elements having means of attachment. 4,716,701, Cl. 52-536.000.
Tam Chow, Teresa M.: *See*—
Baker, Don R.; and Tam Chow, Teresa M., 4,717,413, Cl. 71-86.000.
Tamaki, Akinobu: *See*—
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Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueki, Noriyuki, 4,716,861, Cl. 123-90.200.
Tamura, Chiharu: *See*—
Arai, Noritoshi; and Tamura, Chiharu, 4,717,175, Cl. 280-96.100.
Tamura, Hiroshi; and Sagala, Djuniadi A., to Murata Manufacturing Co., Ltd. Dielectric ceramic composition for high frequencies. 4,717,694, Cl. 501-135.000.
Tamura, Keiichi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing retractor for vehicle. 4,717,089, Cl. 242-107.40A.
Tamura, Tadashi: *See*—
Motonaga, Takao; Fukuhara, Keizi; Tamura, Tadashi; and Yoshida, Toshiji, 4,717,326, Cl. 425-133.100.
Tanaka, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Method of detecting cylinder pressure and cylinder pressure detection device in internal combustion engine. 4,716,759, Cl. 73-115.000.
Tanaka, Hidehiko: *See*—
Yoshida, Kazunori; Suzuki, Fujio; Tanaka, Hidehiko; and Kawabata, Susuma, 4,716,943, Cl. 139-452.000.
Tanaka, Koichi; Ogura, Takashi; Ianiguchi, Koji; Mikami, Akiyoshi; and Yoshida, Masaru, to Sharp Kabushiki Kaisha. Thin film electroluminescence device. 4,717,858, Cl. 313-503.000.
Tanaka, Shinya: *See*—
Kobayakawa, Yoshimi; Kobayashi, Kazunobu; Tanaka, Shinya; Madate, Haruhisa; and Kitamura, Takeshi, 4,717,952, Cl. 358-113.000.
Tanaka, Sohei: *See*—
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Tandem Computers Incorporated: *See*—
Boyle, Richard F.; and Overhouse, Leonard E., 4,718,065, Cl. 371-25.000.
Carr, Richard W., 4,718,002, Cl. 364-200.000.
Tang, Raymond W.; and Tung, Lu H., to Dow Chemical Company, The. Pressure sensitive adhesives containing block copolymer. 4,717,749, Cl. 524-271.000.
Tani, Toshiro: *See*—
Fujioka, Kazuyoshi; and Tani, Toshiro, 4,716,756, Cl. 72-353.000.
Tanimoto, Tateo: *See*—
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, 4,716,687, Cl. 51-131.100.
Tanjo, Toru, to Mita Industrial Co., Ltd. Paper transferring apparatus for a copying machine. 4,717,938, Cl. 355-3.0SH.
Tatge, Robert J.; and Pfenning, Thomas E., to CV International, Inc. Apparatus and method for delivering cryogenic liquid from a supply vessel to receiver vessels. 4,716,738, Cl. 62-55.000.
Tatsuke, Saburo: *See*—
Groover, Phillip B.; Batlle, Jose; Tatsuke, Saburo; Kozukue, Masaaki; and Endo, Yukio, 4,717,043, Cl. 221-7.000.
Taub, Clifford. Storage box with locking cover. 4,717,070, Cl. 229-125.280.
Tauber, Michael, to Safety Socket Screw Corporation. Polygonal tool for removal of stripped hex head fasteners. 4,716,793, Cl. 81-53.200.
Taylor, Wilson G. Bowling shoes and improved heel construction therefor. 4,716,664, Cl. 36-114.000.
TDK Corporation: *See*—
Shiba, Haruo; Hashizume, Kenji; and Okamura, Masatoshi, 4,717,980, Cl. 360-132.000.
Teac Corporation: *See*—
Sakaguchi, Takahiro, 4,716,776, Cl. 74-89.150.
Technicare Corporation: *See*—
Flugan, David C., 4,717,881, Cl. 324-322.000.
Technological Products, Inc.: *See*—
Bill, James M., Sr.; Schmidgall, Earl R.; Schmidgall, Edward G.; and Schmidgall, Frank C., 4,716,642, Cl. 29-265.000.
Tecnoma S.A.: *See*—
Ballu, Patrick, 4,716,678, Cl. 47-1.500.
Tektronix, Inc.: *See*—
Garuts, Valdis E., 4,717,837, Cl. 307-353.000.
Mathur, Hemendra K., 4,717,791, Cl. 174-35.00R.
Teleco Oilfield Services Inc.: *See*—
Cobern, Martin E., 4,716,973, Cl. 175-50.000.
Telectronics N.V.: *See*—
Hansen, James C.; Nappholz, Tibor A.; and Whigham, Robert H., 4,716,903, Cl. 128-419.0PG.
Koning, Gerrit; and Schroeppel, Edward A., 4,716,887, Cl. 128-419.0PG.
Telefonaktiebolaget L M Ericsson: *See*—
Andersen, Ib N., 4,718,062, Cl. 370-94.000.
Telefonaktiebolaget LM Ericsson: *See*—
Thylen, Lars Helge, 4,717,228, Cl. 350-96.140.
Telex Communications, Inc.: *See*—
Hotvet, David A., 4,718,099, Cl. 381-68.400.
Terakawa, Taiju: *See*—
Fujimura, Isao; and Terakawa, Taiju, 4,717,325, Cl. 425-131.500.
Teranishi, Haruo: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Ichikawa, Hiroshi; Imai, Yoshikazu; and Umezawa, Masanobu, 4,717,589, Cl. 427-57.000.
Terauchi, Kiyoshi: *See*—
Sato, Tadashi; Mabe, Atsushi; and Terauchi, Kiyoshi, 4,717,314, Cl. 417-310.000.
Terumo Kabushiki Kaisha: *See*—
Fukasawa, Hiromichi, 4,717,377, Cl. 604-4.000.
Teshigawara, Hiroshi: *See*—
Ichiyanagi, Toshikazu; Sudo, Kanzaburo; Kawai, Zenzaburo; Sekine, Shoji; and Teshigawara, Hiroshi, 4,717,337, Cl. 432-14.000.
Teske, James E.: *See*—
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Texaco Inc.: *See*—
Rundell, Herbert A., 4,716,962, Cl. 166-84.000.
Texas Instrumens Incorporated: *See*—
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Texas Instruments Incorporated: *See*—
Baglee, David A.; and Smayling, Michael C., 4,718,041, Cl. 365-185.000.
Berg, Peter G.; Marcoux, Leo; and Kulwicki, Bernard M., 4,717,813, Cl. 219-541.000.
Curran, Patrick A., 4,717,681, Cl. 437-31.000.
Guttag, Karl; Asal, Mike; and Novak, Mark, 4,718,024, Cl. 364-518.000.
Papamichalis, Panagiotis E., 4,718,087, Cl. 381-34.000.
Texas Tech University Health Sciences Center: *See*—
Barnett, J. Craig, 4,717,546, Cl. 422-63.000.
Textor, Marcus; Werner, Martin; and Franschitz, Wilhelm, to Swiss Aluminium Ltd. Process for manufacturing a microfilter. 4,717,455, Cl. 204-33.000.
Tezuka, Kazunari; and Nakamura, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a lock-up system of an automatic transmission for a motor vehicle. 4,716,999, Cl. 192-3.290.

Tezuka, Nobuo: *See*—
Nishimura, Akimasa; and Tezuka, Nobuo, 4,717,976, Cl. 160-97.000.
Tezuka, Takeshi, to Shiroki Kinzoku Kogyo Kabushiki Kaisha. Reclining angle adjustment device. 4,717,204, Cl. 297-362.000.
Thackeray, James W.: *See*—
Wrighton, Mark S.; White, Henry S., Jr.; and Thackeray, James W., 4,717,673, Cl. 436-68.000.
Thaden, Robert C., to Texas Instrumens Incorporated. Microcomputer containing EPROM with self-program capability. 4,718,037, Cl. 364-900.000.
Thage-Jorgensen, Thorkild: *See*—
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Therkildsen, Albert J.; and Kvinge, Ronald A., to Kvinge, Ronald A. Hand tool. 4,716,610, Cl. 7-138.000.
Thery, Pierre; Ravalitera, Guy; and Cornet, Michel, to Agence Nationale de Valorisation de la Recherche. Thermocouple array for a thermal fluxmeter. 4,717,786, Cl. 136-212.000.
Thiele, Eric W., to Hercules Incorporated. Unifelt air suction system. 4,716,660, Cl. 34-114.000.
Thijssen, Henricus A. C.: *See*—
van Overbruggen, Gerardus J. J.; van Beaumont, Richard A.; and Thijssen, Henricus A. C., 4,717,047, Cl. 222-207.000.
Thisse, Thor R.: *See*—
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Thomas & Betts Corporation: *See*—
Gobert, Bernard, 4,717,058, Cl. 225-93.000.
Greenwood, William S., 4,717,357, Cl. 439-492.000.
Thomas, David K.: *See*—
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Thomas, Guy M. C. M.: *See*—
Huon De Kermadec, Jean; and Thomas, Guy M. C. M., 4,716,838, Cl. 104-173.100.
Thomas, Kenneth D.: *See*—
Popielarski, Edward J.; and Thomas, Kenneth D., 4,717,064, Cl. 228-39.000.
Thomas, Peter D.: *See*—
Long, Terence M.; Newman, David J.; and Thomas, Peter D., 4,718,026, Cl. 364-550.000.
Thomas, Rudolf: *See*—
Ditgens, Klaus; Heinemann, Ulrich; Lunkenheimer, Winfried; Riebel, Hans-Jochem; Stetter, Jorg; Thomas, Rudolf; and Fedtke, Carl, 4,717,415, Cl. 71-93.000.
Thompson, James E.: *See*—
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Thompson, Peter; Otsuka, Nobuo; Yamazaki, Kisuke; and Igarashi, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Duct type multizone air conditioning system. 4,716,957, Cl. 165-12.000.
Thomson-CSF: *See*—
Dubois, Jean C.; Ravaux, Gilles; and Le Barny, Pierre, 4,717,757, Cl. 526-246.000.
Gehin, Claude; and Tourneur, Jacky, 4,717,897, Cl. 333-125.000.
Thune-Eureka A/S: *See*—
Barthel, Sven, 4,717,267, Cl. 384-247.000.
Thylen, Lars Helge, to Telefonaktiebolaget LM Ericsson. Optical directional coupler with amplification. 4,717,228, Cl. 350-96.140.
Tillson, John M.: *See*—
Edwards, David J.; Tillson, John M.; and Benning, James K., 4,718,064, Cl. 371-20.000.
Timblin, Stanley W. Technique for fan cycling to maintain temperature within prescribed limits. 4,718,021, Cl. 364-505.000.
Tin, Jolene L. S.: *See*—
De Barros, Leonardo G.; Buss, Thomas E.; How, Adrian T. G.; and Tin, Jolene L. S., 4,717,989, Cl. 361-424.000.
Tiodize Company, Inc.: *See*—
Adams, Thomas R.; and Wittman, Gary R., 4,717,302, Cl. 411-378.000.
Tisma Machine Corporation: *See*—
Tisma, Steven, 4,716,714, Cl. 53-575.000.
Tisma, Steven, to Tisma Machine Corporation. Apparatus with replaceable trays on automatic packaging machines. 4,716,714, Cl. 53-575.000.
Tizzi, Valtiero. Process for obtaining composite hollow members from variegated longitudinal strips, embodied with or without a removable core. 4,716,750, Cl. 72-52.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Doi, Yoshihara; Soga, Kazuo; Ueki, Satoshi; and Miyazaki, Makoto, 4,717,755, Cl. 525-333.700.
Tobol, Helen K., to Dow Chemical Company, The. 3,5-dichloro-2,4-dimethoxy-6-(trichloromethyl)pyridine having anti-tumor activity. 4,717,726, Cl. 514-348.000.
Toda, Yoshihiro: *See*—
Ogano, Takeo; Toda, Yoshihiro; Mukainakano, Masato; and Shoji, Mikio, 4,716,717, Cl. 56-255.000.
Tojima, Hideto: *See*—
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Umada, Youichi; Ishii, Norio; and Tojima, Hideto, 4,717,769, Cl. 540-536.000.
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Tojima, Hideto; and Ishii, Norio, 4,717,770, Cl. 540-536.000.
Tokai Rubber Industries, Ltd.: *See*—
Saito, Siro, 4,717,111, Cl. 248-562.000.
Tokico Ltd.: *See*—
Godai, Hiroshi; Otani, Yukio; and Utsumi, Noriyuki, 4,716,785, Cl. 74-640.000.
Tokoro, Setsuo: *See*—
Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, 4,716,790, Cl. 74-866.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.
Tomalin, D. S., to General Electric Company. EDM wire electrode. 4,717,804, Cl. 219-69.00W.
Tomer, Lewis P., to B. W. Rogers Company. Flow control valve. 4,716,929, Cl. 137-505.130.
Tomer, Natan. Time metering device particularly useful as a parking card. 4,717,815, Cl. 235-378.000.
Tomiyama, Hideki: *See*—
Watanabe, Toshihiro; and Tomiyama, Hideki, 4,717,642, Cl. 430-213.000.
Tomoegawa Paper Manufacturing Co., Ltd.: *See*—
Suzuki, Akira, 4,717,709, Cl. 503-200.000.
Tomy Kogyo Inc.: *See*—
Furukawa, Masami, 4,717,364, Cl. 446-175.000.
Top Line Manufacturing Inc.: *See*—
Graffy, Thomas F., 4,716,988, Cl. 182-228.000.
Toppan Printing Co., Ltd.: *See*—
Fujita, Toshiji; Yarita, Kazuo; Hashimoto, Toshihiko; and Nojima, Masaki, 4,717,954, Cl. 358-80.000.
Tordoff, Robert L., to Navistar International Transportation Corp. Vehicle hydraulic actuating system. 4,716,732, Cl. 60-584.000.
Toreson, James S.; and Lessner, Jeffrey G., to Xebec. Electrical connector retaining assembly for facilitating removable mounting of a rigid disk drive. 4,717,982, Cl. 360-137.000.
Torii, Hideo: *See*—
Aoki, Masaki; Torii, Hideo; Okinaka, Hideyuki; and Sakai, Masayuki, 4,717,584, Cl. 427-38.000.
Toriumi, Mototada: *See*—
Sootome, Sumitoshi; Toriumi, Mototada; Tanaka, Sohei; and Sasaki, Shinichi, 4,717,139, Cl. 271-116.000.
Toriyama, Motohiro: *See*—
Kawamura, Sukezo; and Toriyama, Motohiro, 4,717,556, Cl. 423-311.000.
Toronto Medical Corp.: *See*—
Saringer, John H., 4,716,889, Cl. 128-25.00R.
'totes', Incorporated: *See*—
Phillips, Bradford E.; Bertacchi, Roy J.; and Busse, John E., 4,717,908, Cl. 340-568.000.
Tourneur, Jacky: *See*—
Gehin, Claude; and Tourneur, Jacky, 4,717,897, Cl. 333-125.000.
Tower, Stephen N.: *See*—
Gjertsen, Robert K.; Bassler, Elmer A.; Heckestein, Edgar A.; Salton, Robert B.; and Tower, Stephen N., 4,717,527, Cl. 176-209.000.
Toyama Chemical Co., Ltd.: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,717,767, Cl. 540-222.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Isaka, Tsutomu; and Nagano, Hiroshi, 4,717,516, Cl. 264-22.000.
Toyoda Gosei Co., Ltd.: *See*—
Yasukawa, Takemasa; Sugita, Hiroshi; Iwasa, Tadanobu; and Aritake, Masanori, 4,716,618, Cl. 15-250.360.
Toyosawa, Shinichi: *See*—
Daifuku, Hideharu; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Toyosawa, Shinichi; and Fujio, Ryota, 4,717,634, Cl. 429-213.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Arai, Noritoshi; and Tamura, Chiharu, 4,717,175, Cl. 280-96.100.
Iwamura, Toore; and Yoshikawa, Hirokazu, 4,717,192, Cl. 296-37.100.
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,716,623, Cl. 16-371.000.
Kobayashi, Nobuyuki; Hattori, Takashi; and Norota, Kazuhiko, 4,718,014, Cl. 364-431.030.
Masuda, Naofumi; Takeshita, Hajime; Iwase, Takahiro; Mochizuki, Hiroyuki; Sibata, Takuo; Miyake, Takashi; and Kobayashi, Nobuo, 4,717,322, Cl. 418-144.000.
Nishikawa, Masumi; Ishikawa, Masanobu; Yokoya, Yuji; and Takizawa, Sumio, 4,716,780, Cl. 74-493.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,717,920, Cl. 343-712.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,717,921, Cl. 343-712.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,717,922, Cl. 343-712.000.
Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, 4,716,790, Cl. 74-866.000.
Sudo, Toshiaki, 4,718,016, Cl. 364-431.070.
Sugihara, Masami; Ogura, Osamu; Arai, Hajime; and Maruyamano, Satoru, 4,716,733, Cl. 60-589.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,716,998, Cl. 192-3.300.
Tracor Hydroanautics, Inc.: *See*—
Conn, Andrew F.; and Johnson, Virgil E., Jr., 4,716,849, Cl. 114-222.000.
Tracy, Clarence J.: *See*—
Nagy, Andrew G.; Stemple, Donald K.; and Tracy, Clarence J., 4,717,446, Cl. 156-626.000.

Trico Products Corp.: *See*—
D'Alba, Anthony R., 4,716,612, Cl. 15-250.230.
Tricon Industries, Incorporated: *See*—
Paul, Donald C.; and Cakora, Dennis R., 4,717,794, Cl. 200-50.00A.
Trieste, Mario; and Whelan, James J., II. Sealing strip for bridging an expansion joint. 4,717,162, Cl. 277-205.000.
Trin, Pierre, to Valeo. Device for bleeding or for draining a heat exchanger, such as a radiator for a motor vehicle. 4,717,119, Cl. 251-144.000.
Tringali, Richard C.; and Pflieger, David C., to Hamilton Industries. Drafting board with replaceable surface layer. 4,716,840, Cl. 108-27.000.
Trisaler, Heinrich: *See*—
Haberstock, Rolf; Trisaler, Heinrich; Vlaykowski, Nikolay; and Maier, Hans P., 4,717,179, Cl. 285-112.000.
Triune Automated Painting Systems: *See*—
O'Brien, Lawrence B.; Winston, Walter E.; Abner, Edmund L.; Buehler, William L.; and Messick, Walter A., 4,717,276, Cl. 401-107.000.
Tromp, Wouter T.: *See*—
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,716,649, Cl. 29-602.00R.
Troncoso, Fernando, Jr. Safety plug device for fuel lines. 4,716,875, Cl. 123-469.000.
Troxler, Beat, to Stopinc Aktiengesellschaft. Pivot assembly for connecting a cover member to a housing of a sliding closure unit. 4,717,127, Cl. 266-287.000.
Troy, Stephen R., to Arinc Research Corporation. Remote parameter monitoring system with location-specific indicators. 4,717,907, Cl. 340-344.000.
TRW Cam Gears Limited: *See*—
Adams, Frederick J.; and Chandler, Kenneth, 4,716,983, Cl. 180-142.000.
TRW Carr France S.A.: *See*—
Klein, Jean-Luc R. G., 4,717,100, Cl. 248-73.000.
TRW Inc.: *See*—
Szkaradnik, Edmund J., 4,717,233, Cl. 350-96.210.
TRW Repa GmbH: *See*—
Fohl, Artur, 4,717,088, Cl. 242-107.200.
Tsay, Horng-Mou: *See*—
Eaton, Stephen M.; Tsay, Horng-Mou; Hagan, James J.; and Yost, Frederick J., 4,717,657, Cl. 435-18.000.
Tschank, Georg: *See*—
Gunzler, Volkmar; Hanauske-Abel, Hartmut; Mohr, Jurgen; Tschank, Georg; Kivirikko, Kari; Majamaa, Kari; and Brocks, Dietrich, 4,717,727, Cl. 514-354.000.
Tse, Samuel W.; and Schroeder, George O., to American Can Company. Film and blends of polyetheramide block copolymer and ethylene vinyl alcohol copolymer. 4,717,618, Cl. 428-213.000.
Tseng, Kenneth K. S.: *See*—
Hung, Paul L. K.; and Tseng, Kenneth K. S., 4,717,740, Cl. 522-96.000.
Tsuboi, Nobuyoshi: *See*—
Sato, Yoshio; Shimada, Satoshai; Sasaki, Hiroshi; Miyamoto, Norifumi; Tsuboi, Nobuyoshi; Nihei, Hideki; Watanabe, Ryuji; Watanabe, Atsumi; Ito, Tetsuo; and Koyanagi, Hiroaki, 4,718,053, Cl. 369-44.000.
Tsuchiya, Takashi: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.
Tsudakoma Corp.: *See*—
Takegawa, Yujiro, 4,716,941, Cl. 139-336.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Satake, Eishin, 4,717,306, Cl. 414-222.000.
Tsuji, Shigeru. Time differential correcting analog timepiece of twenty-four hour system. 4,717,260, Cl. 368-21.000.
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, to Hitachi, Ltd. Apparatus for thin film formation using photo-induced chemical reaction. 4,716,852, Cl. 118-720.000.
Tsukamoto, Hidehiko; Hayashi, Kanji; Sumomogi, Tsunetaka; Oya, Masashi; Ibushi, Junichi; Takasaki, Katsuaki; Arikawa, Masao; Tanimoto, Tateo; Yamamoto, Kunio; Miyaguchi, Kanehisa; Mito, Yoshiki; and Doho, Tamenari, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for grinding a rotary body. 4,716,687, Cl. 51-131.100.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, to Aisin Warner Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Direct coupling clutch with a damper device for a fluid coupling. 4,716,998, Cl. 192-3.300.
Tsukiji, Kensuke, to Honda Giken Kogyo Kabushiki Kaisha. Fuel tank for straddled type vehicles. 4,717,163, Cl. 280-5.00H.
Tsuneeda, Kenichi: *See*—
Ishida, Takao; and Tsuneeda, Kenichi, 4,717,223, Cl. 350-6.800.
Tsunekawa, Sukeyoshi: *See*—
Homma, Yoshio; Tsunekawa, Sukeyoshi; and Sasabe, Shunji, 4,717,462, Cl. 204-298.000.
Tsuno, Koichi: *See*—
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, 4,717,387, Cl. 604-264.000.
Tsunoda, Katsuya: *See*—
Okuyama, Hiroo; and Tsunoda, Katsuya, 4,717,195, Cl. 296-72.000.
Tsunoda, Yoshiaki: *See*—
Matsuda, Hideo; Tsunoda, Yoshiaki; Fujiwara, Takashi; and Usui, Yasunori, 4,717,947, Cl. 357-38.000.
Tsutsumi, Kenichi, to Casio Computer Co., Ltd. Interpolated value computing device for a waveform generated in an electronic device. 4,718,030, Cl. 364-721.000.
Tsutsumi, Teruo, to Kabushiki Kaisha Toshiba. Paper circulating assembly for field sequential multi-color printing apparatus. 4,717,270, Cl. 400-120.000.
Tugcu, Mehmet, to Motorola, Inc. Double-shielded housing for RF circuitry. 4,717,990, Cl. 361-424.000.
Tung, Lu H.: *See*—
Tang, Raymond W.; and Tung, Lu H., 4,717,749, Cl. 524-271.000.
Turk, Amos, to Brassey, J. Michael, a part interest. Removal of amines from air streams. 4,717,553, Cl. 423-245.000.
Turner, James K.; Sturkey, William C.; and Hornbuckle, Charles R., to Gaston County Dyeing Machine Company. Apparatus for wet treatment of cloth in endless rope form. 4,716,744, Cl. 68-62.000.
Turner, Norman L., to Varian Associates, Inc. Platen and beam setup flag assembly for ion implanter. 4,717,829, Cl. 250-492.200.
Turner, Robert C., to British Telecommunications public limited company. Communications network having bit-mapped refresh cycle. 4,718,061, Cl. 370-89.000.
Tzeng, Liang, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Polarization insensitive coherent lightwave detector. 4,718,120, Cl. 455-619.000.
UBE Industries, Ltd.: *See*—
Itatani, Hiroshi; Kashima, Mikito; and Aikawa, Masami, 4,717,494, Cl. 252-70.000.
Uchiyama, Naoki: *See*—
Hosoda, Naoyuki; Morikawa, Masaki; Uchiyama, Naoki; Yoshida, Hideaki; and Ono, Toshiaki, 4,717,436, Cl. 148-432.000.
Ueda, Shinji; Nakajima, Junya; Shishido, Tadao; and Shuto, Sadanobu, to Fuji Photo Film Co., Ltd. Process for processing a color reversal photographic light-sensitive material. 4,717,648, Cl. 430-379.000.
Ueki, Noriyuki: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueki, Noriyuki, 4,716,861, Cl. 123-90.200.
Ueki, Satoshi: *See*—
Doi, Yoshiharu; Soga, Kazuo; Ueki, Satoshi; and Miyazaki, Makoto, 4,717,755, Cl. 525-333.700.
Ueno, Akira: *See*—
Himuro, Keiji; and Ueno, Akira, 4,717,931, Cl. 354-173.100.
Ueno, Hideo; and Hattori, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter. 4,717,269, Cl. 400-51.000.
Uenoyama, Tadashi, to NEC Corporation. Method and apparatus for determining the endpoints of a speech utterance. 4,718,097, Cl. 381-46.000.
Ugawa, Satoru, to Nissan Motor Co., Ltd. Window regulator for an automotive vehicle. 4,716,681, Cl. 49-349.000.
Ulbers, Gerd, to Hommelwerke GmbH. Device for measuring small distances. 4,717,255, Cl. 356-345.000.
Ullman, Timothy J.: *See*—
Yates, John B., III; and Ullman, Timothy J., 4,717,751, Cl. 525-166.000.
Yates, John B., III; and Ullman, Timothy J., 4,717,752, Cl. 525-175.000.
Umada, Youichi: *See*—
Sato, Hiroshi; Hirose, Kenichi; Kitamura, Masaru; Umada, Youichi; Ishii, Norio; and Tojima, Hideto, 4,717,769, Cl. 540-536.000.
Umemoto, Tadahiro; and Kobayashi, Hiroe, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Vibration damping system. 4,716,986, Cl. 181/207.000.
Umemoto, Tomeo: *See*—
Horii, Yasuyuki; Nishikawa, Takao; Yamanishi, Isamu; and Umemoto, Tomeo, 4,716,775, Cl. 74-15.860.
Umezawa, Masanobu: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Ichikawa, Hiroshi; Imai, Yoshikazu; and Umezawa, Masanobu, 4,717,589, Cl. 427-57.000.
Underwood, Alan K., to Armstong Fastenings, Ltd. Wheel nut assemblies. 4,717,299, Cl. 411-11.000.
Union Carbide Corporation: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; Bryant, David R.; Murray, Rex E.; and Maher, John M., 4,717,775, Cl. 568-454.000.
Cavender, Keith D., 4,717,518, Cl. 264-51.000.
Fisch, Herbert A.; Palsha, Edward M.; and Skotko, Sandra L., 4,717,500, Cl. 252-181.400.
Pelton, John F., 4,717,126, Cl. 266-200.000.
Rifi, Mahmoud R., 4,717,753, Cl. 525-330.400.
Unisearch Limited: *See*—
Walsh, Michael J.; and Churches, Alexander E., 4,717,133, Cl. 269-328.000.
Unisys Corporation: *See*—
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,717,493, Cl. 252-62.540.
Popielarski, Edward J.; and Thomas, Kenneth D., 4,717,064, Cl. 228-39.000.
United Kingdom Atomic Energy Authority: *See*—
James, John M., 4,717,510, Cl. 252-628.000.
United States of America
Air Force: *See*—
Blaugher, Richard D.; and Kolek, Robert L., 4,717,437, Cl. 156-52.000.
Army: *See*—
Levy, Stephen, 4,717,834, Cl. 307-106.000.
Mon, George; and Joyce, James W., 4,716,936, Cl. 137-833.000.
Schmitz, John P.; and Hollinger, Jeffrey O., 4,717,115, Cl. 249-112.000.

Srour, Nassy; and Drzewiecki, Tadeusz M., 4,716,935, Cl. 137-825.000.
Energy: *See*—
Duerksen, Walter K., 4,717,420, Cl. 75-84.10R.
Nellis, William J.; Geballe, Theodore H.; and Maple, M. Brian, 4,717,627, Cl. 428-552.000.
Health and Human Services: *See*—
Lee, Albert K., 4,717,548, Cl. 422-68.000.
Navy: *See*—
Anderson, William B., 4,717,862, Cl. 315-246.000.
Ensley, Donald; and Satake, Hiroshi, 4,717,256, Cl. 356-350.000.
Reedy, Ronald E.; Harris, Jay H.; and Albares, Donald J., 4,718,063, Cl. 370-112.000.
U.S. Philips Corporation: *See*—
Dieleman, Jan; and Sanders, Franciscus H. M., 4,717,447, Cl. 156-643.000.
Maas, Henricus G. R.; and Appels, Johannes A., 4,717,689, Cl. 437-225.000.
Messiou, Antoine Y., 4,717,821, Cl. 250-221.000.
Peters, Joseph H., 4,718,067, Cl. 371-38.000.
van der Werf, Pieter; and Versteyne, Albertus, 4,717,457, Cl. 428-701.000.
Van de Wiel, Petrus J. A. M.; and Esser, Leonard J. M., 4,717,944, Cl. 357-23.140.
Zwaga, Bocke; and Haveman, Hendrik J., 4,718,059, Cl. 370-85.000.
Zwier, Jan; and Vasterink, Johannes H. A., 4,717,855, Cl. 313-409.000.
United Technologies Automotive, Inc.: *See*—
Rahrig, Thomas F.; and Hall, Thomas E., 4,717,356, Cl. 439-464.000.
Rahrig, Thomas F.; and Hall, Thomas E., 4,717,359, Cl. 439-595.000.
United Technologies Corporation: *See*—
Ault, Earle A., 4,717,432, Cl. 148-162.000.
Dennison, William T., 4,717,610, Cl. 428-65.000.
Moffatt, E. Marston; and Swarts, Richard E., 4,716,763, Cl. 73-505.000.
University of British Columbia: *See*—
Shaw, John M.; and Oloman, Colin W., 4,717,450, Cl. 162-29.000.
University of Pittsburgh of The Commonwealth System of Higher Education: *See*—
Meno, Frank, 4,716,904, Cl. 128-654.000.
UOP Inc.: *See*—
Arena, Blaise J., 4,717,696, Cl. 502-28.000.
Bricker, Jeffery C.; Imai, Tamotsu; and Mackowiak, David E., 4,717,779, Cl. 585-443.000.
Imai, Tamotsu; Bricker, Jeffery C.; Chao, Tai-Hsiang; and Bricker, Maureen L., 4,717,781, Cl. 585-441.000.
Staehle, Bruce E.; and Holbrook, David L., 4,717,481, Cl. 210-649.000.
Zinnen, Hermann A.; and Franczyk, Thad S., 4,717,778, Cl. 568-934.000.
Upadhyay, Anand K.: *See*—
Diaz, Bonifacio; and Upadhyay, Anand K., 4,717,994, Cl. 363-21.000.
Urano, Chiaki: *See*—
Miki, Masaharu; Ishizawa, Tadao; and Urano, Chiaki, 4,717,315, Cl. 417-365.000.
Urban, Jozsef, to Kontakta Alkatreszgyar. Precision snap-action switch with stiffening ribs between an actuating bulge and support for the actuating spring element. 4,717,795, Cl. 200-67.0DA.
Urban, Manfred; and Ohngemach, Jorg, to Merck Patent Gesellschaft mit beschrankter Haftung. Radiation curable adhesives. 4,717,605, Cl. 428-1.000.
Urbanic, John M.; and Van Linden, Jan H., to Aluminum Company of America. Molten metal conduit. 4,717,052, Cl. 222-590.000.
Usuda, Kinya: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 4,717,645, Cl. 430-296.000.
Usui, Yasunori: *See*—
Matsuda, Hideo; Tsunoda, Yoshiaki; Fujiwara, Takashi; and Usui, Yasunori, 4,717,947, Cl. 357-38.000.
USX Corporation: *See*—
Perfetti, Bruno M., 4,717,422, Cl. 106-19.000.
USX Engineers & Consultants, Inc.: *See*—
Makins, James E., Jr.; and Thompson, James E., 4,716,961, Cl. 166-68.500.
Uto, Nobutaka: *See*—
Iida, Noriyoshi; Uto, Nobutaka; Hiroi, Masakazu; and Hoshi, Akimitsu, 4,717,134, Cl. 270-39.000.
Utsui, Masaaki; Shimizu, Makoto; Hoshina, Noriyuki; Adachi, Nobuyuki; Kurihara, Takashi; and Shiino, Tatsuo, to Fuji Photo Film Co., Ltd. Method of assembling magnetic recording disk cartridge. 4,716,650, Cl. 29-430.000.
Utsumi, Noriyuki: *See*—
Godai, Hiroshi; Otani, Yukio; and Utsumi, Noriyuki, 4,716,785, Cl. 74-640.000.
Vachon, Bertrand. Hook type quick coupling for tractor implement. 4,717,166, Cl. 280-481.000.
Valencia, Alfred E. Automobile turntable. 4,716,837, Cl. 104-38.000.
Valeo: *See*—
Trin, Pierre, 4,717,119, Cl. 251-144.000.
Valtion teknillinen tutkimuskeskus: *See*—
Santamaki, Harry; Leppanen, Juha; Haikonen, Pontti; and Korhonen, Ilkka, 4,717,957, Cl. 358-136.000.
Valyocsik, Ernest W.: *See*—
Olson, David H.; Rodewald, Paul G.; and Valyocsik, Ernest W., 4,717,780, Cl. 585-467.000.
van Beaumont, Richard A.: *See*—
van Overbruggen, Garardus J. J.; van Beaumont, Richard A.; and Thijssen, Henricus A. C., 4,717,047, Cl. 222-207.000.
van Beek, Gys J. Pocket loss prevention guard. 4,716,600, Cl. 2-250.000.
Vandeberg, John T.: *See*—
Brown, Wallace H.; Anderson, Dennis G.; and Vandeberg, John T., 4,717,623, Cl. 428-409.000.
Van de Poel, Rene J.: *See*—
Hilsum, Cyril; and Van de Poel, Rene J., 4,717,244, Cl. 350-333.000.
van der Meulen, Leendert. Beverage can drinking attachment. 4,717,037, Cl. 220-90.600.
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Wittman, Gary R.: *See*—
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Wittmer, Dale E., to GTE Products Corporation. Process for producing beta silicon nitride fibers. 4,717,693, Cl. 501-97.000.
Wolf, Hans P.; and Young, Donald R., to International Business Machines. Charge storage structure for nonvolatile memories. 4,717,943, Cl. 357-23.500.

Wolfe, Robert W.; and Schulze, Harry O., to GTE Products Corporation. Process for binding pigment particles to phosphor particles. 4,717,590, Cl. 427-68.000.
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Yates, John B., III; and Ullman, Timothy J., to General Electric Company. Linear polyester resin blends with high impact resistance. 4,717,752, Cl. 525-175.000.
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Yorgan, Kenneth J. Intersegmental traction apparatus for the cervical spine. 4,716,891, Cl. 128-57.000.
York, Billie M., Jr., to Alcon Laboratories, Inc. Ophthalmic wound healing with aldose reductase inhibitors. 4,717,725, Cl. 514-278.000.
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Zinnen, Hermann A.; and Franczyk, Thad S., to UOP Inc. Process for separating the minor isomers of dinitrotoluene. 4,717,778, Cl. 568-934.000.
Zitting, Gordon T.; and Duke, Jay T., to Microdot Inc. High pressure rotary shaft seal. 4,717,160, Cl. 277-105.000.
Zoni, Sergio, to Dulevo S.p.A. Floor and bounded surface sweeper machine. 4,716,621, Cl. 15-349.000.
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Clemens, R. Michael; and Zaeltvay, Kenneth A., 4,717,382, Cl. 604-122.000.
Zwaga, Bocke; and Haveman, Hendrik J., to U.S. Philips Corporation. Method of transmitting information in a digital transmission system. 4,718,059, Cl. 370-85.000.
Zwier, Jan; and Vasterink, Johannes H. A., to U.S. Philips Corporation. Dual-cathode electron emission device. 4,717,855, Cl. 313-409.000.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JANUARY, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aileo, Jackson A.; and Frieder, Leonard P., Jr., to Gentex Corporation. Protective helmet. Re. 32,569, Cl. 2-416.000.

Burger, Kurt; and Friedrich, Heinz, to Robert Bosch GmbH. Method of manufacturing corrosion-resistant measuring probes. Re. 32,571, Cl. 156-251.000.

Campanelli, Michael R.: *See*—
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., Re. 32,572, Cl. 156-626.000.

Ceshkovsky, Ludwig; and Dakin, Wayne R., to Discovision Associates. Method and apparatus for information retrieval from an optically readable storage medium. Re. 32,574, Cl. 369-32.000.

Conn, Worth R., to Detectors, Inc. Tilt detector. Re. 32,570, Cl. 116-215.000.

Dakin, Wayne R.: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., Re. 32,574, Cl. 369-32.000.

Detectors, Inc.: *See*—
Conn, Worth R., Re. 32,570, Cl. 116-215.000.

Discovision Associates: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., Re. 32,574, Cl. 369-32.000.

Drake, Donald J.: *See*—
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., Re. 32,572, Cl. 156-626.000.

Frieder, Leonard P., Jr.: *See*—
Aileo, Jackson A.; and Frieder, Leonard P., Jr., Re. 32,569, Cl. 2-416.000.

Friedrich, Heinz: *See*—
Burger, Kurt; and Friedrich, Heinz, Re. 32,571, Cl. 156-251.000.

Furumura, Kyozaburo; and Matsunaga, Shigeki, to Nippon Seiko Kabushiki Kaisha. Process for producing a ferrofluid, and a composition thereof. Re. 32,573, Cl. 252-62.520.

Gentex Corporation: *See*—
Aileo, Jackson A.; and Frieder, Leonard P., Jr., Re. 32,569, Cl. 2-416.000.

Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., to Xerox Corporation. Thermal ink jet printhead and process therefor. Re. 32,572, Cl. 156-626.000.

Matsunaga, Shigeki: *See*—
Furumura, Kyozaburo; and Matsunaga, Shigeki, Re. 32,573, Cl. 252-62.520.

Nippon Seiko Kabushiki Kaisha: *See*—
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Robert Bosch GmbH: *See*—
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Xerox Corporation: *See*—
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., Re. 32,572, Cl. 156-626.000.

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TO WHOM

CERTIFICATES WERE ISSUED

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Cage, Donald R.: *See*—
Smith, James E.; and Cage, Donald R., B1 4,491,025, Cl. 73-861.380.

Larus Corporation: *See*—
McDermott, Noel C., B1 4,442,325, Cl. 379-398.000.

McDermott, Noel C., to Larus Corporation. Switchable incremental attenuation for telephone line interface. B1 4,442,325, 1-5-88, Cl. 379-398.000.

Micro Motion, Inc.: *See*—
Smith, James E.; and Cage, Donald R., B1 4,491,025, Cl. 73-861.380.

Pope, George F., to Scoggins Mfg. Inc. Method for forming holes in and installing lines in structural members. B1 3,611,549, 1-5-88, Cl. 29-433.000.

Scoggins Mfg. Inc.: *See*—
Pope, George F., B1 3,611,549, Cl. 29-433.000.

Smith, James E.; and Cage, Donald R., to Micro Motion, Inc. Parallel path coriolis mass flow rate meter. B1 4,491,025, 1-5-88, Cl. 73-861.380.

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Adams, Samuel F.: *See*—
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Airway Industries, Inc.: *See*—
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American Standard Inc.: *See*—
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Amerock Corporation: *See*—
Bates, Wayne C.; and Clayton, LaVerne E., 293,548, Cl. D8-337.000.
Stinson, Phillip D., 293,549, Cl. D8-347.000.

Andersson, Sten, to Haldex AB. Compressed air drier for vehicles or for stationary use. 293,604, 1-5-88, Cl. D23-365.000.

Andreasson, Jan, to Skandiafabriken. Liquid level gauge. 293,558, 1-5-88, Cl. D10-101.000.

Anesthesia Respiratory Technology, Inc.: *See*—
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Anthony Manufacturing Corp.: *See*—
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Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,521, Cl. D6-433.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,523, Cl. D6-436.000.
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Bartholoman, Gunther; Adams, Jurgen; and Scholl, Hans-Peter, to Kienzle Apparate GmbH. Taximeter. 293,557, 1-5-88, Cl. D10-97.000.

Bates, Wayne C.; and Clayton, LaVerne E., to Amerock Corporation. Sash lock. 293,548, 1-5-88, Cl. D8-337.000.

Bellini, Mario. Chair. 293,517, 1-5-88, Cl. D6-366.000.

Bellini, Mario: *See*—
Seike, Seishin; and Bellini, Mario, 293,537, Cl. D7-313.000.

Berggreen, Ib H., to Interlego A.G. Toy merry-go-round top. 293,595, 1-5-88, Cl. D21-108.000.

Bergmann, Konrad; and Fabian, Wolfgang, to American Standard Inc. Water control unit for a hand shower. 293,599, 1-5-88, Cl. D23-233.000.

Bergmann, Konrad; and Fabian, Wolfgang, to American Standard Inc. Combined water control handle and escutheon. 293,605, 1-5-88, Cl. D23-254.000.

Bernhardt Industries: *See*—
Keller, H. Thomas, 293,526, Cl. D6-446.000.
Keller, H. Thomas, 293,527, Cl. D6-446.000.

Bolich, Donald L. Beverage stein. 293,534, 1-5-88, Cl. D7-5.000.

Bonanno, Carmine J., to Voyetra Technologies. Guitar controller for a music synthesizer. 293,589, 1-5-88, Cl. D17-14.000.

Britt, William J., to Dow Chemical Company, The. Bottle. 293,551, 1-5-88, Cl. D9-378.000.

Brown, Alan G., to Impco Carburetion, Inc. Connecting adapter for a gaseous fuel carburetor. 293,581, 1-5-88, Cl. D15-6.000.

Brown Jordan Company Limited Partnership: *See*—
Frinier, Richard, 293,515, Cl. D6-349.000.

Buchin, Karl, to Krone GmbH. Telephone apparatus. 293,571, 1-5-88, Cl. D14-53.000.

Buchin, Karl, to Krone GmbH. Telephone apparatus. 293,572, 1-5-88, Cl. D14-53.000.

Bulgari, Marina, to Marina B Creation S.A. Necklace. 293,561, 1-5-88, Cl. D11-3.000.

Bulwik, Helen C., to Sanca International Inc. Cosmetic kit. 293,612, 1-5-88, Cl. D28-83.000.

Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 293,607, Cl. D26-26.000.

Cadbury Schweppes, PLC: *See*—
Dole, Charles M.; Webster, Gary L.; Koda, Walter; and Karlis, Robert G., 293,544, Cl. D7-397.000.

Canon Kabushiki Kaisha: *See*—
Kando, Masahiro; Yono, Takashi; and Suzuki, Noriyuki, 293,574, Cl. D14-94.000.

Chalabian, Jack S., to K-Jack Engineering Co., Inc. Coin operated door lock for vending machine. 293,592, 1-5-88, Cl. D20-9.000.

Champion Spark Plug Company: *See*—
Morgan, Frederick M., 293,584, Cl. D15-9.000.
Morgan, Frederick M., 293,585, Cl. D15-9.000.

Choi, Jong S., to Gold Star Co., Ltd. Microwave oven. 293,540, 1-5-88, Cl. D7-351.000.

Christianson, Peter J. Combined mixer and pump for hog feed slurry. 293,582, 1-5-88, Cl. D15-7.000.

Citizen Watch Co., Ltd.: *See*—
Sakamaki, Yasuyuki, 293,552, Cl. D10-30.000.
Sakamaki, Yasuyuki, 293,553, Cl. D10-30.000.
Sakamaki, Yasuyuki, 293,554, Cl. D10-30.000.

Clayton, LaVerne E.: *See*—
Bates, Wayne C.; and Clayton, LaVerne E., 293,548, Cl. D8-337.000.

Coast Manufacturing Co., Inc.: *See*—
Kappel, Joseph; and Goldberg, Richard, 293,506, Cl. D3-33.000.

Conn, Marks M., to Mallin Company. Chair frame or the like. 293,519, 1-5-88, Cl. D6-373.000.

Davis, Arnold M., to International Business Machines Corporation. Display terminal for data processing apparatus. 293,579, 1-5-88, Cl. D14-113.000.

DiSesa, Frank J., to Tucker Housewares, Inc. Shelf. 293,533, 1-5-88, Cl. D6-574.000.

Dole, Charles M.; Webster, Gary L.; Koda, Walter; and Karlis, Robert G., to Cadbury Schweppes, PLC. Carbonator unit for a home beverage dispenser. 293,544, 1-5-88, Cl. D7-397.000.

Dow Chemical Company, The: *See*—
Britt, William J., 293,551, Cl. D9-378.000.

Dunlap, Jerald V., to M-D & Co. Packaged air inflator set. 293,583, 1-5-88, Cl. D15-7.000.

Eastman Kodak Company: *See*—
Leonard, Bruce A., 293,587, Cl. D16-6.000.

Encon Manufacturing, Inc.: *See*—
Specht, Paul B.; and Hewitt, Charles D., 293,504, Cl. D16-107.000.

F. J. Strauss Co., Inc.: *See*—
Hang, Mak C., 293,596, Cl. D21-150.000.

Fabian, Wolfgang: *See*—
Bergmann, Konrad; and Fabian, Wolfgang, 293,599, Cl. D23-233.000.
Bergmann, Konrad; and Fabian, Wolfgang, 293,605, Cl. D23-254.000.

Fargis, Paul; and Lief, Philip. Combination photography and art mount. 293,512, 1-5-88, Cl. D6-302.000.

Finney, Frederick T.: *See*—
Mayhew, Fred C.; Turner, David C.; and Finney, Frederick T., 293,564, Cl. D12-169.000.

Fitzgerald, Walter G.; Middleton, Herbert H., Jr.; and Price, Clinton O., to John Middleton, Inc. Humidor. 293,608, 1-5-88, Cl. D27-45.000.

Ford Motor Company: *See*—
Mayhew, Fred C.; Turner, David C.; and Finney, Frederick T., 293,564, Cl. D12-169.000.

Fortel Corporation: *See*—
Martinez, Arthur T., 293,568, Cl. D14-4.000.

Frinier, Richard, to Brown Jordan Company Limited Partnership. Ottoman. 293,515, 1-5-88, Cl. D6-349.000.

Fuzioka, Keizi; and Umemoto, Hitoo, to Ohtsu Tire & Rubber Co., Ltd., The. Tire. 293,562, 1-5-88, Cl. D12-139.000.

Fuzioka, Keizi; and Umemoto, Hitoo, to Ohtsu Tire & Rubber Co., The. Tire sidewall. 293,563, 1-5-88, Cl. D12-152.000.

Garnant, Bruce K.; and Garnant, Elizabeth A. Sign. 293,593, 1-5-88, Cl. D20-31.000.

Garnant, Elizabeth A.: *See*—
Garnant, Bruce K.; and Garnant, Elizabeth A., 293,593, Cl. D20-31.000.

Gauffin, Stig, to Telefonaktiebolaget LM Ericsson. Printer for data terminals. 293,577, 1-5-88, Cl. D14-111.000.

Gold Star Co., Ltd.: *See*—
Choi, Jong S., 293,540, Cl. D7-351.000.
Song, Bong H., 293,541, Cl. D7-351.000.
Yoo, Seung H., 293,542, Cl. D7-351.000.

Goldberg, Richard: *See*—
Kappel, Joseph; and Goldberg, Richard, 293,506, Cl. D3-33.000.

Haas, Ulrich J., to Optyl Eyewear Fashion International Corp. Eyeglass frame. 293,588, 1-5-88, Cl. D16-116.000.

Haldex AB: *See*—
Andersson, Sten, 293,604, Cl. D23-365.000.

Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Cabinet. 293,521, 1-5-88, Cl. D6-433.000.

Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Combined cabinet and shelf unit. 293,523, 1-5-88, Cl. D6-436.000.

Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Shelf unit. 293,528, 1-5-88, Cl. D6-449.000.

Hang, Mak C., to F. J. Strauss Co., Inc. Toy robot. 293,596, 1-5-88, Cl. D21-150.000.

Hara, Kunio, to Kabushiki Kaisha Toshiba. Image scanner for electronic copying machine. 293,576, 1-5-88, Cl. D14-107.000.

Harvey, Peter J. N., to J. H. Fenner & Co. Limited. Belt jointing device. 293,586, 1-5-88, Cl. D15-138.000.

Hase, Yoshiaki, to Asics Corporation. Shoe sole. 293,502, 1-5-88, Cl. D2-320.000.

Hase, Yoshiaki: *See*—
Mitsui, Shigeyuki; and Hase, Yoshiaki, 293,503, Cl. D2-320.000.

Hewitt, Charles D.: *See*—
Specht, Paul B.; and Hewitt, Charles D., 293,504, Cl. D16-107.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Spout. 293,601, 1-5-88, Cl. D23-255.000.

Hirsh Company: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,521, Cl. D6-433.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,523, Cl. D6-436.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,528, Cl. D6-449.000.

Home Health and Safety: *See*—
Tenny, Dale E., 293,611, Cl. D28-64.000.

Hosmer, David W. Paper bundling table. 293,513, 1-5-88, Cl. D6-400.000.

Hunt, Freddie E.; and Ronquillo, John E., to Anthony Manufacturing Corp. Adjustable pipe joint. 293,600, 1-5-88, Cl. D23-264.000.

Hurrelbrink, Harold K., to Magnuson Group. Coat hanger. 293,514, 1-5-88, Cl. D6-318.000.

Igarashi, Tadao, to Sony Corporation. Reel for a video tape cassette. 293,569, 1-5-88, Cl. D14-111.000.

Igarashi, Tadao, to Sony Corporation. Reel for a video tape cassette. 293,570, 1-5-88, Cl. D14-111.000.

Imanishi Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nishikawa, Hideo, 293,539, Cl. D7-337.000.
Nishikawa, Hideo, 293,543, Cl. D7-360.000.

Impco Carburetion, Inc.: *See*—
Brown, Alan G., 293,581, Cl. D15-6.000.

Interlego A.G.: *See*—
Berggreen, Ib H., 293,595, Cl. D21-108.000.

International Business Machines Corporation: *See*—
Davis, Arnold M., 293,579, Cl. D14-113.000.

Intersport Fashions West, Inc.: *See*—
Nagy, Neil F., 293,567, Cl. D13-10.000.

Iskra-Sozd Elektrokovinske Industrije: *See*—
Klojcnik, Ljuban, 293,556, Cl. D10-76.000.

J. H. Fenner & Co. Limited: *See*—
Harvey, Peter J. N., 293,586, Cl. D15-138.000.

James, Richard P., to Personal Products Company. Sanitary napkin. 293,606, 1-5-88, Cl. D24-51.000.

Japan Art Kikaku Co., Ltd.: *See*—
Komamura, Takeo, 293,511, Cl. D6-300.000.

John H. Best & Sons, Inc.: *See*—
Ovitz, Ernest G., III, 293,520, Cl. D6-409.000.

John Middleton, Inc.: *See*—
Fitzgerald, Walter G.; Middleton, Herbert H., Jr.; and Price, Clinton O., 293,608, Cl. D27-45.000.

K-Jack Engineering Co., Inc.: *See*—
Chalabian, Jack S., 293,592, Cl. D20-9.000.

Kabushiki Kaisha Toshiba: *See*—
Hara, Kunio, 293,576, Cl. D14-107.000.

Kando, Masahiro; Yono, Takashi; and Suzuki, Noriyuki, to Canon Kabushiki Kaisha. Facsimile. 293,574, 1-5-88, Cl. D14-94.000.

Kappel, Joseph; and Goldberg, Richard, to Coast Manufacturing Co., Inc. Carrying case for a video cassette recorder. 293,506, 1-5-88, Cl. D3-33.000.
Karlis, Robert G.: *See*—
Dole, Charles M.; Webster, Gary L.; Koda, Walter; and Karlis, Robert G., 293,544, Cl. D7-397.000.
Keller, H. Thomas, to Bernhardt Industries. Chest. 293,526, 1-5-88, Cl. D6-446.000.
Keller, H. Thomas, to Bernhardt Industries. Dresser. 293,527, 1-5-88, Cl. D6-446.000.
Kienzle Apparate GmbH: *See*—
Bartholoman, Gunther; Adams, Jurgen; and Scholl, Hans-Peter, 293,557, Cl. D10-97.000.
Kiiski, Heikki, to Tunturipyora Oy. Bicycle ergometer. 293,598, 1-5-88, Cl. D21-194.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 293,509, 1-5-88, Cl. D3-48.000.
Kiyosawa, Junichi, to Asics Corporation. Shoe sole. 293,501, 1-5-88, Cl. D2-320.000.
Klojcaik, Ljuban, to Iskra-Sozd Elektrokovinske Industrije. Oscilloscope. 293,556, 1-5-88, Cl. D10-76.000.
Koda, Walter: *See*—
Dole, Charles M.; Webster, Gary L.; Koda, Walter; and Karlis, Robert G., 293,544, Cl. D7-397.000.
Komamura, Takeo, to Japan Art Kikaku Co., Ltd. Connector for a picture frame. 293,511, 1-5-88, Cl. D6-300.000.
Krone GmbH: *See*—
Buchin, Karl, 293,571, Cl. D14-53.000.
Buchin, Karl, 293,572, Cl. D14-53.000.
Latino, Richard M.: *See*—
Wright, David; and Latino, Richard M., 293,530, Cl. D6-510.000.
Wright, David; and Latino, Richard M., 293,531, Cl. D6-511.000.
Lenihan, Gary G., to Quaker Oats Company, The. Toy piano. 293,594, 1-5-88, Cl. D21-64.000.
Leonard, Bruce A., to Eastman Kodak Company. Camera. 293,587, 1-5-88, Cl. D16-6.000.
Levine, Barbara S., to Levine, Barbara Sue. Hand dryer. 293,602, 1-5-88, Cl. D28-54.100.
Levine, Barbara Sue: *See*—
Levine, Barbara S., 293,602, Cl. D28-54.100.
Lief, Philip: *See*—
Fargis, Paul; and Lief, Philip, 293,512, Cl. D6-302.000.
Lin, Ping-Hwang. Measuring tape. 293,555, 1-5-88, Cl. D10-72.000.
Lindheimer, Thom. Duck boat. 293,566, 1-5-88, Cl. D12-300.000.
M-D & Co.: *See*—
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MacGregor, Bruce: *See*—
Tong, James K.; and MacGregor, Bruce, 293,500, Cl. D2-314.000.
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Coan, Marks M., 293,519, Cl. D6-373.000.
Marconi, Karen D., to Quaker Oats Company, The. Diaper bag. 293,508, 1-5-88, Cl. D3-48.000.
Marina B Creation S.A.: *See*—
Bulgari, Marina, 293,561, Cl. D11-3.000.
Martinez, Arthur T., to Fortel Corporation. Telephone answering unit. 293,568, 1-5-88, Cl. D14-4.000.
Masco Corporation of Indiana: *See*—
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Masprodenkoh Kabushikikaisha: *See*—
Nakayama, Kazuyoshi, 293,573, Cl. D14-90.000.
Sugiura, Toshihiro, 293,575, Cl. D14-90.000.
Massie, Lewis E. Magnetic novelty sculpture. 293,539, 1-5-88, Cl. D11-131.000.
Matsumaru, Takashi, to Tanita Corporation. Gas igniter or the like. 293,603, 1-5-88, Cl. D7-416.000.
Matsumoto, Nobuki; and Sakino, Kozo, to Ricoh Company Ltd. Printer. 293,578, 1-5-88, Cl. D14-111.000.
Mayhew, Fred C.; Turner, David C.; and Finney, Frederick T., to Ford Motor Company. Automobile front bumper. 293,564, 1-5-88, Cl. D12-169.000.
Middleton, Herbert H., Jr.: *See*—
Fitzgerald, Walter G.; Middleton, Herbert H., Jr.; and Price, Clinton O., 293,608, Cl. D27-45.000.
Miller, Melvin M. Display stand. 293,522, 1-5-88, Cl. D6-436.000.
Miller, Melvin M. Display stand. 293,524, 1-5-88, Cl. D6-436.000.
Miller, Melvin M. Display stand. 293,525, 1-5-88, Cl. D6-436.000.
Mimaki, Akira, to Parker Pen Ltd. Double pen desk set. 293,590, 1-5-88, Cl. D19-75.000.
Mimaki, Akira, to Parker Pen Ltd. Single pen desk set. 293,591, 1-5-88, Cl. D19-75.000.
Mitsui, Shigeyuki; and Hase, Yoshiaki, to Asics Corporation. Shoe sole. 293,503, 1-5-88, Cl. D2-320.000.
Morgan, Frederick M., to Champion Spark Plug Company. Air compressor. 293,584, 1-5-88, Cl. D15-9.000.
Morgan, Frederick M., to Champion Spark Plug Company. Air compressor. 293,585, 1-5-88, Cl. D15-9.000.
Nagy, Neil F., to Intersport Fashions West, Inc. Battery cover. 293,567, 1-5-88, Cl. D13-10.000.
Nakayama, Kazuyoshi, to Masprodenkoh Kabushikikaisha. Down converter for a satellite receiver. 293,573, 1-5-88, Cl. D14-90.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ogasa, Mikio, 293,507, Cl. D3-35.000.
Nishikawa, Hideo, to Imanishi Kinzoku Kogyo Kabushiki Kaisha. Broiler. 293,539, 1-5-88, Cl. D7-337.000.
Nishikawa, Hideo, to Imanishi Kinzoku Kogyo Kabushiki Kaisha. Broiler. 293,543, 1-5-88, Cl. D7-360.000.
Ogasa, Mikio, to Nippon Gakki Seizo Kabushiki Kaisha. Disc magazine case. 293,507, 1-5-88, Cl. D3-35.000.
Ohtsu Tire & Rubber Co., The: *See*—
Fuzioka, Keizi; and Umemoto, Hitoo, 293,563, Cl. D12-152.000.
Ohtsu Tire & Rubber Co., Ltd., The: *See*—
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Optyl Eyewear Fashion International Corp.: *See*—
Haas, Ulrich J., 293,588, Cl. D16-116.000.
Ovitz, Ernest G., III, to John H. Best & Sons, Inc. Sample display booth for carpet, tile and the like. 293,520, 1-5-88, Cl. D6-409.000.
Owen, M. Eugene. Boot for securing a motorcycle tire against rotation. 293,547, 1-5-88, Cl. D8-333.000.
Parker Pen Ltd.: *See*—
Mimaki, Akira, 293,590, Cl. D19-75.000.
Mimaki, Akira, 293,591, Cl. D19-75.000.
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Roberts, Doreen N., 293,560, Cl. D11-158.000.
PENSA, Inc.: *See*—
Tong, James K.; and MacGregor, Bruce, 293,500, Cl. D2-314.000.
Personal Products Company: *See*—
James, Richard P., 293,606, Cl. D24-51.000.
Peyton, Jeffrey L. Puppet figure. 293,597, 1-5-88, Cl. D21-154.000.
Price, Clinton O.: *See*—
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Quaker Oats Company, The: *See*—
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Ricoh Company Ltd.: *See*—
Matsumoto, Nobuki; and Sakino, Kozo, 293,578, Cl. D14-111.000.
Risha, Robert F. Permanent wave rod holder and dispenser. 293,609, 1-5-88, Cl. D28-11.000.
Ritmas, Joost R. Tumbler or similar article. 293,536, 1-5-88, Cl. D7-14.000.
Roberts, Doreen N., to Pendelfin Studios Limited. Table ornament. 293,560, 1-5-88, Cl. D11-158.000.
Rodgers, Charles F.; and Rodgers, Herman R. Nut harvester or the like. 293,545, 1-5-88, Cl. D8-1.000.
Rodgers, Herman R.: *See*—
Rodgers, Charles F.; and Rodgers, Herman R., 293,545, Cl. D8-1.000.
Rohrer, Hermann H. Bottle or similar article. 293,550, 1-5-88, Cl. D9-374.000.
Ronquillo, John E.: *See*—
Hunt, Freddie E.; and Ronquillo, John E., 293,600, Cl. D23-164.000.
Rosenthal Aktiengesellschaft Rechtsabteilung: *See*—
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Ross, Arthur O., to Ross Trading Co., Inc. Chair panel. 293,529, 1-5-88, Cl. D6-494.000.
Ross Trading Co., Inc.: *See*—
Ross, Arthur O., 293,529, Cl. D6-494.000.
Rost, Karl H.; and Adams, Samuel F., to Sonoco Products Company. Textile yarn carrier. 293,505, 1-5-88, Cl. D3-26.000.
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Zimmermann, Anso, 293,538, Cl. D7-317.000.
Rudnick, Martin E. Toothbrush cover. 293,510, 1-5-88, Cl. D4-199.000.
Sakamaki, Yasuyuki, to Citizen Watch Co., Ltd. Watch case. 293,552, 1-5-88, Cl. D10-30.000.
Sakamaki, Yasuyuki, to Citizen Watch Co., Ltd. Watch case. 293,553, 1-5-88, Cl. D10-30.000.
Sakamaki, Yasuyuki, to Citizen Watch Co., Ltd. Watch case. 293,554, 1-5-88, Cl. D10-30.000.
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Sanca International Inc.: *See*—
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Scholl, Hans-Peter: *See*—
Bartholoman, Gunther; Adams, Jurgen; and Scholl, Hans-Peter, 293,557, Cl. D10-97.000.
Schultz, Moses R. Adjustable chaise lounge. 293,516, 1-5-88, Cl. D6-161.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Nightlight. 293,607, 1-5-88, Cl. D26-26.000.
Seike, Seishin; and Bellini, Mario, to Zojorushi Vacuum Bottle, Co., Ltd. Electric insulated beverage dispenser or the like. 293,537, 1-5-88, Cl. D7-313.000.
Shirai, Mituru, to Toyota Jidosha Kabushiki Kaisha. Rear bumper for an automobile. 293,565, 1-5-88, Cl. D12-169.000.
Skandiafabriken: *See*—
Andreasson, Jan, 293,558, Cl. D10-101.000.
Song, Bong H., to Gold Star Co., Ltd. Microwave oven. 293,541, 1-5-88, Cl. D7-351.000.
Sonoco Products Company: *See*—
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Igarashi, Tadao, 293,570, Cl. D14-11.000.
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Specht, Paul B.; and Hewitt, Charles D., to Encon Manufacturing, Inc. Ventilated splash goggles. 293,504, 1-5-88, Cl. D16-107.000.
Steinkamp, Norman A., to Sunbeam Corporation. Curling iron. 293,610, 1-5-88, Cl. D28-35.000.
Stinson, Phillip D., to Amerock Corporation. Key bow cover. 293,549, 1-5-88, Cl. D8-347.000.
Sugiura, Toshihiro, to Masprodenkoh Kabushikikaisha. Frequency converter for an antenna. 293,575, 1-5-88, Cl. D14-90.000.
Sunbeam Corporation: *See*—
Steinkamp, Norman A., 293,610, Cl. D28-35.000.
Sussman, Howard. Combined toothbrush, tumbler and toothpaste holder. 293,532, 1-5-88, Cl. D6-531.000.
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Sylvan, Richard: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,521, Cl. D6-433.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 293,523, Cl. D6-436.000.
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Tanita Corporation: *See*—
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Taper, Richard. Harness for preventing conception in female animals. 293,614, 1-5-88, Cl. D30-144.000.
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Tenny, Dale E., to Home Health and Safety. Dental floss holder. 293,611, 1-5-88, Cl. D28-64.000.
Tong, James K.; and MacGregor, Bruce, to PENSA, Inc. Shoe collar. 293,500, 1-5-88, Cl. D2-314.000.
Tonon & C. S.p.A.: *See*—
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Tonon, Sandro, to Tonon & C. S.p.A. Chair. 293,518, 1-5-88, Cl. D6-370.000.
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Mayhew, Fred C.; Turner, David C.; and Finney, Frederick T., 293,564, Cl. D12-169.000.
Turney, Larry R.; and Zwicker, Roger D., to Victor Equipment Company. Torch. 293,546, 1-5-88, Cl. D8-30.000.
Umemoto, Hitoo: *See*—
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Fuzioka, Keizi; and Umemoto, Hitoo, 293,563, Cl. D12-152.000.
Victor Equipment Company: *See*—
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Voyetra Technologies: *See*—
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Webster, Gary L.: *See*—
Dole, Charles M.; Webster, Gary L.; Koda, Walter; and Karlis, Robert G., 293,544, Cl. D7-397.000.
Wiinblad, Bjorn, to Rosenthal Aktiengesellschaft Rechtsabteilung. Cup. 293,535, 1-5-88, Cl. D7-9.000.
Wingler, Harry L., to Anesthesia Respiratory Technology, Inc. Anesthesia and respiratory face mask. 293,613, 1-5-88, Cl. D29-7.000.
Wright, David; and Latino, Richard M., to Wright Line Inc. Keyboard support drawer for computer workstation. 293,530, 1-5-88, Cl. D6-510.000.
Wright, David; and Latino, Richard M., to Wright Line Inc. Electronic equipment support shelf. 293,531, 1-5-88, Cl. D6-511.000.
Wright Line Inc.: *See*—
Wright, David; and Latino, Richard M., 293,530, Cl. D6-510.000.
Wright, David; and Latino, Richard M., 293,531, Cl. D6-511.000.
Yomo, Takashi: *See*—
Kando, Masahiro; Yomo, Takashi; and Suzuki, Noriyuki, 293,574, Cl. D14-94.000.
Yoo, Seung H., to Gold Star Co., Ltd. Microwave oven. 293,542, 1-5-88, Cl. D7-351.000.
Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Insulated jug or the like. 293,538, 1-5-88, Cl. D7-317.000.
Zojorushi Vacuum Bottle, Co., Ltd.: *See*—
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LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to Metzler Investments and Metropolitan Life Insurance Company. Plum tree, "Anna Sun". 6,077, 1-5-88, Cl. 38.000.

Chrysanthemum Breeders Association NV: *See*—
Van Der Jagt, Martinus, 6,079, Cl. 74.000.

Gardner, Leith M.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 6,078, Cl. 41.000.

Iwakiri, Ben T., to University of California, The Regents of the. Asian pear tree named Daisui Li. 6,075, 1-5-88, Cl. 36.000.

Iwakiri, Ben T., to University of California, The Regents of the. Asian pear tree named "Shin Li". 6,076, 1-5-88, Cl. 36.000.

Metzler Investments and Metropolitan Life Insurance Company: *See*—
Chamberlin, Thomas O., Sr., 6,077, Cl. 38.000.

University of California, The Regents of the: *See*—
Iwakiri, Ben T., 6,075, Cl. 36.000.
Iwakiri, Ben T., 6,076, Cl. 36.000.

Van Der Jagt, Martinus, to Chrysanthemum Breeders Association NV. Chrysanthemum named 'Yellow Repin'. 6,079, 1-5-88, Cl. 74.000.

Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G. Nectarine tree (June Brite). 6,078, 1-5-88, Cl. 41.000.

Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 6,078, Cl. 41.000.

Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 6,078, Cl. 41.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 5TH DAY OF JANUARY, 1988

Berry, Gregory F.; Minkov, Vladimir; and Petrick, Michael, to United States of America, Energy. Open-cycle magnetohydrodynamic power plant based upon direct-contact closed-loop high-temperature heat exchanger. H410, 1-5-88, Cl. 310-11.000.

Buttrill, Sidney E., Jr.: *See*—
Young, Steven E.; and Buttrill, Sidney E., Jr., H414, Cl. 250-423.00R.

Colvin, Kevin W., to Rogers Corporation. High capacitance flexible circuit. H416, 1-5-88, Cl. 361-398.000.

Covey, James H., to United States of America, Army. Rocket/launcher interface. H405, 1-5-88, Cl. 89-1.816.

Farmer, Ray H.: *See*—
Hammon, Ricky K.; Helton, Monte K.; Farmer, Ray H.; and Meadows, James F., Jr., H400, Cl. 244-3.110.

Fisher, Alan R.: *See*—
Lemieux, George E.; and Fisher, Alan R., H398, Cl. 74-689.000.

George, E. Victor, to United States of America, Energy. Electricity and short wavelength radiation generator. H407, 1-5-88, Cl. 376-147.000.

Glasser, Alan, to United States of America, Army. Gun launched kinetic energy penetrator. H403, 1-5-88, Cl. 102-374.000.

Hammon, Ricky K.; Helton, Monte K.; Farmer, Ray H.; and Meadows, James F., Jr., to United States of America, Army. Aimpoint bias for terminal homing guidance. H400, 1-5-88, Cl. 244-3.110.

Helton, Monte K.: *See*—
Hammon, Ricky K.; Helton, Monte K.; Farmer, Ray H.; and Meadows, James F., Jr., H400, Cl. 244-3.110.

Hiremath, Basavaraj V.: *See*—
Newnham, Robert E.; and Hiremath, Basavaraj V., H415, Cl. 338-22.00R.

Ibach, David R., to United States of America, Army. Penetrator munition. H401, 1-5-88, Cl. 72-356.000.

Johnson, Charles H.; and Ogle, Estel E., to United States of America, Army. Water-to-water heat pipe exchanger. H399, 1-5-88, Cl. 165-47.000.

Jones, Michael M.: *See*—
Miller, Walter E., Jr.; Mitchell, Robert R.; and Jones, Michael M., H412, Cl. 250-203.00R.

Julian, Robert W.; Mast, Robert F.; Schlechten, Joseph R.; Warren, George E.; and Zinserling, Manfred H., to United States of America, Navy. High energy absorbing prestressed concrete fender piles and fendering system. H402, 1-5-88, Cl. 405-212.000.

Lelie, Arthur S., to United States of America, Navy. Microphone output-level tester. H413, 1-5-88, Cl. 381-58.000.

Lemieux, George E.; and Fisher, Alan R. Continuously variable transmission with split torque hydrokinetic unit. H398, 1-5-88, Cl. 74-689.000.

Mast, Robert F.: *See*—
Julian, Robert W.; Mast, Robert F.; Schlechten, Joseph R.; Warren, George E.; and Zinserling, Manfred H., H402, Cl. 405-212.000.

Meadows, James F., Jr.: *See*—
Hammon, Ricky K.; Helton, Monte K.; Farmer, Ray H.; and Meadows, James F., Jr., H400, Cl. 244-3.110.

Miles, Michael W., to United States of America, Air Force. Headset for ambient noise suppression. H417, 1-5-88, Cl. 381-94.000.

Miller, Walter E., Jr.; Mitchell, Robert R.; and Jones, Michael M., to United States of America, Army. Coordinate position detector. H412, 1-5-88, Cl. 250-203.00R.

Minkov, Vladimir: *See*—
Berry, Gregory F.; Minkov, Vladimir; and Petrick, Michael, H410, Cl. 310-11.000.

Mitchell, Robert R.: *See*—
Miller, Walter E., Jr.; Mitchell, Robert R.; and Jones, Michael M., H412, Cl. 250-203.00R.

Newnham, Robert E.; and Hiremath, Basavaraj V., to United States of America, Navy. Multilayer PTCR thermistor. H415, 1-5-88, Cl. 338-22.00R.

Ogle, Estel E.: *See*—
Johnson, Charles H.; and Ogle, Estel E., H399, Cl. 165-47.000.

Petrick, Michael: *See*—
Berry, Gregory F.; Minkov, Vladimir; and Petrick, Michael, H410, Cl. 310-11.000.

Rogers Corporation: *See*—
Colvin, Kevin W., H416, Cl. 361-398.000.

Sargent, Steven J.; and Stephenson, Anthony L., to United States of America, Navy. Graphite chamber manufacturing process. H408, 1-5-88, Cl. 156-172.000.

Sayles, David C., to United States of America, Army. Disposal of inorganic chemical wastes. H404, 1-5-88, Cl. 405-128.000.

Schlechten, Joseph R.: *See*—
Julian, Robert W.; Mast, Robert F.; Schlechten, Joseph R.; Warren, George E.; and Zinserling, Manfred H., H402, Cl. 405-212.000.

Spry, Robert J., to United States of America, Air Force. Prism holder. H396, 1-5-88, Cl. 350-287.000.

Stanley, Ann E., to United States of America, Army. Synthesis of cadmium sulfide using the laser-induced reaction of dialkylcadmium and organosulfur compounds. H409, 1-5-88, Cl. 204-157.410.

Stark, David C., to United States of America, Army. Modified bubble inturn mask periphery. H397, 1-5-88, Cl. 128-206.240.

Stephenson, Anthony L.: *See*—
Sargent, Steven J.; and Stephenson, Anthony L., H408, Cl. 156-172.000.

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Young, Steven E.; and Buttrill, Sidney E., Jr., H414, Cl. 250-423.00R.

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Berry, Gregory F.; Minkov, Vladimir; and Petrick, Michael, H410, Cl. 310-11.000.
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Julian, Robert W.; Mast, Robert F.; Schlechten, Joseph R.; Warren, George E.; and Zinserling, Manfred H., H402, Cl. 405-212.000.
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Newnham, Robert E.; and Hiremath, Basavaraj V., H415, Cl. 338-22.00R.

Sargent, Steven J.; and Stephenson, Anthony L., H408, Cl. 156-172.000.

Warren, George E.: *See*—
Julian, Robert W.; Mast, Robert F.; Schlechten, Joseph R.; Warren, George E.; and Zinserling, Manfred H., H402, Cl. 405-212.000.

Wohltjen, Henry, to United States of America, America. Organophosphorus selective ion mobility spectrometer. H406, 1-5-88, Cl. 436-153.000.

Yoder, Max N., to United States of America, America. Quasi-accumulation mode FET. H411, 1-5-88, Cl. 357-22.000.

Young, Steven E.; and Buttrill, Sidney E., Jr., to United States of America, Army. Surface ionization source. H414, 1-5-88, Cl. 250-423.00R.

Zinserling, Manfred H.: *See*—
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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72.2 4,716,994
197 4,716,995
306 4,716,996

CLASS 191
63 4,716,997

CLASS 192
3.29 4,716,999
3.3 4,716,998
30 V 4,717,001
56 F 4,717,003
99 S 4,717,002
111 A 4,717,004

CLASS 194
208 4,717,005
318 4,717,006
343 4,717,007
4,717,008

CLASS 198
347 4,717,009
4,717,010
365 4,717,011
425 4,717,012
461 4,717,013
518 4,717,014
733 4,717,015

CLASS 200
50 A 4,717,794
67 DA 4,717,795
144 B 4,717,796
4,717,797
4,717,798
153 P 4,717,799

CLASS 203
29 4,717,454

CLASS 204
33 4,717,455
34 4,717,456
44.2 4,717,458
44.3 4,717,459
192.1 4,717,461
298 4,717,462
422 4,717,463
427 4,717,464
444 4,717,460

CLASS 206
0.3 4,717,016
264 4,717,017
305 4,717,018
307 4,717,019
372 4,717,020
387 4,717,021
418 4,717,022
459 4,717,023
521 4,717,024
599 4,717,025

CLASS 208
111 4,717,465
113 4,717,466
4,717,467
356 4,717,468

CLASS 209
8 4,717,469
17 4,717,470
273 4,717,471
539 4,717,026
620 4,717,027

CLASS 210
90 4,717,472
170 4,717,473
180 4,717,474
237 4,717,475
256 4,717,476
314 4,717,477
360.2 4,717,478
498 4,717,479
500.42 4,717,800
638 4,717,480
649 4,717,481
651 4,717,482
681 4,717,483
711 4,717,484
781 4,717,485
795 4,717,486

CLASS 211
113 4,717,028

CLASS 212
132 4,717,029
205 4,717,030

CLASS 215
1 C 4,717,031
228 4,717,032
245 4,717,033
318 4,717,034

CLASS 119
9.5 4,717,801
10.55 E 4,717,802
89 E 4,717,803
89 W 4,717,804
108 4,717,805
121 PE 4,717,806
130.21 4,717,807
207 4,717,808
438 4,717,809
457 4,717,810
497 4,717,811
528 4,717,812
541 4,717,813
553 4,717,814

CLASS 220
3 4,717,035
18 4,717,036
90.6 4,717,037
94 R 4,717,038
253 4,717,039
306 4,717,040
316 4,717,041

CLASS 221
3 4,717,042
7 4,717,043
130 4,717,044

CLASS 222
64 4,717,045
107 4,717,046
207 4,717,047
400.8 4,717,048
420 4,717,049
482 4,717,050
545 4,717,051
590 4,717,052

CLASS 223
94 4,717,053

CLASS 224
42.21 4,717,054
42.45 R 4,717,055
158 4,717,056
217 4,717,057

CLASS 225
93 4,717,058

CLASS 226
2 4,717,059

CLASS 227
111 4,717,060
119 4,717,061
120 4,717,062
155 4,717,063

CLASS 228
39 4,717,064
147 4,717,065
179 4,717,066
193 4,717,067
303 4,717,068

CLASS 229
104 4,717,069
125.28 4,717,070

CLASS 235
378 4,717,815
382.5 4,717,816
441 4,717,817
462 4,717,818

CLASS 236
15 E 4,717,071

CLASS 239
75 4,717,072
107 4,717,073
288 4,717,074
398 4,717,075
467 4,717,076
548 4,717,077
550 4,717,078
585 4,717,079
4,717,080

CLASS 241
80 4,717,081
121 4,717,082
197 4,717,083
207 4,717,084
236 4,717,085

CLASS 242
47 4,717,086
75.4 4,717,087
109.2 4,717,088
107.4 A 4,717,089
197 4,717,090
199 4,717,091

CLASS 244
33 4,717,092
89 4,717,093
54 4,717,094
88 4,717,095
137.2 4,717,096
217 4,717,097
223 4,717,098

CLASS 248
57 4,717,099
73 4,717,100
241.1 4,717,101
228 4,717,102
231.3 4,717,103
235 4,717,104
295.1 4,717,105
309.2 4,717,106
353 4,717,107
432 4,717,108
441.1 4,717,109
545 4,717,110
562 4,717,111
639 4,717,112

CLASS 249
63 4,717,113
86 4,717,114
112 4,717,115

CLASS 250
204 4,717,819
209 4,717,820
221 4,717,821
236 4,717,822
4,717,823
237 G 4,717,824
256 4,717,825
307 4,717,826
343 4,717,827
458.1 4,717,828
492.2 4,717,829
178 4,717,830

CLASS 251
30.02 4,717,116
61.1 4,717,117
129.02 4,717,118
144 4,717,119
4,717,120
294 4,717,121

CLASS 252
1 4,717,487
8.551 4,717,488
32.7 E 4,717,489
4,717,490
46.7 4,717,491
51.5 R 4,717,492
62.52 Re.32,573
62.54 4,717,493
70 4,717,494
75 4,717,495
135 4,717,497
174.15 4,717,498
181 4,717,499
181.4 4,717,500
301.23 4,717,502
311 4,717,501
350 4,717,503
406.1 4,717,504
511 4,717,505
548 4,717,507
583 4,717,508
609 4,717,509
628 4,717,510
700 4,717,511

CLASS 256
134.3 R 4,717,122

CLASS 256
48 4,717,123

CLASS 260
189 4,717,512
508 4,717,514

CLASS 261
123 4,717,515

CLASS 264
22 4,717,516
33 4,717,517
51 4,717,518
103 4,717,519
147 4,717,520
219 4,717,521
320 4,717,522
521 4,717,525
827 4,717,523
550 4,717,524

CLASS 266
54 4,717,124
143 4,717,125
300 4,717,126
287 4,717,127
4,717,128

CLASS 267
113 4,717,129
141 4,717,130

CLASS 269
41 4,717,131
261 4,717,132
328 4,717,133

CLASS 270
39 4,717,134
4,717,135

CLASS 271
9 4,717,136
97 4,717,137
103 4,717,138
116 4,717,139
168 4,717,140
183 4,717,141
217 4,717,142
267 4,717,143
307 4,717,144

CLASS 272
72 4,717,145
73 4,717,146
117 4,717,147
145 4,717,148

CLASS 273
1.5 A 4,717,149
1.5 R 4,717,150
58 A 4,717,158
75 4,717,151
4,717,152
197 A 4,717,153
243 4,717,154
322 4,717,155
401 4,717,156
411 4,717,157

CLASS 277
1 4,717,159
105 4,717,160
4,717,161
205 4,717,162

CLASS 280
5 H 4,717,163
96.1 4,717,175
112 A 4,717,164
414.1 4,717,165
481 4,717,166
604 4,717,167
641 4,717,168
648 4,717,169
683 4,717,170
688 4,717,171
707 4,717,172
4,717,173
804 4,717,174

CLASS 281
15 R 4,717,176

CLASS 283
5 4,717,177

CLASS 285
4 4,717,178
112 4,717,179
175 4,717,180
229 4,717,181
230 4,717,182
334 4,717,183

CLASS 286
43 4,717,832
53 4,717,831

CLASS 293
87 4,717,184
340 4,717,185

CLASS 294
1.5 4,717,186
17 4,717,187
67.2 4,717,188
82.32 4,717,189
99.2 4,717,190
119.4 4,717,191

CLASS 296
37.1 4,717,192
37.7 4,717,193
63 R 4,717,194
72 4,717,195
98 4,717,196
107 4,717,197
192 4,717,198
214 4,717,199
4,717,200

CLASS 297
16 4,717,201
191 4,717,202
312 4,717,203
PKG 4,717,204

CLASS 299
39 4,717,205
82 4,717,206

CLASS 301
3 4,717,207
6 C 4,717,208
111 4,717,209
114 4,717,210
119 4,717,211

CLASS 307
44 4,717,833
106 4,717,834
285 4,717,835
310 4,717,836
313 4,717,837
355 4,717,838
359 4,717,839
416 4,717,842
455 4,717,843
465 4,717,844
473 4,717,846
475 4,717,845
4,717,847
549 4,717,848
570 4,717,849
594 4,717,840
646 4,717,841

CLASS 310
156 4,717,850
334 4,717,851

CLASS 313
12 4,717,213
21 4,717,212
107 4,717,214
184 4,717,215
257 R 4,717,216

CLASS 313
23 4,717,852
35 4,717,853
366 4,717,854
409 4,717,855
466 4,717,856
487 4,717,857
503 4,717,858
505 4,717,859
525 4,717,860

CLASS 318
223 4,717,867
288 4,717,868
316 4,717,869

CLASS 324
65 R 4,717,870
115 4,717,871
127 4,717,872
207 4,717,873
208 4,717,874
220 4,717,875
303 4,717,876
4,717,877
4,717,878
309 4,717,879
316 4,717,880
322 4,717,881
415 4,717,882

CLASS 328
151 4,717,883

CLASS 330
4,717,885
251 4,717,884
252 4,717,886
261 4,717,887
4,717,888
297 4,717,889
307 4,717,890

CLASS 331
17 4,717,891
113 R 4,717,892

CLASS 332
7.51 4,717,893
20 4,717,894

CLASS 333
1.1 4,717,895
241 P 4,717,861
246 4,717,862
307 4,717,863

CLASS 338
254 4,717,864
362 4,717,865
Re. 4,718,078
696 4,717,866

CLASS 339
223 4,717,867
288 4,717,868
316 4,717,869

CLASS 324
65 R 4,717,870
115 4,717,871
127 4,717,872
207 4,717,873
208 4,717,874
220 4,717,875
303 4,717,876
4,717,877
4,717,878
309 4,717,879
316 4,717,880
322 4,717,881
415 4,717,882

CLASS 328
151 4,717,883

CLASS 330
4,717,885
251 4,717,884
252 4,717,886
261 4,717,887
4,717,888
297 4,717,889
307 4,717,890

CLASS 331
17 4,717,891
113 R 4,717,892

CLASS 332
7.51 4,717,893
20 4,717,894

CLASS 333
1.1 4,717,895

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25	4,717,896	444	4,717,258	165	4,718,032		4,718,103	179	4,717,537	408	4,717,622
123	4,717,897	446	4,717,259	771	4,718,033	17	4,718,089	429	4,717,538	409	4,717,623
137	4,717,898		CLASS 357	784	4,718,034	26	4,718,090	457	4,717,539	423.1	4,717,624
	CLASS 338	23.14	4,717,944		4,718,035	41	4,718,091	513	4,717,540	432	4,717,625
131	4,717,899	23.3	4,717,941	829	4,718,036		4,718,104		CLASS 422	457	4,717,628
230	4,717,900	23.5	4,717,943	900	4,718,037	56	4,718,105	7	4,717,541	542.4	4,717,626
	CLASS 336	23.6	4,717,942		4,718,038		CLASS 383	15	4,717,542	532	4,717,627
83	4,717,901	24	4,717,945		4,718,039	180	4,717,262		4,717,543	566	4,717,629
	CLASS 337	30	4,717,946		4,718,040		CLASS 384	36	4,717,544	612	4,717,630
32	4,717,902	38	4,717,940		CLASS 365	12	4,717,263	56	4,717,545	628	4,717,631
	CLASS 338		4,717,947	185	4,718,041	43	4,717,264	62	4,717,547	698	4,717,632
162	4,717,903	71	4,717,948	201	4,718,042	49	4,717,265	83	4,717,546	701	4,717,457
	CLASS 340		CLASS 350	227	4,718,043	100	4,717,266	68	4,717,548		CLASS 429
		3	4,717,949	230	4,718,044	247	4,717,267	122	4,717,549	209	4,717,633
52 H	4,717,904	18	4,717,950		CLASS 367	280	4,717,268		CLASS 423	213	4,717,634
58	4,717,905	32	4,717,951	24	4,718,045		CLASS 400	121	4,717,550		CLASS 430
388	4,717,906	34	4,717,953	31	4,718,046	51	4,717,269	219	4,717,551	17	4,717,635
544	4,717,907	80	4,717,954	35	4,718,047	120	4,717,270	230	4,717,552	58	4,717,636
568	4,717,908	107	4,717,955	40	4,718,048	175	4,717,271	345	4,717,553	85	4,717,637
686	4,717,909	113	4,717,952	189	4,718,049	232	4,717,272	383	4,717,554	98	4,717,638
693	4,717,910	133	4,717,956		CLASS 368	613.2	4,717,273	408	4,717,555	124	4,717,639
724	4,717,911	136	4,717,957	21	4,717,260	616.2	4,717,274	411	4,717,556	192	4,717,640
825.060	4,717,914	222	4,717,958	63	4,717,261		CLASS 401	315	4,717,557	198	4,717,641
825.54	4,717,913	227	4,717,959		CLASS 369	104	4,717,275	372	4,717,558	213	4,717,642
825.83	4,717,912	228	4,717,960	32	Re.32,574	197	4,717,276	378	4,717,559	284	4,717,643
	CLASS 342	229	4,717,961	44	4,718,050	216	4,717,277	504	4,717,562	296	4,717,644
66	4,717,915	260	4,717,962		4,718,051	286	4,717,278		CLASS 428		4,717,645
107	4,717,916	282	4,717,963		4,718,052		CLASS 403	10	4,717,563	359	4,717,646
137	4,717,917	283	4,717,964		4,718,053	187	4,717,279	86	4,717,564	379	4,717,648
368	4,717,918	285	4,717,965	54	4,718,054	338	4,717,280	155	4,717,565	393	4,717,647
383	4,717,919	286	4,717,966		CLASS 370		CLASS 404	438	4,717,566	460	4,717,649
	CLASS 343	296	4,717,967	3	4,718,055	16	4,717,281	447	4,717,735	494	4,717,650
712	4,717,920	310	4,717,968		4,718,056	122	4,717,282	462	4,717,567	551	4,717,651
	4,717,921	322	4,717,969	13	4,718,057		CLASS 405	469	4,717,568		CLASS 431
	4,717,922	335	4,717,970	53	4,718,058	17	4,717,283	494	4,717,569	8	4,717,332
903	4,717,923	342	4,717,971	88	4,718,059	50	4,717,284		CLASS 425	44	4,717,333
	CLASS 346		CLASS 360		4,718,060	111	4,717,285	72 R	4,717,323	187	4,717,334
76 PH	4,717,924	8	4,717,972	89	4,718,061	74	4,717,286	130	4,717,324	277	4,717,335
108	4,717,925	31	4,717,973	94	4,718,062	199	4,717,287	131.5	4,717,325	360	4,717,336
140 R	4,717,926	84	4,717,974	112	4,718,063	202	4,717,288	133.1	4,717,326		CLASS 432
	4,717,927	66	4,717,975		CLASS 371		CLASS 406	190	4,717,327	14	4,717,337
160	4,717,928	97	4,717,976	20	4,718,064	122	4,717,289	290	4,717,328	60	4,717,338
	4,717,999	98	4,717,977	25	4,718,065		CLASS 407	328	4,717,329	125	4,717,339
	CLASS 350	106	4,717,978	35	4,718,066	34	4,717,290	335	4,717,561	199	4,717,340
1.5	4,717,220	113	4,717,979	38	4,718,067		CLASS 408	403	4,717,330		CLASS 433
3.7	4,717,221	130	4,717,980		CLASS 372	13	4,717,291	467	4,717,331	9	4,717,341
8.5	4,717,222	133	4,717,981	31	4,718,068	228	4,717,292		CLASS 426		CLASS 434
8.8	4,717,223	137	4,717,982	50	4,718,069		CLASS 409	94	4,717,570	96	4,717,342
8.9	4,717,224		4,717,983		4,718,070	9	4,717,293	104	4,717,571	236	4,717,343
96.10	4,717,226		CLASS 361	61	4,718,071	81	4,717,294	233	4,717,572		CLASS 435
	4,717,227	25	4,717,984	86	4,718,072	132	4,717,295	274	4,717,573	4	4,717,652
96.14	4,717,228	98	4,717,985		CLASS 373		4,717,296	315	4,717,574	5	4,717,653
96.15	4,717,229	253	4,717,986	14	4,718,073	144	4,717,297	402	4,717,575	7	4,717,654
	4,717,230	331	4,717,987	118	4,718,074		CLASS 410	533	4,717,576		4,717,655
96.20	4,717,231	403	4,717,988		CLASS 376	129	4,717,298	548	4,717,577	18	4,717,657
	4,717,232	424	4,717,989	142	4,717,526		CLASS 411	589	4,717,578	19	4,717,658
96.21	4,717,233		4,717,990	309	4,717,527	11	4,717,299	597	4,717,579	80	4,717,659
	4,717,234		CLASS 362	327	4,717,528	38	4,717,300	600	4,717,580	30	4,717,660
96.23	4,717,235	35	4,717,991	345	4,717,529	361	4,717,301		CLASS 427	31	4,717,661
	4,717,236	217	4,717,992	361	4,717,530	373	4,717,302	2	4,717,581	99	4,717,662
	4,717,237	219	4,717,993	383	4,717,531	378	4,717,303	8	4,717,582	106	4,717,663
96.33	4,717,225		CLASS 363	283	4,717,532		CLASS 414	11	4,717,583	133	4,717,664
96.34	4,717,238	21	4,717,994	419	4,717,534	4	4,717,303	38	4,717,584	198	4,717,665
104	4,717,239	43	4,717,995	441	4,717,533	126	4,717,304	39	4,717,585	253	4,717,666
163	4,717,240	56	4,717,996		CLASS 378	134	4,717,305		4,717,586	272	4,717,667
174	4,717,241	71	4,717,998	91	4,718,075	222	4,717,306		4,717,587	296	4,717,668
276 R	4,717,242		CLASS 364	146	4,718,076	303	4,717,307	51	4,717,588	315	4,717,669
332	4,717,243	167	4,718,000	209	4,718,077	307	4,717,308	53.1	4,717,602	320	4,717,670
333	4,717,244	169	4,718,001		CLASS 379	735	4,717,309	57	4,717,589		CLASS 436
463	4,717,245	180	4,718,002	2	4,718,079	753	4,717,310	68	4,717,590	19	4,717,671
516	4,717,246		4,718,003	59	4,718,080		CLASS 415	96	4,717,591	55	4,717,672
617	4,717,247		4,718,004	60	4,718,081	208	4,717,311	128	4,717,592	68	4,717,673
618	4,717,248		4,718,005	98	4,718,082		CLASS 416	150	4,717,593	85	4,717,674
	CLASS 251		4,718,006	392	4,718,083	145	4,717,312	174	4,717,594	103	4,717,675
43	4,717,249		4,718,007	412	4,718,084		CLASS 417	221	4,717,595	501	4,717,676
	CLASS 354		4,718,008	438	4,718,085	269	4,717,313	248.1	4,717,596		CLASS 437
21	4,717,929	300	4,718,009		CLASS 380	310	4,717,314	374.1	4,717,598	24	4,717,677
108	4,717,930	408	4,718,010	30	4,718,086	365	4,717,315	387	4,717,599	27	4,717,678
173.1	4,717,931	414	4,718,011		CLASS 381	372	4,717,316	393.1	4,717,600	29	4,717,679
195.12	4,717,932	422	4,718,012	34	4,718,087	392	4,717,317	421	4,717,601	31	4,717,680
409	4,717,933	424.1	4,718,013	43	4,718,088	407	4,717,318	434.3	4,717,603		4,717,681
415	4,717,934	426	4,718,014		4,718,092		CLASS 418	434.7	4,717,604		4,717,682
417	4,717,935	431.03	4,718,015		4,718,093	100	4,717,319		CLASS 428	34	4,717,683
471	4,717,936	431.05	4,718,016		4,718,094	61 B	4,717,320	1	4,717,605		4,717,684
	CLASS 358	431.07	4,718,017		4,718,095	76	4,717,321		4,717,606	40	4,717,685
3 FU	4,717,937	470	4,718,018		4,718,096	144	4,717,322	15	4,717,607	44	4,717,686
3 SH	4,717,938	480	4,718,019	46	4,718,097		CLASS 419		4,717,608	56	4,717,597
50	4,717,939	491	4,718,020	84	4,718,098	38	4,717,535	40	4,717,609	81	4,717,687
	CLASS 386	500	4,718,021	88.4	4,718,099		CLASS 420	85	4,717,610	97	4,717,688
4	4,717,251	505	4,718,022	77	4,718,100	103	4,717,536	89	4,717,611	120	4,717,449
11	4,717,252	510	4,718,023		CLASS 382			116	4,717,612	135	4,717,689
32	4,717,253	513	4,718,024	9	4,718,101			129	4,717,613	228	4,717,443
334	4,717,254	518	4,718,025	13	4,718,102			143	4,717,614		CLASS 438
345	4,717,255	550	4,718,026					161	4,717,615	59	4,717,218
349	4,717,250	554	4,718,027					195	4,717,616	61	4,717,344
390	4,717,256	572	4,718,028					209	4,717,617		
400	4,717,257	710	4,718,029					213	4,717,618		
		721	4,718,030					287	4,717,619		
		754	4,718,031					323	4,717,620		
								349	4,717,621		

57	4,717,345	103	4,718,111	34	4,717,697	278	4,717,724	175	4,717,752		CLASS 886
71	4,717,346	151	4,718,112	83	4,717,699		4,717,725	330.4	4,717,753	54	4,717,772
72	4,717,347	209	4,718,113	88	4,717,700	291	4,717,731	331.8	4,717,754	457	4,717,773
76	4,717,348	217	4,718,114	107	4,717,701	333	4,717,732	333.7	4,717,755		CLASS 864
82	4,717,219	218	4,718,115	211	4,717,698		4,717,733		CLASS 526	422	4,717,774
83	4,717,217	245	4,718,116		4,717,704	348	4,717,726	146	4,717,756		CLASS 868
92	4,717,349	314	4,718,117		4,717,705	358	4,717,727	246	4,717,757	456	4,717,775
	4,717,350	413	4,718,118		4,717,706	359	4,717,734	307	4,717,758	457	4,717,776
153	4,717,351	419	4,718,119		4,717,707	379	4,717,736	326	4,717,759	806	4,717,777
181	4,717,352		4,718,120	233	4,717,708	547	4,717,737		CLASS 528	934	4,717,778
310	4,717,353		4,718,121	303	4,717,702	554	4,717,729	98	4,717,760		CLASS 505
444	4,717,354		CLASS 474	348	4,717,703		CLASS 521	125	4,717,761	841	4,717,781
452	4,717,355	28	4,717,368		CLASS 903	137	4,717,738	251	4,717,762	843	4,717,779
464	4,717,356	49	4,717,369	200	4,717,709		CLASS 522	324	4,717,763	467	4,717,780
491	4,717,357	161	4,717,370	213	4,717,710	79	4,717,739	337	4,717,764	511	4,717,783
557	4,717,358		CLASS 493	227	4,717,711	96	4,717,740		CLASS 530	531	4,717,782
595	4,717,359	96	4,717,371		4,717,712	116	4,717,741	187	4,717,766	738	4,717,784
710	4,717,360	193	4,717,372		CLASS 512		CLASS 523		CLASS 534	813	4,717,785
856	4,717,361		4,717,373	11	4,717,506	203	4,717,742	9	4,717,513		CLASS 604
	CLASS 441	372	4,717,374		CLASS 514		CLASS 524		CLASS 536	8	4,717,377
82	4,717,362	360	4,717,375	2	4,717,713	13	4,717,743	124	4,717,765	20	4,717,378
	CLASS 446		CLASS 494	10	4,717,714	17	4,717,744		CLASS 540	43	4,717,379
14	4,717,363	40	4,717,376	11	4,717,715	91	4,717,745	222	4,717,767	54	4,717,380
175	4,717,364		CLASS 501	19	4,717,716	100	4,717,746		4,717,768	95	4,717,381
230	4,717,365	20	4,717,690	21	4,717,717	110	4,717,747	335	4,717,769	122	4,717,382
437	4,717,367	46	4,717,691	30	4,717,718	236	4,717,748		4,717,770	135	4,717,383
470	4,717,366	87	4,717,692	86	4,717,719	271	4,717,749		CLASS 549	143	4,717,384
	CLASS 455	97	4,717,693	93	4,717,720	458	4,717,750	548	4,717,771	174	4,717,385
2	4,718,106	135	4,717,694	167	4,717,721		CLASS 515			192	4,717,386
4	4,718,107	143	4,717,695	310	4,717,722	129	4,717,496			264	4,717,387
17	4,718,108		CLASS 502		4,717,728	166	4,717,751			323	4,717,388
51	4,718,109	28	4,717,696	224	4,717,723						
90	4,718,110			252	4,717,730						

CLASSIFICATION OF DESIGNS

D2—	314	293,500		433	293,521		351	293,540		101	293,538		111	293,577		108	293,595
	333	293,501		436	293,522			293,541	D11—	3	293,561			293,578		150	293,596
		293,502			293,523			293,542		131	293,559		113	293,579		154	293,597
		293,503			293,524		160	293,543		138	293,560		115	293,580		194	293,598
D3—	26	293,505			293,525		197	293,544	D12—	139	293,562	D15—	8	293,581	D23—	233	293,599
	33	293,506		446	293,526		416	293,603		182	293,563		7	293,582		254	293,600
	35	293,507			293,527	D8—	1	293,545		189	293,564			293,583		255	293,601
	48	293,508		449	293,528		30	293,546			293,565		9	293,584		264	293,602
		293,509		494	293,529		333	293,547		300	293,566			293,585		365	293,604
D4—	198	293,510		510	293,530		337	293,548	D13—	10	293,567		138	293,586	D24—	51	293,606
D6—	300	293,511		511	293,531		347	293,549	D14—	4	293,568	D16—	8	293,587	D26—	26	293,607
	302	293,512		531	293,532	D9—	374	293,550		11	293,569		107	293,304	D27—	45	293,608
	318	293,514		574	293,533		378	293,551			293,570		116	293,588	D28—	11	293,609
	349	293,515	D7—	5	293,534	D10—	30	293,552		53	293,571	D17—	18	293,589		35	293,610
	361	293,516		9	293,535			293,553			293,572	D19—	73	293,590		54.1	293,602
	366	293,517		18	293,536			293,554		90	293,573			293,591		64	293,611
	370	293,518		313	293,537		72	293,555			293,575	D20—	9	293,592		83	293,612
	373	293,519		317	293,538		76	293,556		84	293,574		31	293,593	D29—	7	293,613
	388	293,513		337	293,539		97	293,557		107	293,576	D21—	64	293,594	D30—	144	293,614
	409	293,520															

CLASSIFICATION OF PLANTS

P.—	36	6,075		6,076		51	6,077	41	6,078	74	6,079

STATUTORY INVENTION REGISTRATIONS

72—	356	H401	128—	206.24	H397	244—	3.11	H400	338—	22 R	H415	376—	147	H407	405—	128	H404
74—	689	H398	156—	172	H408	250—	203 R	H412	350—	287	H396	381—	58	H413		212	H402
89—	1.816	H405	165—	47	H399		423 R	H414	357—	22	H411		94	H417	436—	153	H406
102—	374	H403	204—	157.41	H409	310—	11	H410	361—	398	H416						

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,716,825	4,716,988	4,717,734	4,716,997	4,716,872	4,717,365
4,717,145	4,717,002	4,717,737	4,717,026	4,716,888	4,717,367
4,717,476	4,717,034	4,717,760	4,717,090	4,716,948	4,717,369
4,718,083	4,717,042	4,717,766	4,717,159	4,717,005	4,717,380
04 : 4,716,695	4,717,054	4,717,806	4,717,169	4,717,083	4,717,406
4,716,818	4,717,055	4,717,814	4,717,196	4,717,101	4,717,481
4,716,915	4,717,057	4,717,816	4,717,515	4,717,343	4,717,498
4,717,012	4,717,064	4,717,822	4,717,546	4,717,511	4,717,542
4,717,193	4,717,067	4,717,826	4,717,675	4,717,517	4,717,544
4,717,345	4,717,099	4,717,830	4,717,905	4,717,680	4,717,576
4,717,347	4,717,103	4,717,833	4,718,004	4,717,918	4,717,623
4,717,411	4,717,109	4,717,838	4,718,042	4,717,989	4,717,652
4,717,430	4,717,147	4,717,840	4,718,054	4,718,005	4,717,668
4,717,446	4,717,158	4,717,842	4,718,105	4,718,009	4,717,693
4,717,473	4,717,176	4,717,864	4,491,025	4,718,020	4,717,696
4,717,588	4,717,184	4,717,888	09 : 4,716,763	4,718,082	4,717,778
4,717,597	4,717,187	4,717,894	4,716,831	4,718,098	4,717,779
4,717,641	4,717,221	4,717,896	4,716,973	4,718,109	4,717,781
4,717,677	4,717,225	4,717,912	4,716,979	13 : 4,716,841	4,717,794
4,717,687	4,717,230	4,717,914	4,717,000	4,717,043	4,717,803
4,717,836	4,717,256	4,717,919	4,717,106	4,717,239	4,717,884
4,717,839	4,717,263	4,717,930	4,717,216	4,717,559	4,717,906
4,717,845	4,717,275	4,717,946	4,717,218	16 : 4,716,600	4,717,962
4,717,885	4,717,279	4,717,950	4,717,250	4,716,601	4,717,970
4,717,886	4,717,280	4,717,977	4,717,268	4,717,868	4,717,994
4,717,890	4,717,302	4,717,981	4,717,341	17 : 4,716,607	4,718,108
4,718,036	4,717,318	4,717,982	4,717,401	4,716,622	18 : 4,716,732
4,718,119	4,717,340	4,717,993	4,717,412	4,716,639	4,716,792
05 : 4,717,007	4,717,351	4,718,002	4,717,432	4,716,642	4,716,802
06 : 4,717,156	4,717,355	4,718,018	4,717,439	4,716,645	4,716,894
Re.32,574	4,717,395	4,718,022	4,717,440	4,716,652	4,716,920
4,716,597	4,717,403	4,718,023	4,717,550	4,716,706	4,717,050
4,716,604	4,717,413	4,718,028	4,717,553	4,716,714	4,717,157
4,716,608	4,717,433	4,718,033	4,717,610	4,716,723	4,717,214
4,716,613	4,717,444	4,718,034	4,717,674	4,716,726	4,717,276
4,716,635	4,717,461	4,718,057	4,717,796	4,716,749	4,717,282
4,716,663	4,717,469	4,718,063	4,717,798	4,716,793	4,717,402
4,716,664	4,717,474	4,718,064	4,717,987	4,716,836	4,717,495
4,716,738	4,717,482	4,718,065	4,717,988	4,716,933	4,717,504
4,716,757	4,717,490	4,718,069	10 : 4,716,689	4,716,944	4,717,545
4,716,777	4,717,493	4,718,077	4,717,393	4,716,949	4,717,604
4,716,782	4,717,539	4,718,080	4,717,394	4,717,021	4,717,658
4,716,805	4,717,564	4,718,090	4,717,639	4,717,038	4,717,662
4,716,806	4,717,566	4,718,096	4,717,643	4,717,048	4,717,665
4,716,837	4,717,568	4,718,100	4,717,872	4,717,087	4,717,714
4,716,880	4,717,606	4,718,102	11 : 4,717,548	4,717,095	4,717,951
4,716,886	4,717,627	4,718,117	4,717,910	4,717,110	4,718,086
4,716,895	4,717,655	4,442,325	12 : 4,716,669	4,717,140	19 : 4,716,636
4,716,905	4,717,699	08 : 4,716,809	4,716,671	4,717,178	4,716,683
4,716,911	4,717,718	4,716,875	4,716,677	4,717,202	4,716,684
4,716,914	4,717,726	4,716,903	4,716,696	4,717,308	4,716,700
4,716,937	4,717,732	4,716,916	4,716,740	4,717,353	4,716,953
4,716,967	4,717,733	4,716,947	4,716,808	4,717,360	4,716,980

4,717,025	4,717,296	4,717,740	4,717,870	4,717,304	4,717,281
4,717,056	4,717,298	4,717,753	4,717,879	4,717,307	4,717,286
4,717,168	4,717,311	4,717,780	4,718,021	4,717,334	4,717,288
4,717,371	4,717,335	4,717,782	3,611,549	4,717,336	4,717,396
4,717,801	4,717,458	4,717,834	39 : 4,716,702	4,717,350	4,717,445
4,717,917	4,717,582	4,717,865	4,716,708	4,717,354	4,717,448
4,718,114	4,717,632	4,718,104	4,716,712	4,717,358	4,717,485
20 : 4,716,665	4,717,730	4,718,106	4,716,745	4,717,384	4,717,488
4,716,819	4,717,741	35 : 4,716,923	4,716,751	4,717,407	4,717,513
4,717,149	4,717,750	4,717,190	4,716,752	4,717,422	4,717,555
4,717,332	4,717,774	36 : Re.32,572	4,716,753	4,717,428	4,717,594
21 : 4,716,899	4,717,777	4,716,602	4,716,755	4,717,431	4,717,681
4,716,958	4,717,889	4,716,612	4,716,929	4,717,434	4,717,683
4,717,120	4,717,900	4,716,673	4,716,971	4,717,437	4,717,698
4,717,320	27 : 4,716,605	4,716,736	4,716,991	4,717,463	4,717,704
22 : 4,716,627	4,716,824	4,716,747	4,717,011	4,717,483	4,717,705
4,717,201	4,717,074	4,716,772	4,717,022	4,717,499	4,717,706
4,717,776	4,717,077	4,716,804	4,717,060	4,717,527	4,717,707
23 : 4,717,667	4,717,150	4,716,863	4,717,206	4,717,528	4,717,725
4,717,808	4,717,378	4,716,900	4,717,266	4,717,529	4,717,749
24 : 4,716,849	4,717,449	4,717,023	4,717,294	4,717,531	4,717,754
4,716,935	4,717,762	4,717,024	4,717,356	4,717,532	4,717,784
4,716,936	4,717,802	4,717,078	4,717,359	4,717,534	4,717,785
4,717,115	4,718,099	4,717,093	4,717,414	4,717,538	4,717,825
4,717,382	28 : 4,716,908	4,717,126	4,717,421	4,717,541	4,717,863
4,717,832	4,717,991	4,717,162	4,717,438	4,717,543	4,717,866
4,717,907	29 : 4,716,615	4,717,248	4,717,471	4,717,590	4,717,875
4,718,074	4,716,658	4,717,272	4,717,475	4,717,611	4,718,011
25 : 4,716,599	4,717,098	4,717,278	4,717,489	4,717,626	4,718,024
4,716,885	4,717,104	4,717,297	4,717,500	4,717,666	4,718,037
4,716,892	4,717,125	4,717,328	4,717,522	4,717,671	4,718,041
4,716,930	4,717,295	4,717,349	4,717,523	4,717,690	4,718,045
4,716,978	4,717,374	4,717,372	4,717,536	4,717,692	4,718,046
4,717,045	4,717,487	4,717,373	4,717,561	4,717,702	4,718,047
4,717,075	31 : 4,716,705	4,717,386	4,717,579	4,717,788	4,718,049
4,717,161	32 : 4,716,784	4,717,460	4,717,612	4,717,789	4,718,087
4,717,215	4,716,799	4,717,591	4,717,613	4,717,828	49 : 4,716,830
4,717,240	4,717,735	4,717,596	4,717,773	4,717,847	4,716,974
4,717,253	33 : 4,717,327	4,717,599	4,717,804	4,717,873	4,717,160
4,717,258	4,717,521	4,717,633	4,717,807	4,717,955	4,717,212
4,717,329	34 : 4,716,670	4,717,644	4,717,857	4,718,093	4,717,916
4,717,330	4,716,767	4,717,646	4,717,881	4,718,118	51 : 4,716,798
4,717,333	4,716,771	4,717,649	4,717,908	4,718,120	4,717,017
4,717,385	4,716,845	4,717,661	4,717,986	44 : 4,716,813	4,717,217
4,717,408	4,716,856	4,717,678	40 : 4,716,680	45 : 4,716,594	4,717,563
4,717,581	4,716,881	4,717,679	4,716,848	4,716,624	4,717,653
4,717,607	4,716,896	4,717,708	4,717,015	4,716,807	4,718,003
4,717,621	4,716,955	4,717,711	4,717,290	4,716,820	4,718,025
4,717,670	4,716,966	4,717,712	4,717,468	4,717,616	4,718,081
4,717,673	4,716,987	4,717,748	4,717,583	47 : 4,716,801	4,718,107
4,717,783	4,717,069	4,717,751	4,717,701	4,716,870	4,718,110
4,717,813	4,717,070	4,717,752	4,717,867	4,716,925	53 : 4,716,610
4,717,829	4,717,082	4,717,772	4,718,027	4,717,420	4,716,675
4,717,876	4,717,113	4,717,882	41 : 4,716,666	4,717,558	4,716,919
4,717,883	4,717,153	4,717,924	4,716,668	4,717,567	4,717,073
4,717,935	4,717,189	4,717,949	4,716,679	4,718,085	4,717,092
4,718,019	4,717,243	4,717,956	4,716,847	48 : Re.32,570	4,717,094
4,718,032	4,717,251	4,717,968	4,716,906	4,716,667	4,717,097
4,718,070	4,717,357	4,717,971	4,717,084	4,716,754	4,717,108
4,718,088	4,717,399	4,717,974	4,717,191	4,716,832	4,717,165
4,718,092	4,717,404	4,718,008	4,717,791	4,716,833	4,717,472
26 : 4,716,595	4,717,456	4,718,039	4,717,837	4,716,902	4,717,862
4,716,632	4,717,465	4,718,075	4,717,909	4,716,922	54 : 4,717,008
4,716,674	4,717,466	4,718,079	42 : Re.32,569	4,716,924	4,717,518
4,716,682	4,717,467	4,718,094	4,716,704	4,716,932	4,717,775
4,716,698	4,717,491	4,718,116	4,716,778	4,716,960	55 : 4,716,630
4,716,699	4,717,492	4,537,211	4,716,811	4,716,961	4,716,653
4,716,709	4,717,508	37 : 4,716,637	4,716,904	4,716,962	4,716,660
4,716,713	4,717,560	4,716,692	4,716,954	4,716,963	4,716,821
4,716,797	4,717,565	4,716,697	4,716,956	4,716,964	4,716,829
4,716,803	4,717,570	4,716,715	4,716,976	4,716,968	4,716,840
4,716,810	4,717,577	4,716,744	4,717,049	4,716,969	4,716,843
4,716,874	4,717,614	4,716,912	4,717,052	4,716,970	4,716,858
4,716,883	4,717,619	4,716,989	4,717,066	4,716,975	4,716,890
4,716,921	4,717,631	4,717,010	4,717,071	4,716,977	4,716,891
4,716,952	4,717,654	4,717,391	4,717,107	4,717,003	4,717,102
4,717,027	4,717,657	4,717,660	4,717,112	4,717,039	4,717,135
4,717,028	4,717,700	4,717,676	4,717,177	4,717,086	4,717,283
4,717,035	4,717,713	4,717,729	4,717,188	4,717,131	4,717,618
4,717,036	4,717,715	4,717,764	4,717,219	4,717,151	4,717,721
4,717,185	4,717,717	4,717,818	4,717,233	4,717,152	4,717,913
4,717,249	4,717,722	4,717,827	4,717,234	4,717,262	4,717,996

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06 : 293,510	293,611	293,548	[illegible]	293,579	42 : 293,509
293,513	293,612	293,610	[illegible]	293,587	293,516
293,515	08 : 293,534	18 : 293,522	26 : 293,564	293,589	[illegible]
293,519	12 : 293,532	293,524	27 : 293,582	293,594	44 : 293,607
293,529	293,545	293,525	29 : 293,549	37 : 293,526	45 : 293,505
293,559	17 : 293,504	293,601	[illegible]	293,527	293,551
293,567	293,514	293,613	34 : 293,602	[illegible]	47 : 293,614
[illegible]	293,520	24 : 293,593	36 : 293,506	39 : 293,584	48 : 293,546
293,583	293,521	25 : 293,530	[illegible]	293,585	293,547
293,592	293,523	293,531	293,512	41 : 293,500	51 : 293,597
293,600	293,528	293,533	293,544		

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06 : 6,075	6,076	6,077	6,078		

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C. William Verity, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 30 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected uner PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 31 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 8, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,491,985 through 4,493,114
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 12, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,411,023	06/310,651	10/25/83
4,411,024	06/220,503	10/25/83
4,411,028	06/357,717	10/25/83
4,411,029	06/330,436	10/25/83
4,411,032	06/344,921	10/25/83
4,411,037	06/291,452	10/25/83
4,411,040	06/245,523	10/25/83
4,411,044	06/341,858	10/25/83
4,411,051	06/257,544	10/25/83
4,411,063	06/260,731	10/25/83
4,411,066	06/456,281	10/25/83
4,411,074	06/299,543	10/25/83
4,411,076	06/308,555	10/25/83
4,411,080	06/295,077	10/25/83
4,411,081	06/339,616	10/25/83
4,411,089	06/387,947	10/25/83
4,411,090	06/350,523	10/25/83
4,411,091	06/223,279	10/25/83
4,411,092	06/272,017	10/25/83
4,411,095	06/346,215	10/25/83
4,411,096	06/351,114	10/25/83
4,411,097	06/302,522	10/25/83
4,411,098	06/329,738	10/25/83
4,411,100	06/334,962	10/25/83
4,411,105	06/286,334	10/25/83
4,411,113	06/245,457	10/25/83
4,411,125	06/378,725	10/25/83
4,411,126	06/353,002	10/25/83
4,411,127	06/365,704	10/25/83
4,411,135	06/256,618	10/25/83
4,411,140	06/344,803	10/25/83
4,411,147	06/292,256	10/25/83
4,411,150	06/313,293	10/25/83
4,411,151	06/258,725	10/25/83
4,411,154	06/340,494	10/25/83
4,411,157	06/382,809	10/25/83
4,411,160	06/287,414	10/25/83
4,411,161	06/291,569	10/25/83
4,411,164	06/269,205	10/25/83
4,411,165	06/322,950	10/25/83
4,411,170	06/252,933	10/25/83
4,411,171	06/272,217	10/25/83
4,411,172	06/236,478	10/25/83
4,411,176	06/222,497	10/25/83
4,411,183	06/425,498	10/25/83
4,411,184	06/371,383	10/25/83
4,411,186	06/324,260	10/25/83
4,411,189	06/226,394	10/25/83
4,411,195	06/338,898	10/25/83
4,411,199	06/248,932	10/25/83
4,411,205	06/431,780	10/25/83
4,411,207	06/370,981	10/25/83
4,411,214	06/221,052	10/25/83
4,411,224	06/305,263	10/25/83
4,411,243	06/237,901	10/25/83
4,411,248	06/325,224	10/25/83
4,411,249	06/382,695	10/25/83
4,411,251	06/285,769	10/25/83
4,411,255	06/222,896	10/25/83
4,411,269	06/299,589	10/25/83
4,411,281	06/402,822	10/25/83
4,411,283	06/335,629	10/25/83
4,411,284	06/323,051	10/25/83
4,411,286	06/238,921	10/25/83
4,411,291	06/279,678	10/25/83
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4,411,314	06/287,366	10/25/83
4,411,321	06/382,563	10/25/83
4,411,325	06/355,706	10/25/83
4,411,329	06/355,098	10/25/83
4,411,334	06/216,419	10/25/83
4,411,335	06/247,942	10/25/83
4,411,340	06/435,874	10/25/83
4,411,341	06/244,808	10/25/83
4,411,343	06/301,466	10/25/83
4,411,344	06/340,280	10/25/83
4,411,350	06/299,392	10/25/83
4,411,358	06/329,275	10/25/83
4,411,372	06/326,666	10/25/83
4,411,376	06/319,304	10/25/83
4,411,388	06/247,895	10/25/83
4,411,408	06/446,574	10/25/83
4,411,413	06/261,464	10/25/83
4,411,424	06/346,473	10/25/83
4,411,426	06/278,637	10/25/83
4,411,431	06/372,301	10/25/83
4,411,435	06/273,514	10/25/83
4,411,436	06/365,219	10/25/83
4,411,444	06/352,202	10/25/83
4,411,445	06/273,937	10/25/83
4,411,447	06/317,709	10/25/83
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4,411,487	06/279,647	10/25/83
4,411,493	06/308,899	10/25/83
4,411,506	06/322,702	10/25/83
4,411,509	06/331,587	10/25/83
4,411,512	06/381,924	10/25/83
4,411,513	06/238,584	10/25/83
4,411,522	06/248,154	10/25/83
4,411,525	06/291,935	10/25/83
4,411,535	06/309,667	10/25/83
4,411,544	06/288,770	10/25/83
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4,411,838	06/354,260	10/25/83
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4,412,287	06/418,297	10/25/83
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4,412,348	06/369,009	10/25/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,554,646, Re. S.N. 123,106, Filed Nov. 19, 1987, Cl. 365/189, SEMICONDUCTOR MEMORY DEVICE, Masahiko Yoshimoto, et al., Owner of Record: *Mitsubishi Denki Kabushiki, Tokyo, Japan,* Attorney or Agent: Allan M. Lowe, et al., Ex. Gp.: 233

4,596,311, Re. S.N. 122,701, Filed Nov. 19, 1987, Cl. 188/001.110, BRAKE SYSTEM, Rene H. Brodeur, et al., Owner of Record: *Trailer Train Co., Chicago, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 314

4,629,087, Re. S.N. 123,581, Filed Nov. 20, 1987, Cl. 220/855, WATER CONTAINER, Dick Lenz, Owner of Record: *AG Systems, Inc., Hutchinson, Minn.,* Attorney or Agent: Curtis B. Hamre, et al., Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,263,347, Reexam. No. 90/001,393, Requested: Dec. 7, 1987, Cl. 427/282, APPARATUS AND METHOD FOR MASKING SURFACES, Maynard Banta, Owner of Record: *Minnesota Mining & Mftg. Co., St. Paul, Minn.* Attorney or Agent: D. J. Flickinger, Ex. Gp.: 150, Requester: Owner

4,313,135, Reexam. No. 90/001,391, Requested: Dec. 7, 1987, Cl. 358/149, METHOD AND APPARATUS FOR PRESERVING OR RESTORING AUDIO TO VIDEO SYNCHRONIZATION, J. Carl Cooper, Owner of Record: *Inventor, Sunnyvale, Calif.,* Attorney or Agent: M. L. Harrison, Ex. Gp.: 260, Requester: Owner

4,526,565, Reexam. No. 90/001,394, Requested: Dec. 4, 1987, Cl. 493/196, METHOD OF MAKING FLAT BOTTOM PLASTIC BAG, John E. Hummel, et al., Owner of Record: *Linear Films Inc., Tulsa, Okla.,* Attorney or Agent: Hubbard, Thurman, et al., Ex. Gp.: 320, Requester: Owner

4,562,281, Reexam. No. 90/001,396, Requested: Dec. 9, 1987, Cl. 560/104, PRODUCTION OF BISPHENOL DERIVATIVES, Yukoh Takahashi, et al., Owner of Record: *Sumitomo Chemical Co., Osaka, Japan,* Attorney or Agent: Wenderoth, Lind, et al., Ex. Gp.: 120, Requester: The Goodyear Tire & Rubber Co., Akron, Ohio

4,631,023, Reexam. No. 90/001,395, Requested: Dec. 10, 1987, Cl. 431/329, BURNER FOR GAS BLOW TORCH, Claude Courrege, Owner of Record: *Rippes, S.A., La Haillan, France,* Attorney or Agent: W. A. Drucker, Ex. Gp.: 340, Requester: Owner

4,701,722, Reexam. No. 90/001,392, Requested: Dec. 10, 1987, Cl. 333/14, ARRANGEMENTS FOR MODIFYING DYNAMIC RANGE USING SERIES AND PARALLEL CIRCUIT TECHNIQUES, Ray M. Dolby, Owner of Record: *Inventor, San Francisco, Calif.,* Attorney or Agent: Thomas A. Gallagher, Ex. Gp.: 250, Requester: Owner

Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant

Under 37 CFR Part 10, a practitioner is responsible for taking reasonable steps to avoid foreseeable prejudice to the rights of a client/patent applicant. This responsibility exists in all circumstances including those where the practitioner is operating through a corporate liaison or foreign agent and has no direct contact with the client/patent applicant, who in most cases is the one being represented.

This notice is intended to clarify the appropriate course of action for a practitioner to follow when the practitioner is operating through such a corporate liaison or foreign agent. In such arrangements, the registered practitioner may rely upon the advice of the corporate liaison or the client/patent applicant's foreign agent as to the action to be taken so long as the practitioner is aware that the client/patent applicant has consented after full disclosure to be represented by the liaison or agent. It will be assumed by the Patent and Trademark Office that the client/patent applicant has an agreement with the liaison or agent, arrived at after full disclosure, to be represented by the liaison or agent. Registered practitioners, if they wish, however, may maintain a copy of the agreement in this regard between the client/patent applicant and the liaison or agent in practitioner's file of the application or other proceeding before the Office. If there is, in fact, no such agreement between the client/patent applicant and the liaison or agent, the registered practitioner must communicate to the client/patent applicant.

In circumstances where the practitioner is aware that there is an agreement between the client/patent applicant and the liaison or agent, the practitioner may fully rely upon the advice of the liaison or agent as to the wishes of the client/patent applicant. For example, if the registered practitioner is instructed by the client/patent applicant's liaison or agent to allow an application to go abandoned rather than to respond to an Office action within a set period for response, the practitioner may properly do so without any further notice to the client/patent applicant.

It is assumed that withdrawal from employment by a practitioner will remain a relatively rare occurrence, particularly in view of this clarification. This notice should not be taken to require or encourage withdrawal. If a practitioner should decide to withdraw, however, the practitioner must take reasonable steps to avoid foreseeable prejudice to the rights of the client/patent applicant including allowing time for employment of another practitioner (37 CFR 10.40). Therefore, at least thirty days would be required between the date of approval by the Office of the withdrawal and the later of the expiration date of the response period or the expiration date of the period which can be obtained by a petition for extension of time and fee under 37 CFR 1.136(a). This is necessary so that the client/patent applicant would have sufficient time to obtain other representation or to take other action. If a period has been set for response and the period may be extended without a showing of cause pursuant to 37 CFR 1.136(a) by filing a petition for extension of time and fee, the practitioner will not be required to seek such extension of time for withdrawal to be approved. In such a situation, however, withdrawal will not be approved unless at least thirty days would remain between the date of approval and the last date on which such a petition for extension of time and fee could properly be filed.

Dec. 10, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Aircraft Control Systems Department, General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902.

U.S. 4,663,562. CONTRAST ENHANCEMENT STRUCTURE FOR COLOR CATHODE RAY TUBE.

U.S. 4,667,282. MULTIPLE RECTIFIER CIRCUIT WITH DYNAMIC AC INPUT TO DC OUTPUT.

VOLTAGE RANGE COMPRESSION UTILIZING HALF AND FULL WAVE RECTIFICATION.

U.S. 4,677,367. CURRENT FED BOOST CONVERTER.

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3,717,195. AUTOMATIC METAL LOUVERED SAFETY BLIND, 9623 Horizon Run Rd., Gaithersburg, Md. 20879.

4,587,746. ALVIN WILLIAMS "SOLE AND HEEL SHOE TAP", *Evelyn Sommer,* 360 Lexington Ave., New York, N.Y. 10017.

4,676,044. METHOD OF CONSTRUCTING A DORMER WHILE PRESERVING THE EXISTING ROOF, *Robert Terenzoni,* 98 Boston Ave., Medford, Mass. 02155.

4,690,321. FOLDABLE QUICK PACK FOR FOODSTUFFS AND THE LIKE, *Lolita Spaeth,* LSBERLAG, Wendeberg 43, 3108 Wolfsburg 28, Federal Republic of Germany.

S.N. 941,726. SOLAR SYSTEM SIMULATOR, *Fahad Ali Alnafissa,* 2407 Wilshire Blvd., Suite 4, Santa Monica, Calif. 90404.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 12, 1988

4,492,708	4,669,610	4,681,997	4,690,283
4,558,323	4,670,874	4,682,216	4,690,298
4,575,076	4,671,585	4,682,553	4,690,311
4,588,485	4,671,797	4,683,223	4,690,324
4,588,635	4,671,801	4,684,014	4,690,335
4,597,768	4,672,068	4,684,378	4,690,493
4,623,542	4,672,996	4,684,419	4,690,498
4,624,908	4,673,193	4,684,601	4,690,550
4,625,878	4,673,207	4,684,609	4,690,570
4,626,054	4,673,593	4,684,861	4,690,755
4,627,508	4,674,741	4,684,872	4,690,763
4,629,728	4,674,790	4,685,034	4,690,777
4,630,535	4,676,477	4,685,080	4,690,781
4,641,944	4,677,619	4,685,416	4,690,928
4,642,904	4,677,962	4,686,025	4,690,953
4,644,486	4,678,006	4,686,762	4,691,077
4,645,841	4,678,601	4,687,291	4,691,201
4,648,095	4,678,648	4,687,294	4,691,237
4,650,925	4,678,836	4,687,441	4,691,296
4,652,584	4,679,292	4,687,714	4,691,973
4,657,898	4,679,572	4,687,813	4,692,171
4,658,075	4,679,919	4,687,984	4,692,244
4,659,082	4,680,419	4,688,219	4,692,484
4,660,557	4,680,758	4,688,283	4,692,555
4,660,562	4,681,292	4,688,342	4,694,197
4,660,580	4,681,293	4,688,642	4,695,640
4,663,018	4,681,404	4,688,914	4,695,671
4,663,145	4,681,505	4,689,413	4,695,738
4,663,652	4,681,658	4,689,478	
4,665,086	4,681,895	4,689,658	
4,668,632	4,681,959	4,690,227	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
	Denver Public Library	(303) 571-2347
Colorado	New Haven: Science Park Library	(203) 786-5447
Connecticut	Newark: University of Delaware Library	(302) 451-2965
Delaware	Washington: Howard University Libraries	(202) 636-5060
Dist. of Columbia	Fort Lauderdale: Broward County Main Library	(305) 357-7444
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Illinois	Chicago Public Library	(312) 269-2865
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	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
	Minneapolis Public Library & Information Center	(612) 372-6570
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Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
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	Buffalo and Erie County Public Library	(716) 846-7101
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Pennsylvania	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
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	Providence Public Library	(401) 521-8726
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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 5, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-12-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during December 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,543,308 to 3,551,900, inclusive
Plant Patents . . . . . Numbers 3,008 to 3,010 inclusive

REEXAMINATIONS

JANUARY 12, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 3,966,419 (809th)

CATALYTIC CONVERTER HAVING MONOLITH WITH MICA SUPPORT MEANS THEREFOR

Rodger E. Bloomfield, Linden, Mich., assignor to General Motors Corporation, Detroit, Mich.

Reexamination Request Nos. 90/001,160, Feb. 5, 1987 and 90/001,198, Mar. 23, 1987.

Reexamination Certificate for Patent No. 3,966,419, issued Jun. 29, 1976, Ser. No. 524,486, Nov. 18, 1974.

Reexamination Certificate B1 3,966,419, issued Dec. 10, 1985.

Int. Cl.[4] B01J *8/00*; F01N *3/28*

U.S. Cl. 422—179



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A catalytic converter comprising a housing, a monolithic catalyst element disposed within said housing, said catalyst element having a rate of thermal expansion less than said housing, and support means disposed between said catalyst element and said housing for providing supporting and immobilizing forces therebetween, said support means being formed of mica having a rate of thermal expansion greater than said housing to thereby provide increasing supporting and immobilizing forces between said catalyst element and said housing as the temperature of said converter increases.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,575

HAND GRINDER AND VALVE THEREFORE

Keld O. Hundebol, Ansager, Denmark, assignor to HH Patent ApS, Ansager, Denmark

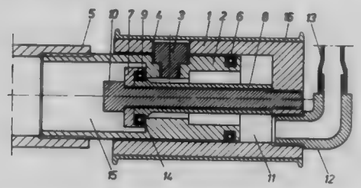
Original No. 4,580,369, dated Apr. 8, 1986, Ser. No. 467,668, Feb. 18, 1983. Application for reissue Aug. 5, 1986, Ser. No. 893,389

Claims priority, application Denmark, Dec. 16, 1982, 5575/82

Int. Cl.[4] B24B *23/00, 55/00;* F16P *3/22*

U.S. Cl. 51—170 R

11 Claims



1. Hand grinder, characterized in that the hand grinder comprises a substantially U-shaped handle pipe (17) having an inlet and an outlet passage (18,19) for a pressure medium used for operating a motor (20), said inlet passage (18) being adapted to supply the pressure medium from a valve (21) to the machine (20), said outlet passage (19) being adapted to carry the pressure medium from the motor (20) to an outlet opening (23) on the handle pipe (17) the ends thereof being designed as handles (25,26), said valve (21) being mounted in one of the handles (25) of the handle pipe (17), and that the motor (20) drives a rotating spindle (27) having a grinding means.

Re. 32,576

COMBINATION REAR VIEW MIRROR AND DIGITAL CLOCK

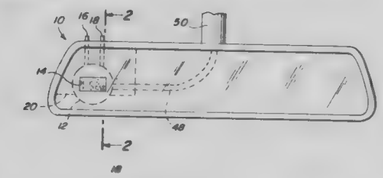
Ronald Pastore, 149 Heathcote Rd., Lindenhurst, N.Y. 11757

Original No. 4,588,267, dated May 13, 1986, Ser. No. 571,820, Jan. 18, 1984. Application for reissue Oct. 31, 1986, Ser. No. 925,673

Int. Cl.[4] G02B *5/08;* B60R *1/12;* G04B *47/02*

U.S. Cl. 350—600

7 Claims



1. A rear view mirror for use in motor vehicles comprising in combination a frame supporting a mirror with a grounded reflective silvered surface on the back of the mirror, an indication instrument means for transmitting power and data to said indicating instrument, means for making said indicating instrument visible to a user of sair rear view mirror, means for attaching said indicating instrument to said rear view mirror including access means for accessing instrument controls and adjustments on the indicating instrument and removal means for removal of said indicating instrument, said means for transmitting power and data to said measuring instrument further compriaing a ground connection to a car's electrical system by means of direct contact between a ground ring on said measuring instrument and said grounded reflective silvered surface on said mirror; at least one pressure clip which contacts electrically active regions on the indicating instrument in such a manner as to assure low resistance electrical contact and sufficient numbers of conductors to transmit said data and power; and a cable with a multiplicity of conductors which is connected on one end to said pressure clips and exits said rear view mirror.

Re. 32,577

FLUID PUMPING DEVICE FOR USE WITH A FLUID PUMP

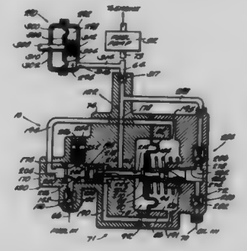
Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Original No. 4,555,221, dated Nov. 26, 1985, Ser. No. 573,302, Jan. 23, 1984. Continuation-in-part of Ser. No. 540,045, Oct. 7, 1983. Application for reissue Jan. 2, 1986, Ser. No. 869,658

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—319

32 Claims



26. Apparatus for pumping oil and for delivering fuel to a fuel pump for a two-stroke internal combustion engine, the fuel pump including a suction port, said apparatus comprising a first inlet adapted to communicate with a source of oil, a second inlet adapted to communicate with a source of fuel, an outlet adapted to communicate with the suction port, and means operative in response to suction at said outlet for delivering fuel from said outlet, and for pumping oil.

Re. 32,578

MOORING SYSTEM

Leendert Poldervaart, La Turbie, France, and Anton Coppens, Oegstgeest, Netherlands, assignors to Single Buoy Moorings Inc., Fribourg, Switzerland

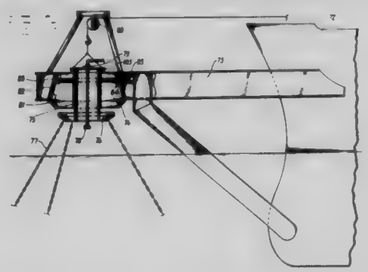
Original No. 4,490,121, dated Dec. 25, 1984, Ser. No. 352,080, Feb. 25, 1982. Application for reissue May 24, 1985, Ser. No. 737,404

Claims priority, application Netherlands, Feb. 26, 1981, 8100936

Int. Cl.[4] B63B *22/02*

U.S. Cl. 441—5 16 Claims

11. In a mooring system comprising a floating device having storage capacity such as a tanker, chains for anchoring the tanker, said chains being connected to a body which is rotatable about a vertical axis on an arm attached to the tanker and through which body conduits extend from the sea bottom towards the tanker; the improvement in which said body comprises a buoy having its own buoyancy, which buoy by means of a quick connecting coupling can be connected to or disconnected from the arm, said buoy carrying the conduits which conduits are provided with quick couplings as well, the buoy comprising a cylindrical sleeve with



buoyancy and a vertical axis, which sleeve at its upper end has said quick connecting coupling.

PLANT PATENTS

GRANTED JANUARY 12, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,080

GERANIUM PLANT NAMED MICKY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,115

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium named Micky, as described and illustrated, and particularly characterized by its bright red-purple flower color with a much deeper red-purple variegation on the upper two petals and approximate center of lower petals; medium early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; very compact, self-branching growth habit; good resistance against white fly; and by its ease of propagation and rooting habit.

6,082

CHRYSANTHEMUM NAMED "READY"

Martinus R. H. van der Jagt, Ter-Aar, Netherlands, assignor to Chrysanthemum Breeders Association NV, Netherlands Antilles

Filed Sep. 30, 1985, Ser. No. 782,100

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 1 Claim

1. A new and distinctive variety of Chrysanthemum named Ready as described and illustrated in the foregoing specification and accompanying drawings.

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PATENTS

GRANTED JAN. 12, 1988

ERRATA

For CLASS	See PATENT NO.
180-117	4,718,501
383-121	4,718,738
439-627	4,718,742
512-004	4,719,040
512-025	4,719,042
512-008	4,719,043
437-101	4,719,123
437-126	4,719,124
437-231	4,719,125
560-331	4,719,289
358-091	4,719,482
358-038	4,719,500

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PATENTS

GRANTED JANUARY 12, 1988

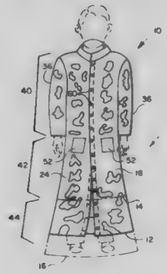
GENERAL AND MECHANICAL

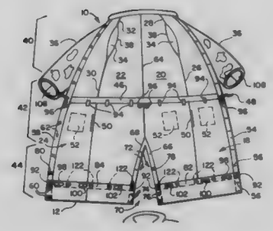
4,718,122

CONVERTIBLE GARMENT

Buddy Steverson, P.O. Box 269; Main St., New Hebron, Miss. 39140

Filed Apr. 20, 1987, Ser. No. 39,915
Int. Cl.[4] A41D *15/00*
U.S. Cl. 2—70 7 Claims





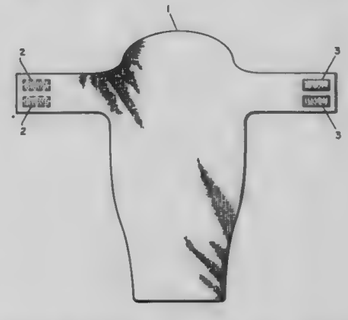
1. A convertible garment for a user comprising:
a left front panel and a left back panel, said left front panel and said left back panel being joined along a common longitudinal left side seam and along a top left seam to form a left shoulder portion, each of said left front panel and said left back panel including an upper portion, a middle portion, and a lower portion;
a left sleeve attached to said left front panel and said left back panel between said longitudinal left side seam and said top left seam.
a right front panel and a right back panel, said right front panel and said right back panel being joined along a common longitudinal right side seam and along a top right seam to form a right shoulder portion, each of said right front panel and said right back panel including an upper portion, a middle portion, and a lower portion;
a right sleeve attached to said right front panel and said right back panel between said longitudinal right side seam and said top right seam;
a back seam which connects the upper portions and middle portions of said left back panel and said right back panel, said back seam extending downwardly to the buttocks region of the user;
a holding means for releasably holding the lower portions of said left back panel, left front panel, right back panel and right front panel against a respective middle portion to form a car coat length garment;
a first front attaching means for attaching adjacent upper and middle portions of said right front panel and left front panel together whereby the car coat garment is closed as said first holding means holds respective lower portions against respective middle portions;
a first extension means for extending the lower portions of said left back panel, left front panel, right back panel and right front panel downwardly to a position to form a raincoat length garment and for releasably holding the extended lower portions of said left back portion, left front portion, right back portion and right front portion against a respective portion of said respective panels;
a second front attaching means for attaching adjacent extended lower portions of said left front portion and said right front portion together whereby the raincoat garment is closed as said second holding means holds respective extended lower portions against respective said panels;
a second extension means for extending a remaining lower portion of said left back portion, left front portion, right back portion and right front portion downwardly to a position to form a ground engaging length garment; and
a third front attaching means for attaching adjacent remaining lower portions of said left front portion and said right front portion together whereby the ground engaging coat garment is closed as said remaining lower portions of said left back portion, left front portion, right back portion, and right front portion are extended.

4,718,123

COLD CLIMATE PROTECTIVE GARMENT

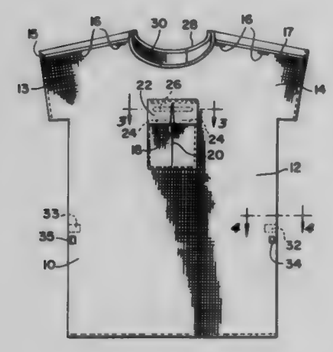
Chrisellene Petropoulos, 9201 Harrington Dr., Potomac, Md. 20854

Filed May 6, 1986, Ser. No. 860,259
Int. Cl.[4] A41D *23/00*
U.S. Cl. 2—91 12 Claims



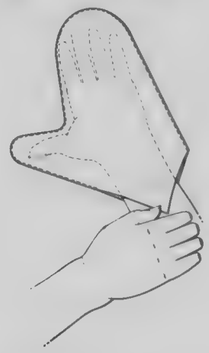
1. A garment for protecting a user's face, neck and upper torso areas from exposure to cold weather, said garment comprising:
a main body tapered at one end and substantially shaped to conform to an upper torso;
first and second appendages each having one end respectively attached at opposite sides of the other end of said main body and at substantially 90° from said main body, said appendages being of sufficient length to encircle the user's neck;
a semi-elliptical muffler element disposed between said appendages with the straight edge attached to the other end of said main body, said semielliptical muffler element when fully extended from said main body substantially covering the user's nose, mouth and chin; and
mating fastening means disposed on the other ends of said appendages for securing said garment at the rear of the user's neck when said appendages encircle the user's neck.

4,718,124
PATIENT GOWN
Marsha M. Sawicki, 2155 School Pl., and Eric C. Herb, 619 Devon Rd., both of Venice, Fla. 33595
Filed Jan. 13, 1987, Ser. No. 3,023
Int. Cl.[4] A41B 9/00
U.S. Cl. 2—114 4 Claims



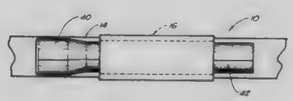
1. A patient's gown, comprising
(a) a body portion having two sleeves attached thereto,
(b) said body portion comprising a front panel and first and second back panels connected by two seams, each panel having an interior side and an exterior side;
(c) said body portion and panels also defining a scooped neck opening;
(d) said sleeve portions having openings extending from the neck opening and along the arm so that access may be provided to the upper body of a patient without removing the gown;
(e) a first column of spaced apart hook and loop type mating fasteners having a length and a width; wherein said length of said fasteners being at least two times greater than said width of said fasteners;
(f) a set of said fasteners being mounted on the interior of one of said back panels vertically spaced apart with said length dimensions being aligned in said vertical direction while a second set of said fasteners being mounted on the exterior of the second of said back panels vertically spaced apart with said width dimensions being aligned in said vertical direction to allow for an adjustable overlapping T-type engagement of the fastening means;
(g) a second and a third set of fasteners being mounted on the openings in the sleeve portions having a spaced apart relationship, with said second set of fasteners being aligned with their width portions running along a marginal edge of the sleeve and a third set of fasteners being aligned with their length portions being along the other marginal edge of said sleeves to allow for a wide area for engagement of the fasteners; and
(h) a pleated pocket located on said front panel of said body portion wherein a medical device can be housed.

4,718,125
DISPOSABLE MITTEN WITH TABS
Roger Derda, 108 W. Pendleton Rd., Banning, Calif. 92220, and Robert F. Derda, 66759 Cahuilla Ave., Desert Hot Springs, Calif. 92240
Filed Nov. 10, 1986, Ser. No. 929,173
Int. Cl.[4] A41D 19/00
U.S. Cl. 2—158 2 Claims



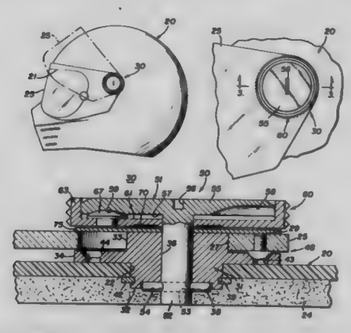
1. An improved mitten of sufficient size for encasing the human hand whereby the thumb is separated from the fingers and the material which forms and covers the finger area is without separations for fingers, wherein the improvement comprises cusp shaped tab elements for easy removal of said mitten which are integrally formed therein to the topsheet and backsheet of said mitten whereby said tab elements are located opposite the finger area of said mitten on the taper terminus closest to the topside and bottomside of the wrist if a human hand were encased in said mitten.

4,718,126
FLASHLIGHT HOLDING APPARATUS
Ronald P. Slay, 7602 Croton St., Houston, Tex. 77036
Filed Oct. 10, 1986, Ser. No. 917,775
Int. Cl.[4] A42B 1/18
U.S. Cl. 2—175 3 Claims



1. An apparatus for holding a flashlight comprising:
a first strap having one surface of hook-type material;
a second strap affixed to one end of said first strap, the other end of said second strap removably attachable to a portion of said first strap, said first strap and said second strap being longitudinally aligned, said second strap having one surface of loop-type material, said surface of loop-type material being on the side of said second strap opposite said hook-type material of said first strap, said second strap being of plasticized material, said first strap having one end sewed to said second strap; and
a section of elastic material affixed to said second section such that a hole is defined by the surfaces of said section of elastic material and of said second strap, said hole having a longitudinal axis aligned with said first strap and said second strap, said hole having an expandable size suitable for receiving the outer diameter of a flashlight, the length of said elastic material being generally transverse to the length of said first and second straps, the ends of said length of said elastic material being sewed together, said length of elastic material encircling said second strap, said section of elastic material being sewed to said second strap, said length of elastic material having a width smaller than the length of a flashlight.

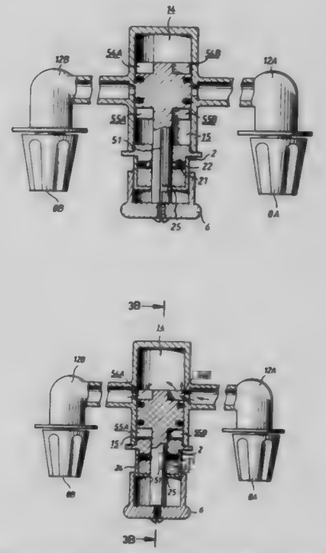
4,718,127
HELMET VISOR WITH LOCKING HINGE ASSEMBLE
Nancy C. Rittmann, Racine; Richard S. Stever, and Steven R. Weste, both of Kenosha, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Jun. 10, 1986, Ser. No. 872,516
Int. Cl.[4] A42B 1/08
U.S. Cl. 2—424 20 Claims



1. In combination a helmet; a visor; and a hinge assembly for mounting said visor on said helmet, said hinge assembly including first detent means carried by said helmet, second detent means carried by said visor, bias means resiliently urging said first and second detent means into engagement with each other to accommodate rotational movement of said visor about a pivot axis among a plurality of detent positions including a fully closed position and a fully open position, said bias means resiliently retaining said visor in each of said detent positions, and non-threaded locking means coupled to said first and second detent means and including a portion rotatably movable about said pivot axis between an unlocking condition accommodating movement of said visor among said detent positions and a locking condition cooperating with said first and second detent means for locking said visor in a selected one of said detent positions.

4,718,128
THREE WAY FAUCET
Jen Y. Fan, 1F., No. 3, Lane 42, I Hsien Rd., Taipei, Taiwan
Filed May 8, 1987, Ser. No. 47,159
Int. Cl.[4] E03C 1/04
U.S. Cl. 4—192 2 Claims

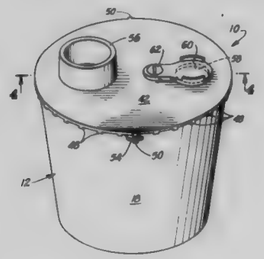
1. A three way faucet comprising:
(A) a water housing, said water housing having a water inlet cavity, a faucet cavity and a threadably engageable shower connection;
(B) a stem, said stem having a vertical stem slot and a horizontal stem slot, said stem also being connected to a handle;
(C) a sleeve, said sleeve fitting into the top of said water housing, said sleeve having at least one spring-loaded steel ball therein for engagement with a corresponding number of concavities on said stem;
(D) a sleeve cover which retains the spring(s) of said spring-loaded steel ball(s), said sleeve cover also having a protruberance which slideably fits into said vertical stem slot or horizontal stem slot, said protruberance aligning and guiding the stem; and
(E) a stem control head, said stem control head having a multiplicity of upper and lower water passages respectively on the upper and lower end thereof, said upper water passages allowing flow of water from said water inlet cavity to said faucet cavity when a handle urges said stem head downwards, and said lower water passages allowing flow of water from said water inlet cavity to said shower connection when said handle urges said stem upwards.

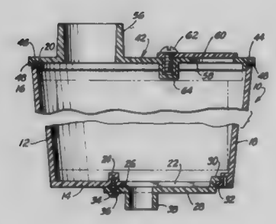


4,718,129
SWIMMING POOL VACUUM APPARATUS
Robert E. Miller, 19050 Colima Rd., Rowland Heights, Calif. 91748
Filed May 1, 1987, Ser. No. 44,666
Int. Cl.[4] E04H 3/20
U.S. Cl. 4—490 7 Claims

1. A swimming pool vacuum apparatus including a container including a bottom having an outlet extending therefrom and a normally opened top, and a lid forming a part of the container closing off the top of said container, the lid having a tubing nipple extending from the top thereof in which the improvement comprises:
said lid having a peripheral groove formed therein and located so as to be opposite the top of said container,
an elastomeric O-ring located within said groove and fitting against said top of said container,
spacer means located on said lid around the periphery of said groove for limiting the amount said O-ring can be compressed and for preventing movement of said O-ring out of said groove, and coacting holding joint means on said

lid and on said exterior of said container adjacent to the top thereof for use in attaching said lid to said container so





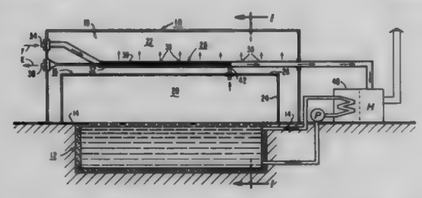


that said O-ring is in engagement with said end of said container.

4,718,130
INTERDOME ENCLOSURE SYSTEM FOR A HEATED SWIMMING POOL

Tim J. Steinback, Apollo, Pa., assignor to Interpools Systems, Inc., Apollo, Pa.

Division of Ser. No. 645,951, Aug. 31, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 936,911
Int. Cl.[4] E04H *3/19, 3/18;* E04B *1/34;* F24H *3/02*
U.S. Cl. 4—499 **10 Claims**



6. An interdome enclosure system in combination with a heated swimming pool and an outer enclosure housing the swimming pool, said system comprising:

(a) an inner enclosure disposed within said outer enclosure and over said swimming pool, said inner and outer enclosures defining a space therebetween; and

(b) means creating an atmospheric pressure with said space which is positive relative to the atmospheric pressure within said inner enclosure by removing air from said inner enclosure at a faster rate than air is replenished to said inner enclosure, said positive pressure creating means including

a first conduit communicating said atmosphere of said space with the atmosphere external to said outer enclosure,

a first fan communicating with said first conduit and operable to direct flow of fresh air from said atmosphere into said space between said outer and inner enclosures,

a second conduit communicating said atmosphere within said inner enclosure with the atmosphere external to said outer enclosure, and

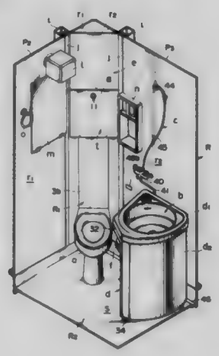
a second fan communicating with said second conduit and operable to direct flow of humid air from said inner enclosure above said swimming pool to said atmosphere external to said outer enclosure,

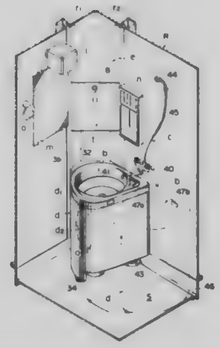
said second fan providing a higher volume flow rate than said first fan to create said positive atmospheric pressure within said space and said first fan providing a negative atmospheric pressure within said inner enclosure relative to an external atmospheric pressure outside of said outer enclosure when said external pressure is considered to be at zero.

4,718,131
SANITARY FACILITY UNIT

Ryuzo Kitamura; Masami Shindo; Masamichi Miyanaga, and Yoshimichi Fukuda, all of Tokyo, Japan, assignors to Toto Ltd., Fukuoka and Tokyo Gas Housing Company, Ltd., Tokyo, both of, Japan

Filed Jul. 28, 1986, Ser. No. 889,629
Int. Cl.[4] A47K *4/00*
U.S. Cl. 4—663 **16 Claims**



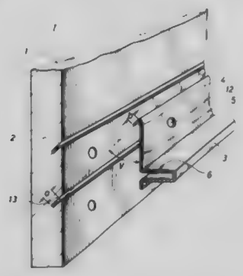


1. A sanitary facility unit comprising a room housing a toliet bowl, a shower head, and a flashing water unit, said flashing water unit comprising a counter and an apron depending downwardly from said counter, said room comprising upstanding walls, a floor and a ceiling, said flashing water unit being pivotable between a first position in which said flashing water unit is located beneath said shower head, said shower head being attached to a portion of one of said walls against which a portion of said flashing water unit is adapted to be abutted when in said first position, said shower head being located above said flashing water unit when in said first position, and a second position in which said flashing water unit is positioned over said toilet, wherein a portion of said flashing water unit is adapted to abut a second one of said walls when in said second position, wherein when said flashing water unit is in said second position an portion of said floor of said room is positioned directly beneath said shower head, said apron defining a storage space under said counter and above said floor, said storage space being adapted to receive said toilet bowl when said flashing water unit is pivoted into said second position, wherein said walls of said sanitary facility unit define an uncompartmented chamber which houses said toliet, said shower head, and said flashing water unit.

4,718,132
PIECE OF FURNITURE, SUCH AS A PIECE OF SEATING OR REST FURNITURE

Kurt Wirland, Älmhult, Sweden, assignor to Inter-Ikea A/S, Humlebæk, Denmark

Filed Jun. 12, 1986, Ser. No. 873,716
Int. Cl.[4] A47C *19/02*
U.S. Cl. 5—11 **9 Claims**

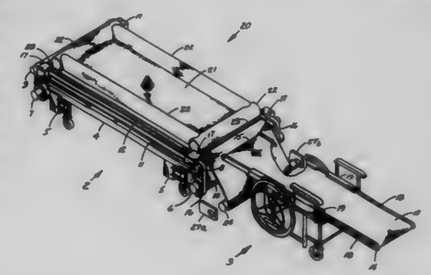


1. A piece of furniture, such as a bed or a chair, comprising: a substantially rectangular frame having two elogated frame sidepieces, a plurality of parallel, elongated grooves in surfaces of said sidepieces which face each other, two elongated profiled rail members, each rail member having a first flange inserted into a groove of the respective frame sidepiece, each rail member further comprising a web abutting the respective frame sidepiece, and also having a second flange extending outwardly from the respective frame sidepiece towards the other sidepiece, for supporting a furniture bottom portion, each first flange forming an acute angle in the range from 15° to 75° with its respective web, the grooves in the frame sidepieces forming a corresponding angle with the sidepiece surface, being free of an inner lining, and mounting means for strengthening the respective frame sidepiece, said mounting means being provided on and abutting the surface of the frame sidepieces at opposite ends thereof, said mounting means having spaced slots of approximately the same width as the grooves in the respective frame sidepiece, the first flange of the member extending into said slots and the web abutting the mounting means.

4,718,133
COLLAPSIBLE TUB—IN AN INVALID BED ARRANGEMENT

Paul DiMatteo, Huntington, and Charles F. Chubb, Brookville, both of N.Y., assignors to Med Bed Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Aug. 20, 1985, Ser. No. 767,515
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **29 Claims**

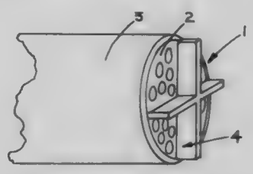


1. A bed having a first sheet of material extending thereacross and roller means at opposite edges of the bed; a power source to rotate said roller means for pulling said first sheet across the bed by said roller means; a second sheet of material having four secured corners; said first sheet and said second sheet being rollable and unrollable from said roller means; attachment means on said first sheet for removably fastening said second sheet of material with said four corners secured so that said first and second sheets maintain a predetermined order and relative positions after being rolled and unrolled from said roller means.

4,718,134
END PLUG FOR BEE SHIPPING TUBES

Bryan H. Ashby, Beltsville, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 2, 1986, Ser. No. 858,809
Int. Cl.[4] A01K *55/00*
U.S. Cl. 6—9 **17 Claims**



1. An apparatus for shipping bees comprising an elongated cylindrical container having an imperforate wall and being open at both ends, a removable end plug for each of said ends, wherein each plug comprises

(a) a perforated disc which snugly fits in one of said open ends, wherein the thickness of said disc is sufficient to prevent bees in said container from stinging anyone handling said plug; wherein said thickness further is sufficient to substantially reduce visibility of said bees to anyone handling said container; and

(b) at least one protruding member on said plug extending away from said disc and longitudinally beyond the outer extremity of said one open end to butt against any external flat surface which may come into contact with said plug, thereby to maintain direct communication between said

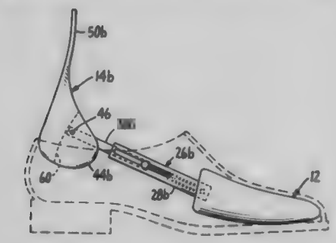
disc and ambient air surrounding said container whenever said plug makes such contact.

4,718,135

SHOE TREE WITH HORN

Timothy E. Colvin, 8 Wildwood Gardens, Piedmont, Calif. 94611

Continuation-in-part of Ser. No. 869,358, Jun. 2, 1986, abandoned, which is a continuation of Ser. No. 680,821, Dec. 12, 1984, abandoned. This application May 1, 1987, Ser. No. 45,364
Int. Cl.[4] A43D *3/14, 3/00*
U.S. Cl. 12—115.8 10 Claims



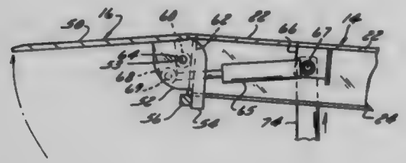
1. A shoe tree comprising: a front portion conformed to fit within the toe area of a shoe; a rear portion conformed to fit within the heel area of a shoe; a compressible strut between said front and rear portions; first connecting means securing the front portion in generally longitudinally aligned compression imparting relationship to the strut; second connecting means securing the rear portion to the strut for pivotal movement about an axis eccentrically disposed relative to said rear portion and extending transversely of the strut, whereby swinging of the rear portion about said axis downwardly toward the front portion and into generally longitudinally aligned relationship with the strut functions to extend the composite length of the tree and swinging of the rear portion about said axis upwardly away from the front portion functions to reduce the composite length of the tree and roll the rear portion out of a shoe within which the tree is received; and a shoe horn secured to the rear portion so as to overlie said portion, said horn extending forwardly of the rear portion over and in spaced relationship to the strut when the rearward portion is longitudinally aligned with the strut, whereby said horn may be gripped from beneath to swing the rear portion away from the front portion.

4,718,136

DOCKBOARDS

Patrick W. Fisher, 7830 N. 53rd St., Milwaukee, Wis. 53223; James P. Hagen, W322 N6811 Wildwood Point Rd., Hartland, Wis. 53029, and Walter E. Meyer, 3359 Highway I, Saukville, Wis. 53090

Filed Jul. 23, 1986, Ser. No. 889,803
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—71.3 4 Claims



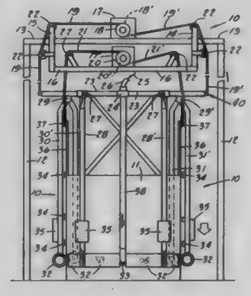
1. A dockboard comprising a ramp assembly, means for supporting said ramp assembly for pivotal movement in a pit formed in a loading dock, means mounted on the bottom of the pit in the loading dock for pivoting said ramp assembly with respect to said supporting means, a lip assembly pivotally mounted on the free end of the ramp assembly, said lip assembly includes a tread plate and a plurality of pivot plates mounted in a parallel spaced relation on said tread plate, means mounted on said ramp assembly for pivoting the lip assembly to an extended position forming a continuation of said ramp assembly, and means for limiting the pivotal movement of said lip assembly, said limiting means comprising a tab formed as an integral part of each pivot plate and a stop bar mounted on said ramp assembly in the path of motion of said tabs whereby a moment force imposed on the tread plate is transferred to said stop bar.

4,718,137

AUTOMATED WASHER FOR CARGO CONTAINER

John L. Jones, P.O. Box 233, Pasadena, Calif. 91102

Division of Ser. No. 882,160, Jul. 7, 1986, and a continuation of Ser. No. 649,522, Sep. 11, 1984, and a continuation of Ser. No. 732,303, May 9, 1985, and a continuation of Ser. No. 785,977, Oct. 10, 1985. This application Nov. 10, 1986, Ser. No. 929,324
Int. Cl.[4] A46B *13/06*
U.S. Cl. 15—56 3 Claims



1. An automatic washer for a cargo container having a completely open top rigid lid, comprising in combination:
multiple adaptively spaced, sized and fixed ground position, load support columns,
multiple fixed stress frame horizontal and vertical members, affixed to the upper level of said load support columns,
at least two separate electric motor powered cable hoists, each one of said cable hoists having double ended rotating power shafts, each shaft having a cable hoist pulley disposed and secured thereon, said cable hoists disposed and secured on said horizontal stress frame members, said pulley power shafts disposed parallel to said ground position,
at least two separate dual opposed sets of load cables, each cable adaptively secured at one cable termini to each one of said cable hoist pulleys, said load cables having lengths at least reaching said ground,
multiple sets of grooved guidance pulleys, positioned and adaptively permanently placed to guide each one of said at least separate dual opposed set of load cables, providing direct vertical load lifting,
multiple horizontal load carrying first hollow pipe length for detergent-water solution flow, each said first hollow pipe length having a first hollow tee coupling conductively disposed midway in the hollow pipe length, each said pipe length supported on the two termini of said first hollow pipe length by two opposed dual cable termini,
multiple second hollow rigid pipe length conductively connected at a second rigid pipe first terminus, carrying detergent-water solution from said first hollow tee coupling to a selectively distantly spaced below water turbine adaptively sized, and having an input securely connected to said second hollow rigid pipe length second terminus, said turbine having a turbine rotor and a turbine rotor eye, said rigid second pipe length longer than the height of said cargo container plus the vertical height of the upraised hinged lids of said container,
multiple third hollow brush length pipes disposed and permanently conductively secured in the eye of the water turbine rotor, one-half length of said third brush pipe being disposed on one side of said turbine rotor and one-half of said length of third pipe being disposed on a second side of said turbine rotor, random apertures being disposed through said third brush length pipe, multiple equal length brush fiber tufts being radially disposed and secured in said brush pipe, providing cylindrical balanced sweeper brush pairs, said turbine rotor providing rotative power to the sweeper brush pairs,
multiple pairs of hollow fourth opposed conductive pipe support members having pipe first termini journaled to rotatively support said sweeper brush pairs, said fourth pipe pair support members second termini conductively connected to a pair of rotatable couplings disposed in said first horizontal load carrying hollow pipes,
a multiple mobile washing unit having cooperatively one of aforesaid multiple horizontal load carrying first hollow pipes for detergent-water solution, one of aforesaid multiple second hollow rigid pipes, one of aforesaid third brush length pipes and water turbine providing one of aforesaid sweeper brushes pairs, and one of aforesaid multiple pairs of opposed fourth conductive pipe support members,
said multiple mobile washing units being closely adjacently coplanarly aligned at their respective sweeper brushes around the interior perimeter and separately around the exterior perimeter of aforesaid cargo container and the container vertically raised lids, providing a concurrent washing of the debris from the interior and exterior side walls of the cargo container as the detergent-water solution is programmed over the side walls and the top lids, and washed by lowering aforesaid load carrying cables supporting aforesaid rotating sweeper brushes.

4,718,138

FOOTWEAR SCRAPER

Steven R. Brown, 156 W. Elm, Louisville, Colo. 80027, and Gene A. Fisher, Highlands Ranch, Colo., assignors to Steven R. Brown, Louisville, Colo.

Filed Jun. 16, 1986, Ser. No. 874,701
Int. Cl.[4] A63C *11/18, 11/22*; A47L *23/00, 23/22*
U.S. Cl. 15—237 17 Claims

1. A device for enabling removal of matter from a ground engagable unit, said device comprising:
hand usable means;
scraper means having a scraping portion and a mounting portion spaced from said scraping portion;
mounting means positioned at said hand usable means; and
connecting means, having a rotatable portion, connecting said mounting portion of said scraper means with said mounting means, rotation of said rotatable portion of said connecting means causing said scraping portion of said scraper means to be adjacent to said hand usable means when in a stored position, and causing said scraping portion of said scraper means to extend from said hand usable means when in an operative position, said connecting means including actuation means for causing rotation of said rotatable portion so that said scraping portion is automatically caused to assume a predetermined one of said positions upon actuation of said actuating means.



4,718,139

AUTOMOTIVE WIPER DEVICE WITH ADJUSTABLE WIPER BLADE FORCE

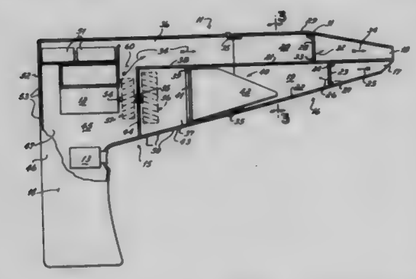
Haruo Okuda, Warabi, and Yukiho Murata, Zama, both of Japan, assignors to Nissan Motor Company Limited, Yokohama and Ichikoh Industries Limited, Tokyo, both of, Japan

Filed Sep. 4, 1986, Ser. No. 903,474
Claims priority, application Japan, Sep. 6, 1985, 60-196002
Int. Cl.[4] B60S *1/34*
U.S. Cl. 15—250.2 13 Claims



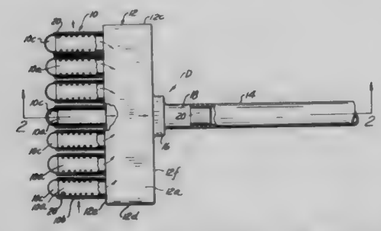
1. An automotive wiper device with adjustable depression force comprising;
a wiper blade;
a wiper arm supporting said wiper blade at one end;
an arm head connected to the other end of said wiper arm for pivotally driving said wiper arm so as to actuate the wiping operation.
a bias means, connected to said wiper arm and said arm head, for biasing said wiper arm and said wiper blade toward an associated vehicular window surface, said biasing means comprising a plurality of springs exerting a biasing force on said wiper arm, said plurality of springs including at least one adjustable spring; and
adjusting means, cooperating with said adjustable spring, for adjusting the biasing force exerted by said adjustable spring.

4,718,140
FIREPLACE BLOWER AND VACUUM
Henry Johnson, R.R. 1 2076 Lucas Rd., Blanchester, Ohio 45107
Filed Mar. 10, 1986, Ser. No. 837,797
Int. Cl.[4] A47L 5/14
U.S. Cl. 15—330 8 Claims



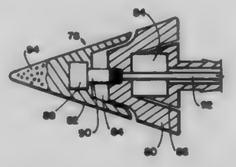
1. An apparatus adapted to alternately, but not concurrently, exhaust air and create a vacuum comprising:
a front portion including an inlet leading into a vacuum chamber and an outlet extending from an exhaust chamber;
said vacuum chamber including a valve adapted to permit air to flow into and not out of said inlet said chamber further including a filter;
said exhaust chamber including a valve adapted to permit air to flow out of and not into said exhaust chamber;
fan means mounted within said apparatus and operated by a reversible motor;
said fan means operable to suck air into said vacuum chamber through said filter when rotated by said motor in a first direction;
said fan means further operable to blow air through said exhaust chamber out of said outlet when rotated by said motor in a second direction.

4,718,141
CLEANING DEVICE
Carol C. Knehal, 3969 Loves Creek Dr., Howell, Mich. 48843
Filed Jan. 27, 1987, Ser. No. 7,281
Int. Cl.[4] A47L 9/06
U.S. Cl. 15—394 2 Claims



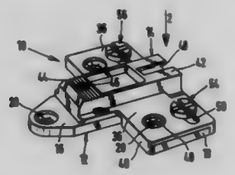
1. A cleaning device for removing dust and like substances from both narrow and wide Venetian blind slats, comprising manifold means communicating with a source of negative pressure and being provided on one surface thereof with a plurality of closely spaced tubular protrusions, and a plurality of closely spaced tubular cleaning members supported upon said one surface of said manifold means and communicating with the interior thereof, each of said cleaning members including a tubular support member engageable at one end thereof with selected tubular protrusions for snap fitting securement thereto, each support member being apertured to provide a plurality of small diameter openings arranged in closely spaced relation along the longitudinal axis thereof, guide means connected to the opposite end of each of said tubular support members and shaped with a rounded dome-like leading surface for guiding the cleaning members into and within the Venetian blind slats, each of said cleaning members further including an air permeable pile sleeve member of sock-like configuration embracing each of said tubular support and guide means thereon in slidable tight-fitting enveloping relation therewith, each of said sleeve members, having a surface provided by a multiplicity of soft texture, short length, upright, fine diameter, and densely arranged fibers, each of said sleeve members being apertured to provide a plurality of small diameter openings arranged in closely spaced relationship along the longitudinal axis thereof and precisely located for registration with like openings in each of said support members, whereby when negative pressure is utilized dust and like substances on the Venetian blind slats are dislodged and sucked through the openings in said sleeve members and in said support members for passage into said manifold means, said support members being selectively removable from the protrusions on said manifold means depending upon the width of the Venetian blind slat being cleaned.

4,718,142
GAS DRIVEN PIPE CLEANER AND REEL
Ronald L. Wahlers, Cape Girardeau, Mo., assignor to D.W. Tool, Inc., Cape Girardeau, Mo.
Filed Jul. 31, 1986, Ser. No. 892,764
Int. Cl.[4] A47L 5/14
U.S. Cl. 15—395 10 Claims



1. Apparatus for clearing an obstruction of clogged discrete particles in a pipeline or the like, said apparatus comprising a flexible hose connected at one end to a source of high pressure gas, said hose being freely insertable into said pipeline and being connected at a second end to an obstruction clearing nozzle, means for regulating the gas source to a selcected pressure, said nozzle having means for connecting it at a rear end to said hose and having a forward portion adapted to contact said obstruction forcefully to dislodge said particles and said nozzle having a gas introduction passage at the rear communicating with said hose and rearwardly directed aspirating gas passage means creating a rearwardly directed gas flow for carrying dispersed particles from the clogged area, said nozzle having a forwardly directed configuration with a transverse rear base and a plenum chamber communicating with said gas introduction passage and said aspirating gas passage means, said nozzle having a stationary rear base connected to a separate rotary cone-shaped head and said head having gas driven powering means, said head being further provided with comminuting elements on the cone-shaped surface and said gas aspirating gas passage means comprising a plurality of circumferentially disposed gas passages extending from said plenum chamber through said base.

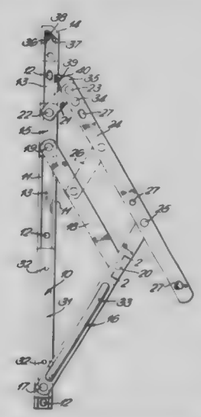
4,718,143
MOUNTING PLATE FOR CABINET HINGES
Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG. Möbelbeschlagrabrik, Reinheim, Fed. Rep. of Germany
Filed Jan. 8, 1986, Ser. No. 817,110
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501048
Int. Cl.[4] E05D 7/04
U.S. Cl. 16—238 13 Claims



1. A mounting plate for the adjustable fastening of a supporting wall-related part of a cabinet hinge on a cabinet carcase, said mounting plate comprising: a bottom part to be attached to a carcase supporting wall, and a top part having fastening means for the supporting wall-related part, guide means on said top and bottom parts for displaceably and selectively lockably mounting said top part on said bottom part, said top and bottom parts each having an elongated middle section with two opposite longitudinal sides, two wings respectively extending from said sides of said middle sections, a first slot running in the direction of displacement of the hinge in one of said wings of said top part, a threaded shaft of a clamping screw being passable through said first slot into a tap in said bottom part, a second slot in the other wing of said top part opposite said one wing provided with said first slot, said second slot running in the direction of displacement of the hinge; a relatively short, shaft-like projection protruding from said bottom part, and a holding head on said projection and laterally over-reaching margins of the second slot with a slight axial clearance and lying free on an upper side of said one wing of said top part, said elongated middle section of the top part having an end pointing into the carcase interior, said top part end having a holding projection which enters into an elongated opening extending in the direction of displacement, in the middle section of the bottom part, and laterally underreaches at least one longitudinal margin of the elongated opening to thereby secure the top part from being lifted off the bottom part in any relative position of said two parts.

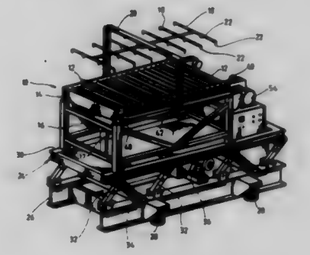
4,718,144
FRICTION SUPPORTED STAYS FOR WINDOWS
John E. Buckley, Tewkesbury, England, assignor to Securistyle Limited, Nottingham, England
Continuation of Ser. No. 560,560, Dec. 12, 1983, abandoned.
This application Sep. 24, 1985, Ser. No. 780,227
Claims priority, application United Kingdom, Dec. 24, 1982, 8236777
Int. Cl.[4] E05C 17/04
U.S. Cl. 16—341 9 Claims

1. A friction supporting stay comprising:
a track;
a slider movable along the track;
a strut pivotally connected to the track;
a brace pivotally connected between the slider and the strut;
a link pivotally connected to the slider;
a metal bar pivotally connected to the link and to the strut to extend therebetween, the bar having a separate plastic nose portion secured at the end thereof remote from the strut, said nose portion being of greater thickness than said bar and having one or more external surfaces substantially perpendicular to the plane of said bar, said bar operatively coupled so that as said slider moves along said track said bar swings between a closed position overlying said track to an open position angled with respect to said track; and
a plastic cap member being of greater thickness than said bar and disposed on the end of said track remote from said strut, said cap member having one or more internal surfaces engageable by the external surfaces of said nose



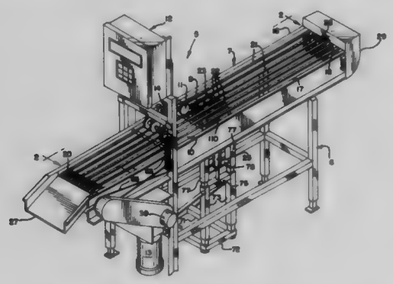
portion of said bar, the external surfaces of said plastic nose portion shaped to cooperate with the internal surfaces of said plastic cap member to wedge therein with the greater thickness of said nose portion and said cap member providing a more secure and accurate location of said nose portion.

4,718,145
APPARATUS AND METHOD FOR EVISCERATING SCALLOPS
Albert B. Silcheastedt, Alamorgorda, N. Mex., assignor to Southern Seafoods, Cape Canaveral, Fla.
Filed Feb. 18, 1986, Ser. No. 830,379
Int. Cl.[4] A22C 29/04
U.S. Cl. 17—45 15 Claims



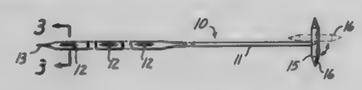
15. A method for eviscerating scallops comprising the steps of
placing shucked scallops on a bed of rotating rollers which are capable of removing the viscera; and
vibrating said bed so as to cause said scallops to progress along said bed.

4,718,146
APPARATUS FOR SAWING TURKEY BREASTS AND OTHER OBJECTS
Frank L. Adkison, Winfield, Iowa, assignor to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Jan. 20, 1987, Ser. No. 5,417
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—52 15 Claims



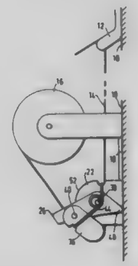
13. In the method of severing a series of objects of approximately the same size into two portions by conveying said objects one at a time into engagement with and past a vertically operating blade, the improvement which comprises,
advancing the objects on the conveyor in increments and stopping the same in superposed position over a lowered scale platform, raising the platform to lift the superposed object off from the conveyor, shifting the object laterally on the scale platform into predetermined alignment with said blade, lowering the platform sufficiently to deposit the positioned object on the conveyor, advancing the object into severing engagement with said blade, and discharging the severed portions.

4,718,147
ONE PIECE TIE
Stuart Fujinami, 2842 S. Norton Ave., Los Angeles, Calif. 90018
Filed Sep. 8, 1986, Ser. No. 904,364
Int. Cl.[4] A44B *9/00*
U.S. Cl. 24—150 FP 6 Claims



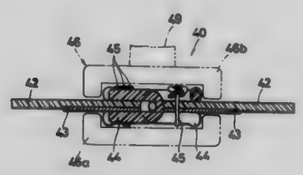
1. A one piece tie adapted for use in releasably securing together a plurality of clothing items made from a wide range of knitted or fabric materials, the one piece tie comprising:
an elongated filament-like flexible plastic main body having a narrow profile extending lengthwise from a pointed first end portion to a second end portion of said flexible main body;
at least one elongated slit formed in and extending lengthwise along said flexible narrow profile first end portion of the main body; and
a crosspiece integral with the second end portion of said main body and extending transversely outwardly from the narrow profile main body;
the main body of the tie having a sufficiently small diameter that the pointed first end and the narrow profile flexible slitted first end portion of the tie can be inserted through and withdrawn from a wide range of fabric and knitted clothing materials without harm thereto,
said crosspiece being insertable through said slit when the crosspiece is manually bent to lie snugly and briefly against an adjacent first end portion of the main body while being inserted through the slit, and, upon release after insertion through the slit, being self-returnable to the former position thereof and effective to prevent the unintended disassembly thereof from the slit.

4,718,148
CLAMPING MEANS FOR A STRAP
David A. McKernon, Littlehampton, and Douglas J. Cunningham, Hants, both of England, assignors to Britax (Wingard) Ltd., Chichester, England
Filed Oct. 7, 1986, Ser. No. 916,167
Claims priority, application United Kingdom, Oct. 9, 1985, 8524916
Int. Cl.[4] A44B *11/12*
U.S. Cl. 24—170 3 Claims



1. Clamping means comprising:
a strap extending between a strap storage location and a strap utilisation location,
a base structure,
a first support member pivotally mounted on the base structure for angular movement about a first pivot axis,
a reaction member secured to the first support member,
a second support member pivotally mounted on the first support member for angular movement about a second pivot axis positioned between the reaction member and the first pivot axis,
a guide member secured to the second support member,
stop means, and
retention means for retaining the guide member and the reaction member in respective rest positions in which the guide member is on the opposite side of the first support member to both the strap storage location and the strap utilisation location and is in engagement with said stop means which prevents movement of the guide member towards the first pivot axis, the strap being freely movable between the guide member and the reaction member;
the distance of the guide member from the second pivot axis being greater than the distance of the reaction member from the second pivot axis, so that tension in the strap exerts a resultant force on the guide member, said resultant force being directed between the first and second pivot axes when the guide member and second support member are both in their rest positions, and tension in the strap exceeding a predetermined level causes angular movement of the first support member to an orientation in which said resultant force is directed on an opposite side of the second pivot axis to the first pivot axis, thereby wrapping the strap round both the reaction member and the guide member so that one layer of the strap is clamped against the reaction member by another layer of the strap.

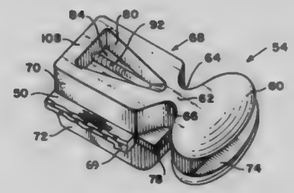
4,718,149
SLIDE FASTENER
Yoshitoki Tsubokawa, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Continuation of Ser. No. 606,201, May 2, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 894,453
Claims priority, application Japan, May 11, 1983, 58-70299[U]; Mar. 28, 1984, 59-45466[U]
Int. Cl.[4] A44B *19/02*
U.S. Cl. 24—392 3 Claims



1. A slide fastener comprising:
(a) a pair of non-woven stringer tapes, each stringer tape being made of a single layer of unfolded non-woven sheet material and having an unfolded inner longitudinal edge portion;
(b) a pair of fabric reinforcement strips each being a web of fabric material and being bonded to one exposed surface of each of said pair of stringer tapes along said unfolded longitudinal edge portion to form a fabric reinforced unfolded longitudinal edge portion;
(c) a pair of rows of coupling elements each attached respectively by at least a pair of rows of sewing stitches to said stringer tapes along said fabric reinforced unfolded longitudinal edge portions;
(d) a slider slidably movable along said rows of coupling elements for taking said rows of coupling elements into and out of mutual engagement with one another, said slider having a pair of wings disposed one on each side of said stringer tapes;
(e) a pull tab pivotably supported on one of said wings, and
(f) said fabric reinforcement strips being exclusively disposed on the surfaces of said pair of stringer tapes which surfaces face away from said one wing of the slider on which said pull tab is supported, and said fabric reinforcement strips having a combined transverse width greater than the width of said slider and being frictionally engagable with the other wing of the slider while said slider is in motion to protect said non-woven stringer tapes against abrasive wear.

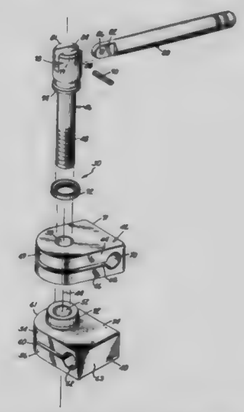
4,718,150
PROJECTION COOLING OF MOLDED SLIDE FASTENER ELEMENTS AND PRODUCT
George B. Moertel, Connellsville, Pa., assignor to Talon, Inc., Meadville, Pa.
Filed Oct. 2, 1980, Ser. No. 193,057
Int. Cl.[4] A01B *19/10*; B29D *29/00*
U.S. Cl. 24—427 8 Claims

1. A stringer for a slide fastener comprising
a longitudinal supporting tape,
a plurality of coupling elements injection molded on spaced portions of the supporting tape,
each of the plurality of coupling elements being made from a polymer resin,
each of the plurality of coupling elements including a head portion and first and second leg portions extending from the head portion in a generally parallel relationship,
each of said first and second leg portions being molded on the respective spaced portion of the supporting tape to secure each coupling element thereto,
each leg portion having an inner surface with the inner surfaces of said first and second leg portions facing each other,
a recess in an outside surface of each leg portion reducing the leg portion's maximum thickness to form a recessed surface extending adjacent the supporting tape,
the reduced thickness of each leg portion defining a rapidly



cooled portion wherein such reduced thickness is less than 60% of the maximum thickness of the respective leg portion, and
the rapidly cooled portion on each leg portion being adapted to decrease porosity therein to produce greater adherence and strength between each coupling element and the supporting tape.

4,718,151
RETRACTOR APPARATUS
Bruce A. LeVahn, New Brighton, and Robert E. Olson, Roseville, both of Minn., assignors to Minnesota Scientific, Inc., Minneapolis, Minn.
Division of Ser. No. 669,362, Nov. 8, 1984, Pat. No. 4,617,916. This application Jun. 2, 1986, Ser. No. 869,347
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—535 6 Claims



1. A clamping mechanism for connecting first and second rod sections of a retractor apparatus, the mechanism comprising:
a first clamping section having a unitary body with a first clamping bore extending therethrough proximate one end of the body and a slot running through said body from the clamping bore to an opposite end of the body, separating the body into first and second resilient leg portions that when brought together reduce the diameter of the first clamping bore for frictionally clamping a rod section, the first clamping section further including a frusto-conical section extending from the first leg portion;
a second clamping section having a unitary body with a second clamping bore extending therethrough proximate

one end of the body and a slot running through said body from the clamping bore to an opposite end of the body, separating the body into first and second resilient leg portions that when moved together reduce the diameter of the second clamping bore for frictionally clamping a rod section, the second leg portion having a frusto-conical recess for frictional engagement with the frusto-conical section of the first clamping section such that when a force is applied bringing the first and second clamping sections together and the leg portions of the respective clamping sections together, each clamping bore frictionally clamps the respective rod section and the frusto-conical recess and frusto-conical section are placed in frictional engagement so that the first and second clamping sections are placed in a clamped position; and

means for providing a force to bring together the leg portions of the respective clamping section and the first and second clamping sections together.

4,718,152

METHOD FOR PRODUCING PATTERNED NON-WOVEN FABRIC

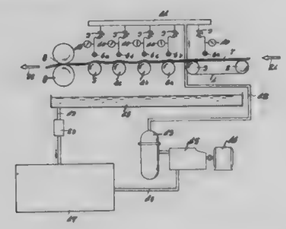
Migaku Suzuki; Toshio Kobayashi, and Shigeo Imai, all of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 455,493, Jan. 4, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,943

Claims priority, application Japan, Jan. 31, 1982, 57-13532

Int. Cl.[4] D04H *1/46*

U.S. Cl. 28—104 **6 Claims**



1. A process for producing nonwoven fabrics wherein a fibrous web is guided onto a water-impermeable supporting member and said fibrous web is subjected to a plurality of fine water jet streams supplied at a jet pressure of 35 Kg/cm^2 or lower from a plurality of nozzles which are arranged at spaced apart intervals across the width of the fibrous web, whereby entangling treatment of the individual fibers of said fibrous web is carried out; the improvement which comprises

(a) starting with a fibrous web weighing from 15 to 100 g/m^2,

(b) guiding said fibrous web into a preliminary entangling stage that comprises a first supporting member consisting of a smooth-surfaced water-impermeable endless belt,

(c) carrying out a preliminary entangling treatment in said preliminary entangling stage by ejecting a plurality of water jet streams from a plurality of nozzles arranged transversely with respect to the direction of movement of said first supporting member,

(d) guiding said fibrous web from said preliminary entangling stage to a final entangling stage consisting of a plurality of spaced-apart smooth surfaced water-impermeable rolls,

(e) carrying out a final entangling treatment with water jet streams ejected from a plurality of nozzles that are located above and in parallel alignment with said spaced apart smooth-surfaced water-impermeable rolls,

(f) thereafter subjecting the fibrous web resulting from step (e) to a patterning treatment on a water-impermeable support having a relief pattern thereon comprising raised portions and recessed portions, said patterning treatment comprising directing a plurality of spaced apart high velocity water streams directly upon the fibrous web toward the raised portions of said relief pattern in an unobstructed manner as the fibrous web passes over said patterned support so that the fibers in the fibrous web resulting from step (e) are reoriented by the action of said plurality of spaced apart high velocity water streams and form a distinct pattern in the fibrous web corresponding to the relief pattern that is on the patterned support which the web moves over.

4,718,153

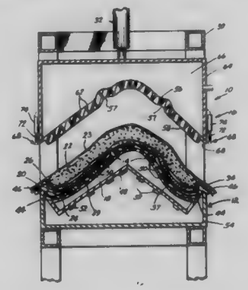
CUSHION MANUFACTURING PROCESS

Donald H. Armitage, Grand Rapids, and Robert C. Angell, Spring Lake, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 10, 1986, Ser. No. 850,292

Int. Cl.[4] B68G *7/00*

U.S. Cl. 29—91.1 **45 Claims**



37. A process for manufacturing upholstered, sculpted cushions, comprising:

providing a surface with sculpted effects thereon;

placing non-preformed upholstery fabric on said surface;

placing non-preformed, foam cushion means overlaying said fabric;

providing air permeable adhesive means between said fabric and said cushion means;

compressing said cushion means against said fabric to force said cushion and fabric to assume the shape of said surface;

injecting hot vapors into said fabric and cushion means to shape them to the sculpted shape of said surface.

4,718,154

PLASTIC EXTRUSION-TRANSPORT ROLLER FOR PHOTOMECHANICAL APPARATUS

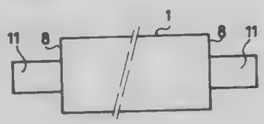
Walter Bauer, and Heinrich Färber, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,566

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530041

Int. Cl.[4] B21B *1/00*

U.S. Cl. 29—123 **5 Claims**



1. In a transport roller extruded from plastics for use in photomechanical apparatus, such as X-ray film cassette-loading and unloading devices, film development apparatus, film sheet processing apparatus for screen image receivers, X-ray receivers or the like, the transport roller including a cylindrical

sleeve with a cylindrical outer surface, the improvement comprising a cross-section of said roller being formed as a circular ring having said cylindrical outer surface and being provided with a plurality of inwardly radially extending ribs having internal curved end surfaces of the same curvature, said end surfaces altogether forming a circular internal surface of the roller for engaging a shaft of the roller, said circular internal surface forming a cylindrical recess extended over the length of the roller, said roller having end faces, said shaft having end portions extending outwardly from said end faces; and end caps applied to said end faces to close said recess, said end caps being connected to said end portions, respectively, each cap having at a side thereof facing a respective end face of the roller, projections, said projections corresponding in shape to spaces between said ribs and in assembly extending between said ribs and being locked therewith.

4,718,155

BEARINGS

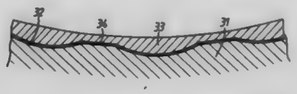
Joseph F. Warriner, 134 Marys Mead, Hazlemere, High Wycombe, Buckinghamshire, England, and Warren E. Snyder, 13800 Watertown Plank Rd., Elm Grove, Wis. 53122

Filed Dec. 20, 1985, Ser. No. 811,930

Claims priority, application United Kingdom, Jan. 5, 1985, 8500212

Int. Cl.[4] B21D *53/10*

U.S. Cl. 29—149.5 S **11 Claims**



1. A process for the production of a bearing having a relatively harder bearing material with a relatively softer overlay alloy, said bearing being suitable for sustaining high loads, the process comprising the steps of:

a. introducing indentations of random shape and dimensions into the surface of relatively harder bearing material by means of shot-peening with a rounded, shatter-resistant shot-peening medium, said indentations having a depth generally being between 0.01 and 0.05 mm,

b. depositing an interlayer on said indented surface,

c. depositing a layer of relatively softer overlay alloy on said interlayer, and

d. machining said bearing to a required dimension.

4,718,156

METHOD OF RETROFITTING AN EXHAUST STACK BY INCORPORATING A FILTER ASSEMBLY

James Cole, Flushing, Mich., assignor to Dee Cramer, Inc., Flint, Mich.

Division of Ser. No. 794,738, Nov. 4, 1985, Pat. No. 4,637,300. This application Aug. 25, 1986, Ser. No. 900,306

Int. Cl.[4] B21D *53/00*

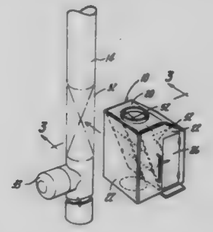
U.S. Cl. 29—157.5 **9 Claims**

1. A method of retrofitting an existing exhaust system which includes an exhaust stack and an exhaust fan, said method comprising the steps of

cutting the exhaust stack to form at least an upper and a lower portion,

installing a filter assembly between the cut portions of the exhaust stack,

providing the filter assembly with an inlet connected with the lower portion of the exhaust stack, an outlet connected



with the upper portion of the exhaust stack and filter elements disposed between said inlet and said outlet.

4,718,157

METHOD AND AN APPARATUS FOR DEBANDING

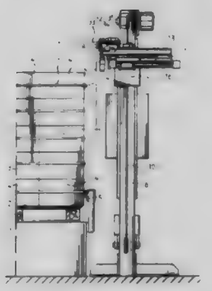
Hearicus M. Keyzers, and Johannes G. W. Van Ottele, both of Oss, Netherlands, assignors to Endra B.V., Netherlands

Filed Feb. 28, 1986, Ser. No. 834,394

Claims priority, application Netherlands, Mar. 4, 1985, 85-00606

Int. Cl.[4] B23P *19/02, 23/00*

U.S. Cl. 29—426.4 **10 Claims**



1. The method of destrapping an object while it is in a stationary position, which comprises the steps of:

moving a cutting/clamping/feeding assembly along a first path perpendicular to the plane of the strap until it is in laterally offset but spaced, facing relation to the strap around the object;

moving the cutting/clamping/feeding assembly along a second path parallel to the plane of the strap toward the object until the cutting/clamping/feeding assembly is laterally positioned with respect to the strap to be severed;

laterally moving the cutting/clamping/feeding assembly along the first path until it is in a straddling relation to the strap to be severed;

substantially simultaneously shearing the strap and resiliently clamping an end of the strap;

maintaining the resilient clamping of the strap while relatively rotating an element effecting the clamping until the strap has been fed to waste; and

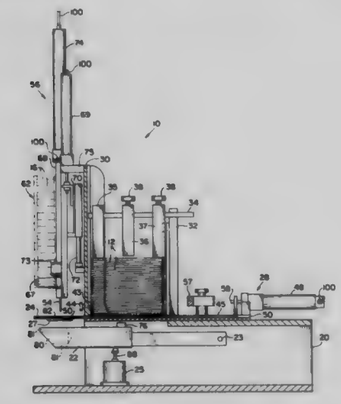
retracting the cutting/clamping/feeding assembly from the object along the first path.

4,718,158

AUTOMATIC TAGGING APPARATUS AND METHOD THEREFOR

Charles Block, 1129 Albert Rd., No. Bellmore, N.Y. 11710

Filed Mar. 11, 1985, Ser. No. 710,510
Int. Cl.[4] B65C 7/00
U.S. Cl. 29—432 20 Claims



1. An apparatus for tagging selected layers of an article comprising

a table having tagging positions thereon;

a supply of tags each of which has a tagging portion;

means to feed the tag portion of a tag from said tag supply to said tagging position on said table;

a supply of tacks for joining to selected layers of an article and a tag with its tagging portion in said tagging position;

means to clamp against said table selected layers of an article to be tagged that are in said tagging position below said table;

means to locate the selected layers of an article in said tagging position below said table and between said table and said clamp;

and means feeding a tack from said supply of tacks to pass at least partially through said tagging portion in said tag in said tagging position to join the fed tag to the selected layers of the article in said tagging position.

4,718,159

APPARATUS FOR TERMINATING AN ELECTRICAL WIRE TO AN ELECTRICAL CONNECTOR

Udo Bronkowski, Neu-Isenburg; Michael Gerst, Worms, and Werner Maack, Seeheim, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 2, 1986, Ser. No. 937,152
Claims priority, application United Kingdom, Dec. 31, 1985, 8531954
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—564.7 11 Claims

1. For use with an electrical connector comprising an insulating housing having a terminal receiving cavity, an electrical terminal in the cavity and a cover removably hinged to the housing and being mateable therewith, apparatus for removing the cover from the housing, terminating an electrical wire to said terminal to provide an electrical connection between the wire and the terminal and then mating the cover with the housing to enclose said electrical connection, the apparatus comprising:

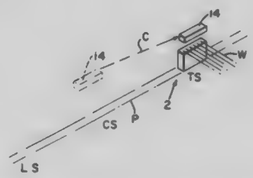
a connector housing loading station;

a wire terminating and cover mating station;

means for transferring the connector housing from said loading station to the terminating station;

a wire termination and cover mating tool mounted above said terminating station;

means for repeatedly driving the tool through a rectilinear downward working stroke towards the terminating station sequentially to terminate the wire to the terminal and to mate the cover with the connector housing, and through an upward return stroke away from the terminating station;



means for guiding the tool through its working stroke and its return stroke;

a cover removal station between the loading station and the terminating station;

means at the cover removal station for removing the cover from the housing; and

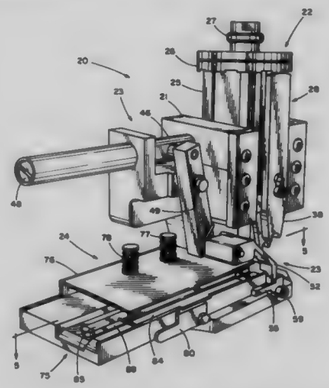
means for then transferring the cover to the terminating station to position the cover between the terminating tool and the connector housing when the wire has been terminated by driving the tool through a first working stroke and the tool has been driven through a subsequent return stroke, to cause the cover to be mated with the housing by the tool during the next following working stroke thereof.

4,718,160

TERMINAL STRIP APPLICATOR

John Bulanda, New Lenox, and Peter Kirsinas, Country Club Hills, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Jul. 10, 1986, Ser. No. 884,163
Int. Cl.[4] H01R 43/055
U.S. Cl. 29—566.2 9 Claims



1. A self adjusting electrical terminal applicator for automatically applying terminals provided in continuous strips of varying terminal pitches, comprising:

a ram carrying a first die set mounted for reciprocation along a first path within a machine body;

track means for accurately positioning the strip of terminals to limit the movement of the strip of terminals to a second path which intersects the first path of the ram;

terminal feeding means for resiliently biasing the terminal strip from a first retracted position to a second advanced position, along the second path in the track means towards the first path and for sequentially advancing a lead terminal of the terminal strip in response to the reciprocation of the ram; and

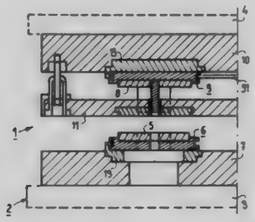
a second die set secured to the applicator in operative alignment with and opposition to the first die set to effect application of the terminals, at least one of the die sets being removable and having stop means for limiting the advance of the terminal feeding means to accurately align the lead terminal carried by the terminal feeding means between the first die set and the second die set, whereby at least one of the die sets may be exchanged to apply terminal strips of varying terminal sizes and/or shapes, with the applicator continuing to automatically precisely feed terminal strips having a range of terminal strip pitches without modification or adjustment of the terminal feeding means of the applicator.

4,718,161

PRESS TOOL COMPRISING INTERCHANGEABLE WORKING PARTS

Jean M. Pfister, and Dorice Vrignaud, both of La Roche Sur Yon, France, assignors to Easweing S.A., Sur Yon, France

Filed Apr. 30, 1986, Ser. No. 857,368
Claims priority, application France, Apr. 30, 1985, 85 06571
Int. Cl.[4] B23Q 3/00
U.S. Cl. 29—568 8 Claims



1. Working parts for a press constituted by stamps and dies, and attachment parts such as blank-holders, punch-holders, die-holders, and stay blocks, wherein it comprises as working parts;

stamps and dies formed from metallic removable disc like elements; and

first attachment means for attaching said stamps and dies to said press including detachable holders, and cradles, said cradles receiving and maintaining in place said holders; and,

second attachment means for attaching said cradles to said press said second attachment means having at least one recess presenting a form complementary to that of said cradle, said second attachment means receiving and securing in rotation and in translation one of the corresponding cradles; and,

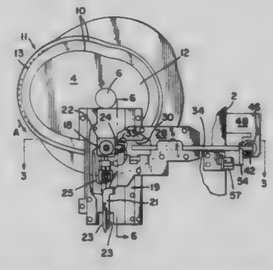
an adjustable clamp system cooperating with a given one of said cradles to render it radially and axially immovable.

4,718,162

WORKPIECE INSERTION DEPTH ADJUSTMENT MEANS

Leo V. Schuppert, Jr., York, and Richard V. Spong, Etters, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 18, 1986, Ser. No. 898,166
Int. Cl.[4] H05K 13/04
U.S. Cl. 29—741 9 Claims



1. In apparatus for inserting a component into a workpiece, by means of an insertion tool driven there towards by a rotary cam having a first cam track receiving a cam follower connected to the tool, means for adjusting the depth to which the component is to be inserted into the workpiece, the insertion depth adjusting means comprising:

a second cam track formed in said cam at a deeper level therein than the first cam track and communicating therewith, the second cam track having a tool driving lobe which is displaced from a tool driving lobe of the first cam track radially of the axis of rotation of the cam; and

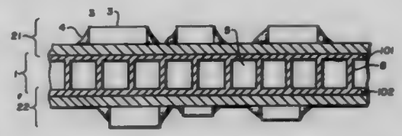
a mechanism for selectively engaging said cam follower with said first or said second cam track to adjust the insertion depth of the workpiece to the extent of the displacement between said cam tracks at the crests of said lobes, said mechanism comprising a first slide carrying said cam follower and being mounted in a tool holder connected to said tool, for movement towards and away from said cam tracks, and drive means connected to said slide to move said cam follower from a first position in one of the cam tracks, to a second position in the other cam track.

4,718,163

PROCESS FOR PRODUCING COOLING DEVICE FOR PRINTED CIRCUIT CARD

Robert Berland, and Bernard Dumont, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 780,798, Sep. 27, 1985, abandoned, which is a continuation of Ser. No. 430,386, Sep. 30, 1982, abandoned.
This application Jan. 30, 1986, Ser. No. 880,100
Claims priority, application France, Dec. 31, 1981, 81 24588
Int. Cl.[4] H05K 3/30
U.S. Cl. 29—837 8 Claims



1. A process for producing a cooling device for a printed circuit card, successively comprising the following steps:

moulding a material with a melting point well below that of copper to form a core having lateral faces, an upper face and a lower face;

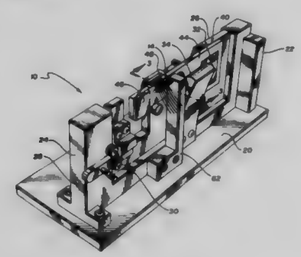
applying a copper coating to the entire surface of said core by electroforming;
machining two lateral faces of said copper coated core so as to remove copper;
dissolving the core and forming a hollow copper frame wherein in said frame a cooling fluid is able to flow;
fixing a printed circuit card to be cooled to a surface of said frame and deposited onto said upper face or said lower face of said core, the face of said card carrying a printed circuit, said face carrying said printed circuit being turned outwards.

4,718,164

APPARATUS FOR ALIGNING WIRES TO SOLDER PADS

John M. Hokanson, and Ronald Weispfenning, both of Hutchinson, Minn., assignors to Hutchinson Technology Inc., Hutchinson, Minn.

Filed Oct. 15, 1986, Ser. No. 919,074
Int. Cl.[4] H05K *13/00, 13/06*
U.S. Cl. 29—840 4 Claims



1. Apparatus for a plurality of wires over solder pads on a workpiece, the apparatus comprising:
(a) fixture means for rigidly supporting a workpiece such that solder pads on said workpiece are exposed; and
(b) wire aligning means for positioning a plurality of wires over said workpiece such that a wire is centered over each solder pad, said wire aligning means including a lacette;
(c) said lacette including a body constructed and arranged to engage a side of said workpiece adjacent a side of the workpiece having solder pads, said lacette further including a plurality of post members secured to said body and spaced such that when one post edge is aligned with the center of a solder pad, each solder pad is aligned with a separate post, wherein said wire aligning means further includes wire guide means for spacing a plurality of wires from each other, said wire guide means including a shaft member having a plurality of o-rings attached thereto at spaced intervals, said o-rings being arranged in pairs so as to define a wire aligning notch between each pair of o-rings.

4,718,165

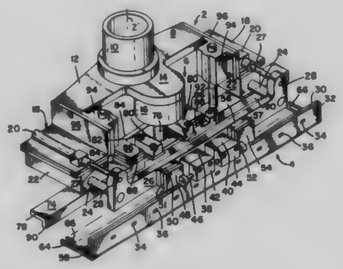
ASSEMBLING ELECTRICAL CONNECTORS TO A CIRCUIT BOARD

George D. Reuss, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 24, 1986, Ser. No. 910,911
Int. Cl.[4] H01R *9/00;* B23P *19/00*
U.S. Cl. 29—842 7 Claims

1. A pick-up head for use in picking up elongate electrical connectors having contact tails depending therefrom and placing the connectors on circuit boards to insert said tails into holes therein, the pick-up head comprising;
a framework having a vertical axis and means for attaching said framework to the Z-axis shaft of a pick-and-place robot with said vertical axis coincident with the axis of said Z-axis shaft;
a pair of connector clamping bars connected to said framework for vertical movement relative thereto and for horizontal movement relatively towards each other to clamp between orthogonally extending surfaces of said bars, an elongate electrical connector extending normally of said vertical axis, the bars being moveable relatively away from each other to release the connector;
a pair of combs mounted to said framework for movement towards and away from said clamping bars and being relative movable between a first position to receive between them the contact tails of a connector clamped between said clamping bars and a second position to grip and thereby to straighten said contact tails;
first drive means connected to the framework and said bars for moving said bars towards and away therefrom;
second drive means connected to said bars for moving them towards and away from each other;
third drive means connected to said framework for moving said combs towards and away from said framework; and
fourth drive means connected to said combs for moving them between their first and their second positions.

7. A method of picking up an elongate electrical connector having contact tails depending therefrom and placing the connector on a circuit board, to insert said tails into holes therein, the method comprising the steps of:
feeding the connector onto an electrical connector support at an electrical connector pick-up station;



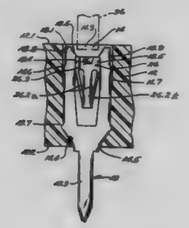
moving a first connector clamping bar down onto the connector to correct any vertical warping thereof, in cooperation with the connector support;
applying a second connector clamping bar to the connector laterally thereof, to correct any horizontal warping of the connector, in cooperation with the first bar, and to cause the connector to be gripped between the said bars to restrain reversion thereof to a warped condition;
raising said bars to raise the connector from the connector support so that said contact tails are clear thereof;
applying combing means to the contact tails to correct any lateral displacement thereof, with tips of the contact tails projecting below the combing means;
transporting said bars to a position above a circuit board at a circuit board assembly station;
moving said bars down towards said circuit board to insert projecting tips into corresponding holes in the circuit board;
withdrawing said combing means from said contact tails;
again moving said bars down towards said circuit board, further to insert said contact tails into said holes in the circuit board; and
moving said bars relatively away from each other to release the connector therefrom.

4,718,166

METHOD OF MAKING A CONNECTOR

Pietro DeFilippis, Aversa; Amedeo Salvatore, and Marios Biscione, both of Naples, Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 710,347, Mar. 11, 1985, Pat. No. 4,605,277.
This application Jan. 21, 1986, Ser. No. 820,775
Claims priority, application Italy, Jun. 13, 1984, 48391 A/84
Int. Cl.[4] H01R *3/00*
U.S. Cl. 29—845 4 Claims



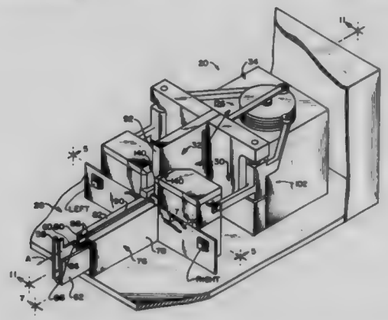
1. A method for making a connector comprising the steps of blanking a strip of flat electrically conductive sheet metal to form a retainer having flat retainer wings disposed in a plane and having surface portions on the respective wings juxtaposed in a plane in spaced facing relation to each other, blanking and forming a strip of electrically conductive sheet metal spring material for forming a spring clip having a loop and having a plurality of integral spring leaves extending from the loop in juxtaposed relation to each other, and inserting the flat retainer wings and the loop in an opening in an electrically insulating body with the retainer arranged to be connected in an electrical circuit and with the loop disposed between said spaced facing surfaces of the flat retainer wings biased into resilient electrical engagement with the flat retainer wings to receive a terminal inserted between the spring leaves of the clip and make detachable, resilient electrical engagement to the terminal to connect the terminal in the electrical circuit.

4,718,167

SEMI-AUTOMATIC ELECTRICAL HARNESS FABRICATING APPARATUS AND METHOD

Robert L. Moore, LaGrange, and Jacob S. Haller, Park Ridge, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 24, 1986, Ser. No. 18,084
Int. Cl.[4] H01R *43/04;* B23P *19/04*
U.S. Cl. 29—861 20 Claims



1. A method of fabricating electrical harnesses, each harness including a connector electrically connected to a plurality of conductors comprising the steps of:
a. providing at least one connector, each connector having a plurality of terminals preloaded partially into a housing with a conductor-receiving terminal portion outside of the housing;
b. positioning the connector with a first conductor-receiving terminal portion spaced apart and generally aligned with a conductor insertion blade;
c. receiving a conductor within a conductor guide channel and detecting said conductor at a predetermined position within said conductor-guide channel;
d terminating said conductor into said first conductor-receiving terminal portion outside of the housing;
e. moving the connector carrying slide one step to position a next adjacent conductor-receiving terminal portion generally aligned with the conductor insertion blade;
f. detecting a next conductor at a predetermined position within said conductor-guide channel; and
g. terminating said next conductor into said aligned conductor-receiving terminal portion outside of the housing and inserting said previously terminated conductor and terminal portion into the housing.

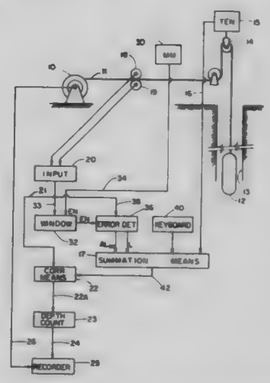
8. Apparatus for fabricating electrical harnesses of the type including a connector electrically connected to a plurality of conductors, the connector having a plurality of terminals preloaded partially into an electrically insulative housing with a conductor-receiving terminal portion outside of the housing, the apparatus including
a connector nest including a frame and a movable slide for receiving and positioning the connector at a starting position with a first conductor-receiving terminal portion spaced apart and generally aligned with a conductor insertion blade of a termination assembly, the movable slide being adapted for stepwise movement in discrete steps corresponding to the centerline spacing between adjacent terminals for sequentially positioning a next adjacent conductor-receiving terminal portion at the termination position, the apparatus being characterized by:
means for sequentially terminating said conductor into said adjacent conductor-receiving terminal portion; and
means for sequentially inserting said terminated conductor and terminal portion into the connector housing.

4,718,168

CABLE LENGTH MEASUREMENT CORRECTION SYSTEM

Wayne L. Kerr, Houston, Tex., assignor to Kerr Measurement Systems, Inc., Houston, Tex.

Filed Dec. 19, 1985, Ser. No. 810,728
Int. Cl.[4] G01B *7/04, 5/18, 7/26*
U.S. Cl. 33—133 50 Claims



1. A method for determining cable length in a well bore for an armored electrical cable coupled between a well tool in a

well bore and a spooling winch at a surface above the well bore in which the cable has detectable valid measurement marks disposed along its length at predetermined intervals where the spacing between the valid measurement marks define a premeasured length of cable between the detectable valid measurement at a predetermined tension on the cable, the method including the steps of:

positioning a well tool on the armored electrical cable in a well bore traversing earth formations,

moving the well tool along the earth formations transversed by the well bore by operating the spooling winch,

while said cable is moving, detecting only valid measurement marks on the cable which occur within a predefined span of cable length at each successive valid measurement mark on a premeasured length of cable and preventing detection of any measurement marks outside of such predefined span of cable length,

continuously measuring with a wheel the length of cable between valid measurement marks for each premeasured length of cable at the earth's surface while moving the well tool through a well bore for deriving first wheel measurements of the length of cable between valid measurement marks for each premeasured length of cable,

continuously comparing each first wheel measurement of the length of cable between valid measurement marks to a first predefined measurement for a length of cable between valid measurement marks for deriving first difference-in-length measurements for each first wheel measurement;

continuously adjusting the magnitude of the next wheel measurement following each first wheel measurement relative to the magnitude of the preceding first difference-in-length measurement for continuously deriving corrected wheel measurements.

4,718,169

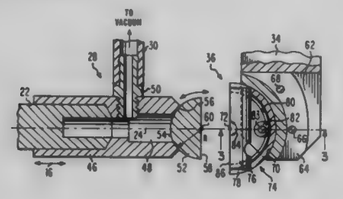
CONTACT ASSEMBLY FOR DISTANCE MEASURING GAUGE

Bogdan Brycki, Maple Shade, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 15, 1986, Ser. No. 941,367

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—143 R **7 Claims**



1. A distance measuring gauge for indicating the value of the distance between a point on a workpiece surface and a reference point comprising:

a distance indicating device including a body representing said reference point;

a distance measuring member coupled to the device and adapted to displace a distance to be measured from said reference point along a first axis, said device including means responsive to the displacement of the member for indicating the distance displacement value of the member;

a measuring contact rotatably secured to the memeber and having a measuring surface adapted to abut the workpiece surface, said contact being secured for rotation about a second axis intersecting the first axis, said second axis lying on said measuring surface;

said gauge including an arm secured to the body, a second measuring contact including a circular cylinder rotatably secured to the arm for rotation about a third axis intersecting said first axis, said second contact having a linear reference measuring surface, said third axis lying on said reference measuring surface, said third axis being tangent to the surface of said cylinder.

4,718,170

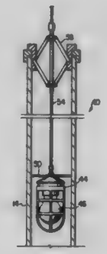
APPARATUS AND MEANS FOR VERTICALLY ALIGNING A HOLLOW CYLINDER

Wallace T. Wheeler, Dallas, Tex., assignor to The Texacone Company, Mesquite, Tex.

Filed Sep. 18, 1986, Ser. No. 908,645

Int. Cl.[4] G01B *15/02*

U.S. Cl. 33—228 **7 Claims**



1. A vertical alignment apparatus for a hollow cylinder comprising:

means for providing light;

a circular disk centrally mounted above the means for providing light;

means for movingly supporting the light means and the disk in an elevated position; and

means for centering the means for providing light and the disk inside the cylinder.

4,718,171

LEVELLING SYSTEM WITH ROTATING LASER BEAM

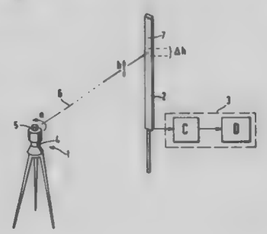
Harald Schlemmer, Karlsruhe, and Rainer Stuhlmüller, Bruchsal, both of Fed. Rep. of Germany, assignors to Nestle & Fischer, Dornstetten, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,177

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601179

Int. Cl.[4] G01B *11/26*; G01C *15/06*

U.S. Cl. 33—290 **10 Claims**



1. A levelling system which comprises: an optoelectronic stadia having a plurality of superimposed optoelectronic elements; a rotating laser beam spaced from said stadia and operative to strike said elements a plurality of times in a measuring cycle, wherein a measuring cycle comprises several different measurements of said laser beam striking said elements; means for varying the height of said laser beam during a measuring cycle; and an evaluation means connected to said optoelectronic elements for height determination purposes operative to determine the mean value from individual measurements of a measuring cycle.

4,718,172

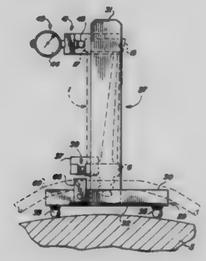
TURBINE BLADE RADIAL POSITION GAGE

Marshall J. Rouse, Charlotte, N.C., and Albert J. Partington, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1986, Ser. No. 913,881

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—530 **6 Claims**



1. Apparatus for determining radial alignment of turbine blades on a turbine rotor by in situ measurement of blade alignment with respect to the surface of the rotor, each of the blades including a root structure for supporting the blade in a matching groove in the rotor, a platform attached to the root structure and an airfoil extending radially outward from the platform and terminating in an integral shroud portion, the apparatus comprising:

an elongated base member having substantially parallel upper and lower surfaces;

first and second elevated contact points formed in spaced apart relationship on the lower surface of said base member, said contact points being adapted to support said base member adjacent the rotor and in a plane substantially parallel to a tangent line to the rotor surface;

a standard having one end fixedly connected to said base member, said standard extending radially outward with respect to the rotor, said standard comprising a rectangular member having substantially parallel opposing surface aligned in an axial direction with respect to the turbine rotor;

a first arm member fixedly attached to and extending from a lower portion of said standard;

a third contact point extending from said first arm member in a tangential direction with respect to the turbine rotor and positioned for contacting the blade platform when the apparatus is in a measuring position, a point of contact between said third contact point and the blade platform being tangentially displaced from a centerline of the blade;

a dial indicator having a reciprocating plunger operatively connected thereto, the extension of said plunger with respect to said indicator providing a reading on said dial indicator representative thereof;

means for attaching said dial indicator to said standard such that said plunger contacts the shroud portion when the apparatus is in the measuring position, said attaching means comprising a second arm member having one end fixedly attached to one of said opposing surface of said standard and having a portion extending normally with respect to said one of said opposing surfaces toward the turbine blade, said attaching means being circumferentially offset from a radius passing through a root of a blade to be aligned and said dial indicator being mounted to said attaching means with said plunger extending tangentially with respect to the turbine rotor; and

means for calibrating the dial indicator such that deviation of radial alignment of the blade with respect to a rotor radial line through the center of the blade root is provided by said indicator.

4,718,173

METHOD AND APPARATUS FOR MEASUREMENT OF STRAIGHTNESS AND FLATNESS

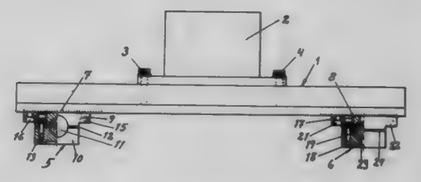
Fritz Ekluad, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 15, 1985, Ser. No. 787,556

Claims priority, application Sweden, Oct. 19, 1984, 8405221

Int. Cl.[4] G01B *5/24*

U.S. Cl. 33—533 **2 Claims**



1. An apparatus for high precision straightness and flatness measurements comprising: a measuring ruler supporting a measuring instrument or its reference means, said ruler being provided with first and second adjustable contact elements spaced from each other at a spacing predetermined for each specific measurement, said spacing defining a distance between subsequent measuring points, the first of said contact elements being provided with a shaft which is perpendicular to the longitudinal direction of said measuring ruler, said first contact element being pivotable around said shaft, said second contact element being provided with a ball joint and freely pivotable in all directions around said ball joint, wherein said contact elements comprise identical feet, each foot comprising an ending position facing the surface to be measured, said ending portion comprising three annular contact sectors located symmetrically in the same plane and providing for substantially identical contact against the surface of the measured object in each measuring stage.

4,718,174

TEMPLATE FOR CUTTING AND FOLDING FURS

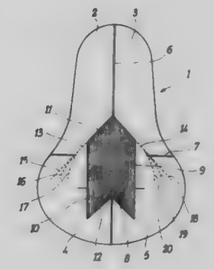
Roberto Masci, Rome, Italy, assignor to Paola Fendi & S.lle S.A.S., Rome, Italy

Filed Sep. 24, 1986, Ser. No. 910,712

Claims priority, application Italy, Apr. 27, 1986, 48066 A/86; May 27, 1986, 35850/86[U]

Int. Cl.[4] A41H *1/00*; A42C *3/00*

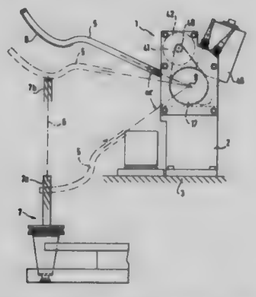
U.S. Cl. 33—562 **5 Claims**



1. A template for use in cutting and folding skins for fur

garments including a plurality of skins and transverse and longitudinal seams between the skins, said template having:
two symmetrical portions defining a longitudinal axis therebetween,
a removable portion located centrally of said template, said portion being removable to form an opening defined by two parallel sides and an upper and a lower end through said template, said sides being parallel to said longitudinal axis; and
curving means on said template for indicating cutting locations on the skins.

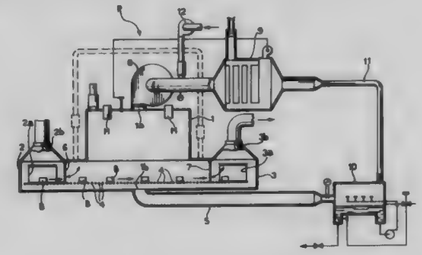
4,718,175
DEVICE FOR MECHANICAL CHECKING FOR TOOLBREAKAGE IN MACHINE TOOLS
Werner Babel, Pfronten-Meillingen, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 30, 1986, Ser. No. 880,074
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1985, 3523510
Int. Cl.⁴ B23B *47/24*; G01B *5/02*
U.S. Cl. 33—626 **10 Claims**



1. In a device for tool checking in machine tools, such device having a sensor assembly for sensing a surface of a tool having a tool rotation axis, and also having an electronic evaluation device operative on signals from the sensor assembly for determining a measurement or location sensed by the sensor assembly, the improvement wherein the sensor assembly includes
a movable feeler rod having a contoured tool contact surface for contacting the end of a tool, said surface having a contour adapted to remain perpendicular to the tool axis during motion of the feeler rod,
drive means coupled to the feeler rod for urging the contact surface against the tip of the tool,
means for controlling driving power provided to the feeler rod by said drive means so that the contact surface contacts the tool with an adjustable force independent of the length of the tool, and
position indicating means coupled to the drive means for developing an indication of the position of the feeler rod and thereby of the tip of a tool, whereby tool wear and breakage are detected and measured by the evaluation device.

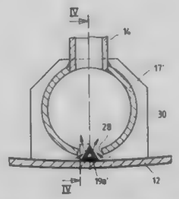
4,718,176
METHOD AND PLANT FOR THE MANUFACTURE OF DRY-CHARGED STORAGE BATTERIES
Guido Clerici, Milan, and Luciano Lemorini, Magenta, both of Italy, assignors to Magneti Marelli S.p.A., Milan, Italy
Filed May 23, 1986, Ser. No. 866,435
Claims priority, application Italy, May 23, 1985, 67475 A/85
Int. Cl.⁴ F26B *3/34*
U.S. Cl. 34—1 **4 Claims**

1. A plant for drying storage batteries comprising
a drying chamber having an inlet and an outlet;
generator means for generating a power microwave field in the chamber;
means for causing a flow of hot inert gas in the drying chamber;
conveyor means for conveying batteries from the inlet to the outlet of the chamber within the field generated by the generator means and through the inert gas flow;



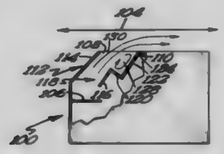
means for heating said inert gas before it is passed into the drying chamber,
condenser means connected between said drying chamber and said inlet to the heater means for removing at least some of the water vapour from the inert gas evacuated from the drying chamber, and
recirculation means for recirculating the inert gas in the drying chamber.

4,718,177
DEVICE FOR CONDENSATE REMOVAL FROM A STEAM-HEATED DRYING CYLINDER
Winfried Haeszner; Werner Junginger; Karl Jeakner, all of Heidenheim; Robert Wolf, Herbrechtingen, and Christian Schiel, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany
Filed Oct. 21, 1985, Ser. No. 789,400
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439105
Int. Cl.⁴ A26B *23/10*
U.S. Cl. 34—119 **12 Claims**



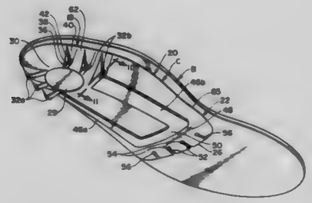
1. A device in a paper machine for removal of condensate from a steam-heated, rotatable drying cylinder having a cylinder shell defining an inside surface comprising:
a condensate suction pipe having inner and outer ends, said suction pipe rotating together with the drying cylinder and extending from the area of the axis of rotation of the drying cylinder to the inside surface of the cylinder shell;
a suction mouthpiece at the outer end of said condensate suction pipe, said suction mouthpiece having a suction opening, which suction mouthpiece is formed as a pipe section sealed at its ends, said piper section having an essentially circular cross-section and an axis extending generally parallel with the axis of rotation of the drying cylinder, the suction opening including an elongate slot positioned near and together with the inside surface of the cylinder shell defines an inlet gap;
a side channel means externally mounted on and generally parallel to said suction pipe, provided on the suction mouthpiece, for additionally feeding steam to the interior of the suction mouthpiece; and
said side channel means including a steam blowing line extending from the interior of the drying cylinder into the interior of the suction mouthpiece, and said steam blowing line having a mouth arranged in the area of the suction opening so that the direction of flow of the steam discharging from the mouth is generally parallel to the direction of flow of the condensate as it flows from the suction mouthpiece towards the suction pipe, which steam blowing line has a point of influx arranged in the area of the drying cylinder axis of rotation.

4,718,178
GAS NOZZLE ASSEMBLY
Rodger E. Whipple, 922 S. Park Ave., Neenah, Wis. 54956
Filed Nov. 29, 1985, Ser. No. 803,128
Int. Cl.⁴ F26B *13/02*
U.S. Cl. 34—156 **45 Claims**



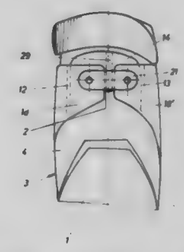
22. A gas nozzle assembly for a dryer apparatus for use with moving webs comprising:
a plate;
jet forming means with an outlet and defining an area for the flow of gas along a jet axis which forms an obtuse angle to a plane defined by the plate; and
vortex forming means positioned proximate the outlet of the jet forming means and proximate the plate, wherein the vortex forming means is positioned to enlarge the area for the flow of gas out of the jet forming means to produce a vortex which causes the gas from the jet forming means to flow generally parallel to the plate.

4,718,179
ORTHOTIC AND METHOD OF MAKING OF THE SAME
Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratories, Inc., Blaine, Wash.
Filed Mar. 7, 1986, Ser. No. 837,584
Int. Cl.⁴ A43B *13/41*, *13/40*
U.S. Cl. 36—44 **7 Claims**



1. An orthotic insert, comprising:
a. a lower, relatively rigid, resilient cap having a heel portion, a midfoot portion and a forefoot portion, said cap member being generally contoured to fit a plantar surface of a person's foot, with said foot being in a desired position;
b. a relatively flexible blank overlying said cap, said blank having a heel portion, a midfoot portion and a forefoot portion;
c. said cap having stabilizing element means connected to and extending downwardly from a lower surface of the heel area of the cap, said stabilizing element means providing recess means therein;
d. said blank having at the heel portion thereof downwardly extending locating element means adapted to interfit with said stabilizing element means so as to properly locate said blank relative to said cap.

4,718,180
SKI BOOT
Kurt Hilgarth, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria
Filed Sep. 16, 1986, Ser. No. 907,983
Claims priority, application Austria, Sep. 17, 1985, 2709/85; Jan. 23, 1986, 157/86
Int. Cl.⁴ A43B *5/04*; A43C *11/00*
U.S. Cl. 36—117 **8 Claims**

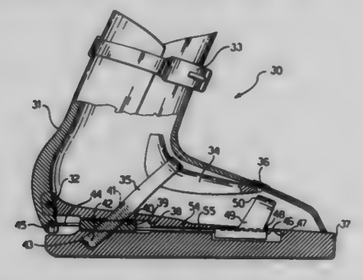


1. A ski boot having a casing and a leg portion which is forwardly and rearwardly pivotable to said casing and, for entry into the boot from the rear, the leg portion comprises a sleeve, which surround the front, lower portion of the shin bone and is open towards the rear, and a cover which is forwardly-upwardly and rearwardly-downwardly pivotable relative to said sleeve and, when the boot has been put on, the cover is securable on the sleeve by a closing means, said sleeve having a front region with a least one slot which extends downwardly from an upper edge of the sleeve so as to define adjacent sleeve portions separated by the slot, characterized in that two flaps are provided on the sleeve to keep the sleeve portions together, such flaps surrounding said region of the sleeve and being pivotally interconnected by means of a pivot member which is pivotally connected to each of the flaps about an axis perpendicular to the plane of the flap so that the flaps are displaced in opposite directions to each other by movements of the foot.

4,718,181
BINDING DEVICE, PARTICULARLY FOR SECURING THE FOOT TO A BEARING STRUCTURE OF A SPORTING IMPLEMENT
Oliviero Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C.S.p.A., Italy
Filed Jul. 2, 1986, Ser. No. 881,365
Claims priority, application Italy, Jul. 2, 1985, 21396 A/85
Int. Cl.⁴ A43B *5/04*
U.S. Cl. 36—119 **11 Claims**

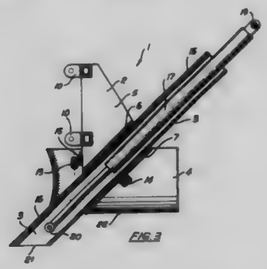
1. A binding device for securing a foot to a bearing structure of a sporting implement comprising:
a slide (4) engaged in the bearing structure for sliding movement in a longitudinal direction thereof;
a plurality of cam-like guides (12) disposed on opposite sides

of said slide and extending at an acute angle to the longitudinal direction of movement of said slide;
means (15–18) for displacing said slide on the bearing structure in the longitudinal direction;
a strap (3) having two end portions (11) arranged arcuately across the bearing structure, said end portions having cam-like counter guides (13) forming a complimentary engagement with said cam-like guides; and



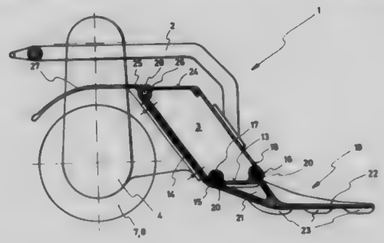
means (10) disposed on the bearing structure for guiding said end portions and prohibiting said strap from moving in the longitudinal direction of movement of said slide;
wherein the movement of said slide in the longitudinal direction causes the strap to tighten or slacken in accordance with the relative movement of said guides and counter guides.

4,718,182
TRENCHER WITH ADJUSTABLE CHISEL
Jeffery M. Toomey, Shelley Beach, and John J. Toomey, Maroochydore, both of Australia, assignors to Seaser Holdings Pty. Limited, Australia
Filed Apr. 24, 1986, Ser. No. 855,429
Claims priority, application Australia, Apr. 24, 1985, PH0278
Int. Cl.[4] E02F *5/02*
U.S. Cl. 37—98 **6 Claims**



1. A trench digging device comprising a frame to be drawn, a downwardly and forwardly directed elongate chisel mounted for longitudinal movement with respect to said frame, chisel adjustment means connected with said frame and said chisel to adjustably position said chisel relative to said frame, and spoil displacement means fixed to said frame to move spoil displaced from a trench by said chisel away from said trench, said spoil displacement means comprising a pair of forwardly and sidewardly directed blades meeting at an apex, each blade having a lower edge adapted to contact the ground into which a trench is being formed, said blades having an aperture through said apex at the lower edge of said blades sized and configured to receive said chisel, said chisel being configured such that operation of said chisel adjustment means is effective to vary the extent of downward and forward projection of said chisel in relation to said blades from a retracted position at which the lower extremity of the chisel is substantially level with the lower edge of the blades of the displacement means to selectively extended positions at which the lower extremity of said chisel is positioned below and in front of said lower edge, in which extended positions, in operation, the chisel has means to cut both the bottom and sides of the trench.

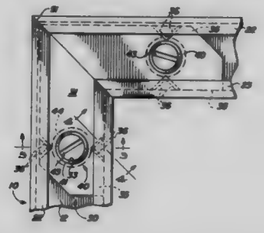
4,718,183
SNOW TILLER
Walter Haug, Blaustein, Fed. Rep. of Germany, assignor to Karl Kassbohrer Fahrzeugwerke GmbH, Ulm/Donau, Fed. Rep. of Germany
Filed Aug. 11, 1986, Ser. No. 895,457
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 8528096
Int. Cl.[4] E01H *4/00*
U.S. Cl. 37—221 **10 Claims**



1. A snow tiller for rear-mounting on a track maintenance vehicle, comprising a transmission for driving at least one tiller shaft, a carrier frame for mounting the snow tiller on the track maintenance vehicle, and a baffle body of trapezoidal cross-sectional shape secured to the carrier frame and extending over the width of the snow tiller, the underside of the baffle body facing the track surface having a levelling attachment secured thereto, said baffle body being formed as a tubular profile member and forming a central tiller frame, said transmission being mounted at the center of said tiller frame for driving two tiller shafts laterally connected to said transmission and having their ends facing away from the transmission mounted in outer bearings secured to the ends of said tiller frame, said tiller frame being formed with mounting grooves extending transversely of the direction of travel, at least one replaceable cover shield being insertably secured in an upper groove facing towards said tiller shafts, and a levelling attachement being insertably secured in at least one lower groove facing the track surface.

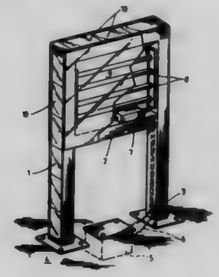
4,718,184
PICTURE FRAME CORNER JOINING SYSTEM
Charles F. Sherman, Townsend, Mass., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Oct. 4, 1985, Ser. No. 784,272
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—155 **12 Claims**

1. In a frame formed by frame sections joined end to end, each of said frame sections having an elongated channel with a rear wall, spaced apart lips opposite said rear wall and defining a longitudinally directed slot and a side wall joining inner edges of each of said lips to a different edge of said rear wall, and improved means for securing an adjacent pair of said sections together at a corner junction and comprising:
a bracket having a pair of legs disposed at an angle substantially identical to the angle made by said frame sections at said corner junction, said legs fitting within said channels of said frame sections at said corner junction, said legs having a width greater than the width of said slots so as to retain said bracket within said channels in said adjacent frame sections, and each of said legs having a threaded hole extending therethrough and defining planar surface portions interrupted by elevated portions projecting thereabove; and
a screw with an externally threaded shank for engagement



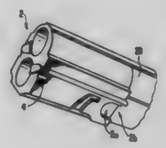
with each of said threaded holes, said screw having an inner end for exerting a force on said rear wall and an outer end adapted to accommodate a tool for producing axial rotation of said screw to force said planar surface portions of said legs into engagement with inner surface portions of said lips and to cause penetration thereof by said elevated portions to thereby create a physical bond between said legs and said frame sections.

4,718,185
MODULAR SOLAR GENERATING SYSTEM
Kevin L. Coulis, and Michael P. Cantrell, both of Houston, Tex., assignors to Solar Signage, Inc., Stafford, Tex.
Filed Nov. 7, 1986, Ser. No. 928,533
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—442 **16 Claims**



13. An integrated solar-powered, electrical display comprising:
a base adapted to house a battery;
a frame mounted on the base and adapted to mount the display to the periphery of the frame;
an array of photovoltaic cells mounted end-to-end around the periphery of the frame;
a first electrical circuit disposed between the battery and photovoltaic cells adapted to supply energy collected by the photovoltaic cells to the battery; and
a second electrical circuit disposed between the battery and the electrical display adapted to supply power from the battery to the electrical display or an other electrical load.

4,718,186
PIVOTAL CONNECTION BETWEEN BREAK-OPEN ACTION AND BARREL OF A GUN
Ennio Mattarelli, Zola Predosa, Italy, assignor to Dynamit Nobel AG, Fed. Rep. of Germany
Filed Mar. 26, 1986, Ser. No. 844,121
Claims priority, application Italy, Mar. 26, 1985, 4829/85[U]
Int. Cl.[4] F41C *11/08*
U.S. Cl. 42—75.04 **10 Claims**



1. A pivotal connection between the sidewalls of a break-open action and at least one barrel of a gun, said connection comprising two coaxial pairs of pivotal members arranged on a common pivot axis, a center of one member of each pair defining said common pivot axis, the two pivotal members of each pair being arranged to complement each other, with one member being provided on a sidewall of the break-open action of the gun and the other member being provided on a corresponding sidewall of the at least one barrel, and said members of each pair exhibiting coupling profiles ensuring a shape-mating connection between the break-open action and the barrel transversely of the axis of the barrel of the gun, said coupling profiles permitting utilization of the axial pressure (S) generated during firing for producing a component force perpendicular to the axial pressure (S), counteracting the spreading apart of the sidewalls of the break-open action.

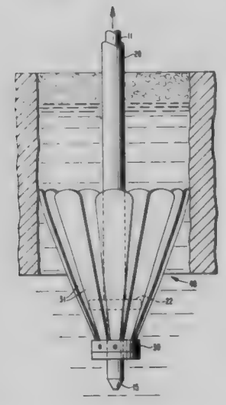
4,718,187
TRIGGER MEANS FOR A WEAPON CONTROL SYSTEM
Frank W. Blake, Annandale, Va., assignor to Electronic Warfare Associates, Inc., Vienna, Va.
Filed Oct. 2, 1986, Ser. No. 914,310
Int. Cl.[4] F41C *19/12*
U.S. Cl. 42—84 **14 Claims**



1. Means of firing a weapon by remote command without interfering with the normal firing procedures of said weapon, comprising:
a weapon having a mechanical trigger, said trigger pivoted at a point intermediate its ends and having an arm extending beyound said pivot point, said arm arranged to engage and hold a sear in a cocked position and to release said sear upon movement of said trigger arm;
motive means operating independently of said trigger arranged to move said trigger arm and to release said sear upon receiving a fire command from a source external to said weapon;

signal means independent of trigger movement for causing a ready signal to be continuously transmitted by said external source during those intervals when the weapon is aimed at a designated taraget, said signal means arranged to preclude reception of a fire command by said motive means except during transmission of said ready signal.

4,718,188
ICE REMOVAL DEVICE
Fred W. Roberts, P.O. Box 540, Williston, N. Dak. 58801
Filed Aug. 8, 1986, Ser. No. 894,903
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 14 Claims



1. A device for removing particles from a hole comprising:
a main rod;
a plurality of overlapping vanes forming a collapsible basket attached adjacent one end of said rod, said vanes being movable from a collapsed position wherein said vanes substantially overlap to a more open position wherein said vanes overlap to a lesser degree to expand said basket; and
means mounted on said main rod for moving said vanes from said collapsed position to said open position.

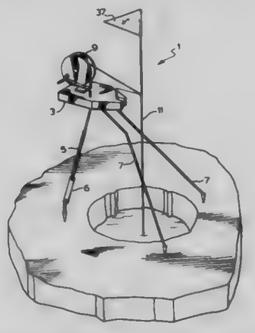
4,718,189
FISHING SPEAK TIP
Rodney C. Stude, 8163 E. Mineral Dr., Englewood, Colo. 80110
Filed Apr. 29, 1987, Ser. No. 44,815
Int. Cl.[4] A01K *81/04*
U.S. Cl. 43—6 9 Claims

1. A fishing spear tip for mounting on a fishing spear shaft comprising:
(a) a first spear prong having a first prong central longitudinal axis, and having a proximal end portion and having a pointed distal end adapted for penetrating a target;
(b) a second spear prong substantially identical in construction to said first spear prong;
(c) a third spear prong substantially identical in construction to said first spear prong;
(d) a prong holder having a central longitudinal axis and having a forward end portion adapted to be positioned distal the spear shaft and a rear end portion adapted to be positioned proximal the spear shaft; said prong holder having a central longitudinally extending straight bore extending rearwardly from said forward end thereof and adapted to receive said proximal end portions of said first, second, and third prongs therein;
(e) adapter means operatively associated with said prong holder for attaching said prong holder to a spear shaft;
(f) matrix material positioned in said straight bore in said prong holder in fixed bonding relationship therewith and in fixedly holding, engaging contact with said proximal end portions of said first, second, and third prongs;
(g) said central longitudinal axes of said first, second, and third prongs, and said central longitudinal axis of said prong holder all being positioned in nonparallel, nonintersecting relationship; terminal end portions of said distal



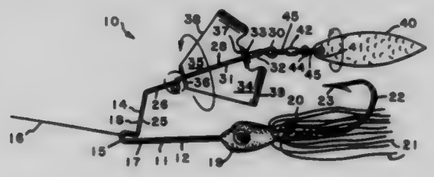
end portions of said prongs being positioned in approximately equally spaced relationship and approximately equally distant from said central longitudinal axis of said prong holder and being substantially positioned in a plane perpendicular to said central longitudinal axis of said prong holder.

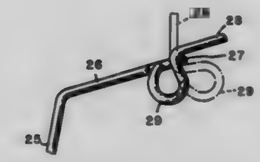
4,718,190
ICE FISHING RIG
Mal Ward, and Carmen Ward, both of Massey, Canada, assignors to 655063 Ontario Limited, Lively, Canada
Filed Jul. 23, 1986, Ser. No. 888,217
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 8 Claims



1. An ice fishing rig comprising a rotatable reel, an electrical alarm device, a battery for operation of said alarm device, and a support stand for said reel, alarm device and battery with an electrical circuit being formed from said battery through said support stand and reel to said alarm device, and circuit breaking means located in a preset reel set-up position and means for activating said circuit through said reel when said reel rotates for closing said circuit and activating said alarm device.

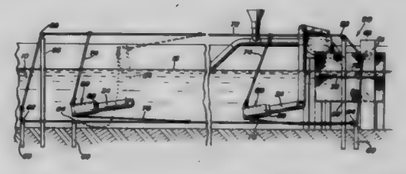
4,718,191
ARTIFICIAL FISHING LURE
Donald D. Gentry, P.O. Box 64, Carterville, Ill. 62918
Filed Jan. 14, 1986, Ser. No. 818,706
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.13 16 Claims





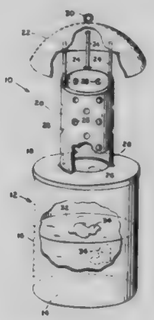
1. In an artificial fishing lure of the class including first and second rearwardly diverging frame means having leading and trailing end portions, an eye means for attaching a fishing line connecting the adjacent leading end portions of said first and second frame means, and weight means and fish hook means carried by said first frame means, the improvement in combination therewith which comprises a movable arm member having leading and trailing end portions carried by said trailing end portion of the second frame means, fish attracting means carried by said arm member, connecting means for movably connecting said leading end portion of the arm member to said trailing end portion of the second frame means, said connecting means including a first terminal looped end and a first terminal end portion adjacent thereto on the said trailing end portion of the second frame means and a second terminal looped end and a second terminal end portion adjacent thereto on the said leading end portion of the arm member, the said first and second terminal looped ends lying in planes which are approximately perpendicular to each other, the external diameter of one of the said first and second terminal looped ends exceeding the internal diameter of the other of the said first and second terminal looped ends and its corresponding said terminal end portion extending through and being positioned within the said other of the first and second terminal looped ends while its corresponding terminal looped end is positioned generally between said other terminal looped end and said first frame means and is otherwise unconnected to said other terminal end to thereby movably connect the trailing end portion of the second frame means to the leading end portion of the said arm member to allow 360 degrees of rotation of the arm in the lateral plane of the arm, the said connecting means being effective to allow said arm member to move back and forth at the point of attachment at its leading end portion and to allow said trailing end portion thereof to move toward and away from said first frame means, and means including said connecting means for preventing said arm member and said fish attracting means carried thereby from moving toward said first frame means a distance sufficient to foul said first frame means, said weight means, said fish hook means, or a fishing line attached to said eye means, said first frame member and the weight means and fish hook means carried thereby, said second frame member and said eye means being constructed and arranged whereby they are maintained in substantially fixed relationship with respect to each other.

4,718,192
HYDROMECHANICAL BAIT TRAP
Robert L. Louk, 2013 Hastings Rd., Gautier, Miss. 39553
Filed Mar. 16, 1987, Ser. No. 26,287
Int. Cl.[4] A01K *69/06*
U.S. Cl. 43—100 10 Claims



1. A hydromechanical bait trap system including conduit means having inlet and outlet ends, a sump, said inlet end opening into said sump below a predetermined liquid level therein, said outlet end discharging into said sump above said inlet end, said conduit means including at least one predetermined section thereof intermediate said inlet and outlet ends for positioning adjacent bottom level in a pond for raising marine life such as shrimp, crayfish and minnows, etc. and incorporating a lateral branch having inlet and outlet end portions, said inlet end portion opening into the interior of said section in at least reasonably good fluid-type sealed relation therewith and being mounted from said section for angular displacement relative thereto about an axis generally paralleling said section and with said lateral branch being swingable between a lowered generally horizontal position and a raised upstanding position with said outlet end portion uppermost, the affective length of said section being such to position said outlet end portion above the level of water in said pond when said lateral branch is in said upstanding position, selectively operable pump means serially connected in said conduit means downstream from said inlet end and upstream from said one section, the outlet end portion of said lateral branch including open trap means mounted therefrom, including structure for ready movement of marine life thereinto from said pond and being restrictive to movement of marine life from said trap means back into said pond.

4,718,193
TRAPS FOR FLYING INSECTS
Bartholomew A. Russelli, 72-15 67th Pl., Glendale, N.Y. 11385
Filed Feb. 18, 1986, Ser. No. 829,957
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—122 9 Claims



1. A trap for flying insects, said trap comprising a watertight can having a closed bottom and an imperforate wall upstanding from said bottom, a cap having an opening therethrough and removably interengageable with the wall of said can at a

VOL 1086 ISS 2 JA 12 1988 UMI

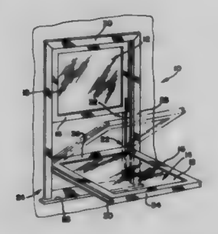
location remote from said bottom, and a cylinder having a bottom end and a top end, said bottom end of said cylinder being in open communication with said cap opening, and the wall of said cylinder having a plurality of holes therethrough and spaced from each other both around the circumference and along substantially the entire length of said cylinder, said cylinder being large enough that said insects can enter said cap by passing through said holes into said cylinder and then out to bottom end of said cylinder through said opening, whereby with water and bait in said can, insects will be lured into said can to their death by drowning, and wherein said cylinder is open at both ends so that insects can also enter said can by entering the top end of said cylinder.

4,718,194

WINDOW SASH SUPPORT AND MOVEMENT LOCK ASSEMBLY

Jack R. FitzGibbon, and Lawrence Versteeg, both of Sioux Falls, S. Dak., assignors to Balance Systems, Inc., N. Sioux Falls, S. Dak.

Filed Oct. 10, 1986, Ser. No. 917,713
Int. Cl.[4] E05D 15/22
U.S. Cl. 49—181 **21 Claims**
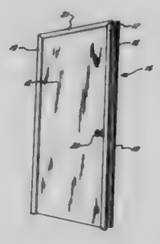


1. A window sash support and movement lock assembly, said assembly comprising, in combination, a pair of opposed guide elements and a connecting structure extending between and joining portions of said guide elements together to form a guide element body, said body permitting deflection of at least parts of said guide elements relative to each other as said body is moved between extended and retracted positions, said body further having generally radially inwardly directed surfaces defining an opening for receiving a cam element, said sash support and movement lock assembly being adapted to move reciprocably with its guide elements being received generally within oppositely disposed channels forming parts of an associated guide track for said sash support and movement lock assembly, each of said guide elements having a first end face surface adapted to be positioned in opposed facing relation to a respective one of the walls of said associated guide track channel and spaced apart by a working clearance from said one wall, with said first end face surfaces of said guide elements lying in generally parallel planes defining therebetween the maximum width of said body in its retracted position, at least one of said guide elements also including an auxiliary end face surface which is slightly inclined inwardly of said body maximum width, at least one locking pin carried by the portion of said guide element which includes said auxiliary end face surface, said auxiliary end face surface and said pin being arranged such that when said body is in its retracted position, said pin lies entirely within said body maximum width, a cam element disposed in said cam receiving opening, and having a pivot axis extending axially therethrough, said cam element including means for receiving a window sash mounting pivot, said cam element and said cam receiving opening being constructed and arranged so that, upon movement of said cam element about said pivot axis, said body moves from said retracted position to said extended position, in which at least a portion of said pin carried by said guide element lies outside plane of said guide element first end face surface when said body is in its retracted position.

4,718,195

APPARATUS FOR MAINTAINING A DOOR IN ALIGNMENT WITH FRAME DURING SHIPPING AND INSTALLATION

Diego Ortega, P.O. Box 8, Jeanerette, La. 70544

Filed Sep. 22, 1986, Ser. No. 909,672
Int. Cl.[4] E06B 1/00
U.S. Cl. 49—380 **7 Claims**



1. An apparatus for maintaining an interior door in the closed position in a preassembled mounting frame including a pair of vertical members, the apparatus, comprising:

a. a first bracket means secured to the door jamb;

b. a second bracket means secured to the free swinging face of the door; and

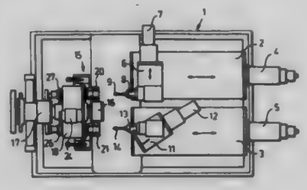
c. means contained within the first bracket means for slidably engaging the second bracket means, and upon moving the engaging means to an angular position secures the door in the closed position, and maintains the vertical members of the mounting frame in a substantially vertical position.

4,718,196

GRINDING MACHINE WORKHEAD FITTED WITH A DRESSING TOOL

Helarich Seewald, Hattwilen, Switzerland, assignor to AB UVA, Bromma, Sweden

PCT No. PCT/SE85/00530, § 371 Date Sep. 25, 1986, § 102(e) Date Sep. 25, 1986, PCT Pub. No. WO86/03706, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 18, 1985, Ser. No. 902,371
Claims priority, application Sweden, Dec. 19, 1984, 8406490
Int. Cl.[4] B24B 53/04
U.S. Cl. 51—5 D **4 Claims**



1. A grinding machine workhead fitted with a dressing tool, said grinding machine comprising:

(a) a chuck (30; 31) for rotatably supporting a workpiece (32; 33);

(b) a tool slide (6; 11) for rotatably supporting a grinding tool (9; 14);

(c) means (2, 4; 3, 5) for effecting relative axial displacement between the tool slide and the chuck to move the grinding

tool into and out of a workpiece engagement location, and to attendantly feed the grinding tool in an axial direction;

(d) means (6, 7; 11, 12) for effecting relative transverse movement between the tool slide and the chuck to engage the grinding tool with the workpiece, and for attendantly transversely feeding the grinding tool; and

(e) a dressing tool (36a, 37a) mounted in association with the chuck for co-rotation therewith; wherein

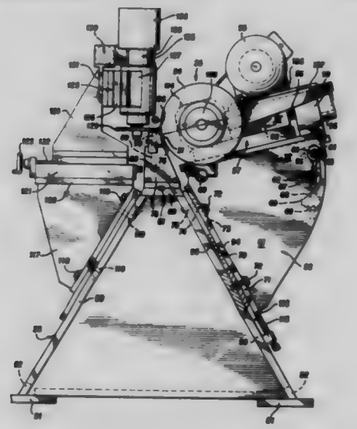
(f) the chuck (30; 31) has an outwardly projecting auxiliary member (34; 35) which carries at an axial distance externally of the workpiece (32; 33) and concentric with the geometric axis thereof an annular dressing tool (36) (37) having an inner diameter larger than an outer diameter of the workpiece, said dressing tool including an annular holder having an inner dressing lining (36a, 37a) of diamond material or the like, such that the grinding tool (9, 14) passes through the dressing tool when brought into engagement with the workpiece, and the auxiliary member includes means (40, 42; 41, 43) for adjusting the relative concentricity between the dressing tool and the workpiece.

4,718,197

MODULAR INDUSTRIAL BLADE GRINDING AND HONING MACHINE

Hans M. Rath, P.O. Box 3188, Staunton, Va. 24401

Filed Jan. 18, 1986, Ser. No. 875,606
Int. Cl.[4] B24B 3/36
U.S. Cl. 51—5 D **25 Claims**



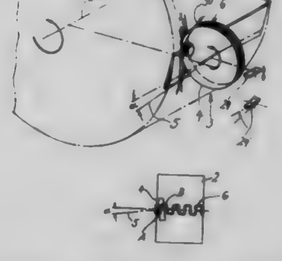
1. In a modular blade strip grinding and honing machine, a blade strip grind station comprising an A-frame and a rigid base supporting the A-frame, a mounting bracket fixed to the top of the A-frame, a blade strip guide and adjacent coolant delivery and discharge means on the mounting bracket, another mounting bracket on one inclined side wall of the A-frame, means to adjust and lock the last-named mounting bracket on said inclined side wall so that the height of the last-named mounting bracket relative to a blade strip in the blade strip guide can be adjusted, a plate pivotally mounted on the last-named mounting bracket and being vertically swingable, means connected with the last-named mounting bracket and said plate to adjust the angle of the plate relative to the horizontal through a range of about 15° and to lock the plate in a selected adjusted position, a precision linear slide on the plate movable toward and away from a blade strip in said guide, a grinding wheel and grinding wheel drive motor on said slide and movable therewith, a precision automatic infeed means for the grinding wheel on said slide and plate including a high resolution stepping motor and a ball screw coupled with a shaft of the stepping motor, another mounting bracket on the other inclined side wall of the A-frame, a horizontal slide on the last-named mounting bracket movable toward and away from said grinding wheel, an upstanding support bracket on the last-named slide, a precision horizontal axis slide on said support bracket and having a movement path across the axis of said horizontal slide, and a vertical axis power-driven reciprocatory dressing wheel for the face of said grinding wheel on said precision horizontal axis slide and being movable across the face of the grinding wheel near and above the blade strip guide and coolant delivery and discharge means.

4,718,198

APPARATUS FOR GRINDING CUTTING EDGES OF KNIVES IN TOBACCO CUTTING MACHINES

Werner Kemmen, Bürscheid, and Nikolaus Hlauder, Wohlterf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,752
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403548
Int. Cl.[4] B24B 9/00
U.S. Cl. 51—33 W **9 Claims**



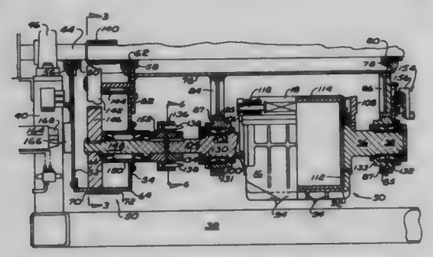
1. In a machine for cutting fibrous material, particularly tobacco, the combination of a holder rotatable about a predetermined first axis; at least one knife mounted on said holder and having an elongated cutting edge arranged to move along an endless cylindrical first path in response to rotation of said holder; and apparatus for sharpening the cutting edge of said knife, comprising a grinding wheel having a working surface and being rotatable about a second axis making with said first axis an acute angle, said second axis being located in a plane which is parallel to a plane extending tangentially of said endless cylindrical first path and said second axis being inclined with reference to a plane including said first axis; and means for repeatedly moving said grinding wheel along a second path extening substantially tangentially of said endless cylindrical first path so that said working surface grinds the cutting edge of the knife during each pass of said grinding wheel along said second path.

4,718,199

ORBITAL BARREL FINISHING MACHINE AND AUTOMATED SYSTEM THEREFOR

John F. Harper, Jr., 1334 Nelpalc Rd., Glastonbury, Conn. 06033

Continuation of Ser. No. 759,278, Jul. 26, 1985, Pat. No. 4,615,148. This application Aug. 25, 1986, Ser. No. 886,533
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[4] B24B *31/02*
U.S. Cl. 51—164.2 4 Claims



1. An automated orbital barrel system comprising:
an orbital barrel finishing machine comprising:
a plurality of drums;
frame means to removably mount said drums in an angularly spaced relationship relative to a central axis;
turret means to rotate said drums in a first direction about said central axis;
orbital rotation means to rotate each said drum about an orbital rotational axis through each said drum in a second direction opposite said first direction;
drive engagement means to selectively couple each said drum to said orbital means for rotational drive engagement therewith, said drive engagement means comprising a plurality of angularly spaced coupling pins which extend parallel to said orbital rotational axis and in fixed axial relationship to said frame means and pin engagement means comprising a female member mounted in fixed relationship to each said drum and defining a plurality of angularly spaced slots which are symmetrically positionable relative to the orbital rotational axis of said drum and are alignable for receiving said coupling pins for rotatably coupling said drum to said orbital rotation means; and
latch means actuable for securing said pins and female member in coupled relationship and releasable to permit axial disengagment of said female member from said coupling pins whereby said drum and associated female member may be removed as a unit from said frame means; and
drum remover means engageable with a said drum unit for disengaging the said drum unit from rotational drive engagement with said orbital rotation means and removing the said drum unit from said orbital barrel machine.

4,718,200

SHARPENING SHEATH COMBINED WITH A KNIFE

Gilles Miquelot, Rumilly, France, assignor to SEB S.A., Selongey, France

Filed Jan. 23, 1986, Ser. No. 821,909
Claims priority, application France, Jan. 30, 1985, 85 01293
Int. Cl.[4] B24B *3/54*
U.S. Cl. 51—214 11 Claims

1. An elongated knife sheath having an access opening at one end thereof for receiving a knife blade, said sheath including; a blade-sharpening body (2, 13) in which is defined a passageway (54, 44, 65, 2) for receiving said knife blade (48), said access opening (54) being at one end of said passageway, and a sharpening device (31, 36, 37) attached to the body (2, 13) in the vicinity of the access opening (54), the sharpening device comprising at least two blade-sharpening elements (31) in relatively displaced relation in the longitudinal direction of the passageway and having crossed blade-sharpening profiles (34) between which is difined a blade-sharpening cavity (39) and a region (41) of relative overlapping of said sharpening elements (31), and resilient means (36) having the function of urging the blade-sharpening elements (31) to a rest position in a direction



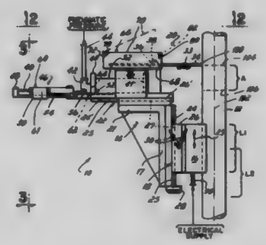
which tends to close the blade-sharpening cavity (39), wherein the resilient means (36) are prestressed in the rest position, and abutment means we then said sheath (42c) which, in the rest position of the blade-sharpening elements (31), bear against the sharpening profile (34) of said elements in regions spaced from said cavity (39) outside a path (44) provided for the knife blade (48) such that each blade-sharpening element abuts an internal abutment means located on a side of the blade opposite from the side sharpened by the associated blade-sharpening element.

4,718,201

METHOD FOR CUTTING A BOILER TUBE AND APPARATUS THEREFOR

Gerald A. Legge, R.R. #3, Box 342, Aurora, Ind. 47001

Continuation-in-part of Ser. No. 721,581, Apr. 10, 1985, Pat. No. 4,633,555. This application Dec. 16, 1985, Ser. No. 809,325
Int. Cl.[4] B26D *3/00, 3/16;* B23D *21/06;* B26B *27/00*
U.S. Cl. 51—241 S 13 Claims



1. A tube cutter apparatus for cutting a tube into two, wherein the tube is constrained against rotation and only a circumferential segment thereof is generally accessible prior to cutting the tube, said tube cutter apparatus comprising:
a frame;
clamp means mounted on said frame for clamping said frame to only a portion of an accessible circumferential segment of a tube to be cut such that said frame and the tube are constrained from rotational movement relative one another;
slide means movably mounted on said frame for free-sliding movement along said frame in a straight line path towards and away from the circumferential segment of the tube when said frame is clamped thereto;
selectively energizable motor means mounted for movement with said slide means for providing rotation when energized;

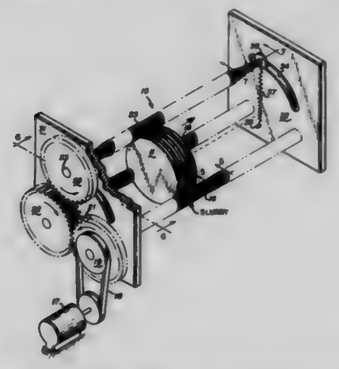
a grinding wafer having a circular outer cutting periphery, said wafer coupled to said motor means for rotation thereby and movement therewith, said motor means mounted to said slide means such that said wafer periphery is rotatable and movable in a movement plane parallel a plane of cut to be made through the tube and into and out of cutting engagement with the tube as said slide means is moved towards and way from the circumferential segment when said frame is clamped thereto and said motor is energized; and
combination slide control/switch means for selectively energizing said motor means and permitting selective control of said movement of said slide means, said motor means being energized by application of pressure to said combination means, said combination means mounted to said slide means such that when pressure is applied to said combination means to energize said motor means said slide means will be caused to be moved toward the circumferential segment of the tube whereby to cut the tube into two in said movement plane with said cutting periphery without relative rotation between the tube and said frame and without grippingly engaging a generally nonaccessible portion of the tube opposite the circumferential portion to which said frame is clamped.

4,718,202

METHOD AND APPARATUS FOR ROUNDING THE EDGES OF SEMICONDUCTIVE WAFERS

Daniel A. Worsham, San Jose, Calif., assignor to Pacific Western Systems, Inc., Mountain View, Calif.

Continuation of Ser. No. 117,012, Jan. 31, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,812
Int. Cl.[4] B24B *9/06*
U.S. Cl. 51—283 E 9 Claims



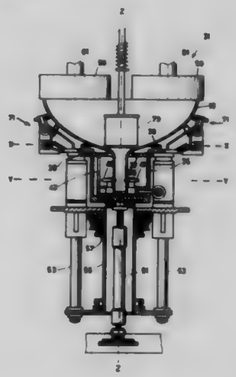
1. In a method for rounding the edges of semiconductive wafers, the steps of:
loading the wafers onto a screw so that the edges of the wafers to be rounded ride in a groove of said screw; and
turning said screw relative to said loaded wafers so as to rotate the wafer and to substantially abrade the edges of the loaded rotating wafers causing same to be rounded.

4,718,203

METHOD FOR WORKING THE FUNNEL PORTION OF A CATHODE RAY TUBE

Henry A. Schwaltz, and Rienk Wessing, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 273,546, Jun. 15, 1981, abandoned, which is a continuation of Ser. No. 45,510, Jun. 4, 1979, abandoned. This application Aug. 2, 1982, Ser. No. 404,156
Claims priority, application Netherlands, Jun. 5, 1978, 7806070
Int. Cl.[4] B24B *9/12*
U.S. Cl. 51—283 E 6 Claims



1. A method for working a cathode ray tube funnel comprising a conical portion and a neck portion, said method comprising:
(a) supporting the funnel at three first centering points on the outer surface of the conical portion with the widest end of the conical portion facing upward, said first centering points being situated on the circumference of a first imaginary circle lying in a first reference plane defining the position at which a deflection coil will be subsequently mounted;
(b) clamping the funnel at three second centering points on the outer surface of the neck portion, said second centering points being situated on the circumference of a second imaginary circle lying in a second reference plane defining the positions at which the deflection coil and an electron gun will be subsequently mounted, the centers of said first and second imaginary circles defining a center line of the funnel;
(c) blocking the funnel against rotation; and
(d) grinding the upper edge of the conical portion to a sealing edge lying in a third plane which forms a right angle with said center line.

4,718,204

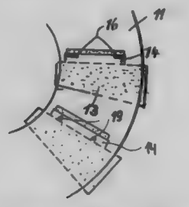
LAMELLAR END GRINDING WHEEL

Gerd Eisenblätter, Jägerweg 10, 8192 Geretsried 2, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,270
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1985, 3525430; Nov. 22, 1985, 3541348
Int. Cl.[4] B24D *13/18*
U.S. Cl. 51—337 21 Claims

1. Lamellar end grinding wheel, in which abrasive flaps overlap one another in tile-like manner and are fixed along the circumferential zone of a circular disc-shaped flexible back plate and project through radial slots in the circumferential

zone, said back plate being a sheet metal plate and said abrasive flaps being held by clamping by edges of the radial slots and



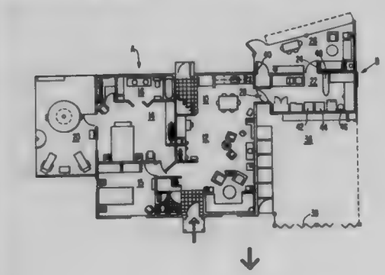
each of said slots including at least one finger being shaped onto an edge of said radial slots for said clamping.

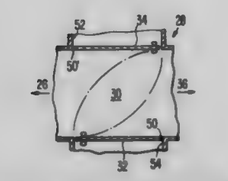
4,718,205

DWELLING CONSTRUCTION

Lawrence H. Taylor, P.O. Box 49-58, 48th St. Sta., Union City, N.J. 07087

Continuation of Ser. No. 725,757, Apr. 22, 1985, abandoned. This application Sep. 4, 1986, Ser. No. 903,889
Int. Cl.[4] E04B *1/34*
U.S. Cl. 52—79.8 2 Claims





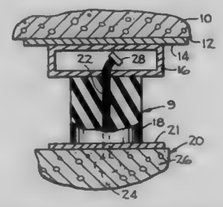
1. A housing construction comprising a first unit enclosing at least a kitchen, living zone, and sleeping and bathing zones, a second unit enclosing at least an auxillary kitchen and laundry having high heat, noise and pollutant producing characteristics, an outside porch and a garage area, a confluence of four passageways connecting the first and the second units as well as said outside porch and garage area, the said passageways including first and second doors, said first and second doors having first, second, third, and fourth positions, said first door in said first position closing the passageway to said second unit, said second door in said first position closing the passageway to said first unit, said first and second doors in said second positions connecting said first and second units and closing access to said outside porch and to said garage area; said first door in said second position and said second door in said first position opening the second unit through the passageways to the garage area; said first door in said first position and said second door in said second position opening the first unit to said outside porch; said first and second doors in said third position the first and second units are each open to each other and open to the outside porch, and to the garage area, and said first and second doors in said fourth position opening the first unit to the outside porch and opening said second unit to the garage area and closing access between the first an second units.

4,718,206

APPARATUS FOR LIMITING THE EFFECT OF VIBRATIONS BETWEEN A STRUCTURE AND ITS FOUNDATION

Edward R. Fyfe, 2253 Ninth Ave., San Francisco, Calif. 94116, and James M. Kelly, 126 The Uplands, Berkeley, Calif. 94705

Filed Sep. 8, 1986, Ser. No. 904,457
Int. Cl.[4] E04H *9/02*
U.S. Cl. 52—167 15 Claims



1. Apparatus for limiting vibrational effects between a structure with an underside and its foundation comprising:

a member attached to the underside of said structure having a chamber and an opening therethrough communicating with said chamber;

an elastomeric load bearing pad having an opening therethrough disposed between said member and said foundation, said elastomeric load bearing pad being deformable in a horizontal direction to absorb horizontally applied forces;

flexible cable tensioning means having a lower end and an upper end, said flexible cable tensioning means connected to said foundation at the lower end thereof and passing through the openings in said elastomeric load bearing pad an said member to enter said chamber of said member at the upper end thereof, said flexible cable tensioning means being movable in unison in a horizontal direction in response to the deformation of said elastomeric load bearing pad in the horizontal direction; and

a stop disposed within the chamber of said member and connected to said tensioning means at the upper end thereof to engage said member to limit the displacement of said elastomeric load bearing pad in the horizontal direction caused by vibrations.

4,718,207

LOADING DOCK SHELTERS

Robert J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa

Continuation-in-part of Ser. No. 606,339, May 2, 1984, Pat. No. 4,601,142. This application Jul. 18, 1986, Ser. No. 887,750
Int. Cl.[4] E04N *14/00*
U.S. Cl. 52—173 DS 14 Claims



1. A loading dock shelter for attachment to a wall having a doorway therein, comprising:

a head pad for extending along the top of a doorway in the wall,

two side pads for extending along the respective lateral sides of the doorway, each of said side pads comprised of a resilient core of compressible, resilient material and having a cover member therearound, said cover member including an inner side panel and an outer side panel,

support means for supporting said head pad and said side pads on the wall in outwardly projecting relation thereto, and

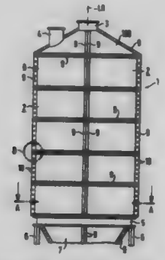
each of said side pads comprising an elongated body portion having upper and lower ends, said body portion adapted to extend substantially vertically on the wall adjacent to the doorway therein, and an elongated leg portion projecting laterally from a portion of said body portion spaced outwardly from the wall in position to extend inwardly across a portion of the doorway and extending longitudinally along said body portion substantially throughout the length of the latter, and a plurality of cover tensioning means for each of said side pads positioned substantially along the length thereof and each having a first portion extending along said outer side panel and secured to said support means rearwardly of said side pads, and a second portion extending diagonally across the junction of said body and leg portions and secured to said inner side panel of said cover member.

4,718,208

METHOD OF MAKING LARGE-VOLUME CONTAINERS, INDIVIDUAL SEGMENTS TO BE USED THEREFOR, AND ALIGNING TOOL FOR ALIGNING THE SAME

Gerrit Foes, Zaandam, Netherlands, assignor to Janssen & Diepenink BV, Zaandam, Netherlands

Filed Nov. 28, 1986, Ser. No. 935,943
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542709
Int. Cl.[4] E04H *7/00*
U.S. Cl. 52—192 9 Claims



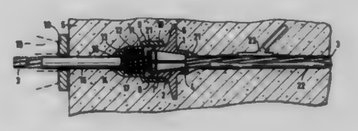
1. A method of making large volume containers such as silos, storage bins, tanks, and the like, comprising: providing prefabricated individual segments each constituting a portion of the container wall and each having an outwardly projecting support member joined thereto along an edge thereof by means of which the individual segments forming one portion of the container wall are interconnected to the individual segments forming another portion of the container wall, said support members being characterized in that they are provided with at least one cut-out which extends only partly into the support member adjacent to the outer margin thereof; positioning the segments forming one portion of the container wall on the segments forming another portion of the container wall so that the outwardly projecting support members thereof are in contact with one another; engaging an aligning tool on one of the support members while it is in contact with the other support member, said aligning tool having a retaining element adapted to be inserted in the cut-out of said one support member, and being provided with at least one roller member which is adapted to be positioned against the outer surface of the segment to which said other support member is joined; moving the roller member of said tool along the outer surface of said segment while the retaining element is positioned in the cut-out of said one support member until the support members of each segment are in aligned relation to one another; and interconnecting the thusly aligned support members.

4,718,209

WEDGE ANCHORAGE FOR A TENSION MEMBER IN A PRESTRESSED CONCRETE STRUCTURE

Per C. Hansen, Oslo, Norway, and Gero Herrmann, Karlsfeld, Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 22, 1985, Ser. No. 790,043
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438865
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 L 15 Claims

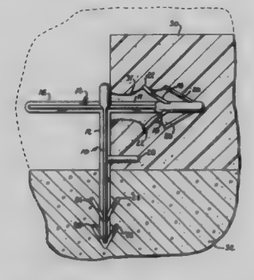


1. Wedge anchorage for applying tension force to one end of a tension member in a prestressed concrete structure where the tension member comprises at least one axially extending steel wire strand or the like arranged to be completely encased for the axial length thereof in the concrete structure and spaced inwardly along the length thereof from the surface thereof, said anchorage comprises an anchor member and an annular wedge with an annular inner surface for securing the tension member in the anchor member and an annular outer surface, said anchor member having an axially extending passage therethrough arranged to receive the tension member and with the tension member extending through and out of said passage, said anchor member having a first end and a second end spaced apart in the axial direction of said passage with said passage extending between the first and second ends, the surface of said passage widens conically from the first end toward the second end and forms a seating surface for the annular outer surface of said wedge, wherein the improvement comprises a cap extending in the axial direction of said passage and having a first end and a second end spaced apart in the axial direction of said passage and the first end of said cap being in locked engagement with said anchor member adjacent the second end of said anchor member, said anchor member and cap are completely encased within the concrete structure with the second end of said cap spaced inwardly from the surface of the concrete structure, said cap having a closure wall at the second end thereof extending transversely of the axial direction of said passage with an opening extending in the axial direction of said passage from the first end to the second end of said cap and through said closure wall so that the tension member can extend through and axially outwardly from said cap within the concrete structure, said tension member arranged to be tensioned between said anchor member and another anchor member spaced axially from the first end of said anchor member in the opposite direction from the second end thereof, said tension member having an axially extending part extending out of the opening through said cap and said closure wall from the second end away from the first end and being in the untensioned state after the tension member is secured in the tensioned state in said anchor member, means for guiding the axially extending part of the tension member in the untensioned state from said cap out of the concrete structure, so that it is axially displaceable relative to the concrete structure to a location where it extends from the concrete structure, and means located within said cap and in axial alignment with said wedge for limiting axial movement of said wedge within said cap in the direction from the first end toward the second end of said cap and for retaining at least an axially extending part of said wedge within said passage in said anchor member providing a secure seating of said wedge in said anchor member after completion of the tension operation so that the outer surface of said wedge remains in contact with the conical surface of said passage after tension force is applied to said tension member.

4,718,210
FASTENER FOR VOID-FORMING MEMBER

James P. McCourt, 10201 Bond, Overland Park, Kans. 66214; Cecil L. Foley, Jr., 604 Mission Creek Dr., Edwardsville, Kans. 66113; Danny L. Shuler, 7807 Bel Ray Dr., Belton, Mo. 64012, and Robert J. Shuler, 10810 Bennington, Kansas City, Mo. 64134

Filed Jul. 8, 1986, Ser. No. 883,113
Int. Cl.[4] E04C 1/00
U.S. Cl. 52—309.12 6 Claims



1. In a composite slab structure having a base of concrete material or the like and a void-forming foam member on a surface of said base, said member presenting peripheral sides generally perpendicular to said surface, a plurality of fasteners spaced around said periphery and each comprising:
a stem proximal to one of said peripheral sides of said member and partially inserted into said base through said surface thereof before said material has cured, and provided with barb means extending from the stem within said base, whereby a portion of said stem projects from said surface adjacent said side of the member,
an arm spaced from said surface, rigid with said said stem and extending from said portion thereof transversely of the stem into said member through a surface of said one peripheral side, and provided with barb means projecting from the arm within said member to secure the arm thereto, and
a stabilizing projection on said portion of the stem spaced from said arm and extending into said member through said surface of said one peripheral side, whereby the fasteners secure the member tightly to the base to preclude relative movement thereof during forming of the composite structure.

4,718,211
BATTEN BAR FOR SINGLE PLY MEMBRANE USED ON ROOFS

Kerston R. Russell, Lake County, Ill., and Robert A. Tubbesing, St. Louis County, Mo., assignors to Greenstreak Plastic Products Company, St. Louis, Mo.

Filed Oct. 29, 1986, Ser. No. 924,365
Int. Cl.[4] E04D 5/14
U.S. Cl. 52—409 9 Claims

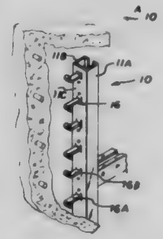


1. A method of affixing a roofing membrane to a roof substrate which comprises placing a section of roofing membrane on said roof substrate, placing an extrusion-smooth batten bar having an open groove is an upper face on a part of the exposed surface of said section of roofing membrane, passing fasteners into said open groove, downwardly through said extrusion-smooth batten bar and through said section of roofing membrane and into said roof substrate to firmly and continuously secure said extrusion-smooth batten bar and said section of roofing membrane to said roof substrate throughout the length of said extrusion-smooth batten bar, applying an adhesive to portions of said section of roofing membrane at opposite sides of and adjacent to said extrusion-smooth batten bar, placing a further section of roofing membrane over the upper face of said extrusion-smooth batten bar and over the adhesive-coated portions of the first said membrane, and pressing said further section of roofing membrane into engagement with the extrusion-smooth upper face of said extrusion-smooth batten bar and with said portions of said section of roofing membrane at opposite sides of and adjacent to said extrusion-smooth batten bar whereby the open groove permits said further section of roofing membrane to remain out of engagement with substantially all portions of said fasteners.

4,718,212
CONCRETE INSERT

Daniel Illich, 149-44 Cherry Ave., Flushing, N.Y. 11355

Filed Dec. 18, 1986, Ser. No. 942,996
Int. Cl.[4] E04B 1/41
U.S. Cl. 52—699 10 Claims

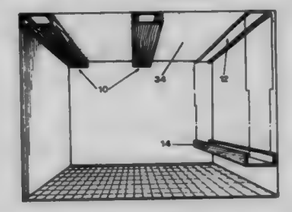


1. A concrete insert comprising a smooth uninterrupted elongated channel shaped structural member having opposed continuous side portions and an interconnected web portion, said web portion having a plurality of transversely extending slots spaced therealong, said slots being paired, the distance between each slot in said pair of slots being greater than the transverse width of said web portion, and a plurality of anchoring means spaced along said web portion, said anchoring means including a U-shaped staple having opposed leg portions, said leg portions being extended through a corresponding slot of said pair of slots, said opposed leg portions being frictionally retained in its corresponding slot, and means for securing said structure member to a concrete form.

4,718,213
DECORATIVE BEAM ASSEMBLY

Frank M. Butterfield, 4181 Valley Trail Dr., Atlanta, Ga. 30339

Filed Jan. 30, 1987, Ser. No. 9,150
Int. Cl.[4] E04C 3/36
U.S. Cl. 52—731 3 Claims

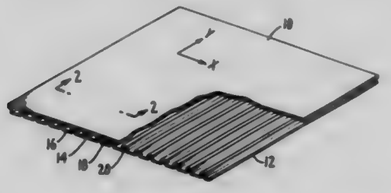


1. A decorative beam assembly for attachment to a ceiling, comprising an elongated support bracket having a flat ceiling attaching surface, means for securing said flat surface to said ceiling, flange members extending outwardly and downwardly from each side of said attaching surface, with said flange members having contoured upper surfaces, a hollow channel-shaped beam being of a length at least equal to said bracket and having a bottom and flexible, spaced, parallel side walls extending upwardly from said bottom, said side walls terminating in inwardly directed arms having bottom surfaces which are complimentary contoured to said upper surface of said flange members, said arms being detachably secured onto said flange members of said support bracket when said support bracket is secured to said ceiling by separating said parallel sidewalls to a width greater than the width of said attaching surface and urging the attaching arms over said flange members using upward pressure so that said attaching arms snap-fittingly engage said flange members.

4,718,214
REINFORCED SIDING PANEL

Richard L. Waggoner, Riverside, Calif., assignor to Alumax, Inc., San Mateo, Calif.

Filed Sep. 12, 1986, Ser. No. 906,748
Int. Cl.[4] E04C 2/32
U.S. Cl. 52—801 14 Claims

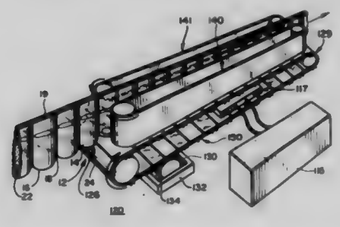


1. A reinforced siding panel comprising, in combination:
a metal sheet having interior and exterior surfaces;
a single contoured plastic sheet attached to the interior surface of said metal sheet, wherein said plastic sheet extends over substantially the entirety of said interior surface of the metal sheet and includes a first regular pattern of protruding surfaces bonded to said interior surface of the metal sheet and a second regular pattern of protruding surfaces spaced from said interior surface of the metal sheet.

4,718,215
APPARATUS AND METHOD FOR ATTACHING FITMENTS TO FLEXIBLE CONTAINERS

Peter Carveth, Glen Ellyn; Albert Stone, Buffalo Grove, and L. Alan White, Gurnee, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 27, 1985, Ser. No. 802,418
Int. Cl.[4] B65B 61/18
U.S. Cl. 53—410 26 Claims



9. An apparatus for attaching fitments to filled flexible containers comprising:
means for coating a surface of the fitments with a particulate slurry for securing the fitments to the filled flexible containers;
means for delivering the coated surface of the fitments in juxtaposition to the filled flexible containers;
means for urging the coated surface of the fitments against the filled flexible containers; and
means for inductively welding the fitments to the filled flexible containers.

4,718,216
PROCESS AND APPARATUS FOR PACKAGING CIGARETTES IN PARTICULAR

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 846,536
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512611
Int. Cl.[4] B65B 11/28
U.S. Cl. 53—444 48 Claims



1. In a process for packaging cigarettes by combining them into cigarette groups and wrapping them in a blank of packaging material, wherein a group is conveyed and introduced into a pack pocket of a folding turret, taking with it the blank provided in a plane transverse relative to the conveying direction of the group, and the group is conveyed further, the blank is folded, and wherein the folding turret (31) is preceded by a group turret (28) which conveys the cigarette groups (21) into the group pockets (64), the articles being pushed into a pocket (64) in the direction of the longitudinal axis of the cigarettes and parallel to the rotational axis of the group turret (28), and being pushed out in an axially transverse direction, the improvement comprising the steps of: conveying cigarette groups (21) in group pairs (21*a*, 21*b*) in two tracks located next to one another; providing the pockets (64) with an axial length which is greater than twice the longitudinal length of the cigarettes; and, in the region of a pushing-in station (27), pushing two cigarette groups (21*a*, 21*b*) in succession into a common pocket (64) in such a way that the cigarette groups (21*a*, 21*b*) are arranged inside the pocket (64) at a distance from one another in the axial direction, wherein a first cigarette group (21*a*), distant from an inlet side pushing-in orifice (68) of the pocket, is pushed into the pocket (64) in a first pushing-in stroke, and the second cigarette group (21*b*) adjacent the pushing-in orifice (68) is pushed into the pocket (64) in a second pushing-in stroke.

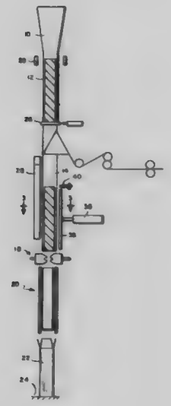
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4,718,217

SETTLING SYSTEMS FOR BAG-IN-BOX MACHINES

Graham J. Ross, Hingham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Aug. 4, 1986, Ser. No. 892,375
Int. Cl.[4] B65B *1/36, 1/22, 9/20*
U.S. Cl. 53—504 3 Claims



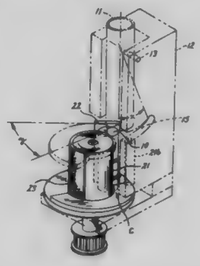
1. Apparatus for filling bags of predetermined length with a predetermined weight of product comprising a measuring tube for receiving said predetermined weight of product, a filling tube of rectangular cross section defined by three sides and an open fourth side, means for forming sheet material into a tube about said filling tube, sealing and severing means engageable at predetermined intervals with the tube at the lower end of the filling tube to form a sealed area transversely of the tube and to sever the tube in said sealed area to form the top and bottom of successive bags, means for releasing the product from the measuring tube into the filling tube while the sealing and severing means are engaged with the tube, means for thereafter disengaging the sealing and severing means from the sealed area, means for moving a predetermined length of tube sealed at its lower end downwardly relative to the sealing and severing means to gravitationally receive the product from the filling tube, means for thereafter reengaging the sealing and severing means to form the top of a filled bag and the bottom of a succeeding bag, and means for effecting cyclical operation of the aforesaid means to fill successive bags of predetermined length, characterized in that there is means for effecting vibration of the product within the filling tube disposed at the open side of the filling tube, first sensing means arranged adjacent the measuring tube operable in the event that the product in the measuring tube exceeds in height said predetermined length of bag to initiate operation of the means for effecting vibration of the product within the filling tube as the product is delivered into the filling tube and abort operation of the cyclical operation so as to stop operation of the feeding means and to retain the sealing and severing means in engagement with the tube, said second means being arranged adjacent the filling tube and operable when the level of the product therein diminishes to said predetermined height to reinitiate the cycle of operation.

4,718,218

COIN WRAPPING MECHANISM

Victor G. Ristvedt, Manchester, Tenn., assignor to Ristvedt-Johnson, Inc., Mt. Prospect, Ill.

Filed Oct. 7, 1985, Ser. No. 785,343
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—532 4 Claims



1. A coin wrapping mechanism for wrapping rills of coins, said mechanism comprising:

coin stacking means for forming a coin stack containing a redetermined number of coins,

means for supporting the coin stack for rotation about its axis,

means for rotating the coin stack about its axis while pressing a wrapping material against the coin stack, said wrapping material having a coating of a pressure-sensitive, releasable adhesive on the side facing the coin stack so that the adhesive adheres to, and is wound around, the coin stack, said rotating and pressing means including a resilient member urging said wrapping material against said coin stack, and means for effecting rolling movement of the circumferencial surface of said coin stack over the surface of said resilient member to effect the winding of said wrapping material around said coin stack,

said resilient member being dimensioned to be spaced away from the coin stack during a portion of said rolling movement to allow (1) removal of the wrapped coin stack, (2) loading of a new coin stack, and (3) insertion of the wrapping material between the coin stack and said resilient member and

means for removing the coin stack from the rotating and pressing means after the desired length of wrapping material has been wound around the coins.

4,718,219

APPARATUS FOR SPIRAL WRAPPING A LOAD BY A WEB OF STRETCHED PLASTIC FILM

Dieter Schmitz, Solingen, Fed. Rep. of Germany, assignor to Cyklop International AG, Cologne, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 43,885
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614775
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—556 14 Claims

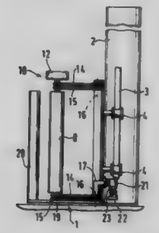
1. An apparatus for spiral wrapping a load by a web of stretched plastic film wherein said load and a film dispenser means are rotated relative to each other during a wrapping cycle, said apparatus comprising:

a base with a base-mounted stand;

carriage means mounted on said stand moveably in the vertical direction, said film dispenser means being mounted on said carriage means;

a device for prestretching said web of stretchable plastic film before it reaches the load, said prestretching device being mounted on said carriage means and being adapted to receive said stretchable film pulled from said film dispenser means and having at least one rotatable prestretch roller coupled for simultaneous rotation with a frictionally engageable wheel means of a friction device and secured together with its associated frictionally engageable wheel means to a moveable support assembly, said friction device being disengaged in a first position of said support assembly and being engaged for elongating said web of stretchable plastic film being transported by said prestretch roller in a second position of said support assembly; and

a switching assembly keeping said support assembly in said first position in a first phase of said wrapping cycle and thereafter allowing said support assembly to move into said second position until the end of said wrapping cycle for prestretching said web of stretchable plastic film, said switching assembly comprising



a cam member supported on a base-mounted component, said cam member being in a guided fashion displaceable in a substantially vertical direction and having an upper abutment surface and a lateral cam surface;

spring means for pretensioning said cam member to move into an upper limit position; and

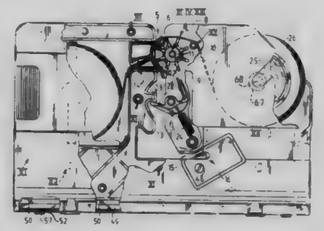
a switching element coupled with said moveable support assembly, said switching element engaging said lateral cam surface during said first phase of said wrapping cycle thereby keeping said support assembly in said first position and engaging said abutment surface at a later and final phase of said wrapping cycle thereby pushing said cam member downward in a direction opposite to the direction in which the spring force of said spring means is applied.

4,718,220

DEVICE FOR APPLYING A CLOSING STRIP AND A CASSETTE THEREFOR

Nicolaas Van Rosendal, No. 244 Berfloweg, 7553 JW Hengelo, and Ary G. Dirkzwager, No. 203 Helmerstraat, 7546 PD Enschede, both of Netherlands

Filed Dec. 13, 1985, Ser. No. 808,733
Claims priority, application Netherlands, Jan. 9, 1985, 8500050
Int. Cl.[4] B65B *67/06*
U.S. Cl. 53—583 26 Claims



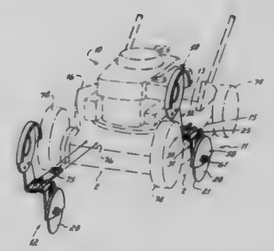
1. Device for applying a closing strip wrapped around a portion of an envelope such as a plastic bag, comprising a housing provided with a channel through which the portion of the envelope is guided during operation; a rotor mounted for rotation on said housing and provided with blades projecting into said channel and defining pockets between successive blades into one of which the portion of the envelope is received as the portion is introduced into the channel; a feed for adhesive closing strip tape emerging into said channel above the rotor and having an adhesive side facing the channel so that the portion of the envelope adheres thereto in partially wrapped relation around the portion of the envelope as the portion of the envelope is received in a pocket of the rotor; cutting means located downstream from said rotor for cutting off a closing strip wrapped around the portion of the envelope from the closing strip tape, and a member located between said rotor and cutting means and extending into said channel from that side thereof opposite the rotor, said member being rigid relative to said housing and defining a deviation in said channel between the rotor and the cutting means, the closing strip being movable over said member and deflected thereby as the partially wrapped portion of the envelope emerges from the pocket of the rotor to form the closing strip wrapped around the portion of the envelope.

4,718,221

LAWNMOWER EDGER AND TRIMMER

Lloyd E. Wessel, 2810 Meadow Dr., and Edward O. Wessel, 3116 Cawein Way, both of Louisville, Ky. 40220

Filed May 21, 1986, Ser. No. 865,624
Int. Cl.[4] A01D *34/84*
U.S. Cl. 56—16.9 10 Claims



1. A rotary lawnmower having a housing, a rotary blade for cutting grass and generating a vacuum in a vacuum zone for lifting clippings up into said housing, and a lawn edger, said edger comprising:

a freely rotatable disk having a sharp circular edge for cutting grass within said vacuum zone;

means for mounting said disk on said housing for movement between at least a retracted position above and inboard said housing, and an edging position wherein said disk is disposed vertically below said housing at a distance sufficient to permit said disk to cut grass along the edge of a lawn within said vacuum zone; and

said mounting means including a hinge having a first hinge arm fixed to said mower housing, a second hinge arm movably connected to said first arm and supporting said disk, and means to positively secure said second hinge arm to said first hinge arm in at least two predetermined positions corresponding respectively to said retracted position and said edging position in order to maintain said disk in said edging position upon contact of the disk with the grass.

8. An edging attachment for a rotary lawnmower having a housing defining a mowing periphery and attachment comprising:

a freely rotatable edging disk having a circular sharp edge; and

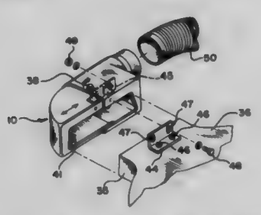
disk mounting apparatus for attaching said disk to a rotary lawnmower, said disk mounting apparatus including a selectively lockable pivot means for operably pivoting said disk for movement between at least a disk edging position extending outwardly of said housing and periphery and a disk retracted position within said periphery, said selectively lockable pivot means preventing disengagement of said disk from said edging position during an edging operation.

4,718,222

UNIVERSAL MOWER DECK BOOT

Stephen K. Lambert, and Dean A. Blakey, both of Greenville, Ohio, assignors to Lambert Corporation, Ansonia, Ohio

Filed Jul. 25, 1983, Ser. No. 516,496
Int. Cl.[4] A01D *34/48*
U.S. Cl. 56—202 3 Claims



1. A two-piece hollow universal boot for mounting over the discharge chute of a mower deck, comprising:

a body having a forward boot section and a rearward boot section;

said forward section including a top, a bottom, a forward wall, and a blank side facing wall, and open at the rear adapted to be telescopically received in relation to said rearward boot section.

said rearward boot section also having top and bottom walls, and a blank side facing wall, which blank wall is in alignment with said blank wall of said forward section when the same are received in telescopic relation, and having an open front,

said rearward section being provided with a rearwardly directed spout which opens into the interior of said rearward section, said rearward section open front forming a cavity in common with the interior of said front section,

said blank walls being knife cuttable to define therein a common deck chute receiving opening in said sections.

4,718,223

FRUIT HARVESTING APPARATUS

Hiroshi Suzuki, Tondabayashi; Shigeaki Okuyama, Kawachinagano; Yoshihiro Ueda, Sakai; Yoshifumi Yukishige, and Masahiko Hayashi, both of Toyonaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

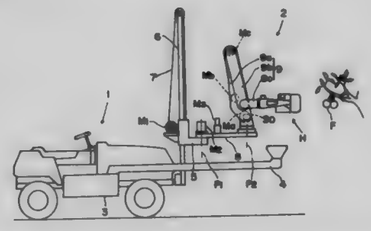
Filed Oct. 20, 1986, Ser. No. 920,653
Claims priority, application Japan, Oct. 17, 1985, 60-232839; Oct. 18, 1985, 60-234125; Oct. 29, 1985, 60-242539; Nov. 7, 1985, 60-249785
Int. Cl.[4] A01D *46/24*
U.S. Cl. 56—328.1 15 Claims

1. A harvesting apparatus for automatically removing fruit from its growth source, comprising;

catch means for catching fruit by means of a vaccuum,

removal means for removing the fruit caught by said catch means, and

drive means for varying a relative position of said catch means and said removal means between a first position in which said catch means is disposed closer than said removal means is to the fruit and a second position in which said removal means is closer than said catch means is to the fruit,



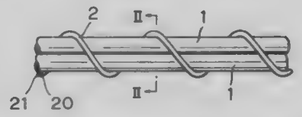
wherein said first position is a position for a guide operation with respect to the fruit and said second position is a position for a fruit removal operation.

4,718,224

STEEL CORE FOR REINFORCING ELASTOMERIC ARTICLES

Yasushi Obata, Shizuoka, Japan, assignor to Tokyo Rope Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 944,465
Claims priority, application Japan, Dec. 23, 1985, 60-287958
Int. Cl.[4] D02G *3/12*; D07B *1/00, 1/10*
U.S. Cl. 57—212 12 Claims



1. A reinforcing structure for elastomeric articles, comprising:

a plurality of elongated filaments arranged in parallel so as to have a common plane passing through all of said filaments; and

means for wrapping said plurality of filaments together and including one wire having a diameter smaller than that of said filaments, said wire wrapping said filaments together so as to form a wrapped filament structure having a relative position of said filaments with respect to each other that does not vary over a full length of the wrapped filament structure and having bending rigidities in predetermined directions that also do not vary over a full length of the wrapped filament structure, the wrapped filament structure being formed so as to be embeddable into the elastomeric articles to be reinforced.

4,718,225

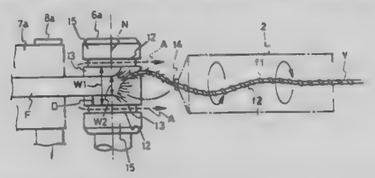
PNEUMATIC SPINNING MACHINE

Asao Sasagi, Kyoto, Japan, assignor to Murata Kaiki Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 27, 1986, Ser. No. 879,334
Claims priority, application Japan, Jun. 27, 1985, 60-141383
Int. Cl.[4] D01H *5/28, 5/26, 5/74*
U.S. Cl. 57—328 8 Claims

1. A pneumatic spinning machine of the type which includes a draft device composed of a series of rollers comprising a pair of back rollers, another pair of top and bottom middle rollers and a further pair of top and bottom front rollers, and an air injecting nozzle for producing whirling flows of air to act upon a bundle of fibers fed from said draft device, whereby a bundle of fibers fed from said front rollers of said draft device is acted upon and ballooned by whirling flows of air in order to twist the bundle of fibers, characterized in that said front rollers

have smooth opposed uninterrupted nip sufaces for moving a bunch of fibers into said air injecting nozzle, and one or more of said front rollers has a pair of circumferential air escape grooves in the surfaces thereof spaced to each side of said



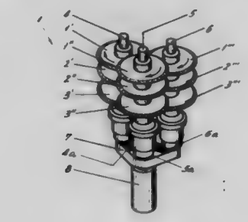
smooth nip surfaces wherein each air escape groove is located at such a position spaced outwardly by a predetermined distance from the width of the bundle of fibers at said nip surface of said front rollers that air passing through said air escape groove will not disturb ballooning of the bundle of fibers.

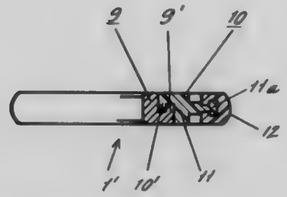
4,718,226

FRICTION ROTOR FOR THE FALSE TWISTING OF SYNTHETIC THREADS

Friedrich Schuster; Hans Hermanns, both of Hannaelberg, and Wolfgang Rader, Schoemgen, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 931,177
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 8532434[U]
Int. Cl.[4] D02G *1/04;* D01H *7/92*
U.S. Cl. 57—340 9 Claims





1. A friction rotor for a false-twisting device, said rotor including:

a reusable base having a periphery and first retaining means along its periphery;

a disposable composite ring having a periphery and a friction covering along its periphery, said ring having a central aperture, and second retaining means adjacent said aperture;

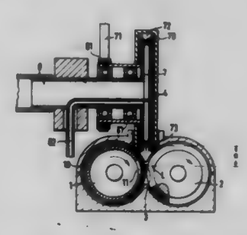
said first and second retaining means being in separable and frictional engagement and cooperating to removably mount said composite ring on said base.

4,718,227

OPEN-END SPINNING PROCESS AND DEVICE FOR ITS IMPLEMENTATION

Karl Hasdeubuck, Gaimersheim, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE85/00449, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/02957, PCT Pub. Date May 22, 1986
PCT Filed Nov. 11, 1985, Ser. No. 878,978
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441495
Int. Cl.[4] D01H *7/895, 7/892*
U.S. Cl. 57—401 25 Claims



1. An open-end spinning process for converting a fiber sliver into yarn, comprising the steps of:

(a) separating said fiber sliver into individual fibers;

(b) aligning said fibers along their longitudinal axes;

(c) conveying said aligned fibers in an air stream to a collection surface;

(d) moving said collection surface in the direction said fibers are conveyed by said air stream;

(e) depositing said fibers onto said collection surface in a continuous bundle of aligned fibers, said fibers being aligned in the direction of said surface is moving;

(f) removing said continuous bundle of fibers from said collection surface in a direction tangent to said collection;

(g) twisting said bundle of fibers into yarn as it is removed from said collection surface; and

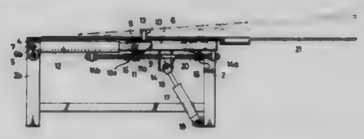
(h) winding said yarn onto a package.

4,718,228

APPARATUS FOR DISPLACING A LINE OF TRACK CHAIN

Yasuaitsu Moriki; Hirotomo Nanakura, and Masayuki Fukui, all of Tokyo, Japan, assignors to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,039
Claims priority, application Japan, Sep. 5, 1983, 58-137514
Int. Cl.[4] B21L *19/00*
U.S. Cl. 59—7 10 Claims



1. An apparatus for displacing a length of track chain lengthwise a predetermined distance, the apparatus comprising: a stationary frame; a guide table slidably receiving thereon a length of track chain during use of the apparatus and having forward and rearward ends and being pivotally mounted at the rearward end thereof on the frame to enable up and down tilting movement of the guide table relative to the frame, the guide table having therein a slot extending lengthwise between the forward and rearward ends; a chain-engaging projection projecting through and displaceable along the guide table slot

and being engageable with a track chain slidably disposed on the guide table to effect lengthwise displacement of the track chain in response to displacement of the chain-engaging projection; guiding means disposed beneath the guide table and mounted to undergo tilting movement therewith for guiding the chain-engaging projection for displacement along the guide table slot; a first reciprocatory fluid motor for reciprocably displacing the chain-engaging projection along the guide table slot through forward and return strokes; a second reciprocatory fluid motor connected to effect up and down tilting movement of the guide table and chain-engaging projection together as a unit to thereby effect the engagement and disengagement of the chain-engaging projection with the track chain during up and down tilting movement of the guide table; and adjustably settable stop means disposed entirely beneath the guide table and accessible from beneath the guide table for adjustably setting the end stop positions of the chain-engaging projection to thereby determine the displacement distance of the track chain for each stroke of the first reciprocatory fluid motor.

4,718,229

FAILSAFE ELECTRONIC CONTROL SYSTEMS

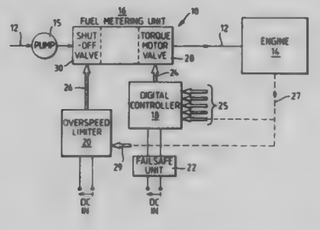
Paul H. Riley, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Sep. 30, 1986, Ser. No. 913,364

Claims priority, application United Kingdom, Oct. 30, 1985, 8526726

Int. Cl.⁴ F02C *1/28*

U.S. Cl. 60—39.281 **9 Claims**



1. A fuel control system for a gas turbine aeroengine, including:

(a) means for sensing the rotational speed of the engine and producing a speed signal representative thereof,

(b) fuel flow metering means for metering the fuel flow to the engine,

(c) first, electronic, control means operative in conjunction with the fuel flow metering means to exercise a first and normal control mode over fuel flow to the engine, and

(d) second, electronic, control means operative in conjunction with the fuel flow metering means to exercise a second and speed limiting control mode over fuel flow to the engine in response to said speed signal, the arrangement being such that the second control means takes over control of fuel flow from the first control means whenever the speed signal exceeds a predetermined value indicating overspeed and retains such control until the speed signal falls below the predetermined value; wherein the fuel control system is adapted to prevent overspeed of the engine due to failure of electronic components when the fuel control system is subjected to higher than normal operating temperatures, the control system further including means for sensing the temperature of the control system and producing a temperature signal representative thereof, and third control means operative to exercise a third and speed limiting failsafe control mode over fuel flow to the engine in response to said temperature signal, the third control means being adapted to irreversibly take over control of fuel flow from the first and second control means if the temperature of the control system exceeds a predetermined value indicative of likely failure of the first and second control means.

4,718,230

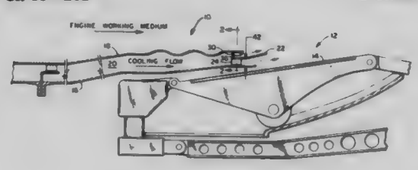
AUGMENTOR LINER CONSTRUCTION

Fred L. Honeycutt, Jr., Lake Park, and Howard J. McLean, No. Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 10, 1986, Ser. No. 929,542

Int. Cl.⁴ F02K *3/10*

U.S. Cl. 60—261 **2 Claims**



1. An augmentor for a gas turbine engine having a gas path for flowing the engine's working medium including a generally circular shaped duct, a variable nozzle attached to the end of the duct in proximity to the engine's working medium exiting from said duct, a generally circular shaped liner attached to the end of said engine concentrically disposed relative to said duct and defining an open ended annular flow path for receiving cooling air between said engine's liner and said duct, said liner terminating in proximity to the exit plane of said duct, the improvement comprising an annular, circumferentially disposed sinusoidally shaped member attached to the end of said liner adjacent the exit end of said duct and extending radially outwardly relative to the engine's working medium and defining open ended passageways, a separate end piece supported to said duct in proximity to said sinusoidal member for distributing the cooling air discharging from said open ended annular flow path and said open ended passageways of said sinusoidally shaped member to said nozzle for defining a uniform flow path around the circumference of said nozzle and to support the liner, one end of said separate end piece providing an abutment for supporting said sinusoidally shaped member when said sinusoidally shaped member is expanded by said engine working medium and said separate end piece extending axially beyond the exit end of said duct and defining with said duct an annular gap having a predetermined auunlar dimension for providing a predetermined amount of cooling air to flow to said nozzle throughout the operating range of said augmentor.

4,718,231

ASSEMBLY FOR HARNESSING WAVE AND TIDE ENERGY

Max M. Vides, Capitulo 1, San Salvador, El Salvador

Filed Feb. 2, 1984, Ser. No. 576,507

Int. Cl.⁴ F03B *13/14*

U.S. Cl. 60—398 **8 Claims**

1. An assembly for harnessing wave and tide energy, said assembly comprising:

(a) an elongated float means for floating on the surface of a body of water having waves moving therealong,

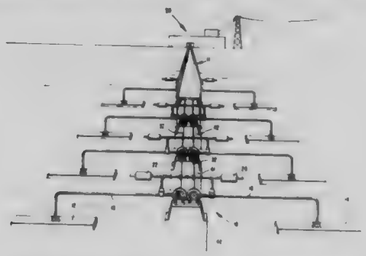
(b) support means freely pivotally connected to the float means for maintaining the float means parallel to the surface of the water,

(c) said support means being effective to maintain said float means with its longest dimension disposed in a direction parallel to the length of the waves moving along the surface of the body of the water,

(d) transmission means including two parallel transmission shafts responsive to the support means as the float means moves up and down with the movement of the waves to produce a rotational movement from which energy may be derived,

(e) said support means including two arm members each having an outer free end pivotally connected to the float means and having counterweight means located at the other inner end thereof which counterweight means extends to an opposing side of the transmission shaft with respect to the corresponding float means to neutralize a portion of the weight of the float means and arm member,

(f) a plurality of base structures fixedly disposed on the bottom of the body of water with the transmission means located on the base structures that are laterally displaced with respect to each other and extend outwardly from a shore station into the body of water in a direction transverse to the length of the waves moving along the surface of the body of water,



(g) the base structures including pier supporting means, and

(h) pier means resting on said pier supporting means and extending outwardly to bridge over the transmission means located on said plurality of base structures,

(i) the transmission means including a double clutch mechanism disposed on the base structures and the two parallel transmission shafts extending between each adjacent two clutch mechanisms carried by said base structures, and

(j) each of the two arm members has an inner forked section each being connected at their inner ends to a respective transmission shaft located on opposite sides of a respective double clutch mechanism located on a base structure.

4,718,232

GRAVITY AND BUOYANCY DRIVEN POWER GENERATORS

Robert W. Willmouth, P.O. Box 19146, Washington, D.C. 20036

Filed Oct. 21, 1986, Ser. No. 921,269

Int. Cl.⁴ F03B *17/02*

U.S. Cl. 60—495 **23 Claims**

1. A bouyancy and gravity actuated apparatus for generating electrical power, said apparatus comprising:

a housing divided into first and second chambers by a partition which extends to the top of said housing and is spaced a predetermined distance from the bottom of said housing, said housing containing a liquid therein;

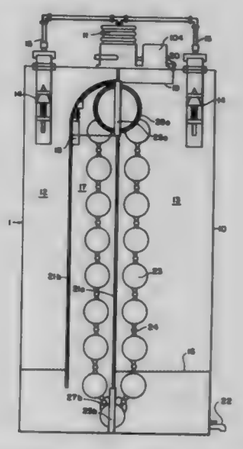
a further vertical chamber located within said first chamber;

means for producing pressure within the housing, the amount of liquid within the chamber being of sufficient volume such that, when a pressure is produced in the chamber, said vertical chamber is filled to the top thereof and the overall level of the liquid within the housing is above the bottom edge of said partition;

an endless flexible carrier extending vertically through the liquid contained in said vertical chamber, through the partition, vertically through an air space defined in said second chamber above the liquid and beneath the partition through the liquid contained at the bottom of the housing;

a plurality of buoyant elements spaced along the length of said flexible carrier;

means for mounting said flexible carrier so as to permit movement thereof in response to said bouyant elements rising due to their bouyancy in said chamber and falling by gravity in said air space; and



means responsive to the movement of said flexible carrier for generating electricity.

4,718,233

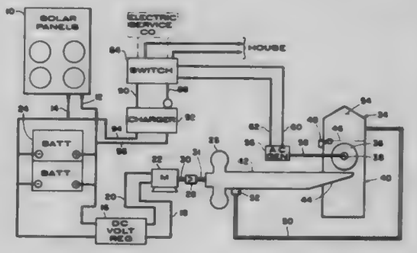
SOLAR POWER TAKE OFF

Wilford C. Barrett, 6109 New Sapulpa Rd., Tulsa, Okla. 74103

Filed Sep. 26, 1985, Ser. No. 780,572

Int. Cl.⁴ F03B *17/02*

U.S. Cl. 60—496 **9 Claims**



1. An apparatus for generating AC electrical energy from solar energy which comprises:

solar panel means for generating DC electrical energy;

a DC motor connected to said solar panel means;

a housing;

a cross-flow turbine in said housing having a shaft and with curved vanes attached thereto and which are submerged in water;

an air compressor driven by said DC motor and having an air outlet;

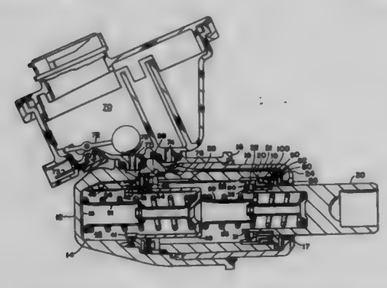
connecting means connecting said air outlet to said cross-flow turbine below said vanes;

an AC generator connected to the shaft of the cross-flow turbine.

4,718,234
FAST FILL VALVING MECHANISM FOR A MASTER CYLINDER

John E. Steer, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Aug. 26, 1986, Ser. No. 900,644
Int. Cl.[4] B60T *11/20*
U.S. Cl. 60—562 21 Claims

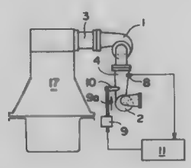


1. A master cylinder, comprising a master cylinder housing with a bore extending axially therein, a reservoir providing fluid for said bore, an end of said housing having a bearing member attached thereto and retaining a sleeve member within said bore, a pair of pistons associated with said master cylinder housing and one of said pistons extending through an opening in said bearing member, an end of said one piston having a fast fill seal, spring member, and land member disposed thereat between the end of the one piston and the sleeve member, the fast fill seal having a plurality of through openings and the seal engaging said land member, the land member having a plurality of pockets adjacent and communicating with respective through openings, the land member having passage means, the spring member disposed between the fast fill seal and land member which is engaged by the fast fill seal, movement of said one piston effecting increased pressure within an associated pressure chamber of said master cylinder and causing said spring member to extend within the pockets at a predetermined pressure and allow pressure within said chamber to be communicated through said through openings, around the spring member, and through the pockets and passage means.

4,718,235
TURBO COMPOUND INTERNAL COMBUSTION ENGINE

Hideo Kawamura, Fujisawa, Japan, assignor to Isuzu Motors, Ltd., Japan

Filed Oct. 20, 1986, Ser. No. 920,457
Claims priority, application Japan, Oct. 24, 1985, 60-238381
Int. Cl.[4] F02G *3/00*
U.S. Cl. 60—624 2 Claims

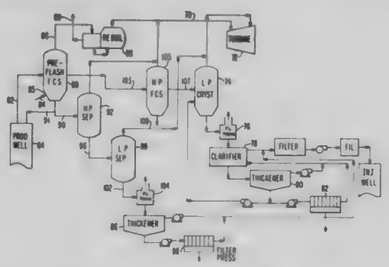


1. An internal combustion engine exhaust energy recovery apparatus comprising:
an engine supercharger means comprising a blower adapted to receive exhaust gases from an engine and to supply intake air thereto;
a recovery turbine disc adapted for rotation with a drive shaft coupled to the engine;
a recovery turbine housing defining a recovery inlet connected to receive engine exhaust gases discharged by said supercharger means; a recovery exhaust port for discharging exhaust gases, a recovery turbine chamber enclosing said recovery turbine disc, and a convoluted recovery passage extending between said recovery inlet and a periphery of said recovery turbine disc;
recovery partition means disposed in said recovery housing and separating said convoluted recovery passage into first and second recovery passages each providing communication between said recovery inlet and said periphery of said recovery turbine disc; and
a recovery valve disposed in said first recovery passage and operable between an open position allowing exhaust gas flow through said first recovery passage and a closed position producing diversion of exhaust gas into said second recovery passage.

4,718,236
APPARATUS AND METHOD FOR MINERAL RECOVERY FROM GEOTHERMAL AND GEOPRESSURED BRINES

Leon Awerbuch, Chevy Chase, Md.; Victor Van der Mast, Lafayette, Calif., and David P. McGrath, Waterbury, Conn., assignors to Bechtel Power Corporation, San Francisco, Calif.

Filed Dec. 12, 1985, Ser. No. 808,417
Int. Cl.[4] F03G *7/04*
U.S. Cl. 60—641.5 8 Claims

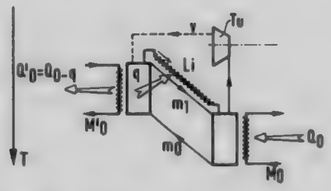


1. Apparatus for handling a geothermal or geopressured brine having mineral values therein comprising:
a reactor for receiving a flow of brine, said reactor being operable to flash the brine to provide a gaseous fraction, to separate the liquid fraction from the solid fraction of the brine and to cause crystallization of the particles in the solid fraction;
means coupled with the reactor for receiving the gaseous fraction and for using such gaseous fraction to perform useful work;
means coupled with the reactor for receiving the solid fraction separated therein from the gaseous and liquid fraction, said receiving means being operable to separate the solid and liquid fraction of the slurry from the gaseous fraction thereof;
means for receiving the solids and liquid fraction including a dewatering means to form a filter cake containing the mineral values to be recovered;
means for receiving the clarified liquid fraction of the reactor for removing the mineral values therefrom.

4,718,237
THERMAL INDUCTION MACHINE

Jacques Starlini, Paris, France, assignor to Alsthom, Paris, France

Continuation-in-part of Ser. No. 683,537, Dec. 19, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 842,701
Claims priority, application France, Dec. 22, 1983, 83 20573
Int. Cl.[4] F01K *25/06*
U.S. Cl. 60—673 6 Claims



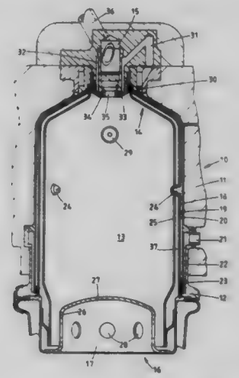
1. A heat pump including:
a first assembly including a distillation column (Kd) having a hottest end and a coldest end and working by diphasic contact with a working fluid made of at least two mixable pure substances, at a first pressure value and in a first temperature range,
and a second assembly including a second column (Kg) having a hottest end and a coldest end and working by diphasic contact at a second pressure value lower than said first pressure value and in a second temperature range,
the first assembly including, associated to said first distillation column, a first boiler (Bd) and a first condenser (Cd),
means for establishing a first pair of flows between said first boiler and said second condenser,
means for establishing a second pair of flows between said first condenser and said second boiler,
means for establishing at least one liquid flow between two intermediate sections of same concentration of both columns and for directing liquid from said second column to said first column,
the boilers being respectively placed at the hottest end of said distillation column and at the coldest end of said second column, and
external sources for applying heat to said boilers, and said condensers supplying heat at external use points,
and means for controlling all established flows and said boilers and said condensors such that said established flows exchange heat with one another and with the columns, so that the exchanges are in equilibrium and that each column receives in each point the heat corresponding to the reversibility condition and that
the temperature of the condensers of both columns are substantially the same.

4,718,238
LIQUID FUEL COMBUSTOR

Harry Todd, Burnley, and Eric Carr, Blackburn, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 22, 1987, Ser. No. 41,601
Claims priority, application United Kingdom, May 3, 1986, 8610854; Sep. 25, 1986, 8623101
Int. Cl.[4] F02C *1/00*
U.S. Cl. 60—746 6 Claims

1. A combustor comprising an inner wall defining a chamber having a closed upstream end and a downstream end through which exhaust gases can flow, a device for introducing an oxidant and liquid fuel into said upstream end, means for injecting a liquid coolant into said chamber at a zone thereof intermediate said upstream end and said downstream end, and a baffle adjacent said downstream end for causing exhaust gases to flow adjacent said inner wall before leaving said combustor,

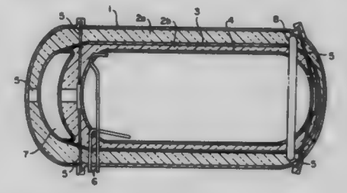


whereby any liquid coolant within said chamber adjacent said inner wall is entrained by said exhaust gases.

4,718,239
CRYOGENIC STORAGE VESSEL

Jeffert J. Nowobilski, Orchard Park, and Richard C. Cipolla, Williamsville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 5, 1987, Ser. No. 22,072
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—55 20 Claims



1. A storage vessel comprising:
(a) a large cryogenic liquid reservoir at one end of the vessel, a small cryogenic liquid accumulator at another end of the storage vessel, and means to pass cryogenic liquid between the reservoir and the accumulator;
(b) means to maintain the pressure within the reservoir greater than ambient pressure;
(c) a vent valve on the accumulator; and
(d) means to operate the vent valve, said means actuated by action of hydrostatic pressure within the accumulator.

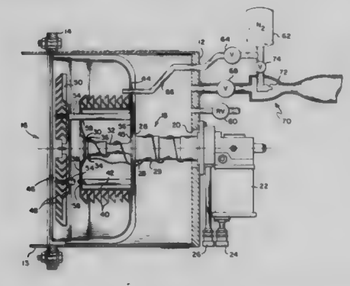
4,718,240
CRYOPUMP REGENERATION METHOD AND APPARATUS

Bruce R. Andeen, Acton, and Robert C. Pandorf, Newton Highlands, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 707,467, Mar. 1, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 4,300
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 10 Claims

6. A vacuum system comprising:
a cryopump for evacuating a chamber;
an ejector pump in direct communication with the cryo-

pump through a valve for removing gas from the cryopump during regeneration; and



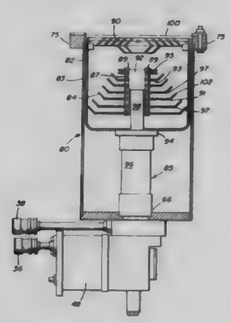
a source of pressurized, substantially inert gas in communication with the ejector pump for use as the actuating fluid in the ejector pump.

4,718,241

CRYOPUMP WITH QUICKER ADSORPTION

Philip A. Leonard, and Bruce R. Anderson, both of Acton, Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 793,707, Oct. 31, 1985, abandoned.
This application Apr. 28, 1987, Ser. No. 52,137
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 10 Claims



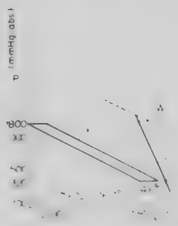
1. A cryopump which comprises:
a refrigerator having first and second stages;
a second stage cryopanel in thermal contact with a heat sink on the second stage of the refrigerator to condense low temperature condensing gases;
a radiation shield surrounding the second stage cryopanel and in thermal contact with a first stage heat sink, and a frontal cryopanel across an opening in the radiation shield serving as a radiation shield for the second stage cryopanel and as a cryopumping surface for higher condensing temperature gases;
the second stage cryopanel comprising an array of discs spaced along an axis perpendicular to the frontal cryopanel, and in close thermal contact with the second stage heat sink, each disc of the array being bent toward the frontal cryopanel at the outer edge of the disc, being flat radially inward from the bend, and being coated with adsorbent material on the surface away from the frontal cryopanel radially inward from the bend in the disc, the outermost edge of each disc being at about the same height as the flat portion of the next disc which lies proximate to the frontal cryopanel.

4,718,242

CHEMICAL HEAT PUMP UTILIZING CLATHRATE FORMATION REACTION

Takao Yamauchi, Yokohama; Kyoya Nishimoto, Chiba, and Nozomu Tanemori, Funabashi, all of Japan, assignors to Shiaryo Corporation, Tokyo, Japan

Filed Dec. 31, 1986, Ser. No. 948,225
Claims priority, application Japan, Jan. 9, 1986, 61-002460; Apr. 28, 1986, 61-096660; May 30, 1986, 61-125373
Int. Cl.[4] F25B *93/00*
U.S. Cl. 62—467 22 Claims



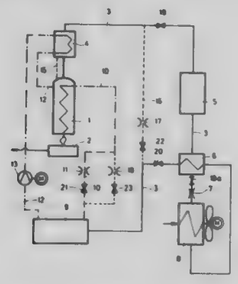
1. A chemical heat pump for raising a temperature of a thermal medium, comprising:
a first heat source;
a second heat source at a temperature lower than a temperature of said first heat source;
a hydrating agent forming a gas hydrate by clathrate formation reaction with water;
first container means for containing and placing the gas hydrate of the hydrating agent in thermal contact with the first heat source, thereby decomposing the gas hydrate into water and gas phase hydrating agent, the hydrating agent absorbing a portion of heat of reaction of gas hydrate decomposition;
first gas conveying means for conveying the gas phase hydrating agent substantially at the pressure at which the gas hydrate is decomposed in said first container means;
second container means connected to said first gas conveying means, for containing and placing said gas phase hydrating agent conveyed by said first gas conveying means in thermal contact with the thermal medium under an equilibrium reaction substantially at a pressure at which the hydrating agent is conveyed by the first gas conveying means, and at a temperature higher than the temperature of the first heat source, the hydrating agent releasing a heat of reaction of said equilibrium reaction, thereby heating the thermal medium to a temperature higher than the temperature of the first heat source, the heat of reaction of said equilibrium reaction being less than a heat of reaction of clathrate formation reaction of the hydrating agent;
third container means for containing and placing material formed in said equilibrium reaction in said second container means in thermal contact with said first heat source at a pressure lower than the pressure of the equilibrium reaction, thereby evolving the gas phase hydrating agent;
second gas conveying means for conveying the hydrating agent evolved in said third container means substantially at a pressure at which the hydrating agent is evolved; and
fourth container means connected to said second gas conveying means, for containing and placing the hydrating agent in thermal contact with the second heat source substantially at a pressure at which the hydrating agent is conveyed by said second gas conveying means, the hydrating agent being in contact with water and forming the gas hydrate by the clathrate formation reaction.

4,718,243

HEAT PUMP SYSTEM AND A METHOD OF OPERATING SAME

Winfried Buschulte, Neuenstadt a.K., and Lutz Mardorf, Hardthausen, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Raumfahrt e.V., Cologne and Mobile Oil AG, Hamburg, both of, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,173
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518276
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—101 13 Claims



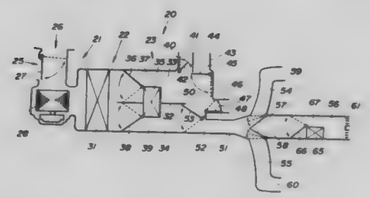
1. A method of operating a heat pump system in an absorption heat pump mode and/or boiler heating mode, comprising the steps of:
(a) heating a solution of a refrigerant in a solvent in a boiler;
(b) delivering the resultant evaporated refrigerant to an absorber through a condenser, through a throttle and through an evaporator when in the heat pump mode, or directly to the absorber when in the boiler heating mode;
(c) combining the refrigerant with the solvent that is drawn, low in refrigerant, from the boiler;
(d) returning the resulting rich solution to the boiler;
(e) providing for the system to be shut down by turning off the heating of the boiler;
(f) additionally closing the flow line connecting the boiler with the absorber when the shut-down is effected; and
(g) opening the refrigerant flow line from the boiler to the absorber when pressure in the boiler exceeds a maximum value for a short period of time necessary for pressure in the boiler to drop back below the maximum level.

4,718,244

AIR CONDITIONER

Shigeru Kobayashi, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1986, Ser. No. 828,359
Claims priority, application Japan, Mar. 8, 1985, 60-44656
Int. Cl.[4] F25D *17/08*
U.S. Cl. 62—176.5 8 Claims



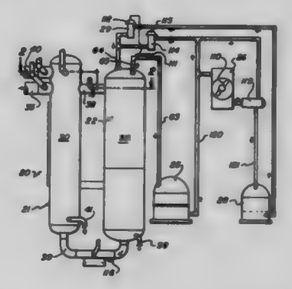
1. An air conditioner for a vehicle including a front windshield and a passenger compartment having a front and a rear segment, the front windshield defining at least part of the front segment of the passenger compartment, the air conditioner comprising:
(a) first means for providing conditioned air into the front segment of the passenger compartment;
(b) second means for providing conditioned air into the rear segment of the passenger compartment;
(c) third means for humidifying the conditioned air provided into the rear segment of the passenger compartment by the second means;
(d) fourth means for selectively activating and deactivating the third means; and
(e) fifth means, responsive to activation and deactivation of the fourth means, for compensating for variations in the temperature of the conditioned air provided by the second means, said temperature variations resulting from changes between activation and deactivation of the third means.

4,718,245

REFRIGERATION SYSTEM WITH BYPASS VALVES

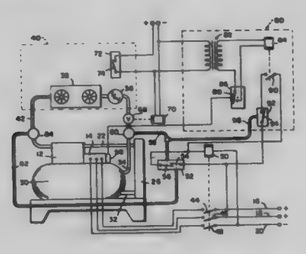
Leon R. Van Steenburgh, Jr., 1900 S. Quince St., Unit G, Denver, Colo. 80231

Continuation-in-part of Ser. No. 860,135, May 6, 1986, Pat. No. 4,689,969. This application Nov. 6, 1986, Ser. No. 927,890
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—196.4 11 Claims



1. A refrigeration system comprising, in combination, an evaporator, means controlling the flow of a liquid refrigerant at a reduced pressure to said evaporator for producing a gaseous refrigerant at a lower pressure and temperature in said evaporator, a compressor for receiving said gaseous refrigerant from said evaporator and compressing said refrigerant to produce a refrigerant at an increased temperature and pressure, a condenser remote from said compressor and evaporator for receiving said refrigerant at increased temperature and pressure and condensing the same to a liquid, a receiver for receiving said condensed liquid refrigerant, means normally supplying said condensed liquid from said receiver to said evaporator flow controlling means, said condenser being subject to low temperatures on the order of about −20° C., a first bypass valve for supplying gaseous refrigerant at said increased pressure and temperature to the interior of said receiver and bypassing said condenser when the pressure in said receiver falls below a predetermined value, and a second bypass valve for supplying gaseous refrigerant at said increased pressure and temperature directly to said evaporator and bypassing said evaporator flow controlling means when the pressure in said evaporator falls below a predetermined value.

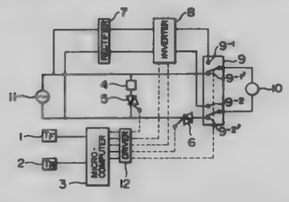
4,718,346
PRESSURE CONTROL OVERRIDE
Charles F. Mitchell, 133 Carlin Dr., Carmel, Ind. 46032
Filed Sep. 2, 1986, Ser. No. 902,588
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—208 5 Claims



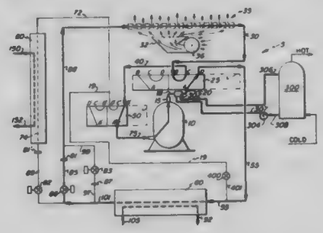
1. A pressure control override apparatus for overriding a conventional pressure control starting switch on a refrigeration system, the refrigeration system having a compressor with a pump-down cycle, an evaporator, a liquid line for conducting a compressed refrigerant between the compressor and the evaporator, and an electrically activated solenoid valve mounted in the liquid line for alternatively opening the liquid line when power is applied to the valve and a closing said liquid line when power is removed from the valve, the apparatus comprising:
a first circuit;
means for alternatively powering said first circuit when power is applied to the solenoid valve, and for removing power from said first circuit when power is removed from the solenoid valve;
an ambient temperature sensing switch in said first circuit and configured to sense the ambient temperature at a location substantially adjacent the compressor, the switch configured to close said first circuit when the ambient temperature falls below a preselected level, and to open said first circuit when the ambient temperature raises above said preselected level; and
a second circuit configured to start said compressor separate from said pressure control starting switch when said second circuit is closed, including a relay switch in said second circuit configured to close said second circuit only when both said first circuit is closed and said first circuit is powered by said powering means, and
a normally closed high pressure safety switch in said second circuit configured to open said second circuit when the pressure in said liquid line reaches a predetermined excessive level.

4,718,247
REFRIGERATOR TEMPERATURE CONTROL SYSTEM
Minoru Kobayashi, Tochigi; Koichi Iizuka, Ashikaga; Ryoichi Fujimoto, Tochigi, and Morio Kobayashi, Oyama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 17, 1986, Ser. No. 908,659
Claims priority, application Japan, Sep. 25, 1985, 60-209505
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—228.4 3 Claims

1. A temperature control system for a refrigerator having a compressor for compressing a refrigerant, said system comprising:
means for converting a first AC power level of a first frequency into a second AC power level of a second frequency higher than said first frequency;
switching means for selectively connecting the compressor to any one of said first AC power level and said second AC power level;
temperature detector means for detecting an internal temperature of the refrigerator; and control means responsive to the detected internal temperature of the refrigerator to operate said switching means so as to connect said compressor to said first AC power level when said detected internal temperature is above a predetermined temperature level and to connect said compressor to said second AC power level when said detected internal temperature remains above said predetermined temperature level for at least a predetermined time interval.

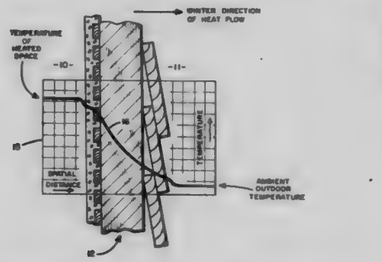


4,718,248
FOUR ELEMENT REFRIGERATION HEAT PUMP AND GEOTHERMAL CONTROL SYSTEMS
Stephen Fisher, 2350 SE. Floresta Dr., Port St. Lucie, Fla. 33452
Filed May 5, 1986, Ser. No. 859,795
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.7 14 Claims



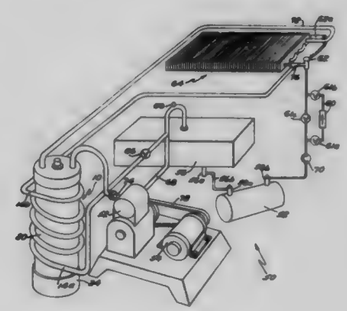
1. A building heating and cooling system for using waste heat to thermally energize thermal storage media to control the temperature of a relatively large pool of water, comprising:
conduit means for circulating the water in said pool;
a heat pump having a single refrigerant fluid compressor with a suction inlet and a pressure discharge outlet;
a refrigerant fluid for use in said compressor;
a first fluid-to-fluid heat exchange means in fluid communication with said pressure discharge of said compressor;
a first refrigerant fluid reversing valve means in fluid communication with said first fluid-to-fluid heat exchange means;
a second fluid-to fluid heat exchange means in fluid communication with said first reversing valve means, said second fluid-to-fluid heat exchange means having a first input and output and a second input and output, said second heat exchange means for indirect heat exchange with the water in said pool or spa
a fluid-to-air heat exchange means for indirect heat exchange between said refrigerant fluid in said fluid-to-air heat exchange means and an airspace, said fluid-to-air heat exchange means being fluidly connected to said first output of said second heat exchange means and directly to said first refrigerant fluid reversing valve means without passing through said second reversing valve means;
a second refrigerant fluid reversing valve means in fluid communication with said suction inlet of said refrigerant fluid compressor, said second refrigerant fluid reversing valve means for selectively diverting refrigerant fluid flow from heat exchange components within said system to said suction inlet of said compressor;
refrigerant fluid conduit means associated with each of said heat exchange means, said compressor, said first refrigerant fluid reversing valve means and said second refrigerant fluid reversing valve means;
valve means operably defining a refrigerant fluid conduit pathway together with said first and second reversing valve means for directing fluid flow direction through said refrigerant fluid conduit pathway wherein said second fluid to fluid heat exchange means operates as a condenser in indirect heat exchange with said conduit means for circulating pool water.

4,718,249
APPARATUS FOR HEATING AND COOLING
Wallace G. Hanson, Rte. 2, Box 103, Dodge Center, Minn. 55927
Continuation of Ser. No. 600,481, Apr. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 371,116, Apr. 23, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,703
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 10 Claims



1. A cooling system in combination with an enclosed structure having inside and outside walls, ceilings and floors and the like, comprising:
(a) said outside walls having heat insulating properties and having means for preventing the flow of air therethrough;
(b) said inside walls having heat insulating properties and having means for preventing the flow of air therethrough;
(c) an intermediate region confined between said outside walls and said inside walls;
(d) a heat pump mechanism placed inside said enclosed structure inside walls and a heat energy transfer medium associated therewith, said heat pump having means for passing said heat energy transfer medium therethrough and for transforming said medium thereby to release heat energy from said medium;
(e) a heat energy radiator located in said intermediate region and coupled to said heat pump to permit the passage of said heat energy transfer medium therebetween, said heat energy radiator having a passage therethrough for said heat energy transfer medium and having means for radiating heat energy therefrom; and
(f) a heat energy absorber inside said enclosed structure inside walls, and coupled to said heat pump to permit the passage of said heat energy transfer medium therebetween, said heat energy absorber having a passage therethrough for said heat energy transfer medium and having means for absorbing heat energy from inside said enclosed structure into said heat energy transfer medium.

4,718,250
COMPACT HEAT EXCHANGER FOR REFRIGERATION SYSTEMS
James Warren, 576 Maple Ave., Teaneck, N.J. 07666
Filed Jul. 7, 1986, Ser. No. 881,370
Int. Cl.[4] F25B *47/00*
U.S. Cl. 62—278 5 Claims



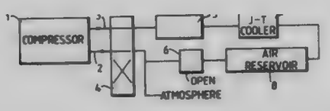
1. In combination with a vapor/compression refrigeration system, a defrosting apparatus for receiving mixed phase refrigerant emanating from the system evaporator outlet during system defrost, and transmitting only superheated gaseous refrigerant to the system compressor inlet, said defrosting apparatus comprising:
a cylindrical metal body having a preselected length, diameter and wall thickness, and top and bottom ends;
a metal defrost tube means having a first tube end, a second tube end, a plurality of helical tubular coils formed therebetween and a defrost valve, said defrost valve outlet being fixedly attached to said second tube end, the inlet of said defrost valve being fixedly attached to the outlet of said compressor, said first tube end being fixedly attached to said evaporator inlet, and said tube coils further being disposed about and fixedly attached to the outside surface of said body, for receiving high temperature, high pressure gaseous refrigerant from said compressor outlet upon opening of said defrost valve and transmitting said high pressure gaseous refrigerant therethrough to said evaporator inlet such that heat from said refrigerant gas is transmitted from said coils, through said wall thickness and into the interior of said body;
a first metal end cap, fixedly attached to said bottom end of said body, for sealably enclosing said bottom end;
a second metal end cap, fixedly attached to said top end of said body, for sealably enclosing said top end thereby forming, in cooperation with said first cap, a chamber therewithin;
a first metal standpipe tube, passing through and fixedly attached to said second end cap, and extending a first preselected depth into said chamber, for receiving said mixed phase refrigerant from said evaporator outlet and transmitting said mixed phase refrigerant into said chamber, said mixed phase refrigerant absorbing said heat transmitted therein from said coil and transforming said mixed phase refrigerant into superheated low pressure refrigerant gas; and
a second metal standpipe tube, passing through and fixedly attached to said second end cap, and extending a second preselected depth into said chamber, said first depth of said first standpipe being substantially greater than said second depth, for receiving and transmitting only said superheated refrigerant to said compressor inlet.

4,718,251

DE-CONTAMINATED FLUID SUPPLY APPARATUS AND CRYOGENIC COOLING SYSTEMS USING SUCH APPARATUS

John Thornton, Enfield, England, assignor to British Aerospace, England

Filed Mar. 24, 1987, Ser. No. 29,680
Claims priority, application United Kingdom, Mar. 24, 1986, 8607224; May 6, 1986, 8611033
Int. Cl.[4] F25B *43/04*
U.S. Cl. 62—475 7 Claims



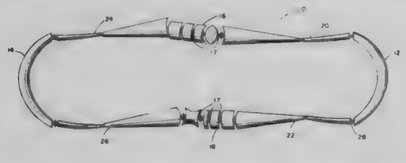
7. A Joule-Thomson cryogenic cooling system comprising a compressor, having an air inlet and a compressed air outlet, a changeover valve arranged to connect either the air inlet, or the air outlet to a contaminant remover and a Joule-Thomson cooler, the arrangement being such that, during cooling the air outlet of the compressor is connected to the contaminant remover to provide a flow of air from the contaminant remover through the Joule-Thompson cooler, the contaminant remover being regenerated by reversing the changeover valve to connect the air inlet of the compressor to the contaminant remover to lower the pressure in the contaminant remover to remove the contaminants from it.

4,718,252

NECKLACE VARIATION FOR A BODY ORNAMENT INCLUDING BALANCING MEANS

Jeannette M. Fossas, Wilson 1085, Santurce, P.R. 00907

Filed Dec. 20, 1985, Ser. No. 811,461
Int. Cl.[4] A44C *15/00*
U.S. Cl. 63—2 20 Claims



1. In a necklace variation for a body ornament having a closable loop with at least four separately identifiable portions thereof,

a first arcuate shoulder rest connected between a first and a second one of said portions for fitting over and conforming to a wearer's shoulder and supporting said ornament;

a second arcuate shoulder rest connected between a third and a fourth one of said portions for fitting over and generally conforming to the other of said wearer's shoulders and supporting said ornament;

a first weight unit connected between said first and third portions for translating its gravitational pull to said first and second arcuate shoulder rests;

a second weight unit connected between said second and fourth portions for translating its gravitational pull to said first and second arcuate shoulder rests and operably counter balancing said first weight unit;

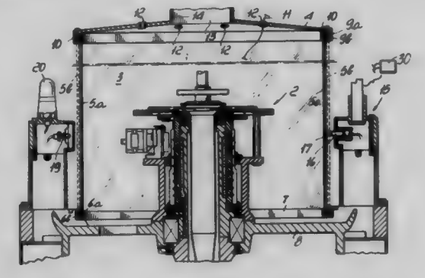
whereby said first and second shoulder rests establish relatively fixed and stable contacts with said wearer's shoulders.

4,718,253

CIRCULAR KNITTING MACHINE FOR PRODUCING STOCKINGS AND THE LIKE WITH A PROTECTIVE SCREEN IN THE PROCESSING AREA

Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia, Italy

Filed Oct. 7, 1986, Ser. No. 916,901
Claims priority, application Italy, Oct. 14, 1985, 23408/85[U]
Int. Cl.[4] D04B *9/00, 35/28, 35/32*
U.S. Cl. 66—8 2 Claims



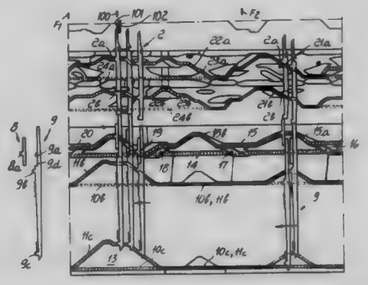
1. Circular knitting machine for producing stockings and the like, including a protective screen in the processing area, wherein the protective screen is comprised of a containment body extending around and above a needle-bearing cylinder to define a chamber containing said needle-bearing cylinder and isolatable from the environment surrounding the machine, said containment body having a lateral surface made of at least two parts, of which at least one is movable with respect to the other for opening or closing said chamber, and including means for the passage of threads passing through said containment body for feeding the machine and a locking device, for detecting the opening or the closing of said chamber, said locking device being connected to a main switch of the machine.

4,718,254

TWIN-CYLINDER CIRCULAR KNITTING MACHINE WITH A PERFECTED DEVICE FOR ACTUATING THE TRANSFER SINKER

Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia, Italy

Filed Nov. 28, 1986, Ser. No. 935,920
Claims priority, application Italy, Dec. 2, 1985, 23047 A/85
Int. Cl.[4] D04B *9/10*
U.S. Cl. 66—14 10 Claims



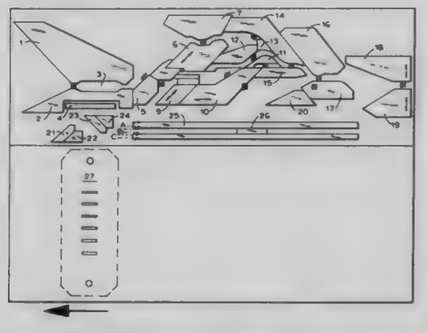
1. Twin-cylinder circular knitting machine with a perfected device for actuating the transfer sinkers, comprising a plurality of selectors which are slideably accommodated in the grooves of the lower needle-bearing cylinder and each act each with its upper end on a transfer sinker for moving the corresponding needle, characterized in that in a same groove of the lower needle-bearing cylinder is accommodated, proximate to the upper end of the selector, a pusher element controllably engageable with the lower end of the corresponding transfer sinker, control means being provided for operating said pusher element independently from the selector.

4,718,255

COMBINED KNITTING AND LOOP TRANSFER CAM ARRANGEMENT FOR KNITTING MACHINES

Klaus Grünzel, Limbach-Oberfrohna; Günther Kessler, and Günther Tröbs, both of Karl Marx Stadt, all of German Democratic Rep., assignors to Veb Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Jun. 25, 1986, Ser. No. 878,130
Claims priority, application German Democratic Rep., Jun. 25, 1985, 2777184
Int. Cl.[4] D04B *7/00*
U.S. Cl. 66—78 5 Claims



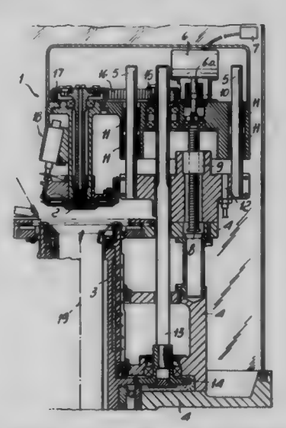
1. In a combined knitting and loop transfer cam arrangement for knitting machines, comprising a knitting carriage running in one direction over the needle beds, knitting needles, sinkers in accordance to which the knitting needles are selected for a pattern-responsive knitting process, pressure bars for pressing the knitting needles away from a influence range of a cam system, inflow cams, loop acceptance and loop transfer cams, tuck cams, clearing cams, needle spring cams and limiting cams, wherein a clearing cam serves at the same time for a loop acceptance and for separating of a knitting needle course for a loop transfer, and a first switchable cam (5) is provided for loop acceptance and tuck-or-loop formation, the improvement comprising a switchable pressure bar (4) for pressing the knitting needles during a sinker selection; a selecting system (27) for sinkers, said switchable pressure bar being arranged at the height of said inflow cams over a region of said selecting system, a tuck cam positioned subsequent to said first switchable cam (5) for optimal adjustment of a tuck and loop transfer position and subdivided into a first cam member (9) displaceable in the direction of elongation of the needles and a second cam member (10) displaceable in the direction of moving of the knitting carriage; a second switchable cam (13) for a form-locking guidance of the knitting needles in the region of a clearing cam (11) and for freeing a path for the knitting needles arriving from a loop transfer position to a limiting cam (12); and combing cams (18, 19) for adjustment to a material being knitted and to a binding formed in the direction of raising of the needles.

4,718,256

KNITTING MACHINE OR THE LIKE WITH A DEVICE FOR RAISING AND LOWERING THE PLATEN

Francesco Lonati, Brescia, Italy, assignor to LONATI S.p.A., Brescia, Italy

Filed Oct. 7, 1986, Ser. No. 916,903
Claims priority, application Italy, Oct. 14, 1985, 23466 A/85
Int. Cl.[4] D04B *15/18*
U.S. Cl. 66—95 3 Claims



1. Knitting machine or the like, with a device for raising and lowering the platen, comprising a frame, associated with the supporting structure of the machine, which supports the platen above the needle-bearing cylinder, guiding means for sliding said frame with respect to said supporting structure parallel to the axis of said needle-bearing cylinder a step motor which is connected to an electronic member for controlling the machine and which acts on moving means connected to said frame and to said supporting structure to perform the above described sliding according to a preset program, said moving means being in the form of a threaded shaft, rotatably supported by said frame and associated coaxially with the output shaft of said step motor, said threaded shaft being arranged parallel to the axis of said needle-bearing cylinder.

4,718,257

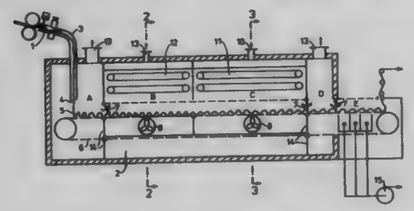
PROCESS AND AN APPARATUS FOR CONDITIONING SYNTHETIC FIBER MATERIAL

Ulrich Heinzler; Rolf-Burkhard Hirsch; Woldram Wagner, all of Dormagen, and Erich Hilgerath, Remscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 729,589, May 1, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 921,758
Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418942
Int. Cl.[4] D06B *3/10*
U.S. Cl. 68—5 E 2 Claims

1. An apparatus for conditioning continuously dry spun synthetic fibers with at least 40% by weight of acrylonitrile units, comprising: a perforated belt steamer sealed in a steam-tight manner and having at least zones A to D separated from each other and a single perforated belt for conveying crimped fiber through zones A, B, C and D in that order, wherein zone A has a fiber inlet device sealed with a sealing flap and a suction device for drawing solvent-charged steam from zone B, wherein there is at least one zone B disposed upstream of zone C in the conveying direction of the fiber and each has a ventilator for circulating the steam within the zone, a heat exchanger for superheating steam; a suction device for drawing solvent-charged steam from zone C counter current to the

conveying direction of the fiber material, zone C has a ventilator for circulating the steam within the zone, a heat exchanger for superheating steam and a steam supply inlet device for



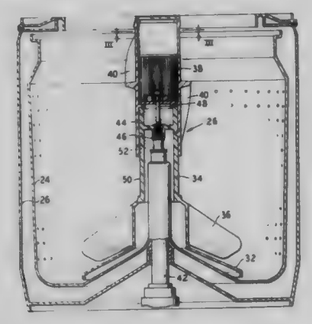
receiving steam, wherein guide plates separate zones B and C from each other and zone D has a suction device for drawing solvent-charged steam from zone C and fiber inlet and outlet sealed with sealing flaps.

4,718,258

REVERSING DRIVE FOR TRIPLE ACTION AGITATOR

Anthony Mason, and Victor W. Cuthbert, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 7, 1986, Ser. No. 848,936
Int. Cl.[4] D06F *17/08*
U.S. Cl. 68—133 **11 Claims**



11. In an automatic washer having a basket for receiving clothes to be washed, an agitator means within said basket for agitating the clothes during a wash cycle, said agitator means including an upper portion, and motor means drivingly connected to said agitator, a secondary agitation means mounted on said agitator for enhancing rollover of said clothes in said basket during agitation, said secondary agitation means comprising:

a driven thruster barrel surrounding said upper portion of said agitator;

said driven barrel having vane means on an exterior portion for forcing clothes downwardly along said upper portion of said agitator;

said driven barrel further provided with inwardly projecting pegs;

said driven barrel still further having an internally splined portion extending around the entire periphery of said driven barrel;

said upper portion of said agitator barrel containing a recessed area for receiving said pegs, said recessed area comprising helical grooves extending vertically and angularly around the exterior of said upper portion of said agitator;

a clutch means including a clutch member mounted on said drive barrel and being pivotable between two positions to selectively engage said thruster barrel; said clutch member having two opposed arms with outwardly directed teeth to selectively engage with said splined portion of said driven barrel to prevent rotary motion between said two barrels when said drive barrel is rotating in a first direction, but to permit rotary motion between said two barrels when said drive barrel is rotating in a second, opposite direction with said clutch member in a first engaged position, and with said clutch member in a second engaged position, and with said clutch member in a second engaged position, rotary motion between said two barrels is permitted when said drive barrel is rotating in said first direction and is prevented when said drive barrel is rotating in said second direction;

two inwardly projecting shift pegs carried on said driven barrel, vertically and angularly spaced apart to alternatively engage said clutch member and alternatively urge it into said two positions; and

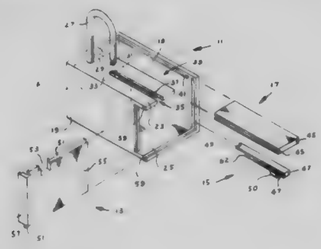
an over-center spring to bias said clutch member into a selected one of said two positions until one of said shift pegs engages and urges said clutch member into the other of said positions.

4,718,259

KEYSAFE

Paul Appelbaum, Lakewood, Colo., assignor to Hampton Lock Co., Inc., Denver, Colo.

Continuation-in-part of Ser. No. 846,040, Mar. 31, 1986, abandoned. This application Feb. 2, 1987, Ser. No. 6,334
Int. Cl.[4] E05B *65/52*
U.S. Cl. 70—63 **6 Claims**



1. Keysafe comprising:

a. main storage case having top wall, spaced apart side walls, rear wall, and a bottom wall;

b. padlock affixed within said main case with the shackle of said padlock extending through the top wall of said case and with the padlock opening for receiving the free end of said shackle being located towards the front end of said case, and a channel in said top wall extending from said opening to the front edge of said top wall;

c. latch bar which is biased rearwardly and slidably mounted for movement along said channel, said bar having a cammed rear end that lies partially within said top wall opening when said shackle free end is not received in said opening and a stop that depends from the bottom of said latch bar and abuts against the inner wall of a lid, to prevent further movement of said latch bar and lid; and

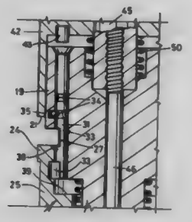
d. lid which is slidably mounted to the front end of said case for movement for opening and closing the front of said case, said lid having means thereon for receiving, when it is closed over the front of said case, the front end of said latch bar to hold said lid against sliding motion, said lid holding engagement occuring when said shackle free end is moved into said opening and downwardly to engage said cammed rear end of said latch to urge said latch into engagement with said latch receiving means.

4,718,260

COMBINATION LOCK

Andrew R. Larking, and Richard N. Swincer, both of 5 Wildwood Road, Happy Valley, South Australia 5159, assignors to Craig R. Bott; Andrew R. Larking and Richard N. Swincer, all of, Australia

PCT No. PCT/AU84/00245, § 371 Date Jul. 24, 1985, § 102(e) Date Jul. 24, 1985, PCT Pub. No. WO85/02438, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 23, 1984, Ser. No. 768,484
Claims priority, application Australia, Nov. 25, 1983, PG2563
Int. Cl.[4] E05B *37/16*
U.S. Cl. 70—299 **7 Claims**



1. In a combination type lock having a hollow base containing a central plunger, a reset surface on the base, a circular surface fixed with respect to the base and having a plurality of notches therein, a plurality of lock plungers carried by the central plunger for movement relative thereto in an axial direction, each said lock plunger having a portion capable of being contained within a respective said base notch to thereby inhibit rotation of the central plunger but each said lock plunger also having a notch, so arranged that there is a plane which, if all said plunger notches lie therein, the lock plungers cease to inhibit rotation,

improvements whereby the lock plungers are equally spaced from one another on a pitch circle, except for one blank space, said central plunger being guided for both rotational and slidable movement in the hollow base, a selection knob obscuring the lock plungers, means guiding the selection knob for rotational and axial slidable movement with respect to the central plunger, and a push pin carried by the selection knob operable to selectively depress said lock plungers, but when located over said blank space, said push pin being operable to depress said central plunger together with said lock plungers, abutting the lock plungers against the reset surface, and thereby effect reset of the lock plungers in said central plunger.

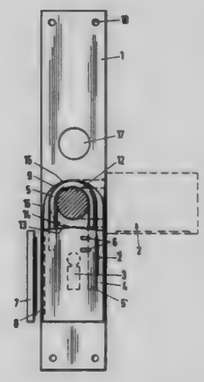
4,718,261

SAFETY ARMATURE FOR A DOOR LOCK

Manfred Kunz, Grunderfstr. 8, D-1000 Berlin 27, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,490
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530620
Int. Cl.[4] E05B *17/14*
U.S. Cl. 70—428 **3 Claims**

1. Safety armature for a door lock, in particular a cylinder lock, with a safety element for the key aperture and/or the keyway, characterized in that the safety element is in the form of a magnetically encodeable closure which, in the locked position, inaccessibly covers the opening of the key aperture and/or keyway and is mechanically latched, and which, after a magnetic unlatching by means of a coded magnetic disc applied to the coding side of the closure, can be moved into the open position and unblocks the opening of the key aperture and/or keyway, the closure comprising a magnetically encodeable padlock (4) that is provided with a steel shackle (5) and the safety armature (1) being firmly connected to a locking and guide element (9) which is formed by two segmental guide disks (10,11) for the locking bolt edge (14) of the padlock (4)



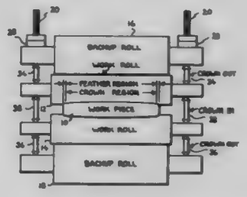
and a circular guide disk (12) for the steel shackle (5) mounted between them.

4,718,262

METHOD FOR CONTROLLING EDGE TAPER IN METAL ROLLING MILL

Donald J. Papiano, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 23, 1982, Ser. No. 371,366
Int. Cl.[4] B21B *37/12*
U.S. Cl. 72—6 **6 Claims**



1. For use in a metal rolling mill having at least one pair of opposed workrolls for reducing the thickness of a metal workpiece passed therebetween, a method for controlling edge taper on the workpiece produced to a specified final gage and crown comprising the steps:

(a) establishing a target rolling pressure for the final pass of the workpiece through the workrolls as a function of a desired maximum amount of edge taper;

(b) establishing a target crown for the workpiece after said final pass;

(c) determining a final roll crown which will produce the target crown for the workpiece using said target rolling pressure; and,

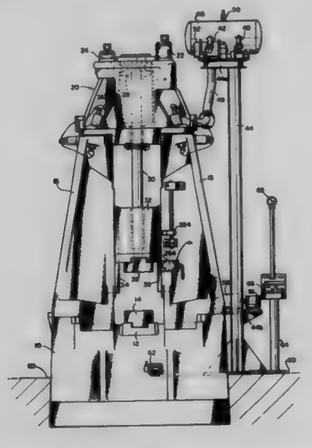
(d) adjusting the crown of said rolls to said final roll crown.

VOL 1086 ISS 2 JA 12 1988 UMI

4,718,263
METHOD OF CONTROLLING OUTPUT ENERGY IN A FORGING HAMMER BY ANTICIPATIVE SENSING OF INPUT PARAMETERS

Charles J. Croot, Chambersburg; Ronald N. Harris, Ft. Loudon, and Charles W. Frame, Chambersburg, all of Pa., assignors to Chambersburg Engineering Co., Chambersburg, Pa.

Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300.
This application Jan. 5, 1987, Ser. No. 512
Int. Cl.[4] B21T 9/20
U.S. Cl. 72—8 1 Claim



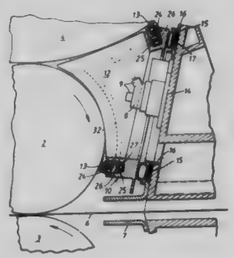
1. The method of obtaining a preselected kinetic energy at the time of impact in blows of a ram of a forging hammer in a system employing an impact device driven by compressible fluid having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram such that the ram is repeatedly movable relative to the frame from a retracted position into impact position, a driving fluid system including a compressible fluid supply, valve means connecting said compressible fluid supply into said at least one cylinder through at least one inlet port at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, and a trapped volume of compressible lifting fluid causing the ram to be retracted from impact position when fluid driving the ram into impact is released from the cylinder, comprising: sensing one or more of the following: pressure of the compressible inlet fluid, residual velocity of the ram at the position at which at least one inlet port is uncovered by the piston, position of the piston at the time of fluid admission and pressure of the lifting fluid; correlating the sensed parameters in connection with predetermined criteria; using the correlation to determine a range of possible kinetic energy at impact and comparing with a preselected kinetic energy input demand; and making adjustments at the valve means so that the anticipated kinetic energy will be at the preselected level at ram impact.

4,718,264
LUBRICATION OF ROLLING MILLS

David W. Guppy, Broadstone; Neil Winkley, Bournemouth, and Joseph L. Watson, Nursling Green, all of United Kingdom, assignors to Davy McKee (Poole) Limited, Poole, England

Filed Jun. 6, 1986, Ser. No. 871,376
Claims priority, application United Kingdom, Jun. 10, 1985, 8514596
Int. Cl.[4] B21B 27/10
U.S. Cl. 72—201 10 Claims

1. A rolling mill comprising:
a plurality of mill rolls;
means for directing liquid coolant onto the rolls at the ingoing side of the mill:
one or more fixed backing supports on which are mounted the coolant directing means;
a casing or casings enclosing the coolant directing means and having contact seals engaging the rolls to prevent

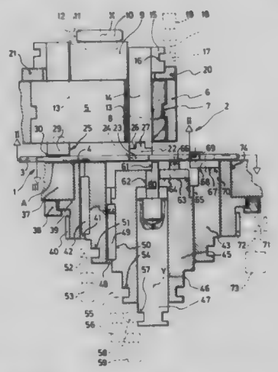


unwanted egress of coolant from the casing or casings onto work entering the mill; and
inflatable sealing means between the casing or casings and the fixed backing support or supports, whereby the position of the casing or casings can be adjusted dependent on the diameters of the rolls.

4,718,265
BENDING APPARATUS FOR ROD- OR RIBBON-SHAPED MATERIAL

Friedhelm Post, Bad Säckingen, Fed. Rep. of Germany, assignor to Alpha Maschinenbau Ag, Zurich, Switzerland

Filed Mar. 5, 1986, Ser. No. 836,305
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3508809
Int. Cl.[4] B21D 7/02
U.S. Cl. 72—217 23 Claims

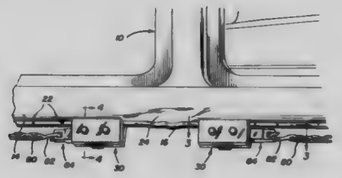


1. A bending apparatus for bending rod-shaped or ribbon-shaped materials, comprising a bending station disposed in a work plane and including at least one bending core mounted for vertical displacement relative to said work plane, and at least one rotary body carrying at least one bending finger mounted for rotation about said bending core and for vertical displacement with respect to said work plane, characterized in that said bending core is mounted together with at least one further bending core for selective employment in a bending operation, in a turret head (5) mounted above said work plane for rotation around a stationary axis (X) of rotation into at least one operating position of a plurality of possible positions, and that said turret head (5) is operatively connected to a rotary drive means.

4,718,266
PINCH WELD PULL CLAMP

Davis R. Jarman, Rte. 1, Box 844B, Hortense, Ga. 31543, and Virgil H. Hinson, 206 Fairway Oaks Dr., Brunswick, Ga. 31525

Filed Jun. 19, 1986, Ser. No. 876,161
Int. Cl.[4] B21D 1/12
U.S. Cl. 72—422 5 Claims

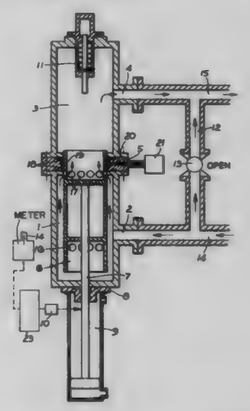


1. A sheet metal margin edge pull clamp including a pair of elongated, generally planar, laterally spaced and generally parallel plates, said plates each including a pair of generally parallel opposite side marginal portions and a pair of opposite end transverse marginal portions, said plates being disposed with said pairs of opposite side and end marginal portions registered with each other, said pair of opposite side and end marginal portions of said plates including sheet metal gripping projections spaced along and projecting toward the other plate with the projections spaced along one marginal portion being interposed between the projections on the corresponding marginal portion of the other plate for contact of the outer extremities of the projections of each plate marginal portion with the opposing side of the corresponding marginal portion of the other plate, a pair of threaded shank-type clamp fasteners spaced apart along said plates and generally equally from said opposite end and side marginal portions and operably connected between said plates to adjustably, positively, draw the central portions of said plates together, one end marginal portion and one side marginal portion of at least one of said plates including an outstanding elongated rib carried by an extending along the corresponding marginal portion, said ribs being generally keyhole shaped in transverse cross-section, an anchor member, said anchor member defining a keyhole-shaped slot in one marginal portion therein in which said ribs are selectively removably slidably receivable, said anchor member also including a second marginal portion remote from said one marginal portion of said anchor member defining an anchor eye, said rib carried by said one end marginal portion of said one plate being generally centered relative to a plane containing said fasteners and said rib carried by said one side marginal portion of said one plate being disposed in a plane normal to said one plate and generally centered between second and third planes normal to said one plate and containing said fasteners, the positioning of said ribs relative to said shank-type fasteners enabling a pull on an anchor member engaged with the rib on said one end marginal portion of said one plate to be evenly distributed relative to sheet metal clamped between the remote end marginal portions of said plates and a pull on an anchor member engaged with the rib on said one side marginal portion of said one plate to be evenly distributed relative to the sheet metal clamped between the remote side marginal portions of said one plate.

4,718,267
METER PROVERS

Graham Capper, 15 Turnberry Way, Dinnington, Sheffield S31 7TA, England

Filed Aug. 18, 1986, Ser. No. 897,648
Int. Cl.[4] G01F 25/00
U.S. Cl. 73—3 15 Claims

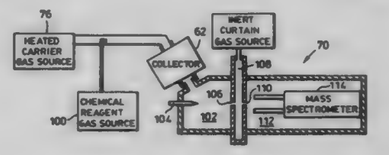


1. A meter prover comprising an upstream chamber with one port, a downstream chamber with another port, either port being for connection to a meter to be proved, a piston body within and bridging the chambers, said piston body having an outer diameter less than a minimum inside measurement across each chamber to form a space around the piston body within either chamber, a stationary seal housing projecting radially inwardly of and positioned between the two chambers, and a fixed sealing ring projecting radially inwardly from said housing and in sealed engagement with the piston body, an independent actuator to initiate a proving run of the piston body from one chamber to the other, a detector unit for the start and end of the proving run, and port openings at at least one end of the piston body providing fluid communication between the chambers prior to the onset of the proving run.

4,718,268
METHOD AND APPARATUS FOR DETECTING A CONTRABAND SUBSTANCE

Neil M. Reid, and William R. Davidson, both of Thornhill, Canada, assignors to British Aerospace Public Limited Company, Bracknell, England

Filed Jun. 4, 1985, Ser. No. 741,052
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G01N 1/22, 33/22
U.S. Cl. 73—23 19 Claims



1. A method of detecting a substance in the contents of a container, said substance being of the kind which emits particulates, said method comprising the steps of:
(1) agitating said contents of said container by an agitator

connected directly to said container, immediately prior to step (2) below, and thereby agitating at least some of said particulates present on surfaces in said container thereby causing at least some of said particulates present within said container to become airborne within said container,

(2) sucking air containing said airborne particulates from said container into a collector without vacuuming any surfaces in said container and collecting at least some of said particulates, such collection being without heating said particulates sufficiently to release vapor of said substance therefrom,

(3) then after collecting said particulates, rapidly heating said collected particulates to a temperature above 160° C. to release vapor of said substance therefrom, and

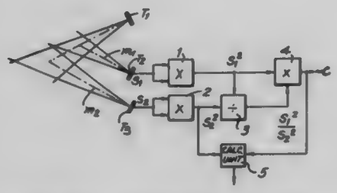
(4) analyzing said vapor for said substance.

4,718,269

SYSTEM FOR MEASURING PARTICLE TRANSPORT IN A FLUID

Wilhelmus J. G. J. Der Kinderen, Delft, Netherlands, assignor to Stichting "Stichting Waterbouwkundig Laboratorium", Delft, Netherlands

Filed Jan. 23, 1985, Ser. No. 748,779
Int. Cl.[4] G01N *29/02*; G01F *1/66*
U.S. Cl. 73—28 14 Claims



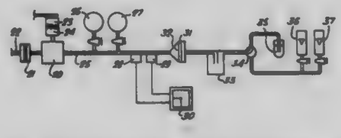
1. In a system for measuring the concentration of objects contained in a fluid, comprising a transmitter for transmitting a wave beam in the direction of a measuring volume in the fluid under the control of an electrical control signal and a first receiver receiving, within a reception beam, waves scattered by the objects in said measuring volume and supplying a corresponding first electrical reception signal, whereby the measuring volume is determined by the intersection of the transmission beam and the reception beam, and a measuring apparatus to which the control signal of the transmitter and the first reception signal of the first receiver are supplied, the improvement wherein the system comprises a second receiver which receives scattered waves from a second measuring volume, determined by the intersection of the transmission beam and the reception beam of the second receiver, and supplies a thereto corresponding second reception signal to the measuring apparatus, whereby the wave propagation path between the transmitter and the second receiver is equal to n times the wave propagation path between the transmitter and the first receiver, where n is an integer, and the measuring apparatus comprises means for forming an output signal which can be expressed as the first reception signal raised to the n-th power, the result thereof being divided by the second reception signal, said output signal at the output of said measuring apparatus representing the concentration of objects contained in the fluid.

4,718,270

POROSIMETER AND METHODS OF ASSESSING POROSITY

Bernard Storr, Kent, United Kingdom, assignor to Coulter Electronics, Ltd., Luton, England

PCT No. PCT/GB84/00170, § 371 Date Jan. 17, 1985, § 102(e) Date Jan. 17, 1985, PCT Pub. No. WO84/04593, PCT Pub. Date Nov. 22, 1984
PCT Filed May 17, 1984, Ser. No. 694,553
Claims priority, application United Kingdom, May 17, 1983, 8313635
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 15 Claims



1. A pore size characterizing device comprising: a gas pressure regulator arranged to be connected to receive a gas supply; a sample holder having an inlet and an outlet, said inlet being connected to said gas pressure regulator to receive gas therethrough, said sample holder being constructed to hold a sample pre-wetted with a liquid having characteristics of a perfluorocarbon, including a low surface tension and a low vapour pressure; a gas pressure sensor connected to said sample holder for measuring the differential pressure of gas across the sample; a gas flow sensor connected to measure the gas flow through the sample; and processing means responsive to said sensors for determining pore size characteristics of the sample.

4,718,271

LOCOMOTIVE LINE TESTER

John L. Garland, Rte. 8, Box 141 A, Corbin, Ky. 40701

Filed Dec. 1, 1986, Ser. No. 936,234
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 9 Claims



1. A portable line testing apparatus for testing the control system of a locomotive, which control system provides control of dynamic braking, traction sanding, and throttle positions of the locomotive, wherein cable connectors are provided at one end of a lead locomotive and at each end of successive locomotives operating under control of the lead locomotive to link the lead locomotive control system to the several locomotives to be controlled, and wherein the control cable connectors have pins for carrying the various control signals, said apparatus comprising:

a housing;

a display board, connected to said housing;

a coupler having a first end connected to said housing and including pin holes on a second end opposite said first end, said pin holes corresponding to the pins of the control cable;

means in said housing for connecting the various control pins from a cable coupler to the display board;

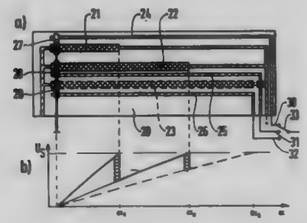
indicating means on said display board for indicating the status of the various control signals.

4,718,272

ADAPTATION METHOD FOR A POSITION DETECTION MEMBER, PARTICULARLY IN A MOTOR VEHICLE

Günther Plapp, Filderstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00366, § 371 Date Jul. 2, 1986, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO86/03258, PCT Pub. Date Jun. 5, 1986
PCT Filed Oct. 5, 1985, Ser. No. 905,381
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442212
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 4 Claims



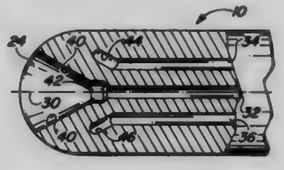
1. Adaptation method for a position detection member, particularly for the detection of positions of a movable control part in a motor vehicle, of the type having a common drive for a plurality of position receivers which scan a plurality of overlapping path areas with different resolutions, comprising the steps of measuring values (W1) in one of said path areas, ascertaining, in the overlapping region of said one path area with another path area to be adapted a correction values (K_i); forming on a basis of the measured values (W1) in said one path area an assignment table T (W1) indicative of desired values of said other path area; adding the ascertained correction value (K_i) to values (M2) measured in said other path area thus forming corrected values (W2) for said other path area; determining a difference value (D) between the corrected values (W2) and the desired values T (W1) and forming in each operating cycle a new correction value (K_{i+1}) depending on the difference value (D).

4,718,273

COMBINATION ALPHA, STATIC AND TOTAL PRESSURE PROBE

William H. McCormack, Tucson, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 31, 1985, Ser. No. 815,406
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—180 27 Claims



1. An air data sensor probe for installation on an aircraft comprising:

a generally cylindrical barrel portion and a rounded nose portion having an exterior wall closing the forward end of the barrel portion, the probe having a central longitudinal axis;

a first opening in the wall of said nose portion, facing generally forward for measuring total pressure, said opening being elongated in a preferred direction which is generally transverse to the central longitudinal axis;

a plurality of off-axis second openings in said nose portion wall, displaced from said first opening, said second openings being interconnected by pairs for sensing pressure which are indicative of angle of attack;

at least one additional opening mounted in said barrel portion rearward of said nose portion for measuring static pressure; and

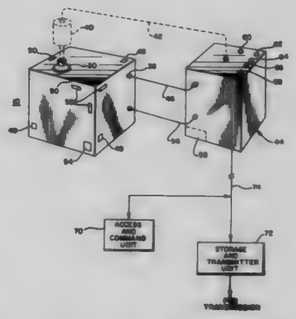
a plurality of conduits coupled to the respective openings for directing the measured pressure signals to a remote location.

4,718,274

GRAVITY METER DIGITIZER

David B. Bell, 714 Bradfield Dr., Garland, Tex. 75042, and Tommy K. Hubbell, 202 Broadway, Whitesboro, Tex. 76273

Filed Sep. 30, 1982, Ser. No. 429,517
Int. Cl.[4] G01M *1/12*
U.S. Cl. 73—382 R 20 Claims



1. A digitizer for a gravity meter having a rotatable gravity readout dial and a null indicator to obtain accurate gravity measurements, said digitizer comprising:

a. a shaft position sensor attached externally of said gravity meter to said readout dial for providing a digital output signal representation of clockwise and counterclockwise rotation of said readout dial during nulling of said indicator,

b. a microprocessor coupled to said shaft position sensor for receiving and storing said sensor digital output signal representation,

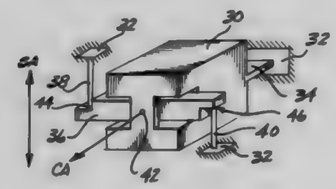
c. means in said microprocessor for analyzing said stored digital output signals from said shaft position sensor and producing and storing a digitized output signal representing gravity in the form of the average position of said readout dial on said gravity meter,

d. means on said gravity meter for generating an analogue error signal representing error in the exact nulling of said indicator by rotating said readout dial, and

e. an analogue-to-digital converter coupled to said gravity meter and said microprocessor for receiving said analogue null error signal and providing a digitized output to said microprocessor for storage whereby said stored gravity signal may be corrected by said stored null error signal.

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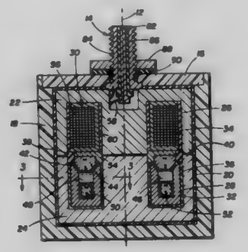
4,718,275
ACCELEROMETER WITH FLOATING BEAM TEMPERATURE COMPENSATION
Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.
Filed Jun. 27, 1986, Ser. No. 879,290
Int. Cl.⁴ G01P 15/10
U.S. Cl. 73—497 **22 Claims**

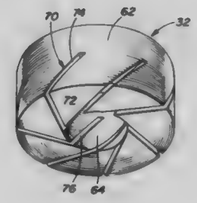


1. An accelerometer for measuring acceleration along a sensitive axis, comprising:
a housing;
a proof mass;
support means for mounting the proof mass with respect to the housing; and
a coupling assembly connected to the proof mass and to the housing, the coupling assembly comprising a pivot member mounted for pivotal movement about a compensation axis normal to the sensitive axis, and first and second force transducers, each force transducer having first and second ends, the first ends being connected to the pivot member at spaced-apart connection points on opposite sides of the compensation axis from one another, the second ends being connected to either the housing or the proof mass such that an acceleration along the sensitive axis results in a compression force on one force transducer and a tension force on the other force transducer, and such that differential thermal expansion or contraction between the force transducers and other accelerometer components results in rotation of the pivot member about the compensation axis.

4,718,276
ANGULAR MOTION SENSOR
Darren R. Laughlin, Albuquerque, N. Mex., assignor to Applied Technology Associates, Inc., Albuquerque, N. Mex.
Filed Apr. 10, 1986, Ser. No. 850,129
Int. Cl.⁴ G01P 15/08; H02K 44/10
U.S. Cl. 73—516 LM **4 Claims**

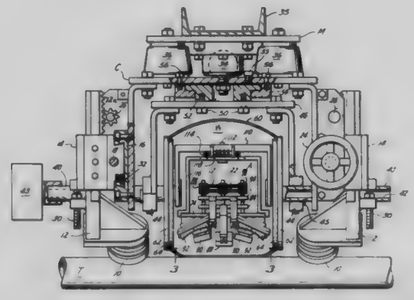
1. In angular motion sensor having an electrically conductive fluid flowing along a predetermined path, means for producing a magnetic field through which the fluid flows along said path and electrode means in contact with said fluid for detecting electric current induced therein, the improvement comprising means for modifying said induced current detected by the electrode means and coupling means mounted in inductive relation to the electrode means for converting the modified induced current into an output signal, said electrode means being a solid annular member within which the fluid is confined, said current modifying means comprising slot means formed in the member at angle to said path for producing a





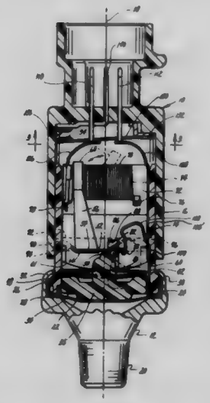
circumferential component of the induced current in the annular member inductively coupled to the coupling means.

4,718,277
METHOD AND APPARATUS FOR CHARACTERIZING DEFECTS IN TUBULAR MEMBERS
James D. Glascock, Houston, Tex., assignor to Sound Optics Systems, Inc., Houston, Tex.
Filed Dec. 12, 1985, Ser. No. 808,343
Int. Cl.⁴ G01N 29/04
U.S. Cl. 73—622 **36 Claims**



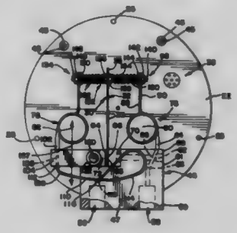
1. A method for ultrasonically inspecting a tubular member, comprising the steps of:
transmitting line-focused sonic beams obliquely through the member with a transducer such that refracted beams are reflected from a rectangle on the inner surface of the member, the rectangle having a longitudinal axis parallel to the longitudinal axis of the member; and
receiving sonic beams reflected from defects in the member.
6. A method for ultrasonicly inspecting a tubular member, comprising the steps of:
simultaneously transmitting sonic beams with an array of transducers such that sonic beams meet witin the tubular member and are reflected from defects in the member; and
receiving reflected beams with the array of the transducers.
10. A method for ultrasonicly inspecting a tubular member, comprising the step of:
providing relative helical motion between the tubular member and at least one line-focused transducer mounted in a search wheel;
positioning the search wheel to follow the relative helical motion between the transducer and the member; and
positioning the transducer within the search wheel such that the line-focused sonic beams are reflected from a rectangle on the inner surface of the tubular member, the rectangle having a longitudinal axis that is parallel to the axis of the tubular member while the search wheel follows the relative helical motion between the transducer and the member.

4,718,278
PRESSURE TRANSDUCER WITH IMPROVED CALIBRATION
Rudolph Bergman, Ann Arbor, Mich., assignor to Hi-Stat Manufacturing Co., Inc., Sarasota, Fla.
Filed Apr. 30, 1986, Ser. No. 857,273
Int. Cl.⁴ G01L 9/02, 19/02, 7/08, 27/00
U.S. Cl. 73—725 **28 Claims**



13. In a pressure tranducer comprising a pressure sensing port, an actuator which is selectively positionable along a straight linear axis in accordance with pressure sensed at said port, an electric circuit element having a length which is transverse to the positionable motion of the actuator, and a pick which is selectively positionable by the actuator along the length of the electric circuit element to cause the pressure transducer to present an electric circuit characteristic as a selectable portion of the electric circuit element in correlation with the sensed pressure, the improvement wherein the pick is coupled with the actuator by a mechanism which comprises a crank pivotally mounted about an axis transverse to the direction of its positioning by the actuator, the pick is caused to swing in an arc about the pivot axis as the crank is operated by the actuator thereby causing the pick to execute an arcuate motion as it is selectively positioned over the length of the electric circuit element, and an adjusting device is provided to act upon the crank for causing the pick to be set to a nominal set-point position, the crank comprises a pivot which is disposed within an apertured portion of a body portion of the pressure transducer, said adjusting device is disposed on said body portion and acts on said pivot, a further apertured portion extending in said body portion on opposite sides of said first-mentioned apertured portion is included, said adjusting device having respective portion disposed within said further apertured portion on opposite sides of said first-mentioned apertured portion, said adjusting device having an intermediate portion which spans said first-mentioned apertured portion and acts on said pivot, and in which said first and further apertured portions are arranged at a right angle and said intermediate portion of said adjusting device spans said first apertured portion at an acute angle to both of said apertured portions.

4,718,279
DUAL BOURDON TUBE TYPE SENSING PRESSURE TRANSDUCER
John Hostick, Glendora, Calif., assignor to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Dec. 1, 1986, Ser. No. 936,366
Int. Cl.⁴ G01L 7/04, 9/04
U.S. Cl. 73—734 **14 Claims**



9. In a fluid pressure transducer assembly of the strain gauge type including a housing defining a chamber, a leaf spring in the chamber, clamping means for mounting a leaf spring in the chamber adjacent one end of the spring cantilever fashion for defining the live length of the leaf spring and a fulcrum about which the leaf spring moves from side to side in a plane extending normally of the leaf spring, with the leaf spring live length being the leaf spring movable component and the leaf spring movable component comprising an electro-mechanical strain gauge sensing transducer electrically connected into a signal conditioning electronic circuit means with the chamber that provides a signal in accordance with the deflection of the leaf spring live length from a zero datum position, means for electrically connecting the circuit means to a source of electrical energy externally of the housing, pressure sensing means mounted in the chamber, and means for connecting the pressure sensing means to a source of pressure fluid, with the pressure sensing means acting on the leaf spring adjacent the other end of same for actuating the strain gauge transducer for effecting a signal generated by the circuit that is proportional to the change in pressure sensed,
the improvement wherein:
said pressure sensing means comprises a first bourdon tube mounted on one side of the leaf spring, and a second bourdon tube mounted on the other side of the leaf spring,
one end of each of said tubes being sealed and mounting an output lever,
with said lever being disposed generally parallel to said leaf spring,
means for resiliently connecting the respective output levers to the leaf spring adjacent the other end of the leaf spring for essentially balanced biasing action of said output levers on said leaf spring,
with the means for connecting the pressure sensing means to a source of pressure fluid comprising the other ends of said tubes each including means for being separately connected to separate conduit means including means for connecting the respective conduit means to a separate source of pressure fluids,
a mounting block being fixed to the housing, and with one of

said output levers being adjustable lengthwise thereof for setting same at its effective length at which said tubes react equivalently when both are exposed to the same fluid pressure at said separate sources of the pressure fluids.

4,718,280

ROLLING LINE WITH MEASURING MEANS

Herrmann Möllner, Grevenbroich, and Hans-Dieter Gerhards, Monheim, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,753
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533120
Int. Cl.[4] G01B 5/30
U.S. Cl. 73—760 3 Claims



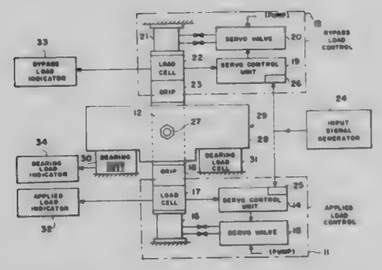
1. A rolling line for rolling tubular or rod-shaped material, having a plurality of rolling stands exchangeably clamped in reception pockets of a base frame closely one after the other, and having a measuring means disposed upstream of the rolling stands at the entry end and beyond the rolling stands at the delivery end and measuring a dimension or other characteristic of the material, each measuring means being supported in or on a measuring roll stand which has the same support and reception surfaces as the rolling stands and which can, like the rolling stands, be inserted and clamped in any reception pocket and like the rolling stands is fixed and immovable in its position thus, unlike the prior art the correct parting and correct attitude are thus resolved.

4,718,281

BEARING-BYPASS MATERIAL SYSTEM TEST

John H. Crews, Jr., Grafton, Va., assignor to The United States of America as represented by the Administrator, National Aeronautics & Space Administration, Washington, D.C.

Filed Feb. 12, 1987, Ser. No. 13,902
Int. Cl.[4] G01N 3/36
U.S. Cl. 73—794 10 Claims



1. A bearing-bypass testing system for testing a specimen containing a central hole comprising:

bearing-reaction plate means attached to said specimen by an elongated member extending through said central hole;

first control means attached to one end of said specimen for applying loads to said specimen either in the direction of or away from said elongated member;

second control means attached to the other end of said specimen for applying loads to said specimen in the direction opposite to the direction to the load applied by the first control means;

bearing load cell means fixed relative to said first control means and attached to said bearing-reaction plate means for measuring the resulting loads on said elongated member;

a signal generator means connected to apply its output signal to said first and second control means to apply either compression or tension loads to said specimen; and

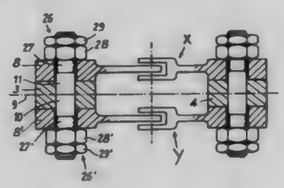
means for applying fixed ratios of the said output signal to said first and second control means whereby the elongated member loads and bypass loads can be measured.

4,718,282

DEVICE FOR MOUNTING RELATIVE DISPLACEMENT SENSORS ON LUGS ON AN AXLE OR A WHEEL LEVER IN AN AIRCRAFT LANDING GEAR

Georges L. A. Bonfils, La Chevrallere, France, assignor to S.F.E.N.A., S.A., Velizy Villacoublay, France

Filed Aug. 15, 1986, Ser. No. 896,827
Claims priority, application France, Aug. 27, 1985, 85 12759
Int. Cl.[4] G01L 1/00, 1/04
U.S. Cl. 73—855 20 Claims



16. A device for independently mounting first and second relative displacement sensors on a pair of lugs constituting an integral portion of an axle or a wheel lever of an aircraft landing gear, each said sensor having a fixing base, and said lugs each having a pair of mutually parallel opposite planar bearing faces, the device comprising for each said lug:

anchor means for each said lug firmly anchored thereto and serving as an anchoring base;

first fixing means for fixing the fixing base of said first sensor to the lug, said anchor means serving as an anchoring base therefor; and

second fixing means for fixing the fixing base of said second sensor to the lug, said anchoring means serving as an anchoring base therefor, with said first and said second fixing means being mounted independently from each other with respect to a respective bearing face of said opposite planar bearing faces.

4,718,283

VORTEX METER BODY

Boris A. Kamentser, Fountain Valley, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 30, 1987, Ser. No. 8,982
Int. Cl.[4] G01F 1/32
U.S. Cl. 73—861.22 3 Claims

1. A one-piece unitary vortex meter body comprising:

(a) an outer housing portion formed as a relatively thin-walled tubular sleeve for forming a conduit therein and with first and second enlarged diameter generally identically dimensioned flange portions at opposite end of said sleeve;

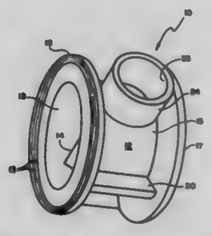
(b) reinforcing rib means extending outwardly from the outer surface of said tubular sleeve and extending between the inner facing surfaces of said flange portions;

(c) bluff body means extending diametrically across the interior walls of said tubular sleeve;

(d) a relatively large diameter columnar protrusion extending from the outer wall of said tubular sleeve on a radial line and terminating beyond the periphery of said flange portions;

(e) receptacle means formed in said protrusion and at least partially in said bluff body means for receiving a vortex sensor assembly;

(f) said bluff body means includes slot means extending therethrough with the long dimension of said slot means



being on the longitudinal centerline thereof, said slot means being configured for receiving a vane portion of the sensor assembly;

(g) said rib means includes a pair of diametrically opposed aligned rib portions, and another radially extending rib generally perpendicular to said aligned ribs; and

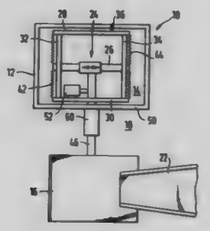
(h) said protrusion has the centerline thereof on the diameter of said another radially extending rib.

4,718,284

BULK FLOW METER

Helmut Pfeiffer, Lörrach, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 852,425
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514987
Int. Cl.[4] G01F 1/20
U.S. Cl. 73—861.73 12 Claims



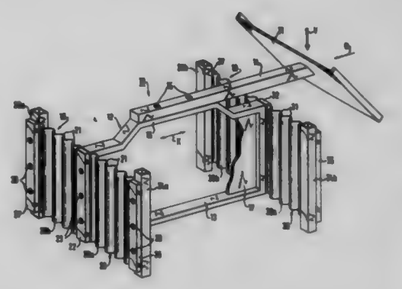
1. Bulk flow meter comprising a measuring chamber separated from the conveying space by a partition, a baffle plate disposed in the conveying space inclined in the fall path of the bulk material to be measured, a horizontally movable baffle plate support which comprises a rod-shaped connecting member projecting through an opening in the partition for supporting the baffle plate, rigid tube means disposed on the baffle plate side of the partition and surrounding a portion of the rod-shaped connecting member, the inner diameter of said rigid tube means being greater than the outer diameter of the rod-shaped connecting member, a first flexible diaphragm connecting one end of said rigid tube means in dust-tight manner to the partition, and a second flexible diaphragm connecting the other end of said rigid tube means in dust-tight manner to the rod-shaped connecting member.

4,718,285

BULK FLOW METER

Helmut Pfeiffer, Lörrach, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 852,521
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514986
Int. Cl.[4] G01F 1/20
U.S. Cl. 73—861.73 10 Claims



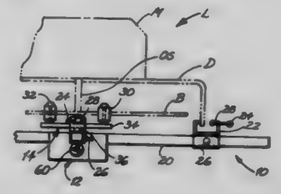
1. A bulk flow meter for measuring the flow of a bulk material, the improvement comprising a main frame and at least one baffle plate which is disposed in the flow and is connected to a rigid support so that it is inclined with respect to the direction of flow, said rigid support being mounted displaceably in the direction of a horizontal axis by at least two spring systems which are in spaced relationship with each other and are secured to both the baffle plate support and to the main frame, each spring system comprising two spring members disposed on opposite sides of the baffle plate support, and each spring member being formed by a corrugated diaphragm section which has straight, parallel, vertical corrugations and is secured to the main frame by a vertical edge portion that is parallel to the corrugations.

4,718,286

DYNAMOMETER SYSTEM FOR ROTARY BLADE-TYPE LAWN MOWERS

Dwain I. Eller, 431 40th Street Ct. East, Bradenton, Fla. 33508

Filed Jul. 3, 1986, Ser. No. 881,791
Int. Cl.[4] G01L 3/20, 3/18, 3/22
U.S. Cl. 73—862.14 6 Claims



1. A dynamometer system for applying a selectable operating load on a rotary-type lawn mower having a motor mounted atop a housing and an output shaft downwardly extending from the motor through the housing, the output shaft having a generally horizontally disposed elongated blade connected thereto at the mid-point of the blade, said system comprising:

lawn mower support means for supportively receiving and securing a rotary-type lawn mower thereupon;

a dynamometer connected to said lawn mower support means and having an input shaft adapted to be operatively engagable with the blade of a rotary-type lawn mower

such that said dynamometer input shaft is rotationally driven during the lawn mower operation;

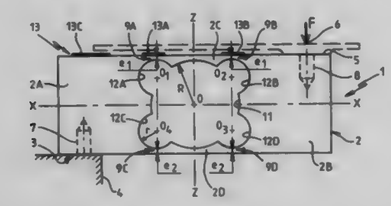
said dynamometer for absorbing a selectable work load output from the lawn mower motor during operation.

4,718,287

FORCE SENSING DEVICE FOR MEASUREMENT APPARATUS

Zvy Mishlborsky, Paris, France, assignor to Esselte Moreau, Saint Maure, France

Filed Jan. 6, 1986, Ser. No. 871,887
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.65 15 Claims



1. A force sensing device for use in a weighing instrument, comprising a substantially parallelepipedic block with maximum and minimum dimensions, respectively called length and width, measured according to perpendicular horizontal axes and an intermediate dimension called height measured according to a vertical axis, such block being provided with a central opening in the direction of its width so as to consist in a deformable parallelogram with two vertical uprights connected through two pairs of thinner zones to two upper and lower horizontal beams, with one of these uprights being intended for fixation of the block to a base and the other of such uprights being intended for securement to a plate for reception of a load to be weighed, said sensing device further comprising means sensitive to flexural deformation and disposed on a substantially planar horizontal face of the block opposite two thinner zones through which one of the horizontal beams is connected to the vertical uprights, with flexibility of said thinner zones of the beam carrying said sensitive means being higher than flexibility of the thinner zones of the other of the horizontal beams.

4,718,288

METHOD AND AN APPARATUS FOR SPLITTING SAMPLES OF POWDERS AND SUSPENSIONS

Kurt Leschonski, Am Dammgraben 20, and Stephan Röthele, Am Rollberg 5, both of 3392 Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 729,055
Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416595
Int. Cl.[4] G01N *1/18, 1/20*
U.S. Cl. 73—863 14 Claims

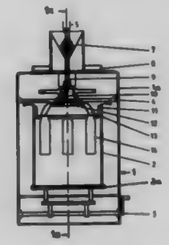
1. A method for splitting samples of particulate matter, comprising the steps of:

(a) forming a stream of particles of the same form as the selected sample from the selected sample;

(b) imparting a rotational velocity and axially outwardly directed trajectory to said stream of particles to form a rotating axially outwardly directed stream of particles;

(c) subdividing said rotating stream of particles into several subsamples of equal angular increments;

(d) collecting said subsamples in the direction of the trajectories of the particles; and



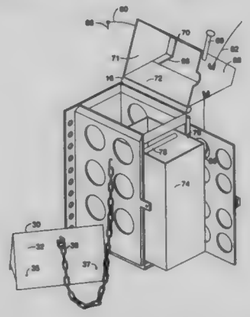
(e) combining some of the subsamples and repeating the steps of imparting, subdividing and collecting to obtain at least one subsample for use as an analysis sample.

4,718,289

DRILL CUTTINGS SAMPLE COLLECTOR

Wesley F. Barrett, Jakarta Pusat, Indonesia, assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 7, 1986, Ser. No. 848,889
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—863.57 5 Claims



1. Apparatus for collecting a sample of drill cuttings from a flow of drill cuttings exiting a wellbore comprising:

a housing suspendable in a falling flow of drill cuttings, the housing including an opening at an upper end thereof;

a drill cuttings receptacle receivable within the housing and having an opening at an upper end thereof for receiving drill cuttings; and

an inclined cover mounted to an upper portion of the housing and across the housing opening therein for varying the quantity of drill cuttings entering the receptacle, the cover including a pair of slideable plates moveable over said housing opening toward and away from a central region of said housing opening.

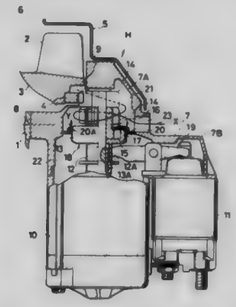
4,718,290

PINION SHIFT STARTER FOR ENGINES

Nobuyoshi Murata, Miki, and Kozo Watanabe, Ono, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 30, 1986, Ser. No. 879,957
Claims priority, application Japan, Jul. 19, 1985, 60-160967
Int. Cl.[4] F02N *15/06*
U.S. Cl. 74—7 A 3 Claims

1. In a pinion shift starter for internal combustion engines, said starter including a starter housing means attached to a crankcase of said internal combustion engine, said crankcase having a rotatable crankshaft and having a portion thereof extending outside of said crankcase, said portion termination in a flywheel, said flywheel having fan means operatively thereon adapted and constructed to drive air towards said crankcase when said flywheel rotates, said flywheel having a ring gear about its circumference, an electric starter motor positioned in said starter housing having a rotor, a solenoid in said starter housing mounted adjacent said starter motor, and overrunning clutch means operatively connected to said rotor, a pinion, said clutch means adapted and constructed to rotate said pinion when said starter is energized, means operatively connected to



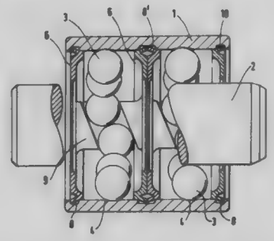
said solenoid to move said pinion into engagement with said ring gear when said solenoid is energized, the improvement comprising wall means in said starter housing to define a first chamber and a second chamber, the pinion being located in said first chamber, the starter and the solenoid being in said second chamber, said wall means having an opening means adapted and constructed to sealing embrace said overrunning clutch means extending therethrough, said first chamber of said starter housing has at least one opening whereby dirt may be discharged therethrough externally of the starter housing under the aegis of air currents created when said fan means on said flywheel rotates.

4,718,291

DEVICES FOR CONVERTING ROTARY MOVEMENT INTO LINEAR MOVEMENT

Ronald A. E. Wood; Edward Godson, both of Nottingham, and Harold E. Flory, Kent, all of England, assignors to RHP Group PLC, England

Filed May 25, 1983, Ser. No. 497,979
Claims priority, application United Kingdom, May 28, 1982, 8215676
Int. Cl.[4] F16H *27/02, 29/02, 29/20*
U.S. Cl. 74—99.15 22 Claims



1. In a device comprising first and second components rotatable about a common axis, the components having confronting curvilinear surfaces one of which is substantially plain and continuous while the other of which is substantially plain continuous and undivided except for relief predominantly in the form of at least one shallow machined-in groove forming a raceway and rolling elements in the form of balls between the confronting surfaces of the components in mutual contact with the confronting surfaces and the raceway; the improvement comprising the raceway being of part-helical form with an end and a start defining a lead;

additional structure defining camming means;

guide means including said camming means,

and further relief of the other confronting surface for transferring and guiding the balls from the end to the start of the raceway; the groove being shallow and regular defining a ball contact angle in the range 3° to 30° between a plane perpendicular to the common axis and the line of action of the forces transmitted at the points of contact between the raceway and the balls and the effective radial space between the confronting surfaces in contact with the balls being designed and constructed to be physically smaller than the diameter of the balls to directly and inherently impose radial pre-load throughout the circulation of the balls in the groove;

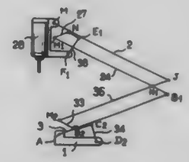
whereby direct relative linear motion between the components parallel to the common axis is resisted in at least one direction as the balls become further wedged in the raceway between the surfaces while relative combined rotary and linear movements can occur in a predetermined relationship defined by the lead of the part helix of the raceway with the balls rolling progressively along the raceway in response to rotary drive imparted to one of the components.

4,718,292

MECHANISM FOR GUIDING AN ELEMENT PARALLEL TO ITSELF

Michel Darmon, 68 boulevard Pasteur, 75015 Paris, France

Filed Apr. 15, 1985, Ser. No. 722,982
Claims priority, application France, Apr. 13, 1984, 84 05901
Int. Cl.[4] F16H *21/44, 21/52*
U.S. Cl. 74—103 1 Claim



1. A mechanism for guiding a driven member parallel to itself comprising:

a first articulated loop comprising in series in the following order:

a carrier member (1);

a first crank member (AB_2);

a first movable member (B_2C_2); and

a first guiding means (34) for guiding a pivotal connection (C_2) of said first movable member (B_2C_2) along a first given path with respect to the carrier member (1);

a second articulated loop comprising in series in the following order:

a driven member (28);

a second movable member (MN);

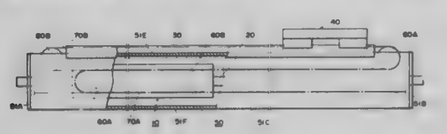
a second crank (NE_1); and

a second guiding means (38) for guiding a pivotal connection (E_1) of said second crank (NE_1) along a second given path with respect to the driven member (28);

an intermediate articulated linkage assembly of the deformable parallelogram type comprising:

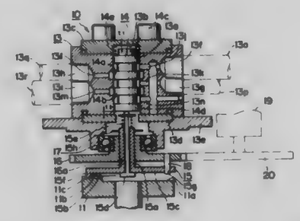
a first input member (B_1B_2) rigidly connected to the first crank (AB_2);
a first output member (M_1N) mounted for displacement parallel to the first input member (B_1B_2) and rigidly connected to the second crank (NE_1);
a second input member (B_2M_2) rigidly connected to the first movable member (B_2C_2), and
a second output member (JN) mounted for displacement parallel to the second input member (B_2M_2), and rigidly connected to the second movable member (MN);
wherein the first articulated loop and the second articulated loop are substantially in a geometrical similarity in which the carrier member corresponds to the driven member, the first crank corresponds to the second crank, the first movable member corresponds to the second movable member, and the first guiding means corresponds to the second guiding means;
said mechanism providing an articulated arm, in which the intermediate articulated linkage assembly comprises two elongated individual parallelogram linkage units in which relatively long sides of each one of the individual parallelogram linkage units are angularly coupled to relatively short sides of the other, the carrier member (1) being adapted to be secured to a support while the driven member (28) carries a device which is movable while remaining parallel to itself irrespective of the state of extension of the arm over a predetermined range.

4,718,293
SLIDE CYLINDER DEVICE
Eiso Muta, Yawata, Japan, assignor to Kabushiki Kaisha Yushin Seiki, Kyoto, Japan
Filed Jun. 3, 1986, Ser. No. 870,191
Claims priority, application Japan, Apr. 24, 1986, 61-62070[U]
Int. Cl.⁴ F16H *21/44*
U.S. Cl. 74—110 3 Claims



1. A slide cylinder device in which a moving board reciprocatively moves in accordance with the reciprocatory movement of a cylinder, said slide cylinder device comprising:
a piston rod;
a cylinder which is reciprocatively movable with said piston rod;
at least two guide rails provided in parallel with said piston rod;
a moving board which is reciprocatively movable along said guide rails;
a frame including standing walls which are provided at both ends of said frame in a longitudinal direction, said standing walls supportingly fixing respective end portions of said piston rod and said guide rails, said frame having an axial configuration that is tunnelled but closed in section;
a pair of movable pulleys provided longitudinally in said frame, said movable pulleys deviating in the axial direction of said cylinder;
at least two flexible linkage members each having a free end portion linked to said moving board and having a proximal end portion linked to said frame, said flexible linkage members each being spanned to each of said movable pulleys; and
a pair of fixed pulleys having some portion of their peripheries exposed from notches in said frame, said notches being formed to deviate on both sides of said frame in the longitudinal direction as well as on both sides of a widthwise direction of said frame, and each of said flexible linkage members, which are spanned to said movable pulleys, being reversed by means of said fixed pulley in order to be linked to said moving board, said moving board being disposed outside said frame.

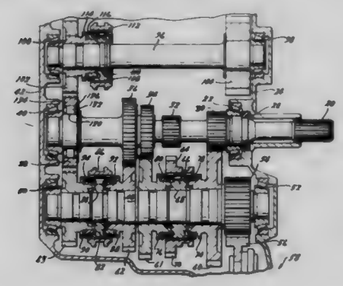
4,718,294
RATIO CONTROL SPOOL VALVE FOR A TOROIDAL TYPE INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION
Hideo Okochi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1986, Ser. No. 833,822
Claims priority, application Japan, Feb. 28, 1985, 60-37566; Feb. 28, 1985, 60-27233[U]
Int. Cl.⁴ F16H *15/12*
U.S. Cl. 74—190.5 6 Claims



1. In a transmission control spool valve for a toroidal type infinitely variable traction roller transmission comprising:
a pair of power rollers disposed between and in rotating engagement with a pair of coaxial input and output discs for varying the transmission ratio by changing their tilting angle, a pair of roller support structures for supporting said power rollers and being slidable in an axial direction, a rotatable, circular cam disc connected to at least one of said roller support structures, a fluid operated actuating means for slidably urging said roller support structure and cam disc in an axial direction;
the improvement wherein said control spool valve comprises:
a valve housing fixedly attached to a fixed member and incorporating therein fluid passages, a spool slidably disposed in said valve housing so as to control supply of pressurized fluid to said fluid operated actuating means, a rotatable cam follower disposed between said spool and said circular cam disc, a resilient member allowing said cam follower to travel in an axial direction with respect to said spool, and a transmission ratio setting means for relatively moving said cam follower along an inclined cam face of said cam disc in the rotational direction of said cam disc to achieve a desired relative location between said spool and said fluid passages.

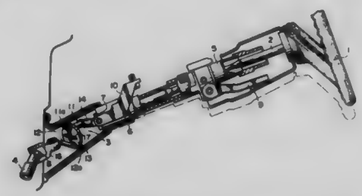
4,718,295
FREE-WHEELING GEARS FOR A MULTIPLE SPEED TRANSAXLE TRANSMISSION
Rhode M. Jesena, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 16, 1986, Ser. No. 863,893
Int. Cl.⁴ F16H *3/08*
U.S. Cl. 74—368 5 Claims

1. In a power transmission for driveably connecting the drive wheels of a motor vehicle to an engine, a drive mechanism comprising:
an input shaft driveably connectable to an engine having a first pinion supported thereon;
a first countershaft rotatably supported and aligned substantially parallel to the input shaft;
a first gear carried on the first countershaft in continuous meshing engagement with the pinion, driveably connectable selectively to the first countershaft;
a second countershaft rotatably supported and aligned substantially parallel to the input shaft;



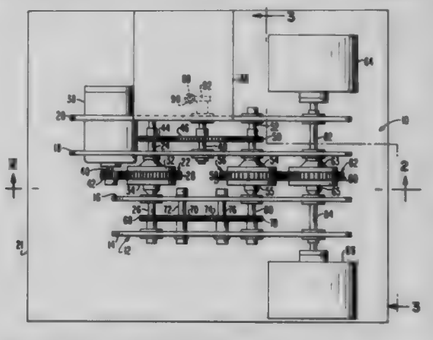
a second gear carried on the second countershaft in continuous meshing engagement with the pinion, driveably connectable selectively to the second countershaft;
clutch means carried on the input shaft for providing a one-way driveable connection between the pinion and the input shaft.

4,718,296
SAFETY STEERING SHAFT OF A VEHICLE
Youichi Hyodo, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Nov. 4, 1986, Ser. No. 926,526
Claims priority, application Japan, Nov. 8, 1985, 60-170875[U]
Int. Cl.⁴ B62D *1/18*
U.S. Cl. 74—492 9 Claims



1. A steering shaft which is deformable in response to a force corresponding to frontal impact of a vehicle comprising:
an upper shaft having upper and lower end portions, said upper shaft including an upper yoke at said upper end portion of the upper shaft, said upper yoke having a pivot center;
a lower shaft having upper and lower end portions, said lower shaft provided with a lower yoke at said lower end portion of the lower shaft, said lower yoke having a pivot center;
an axis of said steering shaft being defined by a line extending between said pivot center of the upper yoke and said pivot center of the lower yoke; and
a deformable plate which is deformable in response to a force corresponding to frontal impact of the vehicle, said deformable plate being perpendicular to the axis of the steering shaft, said lower end portion of the upper shaft and said upper end portion of the lower shaft being fixed to the deformable plate at a first position and a second position, respectively, said first position and said second position being perpendicularly offset from the axis of the steering shaft, said deformable plate having means for controlling deformation of the deformable plate located between the first position and the second position.

4,718,297
INFINITE RATIO TRANSMISSION APPARATUS
Dale A. Hawkins, 8177 Pescadero Rd., Loma Mar, Calif. 94021
Filed Mar. 4, 1985, Ser. No. 707,614
Int. Cl.⁴ F16H *37/08*
U.S. Cl. 74—682 2 Claims

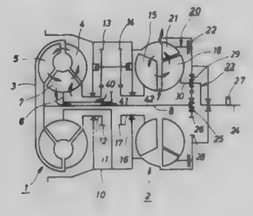


1. Transmission apparatus comprising:
a first differential having first and second coaxial shafts rotatable independently of each other, said first differential having a first drive member and means rotatably coupling the first drive member to said first and second shafts, said first drive member adapted to be coupled to a source of power for rotating the first drive member;
a second differential spaced from the first differential and having third and fourth coaxial shafts rotatable independently of each other, the second differential having a second drive member and means rotatably coupling the second drive member on the third and fourth shafts, said second drive adapted to be coupled to a rotatable load for rotating the load;
first means coupling the first shaft with the third shaft to cause rotation of the third shaft in response to the rotation of the first shaft;
second means coupling the second shaft with the fourth shaft to cause rotation of the fourth shaft in response to the rotation of the second shaft, said first means and said second means being operable to permit rotation of the third and fourth shafts in opposite directions as said first and second shafts, said speed changing means including a power source having a rotatable power shaft, first worm gear means coupling the power shaft to the second shaft, second worm gear means coupled with the first shaft, and differential means coupling the power shaft of the power device with the second worm gear means, said differential means being coupled to the first drive member, whereby the first drive member will rotate the second worm means when the power source is de-energized and will control the speed of rotation of the second worm means as the power device is energized.

4,718,298
HYDRAULIC POWER TRANSMISSION
Masahiro Ohkubo, Kadoma, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan
Filed Nov. 5, 1984, Ser. No. 668,014
Claims priority, application Japan, Nov. 8, 1983, 58-210567
Int. Cl.⁴ F16H *47/10*; F16D *33/10*
U.S. Cl. 74—688 4 Claims

1. A hydraulic transmission comprising:
a torque converter including

a pump impeller operable to be connected to an output shaft of an engine
a stator, and
a turbine runner;
a fluid coupling, including
a pump impeller,
a braking vane wheel, and
a turbine runner;
an intermediate shaft connected to the turbine runner of said torque converter;
an output shaft operably connected to said turbine runner of said fluid coupling;



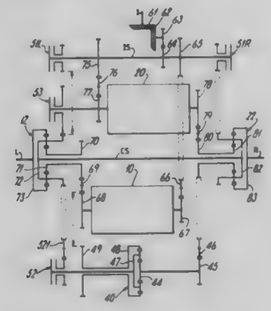
one-way clutch means operably connecting said intermediate shaft to said output shaft of the hydraulic transmission and being operable to transmit torque only from the intermediate shaft to the output shaft; and
control means for controlling said fluid coupling to operate only when the rotational speed of the output shaft exceeds a predetermined value wherein at relative low speeds torque is transmitted from said torque converter, said intermediate shaft and said one-way clutch to said output shaft and at relatively high speeds torque is transmitted from said turbine runner of said fluid coupling to said output shaft.

4,718,299

DRIVELINE FOR A TRACK LAYING VEHICLE

Christopher J. Greenwood, Leyland, United Kingdom, assignor to Leyland Vehicles Limited, Leyland, England

Continuation of Ser. No. 698,429, Feb. 5, 1985, abandoned. This application May 29, 1987, Ser. No. 56,315
Claims priority, application United Kingdom, Feb. 7, 1984, 8403199; Mar. 20, 1984, 8407148
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—691 **8 Claims**



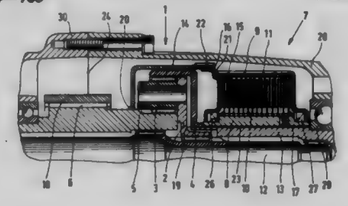
1. A driveline for a track-laying vehicle having a prime mover and a pair of output shafts (L, R) connected to drive left- and right-hand tracks at a predetermined range of speeds, the driveline comprising: two similar continuously-variable-ratio transmission units (10, 20) of the toroidal race-rolling traction type, each having an input adapted to receive input drive from the prime mover and an output; a cross shaft (CS); two similar summing epicyclic gear output units (12, 22), each having a first input (70, 80) geared to the output of a respective transmission unit, an output connected to a respective output shaft (73, 83), and a second input (72, 82) connected to the cross shaft; rotating clutch means (51) connecting the input drive to drive the cross shaft at a first predetermined ratio at which a variation of transmission ratio of the transmissions towards zero will correspond to an increase in track speed, for low regime operation; a middle regime differential gear arrangement (40); rotating clutch means (52) connecting the middle regime differential gear arrangement to have two inputs connected at second and third predetermined gear train ratios respectively to the corresponding outputs of the transmission units and an output connected at a fourth predetermined gear train ratio to the cross shaft such that the cross shaft is driven by the outputs of the two transmission units, to be operable in a middle regime; and means (50) for connecting the input drive to the cross shaft at a fifth predetermined gear train ratio, for high regime operation.

4,718,300

POWER-DRIVE TRANSMISSION WITH VISCOUS CLUTCH

Alfred Magg, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP84/00104, § 371 Date Jan. 23, 1985, § 102(e) Date Jan. 23, 1985, PCT Pub. No. WO84/04792, PCT Pub. Date Dec. 6, 1984
PCT Filed Apr. 9, 1984, Ser. No. 695,367
Claims priority, application Luxembourg, Jun. 1, 1983, PCT/EP83/00140
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—705 **7 Claims**



1. In a distributor transmission comprising:
a spur-gear planetary transmission having a planetary carrier (2), planetary gears (3), a ring gear (4) and a sun gear (5);
an input shaft (12) drives said planetary carrier (2);
said planetary carrier (2) drives said ring gear (4) and said sun gear (5) via said planetary gears (3);
said ring gear (4) drives an output shaft (13);
said sun gear (5) drives an output gear (6);
a viscous clutch (7) connects said ring gear (4) with said sun gear (5);
said viscous clutch (7) has a hollow shaft (8) and a casing (9);
said hollow shaft (8) carries inner discs (10) in an outer spline section;
said casing (9) carries outer discs (11) in an inner spline section;
said viscous clutch (7) is substantially filled with a high-viscosity silicon oil, the improvement wherein
said planetary transmission (1) is axially situated between said output gear (6) and said viscous clutch (7);
a coupling pan (14) overlies said ring gear (4) and connects said sun gear (5) with said casing (9);
a spline section (22) torsion-proof and axially movably connects said casing (9) with said coupling pan (14);
a spline section (23) torsion proof and axially movably connects said ring gear (4) with said output shaft (13);

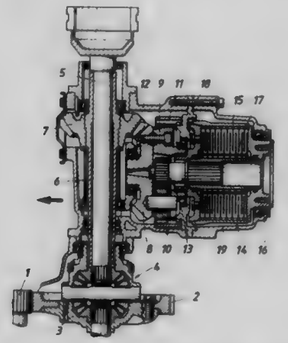
a bearing (29) in a housing part (28) axially holds said viscous clutch (7); and
when said housing part (28) and said bearing (29) are disconnected, the viscous clutch (7) can be axially removed as a complete assembly to provide easy maintenance and replacement of the viscous clutch.

4,718,301

DRIVING MECHANISM FOR MOTOR VEHICLES HAVING AT LEAST TWO LIVE AXLES

Karl Friedrich, Leibnitz, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 24, 1986, Ser. No. 842,907
Claims priority, application Austria, Apr. 2, 1985, 981/85
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—705 **6 Claims**



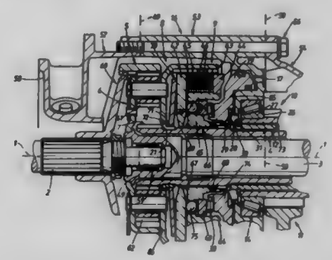
1. A driving mechanism for a motor vehicle, which driving mechanism comprises
an engine having an output shaft which extends transversely to the direction of travel of the vehicle,
first and second live axles,
a change-speed transmission adapted to be driven by said output shaft and having shafts which are parallel to said output shaft,
a spur gear train operatively connected to said change-speed transmission,
first torque-transmitting means for transmitting torque from said spur gear train to said first live axle, and
second torque-transmitting means for transmitting torque from said spur gear train to said second live axle, the second torque-transmitting means comprising a first angle drive operatively connected to said spur gear train, a second angle drive operatively connected to said second live axle, the first and second angle drives having different transmission ratios, a universal-joint shaft interconnected between said first and second angle drives, and a transmission stage constituted by
a planetary gear train disposed between said first angle drive and said universal-joint shaft.

4,718,302

EPICYCLIC DISTRIBUTOR GEAR-BOX FOR DRIVING TWO VEHICLE AXLES OF A MOTOR VEHICLE

Erwin Nussbaumer, Waiblingen; Rainer Gross, Stuttgart; Herbert Botzelmann, Remshalden; Hans Haller, Hattenhofen, and Franz Buchwald, Lauffen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 15, 1987, Ser. No. 3,506
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600874
Int. Cl.[4] F16H *1/44, 1/42*
U.S. Cl. 74—710.5 **17 Claims**



1. In an epicyclic distributor gear-box for driving two vehicle axles of a motor vehicle, having a main shaft concentric with one of two coaxial main shafts connected to the sun wheel of an epicyclic gear-box, each of two other gear elements of the gear-box are connected to one of the coaxial main shafts, having a lock-up plate clutch connected to two of the gear elements, having spring means and an axial pressure piston means, acting against the spring means for actuating the lock-up plate clutch in the direction of a completely disengaged end position and in the direction of a completely engaged end position, each half clutch of the lock-up plate clutch is connected to a respective first or second plate carrier rotationally firmly connected to the associated plates and holding them so that they are axially displaceable and the first plate carrier has a first abutment axially supporting all the plates, the improvement comprising:
the first plate carrier having the first abutment is both immovably fastened by releasable fastening means to the concentric main shaft and has axial passages for a clutch disengagement means,
the spring means both maintains the engaged end position of the lock-up plate clutch and is located on the sun wheel side of the first plate carrier having the first abutment,
the axial pressure piston means is located centrally to the gear-box main axis, and is located on the other side of the first plate carrier; and wherein the spring means includes a plate spring, the radially inner edge region of which plate spring is supported on an axial pressure support surface of the concentric main shaft and the radially outer edge region of which plate spring is supported on an annular pressure plate acting on the clutch plates.

4,718,303

FOUR WHEEL DRIVE TRANSFER CASE WITH CLUTCH MECHANISM

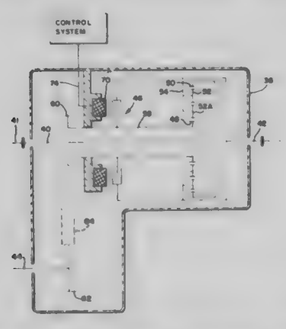
Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Oct. 6, 1986, Ser. No. 915,454
Int. Cl.[4] F16H *1/44, 37/06*
U.S. Cl. 74—710.5 **32 Claims**

1. A transfer case for a full-time four wheel drive vehicle, comprising:
a planetary gear arrangement connectable to an output shaft of a transmission, said gear arrangement including at least

three nested gear components for operably interconnecting said output shaft with both a front and a rear wheel drive output shaft for full time drive to both output shafts such that input torque to the transfer case is normally biased to both output shafts in a predetermined ratio; and

electromagnetically actuatable friction clutch means having



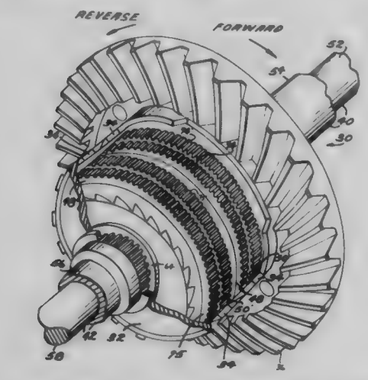
ball ramp mechanism means and frictionally engagable members for operably and conditionally interconnecting two of said planetary gear components in a manner such that the torque bias to the front and rear wheel drive output shafts is controlled by a torque level established between the frictionally engagable members of said clutch means by said ball ramp mechanism means.

4,718,304

VEHICLE DIFFERENTIAL WHICH DISTRIBUTES TORQUE BETWEEN VEHICLE WHEELS IN ACCORDANCE WITH OPERATING DEMANDS

Jessie T. Ivy, 686 W. Shore Dr., Anacortes, Wash. 98221

Filed Dec. 11, 1984, Ser. No. 680,651
Int. Cl.⁴ F16H 1/42
U.S. Cl. 74—714 **16 Claims**



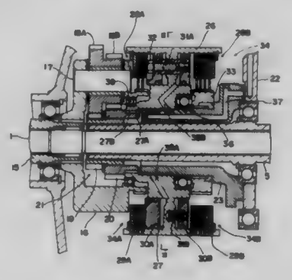
1. A differential for a vehicle, said differential comprising:
a differential case defining a plurality of openings therein;
a ring gear attached to said case;
a driving pinion gear in meshing relation with said ring gear;
left and right axle means disposed in end-to-end relationship to each other and at least partially positioned within said case for connecting with two wheels of the vehicle;
axle driving means within said case and in operative relationship with said left and right axle means for selectively rotating said axle means;
gear assembly means mounted on the exterior of said case, projecting into the interior of said case through predetermined ones of said openings, and in meshing relation with said axle driving means for controlling movement of said axle driving means;
a substantially oil-tight housing enclosing the previously recited elements, and said axle driving means including:
left and right forward axle driving means within said case and in operative relationship with said left and right axle means, respectively, for selectively rotating said axle means only in a forward direction; and
left and right reverse axle driving means within said case and in operative relationship with said left and right axle means, respectively, for selectively rotating said axle means only in a reverse direction.

4,718,305

PLANETARY BACKWARD AND FORWARD DRIVE APPARATUS

Tomeo Umemoto, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Apr. 7, 1986, Ser. No. 849,237
Claims priority, application Japan, Dec. 19, 1985, 60-286797; Dec. 19, 1985, 60-286798
Int. Cl.⁴ F16H 3/44, 57/10
U.S. Cl. 74—784 **5 Claims**



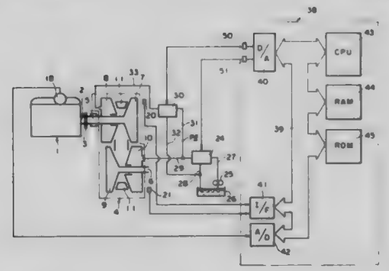
1. A planetary backward and forward drive mechanism comprising;
an input shaft operatively connected to an engine,
an output shaft disposed coaxial with said input shaft,
planetary gear means including a carrier connected to said input shaft, two step planet gears supported by the carrier and consisting of a large first gear and a small second gear, a first sun gear connected to the output shaft and meshing with said first gear, and a second sun gear freely rotatably mounted on the first sun gear and meshing with said second gear,
stationary means radially surrounding said output shaft and comprising a cylindrical stationary member fixed to a stationary casing, said cylindrical stationary member being disposed in coaxial end-to-end relation with said second sun gear,
hydraulic clutch and brake means including;
a clutch casing rotatably supported radially outwardly of said cylindrical stationary member and having a partition wall, a first and a second chambers defined axially of said output shaft and opposed to each other across said partition wall, and a cylindrical base end portion extending from said partition wall toward said planetary gear means and having a radial inner surface splined to a radial outer surface of said second sun gear,
a hydraulic clutch disposed in said first chamber and interconnecting said carrier and said clutch casing thereby to cause said second sun gear and said carrier to rotate in unison,
a hydraulic brake disposed in said second chamber and interconnecting said stationary means and said clutch casing thereby to lock said second sun gear against rotation, and
bearing means disposed between a radial outer surface of the splined cylindrical base end portion of said clutch casing and a radial inner surface of a projecting end extending toward said hydraulic clutch means of said carrier for permitting the relative rotation between said clutch casing and said carrier.

4,718,306

POWER TRANSMISSION FOR USE IN AUTOMOBILES CONTINUOUSLY VARIABLE TRANSMISSION

Takashi Shigematsu; Tomoyuki Watanabe; Setsuo Tokoro, all of Susono, and Daisaku Sawada, Gotenba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 841,427, Aug. 4, 1986, which is a continuation of Ser. No. 642,654, Aug. 21, 1984. This application Apr. 7, 1987, Ser. No. 36,123
Claims priority, application Japan, Aug. 29, 1983, 58-156464
Int. Cl.⁴ B60K 41/16
U.S. Cl. 74—866 **3 Claims**



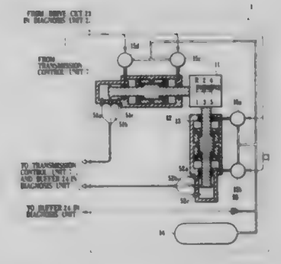
1. A method for compensating the line pressure in a continuously variable transmission, of a vehicle wherein said transmission has a pair of input pulleys controlled by a hydraulic pressure which is supplied to pulleys in a rotably mounted hydraulic cylinder and a pair of output pulleys, controlled in the same manner as said input pulleys, with a belt trained over said pulleys to transmit torque between said input pulleys and said output pulleys comprising the steps of:
determining the input torque Tin transmitted to said input pulley pair;
determining the rotational speed Nin of said input pulley pairs;
determining the output speed Nout of said output pulley pair;
determining a basic control value for the line pressure in response to said input torque Tin and an output/input speed ratio e of said output speed Nout and said input speed Nin;
compensating said basic control value by as a function of the square of said output rotational speed Nout to compensate for errors produced by the centrifugal force;
controlling the line pressure in response to said compensated basic control value.

4,718,307

TRANSMISSION REMOTE CONTROL APPARATUS

Hideo Yabe, Hiki, and Akimitsu Ebina, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 711,709, Mar. 13, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 20,151
Claims priority, application Japan, Mar. 30, 1984, 59-61202
Int. Cl.⁴ B60K 41/06
U.S. Cl. 74—866 **4 Claims**



1. A transmission remote control apparatus comprising:
a command unit which has a manually operated lever and a plurality of speed shift positions and neutral positions and outputs a command signal in accordance with an actual operation of the manually operated lever by a driver;
a power unit comprising a transmission which has a gear shift lever corresponding to said manually operated lever of said command unit, a plurality of gear shift positions and neutral positions corresponding to said speed shift positions and neutral positions of said command unit, respectively, and moving means for moving said gear shift lever to any one of the gear shift positions through at least one neutral position in accordance with a transmission control signal;
a transmission control unit for receiving the command signal from said command unit to output the actual transmission control signal to said power unit; and
a diagnosis unit electrically connected with said power unit for automatically diagnosing whether the gear shift lever is normally shifted in all neutral positions or not while an engine is in stopped condition, by supplying to said moving means of said power unit a signal simulating said actual transmission control signal, said diagnosis unit comprising a controller for outputting a command for controlling the overall diagnostic operation, means for generating the simulated transmission control signal according to the command from said controller, a detecting means associated with said power unit for detecting a current position of said gear shift lever, and means for generating an alarm according to an instruction from said controller;
said controller controlling the diagnostic operation in such manner that, at first, whether the gear shift lever is in any one of the neutral positions or not is checked, if the check result is negative, the alarm being generated from said alarm generating means, and if the check result is affirmative, then, whether the engine is in stopped condition or not is checked, resulting in that, if no, the diagnostic operation is not carried out, but if yes, a neutral position coincidence check with respect to each neutral position is performed, such that said simulated transmission control signal is supplied from said generating means to said power unit to shift said gear shift lever into one neutral position, and at a predetermined time after the simulated transmission control signal is supplied to said power unit, whether the neutral position instructed by the simulated transmission control signal and a current position of said gear shift lever detected by said detecting means coincide

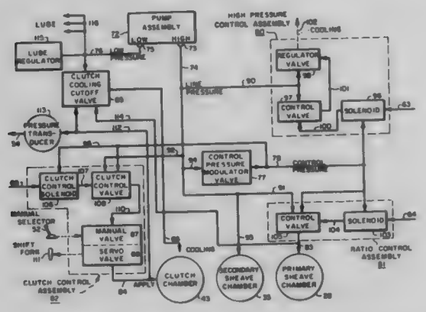
with each other or not is checked, resulting in that, if no, the alarm is generated and if yes, the neutral position coincidence check with respect to next neutral position is performed, the neutral position coincidence check being repeated until all neutral positions are completed.

4,718,308

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

William J. Haley, Ithaca, N.Y., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Mar. 29, 1985, Ser. No. 717,913
Int. Cl.[4] B60K *41/12, 41/18*
U.S. Cl. 74—866 **8 Claims**



1. A control system for a continuously variable transmission having a primary pulley and a secondary pulley, a belt intercoupling the pulleys, a chamber in the primary pulley for admitting and discharging fluid to change the effective pulley diameter and correspondingly change the transmission ratio, a chamber in the secondary pulley for admitting and discharging fluid to maintain tension in the belt as the transmission is driven, a fluid-actuated clutch operable to transfer drive torque from the secondary pulley to an associated drivetrain, which clutch includes a chamber for receiving fluid to apply the clutch and from which fluid is discharged to release the clutch, a main line connected directly to the secondary pulley fluid chamber so that fluid at line pressure is always supplied to the secondary pulley fluid chamber a pump assembly connected to supply fluid under pressure from a first output connection to said main line, a first electromechanical control assembly having an input fluid connection coupled to said main line and an output fluid connection coupled to said clutch and chamber, a second electromechanical control assembly, having an input fluid connection coupled to said main line and an output fluid connection coupled to said primary pulley chamber, and a third electromechanical control assembly coupled to said main line, and means for supplying three electrical control signals, respectively applied to said electromechanical control assemblies, to individually regulate application and release of said clutch, the transmission ratio, and fluid pressure in said main line.

4,718,309

AUTOMATIC TRANSMISSION SYSTEM FOR VEHICLES

Koichi Moriya, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1986, Ser. No. 828,756
Claims priority, application Japan, Feb. 21, 1985, 60-31537
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—866 **6 Claims**

1. An automatic transmission system for vehicles comprising:

means for producing a first signal relating to the speed of the vehicle at each instant;

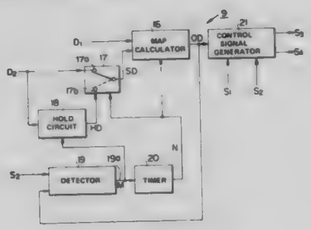
a gear-changing mechanism including a gear-type transmission;

a calculating means for deciding a target gear position of the gear-type transmission at each instant on the basis of predetermined characteristics for changing gears in response to at least the first signal;

a position detecting means for detecting the actual gear position of the gear-type transmission;

means response to outputs from said calculating means and said position detecting means for changing gear of said gear-change mechanism in such a way that the actual gear position becomes equal to the target gear position;

a first means for discriminating whether or not the target gear position is changed; and



a second means responsive to the output of said first means for inhibiting the target gear position from being changed for a predetermined period after the target gear position is changed, wherein said second means has

a holding means responsive to output of said first means for holding the contents of the first signal at the time of the change of the target gear position,

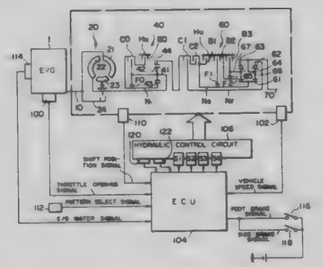
a selecting means responsive to the output of said first means for selecting one or the other of the first signal and an output from said holding means, whereby the output from said holding means is selected for a predetermined period at least during the execution of the operation for changing gears of the gear-type transmission.

4,718,310

SHIFT CONTROL SYSTEM OF AUTOMATIC TRANSMISSION FOR VEHICLE

Yoshio Shindo, and Kunihiro Iwatsuki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 22, 1985, Ser. No. 800,785
Claims priority, application Japan, Nov. 22, 1984, 59-247428
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—867 **5 Claims**



1. A shift control system of an automatic transmission for a vehicle, comprising:

a first transmission and a second transmission, said first transmission including first and second solenoid valves for controlling frictionally engaging devices which can shift

speeds of said first transmission independently of said second transmission, and said second transmission including a third solenoid valve for controlling other frictionally engaging devices which can shift speeds of said second transmission independently of said first transmission, wherein said first transmission and second transmission are shifted simultaneously or alternately to achieve multi-speed shiftings; and

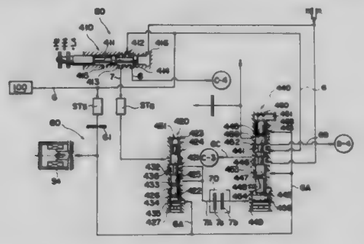
means for changing an acting force to said frictionally engaging devices of said second transmission at the time of shifting speeds of said second transmission at least in accordance with states of said first transmission.

4,718,311

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Yoichi Hayakawa, Toyoake; Masao Kawai, Chiryu; Seiichi Nishikawa, Toyokawa, and Kagenori Fukumura, Toyota, all of Japan, assignors to Aisin-Warner Limited, Toyota and Toyota Jidosha Kabushiki Kaisha, Anjo, both of, Japan

Filed Oct. 25, 1985, Ser. No. 791,444
Claims priority, application Japan, Oct. 26, 1984, 59-226452
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—868 **5 Claims**



1. A hydraulic control system for an automatic transmission having an inhibitor valve, said inhibitor valve comprising

a change-over valve having a first set position and a second set position and functioning to supply and discharge a hydraulic pressure to and from a hydraulic servomehcanism for a friction engaging element through its movement between said first and second set positions;

a means for urging said change-over valve to said first set position; and

a plunger having a first set position and a second set position and functioning to bring said change-over valve into said second set position when the plunger is urged to said second set position;

said inhibitor valve functioning to perform the supply and discharge of the hydraulic pressure to and from the hydraulic servomechanism in accordance with a first hydraulic signal and a second hydraulic signal through a first hydraulic signal generating means which produces said first hydraulic signal for urging said change-over valve to said second set position and urging said plunger to said first set position;

a second hydraulic generating means for producing said second hydraulic signal for urging said plunger to said second position; and

a means for delaying a discharge of said second hydraulic signal;

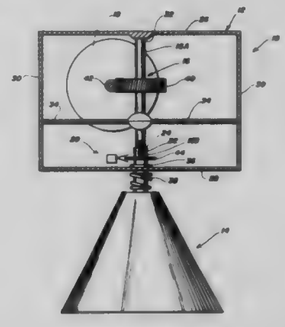
said first hydraulic signal generating means comprising an electronic controller receiving vehicular running conditions such as a vehicle speed and a throttle opening, said electronic controller evaluating the vehicular running conditions and generating a signal corresponding to the evaluation, a solenoid valve energized and deenergized in accordance with the output signal of said electronic controller, and an orifice formed in a first hydraulic signal generating oil passage in which said solenoid valve is provided.

4,718,312

MOTORIZED TWIST OFF CAP OPENER

William C. Jones, Bourbon Rd., R.R. 2, Box 152, Tuscola, Ill. 61953

Filed Jan. 16, 1986, Ser. No. 819,818
Int. Cl.[4] B67B *7/18*
U.S. Cl. 81—3.2 **14 Claims**



1. A motorized kitchen-appliance type opener for removing twist off caps having a range of diameters found in a kitchen from containers without need for manual twisting of same and allowing the user to have both hands free to hold the container during the cap removal operation, said opener comprising:

(a) a housing;

(b) a unitary operator supported from said housing, said operator having a generally conically shaped body with a recessed opening having rigid interior exposed surfaces, the recessed opening being flared for receiving and frictionally engaging larger sized twist off caps towards outer portions thereof and smaller sized twist off caps of lesser diameter more deeply therein whereby said opener accommodates a range of cap sizes found in a kitchen without need for changing said operator;

(c) a motor supported by said housing and operatively connected to said operator to cause rotative movement thereof when said motor is actuated; and

(d) switch means for turning said motor on or off responsive to the user's insertion of the twist off cap into said recessed opening and pressing the cap against the surface thereof, or releasing the same therefrom.

4,718,313

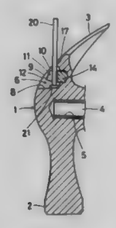
HAMMER HEAD FOR A HAMMER

Toshihiko Yamaguchi, 4-1, Uenoshibacho 4 cho, Sakai-shi, Osaka 593, Japan

Filed Sep. 19, 1986, Ser. No. 909,195
Claims priority, application Japan, Mar. 25, 1986, 61-44348[U]
Int. Cl.[4] B25D *1/00*
U.S. Cl. 81—23 **20 Claims**

1. A hammer head for a hammer which comprises a nail driving part at one end of the hammer head and a claw at the other end of the hammer head, the hammer head including a nail-holding part, the nail-holding part including a striking wall formed in the hammer head and a pair of pinching pieces disposed adjacent to the striking wall, the pinching pieces being elastically deformable for receiving the shank of a nail therebetween with the head of the nail abutted against the striking wall, said striking wall being formed by one surface of a recess formed in said hammer head, said recess being formed along the between laterally spaced-apart sidewalls of a covex arcuately-shaped surface of said hammer head which extends

from a central portion thereof and which forms a surface engaging part of the claw, said pair of pinching pieces being disposed within said recess, said pair of pinching pieces comprising elastic pieces which are deformable towards and away



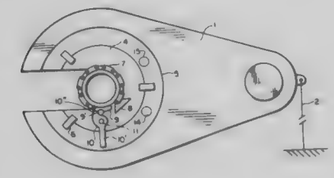
from each other, said elastic pieces being formed integrally with a base portion extending between said elastic pieces, said base portion being fitted in a bore disposed in a wall of said recess which is perpendicular to said striking wall.

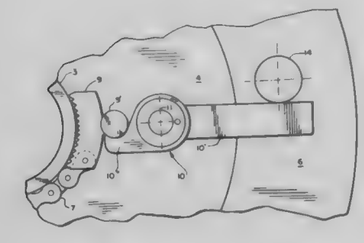
4,718,314

POWER CHAIN WRENCH

William E. Coyle, Sr., Houma, and Dennis J. Peaisson, Raceland, both of La., assignors to Bilco Tools, Inc., Houma, La.

Filed Nov. 28, 1986, Ser. No. 935,678
Int. Cl.[4] B25B *13/52*
U.S. Cl. 81—57.33 6 Claims





1. A power chain wrench for a power tongs having a rotating head, comprising in combination

a plate for mounting concentrically upon said head,

means for rotatably retaining said plate upon said head,

a post extending vertically from said plate,

a flexible member having two ends, said flexible element being of sufficient length to encircle a pipe of a predetermined diameter which is to be rotated by the tongs,

one of said ends being attached to said post and the other end thereof having means for engaging the exterior of said pipe,

a pin extending vertically from said plate,

a lever pivotally mounted upon said pin,

said lever having two ends on opposite sides of said pin, one of said ends comprising a finger adapted to contact said engagement means on the flexible element and the other end of said lever forming an actuating arm, and

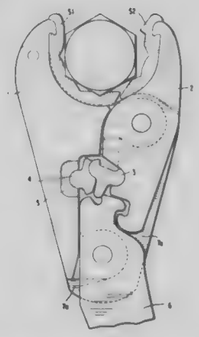
a rod extending vertically from said rotating head, said rod being positioned to engage the actuating arm of said lever.

4,718,315

RATCHET-TYPE WRENCH

Fred-Werner Nitschmann, Arabellastrasse 5, 8000 Munich 81, Fed. Rep. of Germany

PCT No. PCT/EP83/00177, § 371 Date Mar. 6, 1984, § 102(e) Date Mar. 6, 1984, PCT Pub. No. WO84/00316, PCT Pub. Date Feb. 2, 1984
Continuation of Ser. No. 596,470, Mar. 6, 1984, abandoned. This PCT application Jul. 7, 1983, Ser. No. 820,588
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225815; Apr. 12, 1983, 3315151
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—58.2 5 Claims



1. A ratchet-like wrench comprising a wrench body provided with a fixed jaw, a two-armed moveable jaw pivoted on the wrench body to define a spanner aperture with said fixed jaw, a two armed wrench handle pivoted on the wrench body and having a pivot bearing which is situated in the extremity of the wrench body facing away from the spanner aperture, one arm of said handle operatively engaging one arm of said moveable jaw, a rocker element, a first pivot joint for pivoting said rocker element on said fixed jaw, a coupling element having second and third pivot joints for pivotally coupling said coupling element to said rocker arm and said one arm of said moveable jaw, respectively, and having a projection operatively coupled to said handle and a return spring disposed between said coupling member and said moveable jaw for biasing said moveable jaw to the open condition and for preloading the coupling element and the rocker element toward a locking position when said handle and said coupling element are in a first position whereby upon movement of said handle to a second position said coupling element will be pivoted to bring said pivot joints into alignment to move said moveable jaw into a locked nut gripping position.

4,718,316

NUT-HOLDER ATTACHMENT FOR A WRENCH

Ted R. Dedrick, 3427 Mt. Laurence Dr., San Diego, Calif. 92117

Continuation of Ser. No. 707,834, Mar. 4, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 912,640
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—125 6 Claims

1. A nut-holder attachment for a wrench comprising:

a shank member having a forward end, a rearward end, lateral side edges, a top surface and a bottom surface;

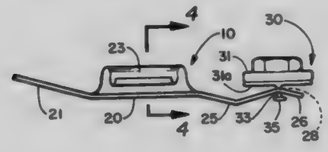
a front spring finger connected to the forward end of said shank member;

a spring clip connected to said shank member for attaching

said nut-holder attachment to the shank portion of a wrench;

a magnetic head having a top surface and a bottom surface;

pivot means connecting the bottom surface of said magnetic head to the top surface of said front spring member; and



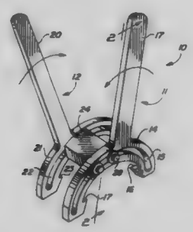
said shank member, said front spring member, and said spring clip are integrally formed from plastic and said pivot means is in the form of an integral living hinge having a disc portion upon whose top surface said magnetic head is attached.

4,718,317

HOSE COUPLING WRENCH

Roy F. Hensler, 10523 127th Ave. N., Largo, Fla. 33543, assignor to Roy F. Hensler, Largo, Fla.

Filed Aug. 21, 1986, Ser. No. 898,659
Int. Cl.[4] B25B *13/48*
U.S. Cl. 81—176.3 8 Claims



1. A hose coupling wrench comprising:

a first movable wrench member having a handle and an arcuate arm attached thereto, the arcuate arm having at least one hose coupling engaging member thereon and one arcuate slot formed therein;

a second movable wrench member having a handle and an arcuate arm attached thereto, the arcuate arm having at least one hose coupling engaging member thereon and an arcuate slot formed therein;

a slider member located between said first and second movable wrench members for spacing said first and second movable wrench members in a predetermined spaced distance from each other, said slider member having a pair of sliding blocks formed on two edges thereof, one of said sliding blocks being positioned in said one arcuate slot in said first movable wrench member and the second slidable block being positioned in said arcuate slot of said second movable wrench member;

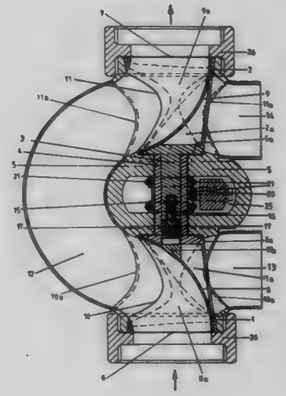
an attaching means for movably attaching said slider member to said first and second movable wrench members, whereby said first and second wrench members can slide relative to each other in guided paths defined by said respective arcuate slots whereby said first and second hose coupling engaging members contact studs on a pipe coupling to effect rotation and subsequent coupling or uncoupling.

4,718,318

FLOW PATH SELECTOR VALVE FOR USE IN WIND INSTRUMENTS MADE OF METAL

Joseph P. Bey, Panoramastrasse 9, D-7530 Pforzheim-Büchenbronn, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,899
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533400
Int. Cl.[4] G10D *9/04*
U.S. Cl. 84—390 31 Claims



1. In a flow path selector valve for use in a wind instrument made of metal, comprising

at least one pair of coaxially arranged and rotatably mounted, first and second valve members consisting each of a solid of revolution and having an outer end portion formed with an axial opening, an inner end portion axially spaced from said outer end portion and a shell formed with a lateral opening, said inner end portions of said first and second valve members of said pair facing each other.

coupling means integrally connecting said inner end portions of said valve members, and

first and second air ducts, which define respective flow paths differing in length, each of said ducts having mutually opposite first and second open ends, which face and are in sealing contact with respective ones of said valve members and adapted to register with said lateral openings of said valve members in different angular positions thereof,

the improvement residing in that

a hollow bearing and drive block is disposed between and in sliding contact with said inner end portions of said first and second valve members,

said coupling means comprise a shaft extending through said block,

said block contains drive means for rotating said shaft, and

each of said valve members comprises a curved pipe section, which defines in said valve member a flow path leading from said axial opening to said lateral opening.

4,718,319

ARRANGEMENT FOR THE ORIENTING OF THE OPEN ENDS OF HOLLOW BODIES

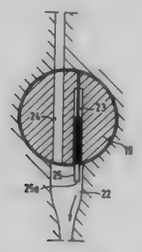
Walter Bujake, Troisdorf; Willi Bernheim, Troisdorf-Oberlar; Hartmut Graber, St. Augustin, and Heinz-Ernst Wagner, Troisdorf-Spich, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,721

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524079

Int. Cl.[4] F42B *33/00*; B21G *3/32*; B21K *27/00*; B23Q *7/12*

U.S. Cl. 86—46 12 Claims



1. An arrangement for the orientation of the open ends of hollow bodies with approximately cylindrical shapes, each of said bodies having at one end a closure providing an at least partially closed base and a maximum cross-section that is less than its length, characterized in that at least one supply duct for transporting a hollow body with an open end is provided; a rotating sorting roller for orienting the open end of said hollow body is arranged so that the at least one supply duct is directed onto a peripheral surface of said roller; the sorting roller having in a plane transverse to said at least one supply duct a transit duct and an associated arresting duct; said arresting duct containing a longitudinally extending projection and at least one outlet duct that is arranged to receive a hollow body from a peripheral surface of the sorting roller opposite to the supply duct for guiding away hollow bodies sorted by said roller.

4,718,320

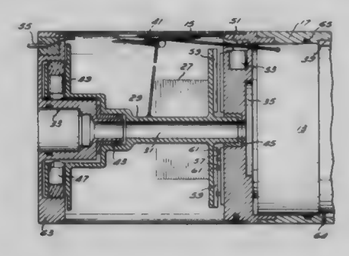
TOWED DECOY SYSTEM

Roger D. Brum, Irvine, Calif., assignor to Southwest Aerospace Corporation, Santa Ana, Calif.

Filed Jan. 12, 1987, Ser. No. 3,248

Int. Cl.[4] F41F *1/00*

U.S. Cl. 89—1.11 11 Claims



8. A deployment and post-deployment towing apparatus for a towed decoy comprising:

a housing carrying a decoy adjacent one end;

a pyrotechnic charge cavity disposed within the housing adjacent the opposite end of said housing;

a tow line cable stowed within the housing in a position between the charge cavity and the decoy connected to both the decoy and to the housing; and

a flow communication path extending between said charge cavity and said decoy for communicating a charge detonated in said charge cavity to said decoy to discharge said decoy from said housing.

4,718,321

REPETITIVE RESONANT RAILGUN POWER SUPPLY

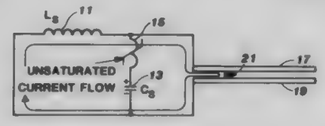
Emanuel M. Honig, and William C. Nunnally, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 19, 1985, Ser. No. 746,478

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[4] F41F *1/02*

U.S. Cl. 89—8 4 Claims



1. A repetitive railgun power supply for accelerating a projectile at predetermined intervals, comprising:

a pair of parallel rails for guiding said projectile and having an inductive load impedance;

a storage capacitor for providing energy to propel said projectile along said pair of parallel rails, said storage capacitor having a first end connected to one rail in said pair of parallel rails and a second end;

a storage inductor for providing a circuit with said storage capacitor resonant at a frequency determined by said predetermined intervals for accelerating said projectiles, said storage inductor having a first end connected to the other rail in said pair of parallel rails and a second end connected to said first end of said storage capacitor; and

a saturable magnetic switch having a low impedance saturated state relative to said inductive load impedance for maintaining energy flow in said resonant circuit formed by said storage capacitor and said storage inductor and having a high impedance unsaturated state relative to said inductive load impedance for transferring energy flow to said pair of parallel rails, said magnetic switch having a first end connected to said first end of said storage inductor and a second end connected to said second end of said storage capacitor and having a volt-second capacity effective to maintain said high impedance state during said accelerating said projectile and to switch to said low impedance state when an arc is formed between said rails as said projectile exits said rails.

4,718,322

MULTIPLE RESONANT RAILGUN POWER SUPPLY

Emanuel M. Honig, and William C. Nunnally, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 19, 1985, Ser. No. 746,479

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[4] F41F *1/02*

U.S. Cl. 89—8 8 Claims

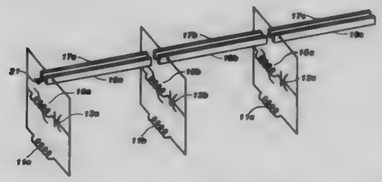
1. A multiple repetitive railgun power supply for accelerating a projectile at predetermined intervals, comprising:

a plurality of serially connected paired parallel rails for guiding said projectile and having an inductive load impedance;

a plurality of powering means for powering said plurality of paired parallel rails, each pair of parallel rails therein powered by a single powering means, each powering means comprising;

a storage capacitor for providing energy to propel said projectile along said pair of parallel rails said storage capacitor having a first end connected to one rail in said pair of parallel rails and a second end;

a storage inductor for providing a circuit with said storage capacitor resonant at a frequency determined by said predetermined intervals for accelerating said projectiles, said storage inductor having a first end connected to the other rail in said pair of parallel rails and a second end connected to said first end of said storage capacitor; and



a saturable magnetic switch having a low impedance saturated state relative to said inductive load impedance for maintaining energy flow in said resonant circuit formed by said storage capacitor and said storage inductor and having a high impedance unsaturated state relative to said inductive load impedance for transferring energy flow to said pair of parallel rails, said magnetic switch having a first end connected to said first end of said storage inductor and a second end connected to said second end of said storage capacitor and having a volt-second capacity effective to maintain said high impedance state during said accelerating of said projectile and to switch to said low impedance state when an arc is formed between said rails as said projectile exits said rails.

4,718,323

THERMO-ELECTRONIC SYSTEM TO CORRECT FOR THERMAL DEFORMATION OF A RESTRAINED PLATE

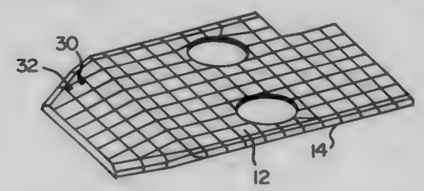
David H. Gladstone, Quebec; Jacques Dubois, Neufchatel; Raymond Carbonneau, Cap Rouge, and Gedeon Drouin, St-Foy, all of Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Canada

Continuation-in-part of Ser. No. 797,715, Nov. 4, 1985, abandoned. This application Apr. 16, 1986, Ser. No. 852,981

Claims priority, application Canada, Dec. 3, 1984, 469141

Int. Cl.[4] F41G *3/08*

U.S. Cl. 89—41.03 7 Claims



1. In a system comprising an instrument mounted on an edge-restrained plate, a method of monitoring changes in the orientation of the instrument due to thermal deformation of the plate caused by radiant heating thereof, the method comprising:

measuring a first plate temperature at a first location spaced from an edge of the plate;

measuring a second plate temperature at a second location between the first location and the edge of the plate;

generating first and second temperature signals representative of the measured first and second temperatures respectively;

combining and processing the first and second temperature signals to produce a deflection signal proportional to the angular deformation of the plate where the instrument is mounted; and

monitoring the deflection signal as a measure of changes in the instrument orientation.

4,718,324

SERVOMOTOR FOR ASSISTING WITH BRAKING INCORPORATING A SWITCH FOR A STOP SIGNAL

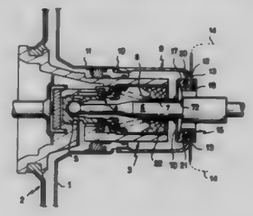
Jean-Pierre Gautier, Aulnay-sous-Bois, and Jean-Louis Peulgault, Paris, both of France, assignors to Bendix France S.A., Paris, France

Filed Apr. 14, 1986, Ser. No. 851,595

Claims priority, application France, Apr. 17, 1985, 85 05811

Int. Cl.[4] F01B *25/26*; F15B *9/10*

U.S. Cl. 91—1 7 Claims



1. A servomotor for assisting with braking comprising, in a casing, a piston structure enclosing valve means actuated by an input rod supporting an abutment component which cooperates in bearing, in a rest position of the servomotor, with a stop structure fixed firmly to the casing, the abutment component movable with the input rod during operation of the servomotor, characterized in that the servomotor includes electrical contact means mounted on the stop structure and capable of being actuated by the abutment component, the electrical contact means including an electrical contact component movable relative to the stop structure and which cooperates in engagement with the abutment component, the stop structure comprising a collar portion of a sleeve extending from the casing, the collar portion forming an internal bearing surface and supporting the electrical contact component, the movable electrical contact component including an actuating portion interposed between the abutment component and the internal bearing surface of the stop structure, the abutment component mounted slidable on the input rod and including at least one bearing surface which cooperates with the actuating portion so that upon release of the input rod the first bearing surface engages the actuating portion which displaces the contact component to effect operation thereof.

4,718,325

HYDRAULIC SWING CONTROL FOR BOOM ASSEMBLY

Daniel B. Shore, Prospect Heights, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 3, 1986, Ser. No. 926,216

Int. Cl.[4] F15B *15/22*, *13/04*

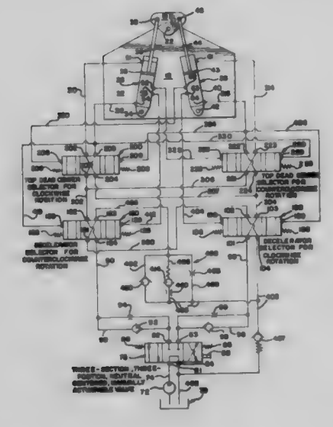
U.S. Cl. 91—189 R 11 Claims

1. In an apparatus having (1) two double-acting piston-cylinder type hydraulic motors each pivotally connected at each end to one of two frame members for effecting relative pivoting movement of said frame members through an arc about a

main pivot axis wherein each said hydraulic motor is fully extended when its respective line of action intersects said main pivot axis, (2) a hydraulic system means connected to said two hydraulic motors for supplying a flow of fluid under pressure from a source of fluid to each said hydraulic motor and for returning the flow of fluid from each said hydraulic motor to said source, and (3) cushioning means connected with said hydraulic system means for restricting flow from both said hydraulic motors to said source during an end portion of the relative pivoting movement of said frame members through said arc,

a mechanism for controlling said pivoting movement comprising:

(a) each said hydraulic motor having a first port beyond one end of the piston stroke length, spaced-apart intermediate second and third ports within the piston stroke length, and a fourth port beyond the other end of the piston stroke length, said second port of each said hydraulic motor being located so that as the associated piston moves from one side to the other of said second port the piston rod of the other hydraulic motor is at its maximum extension,



said third port of each said hydraulic motor being located so that as the associated piston moves from one side to the other of said third port said frame members are at said end portion of relative pivoting movement;

(b) top dead center selector valve means for being arranged in a first configuration to direct flow to the first port of, and from the fourth port of, one of said hydraulic motors while directing flow to the fourth port of, and from the first port of, the other hydraulic motor and including actuation means for arranging said top dead center selector valve means in a second configuration to reverse the flow relative to one of said hydraulic motors in response to a pressure differential between the second and fourth ports of the other of said hydraulic motors; and

(c) decelerator selector valve means for being arranged in a first configuration to direct the return flow from said hydraulic motors so as to bypass said cushioning means and including actuation means for arranging said decelerator selector valve means in a second configuration to direct the return flow to said cushioning means in response to a pressure differential between the third and fourth ports of either of said hydraulic motors.

4,718,326

TANDEM BRAKE BOOSTER

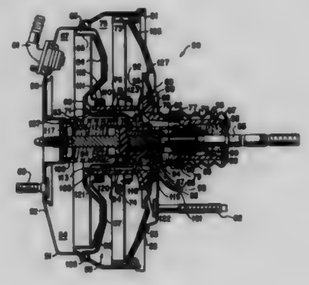
Yusuru Sugiura, Anjo, and Akihiko Miwa, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 771,014, Aug. 30, 1985, abandoned. This application Apr. 2, 1987, Ser. No. 33,874

Claims priority, application Japan, Aug. 30, 1984, 59-132077[U]

Int. Cl.[4] F15B 9/10; F01B 19/00

U.S. Cl. 91—369 A 3 Claims



1. A tandem brake booster, comprising:

a housing;

front and rear movable walls positioned within said housing wherein said rear wall includes a hub member, said hub member having a hole formed therein;

a partition wall interposed between said front and rear movable walls;

first and second constant pressure chambers and first and second variable pressure chambers formed by said movable walls and said partition wall;

first communicating passage means for intercommunicating said variable pressure chambers;

second passage means for intercommunicating said constant pressure chambers;

valve means provided in said rear movable wall for generating a pressure difference between each of said constant pressure chambers and each of said variable pressure chambers and for forwardly moving said movable walls;

a cylindrical case having a radial groove formed therein, a stepped portion and small and large diameter portions positioned within said hole in said hub member;

a spring engaged with said case so as to urge said movable walls rearwardly;

a reaction rubber disc positioned within said stepped portion of said case;

an input push rod;

an output push rod;

a valve plunger slidably inserted into said small diameter portion of said case and connected to said input push rod;

a key member positioned within a radial hole of said hub member and said radial groove of said case and engaged with said valve plunger for limiting sliding of said valve plunger with respect to said rear movable wall such that a forward actuating force of said movable walls acts on said output push rod via said case and said reaction rubber disc wherein a reaction force thereof acts on said valve plunger via said reaction rubber disc wherein upon rearward movement of said movable walls, the movable walls are further rearwardly moved after the rearward movement of valve plunger against housing is stopped due to said key being contacted with said housing; and

a first projection integrally formed on an inner circumferential surface of said hole of said hub member forward of said key member and a second projection integrally formed on an outer circumference of said small diameter portion of said case, respectively, wherein said first projection selectively engages said second projection such that forward axial movement of said case towards said rear movable wall is blocked when said key member is positioned in said hub member and within said radial hole of said case and rotation of said case with respect to said hub member is limited, and wherein said first and second projections are selectively engageable and disengageable by rotation of said case within said hub member when said key member is not positioned in said hub member and said radial hole of said case.

4,718,327

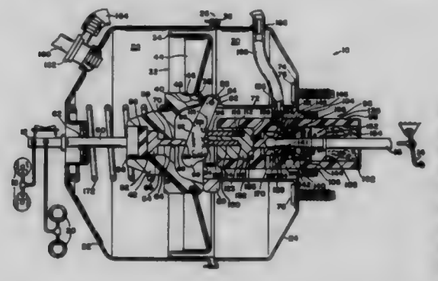
REACTION MECHANISM FOR BRAKE BOOSTER

Lawrence R. Myers, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 803,359, Dec. 2, 1985, Pat. No. 4,672,883. This application Nov. 20, 1986, Ser. No. 932,825

Int. Cl.[4] F15B 9/10

U.S. Cl. 91—369 B 4 Claims



1. A reaction mechanism for a brake booster having a wall that moves within a cavity in response to a pressure differential to produce an output force corresponding to an input force applied to a control member by an input member and lever means through which a reaction force is transferred from said wall to said control member to balance said input force, the improvement comprising:

a first plunger carried by said wall and having a projection that extends therefrom toward said control member;

a second plunger carried by said control member and connected to said input member;

said lever means having an arm with a first end fixed to a support and a second end free to move in an arc as a function of the movement of said wall, said projection engaging said lever adjacent a said second end, said arm having a cam surface located between said first and second end;

first force transmitting means carried by said second plunger;

resilient means for urging said first force transmitting means into constant engagement with said cam surface on said arm; and

second force transmitting means carried by said second plunger, said input force applied to said control member being transmitted from said second plunger into said first plunger through the first force transmitting member and lever means, said reaction force overcoming said resilient means when a predetermined input force is produced to bring said second force transmitting means into engagement with said cam surface and thereafter transfer said input force directly through said lever means into said first plunger for moving said wall during the development of said output force.

4,718,328

BRAKE BOOSTER OF TANDEM TYPE

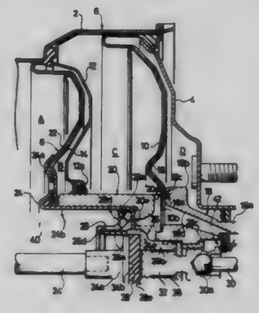
Kohei Mori, Ogawa, and Haruo Suzuki, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1986, Ser. No. 873,240

Claims priority, application Japan, Jan. 17, 1985, 60-9105[U]

Int. Cl.[4] F15B 9/10

U.S. Cl. 91—376 R 10 Claims



1. A brake booster of tandem type including a valve body internally housing a valve mechanism which controls a communication between pressure chambers defined within a shell and a communication between the pressure chambers and the atmosphere, the valve body including passages which provide a communication between the pressure chambers, a center body connected to the valve body and formed with a passage which is adapted to be connected to one of said passages in the valve body, a combination of front and rear power pistons which define the pressure chambers within the shell and centrally formed with paths which are connected to the passages in the valve body and center body, and a hub which is disposed in alignment with the axes of the valve body, the center body and the front power piston and extending through openings therethrough, a nut, said hub being adapted to be threadably engaged with said nut to axially sandwich the valve body, the center body and the front power piston together in an integral manner, the front power piston including a cylindrical retainer portion which is fitted inside the center body and having a radially inward extending, annular flange; wherein

said nut has a portion threadedly engaging externally threads on a portion of said hub protruding forward through said annular flange of said front piston, said nut having an intermediate portion extending radially outward from said threaded portion, and said nut having a radially outer peripheral portions backing the portion of said front piston flange immediately adjacent said cylindrical retainer portion of said front piston, said radially outer peripheral portion being carried by said intermediate portion said intermediate portion of said nut sloping conically rearward toward the radially outer part of said front piston flange, said nut being axially spaced from the radially inner part of said flange.

4,718,329

CONTROL SYSTEM FOR HYDRAULIC CIRCUIT

Kiyoto Nakajima; Kazuo Honma, and Hiroaki Tokuhiro, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,603

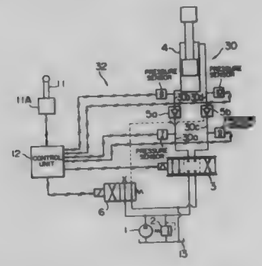
Claims priority, application Japan, Feb. 4, 1985, 60-18570; Sep. 2, 1985, 60-191934; Sep. 2, 1985, 60-191935

Int. Cl.[4] F15B 11/08

U.S. Cl. 91—445 7 Claims

1. A control system for a hydraulic circuit having on-off

valves interposed by means of hydraulic lines between a control valve and an actuator for allowing and blocking a flow of hydraulic fluid therebetween, so that when the on-off valves are closed, a pressure differential exists in the hydraulic lines upstream and downstream of the on-off valves whereby a thrust is produced on the actuator when switching the on-off valves to an open position, operation means for providing a signal to actuate and switch the control valve and on-off



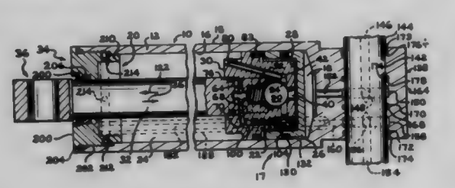
valves, pressure sensor means connected to the hydraulic lines upstream and downstream of the on-off valves for detecting the pressure in these hydraulic lines; and control means for calculating, based on the pressures detected by the pressure sensor means, a value representative of reduction of the thrust applied to the actuator and outputting the calculated value to the control valve while the on-off valves are closed to thereby perform pressure matching control for reducing the thrust.

4,718,330

HYDRAULIC CYLINDER

Bruce W. Mitton, Fayette, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Jan. 18, 1982, Ser. No. 339,947
Int. Cl.⁴ F16J 1/10
U.S. Cl. 92—129 **8 Claims**



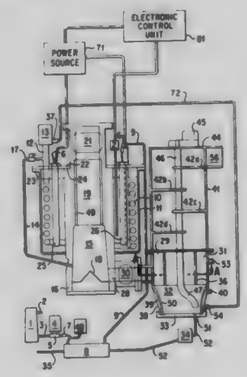
1. A hydraulic cylinder, comprising:
a cylindrical housing;
a piston slidably disposed in said housing and including a piston rod protruding from said piston and extending to the exterior of said hydraulic cylinder;
pilot-actuated relief valve means stepwise operable by a first predetermined hydraulic pressure disposed in said piston for stepwise allowing said piston to move in a first direction when a force acting in said first direction and having a magnitude in excess of a first predetermined value is applied to said piston rod;
said valve means being proportionally operable by a second hydraulic pressure substantially lower than said first hydraulic pressure for allowing said piston to move in a second direction at a rate proportioned to a force in excess of a second predetermined force acting in said second direction is applied to said piston rod.

4,718,331

APPARATUS FOR COOKING PASTE FOODS

Gloriana Anselmi, Castel S. Pietro Terme, and Giuliana De Franceschi, Castenaso, both of Italy, assignors to B. B. D. S. R. L., Bologna, Italy

Filed Mar. 19, 1986, Ser. No. 841,225
Claims priority, application Italy, Mar. 26, 1985, 3380 A/85
Int. Cl.⁴ A47J 19/00, 43/04
U.S. Cl. 99—352 **6 Claims**



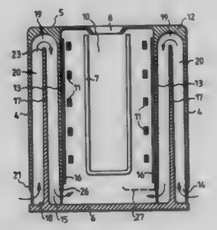
1. An apparatus for cooking paste foods, comprising:
a first chamber having an inlet;
a second chamber having a movable bottom plate adapted to open said second chamber responsive to actuation by a driving mechanism;
a communication duct interconnecting said first chamber and said second chamber;
a first valve for controlling fluid flow through said inlet to said first chamber;
a second valve for controlling fluid flow through said communication duct;
a coiled pipe for conveying water and steam;
a hydraulic system comprising in series a pump having a relay, a heat exchanger and a first duct to convey water to said coiled pipe;
an oil container housing said coiled pipe and for holding oil, said container having an electric resistance means disposed therein positioned for immersion in said oil in said container and a thermostat means, said electric resistance means for heating said oil to a predetermined temperature measured by said thermostat means to yield in said coiled pipe saturated steam;
an electronic power source connected to said electric resistance means;
an electric control means connected to said electric power source;
said thermostat means for monitoring a temperature of oil in said container and for sending signals to said electronic control means when said temperature reaches a predetermined magnitude;
a second pipe interconnecting said coiled pipe and said first chamber to convey said steam to said first chamber, said second pipe including a pressure maintenance valve for limiting a pressure of said saturated steam and a solenoid valve comprising means connected to said relay of said pump for sending a control signal to said relay when said pressure of said saturated steam in said second pipe is lower than a predetermined magnitude;
a stirring means for stirring paste in said second chamber; and
means for introducing pickle into said second chamber.

4,718,332

ELECTRIC TOASTER

Georg Mitbrath, Grünsfeld, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,079
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516353
Int. Cl.⁴ H05B 3/06
U.S. Cl. 99—385 **22 Claims**



1. Electric toaster with heating elements, at least one toast well, into which the toast is fed through a loading and unloading opening, and a housing having inner, outer and intermediate wall portions, said wall portions of said housing being separated from one another and forming meander-shaped flow channel structure for an air stream introduced from outside, with the air stream entering the flow channel through an air inlet opening cooling said outer wall portions of said housing by convection as it passes through said meander-shaped flow channel structure and emerging through an air outlet opening, said meander-shaped flow channel structure including reversing curve portions located in the top and bottom areas of said meander-shaped flow channel structure such that the air stream flows in an upward direction in a first portion of said meander-shaped flow channel structure in a downward direction in a second portion of said meander-shaped flow channel structure.

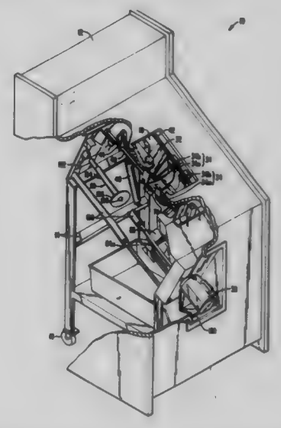
4,718,333

PEELING SYSTEM

Frank D. Pierce, Pacific Grove; Bradford E. Knickerbocker, Piedmont, and Don H. Lenker, Salinas, all of Calif., assignors to Castle & Cooke, Inc., San Francisco, Calif.

Division of Ser. No. 821,267, Jan. 22, 1986. This application Nov. 10, 1986, Ser. No. 928,970
Int. Cl.⁴ A23N 4/20, 7/00
U.S. Cl. 99—486 **12 Claims**

1. Apparatus for peeling an object having a generally soft interior portion surrounded by a generally hard external surface, said apparatus being suitable for use by consumers or in areas with consumers, said apparatus comprising:
knife means for removing the hard external surface from said object, leaving substantially the soft interior portion;
a housing enclosing said knife means to protect consumers or an operator of said apparatus from said knife means, said housing having two openings, one for receiving the object, and one for discharging said soft interior portion after said object has been peeled;
a door connected to the housing in such manner that when the door is in an open position, the opening for receiving the object is substantially unobstructed and when the door is in a closed position, it closes the opening for receiving the object, said door in its closed position providing protection for consumers or said operator from the knife means and from spatters caused by the peeling process;
a first receptacle for receiving said soft interior portion of the object discharged from the discharging opening of the housing after peeling, said first receptacle being so located relative to said housing such that when it is placed in a receiving position it is in position to receive the interior portion through the discharging opening without spatter;
means in said housing for causing relative movement between said object and said knife means, said relative movement being such that the external surface is removed from the object by said knife means; and



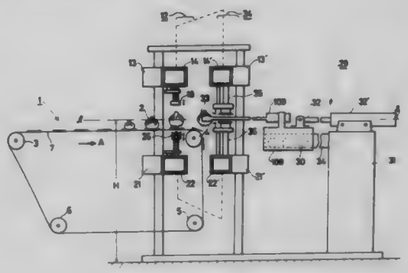
sensing and activating means for sensing whether said door is substantially in the closed position, for sensing whether said first receptacle is in said receiving position, and for activating said movement causing means to remove the external surface after sensing both that the door is substantially in the closed position and that the first receptacle is in the receiving position.

4,718,334

APPARATUS FOR REMOVING STEM AND ROOT OF BULB

Tatsuo Nagaoka, Yokohama, Japan, assignor to Nagaokaseiki Seisakusho Co., Ltd., Kanagawa, Japan

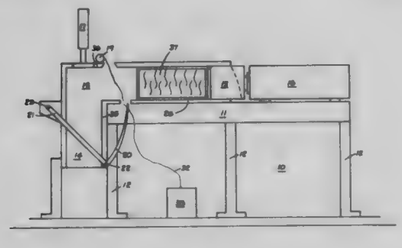
Continuation-in-part of Ser. No. 709,201, Mar. 7, 1985, abandoned. This application Jan. 17, 1986, Ser. No. 875,316
Claims priority, application Japan, Mar. 8, 1984, 59-42892
Int. Cl.⁴ A23N 15/02, 15/04
U.S. Cl. 99—636 **5 Claims**



1. Apparatus for cutting off and removing the stems and roots from bulbs, comprising:
bulb carrying means for carrying said individual bulbs into position for said cutting of the stem and root portions therefrom;
cutting means for cutting said stems and roots from said

bulbs, said cutting means comprising a root cutting element separated from a stem cutting element;
centering means for centering each of said bulbs individually, to a predetermined level between said root cutting element and said stem cutting element; and
holding means for holding each of said centered bulbs individually as centered by said centering means, said holding means being movable to transport each said held bulb at said predetermined level from said centering means to said cutting means for cutting thereby of the root and stem of said held bulb.

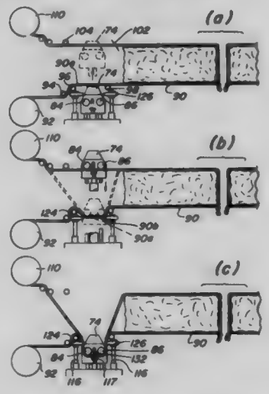
4,718,335
METHOD FOR RECOMPRESSING BALES OF FIBROUS MATERIAL
Gene Ast, 40380 Midway, San Jacinto, Calif. 92383
Division of Ser. No. 792,000, Oct. 28, 1985, Pat. No. 4,676,153.
This application Nov. 4, 1986, Ser. No. 926,569
Int. Cl.[4] B65B *13/20*
U.S. Cl. 100—3 2 Claims



1. A method for recompressing bales of fibrous material which comprises:
introducing a field bale of fibrous material into a recompression chamber;
recompressing said bale to a predetermined size;
retieing the recompressed bale;
transferring said recompressed bale, under compression, to a decompression chamber;
holding said recompressed bale in the decompression chamber for a sufficient period of time for trapped air to escape from the recompressed bale and for the fibrous material of the recompressed bale to loose resiliency; and
ejecting the recompressed bale from the decompression chamber.

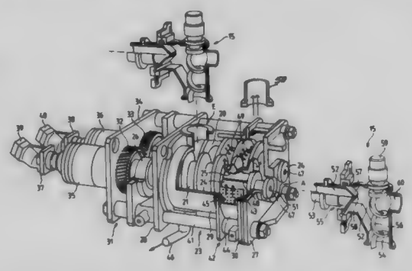
4,718,336
MODULAR AUTOMATIC BALE TIER
Robert A. Munro, Holland, Pa., assignor to Cives Corp., Roswell, Ga.
Filed Oct. 22, 1986, Ser. No. 921,974
Int. Cl.[4] B65B *13/28*
U.S. Cl. 100—3 25 Claims

1. Apparatus for tying bales of compacted material, comprising:
a frame,
a module mounted on one side of the frame,
said module including a wire transport head movable between a first position adjacent said one side of said frame and a second position adjacent an opposite side of said frame,
means for guiding a wire having a first portion extending across a zone proximal said first position and a second portion extending across a zone proximal said second position,
means for reciprocating said head between said first and second positions such that said head engages both wire portions,
means for twisting and cutting said first and second wire portions engaged on said wire transport head to form a closed wire loop around said bale, and



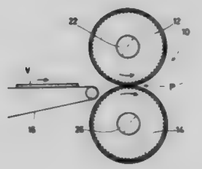
means for adjustably positioning said module with respect to said frame so as to adjustably predetermined the length of said closed wire loop.

4,718,337
APPARATUS FOR THE TREATMENT OF PLANT MATERIAL
Hans Wiederkehr, Rümlang, Switzerland, assignor to Pharos Inventions Ag, Zug, Switzerland
Filed Jun. 28, 1985, Ser. No. 750,393
Claims priority, application Switzerland, Jul. 4, 1984, 3233/84
Int. Cl.[4] B30B *9/16*
U.S. Cl. 100—75 8 Claims



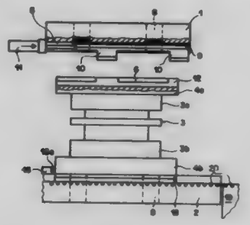
1. An apparatus for treatment of plant material enabling a liquid and solid phase to be obtained therefrom which comprises: a multistage unit having at least two screw presses each having an individual drive wherein the speed of each drive is independently adjustable, said presses separately arranged in stages including a final stage; a material outlet from each of said stages and a material inlet into each of said stages; a transfer duct connecting each of said outlets except the outlet from the final stage with the next succeeding inlet including a conveyor for conveying the material passing out of said outlet into the following material inlet, wherein said plant material is successively subjected to pressing, said transfer duct being provided with an adjustable baffle means for material passing out of said outlet, said conveyor means is a screw conveyor, and said following material inlet includes an inlet-side pipe member housing said screw conveyor.

4,718,338
VENEER PROCESSING APPARATUS
Yashinori Kobe, Aichi, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan
Continuation-in-part of Ser. No. 791,359, Oct. 25, 1985, Pat. No. 4,691,629. This application Aug. 4, 1986, Ser. No. 893,103
Claims priority, application Japan, Aug. 28, 1985, 60-189157
Int. Cl.[4] B30B *9/20*
U.S. Cl. 100—121 9 Claims



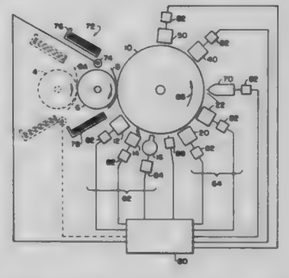
1. An apparatus for processing a veneer, comprising:
a pair of rotary bodies each being provided on an outer periphery thereof a number of teeth, edge lines of which extend each in a direction that intersects an intended direction of rotation of said rotary body, said rotary bodies being located such that said teeth on said rotary bodies are aligned with each other in a predetermined position where the veneer is inserted;
an edge of each of said teeth being indented along the edge line to have alternating projections and recesses, tips of said projections of said teeth on one of said rotary bodies and tips of said projections of said teeth on the other rotary body assuming a predetermined relative position in said predetermined position for veneer insertion and the tips of said projections being adapted to extend into the surface of an inserted veneer sheet; and
a resilient material filling said recesses of said teeth which neighbor each other on each of said rotary bodies.

4,718,339
PRESS WITH CHUCKING PLATES FOR SETS OF TOOLS
Hans Wymann, Lyss, Switzerland, assignor to Feintool International Holding, Switzerland
Filed Apr. 30, 1986, Ser. No. 857,725
Claims priority, application Switzerland, May 1, 1985, 1843/85
Int. Cl.[4] B21D *37/14*; B30B *15/02*
U.S. Cl. 100—295 11 Claims



1. A press of the type having upper and lower plates for chucking a set of tools consisting of an upper tool part and a lower tool part, one of said plates acting as a press ram movable toward and away from the other of said plates acting as a press table, each of said plates including at least one T-slot, and said upper tool part and said lower tool part each including at least one T-slot, said press further having at least two grippers mounted in each of said upper and lower plates and each including a T-slot continuously aligned with a respective said T-slot of said plates, and said T-slot of said upper tool part including two spaced recesses, wherein the improvement comprises:
at least two T-pieces, said T-pieces being spaced apart from one another in said T-slot of said upper plate and structurally separate from said grippers;
first means for bringing said T-pieces and said recesses into alignment with each other; and
second means for locking and clamping said T-pieces in said T-slot of said upper tool part outside said recesses.

4,718,340
PRINTING METHOD
Franklin S. Love, III, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 9, 1982, Ser. No. 407,001
Int. Cl.[4] B41L *13/06*
U.S. Cl. 101—116 15 Claims

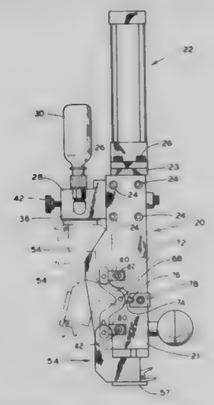


1. A method for preparing a mesh surface which carries a latent image defined by contiguous hydrophobic and complementary hydrophilic areas on said surface, said method comprising:
(a) providing a clean, hydrophilic mesh surface consisting essentially of a first material which is intrinsically substantially hydrophilic;
(b) applying a substantially non-occlusive, hydrophobic and oleophilic layer of a second material over said hydrophilic surface, said layer, when applied, conforming to such mesh surface so as to avoid blocking openings comprising said mesh surface;
(c) maintaining said second material on selected areas of said hydrophilic surface in substantially unchanged condition while forming said latent image on said surface by removing from said surface, in a pre-determined configuration, a quantity of said material, said quantity being sufficient to form said latent image by rendering said portions of said surface substantially hydrophilic compared with said selected areas rendered substantially hydrophobic by the application of said second material.

4,718,341
CONTACT INK STAMPING APPARATUS
Alva J. Bishop, 2270 Weller Dr., Zanesville, Ohio 43701
Filed Sep. 26, 1986, Ser. No. 912,386
Int. Cl.[4] B41F *1/26*
U.S. Cl. 101—334 3 Claims

1. An automatic contact ink stamping apparatus for repetitive printing of predetermined indicia on selected workpieces comprising, in combination, a vertically extending base means supporting a vertically disposed power cylinder and piston at

the upper end and including vertically extending side walls, each of said side walls provided with a vertically extending recess defining a track related to the stroke length of said piston; a reservoir means mounted to said base means and including a downwardly facing horizontally disposed ink pad; a slide block fixed to the lower end of said piston and including rail means operatively mounted in said track for vertical slidable movement therein responsive to the stroke of said piston between a raised and lowered position, said slide block including an outwardly directed lug portion; a slot provided on one of said side walls of said base means defining a cam surface having an upper and lower vertically extending portion defining an essentially linear line of travel and a central generally U-shaped arcuate portion; a metallic insert adjustably fixed within said side wall to define a portion of the cam surface formed by said slot in at least one of said lower and upper vertical extending portions of said slot; a cam follower slideably disposed in said slot; a pivot block having a stamping die surface and being pivotally mounted to said lug portion of said slide block and to said cam follower to move in response to the stroke of said piston in a path defined by said slot between a raised ink supply position with said stamping surface engaging said ink pad and a lowered printing position with said stamping surface inverted 180 degrees relative to said ink supply position to engage and mark a workpiece.



4,718,342

RESILIENT SHEET GRIPPER FOR A SHEET-FED ROTARY PRINTING PRESS

Rudolf Raab, Hanau; Manfred Herold, Kahl/Main, and Peter Hummel, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,488

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529639

Int. Cl.⁴ B41F *1/30*

U.S. Cl. 101—409 **3 Claims**

1. A sheet gripper assembly for use in a press cylinder of a sheet-fed rotary printing press comprising,

a gripper shaft mounted on said cylinder for relative rotational movement,

a gripper support on said cylinder,

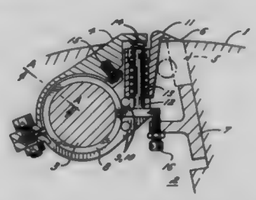
a clamping member fixed to said gripper shaft,

an abutment member mounted on said gripper shaft for rotational and axial movement relative to said gripper shaft,

said abutment member having a guide pin,

a gripper finger having a sleeve portion mounted on said abutment member guide pin for relative sliding movement,

said gripper finger having a tip and being pivotable upon rotational movement of said gripper shaft from an open position to a sheet engaging position whereby said tip cooperates with said gripper support for engaging a sheet therebetween, and



means fixed to said cylinder for supporting an axially positionable stop screw against which said abutment member is engagable upon pivoting of said gripper finger toward said sheet engaging position whereupon said gripper shaft is rotatable relative to said abutment member and said gripper finger is moveable relative to said abutment member pin toward said sheet engaging position in a path substantially perpendicular to said support surface.

4,718,343

RESILIENT SHEET GRIPPER FOR A SHEET-FED ROTARY PRINTING PRESS

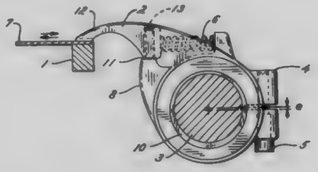
Valentin Gensheimer, Muhlheim/Main, and Winfried Hartung, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,761

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529596

Int. Cl.⁴ B41F *1/30*

U.S. Cl. 101—409 **5 Claims**



1. A sheet gripper assembly for use in the rotatable cylinder of a sheet-fed rotary printing press comprising

a gripper support surface on said rotatable cylinder,

a rotatable gripper shaft,

a pivotal gripper finger mounted on said gripper shaft for movement between a closed position for engaging a sheet between said support surface and gripper finger and an open position pivoted away from said support surface,

eccentric means on said shaft for supporting said gripping finger for movement relative to said gripper shaft about an axis eccentric to the axis of said gripper shaft,

clamping means on said gripper shaft adapted for movement with said gripper shaft,

spring means interposed between said clamping means and said gripper finger for biasing said gripper finger in a sheet engaging direction of movement, and

said eccentric means and gripper shaft being rotatable relative to said gripper finger upon engagement of a sheet by said gripper finger so as to move the gripper finger about said eccentric axis for preventing relative sliding movement between said gripper finger and the engaged sheet.

4,718,344

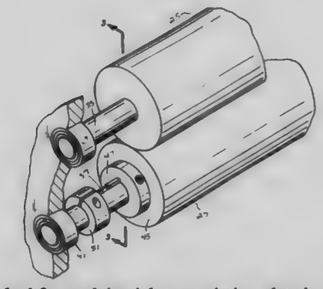
APPARATUS AND METHOD FOR OSCILLATING THE FORM ROLLERS IN A PRINTING PRESS

Milton R. Lemaster, 16528 Westgrove, Dallas, Tex. 75248

Filed May 2, 1986, Ser. No. 858,944

Int. Cl.⁴ B41F *1/46*

U.S. Cl. 101—426 **14 Claims**



1. A method for applying ink to a printing plate in a lithographic printing press, said method comprising the steps of:

providing a series of ink distribution rollers for transferring ink from an ink source to the printing plate, said roller including at least one vibrating roller and at least one form roller disposed between said vibrating roller and said plate and being in contact with both said vibrating roller and said plate so that rotary and axial motion of said vibrating roller is substantially imparted to said form roller;

rotating said vibrating roller about its major axis and moving said vibrating roller in an oscillating manner along its major axis to transfer ink to said form roller; and

allowing said form roller to rotate in response to the rotary motion imparted thereto by said vibrating roller and to move axially along with said vibrating roller in an oscillating manner substantially the same distance in either direction as said vibrating roller so that said form roller applies a relatively uniform coating of ink to said printing plate.

4,718,345

PRIMER ASSEMBLY

Malek E. Yunan, Boonton Township, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 616,138, Jun. 1, 1984, abandoned. This application Mar. 25, 1985, Ser. No. 714,505

Int. Cl.⁴ F42B *3/10*; C06C *5/04*

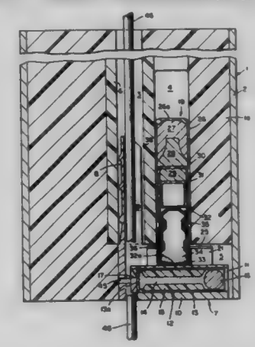
U.S. Cl. 102—275.3 **17 Claims**

1. A primer assembly adapted to be threaded onto a low-energy detonating cord (LEDC) and comprising:

(a) a substantially cylindrical explosive primer (1) having a detonator-receiving cavity therein substantially parallel to its longitudinal axis, and (2) being associated with, an aperture used for threading LEDC at a location separated from, and on an axis substantially parallel to, said cavity:

(b) seated within said detonator-receiving cavity, a detonator having a percussion-sensitive ignition charge therein at its actuation end; and

(c) an explosive coupler comprising a plastic connecting block housing a coupling charge of shock-sensitive detonating explosive in linear array in a bore therein; said explosive coupler being attached to said primer in a manner such that said explosive charge in said bore is (1) perpendicular to said detonator and in initiating proximity to said detonator's percussion-sensitive ignition charge, and (2) perpendicular to said aperture and in close enough proximity thereto to be initiated by the detonation of LEDC threaded through said aperture; the energy output and degree of sensitivity of said charge being such that said explosive primer is adapted to be initiated by said detonator as a result of the transmission of an initiating impulse from said LEDC to said detonator via said explosive coupler.



4,718,346

EXPLOSIVE CHARGE FOR THE EXPLOSIVE WELDING OF LARGE DIAMETER PIPES, AND A METHOD FOR ITS MANUFACTURE

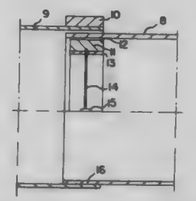
Hermann Schmid; Per Sjöberg, and Leif Svensson, all of Karlskoga, Sweden, assignors to Nobel Kemi AB, Karlskoga, Sweden

Filed Jan. 20, 1986, Ser. No. 876,500

Claims priority, application Sweden, Jan. 20, 1985, 8500279

Int. Cl.⁴ F42B *1/02*

U.S. Cl. 102—310 **22 Claims**



1. An explosive charge for explosive jointing comprising an annular effective charge containing a secondary explosive;

a booster disk produced from at least one secondary explosive and having a circular outer periphery and a centered detonator opening for mounting of a detonator united with said annular effective charge throughout its entire outer periphery;

a buffer of an elastically deformable material that covers the outer side of the effective charge facing the object that is to be explosively jointed and bridging the distance thereto;

a high density temper material covering the inner side of the effective charge counter-directed away from said object to be explosively jointed;

wherein the same type of explosive and polymer binder are included in both the booster disk and the effective charge;

said effective charge further including a high-density substance compatible with the other components of the effective charge and being selected from the group of metal, metal oxide powder, and mixtures thereof;

wherein said explosive charge further includes gas blisters in the form of air-filled microspheres of glass or polymer material; and

wherein said high-density tamper material includes pow-

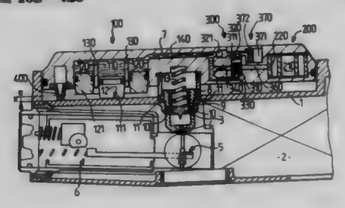
dered metal and the same polymer binder as in said effective charge.

4,718,347

PRESSURE PLATE FOR MINES, IN PARTICULAR ANTI-TANK MINES, AND MINE COMPRISING SAME

Jean Buricos, Ramonville St Agne, and Denis Dilhan, Asterive, both of France, assignors to Etienne LaCroix Tous Artifices S.A., France

Filed Jan. 27, 1987, Ser. No. 6,950
Claims priority, application France, Jan. 29, 1986, 86 01238
Int. Cl.[4] F42B *23/28*
U.S. Cl. 102—428 **16 Claims**



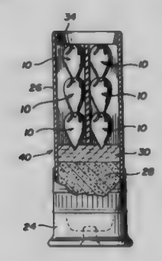
1. Pressure plate for a mine adapted to be triggered by complete depression of the pressure plate, which incorporates a hydraulic circuit comprising a pressure chamber containing a fluid that is compressed by force applied to the pressure plate, a depressurization unit through which said fluid is evacuated from said pressure chamber in a controled manner in response to a sustained force greater than a predetermined threshold being applied to the pressure plate, and a bistable member adapted to move between a first position in which it prevents communication between said pressure chamber and said depressurization unit and a second position in which it establishes communication between said pressure chamber and said depressurization unit, the arrangement being such that said bistable member is initially in said first position when no force is exerted on the pressure plate and remains in said first position so long as the pressure plate is subjected to an increasing or stable force and switches to said second position when the pressure of said fluid decreases after it has increased due to a force of this kind whereby, after increasing to a maximum value and then decreasing to a minimum value, an increase in said force results in depressurization of said fluid and complete depression of the pressure plate, so triggering the mine.

4,718,348

GROOVED PROJECTILES

John E. Ferrigno, 925 E. Magnolia, Apt. Q-2, Tallahassee, Fla. 32301

Filed May 16, 1986, Ser. No. 863,788
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—439 **2 Claims**



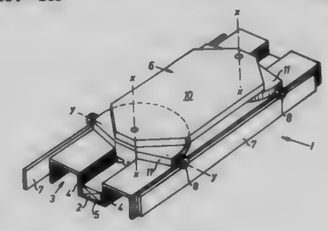
1. A shell for use in a shotgun or other smooth bore weapon comprising a shell case including an explosive charge in back of projectile means located in a forward end portion of the case, wherein the projectile means comprises plural individual projectiles arranged in at least one stack extending lengthwise of the case, each projectile being substantially teardrop-shaped having a substantial hemispherical relatively blunt nose portion facing the forward end of the case, an elongate tail portion tapering smoothly from a junction with the nose portion to a relatively sharp tip, and a depression in the nose portion, the projectiles being stacked with the tip of one projectile located in the depression of the projectile therebehind, the projectiles being stacked in plural columns with partition means therebetween forming, in conjunction with the case, elongate compartments snugly receiving the respective columns of stacked projectiles.

4,718,349

CONVEYOR LINE FOR HEAVY GOODS CONVEYING

Per E. Walström, Strandgatan 2, S-992 00 Vadstena, Sweden

Filed May 28, 1986, Ser. No. 868,243
Claims priority, application Sweden, May 29, 1985, 8502634
Int. Cl.[4] B61B *13/12*; B65G *29/00*
U.S. Cl. 104—165 **12 Claims**



1. Conveyor line comprising at least one pallet for conveying heavy loads, the line including a continuously moving conveyor belt guided for movement between fixed, parallel, guide walls, said pallet being operatively related to said belt for frictional drive thereby when movement of the pallet along the conveyor line is unimpeded and for gliding movement of said belt relative to the pallet when said movement of the pallet is restrained, the improvement consisting in that fixed support members are provided parallel to and at opposite sides of said guide walls, at least one guide element effectively supporting said pallet and in turn being supported by said fixed support members for movement therealong, said guide element also being mounted for movement about a vertical axis to enable movement of the pallet about curved sections, if any, in the conveyor line, and a glide shoe operatively related to said guide element and said belt and including means for yieldingly engaging the glide shoe with the belt to convey the pallet along the conveyor line when the pallet is loaded.

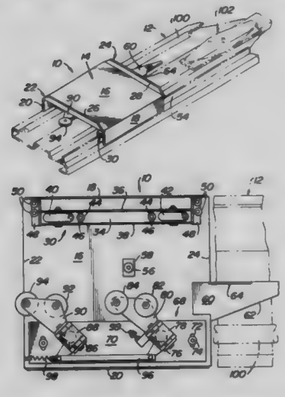
4,718,350

SMALL LIGHTWEIGHT DRIVERLESS VEHICLE

Charles E. Jacoby, Bethlehem, and Per E. Lindqvist, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 7, 1981, Ser. No. 328,271
Int. Cl.[4] B61B *13/12*
U.S. Cl. 104—166 **15 Claims**

10. A driveless vehicle comprising a body having opposite sides extending between a front and a rear end, first and second sets of wheels on said opposite sides for supporting said body so that a deck portion of the body is horizontally disposed, said first set of wheels being support wheels adapted to ride on a rail, drive wheel means adapted for oscillation between a drive position and stop position, said drive wheel means being biased to a drive position, said second set of wheels being said drive wheel means, each drive wheel means supporting a pair of cam followers which are rotatable about vertical axes at different distances from an associated drive wheel, the drive wheels being coupled together for movement as a unit, the lower periphery of the support wheels and drive wheels being at substantially the same elevation, one pair of cam followers being arranged for causing the drive wheel means to move toward a stop position upon contact with a cam, said drive wheel means being adapted to perform the dual function of



supporting its side of the body and for propelling the body by frictional contact with a drive shaft.

11. A driverless vehicle comprising a body having support wheels and at least one drive wheel, said drive wheel having a movable mount, means connected to said mount for shortening the length of a cam surface adapted to move said mount, said means including two cam followers rotatable about vertical axes at different distances from said drive wheel for sequential contact with a cam.

4,718,351

ARTICULATED COUPLING FOR INTEGRAL TRAINS

Thomas H. Eagle, Cape Vincent, N.Y., assignor to General Signal Corporation, Stamford, Conn.

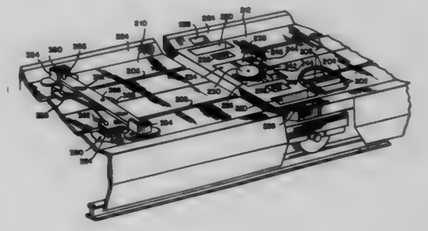
Continuation-in-part of Ser. No. 776,764, Sep. 16, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 853,562
Int. Cl.[4] B61F *3/12, 5/14*; B61G *5/02*
U.S. Cl. 105—4.3 **28 Claims**

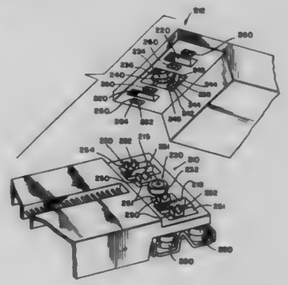
20. An articulated coupling for a rail car having a body with first and second ends, and an axle mounted to said body at said first end, comprising:

first coupling means including a pair of members having complementary spherical surfaces, one member of said pair on each end of said body on the longitudinal axis of said body;

second and third coupling means each including a pair of members having concave and convex complementary cylindrical surfaces which have axes parallel to a lateral axis of said body, one member of each pair associated with each end of said body, separated from each other along said lateral axis of said body including therebetween said first coupling means;

the axes of said cylindrical surfaces of said second and third coupling means being coaxial and include the center of





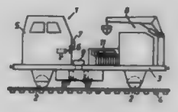
said spherical surfaces of said first coupling means when mated.

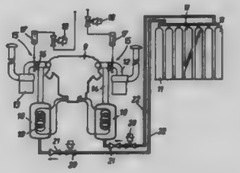
4,718,352

RESCUE VEHICLE WITH EMERGENCY ENGINE ACTUATION

Josef Theurer, Vienna, and Leopold R. Gruber, Scheibbs, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Mar. 10, 1986, Ser. No. 837,952
Claims priority, application Austria, Mar. 18, 1985, 806/85
Int. Cl.[4] B61C *5/02*; B61D *15/00*
U.S. Cl. 105—62.1 **7 Claims**



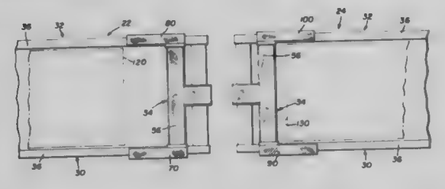


1. A work vehicle adapted for mobility along a track and for rescue work in underground or high-altitude sections in the atmosphere having alow oxygen-containing gas content, the vehicle being capable of carrying rescue personnel and being equipped with rescue apparatus, which comprises

(a) an internal combustion engine for driving the vehicle, the engine operating with a fuel injected thereinto in admix-

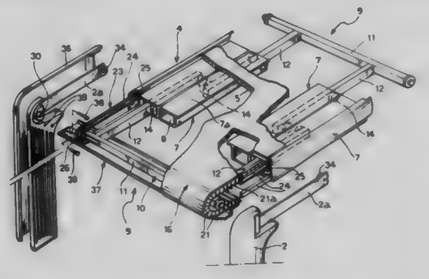
ture with an oxygen-containing gas of a higher oxygen content than said low oxygen-containing gas,
(b) a suction conduit connected to the engine for supplying the oxygen-containing gas of a higher oxygen content to the engine from an ambient atmosphere consisting of said oxygen-containing gas of a higher oxygen content,
(c) a supply of the oxygen-containing gas of a higher oxygen content in a compressed state carried on the vehicle,
(d) a conduit means connecting said supply to the engine for supplying the oxygen-containing gas of a higher oxygen content to the engine,
(e) switching means for selectively interrupting the flow of the oxygen-containing gas from the ambient atmosphere when the oxygen-containing gas of higher oxygen content is supplied through the conduit means and for interrupting the flow of oxygen-containing gas through the conduit means when the oxygen-containing gas from the ambient atmosphere flows to the engine through the suction conduit, the swithching means comprising
(1) a flap valve in the suction conduit and
(2) a solenoid shut-off valve in the conduit means, and
(f) an instrument for measuring the oxygen content of the ambient atmosphere, the instrument emitting a switching control signal indicating when the ambient atmosphere has said low oxygen-containing gas content and the control signal operating the switching means for interrupting the gas flow to the engine from the ambient atmosphere and permitting the gas flow to the engine from the supply of the oxygen-containing gas of a higher oxygen content.

4,718,353
CONTAINER CARRYING RAILROAD CAR WITH WALKWAYS FOR ACCESS TO CONTAINERS
James J. Schuller, Crete, and Harold E. Gramse, Lansing, both of Ill., assignors to Thrall Car Manufacturing Co., Chicago, Ill.
Filed Sep. 12, 1986, Ser. No. 906,372
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—406.1 12 Claims



1. A railroad car capable of carrying stacked containers which form stacks of different lengths comprising:
a car body having opposing car ends supported by rail truck means adapted for movement over a railroad;
the car body having opposing side walls and an end wall near each end connected to the side walls with said side walls and end walls defining a well in which a container can be received;
means for supporting the bottom of a container, when in the well;
each side wall including a side top chord member;
walkway means in fixed non-movable position on top of each side top chord member along each end of the well and accessible from the adjoining car end;
the walkway means extending in each longitudinal direction form the longitudinal end of the well;
the walkway means comprising a substantially flat running board having parallel longitudinal inner and outer side edges parallel with the side wall top chord;
the inner edge of the running board being spaced horizontally outwardly of the well longitudinal edge; and
a transverse walkway means located adjacent but past each well end and extending to the two running boards at the car sides.

4,718,354
EXTENSIBLE TABLE
Giancarlo Piretti, Bologna, Italy, assignor to Castilia S.p.A., Bologna, Italy
Filed Sep. 19, 1985, Ser. No. 777,812
Claims priority, application Italy, Sep. 19, 1984, 67938 A/84
Int. Cl.[4] A47B *1/06*
U.S. Cl. 108—68 14 Claims



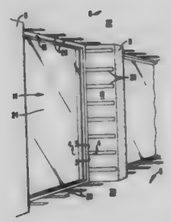
1. An extensible table comprising in combination:
a rigid panel defining a working plane of the table in a condition of minimum extension thereof, and
two structures for extending a rigid panel from two opposite sides thereof;
each structure comprising a frame connected to the panel for sliding movement in a direction parallel to the plane of the panel between an extreme retracted position within the panel and an extreme extended position in which said frame projects from one side of the panel;
a pair of table legs connected to each frame;
a flexible continuous covering sheet having a central part fixed to and covering the rigid panel and two end parts projecting from the panel and extending in the direction of sliding of each frame;
a plurality of stiffening bars connected to the lower surface of each end part of the flexible continuous covering sheet which projects from the rigid panel, said bars having pins projecting from opposite ends thereof with said bars being perpendicular to the direction of sliding of each frame;
said rigid panel being provided with guide passages and each frame including at least one pair of guide rods slidable in said guide passages and a cross member fixed to the ends of the guide rods farthest from the panel; and
guide means for said stiffening bars carried by each frame and engaged by said pins, said guide means for each frame comprising two lateral U-shaped guide channels secured to said cross member and engaged by said pins with each guide channel having two parallel horizontal passes and a curved intermediate part whereby the flexible continuous sheet connected to the stiffening bars will have a first pass constituting an elongation of the working plane and a second pass guided beneath said first pass, whereby the lengths of the first and second passes are a minimum and a maximum, respectively, in the completely retracted position of the frame and a maximum and a minimum, respectively, in the completely extended position of the frame.

4,718,355
VERTICALLY ADJUSTABLE PATIENT SUPPORT TABLE
George W. Houghton, 532 Holland Ave., Cayce, S.C. 29033
Filed Feb. 4, 1986, Ser. No. 826,018
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—147 10 Claims



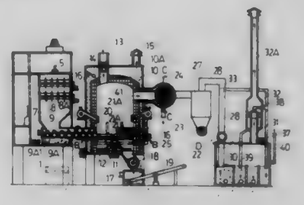
1. A horizontally disposed and vertically movable patient support assembly comprising a patient supporting platform, a plurality of separate and independent feet disposed in a predetermined, and fixed wide stance pattern upon a supporting surface, each foot extending a short distance vertically above such supporting surface and each foot having pivot means for pivotally mounting an associated support leg member, a pair of elongate lead screws underlying opposite side portions of the supporting platform and a pair of nut members on each lead screw, means for reversibly rotating the lead screws in unison, a plurality of support leg members, each pivotally attached adjacent its upper end to an associated nut member and extending therefrom into pivotal connection with the respective pivot means of an associated foot, each support leg member having an intermediate pivot means located midway between its pivotal connection to its associated nut member and its pivotal connection to its associated foot, a plurality of brace pivot means underlying the supporting platform in vertically spaced alignment above an associated foot, a brace pivotally connected with a respective brace pivot means and extending therefrom into pivotal connection with an associated intermediate pivot means, the length of each brace between its pivotal connections to its associated brace pivot means and its associated intermediate pivot means being equal to the distance between each pivot means and its associated intermediate pivot means so that the supporting platform is movable vertically, parallel with the supporting surface without moving the feet from the predetermined pattern thereof.

4,718,356
EXTERIOR BLAST PROTECTION FOR BUILDINGS
Marc S. Caspe, 1640 Oakwood Dr., San Mateo, Calif. 94403
Filed Feb. 25, 1986, Ser. No. 832,910
Int. Cl.[4] E05G *3/00*; E04H *9/00*
U.S. Cl. 109—27 23 Claims



1. Apparatus for protecting a section of an exterior building wall against damage due to blast pressure generated from a blast force on an exterior of the section equal to a predetermined threshold reaction force at which the section sustains substantially no damage, the section being peripherally surrounded by structural building members, the apparatus comprising:
guide means operatively coupled with the building members and the wall section permitting linear movement of the wall section relative to the building members in a direction substantially perpendicular to the wall section and towards an interior of the building; and
brake means operatively coupled with the wall section for preventing movement of the section towards the building interior until the blast force applied to the exterior of the section at least equals the threshold reaction force, at which time linear movement of the wall section relative to the building members begins, the brake means continuing to apply this same reaction force only for as long as movement of the wall section under the blast force occurs.

4,718,357
MULTI-FUNCTION AUTOMATIC GARBAGE FURNACE
Chi-Chen Wang, No.5 Lane 44, Nan Man Road, and Chi-Chu Wang, No.149-8 Nan Man Road, both of Taizan, Taiwan
Filed Jan. 8, 1987, Ser. No. 1,596
Int. Cl.[4] F23D *14/00*; F23G *5/00*
U.S. Cl. 110—235 2 Claims



1. A multi-function automatic garbage furnace comprising:
a garbage room for storing garbage which is to be loosened by claws of losseners and to carried into a main burning chamber by a screw conveyor,
means for lifting garbage and dropping it into said garbage room,
a main burning chamber having a rotating bottom net and a rotating leaf wheel under said bottom net for moving ashes which have fallen through said bottom net to a discharge slope and conveying means,
first and second ring-shaped air supply pipes respectively set above and below said rotating bottom net in said main burning chamber,
a secondary burning chamber for burning waste gas coming from said main burning chamber,
a cyclone tank for separating comparatively large impure particles from the twice-burned waste gas coming from the secondary chamber through centrifugal action,
blowers for sucking the waste gas out of the main burning chamber into the secondary burning chamber, and then into said cyclone tank,
sedimentation pools for removing other impure particles in the waste gas, and
a spraying room to spray clean water into the waste gas coming out of the sedimentation pool for further cleaning action of the gas.

4,718,358

METHOD AND APPARATUS FOR PROCESSING WASTE MATTER

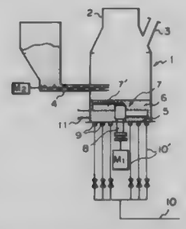
Mitsuhiko Noma, Tokyo; Junichi Yamaji, and Toyoshi Mizushima, both of Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 803,655, Nov. 29, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 893,461

Claims priority, application Japan, Dec. 25, 1984, 59-272066; Dec. 25, 1984, 59-272067; Dec. 25, 1984, 59-195299[U]; Dec. 25, 1984, 59-195300[U]

Int. Cl.[4] F23G 5/00, 5/10, 5/12

U.S. Cl. 110—250 24 Claims



1. A method of incinerating waste matter by employing an incinerator comprising the steps of:

irradiating microwaves onto a bed consisting of granules which are kept under agitation, said granules being made of material exhibiting the characteristics of good absorption of microwaves so that the granules are heated by such absorption; and

continuously charging said waste matter on said layer heated by the radiation of microwaves.

4,718,359

PROCESS AND A MEANS FOR BURNING SOLID FUELS, PREFERABLY COAL, TURF OR THE LIKE, IN PULVERIZED FORM

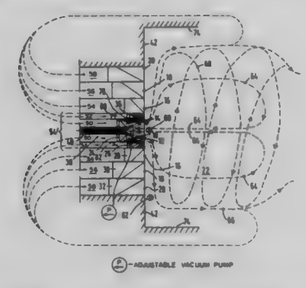
Kurt Skoog, Johanneshov, Sweden, assignor to Stubinen Utveckling Ab, Stockholm, Sweden

Division of Ser. No. 569,901, Jan. 11, 1984, Pat. No. 4,569,295. This application Jan. 3, 1986, Ser. No. 816,140

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301469; Mar. 18, 1983, 3309905; Mar. 18, 1983, 3309906

Int. Cl.[4] F23D 1/02

U.S. Cl. 110—264 12 Claims



1. A means for burning solid fuels, in particular coal, turf or the like in pulverized form, comprising a combustion chamber into which opens an entrance port for introducing the fuel, and further comprising an air entrance surrounding the fuel entrance port concentrically and comprising swirl elements setting the air flow in rotation, characterized IN THAT the air entrance is embodied as a register comprising a multiple of concentric air entrance ports, each of said air entrance ports being associated with swirl elements and the annular gap width of the two air entrance ports situated nearest to the fuel entrance can be modified by moving an annular orifice comprising the two adjacent side walls of the two air entrance ports in the direction of access of the fuel entrance port, the annular orifice preferably forming part of the pipe or similar sleeve separating the two partial air flows nearest to the fuel entrance port from each other, whereas the remaining air entrance ports situated radially somewhat further away from the fuel entrance port can be closed or opened individually.

4,718,360

METERING FEEDER

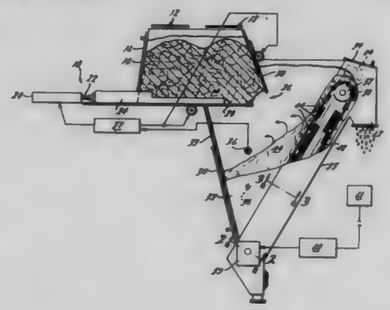
Thomas A. Ginter, Ypsilanti; Neil H. Johnson; Harold L. Knox, both of Grosse Ile; David C. Reschly, Monroe, all of Mich., and Kim E. Spurlock, Toledo, Ohio, assignors to Detroit Stoker Company, Monroe, Mich.

Division of Ser. No. 747,372, Jun. 20, 1985, Pat. No. 4,616,573, which is a continuation of Ser. No. 558,376, Dec. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 490,657, May 2, 1983, abandoned. This application May 5, 1986, Ser. No. 859,411

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] F23K 3/00

U.S. Cl. 110—327 4 Claims



1. An apparatus for delivering solid fuel for combustion comprising:

hopper means for containing a quantity of solid fuel;

means for introducing fuel into said hopper;

conveyor means at least partially disposed within said hopper for removing fuel from said hopper and having an upper portion;

wherein said conveyor means includes a closed course of cleats for movement in a fuel removing direction and said cleats extend in acute angular relation to said direction of movement, a portion of said closed course facing interiorly into said hopper means for contacting the fuel therein, said hopper means and said upper portion of said conveyor means defining a substantial unrestricted space extending substantially the entire length of said upper portion;

said conveyor means being sufficiently inclined and operable at a speed to promote backtumbling of said fuel from said cleats into said unrestricted space, thereby serving to decompact said fuel before it is delivered for combustion.

4,718,361

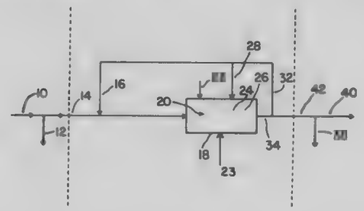
ALKALI INJECTION SYSTEM WITH CONTROLLED CO_2/O_2 RATIOS FOR COMBUSTION OF COAL

Gregory F. Berry, Naperville, Ill., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 21, 1986, Ser. No. 933,460

Int. Cl.[4] F23J 11/00, 15/00

U.S. Cl. 110—345 8 Claims



1. A combustion process for an organic fuel comprising the steps of providing a combustion zone for burning a fuel with oxygen,

introducing an organic fuel to a combustion zone,

introducing a mixture of carbon dioxide and oxygen to the combustion zone to form a combustion gas, the mixture having essentially no nitrogen gas,

providing heat exchanger means downstream from the combustion zone,

introducing a carbon dioxide as a cooling gas into the combustion gas between the combustion zone and the heat exchanger means to reduce the temperature of the combustion gas to below about 1150K and from a cooled combustion gas, and,

recycling a portion of the cooled combustion gas to be combined with oxygen for the combustion zone.

4,718,362

WASTE DESTRUCTION

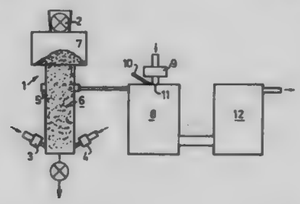
Sven Santén, Hofors; Sven Eriksson; Lars Bentell, both of Falun, and Hakan Johansson, Sandviken, all of Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Filed Apr. 9, 1986, Ser. No. 849,656

Claims priority, application Sweden, May 3, 1985, 8502165

Int. Cl.[4] F23G 5/12

U.S. Cl. 110—346 19 Claims



1. A method of destroying waste to form a leach-proof slag and a gas containing only H_2 and CO as combustible constituents, comprising the steps of:

(a) supplying a waste material at the top of a shaft furnace while simultaneously supplying energy in the form of hot oxidizing gas at the bottom of the shaft furnace,

(b) discharging liquid slag from the bottom of the furnace shaft and withdrawing the gas generated at the top of the furnace shaft, and

(c) supplying the gas generated to a subsequent reaction chamber, while simultaneously supplying energy in the form of a hot gas heated by means of a plasma generator.

4,718,363

MULTI-PURPOSE SEEDING MACHINE

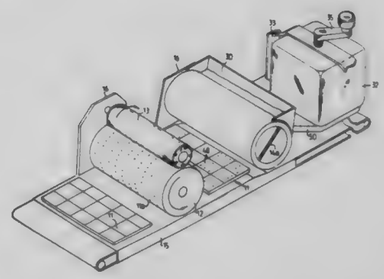
Geoffrey A. Williamson, Warragul, Australia, assignor to Williamson Hi-Tech Int'l Pty Ltd., Warragul, Australia

Filed Feb. 26, 1986, Ser. No. 833,340

Claims priority, application Australia, Feb. 28, 1985, PG9542

Int. Cl.[4] A01C 7/04

U.S. Cl. 111—1 8 Claims



1. In a vacuum seed singulating machine of the type having a rotary, cylindrical drum and a seed reservoir adjacent said drum, said drum having at least one row of apertures for capturing seed by suction and releasing such seed when the suction is broken, the improvement comprising:

a static manifold member defining a negative pressure zone for communicating a vacuum to said drum and a second zone for communicating air of at least ambient pressure to said drum, the vacuum zone being more extensive than the second zone, said vacuum and second zones defining a circular shape which lies within the cross-sectional shape of said drum;

said drum having a series of ducts aligned to communicate the vacuum zone and the second zone with apertures in said row of apertures and to retain the drum against said manifold member;

means to center and rotate said drum relative to said manifold member; and

means for providing a vacuum to said vacuum zone and at least ambient air pressure to said second zone, the vacuum being sufficient to retain said drum in engagement with said manifold member, whereby the drum will be retained on said manifold member by vacuum while the machine is operating and easily removed and replaced when the machine is not operating.

4,718,364

SEWING MACHINE HAVING A WASTE MATERIAL CONTAINER

Rolf Kessler, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dürkopp Nähmaschinen GmbH, Fed. Rep. of Germany

Filed May 19, 1987, Ser. No. 51,869

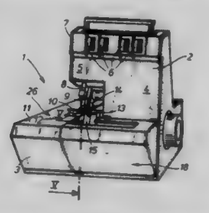
Claims priority, application Fed. Rep. of Germany, May 28, 1986, P3614429[U]

Int. Cl.[4] D05B 37/00

U.S. Cl. 112—122 8 Claims

1. A sewing machine, comprising a base having a top base blade, a trimmer operable to the said base, and a waste container for trimmed waste having a guide groove for the waste, a portion of said base defining said waste container being

located below said trimmer and extending directly to said trimmer and having a container top aligning with said top base

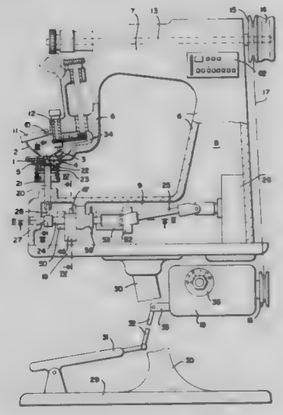


blade and covering the rest of said base and falling together with said base of the support surface for the sewing material.

4,718,365
BLIND-STITCH SEWING MACHINE

Georg Hauser, Strassbergerstr. 24, D-8000 Munich 40, and Rolf Höggenstaller, Sandbergstr. 6, D-8031 Wessling, both of Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 869,681
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519849
Int. Cl.[4] D05B *1/24*
U.S. Cl. 112—176 6 Claims

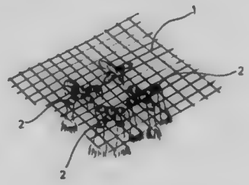


1. A blind-stitch sewing machine of the type on which the fabric bender is adjustable by means of a rocker shaft between a sewing position wherein the material being sewn is caused to bulge into the arcuate trajectory of an arc needle, and a release position wherein the material being sewn is permitted to be inserted and removed, the rocker shaft cooperating with a stop defining the sewing position of the fabric bender, and the stop being adjustable for setting the stitch-depth of the arc needle in the particular material to be sewn so that a corresponding distance between the fabric bender in the sewing position and the trajectory of the arc needle may be assured, which machine comprises: an adjustable stop (40) in the form of a cam (47) which is rotatable by means of an electric stepping motor (52) connected to an electric control circuit (42) having a memory (71) for plural different distances between the fabric bender (5) in the sewing position and the trajectory of the arc needle (2) in accordance with the particular distance fetched from the memory (71) upon the actuation of a manual stitch-depth selector (43) connected to the electric control circuit (42).

4,718,366
PROCESS FOR THE MANUFACTURE OF TUFTED RUGS, CARPETS, ETC. AND PRODUCTS MANUFACTURED THEREBY

Carlos D. Giraldi, and Joao M. Giraldi, both of Rio de Janeiro, Brazil, assignors to Industria E Comercio Textil Avanti Ltda, Rio de Janeiro, Brazil

Filed Jul. 28, 1986, Ser. No. 889,711
Claims priority, application Brazil, Jan. 31, 1986, 8600411
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—266.2 7 Claims

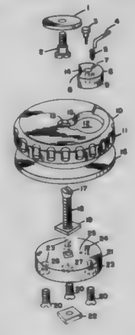


1. A process for manufacturing tufted products such as rugs, carpets and the like on a pre-woven base, comprising the steps of applying a first set of tuft forming yarns to the base to form a first set of parallel rows of tufts, and then applying a second set of tuft forming yarns to the base to form a second set of parallel rows of tufts which lie in a different direction from said first set of parallel rows of tufts, to form a two-directional tufted structure.

4,718,367
MAST STEP ASSEMBLY

Daniel D. Camp; Richard Grant, and Ronald D. Sciulli, all of Honolulu, Hi., assignors to ATECS Corporation, Honolulu, HI.

Continuation-in-part of Ser. No. 601,606, Apr. 18, 1984, Pat. No. 4,579,074. This application Jan. 8, 1986, Ser. No. 817,196
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] B63B *35/72*
U.S. Cl. 114—39.2 4 Claims

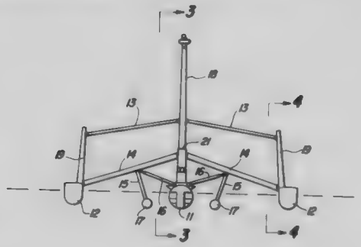


1. A mast stepping device for securing a mast to a sail board comprising,
a body having upper and lower surfaces, a central bore, and t-slot means formed in the upper surface for receiving a mast shoulder bolt, and
a mounting bolt extending downwardly from the central bore and being perpendicular to the lower surface.
wherein the t-slot means comprises,
inner, middle and outer circular spaces arranged in ascending order with the inner space being concentric with the central bore, and
a circular plug rotatably mounted in the outer space, the circular plug having an arcuate indentation which, when aligned with the middle space forms an opening for receiving the mast shoulder bolt, the inner space and middle space having a slot formed at a bottom portion thereof which facilitates movement of the mast shoulder bolt to a central position in the central bore, the mast shoulder bolt being held in the central position by rotating the circular plug such that a circumferential edge abuts the mast shoulder bolt.

4,718,368
SUBMERSIBLE WATER CRAFT

Terry C. Ings, 6 Tyler Street, Joondanna, Western Australia 6060, Australia

PCT No. PCT/AU84/00209, § 371 Date Sep. 12, 1985, § 102(e) Date Sep. 12, 1985, PCT Pub. No. WO85/02157, PCT Pub. Date May 23, 1985
PCT Filed Oct. 17, 1984, Ser. No. 767,280
Claims priority, application Australia, Nov. 11, 1983, PG2347
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—61 13 Claims



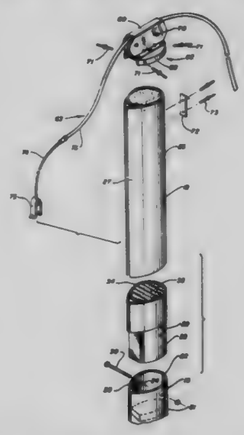
12. A partially submersible water craft comprising a main hull and a pair of secondary hulls each positioned on a respective side of said main hull, linkage means connecting each of said secondary hulls to a respective side of said main hull, drive means for effecting pivotal movement of said linkage means relative to said main hull for moving said main hull between a first position substantially level with said secondary hulls and a second position below said secondary hulls, and power means for driving said water craft carried by an element thereof other than said main hull, said power means comprising a pair of propulsion means each carried by a respective one of said linkage means and positioned between said main hull and the respective secondary hull.

4,718,369
NON-CONDUCTING MAST FOR SAILBOATS

Jerry B. Pollard, San Clemente, Calif., assignor to Coast Catamaran Corporation, Oceanside, Calif.

Continuation of Ser. No. 589,511, Mar. 14, 1984, Pat. No. 4,597,346. This application Mar. 3, 1986, Ser. No. 835,642
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—90 14 Claims

1. A sailboat mast comprising an elongated lower metal portion and an elongated composite upper portion, the composite upper portion comprising a longitudinally extending plastic core and at least one layer of resin-impregnated glass fibers surrounding the core, the upper portion being molded to form a pair of longitudinally extending grooves in the outer surface thereof, and a longitudinally extending plastic luff

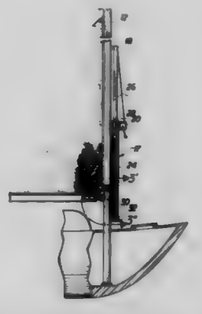


track having a luff rope channel and a pair of attaching flanges extending into said grooves.

4,718,370
MAST RAISING MECHANISM FOR SAILBOAT

Alejandro Portell-Vila, 1990 W. 56 St., No. 1110, Hialeah, Fla. 33012

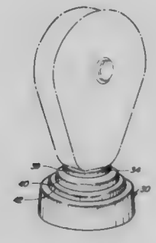
Filed Dec. 31, 1986, Ser. No. 948,971
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—91 4 Claims



1. A mast raising mechanism for raising a mast that is hinged to a lower mast section uprightly affixed in a sailboat, said mast raising mechanism comprising:
(a) an elongated base section having means for removably mounting said elongated base section to said lower mast section in a vertical position,
(b) said lower mast section including a cup-like holder adapted to receive the lower end of said elongated base section and including a slot therein,
(c) said elongated base section having a finger adapted to fit into said slot and hook against an adjacent side wall of said lower mast section when said lower end of said elongated base section is set in said cup-like holder,
(d) an extender section telescopically movable with respect to said elongated base section and having a means for locking said extender section to said elongated base section when said extender section is fully extended, and
(e) means for pulling said mast from a substantially horizon-

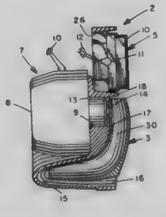
tal position to a substantially vertical position via a pulling force directing means mounted at the top of said extender section.

4,718,371
RESILIENT SUPPORT FOR YACHT FITTING
Peter O. Harken, Pewaukee; Eugene J. Cramer, Milwaukee, both of Wis., and Robert A. Whitehouse, Newport, R.I., assignors to Vanguard, Inc., Pewaukee, Wis.
Filed Jul. 14, 1986, Ser. No. 885,289
Int. Cl.[4] B63B *21/10*
U.S. Cl. 114—364 7 Claims



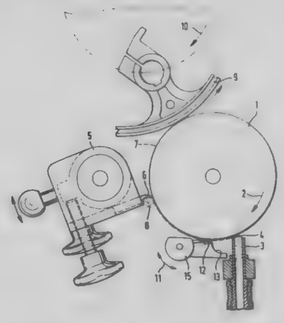
1. A resilient support for a yacht fitting wherein a pivotal connection is provided between the fitting and a support surface, said resilient support comprising a hollow conical member of resilient material extending between said fitting and said support surface and around said pivotal connection to cover said connection, the portion of said conical member adjacent said fitting being smaller diameter than the portion adjacent said support surface and providing lateral resilient support against tilting of said fitting to one side.

4,718,372
VEHICLE WARNING SYSTEM
Basil W. Wheeler, 1207 N. Hine St., Athens, Ala. 35611
Filed Mar. 6, 1986, Ser. No. 837,011
Int. Cl.[4] G08B *7/06*
U.S. Cl. 116—3 13 Claims



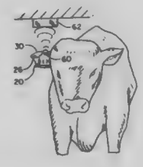
1. A vehicle warning system comprising:
a main housing (disposed) configured for attachment to said vehicle;
a deflector attached to said main housing;
a sound generator attached to the deflector and to said main housing;
a mounting base for mounting the warning system on a vehicle, said mounting base being attached to said main housing;
a light producing means in a portion of the main housing that functions as a receptacle for the light producing means, said light producing means being attached to said housing; and
a trim means for covering and concealing said mounting base and portions of said housing, said trim means being attached to said housing.

4,718,373
ADHESIVE APPLICATOR FOR A LABELING MACHINE
Rudolf Zodrow, Duesseldorf, Fed. Rep. of Germany, assignor to Krones Ag Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany
Filed Jun. 12, 1986, Ser. No. 873,565
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521394; Mar. 15, 1986, 3608773
Int. Cl.[4] B05C *1/02*
U.S. Cl. 118—262 2 Claims



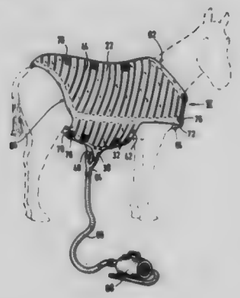
1. In an adhesive applicator for a labeling machine, having an adhesive roller rotatable in one direction and with a resilient surface, adhesive-supply means for applying adhesive to the roller, an adhesive doctor position downstream of the adhesive-supply means in relation to the one direction that the roller rotates in, and a label pickup element with a rigid adhesive-pickup surface and mounted to roll the adhesive-pickup surface over the surface of the adhesive roller downstream of the doctor, the improvement wherein the surface of the adhesive roller is a friction surface comprising abrasive structures embedded in the resilient surface of the adhesive roller and that removes, at least to some extent mechanically, defective labels that get jammed up upstream of the adhesive doctor.

4,718,374
ANIMAL EAR TAG AND IDENTIFICATION SYSTEM
Norman J. Hayes, P.O. Box 2450, Cody, Wyo. 82414
Continuation-in-part of Ser. No. 675,529, Nov. 28, 1984, Pat. No. 4,612,877. This application Jul. 14, 1986, Ser. No. 885,008
Int. Cl.[4] G09F *3/00*
U.S. Cl. 119—156 9 Claims



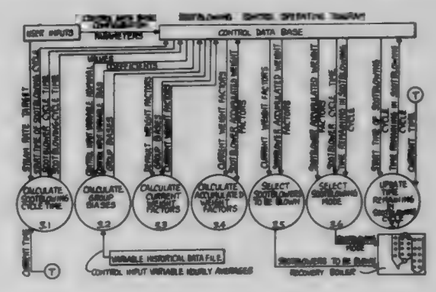
1. An ear tag assembly for mounting on the ear of a bovine-type animal or the like having an upper ear portion, a rear end portion, and a front ear portion with a central pocket beneath said upper ear portion between said front ear portion and said rear ear portion, and the assembly comprising:
a one-piece tag retaining member made of molded plastic material, with a generally vertically extending central slot means therein, adapted to be located in the central pocket of the animal ear in a substantially horizontal attitude opposite a generally vertically extending slit in the upper ear portion of the animal ear;
a one-piece identification member made of flexible plastic material with an enlarged identification portion located in front of the animal ear, in downwardly generally vertically extending relationship to the upper ear portion, an intermediate portion of reduced width relative to said identification portion and located adjacent the upper ear portion and the front ear portion; a generally vertically downwardly extending strap portion of reduced width relative to said intermediate portion extending through the generally vertically extending slit in the animal ear and the generally vertically extending central slot means in said one-piece tag retaining member, and a generally vertically downwardly extending head portion mounted in abutting engagement with a generally horizontally extending portion of said one-piece tag retaining member;
said retaining member comprising:
a base portion having a thickness such as to be relatively inflexible;
a pair of relatively thin flexible flange portions located on opposite sides of said central slot means for flexible outward movement to enable passage of said head portion therethrough in one direction and flexible inward movement after passage of said head portion therethrough to thereafter prevent passage therethrough in the opposite direction; and
blade attachment slot means in said head portion and said strap portion for releasable attachment to a portion of a cutting blade during forward movement of the cutting blade while mounting of the ear tag assembly on an animal ear and for enabling said head portion to be passed through a slit in the animal ear and through said central slot means in said retaining member with the cutting blade and for enabling the cutting blade to be detached from said head portion during rearward movement of the cutting blade; said blade attachment slot means comprising a generally retangular-shape slot having a rear wall portion in said strap portion and a front wall portion in said head portion and rearwardly facing upper and lower openings between said head portion and said strap portion.

4,718,375
DRYING APPARATUS FOR HORSES AND THE LIKE
Max Krieger, Scherpenseeler Str. 39, D-5180 Eschweiler, Fed. Rep. of Germany
Filed Jun. 3, 1986, Ser. No. 870,081
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—160 8 Claims



1. Drying apparatus for horses and the like, comprising in combination an inflatable tubelike jacket made of an inner cut and an outer cut, wherein both cuts (a) are made from an airtight flexible foil, (b) have identical shape, (c) are bonded together along their margins at marginal bonds except at two supply regions, (d) are bonded together at different sets of connecting stripes, which terminate in a distance of some centimeters inside of the outer margin whereby tubelike air ducts are formed between adjacent connecting stripes, and marginal air ducts are formed between the marginal bonds and the adjacent connecting stripes, (e) the two cuts are further bonded along a back-bone line and (f) are symmetrical to said line; the inner cut has a plurality of discharge holes arranged only in the tubelike air ducts, and vent-holes are provided in the area of the connecting stripes, and closure means are provided at the outer cut for closing and opening said tubelike jacket, wherein the jacket when feeding air through the said supply regions and into the air ducts is inflated and assumes the shape of a tubelike body having three openings, a first opening for a neck, a second opening for frontlegs and a third opening for rear legs and a tail of the horse, the air flowing through the discharge holes into the inner side of the jacket escapes through the vent-holes to the outside of the jacket.

4,718,376
BOILER SOOTBLOWING CONTROL SYSTEM
Pierre E. Leroueil, Federal Way; R. East James, Redmond, and Gregory K. Brock, Auburn, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Continuation of Ser. No. 793,863, Nov. 1, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 15,482
Int. Cl.[4] F22B *37/18*
U.S. Cl. 122—390 22 Claims

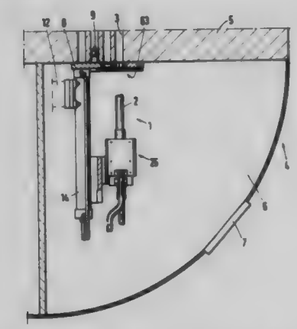


1. A method for controlling soot blowers in a boiler which comprises:
assigning the sootblowers into a plurality of groups, the sootblowers within a group being generally adjacent to each other and covering heat transfer surfaces having similar fouling deposit formation characteristics;
assigning a weight factor to each individual sootblower in every group, said weight factors determining the frequency of operation of each sootblower as a percentage of all sootblowing cycles so that not all of the sootblowers are blown every sootblowing cycle;
determining which sootblowers within a group are to be blown in any given sootblowing cycle using a spreading algorithm; and
beginning every sootblowing cycle in the boiler with the most upstream sootblower group and proceeding progressively with sootblowing through all other groups in the direction of flow of combustion gases until reaching the most downstream sootblower group in order to sweep dislodged fouling deposits from the upstream heat transfer surfaces in the direction of flow of combustion gases, whereby the boiler is maintained at or near maximum efficiency with reduced sootblowing steam usage.

4,718,377
DEVICE FOR PLACING A CYLINDRICAL BODY, ESPECIALLY A SLEEVE, IN A TUBE OF A STEAM GENERATOR

Hans Haller, Mannheim, Fed. Rep. of Germany, assignor to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 833,267
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509177
Int. Cl.[4] F22B 37/24
U.S. Cl. 122—510 12 Claims

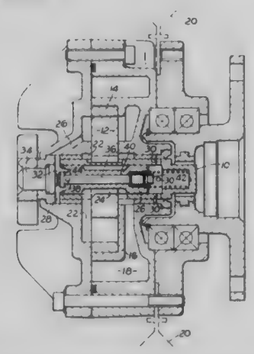


1. In a steam generator having a tube sheet, tubes ending in the tube sheet and a chamber adjoining the tube sheet having an access opening formed therein, the improvement comprising a device disposed in the chamber for inserting a sleeve into one of the tubes in a plurality of partial insertion strokes, said inserting device including a movable clamping device holding and moving the sleeve in axial direction of the tube in one of said partial insertion strokes, and a stationary clamping device associated with said movable clamping device holding the sleeve during a backstroke of said movable clamping device.

4,718,378
TRANSMISSION COUPLING

Robin E. Child, Holmby House, England, assignor to Concentric Pumps Limited, Birmingham, England

Filed Aug. 1, 1986, Ser. No. 892,998
Claims priority, application United Kingdom, Aug. 14, 1985, 8520351
Int. Cl.[4] F01P 5/04
U.S. Cl. 123—41.12 2 Claims

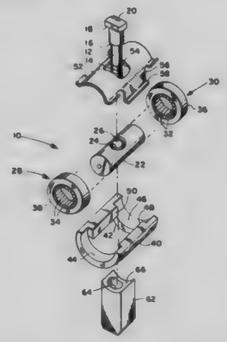


1. A thermostatically actuated drive coupling for the cooling fan of an internal combustion engine, comprising a gerotor pump having an input drive shaft with an input pumping rotor mounted thereon, an output pumping rotor connected to drive a fan, a reservoir for fluid, the pump having a suction fluid inlet connected to withdraw fluid from the reservoir and an outlet arranged to discharge fluid into the reservoir, a bypass passage connected to conduct fluid from the outlet to the inlet so as to prevent the pump from self-priming and to cause the pump to run dry without pumping and without driving the output pumping rotor, and a valve located in said passage which is thermostatically actuated upon increase in temperature to close so as to cause the pump to self-prime and drive the output rotor.

4,718,379
ROCKER ARM PIVOT ASSEMBLY

David P. Clark, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 27, 1986, Ser. No. 866,654
Int. Cl.[4] F01L 1/18
U.S. Cl. 123—90.39 8 Claims

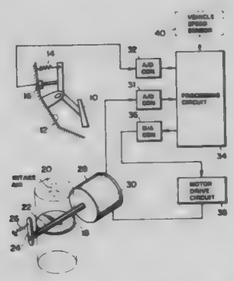


1. A rocker arm pivot assembly for valve gear of an engine, said assembly comprising:
(a) an elongated post member having means for attachment thereto provided on one end thereof and a reaction surface disposed distally of said attachment means and extending in a direction to resist loads applied thereto generally in the direction of elongation of said post;
(b) a fulcrum member having said post member received therethrough, said fulcrum registered on one side thereof against said reaction surface and having a pair of journalling surfaces thereon extending transversely of said post in opposing directions;
(c) rolling bearing means received on each of said journalling surfaces of said fulcrum member;
(d) a semi-cylindrical sleeve member with said post member received therethrough, said sleeve member having a pair of spaced journalling surfaces provided on the inner periphery thereof, said surfaces each contacting one of said bearing means;
(e) flexible retaining means with said post member received therethrough, said retaining means including journalling surfaces formed thereon engageable with said bearing means, and means formed thereon engaging said sleeve whereby said bearing means are maintained in position between said sleeve and said retaining means; and
(f) spacer means operative to maintain said fulcrum member in contact with said post reaction surface upon attachment of said post member to an engine.

4,718,380
SYSTEM AND METHOD FOR CONTROLLING THE OPENING ANGLE OF A THROTTLE VALVE ACCORDING TO THE POSITION OF AN ACCELERATOR POR AN AUTOMOTIVE VEHICLE

Shinji Katayose, Tokyo; Minoru Tamura, Yokohama; Hideaki Inoue; Akira Takei, both of Yokosuka, and Takashi Oka, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 9, 1986, Ser. No. 849,708
Claims priority, application Japan, May 27, 1985, 60-113792; Jul. 19, 1985, 60-159461
Int. Cl.[4] F02D 11/10, 9/02
U.S. Cl. 123—399 8 Claims



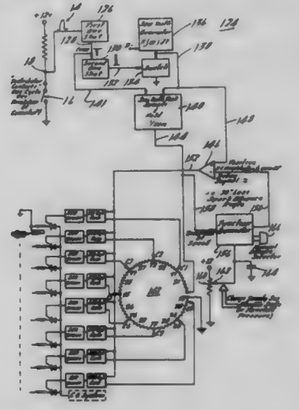
1. A system for controlling an opening angle of a throttle valve installed within an engine of a vehicle, comprising:
(a) first means for detecting the operating position of an accelerator member of the vehicle and outputting a signal indicative thereof;
(b) second means for determining whether the accelerator member has been held at a relatively constant depressed position so as to hold the vehicle speed approximately constant on the basis of the behavior of the signal derived by said first means; and
(c) third means for adjusting the opening angle position of the throttle valve to such a degree that the vehicle speed remains approximately constant when said second means determines that the accelerator member has been held at a relatively constant depressed position so as to hold the vehicle speed approximately constant and such that the incremental change in the opening angle position of throttle valve per incremental change in depressed position of said accelerator member is increased as the difference between the current accelerator member position and the last relatively constant depressed position of the accelerator member becomes greater.

4,718,381
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

John A. McDougal, 2801 Port Hwy., Flint, Mich. 48507, and John W. Leuningtoe, Ypsilanti, Mich., assignors to John A. McDougal, Detroit, Mich.

Continuation of Ser. No. 651,042, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 374,803, May 4, 1982, Pat. No. 4,471,737, which is a continuation of Ser. No. 161,282, Jun. 20, 1980, abandoned, which is a division of Ser. No. 934,322, Aug. 16, 1978, Pat. No. 4,257,373, which is a division of Ser. No. 800,959, May 26, 1977, Pat. No. 4,116,173, which is a continuation of Ser. No. 572,167, Apr. 28, 1975, abandoned, which is a division of Ser. No. 336,559, Feb. 28, 1973, Pat. No. 3,903,856. This application Jun. 2, 1986, Ser. No. 873,075
Int. Cl.[4] F02P 5/04
U.S. Cl. 123—406 4 Claims

1. In an engine having a predetermined operating cycle and including wall means defining at least one combustion chamber and igniting means associated with said combustion chamber for igniting a charge of fuel and air in said combustion chamber when energized, said fuel having a predeterminable octane rating, an ignition system for controlling the timing of the ignition of said charge for said combustion chambers, comprising;
energizing means adapted to be connected to said igniting means for energizing said igniting means in response to a timing signal,
means for generating a timing signal operatively connected to said energizing means, said timing signal being adjustable with respect to the mechanical cycle of said engine in response to an engine speed parameter and a charge density parameter,

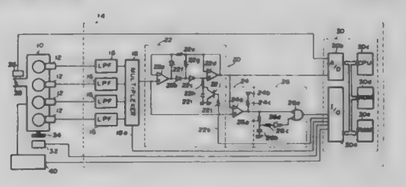


a manually adjustable octane selector and,
function generator means responsive to manual actuation of said octane selector and operatively connected to said timing signal for selecting a predefined range of ignition timing relationships in accordance with said predeterminable octane rating, said engine speed parameter and said charge density parameter such that the ignition timing adjustment due to said predeterminable octane rating, said engine speed parameter and said charge density parameter is made only in accordance with said predefined range of ignition timing relationship to provide an optimum spark advance.

4,718,382
DEVICE FOR CONTROLLING IGNITION TIMING IN INTERNAL COMBUSTION ENGINE

Akira Tanaka, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,220
Claims priority, application Japan, Feb. 19, 1986, 61-34329; Feb. 19, 1986, 61-34333
Int. Cl.[4] F02P 5/14
U.S. Cl. 123—425 8 Claims



6. A device for controlling ignition timing in an internal combustion engine, comprising:
a. combustion state detection means disposed in the vicinity of the combustion chamber of each cylinder of an internal

combustion engine for detecting the state of combustion in the combustion chamber,

b. crankshaft angle detection means disposed in the vicinity of the rotating member of the internal combustion engine for detecting the angular position of a crankshaft of the internal combustion engine,

c. maximum cylinder pressure angle calculation means which receives the outputs of the combustion state detection means and the crankshaft angle detection means and calculates the maximum cylinder pressure angle,

d. cylinder pressure calculation means which receives the output of the combustion state detection means and calculates the cylinder pressure,

e. ignition timing calculation means which receives the outputs of the crankshaft angle detection means, the maximum cylinder pressure angle calculation means and the cylinder pressure calculation means and calculates the ignition timing such that the maximum cylinder pressure angle converges on a target angle, and

f. ignition means which receives the output of the ignition timing calculation means and ignites a fuel and air mixture in the combustion chamber,

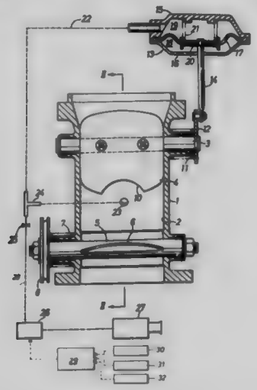
whereby said ignition timing calculation means detecting transient conditions in the engine driving operation on the basis of the output of the cylinder pressure calculation means.

4,718,383

THROTTLE BODY FOR FUEL INJECTION SYSTEM

Takashi Fujisawa, c/o Kabushiki Kaisha Honda Gijutsu Kenkyusho 4-1, Chuo 1-chome, Wako-shi Saitama-ken, Japan

Filed Sep. 2, 1986, Ser. No. 902,927
Claims priority, application Japan, Sep. 2, 1985, 60-134656[U]
Int. Cl.[4] F02M 7/00
U.S. Cl. 123—442 6 Claims



1. A throttle body for a fuel injection system of an internal combustion engine, comprising:

a main body defining an intake bore therein;

an air valve provided at an upstream location in the intake bore;

a throttle valve provided at a downstream location in the intake bore;

a fuel injection nozzle which is adapted to inject fuel into the intake bore;

a biasing means for biasing the air valve towards its closed state;

an actuator which tends to increase the opening angle of the air valve according the magnitude of the negative pressure existing in the intake bore between the air valve and the throttle valve;

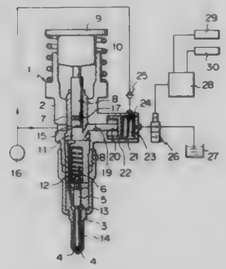
a prohibiting means which prohibits the action of the actuator when the engine has not been warmed up.

4,718,384

FUEL INJECTOR FOR USE IN AN INTERNAL COMBUSTION ENGINE

Takeshi Takahashi, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 15, 1986, Ser. No. 863,424
Claims priority, application Japan, May 29, 1985, 60-113993
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—447 16 Claims



1. A fuel injector of an internal combustion engine, comprising:

an injector body forming a pressure chamber therein;

a spring loaded needle for controlling the opening operation of a nozzle bore to automatically open said nozzle bore and inject fuel in said pressure chamber from said nozzle bore when pressure in said pressure chamber exceeds a predetermined pressure;

pressurizing means for pressurizing the fuel in said pressure chamber; and

volume control means for controlling a volume of said pressure chamber and controlled by liquid pressure which is lower than the pressure generated in said pressure chamber when the injection of fuel is carried out, said volume control means increasing said volume to stop the injection of fuel;

said volume control means comprising a cylinder, a piston device movable in said cylinder to control said volume, a cylinder chamber defined by said piston device and filled with liquid generating said liquid pressure, and a control device controlling said liquid pressure to reduce said liquid pressure for increasing said volume.

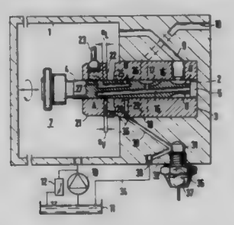
4,718,385

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES WITH EXHAUST GAS RECIRCULATION

Karl Kourath, Freiberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 5, 1987, Ser. No. 11,660
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612068
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—449 22 Claims

1. A fuel injection pump for internal combustion engines with exhaust gas recirculation, having an electrical control element, actuated in accordance with load, for completing or controlling an electrical circuit for controlling an exhaust gas recirculation valve, which comprises a housing, a fuel suction chamber (7) in said housing, a cylinder (2) formed in said housing, a pump piston (4) driven such that said pump piston simultaneously reciprocates and rotates in said cylinder (2), a pump work chamber (5) formed in said cylinder between one end of said pump piston and said housing, a relief conduit (15) extending axially within said pump piston from said work chamber and having a blind bore and communicating permanently with the pump work chamber and outlet from said relief conduit juxtaposed said blind bore, a governor slide (21) that surrounds the pump piston in said suction chamber (7) subjected to fuel pressure and adjustable in accordance with load, said governor slide adapted to close said outlet (A) of the relief conduit during a variable portion of a stroke course of said pump piston, a second conduit (25) disposed in said pump



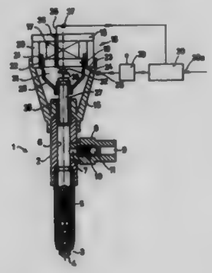
piston (4), said second conduit including an inlet (E) and an outlet (B with its inlet (E) disposed in an operative range of the governor slide (21) spaced apart from the outlet (A) of the relief conduit (15), such that the inlet (E) of the conduit (25) is opened only whenever the outlet of the relief conduit is open, a line (29, 30) in said housing that communicates with said outlet (B) that leads to a blind bore (31), a control element (35) that communicates with said blind bore (31), said control element operated by a pressure force and a relief line (32, 33) that connects with said blind bore (31).

4,718,386

FUEL INJECTOR

Wilhelmus T. M. Gieles, Eindhoven, Netherlands, assignor to Volvo Car B.V., Netherlands

Filed Jun. 6, 1986, Ser. No. 871,525
Claims priority, application Netherlands, Jun. 6, 1985, 8501647
Int. Cl.[4] F02B 3/00
U.S. Cl. 123—472 4 Claims



1. A fuel injector comprising

an injector body having a cylindrical bore therein, a fuel supply passage communicating with the bore;

a plunger contained within and movable in the longitudinal direction through the bore; a cylindrical winding, the plunger being connected to the winding;

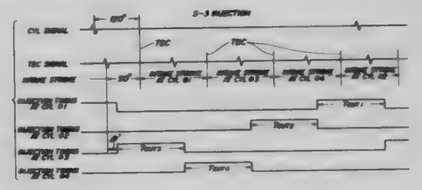
a permanent magnet circuit, including an annular air gap and the winding being positioned in the air gap, a controlled power source for supplying a current with a pulse shaped wave form, the power source being connected with the winding for supplying current to the winding, the power source including a control circuit, the power source further comprising a plunger displacement connector comprised of a permanent magnet and a magneto-resistive sensor, one part of the combination being stationary and the other part of the combination being coupled to the plunger for being moved by movement of the plunger, the output signal of the sensor being supplied as a feedback signal to the power source control circuit for controlling the power source.

4,718,387

FUEL INJECTION TIMING CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Takashi Shinchi, and Takafumi Nishikawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1987, Ser. No. 9,268
Claims priority, application Japan, Jan. 31, 1986, 61-019076
Int. Cl.[4] F02D 41/02
U.S. Cl. 123—478 6 Claims



1. A method of controlling the timing of fuel injection in an internal combustion engine having a plurality of cylinders and as many fuel injection valves provided respectively for said cylinders, wherein the injection timing of each of said fuel injection valves is determined in response to operating conditions of said engine, the method comprising the steps of: (1) determining operating conditions of said engine; (2) supplying fuel through injection to one of said cylinders that corresponds to a present pulse of a control signal upon generation of the present pulse, when said engine is determined to be in a first predetermined operating condition, said control signal being generated at a predetermined crank angle of said engine before a top dead center of each of said cylinders at which an intake stroke commences in said each of said cylinders; and (3) supplying fuel through injection to another one of said cylinders that corresponds to a pulse of said control signal next to a present pulse thereof upon generation of the present pulse, when said engine is determined to be in a second predetermined operating condition.

4,718,388

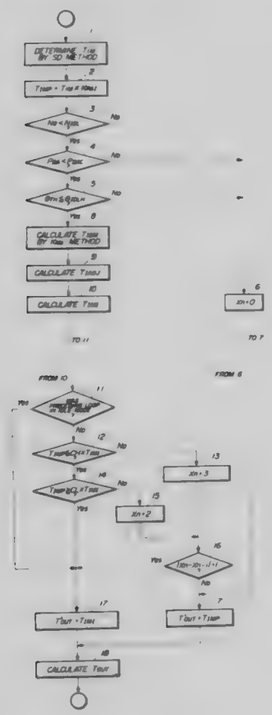
METHOD OF CONTROLLING OPERATING AMOUNTS OF OPERATION CONTROL MEANS FOR AN INTERNAL COMBUSTION ENGINE

Takeo Kiuchi, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,177
Claims priority, application Japan, Oct. 12, 1985, 60-227575
Int. Cl.[4] F02M 51/00
U.S. Cl. 123—478 10 Claims

1. A method of controlling an operating amount of an operation control means for controlling the operation of an internal combustion engine on the basis of a first desired operating amount determined in dependence on a value of a first engine operating parameter indicative of load conditions of said engine when said engine is operating in a predetermined low load condition, and on the basis of a second desired operating amount determined in dependence on a value of a second engine operating parameter indicative of load conditions of said engine when said engine is operating in an operating condition other than said predetermined low load condition, said method comprising the steps of: (1) when said engine has entered said predetermined low load condition from an operat-

ing condition other than said predetermined low load condition, (i) determining the difference between said first and second desired operating amounts of said operation control means, which are determined in dependence on the values of said first and second engine operating parameters, respectively, and obtaining a correction value of the operating amount of said operation control means on the basis of the determined difference, (ii) correcting the determined first desired operating amount by said correction value, (iii) comparing the corrected first desired operating amount with the determined second desired operating amount, and (iv) determining the desired operating amount of said operation control means in dependence on the determined second desired operating amount, from the time said engine has entered said predetermined low load condition to the time the corrected first desired operating amount becomes substantially equal to the determined second desired operating amount, even while said engine is actually operating in said predetermined low load condition; (2) determining the desired operating amount of said operation control means in dependence on the corrected first desired operating amount after the corrected first desired operating amount becomes substantially equal to the determined second desired operating amount until said engine enters an operating condition other than said predetermined low load condition; and (3) controlling the operating amount of said operation control means on the basis of the desired operating amount determined at said step (1)–(iv) or (2).

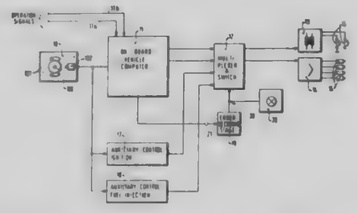


4,718,389

APPARATUS FOR THE CONTROL OF REPETITIVE EVENTS DEPENDENT ON OPERATING PARAMETERS OF INTERNAL COMBUSTION ENGINES

Günther Hönig, Ditzingen; Uwe Kiencke, Ludwigsburg, and Alfred Schulz, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 196,914, May 5, 1980, Pat. No. 4,414,949. This application Sep. 24, 1982, Ser. No. 423,051
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838619
The portion of the term of this patent subsequent to Jul. 12, 2003, has been disclaimed.
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—479 **12 Claims**



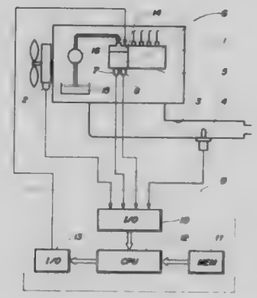
1. Apparatus for controlling repetitive events dependent upon operating parameters of a vehicular internal combustion engine, and including at least one of:
ignition events; fuel injection events; transmission events, comprising
a vehicular computer (11);
means (11*a*, 11*b*) applying vehicle operation signals to the computer;
an engine rotation sensor (10) coupled to a rotating shaft of the engine, said sensor being connected to and applying engine rotation signals to the computer,
the computer generating a sequence of control signals (U21) having a predetermined common characteristic in dependence on the signals applied thereto and in accordance with a program stored therein;
at least one output control stage (13, 14) for triggering the event or events to be controlled;
at least one auxiliary control device (17, 18) connected to the engine rotation sensor (10) and receiving the engine rotation signals;
a controllable switching device (12) having its output connected to the input of the at least one output control stage (13, 14) and inputs, respectively, connected to the output of the computer (11) and to the auxiliary control device, or devices (17, 18) and operative to selectively switch the outputs to one of the inputs;
an error decoding stage (19) connected to the computer (11) and receiving output signals from the computer,
said error decoding stage (19) controlling the controllable switching device (12) to connect the respective output control stage to the associated auxiliary control device (17, 18) and disconnect the circuit path from the computer (11) to said output control stage upon detection of a computer malfunction or operatig error:
wherein the error decoding stage includes
means (29) for generating a signal sequence having a characteristic which is similar to said predetermined characteristic; and
a retriggerable timing and comparison element (22–28) connect to and comparing the relative relationship of the characteristic of the signal sequence from said sequence generating means (29) with the predetermined characteristic of the control signals received from the computer and providing an "error" outpout if the characteristics of the signal sequence and the control signals from the computer do not have a predetermined relationship to thereby provide an output indication of computer malfunction or operating error.

4,718,390

FUEL INJECTION TIMING CONTROL METHOD FOR DIESEL ENGINES

Tadao Gondo; Tsuneyuki Chiyoda, and Keiichi Yamada, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1986, Ser. No. 828,831
Claims priority, application Japan, Feb. 15, 1985, 60-026573
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—500 **2 Claims**



1. A method of controlling the timing of fuel injection into a diesel engine having a fuel injection pump, an injection timing control device operatively connected to said fuel injection pump, and an electronic control unit,
the method comprising the steps of:
(a) detecting the rotational speed of said engine;
(b) detecting a fuel injection quantity supplied to said engine as a parameter value indicative of the magnitude of load on said engine;
(c) calculating a desired value of the fuel injection timing based upon the engine rotational speed and said fuel injection quantity thus detected, by means of said electronic control unit; and
(d) driving said injection timing control device according to said desired value of the fuel injection timing thus calculated, so as to minimize the difference between said calculated desired value of the fuel injection timing and an actual value of the fuel injection timing, by means of said electronic control unit;
wherein said engine has an oxygen concentration sensor for detecting oxygen concentration in exhaust gases emitted from said engine and for providing an output indicative of said detected oxygen concentration; and
said step (b) comprising detecting said fuel injection quantity solely from an output of said oxygen concentration sensor indicative of said oxygen concentration, the output of said oxygen concentration sensor varying in linear proportion to a change in said fuel injection quantity.

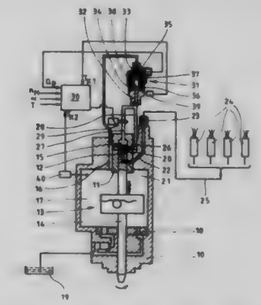
4,718,391

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Helmut Rembold, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,251
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602713
Int. Cl.[4] F02D *41/40*; F02M *59/20*
U.S. Cl. 123—506 **15 Claims**

1. A fuel injection pump for internal combustion engines having at least one pump piston arranged to define a pump work chamber for generating an injection pressure; an electromagnetic control device to control a relief conduit leading to said pump work chamber in order to define the onset and end of supply; a measuring device arranged to communicate with said relief conduit, said measuring device adapted to measure the return flow quantity of fuel during one supply stroke of said pump piston and thereby emit an electrical return flow quantity signal; and electronic control unit associated with said fuel injection pump, said control unit adapted to impose control signals for blocking or opening the relief conduit upon said magnetic control device in accordance with the return flow quantity signal and engine operating characteristics such as load, rpm and temperature, said control unit (30) further having a fluctuation detector (48), which detects fluctuations in the return flow quantity signal (Q_R) and emits the appearance of chronological or spatial fluctuations, measured with respect to a reference point (BZ), in the form of detection signals (ϕ_A, ϕ_B, ϕ_E, $\phi_1-\phi_4$), and further that with the detection signals (Q_1, Q_E, Q_1-Q_4), the imposition of the control signals (Q_{MV}) is corrected.

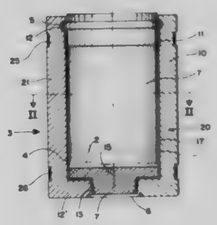


4,718,392

DEVICE FOR PREHEATING LIQUIDS, ESPECIALLY FOR PREHEATING LIQUID FUELS USED FOR COMBUSTION AND FOR POWERING ENGINES

Max Pusterla, Orselina, Switzerland, assignor to Lucrex Brevetti SA, Orselina, Switzerland

Filed Aug. 25, 1986, Ser. No. 900,007
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532243
Int. Cl.[4] F02G *5/00*; F02M *15/00*
U.S. Cl. 123—557 **6 Claims**

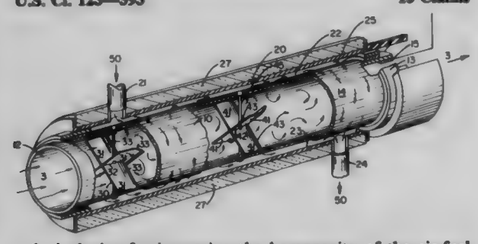


1. A device for filtering and preheating liquids, especially for filtering and preheating fuels used for combustion and for powering engines, comprising:
a filter bowl constituting an exchangeable container for the liquid to be filtered and preheated;
said filter bowl having a predeterminate outer contour;

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a preheating device;
attachment means for exchangeably interengaging said filter bowl with said preheating device;
said preheating device containing a thermal-insulating outer jacket having an inner surface;
said thermal-insulating outer jacket comprising a substantially rigid, dimensionally stable insulating jacket;
said preheating device further containing a heat source comprising a superficial heating element provided at said inner surface of said thermal-insulating outer jacket;
said superficial heating element comprising at least one exposed and substantially tear-resistant contact surface contacting said filter bowl without being damaged during an exchange of said filter bowl; and
said inner surface of said thermal-insulating outer jacket, at least in the region of said superficial heating element, substantially conforming with at least part of said predeterminate outer contour of said filter bowl in order to ensure for good heat transfer between said superficial heating element and the filter bowl.

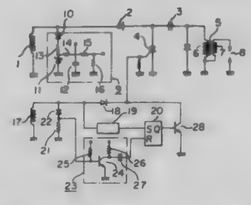
4,718,393
AIR-FUEL HOMOGENIZER
Richard J. Bakish, 75 Madison St., E. Weymouth, Mass. 02189
Filed Nov. 20, 1986, Ser. No. 933,012
Int. Cl.[4] F02M *29/04*
U.S. Cl. 123—593 13 Claims



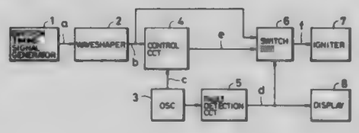
1. A device for increasing the homogenity of the air-fuel stream between the carburetor or fuel injection unit and the intake manifold of an internal combustion engine, comprising:
a first cylindrical member connected between said carburetor or fuel injection unit and said intake manifold, and containing said air-fuel stream;
a plurality of sets of vanes concentrically positioned within said first cylindrical member; and
means for controlled heating of the air-fuel stream within said first cylindrical member.

4,718,394
IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Yoshihisa Houjoh, and Hiroshi Okuda, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 9, 1987, Ser. No. 1,881
Claims priority, application Japan, Jan. 17, 1986, 61-8310; Jan. 17, 1986, 61-8309; Jun. 11, 1986, 61-135373; Oct. 31, 1986, 61-261211
Int. Cl.[4] F02P *3/06*
U.S. Cl. 123—599 8 Claims

1. An ignition device for an internal combustion engine which comprises;
a generating coil for generating a charging output depending on the rotation of an internal combustion engine,
an ignition circuit including an ignition capacitor charged by the charging output generated from said generating coil,
a signalling coil connected to said ignition circuit and generating an a.c. ignition signal including a continuous one cycle in response to a given crank angle of said engine, and
a switching means which renders the ignition signal to become ineffective on the basis of the latter half cycle of the ignition signal from said signalling coil and renders said ignition signal to become effective by releasing the ineffective condition of the ignition signal on the basis of the former half cycle, whereby said ignition signal is supplied to said ignition circuit within an ignition signal effectual period.



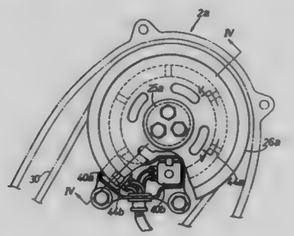
4,718,395
IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE
Toshio Iwata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 27, 1987, Ser. No. 7,241
Claims priority, application Japan, Jan. 30, 1986, 61-20625
Int. Cl.[4] F02P *11/00*
U.S. Cl. 123—615 5 Claims



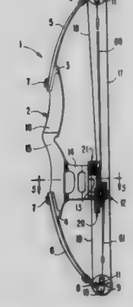
1. An ignition control system for an internal combustion engine comprising:
signal generating means for generating an ignition timing signal synchronized with the rotation of the engine;
an oscillator for generating a clock pulse;
control means for calculating the energizing time of an ignition coil upon reception of the clock pulse from said oscillator and the ignition timing signal from said signal generating means;
defect detector means for detecting the presence or absence of a defect of the clock pulse of said oscillator; and
switching means controlled to be switched by the defect detector means for leading the output of said control means to an igniter when the clock pulse is normally outputted from said oscillator and leading the output of said signal generating means to the igniter when the clock pulse is abnormally outputted from said oscillator.

4,718,396
MULTICYLINDER INTERNAL COMBUSTION ENGINE WITH ROTATION SENSOR
Shinichi Shimada, and Kazuo Otsuka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 24, 1986, Ser. No. 922,994
Claims priority, application Japan, Oct. 21, 1985, 60-235046; Oct. 21, 1985, 60-235047
Int. Cl.[4] F02P *7/067*
U.S. Cl. 123—617 18 Claims

1. In a rotation sensor for an internal combustion engine having a crankshaft, a camshaft, a drive pulley on the crankshaft, a driven pulley on the camshaft, and an endless belt trained around the driver and driven pulleys, an improvement comprising, rotation sensing means on the driven pulley and engine for sensing the rotational position of the driven pulley relative to the engine during rotation of the driven pulley.

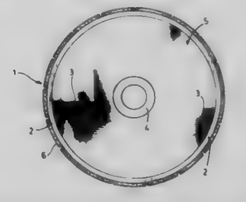


4,718,397
COMPOUND BOW
Robert E. Remick, Cedar Key, Fla., assignor to Kidde Recreation Products, Inc., Northbrook, Ill.
Filed Jul. 23, 1985, Ser. No. 758,081
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R 23 Claims



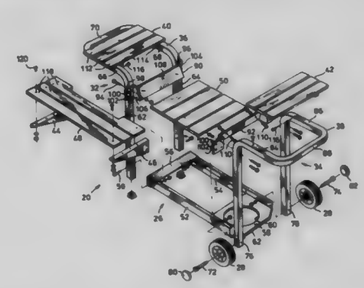
1. A compound bow including, a handle assembly, upper and lower limbs extending from opposite ends of said handle assembly and each having an outermost tip, a cam assembly attached to said bow, a bowstring spanning said limb tips and including upper and lower string cables respectively extending downwardly and upwardly from adjacent said upper and lower limb tips and attached to said cam assembly, upper and lower power cables respectively extending from adjacent said upper and lower limb tips and attached to said cam assembly, said cam assembly including a plurality of cam elements pivotally mounted for arcuate displacement in a plane substantially 90° to a plane passing between said bowstring and said handle assembly, a string cable controller attached to said bow vertically adjacent said cam assembly, and one said string cable engaging said string cable controller to change its direction of travel intermediate one respective said limb tip and said cam assembly.

4,718,398
CIRCULAR SAW FOR STONY MATERIALS
Charles P. Halles, Tellin, Belgium, assignor to Diamant Boart Societe Anonyme, Brussels, Belgium
Filed Sep. 4, 1986, Ser. No. 903,795
Claims priority, application Belgium, Sep. 4, 1985, 0/215541
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 13 Claims



1. A circular saw (1) for stony materials comprising a peripheral rim (2) provided around its circumference with cutting elements (6) and surrounding a composite core (3) of which the lateral faces are covered by two annular discs (5) equal in diameter of thin plate assembled by bonding under pressure and of which the centre is provided with a central ring (4) for mounting on a drive shaft, characterized in that the core (3) consists of a thin skeleton having a cellular structure of open or closed cells to which the said annular discs are applied.

4,718,399
BARBEQUE WAGON
Charles G. Shepherd, Oakville, Canada, assignor to B. D. Watt Co. Limited, Oakville, Canada
Filed Apr. 25, 1986, Ser. No. 855,667
Claims priority, application Canada, Apr. 26, 1986, 480248
Int. Cl.[4] A47J *37/07*
U.S. Cl. 126—25 R 5 Claims



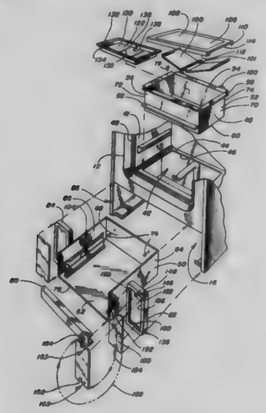
1. An adjustable wagon for supporting a range of sizes of barbeques of the kind having a container with a cover adapted to close the container, a grill supported within the container, and heat-generating means located in the container beneath the grill, the wagon comprising:
a wheeled base;
first and second end structures for attachment to the base to extend upwardly from the base with the end structures spaced from one another selectively according to the width of barbeque to be supported;
connecting means coupling the end structures to the base and including adjustment means for selecting the position of at least one end structure relative to the base;
support means coupled to the end structures for receiving the barbeque between the end structures; and
means attaching the barbeque to the support means.

4,718,400

GAS RANGE CONSTRUCTION

Lawrence C. Lotz, and Franklin D. Garrison, both of Marion, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 24, 1986, Ser. No. 945,900
Int. Cl.[4] F24C *15/00, 3/00*
U.S. Cl. 126—41 R **14 Claims**



1. An improved range frame of the type having a housing with an internal wall surface defining a cooking space, the improvement comprising:

a wall within said cooking space dividing the space into a first, main oven compartment and a second compartment, said dividing wall having an opening therethrough for establishing communication between said compartments;

a pan;

a gas burner;

means for mounting the gas burner in one of said compartments adjacent said dividing wall opening with the gas burner exposed to both compartments; and

means for selectively mounting the pan to the housing to shield said second compartment from the gas burner,

whereby said frame can be used selectively (a) as part of a high broiler configuration with said pan mounted to the housing permitting said second compartment to be used as a storage compartment, and (b) as part of a low broiler configuration without said pan permitting said second compartment to be exposed to the heating element for broiling of food therein.

4,718,401

HOT AIR FURNACE

Warren H. DeLancey, Elyria, Ohio, assignor to Kenneth J. Dornback, Sr. and Robert F. Dornback, Sr., both of Eastlake, Ohio

Filed Sep. 24, 1986, Ser. No. 911,239
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 R **9 Claims**

1. A hot air furnace, comprising:

(a) structure defining a heating chamber for heating comfort air;

(b) blower means for urging comnfort air through said heating chamber;

(c) a heat exchange assembly disposed in said heat exchange chamber and located in heat exchange relationship with comfort air passing through said heat exchange chamber;

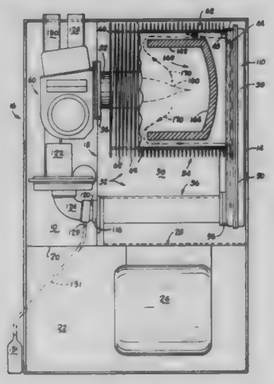
(d) said heat exchange assembly comprising:

(i) a combustion member including a substantially cylindrical wall defining an end opening comunicating with a burner means;

(ii) a condenser positioned in the flow path of comfort air upstream of said combustion member;

(iii) a transfer member connected to an other and opening defined by said cylindrical wall and operable to convey products of combustion from said combustion member to said condenser;

(iv) diffuser member mountd within said combustion member and including a flame stop portion located intermediate said burner means and said other end opening whereby a flame generated by said burner is inhibited from extending into said transfer member;



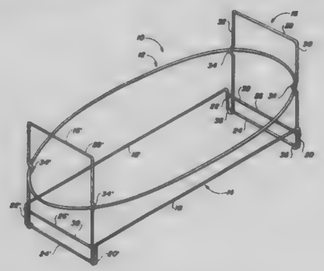
(v) said diffuser member further including a side wall portion extending from said flame stop portion, toward said burner means, said side wall portion located in a confronting relation with major portion of an inside surface of said combustion chamber but spaced therefrom to define a circuitous path for products of combustion to follow, from a region of combustion to said transfer member whereby the products of combustion are urged to travel along said inside surface of said cylindrical wall of said combustion member.

4,718,402

COLLAPSIBLE ROASTING FRAME

Donald E. Fordyce, 5337 Bastille, El Paso, Tex. 79924

Continuation-in-part of Ser. No. 807,447, Dec. 10, 1985, Pat. No. 4,648,379. This application Mar. 3, 1987, Ser. No. 22,259
Int. Cl.[4] F24C *15/16*
U.S. Cl. 126—337 R **6 Claims**



1. A collapsible roasting frame adapted to fit within a roasting pan and hold a fowl or roast;

said roasting frame comprises a support frame, standards at each opposed end of said support frame, and a removable ring member made of bent wire; means by which said standards are pivotally attached to said support frame and which provide handles at the upper ends thereof; legs provided at the bottom of said support frame, and notches in said standards at a location above the legs and below the handles;

said ring member is removably supported within said notches with said handles being located above said ring member; whereby:

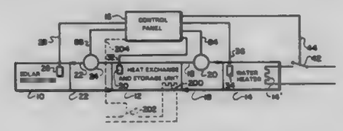
a product to be cooked is placed within said removable ring member, said removable ring member is received within said notches on said standards so that the roasting frame containing the product can be placed within a roasting pan where the product is supported free of the bottom of the pan.

4,718,403

CONTROL FOR WATER HEATER SYSTEM

Danny McCall, Hickory, N.C., assignor to Exemplar, Inc., Hickory, N.C.

Filed Oct. 11, 1985, Ser. No. 786,663
Int. Cl.[4] F24J *2/42*
U.S. Cl. 126—427 **19 Claims**



1. In a water heating solar energy collection and storage system which includes a water heating means having an independent heating element and a predetermined storage capacity for heated water, a solar panel, a heat storage chamber containing a heat storing material for storing solar heat, selectively operable first fluid transfer means for passing a fluid between said solar panel and said storage chamber to transfer available heat from said solar panel to said storage chamber, and selectively operable second fluid transfer means for passing water between said water heating means and said storage chamber to transfer available heat from said storage chamber to said water heating means, control means for said system comprising:

(a) selectively settable timer means;

(b) first sensor means for sensing the temperature of the fluid in said heat storage chamber (Temp. 1);

(c) second sensor means for sensing the temperature of the water in water heating means (Temp. 2);

(d) programmable means for selectively operating said system in the following modes of operation:

(i) a first mode in which said heating element is maintained in a deenergized condition whenever said Temp. 1 is greater than Temp. 2;

(ii) a second mode in which said heating element is maintained in a deenergized condition during predetermined time periods determined by the setting of said timer means;

(iii) a third mode in which said heating element is maintained in an energized condition whenever Temp. 2 is below a predetermined temperature level and is maintained in a deenergized condition whenever Temp. 2 is at or above said predetermined temperature.

4,718,404

SOLAR COLLECTOR APPARATUS AND METHOD

Charlton Sadler, P.O. Box 446, Brooksville, Fla. 33512

Filed Mar. 26, 1986, Ser. No. 844,117
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—448 **10 Claims**

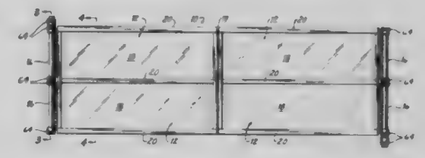
1. A solar collector system, comprising in combination:

an extruded solar collector composed of a ceramic material produced by an extrusion process and composed of a vitrified ceramic material with a plurality of orifices longitudinally extending therethrough;

an input manifold having a plurality of nipples corresponding to the plurality of orifices;

an output manifold having a plurality of nipples corresponding to the plurality of orifices;

means for positioning said nipples of said input manifold into one end of the plurality of orifices and for positioning said nipples of said output manifold into the other end of the plurality of orifices such that a fluid flowing into said input manifold flows through said nipples of said input manifold into the plurality of orifices and then through said nipples of said output manifold into said output manifold;



a sheet of transparent material affixed in a speced-apart position above said solar collector by means of a stand-off material;

said stand-off material comprises strips of insulated material adhered to said solar collector and said sheet of transparent material;

said strips of material comprise closed cell glass foam;

an insulated material positioned about said manifolds; and

an arcuate member adhered between said sheet of transparent material and said strip of material and positioned over one of said manifolds to prevent debris from being deposited between said manifold and said solar collector

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4,718,405

ENHANCING L-GLUCOSE YIELD: EPIMERIZATION OF L-MANNOSE BY MOLYBDATE IN PRESENCE OF EPIMERIZATION INHIBITORS

Bruce E. Firth, Arlington Heights, and Blaise J. Arena, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 889,154, Jul. 25, 1986, abandoned. This application Mar. 23, 1987, Ser. No. 29,286
Int. Cl.[4] C07H *1/00, 1/06*
U.S. Cl. 127—46.1 **6 Claims**

1. A method of enhancing the yield of L-glucose from an aqueous mixture containing at lest about 40 percent by weight L-mannose on a dry solids basis and containing molybdate epimerization inhibitors, said mixture containing inhibitors arising from the hydrocyanation of L-arabinose, where the method comprises catalyzing the epimerization of L-mannose to L-glucose with a solution of a molybdate containing up to about 1500 parts per million molybdenum at a pH below 3.0 and at a temperature between about 75 and about 100° C. for a time sufficient to give a ratio of L-glucose to L-mannose of at least 1.

4,718,406

FIBER OPTICS IMAGE SCOPE (MICRO-ENDOSCOPE), URETEROSCOPE

Robert U. Bregman, and Parviz Soltan, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1982, Ser. No. 392,185
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **3 Claims**

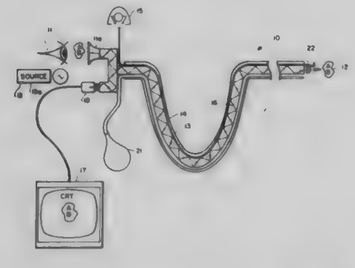
1. An improved flexible endoscope having a reduced diameter throughout its entire length of insertion and flexibility for

diagnosing and treating ureteral and renal disorders comprising:

means extending the length of the endoscope for providing illumination having a sector-shaped cross-sectional configuration;

means extending the length of the endoscope and adjacent the illumination providing means for permitting observation;

an elongate flexible tubing extending the length of the endoscope and having an outer diameter dimension of two millimeters for encasing the illumination providing means



and the observation permitting means and for defining a longitudinal fluid duct that completely fills the remainder of the elongate flexible tubing's interior, an outer surface of the illumination providing means has a rounded cross-sectional configuration shaped to contiguously accommodate an inner surface of the elongate flexible tubing and further has a coaxially disposed channel shaped to receive the observation permitting means and the two millimeter outer dimension of the elongate flexible tubing is small enough to pass into and through the ureter into the kidney without the need for ureteral dilation or without trauma.

4,718,407

OPERATING MECHANISM FOR BENDABLE SECTION OF ENDOSCOPE

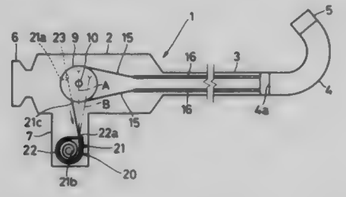
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 922,020, Oct. 22, 1986. This application Jan. 16, 1987, Ser. No. 3,859

Claims priority, application Japan, Apr. 4, 1986, 61-49840[U]

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **15 Claims**



1. An endoscope comprising:

an operating body;

an inserting portion extending from said operating body and having a distal end section formed into a resiliently bendable section;

an angularly movable member mounted within said operating body for angular movement around a center of rotation;

a pair of operating wire means having their respective one ends operatively connected to said angularly movable member and the respective other ends operatively connected to said bendable section;

an operating member arranged exteriorly of said operating body and operatively connected to said angularly movable member, for angularly moving said angularly movable member to resiliently bend said bendable section; and

a biasing mechanism associated with said operating body and operatively connected to said angularly movable member, said biasing mechanism including a casing and strap-like spring means spirally wound within said casing, said spring means having one end thereof drawn out of said casing and the other end located within said casing, said spring means applying a spring force to a point of action on said angularly movable member spaced from the center of rotation thereof is such a manner that when said bendable section extends straight, the spring force of said spring means passes through the center of rotation of said angularly movable member so as to apply substantially no moment of rotation to said angularly movable member, and when said bendable section is resiliently bent, the spring force of said spring means applies moment of rotation to said angularly movable member.

4,718,408

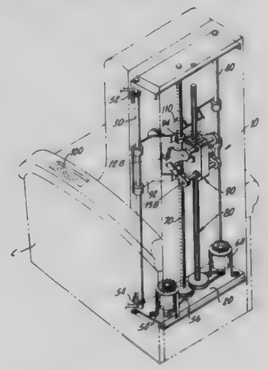
VARIABLE MASSAGE APPARATUS HAVING A CLUTCH SELECTIVELY ENGAGING ALTERNATE GEARS

Armando Barreiro, 9460 NW. 13 St., Bay #69, Miami, Fla. 33172

Filed Apr. 29, 1986, Ser. No. 857,187

Int. Cl.[4] A61H *7/00, 23/02*

U.S. Cl. 128—52 **2 Claims**



1. A massage apparatus mountable behind the back of a chair, comprising:

A. a flat horizontal platform;

B. vertically extending guiding means mounted perpendicularly to said platform;

C. motor means mounted on said platform including a shaft that is disposed in parallel to said guiding means;

D. a massage mechanism unit slidably mounted over said guiding means and including two sets of gears and clutch means for transmitting the rotation of said shaft and for selectively engaging one of said sets of gears depending on the direction of rotation of the shaft of said motor means and said clutch means further including a clutch member of cylindrical shape and having an external thread and a cylindrical clutch housing coaxially housing said clutch member, said housing including an internal thread compatible with said external thread thereby allowing said clutch member to longitudinally travel inside said housing to engage one of said two gears connected to said shaft member;

E. two shaft members rigidly connected to each one of said gears;

F. linkage means having two ends and said linkage means being pivotally mounted to said two shaft members on one end and further including each of said linkage means having at least one rubber wheel rotatably mounted at the other end so that the rotation of said gears impart a predetermined reciprocating movement to the ends having said wheels mounted thereon and said wheels positioned in the area behind the back of said chair so that said unit may travel up and down the spine of a user.

4,718,409

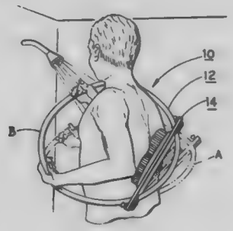
BODY CARE APPLICATOR

Uri Gershov, 40 Wallingford Rd., Brighton, Mass. 02135; Edward Marinow, and Eleanor Marinow, both of 186 Sundown Trail, Williamsville, N.Y. 14221

Filed Oct. 16, 1986, Ser. No. 919,634

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—62 R **7 Claims**



1. Self treatment body care applicator apparatus for accessing and applying treatment to the dorsal area of the human torso comprising a circular frame element of nonextensible, resiliently flexible, tubular plastic material for circumscribing a portion of a human torso and a set of diverse interchangable applicator assemblies, each being secured to said frame element separately and individually usable, each applicator assembly of said set comprising an elongate, rigid, planar backing element having an open ended slot at each end extending parallel to the longitudinal central axis of said backing element, said backing element being readily and firmly engagable with and quickly and readily removable from said frame at circumferentially spaced points, a slot restricting means located at each end of said backing element, said slot restricting means selectively blocking the open ends of said slots so as to secure said applicator assembly to said frame element, each backing element of said set having a different type of body care appliance secured to a major surface thereof whereby each applicator assembly is readily securable to and readily removable from said frame element for performing successive steps in a body care routine.

4,718,410

SURGICAL IMPLANTS

Said I. Hakky, P.O. Box 783, Baghdad, Iraq

PCT No. PCT/GB79/00130, § 371 Date Apr. 1, 1980, § 102(e) Date Apr. 1, 1980, PCT Pub. No. WO80/00302, PCT Pub. Date Mar. 6, 1980

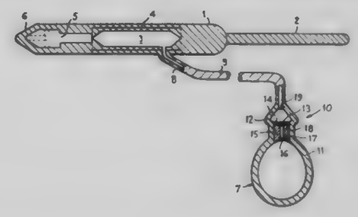
PCT Filed Aug. 2, 1979, Ser. No. 192,384

Claims priority, application United Kingdom, Aug. 2, 1978, 32037/78; Dec. 29, 1978, 50188/78

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—79 **19 Claims**

1. A surgical implant comprising an inflatable penile member arranged for implanting within a penis, inflating means arranged for implanting in the patient's body for inflating the penile member, said penile member comprising a flexible rod-like body formed of a synthetic material and having an inflatable chamber therein and a flexible tail-like portion projecting from the proximal end of said body, said inflatable chamber being elongated and generally cylindrical, said chamber being disposed adjacent to the proximal end of the rod-like body and surrounded by generally cylindrical means for constraining said chamber, said inflating means comprising a flexible bulb containing fluid for pressurizing and inflating said chamber and connected to said chamber by a flexible tube and a non-return valve arranged to prevent fluid discharged from the bulb into



the chamber from returning to the bulb when said chamber is inflated, said constraining means comprising reinforcing means embedded in said body adjacent the distal end thereof in order to stiffen said body while substantially preventing said body from expanding radially when said chamber is inflated, said valve having manually operable means arranged to be manually operated to permit fluid to return from said chamber to said bulb.

4,718,411

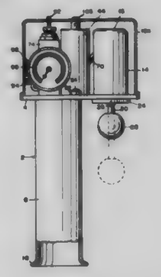
MALE ERECTING DEVICE

Edward T. Stewart, 107 Plaza Ter., Dodge City, Kans. 67801

Filed Feb. 13, 1987, Ser. No. 14,361

Int. Cl.[4] A61F *5/41*

U.S. Cl. 128—79 **5 Claims**



1. A male erecting device comprising a self-contained, hand-held unit, said unit comprising:

a. a penile tube sufficiently large to contain a fully erect penis therein, being open at one end to be applicable over a non-erect penis and to be sealed against the user's body around the base of the penis,

b. a vacuum pump operable when actuated to pump air from said penile tube to produce a vacuum therein, said vacuum being operable to cause erection of the penis, said pump being manually operable and comprising a pump cylinder, a manually operable piston movable in said cylinder, said cylinder being vented to atmosphere at one side of said piston and being connected to said penile tube at the opposite side of said piston, and

c. a check valve carried by said piston and operable to permit the flow of air past said piston toward the vented side thereof, but to close to prevent a reverse flow of air, said check valve comprising a rubber O-ring contained loosely

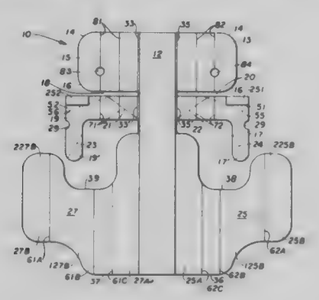
in a peripheral groove of said piston and having wiping contact with the wall of said cylinder, said groove being vented to the cylinder at the vented side of said cylinder, said O-ring functioning as a valve to close the air passage around the piston during the vacuum stroke of said piston, but to open said air passage during the reverse stroke of said piston.

4,718,412

DISPOSABLE CERVICAL IMMOBILIZATION MEANS

William R. Nesbitt, 9697 Blue Oak La., Loomis, Calif. 95650

Continuation-in-part of Ser. No. 650,206, Sep. 13, 1984, Pat. No. 4,594,999. This application Jun. 6, 1986, Ser. No. 871,390
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **19 Claims**



1. A cervical spine board adapted to restrain the head and body of an injured person comprising

a main body portion, and

a flat, elongated, central reinforcement portion of a rectangular configuration, of similar length to that of the main body, portion,

said main body portion having a central section,

a pair of head flanges, one of which extends outwardly on either side of said central section and which flanges are capable of moving from a first position in the same plane as said central member to a second position generally normally upward from said central section,

a hard neck collar comprising

a pair of neck collar members, one on each side of the central portion, extending outwardly from said central section and extending further than said head flanges, movable from a first position in the same plane as said head flanges, to a position substantially parallel to each other, along the sides of the neck,

each neck collar member being a downward L shaped unit, and having built in outwardly foldable chin tab,

said chin tab formed by a score line located at the intersection of two legs,

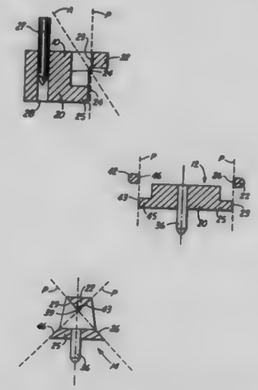
a pair of body members, one on each side of said central portion, said body members including a first L-shaped segment adjacent to said central member and a wing segment capable of moving from a first position in the same plane as the central portion upwardly and inwardly toward the other of said wing segments to a spaced relationship second position spaced from the other of said wing members.

4,718,413

BONE CUTTING GUIDE AND METHODS FOR USING SAME

Wesley Johnson, Bloom, Minn., assignor to Orthonet, Inc., Minneapolis, Minn.

Filed Dec. 24, 1986, Ser. No. 946,586
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VW **12 Claims**



1. A cutting guide for a bone saw blade comprising:

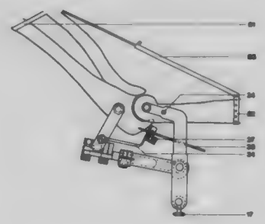
a body; a guide element carried by the body and having a pair of guide surfaces adapted to guidingly and slidingly engage opposite generally flat sides of a saw blade to guide the blade in a predetermined plane during operation of the saw when the blade is biased concurrently against both of said guide surfaces, said surfaces being spaced from one another generally along the predetermined plane a sufficient distance to enable the saw blade to pivot out of said plane away from engagement with at least one of the guide surfaces through an angle of at least approximately 15°; and attachment means for attaching the guide to a bone surface to orient the guide element with respect to the bone.

4,718,414

INSTRUMENT FOR ELBOW SURFACE REPLACEMENT ARTHROPLASTY

Gerald A. B. Saunders, Sydenham, and Charles Sorbie, Kingston, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation of Ser. No. 730,931, May 6, 1985, Pat. No. 4,624,250, Continuation-in-part of Ser. No. 507,378, Jun. 24, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,214
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VY **4 Claims**



1. A method for surgically implanting an elbow prosthesis comprising:

(a) exposing medial and lateral epicondyles of an elbow to be replaced;

(b) removing a crown from each of said medial and lateral epicondyles so as to provide flattened epicondylar plateaus;

(c) determining a geometric trochleal centre and a geometric capitellum centre on respective ones of said epicondylar plateaus, and drilling pilot holes thereat;

(d) mounting a width-adjustable humeral clamp, provided with a pair of mounting pins, on said elbow by inserting said pins into respective ones of said pilot holes, adjusting the width of said clamp and securing in a selected orientation by insertion of at least one lateral locking pin;

(e) mounting one end of a longitudinally extending ulna fixation assembly on said humeral clamp perpendicularly thereto; said ulna fixation assembly having an adjustable crosshead assembly at the free end thereof, coronoid arms extending from each end of said crosshead assembly and an olecranon bracket extending intermediate the ends of said crosshead and angularly adjustable so that a pin extending through the free end thereof into the olecranon is substantially parallel to the axis of said ulna;

(f) securing said ulna and humerus at an inclined angle of about 135 degrees with strap means between the distal end of the ulna and the proximal end of the humerus;

(g) securing said pin extending through the olecranon bracket in a plane parallel the axis of said ulna;

(h) mounting a selected humeral cutting cam on said humeral clamp on the medial side thereof;

(i) inserting a cutting means through said cutting cam and shaping the trochleal and capitelum portions of the distal end of said humerus therewith;

(j) replacing said humeral cutting cam and cutting means with a selected ulna cutting arc template;

(k) inserting said cutting means through said cutting arc template and shaping the proximal end of said ulna therewith;

(l) mounting a radial cutting gauge on the lateral side of the humeral clamp and resecting the proximal end of the radius;

(m) removing said humeral clamp from said elbow;

(n) mounting a radius prosthesis on said resected radius from the lateral side of the elbow;

(o) slidingly inserting a humeral prosthesis on said prepared humerus from the medial side;

(p) slidingly inserting an ulna prosthesis on said prepared ulna from the medial side;

(q) replacing said medial and lateral epicondyles; and

(r) closing both medial and lateral wound sites.

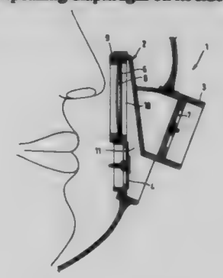
4,718,415

BREATHING MASK HAVING A TRANSDUCER MOVABLE PARTS COUPLED TO A SPEAKING DIAPHRAGM FOR SPEECH TRANSMISSION

Reinhard Bolnberger, Vienna, and Werner Fidi, Baden, both of Austria, assignors to AKG Akustische u.KinoGeräte Gesellschaft m.b.H., Austria

Continuation of Ser. No. 686,205, Dec. 26, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 899,746
Claims priority, application Austria, Dec. 27, 1983, A 4533/83
Int. Cl.[4] A62B *7/14*
U.S. Cl. 128—201.19 **1 Claim**

1. A breathing mask comprising a valve carrier (2) having a recess therein and an opening therethrough adjacent said recess, an exhaling valve (4) mounted to said valve carrier, an inhaling valve (7) mounted to said valve carrier, an electrodynamic transducer (13) connected to said valve carrier and extending across said opening, said transducer having a transducer diaphragm (12) extending across said opening and facing an interior of the breathing mask, a speaking diaphragm (6) having an outer rim engaged against said recess and being in direct contact with said transducer diaphragm for directly transmitting vibrations of said speaking diaphragm to said transducer diaphragm, and a screw ring (9) connected to said valve carrier and pressing said rim of said speaking diaphragm against said recess to urge said speaking diaphragm against said transducer diaphragm, said transducer diaphragm (12) having an inwardly convex portion which is engaged directly against said speaking diaphragm (6), and a perforated protective cover covering said speaking diaphragm on its side facing the interior



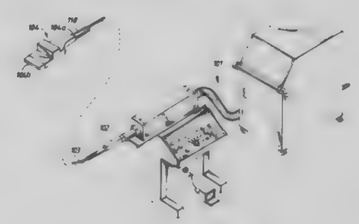
of said breathing mask, said perforated protective cover having an outer rim engaged against said screw ring (9) and said rim of said speaking diaphragm.

4,718,416

LASER TREATMENT APPARATUS

Yasuaki Nanaumi, Kuroiso, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 11, 1985, Ser. No. 690,634
Claims priority, application Japan, Jan. 13, 1984, 59-4381
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **9 Claims**



1. Laser treatment apparatus, comprising:

means for generating a laser beam;

a handpiece having an incident end and an emission end end;

an optical fiber having an incident end connected to said generating means and an emission end connected to said handpiece, said optical fiber transmitting said generated laser beam to said handpiece incident end;

a plurality of means for uniformly distributing laser radiation, each of said distributing means having an incident end and an emission end corresponding to said handpiece incident and emission ends, respectively, said distributing means being positioned side-by-side in said handpiece;

a sleeve of magnetic material secured to the emission end of said optical fiber;

a guide member mounted in said handpiece and movably securing said sleeve so as to permit movement of said sleeve in a direction parallel to said incident end surfaces to permit selective positioning of the emission end of said optical fiber in proximity to the incident ends of individual ones of said distribution means;

a plurality of electromagnetc mounted in said handpiece, the energization of said electromagnets being operable to move said sleeve; and

means for selectively energizing said electromagnets to selectively position the emission end of said optical fiber at the incident ends of said distributing means for form a

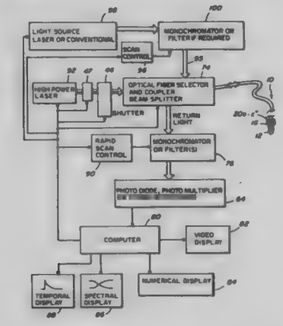
plurality of specified uniform laser radiation patterns at said handpiece emission end.

4,718,417

VISIBLE FLUORESCENCE SPECTRAL DIAGNOSTIC FOR LASER ANGIOSURGERY

Carter Kittrell, Cambridge, Mass.; Robert L. Willett, Billings, Mont.; Cynthia de los Santos-Pacheco, Cambridge, Mass.; Leo T. Kenny, New Bedford, Mass., and Michael S. Feld, Waban, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 22, 1985, Ser. No. 715,131
Int. Cl.[4] A61N *5/06*; G01N *21/64*
U.S. Cl. 128—303.1 11 Claims



1. A method of diagnosis of the type of tissue in the artery, including distinguishing artery wall from atheromateous plaque, comprising the steps of:

(a) providing a catheter with one or more optical fibers in which the distal end of the catheter is enclosed by an optical shield transparent to light radiation and wherein the proximal end of the catheter and optical fibers may be coupled to a source of optical radiation wherein the radiation is capable of exciting fluorescence and scattering light;

(b) inserting said catheter into an artery until the optical shield is brought into contact with a suspected arterial lesion or other tissue to be diagnosed;

(c) selecting an optical fiber and coupling said light at a wavelength of about 480 nm from the light source to the proximal end of said optical fiber whereby the light enters the proximal end of the optical fiber and is transmitted by the selected optical fiber to the distal end of said fiber out the optical shield and impinges on the suspected lesion, and the scattered and fluorescent light is returned to the proximal end of the selected optical fiber, and is coupled to a spectral analyzer wherein the fluorescence or scattered light excited by said light is analyzed to determine if the material contacted by the optical shield and, in particular, the portion irradiated by the incident light from the selected optical fiber is healthy arterial tissue or plaque or other material;

(d) observing at the proximal end of the selected fiber the fluorescence excited by said light to analyze the spectral profile in the range 520–610 nm, where peaks occur;

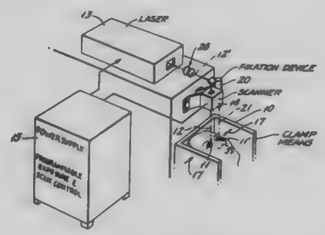
(e) determine from ratios of fluorescence peak heights at 550 nm and 600 nm and the valley at 580 nm, or by analyzing other fluorescence wavelengths, whether the tissue being analyzed is artery wall, plaque, blood or other tissue.

4,718,418

APPARATUS FOR OPHTHALMOLOGICAL SURGERY

Francis A. L'Esperance, Jr., Englewood, N.J., assignor to LRI L.P., New York, N.Y.

Continuation of Ser. No. 794,444, Nov. 4, 1985, abandoned, which is a division of Ser. No. 748,358, Jun. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 552,983, Nov. 17, 1983, abandoned. This application Oct. 8, 1986, Ser. No. 916,646
Int. Cl.[4] A61F *9/00*; A61N *5/06*; A61B *19/00*
U.S. Cl. 128—303.1 41 Claims



1. Apparatus for performing ophthalmological surgery to reduce an ascertained astigmatic condition by selective ablation of the anterior surface of the cornea with penetration into the stroma to achieve a volumetric removal of corneal tissue, said apparatus comprising laser means having a chassis and producing an output beam in the ultraviolet portion of the electromagnetic spectrum and characterized by a spot which at eye impingement is small in relation to the cornea to be operated upon, said laser means including means for adjusting beam-exposure flux to a level at which corneal-tissue ablation per unit time is to an ascertained elemental depth which is but a fraction of desired maximum depth into the stroma region, scan-deflection means positioned for deflection of said beam in a limited field about a central axis, means for steadying the cornea with respect to said chassis and with the central area of the cornea centered on the central axis of scan deflection of said beam, said scan-deflection means having X-Y coordinates of deflection for area coverage at least within the perimeter of said limited field, adjustable means for angular selection of the orientation of said coordinates to position one to the exclusion of the other of said coordinates in oriented relation to the ascertained astigmatism axis of the cornea to be operated upon, and means including a microprocessor for establishing a series of different centrally related perimeter limits of generally rectangular-area scan within the perimeter of said limited field and for coordinating the operation of said scan-deflection means in a controlled program of limitation of one area scan within one perimeter limit before repeating such coordination within the next-successive perimeter limit in the series, the successively scanned areas being of varying width and symmetrical about a central axis aligned with said astigmatism axis, whereby ablative penetration to said maximum depth is the cumulative result of plural area scans of each of a succession of different but overlapping rectangular areas, with astigmatism-reducing cornea-curvature correction.

4,718,419

SNARE ASSEMBLY FOR ENDOSCOPE

Tsutomu Okada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan

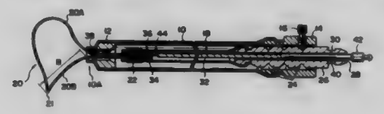
Filed Jul. 30, 1986, Ser. No. 890,629
Claims priority, application Japan, Aug. 5, 1985, 60-172171; Sep. 17, 1985, 60-204820
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.15 18 Claims

1. A snare assembly for an endoscope comprising a flexible outer tube having a forward end and a base end; a folded snare

inserted into said tube to be movable back and forth and having a folded end portion and a relatively short snare section extending from a base end portion of the snare to the folded end portion;

slide means attached to the base end portion of the short snare section and having the snare section extending therein;

stopper means slidably positioned within said flexible tube to be movable back and forth within said flexible tube to change the longitudinal position of said stopper means



relative to said flexible tube, said stopper means abutting against said slide means upon the forward movement of said snare beyond a predetermined position; and

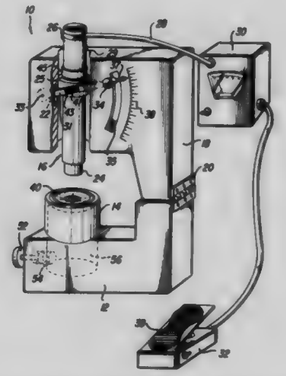
first releasable fixing means on said stopper means and second releasable fixing means on said flexible tube, said first fixing means being movable with said stopper means and being releasably attachable to said second fixing means for releasably fixing the stopper means to said tube at a selected relative position for changing the distance said relatively short snare section extends from the forward end of said flexible tube.

4,718,420

METHOD AND APPARATUS FOR TREPHINING CORNEAL TISSUE IN PREPARATION FOR KERATOPLASTY

Michael A. Lemp, 4918 Hillbrook La., Washington, D.C. 20016

Filed Mar. 6, 1986, Ser. No. 836,802
Int. Cl.[4] A61B *17/16*
U.S. Cl. 128—310 14 Claims



4. An apparatus for preparing a corneal tissue for keratoplasty, comprising:

a base having a concave surface for supporting a corneal-scleral donor button with the anterior surface of the donor button against the concave surface and the posterior surface of the donor button facing away from the concave surface,

said concave surface having indicia means for cooperating with physical characteristics of the donor button to assist in visually centering the donor button on the concave surface,

said base having suction means for adhering a centered donor button to said concave surface by acting on the donor button through the concave surface,

a cutting means comprising a cutting blade mounted in a blade holding means and movable circularly about an axis coincident with the axis of the concave surface,

advancing means mounting the cutting blade for advancing movement toward the concave surface in a direction substantially parallel to and coaxial with the axis of the concave surface,

said concave surface having at least one circular groove formed therein which is aligned with the cutting blade and positioned to receive the cutting blade after it has advanced axially completely through the donor button,

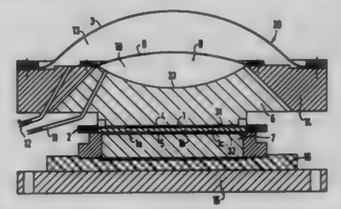
power means for rotating the cutting blade and means for advancing the cutting blade to and through the donor button and into the circular groove formed in the concave surface, and said power means having means for commencing circular movement of the cutting blade before it reaches the donor button and maintaining said circular movement until the cutting blade has passed axially completely through the donor button and into said aligned circular groove, to therbey cut a finished donor button out of the corneal-scleral donor button.

4,718,421

ULTRASOUND GENERATOR

Arnim Rohwedder, and Gerd Wessels, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 890,103
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528676
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 20 Claims



1. In an ultrasound generator for an acoustical irradiation of pathological changes in a human body, said generator comprising a planarly fashioned piezo-electric transducer which is acoustically coupled to an acoustical lens on a first surface and is acoustically coupled to a dampening member on a second surface opposite the first surface, said transducer being provided with electrodes on these two surfaces, the improvements comprising a layer of soft metal being provided adjacent each of the first and second surfaces and extending between the piezo-electric transducer and the acoustical lens as well as between the transducer and the dampening material, said layers of soft metal simultaneously serving as both electrodes for the transducer and for acoustically coupling the piezo-electric transducer respectively to the acoustical lens and the dampening member.

4,718,422

COHERENT BEAM COUPLER SYSTEM AND METHOD II

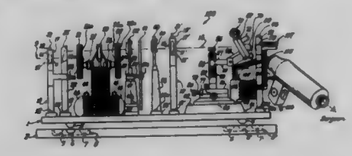
Larry Rosenberg, 3440 Caroline Ave., Culver City, Calif. 90230

Filed May 9, 1985, Ser. No. 732,378
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—632 4 Claims

1. The method for diagnosing the aberrant condition of a

selected site within the body of a subject, including the steps of:

(a) directing laser light from at-least-one laser beam source onto said selected site to excite such site, whereby laser light is re-emitted from said selected site;



(b) conducting Doppler spectral analysis of said re-emitted laser light; and,

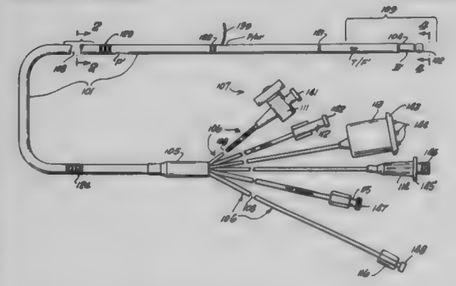
(c) electrophoretically determining the chemical composition of the selected site where the aberrant condition exists.

4,718,423

MULTIPLE-FUNCTION CARDIOVASCULAR CATHETER SYSTEM WITH VERY HIGH LUMENAL EFFICIENCY AND NO CROSSOVERS

Allan F. Willis, Newbury Park, and Byron L. Moran, Santa Barbara, both of Calif., assignors to Spectramed, Inc., Newport Beach, Calif.

Filed Oct. 17, 1986, Ser. No. 920,736
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—634 **13 Claims**



1. A cardiovascular diagnostic and therapeutic catheter system for determining cardiac output, blood oxygen saturation, and oxygen consumption in a human patient; said system incorporating a catheter of advantageously limited diameter without any interlumen crossovers, and comprising:

a catheter having at least two lumens and having a distal end adapted for insertion through such patient's vascular system and heart, and having a proximal end adapted for functional attachment to apparatus outside such patient's body;

a first orifice defined in the side of the catheter at a first measured distance from the distal end, communicating with a first one of the two lumens, and adapted for passage of liquid from the first one of the two lumens into such patient's vascular system;

injecting means, outside such patient's body and communicating with a proximal portion of the first one of the two lumens, for forcing passage of liquid from the first one of the two lumens through the orifice into such patient's vascular system;

at least one temperature-measuring device disposed along the catheter near its distal end for exposure to temperatures of such patient's vascular system;

long, thin, signal-carrying means, disposed within only the second one of the two lumens, free of interlumen crossover into the first one of the two lumens, and functionally interconnected with the temperature-measuring device;

signal-utilization means, outside such patient's body and interconnected with the signal-carrying means at a proximal portion of the second one of the two lumens, for utilizing said temperature-measuring device to measure the temperature within such patient's vascular system;

whereby the temperature-measuring device and the signal-utilization means in combination are responsive to temperature variations resulting from forced passage of liquid through said first one of the two lumens;

optical-fiber means also disposed within the second one of the two lumens, adapted to project light from the distal end of the catheter into such patient's vascular system and to receive light reflected back from such patient's vascular system, for measurement of oxygen saturation of such patient's blood;

light-emitting means, disposed outside such patient's body and interconnected with the optical-fiber means at a proximal portion of the catheter, for transmitting light through the optical-fiber means to be projected into such patient's vascular system; and

light-detecting means, disposed outside such patient's body and interconnected with the optical-fiber means at a proximal portion of the catheter, for receiving light through the optical-fiber means after reflection back from such patient's vascular system, and adapted for interpretation of the received light to determine oxygen saturation of such patient's blood;

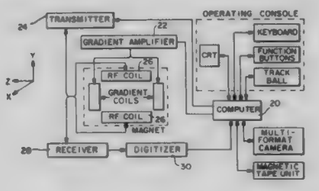
wherein said catheter system provides measurements of cardiac output and oxygen saturation, and by calculation therefrom also provides measurement of oxygen consumption in such patient, using only said two lumens and without any interlumen crossover of signal-carrying means.

4,718,424

NMR IMAGING OF BLOOD FLOW BY MOMENT VARIATION OF MAGNETIC GRADIENTS

Dwight G. Nishimura, Palo Alto, Calif., assignor to Stanford University, Stanford, Calif.

Filed Aug. 7, 1986, Ser. No. 894,318
Int. Cl.[4] A61B 5/05
U.S. Cl. 128—653 **16 Claims**



8. Apparatus for selectively projection imaging moving material using magnetic resonance techniques comprising

first means for establishing a first magnetic field including a first magnetic gradient field for image/slice selection,

second means for exciting nuclear spins in a selected image slice,

third means for applying a second magnetic gradient following excitation of nuclear spins and a third magnetic gradient during detection of nuclear spin signals,

means for detecting nuclear spin signals during a readout period,

fourth means for subtracting first nuclear spin signals from second nuclear spin signals, said first and second nuclear spin signals resulting from the application of magnetic gradients whose waveforms have different first moments, wherein said first and second nuclear spin signals are

vectors and the resultant signal is dependent on the phase and amplitude of said nuclear spin signals, and

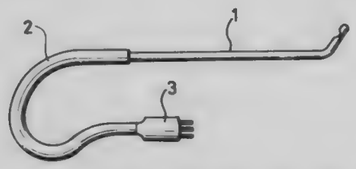
means for imaging the difference in said nuclear spin signals to provide a projection image of moving material.

4,718,425

CATHETER WITH PRESSURE SENSOR

Junsuke Tanaka; Ikuo Inage, and Terno Hyugaji, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed May 27, 1986, Ser. No. 866,668
Claims priority, application Japan, May 29, 1985, 60-114262
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—673 **7 Claims**



5. In a catheter having a blood pressure sensor at one end thereof for use in monitoring blood pressure in active mammals by inserting a first portion of the catheter having the sensor thereon through a blood vessel of the mammal and having a second portion thereof extending beneath the skin of the mammal and emerging at a location exterior to the mammal for connection to a transmission means for conveying blood pressure information to a monitor; the improvement comprising:

the first portion being a tube made of woven DACRON, having a diameter sufficiently small to fit through a selected blood vessel of the mammal and a length sufficient to reach the left ventricle of the mammal from a point of insertion into the blood vessel, the first portion of the catheter having a tensile elasticity in the range of 25–150 kg;

the second portion of the catheter being a tube made of soft polyvinylchloride, having a diameter slightly greater than that of the first portion, having a tensile elasticity in the range of 1–10 kg and being bonded to the first portion by a rubber adhesive;

an electrical connector attached to the end of the second portion of the catheter for connection to the transmission means; and

electrical lead means extending through the first and second portions of the catheter and being connected to the pressure sensor and the electrical connector, the electrical lead means having a TEFLON coating thereon in the range of 0.5 to 1.5 as thick as the diameter of the conductor means in the lead, whereby the catheter withstands flexing without breakage so that the blood pressure of the active mammal can be continuously monitored with minimal interference with the activities of the mammal.

4,718,426

METHOD FOR DETERMINING DIASTOLIC ARTERIAL BLOOD PRESSURE IN A SUBJECT

Ted W. Russell, Northport, N.Y., assignor to Cortronic Corporation, Ronkonkoma, N.Y.

Division of Ser. No. 581,134, Feb. 17, 1984, Pat. No. 4,669,485. This application Jan. 22, 1987, Ser. No. 6,626
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—679 **5 Claims**

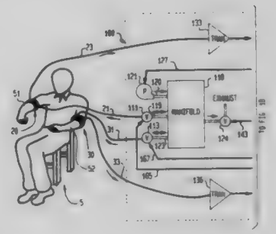
1. A method of determining a measure of the diastolic arterial blood pressure in a subject comprising the steps of:

determining a group, of a pre-selected number of sequentially occurring individual pressure waveforms, from all the pressure waveforms occurring during deflation of an occlusive cuff, wherein said group possesses maximum average amplitude,

selecting, in accordance with pre-selected criteria, at least one individual pressure waveform from the group and setting mean pressure of the subject equal to the occlusive cuff pressure corresponding to the selected individual pressure waveform,

determining the systolic pressure of the subject, and

ascertaining the measure of diastolic pressure in accordance with the formula:



$$D=AM-Sy/(A-Y)$$

for at least a chosen one of all of said pressure waveforms in which

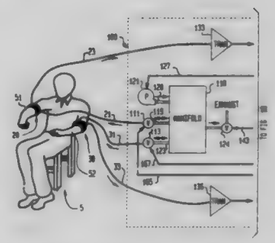
D is the measure of diastolic pressure, A is the uncalibrated peak amplitude of said chosen pressure waveform, Y is the mean value (area/duration) of said chosen pressure waveform, and S and M are the systolic and mean pressure values respectively, associated with said subject.

4,718,427

METHOD FOR DETERMINING SYSTOLIC ARTERIAL BLOOD PRESSURE IN A SUBJECT

Ted W. Russell, Northport, N.Y., assignor to Cortronic Corporation, Ronkonkoma, N.Y.

Division of Ser. No. 581,134, Feb. 17, 1984, Pat. No. 4,669,485. This application Jan. 22, 1987, Ser. No. 6,627
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—679 **7 Claims**



1. A method for determining systolic arterial blood pressure in a subject comprising the steps of:

controllably deflating an occlusive cuff secured around a limb of the subject,

detecting a pre-determined number of pressure waveform peaks and simultaneously occurring corresponding occlusive cuff pressures occurring during occlusive cuff deflation,

determining a first measure of the variability of these detected peaks,

defining co-ordinates of a first point in terms of an average of

the detected peaks and an average of the corresponding occlusive cuff pressures,

successively maintaining the pressure of said occlusive cuff at a substantially constant value for a corresponding pre-selected time interval and detecting additional pressure waveform peaks and determining a second measure of the variability associated therewith during said corresponding time interval,

defining co-ordinates of a second point in terms of an average of said additional peaks and said constant pressure value,

modifying the values of the co-ordinates of said first and/or second points, in response to said first and/or second variability measures,

ascertaining an intermediate value of systolic pressure in terms of the co-ordinates of a point of intersection between a line defined by said first and second points and a line representing a pre-determined constant pressure value, and

modifying said intermediate systolic pressure value in response to said first and/or second variability measures so as to obtain a final systolic pressure value.

4,718,428

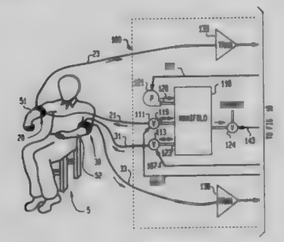
METHOD FOR DETERMINING DIASTOLIC ARTERIAL BLOOD PRESSURE IN A SUBJECT

Ted W. Russell, Northport, N.Y., assignor to Cartronic Corporation, Roakoakoma, N.Y.

Division of Ser. No. 581,134, Feb. 17, 1984, Pat. No. 4,669,485. This application Jan. 22, 1987, Ser. No. 6,628

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—679 **2 Claims**



1. A method of determining a measure of the diastolic arterial blood pressure in a subject comprising the steps of:

a. establishing, in response to a sequence of occlusive pressure waveform peaks and corresponding occlusive cuff pressure values occurring during deflation of an occlusive cuff, a sequence of mid-point co-ordinates, wherein one co-ordinate of each mid-point is an average of the peak amplitudes of two successive pressure waveforms and the other co-ordinate of each mid-point is an average of the occlusive cuff pressure values corresponding to each of said two peaks,

b. grouping every mid-point into an alternate one of at least two series,

c. determining the value of slope of each of a plurality of line segments, wherein each segment joins a pair of adjacent mid-points in one of said sequences,

d. testing each of said slope values against pre-defined limits to determine whether any of said mid-points is attributable to a negator or a reversal,

e. removing any pressure waveform peak and its corresponding occlusive cuff pressure value attributable to a negator or a reversal from the sequence and repeating steps (a), (b), (c) and (d) until substantially all pressure waveform peaks attributable to either negators or reversals have been removed,

f. comparing the slope of each segment in each series against a pre-defined threshold and, in response thereto, choosing an appropriate one of the segments comprising each series,

g. choosing an appropriate pressure waveform peak amplitude value that precedes the leading mid-point associated with the chosen segment in each series,

h. selecting one of the resulting chosen pressure waveform peak amplitude values as the diastolic measure.

4,718,429

METHOD OF REDUCING FATTY DEPOSITS IN THE HUMAN BODY

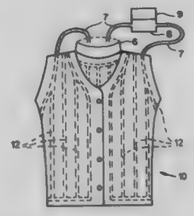
Udo Smidt, 133, Flilderstrasse, D-4130 Moers 1, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,116

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308353

Int. Cl.⁴ A61F 7/00

U.S. Cl. 128—400 **8 Claims**



1. A method of reducing or removing fatty deposits in a human body comprising the steps of:

(a) providing a cooling device having a cooling fluid source and a cooling fluid panel adapted to be placed on the human body having the fatty deposits for reducing the skin surface temperature by entering into a heat-exchange relationship therewith, said panel comprising at least one heat-exchange surface, at least one fluid conducting passage running largely through said heat-exchange surface, a inlet conduit for directing relatively low-temperature cooling fluid from said cooling fluid source into said fluid conducting passage, an outlet conduit for directing relatively high-temperature cooling fluid out of said fluid conducting passage, and means for controlling the temperature of the cooling fluid flowing as it flows into said cooling fluid panel;

(b) placing said heat-exchange surface of said cooling fluid panel on a surface portion of a human body in a heat exchange relationship therewith;

(c) flowing a cooling fluid through said cooling fluid panel;

(d) providing a temperature controlling means for controlling the temperature of said fluid such that heat is extracted by said heat exchange surface from the surface portion of said human body adjacent to said heat exchange surface thereby reducing the temperature of said surface portion to a temperature between about 15° and 25° C.; and

(e) maintaining said cooling fluid panel on said surface portion of said human body to be treated for a period of time sufficient for said human body to consume fatty deposits to make up for heat loss to the cooling device.

4,718,430

PROCEDURE AND DEVICE FOR THE ADMINISTERING OF INSULIN OR SIMILAR LONG-TERM MEDICAMENTS

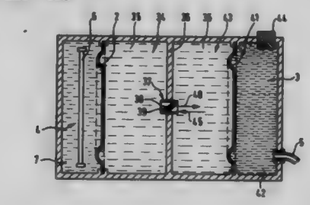
Walter Holser, Drosteweg 19, Meerslburg, Fed. Rep. of Germany (7758)

Filed Sep. 20, 1985, Ser. No. 778,124

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434832; Jan. 18, 1985, 3501534

Int. Cl.⁴ A61B 5/00; A61M 1/03

U.S. Cl. 128—632 **16 Claims**



6. Apparatus for the administration of a long-term medicament, such as insulin, to the body of a person, comprising:

a dosage device implanted in the body and comprising a reservoir having two chambers separated by an elastic membrane,

one of said chambers containing the medicament and the other chamber containing a liquid propellant having a temperature-dependent vapour pressure to substantially continuously maintain pressure on the medicament via said membrane,

said chamber containing the medicament having an outlet in communication with the body,

means for determining at certain times the need of the body for the medicament by sensing a blood component of said person,

an electrical means at the dosage device for altering the temperature of the propellant to alter its vapour pressure to exert altered pressure via the elastic membrane to control the amount of medicament discharged through the outlet in accordance with the electrical power supplied to the device, and

means for controlling the electrical power supplied to said electrical device to govern the quantity of medicament dispensed at said certain times.

4,718,431

SURFACE COIL WITH CALIBRATION SUBSTANCE FOR USE IN A NUCLEAR MAGNETIC RESONANCE APPARATUS

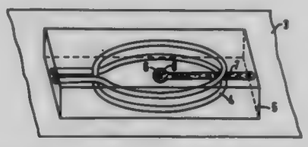
Winfried Hardt, Erlangen; Arnulf Oppelt, Sparldorf, and Helmut Sturm, Erlangen-Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 2, 1986, Ser. No. 914,235

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537541

Int. Cl.⁴ A61B 5/05

U.S. Cl. 128—653 **3 Claims**



1. A device for use in spectroscopic in vivo examination using a nuclear magnetic resonance apparatus for exciting nuclear magnetic spins in an examination subject and for picking up the resulting resonance signals comprising:

a carrier block capable of being placed on said examination subject and having a hollow bulb disposed therein and a capillary tube extending from said bulb to an exterior edge of said carrier block;

a flat radio-freqency coil for exciting said nuclear spins and for receiving said resulting resonance signals, said coil having a center coincident with said bulb; and

a calibration substance disposed in said bulb and in said capillary tube in said carrier block, said calibration substance consisting of a material excitable by said radio-frequency coil and emitting a resonance signal in response to said excitation measurable by said radio-frequency coil.

4,718,432

CT IMAGING APPARATUS AND METHOD FOR MEASURING LOCAL CEREBRAL BLOOD FLOW

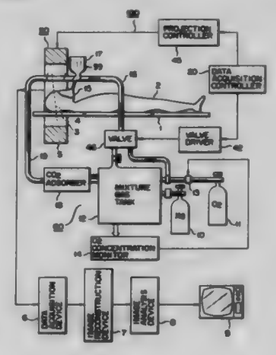
Takanori Kimura, Yaita, and Naotoshi Kobayashi, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 746,523, Jun. 19, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 15,491

Claims priority, application Japan, Jun. 20, 1984, 59-126734

Int. Cl.⁴ A61B 6/00

U.S. Cl. 128—654 **5 Claims**



1. A CT imaging apparatus for measuring local cerebral blood flow of a patient under examination comprising:

a source of tracer gas;

a conducting member;

conducting member means for supplying tracer gas via the conducting member into the patient under examination;

means for controlling starting and ending times of supplying the tracer gas;

means, including at least an X-ray generation source, a data acquisition device and an image reconstruction device, for simultaneously producing X-ray tomographic image data of preselected slices in both the patient and the conducting member, said tomographic image data involving local cerebral blood flow in the patient and also tracer gas flow through the conducting member;

means for analyzing the tomographic image data involving the local cerebral blood flow and the tracer gas flow to measure the local cerebral blood flow and the tracer gas flow; and

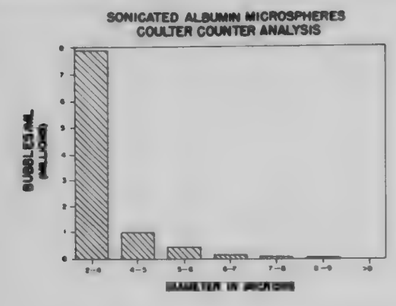
means for displaying a reconstructed tomographic image obtained from the tomographic image data and for displaying an image indicating the measured local cerebral blow flow.

4,718,433

CONTRAST AGENTS FOR ULTRASONIC IMAGING

Steven B. Feinstein, 295 Hasting Ave., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 461,664, Jan. 27, 1983, Pat. No. 4,572,203. This application Dec. 5, 1985, Ser. No. 805,975
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 9 Claims



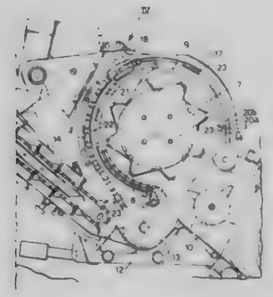
1. The method of ultrasonic imaging in which microbubbles are injected into a mammal to alter the accoustic properties of a predetermined area which is then ultrasonically scanned to obtain an image of the area for use in medical procedures, wherein the improvement comprises the steps of forming an aqueous protein solution, subjecting said solution to high frequency sonication while heating the solution sufficiently to denature portions of the protein, said sonication forming microbubbles of relatively uniform size stabilized by the denatured protein, and using the stabilized microbubbles as an injectate for said ultrasonic imaging.

4,718,434

AXIAL-FLOW THRESHER-SEPARATOR UNITS FOR COMBINE HARVESTERS

Giuseppe Raineri, Bassano del Grappa, Italy, assignor to Pietro Laverda S.p.A., Bregaaze, Italy

Filed Nov. 19, 1986, Ser. No. 932,414
Claims priority, application Italy, Nov. 19, 1985, 54061/85[U]
Int. Cl.[4] A01F *12/00*
U.S. Cl. 130—27 J 3 Claims



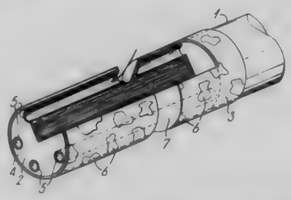
1. An axial-flow thresher-separator unit for combine harvesters, comprising:
a thresher-separator cylinder,
a separator casing in the form of a perforated tubular body surrounding the thresher-separator cylinder,
at least one elongate member for cleaning the outer surface of the separator casing, which extends parallel to the axis of the threaher-separator cylinder and is movable on the outer surface of the separator casing along portions of circular arcs lying in a plane F substantially perpendicular to the axis of the threaher-separator,
a pair of chains slidable in planes substantially perpendicular to the axis of the thresher-separator cylinder, to which the ends of the elongate members are joined,
a pair of gears joined by a shaft, each of which meshes with one of the chains so that their rotation causes the translation of the chains, and
means for rotating the gears, wherein said means are arranged to transmit an alternating rotary movement to the gears, wherein each of the chains is an open loop and is guided within a double rail constituted by two parallel strips located above and beneath the pins of the chain, and wherein the longitudinal edges of each strip slidably engage the facing surfaces of the two plates constituting each inner link of the chain.

4,718,435

SMOKING ARTICLES

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company, Ltd., London, England

Filed Dec. 22, 1986, Ser. No. 945,721
Claims priority, application United Kingdom, Dec. 23, 1985, 8531656
Int. Cl.[4] A24C *5/60*; A24D *3/04*
U.S. Cl. 131—281 9 Claims



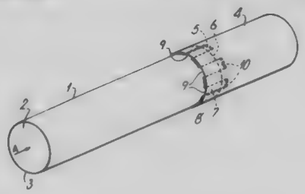
1. A method of operating on a smoking article, which article comprises a smoking material rod and a mouthpiece attached to said rod by a tipping wrapper, said mouthpiece comprising a ventilation duct, wherein a heated former is brought into contact with that portion of said smoking article occupied by said tipping wrapper to produce a ventilation indentation and an opening in said indentation intercommunicating said identation and said ventilation duct.

4,718,436

SMOKING ARTICLES

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company, Ltd., London, England

Filed Dec. 22, 1986, Ser. No. 945,722
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 10 Claims



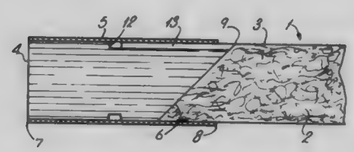
1. A smoking article comprising a smoking material rod, a mouthpiece in abutment with one end of the smoking material rod and having an air permeable peripheral surface and a tipping wrapper surrounding the mouthpiece and circumferentially overlapping the end of the smoking material rod in abutment with said mouthpiece, said wrapper being attached to but radially spaced from the underlying peripheral surfaces of said rod and said mouthpiece at first lengthwise extending, circumferentially spaced zones by spacing means, and said wrapper being unattached to and being spaced from said peripheral surfaces at second zones intermediate said first zones to provide ventilation air ducts each lengthwise extending from a first open end at said rod to a second end at the peripheral surface of said mouthpiece to provide for the flow of ventilation air into said second zones through said first open ends and from said second zones through said second open ends into said mouthpiece through the permeable peripheral surface of said mouthpiece.

4,718,437

SMOKING ARTICLES

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company, Ltd., London, England

Filed Dec. 22, 1986, Ser. No. 945,723
Claims priority, application United Kingdom, Dec. 23, 1985, 8531658
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 9 Claims



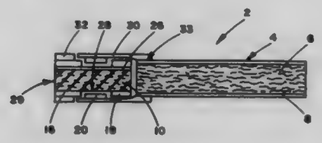
1. A smoking article comprising a smoking material element attached to said rod by a tipping wrapper, the rod and the element abutting each other along a plane inclined to the longitudinal axis of the article, said tipping wrapper having first and second circumferentially extending edges, said first edge being at the abutment of the rod and the element, and the second edge being near to the mouth end of said article wherein at the periphery of the abutment a portion of said element extends upstream of and beyond said first edge of said wrapper thereby defining air ingress means into said element upstream of said first edge of said wrapper.

4,718,438

FILTER CIGARETTE HAVING ROTATABLE ADJUSTMENT

Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 11, 1986, Ser. No. 895,397
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 3 Claims



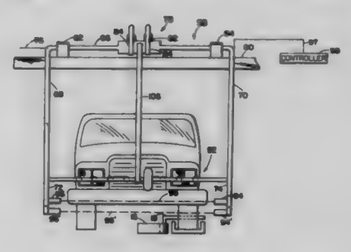
1. A filter cigarette comprising in combination a rod of smokable material, an axially aligned filter plug having an air permeable filter element and circumscribing wrapping material, and tipping material circumscribing the filter plug and an adjacent portion of the rod, wherein
(i) the filter element has a rod end and a mouthend each open to permit the passage of air and smoke therethrough, and has fixedly secured thereto a first layer of substantially air impermeable wrapping material such that the wrapping material partially circumscribes the filter element thereby providing a partially wrapped filter element having a substantially air impermeable region and an air permeable region, and the partially wrapped filter element is circumscribed by a second layer of wrapping material having, in sequence, abutting mouthend, central and rod end bands;
(ii) the mouthend and rod end bands are fixedly secured to the underlying region of the plug, and the central band is rotatable about the longitudinal axis of the cigarette;
(iii) the central band is rotatable relative to the filter element and overlies the first layer over the longitudinally extending length of the band, and has a region of substantial air impermeability and a region of air permeability therein, each of which regions can be rotated into varying degrees of registry with the region of the filter element not covered by the first layer;
(iv) the tipping material is provided in two segments wherein
(a) the first segment is fixedly secured to and extends from the rod thereby overlying the rod end band and central band and is fixedly secured only to the central band to join the rod to the filter plug, and (b) the second segment overlies and is fixedly secured to the mouthend band;
(v) the tipping material has a region of air permeability therein at least in the region thereof which overlies the air permeable region of the central band;
(vi) the lateral regions of the cigarette circumscribed by the mouthend and rod end bands are substantially air impermeable; and
(vii) rotation of the filter plug relative to the rod provides for varying degrees of registry of the substantially air impermeable regions and air permeable regions of each of the partially wrapped filter element and the central band.

4,718,439

VEHICLE WASHING SYSTEM HAVING APPARATUS FOR FOLLOWING A VEHICLE SURFACE CONTOUR

William Gorra, Bolton; Kenneth J. O'Neil, Manchester, and Jeffrey S. Dawson, Granby, all of Conn., assignors to Syndet Products, Inc., Manchester, Conn.

Filed Dec. 4, 1985, Ser. No. 805,347
Int. Cl.[4] B60S *3/04*
U.S. Cl. 134—57 R 17 Claims



1. A vehicle washing system having a vehicle conveyor for transporting a vehicle to be cleaned through a plurality of stations in a vehicle cleaning line, said system comprising:
at least one cleaning station along the cleaning line at which a cleaning fluid is applied to the vehicle as part of the cleaning process;
an overhead gantry located along the cleaning line at the cleaning station and under which the vehicle travels when passing through the cleaning station;
a boom mounted to the overhead gantry for pivotal movement about a pivot axis extending in a direction transverse to the cleaning line;

nozzle defining means for dispensing the cleaning fluid mounted on the boom at a point remote from and in a fixed, spaced apart relation with the pivot axis for arcuate movement with the boom and providing a directional discharge of the cleaning fluid toward a passing vehicle;

vehicle contour following means connected with the boom for controlling pivotal movement of the boom and the dispensing nozzle relative to the vehicle surface, said following means being spaced apart from and in a non-contacting relation with the vehicle surface and

nozzle rotating means connected with the boom and the nozzle for redirecting the directional discharge as the boom and nozzle follow the contour of the passing vehicle.

4,718,440

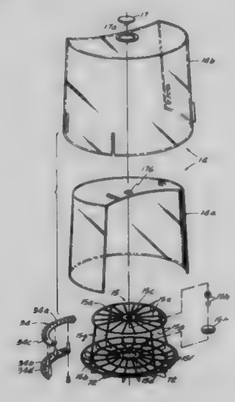
NON ELECTRIC DISHWASHER

Brian Hawker, Kent, United Kingdom, and Joseph Faggard, Orange County, Calif., assignors to AC Industries, Ltd., United Kingdom

Continuation-in-part of Ser. No. 739,879, May 31, 1985, abandoned. This application Sep. 18, 1985, Ser. No. 777,174

Int. Cl.⁴ B08B *3/02*

U.S. Cl. 134—141 **14 Claims**



1. A dishwasher adapted to be interconnected with a source of water under pressure, comprising:

(a) a base;

(b) a closure housing carried by said base said closure housing having a central axis and interconnected top and side walls;

(c) a rack adapted to support articles to be washed having upper and lower peripheral portions interconnected by upstanding portions;

(d) rack suspension means for supporting said rack for rotation within said closure housing about the central axis thereof comprising:

(1) a rigid generally vertically extending column coaxially aligned with said central axis of said housing;

(2) first bearing means carried by said base for rotatably supporting said column; and

(3) second bearing means carried by said top wall of said closure housing for rotatably supporting said column said second bearing means comprising a supporting member for rotationally supporting the upper extremity of said vertically extending column said supporting member being spaced from said top wall of said closure;

(e) jet means interconnected with the source of water under pressure for directing jets of water in the direction of said rack to impart rotational movement thereto, said jet means comprising:

(1) a spray jet means for urging rotation of said rack, said means comprising a first conduit extending beneath said rack, a second generally vertically extending conduit interconnected with said first conduit and disposed proximate the periphery of said rack and a third conduit extending over said rack, a portion of said third conduit extending between said top wall of said closure and said supporting member whereby said third conduit can be superimposed over the central axis of said housing;

(2) a collimated jet means for emitting a collimated stream of water in the direction of said rack; and

(3) control means comprising:

(i) valve means for regulating the flow of water from the source of water under pressure to said jet means; and

(ii) diverter means disposed proximate the junction of said first and second conduits for selectively diverting the flow of water between said collimated jet means and said spray jet means said diverter means being adjustable to direct said collimated stream of water in a first direction urging counterclockwise rotation of said rack and in a second direction urging clockwise rotation of said rack.

4,718,441

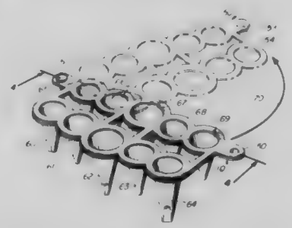
DECORATOR TIP CLEANING DEVICE

Harry C. Daum, 25512 Dana Mesa Dr., San Juan Capistrano, Calif. 92675, and Marlene K. McKeown, 24671 Rollingwood Rd., El Toro, Calif. 92630

Filed Jul. 28, 1986, Ser. No. 889,910

Int. Cl.⁴ B08B *3/00*

U.S. Cl. 134—201 **7 Claims**



1. For use in cleaning a plurality of generally tapered decorating tips, a decorator tip cleaning device comprising:

a first substantially planar member defining a first plurality of apertures;

a second substantially planar member defining a second plurality of apertures; and

retaining means for removeably securing said first and second substantially planar members in an overlying relationship such that corresponding ones of said apertures within said first and second plurality of planar members are substantially aligned;

wherein said retaining means includes means pivotally securing said first and second substantially planar members such that said first and second members are pivotally moveable between a first overlying position and a second offset position; and

nesting means causing said first and second members to be snap-fitted together in said first overlying position; and

a first tab extending outwardly from said first substantially planar member defining a first aperture; and

a second tab extending outwardly from said second substantially planar member defining a first extension, said first extension extending through said first aperture and terminating in a head securing said first and second substantially planar members in a pivotal attachment.

4,718,442

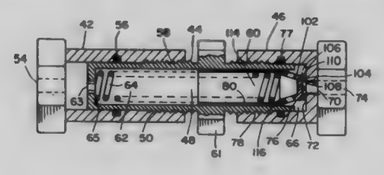
CRYOGENIC REFRIGERATOR COMPRESSOR WITH EXTERNALLY ADJUSTABLE BY-PASS/RELIEF VALVE

Harry G. Nicoll, Norwell, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Feb. 27, 1986, Ser. No. 834,201

Int. Cl.⁴ F16K *17/06*

U.S. Cl. 137—1 **12 Claims**



1. An externally adjustable inline pressure relief valve comprising:

an inlet member having an inlet port connectable to a supply line;

an outlet member having an outlet port connectable to an outlet line;

a compression member between and threadedly coupled to each of the inlet member and the outlet member and having a duct therein for providing fluid communication between the inlet port and the outlet port, the compression member being exposed between the inlet member and outlet member such that it may be gripped to be rotated and thus axially translated relative to the inlet member and the outlet member;

a valve member axially translatable into contact with the inlet member for closing the inlet port from within the duct; and

a compression spring compressed by the compression member against the valve member to force the valve member into contact with the inlet member against fluid pressures, the compression of the spring being externally adjustable by rotation of the compression member relative to the inlet member and the outlet member.

4,718,443

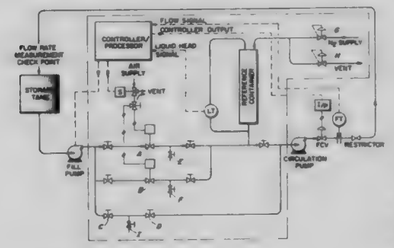
MASS FLOWMETER APPARATUS

Billy R. Adney, Orange, Tex.; Charles W. Alworth, Ponca City, Okla.; John B. Durkee, Ponca City, Okla., and Bryce T. Jeffries, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 6, 1987, Ser. No. 11,954

Int. Cl.⁴ G01F *11/28*

U.S. Cl. 137—8 **14 Claims**



1. A mass flowmeter apparatus comprising

(1) a substantially vertical container having a known mass content per unit of height or weight, said container in direct open fluid communication with a conduit containing liquid;

(2) means capable of providing a positive displacement pressure at the upper end of said vertical container;

(3) means for filling said vertical container with liquid, and placing a constant positive displacement pressure on said container;

(4) means for monitoring the amount of liquid in said vertical container over a measured time interval and determining rate of flow as change in mass divided by elapsed time as fluid exits the container.

4,718,444

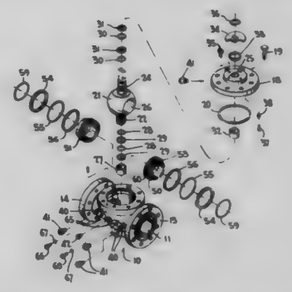
VALVE SEAT RETRACTION METHOD AND APPARATUS

Leon W. Boelte, Norman, Okla., assignor to KF Industries, Inc., Oklahoma City, Okla.

Filed Dec. 4, 1986, Ser. No. 938,150

Int. Cl.⁴ F16K *43/00, 5/20*

U.S. Cl. 137—15 **21 Claims**



12. The method of retracting a valve seat, located in a valve housing, away from slidable sealing engagement with a ball valve member in opposition to a resilient bias force urging the forward end of the valve seat against the ball valve member, said method comprising the step of:

threadedly inserting a retraction tool into said valve housing via a retraction port in a direction perpendicular to the direction of said bias force to slide the distal end of said retraction tool along a convex camming surface of said valve seat which tapers toward said forward end of the valve seat, thereby forcefully displacing said valve seat from said ball valve member, by applying a variable and rotatably settable force to said valve seat at said camming surface in opposition to said resilient bias force, the retraction force increasing as the depth of insertion of said retraction tool increases with the rotatable setting.

4,718,445

POSITION INDICATOR FOR A ROTARY VALVE ACTUATOR

Charles Lundberg, New London, Miss., and Anthony C. Summers, Houston, Tex., assignors to General Signal Corporation, Stamford, Conn.

Filed Oct. 16, 1986, Ser. No. 919,495

Int. Cl.⁴ F16K *51/00, 37/00*

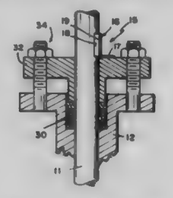
U.S. Cl. 137—15 **1 Claim**

1. A method of assembly of a position indication means for a valve arrangement having a first and second part, said first part being journalled for rotation within said second part for varying flow of a medium within said second part, wherein said method comprises:

(a) positioning said first part within said second part of said valve arrangement in a preferred position;

(b) attaching said indicator strip to said first and second parts;

(c) severing said indicator strip prior to further rotation at a point between said first and second part for providing a



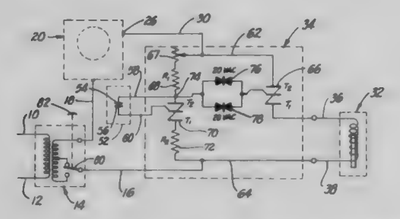
first and second strip on said first and second part having adjacent edges of said first and second strips respectively aligned at said preferred position.

4,718,446

TIME AND MOISTURE-RESPONSIVE SPRINKLER CONTROL SYSTEM

Bobby R. Simpson, 1072 Trask, Garden Grove, Calif. 92643

Filed Apr. 15, 1986, Ser. No. 852,323
Int. Cl.[4] A01G *25/16*
U.S. Cl. 137—78.3 **13 Claims**



1. A time and moisture responsive sprinkler control system comprising:
- a source of alternating current electric power, said source having selector means for selecting between higher voltage and lower voltage;
- a control circuit for connection to said source of alternating current electric power and serially connecting a clock for controlling sprinkler on time and an electric motor for controlling a sprinkler valve, said control circuit also including a moisture sensor for sensing subterranean moisture;
- said control circuit including a switch serially connected between said power source, said clock and said electric motor for controlling flow of electric power from said power source to said electric motor, and connection means for connecting the moisture sensor to said switch to control said switch when said selector means selects lower voltage and eliminates control by said moisture sensor when said selector means selects higher voltage.

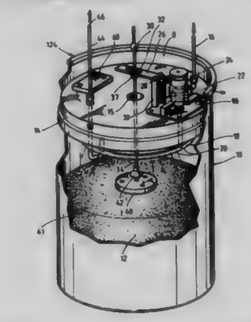
4,718,447

APPARATUS FOR DISSOLVING A SOLID

Ralph E. Marshall, 11830 Amblewood St., Stafford, Tex. 77477

Filed Apr. 24, 1987, Ser. No. 42,356
Int. Cl.[4] B01D *11/02*
U.S. Cl. 137—268 **16 Claims**

1. An apparatus for producing a solution of a soluble solid in a container which comprises:
- a float adapted to fit within the container without binding;
- a solvent inlet mounted on the float for admitting solvent for the soluble solid to the underside of the float;
- a solution outlet mounted on the float for withdrawing by remote means the solution on which the float is floating produced by the action of the solvent on the soluble solid;
- a sensor for sensing the distance between the upper surface of the soluble solid in the container and a point on the float which floats in the solution produced by the action of the solvent on the soluble solid;



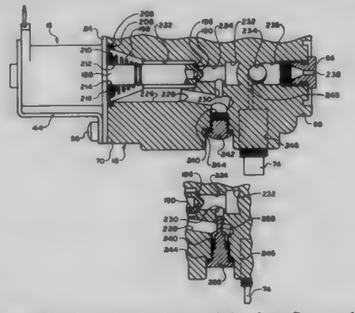
- a valve responsive to the sensor for admitting solvent through the solvent inlet from a remote supply of solvent so as to maintain between predetermined limits the distance between the float and the surface of the soluble solid in the container which is exposed to the solvent; and,
- fluid conduction means connecting the solvent inlet and the valve.

4,718,448

GAS VALVE

John J. Love, St. Louis, and Carl F. Fernstrom, Marlborough, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 842,892, Mar. 24, 1986, abandoned. This application Apr. 13, 1987, Ser. No. 37,072
Int. Cl.[4] F17D *3/03*
U.S. Cl. 137—271 **2 Claims**



1. In a gas valve for selectively providing low-flow and full-flow rates of gas flow to a burner:
- a valve body having an inlet and an outlet;
- a first solenoid operated valve for controlling flow of gas from said inlet to a chamber;
- a passageway downstream of said chamber having a valve seat at the entrance thereto;
- a second solenoid operated valve including a valve member cooperative with said valve seat;
- a third solenoid operated valve for controlling flow of gas from said passageway downstream of said chamber to said outlet;
- low-flow passageway means providing constant communication between said chamber and said passageway downstream of said chamber so that, when only said first and third valves are energized, the low-flow rate of gas flows to said outlet,
- said second valve being effective, when energized, to permit gas to flow past said valve member and said valve seat so that, when said first, second, and third valves are energized, gas flow past said valve member and said seat combines with gas flow through said low-flow passageway means to establish the full-flow rate of gas flow to said outlet,
- said low-flow passageway means including a drilled passageway,
- said valve body including a threaded opening axially aligned with said drilled passageway; and
- screw means threadedly engaged in said threaded opening for effecting the value of said low-flow rate of gas flow and being selectable so that said gas valve is convertible from use with one type of gas to use with another type of gas,
- said screw means comprising, when said gas valve is used with said one type of gas, a screw which terminates exteriorly of said drilled passageway, and said screw means comprising, when said gas valve is used with said another type of gas, a screw which is cooperative with said drilled passageway for reducing said low-flow rate of gas flow.

4,718,449

FLOAT OPERATED VALVE ASSEMBLY WITH WEIGHTED BODY

George S. Ralph, 86621 Lorane Hwy., Eugene, Oreg. 97405

Filed Dec. 12, 1986, Ser. No. 940,804
Int. Cl.[4] F16K *31/26, 33/00*
U.S. Cl. 137—444 **5 Claims**

1. A float operated valve assembly for submerged deposit into a fluid receptacle, said valve assembly comprising,
- a tubular base for rested placement on the receptacle bottom,
- a weighted body on said base which supportably engages the receptacle bottom to confine the base body against upward movement,
- a valve body supported by said base in an offset manner while maintaining the valve body adjacent the receptacle bottom, said valve body being directly coupled to said based end in fluid communication with said base for regulating water flow into the receptacle, said valve body including outlet ports and an actuator arm,
- a float coupled to said valve actuator arm, and
- said base adapted to receive one end of a conduit to supply said valve body with a source of fluid.

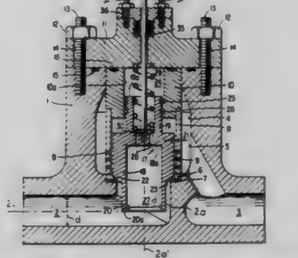
4,718,450

PRESSURE RELIEF VALVE

L. Ike Ezekoye, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 833,299, Feb. 26, 1986. This application Jun. 11, 1987, Ser. No. 61,845
Int. Cl.[4] F16K *31/38*
U.S. Cl. 137—494 **7 Claims**

1. In a pressure relief valve including a valve housing, inlet and outlet ports in the valve housing, said inlet port having a longitudinal axis and a diameter; a valve seat supported in the valve housing, said valve seat surrounding the inlet port and defining an opening, therein, a valve head movably supported in the valve housing and having a closed and a maximum open position, said valve head further having a seating face arranged for cooperation with said valve seat to prevent, with a fluid-tight seal, a communication between the inlet port and the outlet port in a seated position of said valve head and to allow communication between said inlet port and said outlet port in a lifted position of said valve head; a valve spring supported in said valve housing and operatively connected to said valve head for urging, with a spring force, said valve head into said seated position; said valve head having a first surface portion exposed to fluid pressure prevailing in the inlet port; said first surface portion being so oriented that a first force derived from the fluid pressure and oriented against said spring force is applied to said valve head for moving the valve head into the lifted position when said fluid pressure prevailing in said inlet port exceeds a predetermined value set by said valve spring; the improvement comprising
- (a) a terminal bend forming a downstream continuation of said inlet port and terminating at said valve seat; said terminal bend having a longitudinal axis oriented substantially perpendicularly to the longitudinal axis of said inlet port; said valve head being arranged for movement parallel to said longitudinal axis of said terminal bend;
- (b) a first chamber situated in said valve housing; said first chamber being bounded by said valve head and being sealed towards said outlet port; said valve head being situated between said first chamber and said inlet port;
- (c) a second, generally cylindrical chamber provided in said valve head and having an axis generally coinciding with the longitudinal axis of said terminal bend; said second chamber having an opening lying in a plane perpendicular to the longitudinal axis of said terminal bend for maintaining a continuous communication between said second chamber and said inlet port; said second chamber having a diameter being at least as large as the diameter of said inlet port;
- (d) channel means provided in said valve head for maintaining continuous communication between said inlet port and

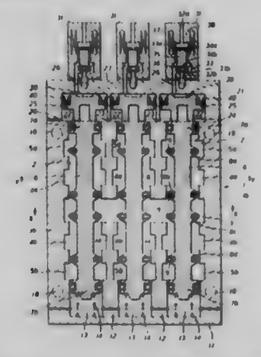


said first chamber for admitting fluid from said inlet port to said first chamber to generate a fluid pressure therein; said channel means maintaining communication between said first and second chambers;
- (e) a skirt-like extension forming part of said valve head and defining at least one part of said second chamber; said extension having a peripheral terminal edge surrounding and defining said opening of said second chamber; said extension being situated in said terminal bend; in said closed position of said valve head said extension projecting transversely into said inlet port at least to the longitudinal axis thereof and in said maximum open position of said valve head said extension being withdrawn at the most to a location in which said extension is just clear of said inlet port; said extension presenting a flow barrier upstream of said valve seat as viewed in a direction of fluid flow for protecting fluid in said second chamber from flow turbulences in the lifted position of said valve head; and
- (f) a second surface portion forming part of said valve head and bounding said first chamber; said second surface portion being exposed to the fluid pressure in said first chamber and being so oriented that a second force derived from the fluid pressure in said first chamber and being codirectional with said spring force is applied to said valve head.

4,718,451
DIRECTIONAL CONTROL VALVE

Seiji Kosugi, Seku, Japan, assignor to Shokotsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 757,439, Jul. 22, 1985, abandoned. This application Jan. 2, 1987, Ser. No. 166
Claims priority, application Japan, Dec. 18, 1984, 59-191890
Int. Cl.⁴ F15B 13/08
U.S. Cl. 137—596.16 9 Claims



1. In a directional control valve having a plurality of pilot-driven valve mechanisms which comprises a casing pierced with a plurality of parallel valve bores and a corresponding number of spool valve bodies inserted therein, each of the spool valve bodies being switched by a piston driven by pilot fluid pressure between one position where the pressure fluid fed from a pressure supply port is discharged to a power output port and another position where the pressure fluid from the power output port is discharged to a pressure exhaust port, the improvement which comprises a valve casing that is a monolithic block having said plurality of parallel valve bores pierced between a pair of opposite faces thereof and bores to provide the pressure supply, power output and pressure exhaust ports pierced in the direction perpendicular to said series of valve bores, an intermediate plate fastened to one end surface of the valve casing where the valve bores open, the intermediate plate having a plurality of cylinders corresponding to the valve bores and opening on that side thereof which faces the valve casing, the cylinders being brought into communication with each other by grooves cut on said side of the intermediate plate facing the valve casing, while being opened into the atmosphere through a relief port provided in the outer wall of the intermediate plate, a piston that is slidably fitted in each cylinder and brought in contact with the end surface of a valve body inserted in the corresponding valve bore, a pilot chamber that is provided on the inner-end side of the cylinder, and a plurality of pilot valves to supply pilot pressure fluid to the pilot chambers provided on said intermediate plate.

4,718,452
EMERGENCY POTABLE WATER STORAGE SYSTEM

Douglas W. Maitland, 13815 Loretta Drive, Santa Ana, Calif. 92705

Filed Nov. 3, 1986, Ser. No. 926,256
Int. Cl.⁴ F03B 11/00
U.S. Cl. 137—592 18 Claims

1. An emergency potable water supply system for coupling to a faucet of a dwelling, the faucet being coupled for controlling the flow of water under pressure from a municipal water supply, said system comprising:

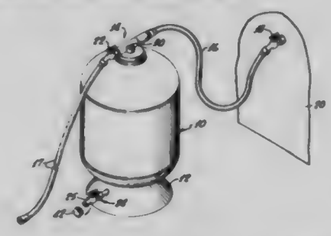
storage tank means for receiving water, said storage tank means including a tank having a frusto-conical configuration on the upper interior portion thereof;

water inlet means in flow communication with said tank means for connection to the faucet of the dwelling for introducing water into said tank means to a level to substantially fill said upper interior portion from the municipal water supply;

check valve means in series flow relation with said water inlet means;

first water outlet means in flow communication with the interior of said tank means, said first water outlet means being at a location above the highest level of water to be received within said tank means for enabling substantial replenishment of the water therein when discharging water therefrom under pressure fromsaid municipal water supply;

manually operable valve means in fluid flow communication with said first water outlet means;

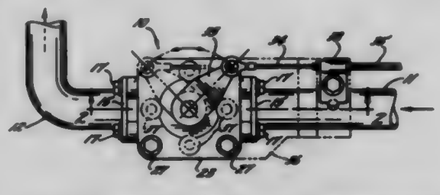


second water outlet means in flow communication with the interior of said tank means, said second water outlet means being at a location at the lowest point of said tank means and having a manually operable valve means, said tank being substantially completely filled from the dwelling faucet, with loss of pressure of the municipal water source actuating said check valve means, with removal of the stored water being effected under force of gravity from said second water outlet means with said check valve means acting as a vacuum release during removal of the water when the water inlet means are disconnected from the dwelling faucet.

4,718,453
ROTARY VALVE

Robert H. Ahrens, deceased, late of Janesville, Wis. (by Mary Jane Ahrens, administrator), assignor to Bergstrom Manufacturing Co., Rockford, Ill.

Filed Feb. 6, 1987, Ser. No. 11,889
Int. Cl.⁴ F16K 7/18
U.S. Cl. 137—614.11 11 Claims



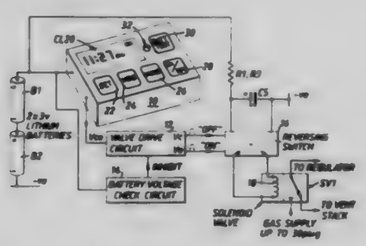
1. A valve comprising a housing having an inner wall defining a chamber of generally circular cross-section, angularly spaced inlet and outlet ports formed in said housing and communicating with said chamber, and a valve member rotatable within said chamber between a first position closing said ports and a second position opening said ports at least partially, said valve member compriaing a spider supported within said housing to rotate about an axis coinciding with the axis of said chamber, first and second endless belts made of resiliently flexible material, means supporting said belts on said spider to cause said belts to turn with said spider about said axis while permitting each belt to travel in an endless path relative to said spider during such turning, said first and second belts closing said inlet and outlet ports, respectively, when said valve member is in said first position and opening said inlet and outlet ports, respectively, as said valve member is turned toward said

second position, said means causing a substantial length of each belt to engage and conform with the inner wall of said housing and enabling each belt to roll along said wall as said valve member is turned between said positions.

4,718,454
VALVE OPERATING SYSTEM

William Appleby, Gosforth, England, assignor to British Gas Plc, London, England

Filed Oct. 17, 1986, Ser. No. 919,867
Claims priority, application United Kingdom, Nov. 20, 1985, 8528572
Int. Cl.⁴ F16K 31/02
U.S. Cl. 137—624.11 9 Claims

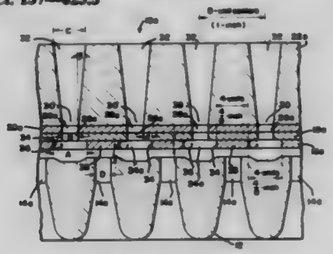


1. A valve operating system comprising battery means powering said system, a bistable valve means operable by at least one solenoid, a capacitor connectable by semiconductor switch means to the solenoid to discharge through the solenoid during its 'on' periods and which is maintained charged during its 'off' periods, a drive circuit controlling the switch means by voltage pulses, a control module providing a liquid crystal display of real time and allowing selection of operating times of the valve means by manually operable elements said drive circuit deriving the pulses from the output of the module, the system excepting the solenoid during its 'off' periods being continuously powered by the battery means but the current consumption of the drive circuit during said 'off' periods being substantially zero, and said system further comprising battery voltage check circuit means for, responsive to a fall in the voltage of said battery means below a predetermined level, inhibiting the operation of said drive circuit to drive said switch means to one of its two conditions.

4,718,455
PLATE-TYPE FLUID CONTROL VALVE

Jules L. Dunoyer, Princeton, N.J., and Robert E. Drews, Elmira, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 5, 1986, Ser. No. 927,134
Int. Cl.⁴ F16K 7/12
U.S. Cl. 137—625.3 11 Claims



1. A plate-type, fluid control valve, comprising:

a ported valve seat;

a ported stop plate;

a ported valving element movably disposed between said seat and plate, and having each port therein directly aligned with a correasponding port in said stop plate; and

at least one, ported, buffer plate movably disposed between said valve seat and said stop plate; wherein

each said port in said valving element is wider than such corresponding port in said stop plate with which it is directly aligned;

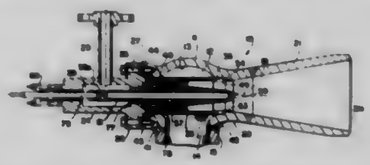
said ports in said valving element are separated therebetween by ligaments; and

each of said ligaments has a width which is not less than the width of a valving element port immediately adjacent thereto.

4,718,456
STEAM CONDITIONING VALVE

Kevin G. Schoonover, Tucker, Ga., assignor to Steam Systems and Services, Incorporated, Atlanta, Ga.

Continuation of Ser. No. 698,971, Apr. 16, 1984, abandoned. This application Mar. 25, 1986, Ser. No. 844,262
Int. Cl.⁴ F16K 11/07
U.S. Cl. 137—625.37 9 Claims



1. A steam conditioning valve for adjusting a flow of steam and introducing a selectable flow of desuperheating water to the steam, comprising:

a valve body having an interior wall defining a hollow interior region extending within the valve body along a longitudinal axis;

said interior region having a first end opening and a second end opening aligned on the longitudinal axis;

a steam inlet opening in said valve body for connection to a source of steam and interrupting a side of said interior wall to admit steam into said interior region intermediate said first and second end openings;

said valve body having an outlet throat region communicating with the interior region at one end opening;

a hollow stationary sleeve located in the interior region of the valve body,

said sleeve having a cylindrical inner surface axially aligned with the longitudinal axis within the valve body;

said sleeve having an outer surface spaced apart from the interior wall defining the interior region of the valve body, the sleeve defining an annular space between the sleeve and the interior wall, the annular space surrounding the sleeve and communicating with the steam inlet opening to admit steam to the outer surface of the sleeve;

said sleeve having first and second ends respectively engaging the first and second openings of the interior region and isolating the annular space, and thus the steam inlet opening, from said outlet throat region;

a plurality of steam flow orifices extending through said hollow sleeve and arrayed along the longitudinal axis of the sleeve, the steam flow orifices allowing steam to enter the sleeve from the annular space and the steam inlet opening;

a steam control valve slidably disposed within the hollow sleeve and operable from outside the valve body for axial movement between first and secondpositions within the sleeve along the longitudinal axis;

the steam control valve including a blocking member having an end proximal to the outlet throat region and having a blocking surface in close sliding relation with the cylindrical inner surface of the hollow sleeve to block all the

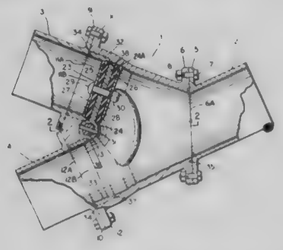
steam flow orifices when the steam control valve is at said first position, thereby preventing steam flow through the sleeve;
the blocking surface configured to progressively unblock the steam flow orifices arrayed along the sleeve as the steam control valve moves from said first position toward said second position, thereby allowing a progressively greater amount of steam flow from the steam inlet opening to enter the outlet throat region through the hollow sleeve;
said steam control valve further including a stem coaxial with said blocking member, the stem longitudinally extending to first and second end portions beyond the ends of the blocking member;
a water flow passage extending within the stem;
one end portion of the stem extending into the outlet throat region of the steam conditioning valve and having water spray orifices communicating with the water flow passage in the stem;
means defining a liquid receiving chamber on the valve body in coaxial alignment with said longitudinal axis;
a water inlet opening into said liquid receiving chamber for connection to a source of water;
said other end portion of the stem extending in the liquid receiving chamber for reciprocal movement therein as the steam control valve moves between first and second positions;
a plurality of water flow orifices extending through the other end portion of the stem into communication with the liquid receiving chamber and communicating with the water flow passage in the stem;
the water flow orifices being longitudinally arranged along the other portion of the stem, in relation to the liquid receiving chamber, to lie outside the liquid receiving chamber when the steam control valve is at said first position, so that no water enters the water flow passage in the stem; and
the water flow orifices being longitudinally arranged for progressive entry into the liquid receiving chamber as the steam control valve moves from the first to second positions,
so that water is admitted to the outlet throat region through the water spray orifices for desuperheating the steam therein, in proportion to the amount of steam entering the throat region through the hollow sleeve.

4,718,457

DIVERTER VALVE

G. William Luger, 1716 Raleigh Dr., Burnsville, Minn. 55337

Filed Jun. 20, 1986, Ser. No. 876,453
Int. Cl.[4] F16K *11/052*
U.S. Cl. 137—875 4 Claims



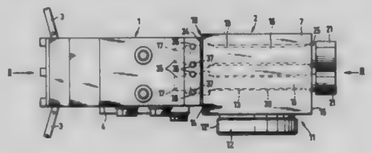
2. A diverter valve comprising:
a housing defining an inlet opening and having interior surface means defining a passageway leading from the inlet opening and forming a pair of second passageways having branch outlet openings, the second passageways separating at a junction region;
a paddle pivotally mounted in the housing at the junction region and movable between a first position in which said paddle prevents flow from the inlet opening to a first branch outlet opening while permitting flow through the second branch outlet opening, and a second position in which the paddle prevents flow from the inlet opening to the second branch outlet opening while permitting flow through the first branch outlet opening;
sealing means defining a continuous peripheral seal on both sides of said paddle; and
a separate valve seat member in each second passageway adjacent the junction region, and each valve seat member forming a a continuous peripheral valve seat surface defining the respective branch outlet openings, and positioned to provide a seat for the seals in the respective first and second positions of the paddle, said valve seat surfaces tapering to smaller size in the direction of movement of material through the housing, the seat surfaces merging smoothly with the interior surface of the housing to avoid surface irregularities at the junction of the housing and respective valve seat members.

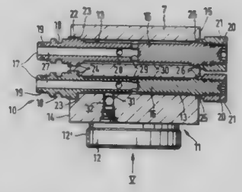
4,718,458

DISTRIBUTORS FOR PRESSURE FLUID CONTROL SYSTEM IN MINERAL MINING INSTALLATIONS

Walter Weirich, Dortmund, and Bernd Peters, Dülmen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia GmbH, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,956
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602023
Int. Cl.[4] F16L *39/02*
U.S. Cl. 137—884 18 Claims





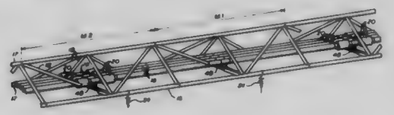
1. In a pressure fluid control system for an underground mineral mining installation; said system employing distributor apparatus having one interface provided with means for coupling the apparatus to a bundle of hoses, another interface connectible via means employing plug-in connections to a control device with valves for controlling the flow of pressure fluid and internal passages providing connections between the interfaces, the improvements comprising:
the apparatus is composed of at least one block with external faces defining the interfaces, bores are provided in the block, elongate coupling members are mounted in the bores in the block, the coupling members themselves forming part of the plug-in connections and containing bores constituting part of said internal passages, and sealing means seal the coupling members with respect to the bores in the block and permit limited movement of the coupling members within the bores.

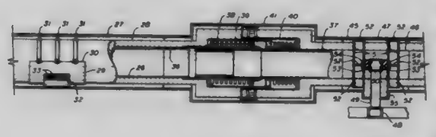
4,718,459

UNDERWATER CRYOGENIC PIPELINE SYSTEM

Alexander S. Adorjan, Pearland, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Feb. 13, 1986, Ser. No. 829,054
Int. Cl.[4] F16L *1/00, 1/04*
U.S. Cl. 138—105 32 Claims





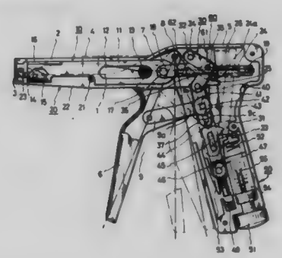
1. An underwater cryogenic pipeline system comprising:
at least one pipeline for cryogenic fluid including a high nickel content steel inner pipe for carrying the cryogenic fluid, an outer jacket around the inner pipe defining an annular space therebetween and insulation in the annular space;
an elongate open frame adapted to be laid underwater for supporting the pipeline and resisting forces on the pipeline;
a plurality of pipe anchors attached to the pipeline and to the frame at a plurality of locations to transfer axial forces in the inner pipe to the frame; and
at least one ground anchor attached to the frame for transmitting axial forces in the frame to the soil or sea bed.

4,718,460

BINDING TOOL

Shinichi Sato, Tokyo, Japan, assignor to Satogosei Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 779,952, Sep. 20, 1985, abandoned. This application Apr. 2, 1987, Ser. No. 32,824
Claims priority, application Japan, Oct. 12, 1984, 59-213583
Int. Cl.[4] B21F *9/02*
U.S. Cl. 140—93.2 1 Claim



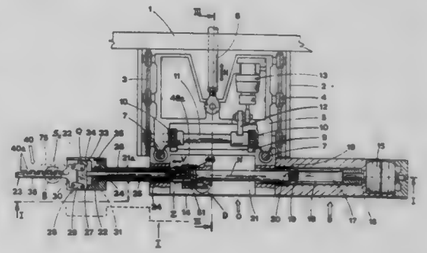
1. A binding tool comprising a holding and tensioning means including a movable slide having a rear end part and a front end part and having a binding band holding part in the front end part, a driving part adjacent the rear end part of said slide including a toggle mechanism having at an input side thereof a slide connecting link connected to the rear end part of said slide and including at an output side thereof a toggle slide and arranged so as to push down the toggle slide when driven, the driving part having a rotary fulcrum portion below said toggle mechanism, a sector slide movable downwardly in the rotary fulcrum portion of said driving part and operated by said toggle slide, a switch lever pivoted at a lower end thereof to said sector slide and having a locking projection in an upper part thereof, a cutter arm having at one end a cut producing end and in the other end two operating parts disengageable with said locking projection and rockably pivoted centrally of the arm, a handle having in an upper part thereof a cut producing end operating said cutter arm for cutting and a handle connecting link pivoted at one end in the middle of said handle and connected at the other end with said driving part disengageably with the operation of the toggle slide, whereby when the locking projection is engaged with one of said two operating parts the cutter arm is activated to cut the band under a predetermined tension and when the locking projection is disengaged the cutter arm is activated by the handle to cut the band under a relaxed tension after the band is related.

4,718,461

DEVICE FOR BENDING THE LEADS OF ELECTRICAL AND/OR ELECTRONIC COMPONENTS

Mario Musiani, Bologna, Italy, assignor to Arcotronics Italia, S.p.A., Bologna, Italy

PCT No. PCT/GB85/00531, § 371 Date Oct. 20, 1986, § 102(e) Date Oct. 20, 1986, PCT Pub. No. WO86/03371, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 20, 1985, Ser. No. 923,836
Claims priority, application Italy, Nov. 30, 1984, 3626 A/84
Int. Cl.[4] B21F *1/00*
U.S. Cl. 140—105 21 Claims



1. A device for bending the leads of electric and/or electronic components supplied at a first station S1 by means 70 with leads (50*a*) coaxial relative to the body (50*b*) of the relevant component (50) and with the components having a pre-established spatial orientation characterised in that the device comprises: a bank (40) comprising a plurality of bending stations (40*a*) positioned side by side each for receiving an appropriate component (50), the stations being associated with corresponding fixed benders (23) and moving benders (90); selection means for longitudinally moving the bank (40) to position a selected bending station (40*a*) at the first station (S1); means controlling the moving benders (90) to define for them, in conjunction with the fixed benders (23): a rest position for receiving the appropriate component in the selected bending station, an intermediate position for clamping at least one lead of this component in the selected bending station (40*a*) in synchrony with disengagement of the first means (70) from the component (50), and lastly a final position for bending at least on lead (50*a*) and determining a predetermined pitch 'P' between the leads; rotating means for rotating the bank (40) of bending stations (40*a*) through a pre-selected angle, acting in synchrony with the means for controlling the moving benders (90), the rotating means orientating the selected bending station (40*a*) opposite a discharge station (S2); a first carriage (8) supporting the bank (40) and relevant selection means, the

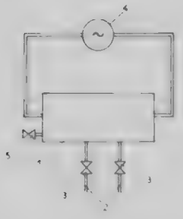
rotating means and the control means; means for moving the first carriage (8) between a first position enabling the selected bending station (40a) to be positioned in the first station (S1), and a second position, reached in synchrony with the rotating means determining the position of the selected bending station (40a) in the above-mentioned first station (S1), disengagement of the moving benders (90) from the leads (50a) component (90) occurring in the second position.

4,718,462

METHOD AND APPARATUS FOR FORMING GASEOUS MIXTURES

Roger Fix, 14, boulevard du Champ de Mars, Colmar (Haut-Rhin), France

Filed Jan. 19, 1981, Ser. No. 226,178
Claims priority, application France, Jan. 18, 1980, 80 01366
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—9 3 Claims



1. A process for the production of gaseous mixtures, comprising introducing into a closed container a mixture of gases having a predetermined ratio to each other, with one gas in lesser quantity than another gas, thoroughly mixing the first gaseous mixture thus produced, then subjecting said first gaseous mixture, with said gases in the same said predetermined ratio, to a further dilution with an accurately predetermined quantity of said another gas, and thoroughly mixing the second gaseous mixture thus produced, thereby to produce a said second gaseous mixture in which said one gas is present in highly diluted condition but accurately predetermined quantity.

4,718,463

METHOD OF PRODUCING PREFILLED STERILE PLASTIC SYRINGES

Raymond W. Jurgens, Jr., Manchester, Mo.; Richard G. Johnson, Raleigh, N.C., and Leroy R. Nadler, Maryland Heights, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 811,456, Dec. 20, 1985. This application Dec. 8, 1986, Ser. No. 938,828
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—11 3 Claims

1. A method of producing a prefilled, sterile plastic syringe having a molded plastic barrel with an open end and a nozzle at the opposite end, a tip seal closing the nozzle, and a piston slidable in the barrel and sealing the open end of the barrel to retain a liquid therein; the method comprising the steps of:

removing debris and other contaminants from the tip seal and piston;

destroying microbial contaminants on the tip seal and piston;

washing the barrel with a sequence of a multiplicity of jets of water to remove debris and pyrogens from the barrel;

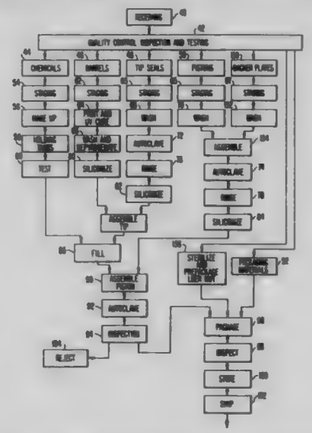
applying a lubricant to the tip seal, piston and barrel;

assembling the tip seal on the nozzle of the barrel;

filling the barrel through its open end with a desired quantity of liquid material;

assembling the piston in the open end of the barrel after the filling thereof to complete the enclosure and sealing of the syringe and its contents; and

autoclaving the assembled and sealed syringe to sterilize the plastic syringe and its contents, while maintaining a pressure on the outside surfaces of the syringe at least equal to the pressure of the syringe contents during autoclaving.

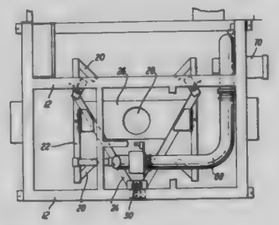


4,718,464

BAG FILLING APPARATUS

Elsworth R. Delves, c/o Purpose Engineers Limited, Delves Road, Heanor Gate, Industrial Estate, Heanor, Derbyshire, and James I. Davidson, c/o Sidian Trading Limited, Peatling Parve, Lutterworth, Leicestershire, both of England

Filed Jul. 25, 1986, Ser. No. 889,350
Claims priority, application United Kingdom, Aug. 2, 1985, 8519451
Int. Cl.[4] B65B *1/22, 1/32*
U.S. Cl. 141—75 7 Claims



1. A bag filling apparatus comprises:

(a) a rigid support frame;

(b) a material inlet for material to be deposited in the bag;

(c) arms connected to the support frame adapted to carry handles on the top of a bag to be filled to suspend the bag with its top opening in registry with the material inlet;

(d) a bag base support movably mounted on the support frame below the material inlet;

(e) a bag base contacting member having inwardly inclined surfaces forming the upper face of the bag base support;

(f) a raising and lowering assembly connecting the bag base support with the support frame and operable to raise or lower the bag base support into contact or away from contact with the base of a bag suspended from the frame, said assembly including at least one connection incorporating a piston and cylinder device, connected between the support frame and the bag base support;

(g) a sub-frame movably suspended from said support frame around the material inlet; and

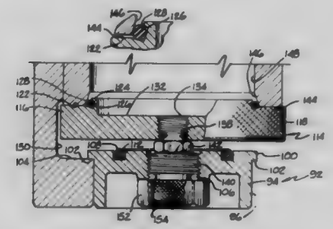
(h) three tensile connecting members pivotally mounted between the support frame and the sub-frame to suspend the subframe from the support frame, at least one strain gauge being provided on each connecting member whereby it acts as a load cell, each connecting member being arranged such that a respective connecting line joining a connection point with the support frame and its connection point with the subframe lies at an angle to the vertical and to the horizontal and at an angle of 120° to a similar line of a neighboring member.

4,718,465

CLEANING SYSTEM FOR CAN FILLING APPARATUS

Larry M. Dugan, Boulder,, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Jul. 3, 1986, Ser. No. 881,649
Int. Cl.[4] B67C *3/26*
U.S. Cl. 141—99 5 Claims



1. A system for use in a cleaning operation to provide a seal for the tulips of a can filling apparatus during such cleaning operation, which tulips are normally used for filling can, comprising:

a can filling apparatus having a rotatable filler wheel means;

a plurality of can filler units attached to said filler wheel means for rotation therewith;

a plurality of pocket means on said rotatable filler wheel means, each of said pocket means located in an axial direction below each of said can filler units and normally used to locate each of said cans;

each of said can filler units having a bottom surface and a generally cylindrical inner surface having a longitudinal axis and terminating in an open end extending through said bottom surface and facing and aligned with one of said pocket means;

plate means mounted on each of said can filler units, said plate means having a radially inwardly extending support flange integral therewith for use in said cleaning operation;

said support flange having a generally semi-cylindrical surface having a longitudinal axis coinciding with the longitudinal axis of said generally cylindrical inner surface of each of said can filler units and an upper surface facing said bottom surface and spaced a distance in an axial direction below said bottom surface and having an edge portion terminating at said generally semi-cylindrical surface;

seal means for sealing said open end of each of said can filler units during a cleaning opeation;

said seal means comprising:

an annular sealing surface on said generally cylindrical inner surface of each of said can filler units terminating at said open end;

a rotatable support member having a body portion having a generally cylindrical outer surface and longitudinal axis and a flange extending radially outwardly therefrom and having a lower surface at least of portion of which is in contact with and rotatable supported on said upper surface of said support flange so that the longitudinal axis of said body portion coincides with the longitudinal axis of said generally semi-cylindrical surface of said support flange;

a sealing member having a longitudinal axis and an annular sealing surface facing said bottom surface of said can filler unit;

an annular projection extending in an axially outward direction from said annular surface of said sealing member and having an outer surface;

sealing means for forming a fluid tight seal between said annular sealing surface and said outer surface of said projection means and for preventing relative rotation between said annular sealing surface and said outer surface of said annular projection during rotation of said support member; and

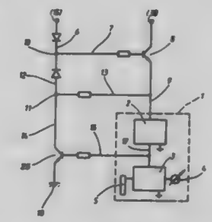
connecting means for connecting said sealing member to said support member so that rotation of said support member moves said sealing member in an axial direction to move said sealing means into sealing engagement with said annular sealing surface to provide a fluid tight seal between each of said can filler units and said sealing member or in an opposite axial direction so that said sealing member and said support member may be removed from or positioned on said support flange.

4,718,466

CIRCUIT ARRANGEMENT FOR THE ELECTRO-THERMAL MEASUREMENT OF THE FILLING LEVEL IN THE TANK OF A MOTOR VEHICLE

Heinz-Georg Burghoff, Reichenbach, and Werner Daub, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 8, 1986, Ser. No. 938,885
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543153
Int. Cl.[4] G01F *23/00*
U.S. Cl. 141—95 5 Claims



1. A circuit arrangement for the electro-thermal measurement of the filling level in a tank of a motor vehicle, comprising resistance sensor means operable to be heated with a substantially constant current, a voltage supply, a further voltage source evaluation circuit means operatively connected with said resistance sensor means, and sequence control means for controlling the operation of said evaluation circuit means in cyclic sampling periods, with the voltage supply effectively turned-on, in such a manner that the sensor means is heated during a heating period at the beginning of a sampling period and the corresponding voltage or current values in the sensor means are measured at the beginning and at the end of the heating period and any changes thereof which depend on an immersion condition of the resistance sensor means, are correspondingly evaluated by the evaluation circuit means for indicating the filling level, the sequence control means operatively connected with the voltage supply being operatively connected with a further voltage source, and switching means operable upon a turning off the voltage supply for supplying the sequence control means with voltage from said further voltage source during a time interval corresponding to the completion of the first sampling period, said further voltage

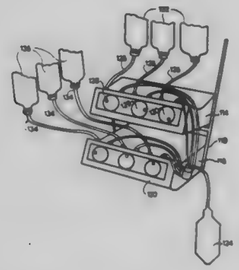
supply being automatically turned off by said circuit means after said time interval.

4,718,467

PUMPING MODULE ARRANGEMENT AND MANIFOLD

Alexandro Di Gianfilippo, Crystal Lake; Michael Becker, Wheeling, and James R. Hitchcock, Jr., Barrington, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 30, 1986, Ser. No. 869,153
Int. Cl.[4] B67C 3/02
U.S. Cl. 141—105 6 Claims



1. A device for transferring precise amounts of multiple fluids from first and second sets of multiple fluid source containers into a single receiving container under laminar air flow conditions, comprising:

a first generally rectangular pumping module;

a second generally rectangular pumping module spaced apart from said first pumping module;

a generally cylindrical housing attached to one of said pumping modules, said housing having a first plurality of radially extending input ports in a first plane, and a second plurality of radially extending input ports in a second plane, said housing also having a generally axially extending output port at one end thereof, said output port being generally oriented toward the back of said one module of said pumping;

a first plurality of tubes, each one of said tubes having one end in communication with a single source container of said first set of multiple fluid source containers, and another end in fluid communication with one input port of said first plurality of radially extending ports of said housing, flow of fluid through each of said first plurality of tubes being controlled by said first generally rectangular pumping module;

a second plurality of tubes, each one of said tubes having one end in communication with a single source container of said second set of multiple fluid source containers, and another end in fluid communication with one input port of said second plurality of radially extending ports of said housing, flow of fluid through each of said second plurality of tubes being controlled by said second generally rectangular pumping module; and

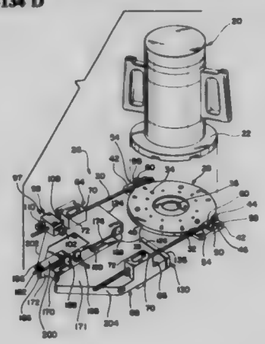
said second pumping module being located above said first pumping module and spaced apart from said first pumping module by at least one-sixth the height of the first pumping module so that when laminar air is flowing from the back of said pumping modules to the front of said pumping modules, laminar air flow exists across said output port of said housing.

4,718,468

ROUTER GUIDE

George W. Cowman, Monkton, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 25, 1986, Ser. No. 833,373
Int. Cl.[4] B27C 5/10
U.S. Cl. 144—134 D 20 Claims



9. A router guide for guiding a router during cutting operations, which comprises:

a subbase plate for attachment to the router;

a guide element;

coupling means for coupling the subbase plate and the guide element;

the guide element positionable on the coupling means in at least first and second positions relative to the subbase plate;

a pair of guide surfaces located on the guide element for guiding the router relative to a workpiece when the guide element is in the first position and during a prescribed cutting operation;

guide means mounted on the guide element for guiding the router during a curvilinear cutting operation when the guide element is in the second position.

4,718,469

PREFORMED PLUG-TIRE REPAIR

Russell W. Koch, Hartville, Ohio, and Douglas D. Snyder, Tempe, Ariz., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 718,666, Apr. 1, 1985, Pat. No. 4,618,519, and a continuation-in-part of Ser. No. 767,998, Apr. 21, 1985, abandoned, which is a continuation of Ser. No. 584,426, Feb. 28, 1984, abandoned, said Ser. No. 718,666, is a continuation-in-part of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 872,313
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] B60C 21/00; B32B 25/00
U.S. Cl. 152—370 18 Claims

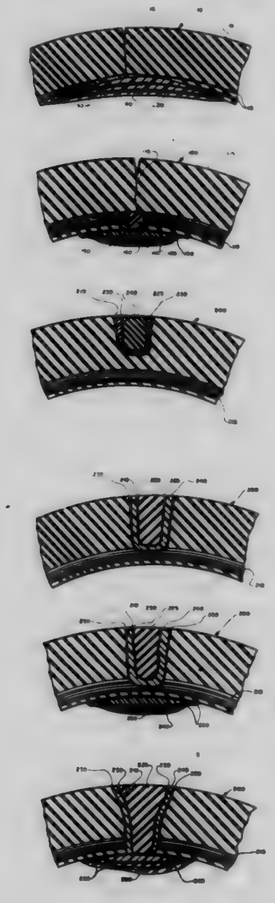
1. A repaired elastomer article; comprising:

the elastomer article, said article being cured and having a hollow therein, a treating agent, said treating agent coating said hollow;

a cured and preshaped elastomer plug, said cured and preshaped elastomer plug being free from an amine curable polymer or prepolymer and residing within said hollow;

a channel in said hollow, said channel existing between said plug and said article;

an amine curable polymer or prepolymer, said amine curable polymer or prepolymer substantially filling said channel; and,



said amine curable polymer or prepolymer cured to said elastomer plug and to said article at ambient temperature.

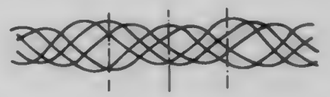
4,718,470

PNEUMATIC RADIAL TIRES

Noboru Kaukabe, Ohme; Masaaki Morimoto, Sakato; Eiichi Koyama, and Koichi Kojima, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Japan

Continuation of Ser. No. 184,839, Sep. 8, 1980, abandoned. This application Mar. 7, 1986, Ser. No. 838,194
Claims priority, application Japan, Sep. 13, 1979, 54-116733
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] B60C 9/18
U.S. Cl. 152—451 9 Claims

1. A passenger car pneumatic radial tire comprising a carcass of radial structure and a belt superimposed about an outer periphery of a crown portion of said carcass and composed of a rubberized steel cord layer, the improvement wherein said belt is composed of at least one open-twisted steel cord layer formed by embedding open-twisted steel cords, each cord being composed of 4 to 5 adjacent steel filaments with an open-twisted construction in the lengthwise direction of the cord, said open-twisted construction having alternatively an open-twisted portion in which all of steel filaments are twisted without being closed to each other and a relatively closely twisted portion wherein at least two, but not all, of the adjacent filaments are substantially closed with each other and, said cord having an elongation of 0.2 to 0.7 percent under a load of 5 kg/cord and a twisting pitch of 8 to 16 mm, in a coating rubber having a 100% modulus of 30 to 70 kg/cm^2.

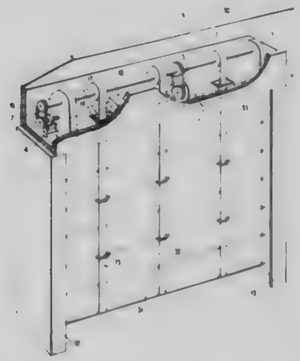


4,718,471

FIXING AND PROTECTIVE HOUSING FOR THE DRIVE MEANS OF A CONCERTINA TYPE DOOR

Bernard Kraeutler, Dunieres, France, assignor to Nergeco, Dunieres, France

Filed Nov. 6, 1985, Ser. No. 795,610
Claims priority, application France, Nov. 5, 1984, 84 16800
Int. Cl.[4] A47H 5/14; E06B 3/94
U.S. Cl. 160—84 R 3 Claims



1. A concertina type door installation, comprising:

(a) a pair of horizontally spaced vertical risers (12, 13) interconnected at tops thereof by a metal channel section beam;

(b) a flexible curtain (31) stiffened at regular intervals by a plurality of horizontal, vertically spaced rods (32), said curtain being disposed between said risers;

(c) a plurality of door-lifting belts (15) fixed at lower ends thereof to a bottom rod of the curtain and preferably passing through guides fixed at intervals along the rods;

(d) a belt-winding shaft (2) rotatably disposed above the curtain, upper ends of said belts being fixed to said shaft;

(e) a motor and reduction gear unit (1) for driving the shaft; and

(f) an end-of-stroke unit (4) for stopping the motor when the curtain reaches a fully open or a fully closed position;

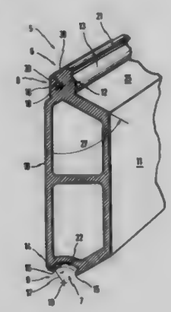
(g) said metal channel section beam defining a protective housing (11) in the form of an elongate rectangular U-shaped trough internally mounting the belt-winding shaft, the motor and reduction gear unit, and the end-of-stroke unit for the concertina type door, said housing being disposed across upper ends of the risers and being open along one longitudinal face other than a bottom face,

(h) wherein the housing includes means (33) for heating an inside of the housing.

4,718,472
SECTIONAL STRIP FOR ROLL-UP, FOLD-UP, AND SIMILAR GATES

Michael Hörmann, Steinhagen, Fed. Rep. of Germany, assignor to Hörmann KG Amshausen, Steinhagen, Fed. Rep. of Germany

Continuation of Ser. No. 750,901, Jul. 1, 1985, abandoned. This application Jan. 13, 1987, Ser. No. 5,343
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425556
Int. Cl.[4] E06B *9/14*
U.S. Cl. 160—229 R 18 Claims

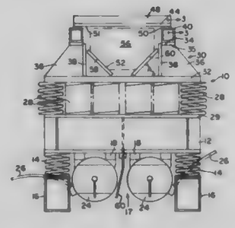


1. A sectional strip with an outward-facing outside and an inside for roll-up and fold-up gates, comprising: a gate having a total width and forming a plane; means for pivoting adjacent upper and lower identically shaped sectional strips in relation to the plane of a gate; said sectional strip having a top articulation location and a bottom articulation location each articulation location extending over the total width of the gate for said pivoting; said gate comprising of sectional strips forming the gate plane when not rolled up and forming a rolled-up profile when rolled up onto armor of rolled-up sectional strips; said top articulation comprising at least one perpendicular sector with an outward facing surface; said bottom articulation comprising at least one cylindrical sector with an inward-facing surface; said top and bottom articulations having surfaces with radii of curvature that are substantially equal in length, said radii having centers of curvature located on two straight lines extending at equal perpendicular distances from the plane of the gate and along the width of the gate, said gate being comprised of outsides of the sectional strips; one of said two straight lines is associated with the top articulation location and the other of said two straight lines is associated with the bottom articulation location, said top articulation location having a pivoting axis coinciding with the straight line associated with said top articulation and said bottom articulation having a pivoting axis coinciding with the straight line associated with said bottom articulation; the distance of the straight lines from the outside being less than that to the inside, so that formation of gaps in the gate when rolled up or unrolled is prevented; a cam in said inward-facing surface, each articulation location of two concentric surface areas with a different radius of curvature that is substantially the same length for said two surface areas and with an outward-facing surface includes with the longer radius of curvature a central angle that is smaller than one with the shorter radius of curvature and is in the form of said cam, a surface having the longer radius of curvature comprising a recess being of an adjacent sectional strip with a central angle that is greater than one in relation to the shorter radius of curvature and forming a maximum angle at the articulation location when the sectional strips are rolled up out of the plane of the gate onto the armor.

4,718,473
VIBRATORY STRESS RELIEF APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation of Ser. No. 695,076, Jan. 25, 1985, abandoned. This application Jul. 30, 1986, Ser. No. 915,864
Int. Cl.[4] B22D *29/00*
U.S. Cl. 164—132 7 Claims

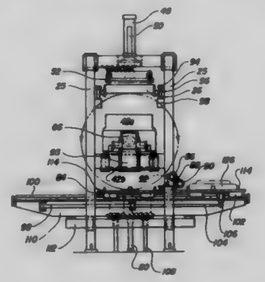


1. In a vibratory stress relief apparatus for a casting or the like, said apparatus comprising a base resiliently supported on a bearing surface, vibratory means carried by said base, a housing having a support plate on which the casting is positionable, resilient means supporting said housing on said base, closure means secured to the housing, and means for selectively positioning said closure means on the housing a predetermined distance from the top of the housing, said means for selectively positioning comprising a plurality of shims which can be placed selectively individually and in stacked relationship between the closure means and housing to thereby produce a desired optimum gap between the closure means and the casting, whereby said vibratory means will vibrate said housing and will hammer and rattle the casting between the closure means and the support plate to stress relieve and to clean said casting.

4,718,474
MOLD TRANSFER MECHANISM FOR A MOLDING MACHINE

Kenneth E. Bellis, Rochester; Jackson E. Brown, Mt. Clemens, and Pheroze J. Nagarwalla, Rochester Hills, all of Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Dec. 3, 1986, Ser. No. 937,642
Int. Cl.[4] B22C *11/04, 17/02*
U.S. Cl. 164—158 19 Claims

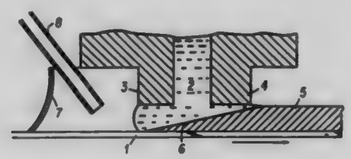


1. A mold transfer mechanism for a molding machine of the type including a frame (**25, 27**), at least one mold box (**42***a*) having a mold cavity for forming a mold (**126**) therein and means (**60, 66**) for mounting said mold box (**42***a*) on said frame (**25, 27**) for rotation of said mold box (**42***a*) between a molding position and a mold discharge position, comprising:
an elongate mold transfer carriage (**84**) positioned below said mold box (**42***a*) when said mold box (**42***a*) is in said discharge position thereof, said mold transfer carriage (**84**) including first and second sections for respectively supporting first and second molds (**126**) thereon;
means (**76**) for transferring a mold (**126**) from said mold box (**42***a*) when said mold box (**42***a*) is in said discharge position to one of said first and second sections of said mold transfer carriage (**84**); and,
means (**98, 100, 110**) for shifting said mold transfer carriage (**84**) along its longitudinal axis between a first position in which said first section of said transfer carriage (**84**) is disposed beneath said mold box (**42***a*) and said second section is disposed in a first laterally outboard position; and a second position in which said first section of said mold transfer carriage (**84**) is disposed in a second laterally outboard position and said second section is disposed beneath said mold box (**42***a*).

4,718,475
APPARATUS FOR CASTING HIGH STRENGTH RAPIDLY SOLIDIFIED MAGNESIUM BASE METAL ALLOYS

Santosh K. Das, Randolph; Derek Raybould, Denville; Richard L. Bye, Jr., Morris Township, Morris County, and Chin-Fong Chang, Lake Hiawatha, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 618,289, Jun. 7, 1984, Pat. No. 4,675,157.
This application Feb. 20, 1987, Ser. No. 16,892
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—415 1 Claim

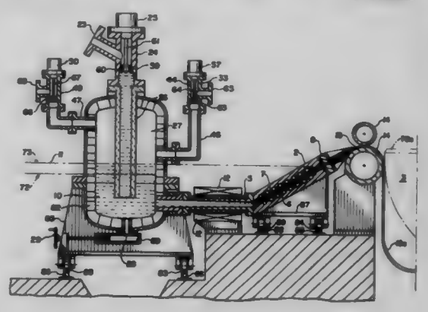


1. In an apparatus for fabricating continuous metal strip composed of a low density, readily oxidizable magnesium base alloy by casting the alloy directly from the melt through a slotted nozzle onto a moving chill substrate, the improvement which comprises in combination:
(a) scraping means located upstream of said slotted nozzle and being adapted to ride on said substrate and remove the gaseous boundary layer associated therewith,
(b) gas supply means disposed between said scraping means and said nozzle for introducing a replacement gas behind said nozzle so that said replacement gas contacts said substrate within 2 to 4 inches of said nozzle and rides on and is carried with said substrate to said nozzle; and
(c) shielding means located proximate to said nozzle and configured to form a semi-closed chamber around said nozzle and said substrate, said chamber having a bottom wall comprising said substrate, a top wall comprising said nozzle, side walls comprising a plurality of side shields and a back wall comprising said scraping means, each of said side walls extending from said back wall to a point about 2 to 3 inches past said nozzle slot, said shielding means being operative to direct and confine said replacement gas in the vicinity of said nozzle.

4,718,476
METHOD AND APPARATUS FOR EXTRUSION CASTING

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to Blaw Knox Corporation, Pittsburgh, Pa.

Filed Feb. 14, 1986, Ser. No. 829,797
Int. Cl.[4] B22D *11/12;* B21B *1/46*
U.S. Cl. 164—476 8 Claims

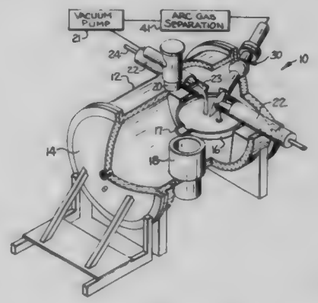


1. The method of continuously casting metal strip having a greater width than thickness which comprises heating metal to the liquid phase, introducing the liquid metal into a closed vessel having an outlet for metal through an elongated mold followed by a sizing die with a die opening thickness dimension of at least about 1 millimeter and a width dimension greater than its thickness dimension, applying a cooling medium to the exterior elongated walls of the mold so as to solidify metal therein from said elongated walls in the direction of the section thickness and supplying gas under pressure to the molten metal in the vessel sufficient to cause the major portion of the length of solidified metal in the mold to be extruded through the sizing die, then lowering the pressure to a pressure not permitting further movement of metal through the die while continuing to maintain said pressure on the metal in the mold and die during the solidification of said metal.

4,718,477
APPARATUS AND METHOD FOR PROCESSING REACTIVE METALS

Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Jul. 30, 1986, Ser. No. 892,068
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—495 16 Claims



1. An apparatus adapted for melting a reactive metal and the like, and comprising
an enclosed heating chamber,

a hearth positioned within said chamber for supporting a molten metal,

means for substantially evacuating said heating chamber,

a plasma arc torch including a torch housing, a rear electrode mounted within said housing and comprising an elongate tubular metal member having an internal bore and a closed inner end and an open outer end, with said internal bore having an axial length which is at least about ten times its diameter, a collimating nozzle comprising a tubular metal member having a bore therethrough, said nozzle being mounted within said housing and in coaxial alignment with said rear electrode, and vortex generating means for generating a vortical flow of a gas at a location intermediate said rear electrode and said nozzle,

means mounting said torch to said heating chamber at a predetermined distance from said hearth, and

power supply means operatively connected to said rear electrode and to said hearth for operating said torch in a transfer arc mode wherein an arc extends from said bore of said rear electrode through said collimating nozzle and to said hearth, and wherein said vortex generating means and said power supply means may be coordinated such that the arc attaches adjacent the closed inner end of said bore of said rear electrode and at least about one half the length of the arc extending from said rear electrode to said hearth is located within the torch.

4,718,478

PROCEDURE FOR CONTROLLING A THERMAL INSTALLATION

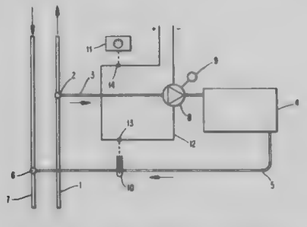
Jakob Huber, Les Avanseyres 8, 1806 St.-Legier, Switzerland

Filed Jan. 7, 1985, Ser. No. 689,387

Claims priority, application Switzerland, Jan. 13, 1984, 172/84

Int. Cl.[4] G05D *23/00*; G01K *17/06*; F24D *3/02*

U.S. Cl. 165—1 **12 Claims**



1. In a process for controlling the circulation of a heat exchange fluid through a fluid delivery conduit from thermal regenerating means to a plurality of separate apartments; each of said apartments provided with heat exchange means, a fluid supply pipe interconnecting said delivery conduit and an inlet of said heat exchange-means, a return pipe fluidly interconnecting an outlet of said heat exchange means with a common return conduit for returning fluid to said regenerating means, a fluid circulation pump located in one of said supply and return pipes for circulating fluid through said heat exchange means, and a motor for driving said pump, said process including the step of independently controlling the circulation of heat exchange fluid in each of said apartments, the improvement comprising independently measuring the heat transferred in said heat exchange means of each apartment by the steps of:

sensing the temperature of fluid in said return pipe and controlling said pump to restrict the flow of fluid through said heat exchange means if the sensed temperature of fluid in said return pipe deviates from a first set point, maintaining a selected substantially constant temperature difference between the flowing fluid in said supply and return pipes independently of temperature conditions inside and outside said apartment,

providing a temperature-dependent value obtained independently of the temperatures in said supply and return pipes and controlling said pump to restrict the flow of fluid through said heat exchange means if said temperature-dependent value deviates from a second set point, and

obtaining a measurement of the amount of heat transferred by said heat exchange means by measuring the amount of fluid circulating through said heat exchange means independently of the amounts of fluid circulating through the heat exchange means of the remaining apartments.

4,718,479

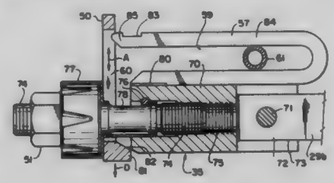
ANTIVIBRATION BAR INSTALLATION APPARATUS

Hermann O. Lagally, Hempfield Township, Westmoreland County, and John H. Stevens, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 6, 1985, Ser. No. 773,274

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—69 **3 Claims**



1. A steam generator for a nuclear power plant comprising a shell, a tube bundle comprising a plurality of tubes having an approximate U-shaped configuration arranged in successive columns and rows within said shell, said tubes being adapted to heat feedwater flowing around the outside of said tubes, antivibration means for substantially eliminating vibrations of said tubes as a result of steam generator operation, said antivibration means comprising compliant or expandable antivibration bars fitted between successive columns and within the U-shaped portion of said tubes, said antivibration bars being mechanically attached at the ends thereof to a retaining ring arranged around the outer periphery of said tube bundle at the U-shaped portion thereof, said mechanical attachment comprising a latch and a hook, said hook being attached to a hollow member which is attached to an end of said vibration bar, said retaining ring fitting within said hook, said latch comprising a plate slidingly arranged with said hook and fitting across the open end of said hook whereby said retaining ring is captured within said hook when said latch is slid over the open end of said hook, said latch being further movable relative to said hook in a direction perpendicular to the longitudinal axis of said antivibration bar, and said latch includes a first tapered surface which mates with a second tapered surface included with said hollow member whereby longitudinal motion of said latch results in a wedging action between said latch and hook and whereby a detent within the unconnected end of said hook fits within and is captured by the end of an opening in said latch causing said hook to close downward onto said retaining ring and applying a compressive force thereto.

4,718,480

APPARATUS AND METHOD FOR SCRAPING THE INTERIOR OF A FLUID HANDLING DEVICE

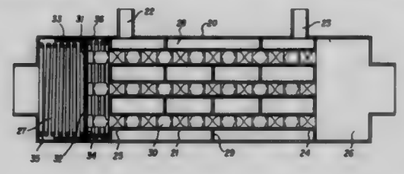
Masahiro Kito, Nagoya, Japan, and Katsuhiro Mori, Hove, England, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 16, 1986, Ser. No. 852,827

Claims priority, application United Kingdom, Apr. 27, 1985, 8510750

Int. Cl.[4] F28F *17/00*

U.S. Cl. 165—94 **1 Claim**



1. A method of scraping an interior surface of a fluid handling device having a longitudinal axis, a scraping means disposed therein in scraping contact with the interior surface, a fluid outlet manifold, and spring means disposed in the outlet manifold, the spring means being made of a temperature-responsive shape memory alloy and exhibiting a first shape at temperatures below a predetermined temperature and a second shape at temperatures above the predetermined temperature, the spring means operatively engaging the scraping means such that a change of shape of the spring means will cause longitudinal movement of the scraping means, said method comprising the steps of:

exposing the spring means to the temperature of a fluid in the outlet manifold;

raising the temperature of the spring means an amount sufficient to cause a change of shape of the spring means from the first shape to the second shape;

using said change of shape of the spring means to move the scraping means in a first axial direction within the fluid handling device, thereby scraping the interior surface;

lowering the temperature of the spring means an amount sufficient to cause the spring means to return to the first shape; and

moving the scraping means in a second axial direction within the fluid handling device, thereby further scraping the interior surface.

4,718,481

FLUID HEATING APPARATUS

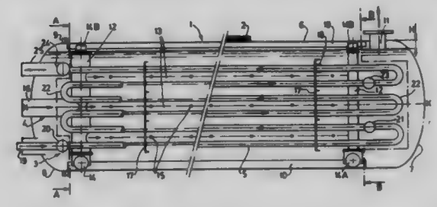
Daniel Delatte, Saint Maur, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 8, 1985, Ser. No. 785,565

Claims priority, application France, Oct. 17, 1984, 84 15882

Int. Cl.[4] F28F *13/06*; F17C *7/02*

U.S. Cl. 165—108 **16 Claims**



1. A fluid heating apparatus comprising a case, a heating fluid injection device mounted in the case and having at least one perforated pipe, a group of tubes disposed in the case for circulating the fluid to be treated, and interconnecting means supported by said injection device independently of said case and supporting said group of tubes for movement relative to said case, whereby said group of tubes is supported by said injection device via said interconnecting means as a unit that is insertable into and removable from the case, and a liquid discharging overflow in an upper portion of the case at an elevation to maintain said injection device and said tubes immersed in a liquid that originates as said heating fluid.

4,718,482

METHOD FOR MANUFACTURING HEAT EXCHANGE VEHICLE

Tetsuji Iwama; Katashi Katsumata; Hajime Kudo, and Yo Takeuchi, all of Susonoshi, Japan, assignors to Mitsubishi Aluminum Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,873

Claims priority, application Japan, Oct. 7, 1985, 60-221859

Int. Cl.[4] F28F *13/18*

U.S. Cl. 165—133 **36 Claims**

19. A heat exchanging vehicle formed by the steps comprising:

(a) forming an inorganic surface layer over a cold-rolled sheet of aluminum or an aluminum alloy;

(b) treating said inorganic surface layer with an aqueous solution containing a phosphoric compound to deposit said phosphoric compound on said inorganic surface layer;

(c) annealing said sheet; and

(d) forming said sheet into a heat exchanging vehicle.

4,718,483

HEAT EXCHANGER WITH EXTERNALLY ENAMELLED BAYONET-TUBES

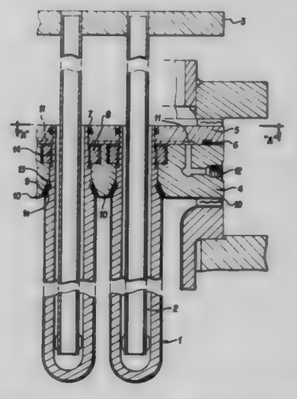
Gianni Artusi, Venice, Italy, assignor to Tycon Spa, San Dona di Piave, Italy

Filed Mar. 13, 1986, Ser. No. 839,099

Claims priority, application Italy, Apr. 23, 1985, 20459 A/85

Int. Cl.[4] F28D *7/12*

U.S. Cl. 165—142 **4 Claims**



1. A heat exchanger with a plurality of externally enamelled bayonet tubes comprising:

a tube plate having an inner surface and outer surface with a plurality of tube mounting apertures and means for mounting said plurality of bayonet tubes in said apertures so that they project outwardly from said inner surface;

each tube mounting aperture having a frusto-conical seat adjacent the outer surface of the plate and each bayonet

tube having a frusto-conical portion for fitting in a sealing manner into one of said frusto-conical seats;
a PTFE sheet overlying the entire inner surface of said tube plate and having a plurality of apertures positioned to correspond with said tube plate apertures and cup shaped portions around the apertures in the sheet;
a plurality of cup springs within the tube plate apertures positioned to press the PTFE sheet against the frusto-conical portion of the bayonet tubes to seal the seating between the tubes and the plate.

4,718,484

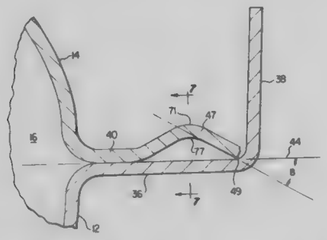
HEAT EXCHANGER UNIT

Russell W. Hoeffken, Belleville, Ill., assignor to SnyderGeneral Corporation, Minneapolis, Minn.

Division of Ser. No. 417,672, Sep. 13, 1982, Pat. No. 4,510,660, which is a continuation-in-part of Ser. No. 295,041, Aug. 21, 1981, Pat. No. 4,441,241, which is a division of Ser. No. 178,338, Aug. 15, 1980, Pat. No. 4,298,061. This application Sep. 26, 1984, Ser. No. 655,044

Int. Cl.[4] F24H 9/00; F28F 3/14

U.S. Cl. 165—170 **18 Claims**



1. A heat exchanger unit for a hot air furnace or the like, having a pair of opposed shell sections each formed from a sheet of metal and having a flange formed along at least one edge complementary to the adjacent edge of the other section, said flanges being engaged, at least an outer portion of one of the flanges being folded over the corresponding outer portion of the other flange, said other flange having a portion forming an arch extending generally parallel to the edge of said other flange, said other flange crimped at the arch and edge between said folded over portion of said one flange and the remainder of said one flange, the arch of said other flange elastically deformed by the crimp, the elastic deformation maintaining the edge of said other flange forced against said one of said flanges to form a substantially leakproof metal to metal joint between the edge of the other flange and said one flange.

4,718,485

PATTERNS HAVING HORIZONTAL AND VERTICAL WELLS

Alfred Brown; Marc F. Fontaine, and Margaret A. Hight, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

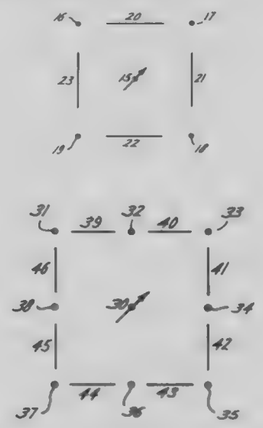
Filed Oct. 2, 1986, Ser. No. 914,214

Int. Cl.[4] E21B 43/24, 43/30

U.S. Cl. 166—50 **10 Claims**

1. A well pattern having at least one substantially horizontal production well, and at least two substantially vertical production wells, which comprises:
a substantially horizontal production well approximately located on and parallel to an axis running between two substantially vertical production wells,
said horizontal production well having a length of about 30% to about 60% of the distance between the two vertical production wells.

9. A modified inverted 5-spot vertical well pattern having at least one substantially horizontial production well, one substantially vertical central injection well, and four substantially vertical corner production wells, which comprises:
at least one substantially horizontial production well approximately centered between two of the vertical corner production wells and approximately located on and parallel



to an axis running between the two substantially vertical corner production wells,
said horizontal production well having a length of about 30% to about 50% of the distance between the two vertical corner production wells.

4,718,486

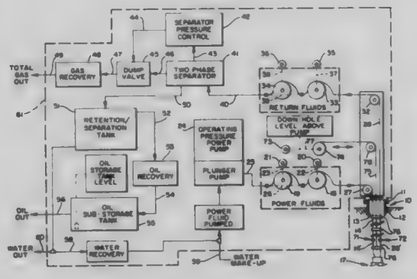
PORTABLE JET PUMP SYSTEM WITH PUMP LOWERED DOWN HOLE AND RAISED WITH COILED PIPE AND RETURN LINE

John B. Black, 2115 Norman, Pasadena, Tex. 77506

Filed Jun. 24, 1986, Ser. No. 888,726

Int. Cl.[4] E21B 19/22, 43/00

U.S. Cl. 166—68 **18 Claims**



1. A portable jet pump with the jet pump lowered down hole and raised with uncoiling and coiling of pipe and return line comprising: a portable well jet pump system including, a jet pump connected to a pipe and a return line that are feedable from the coiled state and in return back to the coiled state on pipe coil reel means and on return line coil reel means, respectively; first drive means for said pipe coil reel means, and second drive means for said return line coil reel means for uncoiling said pipe and said return line to lower said jet pump down a well and for coiling of said pipe and said return line in withdrawing said jet pump from a well; transport means

mounting said portable well jet pump system for movement to wells to be pumped and from well to well; wherein said pipe is flexible tubing; and said return line is a flexible tube return line; a first flexible tubing guide roller is mounted on said transport means for properly guided entrance into and withdrawal of said pipe flexible tubing from a well; and a second flexible tubing guide roller mounted on said transport means for properly guided entrance into and withdrawal of said flexible tube return line from a well.

4,718,487

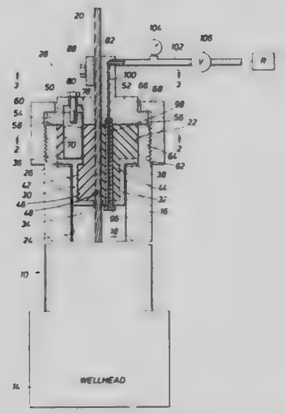
AUXILIARY WELL PRESSURE PACKOFF ASSEMBLY

C. P. Lanmon, II, Houston, Tex., assignor to Hydrolex, Inc., Longview, Tex.

Filed Mar. 31, 1986, Ser. No. 846,132

Int. Cl.[4] E21B 33/02

U.S. Cl. 166—82 **22 Claims**



1. An auxiliary pressure packoff assembly for wireline control equipment having a wireline valve forming an outlet passage, comprising:
(a) lower retaining body means being positionable within said outlet passage of said wireline valve and being positionable about the wireline extending through said outlet passage;
(b) upper retaining body means being positionable about said wireline in spaced relation with said lower retaining body means and forming a closure for said outlet passage of said wireline valve, said upper retaining body means, lower retaining wireline valve, said upper retaining body means, lower retaining body means and said wireline valve body cooperating to define a packing chamber within said outlet passage of said wireline valve, said upper retaining body means having clamp means for securing said wireline in fixed relation therewith;
(c) resilient sealing body means being positionable about said wireline and substantially filling said packing chamber;
(d) sealing body deforming means being interconnected with said upper retaining body means and being movable relative thereto for mechanically deforming said resilient sealing body means and developing a seal thereof with said wireline valve means and said wireline, said resilient sealing body being further deformed by well pressure acting thereon for pressure enhanced sealing, said lower retaining body, upper retaining body and said resilient sealing means are each in the form of two half segments capable of positioning about said wireline in such manner that the wireline extends substantially centrally therethrough;
(e) means retaining said upper retaining body means in positive assembly with said wireline valve body means; and
(f) vent means communicating well pressure through said upper and lower retaining body means and said resilient sealing body means.

4,718,488

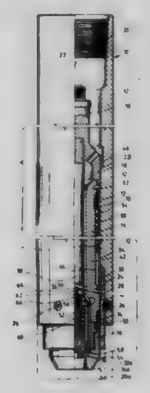
PUMP-OUT PLUG SYSTEM FOR A WELL CONDUIT

Ronald E. Pringle, Houston, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 12, 1987, Ser. No. 24,950

Int. Cl.[4] E21B 33/12

U.S. Cl. 166—135 **10 Claims**



1. A pump-out plug system for a well conduit comprising,
a landing nipple adapted to be connected to a well conduit, said nipple including a no-go shoulder and a recess extending out the bottom of the nipple,
a landing sub is telescopically positioned in the recess, said sub including a locking notch,
seal means between the landing sub and the landing nipple,
shear means releasably locking the landing sub to the landing nipple,
a pump-out plug adapted to seat in the landing sub,
expandable locking means connected to the plug for engaging the locking notch for locking the plug in the landing sub,
a bi-directional flow blocking valve connected to the plug which when opened allows fluid to flow through the plug and when closed prevents fluid flow through the plug, and
a running tool releasably connected to the plug for landing the plug in the landing sub and releasably connected to the valve for holding the valve in the open position when running the plug into the landing sub.

4,718,489

PRESSURE-UP/BLOWDOWN COMBUSTION - A CHANNELLED RESERVOIR RECOVERY PROCESS

Richard J. Hallam, and John K. Donnelly, both of Calgary, Canada, assignors to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Sep. 17, 1986, Ser. No. 908,306

Int. Cl.[4] E21B 43/18, 43/247

U.S. Cl. 166—259 **11 Claims**

1. A process for producing oil from a heavy oil reservoir in which pressure can be built up by injection of oxidizing gas and propagation of a combustion front, said reservoir having completed therein an injection well and a plurality of production wells, said reservoir having a network of generally linear, narrow, permeable channels interconnecting the wells, the

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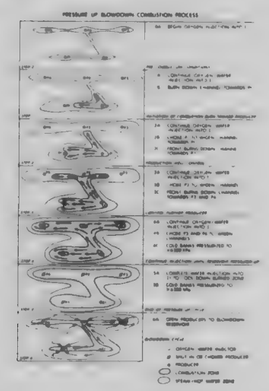
reservoir otherwise being resistive to fluid injection, said process comprising:

(a) injecting oxidizing gas through the injection well and initiating combustion in the reservoir at the injection well;

(b) injecting oxidizing gas through the injection well into the reservoir at a pressure less than the reservoir fracturing pressure and propagating forward combustion generally linearly toward a first of the production wells through a channel while producing said production well substantially unrestricted, to induce rapid advance of the combustion front through the channel;

(c) when there is indication at the first production well that heat breakthrough has been established between the injector and said first production well, then restricting the first production well before the combustion front arrives at said first production well;

(d) continuing to inject oxidizing gas through the injection well as before, with the first production well restricted, to induce rapid advance of the combustion front through another channel toward a second production well which is produced unrestricted;



(e) when there is indication at the second production well that heat breakthrough has been established between the injector and said second production well, then restricting the second production well before the combustion front arrives at said second production well;

(f) continuing to inject as before, with the production wells which have experienced heat breakthrough being restricted, to cause a significant pressure build-up in the network and surrounding reservoir to a pressure level which is less than the reservoir fracturing pressure;

(g) substantially terminating oxidizing gas injection through the injection well;

(h) injecting water through one of the wells to cool the burned channels;

(i) opening at least one of the aforesaid production wells to produce oil and blow down the reservoir thereby resaturating the burned channels with oil; and

(j) igniting the oil in the re-saturated channel and repeating steps (b) to (i) inclusive at least once.

4,718,490

CREATION OF MULTIPLE SEQUENTIAL HYDRAULIC FRACTURES VIA HYDRAULIC FRACTURING COMBINED WITH CONTROLLED PULSE FRACTURING

Duane C. Uhri, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1986, Ser. No. 946,236

Int. Cl.[4] E21B *33/138, 43/26, 43/263, 43/28*

U.S. Cl. 166—281 **20 Claims**

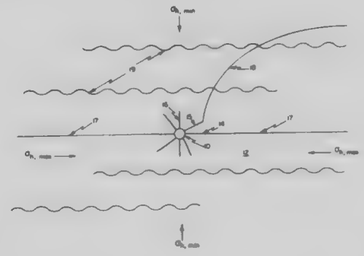
1. A method for creating multiple sequential hydraulic fractures via hydraulic fracturing combined with controlled pulse fracturing comprising:

(a) creating more than two simultaneous multiple vertical radial fractures via a controlled pulse fracturing method;

(b) applying thereafter hydraulic pressure to the formation in an amount sufficient to fracture said formation thereby forming a first hydraulic fracture perpendicular to the least principal horizontal in-situ stress where said first fracture originates from the tip of a controlled pulse fracture that is substantially perpendicular to the least principal horizontal in-situ stress;

(c) maintaining said hydraulic pressure on the formation while pumping alternate slugs of a thin-fluid spacer and a temporary blocking agent having a proppant therein into said fracture until said fracture screens out whereupon a second hydraulic fracture is initiated at the tip of another controlled pulse fracture which then exhibits the least closure stress due to the alteration of the local in-situ stresses caused by said first hydraulic fracture;

(d) maintaining said hydraulic pressure on said formation while pumping alternate slugs of said thin-fluid spacer and said blocking agent into said second hydraulic fracture thereby causing said second hydraulic fracture to propagate away from said first hydraulic fracture in a curved trajectory which eventually becomes substantially perpendicular to the original least principal in-situ stress due



to the interaction of the original in-situ stresses and stress from said first hydraulic fracture in combination with stress from said second hydraulic fracture;

(e) maintaining said hydraulic pressure on said formation while pumping alternate slugs of said thin-fluid spacer and said blocking agent into said last formed hydraulic fracture until this fracture screens out whereupon another hydraulic fracture initiates at the tip of another controlled pulse fracture which then exhibits the least closure stress due to alteration of the local in-situ stresses by all previously formed hydraulic fractures;

(f) maintaining said hydraulic pressure on said formation while pumping alternate slugs of said thin-fluid spacer and said blocking agent into said last formed hydraulic fracture to cause said last formed hydraulic fracture to propagate away from said previously formed hydraulic fractures in a curved trajectory which eventually becomes substantially perpendicular to the said original least principal in-situ stress due to the interaction of said original in-situ stresses and stresses from previously formed hydraulic fractures with said last formed hydraulic fracture; and

(g) repeating steps (e) and (f) until a desired number of curved sequential hydraulic fractures are created as extensions to said multiple vertical radial fractures obtained in step (a).

4,718,491

PROCESS FOR PREVENTING WATER INFLOW IN AN OIL- AND/OR GAS-PRODUCING WELL

Norbert Kholer, Saint Germain en Laye; Resé Tabary, Le Pecq, and Alain Zaitoun, Rouen, all of France, assignors to Institut Francais du Petrole, Fuell-Malmaison, France

Filed Aug. 29, 1986, Ser. No. 901,804

Claims priority, application France, Aug. 29, 1985, 85 12991

Int. Cl.[4] E21B *33/138*

U.S. Cl. 166—294 **8 Claims**

1. A process for preventing water inflow in an oil-and/or gas-producing well, wherein an aqueous dispersion of a polysaccharide is injected in the formation surrounding the producing well, from said well, and then the well is brought again in production and the produced fluids are recovered, characterized in that said aqueous dispersion of polysaccharide is injected at a polysaccharide concentration of 200 to 5000 parts per million of parts by weight and at such a rate that the shear gradient, measured at the input of the formation, is at least 50 sec.$^{-1}$ and the viscosity of said dispersion is lower than 10 mPa.s.

4,718,492

PROCESS FOR PASSING CARBON DIOXIDE THROUGH A CASED, CEMENTED AND PERFORATED WELL

Hermanus G. Van Lear, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 827,922, Feb. 10, 1986, abandoned. This application Jun. 16, 1987, Ser. No. 65,171

Claims priority, application Canada, Feb. 11, 1985, 473990

Int. Cl.[4] E21B *33/138, 41/02*

U.S. Cl. 166—295 **8 Claims**

1. In a process for completing and operating a well for production of a liquid from a subterranean reservoir in which a casing string is cemented and perforated and a CO_2-containing fluid is flowed through a plurality of casing perforations and cement tunnels into or out of the reservoir, an improved process for reducing CO_2-induced damage of the cement, comprising:

injecting a first aqueous liquid which is compatible with the liquid in the well and the reservoir into the casing string prior to the flowing of the CO_2-containing fluid;

flowing the first aqueous liquid into and out of contact with the casing perforations and the cement tunnels to displace debris from the casing perforations and the cement tunnels;

injecting into the casing string a volume of an oleogenous liquid which contains a plurality of dissolved epoxy resin-forming components and epoxy resin-curing agents capable of subsequently forming and depositing a cured epoxy resin at the reservoir temperature and has a volume which is not significantly more than enough to fill the casing perforations and the cement tunnels;

injecting a second aqueous liquid which is compatible with the liquid in the well and reservoir into the casing string;

displacing the oleogenous liquid ahead of the second aqueous liquid so that the oleogenous liquid is driven to fill the casing perforations and the cement tunnels;

maintaining the oleogenous liquid at least substantially stationary until a deposition of at least substantially cured epoxy resin has occurred substantially selectively within the casing perforations and the cement tunnels;

injecting into the casing string a third aqueous liquid which is compatible with the liquid in the well and reservoir;

flowing the third aqueous liquid into and out of contact with the casing perforations and the cement tunnels to displace the resin-forming components which are undeposited; and

subsequently flowing the CO_2-containing fluid through the resin coated casing perforations and the cement tunnels.

4,718,493

WELL TREATING METHOD AND SYSTEM FOR STIMULATING RECOVERY OF FLUIDS

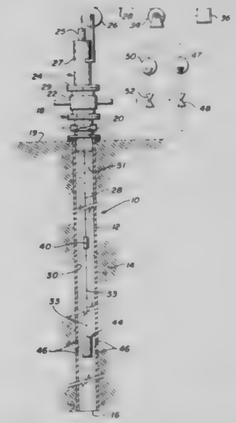
Gilman A. Hill, Englewood; Richard S. Passamaneck, Littleton, and Kesell J. Touryan, Indian Hills, all of Colo., assignors to Mt. Moriah Trust, Englewood, Colo.

Continuation-in-part of Ser. No. 686,990, Dec. 27, 1984, Pat. No. 4,633,951. This application Dec. 18, 1986, Ser. No. 943,551

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] E21B *43/26, 43/267*

U.S. Cl. 166—308 **9 Claims**



1. A method for fracturing a subterranean earth formation to stimulate the production of fluid from said formation wherein a wellbore extends at least to said formation from a surface point, said wellbore being provided with casing means forming a substantially fluid tight interior space, said method comprising the steps of:

providing perforating means for perforating said casing means at a predetermined zone of said formation to provide for flow of fluids between said formation and said wellbore and placing said perforating means at said zone,

filling at least a portion of said wellbore with a compressible fracturing fluid comprised of a liquid containing dispersed quantities of gas and having a solid propant dispersed therein;

raising the pressure of said fracturing fluid in said wellbore to a predetermined pressure greater than the preasure required to hydraulically extend a fracture in said formation at said zone; and

actuating said perforating means to form apertures in said casing means whereby the pressurized fracturing fluid at said predetermined pressure is allowed to flow into said formation under decompression forces to fracture said formation with a quantity of said fracturing fluid and to prop fractures in said formation open with said propant.

4,718,494

METHODS AND APPARATUS FOR SELECTIVELY CONTROLLING FLUID COMMUNICATION BETWEEN A PIPE STRING AND A WELL BORE ANNULUS

Dale E. Meek, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,700

Int. Cl.[4] E21B *34/08*

U.S. Cl. 166—373 **10 Claims**

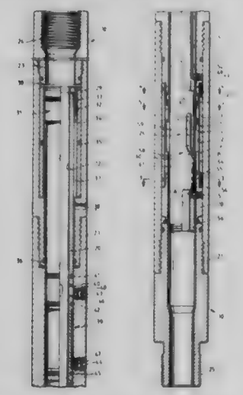
1. A method for selectively controlling communication between the fluids in a well bore and the fluids in a pipe string having a reversing valve connected thereto including a hous-

ing with upper and lower ports therein, and valve means operatively disposed in said housing for movement in an extended span of travel between upper and lower port-opening positions in response to successive changes in the direction of the pressure differential between said fluids and comprising the steps of:

providing stop means movable into a blocking position to first limit said valve means to movement back and forth in a restricted portion of said span of travel between upper and lower port-closing positions;

providing indexing means responsive to a predetermined number of said pressure differential changes for progressively moving said stop means away from said blocking position and thereby freeing said valve means to then move in said extended span of travel; repetitively changing the direction of said pressure differential between said fluids for progressively moving said stop means out of said blocking position to free said valve means to move in one direction along said extended span of travel to one of said port-opening positions; and

whenever said valve means move to said one port-opening position again changing the direction of said pressure differential between said fluids for selectively moving said valve means in the opposite direction along said extended span of travel to the other of said port-opening positions while said stop means are out of said blocking position.



6. Apparatus adapted to be coupled in a pipe string suspended in a well bore and comprising:

a tubular housing having upper and lower ports arranged therein communicating the interior and exterior of said housing;

valve means cooperatively arranged in said housing for moving longitudinally toward a first port-opening position in relation to one of said ports only in response to an increased pressure in said housing greater than the exterior pressure and for moving longitudinally toward a second port-opening position in relation to the other of said ports only in response to an increased exterior pressure greater than the interior pressure therein;

indexing means including a sleeve member rotatably arranged on said valve means, and ratchet-and-pawl means cooperatively arranged for incrementally advancing said sleeve member between multiple angularly-spaced positions around said valve means in response to said longitudinal movements of said valve means; and

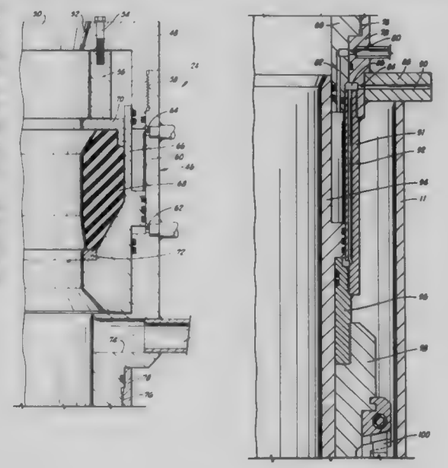
first and second stop means cooperatively arranged on said valve means and said sleeve member respectively for limiting movement of said valve means to a restricted travel span between upper and lower port-closing positions lying between said upper and lower ports and thereby blocking movement of said valve means beyond said restricted travel span to either of said port-opening positions until said sleeve member has been advanced to a predetermined one of its said angularly-spaced positions.

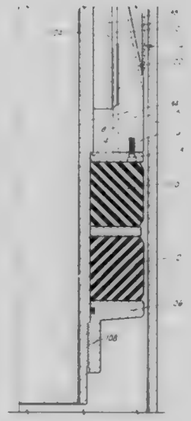
4,718,495

SURFACE PACKER AND METHOD FOR USING THE SAME

Eric P. Lubitz; David D. Szarka; Ernest E. Carter, Jr., and Robert L. Jessup, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 8, 1986, Ser. No. 861,767
Int. Cl.[4] E21B *33/03*
U.S. Cl. 166—387 42 Claims





15. A method for sealing a string of casing received in a well bore located beneath a drilling rig platform comprising the steps of:

lowering the string of casing into the bore until the casing extends from substantially the lower end of the bore to a point above the platform;

mounting a packer of the type which may be fluidically set on the upper end of said casing string, said step of mounting a packer comprises the steps of:

mounting said packer on the upper end of an elongate annular body;

lowering said body into the upper end of said casing string; and

anchoring said body to the upper end of said casing string; and

setting said packer.

25. Apparatus for sealing a well casing at the upper end thereof comprising:

an annular body having a lower end adapted for sealing connection to the upper end of said well casing;

a packer of the type which may be fluidically set mounted on the radially inner surface of said annular body, said packer including:

an elastomeric packer element; and

a setting piston adjacent said packer element for setting the same;

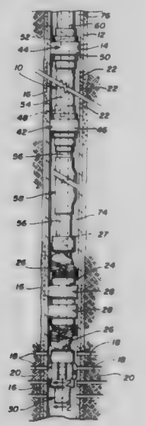
a slip bowl mounted on said body over said packer; and means for anchoring said body to said casing.

4,718,496

METHOD AND APPARATUS FOR THE COMPLETION OF AN OIL OR GAS WELL AND THE LIKE

Charles R. Tompkins, and Michael Pitts, both of Midland, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 5, 1987, Ser. No. 602
Int. Cl.[4] E21B *33/124, 33/129*
U.S. Cl. 166—387 10 Claims



1. Improved apparatus for isolating a damaged section of casing, isolating a formation, and pressure testing the apparatus while located in a cased well bore, said apparatus comprising:

a first packer assembly having a flow passageway therethrough sealingly engaging the casing for isolating the formation;

first valve means for closing the passageway through said first packer assembly during testing;

a second packer assembly sealingly engaging the casing and having a flow passageway therethrough;

first conduit means connecting said first and second packer assemblies with the flow passageways in communication;

second valve means located in said first conduit means for permitting flow from said first conduit means into an annular space defined by said first and second packer assemblies, said first conduit means, and said casing during pressure testing of the seals of said first and second packer assemblies;

a third packer assembly sealingly engaging the casing having a passageway therethrough and connected in spaced relationship to said second packer assembly with said passageways in communication, the distance between said second and third packer assemblies spanning said damaged section of casing for isolating said damaged section; and,

second conduit means connected to said third packer and extending upwardly through said well bore forming an annulus with said casing wherein pressure may be applied to pressure test the seal of said third packer assembly.

7. A method for isolating a damaged section of casing, isolating a formation, and pressure testing apparatus located in a cased well bore, the method comprising the steps of:

positioning apparatus in the cased well bore, the apparatus including a first valve located below a first packer, a second valve located in a first conduit between said first packer and a second packer, a third packer located above said second packer and connected in spaced relationship to said second packer by a distance greater than length of the damaged section of casing, and a second conduit connected to said third packer and extending to the surface, said apparatus being positioned with the second and third packers isolating the damaged section and with the first packer isolating the formation;

setting said first, second and third packers to form seals with said casing;

applying pressure in the annulus formed between the second conduit and casing to test the seal between said third packer and the casing;

closing said first valve;

opening said second valve; and,

applying pressure through said conduits to an annular space defined by said first and second packers, said casing, and said second conduit to test the seals between said first and second packers and said casing.

4,718,497

FIRE AND EXPLOSION DETECTION AND SUPPRESSION

Peter E. Moore, Reading, and Brian D. Powell, Maidenhead, both of England, assignors to Graviner Limited, Berkshire, England

Filed Nov. 25, 1986, Ser. No. 934,664
Claims priority, application United Kingdom, Dec. 20, 1985, 8531487
Int. Cl.[4] A62C *37/04*
U.S. Cl. 169—61 12 Claims

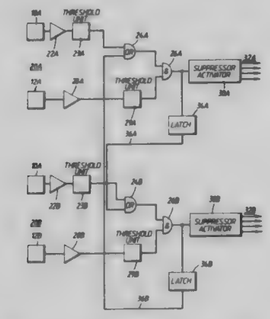
1. A fire and explosion detection and suppression system, comprising

a plurality of radiation sensors each producing an electrical signal in response to detection of at least a predetermined amount of a respective predetermined type of electromagnetic radiation,

alarm means having a normal mode of operation and a modified mode of operation and connected to receive the said

VOL 1086 ISS 2 JA 12 1988 UMI

electrical signals, the alarm means being operative in the said normal mode to produce a first alarm signal only in response to the receipt of said electrical signals from a predetermined selection of the sensors including at least one sensor responsive to a first said predetermined type of radiation and being operative in the said modified mode to produce a second alarm signal in response to the receipt of said electrical signals from a different predetermined selection of the sensors not including the said sensor responsive to the said first predetermined type of radiation, and



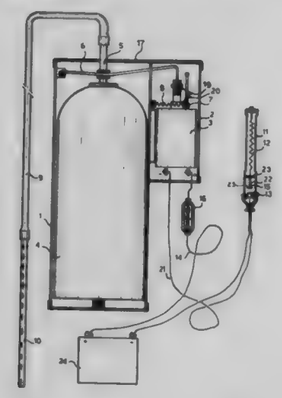
switching means operative to switch the alarm means from the normal to the modified mode in response to discharge into the vicinity of the said sensor responsive to the said first predetermined type of radiation of a fluid agent which attenuates radiation of the said first predetermined type.

4,718,498

AUTOMATIC TRIGGER MECHANISM FOR PORTABLE FIRE EXTINGUISHERS

Argiros Davios, Peloponneso 33, Petroupoli 132.31; Petros Davios, Markou Botsari, Petroupoli 132.31, and Emmanuel Makridakes, Emm.Xanoto 15, Petroupoli 132.31, all of Athens, Greece

Filed Aug. 18, 1986, Ser. No. 897,764
Claims priority, application Greece, Apr. 23, 1986, 861076
Int. Cl.[4] A62C *35/12*
U.S. Cl. 169—62 **7 Claims**



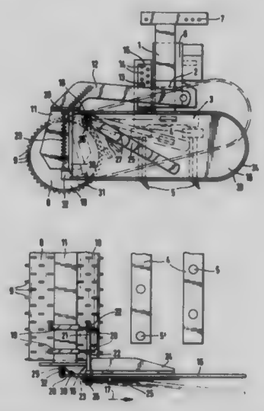
1. A device, comprising
a tank containing a fire extinguishing fluid,
a valve on said tank having a bracket connected thereto, for causing said fire extinguishing fluid to be released out of said tank via said valve when said bracket is moved,
an electromagnet having a solenoid connected to an end of said bracket, for moving said bracket and releasing said fire extinguishing fluid when current is supplied to said electromagnet, and
sensing means for detecting flames in the vicinity thereof, and for closing a circuit providing therewith for supplying said current to said electromagnet when said flames are detected by said sensing means,
wherein said sensing means comprises
a frame,
a first spring fastened at a first end thereof to a first end of said frame, said first spring extending when heated by said flames in the vicinity thereof, and
contact means for closing said circuit when said first spring is heated by said flames, including a pin connected at a second end of said first spring, and a second spring urging said pin to a position to close said circuit when said first spring extends due to said flames in the vicinity thereof.

4,718,499

TRACTOR-POWERED CULTIVATOR WITH SWINGABLE BAFFLES

Franz Grosse-Scharmann; Reinhard Higgen, both of Hude; Reinhard Gieseke, Oldenburg, and Bernd Gattermann, Hude, all of Fed. Rep. of Germany, assignors to Amazonen Werke H. Dreyer GmbH & Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Oct. 30, 1985, Ser. No. 792,951
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1964, 3440106
Int. Cl.[4] A01B *49/02*
U.S. Cl. 172—68 **18 Claims**



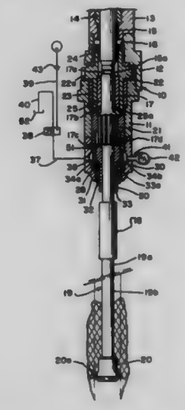
1. In a tractor-operated cultivator movable in a direction of travel and having powered cultivating tools, a trailing roller behind the cultivating tools in the direction of travel, vertically oriented baffles mounted on the trailing roller, extending at least approximately along the direction of travel, and positioned laterally next to outer ones of said cultivating tools in their operating positions to block the clods of earth thrown out to the side by the cultivating tools, means mounting each of the baffles for swinging movement around a pivot while retaining their vertical orientation, the improvement wherein the means mounting each of the baffles comprises a fastener including said pivot and connecting a rear portion of a respective one of the baffles with the trailing roller in the vicinity of the pivot and wherein the fastener includes another pivot that extends horizontally across the direction of travel to permit each of the baffles to yield horizontally and vertically, while retaining their vertical orientation.

4,718,500

REVERSIBLE PERCUSSION DEVICE FOR PERCUSSION TOOL

Masami Mori, Machida, Japan, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 3, 1986, Ser. No. 825,212
Int. Cl.[4] B25D *9/04*
U.S. Cl. 173—132 **8 Claims**



1. In a percussion tool having a housing, a main piston reciprocated within a main piston cylinder within said housing by fluid pressure, an anvil element exerted with a first impact thereon by the forward movement of said main piston, said anvil element being further exerted with a second impact on said anvil element in the direction opposite to that of the first impact, said second impact being produced by a reverse percussion device comprising a source of pressurized fluid for supplying pressurized fluid, a buffer chamber receiving said pressurized fluid, a reverse cylinder constituting a first portion of said buffer chamber and a secondary piston constituting a second portion of said buffer chamber in sliding relationship to said anvil element and to said reverse cylinder to allow the volume of said buffer chamber to be varied, said secondary piston having a surface limiting the axial displacement of said anvil element in response to expansion of said buffer chamber upon introduction of said pressure fluid into said buffer chamber whereby said anvil element impacts said secondary piston and is in turn impacted thereon by reaction of said secondary piston in reverse.

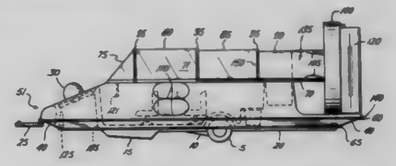
4,718,501

SELF-TRAILERING HOVERCRAFT

James R. Lawler, P.O. Box 36229, Houston, Tex. 77236

Filed Sep. 5, 1985, Ser. No. 773,372
Int. Cl.[4] B60V *1/04, 1/16*
U.S. Cl. 180—117 **7 Claims**

1. A vehicle propelled by pneumatic processes, comprising:
a hull having sides and a bow and a stern;
wheels mounted on said hull;
a skirt attached to said sides of said hull at two positions to form a U-shaped skirt forming a first chamber in the interior of said U-shape and a second chamber interior of the inner wall of said U-shaped skirt;
a deck mounted on said hull forming an upper,
substantially lateral surface on said bow and sides;
a cockpit formed in said deck;
a rear thrust engine mounted on said hull at the rear of said cockpit; and
a rear thrust propeller mounted on and driven by said rear engine wherein
said sides are sloped;



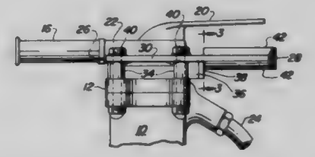
said skirt is formed of two mirror image pieces; and
said hull is round in shape at the bow and stern, identical profile on each side, and one each of said pieces of said U-shaped skirt extending from substantially the middle of said bow to the middle of said stern along one of said sides.

4,718,502

REPLACEMENT HANDLE FOR A JACKHAMMER

Lorenzo T. Garcez, 631 N. San Ignacio, San Antonio, Tex. 78228

Filed May 30, 1986, Ser. No. 868,465
Int. Cl.[4] B25D *17/04*; B25G *3/24*
U.S. Cl. 173—171 **7 Claims**



1. A replacement handle for substitution for a handle broken off from a flat top of a jackhammer, comprising a one-piece, Y-shaped element of rigid plate-like material having opposite flat faces lying respectively in parallel planes and having a leg and a pair of arms coplanar with the leg for overlying the flat top of a jackhammer, each arm having an aperture therethrough on an axis normal to the planes of the element faces for receiving fasteners engageable with the flat top of a jackhammer.

4,718,503

METHOD OF DRILLING A BOREHOLE

Robert B. Stewart, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 28, 1986, Ser. No. 901,119
Claims priority, application United Kingdom, Dec. 23, 1985, 8531627
Int. Cl.[4] E21B *21/12*
U.S. Cl. 175—70 **14 Claims**

1. A method of drilling a borehole using a drill bit coupled to a pipe string comprising a pair of concentric drill pipes with an annular space therebetween, the method comprising:
drilling a borehole section;
circulating a first low-viscosity drilling fluid through the interior of the inner drill pipe, the drill bit and the annular space between the pipes;
keeping a volume of a second fluid having properties dissimilar to the first low viscosity drilling fluid substantially stationary in a pipe/formation annulus between the outer pipe string and the borehole wall; and
displacing said first low-viscosity drilling fluid from the interior of the inner pipe and from the annular space

between the pipes upon cessation of drilling the bore hold section by circulating said second fluid therethrough until

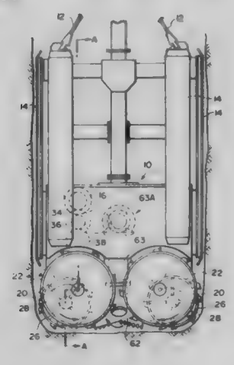


said interior and annular space are completely filled with said second fluid.

4,718,504
TRENCH EXCAVATOR

Tetomu Terashima, Meguro; Hiroyuki Kawasaki, Hachiouji, and Tadao Takahashi, Setagaya, all of Japan, assignors to Tone Boring Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 837,202
Claims priority, application Japan, Mar. 15, 1985, 60-52052; Mar. 28, 1985, 60-64314
Int. Cl.[4] E21B *4/02, 4/04*
U.S. Cl. 175—96 6 Claims

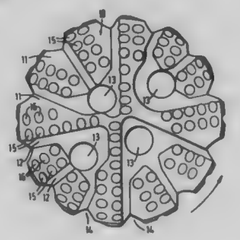


1. A trench excavator comprising:
a suspendable excavator body;
a driving source mounted in said excavator body;
a pair of drum cutters disposed coaxially in the lower portion of said excavator body at a predetermined distance from each other, each of said drum cutters having a horizontally-directed rotational axis;
a cylindrical ring cutter interposed between said pair of drum cutters and having an axis parallel to the rotational axes of said drum cutters, said ring cutter axis being located downwardly eccentrically with respect to said drum cutters axes; and
a power transmission mechanism for transmitting power from said driving source by means of a space formed between the upper opposing faces of said pair of drum cutters, wherein said pair of drum cutters and said ring cutter interposed therebetween form one unit and a plurality of such units are arranged parallel to one another in the lower portion of said excavator body, and that within a space formed between said units there is provided a reverse shaft and on both sides of said reverse shaft there are provided a pair of bit shafts each having a bit in the lower portion thereof.

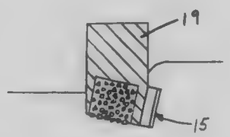
4,718,505
ROTARY DRILL BITS

John Fuller, Penzance, England, assignor to NL Petroleum Products Limited, Gloucestershire, England

Filed Jul. 12, 1985, Ser. No. 754,506
Claims priority, application United Kingdom, Jul. 19, 1984, 8418481
Int. Cl.[4] E21B *10/52*
U.S. Cl. 175—329 18 Claims





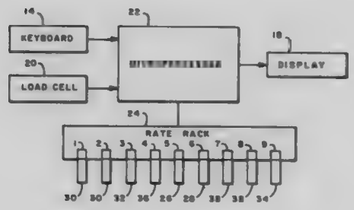


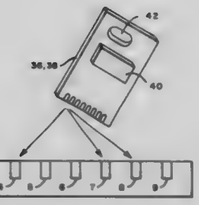
1. A rotary drill bit for use in drilling or coring holes in subsurface formations comprising a bit body having a shank for connection to a drill string, a plurality of cutting elements mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit body for cooling and/or cleaning of the cutting elements, at least some of the cutting elements each comprising a preform cutting element having a superhard front cutting face, there being spaced from but associated with at least certain of said cutting elements, with respect to the normal direction of rotation of the bit, respective abrasion elements, each of said abrasion elements comprising a plurality of particles of superhard material embedded in a respective, elongate, stud-like carrier element having one end wholly enclosed within a socket in the bit body in such spaced relation to the respective cutting element, and the other end protruding freely from the bit body transverse to the normal direction of rotation of the bit.

4,718,506
PROM CARD ARRANGEMENT FOR POSTAL/SHIPPING SCALE

Karen F. Hills, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 31, 1987, Ser. No. 33,123
Int. Cl.[4] G01G *23/22, 19/413*
U.S. Cl. 177—25 10 Claims



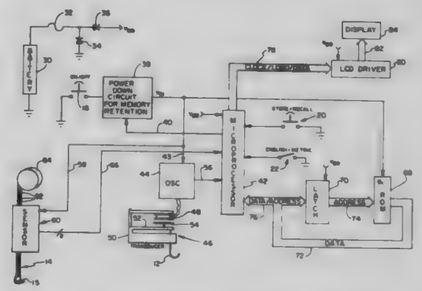


1. In combination with a scale having:
means for sensing the weight of an article;
a rate rack having slots for electrically and physically receiving PROM boards; and
calculating means, responsive to look-up tables on PROM boards inserted into the slots, for calculating a shipping charge for the article based on the sensed weight of the article, a selected destination zip code or shipping zone for the article, a selected carrier for the article, and a selected shipping point for the article;
apparatus for providing a selection of shipping point look-up tables and carrier look-up tables to the calculating means comprising:
a number of PROM boards, each containing a look-up table indicative of zip-to-zone conversion for a remote drop ship point, and each having a distinguishing characteristic identifying the PROM board as a DS-PROM board; and
a number of PROM boards, each containing a look-up table indicative of shipping rates for an alternate carrier, and each having a distinguishing characteristic identifying the PROM board as an AC-PROM board.
means, associated with the calculating means, for determining whether a PROM board inserted into a particular slot is a DS-PROM board or an AC-PROM board based on the distinguishing characteristic of the PROM board inserted into the slot, and for providing an indication of the determination to the calculating means.

4,718,507
ELECTRONIC SCALE AND LENGTH MEASUREMENT APPARATUS INCLUDING A DIGITAL READOUT

Clyde W. Howlett, 544 S. Hebron, Evansville, Ind. 47715, and David E. Mitchell, Poseyville, Ind., assignors to Clyde W. Howlett, Evansville, Ind.

Filed Sep. 4, 1986, Ser. No. 903,596
Int. Cl.[4] G01G *3/14, 3/08*
U.S. Cl. 177—210 FP 6 Claims

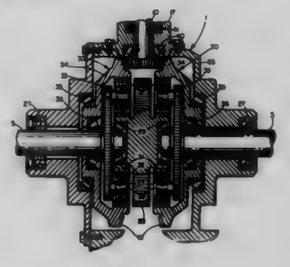


1. An electronic weighing scale including calibration means comprising:
means for supporting an object to be weighted;
deflecting means operatively associated with said supporting means for statically deflecting a distance which is proportional to the weight of the supported object;
an electrical coil mounted in proximity to said deflecting means;
electrical circuit means connected to said coil and operative for providing an oscillating electrical signal whose frequency varies as a function of the static deflection of said deflecting means; and
calibration means operatively associated with said coil means and movable relative thereto for varying said oscillating electrical signal frequency as a function of the position of said calibration means relative to said coil.

4,718,508
DRIVING AND STEERING SYSTEM

Pentti J. Tervola, 3663 Lakewood Rd., Lake Worth, Fla. 33461

Filed Feb. 20, 1986, Ser. No. 831,429
Int. Cl.[4] B62D *11/14*
U.S. Cl. 180—6.44 8 Claims



1. A driving and steering system for a vehicle having at least two propelling means comprising a housing between said propelling means; coaxial output shafts rotatably supported by said housing for driving the respective propelling means; a power-driven member coaxially between said output shafts and rotatably supported by the latter; a pair of planetary gear sets in said housing coaxial with and straddling said power-

driven member; each planetary gear set comprising a ring gear element rotatably supported in said housing, a sun gear element, and a planet gear-carrier element having planet gears meshing with both said ring gear and sun gear elements; said planetary gear sets having the same one of said sun gear and planet gear-carrier elements in driving engagement with said power-driven member, and having the other one of said sun gear and planet gear-carrier elements in driving engagement with the respective output shafts; and a steering shaft rotatably supported by said housing and operatively connected to said ring gear elements to retain said ring gear elements against rotation for straight line propulsion of the vehicle and to rotate said ring gear elements in opposite directions thereby to correspondingly increase and decrease the speeds of said output shafts and propelling means for turning of the vehicle; each output shaft being rotatably supported by axially spaced apart bearing means between said shaft and said housing, between said shaft and said ring gear element, and between said ring gear element and said housing.

4,718,509

MULTI-AXLE VEHICLE WITH SINGLE WHEEL DRIVES

Friedrich Ehrlinger, and Manfred Goeft, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

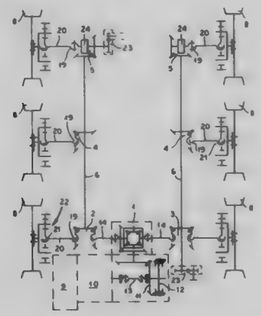
PCT No. PCT/EP84/00412, § 371 Date Sep. 30, 1985, § 102(e) Date Sep. 30, 1985, PCT Pub. No. WO85/03042, PCT Pub. Date Jul. 18, 1985

PCT Filed Dec. 19, 1984, Ser. No. 777,788

Claims priority, application Luxembourg, Jan. 13, 1984, PCT/EP84/00008

Int. Cl.⁴ B62D *61/10*

U.S. Cl. 180—24.08 **9 Claims**



1. A multi-axle vehicle, comprising:

a plurality of driven wheels spaced apart along opposite sides of a vehicle chassis and provided with respective wheel drives adjacent the respective wheels;

a respective drive train extending along each of said opposite sides and including a respective distribution drive spaced from but proximal to the respective wheel drive;

a central drive operatively connected to both of said drive trains for driving same;

a respective shaft connecting an output gear of each of said distribution drives with an input gear of a respective wheel drive; and

articulation means interposed between each of said shafts and the respective distribution drive, each of said distribution drives comprising:

a housing enclosing the respective said output gear,

a respective collar connected to the respective said output gear in the respective housing and having a length by which the respective collar projects from said housing, and

a respective bearing on said length of each of said collars journaling the respective collar on the respective housing, each of said articulation including:

a respective pivot between an end of the respective shaft extending through a respective one of said collars and the respective collar located inwardly of the respective said bearing and the respective collar within the respective house, each of said end of the respective shaft extending through the respective collar and the respective gear to the respective pivot, each said collar surrounding the respective shaft with clearance at an end of each collar remote from the respective pivot to permit angular excursion of each shaft relative to the respective housing and collar of the respective pivot.

4,718,510

MOTOR VEHICLE WITH IMPROVED COUPLING STRUCTURE FOR SPEEDOMETER CABLE

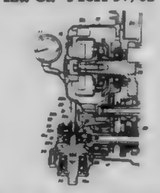
Katsuhiko Ito, and Toshio Tsuchiya, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,427

Claims priority, application Japan, May 31, 1985, 60-118387; May 31, 1985, 60-118388

Int. Cl.⁴ F16H *37/02*

U.S. Cl. 180—54.1 **7 Claims**



1. A motor vehicle with a coupling structure for a speedometer, comprising:

at least one steerable wheel, at least one drive wheel;

a frame supporting said steerable and drive wheels;

a power unit assembly mounted on said frame between said steerable and drive wheels, said power unit assembly including a crankcase, a gear transmission case connected to said crankcase, and a gear case attached to one side wall of said gear transmission case;

a speedometer supported on a front portion of said frame;

a crankshaft rotatably disposed in said crankcase;

an output shaft rotatably disposed in said gear transmission case;

a pair of bevel gears meshing with each other and rotatably mounted in said gear case, one of said bevel gears being operatively coupled to said output shaft;

a propeller shaft connected between the other of said bevel gears and said drive wheel; and

a speedometer cable having one end operatively coupled to said other bevel gear through a connecting shaft and the opposite end operatively coupled to said speedometer said connecting shaft extending axially of said other bevel gear.

Patent Not Issued For This Number
4,718,511

4,718,512

INSTRUMENT PANEL

Takumi Miyazaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

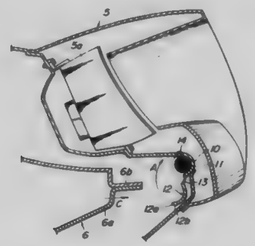
Filed Sep. 23, 1981, Ser. No. 304,897

Claims priority, application Japan, Sep. 29, 1980, 55-134223

Int. Cl.⁴ B60K *37/00*

U.S. Cl. 180—90 **1 Claim**

1. An instrument panel with a flexible harness arranged adjacent thereto at a location in opposition to a vehicle body and the like, said instrument panel comprising a clip panel covering said harness in its operative position, said clip panel made of a panel which is long in a lengthwise direction of the harness and short in a direction perpendicular to said lengthwise direction and is arcuately curved along its longitudinal axis to conform to the outer configuration of said harness, said clip panel having on one longitudinal side thereof a series of thin hinges arranged side by side in the lengthwise direction and permanently secured to the instrument panel for enabling said clip panel to move to an operative position for engagement



with said harness, said clip panel having on another longitudinal side latches having catch means disposed along said another side for holding the clip panel in an operative position, said instrument panel further being formed with latch apertures adapted to receive said latches to engage said catch means.

4,718,513

WHEEL DRIVEN AIR CUSHION VEHICLE

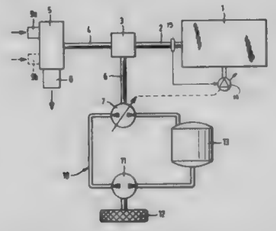
Seppo Korppoo, Espoo, and Martin Landtman, Helsinki, both of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Continuation-in-part of Ser. No. 539,752, Oct. 6, 1983, abandoned. This application Feb. 12, 1986, Ser. No. 828,858

Claims priority, application Finland, Oct. 19, 1982, 823577

Int. Cl.⁴ B60V *3/02*

U.S. Cl. 180—119 **8 Claims**



7. An air cushion vehicle comprising a main engine, fuel supply control means for controlling the rate of supply of fuel to the main engine, tachometer means for detecting the speed of operation of the engine, said tachometer means being connected to the fuel supply control means for controlling the rate supply of fuel to the main engine so as to maintain constant the speed of operation of the engine, a fan device with at least one through flow duct for pressurizing air in an air cushion for supporting said vehicle, a traction wheel device for propulsion of said vehicle, a hydraulic drive system for driving the traction wheel device, power transmission means connecting said main engine to drive said fan device and said hydraulic drive system at respective constant transmission ratios, whereby power is simultaneously transmitted from the main engine to both said fan device and said traction wheel device, and the vehicle further comprising two power consumption adjustment devices for altering the power consumption characteristics of said fan device and said hydraulic drive system respectively, the power consumption adjustment device of one of said fan device and said hydraulic drive system being connected to said fuel supply control means so that when the power consumption characteristic of the other of said fan device and said hydraulic drive system is altered the ratio of power distribution from the main engine to said fan device and said hydraulic drive system is regulated.

4,718,514

STEERING FORCE CONTROL DEVICE FOR POWER STEERING APPARATUS

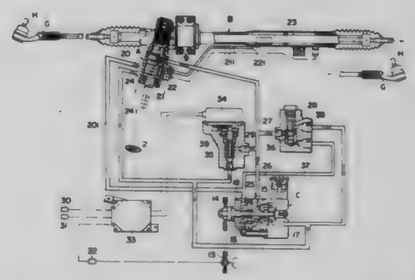
Shuzo Hirakushi, Nara, Japan, assignor to Koyo Seiko Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,635

Claims priority, application Japan, Sep. 9, 1985, 60-197804

Int. Cl.⁴ B62D *5/08*

U.S. Cl. 180—142 **30 Claims**



1. A steering force control device for a power steering apparatus, having a hydraulic pressure reaction chamber provided inside a main valve for controlling a relative torsional angle between an input shaft connected to a steering wheel and an output shaft connected to the power steering apparatus in response to a fluid pressure applied to the hydraulic pressure reaction chamber so as to apply a hydraulic reaction to the steering wheel, the steering force control device comprising:

a main pump driven by an engine of a vehicle to feed a first pressurized fluid to said power steering apparatus through said main valve;

a sub-pump driven by the engine of the vehicle to supply a second pressurized fluid separately from the first pressurized fluid to the hydraulic pressure reaction chamber within said main valve;

a first oil passage connected between a discharge opening of said main pump and said main valve to transfer said first pressurized fluid from the main pump to the main valve;

second and third oil passages for reciprocatingly transporting said first pressurized fluid between said main valve and said power steering apparatus to power-assist in driving the power steering apparatus;

a fourth oil passage for circulating said first fluid, which has been transported from said power steering apparatus to said main valve, to a tank which receives said first fluid from said main valve;

a fifth oil passage for supplying said second pressurized fluid from a discharge opening of said sub-pump to the hydraulic pressure reaction chamber within said main valve;

first and second branch passages which are branched from said fifth oil passage to circulate said second fluid to said tank;

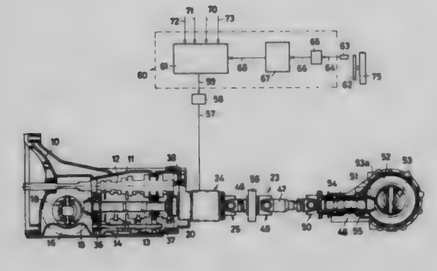
first throttle means installed in said first branch passage and actuated by a hydraulic circuit pressure of the first pressurized fluid fed from said main pump to said main valve for controlling the pressure of said second fluid applied to the hydraulic pressure reaction chamber;

a third branch passage connected between said first throttle means and the discharge opening of the main pump to transmit said hydraulic circuit pressure of the first pressurized fluid to said first throttle means; and

second throttle means installed in said second branch passage and actuated in response to the speed of the vehicle

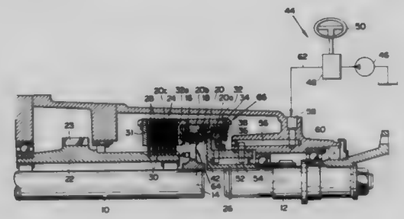
and the steering angle thereof to control the pressure of said second fluid applied to the hydraulic pressure reaction chamber.

4,718,515
CONTROL DEVICE FOR A VEHICLE WITH DISENGAGEABLE FOUR-WHEEL DRIVE
Cristoforo Fanti, Milan; Gianclaudio Travaglio, Arese; Luciano Ferrario, Rho, and Saverio Moscatelli, Milan, all of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy
Filed Aug. 4, 1986, Ser. No. 892,366
Claims priority, application Italy, Aug. 6, 1985, 21872 A/85
Int. Cl.⁴ B60K *23/08, 17/34*
U.S. Cl. 180—233 **6 Claims**



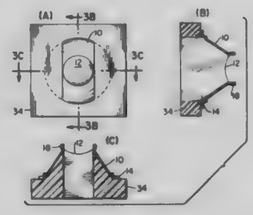
1. A control device particularly for a four-wheel drive vehicle in which one wheel group is always engaged, the output shaft of the change-speed gearbox being connected permanently to the differential of said one wheel group and being connectable selectively to the differential of the other wheel group by separable connection means and actuator means, said control device comprising vahicle speed sensor means operationally connected to a control unit comprising comparator means arranged to compare the vehicle speed signal with predetermined limiting values to establish whether they are greater or less than said limiting values and to provide signals indicative of the results of the comparison, said control unit being operationally connected to said actuator means, said control device also comprising means for sensing the position of the accelerator pedal, said comparator means being also able to compare the accelerator pedal position signal with a predetermined limiting value to establish whether it is greater or less than said limiting value and to provide signals indicative of the comparison, said control unit also comprising logical operation means in cooperation with said comparator means and responsive to said signals is able to feed to said actuator means first signals for causing said connection means to disconnect the differential of said other wheel group from the change-speed gearbox output shaft should the speed be less than and the accelerator pedal position be less than the respective limiting values, and second signals for causing said connection means to connect said differential of said other wheel group with the change-speed gearbox output shaft should the speed be less than and the accelerator pedal position exceed the respective limiting value, or should the speed alone be greater than the respective predetermined limit.

4,718,516
FOUR WHEEL DRIVE UNIT
Kiyotaka Ozaki, Yokosuka, and Shuuji Torii, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 14, 1985, Ser. No. 797,927
Claims priority, application Japan, Nov. 17, 1984, 59-242687
Int. Cl.⁴ B60K *17/34;* **F16D** *43/21*
U.S. Cl. 180—233 **9 Claims**



1. A four wheel drive unit for an engine-powered road vehicle, comprising:
an input shaft supplied with engine power;
a first output shaft drivingly connected to said input shaft and a first pair of road wheels for constantly transmitting engine power from said input shaft to said first pair of road wheels;
a second output shaft drivingly connected to a second pair of road wheels;
a friction clutch interposed between said input shaft and said second output shaft for variably transmitting engine power from said input shaft to said second pair of road wheels;
clutch engaging means for engaging said clutch with an increasing force as output torque of said first output shaft increases and thereby increasing engine power transmitted from said input shaft to said second output shaft; and
clutch disengaging means for disengaging said clutch with an increasing force as steering effort of the vehicle increases and thereby reducing engine power transmitted from said input shaft to said second output shaft.

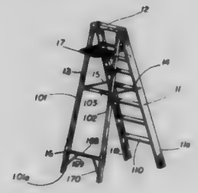
4,718,517
LOUDSPEAKER AND ACOUSTIC TRANSFORMER THEREFOR
David E. Carlson, Niles, Mich., assignor to Electro-Voice, Inc., Buchanan, Mich.
Filed Feb. 27, 1986, Ser. No. 834,311
Int. Cl.⁴ G10K *13/00;* **H04R** *7/00*
U.S. Cl. 181—159 **13 Claims**



1. A speaker system comprising a substantially frusto-conical diaphragm having a hollow space in front of said diaphragm, a predetermined diameter, and an open face, and means for inhibiting the effect of an acoustic concentric standing wave pattern in the space in front of said diaphragm, said means

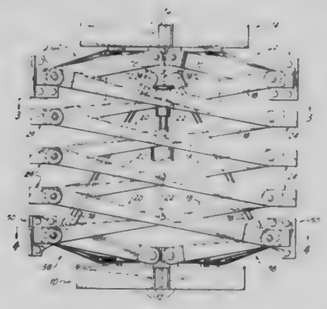
comprising a substantially solid phase plug structure spaced closely to said diaphragm in non-touching relationship, and largely filling the volume of the hollow space associated with said diaphragm, said plug including a centrally located open slot for defining a substantially rectangular aperture leading away from the open face of said diaphragm to the frontmost portion of said phase plug.

4,718,518
STEP LADDER
William E. Brown, 3228 South St., Hollywood, Fla. 33021
Filed Nov. 17, 1986, Ser. No. 931,350
Int. Cl.⁴ E06C *7/42, 7/50*
U.S. Cl. 182—22 **1 Claim**



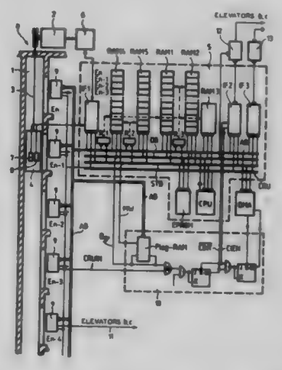
1. A convertible step ladder having a back section (13) comprising a pair of rails (101, 102) in combination with a detachable section (16); said detachable section comprising leg portion (160, 161) and an upper portion comprising a horizontal cross member (168) spanning a pair of channel means (162, 163) having first orifices (162*a*, 163*a*) and bolts (166, 167); said rails (101, 102) seating in said channel means on said cross member and having second orifices (102*b*) registering with orifices (162*a*, 163*a*); said channels being locked together by insertion of bolts (166, 167) into the corresponding orifices; said ladder being so characterized that when said detachable section is removed the back section is shorter than the front section and can rest on a higher step on a flight of stairs than the front section and yet be level.

4,718,519
HIGH LIFT SCISSOR JACK
Sidney L. Barker, 4301 Hudson La., Tampa, Fla. 33624
Filed Oct. 21, 1985, Ser. No. 788,778
Int. Cl.⁴ B66B *11/04*
U.S. Cl. 187—18 **12 Claims**



1. A high lift scissors jack comprising:
a support base;
a platform support;
a plurality of sets of scissor members;
each of said sets of scissor members having a plurality of pairs of lever arms;
each of said pairs of lever arms pivotally connected at their centers;
a plurality of connectors;
each of said connectors having two pivots spaced from each other at a fixed angle;
each of said connector pivots supported on adjacent sides by a shoulder;
said lever arms of each of said pairs having respective ends connected to one of said connector pivots, and the other of said connector pivots being connected to an end of a lever arm in an adjacent set of scissor members;
a first transition assembly connecting said support base to the bottom of each of said sets of scissor members, said first transition assembly comprising
a pivoted strut for each intersection of adjacent sets of scissor members pivotally mounted to said support base with two spaced pivots, and a transition connector for each intersection of adjacent sets of scissor members having three pivots spaced from each other at fixed angles,
each of said pivots supported on each side by a shoulder,
each of the two outer pivots of said three pivots serving as the connector pivot for the lowest lever of one of the adjacent sets of scissor members, and
the center pivot of said three pivots connected to said strut for the intersection of adjacent sets of scissor members;
a second transition assembly connecting said platform to the top of each of said sets of scissor members; and
means for extending and retracting said sets of scissor members.

4,718,520
GROUP CONTROL FOR ELEVATORS
Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland
Filed Apr. 8, 1987, Ser. No. 36,666
Claims priority, application Switzerland, Apr. 11, 1986, 01440/86
Int. Cl.⁴ B66B *1/18*
U.S. Cl. 187—127 **7 Claims**



1. In a group control for elevators with call registering devices at each floor and load measuring devices provided in the cars of the elevator group, with selectors assigned to every elevator of the group indicating in each case the floor of a possible stop, with a scanning device having at least one position for every floor, and with a control device, by means of which the calls entered at the floors are assigned to the cars of the elevator group, where the control device per elevator includes a computing device, a floor call memory and a car call memory, and where the computing device at every position of a first scanner of the scanning device calculates the servicing

costs K corresponding to the waiting times of the passengers according to the equation

$$K=t_v(P_M+k_1\cdot R_E-k_2\cdot R_C)+k_1[m\cdot t_m+t_v(R_E+R_C\cdot -R_{EC}+Z)]$$

where $t_v(P_M+k_1\cdot R_E-k_2\cdot R_C)$ is the internal servicing cost K_I and $k_1[m\cdot t_m+t_v(R_E+R_C-R_{EC}+Z]$ is the external servicing cost K_A and further including a cost memory for storing the servicing costs K, a pair of cost share memories for storing the internal and external servicing costs K_I and K_A respectively, a cost comparison device for determining the car with the lowest servicing costs K at every position of a second scanner of the scanning device and an assignment memory, where an assignment instruction for a floor call of the respective scanner position can be written into the assignment memory of the car exhibiting the lowest servicing costs K, the improvement comprising:

a call registering device having call buttons in the form of a ten key keyboard and a plurality of call memories corresponding to the number of floors to be served for storing calls for desired destination floors entered in response to actuation of said call buttons;

said call memories being connected with a floor call memory and a car call memory where in response to the presence of at least one call in said floor call memory, registered by said call registering device, a call is stored for the floor specified by said call registering device;

said car call memory including a first memory containing assigned car calls and further memories for storing the car calls which are entered at the respective floors for desired destination floors, but not yet assigned to a car, which car calls are considered in the calculation of the servicing costs K of the scanner position assignment to the respective floor; and

said first memory, said further memories, said floor call memory and said assignment memory are connected by means of a coincidence circuit whereby on assignment of a floor call, the car calls stored in said further memories are transferred into said first memory.

4,718,521

BICYCLE CALIPER BRAKE ASSEMBLY

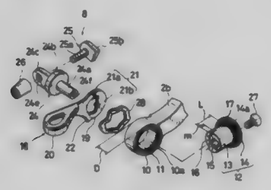
Mikio Hosokawa, Fukui, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Dec. 19, 1986, Ser. No. 943,427

Claims priority, application Japan, Dec. 19, 1985, 60-195980[U]

Int. Cl.⁴ F16D *65/48*; B60L *1/12*

U.S. Cl. 188—24.19 **8 Claims**



1. A bicycle caliper brake assembly comprising:

first and second calipers each pivotally supported by a support shaft,

said calipers respectively having shoe support portions which support a pair of brake shoes on both sides of a bicycle wheel rim and which are always biased away from each other,

said second caliper having a connecting portion connected to an outer cable of a double type control cable,

said first caliper having a connecting portion provided with a boss,

a rotary member rotatably fitted in said boss and axially movable in said boss within a limited range,

a pivotal adjusting lever for rotating said rotary member within a limited range,

a cable retainer which is mounted eccentrically on said rotary member for connection to an inner cable of said control cable and which is displaced between a lower dead point and an upper dead point when said rotary member is rotated by said lever,

said boss being formed at one end thereof with a first annular row of teeth,

said rotary member being formed with a second annular row of teeth which is engageable with and disengageable from said first row of teeth in response to axial movement of said rotary member, and

elastic means for urging said rotary member to bring said second row of teeth into engagement with said first row of teeth.

4,718,522

AUTOMATIC ADJUSTMENT APPARATUS FOR A VEHICLE BRAKE LEVER OF A BRAKE

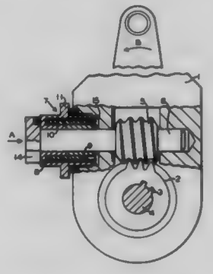
Josef Franis, Hanover, and Jorg Vanselow, Ronnenberg, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,734

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533686

Int. Cl.⁴ F16D *51/00, 65/38*

U.S. Cl. 188—79.5 K **8 Claims**



1. An automatic adjustment apparatus for adjusting a braker lever of a brake positioned on a road vehicle, said automatic adjustment apparatus comprising:

(a) a brake lever positioned for pivotal movement around a longitudinal axis of a brake shaft;

(b) a worm shaft positioned substantially in said brake lever;

(c) a worm gear wheel closable in a force-tight manner with said brake shaft and engaged with said worm shaft;

(d) a one-way coupling including a wrap spring positioned around a longitudinal axis of said worm shaft which in a closing direction can transmit a drive movement of a drive apparatus to said worm shaft in a brake adjustment direction; and

(e) a ratchet means positioned between a portion of said wrap spring of said one-way coupling and said brake lever for preventing a torsional motion of said wrap spring around said longitudinal axis of said worm shaft in one direction, said ratchet means including;

(i) a toothed ratchet having a ratchet wheel positioned around said longitudinal axis of said worm shaft and connected rotationally with said brake lever; and

(ii) a ratchet lever formed by a protruding winding of said wrap spring facing said ratchet wheel.

4,718,523

MAGNET BODY FOR ENGINE BRAKES

Schneider, Rudolf, Meckenbeuren, and Siegfried Winkelmann, Tettnang, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

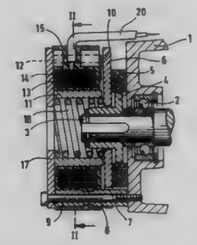
PCT No. PCT/DE86/00051, § 371 Date Oct. 17, 1986, § 102(e) Date Oct. 17, 1986, PCT Pub. No. WO86/05027, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 13, 1986, Ser. No. 931,749

Claims priority, application PCT Int'l Appn., Feb. 20, 1985, PCT/EP85/00053

Int. Cl.⁴ F16D *59/02*; H01F *7/16*; H02K *7/102*

U.S. Cl. 188—161 **9 Claims**



1. A magnet body (11, 12, 13, 17) for engine brakes which is secured to an engine flange (1) by means of bolts (9) that non-rotationally hold an axially movable armature disk (6) through which projects a shaft end (3) on which is held a brake flange (4) with friction bodies (5), wherein said magnet body (11, 12, 13, 17), having an iron U cross section toward said armature disk (6) contains a winding (13) excitable by means of direct current and surrounded by a plastic shell (14), characterized in that said U cross section of said magnet body (11, 12, 13, 17) consists of circularly arranged individual cross sections and is formed by several side leg portions (11, 12, 17) held spaced apart by spoke-like arranged spaces, and which consist of iron molded parts fixed in place with respect to each other and to said winding (13) by said plastic shell (14) that fills the spaces.

4,718,524

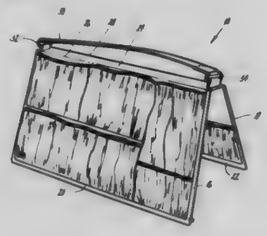
ORGANIZER FOR PERSONAL SUNDRY ITEMS

Anita B. Crumley, 10108 Canton Center, Plymouth, Mich. 48170

Filed Apr. 3, 1987, Ser. No. 33,726

Int. Cl.⁴ B65D *30/22*

U.S. Cl. 190—110 **3 Claims**



1. An organizer, comprising:

first and second similarly shaped panels having inner edges pivotally connected about a hinge section having a pair of spaced fold lines such that the first and second panels are foldable between a first position in which the first panel is disposed adjacent to and substantially parallel to the second panel, a fully open position in which the first panel and the second panel are disposed in a common plane, and a partially folded position in which the first panel is disposed at an angle with respect to the second panel so as to be self-supporting when the outer edges of the two panels are disposed on a supporting surface;

strap means connected between the outer edges of first and second panels to prevent spreading thereof in said partially folded position; and

first pocket means disposed on opposite sides of the first panel, and second pocket means disposed on opposite sides of the second panel.

4,718,525

SYSTEM FOR CONTROLLING START CLUTCH OF AUTOMATIC TRANSMISSION

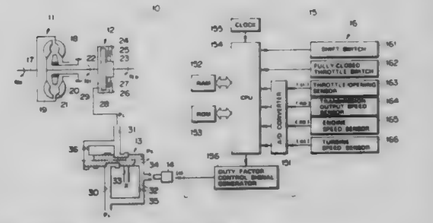
Hiroshi Yamaguchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1986, Ser. No. 848,481

Claims priority, application Japan, Apr. 6, 1985, 60-73207; Apr. 11, 1985, 60-77118; Apr. 30, 1985, 60-92432

Int. Cl.⁴ B60K *41/28*; F16D *43/28*

U.S. Cl. 192—0.052 **16 Claims**



1. A control system, comprising:

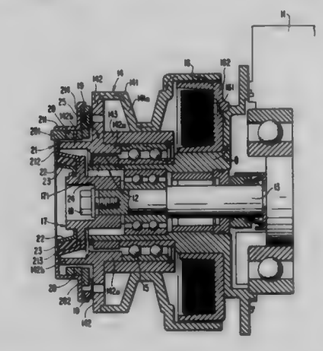
a vehicular automatic transmission for transmitting power from an engine to wheels of a vehicle, said transmission having at least a start clutch which is engaged by fluid pressure,

actuator means for varying an engagement force of the start clutch by varying the fluid pressure, said actuator means having a first position for increasing the fluid pressure to engage the start clutch and a second position for decreasing the fluid pressure to disengage the start clutch, said actuator being moved between said first and second positions in response to a control signal having a variable duty factor such that, as the duty factor increases, the actuator remains longer in the first position,

sensor means responsive to a position of an accelerator member of said engine for producing a start signal representing a start of the vehicle when said accelerator member moves away from an idle position, and

controller means connected with said sensor means for controlling the fluid pressure supplied to the start clutch by varying said duty factor of said control signal upon receipt of said start signal so that said duty factor of said control signal increases immediately from a low disengage value to a transient high value to increase said fluid pressure, then falls from said transient high value to a transient low value to decrease said fluid pressure, and finally increases gradually and continuously from said transient low value to a high engage value to gradually increase said fluid pressure.

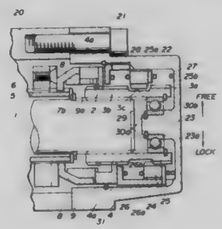
4,718,526
ELECTROMAGNETIC SPRING WOUND CLUTCH FOR A REFRIGERANT COMPRESSOR
Takatoshi Koitabashi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Sep. 5, 1984, Ser. No. 647,382
Claims priority, application Japan, Sep. 5, 1983, 58-137669[U]
Int. Cl.[4] F16D *3/12, 27/10*
U.S. Cl. 192—35 5 Claims



1. In an electromagnetic spring-wound clutch comprising a first rotatable member having an axial end plate formed of magnetic material, a second rotatable member and an armature plate coaxially disposed with respect to said first rotatable member, said armature plate being coupled to said second rotatable member and frictionally engageable with said first rotatable member, a coil-wound spring positioned around said second rotatable member and connected at one end to said armature plate, a cover plate connected to the second end of said coil-wound spring and having a cylindrical portion to cover the outer peripheral surface of said coil-wound spring, an electromagnetic device associated with said first rotatable member to attract said armature plate to the axial end plate of said first rotatable member, the improvement comprising said cover plate having a polygonal-shaped bent portion at its inner end; said second rotatable member having a corresponding polygonal-shaped member facing said polygonal-shaped bent portion of said cover plate at a predetermined gap; and an elastic member placed between said polygonal-shaped bent portion of said cover plate and said corresponding polygonal-shaped member of said second rotatable member in the predetermined gap to absorb the impact force generated upon engagement of said armsture plate with said first rotatable member.

4,718,527
HUB CLUTCH
Sakuo Kurihara, Tochigi, Japan, assignor to Tochigi-Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan
Filed Jan. 22, 1986, Ser. No. 821,551
Claims priority, application Japan, Jan. 23, 1985, 60-7894[U]; Feb. 18, 1985, 60-21448[U]; May 11, 1985, 60-69821[U]
Int. Cl.[4] F16D *1/06, 43/20*
U.S. Cl. 192—54 4 Claims

1. A hub clutch for selectively transmitting torque between an axle shaft extending in an axial direction and a wheel hub, said hub clutch comprising:
a cylindrical casing secured to the wheel hub and having a spline extending along an inner surface thereof;
a driving gear fixed to an end of the axial shaft within said casing, said driving gear having splines extending along an outer surface thereof;
a first cam means in splined engagement with said driving gear and movable therealong in said axial direction, said first cam means having cam portions projecting toward an inner side of the hub clutch;
a second non-rotatable cam adjacent said first cam and cooperating therewith, said second cam having a second cam grooved portion engaging said cam portions of said first cam means;
a rotatable cam ring in a frictional braking relationship with said second cam and engaging said cam portions of said first cam means,
said cam ring comprising a cam ring grooved portion, second cam portions and stoppers opposite from one another with respect to said cam ring grooved portion;
a clutch ring movable in said axial direction between a first clutched position adjacent an outer side of the hub clutch at which the clutch ring operatively connects the splines of said driving gear and the spline of said casing for transmitting torque between the axle shaft to which said driving gear is fixed and the wheel hub to which said casing is fixed and a second unclutched position at which the clutch ring does not transmit torque between the axle shaft and the wheel hub;
a shift spring for urging said clutch ring toward said clutched position in said axial direction; and

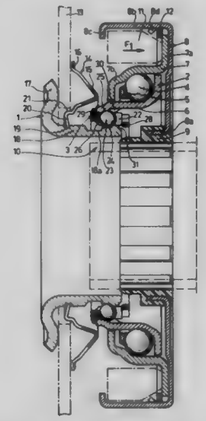


a return spring for urging said clutch ring toward said unclutched position and for urging said cam ring and said second cam together to maintain said frictional braking relationship,
the projecting cam portions of said first cam means extending in said second cam grooved portion and in said cam ring grooved portion when said cam ring is in said unclutched position and, when the axle shaft is rotated, said projecting cam portions of said first cam means being urged in said axial direction toward said outer side of the hub clutch by said respective grooved portions whereupon said projecting cam portions follow said second cam portions of said second cam and said first cam means is urged thereby further toward said outer side of the hub clutch for urging said clutch ring toward said clutch position which it attains under the influence of said shift spring and during which said cam ring is maintained in a non-rotatable state relative to said second cam by the frictional braking relationship established therebetween and maintained by said return spring, whereat said first cam portions abut said stoppers and further displacement of said first cam means and said clutch ring toward the outer side of the hub clutch is terminated.

4,718,528
TRACTION-TYPE CLUTCH BEARING DEVICE
Fabrice Caron, Montigny le Bretonneux, and Eric Loizeau, Clamart, both of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France
Filed Jan. 27, 1986, Ser. No. 822,495
Claims priority, application France, Jan. 28, 1985, 8501138
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 20 Claims

1. A traction-type clutch thrust bearing device adapted for mounting to a clutch diaphragm over an axial guide tube, said device comprising:

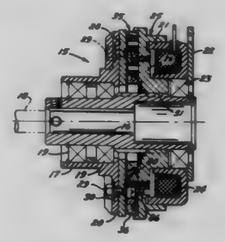
an engaging assembly having an engaging piece and including elastic means for connecting said assembly to the diaphragm; said engaging piece having an end, and inner periphery, and an outer periphery;
a thrust bearing assembly adapted to reciprocally slide on the guide tube;
one of said assemblies having a wedging surface and another one of said assemblies having a retaining groove therein defining a wedging zone;
one of said assemblies having a release groove defining a release zone;
connecting means for releasably locking said assemblies together, said connecting means comprising a plurality of balls, and a ball retaining element positionable between said assemblies for retaining said balls;
said balls, said wedging surface and said retaining groove cooperating to releasably lock said assemblies together;



each of said balls being movable to a locking position in response to movement of said thrust bearing assembly in a first axial direction toward said engaging assembly and then in a second direction opposite to said first direction;
each of said balls when in its locking posiiton lying in said retaining groove and engaging said wedging surface to lock said assemblies together;
said release groove being positioned to receive said balls when said thrust bearing assembly is moved further in said first direction;
said balls when in said release zone being radially displaced from the wedging surface to unlock said connecting means so that said thrust bearing assembly is movable in said second direction to disconnect it from said engaging assembly.

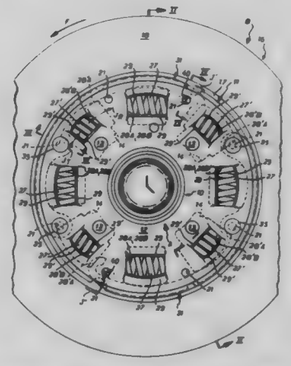
4,718,529
FRICTION FACE FOR A MAGNETIC COUPLING
Edward R. Kroeger, Beloit, Wis., and Richard C. Dvorak, Rockton, Ill., assignors to Dana Corporation, Toledo, Ohio
Filed Jul. 31, 1986, Ser. No. 891,156
Int. Cl.[4] F16D *69/00*
U.S. Cl. 192—107 R 14 Claims

1. A friction face for a magnetic coupling, said friction face comprising a substantially flat and planar sheet formed of molded friction material and having parallel faces, inserts made of low reluctance magnetic material located-in-place within said molded sheet by the friction material and having parallel faces which are flush with the faces of said sheet, each of said inserts comprising an elongated plate disposed in the plane of said sheet, each of said inserts having shoulder means integral with said plate and disposed in intimate engagement with the friction material of said sheet for preventing said inserts from shifting relative to said sheet in either direction along the thickness of the sheet and for preventing said inserts from shifting relative to the sheet in any direction in the plane of the sheet thereby to lock the inserts securely within the sheet and to keep the faces of the inserts flush with the faces of the sheet,



each of said inserts including a block formed integrally with and projecting from one side of the respective plate and having a face defining at least part of one of the said faces of the insert, the other said face of the insert being defined by the opposite side of said plate and being of substantially greater area than said one face.

4,718,530
TORSIONAL DAMPER
Pierre Loizeau, Ville D'Avray, and Philippe Lhermite, Senlis, both of France, assignors to Valeo, Paris, France
Filed May 15, 1984, Ser. No. 610,513
Claims priority, application France, May 16, 1983, 83 08046
Int. Cl.[4] F16D *3/66*
U.S. Cl. 192—106.2 13 Claims



1. A torsional damper suitable for use in a friction clutch plate, said torsional damper comprising at least two coaxial parts mounted to rotate relative to one another within a defined range of relative angular movement, a first of said coaxial parts including two annular flanges disposed in spaced parallel relation, circumferentially acting elastic means between said coaxial parts resisting such relative angular movement over at least part of said defined range of relative angular movement and incorporating at least one elastically deformable arm which extends in a substantially circumferential direction, means for mounting said at least one elastically deformable arm at a first end thereof on a first of said annular flanges of said first coaxial part, said at least one elastically deformable arm being unsupported at a second end, a first shoulder on said second end of said at least one elastically deformable arm, and a second shoulder on a second of said coaxial parts engageable

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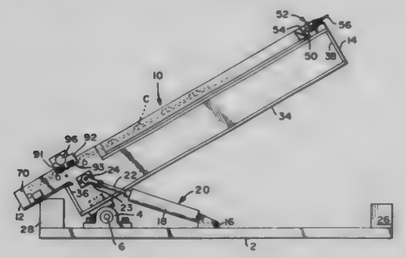
with said first shoulder for rendering said at least one elastically deformable arm operative, and a friction disk attached to said first coaxial part.

4,718,531

ELECTRICAL CONNECTOR PICK-UP STATION

Edward A. Bianchi, Hummelstown, and Dallas E. Schlegel, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 24, 1986, Ser. No. 833,314
Int. Cl.[4] B65G *47/06*; H05K *13/02*
U.S. Cl. 193—17 **8 Claims**



1. An electrical connector pick-up station comprising:

a base;

a connector and connector supply magazine support frame mounted on said base, said frame being elongate and having a first end, a second end opposite thereto, and support surface means between said ends and remote from said base, said support surface means including a connector supporting first surface proximate to said first end of the frame and a connector supply magazine supporting second surface between said first surface and said second end of the frame;

means connecting said frame to said base for pivotal movement between a connector pick-up first angular position in which said support surfaces are horizontal and a connector supply second angular position in which said frame is tilted so that said second end of said frame is raised above said first end thereof;

first drive means for moving said support frame between its pick-up and its connector supply positions;

ribs on said first surface defining a row of parallel, open ended first channels each for slidably receiving an elongate electrical connector and extending lengthwise of said support frame, said ribs being spaced from said first end of the support frame;

a connector locating comb projecting from said first end of the support frame towards said ribs and being spaced therefrom, said comb defining a row of connector positioning notches each aligned with, and opening towards, a respective one of said first channels;

a plurality of connector guiding means each extending between each notch and the first channel that is aligned therewith;

connector retaining means associated with each connector guide means and being movable between a connector retaining first position and a connector receiving second position;

second drive means for moving said connector retaining means between their first and second positions; and

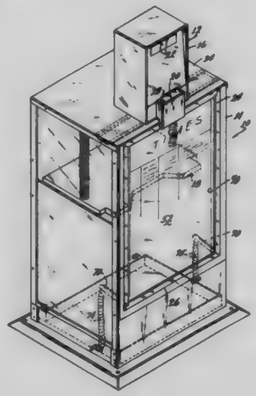
means on said second supporting surface for locating adjacent to said first supporting surface, a connector supply magazine defining a row of parallel connector receiving second channels, with each second channel opening towards a respective first channel and being aligned therewith, said first drive means being actuable to move said support frame from its connector pick-up position to its connector supply position to cause a connector in each second channel to slide through the first channel that is aligned therewith and the leading end of the connector to be received in the notch that is aligned with said first channel, and subsequently to move said support frmae to its connector pick-up position, said second drive means being actuable to move each connector retaining means to its first position upon the leading ends of the connectors being received in said notches and to move each retaining means to its connector receiving position upon said support frame being moved to its connector pick-up position, wherein said ribs are provided on a support plate having teeth projecting therefrom towards said second end of the support frame for engagement in recesses in said magazine, means being provided at the second end of said support frame for releasably holding said magazine down on said second supporting surface when said teeth are engaged in said recesses.

4,718,532

COIN OPERATED VENDING MACHINES FOR NEWSPAPERS OR THE LIKE

Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Co., Inc., Gardena, Calif.

Filed Dec. 19, 1985, Ser. No. 810,676
Int. Cl.[4] G07F *11/02*
U.S. Cl. 194—350 **6 Claims**



1. In a vending machine having a primary enclosure for storing articles to be vended, said enclosure including an access door, a coin operated door locking mechanism and a coin box for receiving coins accepted by said door locking mechanism, said primary enclosure including a top wall and said coin operated door locking mechanism being housed in a secondary enclosure mounted on said top wall and having a key operated secondary access door thereinto, the improvement comprising:

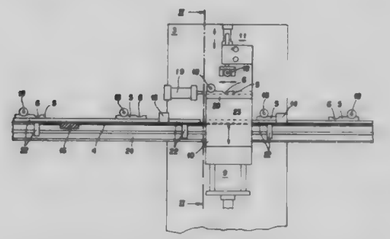
said coin box being supported under a coin drop opening defined in said top wall within said primary enclosure for ready access thereto through said access door and coin box lock means securing said coin box against removal from said primary enclosure, whereby mutually exclusive access may be had to each of said coin operated door locking mechanism and said coin receiving box; said coin box having a top opening for removing coinage from said box said box being removably supported against said top wall, said top wall closing access into said top opening to prevent removal of coinage in said coin box by persons having access into said primary housing without first opening said coin box lock means.

4,718,533

TRANSPORT INSTALLATION FOR A PRODUCTION LINE HAVING PARALLEL-ARRANGED PROCESSING STATIONS

Manfred Nussbaumer, and Bruno Fischer, both of Dietikon, Switzerland, assignors to Micafil AG, Zurich, Switzerland

Filed Sep. 9, 1986, Ser. No. 905,233
Claims priority, application Switzerland, Feb. 12, 1986, 564/86
Int. Cl.[4] B65G *47/00*
U.S. Cl. 198—346.1 **3 Claims**



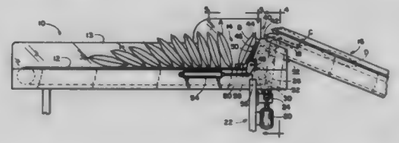
1. In a production line for the manufacture of electric structural parts such as rotors and stators, the production line including a conveyor belt and a plurality of processing stations disposed along the conveyor belt, workpiece carriers mounted on and transported by the conveyor belt, each carrier comprising workpiece receiver means, the improvement comprising lifting means at each processing station for lifting at least one carrier from the conveyor belt into a holding position for further handling while leaving said conveyor belt unobstructed so that subsequent carriers are conveyed on said belt below the lifted carrier, gripping means for selectively removing and inserting workpieces into and from said workpiece receiver means of the lifted carrier, said lifting means arranged to lower the lifted carrier back onto said conveyor belt, and movable stop means adjacent said conveyor belt upstream of said lifting means to stop a subsequent carrier as said lifted carrier is being lowered back onto said conveyor belt, said lifting means being arranged to permit a lifted carrier to be moved horizontally, guided by rails, while seated on said lifting means in a lifted position.

4,718,534

COLLATING CONVEYOR FOR BAGGED PRODUCTS

Chester H. Harper, Aurora, Oreg., assignor to Allen Fruit Co., Inc., Newberg, Oreg.

Filed Aug. 15, 1986, Ser. No. 896,977
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—401 **3 Claims**



1. A collating conveyor arrangement for bagged product, comprising:

(a) a feed conveyor on which individual bags of product are carried forward;

(b) an intermittently movable, forwardly indexing, takeoff conveyor;

(c) collating erector means interposed between the feed and takeoff conveyors for assisting in the transfer of bags between the conveyors and erecting them, one at a time, by forward movement of the erector means while the takeoff conveyor is stationary into a forwardly inclined position on the takeoff conveyor so as to assemble a collated column of bags on the takeoff conveyor;

(d) means for sensing the arrival of a bag on the takeoff conveyor be sensing the presence of said bag in a rearwardly inclined position on said takeoff conveyor and generating a first signal in response to sensing said arrival;

(e) erector actuation means included in the erector means, for actuating the erector means into said forwardly inclined position in response to said first signal;

(f) actuator means for commencing each forward indexing movement of the takeoff conveyor in response to the completion, by said erector means, of the erection of each bag into said forwardly inclined position;

(g) means inclined in said actuator means and located downstream of the erector means, for sensing the completion of erection of each bag into said forwardly inclined position by sensing the presence of each bag in said fowardly inclined position on said takeoff conveyor and for generating a second signal in response to sensing the completion of the erection of each bag; and

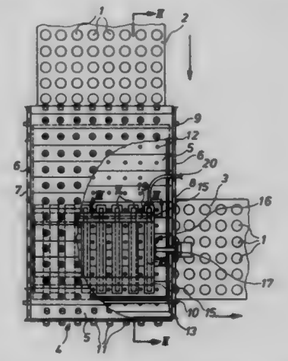
(h) means included in said actuator means for commencing each forwardl indexing movement of said takeoff conveyor in response to said second signal.

4,718,535

METHOD AND APPARATUS FOR THE REARRANGING OF BAKERY ARTICLES

Manfred Wolff, Weinstadt, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

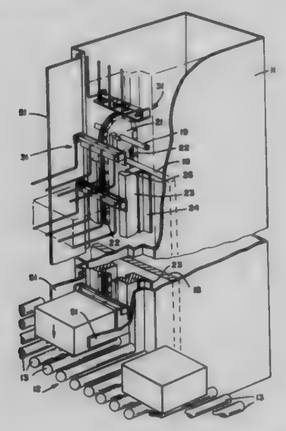
Filed Jan. 14, 1987, Ser. No. 3,125
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3601904
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—424 **16 Claims**



7. Apparatus for rearranging baking articles comprising a first conveyor on which baking articles are transported in successive transverse rows, a second conveyor extending at an angle to the first conveyor, a third conveyor located above said first and second conveyors and driven in the same direction as said first conveyor, suction means on said third conveyor for lifting a plurality of successive transverse rows of articles from said first conveyor and conveying said articles by said third conveyor to a position above the second conveyor in which the transverse rows of articles form longitudinal rows, and means for interrupting the suction means when the articles in said plurality of successive transverse rows are above the second conveyor so that the articles simultaneously drop on to the second conveyor and the articles previously arranged in transverse rows on the first conveyor are transported in longi-

tudinal rows on the second conveyor, wherein said first and third conveyors are driven continuously.

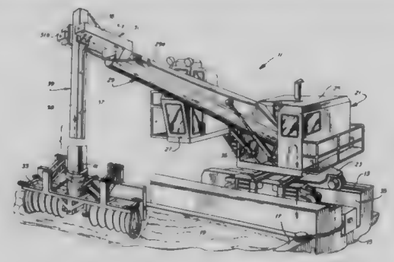
4,718,536
STACK STORAGE ELEVATOR FOR SLICED, STACKED COMESTIBLE PRODUCTS
Edward P. Toby, San Rafael, Calif., assignor to Toby Enterprises, San Francisco, Calif.
Filed Oct. 15, 1986, Ser. No. 919,139
Int. Cl.⁴ B65G *1/00, 37/00*
U.S. Cl. 198—469.1 **12 Claims**



1. A storage elevator for comestible items, including; a roller conveyor adapted to transport said items in a linear array of generally regularly spaced items, means for depositing additional like items on said roller conveyor in vacant spots of said linear array, including a plurality of platform assemblies disposed in vertically stacked fashion adjacent to said roller conveyor, each platform assembly including means for supporting an additional like item, means for advancing said platform assemblies in stepwise, descending fashion, each stepwise advance driving the lowermost of said platform assemblies in said vertical stack to deposite the item supported thereon onto said roller conveyor, means for enabling rotation of each of said platform assemblies with respect to said vertical stack and said roller conveyor, including a plurality of pivot shafts each extending in rotating fashion between one of said platform assemblies and said means for advancing said platform assemblies in stepwise, descending fashion.

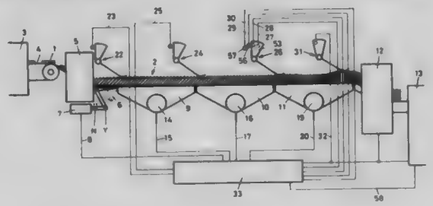
4,718,537
FEEDER HEAD ASSEMBLY
Charles P. Miller, McHenry, Ill., assignor to Miller Formless Co., Inc., McHenry, Ill.
Continuation-in-part of Ser. No. 672,151, Nov. 16, 1984, which is a continuation of Ser. No. 414,383, Sep. 2, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 750,418
Int. Cl.⁴ B65G *67/58*
U.S. Cl. 198—513 **15 Claims**

1. A self-adjusting feeder head assembly for accumulating bulk material and moving the material into a movable lifting conveyor which is suspended above a mass of bulk material and which includes an elongated enclosure and means for lifting the bulk material through said enclosure, said feeder head assembly comprising: an elongated frame structure pivotally mounted to and suspended from the bottom distal end portion of said lifting conveyor for movement with said lifting conveyor and extending transversely of the longitudinal axis of said bottom distal end portion of said lifting portion; at least one auger disposed longitudinally of said frame rotatably mounted to said frame for accumulating and advancing said powdered material to said lifting conveyor, one end of said auger disposed proximate said enclosure; said frame being pivotable with respect to said lifting conveyor so that said frame and said auger remain in a common plane with said lifting conveyor; power means disposed on said frame for rotating said auger about its longitudinal axis; and non-powered biasing means disposed between said frame and said lifting



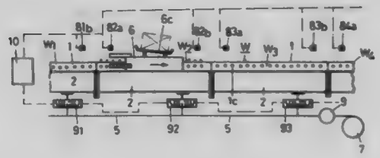
conveyor for yieldably, resiliently and automatically biasing said frame and auger to a predetermined angular relationship with said lifting conveyor; said pivotal frame automatically adjusting and disposing said auger substantially parallel to the surface of said mass of material and said biasing means automatically adjusting and disposing said auger to a predetermined angular relationship with the lifting conveyor as said auger moves material to said lifting conveyor.

4,718,538
METHOD AND APPARATUS FOR CONVEYING FLAT ARTICLES
Martin Löw, Gächlingen, and Wolfgang Hertrich, Neuhausen am Rheinfall, both of Switzerland, assignors to SIG Schweizerische-Industrie Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Aug. 28, 1986, Ser. No. 901,377
Claims priority, application Switzerland, Aug. 28, 1985, 3703/85
Int. Cl.⁴ B65G *43/10*
U.S. Cl. 198—575 **10 Claims**



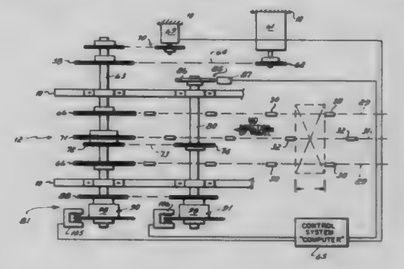
1. In a method of conveying flat, edgewise upstanding, face-to-face contacting items in at least one item column divided into a plurality of serially arranged column parts on a plurality of end-to-end arranged conveyor tracks forming together a conveyor apparatus arranged to advance the items to an item processing machine situated downstream of the conveyor apparatus; including the steps of separately driving each conveyor track and sensing, by separate sensors associated with each conveyor track, the extent of inclination of the items on each conveyor track; the improvement comprising the following steps:
(a) de-energizing the drive of any individual said conveyor track if the items situated thereon assume an orientation having a steepness of predetermined extent and if, at the same time, the item processing machine and the drives of all conveyor tracks situated downstream of said individual conveyor track are at a standstill; and
(b) energizing and maintaining energized the drive of any individual said conveyor track if the items situated thereon assume a steepness less than said predetermined extent, or if the drive of any of the downstream-situated conveyor tracks or the item processing machine is energized or is in an energized state.

4,718,539
CONVEYOR MEANS
Ichiro Fukuwatari, Cochigi; Seiji Watanabe; Naoyuki Takahashi, both of Sano; Takahisa Nitta, Fuchu, and Yoshio Saito, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Kiden Kogyo, Ltd., Hyogo, both of, Japan
Continuation of Ser. No. 688,401, Jan. 2, 1985, abandoned. This application Jan. 9, 1987, Ser. No. 6,249
Int. Cl.⁴ B65G *35/00*
U.S. Cl. 198—619 **3 Claims**



1. A pallet type conveyor comprising:
a transporting track having a length extending in the direction in which products are to be transported and having a plurality of successive block units;
a transporting pallet on which products to be transported can be carried and mounted on said track for movement therealong in the direction of the length of said track, said pallet having means cooperating with said track for confining a cushion of compressed air between said pallet and said track for supporting said pallet above said track;
compressed air supply means for supplying compressed air to said block units in succession and to direct the compressed air against the transporting pallet for supporting said pallet;
a plurality of linear motor portions forming one part of a linear motor means, one such portion being only in the central part of each of said block units and spaced from the preceding and succeeding linear motor portions for driving said transporting pallet along said track in the direction in which products are to be transported, said pallet having thereon means forming the remainder of said linear motor means, each such portion of said linear motor means being sufficiently long for giving said pallets sufficient momentum to enable them to reach the next successive portion, the spacing being sufficiently great that if a pallet is caused to stop between two such portions the force produced by the linear motor means is insufficient to move the pallet;
blade means on said pallet in line with the flow of compressed air against said pallet from said compressed air supplying means and oriented to move said pallet in the direction of the length of said track;
compressed air supply control means for controlling the supply of compressed air to the respective block units to supply compressed air at a first pressure just sufficient to support said pallet above said track and insufficient to drive said pallet along said track when striking said blade means, and for controlling the supply of compressed air to discontinue the supply of compressed air to one block unit after the pallet has passed said one block unit and to start supply of compressed air to a next successive block unit just before the pallet starts to pass said one block unit, and for controlling the supply of compressed air for increasing the pressure of compressed air supplied to said block units to a second pressure higher than said first pressure and sufficient to moving said pallet in the direction of the length of said track when it strikes said blade means, whereby when a pallet is stopped or blocked from being transported at a position between said linear motor portions where it is not able to be driven by said linear motor means, said compressed air supply control means can be actuated to supply compressed air at said second pressure sufficient to move said pallet to a position where it can again be driven by said linear motor means.

4,718,540
AUTOMATIC CHANGEOVER FOR CARTONERS
Joseph D. Greenwell, Florence, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.
Filed Nov. 7, 1986, Ser. No. 928,526
Int. Cl.⁴ B65G *15/20*
U.S. Cl. 198—627 **1 Claim**



1. In a cartoner having a transport conveyor having an endless chain carrying a leading lug and an endless chain carrying a trailing lug, and a main drive for said cartoning machine connected to said endless chains, a mechanism for adjusting the spacing between leading and trailing lugs comprising,
a direct connection from said main drive to said trailing lug conveyor,
at least one phase variator forming the connecting between said main drive and said leading lug conveyor, to drive said leading lug conveyor in synchronism with said cartoner,
said phase variator having a housing, a driving gear, a driven gear and an intermediate gear interconnecting the driving and driven gears, all said gears normally having no relative rotation, thereby functioning as a rigid drive coupling,
a brake,
means connecting said brake to said variator to cause a differential movement of said leading lug with respect to said main drive to vary the position of said leading lug with said trailing lug while said main drive drives said cartoner.

4,718,541
TOBACCO FEEDER WITH SLAT CONVEYORS
Edwin L. Wilding, 10210 Garlasreid Pl., Louisville, Ky. 40223
Filed Nov. 1, 1985, Ser. No. 793,982
Int. Cl.⁴ B65G *15/42*
U.S. Cl. 198—699.1 **5 Claims**

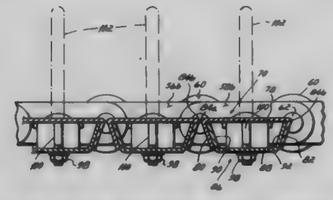
1. A feed conveyor for use in a tobacco feeder for elevating tobacco product from a lower level hopper conveyor up an inclined conveying run to a higher level, said feed conveyor comprising:
a plurality of conveying slats each having outer ends and a flat tobacco conveying member defining a tobacco support surface lying in a conveying plane and integral for-

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ward and rearward slat stiffening legs bent from said tobacco conveying member and inwardly toward each other, the bends forming respecive forward and rearward longitudinally extending edges of said conveying slat and each said leg forming an included angle of less than 90° and greater than 0° with respect to said tobacco conveying surface;

a plurality of reinforcing slats, each having a horizontal member and integral forward and rearward legs bent outwardly away from one anotehr relative to said horizontal surface;

said reinforcing slats being disposed within said conveyor slats and extending substantially from one outer end thereof to another so that said legs of said reinforcing slats are disposed between and respectively engage said legs of said conveyor slats, and so that said horizontal member of said reinforcing slats are respectively spaced from and lie



in a plane parallel to that of said tobacco conveying members of said conveyor slats, whereby increasing loads on said conveying slats increases resistance of said so combined conveying and reinforcing slats to further deflection;

drive chains having inclined runs, said conveying slats being mounted to said drive chains so that said longitudinal edges thereof are disposed in substantially constantly abutting relationship, said slat defining an inclined tobacco conveying run;

tobacco lifting means mounted on and extending outwardly from the tobacco support surface of said conveying slats for lifting tobacco product up said inclined conveying run when said incline is otherwise too steep for conveying tobacco up said inclined conveying run without said lifting means;

said lifting means connecting said reinforcing slats to respective ones of said tobacco conveying slats.

4,718,542

FIXING OF ATTACHMENTS TO THE SIDE WALLS OF THE PANS OF SCRAPER-CHAIN CONVEYORS

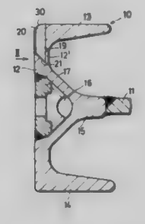
Helmut Temme, Waltrop, and Manfred Redder, Lünen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Postfach, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 327,773

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1981, 3102701

Int. Cl.⁴ B65G *19/28*

U.S. Cl. 198—735 **8 Claims**



1. A channel section or pan for a scraper-chain conveyor, said pan having sigma-shaped side walls with a floor plate therebetween, each side wall having upper and lower flanges and upper and lower webs, wherein at least one of the side walls is provided with shaped recesses in the upper web, each shaped recess being open to the exterior of the side wall and to the upper flange and having a depth less than the thickness of the upper web, each recess being generally U-shaped from the exterior of the upper web and internally relieved to provide a pocket and at least one screw-threaded fixing element with a head of U-shaped configuration matching the shape of the recesses so as to be snugly received within the pocket of one of the recesses substantially completely to fill said one recess.

4,718,543

CHAIN CONVEYOR FOR WORKPIECKS AND WORKPIECE CARRIERS

Ernst Leisner, Ditzingen; Gernot Maier, Stuttgart, and Peter Rothfuss, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

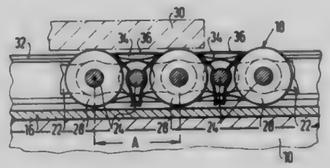
PCT No. PCT/DE85/00318, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/02622, PCT Pub. Date May 9, 1986

PCT Filed Sep. 11, 1985, Ser. No. 897,761

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438786

Int. Cl.⁴ B65G *39/20*

U.S. Cl. 198—779 **11 Claims**



1. A chain conveyor for workpieces and workpiece carriers, comprising:

guiding means;

a roller chain guidable by said guiding means and including a plurality of rollers spaced apart from one another, a plurality of side and intermediate hinge pins arranged so that two of said side hinge pins rotatable support two of said rollers located between said neighboring two rollers, and a plurality of link joints each connecting two of said side hinge pins neighboring each other, said rollers being arranged so that a free space remains between said neighboring two rollers, said roller chain having a side facing toward said workpieces and workpiece carriers to be transported; and

means for preventing chips, screws and other small parts from entering said free space from said side and including an insert element arranged between said neigboring two rollers and engagably supported by said one of said intermediate hinge pins located between said neighboring two rollers, said insert element being composed of resilient material so as to form at least one spring element, said spring element being catchable around said one of said intermediate hinge pins because of said resilient material, said spring element having a flat web portion and two side portions resilient relative to each other, each of said side portions extending from said flat web portion and arranged between said two neighboring rollers such that each of said side portions is closest to a respective one of said two neighboring rollers, each of said side portions having a first part extending tangentially relative to said respective one of said two neighboring rollers and having a second part extending from said first part, said second part of each of said side portions being formed and arranged so that said one of said intermediate hinge pins is catchable and embracable between both of said second parts, said second part having a respective pressing surface which is pressable against said one of said intermediate hinge pins when in a catch position, each of said side portions of said spring element also having a free end part extending from said respective pressing surface, said free end parts being formed to resiliently exert a restoring force which returns said spring element to said catch position when a predetermined distance between said two neighboring rollers is restored after having been shortened when said roller chain experiences a curvature such that said two neighboring rollers are pressed against said spring element to move said spring element out of said catch position.

4,718,544

FLEXIBLE LAGGING STRIPS FOR DRUM PULLEYS

Harold L. Herren, 802 Main St., Platteville, Colo. 80651

Continuation-in-part of Ser. No. 06/730,363, May 3, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 857,933

Int. Cl.⁴ B65G *23/06*

U.S. Cl. 198—843 **13 Claims**



1. A flexible, replaceable lagging structure conbination for attachment to the peripheral surface of a conveyor belt drum pulley, said combination comprising a single length of flexible rubber traction material and at least two spaced-apart arcuate metal sections; wherein each said metal section is secured to the underside of said length of flexible rubber traction material; wherein one edge of each of the outermost metal sections is exposed for welding to said surface of said pulley, and said rubber traction material is disposed above said metal sections and provides a traction surface for said pulley.

4,718,545

CARTON FOR SHIPPING AND DISPLAY

John G. Chrzanowski, New York, N.Y., and Janice A. Jaworski, Norwalk, Conn., assignors to Swingline Inc., Long Island City, N.Y.

Filed Oct. 31, 1986, Ser. No. 925,447

Int. Cl.⁴ B65D *0.5/52*

U.S. Cl. 206—45.15 **5 Claims**

1. A carton for use as a shipping and display container comprising:

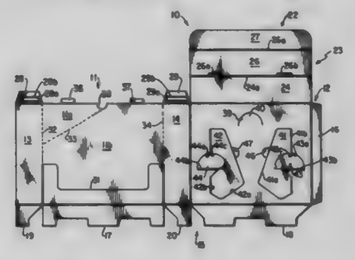
(a) a rectilinear product container body including front top panel, back bottom panel, side panels and locking bottom panels;

(b) an upper opening flap arrangement including a main flap hinged to the back bottom panel, two minor side tabs hinged to said side panels, the upper opening flap including three tandem flap sections; such upper opening flap arrangement in turn having

(i) a first closed position for shipping;

(ii) a second open position in which a flap section of the main flap extends beyond the container body in the same plane as the back bottom panel; and

(iii) a third position closed for display in which the main flap is folded with all flap sections parallel to one another and at least one of said side tabs tucked in between the two said flap sections; and



(c) a removable panel portion in the front top panel for removal to expose the product.

4,718,546

DISPLAY HANGER FOR SUSPENDERS

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B7G Plastics, Inc., New York, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,487

Int. Cl.⁴ A47G *25/14, 25/36*

U.S. Cl. 206—296 **3 Claims**

1. In combination, suspenders of type including a pair of straps, each strap having a pair of slotted stems at an extremity thereof, each such slot being of given maximum open dimensions in length and width, and a display hanger comprising a flat upstanding body having a hook portion and having a pair of openings extending therethrough below said hook portion, and an elongate member cantilever supported in upstanding disposition in said body in each said opening, each said member having a shank portion contiguous with said body and having sufficient length for residence in the slots of a distinct pair of stems, and having an enlargement at the free end thereof for retention of said stems, said enlargement having a width exceeding the width of said shank portion, less than such maximum slot length and greater than such maximum slot width, said openings and said members further being of respective dimensions such that said members may be deflected from first dispostions in the plane of said body into second dispositions out of the plane of said body to receive said stems and may be returned to said first dispositions with said stems retained thereon.

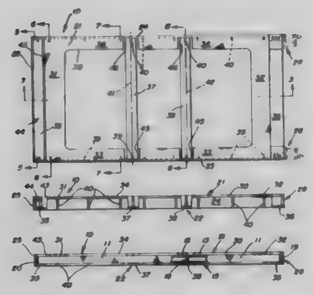
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4,718,547

COMPACT DISC SECURITY PACKAGE

William D. MacTavish, 309 Sequoya Dr., Hopkinsville, Ky. 42240

Filed Jul. 27, 1987, Ser. No. 78,387
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—309 7 Claims



1. A security package for an elongated, rectangular compact disc container having opposite end portions and a compartment in one end portion receiving a rectangular storage box containing a compact disc, the storage box having a length less than one-half the length of the rectangular container and having an interior transverse edge, comprising:

(a) a hollow parallelepiped receptacle having a front face, a back face, opposed side walls, a closed end wall, and an opposite open end,

(b) said receptacle being slightly larger than, and being adapted to receive lengthwise in a substantially close fit in an operative position, an elongated compact disc container having a compartment in one end portion receiving a rectangular storage box less than one-half the length of the container and having an interior transverse edge,

(c) closure means for opening and closing said open end,

(d) said front face comprising a front wall having a substantially large display opening therein,

(e) said back face being substantially open and comprising a first transverse ledge adjacent said closed end wall, a second transverse ledge adjacent said open end, and first and second transverse planar rib members, said ledges and said rib members being coplanar and spaced from said front wall,

(f) said first rib member being spaced longitudinally from said open end a distance slightly less than the length of the storage box of the elongated compact disc container received in said receptacle, so that said first rib member is in transverse alignment with the interior edge of the storage box when said container is in a first right-side-up operative position in which the storage box is closer to said open end than said closed end wall of said receptacle,

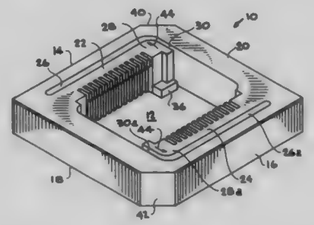
(g) said second rib member being longitudinally spaced from said closed end wall a distance slightly less than the length of the storage box of the elongated compact disc container received in said receptacle so that said second rib member is in transverse alignment with the interior edge of the storage box when said container is in a second upside down operative position in which the storage box is closer to said closed end wall than said open end of said receptacle.

4,718,548

PROTECTIVE HOUSING FOR A LEADLESS CHIP CARRIER OR PLASTIC LEADED CHIP CARRIER PACKAGE

David Estrada, Santa Clara; Danh C. Tran, San Jose, and Alex A. Zambe, Sunnyvale, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 19, 1986, Ser. No. 944,266
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—329 5 Claims



1. A universal protective housing for a leadless chip carrier (LCC) or plastic leaded chip carrier (PLCC) package comprising:

a square-shaped solid body having a central cavity for receiving a LCC or PLCC package, said solid body being formed of a top side portion, a bottom side portion, a left side portion and a right side portion, each of said portions having a dimension of approximately 1.200 inches in length and approximately 0.200 inches in height;

an upper beam member extending between said left side portion and said right side portion and being spaced apart a predetermined distance below the interior surface of said top portion by a first gap, said upper beam member having its one end thereof being formed integrally with the interior surface of said left side portion, said upper beam member extending laterally toward said right side portion and terminating at a free end thereof, a downwardly extending arcuate section being formed integrally at the free end of said upper beam member and being spaced apart from the interior surface of said right side portion by a second gap;

said upper beam member including a plurality of ribs disposed along its interior surface in an equally spaced apart relationship so as to form vertical slots therebetween extending upwardly from the bottom surface of said upper beam member to the top surface thereof;

a lower beam member extending between said left side portion and said right side portion and being spaced apart a predetermined distance above the interior surface of said bottom portion by a third gap, said lower beam member having its one end thereof being formed integrally with the interior surface of said right side portion, said lower beam member extending laterally toward said left side portion and terminating at a free end thereof, an upwardly extending arcuate section being formed integrally at the free end of said lower beam member and being spaced apart from the interior surface of said left side portion by a fourth gap;

said lower beam member including a plurality of ribs disposed along its interior surface in an equally spaced apart relationship so as to form vertical slots therebetween extending upwardly from the bottom surface of said lower beam member to the top surface thereof;

each of said plurality of ribs of said upper and lower beam members including a finger extending inwardly from the top portion thereof;

a first corner formed by the intersection of said top portion and said right side portion, said first corner being cut to form a first chamfered surface;

a second corner formed by the intersection of said bottom portion and said left side portion, said second corner being cut to form a second chamfered surface;

support means for supporting the lower surface of the chip package at the corners thereof, said support means being formed on the interior surfaces of said left and right side portions and on said downwardly extending and upwardly extending arcuate sections;

said support means including a first support member formed integrally along the bottom surface of said downwardly extending arcuate section and extending inwardly toward the center of said housing, a second support member formed integrally on the interior surface of said left side portion along the bottom surface thereof and extending inwardly toward the center of said housing and being aligned with said first support member, a third support member being formed integrally along the bottom surface of said upwardly extending arcuate section and extending inwardly toward the center of said housing, and a fourth support member formed integrally on the interior surface of said right side portion along the bottom surface thereof and extending inwardly toward the center of said housing and being aligned with said third support member; and

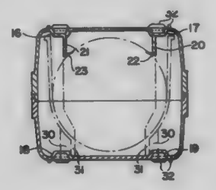
said downwardly extending and upwardly extending arcuate sections being moved outwardly from the central cavity into the respective first through fourth gaps when said first and second chamfered surfaces are squeezed toward each other so as to permit insertion or removal of the chip package from the central cavity.

4,718,549

CONTAINER FOR THE STORAGE AND SHIPMENT OF SILICON DISKS OR WAFERS

Luigi Rissotti, Vercelli; Moreno Morici, Cameri; Fabrizio Leoni, S-Trecate, and Adriano Girardi, Bellinzago, all of Italy, assignors to Dynamit Nobel Silicon S.p.A., Novara, Italy

Filed Mar. 10, 1986, Ser. No. 837,758
Claims priority, application Italy, Mar. 8, 1985, 47788 A/85
Int. Cl.[4] B65D *85/30, 57/00*
U.S. Cl. 206—334 21 Claims



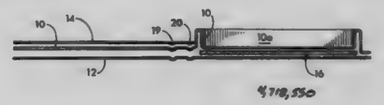
1. A container for the storage and shipment of silicon wafers which comprises a lower box half and an upper box half which are joined releasably in a shape-mating fashion for the formation of an outer protective box-like receptacle, and a cassette adapted to be arranged in said box-like receptacle for the accommodation and storage of a plurality of silicon wafers, closure means on the lower and upper box halves for sealing the two box halves and for locking the halves together; guide means in the lower and upper box halves for engaging the cassette so that the shifting of the cassette within the box-like receptacle is prevented and auxiliary retaining means provided in the upper box half for blocking-off the cassette and for retaining the silicon wafers within the cassette; said guide means including two profiled sections extending longitudinally in the lower box half, each of the sections projecting inwardly within the box and being arranged parallel to the other, said sections being adapted to engage lower side surfaces of the cassette whereby longitudinal and lateral movement of the cassette is prevented.

4,718,550

THERMOFORMED COMPOSITE CASSETTE ALBUM

Breck J. Johnson, 4555 Juneau La., Plymouth, Minn. 55446

Filed Oct. 24, 1986, Ser. No. 922,992
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 6 Claims



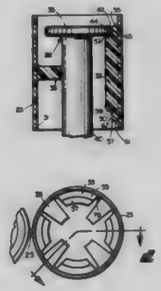
1. A thermoformed composite cassette album having a front and rear cover connected by a spine, said album being formed from a stiff thermoformable base sheet extending the width and breadth of both the front and rear cover of the album and through the spine area and including an article holding tray molded in the back cover thereof with at least one pocket opening inwardly and an upstanding tray sidewall, a pair of soft flexible plastic sheets including a first outer sheet of the same size as the base sheet bonded over the outside surface of the base sheet and a second soft flexible cover liner sheet bonded to the inner surface of the front cover and including a medial extension projecting over the spine between the front and rear covers whereby the base sheet is sandwiched between the soft flexible sheets in the area of the spine and a pair spaced apart parallel vertically extending heat seals thermally bonding together 3 layers comprising the outer soft plastic sheet, the thermopormable base sheet and the medial extension of the soft plastic cover liner sheet to form a 3 layer laminate in each seal whereby the stiff plastic sheet is encapsulated between the soft plastic sheets to prolong the life thereof and the cover liner is adapted to receive printed indicia applied to the exposed surface thereof inside the front cover.

4,718,551

COLLATION STRIP

Jon K. Whitledge, Ravenna, Ohio, assignor to Erico International Corporation, Solon, Ohio

Filed Oct. 17, 1986, Ser. No. 919,982
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—347 17 Claims



1. A collation strip for headed fasteners having a head and shank comprising a plurality of web connected cylindrical housings of frangible material, each housing being adapted to receive and support headed fasteners of at least two different sizes extending axially therein, the interior of each housing including circumferentially spaced support means to surround and support the heads of such different sized fasteners within the confines of said housing, said support means comprising a plurality of protruding ridges located along the inside surface of said housing, and circumferentially alternating spaced guide

means axially spaced from said first means to guide and aixally align and support the shank of such fastener.

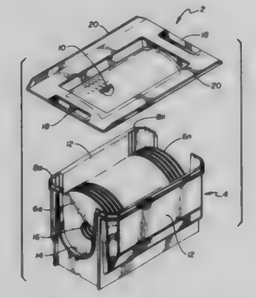
15. A collation strip for headed fasteners having a head and shank comprising a plurality of cylindrical and symmetrical housings, each housing being adapted to receive and support a headed fastener extending axially therein from either axial end of said housing, the interior of said housing including circumferentially spaced support means in the proximity of each axial end of said housing such that each of said support means is equally spaced from the respective axial end of said housing, and circumferentially alternating spaced guide means centrally located along the axial length of said housing to guide and axially align and support the shank of such fastener.

4,718,552

DISK SHIPPER AND TRANSFER TRAY

Alexander N. Rossi, Pleasanton, Calif., and Lynn Milbrett, Young America, Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Dec. 1, 1986, Ser. No. 937,680
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—444 18 Claims



1. A disk shipper containing:

a shipper bottom including a generally rectangular floor member having a disk nest elevated above the floor member, the disk nest comprising a plurality of arcuate disk engaging and supporting grooves curved to the peripheral contour of the disks to engage and support the disks in upright parallel spaced-apart axial alignment, the disks optimally containing a central hole concentric with the circumference of the disk, four sides angled upwardly and slightly outwardly from the floor member, a female trough inside the four sides substantially surrounding the disk nest, latching receiving means on opposite sides of the shipper bottom, cover positioning members extending vertically upwards from the sides of the shipper bottom, the disk nest and the sides of the shipper bottom configured so that the disks are accessible to internal diameter handling of disks having a central hole and to external diameter handling substantially below the horizontal centerline of the disks;

shipper cover including a generally rectangular top member having a plurality of arcuate disk locating elements in cooperating alignment with the arcuate disk supporting grooves in the shipper bottom for maintaining the disks in upright parallel spaced-apart axial alignment, four sides angled downwardly and slightly outwardly from the top member, latching engaging means on opposite sides of the shipper bottom for latching attachment with the latching receiving means on the shipper bottom, and bottom positioning members extending vertically downwards from the sides in cooperating alignment with the cover positioning members on the shipper bottom; and

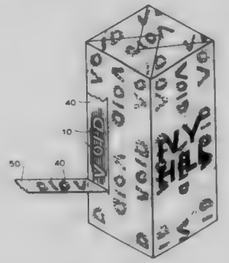
the shipper bottom is transfer compatible with a disk carrier, the disk carrier having opposed side walls for carrying a plurality of axially aligned disks therebetween, an open top through which disks may be inserted and ejected, end walls joining the side walls, a bottom having disk support surfaces engaging and supporting the disks in upright parallel spaced-apart axial alignment, the disk support surfaces of the disk carrier and the disk supporting grooves of the shipper bottom having the same radius of curvature, maintaining the same axial disk spacing between the plurality of disks, and having the same total disk capacity, the side walls of the disk carrier configured so as to be able to fit into the trough of the shipper bottom, allowing the plurality of disks to be engaged and supported by both the disk support surfaces of the disk carrier and by the disk supporting grooves of the shipper bottom simultaneously, so that the disks can be transferred from the shipper bottom to the disk carrier and from the disk carrier to the shipper bottom in a non-rolling transfer.

4,718,553

TAMPER-EVIDENT PACKAGING, METHOD OF MAKING SAME, AND INTERMEDIATE THEREIN

Anthony R. Adamoli, Lafayette; Robert P. Jewett, Old Tappan; Herbert Friedman, Fort Lee, and Alan A. Chalem, Clifton, all of N.J., assignors to Ivy Hill Corporation, New York, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,390
Int. Cl.[4] B65D *65/40*
U.S. Cl. 206—459 20 Claims



1. Tamper-evident packaging comprising:

(A) an erected, filled, and closed carton having an outer surface with ink thereon visible from outside of said closed carton; and

(B) a transparent film overwrapping said closed carton and secured to said ink on said outer carton surface in selected differentially adherent patterns;

whereby removal of said film from said overwrapped carton also removes said ink in one of said selected patterns to reveal a desired pattern of deinked outer carton surface and thereby evidence tampering.

4,718,554

METHOD OF CARDING PIERCED EARRINGS AND ASSEMBLY THEREBY FORMED

Vincent J. Barbato, Cranston, R.I., assignor to Pakula and Company, Chicago, Ill.

Filed Oct. 21, 1986, Ser. No. 921,634
Int. Cl.[4] B65D *73/00*; B65B *15/02*
U.S. Cl. 206—477 6 Claims

1. A method of carding a pierced earring comprising the steps of:

(a) assembling an earring clutch with an earring display card, said display card being of a type which is adapted to be suspended from a display hanger and including a main card portion, said main card portion having an aperture therethrough, said clutch being assembled with said display card so that it is releasably secured in said aperture; and



(b) assembling a pierced earring with said clutch by slidably inserting the post of said earring through said clutch.

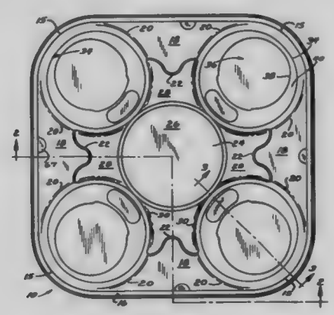
5. The assembly formed by the method of claim 1.

4,718,555

CARRYING TRAY

Christopher P. Amberg, Augusta, Ga., assignor to Fort Howard Cup Corporation, Green Bay, Wis.

Continuation-in-part of Ser. No. 756,041, Jul. 17, 1985, abandoned. This application Mar. 27, 1987, Ser. No. 31,937
Int. Cl.[4] B65D *21/02*, *1/36*, *25/10*
U.S. Cl. 206—519 9 Claims



1. A beverage tray for securely carrying beverage cups of various types and sizes comprising:

a base portion;

sidewall portions extending upwardly from the periphery of said base portion to provide stability over a substantial portion of a cup's height;

protrusion means projecting inwardly from substantially the center of each sidewall portion, said protrusion means partially defining the sidewalls of a cup receiving cavity;

a center post projecting upwardly from substantially the center of said base portion, said center post partially defining the sidewalls of a cup receiving cavity;

bridge means connecting each of said protrusion means to said center post, said bridge means partially defining the sidewalls of a cup receiving cavity;

a plurality of cup receiving cavities, sidewalls of said cavity defined by said protrusion means, said center post, said sidewall portions and said bridge means, said cavities designed to receive and retain one of a plurality of different sized and type beverage cups;

a bottom platform in each of said cup receiving cavities, said platform projecting upwardly from said base portion for stably supporting a flat-bottomed cup, the circumferential side walls of said platform spaced from said sidewalls of said cup receiving cavity;

first gripping means projecting upwardly from said base portion for gripping the chime of a chime-bottom cup; and

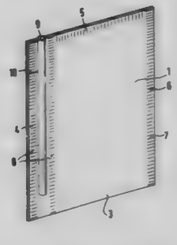
second gripping means projecting upwardly from said base portion within each of said cavities for gripping the chime of a chime-bottom cup, said second gripping means radially spaced from said first gripping means whereby the chime portion of a first sized chime-bottom cup is gripped between said first and said second gripping means and the chime portion of a second sized cup is gripped between said second gripping means and said sidewall of said cavity.

4,718,556

BAG

Bodo Hildebrandt, Riedstadt, Fed. Rep. of Germany, assignor to Wella AG, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP85/00567, § 371 Date Jul. 10, 1986, § 102(e) Date Jul. 10, 1986, PCT Pub. No. WO86/02908, PCT Pub. Date May 22, 1986
PCT Filed Oct. 26, 1985, Ser. No. 887,825
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441797
Int. Cl.[4] B65D *33/02*, *27/34*, *27/36*
U.S. Cl. 206—604 6 Claims



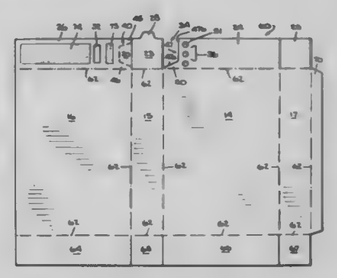
1. A bag (1) having an edge (4) closed by a flat connecting seam (8) and a tear zone (10) in the outer region of said seam (8), and further including a rod (9) positioned within said seam (8), the rod (9) extending longitudinally of the seam (8) and extending at both sides of the tear zone, said rod being made of brittle, easily breakable material.

4,718,557

EASY OPENING, RECLOSABLE CARTON

Herbert Friedman, Fort Lee, N.J., assignor to Ivy Hill Corporation, New York, N.Y.

Filed Apr. 3, 1987, Ser. No. 34,415
Int. Cl.[4] B65D *5/72*
U.S. Cl. 206—621.3 43 Claims



1. A sheet-like blank for forming an easy opening carton having side panels and end panels, the blank comprising at least

four side panels and at least three end panels, first, second and third end panels being foldably connected to first, second and third side panels, respectively, the second side panel having an end connected to the second end panel and opposed sides, the first and third end panels each extending from the respective side panel a distance which is substantial compared to the width between opposed sides of the second side panel, each of the first, second and third end panels being defined by opposed ends and opposed sides, one of the ends of each of the first, second and third end panels being connected to a respective side panel, the first end panel having a first region proximate a first side thereof which is weakened and defined by at least one weakened portion in which the blank is at least partially cut through, the third end panel having or defining a second region proximate a first side thereof which is one of a weakened region defined by at least one weakened portion in which the blank is at least partially cut through and an open region, the first and second regions being of generally the same size and being disposed in generally corresponding locations relative to the respective first sides theeof and lying within given distances from the respective first side of the respective end panel, the second end panel extending a distance from the second side panel which is greater than each of the given distances.

4,718,558

PROCESS AND APPARATUS FOR SORTING SAMPLES OF MATERIAL

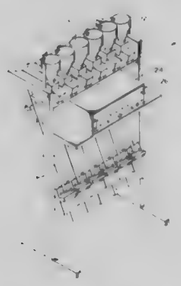
Fernando Castaneda, San Jose, Costa Rica, assignor to Xeltron, S.A., San Jose, Costa Rica

Filed Oct. 15, 1985, Ser. No. 787,534

Claims priority, application European Pat. Off., Oct. 17, 1984, 84/122,504

Int. Cl.[4] B07C 5/342; G05B 23/02

U.S. Cl. 209—546 23 Claims



1. A method for automatically adjusting the variable gain of a sorting device that sorts individual samples of material using a signal processor which activates the sorting device, comprising:

producing a signal pulse for each sample and amplifying the pulse according to the gain to which the signal processor has been previously adjusted;

measuring an amplitude value of each of the amplified pulses;

generating the total count of said amplified pulses up to a predetermined count;

counting the amplified pulses within the total count having an amplitude value exceeding a predetermined standard value; and

readjusting the gain of the signal processor when the number of amplified pulses having an amplitude value exceeding the predetermined standard value deviates from a preselected number.

4,718,559

PROCESS FOR RECOVERY OF NON-FERROUS METALLIC CONCENTRATE FROM SOLID WASTE

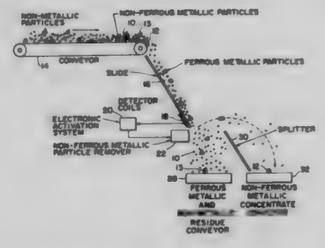
Garry R. Kenny, College Grove; Edward J. Sommer, Jr., and Mark E. Shepard, both of Nashville, all of Tenn., assignors to Magnetic Separation Systems, Inc., Nashville, Tenn.

Continuation-in-part of Ser. No. 397,559, Jul. 12, 1982, Pat. No. 4,541,530. This application Jul. 2, 1985, Ser. No. 751,318

The portion of the term of this patent subsequent to Sep. 17, 1902, has been disclaimed.

Int. Cl.[4] B07C 5/344

U.S. Cl. 209—571 7 Claims



1. A non-magnetic process for the separation of non-ferrous metallic particles from a solid waste mixture of non--metallic particles, ferrous metallic particles and non-ferrous metallic particles, comprising the steps of:

(a) conducting a solid waste mixture of non-metallic particles, ferrous metallic particles, and non-ferrous metallic particles in a feed stream through a concentration zone,

(b) electronically detecting said non-ferrous metallic particles in said concentration zone by passing all said particles in the vicinity of a detector coil connected in a phase detector circuit, said circuit producing a frequency phase error signal comparable to a decrease in the inductance of said detector coil responsive only to the proximity of said non-ferrous metallic particles,

(c) removing said non-ferrous metallic particles from said ferrous metallic particles and said non-metallic particles in said feed stream in response to said frequency phase error signal.

4,718,560

DEVICE FOR TRANSPORTING DIFFERENT KINDS OF ARTICLES

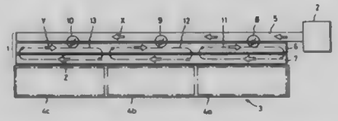
Masaharu Kiriake, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Sep. 12, 1984, Ser. No. 649,906

Claims priority, application Japan, Sep. 16, 1983, 58-143565[U]

Int. Cl.[4] B07C 5/36; B65H 67/06

U.S. Cl. 209—656 2 Claims



1. A device for sorting and transporting a plurality of articles comprising:

first, second and third belt conveyors disposed in mutually parallel relationship to each other, said first and second belt conveyors being mutually adjacent and said second and third belt conveyors being mutually adjacent, said first and third belt conveyors moving in a direction opposite to said second belt conveyor,

first and second guide members being designed such that said first guide member directs said articles from said second belt conveyor to said third belt conveyor and said second guide member directs said articles from said third belt conveyor to said second belt conveyor to thereby form a circulating path for said articles, and

a sorting mechanism for identifying and sorting articles transported on said first belt conveyor so as to cause articles identified and sorted by said sorting mechanism to be moved from said first belt conveyor to said second belt conveyor,

wherein said article is a spinning bobbin supported on a carrier, said carrier having a base plate portion configured to rest upon said first, second or third conveyors; and

wherein said carrier includes an identifying groove formed in said base plate portion, the height at which said identifying groove is positioned being differentiated depending upon the kind of spinning bobbin supported on said carrier,

wherein said sorting mechanism includes a stationary sorting gauge positioned at a fixed height above said first belt conveyor to thereby encounter the base plate portion of the carriers resting on said first belt conveyor;

whereby the carriers having an identifying groove whose height is not coincident with the height of the sorting gauge are moved from said first belt conveyor to said second belt conveyor.

4,718,561

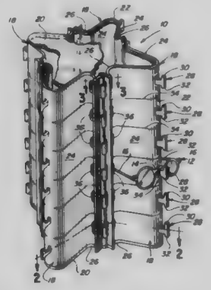
EYEGLASS FRAME DISPLAY

Ronald P. Eckert, Prospect Heights, Ill., assignor to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Apr. 3, 1986, Ser. No. 847,687

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—13 10 Claims



1. A display assembly for eyeglass frames, each frame having a bridge and spaced temples, comprising a plurality of upright modules arranged edge-to-edge to define a multi-sided geometrical configuration, each module including:

a forwardly projecting mid-portion defining a vertical front face,

a plurality of vertically spaced support means projecting forwardly of said front face and each serving as a cradle for the bridge of an eyeglass frame,

horizontally spaced side portions extending rearwardly of the vertical front face,

vertically extending concave edge portions at the rear of the side portions, the concave edge portions curving forwardly to define a hooked configuration, and

spaced apertures at the base of each concave edge portion through which the temples can be extended, with the concave hooked configurations of the edge portions serving to guide the temples into the apertures and prevent the temples from sliding past the edges.

4,718,562

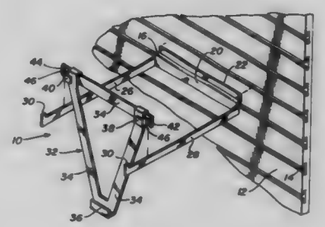
VERTICAL PACKAGE DISPLAY RACK

A. C. Winkler, Jr., Irving, Tex., assignor to Standard Fixture Co., Inc., Dallas, Tex.

Filed Dec. 15, 1986, Ser. No. 941,706

Int. Cl.[4] A47F 5/08

U.S. Cl. 211—94.5 5 Claims



1. Apparatus for displaying one or more generally rectangular packages comprising:

(a) a support structure;

(b) a mounting member including means for attaching the mounting member to said support structure, said mounting member including at least two substantially parallel package supporting arms projecting from said support structure; and

(c) a holder for receiving a generally rectangular package, said holder including

(i) a rigid package supporting frame having a front side, a back side and an upper edge,

(ii) a flange extending laterally and downwardly from each end of said upper edge to engage said package supporting arms and suspend said holder from said upper edge in a vertical position with said front side facing away from said support structure, and

(iii) at least one bracket extending from said front face of said rigid package supporting frame for engaging an edge of the generally rectangular package to secure said generally rectangular package to the front face of said rigid package supporting frame.

4,718,563

OVERHEAD GANTRY

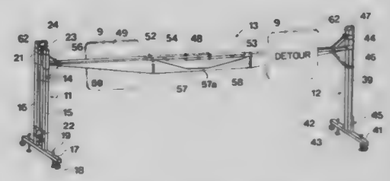
Louis Ellgass, Estavayer-le-lac, Switzerland, assignor to L. Ellgass SA, Switzerland

Filed Oct. 17, 1985, Ser. No. 788,232

Claims priority, application Switzerland, Oct. 20, 1984, 5020/84

Int. Cl.[4] B66C 11/00

U.S. Cl. 212—142.1 10 Claims



1. A transportable overhead gantry for spanning a roadway, comprising:

two supports defining masts and one cross-member for carrying traffic signs, the supports being provided with lifting means for lifting and lowering the cross-member along the supports, the supports being foldable towards one another

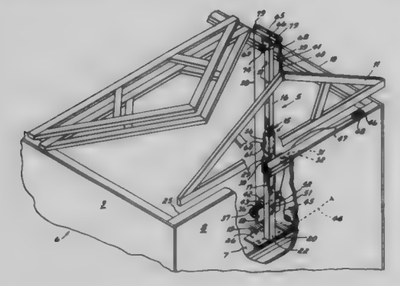
in a plane of the cross-member and the cross-member being telescopically retractable, whereby the gantry can be folded up with the cross-member lowered and transported on a truck, and further comprising a self-acting brake operable to fix the cross-member to the supports in the event of failure of the lifting means.

4,718,564

PORTABLE CONSTRUCTION HOIST

Jonathan L. Bailey, 6939 LaBoiteaux Ave., Cincinnati, Ohio 45239

Filed Aug. 13, 1986, Ser. No. 896,607
Int. Cl.[4] B66C *23/18*
U.S. Cl. 212—179 4 Claims



1. A portable hoist for lifting loads such as roof trusses at the site of a building under construction, said building having at least a wall and a floor inside the wall, said hoist comprising:

(a) a base adapted to be disposed inside the wall to support said hoist upon the floor, said hoist being securable to at least one of the wall and the floor;

(b) a vertical mast telescopically adjustable to a desired working height, said mast having an upper end and a lower end, said lower end of said mast being attached to said base in a manner and location permitting said mast to be positioned substantially flush against the inside of the wall;

(c) securement means for securing said mast to the wall to stabilize the hoist;

(d) an electric winch having a cable wound thereon for lifting objects, said winch being adapted to be removeably mounted to one of said mast and said base at a location adjacent said lower end of said mast, and

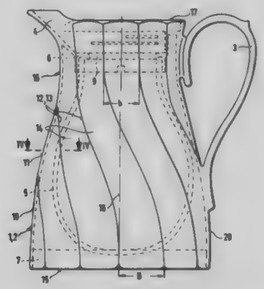
(e) a horizontal boom having a pulley at each end for carrying said cable, the length of said boom being sufficient to extend outside the wall so that a load raised from outside the wall can be lifted above the wall and swung into a position inside the wall, said boom being freely rotatably and removeably secured near the center thereof to said upper end of said mast said boom being short relative the working height of said mast so that the weight of said load is substantially counterbalanced by the tension in the portion of said cable running between said winch and one of said pulleys.

4,718,565

PLASTIC JUG OR FLASK, PARTICULARLY A PLASTIC JACKET OF AN INSULATING JUG OR FLASK, HAVING A RELIEF ORNAMENT ON THE JACKET SURFACE

Anso Zimmermann, Niederasula, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederasula, Fed. Rep. of Germany

Filed Apr. 23, 1986, Ser. No. 855,969
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526084
Int. Cl.[4] A47J *41/00*; B29C *45/26*
U.S. Cl. 215—1 C 6 Claims



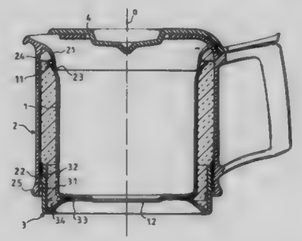
1. In a plastic jug or flask, particularly a plastic jacket of an insulating jug or flask, that is produced by injection molding in a two-part injection mold having axial dividing joints for forming axial jacket seam lines on the jacket surface of the plastic jacket, and a relief ornament on the jacket surface in the configuration of substantially vertical and spiral projections defining resilient jacket surface strips therebetween; the improvement comprising in that two jacket seam lines formed by said mold extend in a median axial plane (E), and the jacket surface strips in the region of the jacket seam lines subtend exterior angles (W) equal to or slightly greater than 90° with the median axial plane (E) of said jug.

4,718,566

INSULATED CARAFE

Dieter Wunder, Reichelsheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Continuation of Ser. No. 768,032, Aug. 21, 1985, abandoned.
This application Dec. 31, 1986, Ser. No. 948,107
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434331
Int. Cl.[4] A47J *41/00*
U.S. Cl. 215—13.1 20 Claims



1. Insulated carafe comprising

an inner container having a cylindrical wall portion with an annular outwardly inclined upper edge surface and a transverse base portion,

jacket structure housing said inner container, said jacket structure including

a first member having a cylindrical body portion surrounding and spaced from the cylindrical wall portion of said inner container, an annular, continuous flexible flange adjacent the top of said first member and seated in positive sealing relation under radial and axial elastic pretension on said outwardly inclined upper edge surface of said inner container, and coupling structure adjacent the bottom of said cylindrical body portion, and

a second member having a cylindrical body portion, an annular continuous flexible flange that has an upwardly directed inner edge that provides a circumferential sealing lip, said sealing lip abutting the marginal area of said transverse base portion of said inner container under pretension acting parallel to the central axis of said carafe in positive sealing relation under elastic pretension, and coupling structure in coupling engagement with the coupling structure of said first member,

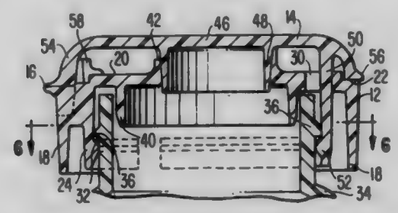
said first and second members having cooperating sealing surfaces adjacent said coupling structures in sealing engagement to provide a continuous seal between said first and second members, said inner container and said jacket structure cooperating to provide a sealed chamber surrounding a cylindrical body portion of said inner container.

4,718,567

CHILD RESISTANT DISPENSING CLOSURE

Donald La Vange, Cumberland, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Apr. 1, 1987, Ser. No. 32,562
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—216 14 Claims



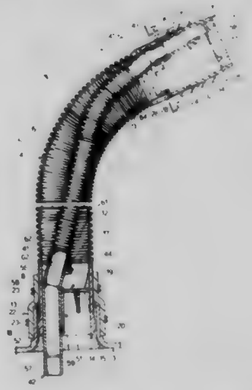
1. A child resistant dispensing closure comprising a cap base member and a cap lid member, said cap base member being defined by a top surface, an exterior skirt and an interior skirt, a slot formed in said top surface, a dispensing opening formed in said top surface, said interior skirt being provided with a skirt interruption at the location of said slot, a cap locking bead provided on said interior skirt, said cap locking bead being adapted to engage a container locking bead provided on the neck of a container, said container locking bead being provided with an interruption, said cap base member being adapted for rotation with respect to said neck, a depending locking prong provided on said cap lid member, said cap lid member being adapted for movement with respect to said cap base member from an open position wherein said dispensing opening is unobstructed to a closed and locked position wherein said cap lid member closes off said dispensing opening by a user manually moving said cap lid member toward said cap base member so as to cause said locking prong to enter said slot and engage said container locking bead, said cap lid member being adapted for movement from said closed and locked position to said open position by a user manually rotating said dispensing closure with respect to said neck so as to align said slot with said interruption in said container locking bead so as to disengage said locking prong from said container locking bead, and then manually moving said cap lid member away from said cap base member.

4,718,568

FUEL FILLER MEMBER FOR VEHICLES

Attilio Dal Palù, Rivoli, Italy, assignor to Fabbrica Italiana Serrature Torino Fiat, Turin, Italy

Filed Nov. 12, 1986, Ser. No. 930,006
Claims priority, application Italy, Nov. 15, 1985, 54044/85[U]
Int. Cl.[4] B65B *3/18*
U.S. Cl. 220—86 R 16 Claims



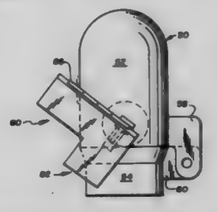
1. For use in conjunction with a vehicle including a fuel tank and a fuel filler inlet, a fuel filler member disposed between and connecting said inlet and said tank, said member comprising a first fuel filler pipe, and a second breather pipe located in said first pipe, said first and second pipes defining between them a passageway permitting fluid communication between said inlet and said tank; wherein said second pipe is dimensioned to convey air present in said tank towards said inlet, is in major part rectilinear, and is shorter than the longitudinal extent of said first pipe; and wherein said second pipe includes a second pipe central portion having a corrugated outer surface.

4,718,569

LOCKING SYSTEM FOR GAS CYLINDERS

John F. Swanson, 11 Battle Park Dr., Spotsylvania, Va. 22553

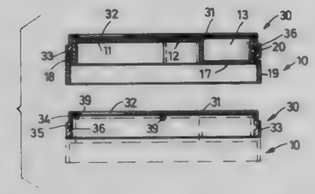
Filed Oct. 7, 1986, Ser. No. 916,100
Int. Cl.[4] B65D *85/20*, *81/24*
U.S. Cl. 220—212 5 Claims



1. A removable and lockable box for cooperating with a gas cylinder cap assembly, said gas cylinder cap assembly having upper and lower portions hingedly connected together and means for locking the upper and lower portions together, said lower portion having an upper edge and means defining a slot extending downwardly away from said upper edge, said box having a lower body portion and a lid hingeably attached thereto on one side of the lower body portion, said lower body portion having an outwardly directed T-shaped mounting member positioned on a side of said lower body portion opposite said one side, said lid including an outwardly directed tab member positioned so as to overlie said T-shaped flange when said lid is closed over said lower body portion so that when

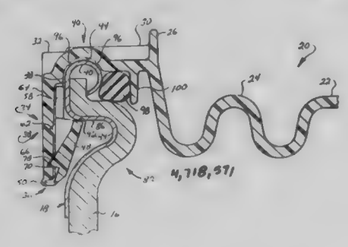
said T-shaped mounting member is positioned within said slot means said box will be retained on said cap and when said lid is closed and the upper portion of the cap is closed and locked thereover said lid will be simultaneously locked in a closed position.

4,718,570
DISPENSER FOR PASTY COMPOSITIONS
Horst Diener, Ulm-Göggingen, Fed. Rep. of Germany, assignor to Vita Zahnfabrik H. Rauter GmbH & Co., Bad Sackingen, Fed. Rep. of Germany
Filed Mar. 18, 1987, Ser. No. 27,601
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—253 28 Claims



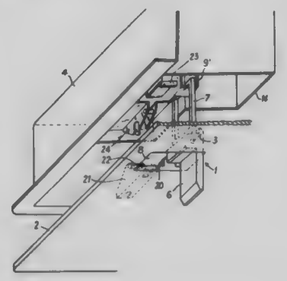
1. A dispenser for pasty compositions, especially facing material in dental technology and the like, comprising:
a circular box being closed by a cover and having a bottom and a wall, characterized in that in the peripheral area of the box cavity there is arranged a packing member (11), covering an opening (32) formed in the cover (30) when the cover (30) is in the closing position, and that the cover (30), being guided in an endless groove (36), can be turned on the box (10).

4,718,571
MOLDED LID ASSEMBLY WITH PRIMARY AND SECONDARY LATCHING FEATURES
Paul G. Bordner, 7803 Fairlawn Dr., Pickerington, Ohio 43147
Filed Mar. 27, 1987, Ser. No. 31,511
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 24 Claims



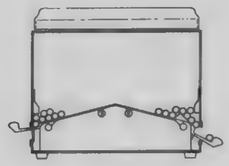
1. A molded lid for removable closure over a container having a bottom and sidewall extending upwardly therefrom to a top portion including a rim structure having an upwardly disposed rim bead, an outwardly disposed side surface portion and an inwardly extending engaging region formed inwardly of and below said rim bead and having an upper contact surface, comprising:
a lid top portion formed of resilient plastic material extensible across said container top portion to an outer periphery locatable adjacent said rim structure;
a skirt assembly integrally formed with said lid top portion and extending downwardly from said periphery to a lower edge locatable below said engaging region upper contact surface;
a primary latching assembly integrally formed with said skirt assembly and including:
a plurality of discrete lid lock pocket assemblies formed integrally with said skirt assembly and defining a lock chamber intermediate the inwardly disposed side of said skirt assembly and said container sidewall,
an interference lug pivotally coupled with said skirt lower edge at a said lid lock pocket assembly for pivotal movement about said lower edge into said lock chamber into a securing orientation for deriving abuttable contact with said engaging region upper contact surface to effect substantially rigid compressive restraint between said pivotal coupling with said skirt lower edge and said contact surface abuttable contact, and resiliently deformable toward the inside surface of said skirt assembly when said lid skirt assembly is being positioned over said container rim structure,
said skirt assembly including a parting groove extending thereabout to define upper and lower skirt portions and hand graspable means coupled with said skirt lower portion for effecting the manual removal of said lower skirt portion from along said parting groove including said primary locking assembly interference lugs;
a secondary latching assembly including:
a generally semi-cylindrically shaped lid rim disposed at the said lid top portion outer periphery, and having a bead conforming interior surface nestable in seating adjacency with said upwardly disposed container rim bead, and
said upper skirt portion being configured having an internal dimension selected as less than the corresponding outside dimension of said container rim structure outwardly disposed side surface portion to effect a press fit therebetween.

4,718,572
DEVICE FOR HALF-OPENING THE DOOR OF A BOX CONTAINING SAFETY EQUIPMENT, SUCH AS OXYGEN MASKS
Dominique Gosse, Le Chesnay, and Gerard Silber, Chilly-Mazarin, both of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), France
Filed Aug. 8, 1986, Ser. No. 894,790
Claims priority, application France, Aug. 8, 1985, 85 12162
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 16 Claims



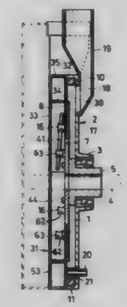
1. A device for partially opening the door of a compartment containing safety equipment such as oxygen masks, said device comprising:
an opening member pivotably secured to the door about a transverse axis parallel to the door and across an associated opening in the door, said opening member having an operating portion disposed to one side of said axis and a latching portion disposed substantially diametrically opposite said operating portion, wherein said opening member is pivotable between at least a normal position in which said operating portion closes the associated opening in the door, and an inspection position in which the door is held in a partially open position without releasing the enclosed safety equipment; and
a latching member attached to the compartment for engaging said latching portion when said opening member is in said inspection position to thereby hold the door in a partially open position.

4,718,573
DISPENSER FOR ELONGATED ARTICLES
Gregory J. Wenkman, Middleton, and Ferdinand F. Salzmann, Prairie du Sac, both of Wis., assignors to Traex Corporation, Dane, Wis.
Continuation-in-part of Ser. No. 698,134, Feb. 4, 1985, abandoned. This application Jul. 8, 1985, Ser. No. 752,771
Int. Cl.[4] B65H *3/62*
U.S. Cl. 221—202 15 Claims



1. A dispenser for elongated articles that is especially adapted for convenient assembly comprising;
(a) a storage bin having a front wall and a rear wall opposed thereto and opposed side walls, inner surfaces of which walls define a chamber, the front wall having an article discharge slot extending substantially from side wall to side wall that has a size sufficient to allow an elongated article to be dispensed therethrough with its longitudinal axis oriented generally horizontally and parallel to the front wall;
(b) a chamber floor contained within the chamber and inclining downwardly toward the article discharge slot;
(c) a lever arm hingedly attached to the chamber floor to form therewith a lever arm-floor assemblage having a lever arm portion and a floor portion, the lever arm-floor assemblage including substantially all of those moving parts of the dispenser whose function directly relates to dispensing elongated articles therefrom, the lever arm extending forwardly through the article discharge slot and having a dispensing position, in which its forwardmost parts are depressed, and a closed position, in which its forwardmost parts are elevated;
(d) retaining means for retaining the elongated articles within the chamber when the lever arm is in its closed position and dispensing a selected number of elongated articles through the article discharge slot when the lever arm is in its dispensing position;
(e) a pair of end braces located in the chamber, each generally adjacent one of the sidewalls, the floor portion of said lever arm-floor assemblage being releasably attachable to the end braces so that the lever arm-floor assemblage, after preassembly outside the chamber, can be releasably secured to the end braces, so that said assemblage is mounted within the chamber;
(f) wherein the end braces further have a front engagement notch and a rear engagement notch, the front engagement notch including rearwardly presented, undercut retention surfaces and being otherwise generally upwardly and rearwardly open, the rear engagement notch opening generally upwardly and having a narrowed neck; and
(g) wherein the chamber floor has opposed floor side edges extending generally adjacent to the side walls, the chamber floor further having a front floor pin and a rear floor pin that extend endwardly at each floor side edge, the front and rear floor pins being separated from each other by a distance such that, when the front floor pin is inserted into the front engagement notch, the rear floor pin may be thrust down into the rear engagement notch, passing the narrowed neck thereof to be retained therein, so that the chamber floor and other parts of the lever arm-floor assemblage may be attached within the chamber in secure, rigidly attached relation.

4,718,574
SOWING ASSEMBLY FOR SINGLE-SEED SOWING MACHINES
Jan Schoenmaekers, Meersen, Netherlands, assignor to Messrs. H. Fahse & Co., Fed. Rep. of Germany
Filed Sep. 30, 1985, Ser. No. 782,004
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, P3505231
Int. Cl.[4] A01C *7/04*
U.S. Cl. 221—203 13 Claims



1. Sowing apparatus for a single-seed sowing machine, said apparatus comprising:
a housing divided into first and second regions;
a vacuum chamber defined in said first region and adapted to be connected to a vacuum source;
a seed chamber and a seed holding chamber defined in said second region, said seed holding chamber having a discharge opening;
a partition separating said seed chamber from said seed holding chamber;
a seed receiving receptacle in communication with said seed chamber;
an apertured plate rotatable within said housing between said vacuum chamber and said seed holding chamber, said plate including holes arranged in a reference circle that moves past said partition and said discharge opening;
mean for cutting off the vacuum through said holes as they pass over said discharge opening;
a drive shaft rotatably mounted within said housing;
a mounting plate positioned within said vacuum chamber and mounted for rotating by said drive shaft;
means for releasably mounting said apertured plate to said mounting plate; and
a seal fixedly located at the edge of the vacuum chamber, said seal supporting the entire radial outer edge of said apertured plate, as said apertured plate moves relative to said seal, the radial outer edge of said plate being stressed in a direction toward said seal.

4,718,575

APPARATUS FOR ASCERTAINING THE LEVEL OF FLOWABLE MATERIAL IN DUST SEPARATORS AND THE LIKE

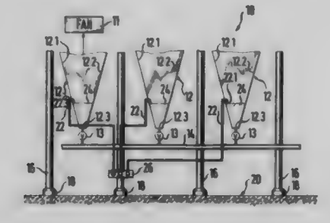
Rolf Becker, Engelskirchen, and Werner Frank, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Walther & CIE Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,330

Claims priority, application South Africa, Aug. 19, 1985, 85/6265

Int. Cl.[4] B67D *5/08*; H01H *35/00, 35/40*

U.S. Cl. 222—53 13 Claims



1. Apparatus for monitoring the accumulations of flowable solid material in a container for flowable material, particularly in the hopper of a dust separator, comprising a conduit having a first opening disposed in the container at a predetermined level, a readily accessible second opening outside of the container, and an intermediate portion disposed between said openings; means for extablishing a pressure differential between the interior of the container and the atmosphere at the second opening so that a gaseous fluid tends to flow from one of said openings toward the other of said openings and the pressure differential undergoes a change in response to at least partial obstruction of said first opening as a result of accumulation of flowable material in the container to said level, said means for establishing said pressure differential comprising means for drawing gaseous fluid from the container so that the fluid tends to flow from said second opening toward said first opening; and means for generating signals in response to a rise of fluid pressure in said conduit, comprising a valving element movable to and from an operative position in which said valving element at least partially seals said second opening under the pressure of atmospheric air, and means for biasing said valving element away from said operative position so that the valving element is free to leave said operative position when the pressure differential between the interior of said conduit and the atmosphere at said second opening is reduced as a result of at least partial obstruction of said first opening by the flowable material in the container.

4,718,576

FLUID INFUSION PUMPING APPARATUS

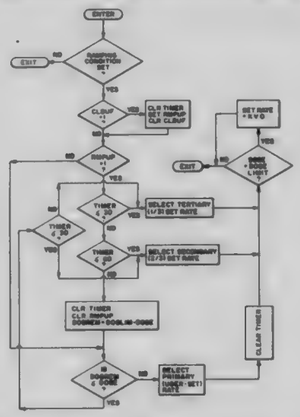
Paul S. Tamura; Ted A. Hadley, both of Mountain View, Calif., and Wayne R. Kelsey, Des Plaines, Ill., assignors to Oximetrix, Inc., Mountain View, Calif.

Filed Dec. 23, 1985, Ser. No. 812,620

Int. Cl.[4] B67D *5/08*; A61M *37/00*

U.S. Cl. 222—63 13 Claims

1. In an infusion pumping apparatus having a motor for driving a pumping member to expel liquid, from a pumping chamber having an input from a single source of said liquid, at a rate as determined by a preset motor output rate, ramping control means for initiating the pumping of said liquid by operating the motor at a plurality of starting fractional rates for predetermined periods of time until the preset rate is obtained, each starting fractional rate being less than the preset rate and successive starting fractional rates increasing the motor rate, maintaining said preset rate for a selected period of time and means for stopping the motor after a predetermined quantity of said liquid has been delivered, said ramping control means also operating the motor at a plurality of stopping fractional rates for predetermined periods of time prior to the stopping of the



motor, each stopping fractional rate being less than the preset rate and successive stopping fractional rates decreasing the motor speed.

4,718,577

SUSPENDABLE DISPENSER PACK CONTAINER FOR FLOWABLE SUBSTANCES, SUCH AS LIQUIDS, PASTES, POWDER AND FINE GRANULES

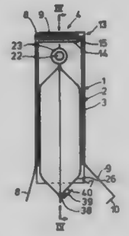
David B. Morris; Andrew C. Rollett; Donald M. Roberts, all of Bury St. Edmunds, and Christopher D. Emmerson, Sutton, all of United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,668

Claims priority, application United Kingdom, Jul. 26, 1985, #8518942

Int. Cl.[4] B65D *33/06*; B67D *5/64*

U.S. Cl. 222—105 11 Claims



1. A suspendable dispenser pack container for high value, flowable substances, such as liquids, pastes, powders and fine granules, comprising: a bag which in a filled state has a connector sealed with a foil and a outer carton which is closed by flaps which at a top end of the bag is provided with a hanging loop through which a tube is disposed, wherein the connector is disposed at a lower end of the bag in one of the bag walls, the interior of the bag runs generally conically at the bottom to the connector; wherein the outer carton in the region of the longitudinal axis of the loop and tube has a locating aperature on at least one side and through which one end of the tube is disposed to hold the loop and tube in alignment with the locating aperture; the length of the bag from the longitudinal axis of the loop and tube to the connector in an empty as well as in the filled state, is longer than the height of the closed outer carbon

from the bottom to the longitudinal axis of the locating aperture, loop and tube, whereby when hanging and with the base of the outer carton open, the connector protrudes at least as far as the opened flaps of the outer carton.

4,718,578

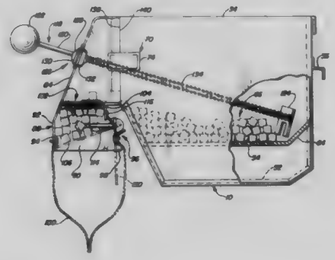
BULK GOODS DISPENSER

John R. Radek, Hinsdale; Al Kaminocki, Chicago, and Len Laskowski, Woodridge, all of Ill., assignors to Ready Metal Manufacturing Company, Chicago, Ill.

Filed Nov. 7, 1985, Ser. No. 795,896

Int. Cl.[4] B67D *5/60*

U.S. Cl. 222—108 3 Claims



1. A dispenser for dispensing particulate goods directly into a receptacle, comprising a bin for receiving and storing said particulate goods, said bin having walls defining a goods receiving opening, one of said walls slanting upwardly from the bottom of said bin toward said opening and defining a ledge, a dispenser unit supported on said ledge in abutting relationship closing off said receiving opening, means for detachably securing said dispenser unit to said bin, said dispenser unit having a housing formed by walls including a transparent front slanted wall and a pair of spaced bottom walls defining with a portion of said front wall a downwardly extending chute having a retractable trap door resiliently biased into a closed position by a spring, a handle secured to said trap door and passing through spaced walls of said housing for pivotally mounting said trap door on said housing, and a manipulator extending through said front wall and retractably mounted for scooping a portion of said particulate goods of said bin into said chute.

4,718,579

BEVERAGE DISPENSING MACHINE

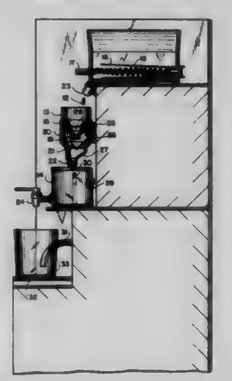
Deborah S. Brody, Brooklyn, N.Y.; Robert C. Kendall; Douglas E. Murray, both of Hamilton Square, N.J., and James R. Weldon, New York, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 27, 1986, Ser. No. 867,831

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—129.4 5 Claims

1. A beverage dispensing machine comprising a hopper holding a supply of a powdered beverage mix which contains an intensive sweetener, a powder dispensing means connected with said hopper, said dispensing means including a discharge tube through which powder is intermittently supplied to a first funnel-shaped mixing chamber, water supply and delivery means for delivering water to the mixing chamber each time powder is received therein in order to begin dispersion and solubilization of the powder in the water within the first mixing chamber, and exit tube from said first mixing chamber leading to a second chamber, means within the second chamber to prevent the liquid from passing through said second chamber in an unrestricted manner said means being effective to promote further dispersion and solubilization of the powder in the water and said second chamber being free of any mechanical agitator, means to thereafter feed the powder and water mixture into a reservoir in a manner which provides additional dispersion and solubilization to any undissolved powder, said reservoir having a capacity of no greater than about four cups of beverage and said reservoir having a dispensing valve for dispensing beverage on demand, with the flow of beverage into said reservoir slightly exceeding the flow of beverage out of said reservoir.



4,718,580

STRUCTURE FOR FORMING A REFRACTORY JOINT OF PREDETERMINED THICKNESS BETWEEN A REFRACTORY NOZZLE AND A REFRACTORY PLATE

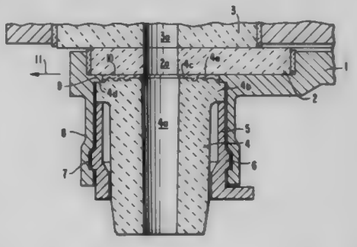
Eduard Bierbaum, Kaarst, Fed. Rep. of Germany, and Walter Vetterli, Winterthur, Switzerland, assignors to Metacon AG, Zurich, Switzerland

Filed Jun. 13, 1985, Ser. No. 744,264

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1984, 3423191

Int. Cl.[4] B22D *41/08*

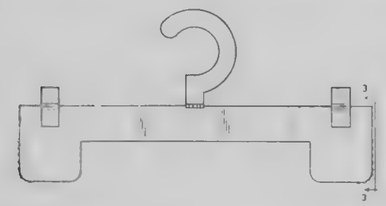
U.S. Cl. 222—600 9 Claims



1. In a discharge structure, particularly for controlling the discharge of molten metal from a metallurgical vessel, of the type including a refractory plate, a mounting frame supporting said refractory plate, an exchangeable refractory nozzle, a mounting sleeve surrounding and supporting said nozzle, lock means between said sleeve and said frame for locking said sleeve and said nozzle to said frame in a position with an inner end face of said nozzle urged toward a confronting surface of said refractory plate, and a refractory joint forming a seal between said end face and said surface, the improvement of means spacing said end face and said surface by a predetermined distance and thereby for forming said joint of a predetermined thickness, said spacing means comprising:

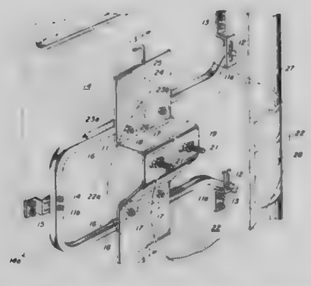
abutment means, extending from said frame and abutted by an inner end of said nozzle, for forming an axial support for said nozzle upon said lock means urging said nozzle toward said plate.

4,718,581
GARMENT HANGER
Fran Chiaramonte, 212 Dorothy St., Scottdale, Pa. 15683
Filed Jan. 8, 1987, Ser. No. 1,519
Int. Cl.[4] A41D *27/22*
U.S. Cl. 223—96 1 Claim



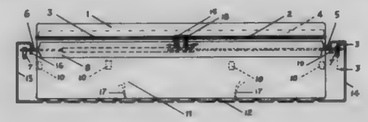
1. A garment hanger for grasping the waistband of trousers of the like, comprising:
   a. hanger means including support member means having hook means fixedly secured to an intermediate section thereof;
   b. clamp means attached to said support member means and being operable to grippingly support said trousers;
   c. serrated edge means forming a part of said clamp means, said serrated edge means including a first set of teeth frictionally engageable with an exterior portion of said trousers and a second set of teeth which penetrate an interior portion of waistband material of said trousers, said first set of teeth being provided with rounded points so as to prevent penetration of said first set of teeth into a material portioni of said trousers, said second set of teeth being provided with sharpened points to effectively cause a penetration of said second set of teeth into said waistband material, said first and second sets of teeth being held in an abuttable and relatively movable engagement by spring means; and,
   d. additional serrated edge means formed on end portions of said support member means, said additional serrated edge means including sharp pointed teeth for grasping said interior portion of said waistband material, said pointed teeth being directed upwardly with respect to a downward hanging direction of said trousers.

4,718,582
SPARE TIRE MOUNTING BRACKET FOR VAN-TYPE VEHICLE
Thomas A. Iovenitti, 8509 Whitefish, Fountain Valley, Calif. 92708
Filed Feb. 24, 1987, Ser. No. 17,280
Int. Cl.[4] P62D *43/00*
U.S. Cl. 224—42.21 1 Claim



1. A spare tire mounting bracket for a van-type vehicle having rear double doors, each of said double doors being hinged at their respective outer edges to the van body of said vehicle at hinges spaced inwardly of opposed rear corners of said body and to which said bracket can be mounted to store a spare tire, said bracket comprising:
   (a) an elongated tire support bar having an inner end and an outer end;
   (b) means for fixing of said support bar in generally horizontal relation to one of said doors such that the ends of said bar are adjacent the respective side edges thereof;
   (c) a tire support carriage slidably mounted on said bar and movable thereon between said inner and outer ends;
   (d) means for fixing the lateral position of said carriage on said bar at preselected locations; and
   (e) means for detachably mounting a spare tire on said support carriage such that a diametral plane of the tire is parallel to the horizontal axis of said bar,
   to permit location of said mounted tire in at least two operative positions,
   said preselected locations comprise a first location at which the peripheral edge of said tire clears the inner edge of the other of said rear doors on which it is mounted, and
   a second location at which the peripheral edge of said tire overlies the inner edge of said other door but clears the rear corner of said van body when the door on which it is mounted is fully opened.

4,718,583
PORTABLE LUGGAGE CARRIER FOR PICKUP TRUCKS
Randall Mullican, 8201 Brentwood Ave., Lubbock, Tex. 79424
Filed Oct. 14, 1986, Ser. No. 918,843
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—42.42 R 5 Claims

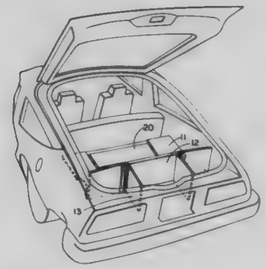


1. A portable luggage carrier for mounting transversely in the open bed of a pickup truck which has a floor and a pair of upright side panels extending along opposite longitudinal sides of said floor and at least two pair of longitudinally spaced transversely aligned holes in said upright panels adjacent to the upper edges thereof, said portable luggage carrier comprising a flexible elongated bag having a lid, a bottom, front and back longitudinal side walls and a pair of opposite end walls connected to said bottom and extending upwardly therefrom forming a continuous enclosure about said bottom, said side walls each having an upper edge, a tubular casing attached to each of said side walls adjacent to and parallel to the upper edge thereof, a pair of telescoping support rods, therebeing one support rod extending longitudinally through each of said casings with opposite ends projecting outwardly of the opposite ends of said casing, each of said support rods being adjustable in length so that the opposite ends thereof may be extended through one of said two pair of transversely aligned holes in said side panels for supporting said flexible bag from said side panels.

4,718,584
AUTOMOTIVE ACCESSORY FOR HATCHBACK AUTOMOBILES AND STATION WAGONS
Joseph T. Schoesy, 4224 Marcrest, Cincinnati, Ohio 45211
Filed Aug. 8, 1986, Ser. No. 916,785
Int. Cl.[4] B60R *5/00*
U.S. Cl. 224—42.42 8 Claims

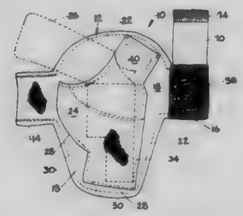
1. A collapsible automotive accessory for installation in a rear area of a hatchback automobile or station wagon, said

accessory adapted for forming compartmentalized enclosures for retaining small articles placed therein in restricted positions, comprising:
   (a) a substantially flat base;
   (b) a back flap swingably attached in a lateral direction to the base so as to permit vertical movement from the base to a substantially upright position and means for retaining said upright position so that the vertical walls of the area and the back flap create an inner open topped enclosure; and



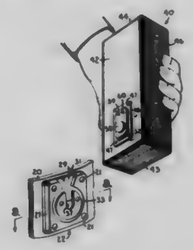
   (c) at least two side flaps swingably attached to the back flap so as to move outwardly from the raised back flap and means for retaining said position so that the vertical walls of the rear area, the back flap, and the side flaps create at least three open-topped enclosures,
   further wherein said flat base and back flap are dimensioned so that when laid flat in the rear area there is (1) minimal sidewall clearance with the inner vertical walls of the area so as to prevent substantial lateral and longitudinal movement of the accessory and (2) they form a substantially planar unit.

4,718,585
ANTI-SLIP HOLSTER AND METHOD OF USING THE SAME
John H. Atkins, Sr., Cincinnati, Ohio, assignor to A & B Industries, Inc., Cincinnati, Ohio
Filed Oct. 15, 1986, Ser. No. 918,570
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—238 9 Claims



1. A holster for holding a hand gun, comprising:
(a) a body having
   (i) an inner panel placed adjacent a wearer's body, the inner panel having inner and outer surfaces, wherein the inner surface is placed adjacent a wearer's body;
   (ii) an outer panel joined along its lower margins to the inner panel outer surface; and
   (iii) a bolster, joined along a first margin to the inner panel and joined along a second margin to the outer panel, wherein the inner panel, outer panel and bolster cooperate to form a compartment for receiving a hand gun;
(b) belt receiving means associated with the inner surface of the inner panel;
(c) a first tab joined to a first side of the inner panel, the first tab having an inner surface placed adjacent a wearer's body, the first tab inner surface including a belt receiving means;
(d) a second tab joined to an opposite side of the inner panel, the second tab having an inner surface placed adjacent a wearer's body, the second tab inner surface including a belt receiving means,
wherein the belt receiving means of the first tab, second tab and inner panel are aligned for simultaneously receiving a belt.

4,718,586
SWIVEL FASTENING DEVICE
Kiyohiko Hagino, 2-2-11 Nishitomi, Fujisawa-City, Kanagawa Prefecture, Japan
Filed Aug. 8, 1986, Ser. No. 894,619
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—252 9 Claims



1. A belt support for a carrying case comprising, in combination:
   (1) a belt element comprising a base plate of substantially rectangular form with front and rear faces, top, bottom and side edges,
   the base plate rear face being substantially flat,
   the base plate front face being configured as follows:
   the outer portion of the front face being flat and substantially parallel to the base plate rear face except centrally of the top edge of the front face, which portion is relieved in a part thereof to a first fixed depth,
   a first, continuous channel being formed in said front face at least to said first fixed depth extending from the front face top edge relieved portion downwardly into and centrally of the front face,
   a second circular shaped channel formed in said front face to at least a second lesser depth and extending peripherally of said first channel in at least the lower portions thereof and connecting into said first channel in the upper portion thereof,
   said second channel having inner and outer walls,
   the portion of the front face between the first and second channels being somewhat recessed,
   a slotted plate fixed to said recessed portion of the front face between the first and second channels,
   the slot in said plate leaving portions of the plate extending inwardly of and overlying the peripheral limits of said first channel,
   the periphery of said plate defining a trackway with said second channel outer wall, and
   (2) a case element, said case element having front and rear sides thereto and being substantially rectangular with top, bottom and side edges,
   said case element having a post with a round, larger diameter, substantially flat head thereon positioned substantially centrally of the front side thereof,
   said case element also having two pegs positioned on the front side thereof spaced downwardly and symmetrically away from said post and also substantially separated from one another,

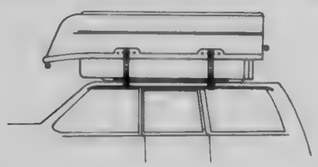
the round, flat head of the post on said case element being receivable in and moveable the length of said first channel with the edge of said round flat head received under the plate extensions over said first channel and being rotatable therewithin with said case element when said round flat head is at the base of the first channel,
the pegs receivable in the second channel and trackway when the round flat head of the post is at the base of the first channel, upon rotation of the case element with respect to said belt element towards a position where the case element top edge and belt element top edge are in alignment,
the pegs and the round flat headed post working in the two channels to retain the case element and belt element in rotational engagement for an arc of over 180°.

4,718,587

CAR-TOP CARRIER TO ALLOW CONVERSION TO SMALL UTILITY WATERCRAFT

Hubert H. Roberts, 779 Lower Donnally Rd., Charleston, W. Va. 25304

Continuation of Ser. No. 697,629, Jan. 30, 1985, which is a continuation-in-part of Ser. No. 544,739, Oct. 24, 1983. This application Jul. 1, 1986, Ser. No. 881,213
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—328 **19 Claims**



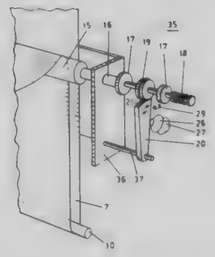
1. A device usable in a carrier mode in which it acts as a car-top luggage carrier and also usable in a watercraft mode in which it acts as a boat, including:
two dissimilar hollow thin shelled containers so constructed to allow their union through interlocking parts into a configuration that allows an alternate use as either a car-top luggage carrier, when in the carrier mode, with one of said containers smaller than the other, the smaller container being the carrier when in the carrier mode and the stern section of the watercraft when in the watercraft mode, and the larger container being the cover when in the carrier mode and the bow section when in the watercraft mode,
said smaller container having an end which acts as the front end of said smaller container when in the carrier mode and as the rear end of said smaller container when in the watercraft mode,
said larger container having an end which acts as its front end in both of said modes,
the forward end of one of said containers, when in its carrier mode, having a recess,
the forward end of the other of said containers, when in its carrier mode, including projection means for entering said recess, in said carrier mode, for inter-connecting said containers and aiding in holding them in place,
in which said projection means is on the smaller container and said larger container defines said recess,
in which said projection means is a horizontal plate extending forwardly from the front end of the smaller container when the latter is in said carrier mode.

4,718,588

METHOD OF, AND APPARATUS FOR, RETRACTING THE LOOPS AND ENDS OF TOWELS INTO A TEXTILE TOWEL DISPENSER

Sandro Arabian, Vaduz, Liechtenstein, and Manfred Baumann, Diepoldsau, Switzerland, assignors to CWS AG, Baar, Switzerland

Division of Ser. No. 621,866, Jun. 18, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 828,982
Claims priority, application Switzerland, Jun. 24, 1983, 3451/83
Int. Cl.[4] A47K *10/28*; B65H *20/00*
U.S. Cl. 226—127 **7 Claims**



1. An apparatus for retracting towel loops and an end of a cloth towel into a cloth towel dispenser, comprising:
a first towel loop formed outside the cloth towel dispenser;
a cover operatively associated with said cloth towel dispenser;
a second towel loop formed by said cloth towel and disposed behind said cover;
a weighted roller placed in said second towel loop;
a retraction roller provided with friction means;
said retraction roller guiding said second towel loop to the rear of said cover;
a blocking device coupled with said retraction roller;
said blocking device containing a time delay mechanism determining a predetermined moment of time for retracting said first towel loop;
said retraction roller has a journal; and
said blocking device comprising:
a friction clutch including a friction wheel movably supported at said journal of said retraction roller;
said friction clutch including means for connecting said friction wheel with said journal of said retraction roller;
a lever in the form of a sector of a large friction wheel cooperating with said friction wheel of said friction clutch;
said lever having a friction surface and engaging said friction wheel by means of said friction surface;
a stop disposed opposite to said lever;
a housing;
a first suction cup connected to said lever and a second suction cup connected to said housing;
said first and said second suction cups being operative as said time delay mechanism for said blocking device; and
means for taking-up the retracted towel loop.

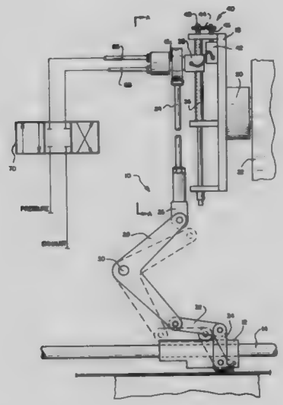
4,718,589

STOCK MATERIAL FEED MECHANISM

James O. Nelson, 35440 Beachpark Dr., Eastlake, Ohio 44094

Filed Jun. 9, 1986, Ser. No. 871,804
Int. Cl.[4] B65H *20/00*
U.S. Cl. 226—142 **7 Claims**

1. An apparatus for adjusting the stroke of a stroke material feed mechanism used in a punch crank press, said stroke material feed mechanism including a feed block for advancing intermittently stock material into the working area of the punch crank press, rotatable crank pin means for effecting reciprocal movement of the feed block, and crank link means for transmitting rotational movement of the crank pin means into the reciprocal movement of said feed block, said apparatus comprising:
a throw member fixedly attached to the crank shaft of the punch crank press for joint rotation therewith, said crank pin means being attached to said throw member at a position offset from the axis of the crank shaft for joint rotation with said throw member, the distance between the axes of said crank shaft and said crank pin means determining the crank arm and, therefore, the amount of stock length advanced into the working area;
fluid motor means for displacing said crank pin means relative to said throw member to change the eccentricity of said crank pin means relative to the axis of said crank shaft and thereby the crank arm whereby the amount of stock length advanced into the working area is changed;
a threaded rod mounted on said throw member and a nut associated with said crank pin means and movable along said threaded rod upon rotation of said threaded rod to



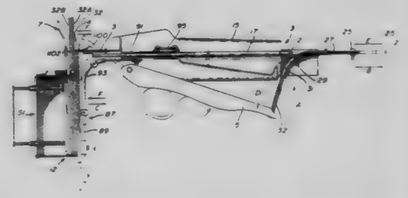
thereby change the eccentricity of said crank pin means, said fluid motor means effecting rotation of said thread rod means in a predetermined direction in response to actuation thereof by a press operator to thereby provide for longitudinal movement of said nut;
drive means for transmitting torque from said fluid motor means to said threaded rod;
said fluid motor means comprising a fluid motor, conduit means for directing fluid flow to and from said motor, and a valve for controlling fluid flow through said conduit means;
said throw member comprising a flange plate mounted on said crank shaft for joint rotation therewith and two spaced support plates extending transverse to said flange plate and fixed thereto for supporting said threaded rod for rotation;
said fluid motor being fixedly attached to said flange plate between said two support plates; and
said conduit means comprising passage means extending through said crank pin means and said nut and flexible conduit means connected with said passage means.

4,718,590

FASTENER DISPENSING DEVICES

Bernard Engelhardt, 51 Abbeywood Trail, Don Mills, Ontario, Canada M3B 3B4

Filed Jul. 28, 1986, Ser. No. 889,743
Int. Cl.[4] B65C *7/00*
U.S. Cl. 227—67 **22 Claims**



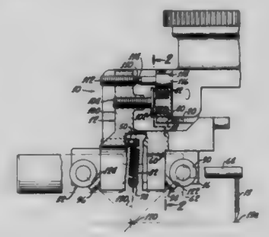
1. A fastener and tag dispensing device, said device comprising a trigger means for activating, when moved in a triggering direction, a push rod to extend through a hollow needle member, whereby to anchor a fastener in a pierceable product;
the improvement comprising:
positioning means for positioning said product so that one side of said product is adjacent the front end of said needle member;
a tag dispenser comprising means for automatically placing a tag in front of said needle member in response to activating said trigger means;
moving means for moving said positioning means and said tag towards said needle member, said moving means being activated to move towards said needle member when said trigger means is moved in said triggering direction;
whereby, said product and said tag are caused to approach said needle member, to be pierced by said needle member, and to slide on said needle member so that said needle member extends through said product and tag, and the front end of said needle member extends beyond the other side of said product and tag a sufficient distance for the dispensing device to dispense a fastener and tag so that when said product is removed from said positioning means, a fastener and tag are attached thereto.

4,718,591

WIRE BONDER WITH OPEN CENTER OF MOTION

William H. Hill, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1986, Ser. No. 944,704
Int. Cl.[4] B23K *1/06, 20/10*
U.S. Cl. 228—1.1 **13 Claims**



1. Mounting apparatus for relatively movable parts comprising:
a first part,
a second part having an element to be moved relative to said first part, and

mounting means for mounting the second part to the first part for motion of said element about a center of motion displaced from said first and second parts, said mounting means comprising

first and second mutually spaced rolling guide members rotatably mounted on said first part on first and second mutually spaced axes, said guide members having first and second arcuate guide surfaces, respectively, positioned on one side of said center of motion,

first and second guide follower rods on said second part in rolling contract with said first and second guide surfaces respectively and positioned between said guide surfaces

and said center of motion, and

means for urging said guide follower rod against said guide surfaces and away from said center of motion.

7. An ultrasonic wire bonder comprising:

a bonder frame,

a transducer support having a bonder tip connected thereto,

mounting means for mounting the transducer support to the bonder frame for motion of said bonder tip about a center of motion displaced from said transducer support and frame, said mounting means comprising:

first and second mutually spaced rotatably mounted rolling guide members on said frame having first and second arcuate guide surfaces, respectively, positioned on one side of said center of motion,

first and second guide followers on said transducer support in moving contact with said first and second guide surfaces respectively and positioned between said guide surfaces and said center of motion, and

means for urging said guide followers against said guide surfaces, said urging means including spring means connected between said frame and said transducer support for urging said transducer support away from said center of motion.

4,718,592

APPARATUS FOR SOLDERING AN ORNAMENTAL CHAIN WITH LOOPS HAVING TWO INTERTWINED STRANDS

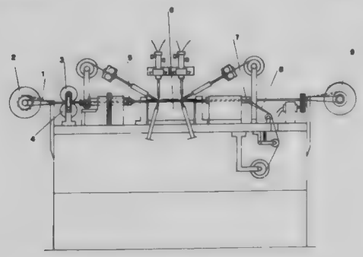
Ferdinando Grotto, Via Monte Novegno, 39 Bassano Del Grappa (Vicenza); Franco Bassan, Via Giulietti, 35 Vicenza, and Giovanni Campora, Via Gasparoni, Vincenza, all of Italy

Filed Dec. 18, 1986, Ser. No. 943,562

Claims priority, application Italy, Dec. 24, 1985, 85626 A/85

Int. Cl.⁴ B21L *3/02*

U.S. Cl. 228—47 **5 Claims**



1. An apparatus for soldering an ornamental chain of the type of a rope made from two intertwined strands with loops for simultaneously soldering on two locations and with recovery of the cores which hold the loops, which comprises first means (2) for winding and for unwinding the chain to be soldered, second means for advancing the chain to a soldering device, said soldering device comprising two flame injectors, arranged opposite one to the other and acting on the loops of the chain, a pair of vertically movable clamps for holding the chain during the soldering operation, a support (6) having a longitudinal opening for passing the chain through, said support having two recesses in the two locations where soldering is carried out, means (26,27) for feeding the soldering material to said two locations and means (32 and 33) for displacing transversely said flame injectors after said soldering operations away from the chain, third means for winding the chain and fourth means for recovering the cores from said chain after said soldering operations are completed.

4,718,593

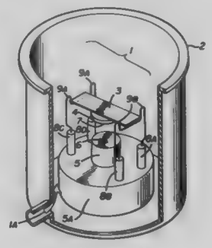
METHOD OF FORMING ALLOYED METAL CONTACTS ON ROUGH SAW-DAMAGED SILICON SURFACES

Gunther Rötzer, Apartado 161, Cumaná, Venezuela

Filed Oct. 17, 1986, Ser. No. 920,575

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—123 **17 Claims**



1. A method for the permanent bonding of a metal electrode to a rough cut and unmodified semiconductor material with a solder, which method comprises:

(a) contact the surface

(i) of the semiconductor material, in an inert atmosphere at between about 800° and 1300° C. wherein the surface of the semiconductor material is rough cut and is not subsequently treated further, with

(ii) a metal electrode wherein the surface of said metal electrode comprises

(iii) a solder admixture alloyed on the surface of the metal electrode at between about 1000° and 1500° C. itself comprising between about 11 to 89 percent by weight of palladium and about 11 to 89 percent by weight of silver; and

(b) the soldered joint contacting the metal electrode and semiconductor material is then cooled from the semiconductor material side of the contact in inert atmosphere to ambient temperature.

4,718,594

ICE CREAM CATCHER

Michele Harazi, 125 Keats Pl., Cherry Hill, N.J. 08003

Filed Dec. 12, 1986, Ser. No. 941,033

Int. Cl.⁴ B65D *3/28*

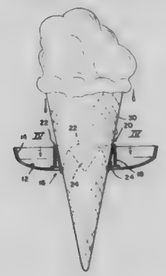
U.S. Cl. 229—1.5 H **6 Claims**

1. Ice cream catcher comprising:

a dish having a center, an interior and an orifice in the center,

a collar encompassing said orifice and having a wall extending upwardly from the interior of said dish to form an annulus catching volume with said dish,

an aperture in said collar coaxial with said orifice, and



flap means extending from the top of said collar down into said collar and through said aperture for engaging and sealing a cone inserted through said aperture.

4,718,595

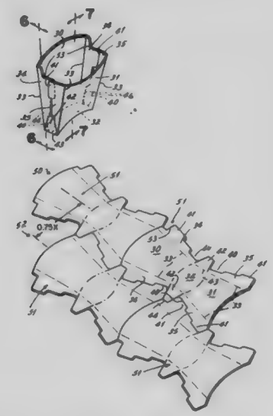
PAPERBOARD CONTAINER FOR FAST FOOD

Kenneth W. Jones, 615 Quail Run, Middletown, Ohio 45042

Filed Aug. 4, 1986, Ser. No. 892,839

Int. Cl.⁴ B65D *5/18*

U.S. Cl. 229—1.5 B **4 Claims**



1. A paperboard container comprising,

a front wall, bottom wall hinged to said front wall and a back wall hinged to said bottom wall,

each of said front and back walls having side edges on opposite sides of said walls,

a side flap hinged to each side edge,

each side flap having a recess at one end adjacent said bottom wall and a glue tab at the other end of said side flap,

the glue tabs on said facing side flaps of said back and front walls overlapping and being glued together to form a scoop type container,

the recesses on facing side walls forming openings at the bottom of said container when said tabs are glued together,

and bottom flaps hinged to the end edges of said bottom wall, said bottom flaps being tucked into said openings to close them.

4,718,596

FOLDING TRAY

Berthold Müller, Süssen, and Konrad Bantleon, Geislingen/-Steige, both of Fed. Rep. of Germany, assignors to Michael Hörauf Maschinenfabrik GmbH & Co. KG, Süssen, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,418

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612998

Int. Cl.⁴ B65D *5/24*

U.S. Cl. 229—109 **7 Claims**



1. In a folding tray formed by a single piece foldable blank, comprising: an approximately rectangular bottom part; four lateral wall parts connected with said bottom part by fold lines; and four corner elements for joining together the lateral wall parts; each of said corner elements formed by an essentially rectangular center part, and two transition sections each comprising at least two triangular folding parts joined on either side by fold lines to the center part and one said lateral wall, respectively; said triangular parts being folded upon each other to form a transition between the center part and the lateral walls; border sections joined by fold lines to outer peripheries of said lateral wall parts and said corner elements, respectively, said border sections forming a border flange of said tray; the improvement wherein each said corner element includes an equalizing section disposed between said center part and an associated one of said border sections carried by said center part; said equalizing section joined to said center section and its associated border section, respectively, by fold lines which are convergent adjacent to the fold line joining said center part to said transition sections, respectively, to minimize bulging of said associated border section.

4,718,597

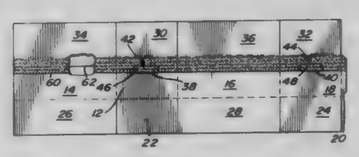
BLANK AND A BOX THEREFROM HAVING EXTENDED LIFE

Richard E. Bishop, Weston, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Sep. 24, 1986, Ser. No. 911,160

Int. Cl.⁴ B65D *5/46*

U.S. Cl. 229—52 B **11 Claims**



1. A corrugated multi-ply fibreboard box, the innermost ply of said multi-ply fibreboard defining the inside surface of said box, said box having sides, each of said side having a top edge and opposite said top edge a bottom flap extending from each of said sides, means of fastening each of said bottom flap to define a bottom,

at least one of the sides, having in its top half portion a hand

grasping aperture, said aperture being substantially vertically centered with respect to said at least one of the sides,

between said hand grasping aperture in said at least one of the sides and said top edge of said at least one of the sides, fused on said innermost ply, a load diffusing reinforcing band, said band further extending along each of said sides, as to form an endless circumferential reinforcing band on the top half portion of said box, said band having a network of substantially unstretchable fibres selected from the group consisting of synthetic and man-made fibres and thereby forming a supple and multi-directionally tension and tear resistant band enabling a load resulting from grasping said hand grasping aperture, to be diffused along said band and into said plies and avoiding critical stress points and resisting tears when said box is subjected to said load, and

between said hand grasping aperture on said at least one of the sides and said top edge of said at least one of the sides, fused on one of said plies other than said innermost ply, and not adjacent to said innermost ply, and vis-à-vis said load diffusing reinforcing band, a constraining reinforcing band, said constraining reinforcing band further extending along each of said sides, as to form an endless circumferential reinforcing band on the top half portion of said box, said constraining reinforcing band having a plurality of parallelly oriented substantially unstretchable fibres selected from the group consisting of synthetic and man-made fibres selected from the group consisting of synthetic and man-made fibres, and thereby forming a supple longitudinally tension-resistant and transversally tear-resistant band to constrain said sides of said box, to strengthen the fibreboard above said aperture and its vicinity and to block any tears expanding towards said constraining reinforcing band.

4,718,598

LIQUIDS PACKAGE WITH HANDLE

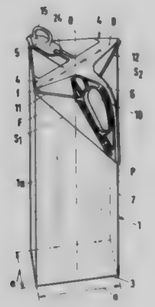
Herwig Pupp, Lund; Franz Soukup, Malmo, both of Sweden, and Wilhelm Reil, Beusheim, Fed. Rep. of Germany, assignors to Tetra Pak Finance & Trading S.A., Pully, Switzerland

Filed Apr. 10, 1987, Ser. No. 36,953

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612985

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 A 7 Claims



1. A package for flowable contents, comprising:

a tube formed of carrier material coated at least on one side with thermoplastics synthetic material and having at least one longitudinal seam;

a cover formed of thermoplastics synthetic material with no carrier material, injection molded onto one end of said tube and defining a pourer device;

a tetragonal bottom located at an opposite end of said tube and constructed from a folded over portion of said tube;

a handle connected to said cover and mounted laterally on said tube below said cover;

said package defining a quadrilateral outer contour, the outside dimensions of said bottom being equal to the tetragonal outer cross-sectional dimensions of said package along said tube from said bottom to said cover; and

said handle and said cover being integrally injection molded onto said tube within the quadrilateral outer contours of said package.

4,718,599

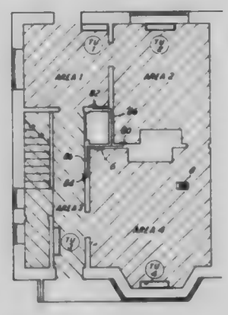
CONTROL SYSTEMS

Alan R. W. Brown, Northolt, United Kingdom, assignor to Zeal-town Limited, Edgware, United Kingdom

Filed Nov. 3, 1986, Ser. No. 926,464

Int. Cl.[4] F23N *5/20*

U.S. Cl. 236—46 R 10 Claims



1. A control system

for remotely controlling a plurality of terminal units divided into a plurality of different groups, the system comprising

a timer having a plurality of programme sequences equal in number to the number of groups of terminal units,

means for connecting each group of terminal units to the timer so as to be controlled in response to a corresponding one of said programme sequences,

switch means for each terminal unit located remote from each terminal unit for selectively disconnecting and reconnecting each terminal unit to the connecting means, and

remote control means for selectively triggering each switch means.

4,718,600

VEHICLE HEATER

Willibald Adam, Ottobrunn, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

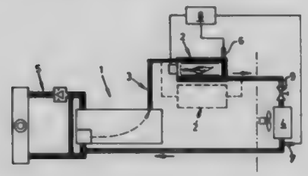
Filed Dec. 8, 1986, Ser. No. 938,831

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544023

Int. Cl.[4] G05D *23/00*

U.S. Cl. 237—2 A 11 Claims

1. Vehicle heater with an auxiliary heating apparatus that is operable independent of the engine, said heating apparatus being disposed in a vehicle heating circuit, which contains a vehicle heat exchanger which radiates heat to the vehicle interior, downstream of the heating apparatus, said heating circuit being connected to an engine coolant circuit, wherein a temperature sensor in the heating apparatus, is provided for detecting the temperature of a heat exchange medium acted upon by the heating apparatus, another temperature sensor is provided for detecting the temperature at an output area of the vehicle heat exchanger and wherein control means is provided for controlling operation of the heating apparatus based upon



a temperature difference value determined from the temperature values detected by said temperature sensors.

4,718,601

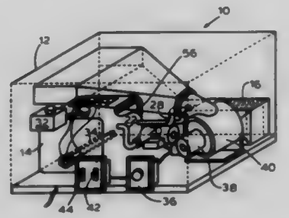
HEATING UNIT

Paul T. Chike, Rte. 3, Box 108B, Dover, Del.

Filed Apr. 23, 1986, Ser. No. 854,875

Int. Cl.[4] F24H *3/06, 7/00*

U.S. Cl. 237—16 8 Claims



1. A hot water forced air circulation heater comprising:

housing means;

liquid storage means fixidly secured within said housing means;

heating means, said heating means comprising an electric immersion heater positioned within said liquid storage means and being operable to heat said liquid therein;

heat exchanger means being operable to receive a flow of heated liquid from said liquid storage means;

pump means for providing said flow of liquid from said liquid storage means to said heat exchanger means, said pump means further being operable to return said liquid to said liquid storage means after said liquid has passed through said heat exchanger means;

blower means operable to direct a flow of air over liquid containing coils in said heat exchanger means, thereby to heat said air passing thereover, said blower means being positioned on a downstream side of air flow across said heat exchanger means; and

venturi means fluidly interconnecting said heat exchanger means with said blower means, said venturi means operating to accelerate and controllably direct air flow across said heat exchanger means in a controlled and efficient manner.

4,718,602

FUEL OPERATED VEHICLE HEATER

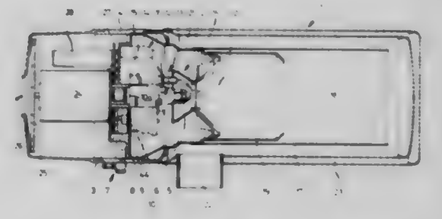
Wolfgang Beck, Munich; Werner Lacius, Starnberg; Ernst Mosig, Iffeldorf, and Bernhard Umlauf, Seefeld, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 912,529

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536143; Oct. 10, 1985, 3536170

Int. Cl.[4] B60H *1/22*

U.S. Cl. 237—32 19 Claims



1. Fuel-operated vehicle heater having an atomizing burner, an atomizing nozzle carried by a nozzle holder, a fuel pump for delivering fuel to the atomizing nozzle via a filter and an interposed solenoid valve, and a combustion air blower driven by a drive motor, wherein the nozzle holder is in the form of a housing by way of which the heater components comprised of the atomizing nozzle, the fuel pump, the filter and the solenoid valve are combined into a unified subassembly carried by said nozzle holder as a single unit.

4,718,603

ANCHOR FOR A RAILWAY TIE EMBEDDED IN BALLAST

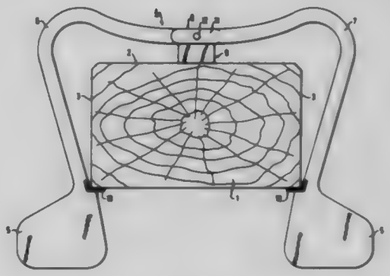
Josef Eisenmann, Munich; Henning von Heimburg, Lüdenscheid; Friedhelm Weber, Nemmerade; Dirk Verderkwick, and Helmut Eisenberg, both of Werdohl, all of Fed. Rep. of Germany, assignors to Vossloh-Werke GmbH, Werdohl, Fed. Rep. of Germany

Continuation of Ser. No. 702,346, Feb. 15, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 913,958

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411277

Int. Cl.[4] E01B *3/48*

U.S. Cl. 238—106 5 Claims



1. Anchor for a railway tie embedded in ballast comprising: an approximately inverted U-shaped clamp having at least two parts to be secured to the tie to embrace this substantially transversely of the tie axis in the region of the tie upper surface and the tie lateral surfaces; each part including an abutment surface which contacts the lower surface of the rail tie, and

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prevents upward motion of the railway anchor with respect to the rail tie; said two parts overlapping at their upper terminal portions and connected by a pivoting arrangement comprising a tightening means which extends through said overlapping portions, said tightening means is a screw bolt which is arranged in an internal thread of a bore of a sleeve and abuts with its free lower end on a pressure plate for contact with the upper surface of the tie, said tightening means adapted to produce a tightening forte on said two parts wherein their lower terminal portions are forced inwardly with respect to the lateral surface of the tie, plates on respective ends of said clamp, said plates extending outward from said clamps and lying substantially in a plane parallel to the plane of the clamp and extending beyond the lower terminal portion of said clamp for extending into the ballast for increase of the transverse and longitudinal resistance to displacement of the railway; and wherein the lower edge of each plates includes an angle with the relevant lateral surface of the tie which is smaller than 90°.

4,718,604

CLAMP AND FASTENING ARRANGEMENT FOR RAILS

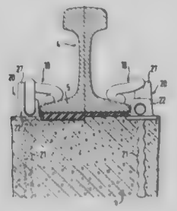
Helmut Eisenberg, Werdohl; Heaning von Heimburg, Lüdenscheid; Friedhelm Weber, Neuenrade; Achim Beste, and Dirk Vorderbrück, both of Werdohl, all of Fed. Rep. of Germany, assignors to Vossloh-Werke GmbH, Werdohl, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,594

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509472; Mar. 15, 1985, 3509473

Int. Cl.⁴ E01B *9/48*

U.S. Cl. 238—349 **12 Claims**



1. Clamp (9, 10) for rails, from a bar of resilient steel with multiple bends, featuring—when viewed in assembled condition—

an essentially straight first section (11) that is essentially horizontal,

several subsequent curved sections (12, 13) and

a last section (14) that lies on a side of the first section that faces the rail, characterized in that

a second section (12) is curved upwards in a vertical plane passing through the first section (11), and

all subsequent sections of the clamps (9, 10) lie on the side of the first section (11) that faces the rail (4), and wherein clamp (10) consists of four sections (11, 12, 13 and 14) and, in top view, looks like a "η" and in side view like an "e"-shaped loop, and wherein two ends of the clamp (A, E) protrude beyond the arched sections (12, 13) in the horizontal direction.

4,718,605

REVERSIBLE GEAR OSCILLATING SPRINKLER

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Filed Sep. 19, 1986, Ser. No. 909,487

Int. Cl.⁴ B05B *3/16*

U.S. Cl. 239—242 **12 Claims**

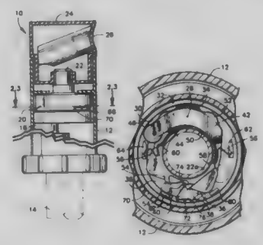
1. An oscillating sprinkler unit, comprising:

a sprinkler head mounted for rotation about a first axis;

a drive motor;

a reversible gear train for drivingly connecting said drive motor for driving said sprinkler head in alternate directions, comprising final drive gear means connected to said sprinkler head, shiftable drive means comprising alternately operable terminal gear means and carrier means for carrying said terminal gear means and shiftable to alternately engageable positions with said final drive gear means for driving said sprinkler head in alternate directions;

shifting arm means pivotally mounted adjacent said carrier means and movable between alternate shifting positions



by engagement with shoulder means carried by said final drive gear means, and lost motion means for connecting said shifting arm means with said carrier means for shifting said carrier means between said alternately engageable positions upon movement of said shifting arm means between said alternate shifting positions;

first over-center biasing means for maintaining said carrier means in a selected one of said alternately engageable positions until positively shifted therefrom by said shifting arm means; and

second over-center biasing means for maintaining said shifting arm means in a selected one of alternate shifting positions by said shoulder means.

4,718,606

METHOD AND DEVICE FOR AGRICULTURAL CROP SPRAYING

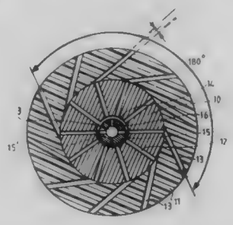
Jean Genbrugge, Broechem, Belgium, assignor to Multinorm BV, Nieuw-Vennep, Netherlands

Filed Sep. 9, 1985, Ser. No. 773,788

Claims priority, application Netherlands, Sep. 11, 1984, 8402774

Int. Cl.⁴ B05B *3/06, 1/28, 3/04*

U.S. Cl. 239—251 **7 Claims**



4. A crop spraying device which comprises a boom adapted to be transported by a vehicle over a field while in substantially horizontal position, a plurality of spray nozzles carried by said boom in longitudinally spaced relation therealong, each spray nozzle having a rotatable body and a tubular member receiving crop-treating liquid under pressure and defining an axis about which the body is rotated, said tubular member having a part-

circumferential groove therein and each body having a circumferentially spaced series of ducts only some of which communicate with said groove in any rotational position of the body on the tubular member about the axis defined thereby, said ducts being spaced from one another relative to the length of said groove so that a plurality of said ducts are in communication with said groove at all times, said ducts having discharge channels which are angled non-radially with respect to such axis so as to impart rotary motion to the body in response to pressurized crop-treating liquid flowing through said groove and those ducts in communication therewith, and means mounting said tubular members on the boom for individually adjusting the axes defined thereby in selected non-vertical positions.

4,718,607

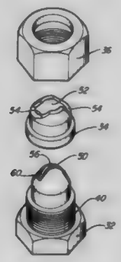
ATOMIZED LIQUID SPRAY ORIFICE

Walter E. Levine, Port Huron, Mich., assignor to Acheson Industries, Inc., Port Huron, Mich.

Filed Jul. 30, 1986, Ser. No. 891,746

Int. Cl.⁴ B05B *1/04*

U.S. Cl. 239—451 **2 Claims**



1. A spray orifice adapted for discharging a mixture of atomized liquid entrained within a gas stream for coating a surface with said liquid, comprising:

a body member having an inlet end and an outlet end, said inlet end being unobstructed and said outlet end having an exterior surface defined by a curved surface of revolution and a laterally extending slot defined by a pair of nonparallel planes through said outlet end having a minimum width at its radially outer ends and a maximum width at its center, said body member further defining an inside cavity adjacent said outlet end defined by a curved surface of revolution such that the thickness of said body member at said discharge end is substantially uniform in the regions defining the edges of said slot wherein said mixture of atomized liquid entrained within a gas stream supplied through said inlet end is discharged through said slot in a fan-shaped pattern; and

an adjustment cap member which closely conforms to said body member at said outlet end and defines a pair of opposed cam surfaces, said cam surfaces enabling the pattern of discharge from said slot to be varied by selectively covering portions of said slot as said adjustment cap is rotated with respect to said body member.

4,718,608

DRIP LEVEL IRRIGATION EMITTER

Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering, Ltd., Tel-Aviv, Israel

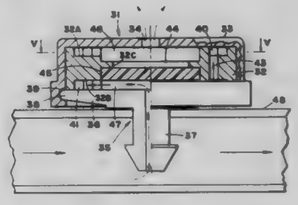
Continuation of Ser. No. 703,436, Feb. 20, 1985, abandoned, which is a continuation of Ser. No. 497,569, May 24, 1983, abandoned, which is a continuation of Ser. No. 143,098, Apr. 23, 1980, Pat. No. 4,384,680, which is a continuation-in-part of Ser. No. 845,277, Oct. 25, 1977, Pat. No. 4,209,133. This application Nov. 12, 1986, Ser. No. 930,066

Claims priority, application Israel, Oct. 26, 1976, 50766

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.⁴ B05B *15/00*

U.S. Cl. 239—542 **8 Claims**



1. An irrigation emitter unit comprising:

(a) fluid flow rate reducing means having an inlet and an outlet, said inlet being adapted to be placed in communication with an irrigation supply;

(b) said reducing means having a wall portion formed with a recessed cavity that communicates with the outlet of said fluid flow rate reducing means;

(c) an emitter unit outlet aperture formed in a base of said cavity;

(d) said cavity having a rim defining an area substantially greater than an area of a rim of said emitter unit outlet aperture; and

(e) a reliantly flexible membrane having a periphery juxtaposed with respect to said cavity rim and exposed to said irrigation supply so as to be pressed sealingly, during operation, against substantially the entire periphery of said cavity rim solely under influence of fluid pressure and to define, with said cavity, an outlet control chamber;

wherein when the fluid pressure of said irrigation supply acting on said membrane exceeds the fluid pressure in the outlet control chamber by a predetermined amount, said membrane flexes elastically towards said emitter unit outlet aperture so as to define, with a rim of said emitter unit outlet aperture, a restricted outflow path thereby limiting variations in the outflow rate.

4,718,609

MATERIAL COMMINUTOR

Thomas E. Rolle; David J. Nebel; John L. Shulan, and William P. Liljestrom, all of Dubuque, Iowa, assignors to T. D. J. Co., Inc., Dubuque, Iowa

Filed Mar. 20, 1986, Ser. No. 841,795

Int. Cl.⁴ B02C *19/18*

U.S. Cl. 241—33 **10 Claims**

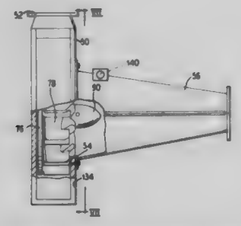
1. A device for the comminution of solid material comprising:

a turbine mounted on a shaft for rotation about an axis;

said shaft mounted in a cantilevered manner in a set of bearings;

said turbine comprising a backing plate secured to said shaft, a plurality of turbine blades removably securable to said backing plate, and removable locking means for holding said blades onto said backing plate and shaft assembly;

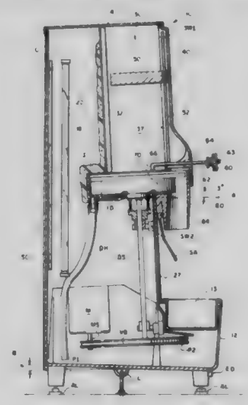
said blades including means to permit relative positional adjustments between said blades;
an oil recirculation system for direction oil past said bearings including a means for cooling said oil;
a motor;
a drive connection between said motor and said turbine for rotatably driving said turbine;
adjustment means associated with said drive connection for varying the rotational speed of said turbine comprising a belt drive arranged over a set of pulleys mounted on said shaft, an output shaft of said motor, and a jack shaft interposed between said turbine shaft and said motor shaft, at least one of said pulleys having an adjustable diameter;
a housing enclosing said turbine having an axial inlet and a tangential outlet for the passage of an air stream caused by said rotating turbine;



a plurality of different sized removable expansion chambers individually attachable to said housing at said inlet;
pressure sensing means in said expensive chamber for detecting and displaying the pressure in said chamber adjacent to said turbine;
feed tube means for introducing material to be comminuted into said air stream upstream of said expansion chamber;
whereby said blades can be removed and replaced and the relative positions of said blades can be adjusted to increase the efficiency and useful life of the device, the rotational speed of said turbine shaft can be varied by adjusting the diameter of said adjustable diameter pulley, a user can adjust the speed of said turbine to achieve a desired pressure in said expansion chamber and each of said expansion chambers can be removed and replaced with an expansion chamber of a different size to vary the size of the resultant material comminuted in said device.

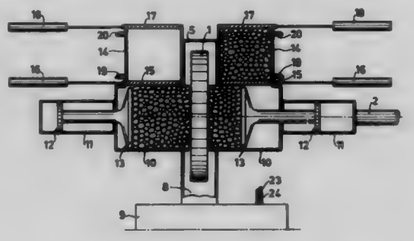
4,718,610
ICE SHAVER
Harold D. Gallaher, Bismarck, Mo. 63624
Filed Sep. 17, 1985, Ser. No. 776,780
Int. Cl.[4] B02C *18/12*
U.S. Cl. 241—37.5 **31 Claims**

1. Apparatus for shaving ice for making snow cones comprising:
an elongated housing;
base means for supporting said housing upon a suitable platform;
casing means for shaving ice particles from a block of ice and dispensing such shavings therefrom;
access means provided with said housing for facilitating service of structure interiorly thereof;
weight means with said access means for providing gravity bias to a block of ice after thereof within said housing;
guiding and braking means for controlling the flow of said block of ice within said housing;
discharge means for receiving and dispensing the shaved ice;
said casing means including a pair of castings, one casting being stationarily mounted beneath the other one which is rotatably mounted, thus the lower casting catching ice shavings as produced by the upper rotatable casting from the block of ice; and
said upper rotatably mounted casting having a central channel for receiving the ice shavings with an entrance open-



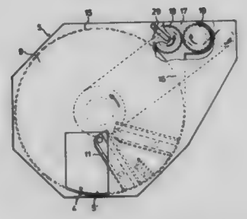
ing to said channel having ice shaving means affixed adjacent said opening.

4,718,611
DEVICE FOR PRODUCTION OF MECHANICAL PULP
Hjalmar S. I. Bystedt, Enebyberg, Sweden, assignor to Sunds Defibrator, AB, Stockholm, Sweden
Filed Jul. 1, 1980, Ser. No. 165,120
Claims priority, application Sweden, Jul. 6, 1979, 7905942
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] B02L *7/11*
U.S. Cl. 241—43 **3 Claims**



1. A device for the production of mechanical pulp from a lignocellulose material comprising a grinding disc (1) having two opposed end surfaces and rotating around a shaft (2) running at right-angles through the center of each of said end surfaces of the disc, and means (10–13) for holding and pressing one or more pieces of the material to be processed against both of said end surfaces, each of said opposed end surfaces defining a grinding surface oriented in the plane of said grinding surfaces; and inlet means for introducing a liquid medium during a grinding operation, characterized in that the grinding disc is enclosed in a housing (5) kept at above-atmospheric pressure; in that the means for holding the material to be processed is so designed as to hold the pieces of such material with their fibers largely pointing in a direction outwards from the center of the grinding disc; in that the means (7) for introducing liquid is so designed as to carry said liquid to the center of the grinding disc; in that said means for holding the material to be processed includes a plurality of pockets (10) located adjacent to each of said two opposed end surfaces; and in that the pockets located adjacent to one of said end surfaces face the pockets located adjacent to the opposed end surface, the material to be processed being introduced via a chute (14) located adjacent to each of said pockets.

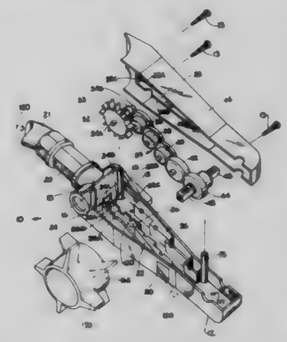
4,718,612
MAIZE CHOPPER
Petrus W. Zweegers, Geldrop, Netherlands, assignor to P. J. Zweegers en Zonen, B.V., Geldrop, Netherlands
Filed Jan. 14, 1986, Ser. No. 818,829
Claims priority, application Netherlands, Jan. 26, 1985, 8500217
Int. Cl.[4] B02C *18/22*
U.S. Cl. 241—55 **2 Claims**



1. A maize chopper comprising a frame and a casing supported by said frame, means on said frame for supplying maize-stalks to said casing, a rotatable chopping wheel within said casing and having a supporting plate, said casing having front and rear walls and said supporting plate being disposed substantially midway therebetween, a discharge passage connected to said casing and a discharge duct connected to said discharge passage, rotatable brush cutter means disposed in said discharge passage and having axes of rotation parallel to the rotary axis of said chopping wheel, cutting elements on one side of said chopping wheel supporting plate and fan blades on the other side of said supporting plate, the length of said brush cutter means measured in the direction of axis of rotation thereof being less than the dimension of the discharge passage measured in the same said direction to define an unimpaired passage sufficiently large to accommodate an airstream to provide an effective displacement of the crop thrown into the discharge duct by said brush cutter means such that in operation said fan blades generate said air stream behind said brush cutter means as seen from said front wall through said discharge passage to said discharge duct.

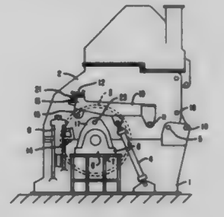
4,718,613
GUTTER CLEANING DEVICE
David E. Moomaw, 423 Oakwood Ave., East Aurora, N.Y. 14052
Filed Sep. 9, 1986, Ser. No. 905,699
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—60 **25 Claims**

1. A self-propelled gutter cleaning device, powered by water supplied from a hose, comprising:
(a) an elongated body constructed and arranged to fit within a gutter;
(b) hose receiving means connected to a first end of the body;
(c) a paddlewheel having a gear portion rotatably mounted within the body;
(d) a passageway constructed and arranged within the body for directing water from the hose receiving means against the paddlewheel so as to cause rotation thereof;
(e) at least one exit port constructed and arranged in communication with the passageway for directing water from the body into the gutter;
(f) a gear train rotatably mounted within the body and meshingly engaged with the gear portion of the paddlewheel; and



(g) at least one drum removably connected to the gear train for mulching debris and advancing the device in the gutter as water rotates the paddlewheel which in turn rotates the gear train and the drum.

4,718,614
LIFTING MECHANISM FOR A CRUSHER
Dietrich Hüsler, Velmar, and Josef Weber, Meisenigen, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany
Filed Aug. 6, 1986, Ser. No. 893,588
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528288
Int. Cl.[4] B02C *13/282*
U.S. Cl. 241—189 R **5 Claims**



1. In a lifting mechanism for a crusher or size-reducing machine having a two-part machine housing and a horizontal rotor with striking tools, where the plane of separation between the lower housing part and the upper housing part of the machine extends through the plane of the central axis of said rotor, where said upper housing part can be raised about a pivot axis that is disposed parallel to the axis of said rotor via respective piston-cylinder units that are disposed on both sides of said upper housing part, with the latter being capable of being fixed in the raised position, and where the base of each of two rotor shaft bearing housings is detachably secured to a floor stand on said lower housing part, the improvement comprising:
pivot arms disposed on opposite sides of said upper housing part, with each pivot arm having two ends, including a first end that is pivotably connected to said upper housing part, and a second free end, with the piston of each of said piston-cylinder units being pivotably connected with a respective one of said pivot arms;
a securing mechanism provided on each of side of said pivot arms in the vicinity of said free end thereof;
means provided on said upper housing part for cooperating

VOL 1086 ISS 2 JA 12 1988 UMI

with said securing mechanism to fix said free pivot arm end on said upper housing part in two different positions; and

a coupling mechanism provided on each of said pivot arms for coupling a respective one of said rotor bearing housings thereto.

4,718,615

ARRANGEMENT FOR HOLDING YARN PACKAGES

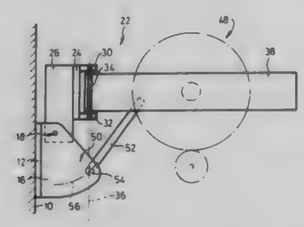
Walter Hefti, Ettenhausen; Urs Keller, Seuzach, and Robert Ammann, Ohringen, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Mar. 24, 1986, Ser. No. 843,172

Claims priority, application United Kingdom, Apr. 22, 1985, 8510172

Int. Cl.[4] B65H *54/42, 54/553*

U.S. Cl. 242—18 DD 14 Claims



1. In an apparatus for winding yarn packages, an arrangement for holding bobbin tubes during the winding operation, comprising one arm; means on said one arm for supporting a portion of the respective bobbin tube; another arm; means on the other arm for supporting a portion of the respective bobbin tube; first mounting means for mounting said arms for pivoting about a first axis as a yarn package forms on the respective bobbin tube; second mounting means for mounting said one arm for pivoting about a second axis extending transversely to said first axis for installing the bobbin tubes on and removing the packages from the holding arrangement, a first member movable with said one arm during the pivoting thereof about said first axis and also about said second axis, and a second member engaging said first member during the pivoting thereof about said first axis as well as about said second axis with an engagement force at a contact zone which moves about said first axis concurrently with the pivoting of said one arm about said first axis and is situated at most so close to said second axis that said engagement force has only a negligible effect on the pivoting of said one arm about said second axis.

4,718,616

WINDING APPARATUS FOR FORMING LAPS

Rene Schmid, Niederneunforn, Switzerland, and Hermann Krehl, Karlsruhe, Fed. Rep. of Germany, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Division of Ser. No. 657,352, Oct. 3, 1984, Pat. No. 4,637,565. This application Sep. 2, 1986, Ser. No. 902,660

Claims priority, application Switzerland, Oct. 10, 1983, 5506/83

Int. Cl.[4] B30B *3/04;* B65H *18/06*

U.S. Cl. 242—55.1 12 Claims

1. A wind-up apparatus for forming textile fiber laps, comprising:

at least one rotatable winding roller;

a predetermined number of calender rolls associated with said at least one rotatable winding roller and serving for consolidating a fiber layer into a windable fiber lap;

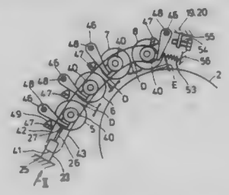
each calender roll of said predetermined number of calender rolls having a predetermined rest position and an operating position;

one of said predetermined number of calender rolls being arranged for cooperation with said at least one rotatable winding roller;

said one calender roll, in said rest position thereof, being arranged at a first predeterminate spacing from said at least one rotatable winding roller;

said one calender roll, in said operating position thereof, being arranged at a second predeterminate spacing from said at least one rotatable winding roller such that there is no contact between said one calender roll and said at least one rotatable winding roller in the absence of said fiber lap;

means operatively associated with said one calender roll and determining said second predeterminate spacing between



said at least one rotatable winding roller and said one calender roll in said operating position of said one calender roll;

guide means provided for said calender rolls to enable said calender rolls to be movable within a given mobility range defined between said rest position and said operating position;

means for supporting said guide means and arranged in substantially fixed relationship to said at least one rotatable winding roller; and

said guide means comprising force-producing means for moving the calender rolls into said predetermined rest position thereof.

4,718,617

SPINNING REEL WITH ACCELERATION-CONTROL MECHANISM TO PREVENT REVERSE ROTATION

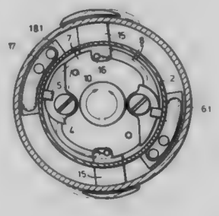
Jozsef Vadasz; Gyorgy Szecsenyi, and Jozsef Drescher, all of Budapest, Hungary, assignors to Magyar Optikai Muvek, Budapest, Hungary

Continuation-in-part of Ser. No. 834,621, Feb. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 510,450, Jun. 10, 1983, abandoned. This application Sep. 12, 1986, Ser. No. 907,068

Claims priority, application Hungary, Oct. 19, 1981, 3031; PCT Int'l Appl., Oct. 19, 1982, PCT/HU82/00054

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.2 G 12 Claims



1. A spinning-type fishing reel comprising:

a support which can be mounted on a fishing rod;

a rotor mounted on said support and rotatable about an axis, said rotor provided with a line-guide member including a bail which can be swung between a casting position and a line takeup position;

a spool mounted on said support and centered on said axis;

a mechanism including a crank for rotating said rotor when said bail is swung into said line takeup position for winding a line on said spool;

a drum fixedly mounted on said support and centered on said axis;

a circular plate mounted on said rotor and disposed coaxially in said drum;

a pair of flyweights pivotally mounted on said circular plate by respective pivots diametrically opposite one another, each flyweight being provided with a friction surface at one side of said respective pivot thereof and engageable with said drum under the influence of centrifugal force and inertia when said rotor is rotated in one direction with a critical combination of angular velocity and angular acceleration;

a pair of detents mounted on said circular plate diametrically opposite one another; and

a pair of springs mounted at said circular plate diametrically opposite one another, each spring engaging a respective flyweight at another side of said respective pivot thereof for biasing said flyweight away from said drum and against said respective detent associated with said flyweight whereby, upon rotation of said rotor in said one direction by said line in the setting of a hook in a fish at said critical combination of angular velocity and angular acceleration, said flyweights jam against said drum and prevent further rotation of said rotor.

4,718,618

METHOD FOR FEEDING FILM

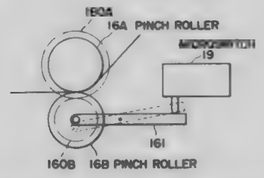
Akira Ichizuka, Ayase, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Sep. 17, 1986, Ser. No. 908,501

Claims priority, application Japan, Sep. 28, 1985, 60-215624

Int. Cl.[4] G03B *1/04*

U.S. Cl. 242—195 3 Claims



1. A method for feeding a film in a film reader system of the type having a first reel around which a film provided with a leader film is wound, a wind-back motor operatively connected to said first reel to drive the same, a second reel around which the film is wound, a wind-up motor operatively connected to said second reel, and a detecting means located along the film travelling path between said first and second reel for detecting the passing of the film, said method comprising the steps of:

preparing a film provided with a leader film having a width greater than the distance between end flanges of said first reel;

driving said wind-up motor in a direction to wind up the film around said second reel;

stopping driving said wind-up motor when the desired amount of film has been wound up;

winding back the film by driving said wind-back motor at high speed in a direction to rewind the film around said first reel;

detecting the passage of said leader film past said detecting means during a film wind-back operation;

braking said wind-back motor upon detection of the passage of said leader film and reversely driving said wind-up motor at high speed in a film wind-back direction to release said leader film from said first reel;

thereafter driving said wind-back motor and said wind-up motor at low speed in a synchronized manner in the film wind-back direction, and, finally,

driving said wind-back motor at high speed again upon detecting the passage of the end of said leader film past said detecting means.

4,718,619

MANOEUVERABLE SUPERCRITICAL WING SECTION

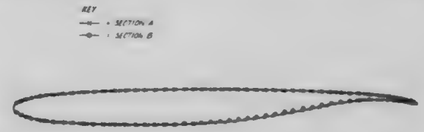
Patrick R. Ashill, Bromham; Donald Pierce, Crookham Village; Desmond A. Treadgold, Farnborough, and John L. Fulker, Sharnbrook, all of United Kingdom, assignors to Ministry of Defence, England

Filed Jul. 20, 1984, Ser. No. 632,445

Claims priority, application United Kingdom, Jul. 28, 1983, 8320334

Int. Cl.[4] B64C *3/14*

U.S. Cl. 244—35 R 23 Claims



1. A supercritical wing having a section comprising a thickness chord ratio between 8 and 9%, a leading edge region, an upper surface characterised by a first region extending from the leading edge region to about 10% chord and wherein curvature drops rapidly, a second region extending from about 10% chord to about mid-chord and wherein curvature drops less rapidly, a third, minimum curvature region, extending rearwardly from the second region to about 75% chord, and a fourth region extending rearwardly from the third region to the trailing edge and wherein the curvature is generally higher than in the third region, and the lower surface characterised by a first region extending rearwardly from the leading edge region and wherein curvature is generally higher than over the same extent of the upper surface, a second region extending rearwardly from the first and wherein curvature changes sense, and a third region extending rearwardly from the second region to the trailing edge and wherein the curvature is of the opposite sense to that in the lower surface first region and additionally comprising a downwardly deflectable trailing flap hinged to the wing section at a position between 70% and 80% chord, the flap and the upper surface comprising a means for generating re-expansion of the flow over the region of the flap hinge when the flap is deployed during supecritical conditions.

4,718,620

TERRACED CHANNELS FOR REDUCING AFTERBODY DRAG

John A. Braden, 2791 Okawana Dr., Marietta, Ga. 30067, and Charles J. Dixon, 3261 Hickory Crest Dr., Marietta, Ga. 30064

Filed Oct. 15, 1984, Ser. No. 660,708

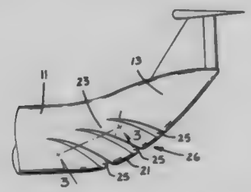
Int. Cl.[4] B64C *1/38*

U.S. Cl. 244—130 12 Claims

1. A fluid flow control device for reducing the vorticity discharged from and drag associated with an aircraft having an upswept body afterbody having sides and an undersurface comprising:

(a) a series of longitudinally spaced pairs of ridges forming symmetric flow channels arranged in approximately a helical fashion on either side of the afterbody so as to intersect at approximately the centerline of the undersurface;

(b) each ridge having a generally rearward pitch such that the symmetric flow channels have a substantially trough-like configuration; and each ridge forming the associated flow channel so as to be positioned to cross local fluid flow streamlines at an optimum angle for producing a



strong vortex core having a rotational direction opposite to that of the vorticity discharged from the respective side of the afterbody along the length of the channel;

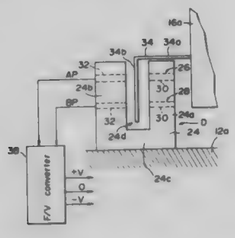
whereby there is a redistribution and attenuation of the rotational energy of a trailing vortex system as well as a suppression of fluid flow separation from the afterbody.

4,718,621

AUTOMATIC TRANSPORTATION SYSTEM

Arata Horinouchi, Ise, and Tadao Iseki, Toyohashi, both of Japan, assignors to Shinko Electric Co., Ltd.

Filed Oct. 24, 1986, Ser. No. 922,526
Int. Cl.[4] B61L *13/00*
U.S. Cl. 246—122 R **5 Claims**



1. An automatic transportation system comprises:

(a) a track mounted on a floor;

(b) a carriage movable along said track in opposite directions and having a reaction plate;

(c) a plurality of stators mounted on the floor at regions spaced along said track, each of said stators being operable to apply a traveling magnetic field to said reaction plate to impart a propelling force to said carriage to move it along said track;

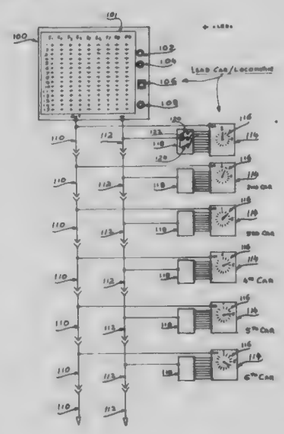
(d) a detector unit comprising a plate mounted on said carriage and having a pair of parallel spaced first and second rows of slots formed therethrough and extending in a direction of movement of said carriage, and at least one detector means disposed adjacent to one of said stators, said detector means comprising a pair of spaced first and second sensors disposed in a plane perpendicular to the direction of movement of said carriage in such a manner that said first and second rows of slots are brought into registry with said first and second sensors, respectively, during the movement of said carriage along said track, said slots of each row being spaced an equal distance from one another, said first row of slots being out of phase from said second row of slots by a predetermined angle, said first and second sensors sensing said first and second rows of slots, respectively, to produce a first and a second sensing signal representative of the speed of movement of said carriage when said first and second rows of slots are brought into registry with said first and second sensors, respectively, said detector unit further comprising a converter means responsive to said first and second sensing signals to produce an output signal representative of the speed of movement of said carriage, said output signal being positive when said carriage is moved along said track in one direction while said output signal is negative when said carriage is moved in the other direction whereby the polarity of said output signal represents the direction of movement of said carriage.

4,718,622

TRAIN FAULT MONITORING SYSTEM

Aminur Rahman, 94-35, 239 St., Floral Park, N.Y. 11001

Filed Apr. 24, 1986, Ser. No. 855,323
Int. Cl.[4] B61L *23/00*; B61K *13/00*
U.S. Cl. 246—169 R **5 Claims**



1. A monitoring system for monitoring faults of a plurality of functions in each rail road car of a train from the lead car comprising:

a digital electronic master unit located in said lead car for scanning each car in sequence from a first car of said train to a last car of said train to monitor one identical function in each car and repeating said scanning sequence for a next identical function until the plurality of functions are all scanned, by transmitting a sequence of electrical pulses one at a time and receiving electrical acknowledging pulses which represent the car and the function being monitored, said master unit comprising indicating means which indicates said car and said function being monitored in the absence of an acknowledging pulse being received by said master unit to indicate a fault condition;

first counting means for counting each said transmitting pulse in said scanning sequence, the instantaneous sum of said counted pulses determining which one of said cars is being monitored, and said counting means being reset when said instantaneous sum becomes greater than the maximum number of cars adaptable by said monitoring system;

second counting means for determining which identical function in each car in said scanning sequence is being monitored based upon the sum of the instantaneous count of said second counting means, said count of said second counting means being incremented to indicate a next identical function by said first counting means when said instantaneous sum of said first counting means becomes greater than the maximum number of cars adaptable by said monitoring system and said master unit switching to a stop mode by discontinuing the transmission of said transmitting pulses with the instantaneous sum of said second counting means becomes greater than the maximum number of functions provided in said monitoring system; decoder means for receiving said first and second counts for determining which car and which function is being monitored, said decoder means actuating said indicating means in the absence of an acknowledging pulse;

a respective digital car unit located in each rail road car for receiving said transmitting pulses from said master unit and returning an acknowledging pulse, each car unit have selector means set to a count different from the other selector means on other cars for transmitting an acknowledging pulse only when the count of a first counting means of said car unit corresponds with the selected count on said selector means and the said acknowledging pulse is transmitted through one of the channels selected by a second counting means of said car unit and said channel corresponds to one of the monitorable functions of a car;

a respective functional relay assembly located on each car for monitoring said plurality of functions on each car and transmitting or not transmitting said acknowledging pulses from said car unit depending upon whether the selected function being monitored has a fault condition;

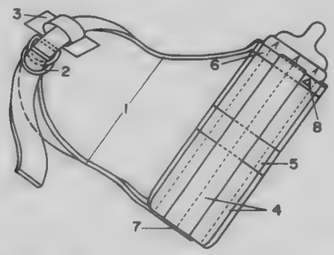
means running the length of the train and connecting said master unit, said car unit and said functional relay assembly for transmitting said transmitting and acknowledging pulses.

4,718,623

BOTTLE SLING FOR HOLDING A BABY BOTTLE WHILE TRAVELING

Alice M. McClure, 5982 SW. Harrington, Lake Grove, Oreg. 97035

Filed Aug. 25, 1986, Ser. No. 870,830
Int. Cl.[4] A47D *15/00*
U.S. Cl. 248—102 **2 Claims**



1. A nursing bottle support comprising a series of equal length body straps joined together at the mid-points thereof and adapted to engage the sides of a nursing bottle, a neck strap joined to the ends of the body straps and including a closure means on the ends thereof so as to form a neck engaging portion, a pair of suspension straps with the first joined to the midpoint of the body straps and the second joined near the end of a body strap, strap fastening means on the ends of the suspension strap, and a piece of hook and loop tape joined in a circle, with the second suspension strap received through the circle so as to provide an adjustable car seat engaging means.

4,718,624

FOLDING MICROPHONE STAND

Robert G. Greulich, Cranford, N.J., assignor to Atlas Sound Division of American Trading and Production Corp., Parsippany, N.J.

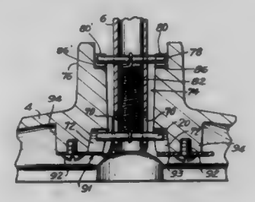
Filed May 30, 1986, Ser. No. 868,500
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—158 **12 Claims**

1. A folding microphone stand for supporting an object, the folding stand comprising:

stand tube means having a top portion to which an object may be attached, and a bottom portion;

base means in which the bottom portion of the stand tube means is centrally and pivotally supported for motion between an erect position and a stored position and which includes V-shaped slots and recess means for receiving the stand tube means in the stored position;

locking means on the stand tube means for engaging the base means to secure the stand tube means in at least the erect position and the stored position;



pivot means pivotable within the V-shaped slots for retaining the bottom portion of the stand tube means in the base means, the pivot means providing limited longitudinal movement of the stand tube means relative to the base means, the pivot means permitting rotation of the stand tube means between the erect position and the stored position;

engaging means on the base means for engagement with the locking means in each of said positions; and

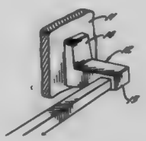
resilient means connected to the pivot means and the locking means to urge the locking means into engagement with the engaging means.

4,718,625

WALL MOUNTING SYSTEM WITH BASE AND DETACHABLE BRACKET

John W. Bodn, Roscoe, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Feb. 26, 1987, Ser. No. 19,435
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—222.1 **5 Claims**



1. The combination of, a base adapted to be secured rigidly to an upright wall, and a bracket adapted to be secured detachably to said base, said base and said bracket each having upper and lower end portions, coacting means on the upper end portions of said base and said bracket and adapted to engage one another to prevent said bracket from moving downwardly relative to said base and to prevent the upper end portion of said bracket from moving outwardly relative to said base, detent means supported to move upwardly and downwardly on the lower end portion of said base, spring means on said base for urging said detent means downwardly while permitting said detent means to move upwardly, means on the lower end portion of said bracket for moving said detent means upwardly when the lower end portion of said bracket engages

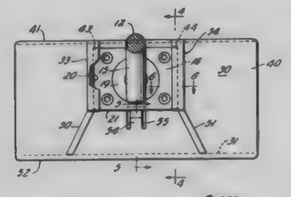
said detent means and is moved in a predetermined direction relative to said base, means on the lower end portion of said bracket for receiving said detent means and for interlocking with said detent means to prevent the lower end portion of said bracket from moving outwardly relative to said base, said detent means comprising a generally U-shaped member having an upper and generally horizontally extending bridge and having a pair of laterally spaced legs formed integrally with and projecting downwardly from said bridge, and said spring means comprising a contractile spring stretched between said bridge and the lower end portion of said base.

4,718,626

DISPLAY DEVICE WITH LABEL MOUNT OR THE LIKE

David R. Thalenfeld, Bear Creek, and Joel I. Glickman, Huntingdon Valley, both of Pa., assignors to Trion Industries, Inc., Wilkes-Barre, Pa.

Filed Aug. 29, 1986, Ser. No. 902,431
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—225.1 7 Claims



7. A label holder especially designed and adapted for mounting on a merchandise display hook, where the hook is provided with a generally rectangular flat mounting plate, which comprises a single piece molding of clear, colorless, transparent material having

(a) a thin, flat label support of a size and shape to receive and support a label,

(b) an integral flange extending horizontally along the bottom margin of said label support,

(c) opposed, spaced integral mounting flanges projecting from the back of said label support and extending vertically thereon,

(d) said mounting flanges being of generally L-shaped cross section and comprising side flange portions and back flange portions defining, together with back surface portions of said label support, confining recesses for engaging opposite side edge margins of said mounting plate,

(e) said label support having vertically disposed elongated through openings therein positioned directly in front of said back flange portions,

(f) said through openings being at least co-extensive in size and shape with the size and shape of said back flange portions,

(g) the inner walls of said side flange portions being aligned with outer edges of said vertically disposed through openings,

(h) integral upper and lower abutment means on said label support engageable with upper and lower edges of said mounting plate,

(i) said lower abutment means being deflectable forwardly during insertion of said mounting plate in said confining recesses,

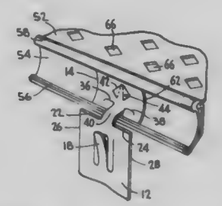
(j) said upper abutment means being aligned with the upper extremities of said vertical through openings.

4,718,627

STRIP MERCHANDISER WITH UNIVERSAL MOUNTING MEANS

Jacob Fast, and Robert A. Fast, both of 7561 NW. 9th St., Plantation, Fla. 33317

Filed Mar. 12, 1987, Ser. No. 25,208
Int. Cl.[4] F16B 5/06
U.S. Cl. 248—225.1 8 Claims



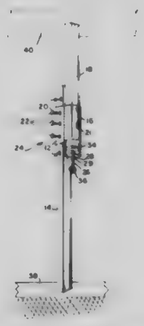
1. A strip merchandiser of plastic sheet material comprising an elongate body portion including longitudinally spaced product suspension hook defining means, and a mounting portion at one end of the body portion, the mounting portion being in the form a mounting panel separated from the body portion by respective slits having respective lateral sections extending inwardly from opposite longitudinal edges of the strip and respective longitudinal sections extending lengthwise of the strip from the lateral sections toward one end of the strip defining one edge of the panel, the longitudinal sections defining a stem therebetween connecting the mounting panel to the body portion of the strip, and the mounting panel including a further slit between said longitudinal sections and said one end of the strip, the further slit defining a depressable head for engaging in a shelf aperture and the like to form one mode of suspension with portions of the panel adjacent the head engaging an upper surface of the shelf to preclude upward tilting of the strip, the depressable head being connected to the mounting panel by a connection line located between said longitudinal sections and said one end of the strip, and wherein said lateral sections define a split edge of the panel, the panel being capable of being flexed between said split edge and said one edge of the strip for engagement in a concave price channel to provide another mode of suspension for the strip.

4,718,628

ADJUSTABLE SHORE

Michael Vitta, 7 Elmwood Ave., Salem, N.H. 03079

Filed Mar. 21, 1986, Ser. No. 842,673
Int. Cl.[4] E04G 25/02
U.S. Cl. 248—354.3 16 Claims



5. An adjustable shore apparatus comprising:

a first sleeve member adapted to slidably receive a major length adjusting vertical support member;

a plurality of holes disposed in said first sleeve member in spaced vertical relationship;

a major length adjusting vertical support member adapted to slidably move through said first sleeve member;

a first adjusting means adapted, in association with said holes, to releasably engage said major length adjusting support member and secure said first sleeve member at a selected position along said major length adjusting support member to provide the major adjustment of the overall length of said shore apparatus;

a second sleeve member adjacent said first sleeve member;

said second sleeve member having an upper end open to slidably receive a minor length adjusting vertical support member and a base means disposed across the lower end of said second sleeve member to thereby prevent passage of the minor length adjusting vertical support member beyond said base means;

support means disposed within said second sleeve member adjacent said base means and movable within said second sleeve member for supporting engagement with said minor length adjusting vertical support member;

a second adjusting means associated with said support means and extending through said base means for linear vertical movement of said minor length adjusting vertical support member within said second sleeve member relative to said major length adjusting vertical support member to thereby adjust the overall length of said major and said minor length adjusting support member.

4,718,629

VACUUM HOLDING DEVICE

Dieter Block, Kiel, and Hans Peaza, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,713
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522829; Aug. 3, 1985, 3527937
Int. Cl.[4] A45D 42/14
U.S. Cl. 248—363 9 Claims



1. In a device for clamping a sheet of material, said device having a suction box provided with a sole of a suction plate, said sole having a holding surface and being provided with a plurality of suction bores each of which expands into a cylindrical valve chamber as it approaches the suction box, the improvements comprising a second plate closing all of the valve chambers and having a plurality of second bores, each second bore being substantially the same size as a suction bore and being aligned with a suction bore, each of the valve chambers receiving a freely mobile valve reed for movement within the valve chamber, each valve reed having a slight arcuate configuration to produce a cylindrical convex surface.

4,718,630

PORTABLE READING IN BED BOOK HOLDER AND LAP WRITING SURFACE

Betty A. Richard, 5815 Magnolia, Commerce City, Colo. 80022

Filed Nov. 21, 1986, Ser. No. 933,175
Int. Cl.[4] A47B 97/04
U.S. Cl. 248—444.1 20 Claims

1. Apparatus for use as a portable supporting device comprising:

a generally rectangularly shaped frame having a central opening and a length greater than its width;

said frame having an upper surface and a lower surface;

an inner recess formed in said upper surface of said frame to provide a generally rectangular support ledge surrounding said central opening;

a transparent sheet member positioned on said support ledge and secured thereto;

said frame having at least four side members, two of which extend in a lengthwise direction and two of which extend in a widthwise direction;

said two lengthwise extending side members and said two widthwise extending side members being joined together to form four corners;

a plurality of fixedly mounted leg mounting means projecting downwardly from said lower surface of said frame adjacent to each of said four corners;

four of said leg mounting means cooperating for use of said apparatus for one purpose and comprising;

a first pair of leg mounting means each having an included angle between its longitudinal axis and the lower surface of each of said two widthwise extending side members of x degrees and an included angle between its longitudinal axis and the lower surface of one of said two lengthwise extending side members of x1 degrees;

a second pair of leg mounting means each having an included angle between its longitudinal axis and the lower surface of each of said two widthwise extending side members of x2 degrees and an included angle between its longitudinal axis and the other of said two lengthwise extending side members of about x3 degrees;

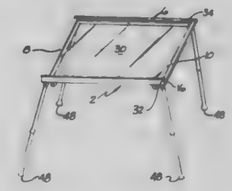
four of said leg mounting means cooperating for use of said apparatus for a different purpose and comprising;

a third pair of leg mounting means each having an included angle between its longitudinal axis and the lower surface of each of said two widthwise extending side members of x4 degrees and an included angle between its longitudinal axis and the lower surface of one of said two lengthwise extending said members of x5 degrees;

a fourth pair of leg mounting means each having an included angle between its longitudinal axis and the lower surface of each of said two widthwise extending side members of x6 degrees and an included angle between its longitudinal axis and the other of said two lengthwise extending side members of about x5 degrees;

each of said x, x1, x2, x3, x4, x5 and x6 degrees being a different number; and

a leg secured to at least two of said leg mounting means at said corners.



4,718,631

FOOT ISOLATING

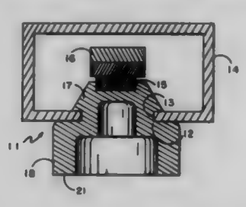
David F. Reynolds, Wrentham, and David Jacobs, Watertown, both of Mass., assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Continuation of Ser. No. 665,320, Oct. 26, 1984. This application Apr. 22, 1986, Ser. No. 857,518
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—615 8 Claims

1. Apparatus for providing shock and vibration isolation comprising,

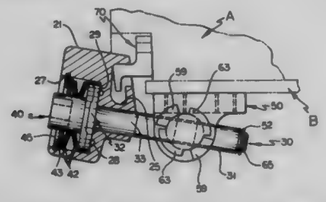
foot isolating means having a normally vertical axis of symmetry and made of resilient material for providing antiskid support and shock and vibration isolation in an axial direc-

tion along and all radial directions perpendicular to said normally vertical axis,
said foot isolating means being formed with a circumferential annular recess for receiving the edge of an opening in a base supported thereby intermediate the top and bottom surfaces thereof to divide said foot isolating means into a lower foot section and an upper isolator section and characterized by the same stiffness in both tension and compression,
and fastening means secured to the top of said upper isolator section for connection to a component to be isolated for



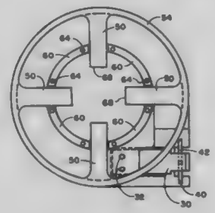
shock and vibration isolation both from a base having an opening edge seated in said annular recess and a support on which said lower foot section is supported,
the stiffness in said isolator section being different from that in said foot section,
said foot and isolator sections being contiguous portions of a unitary structure that is a resilient elastomer and free to move in said axial and radial directions for providing shock and vibration isolation in said axial direction and said all radial directions,
the natural frequency of said foot section being different from the natural frequency of said isolator section.

4,718,632
HOLD-DOWN TYPE MECHANISM
William S. Meineke, Lomita, Calif., assignor to Rexnord Inc., Brookfield, Wis.
Filed Aug. 14, 1986, Ser. No. 896,903
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—681 **9 Claims**



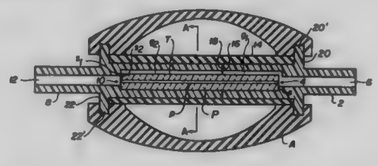
1. A mechanism of the hold-down type which applies a predetermined force to a unit, and insertion and extraction forces thereto for movement relative to a structure upon which the unit is mounted, said mechanism being constructed for use in confined areas and comprising:
a hook adapted for mounting to a portion of the unit;
a housing closed at one end and constructed for releasable engagement with said hook;
drive means for applying a load to the unit, said drive means including a drive shaft extending from one end of said housing opposite said closed end; and
means for pivotably containing said drive shaft in a predetermined orientation relative to the unit, said means including a nut element constructed to engage and permit axial movement of said drive shaft through said nut in a first, forward direction for insertion of the unit, and in a second rearward direction, opposite said first direction, for extraction of the unit relative to the structure.

4,718,633
WIRE CONTAINER
Mark Weixel, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 24, 1987, Ser. No. 17,399
Int. Cl.[4] B65H *49/00*
U.S. Cl. 242—129 **6 Claims**



1. Wire container apparatus comprising:
a base member and a shroud member;
said base member comprising a cylindrical drum with a base plate at a first end thereof, container mounting and registration means formed through said base plate in alignment with the longitudinal axis of said drum, wire clamping means recessed within said base plate, and a plurality of lever arm pivot slots in a second end of said drum;
said shroud member comprising a cylindrical rim having a plurality of lever arms projecting inwardly from an end of said rim and extending a part way towards the longitudinal axis of said rim, each of said plurality of lever arms having pivot means disposed in one of said plurality of pivot slots in said drum to secure said shroud member to said base member in a manner to permit axial movement therebetween upon the application of force to at least one of said plurality of lever arms.

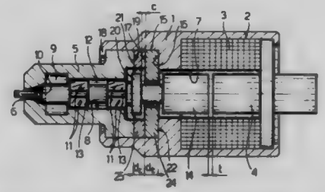
4,718,634
PHYSIOLOGICAL PRESSURE MONITORING SYSTEM FLUSH VALVE
Albert K. Bond, Burlington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sep. 23, 1986, Ser. No. 910,543
Int. Cl.[4] F16K *51/00*; A61M *5/00*
U.S. Cl. 251—117 **5 Claims**



1. A valve assembly comprising:
a first housing having a cavity in one end and a passageway in the other end that communicates with said cavity;
a second housing having a cavity in one end and a passageway in the other end that communicates with the latter cavity;
a tube having ends and a passageway extending therethrough between said ends, the ends of said tube being respectively mounted in said cavities so as to place the passageway of said tube in communication with the passageways in said housings;
means for coupling the end of said tube in the cavity of said first housing to said first housing so that they will move together;

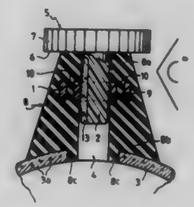
an elastic sleeve coaxial with said tube and outside of it, said sleeve having ends respectively coupled to said housings so as to respectively form seals therewith;
means defining a path in said housings in parallel with the passageway in said tube;
means for providing communication between the passageway in said first housing and the adjacent end of the path within it;
the adjacent surfaces of the cavity in the second housing and the end of the tube therein normally being in contact so as to form a seal that prevents communication between the passageway in said second housing and the path in said second housing; and
resilient means coupled to said housings that permits said adjacent surfaces to be in contact when not activated and for separating said housing and said adjacent surfaces when activated.

4,718,635
FUEL METERING VALVE FOR AN INTERNAL COMBUSTION ENGINE FEED DEVICE
Roberto de Concini, Zola Predosa, and Pietro Busacchi, Bologna, both of Italy, assignors to Weber S.p.A., Turin, Italy
Filed Mar. 24, 1986, Ser. No. 843,145
Claims priority, application Italy, Mar. 22, 1985, 53165/85[U]
Int. Cl.[4] F16K *31/06*; F02M *51/06*
U.S. Cl. 251—129.18 **5 Claims**



1. A fuel metering valve for an internal combustion engine fuel feed device, said valve comprising:
a casing defining an enclosure and a shoulder in said enclosure, which casing defines a fuel feed path;
an electromagnet with a core mounted in said enclosure;
a nosepiece with an axial bore and a front surface, which cooperates with said casing shoulder to define a valving member housing;
a valve member operable to control fluid flow through said fuel metering valve, said valve member axially movable between a first position closing said fuel path and a second position opening said fuel path, said valve member having a rigid armature arranged for attraction by said electromagnet core;
an annular stop member mounted and operable in said valving member housing as a valve stop at said valve member second position, said annular stop member having at least a first flat surface and a second flat surface, said first flat surface operable as a stop for said valve member and the second flat surface operable as a shoulder for said nosepiece front surface, said annular stop member including a first annular washer defining a first inner diameter and outer diameter, and a second annular washer defining a second inner and outer diameter, wherein at least one of said first and second inner diameters and first and second outer diameters are unequal,
one of said first and second annular washers defining said first flat surface and a flat bearing surface to contact said casing shoulder, and the other of said first and second annular washers defining said second flat surface to contact said nosepiece, which other washer contacts said one washer first flat surface;
said core and said armature cooperating to define an air gap therebetween at said valve member second position, which air gap is a function of the separation between said stop member first flat surface and said shoulder;
said second flat surface separated from said shoulder and contacting said nosepiece at a predetermined distance to define the stroke of said valve member travel from said first position to said second position.

4,718,636
BRANCH COUPLING ON FLEXIBLE HOSE
Gilles Briet, Gueugnon, France, assignor to Hutchinson, Paris, France
PCT No. PCT/FR86/00042, § 371 Date Oct. 27, 1986, § 102(e) Date Oct. 27, 1986, PCT Pub. No. WO86/04972, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 13, 1986, Ser. No. 923,144
Claims priority, application France, Feb. 14, 1985, 85 02097
Int. Cl.[4] F16K *51/00*
U.S. Cl. 251—145 **11 Claims**



1. A branch connection extending from a branch opening in a wall of a main flexible pipe, said branch connection comprising:
a molded piece of elastomer or plastic having a distal end and a proximal end;
a branch duct extending from within the branch opening, at said distal end, to said proximal end and adapted to receive a male threaded element at said proximal end, a portion of said branch duct being defined by a tubular threaded insert adapted to threadingly receive said male threaded element, said tubular threaded insert being embedded within said molded piece, said tubular threaded insert defining a plurality of channels through walls of said threaded insert, said elastomer or plastic of said molded piece extending into and through said channels; and
means for draining without removing said male threaded element.

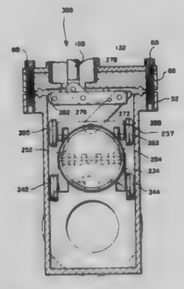
4,718,637
HIGH VACUUM GATE VALVE HAVING IMPROVED METAL VACUUM JOINT
Jose L. Costin, Orinda, Calif., assignor to MDC Vacuum Products Corporation, Hayward, Calif.
Division of Ser. No. 881,074, Jul. 2, 1986, Pat. No. 4,681,329.
This application Apr. 20, 1987, Ser. No. 40,198
Int. Cl.[4] F16K *25/00*, *31/52*
U.S. Cl. 251—158 **10 Claims**

1. A two part high vacuum gate valve construction comprising a control mechanism part and a valve body part,
the control mechanism part including a linearly translatable control stem shaft, and a first generally rectangular high vacuum joint providing flange having a central opening through which the shaft freely passes, and a high vacuum joint providing geometry on the other major face thereof enabling said control mechanism part to be removably joined to and sealed with said valve body part, and displacement means for controllably displacing said shaft,
the valve body part including
a generally rectangular case secured at an upper end to a second generally rectangular high vacuum joint provid-

ing flange having a mirror image sealing geometry to said first high vacuum joint providing flange,

two machined fluid flow flanges passing through openings defined through opposite sidewalls of said case and sealed thereto, at least one of the fluid flow flanges having an inside gate sealing surface machined prior to insertion through and sealing of the flange to the sidewall of the case, the fluid flow flanges defining central flow passages and including outer sealing means enabling formation of high vacuum joints with piping to which the valve may be operationally attached,

two part, levered carriage means having a central transverse pivot joint and having endwall engagement means for causing said pivot joint to pivot toward said inside gate sealing surface of the one flow flange in response to continued actuation force supplied by said control stem



shaft after an inside endwall of said case has been contacted,

a valve gate having a sealing surface for engaging the inside gate sealing surface of the one flow flange when the carriage means is opposite the other flow flange and having a back surface with pivoted engagement means, the engagement means engaging the carriage means at the central transverse pivot joint,

double jointed linkage assembly means having one link part pivotally fixed to said second flange and linked to said control stem shaft for double jointed arcuate movement as said shaft is moved along its locus of rectilinear limited displacement, and having a second link part linked to said first link part and to said carriage means, for levering actuation force supplied by the central stem shaft to the carriage means thereby to cause said gate to close and then seal.

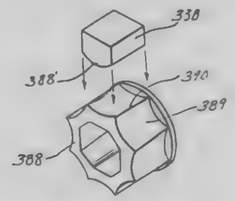
4,718,638

DETENT MECHANISM FOR FLUID FLOW CONTROL VALVE

James R. Philpot; Steve R. Pinkston, both of St. Louis, and Harry Nurre, St. Louis County, all of Mo., assignors to Essex Industries, Inc., St. Louis, Mo.

Division of Ser. No. 756,710, Jul. 19, 1985, Pat. No. 4,643,215. This application Dec. 22, 1986, Ser. No. 944,881
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—297 2 Claims

1. In a fluid flow control valve including a valve body, a fluid inlet and a fluid outlet means, and a rotor within the body carrying a plurality of fluid flow control openings of different sizes for providing different fluid flow rates from the fluid inlet to the fluid outlet means selected according to orientation of the rotor by rotation thereof within the valve body, selector means extending from the valve body for permitting normal orientation of the rotor to different flow rate positions, and a shaft interconnected to the selector means and the rotor, the shaft having an outer end carrying a control knob, the improvement comprising detent-engaging structure carried by the shaft defining an outer periphery thereof having a plurality of recesses corresponding in number to the different flow rates, each of the recesses being of arcuate character, a detent having an outwardly rounded surface of convex character for engaging the arcuate recesses sequentially, and means resiliently urging the detent toward said detent-engaging structure for engaging the recesses sequentially, said structure also defining cusps extending radially outwardly between the respective recesses, whereby there is provided instability if such rotation causes positioning of any of the cusps against the dentent,



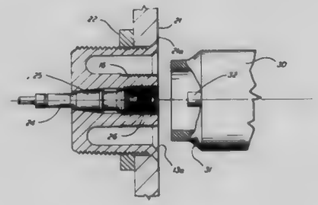
whereby to urge the shaft toward a position of stability seating the detent in any of the recesses on either side of the so-positioned cusp, for preventing stable orientation of the rotor in any position other than a selected flow rate positions, said detent-engaging structure being removable from the shaft at its outer end, the valve body including a body recess for receiving the detent, said detent-engaging structure defining a retaining portion for retaining the detent within the body recess in position longitudinally of the shaft for engagement of such recesses.

4,718,639

TIRE VALVE BODIES

Allen L. Sherwood, and Allen L. Sherwood, Jr., both of Box 9, Rte. 3, Owego, N.Y. 13827

Filed Feb. 17, 1987, Ser. No. 15,707
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—366 5 Claims



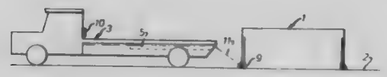
1. A valve body for use on a metal wheel rim adapted to carry a tubeless tire, comprising a rigid annular cup member having a base wall portion, a generally cylindrical outer wall portion extending from base wall portion and terminating in an axially and radially outwardly extending flange portion, a generally cylindrical central tube portion rigidly spaced radially inwardly from said outer wall portion and extending axially from said base wall portion a distance such that the end of said tube portion does not extend axially beyond said flange portion, said tube portion being internally threaded to receive a valve core.

4,718,640

APPARATUS FOR CONTAINER HANDLING

Karl B. Y. Flodin, Halmstad, Sweden, assignor to Hydraulik-Konsult Yngve Flodin Aktiebolag, Halmstad, Sweden

Filed Sep. 9, 1985, Ser. No. 773,889
Claims priority, application Sweden, Sep. 19, 1984, 8404686
Int. Cl.[4] B66F *7/26*
U.S. Cl. 254—45 3 Claims



1. Apparatus for lifing a container of the type including four vertical end corners each having a lower corner connecting box with horizontal and vertical surfaces provided with respective openings adapted to serve as anchoring means, said apparatus comprising:

four hydraulic lifting devices, four mechanical connecting devices corresponding to said hydraulic lifting devices for connecting the respective lifting devices each to a corresponding connecting box of said container, and conduit means for connecting said hydraulic lifting devices to a power supply,

each lifting device comprising a hydraulic piston and cylinder assembly including a rod fixed to the piston of said assembly and extending out of the cylinder to serve as a retractable supporting leg when said assembly is in an operative position with a longitudinal axis of said assembly substantially vertically positioned,

each mechanical connecting device comprising an intermediate member, clamping means supported by one end of said intermediate member for clamping said intermediate member to the respective cylinder of the corresponding lifting device, and releasable attachment means supported by an opposite end of said intermediate member for releasably attaching said intermediate member to said corresponding connecting box,

said attachment means of said connecting device comprising releasable clamping members for releasably clamping said intermediate member to said corresponding connecting box, securing means for releasably securing said clamping members in clamped condition to said corresponding connecting box, hinge means including relatively pivotable and disconnectible first and second hinge members, and pivot means connecting said hinge members in such a manner as to permit pivotal movement of said intermediate member about an axis parallel to said longitudinal axis of said assembly when said clamping members are released from said corresponding connecting box and thereby to permit pivotal movement of said intermediate member with the corresponding lifting device connected thereto between angularly spaced operative and rest positions, said first hinge member being fixed to said intermediate member,

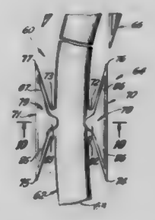
said attachment means further comprising means for releasably connecting said second hinge member to said corresponding connecting box, including a block which is insertable into said connecting box through one said opening thereof, means for connecting said block to said second hinge member, and means for firmly clamping said block against an inner side of said corresponding connecting box, and releasable locking means for locking said first hinge member relative to said second hinge member in either of two angularly spaced positions corresponding respectively to said operative and rest positions of the corresponding lifting device.

4,718,641

BARBED TAPE WITH REINFORCED BARBS

Michael R. Maniere, Sandy Hook, Conn., assignor to MRM Security Systems, Inc., Waterbury, Conn.

Filed Nov. 6, 1986, Ser. No. 927,833
Int. Cl.[4] B21F *25/00*
U.S. Cl. 256—8 7 Claims



1. A helical barbed tape formed from a unitary strip of metallic material having a thickness of between approximately 0.015 inches and 0.030 inches, said helical barbed tape comprising a continuous elongated central supporting portion of generally helical configuration with the plane of the central supporting portion being aligned generally perpendicular to the axis of the helix, said helical barbed tape further comprising a plurality of barb clusters disposed at spaced apart locations along said central supporting portion, each said barb cluster comprising first and second generally planar pairs of barbs disposed on opposite sides of said central supporting portion and connected thereto, each said barb comprising a reinforcement defining a portion of said barb extending out of the plane of said pair, each said reinforcement defines an embossment formed in each said barb which substantially prevents the associated barb from being bent out of the plane of the associated pair of barbs, the embossment in each said barb being of generally teardrop configuration and including a pointed end, said pointed end of said embossment being aligned with the point of said barb, and wherein each said barb cluster comprises first and second roots extending respectively from opposite sides of said central supporting portion and connecting said first and second pairs of barbs to said central supporting portion and wherein the single reinforcing embossment of each said barb extends into the associated root connecting said pair of barbs to said central supporting portion.

4,718,642

WIRE LATTICEWORK AND FENCE OF WIRE LATTICEWORK

Kiyoshi Nakayama, Takamatsu, Japan, assignor to Asahi Steel Industry Co., Ltd., Japan

Filed Jul. 2, 1986, Ser. No. 881,129
Int. Cl.[4] E04H *17/16*
U.S. Cl. 256—24 22 Claims



1. A wire latticework for a fence including a plurality of

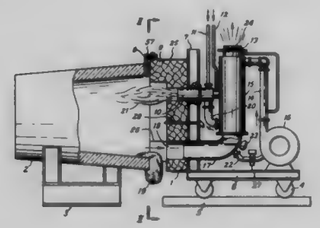
horizontal wire members and vertical wire members, wherein circular portions are formed each on at least the upper ends of said vertical wire members, a group of horizontal members are arranged within the circular portions and connected thereto so as to form a cylindrical part, some of the horizontal wire members within said cylindrical part or on the other part of the latticework are thicker in diameter than the rest of said horizontal wire members.

4,718,643

METHOD AND APPARATUS FOR RAPID HIGH TEMPERATURE LADLE PREHEATING

Grigory M. Gitman, Duth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Filed May 16, 1986, Ser. No. 863,862
Int. Cl.[4] F27D *23/00*
U.S. Cl. 266—44 **23 Claims**



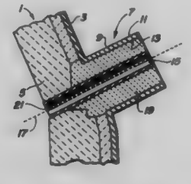
1. An apparatus for preheating a ladle, which comprises:
a refractory lined wall;
a partial sealing ring which extends forward from said wall and which is sized to meet the rim of the ladle to form an insulating seal therewith, the ends of said sealing ring forming an opening between the rim and said wall to allow for the protrusion normally caused by metal buildup on the ladle rim, said sealing ring comprising refractory material;
a burner extending through said wall, within the circumference formed by said sealing ring, for directing a flame into the ladle interior; and
an exhaust duct through said wall located at the opening formed by the ends of said sealing ring, for evacuating the flue gases from within the ladle when it is being heated and also for evacuating exterior ambient air drawn through said opening toward the interior of the ladle when it is being heated.

4,718,644

SLAG SENSOR TAPHOLE ASSEMBLY

John P. Hoffman, Coopersburg, Pa.; David G. Hill, Michigan City, Ind.; Thomas Y. Ballock, Chesterton, Ind., and Roger E. Mays, Valparaiso, Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 1, 1984, Ser. No. 655,830
Int. Cl.[4] C21C *5/42*
U.S. Cl. 266—99 **8 Claims**



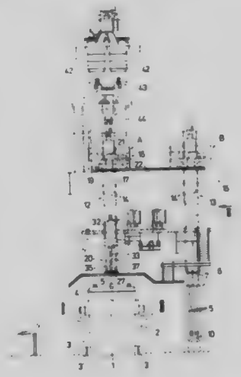
1. In a metallurgical vessel for processing a combination of molten ferrous metal and slag, said vessel having an outer metallic shell and an inner refractory lining with a taphole extending through said outer shell and refractory lining, the improved taphole assembly comprising:
(a) a metallic taphole nozzle having sides extending outwardly from said shell, the inner surface of said sides forming a central aperture concentric with said taphole;
(b) said nozzle including a pair of metallic sidewall portions spaced in generally opposing relationship, said opposing sidewall portions comprising a non-ferromagnetic alloy metal having a relative permeability less than 2.0 and an electrical resistivity of at least 5.0 microhm-cm;
(c) each of said opposing sidewall portions having a closed loop groove in the inner surface thereof;
(d) each groove having an electromagnetic coil therein, said groove being of sufficient depth to permit said coil to be positioned completely below the inner surface of said sidewall;
(e) means in combination with said electromagnetic coils for indicating the presence or absence of slag; and
(f) refractory means covering said inner surface of said nozzle and said coils for protection against molten metal and slag.

4,718,645

LADLE STAND ARRANGEMENT FOR TREATING MOLTEN METAL

Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 24, 1986, Ser. No. 923,130
Claims priority, application Austria, Nov. 21, 1985, 3394/85
Int. Cl.[4] C21C *5/00*
U.S. Cl. 266—142 **2 Claims**



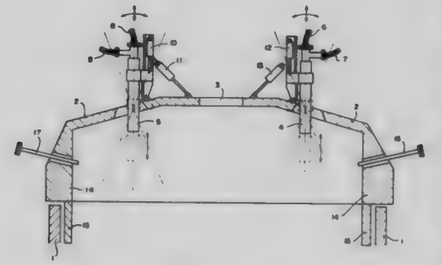
1. A ladle stand arrangement for treating molten metal, comprising a ladle placed in a treatment position, a vertically liftable and lowerable car carrying a lance and arranged above said ladle, a reservoir for a treating agent on said car, said lance having a cavity arranged to be in communication with said reservoir, and a lance exchange station arranged laterally of said treatment position, said lance carrying car being movable between said treatment position and said lance exchange station, wherein the improvement comprises
a respective stationary vertical rail guide means for said lance carrying car arranged in vertical alignment with the treatment position and said lance exchange station,
a carriage for said lance carrying car and displaceable between the upper ends of said rail guide means for respective vertical alignment therewith,
a lance manipulating means arranged on said lance carrying car and adapted to hold and release a lance, said lance manipulating means being movable between an operating position and a lance exchange position laterally beside said operating position and cantilevering from said lance carrying car,
a coupling means arranged on said lance carrying car above the operating position of said lance manipulating means, and
an actuating unit arranged on said lance carrying car and adapted to operate said coupling means to provide for communication of said reservoir with said cavity of said lance.

4,718,646

LADLE HEAD

Lars Jonsson, and Mats Johansson, both of Lidingö , Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Jun. 10, 1986, Ser. No. 872,575
Claims priority, application Sweden, Jun. 10, 1985, 8502863
Int. Cl.[4] C21C *5/42*
U.S. Cl. 266—242 **2 Claims**



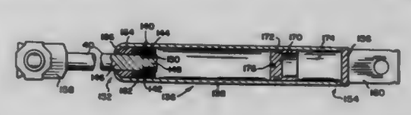
1. A head for a ladle comprising:
a horizontal part and a vertical part, both parts having inside walls provided with a refractory material;
at least one burner disposed in said horizontal part for supplying liquid or gaseous fuel and oxygen gas for heating the melt in the ladle;
retaining means for the burner mounted on said horizontal part for axial movement of said burner in relation to the surface of the melt bath and adapted for adjustment of an angle between the vertical line of the burner and the surface of the melt bath;
said vertical part including an upper and a lower cylindrical part, said lower part having an outer diameter of the cylinder wall smaller than the inner diameter of the ladle wall, and extends axially so as to substantially cover the ladle wall between the head and the surface of the melt bath, said upper part including horizontally disposed passage means in which lances are arranged, for supplying oxygen to the space between the head and the surface of the melt bath; and wherein
a portion of the total quantity of the oxygen supplied to the head being fed to the burner and the remaining portion being fed to the lances, the oxygen gas fed through the lances providing a rotational movement of the body of gas beneath the head for increasing the thermal transmitting capacity.

4,718,647

PNEUMATIC COUNTERBALANCE WITH DUAL FORCE

George C. Ladwig, Florence, S.C., assignor to AVM, Inc., Marion, S.C.

Division of Ser. No. 425,565, Sep. 28, 1982, Pat. No. 4,635,908, which is a division of Ser. No. 122,850, Feb. 20, 1980, abandoned.
This application Dec. 1, 1986, Ser. No. 936,386
Int. Cl.[4] F16F *5/00, 9/00*
U.S. Cl. 267—64.11 **15 Claims**



1. A dual force pneumatic spring link comprising: a cylinder assembly with a closed end; a piston assembly in said cylinder with a piston shaft extending from the other end of said cylinder, a bushing on said shaft, an annular seal means around said shaft, a piston with a piston ring, sealing against said cylinder, fixed on the end of said shaft; the other end of said cylinder including means to retain said bushing; said seal means providing a static seal against the cylinder, and a dynamic seal around said shaft; said piston and piston ring providing means enabling metered orifice by-pass flow of gas across said piston during the extension stroke and a free flow by-pass fluid communication path across said piston during the retraction stroke; a predetermined small quantity of oil being contained in said cylinder; a predetermined accurate quantity of gas under at least several atmospheres of pressure in said cylinder, having been pre-loaded under pressure into said cylinder before, and maintained under pressure during, the final mechanical assembly steps of forced insertion of the shaft seal and bushing into the cylinder followed by providing the retaining means on the end of cylinder, whereupon said spring link contains and retains an accurately pressurized and predetermined quantity of gas; and said piston assembly further includes a second floating piston, with seal ring means, disposed between said shaft fixed piston and the closed end of said cylinder assembly with said gas under pressure being equalized on each face of said floating piston; said floating piston adapted to be engaged by said shaft fixed piston during a final portion of the retraction stroke of said shaft to provide a larger force biasing said piston and shaft toward an extended condition.

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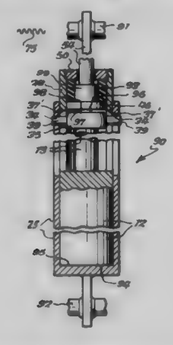
TENSION-COMPRESSION LIQUID SPRING UNIT

Douglas Taylor, Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Sep. 10, 1986, Ser. No. 905,799
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—64.13 **22 Claims**

1. A liquid spring unit operable in both tension and compression comprising: a liquid spring including a cylinder, piston, compressible liquid in said cylinder, and liquid seal means between said piston and cylinder; a housing mounting said cylinder therein for slidable movement; first attachment means on said housing for attachment to a first structural member; second attachment means spaced from said first attachment means and mounted relative to said cylinder for attachment to a second structural member; first means supported by said housing for holding said cylinder against movement in a first direction when said first and second spaced attachment means are moved toward each other to cause said second attachment means to effectively engage said piston and cause said piston to move in said first direction into said cylinder to thereby provide a spring action in compression; second means supported by said housing for holding said piston against movement in a second direction which is opposite to said first direction when

said first and second spaced attachment means are moved away from each other to cause said cylinder to be moved in said second direction to thereby provide a spring action in tension; and mechanical spring means having a lower spring force than



said liquid spring operatively interposed between said first and second attachment means for absorbing low amplitude forces without driving said piston into said cylinder when said first and second attachment means move relative to each other in response to said low amplitude forces being applied thereto.

4,718,649

ROLLING BELLOWS FOR PNEUMATIC CUSHIONING OF A VEHICLE

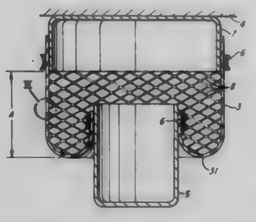
Klaus Pohlmann, Wunstorf; Konrad Müller, Garbsen; Hartwig Voss; Gunter Drescher, both of Hanover, and Gerhard Thurow, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 610,576, May 16, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 835,968

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318060

Int. Cl.⁴ F16F *9/04*

U.S. Cl. 267—64.24 **8 Claims**



1. A rolling bellows for pneumatic cushioning of a vehicle during which problems of creasing and telescoping of parts are encountered via reduction of friction so that facing wall parts may slide against each other easily; said bellows being in the form of a tube body extending in an axial direction and which is made of rubber or rubber-like synthetic material including an interior surface having an entire periphery in a circumferential direction as well as a bellows wall having a thickness, and includes reinforcing inserts; in the installed state, said bellows including an interior surface as well as a substantially smooth outer surface supported in rolling contact against an outer surface of a rigid rolling cylinder, at the same time forming a cylindrical curvature which may encouter a problem at a location therewith which is particularly prone to tension cracks and also to encounter a problem of crease-free telescoping of the bellows in the pressureless state during assembly although subject to limited space conditions;

the improvement in combination therewith which comprises integrally formed-on raised surface portions which intersect one another in a rhombus-diamond-shaped configuration located over the entire interior surface of said bellows wall itself and in the region of said cylindrical curvature, said integrally formed-on raised surface portions extending in two linear systems angularly disposed relative to one another and being distributed over the entire interior surface; said raised surface portions extending from said interior surface by a distance of less than 1 mm which corresponds to only a fraction of the thickness of the wall of said bellows; said raised surface portions serving for breaking-up interior surface of the bellows in the location of the cylindrical curvature into a plurality of raised surface elements defining partial surfaces therewith to aid in direct sliding and rolling of such partial surfaces on one another to permit rolling off as to each other even under stress in changing directions without encountering otherwise constantly arising danger of premature destruction due to folds and localized chafing damage and so as to facilitate rolling in a pressureless state under emergency conditions such that danger of premature destruction as a result of formation of creases and cracks is practically eliminated and to achieve insensitivity of said rolling bellows to extreme operational conditions as well as to prolong useful life thereof.

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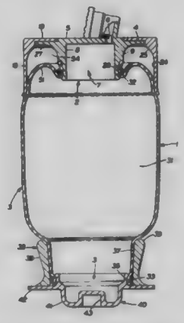
AIR SPRING FOR VEHICLE

Wayne H. Geno, Cicero, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 23, 1986, Ser. No. 877,950

Int. Cl.⁴ F16F *9/04*

U.S. Cl. 267—64.27 **11 Claims**



1. An improved air spring for vehicles including:

(a) first and second piston members located in a generally axial spaced relationship when in an at-rest position, said piston members being adapted to be mounted on spaced portions of a vehicle and movable towards and away from each other;

(b) a fluid pressure chamber formed between the piston members by a flexible sleeve sealingly connected to said piston members at opposite ends of said sleeve, said sleeve having a greater axial length than the length required to extend between said piston members when in the at-rest position forming a rolled end at each end of said sleeve;

(c) an annular-shaped member extending about the first piston member with one of the rolled ends of said flexible sleeve extending about and along said first piston member and along the inner periphery of said annular-shaped member when in the at-rest piston; and

(d) the second piston member having an annular-shaped outer wall with the other of the rolled sleeve ends extending along an outer surface of said outer wall, said wall being configured to move axially telescopically about the first piston member and within the confines of the annular-shaped member thereof when the piston means move axially toward each other from the at-rest position toward a jounce position, and with the rolled ends moving towards an unrolled state as the piston members move axially apart from the at-rest position toward a extended position.

4,718,651

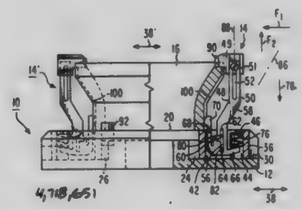
SELF-ACTING DUAL-MODE CLAMP

Bogdan Brycki, Maple Shade, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 30, 1986, Ser. No. 947,862

Int. Cl.⁴ B23Q *3/08*

U.S. Cl. 269—94 **12 Claims**



1. A dual acting clamp mechanism comprising:

a support;

a jaw member movably secured to the support; and

jaw displacement means including male element receiving means comprising a T-shaped slot in one of the member and support, a pair of spaced pin elements secured to the other of the member and support engaged with the receiving means slot and a spring coupled to the member and support, said elements, element receiving means and spring being arranged such that the jaw member has a first clamp position, a second release position and a third neutral position, said jaw member automatically assuming the release position in response to a first force in a first direction on the member placing the member in the neutral position from the clamp position and automatically assuming the clamp position in response to a second force on the member in a second direction different than the first direction placing the member in the neutral position from the release position.

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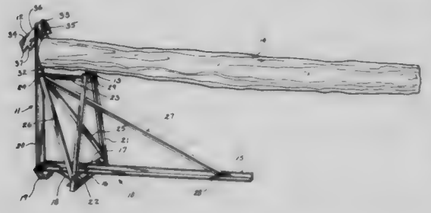
SAWBUCK

Lowell G. Liebenstein, 2142 Maple Rd., Grafton, Wis. 53024

Filed May 30, 1986, Ser. No. 869,097

Int. Cl.⁴ B25H *1/06*

U.S. Cl. 269—296 **5 Claims**



1. A sawbuck for the support of logs or the like, comprising a frame assembly, and opposed jaw means mounted on the frame assembly for receiving a log or the like therebetween, said jaw means comprising a lower jaw and an upper jaw, said lower jaw being spaced beneath and ahead of said upper jaw and serving as a fulcrum support upon which a log or the like can rest and pivot into engagement with the upper jaw for cantilevered support relative to the frame assembly, said upper jaw comprising a plate member pivotally disposed for movement in a generally fore-and-aft vertical plane for engaging with a log or the like adjacent to the rear end thereof.

4,718,653

PORTABLE SURGICAL DRAINAGE PLATFORM

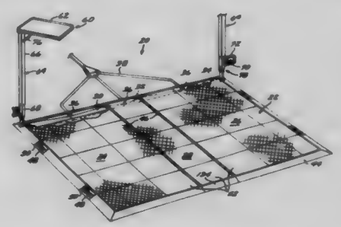
Michael L. Rothman, 440 St. Michaels Dr., Santa Fe, N. Mex. 87501

Continuation of Ser. No. 792,544, Oct. 29, 1985, Pat. No. 4,635,913. This application Oct. 29, 1986, Ser. No. 924,447

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ A61G *13/00*

U.S. Cl. 269—327 **16 Claims**



1. A portable surgical drainage platform for collecting fluids discarded during surgical operations, said platform comprising:

a central support tray and two outer support trays situated adjacent opposite edges of said central support tray, each of said support trays including a trough at one end, an upper fluid receiving surface which channels fluids toward and into said trough, a drain for evacuating fluids from said trough, and means situated below said upper fluid receiving surface for supporting the same;

means for rotatably attaching said outer support trays to said central support tray, said attaching means including overlapping hinges to prevent fluid from leaking between said outer support trays and said central support tray;

means for locking each said outer support tray in a folded position when rotated about said attaching means with respect to said central support tray;

means for damping the downward movement of each said outer support tray when unfolded to align said outer support trays with said central support tray;

a plurality of removable perforated mats, said mats being situated upon said upper fluid receiving surfaces of said support trays to provide a non-slip surface through which fluids may pass; and

a plurality of roller mechanisms situated below said upper fluid receiving surface of said central support tray, said roller mechanisms being capable of supporting said central support tray above a floor or the like to facilitate movement of said portable surgical drainage platform across the floor or the like.

4,718,654

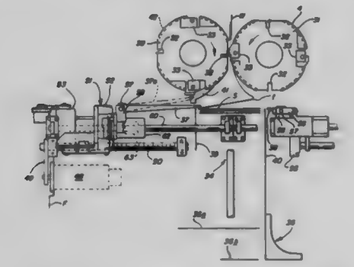
APPARATUS AND METHOD FOR SEPARATION AND DELIVERY OF CONTINUOUS FORMS

Dennis W. Ehlers, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 833,236, Feb. 27, 1986, abandoned. This application Apr. 22, 1986, Ser. No. 855,132

Int. Cl.[4] B65H *41/00*

U.S. Cl. 270—52.5 8 Claims



1. A method for developing stacks of zig-zag folded web segments comprising:

perforating a continuous web at equally longitudinally spaced transverse lines,

zig-zag folding said web along said lines and delivering said web into a stacking path having stack elevator means, said path having opposite sides defined by said lines of fold-perforation,

providing first and second movable substacks supporting plates, one on each side of said path, moving said first plate completely across said path to sever said web into a completed stack below said first plate and a developing stack above said first plate and supported thereon,

transferring the support of said developing substack from said first plate to said elevator means,

moving said second plate partially across said path to define a first substack therebelow and a developing second substack thereabove and while said first substack is supported against concavity,

moving said first plate partially across said path to define a completed substack therebelow and a third developing substack thereabove and while said second substack is supported against concavity,

thereafter removing said second plate from said path to transfer support of two accumulated substacks to said elevator means,

cyclically repeating the movement of said plates partway through said path until a predetermined number of substacks has been accumulated with each substack being supported in turn against concavity, and

finally moving said first plate completely across said path to sever said web into a completed stack.

4,718,655

APPARATUS FOR HANDLING PAPER SHEETS

Masao Okuyama, Ibaraki; Masataka Kawauchi, Ishioka; Tamio Inami, Tsuchiura; Tsuyoshi Ogasawara, Ibaraki; Yutaka Nagasawa, Owariasahi; Shigeru Sasaki, Ibaraki; Yoshio Fukudome, Owariasahi; Yasuo Shiragai, and Katsuaki Inoue, both of Niigata, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,195

Claims priority, application Japan, Nov. 28, 1984, 59-249507; Nov. 30, 1984, 59-251826

Int. Cl.[4] B65H *5/06, 29/00*

U.S. Cl. 271—3.1 19 Claims

1. Apparatus for handling sheets, comprising means for transporting the sheets therein, means for successively stacking the sheets in a receiving station, and means for taking out the thus stacked sheets one by one in succession from said receiving station,

wherein

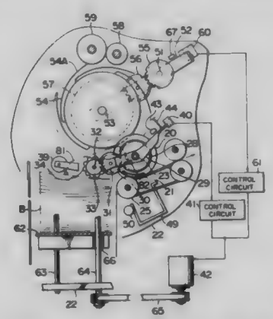
said sheet stacking means comprises

a plurality of vane-wheel type stacking wheels rotatably mounted on a frame for receiving and guiding the sheets transported by said transporting means, and

arresting means for successively separating said sheets received in said vane-wheel type stacking wheels at a predetermined position and stacking the separated sheets in said receiving station, and

said sheet taking-out means comprises

intermittently rotated means for frictionally picking up the sheets stacked in the receiving station by abutting against



a surface of a topmost sheet of said sheets, said frictional pick-up means being disposed between said vane-wheel type stacking wheels and pivotable relative to the frame,

separating and feeding means for separating and feeding out said sheets one by one in succession in cooperation with intermittent rotation of said friction pick-up means, said separating and feeding means comprising feed rollers, each of which has a friction member on the roller circumference and gate rollers made of high friction coefficient material and, said feed rollers and gate rollers being disposed adjacent to a forward side of said stacked sheets as viewed in the direction of taking out, and

means for rotating said pick-up means to retract said pick-up means from the surface of the stacked sheets when the sheets are stacked and to abut against said surface of the stacked sheets when the sheets are taken out.

4,718,656

METHOD OF, AND APPARATUS FOR, LOADING A SINGLING INSTALLATION FOR PRINTED PRODUCTS, ESPECIALLY A FEEDER

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 25, 1986, Ser. No. 856,027

Claims priority, application Switzerland, May 2, 1985, 01859/85

Int. Cl.[4] B65H *5/22*

U.S. Cl. 271—3.1 32 Claims

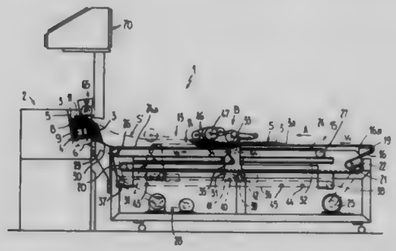
1. A method of loading with printed products a feeder installation operatively associated with a withdrawal location, said method comprising the steps of:

infeeding the printed products in an imbricated formation at a predetermined mutual spacing between the individual printed products within said imbricated formation and at a predetermined infeed rate to a buffer stack forming location;

forming at the buffer stack forming location a buffer stack from the infed printed products such that said buffer stack precedes and adjoins a stack formed at a rear side of a withdrawal location at a feeder installation relative to a predetermined general conveying direction of the infed printed products;

said step of forming said stack entailing adding the infed printed products to said stack formed at said rear side of said withdrawal location subsequent to said step of forming said buffer stack and substantially aligning the printed products with respect to their edges and such that said stack assumes a predetermined configuration;

said step of forming said buffer stack further entailing sliding the infed printed products upon each other such that the printed products assume a reduced mutual spacing between individual ones of the infed printed products in said buffer stack and such that the printed products assume a predetermined inclination relative to said predetermined general conveying direction;



during said step of forming said stack of printed products at the rear side of the withdrawal location relative to said predetermined general conveying direction, loading the feeder installation with the printed products in said predetermined general conveying direction;

individually withdrawing the printed products from said stack at said withdrawal location of said feeder installation at a predetermined withdrawal rate;

said step of forming said buffer stack still further entailing forming a buffer stack of an adjustable length and adjusting said adjustable length of said buffer stack as a joint function of said predetermined infeed rate of the printed products and said predetermined withdrawal rate of the individual printed products such that said stack of the infed printed products at said rear side of said withdrawal location is maintained at a substantially constant size during said step of loading said feeder installation.

4,718,657

PAPER STACKER

Brian Otter, Toronto, and Manuel Dias, Mississauga, both of Canada, assignors to Delphax Systems, Mississauga, Canada

Filed Nov. 28, 1984, Ser. No. 675,912

Claims priority, application Canada, Dec. 1, 1983, 442377

Int. Cl.[4] B65H *31/10*

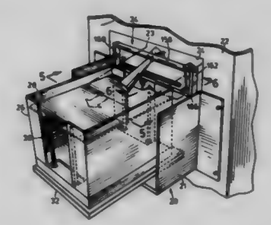
U.S. Cl. 271—184 11 Claims

1. A paper stacker for use at the output from a sheet printer or copier to collect the sheets, the stacker comprising;

a base;

a hopper supported by the base and having a movable floor which receives the sheets of paper travelling horizontally to build a stack on the floor of the hopper; and

an elevator mechaniam attached to the base and including four supports of close coiled springs having outer ends in



engagement with the moveable floor, means contained in the base to guide portions of the supports inside the base to

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4,718,658

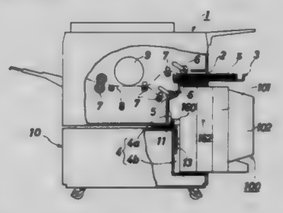
SHEET FEEDING SYSTEM USING DETACHABLE SHEET STORAGE UNIT IN IMAGE PROCESSING DEVICE

Toshihiko Hirose, Yamanashi, and Tatsuhiko Nezu, Kofu, both of Japan, assignors to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Feb. 27, 1986, Ser. No. 833,157

Int. Cl.[4] B65H *7/02, 1/08*

U.S. Cl. 271—258 3 Claims



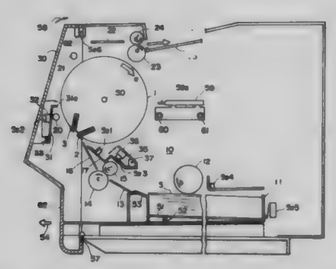
1. A sheet feeding system for using in an image processing device having an image forming unit and a pedestal for permitting the image forming unit to be placed thereon, which comprises a sheet storage unit incorporating a sheet tray for permitting a large number of sheets to be stacked thereon and an elevating drive means for vertically moving said sheet tray so as to position the sheets stacked on said sheet tray to a fixed level, said image forming unit being provided in its lower side portion with an upper cavity half for receiving the upper portion of the sheet storage unit, and a sheet intake port formed in the innermost portion of the upper cavity half, and at least one sheet delivery roller disposed near said sheet intake port, said pedestal being provided in its upper side portion with a lower cavity half for receiving the lower portion of the sheet storage unit, which upper and lower cavity halves define a holder cavity for detachably receiving said sheet storage unit; and first and second coupling means for bringing the sheet storage unit into mutual engagement with the image forming unit, wherein said first coupling means comprises a pair of first coupling elements, one of the first coupling elements being located at the front portion of said sheet storage unit and the other first coupling element being located on the image forming unit at the portion opposite to said one first coupling element, and said second coupling means comprises two pairs of second coupling elements, one of each pair of the second coupling elements being located at either side wall portion of the sheet storage unit and the other of each pair of the second coupling elements being located on the image forming unit at the portion opposite to said one of each pair of second coupling elements.

4,718,659

SHEET WINDING APPARATUS

Toshihiro Hayashi, Tokyo, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1986, Ser. No. 829,093
Claims priority, application Japan, Feb. 13, 1985, SHO 60-27213
Int. Cl.[4] B65H 7/06
U.S. Cl. 271—259 3 Claims



1. A sheet winding apparatus with a detection mechanism for detecting incorrect winding of a sheet, said sheet winding apparatus comprising;
- a housing;
- a winding drum disposed in said housing and having a first clamp member for clamping the front edge of the sheet and a second clamp member for clamping the rear edge of the sheet;
- a drum driving means for driving said winding drum at a predetermined speed;
- a sheet feed means for feeding the sheet toward said first clamp member;
- a clamp driving means for driving said first and second clamp members so as to clamp the front and rear edges of the sheet fed by said sheet feed means;
- a cover member movably mounted on said housing for access to said winding drum by opening of said cover member;
- means for detecting improper clamping of the sheet on said winding drum by movement of the sheet away from said winding drum and into contact with said detecting means comprising an actuator member movably provided at the inside of said cover member, said actuator member being movable by an advancing sheet whose front edge is not correctly clamped by said first clamp member and by opening of said cover member;
- a sensing means for sensing the movement of said actuator member and outputting a signal; and
- a stop means for stopping the rotation of said winding drum when said signal is output from said sensing means.

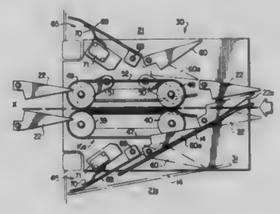
4,718,660

ANTI-JAMMING MEANS FOR A POCKET OF A MAIL SORT MACHINE

Henry A. Daboub, 1420 Grand Teton, DeSoto, Tex. 75115

Filed Oct. 9, 1985, Ser. No. 785,875
Int. Cl.[4] B65H 39/10, 29/38; B07C 9/00
U.S. Cl. 271—305 8 Claims

1. An anti-jamming diverter means for diverting a document into a pocket of a document sorting machine from the centerline of a document transport through said machine, said means comprising:
- diverter means positioned adjacent said pocket for allowing a document to continue on said transport and by said pocket when in a first or deactuated position and for intersecting the centerline of said transport when in a second or actuated position to thereby divert a document from said transport into said pocket;
- means for moving said diverter to said first and second positions;
- kicker means positioned to extend inwardly into said pocket at an angle with respect to said centerline of said transport when in a first or deactuated position and for allowing entry of said document into said pocket when in a second or actuated position, said kicker means moving the tail of the document into said pocket when in said deactuated position; and
- means for moving said kicker means to said first and second positions;
- whereby said diverter means and said kicker means comprise:



- a kicker gate element positioned to extend inwardly into said pocket at an angle with respect to said centerline of said transport when said kicker gate element is in said first or deactuated position and to intersect said centerline of said transport when said kicker gate element is in said second or actuated position;
- and wherein said means for moving said diverter means and said kicker means comprise:
- means for moving said kicker gate element from said first position to said second position to divert a document from said transport into said pocket when actuated and for moving said kicker gate element from said second position to said first position to kick the tail of said document away from the point of entry into said pocket when deactuated.

4,718,661

APPARATUS FOR PLAYING A GAME IN WATER AND SEPARABLE AND RE-ATTACHABLE TAIL MEMBER

Henry S. Wolfe, 14810 Rue De Bayonne, Apt. 3 H, Clearwater, Fla. 33520

Filed Apr. 15, 1985, Ser. No. 723,454
Int. Cl.[4] A63G 19/00; A63B 7/00
U.S. Cl. 272—1 B 4 Claims



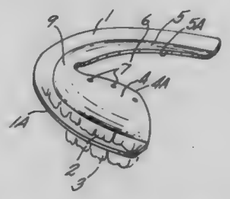
1. A game apparatus for playing a game in a body of water, comprising,
- a first buoyant mount of a size and shape to be straddled and operated by a first rider,
- said first mount being sufficiently buoyant to completely buoyantly support said first rider in water,
- said first mount having a tail member detachably secured to its aft end which end is behind the rider of said first mount when said rider faces in the direction of travel of said first mount,
- a second buoyant mount adapted to be straddled and operated by a second rider,
- said second mount being sufficiently buoyant to completely buoyantly to support said second rider in water,
- said tail member being detachably secured to said first mount by means with portions separable from each other by a tugging force thereon by said second rider, said separable means also being means for re-attaching said detachably secured tail member to said first mount after detachment of said tail member from said first mount, said separable and re-attaching means operating to secure and to re-attach said tail member to said first mount independently of any other structure and structured to facilitate both separation of the portions of the separable means and re-attachment of the same to said first mount,
- whereby said second rider may pursue said first rider in an attempt to remove said tail member.

4,718,662

TONGUE POSITIONING AND EXERCISING DEVICE

Richard B. North, 1321 SE. Magnolia Dr., Roseburg, Oreg. 97470

Filed Dec. 26, 1985, Ser. No. 813,413
Int. Cl.[4] A63B 23/00; A61F 5/56
U.S. Cl. 272—95 7 Claims



1. A tongue positioning and muscle training device for periodic positioning in clenched engagement with upper and lower teeth of the wearer, said device comprising,
- a curved frontal marginal area for retentive disposition intermediate the clenched teeth of the upper and lower dental arches, and
- a pair of inclined tongue supporting portions extending laterally inwardly from said marginal area and each portion having an upper convex surface forming upper rounded tongue supporting surfaces and inwardly disposed surfaces for centering the tongue, said portions with their upper convex surfaces in place in the mouth being dimensioned to be subjacently spaced from the alveolar gum ridge of the wearer's mouth for receiving and elevating the tongue and confining the latter substantially centrally in the mouth for touching the alveolar ridge of the mouth and guiding the tongue above and out of contact with the wearer's teeth.

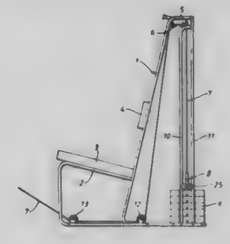
4,718,663

EXERCISING APPARATUS

Keith E. Shepherd, 24 Palm Close, New Inn, Pontypool, Gwent. NP4 0DE, Great Britain

Filed Feb. 5, 1986, Ser. No. 826,351
Int. Cl.[4] A63B 21/06
U.S. Cl. 272—118 6 Claims

1. An exercising apparatus comprising a support framework defined by guide rods extending upwardly in pairs on both sides of the framework, a carrying member having a pair of downwardly extending arms with aligned passageways defined therethrough at various heights, at least one locating rod for receipt within said passageways, weight members, each of which comprises a body in the form of a hollow container provided with a removable closure cap, and constructed from a rigid plastics material, each weight member being formed with side and end walls, a top surface and an underneath surface, passageways defined through from the one surface to the other for receipt of the pair of arms of the carrying member, recesses define at the sides of the body to accommodate the pairs of upwardly extending guide members, so that the weight member is positioned between the guide members and is stabilized thereby, and a guideway defined in the lower surface of each body for receipt of the locating rod which will be attached to the arms of the carrying member so as to support at least some of the weights, the carrying member, interconnected with at least some of the weight members by the locating rod, being attached to a lifting cable.

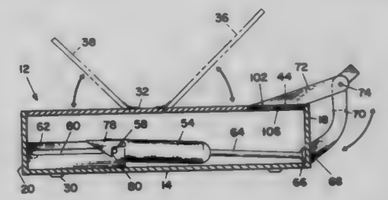


4,718,664

PORTABLE, LIGHT WEIGHT EXERCISE MACHINE

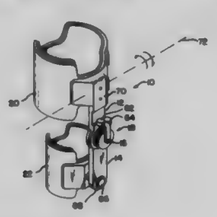
David P. Carpenter, Fort Washington, Md., assignor to M. Michael Carpenter, Tarzana, Calif.

Filed Jun. 19, 1985, Ser. No. 746,630
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—130 17 Claims



1. A portable exercise machine for working opposing muscle sets of a user's muscular system, comprising:
- platform means upon which said user sits to secure said portable exercise machine for use;
- pivot means mounted upon said platform means;
- lever means connected to said pivot means including means for engagement by said user;
- resistance plunger means slidably mounted upon said platform means and connected to said pivot means to be slid into an operative position as said pivot means is rotated in said platform means;
- said platform means comprises a walled container to whose walls said resistance plunger means and pivot means are permanently mounted and into which said plunger, pivot, and lever means are stored; and
- said resistance plunger means resisting, in first and second directions, the motion of said lever means imparted by said user wherein said user works one muscle set in said first direction and works an opposing muscle set in said second direction.

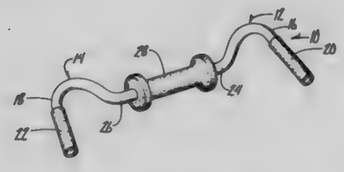
4,718,665
EXERCISE DEVICE
James F. Airy, and Thomas D. Kadavy, both of Bellevue, Wash., assignors to Soma Dynamics Corporation, Bellevue, Wash.
Filed Jul. 15, 1986, Ser. No. 886,155
Int. Cl.[4] A63B 21/22
U.S. Cl. 272—132 8 Claims



1. An exercise device compriaing:
a first lever arm;
a second lever arm;
a pivot means for pivotally connecting said first lever arm to said second lever arm, so that said first lever arm can be pivoted with respect to said second lever arm in a first direction and in a second direction that is opposite said first direction;
first and second fasteners mounted on said first and second lever arms, respectively, for securing said lever arms to respective pivotally interconnected limbs of an exerciser with the pivot axis of said pivot means positioned approximately on the pivot axis of the joint pivotally interconnecting said limbs;
a gear mechanism having an output shaft that is coaxial with said pivot means, said gear mechanism converting pivotal movement between said first and second lever arms into rotation of said output shaft in respective first and second directions, said gear mechanism including a planetary gear system having a ring gear mounted on said first lever arm coaxially with said pivot means, a sun gear fixedly mounted on said output shaft, and a plurality of planet gears each meshing with said sun gear and said ring gear, said planet gear being rotatably mounted on said second lever arm so that pivotal movement between said first and second lever arms is transmitted to said output shaft in sequence through said ring gear, planet gears and sun gear; and
a braking mechanism mounted on one of said lever arms, said braking mechanism being coupled to the output shaft of said gear mechanism and resisting rotation of said output shaft thereby resisting pivotal movement between said first and second lever arms in said first and second directions.

2. An exercise device comprising:
a first lever arm;
a second lever arm;
a pivot means for pivotally connecting said first lever arm to said second lever arm, so that said first lever arm can be pivoted with respect to said second lever arm in a first direction and in a second direction that is opposite said first direction;
first and second fasteners mounted on said first and second lever arms, respectively, for securing said lever arms to respective pivotally interconnected limbs of an exerciser with the pivot axis of said pivot means positioned approximately on the pivot axis of the joint pivotally interconnecting said limbs;
a gear mechanism having an output shaft, said gear mechanism converting pivotal movement between said first and second lever arms into rotation of said output shaft in respective first and second directions;
a braking mechanism mounted on one of said lever arms, said braking mechanism being coupled to the output shaft of said gear mechanism and resisting rotation of said output shaft, thereby resisting pivotal movement between said first and second lever arms in said first and second directions; and
a first brace securing said first lever arm to a first human limb, said first brace being pivotally attached to said first lever about an axis that is perpendicular to a pivot axis between said first and second lever arms; and
a second brace securing said second lever arm to a second human limb, said second brace being attached to said second lever arm through a pivot joint that allows universal pivotal movement between said second brace and said second lever arm.

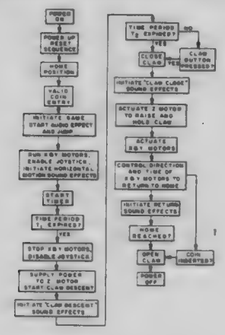
4,718,666
UPPER BODY EXERCISE DEVICE
Jerry L. O'Donnell, 3906 Onawa, and Cecil W. Bopp, 2324 Ansborough Ave., both of Waterloo, Iowa 50701
Filed Apr. 3, 1986, Ser. No. 847,760
Int. Cl.[4] A63B 21/02
U.S. Cl. 272—137 15 Claims

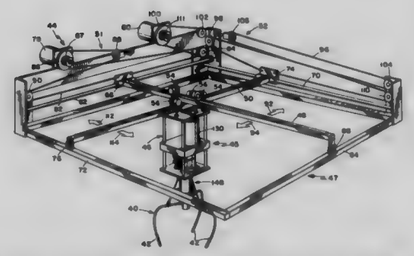


1. An exercise device for development of the hands, wrists, arms, and upper body of an exerciser, comprising:
first and second oppositely disposed handle members having outer gripping portions and inner portions;
flange means secured to said inner portions of said handle members;
an elastromeric middle member, said middle member encapsulating each said flange means to provide a secure and non-releasable junction between said middle member and said handle members; and
said middle member being deformable and twistable by a user from an original position allowing said handle members to be moved towards one another and to be twisted with respect to said middle member while providing resistance to such movement and resiliently returning to said original position after deformation and twisting of said middle member.

4,718,667
AMUSEMENT DEVICE
Stephen P. Shoemaker, Jr., 123 International Boardwalk, Redondo Beach, Calif. 90277
Filed Oct. 28, 1985, Ser. No. 791,687
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 GC 24 Claims

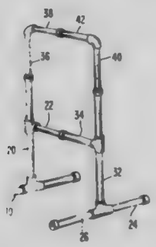
1. An amusement device for retrieval of prize items by a player, comprising:
a housing having a floor over which prize items can be distributed and delivery means for delivering items to a player;
pick up means for picking up items from the floor of the housing;
a transport mechanism on which the pick up means is mounted, including horizontal transport means for transporting the pick up means in a horizontal plane above the floor area between a start position above the delivery means and a chosen horizontal location in the housing, and vertical transport means for moving the pick up means vertically up and down at a chosen horizontal location between a raised position and a lowered position at the level of underlying prize items;
control means for controlling operation of the horizontal and vertical transport mechanisms, the control means including player controlled means for control of the horizontal and vertical transport mechanisms; and





the player controlled means including means for controlling the horizontal direction of travel of the pick up means, means for controlling the vertical position at which the pick up means is actuated to attempt to pick up a prize, and means for controlling actuation of the pick up means to attempt to pick up a prize, the control means including means for automatically returning the pick up means to the start position when the pick up means is actuated.

4,718,668
UNIVERSAL TENNIS TRAINING MEANS
Donald Schipske, 347 Massachusetts Ave., Trenton, N.J. 08629
Filed Apr. 14, 1986, Ser. No. 851,848
Int. Cl.[4] A63B 69/38
U.S. Cl. 273—29 A 21 Claims

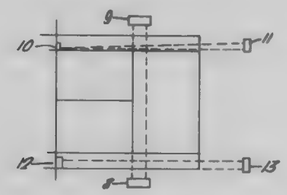


1. A universal tennis training means comprising:
(a) a first support member extending horizontally and defining a first hollow support chamber therein adapted to receive ballast material to facilitate stabilization of the universal tennis training means, said first support member defining a first access hole therein in fluid flow communication with respect to said first hollow support chamber to selectively allow placement and removal of ballast material therein;
(b) a first lower vertical member fixedly secured with respect to said first support member and extending vertically upward therefrom;
(c) a first lower horizontal member fixedly secured with respect to said first lower vertical member and extending outwardly horizontally therefrom;
(d) a second support member extending horizontally and defining a second hollow support chamber therein adapted to receive ballast material therein to facilitate stabilization of the universal tennis training means, said second support member defining a second access hole therein in fluid flow communication with respect to said second hollow support chamber to selectively allow placement and removal of ballast material therein;
(e) a second lower vertical member fixedly secured with respect to said second support member and extending vertically upward therefrom;
(f) a second lower horizontal member fixedly secured with respect to said second lower vertical member and extending outwardly horizontally therefrom toward said first lower horizontal member, said second lower horizontal member being telescopically engageable with respect to said first lower horizontal member to an extent equal to at least substantially one half of the length thereof to allow for changes in the lateral spacing between said first lower vertical member and said second lower vertical member;
(g) a first upper vertical member extending upwardly from said first lower vertical member and being telescopically engageable therewith to an extent equal to at least substantially one half of the length thereof;
(h) a first upper horizontal member being fixedly secured with respect to said first upper vertical member and extending approximately horizontally outwardly therefrom;
(i) a second upper vertical member extending upwardly from said second lower vertical member and being telescopically engageable therewith to an extent equal to at least substantially one half of the length thereof;
(j) a second upper horizontal member being fixedly secured with respect to said second upper vertical member and extending approximately horizontally outwardly therefrom toward said first upper horizontal member and being telescopically engageable therewith to an extent equal to at least substantially one half of the length thereof to allow for changes in the lateral spacing between said first upper vertical member and said second upper vertical member;
(k) a first sealing means selectively positionable at said first access hole to retain ballast material within said first hollow support chamber; and
(l) a second sealing means selectively positionable at said second access hole to retain ballast material within said second hollow support chamber.

4,718,669
ELECTRICALLY OPERATED LINE MONITOR FOR TENNIS
William C. Carlton, Tas-Sig, Tas-Sig, M'Xlokk, and Margaret P. England, Villa Aventura, San Gwann, both of Malta
Continuation-in-part of Ser. No. 463,695, Jan. 14, 1982, abandoned, which is a continuation of Ser. No. 92,906, Nov. 9, 1979. This application Aug. 2, 1982, Ser. No. 403,962
Claims priority, application United Kingdom, Nov. 10, 1978, 7844026; Dec. 29, 1978, 7850208
Int. Cl.[4] A63B 61/00
U.S. Cl. 273—29 R 28 Claims

1. An electrically operated device to monitor the area near a critical line on a tennis court, said device including at least one transmitting means comprising a first transmitter in a first position, at least a first receiver in a second position, a further transmitter, a further receiver, and at least one signalling means controlled by the said first receiver, the said first transmitter

projecting a first ray, the effective part of which registers on the said first receiver, the said first ray running substantially parallel to the said critical line and running over an area of the court on which a standard tennis ball in play would strike if it were a "good" ball, the said first receiver comprising means for defining the effective part of the said first ray, said effective part of said first ray being the part of said first ray which registers on said first receiver, the cross section of the effective part of the said first ray throughout its useful length being limited so that the said cross section is substantially smaller in any dimension than the diameter of a standard tennis ball, and so that the highest effective part of the said first ray above the playing surface of the court is less than the height of a standard tennis ball in play making contact with the ground, the said



further transmitter projecting a further ray which registers on said further receiver and which is the closest ball monitoring ray to said first ray, said device being characterised in that:

(1) the said signalling means generates a "good" signal only on the complete interruption of the effective part of the said first ray registering on the said receiver;

(2) the said first ray is so positioned that a standard tennis ball in play falling across the said area of the court in which it would strike if it were a "good" ball and falling towards the said critical line and which just completely interrupts the said effective part of the said first ray, must afterwards strike the said critical line; and,

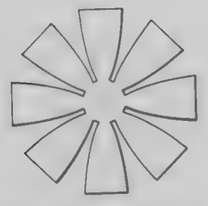
(3) the receiver of said further ray is spaced apart from the said receiver of the said first ray by a distance greater than the diameter of a standard tennis ball.

4,718,670

LINE FAULT DETECTOR BALL

George S. Gray, 191 N. Parade, Mount Druitt, New South Wales, Australia

Division of Ser. No. 519,772, Jun. 30, 1983, Pat. No. 4,664,376. This application Sep. 23, 1985, Ser. No. 779,377
Claims priority, application Australia, Aug. 10, 1982, PF5307
Int. Cl.[4] A63B *39/00, 39/02*
U.S. Cl. 273—61 R 13 Claims



1. A tennis ball for use with an electronic detection apparatus, said tennis ball comprising:

(a) a resilient shell having an interior wall,

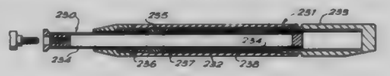
(b) a thin flexible aluminum conductive layer concentric with said resilient shell and in contact with said interior wall said conductive layer flexing resiliently with said resilient shell and in which an eddy current is induced by passage of the ball through an oscillating field.

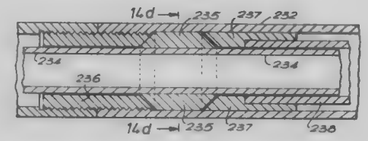
4,718,671

TELESCOPICALLY ADJUSTABLE GAME CUE

Peter A. Desmond, Ilfracombe, and James S. Rich, Berrysarbour, both of England, assignors to Tele-Cue Limited, North Devon, England

Filed Mar. 3, 1986, Ser. No. 835,286
Claims priority, application United Kingdom, Mar. 2, 1985, 8505406; May 10, 1985, 8511831; Sep. 6, 1985, 8522200
Int. Cl.[4] A63D *15/08*
U.S. Cl. 273—68 10 Claims





3. A telescopic cue the length of which is infinitely adjustable between two end positions corresponding to maximum and minimum cue lengths, comprising:

a butt section having a main part threadably engaged with a grip part;

a central section telescopically received within said butt section for adjusting said cue length; and

a lock disposed within said butt section for securing said central section relative to said butt section to fix said cue length, said lock comprising at least one externally bevelled collet disposed around said central section between first and second relatively movable abutments, and said grip part having a forward extension within said main part operable upon relative rotation of said main and grip parts in one sense to urge one of said abutments towards the other to compress said collet into locking frictional engagement with said central section to secure said central section relative to said butt section to fix said cue length, and upon relative rotation of said main and grip parts in an opposite sense to release said locking frictional engagement to permit relative movement of said central and butt sections to adjust said cue length.

4,718,672

SLOT MACHINE

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

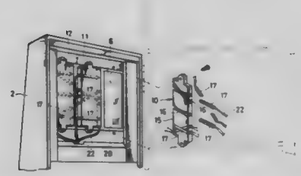
Filed Nov. 17, 1986, Ser. No. 930,936
Claims priority, application Japan, Nov. 15, 1985, 60-174893[U]
Int. Cl.[4] G07F *17/34*
U.S. Cl. 273—143 R 15 Claims

1. A slot machine having N symbol series which are movable and disposed side by side, each symbol series having a plurality of symbols disposed at a predetermined pitch, a display window through which M symbols of each symbol series are visible, N and M each being an integer greater than 2, and a plurality of winning lines corresponding to straight lines on an N×M symbol matrix displayed in the display window, comprising:

a plurality of transparent rod support members superposed on said display window along said winning lines;

a plurality of light emitting elements mounted on each said support member; and

means for selecting at least one winning line and for controlling the illumination of a plurality of said light emitting



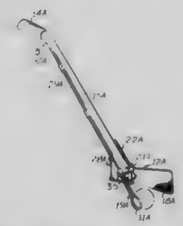
elements disposed along said at least one selected winning line.

4,718,673

BALL MANIPULATING APPARATUS FOR GAMES

Joseph E. Bateham, Rte. 1, Box 2390, Sylvester, Ga. 31791

Continuation-in-part of Ser. No. 730,337, May 3, 1985, Pat. No. 4,615,555. This application Jun. 2, 1986, Ser. No. 869,354
Int. Cl.[4] A63B *53/06, 59/00*; B25J *1/06*
U.S. Cl. 273—162 E 7 Claims



1. Ball manipulating apparatus for selectively retrieving, putting and pitching a ball, said manipulating apparatus comprising a shank, a handle at the upper end of said shank, a putting head at the lower end of said shank, said putting head including opposed flat faces, at least one flat face of said opposed flat faces being adapted for striking a ball to effect said putting, and holding means mounted adjacent to one of said opposed flat faces for selectively holding a ball between said holding means and said putting head, said holding means and said putting head being pivotal with respect to each other for allowing a ball to be selectively received between said holding means and said putting head, an operating arm for causing relative motion between said putting head and said holding means, and operating means adjacent to said handle for moving said operating arm, the arrangement being such that a ball can be selectively held between a flat surface of said putting head and said holding means and said ball can be released by operation of said operating means for pitching said ball, and one of said flat faces of said putting head can be used to strike a ball.

4,718,674

GOLF STANCE AND SWING PRACTICE DEVICE

Darrell I. Henry, R.R. #1, Box 20, Westhope, N. Dak. 58793

Filed Jun. 16, 1986, Ser. No. 874,844
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 C 4 Claims

1. A golf stance and swing practice device for use in positioning a golfer in proper relation to a golf ball for lining up a golf shot and for judging the proper degree of stroke for hitting a golf ball any specific distance within the golfer's skill level comprising:

means including a plurality of linear frame members for positioning a golfer in proper relation to a golf ball for properly positioning said golf ball for lining up any golf shot, each of said plurality of linear frame members has graduated markings along its length;

means including a gradusted linear bar for establishing the correct target line for a golf shot, said graduated linear bar having adjustment means coupled thereto for creating a vertical angle of any specific degree relative to the ground;



means including a plurality of rotatable connectors for joining together each of said plurality of linear frame members;

means including a single rotatable connector for rotatably connecting one of said plurality of linear frame members to said graduated linear bar; and

means including a plurality of foot position markers for providing an indication of where to properly position the golfer's feet for any particular stroke.

4,718,675

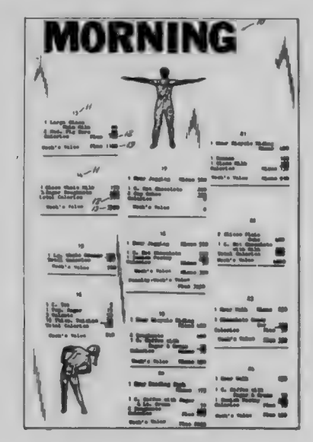
DIET GAME

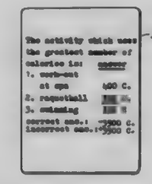
Arnold Rosenberg, and Norma H. Rosenberg, both of 5323 Cobalt Ct., Cape Coral, Fla. 33904

Filed Apr. 12, 1985, Ser. No. 722,513
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—243 1 Claim

1. A diet game for play by a plurality of players comprising: a plurality of individual menus, each containing a plurality of daily eating activities, each activity including individual numbered choices, said choices having listings of food and/or activity which have plus or minus calorie values associated therewith; and a deck of selector cards, some of which are numbered to correspond to the number of individually numbered choices on said menus and others of which indicate particular penalties in terms of calorie value; an additional deck of cards, said additional cards having test material thereon relating to questions to be posed to players affecting individual

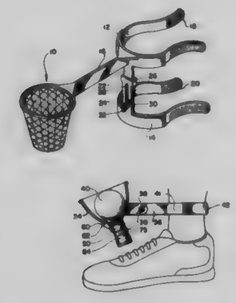
scores; a plurality of numbered human male and female figures indicating various degrees of obesity, as score indicating





means; and numerical scoring means for indicating positive and negative caloric scores.

4,718,676
BALL CATCHING CUP WITH LEG ATTACHMENT
Felton F. Collins, Jr., 1138 E. 73rd St., Los Angeles, Calif. 90001
Filed Jul. 28, 1986, Ser. No. 890,384
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—324 **4 Claims**



1. A ball and catch game comprising a ball receiving net, said net having a base portion, one end of a rigid support bar secured to the rim of the net, a first leg embracing C clamp comprising arm portions and a connected bow portion, the opposite end of said support bar connected to said bow portion of said first C clamp, an adjusting bar rigidly connected to the bow of said C clamp and extending in a downward direction transverse to the plane defined by the arms and bow of the first C clamp, a second ankle embracing C clamp comprising arm portions and a connected bow portion, said second C clamp disposed in a plane which is in spaced parallel relationship to said first C clamp, said second C clamp having an adjusting bar receiving channel extending in an upward direction transverse to the plane defined by the arms and bow of said second C clamp, said adjusting bar receiving channel receiving the adjusting bar depending from the first C clamp, and locking means connected between the adjusting bar and the adjusting bar receiving channel to vary and lock the separation between the first and second C clamps so that the spaced first and second C clamps can be clamped to legs having different lengths.

4,718,677
THROW AND CATCH GAME
Earl E. Barnes, 1550 S. 12th St., Aransas Pass, Tex. 78336
Filed Nov. 5, 1985, Ser. No. 795,210
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—412 **6 Claims**

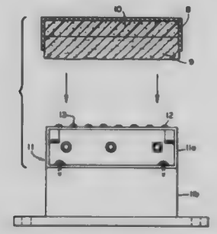


1. A throw and catch game comprising:
a projectile for throwing from a first player to a receiving player, said projectile at least partially covered with a bonding material;
at least one receiver for receiving and engaging the projectile, said receiver at least partially covered with said bonding material and adaptable to be held on the limb of a human at a position intermediate to the extremities of said limb;
said receiver is comprised of an elastic sleeve adapted to fit the knee area of said limb, said sleeve being of sufficient length to cover from one side of the knee joint to the other.

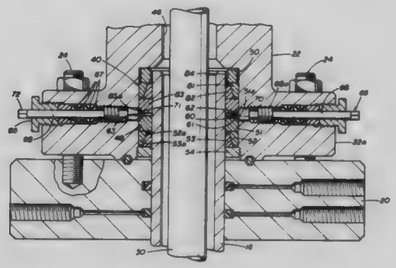
4,718,678
METHOD AND ARTICLE FOR SEALING PROTECTION OF TERMINAL BLOCKS
Jan Vansant, Korbeek, Belgium, assignor to N. V. Raychem S.A., Kessel-Lo, Belgium
Filed Jun. 13, 1986, Ser. No. 874,252
Claims priority, application United Kingdom, Jun. 13, 1985, 8515009
Int. Cl.[4] F16J *15/14;* **H02G** *15/04*
U.S. Cl. 277—1 **17 Claims**

1. A method of environmentally sealing an indented surface by means of an article comprising:
(a) a support;
(b) a sealing material; and
(c) a substantially elastically deformable means for maintaining the sealing material under compression;
which method comprises:
(1) applying the article to the surface such that the sealing material is displaced partially into the indentations and the means (c) is deformed; and
(2) fixing the support against substantial movement with respect to the surface;

the means (c) being capable of maintaining the sealing material under compression after step (2) and after some subsequent displacement of the sealing material further into the indentations.

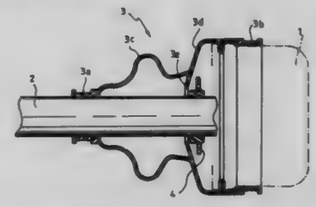


4,718,679
LOCKDOWN RING ASSEMBLY FOR WELLHEAD SEAL
Larry A. Vyvial, Rosenberg, Tex., assignor to Cooper Industries, Houston, Tex.
Filed Jan. 15, 1987, Ser. No. 3,679
Int. Cl.[4] F16J *15/18, 15/24*
U.S. Cl. 277—112 **5 Claims**



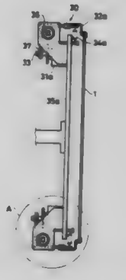
1. A mechanism for simultaneously applying balanced loading forces to the dual sealing devices of a dual crossover seal assembly installed in vertical tandem array in an annulus between concentric inner and outer cylindrical surfaces within a pressurized wellhead, said sealing devices each including sealing elements for effecting a seal between the concentric cylindrical surfaces and having an energizer ring with an annular camming surface adapted to receive an energizing force for compressing and energizing the sealing elements, said mechanism comprising:
a loading ring assembly of a plurality of arcuate ring segments arranged in circular fashion within the wellhead annulus between the dual sealing devices of the dual crossover seal assembly with the ends of the arcuate ring segments in spaced relation to allow for radial expansion and contraction of the ring assembly, each said ring segment having a downward facing camming surface in cooperative engagement with the camming surface on the energizer ring of the lower sealing devices and having an upward facing camming surface in cooperative engagement with the camming surface on the energizer ring of the upper sealing device, and an outer circumferential surface adapted to be engaged by the nose end of a holddown screw;
a plurality of holddown screws installed in the wellhead in radial array about the longitudinal axis of the wellhead with equiangular spacing of the holddown screws, each adapted for axial movement toward the wellhead axis and having a contact nose in abutting engagement with the outer circumferential surface of a ring segment, whereby actuation of the holddown screws drives the ring segments in radial inward direction to thereby cam the energizer rings of the upper and lower sealing devices in an axial direction for simultaneously applying balanced axially compressive forces to the sealing devices to effect their energization and effective sealing of the wellhead annulus.

4,718,680
BELLOWS SEALING SHEATH FOR ARTICULATED JOINTS
Hubert T. Halcourwy, Versailles, and Jean-Michel F. Tixier, Montrouge, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur Seine, both of, France
Filed Apr. 2, 1987, Ser. No. 34,109
Claims priority, application France, Apr. 11, 1986, 86 05402
Int. Cl.[4] F16J *3/04, 15/52*
U.S. Cl. 277—212 FB **1 Claim**



1. A bellows sealing sheath for an articulated joint including a bellows which connects together two sleeves intended to be mounted respectively on the driving element and on the driven element and which includes an inner ring in the extension of the first fold on the same side as one of the elements, wherein a deflector is mounted on the other element, on the same side as the first element with respect to the inner ring, while being firmly secured to this other element and having no contact with the ring.

4,718,681
SAMPLE CHUCKING APPARATUS
Yutaka Kakehi, Hikari; Ryokichi Kaji, Chiyoda; Hideki Izumi, Kudamatsu; Toshiaki Makino, Kudamatsu; Kazuaki Ichihashi, Kudamatsu, and Sosuke Kawashima, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 22, 1985, Ser. No. 768,332
Claims priority, application Japan, Aug. 31, 1984, 59-180309; Dec. 3, 1984, 59-254009
Int. Cl.[4] B23B *31/18*
U.S. Cl. 279—106 **10 Claims**



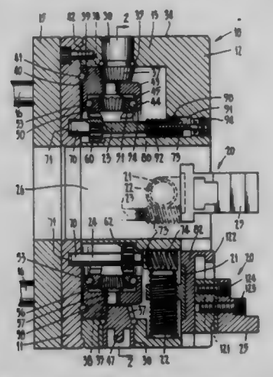
1. A sample chucking apparatus, comprising a base adapted to be moved in a vacuum chamber and to face a sample, clip

means provided at a plurality of positions for supporting and releasably holding said sample, said clip means being movable with said base in accordance with a movement of said base, means mounted on said base for magnetically actuating said clip means to selectively open and close said clip means, and means for applying a spring force to said clip means in a direction opposite to a direction of a magnetic force applied on said clip means by said means for magnetically actuating said clip means.

4,718,682
FOUR JAW RADIAL CHUCK

Anton Zilic, 389 Police Road, and Robert B. Angrakian, 2 Medoro Grove, both of Mulgrave, Victoria 3170, Australia

Filed Oct. 31, 1984, Ser. No. 666,907
Claims priority, application Australia, Nov. 4, 1983, PG2210
Int. Cl.[4] B23B *31/12*
U.S. Cl. 279—116 **7 Claims**



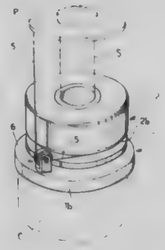
1. A chuck for a machine tool comprising a cylindrical housing having opposed axially inner and outer surfaces, four jaws equally spaced around the outer surface of the housing in diametrically opposed pairs, each jaw being radially displaceable, a circular scroll mounted co-axially within said housing to be axially rotatably thereto by a key operable drive pinion mounted with in the wall of the housing, said scroll carrying a pair of parallel spaced apart co-axially mounted differential gears interconnected by at least one differential pinion, the pinion being mounted on the scroll to impart rotation from the scroll to the differential gears so that said scroll is rotatable relative to each differential gear but rotation of the scroll can directly transmit the same rotation to both differential gears, each said differential gear meshing with a pair of drive shafts, each of which, in turn, drives a jaw of the chuck so that rotation of one differential gear causes linear radial movement of one pair of jaws and one pair of jaws can be moved with the other pair held stationary.

4,718,683
LINEAR DISPLACEMENT-ELECTRICAL SIGNAL TRANSDUCER, PARTICULARLY FOR AUTOMATIC LEVELLING DEVICES FOR MOTOR VEHICLE SUSPENSIONS

Giampiero Perga, Leini , Italy, assignor to Marelli Autronica S.p.A., Pavia, Italy

Filed Jun. 13, 1985, Ser. No. 744,437
Claims priority, application Italy, Aug. 14, 1984, 67818 A/84
Int. Cl.[4] B62D *37/00*
U.S. Cl. 280—6 R **9 Claims**

1. An electrical transducer for detecting relative linear displacements between first and second members comprising:
a stator connectable to said first member;
a rotor rotatably supported by said stator;
a flexible traction member having one end adapted to be anchored to said second member and its other end attached to said rotor;
connecting means for attaching the other end of said traction member to said rotor wherein said rotor rotates in one direction relative to said stator when said first and second members are displaced away from each other;
resilient return means for rotating said rotor in the opposite

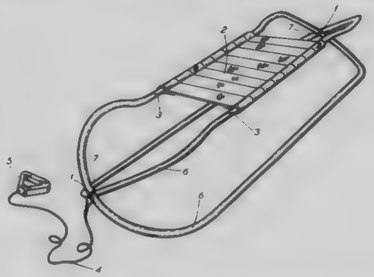


direction of rotation when the two members are displaced towards each other; and
electrical sensor means for outputting electrical signals indicative of the angular position of the rotor relative to the stator, wherein the sensor means comprise a Hall-effect sensor fixed to the stator and a magnet carried by the rotor and facing said sensor; and
said magnet is positioned relative to the axis of rotation of the rotor at a radial distance that is variable in a predetermined manner.

4,718,684
FOLDABLE SLED

Djordje Rabatic, Aleja Viktora Bubaja Str. No. 55/18, 41000 Zagreb, Yugoslavia

Continuation-in-part of Ser. No. 468,191, Feb. 22, 1983, abandoned. This application May 23, 1986, Ser. No. 868,210
Claims priority, application Yugoslavia, Feb. 24, 1982, 402/82
Int. Cl.[4] B62B *13/16*
U.S. Cl. 280—20 **4 Claims**

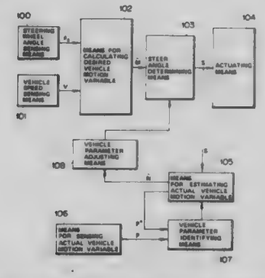


4. A foldable sled with a safety fastener for holding the sled in unfolded condition, comprising:
two cylindrical frame members;
fasteners for rotatably connecting the frame members at two points on a longitudinal axis thereof for swinging relative each other from a sled-operative or open postion into an inoperative or closed position; and
a fabric slipped over the frame members for forming a seat, wherein one of the fastener means comprises a rod (72) pivotably through each frame member and having to blind nuts (74) on opposite sides thereof, a body (71) receiving the rod (72) in an axial hole thereof, a spiral spring (75) slipped over the rod and resting with one end on one of the blind nuts (74) and with the other end on one end of the body (71), and two perpendicular grooves on the other end of the body at right angles to the rod the grooves having rounded bottoms and widths which correspond to the outer diameters of the cylindrical frame members for receiving them under urging from the spring.

4,718,685
MODEL SOLVING TYPE VEHICLE STEERING CONTROL SYSTEM WITH PARAMETER IDENTIFICATION

Taketosi Kawabe, Tokyo, and Ken Ito, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 8, 1986, Ser. No. 939,107
Claims priority, application Japan, Dec. 9, 1985, 60-276590
Int. Cl.[4] B62D *5/00*
U.S. Cl. 280—91 **13 Claims**

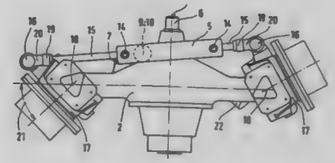


1. A control system for steering a controlled vehicle having first and second wheels, comprising:
(i) means for sensing a steering wheel angle of said controlled vehicle, and determining a sensed value of said steering wheel angle,
(ii) means for sensing a vehicle speed of said controlled vehicle, and determining a sensed value of said vehicle speed,
(iii) means for sensing a turning behavior of said controlled vehicle by sensing a first vehicle motion variable representing the turning behavior, and determining a sensed value of said first vehicle motion variable,
(iv) actuating, means for steering said controlled vehicle by altering a first wheel steer angle of said first wheels in accordance with a desired value of said first wheel steer angle, and
(v) controlling means for determining said desired value of said first wheel steer angle, said controlling means comprising at least;
(v-i) target turning behavior determining means connected with said steering wheel angle sensing means and said vehicle speed sensing means for determining a desired value of a second vehicle motion variable corresponding to a vehicle steering response with respect to said sensed value of said steering wheel angle and said sensed value of said vehicle speed by solving a desired vehicle model simulating a motion of a desired vehicle defined by values of vehicle parameters,
(v-ii) steer angle determining means connected with said target turning behavior determining means for determining said desired value of said first wheel steer angle required to achieve said desired value of said second motion variable in said controlled vehicle by solving a first actual vehicle model representing said controlled vehicle by use of values of said vehicle parameters inclusive of a first vehicle parameter,
(v-iii) actual turning behavior estimating means connected with said steer angle determining means for determining an estimated value of said first motion variable resulting from said desired value of said first wheel steer angle by solving a second actual vehicle model simulating a motion of said controlled vehicle by use of values of said vehicle parameters inclusive of said first vehicle parameter,
(v-iv) parameter identifying means connected with said turning behavior sensing means for modifying only said second actual vehicle model by adjusting the value of said first vehicle parameter of said second actual vehicle model so that said estimated value of said first motion variable determined according to said second actual vehicle model approaches to said sensed value of said first motion variable, and thereby determining a desired value of said first vehicle parameter, and
(v-v) parameter adjusting means for modifying said first actual vehicle model by adjusting the value of said first vehicle parameter of said first actual vehicle model so as to approach said desired value of said first vehicle parameter.

4,718,686
STEERING ARRANGEMENT FOR MOTOR VEHICLES

Peter Dziuba, Überlingen; Rauter Jürgen, Friedrichshafen, and Günter Fusseder, Schw.-Gmünd, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP85/00550, § 371 Date Jun. 3, 1986, § 102(e) Date Jun. 3, 1986, PCT Pub. No. WO86/02611, PCT Pub. Date May 9, 1986
PCT Filed Oct. 21, 1985, Ser. No. 878,968
Claims priority, application Luxembourg, Oct. 24, 1984, PCT/EP84/00331
Int. Cl.[4] B62D *7/06*
U.S. Cl. 280—95 R **6 Claims**



1. Steering arrangement for motor vehicles comprising:
a vehicle frame;
an axle housing journaled by means of a pivot bearing pivot in said frame;
a pair of steering knuckle bearings, each being connected to an end of said axle housing;
a wheel hub or a wheel hub drive attached in a pivoting manner to each of said steering knuckle bearings;
at least one piston rod to serve as a longitudinally stiff tie rod;
a pair of steering lever bearings each receiving an end of said piston rod;
a double-acting actuator driving said piston rods, depending upon the direction of activation, pivotable in said steering lever bearings with respect to said axle housing, said actuator being linked to said axle housing via a linkage connection comprising a connecting lever;
said linkage connection positioned to the side of said pivot bearing pivot, away from the center of said actuator, and further linked to an end of said actuator with limited but angularly universally movable articulation;
said linkage connection exhibiting two articulations of which one articulation only makes possible a horizontal rotation of said connecting lever with respect to said piston rod, said one articulation being fastened between an end of said connecting lever and said axle housing; and
a ball joint being provided in said linkage connection whose ball stud is fastened to said actuator.

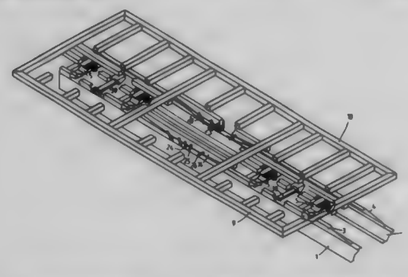
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4,718,687

MULTI-AXLE MOTOR VEHICLE WITH A BODY

Ernst Hartmann, Alzfeld, and Waldemar Stuhr, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Matra-Werke GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP85/00311, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO86/00270, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 26, 1985, Ser. No. 841,532
Int. Cl.[4] B62D *21/02*
U.S. Cl. 280—104 6 Claims



1. A multi-axle motor vehicle with a warp flexible frame, generally movable with respect to a longitudinal warp axis comprising a frame having a superposed assembly frame attached thereto, and a separate body relatively incapable of twisting and supported on said assembly frame by means of support elements, including a connection that flexibly absorbs vertical forces and longitudinal forces and allows only limited relative movements between the frame and body provided adjacent the center line the body between the body and the assembly frame, at least one support element connected between the assembly frame at at least one additional point along the length of the body and that is disposed in the longitudinal direction of the vehicle and a side thrust support connection that absorbs transverse forces provided in at least one zone of the body between the body and the assembly frame, characterized in that the support element located in an additional point is located at at least one end of the body and has a curved load distribution curve surface connected to the assembly frame, whose axis of curvature lies at least approximately coaxial to the warping axis of the frame, and that the side thrust support connection is adjustable to the movement of the support element and that one of the at least one load distribution surfaces is swivellable around an axis perpendicular to the longitudinal median plane of the vehicle.

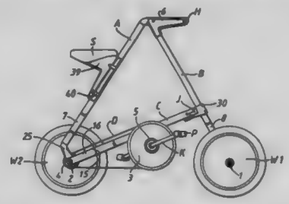
4,718,688

COLLAPSIBLE BICYCLES WITH TRIANGULAR FRAMES

Mark A. Sanders, 16 Green Lane, Windsor, Berkshire, United Kingdom

PCT No. PCT/GB86/00100, § 371 Date Oct. 16, 1986, § 102(e) Date Oct. 16, 1986, PCT Pub. No. WO86/05155, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 24, 1986, Ser. No. 945,101
Claims priority, application United Kingdom, Feb. 27, 1985, 8505070
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—278 21 Claims

1. A collapsible bicycle comprising a triangular frame formed from the interlinking of a forward strut, a rear strut, and a generally horizontal bottom strut which is connected to the other two struts at or near their lower ends, a wheel mounted at or near the lower ends of each of the forward and rear struts, each wheel being carried by a support which is offset from the axis of the respective strut, whilst the upper ends of the forward and rear struts are non-fixedly interconnected so that these two struts can be moved to lie alongside one another, after releasing a frame locking member on the bottom strut, so that the two wheels will lie side by side and



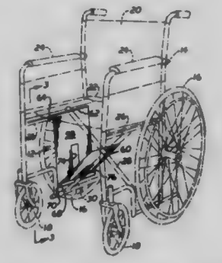
with their respective offset supports positioned at opposite sides of the pair of wheels.

4,718,689

URINARY COLLECTION BAG AND TUBING SUPPORT SYSTEM

Jacqulyn B. Lott, 4515 English Ct., R.R. 3, Bartow, Fla. 33830

Filed Jul. 7, 1986, Ser. No. 882,707
Int. Cl.[4] A47C *7/62*; A61F *5/44*
U.S. Cl. 280—289 WC 11 Claims



1. A urinary collection bag and tubing support system for use in combination with a folding wheelchair having a seat, a frame and cross supports, said support system comprising: a tubing support formed from a flexible material and attached to the frame of the folding wheelchair underneath the seat thereof such that said tubing support is folded in response to folding of the wheelchair; and a folding collection bag cradling support including a first substantially rigid support member removably attached to the wheelchair frame below said tubing support and a second substantially rigid support member hingedly attached to said first support member and being engagable by a cross support such that said second support member is folded relative to said first support member in response to folding of the wheelchair, whereby a urinary collection bag may be cradled by said collection bag cradling support in operative, fluid receiving relation to one end of a length of urinary tubing, at least a portion of the length of the tubing being placed on said tubing support and the other end of the tubing being attachable in fluid communicating relation to a catheter.

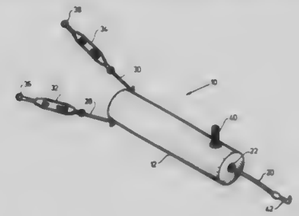
4,718,690

TOW LINE

Jimmie W. Baker, HC01 Box 274-A, Kingston, Id. 83839

Filed Nov. 17, 1986, Ser. No. 931,051
Int. Cl.[4] B60D *1/18*
U.S. Cl. 280—480 3 Claims

1. A shock absorbing tow line assembly comprising:
a. housing means;
b. tow lines means attachable to an object to be towed;
c. spring means operably retained in said housing means, said spring means being attached to one free end of said tow line means, said one free end of said tow line means being fixedly secured to a plate member movable within said housing means, said spring means being retained between said plate member and a first enclosed end of said housing means, said tow line means extending through a small aperture in said first enclosed end;
d. first vehicle attachment means for effecting an attachment



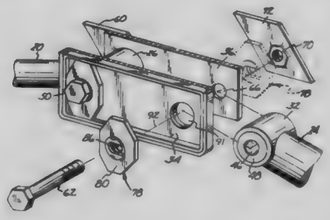
of said housing means to a bumper hitch of a towing vehicle; and,
e. second vehicle attachment means for effecting an attachment of said housing means to said towing vehicle, said second attachment means including at least one cable member attachable between said housing means and a frame structure of said towing vehicle.

4,718,691

DEVICE FOR ADJUSTING TOE OF A VEHICLE WHEEL

John Specktor, Golden Valley, and Gerald A. Specktor, St. Paul, both of Minn., assignors to Shim-A-Line, Inc., Minneapolis, Minn.

Filed Aug. 15, 1986, Ser. No. 896,637
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—661 26 Claims



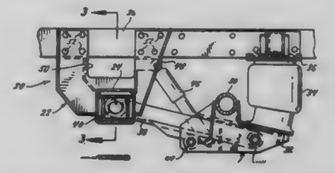
1. A device for adjusting toe angle of a wheel attached to a vehicle by a suspension system that includes at least one control arm attached to the vehicle by an end having a bore transversely disposed therein with respect to the axis of the control arm, said end being disposed between first and second mounting means attached to the underside of the vehicle and a bolt extending through first and second apertures of the first and second mounting means, respectively, and through the bore of the control arm along a first axis, the device comprising:
a base having a third aperture with a first center;
engaging means extending outwardly from the base for engaging the first aperture, the engaging means having an outer arcuate surface that secures against an inner curvature of the first aperture thereby centering the third aperture a preselected distance from the first axis; wherein the bolt extends through the first aperture, the bore and the second aperture such that the bolt lies along a second axis disposed from the first axis.

4,718,692

HEAVY VEHICLE SUSPENSION WITH UNITIZED NARROW PROFILE BOLSTER BEAM HANGER ASSEMBLY AND OUTBOARD SPRING MOUNT

John E. Raidel, Rte. 1, Box 400-N, Springfield, Mo. 65804

Continuation of Ser. No. 572,892, Jan. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 502,496, Aug. 29, 1983, Pat. No. 4,529,224, which is a continuation of Ser. No. 266,006, May 21, 1981, abandoned. This application Oct. 7, 1986, Ser. No. 916,378
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—713 14 Claims



1. A suspension system for a vehicle of the kind having an axle and a frame including transversely spaced first and second longitudinal rails on opposite sides of the vehicle, comprising a transverse bolster beam, hanger means supported from and depending downwardly from the first rail, the hanger means comprising a plate-like skirt having a relatively long profile in a longitudinal direction and having a narrow profile in a transverse direction, thereby minimizing transverse projections of the skirt to allow clearance of other vehicle components on opposite sides of the skirt, means for connecting the bolster beam to the skirt to support the bolster beam from the skirt and from the skirt of a like hanger means supported from and depending downwardly from the second rail, the connecting means of the bolster beam to the skirt being spaced below the rails, a torque beam having forward and rearward ends, means connected directly to the bolster beam and directly to the forward end of the torque beam for supporting the torque beam from the bolster beam while allowing rocking movement of the torque beam within a generally longitudinal plane, a lower spring seat on the rearward end of the torque beam and positioned laterally outboard of the first rail, an upper spring seat supported from and projecting laterally outward from the first rail, means to connect the lower and upper spring seats to opposite sides of an air spring, and means for connecting the torque beam to the axel at a location intermediate the ends of the torque beam, the means for supporting the torque beam from the bolster beam comprising an elastomeric bushing, and including a pair of parallel longitudinally oriented and transversely spaced mounting plates fixed to the bolster beam, the elastomeric bushing being connected to and extending between the mounting plates.

4,718,693

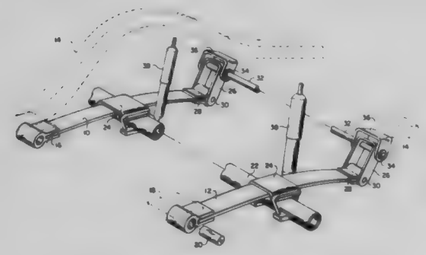
COMPOSITE LEAF SPRING SUSPENSION WITH INTEGRAL SWAY BAR

Benjamin V. Booher, 1721 Aldersgate, Leucadia, Calif. 92024

Filed Jun. 11, 1986, Ser. No. 872,859
Int. Cl.[4] B60G *11/04*
U.S. Cl. 280—718 14 Claims

1. A vehicle suspension system comprising:
a pair of elongate springs, each made of a composite material;
means for connecting a forward end of each of the springs to a corresponding side of a vehicle frame so that the springs extend parallel in a longitudinal direction relative to the frame;
means for rigidly connecting an intermediate portion of each of the springs to an axle housing extending in a transverse direction relative to the frame;

shock absorber means connecting the axle to the frame for damping motion of the axle relative to the frame;
a sway bar; and
shackle means rigidly connected to each end of the sway bar



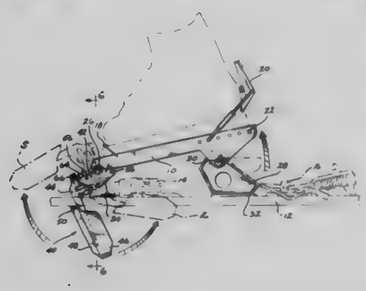
for connecting a rearward end of each of the springs to a corresponding end of the sway bar for thereby transmitting deflections of one spring to the other by rotation of said sway bar for inhibiting rotation of the vehicle frame relative to the axle housing during cornering.

4,718,694

BACKCOUNTRY SKI BINDING

Ralph E. Brice, 15041 SE. 14th St., Bellevue, Wash. 98007; Ronald G. Green, Ephrata; Ronald L. Lawrence, and James D. Miller, both of Renton, all of Wash., assignors to Ralph E. Brice, Bellevue, Wash.

Filed Aug. 29, 1985, Ser. No. 770,848
Int. Cl.⁴ A63C *7/10*
U.S. Cl. 280—605 **7 Claims**



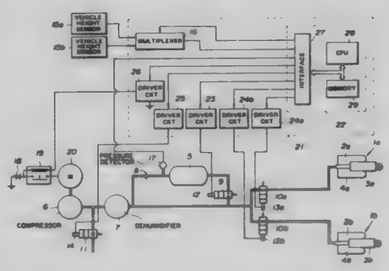
1. A detachable backcountry binding suitable for use on a ski of the type having a downhill binding with releasable toe and heel pieces, said binding comprising:
a frame having a forward end detachably mountable on the ski for supporting the forward portion of the ski boot above the upper surface of said ski, said frame including means for holding a ski boot thereon and rear support means engageable with the ski for supporting the rearward portion of the ski boot above the upper surface of said ski, said rear support means allowing the rearward portion of the boot to move freely upward;
a climbing attachment connected to said frame so as to be detachably mountable therewith on said ski, said climbing attachment including a climbing member that is adapted to extend downward from said ski and engage snow upon which said ski is used; and
a pivot block, said pivot block being mountable on the ski forward of the toepiece, said frame and said climbing attachment being pivotally connected to one another and pivotally and releasably connectable to said pivot block for independent pivotal movement about a common axis.

4,718,695

VEHICLE HEIGHT CONTROL SYSTEM WITH FAIL-SAFE OPERATION FOR FAULTY VEHICLE HEIGHT SENSOR

Kenji Kawagoe, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 8, 1986, Ser. No. 861,010
Claims priority, application Japan, May 13, 1985, 60-100793
Int. Cl.⁴ B60G *17/00*
U.S. Cl. 280—707 **6 Claims**



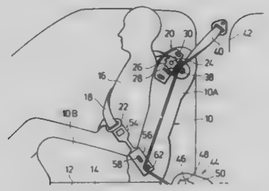
1. A vehicle height control system comprising:
a vehicle height controlling means, having a first component associated with a front suspension system for adjusting the height at the front portion of the vehicle, and a second component associated with a rear suspension system for adjusting the height at the rear portion of the vehicle;
a vehicle height monitoring means for monitoring vehicle height, said vehicle height monitoring means including at least a pair of first and second vehicle height sensors associated with said first and second components respectively for generating vehicle height indicative signals; and
a controller selectively receiving one of said vehicle height indicative signals, producing a control signal for controlling a corresponding one of said first and second components of said vehicle height controlling means in accordance with the selected one of said front and rear vehicle height indicative signals in order to maintain the vehicle height within a given object height range, checking whether said selected one of said vehicle height indicative signal values is in a predetermined normal range for detecting an abnormality of said vehicle height indicative signal value, checking the other vehicle height indicative signal value against an object height indicative value range when an abnormality of said selected one of vehicle height indicative signals is detected, and producing control signals for said first and second components of said vehicle height controlling means ordering the vehicle to be lowered when an abnormality of one of said vehicle height indicative signal values is detected and the other vehicle height indicative signal value is within said object height indicative value range, and for disabling vehicle height control of said first and second components by said vehicle height controlling means when an abnormality of one of said vehicle height indicative signal values is detected and the other of said vehicle height indicative signal values is out of said object height indicative range value so that said vehicle height remains at its current level.

4,718,696

RETAINING STRUCTURE FOR WEBBING SECURED TO SEAT OF VEHICLE

Teruhiko Koide; Teruhiko Kawaguchi; Hideyuki Suzuki, and Tsutomu Muraoka, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jan. 9, 1986, Ser. No. 871,831
Claims priority, application Japan, Jan. 14, 1985, 60-89677[U]
Int. Cl.⁴ B60G *22/18, 22/02*
U.S. Cl. 280—801 **24 Claims**



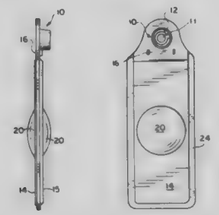
1. A retaining structure for webbing secured to a seat of a vehicle, which comprises:
(a) an occupant restraining webbing wound up by a first retractor, wherein both the retractor and a free end of the webbing are anchored to said seat, and
(b) a continuous flexible retaining member secured at one end thereof to the side wall of the body of the vehicle and at the other end to the floor of the vehicle body and having an intermediate portion mechanically coupled to the intermediate portion of the webbing,
whereby, in the event of a vehicular emergency the tension which acts on said webbing is transmitted to the vehicle body.

4,718,697

IDENTIFICATION DEVICES

Petrus A. Berardus van Amelsfort, Ashhurst, New Zealand, assignor to Allflex International Limited, Palmerston North, New Zealand

Filed Jun. 10, 1986, Ser. No. 872,551
Claims priority, application New Zealand, Jun. 11, 1985, 212275
Int. Cl.⁴ B65D *85/00, 85/30;* **G08C** *17/00;* **K44C** *3/00*
U.S. Cl. 283—107 **8 Claims**



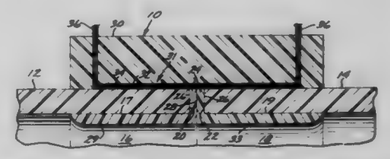
1. An electronic identification device comprising a carrier and an electronic transmitter located within said carrier, the carrier comprising a body portion, attachment means and a flexible portion coupling said attachment means with said body portion, the attachment means being adapted to facilitate attachment of the carrier to an object to be identified, the body portion, attachment means and coupling portion being integrally formed from a resilient plastics material, said body portion comprising two panels mounted to said coupling device, the panels being fastened together to form an internal cavity in which said electronic device is encapsulated there being protection means provided about said cavity to protect said encapsulated electronic device.

4,718,698

APPARATUS AND METHOD OF FORMING FUSION WELDED BUTT JOINT BETWEEN THERMOPLASTIC PIPE SECTIONS

Donald C. Hill, Pasadena, Calif., assignor to R. W. Lyall & Company, Inc., Santa Fe Springs, Calif.

Filed Nov. 8, 1985, Ser. No. 796,545
Int. Cl.⁴ F16L *47/02*
U.S. Cl. 285—21 **5 Claims**



1. Pipe joint apparatus for forming a fusion joint between the ends of thermoplastic pipe sections of predetermined interior and exterior diameters and having a predetermined melting temperature, said apparatus comprising:
a pair of tubular plastic insert sleeves made of a thermoplastic meltable at said predetermined temperature and formed with barrels to telescope in close fitting relationship within the respective pipe sections, said sleeves including radialy outwardly disposed end flanges for overlying the ends of said pipe sections and having oppositely directed first and second faces for engagement of said first faces with the ends of the pipe sections, respectively, and for abutting engagement of said second faces with each other upon arrangement of the pipe sections in axially aligned relation; and
a thermoplastic tubular coupling collar having mounted in the interior surface thereof a heater for heating said ends of said pipe sections and said flanges to said predetermined temperature, said collar being adapted to telescope over the exterior of the pipe sections for disposition of said heater in coaxial relation over the abutting said second faces whereby said heating means may be energized to heat said flanges and said ends of said pipe sections to said predetermined temperature to cause flanges and pipe ends to fuse together while the barrels of said coupling sleeves remain at a temperature below said predetermined temperature and afford radial support against radial inward displacement of the wall of said pipe sections.

4,718,699

GAS SYSTEM OUTLET STATION ASSEMBLY

Stanley J. Kulish, Chesterfield; Bidwell C. Cranage, Ferguson, both of Mo.; James F. Mariol, Cincinnati, and Robert P. Swank, Mansfield, both of Ohio, assignors to Allied Healthcare Products, Inc., St. Louis, Mo.

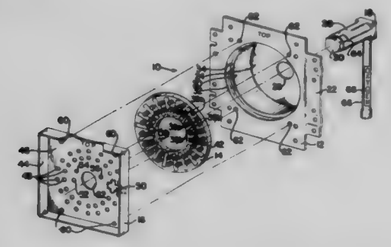
Filed Feb. 14, 1983, Ser. No. 466,280
Int. Cl.⁴ F16L *25/00*
U.S. Cl. 285—12 **11 Claims**

1. A face plate assembly for a gas-unique keyed gas delivery system, said assembly comprising:
an index plate including a universal body member having a front side and a back side and a plurality of apertures each extending therethrough,
said plate further including indexing pins each adapted to be received within any preselected one of said apertures and having a head on one end thereof configured relative to said apertures to preclude passage of the pin therethrough,
each said pin being disposed within a preselected one of said apertures and extending outwardly from the back side of said member with said head thereof abutting against said

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front side whereby said pins collectively define a gas-unique key;

a gas-unique facia plate adapted to mate with said index plate; and



means for mounting said facia plate on said front side of said index plate in abutment against said pin heads to captively retain said pins within said preselected apertures.

4,718,700

T-SHAPED HOSE

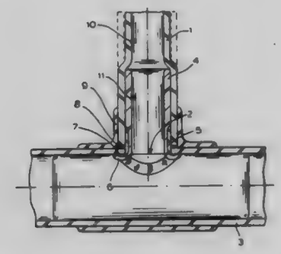
Frank Horch, Buxtehude; Hermann Brockmann, Buchholz; Herbert Barfuss, and Werner Schütt, both of Hamburg, all of Fed. Rep. of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg-Harburg, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,146

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430053

Int. Cl.⁴ F16L *41/00*

U.S. Cl. 285—156 **2 Claims**



1. In a T-shaped hose formed of rubber or rubber-like material having an embedded reinforcing inlay of high stressability fabric or fiber structure, wherein a vulcanized branch hose is secured at one end at the opening in the wall of a vulcanized main hose, the zone of connection being lined on the inside of the branch hose with a sleeve formed of polyamide or other viscous plastic, which abuts the cylindrical inner wall of the main hose with a flange-like edge, and said zone of connection being covered on the outside with a still-vulcanizable rubber mixture, the improvement comprising:

an axially wide, annular recess formed in the outer surface of said sleeve adjacent the flange;

an annular channel formed between the inner wall of the main hose at the connection zone and said flange by said flange being axially deformed backwards at its outer edge, said annular channel being interconnected with said recess; and

a still-vulcanizable rubber mixture injected into and filling said annular recess and said annular channel so that upon vulcanization a solid and rigid bond is formed between the sleeve and the branch and main hoses at the zone of connection.

4,718,701

PIPE COUPLING APPARATUS WITH SPLIT RING AND CLAMPS

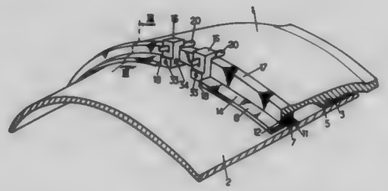
Pierre Vigneron, and Jean-Pierre Vitel, both of Pont A Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 9, 1987, Ser. No. 23,500

Claims priority, application France, Mar. 7, 1986, 86 03254

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—91 **5 Claims**



1. An apparatus for coupling two pipes together wherein a male spigot end (2) of one pipe is inserted into a female bell housing (1) on an end of another pipe, the bell housing defining an inner surface (13) and having a radially inwardly extending flange (12), comprising:

(a) a circumferential, radially outwardly extending shoulder (7) fixed to the spigot end of said one pipe and disposed inwardly of the bell housing flange,

(b) a split bearing ring (6) disposed around the spigot end, below the bell housing flange, and having a radially outwardly extending lip (11) hooked under and inside of said flange and defining therewith an annular chamber (15), said bearing ring having an internal surface (9) disposed in engagement with the spigot end shoulder,

(c) a mass of incompressible granular material (32) disposed in said chamber,

(d) a pair of spaced separation clamps (16) engaged with an end portion of the bell housing and each having a stop lug (19) disposed in mating engagement with a complementary configured end (18) of the ring, said clamps being forcibly spread apart to attendantly diametrically expand the split ring to urge the lip thereof into tight engagement with said inner surface (13) of the bell housing, and

(e) means (20) for individually locking the spread apart clamps to said end portion of the bell housing to maintain said ring expansion.

4,718,702

EXPANSIBLE COUPLING

Calvin Rushforth, Andover, and Walter L. Brassert, Belmont, both of Mass., assignors to Northern Research & Engineering Company, Woburn, Mass.

Filed Nov. 6, 1985, Ser. No. 795,478

Int. Cl.⁴ F16L *27/12*

U.S. Cl. 285—114 **13 Claims**

1. An expansible coupling for, and in combination with, a pair of tubular elements, comprising:

a sleeve having a longitudinal axis; and

first and second tubular elements; wherein

end portions of said elements are mounted, through given extents thereof, onto said sleeve;

said elements are collinearly aligned with said axis; and

ends of said elements, which terminate said end portions, are (a) spaced apart, and (b) mutually confronting; and further including

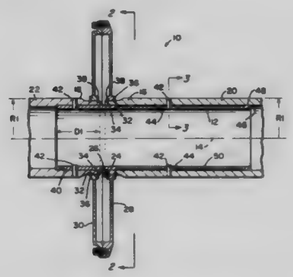
a first disc centrally coupled to one of said element end portions; and

a second disc centrally coupled to the other of said element end portions; wherein

peripheries of said discs are mutually fastened together;

said end portions of one of said elements is in contacting engagement with said sleeve, fully circumferentially thereof;

said sleeve has an end which is in contacting engagement with said one element, fully circumferentially thereof; and



intermediate said end of said sleeve and said end of said one element there obtains an axially-extended, annular void between said sleeve and said one element.

4,718,703

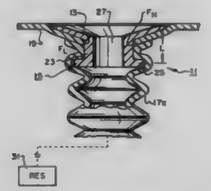
APPARATUS AND METHOD FOR INTERCONNECTING A RESERVOIR WITH A RUBBER CUP

Joe S. Harrell, 2127 Siesta Dr., Dallas, Tex. 75224

Filed Sep. 26, 1986, Ser. No. 911,886

Int. Cl.⁴ F16L *3/04*

U.S. Cl. 285—158 **6 Claims**



1. Means for interconnecting a rubber, fluid-impermeable cup having a wall thickness with a reservoir comprising:

a. an aperture of first radial dimensions penetrating laterally through said cup at a predetermined location and having a wall extending peripherally therearound;

b. an attacher having a base, a stem, and a flange; said attacher terminating at said base and at said flange and said base having a bore penetrating therethrough and connected to said stem at a first end thereof; said stem having a bore penetrating therethrough and connected at its other end to said flange; said flange having said bore penetrating therethrough and extending laterally outwardly to a larger diameter than said stem; said stem having a second radial dimension slightly greater than said first radial dimension of said aperture so as to effect an interference fluid-impermeable seal with said wall of said aperture when inserted therethrough and having a first longitudinal length L greater than the thickness of the wall of the cup so as to provide a longitudinal space between the wall of the cup and said flange when installed through said aperture; and

c. a short section of rubber tubing adapted for connection with said reservoir at a first end and having its second end adapted for connection to said cup; said tubing having elasticity and adapted for being forced over said flange of said attacher, having a radial elastic memory for remaining in an attained position when forced over said flange and having a longitudinal elastic memory and adapted to be forced over said flange sufficiently to effect a longitudinal force against the wall of the cup and said flange, thereby effecting a fluid-impermeable seal joint and a mechanical seal joint without use of adhesives.

4,718,704

LATCH ASSEMBLY FOR A DOOR OR WINDOW

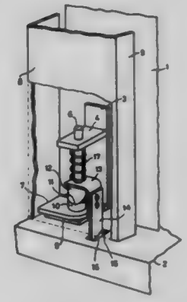
Cornelis Verhoog, Jr., Oostzaan, Netherlands, assignor to Verhoog's Handelsonderneming B.V., Zaandam, Netherlands

Continuation of Ser. No. 562,732, Dec. 19, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 933,322

Claims priority, application Netherlands, Dec. 21, 1982, 8204919

Int. Cl.⁴ E05C *1/14*

U.S. Cl. 292—169 **2 Claims**



1. A latch assembly that mounts entirely on the exterior of a door and yet is concealed from view and protected by a handle used to open the door, said latch assembly comprising in combination:

a door;

an actuating handle including an extended channel of generally concave cross section having two lips joined by a central portion;

means located on the exterior of said door for mounting said actuating handle to said door for limited pivotal motion about an axis that is parallel to the channel and parallel to said door with the lips of the channel extending toward but spaced from said door;

first cam means affixed to said actuating handle for pivotal motion with it and having an inclined cam surface that faces generally in a first axial direction and that progresses both axially and circumferentially around the axis;

second cam means slidably and non-rotatably mounted to the exterior of said door and having an inclined cam surface bearing against the inclined cam surface of said first cam means for producing a translational motion of said second cam means parallel to the axis when said actuating handle is pivoted;

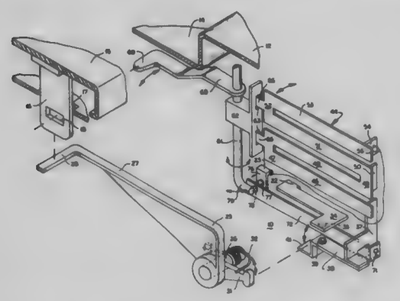
a latch bolt connected to said second cam means for translational motion with said second cam means parallel to the axis, whereby rotation, in one sense, of said actuating handle about the axis results in translational motion of said latch bolt in one direction and rotation of said actuating handle in the opposite sense results in translational motion of said latch bolt in the opposite direction;

the two lips and the central portion of the extended channel substantially enclosing a space between the extended channel and said door;

said first cam means, said second cam means, and said latch bolt located in said space so as to be concealed from view and protected by said extended channel.

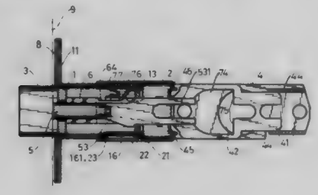
VOL 1086 ISS 2 JA 12 1988 UMI

4,718,705
BIMETAL ACTUATED LOCK
Richard P. Case, Webster City, Iowa, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Aug. 25, 1986, Ser. No. 899,862
Int. Cl.[4] E05B 17/22
U.S. Cl. 292—201 10 Claims



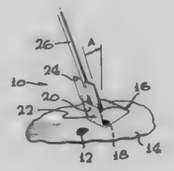
1. A safety interlock for a door of an appliance or the like comprising: a door movable between open and closed positions, a frame member, a lock mechanism mounted on said frame member, said lock mechanism including a bimetallic element having first and second ends, said bimetallic element being fixed at said first end to said frame member and carrying lock means at said second end, said bimetallic element, upon application of heat thereto, being movable to move said lock means, latch means carried by said door, said latch means having a notch therein positioned when the door is closed to be engageable by said lock means upon application of heat to said bimetallic element, means to supply an electric current through said bimetallic element to heat it, and shunt means in parallel with said bimetallic element, said shunt means including switch means operable when said lock means moves a predetermined distance towards said latch means to cause at least part of said electric current to bypass said bimetallic element and thereby reduce the heating effect of said electric current.

4,718,706
TUBULAR DOOR LOCK WITH AN ADJUSTABLE DEVICE
Yau C. Fang, Chiayi, Taiwan, assignor to Posse Lock Manufacturing Co., Ltd., Hou-Hu Chiayi, Taiwan
Filed Jul. 1, 1986, Ser. No. 880,878
Int. Cl.[4] E05C 21/00
U.S. Cl. 292—337 3 Claims



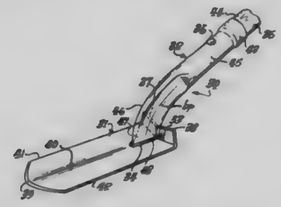
1. A length-adjustable tubular door lock comprising a tubular main shell having a forward open end with a surrounding face-plate and a rear wall with an aperture, a tubular extender shell received on the main shell, the extender shell having an open forward end and an apertured back wall, a pair of elongate assembly plates extending rearwardly from the apertured back wall of the extender shell with a space therebetween, aligned openings in the assembly plates for a rotatable door-knob shaft, an extending and retracting door bolt, a locking plate having a forward end secured to the door bolt, the locking plate being received within the main shell with the bolt extending from said forward open end thereof, biasing means fitted between the rear wall of the main shell and the bolt for projecting the bolt outwardly of said forward end, a pulling plate in the main shell adjacent the locking plate, a projecting tab on the pulling plate, an elongate aperture in the locking plate having a pair of spaced locating formations for selective receipt of the tab therein, an unlocking plate having a forward end portion received in the main shell adjacent the pulling plate and a rearward end portion extending through the apertured back wall of the extender shell between the assembly plates, a pivot connection between the forward end portion of the unlocking plate and the pulling plate, an opening in the rearward end portion of the unlocking plate to receive the door knob shaft so that rotation of the shaft may provide rearward movement of the unlocking plate, the pulling plate and the locking plate to retract the bolt, a two-position detent means connected between the main shell and the extender shell for providing lengthwise movement of the extender shell on the main shell between forward and backward positions effectively adjusting the distance between the face plate and said apertures in the assembly plates, and adjustment means for correspondingly moving the tab on the pulling plate as between the respective locating formations in the locking plate to effectively adjust the distance between said opening in the locking plate and the bolt in conformity with said forward and backward positions of the extender shell, the adjustment means including a back end portion of the pulling plate protruding outwardly from the apertured back wall of the extender shell for engagement by an inserted object to tilt the pulling plate about said pivot connection for engaging and disengaging the tab in the respective locating formations.

4,718,707
DISPOSABLE WASTE SCOOPER
Bart E. Greenhut, Los Angeles, Calif., assignor to Petpro Products, Inc., Los Angeles, Calif.
Filed Oct. 22, 1986, Ser. No. 922,177
Int. Cl.[4] A01K 29/00; B65D 13/06
U.S. Cl. 294—1.4 11 Claims



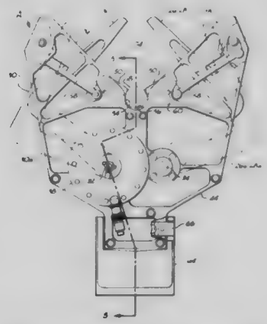
1. A disposable feces scooper apparatus for scooping feces off the ground, comprising:
a frame with a largely horizontal bottom which can be substantially scrapped along the ground;
a flexible bag having an opening and walls at said opening mounted on said frame including a bottom opening portion mounted on said frame bottom and an upper opening portion;
a closing device which is coupled to said upper opening portion of said bag and which is moveably mounted on said frame between an open position wherein said closing device lies above said frame bottom with said bag opening open and a closed position wherein said closing device is lowered to lie substantially against said bottom of said frame and closes said opening, said frame bottom being constructed so it can substantially abut the ground while the closing device is lowered.

4,718,708
TOOL PRODUCT AND METHOD OF MAKING
Victor Zacuto, 5705 Bevis Ave., Van Nuys, Calif. 91411
Filed Sep. 17, 1984, Ser. No. 651,072
Int. Cl.[4] A01B 1/22; B25G 3/02
U.S. Cl. 294—57 7 Claims



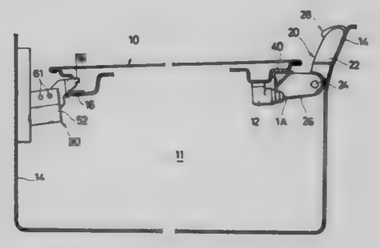
1. A shank for a tool or the like comprising
a single walled hollow member having a longitudinal axis extending between an upper end and a lower end therefor,
a tubular portion formed integrally in said member extending from its upper end along its longitudinal axis,
a buckled portion having generally a figure-eight outline in cross-sectional appearance and including no more than one curved segment extending from said tubular portion towards the lower end, and
a remaining length in the buckled portion extending from the one curved segment to such lower end.

4,718,709
ORBITAL MANEUVERING VEHICLE END EFFECTORS
W. Neill Myers; John C. Forbes, both of Huntsville, Ala., and Wayne L. Barnes, Petersburg, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Dec. 16, 1984, Ser. No. 902,159
Int. Cl.[4] B66C 1/10; B25J 3/00
U.S. Cl. 294—106 19 Claims



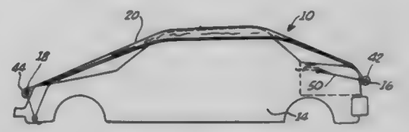
1. An end effector device for grasping the handle of a space telescope and the like comprising:
a base;
a pair of spaced face plates carried by said base;
a pair of pivotal fingers carried by said face plates;
an intermediate pivotal finger carried by said face plates meshing with said pair of pivotal fingers in a counterrotating motion;
retainer means carried by said face plates for retaining said handle in a latched position;
guide means carried by said face plates for guiding said handles toward said retainer means; and
drive means for rotating said pair of fingers and said intermediate finger in counterrotation with respect to one another in a manner that said fingers engage said handle and move said handle towards said retainer means for retention therein.

4,718,710
UNIT FOR STORING DEMOUNTABLE ROOF PANEL
Tooru Iwamura, and Hirokazu Yoshikawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jul. 9, 1986, Ser. No. 883,774
Claims priority, application Japan, Jul. 12, 1985, 60-106632
Int. Cl.[4] B60J 7/20, 7/11
U.S. Cl. 296—37.1 18 Claims



1. A unit for storing a demountable roof panel, wherein movements of said demountable roof panel are controlled by a roof panel fixing device, with which one end edge of said demountable roof panel is engaged, and a roof panel holding device, with which an opposite end edge of said demountable roof panel is engaged, to thereby store said demountable roof panel in a storing space of a motor vehicle, said roof panel holding device including an urging member held on an inner peripheral wall of a storing space in a manner to be movable in a direction of said roof panel fixing device for coupling into a mounting cutout of said demountable roof panel, wherein edge surfaces circumscribing said cutout control the movement of said demountable roof panel in vertical and lateral directions, said urging member resiliently urging said demountable roof panel toward the direction of said roof panel fixing device.

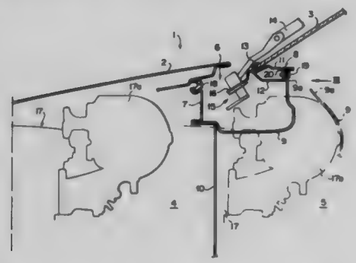
4,718,711
PORTABLE CAR PORT
David Rabbit, 1160 Sugar Sand Blvd., #401, Singer Island, Fla. 33404
Filed Aug. 8, 1986, Ser. No. 894,684
Int. Cl.[4] B60J 11/00
U.S. Cl. 296—136 9 Claims



1. A portable car port comprising:
a light weight weather shelter canopy,
an anchor means for connection inside an automobile trunk for storage of the car port in the trunk of an automobile,
said anchor means includes a rear bar connected to said anchor means, said canopy connected at one end to said rear bar,
a roll bar means connected to the other end of said canopy for placing the canopy in a rolled up condition on said roll

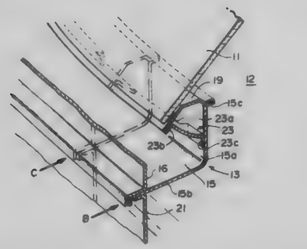
bar means and for unrolling said canopy over the automobile from said rear bar to the front of the automobile,
a front anchor means connected to said roll bar means for anchoring said roll bar at the end of said canopy to the front of the auto.

4,718,712
FRONT STRUCTURE OF VEHICLE BODY
Shirou Nakatani, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan
Filed Apr. 10, 1986, Ser. No. 850,136
Claims priority, application Japan, Apr. 12, 1985, 60-78687
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] B62D *25/08, 25/14*
U.S. Cl. 296—192 9 Claims



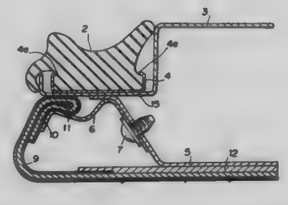
1. A front structure for a vehicle body having a cowl box extending along a lower edge of a windshield, the cowl box being formed by a closed cross section windshield holding member for holding the windshield, comprising: a front cowl plate and a dashboard upper panel fixed to the windshield holding member at a junction, the front cowl plate defining a front face of the cowl box and the dashboard upper panel defining a bottom and a rear face of the cowl box, and wherein the windshield holding member and the dashboard upper panel separate upon vehicle impact and resultant cowl box deformation such that the windshield and holding member remain engaged.

4,718,713
FRONT STRUCTURE OF VEHICLE BODY
Toshinori Sakamoto, and Osamu Matsuura, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan
Filed Jun. 4, 1986, Ser. No. 870,413
Claims priority, application Japan, Jun. 6, 1985, 60-123208
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] B62D *25/08, 25/14*
U.S. Cl. 296—192 8 Claims



1. A front structure for a vehicle having a cowl box extending along a lower edge of a windshield and an engine compartment formed in front of the cowl box characterized in that said cowl box has bottom and rear faces defined respectively by a horizontal wall portion and a vertical wall portion of a dashboard upper panel, an upper member for holding the windshield connected to a flange provided on an upper edge of the dashboard upper panel, and a lower member extending along the upper member in the transverse direction of the vehicle body and connected to the upper member at a first end and to the vertical wall portion of the dashboard upper panel at a second end, by separable securement means a junction between the second end of the lower member and the vertical wall portion at said separable securement means being more fragile upon vehicular impact and resultant cowl box deformation than the connections of the upper member to both the lower member and the dashboard upper panel upper edge flange allowing the upper member to remain engaged with the windshield.

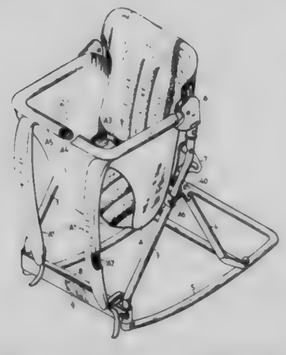
4,718,714
VEHICLE SUPPORT STRUCTURE FOR A DETACHABLE ROOF
Masaharu Tanino, and Masaru Ogiso, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Continuation of Ser. No. 808,657, Dec. 13, 1985, abandoned.
This application Mar. 17, 1987, Ser. No. 27,996
Claims priority, application Japan, Dec. 14, 1984, 59-189981
Int. Cl.[4] B60R *13/02;* B60J *7/11*
U.S. Cl. 296—214 7 Claims



1. A vehicle support structure for a detachable roof, comprising:
a roof panel extending along the vehicle exterior and terminating in a downwardly recessed frame having an upper support surface;
sealing means positioned within said recessed frame along said upper support surface for providing weather sealing between said roof panel and the detachable roof when the detachable roof is closed;
lining means extending beneath said roof panel for lining at least a portion of the interior of the vehicle, said lining means having a support base spaced below said recessed frame, said lining means also having an upwardly bent end section secured to a lower surface of said recessed frame;
an inner panel member aligned along a surface of said support base and extending upwardly between said support base and said recessed frame; and
clamping means secured to said inner panel member and contacting said end section for resiliently retaining said end section in engagement with said recessed frame.

4,718,715
ADJUSTABLE FOLDING BABY CHAIR
Ching-Chou Ho, No. 58, Ching Fong Street, Taipei, Taiwan
Filed Apr. 7, 1987, Ser. No. 35,459
Int. Cl.[4] A47D *13/10*
U.S. Cl. 297—32 1 Claim

1. An adjustable folding baby chair characterized by comprising:
a back support with two rivet holes and a slot in the part near each end, having a cross bar connected to the side pieces and two compression springs of suitable length fitted in the end parts between the slot and one of the rivet holes,
two main rods, with three rivet holes and a slot in the part near each top end and with a rivet hole in the part near each bottom end, having a compression spring of suitable length fitted in the part between the slot and the lower rivet hole, a square-headed telescopic cap fitted on the end and fixed with a rivet being inserted through the slot,
a plastic foot board consisting of a channel plate and two connectors with tabs and recesses at each end for connecting the main rods and the rocker specified below,
a rocker connected to the foot board and having a stop block on each side piece,
a stay rod, with two end parts slightly bent, connected to the main rods with H connectors and rivets inserted in the third rivet holes of the main rods,
a pair of adjusting plates, each plate being triangular shaped

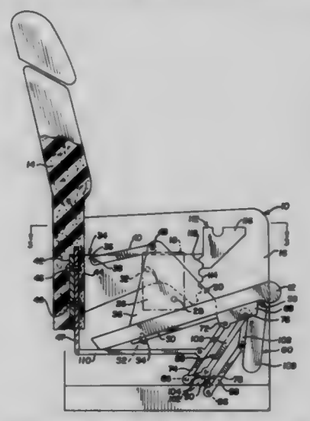


and having rivet holes in the corners to be fixed between the back support and main rod, and having a curved slot through which the cross bar is inserted,
two seat support connectors each consisting of a tubular part on the top for holding the seat support, and a hollow sector case having a notch at the bottom to receive the square-headed telescopic cap and a rivet hole for fixing the main rod,
a seat support with two end parts bent slightly and fastened to the seat support connectors by means of V spring catches with conical projections snapped in the holes in the end parts,
a seat made in the size corresponding to the framework and having two shoulder straps for use to carry the chair on the back, a waist strap for safety purpose, and a tubular fastener to fasten the baby chair on the car seat with the car safety strap,
a protective band fixed to the foot board to protect the carrier when the baby chair is carried on the back.

4,718,716
RECLINING CHAIR
William E. Stumpf, South Minneapolis, Minn.; Donald T. Chadwick, Los Angeles, Calif., and Bruce R. Gezon, Jenison, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Dec. 3, 1986, Ser. No. 937,567
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—85 10 Claims

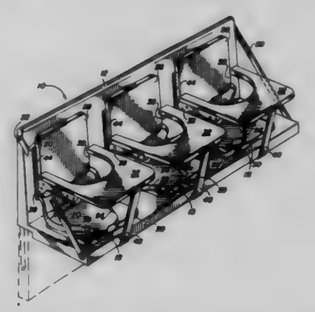
1. In reclining chair having a seat, backrest, and side supports, means mounting the seat and backrest to the side supports so that the backrest reclines with respect to the seat, the improvement in the mounting means comprises:
a backrest bracket rigidly affixed to said backrest for supporting said backrest;

side support brackets rigidly affixed to said side supports and pivotably mounting said backrest bracket;
a seat support bracket rigidly affixed to said seat and pivotably mounted to said side support brackets for pivotably supporting said seat on said side support brackets; and
a coupler link having one end pivotably mounted to said backrest bracket and having a second end pivotably mounted to said seat support bracket for coordinating movement of said seat with said backrest;



the backrest bracket, the side support brackets, the seat bracket and the coupler link being so configured and arranged that an axis of rotation of said backrest with respect to said seat passes approximately through the hips of a chair occupant and so that the center of gravity of the chair occupant will be translated substantially horizontally upon rotation of said backrest with respect to said seat about said axis of rotation.

4,718,717
MULTIPLE PERSON TRAY SEAT
Jorge Cruz, P.O. Box 4082, Ocala, Fla. 32678
Filed Feb. 17, 1987, Ser. No. 15,211
Int. Cl.[4] A47B *83/02*
U.S. Cl. 297—135 10 Claims



1. A multiple person tray seat for attachment to a wall or other support, comprising:
a seat back;
a seat bottom having a plurality of side-by-side seating places thereon and being pivotally connected to said seat back for movement between a first position perpendicular to said seat back and a second position substantially parallel to said seat back;

means for securing said seat bottom in said first position; and

means for removably attaching a tray to said seat back at each side of each seating place at an independently selectable one of a plurality of elevations above said seat bottom first position, said means serving to place the tray into a seating place occupant confining position.

4,718,718

TRIM COVER FOR USE WITH SEATS IN VEHICLES

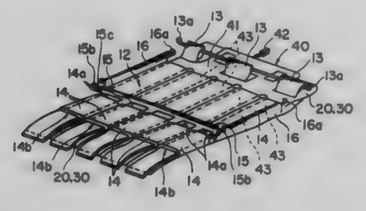
Hidekazu Maruyama, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Aug. 8, 1986, Ser. No. 894,880

Claims priority, application Japan, Aug. 9, 1985, 60-122435[U]

Int. Cl.[4] A47C *7/74*

U.S. Cl. 297—180 6 Claims



1. A trim cover for covering a seat cushion of a seat in a vehicle, comprising:

a surface skin;

a base cloth connected to said surface skin;

wadding sandwiched between said surface skin and said base cloth;

an electric heater comprising a plurality of band-like portions;

a plurality of elongated sack-like portions formed between said surface skin and said base cloth, each sack-like portion being separated from adjacent sack-like portions by seams which bind said surface skin and said base cloth together, each sack-like portion receiving one of said plurality of band-like electric heater portions and having an opening formed intermediate its length;

a pulling loop traversing said plurality of sack-like portions at their openings, said pulling loop being joined together with said surface skin and said base cloth and having a plurality of through-holes permitting passage therethrough of said plurality of band-like electric heater portions, whereby each band-like portion extends from a respective sack-like portion on one side of a through-hole, through said through-hole and into the sack-like portion on the other side of said through-hole; and

a pulling wire passed through said pulling loop for securing the trim cover to the seat cushion.

4,718,719

ENERGY ABSORBING AIRCRAFT SEAT FRAME STRUCTURE

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

Filed Aug. 5, 1986, Ser. No. 893,175

Int. Cl.[4] B60R *21/00*

U.S. Cl. 297—216 11 Claims

1. In a framing system for supporting a plurality of seats in a multi-passenger seating unit which has both lateral and fore and aft support means for supporting seat cushion means, said seating unit including front and rear support leg members attached at their upper ends at spaced locations to fore and aft located portions of said support means so that said upper ends will be maintained at a fixed distance from each other, said front and rear support leg members having their lower ends connected to each other by a connecting member and to a seating track on the floor by at least one track fitting member which includes locking portions which are adapted to engage complementary shaped openings in said seating track; said seating unit being characterized in that said front and rear support leg members are bent into a generally "U" shape with the leg portions of each "U" being divergent from each other and with the outer surface of the bend portion of the "U" of one support leg member being in engagement with the outer surface of the bend portion of the "U" of the other support leg member; said front and rear support leg members each, respectively, having the upper and lower leg portions thereof directed generally forwardly and rearwardly; means for maintaining the front and rear leg support members in engagement with each other at their bend portions; and a curved die member mounted in contact with the curved inside surface of the forward facing bend of the front support leg member, said curved die member serving to guide and control the bending movement of the upper and lower leg portions of said front support leg member toward one another when a sufficient downward and forward force is applied to said seating unit to cause the upper and lower ends of said front support leg member to move toward each other.

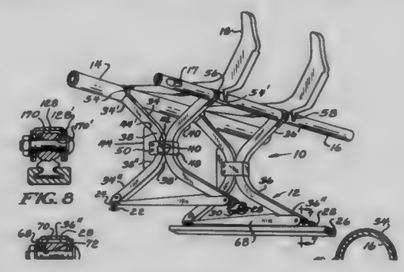


FIG. 8

4,718,720

CUSHIONED SEAT INCLUDING AN IMPACT MEMBER

Dieter Braun, Rheda-Wiedenbrück; Werner Möller, Herzebrock, and Werner Thüllig, Rietberg, all of Fed. Rep. of Germany, assignors to Westfalia-Werke Franz Knöbel & Söne Kommanditgesellschaft, Wiedenbrück, Fed. Rep. of Germany

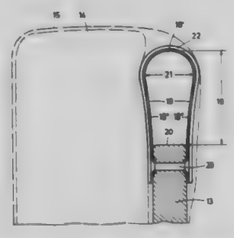
Continuation of Ser. No. 674,051, Nov. 21, 1984, abandoned.

This application Aug. 18, 1986, Ser. No. 897,774

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342881

Int. Cl.[4] B60R *21/00*

U.S. Cl. 297—216 9 Claims



1. A cushioned seat for a vehicle, which comprises:

a cushion portion of a predetermined height and width;

a rigid base member longitudinally extending along a back part of said cushion portion of a height less than said predetermined height of said cushion portion;

an elongated inverted U-shaped impact member mounted on said rigid base member and longitudinally extending along an upper edge portion about said back part of said cushioned portion of said cushioned seat, said elongated inverted U-shaped impact member being formed of leg members, said leg members of said elongated inverted U-shaped member forming curves with a base portion thereof and wherein a distance (21) between said curves of said elongated inverted U-shaped member is greater than a distance between said leg members of said elongated inverted U-shaped support member at said rigid member, said impact member being formed of a deformable material and of deformable thickness; and

a cover member enclosing said cushioned portion, said rigid base member and said elongated inverted U-shaped impact member thereby forming said cushioned seat, said cover member engaging said impact member, said impact member being disposed to receive directly an impact force.

4,718,721

CHAIR COVER

Susan Pompa, 7215 N. Kildare, Lincolnwood, Ill. 60646

Filed Apr. 22, 1985, Ser. No. 726,347

Int. Cl.[4] A47C *31/10*

U.S. Cl. 297—219 1 Claim

1. A chair cover comprising,

a main panel of sheepskin including the leather and wool, having a front side with the wool expose thereon, and a rear side, and having a length greater than its width,

the panel being made up of a plurality of sections extending transversely and secured together, forming a unitary character of the panel,

the sections being of such length that, in their position in the completed panel, and with the panel in relaxed position, their end portions form a rear portion of the panel extending peripherally around the panel on the rear side thereof, the rear portion extending transversely inwardly, essentially toward the center of the panel, and

a continuous flexible trimming strip secured to the inner edge of the rear portion continuously therearound, the central portion of the panel, considered longitudinally of the panel, being of greater width, transversely of the panel, than the end portions whereby to provide a bulgy portion, the bulgy portion being adapted to be fitted into a space between the seat and backrest of the chair to which the cover is applied whereby to enable the end portions to fit snugly to the seat and backrest, the panel having one end portion wider than the other and both end portions being tapered at least to a degree, the sections of the panel including a central section that is longer, transversely of the panel, than the remaining sections, and constituting at least a substantial portion of said bulgy portion, and the remaining panels being tapered, diminishing in length, transversely of the panel, progressively toward the ends of the panel.

4,718,722

CHILD'S SAFETY SEAT FOR USE IN AUTOMOBILES

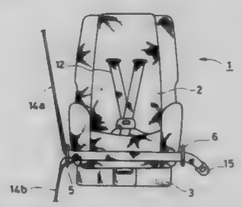
Kouzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan

Filed Nov. 18, 1986, Ser. No. 932,682

Claims priority, application Japan, Nov. 29, 1985, 60-184652[U]

Int. Cl.[4] A47D *7/00*

U.S. Cl. 297—250 3 Claims



1. A child's safety seat for use in an automobile equipped with a seat belt, comprising child support means including a seat portion having a front edge, a rigid elongated member connected to said seat portion substantially along said front edge and having mounting ends protruding on both sides from said seat portion, two ring members (5, 6) each having a round opening (10) and a seat belt opening (11), and means (8) for rotatably mounting one of said ring members with its round opening to one of said protruding mounting ends of said rigid elongated member and for rotatably mounting the other ring member to the other of said protruding mounting end, whereby said seat belt can be passed through said seat belt openings in any rotated position of said ring members.

4,718,723

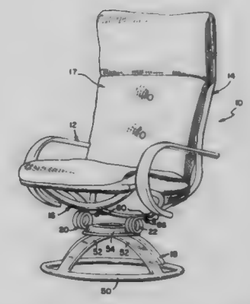
ROCKING CHAIR CONSTRUCTION AND METHOD OF MAKING SAME

Donald L. Bottemiller, Wadena, Minn., assignor to Homecrest Industries Incorporated, Wadena, Minn.

Filed Aug. 29, 1986, Ser. No. 902,292

Int. Cl.[4] A47C *3/025*

U.S. Cl. 297—265 2 Claims



1. A method of making a rocking chair having a pair of substantially parallel coil springs made of steel, each spring having a terminal end substantially parallel with the base for providing a rocking motion, the method comprising:

providing a chair frame structure made of aluminum or an aluminum alloy construction, the chair frame structure having a chair portion and a back portion, the chair portion having left and right tubular ends and the back portion having left and right tubular ends, all the ends disposed proximate a lower portion of the chair frame structure;

VOL 1086 ISS 2 JA 12 1988 UMI

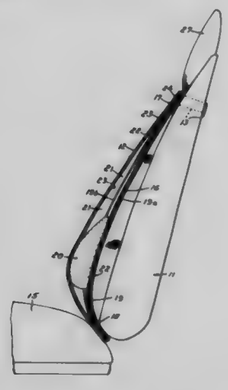
providing an elevated, stationary, ground-engaging base to which the steel coil springs are fixedly attached;
providing a steel sleeve for each coil spring having a pair of steel tubing sections extending away from the sleeve positioned to engage one tubular end of the chair portion and one tubular end of the back portion;
positioning the terminal end of each coil spring through the steel sleeve;
fixedly attaching the steel sleeve to the terminal free end of of the coil spring by set screws;
positioning the tubular ends of the aluminum or aluminum alloy tubing in an overlapping relationship with the corresponding steel tubing sections; and
mechanically joining by crimping the aluminum or aluminum alloy tubular ends with the steel tubing section to produce a permanent attachment.

4,718,724

LUMBAR SUPPORT FOR SEAT ATTACHMENT

Myron Quinton, Auburn Hills, Mich., and Sharon Weiselfish, West Hartford, Conn., assignors to Orthops Incorporated, Auburn Hills, Mich.

Filed Dec. 3, 1986, Ser. No. 937,496
Int. Cl.⁴ A47C *3/00*
U.S. Cl. 297—284 **4 Claims**



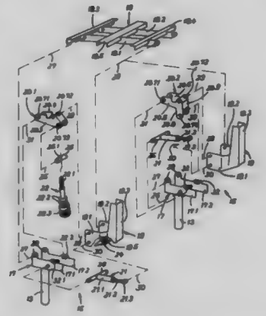
1. In combination, an individual seat having a lower seat element and a seat back with its lower extremity closely adjacent said lower seat element, an adjustable accessory lumbar support removably attached to said seat back comprising a rectangular perimeter frame, a fabric envelope enclosing said frame, said envelope having an expandable chamber, an enclosed vertically adjustable lumbar support cushion within said chamber, said cushion having a flat rearward portion and a vertically arcuate lumbar support portion extending horizontally within the perimeter of said frame, a vertical strap attached to said cushion, top and bottom passages in the back of said envelope at the extremities of adjustment with reinforced eyelets for passage of said vertical strap, said strap extending in a continuous strand outside of the back of said fabric envelope through said respective passages manually engageable for vertical adjustment of said lumbar support cushion in either direction within the extremities of said adjustment, said strap normally engaging and being concealed by said seat back but accessible upon removal of said accessory lumbar support from said seat back fro manual vertical adjustment of said cushion within said envelope, said fabric envelope having layers of material attached together at upper and lower extremitites of said expandable chamber, a depending flap extending from said lower extremity of attached envelope layers for frictionally retained insertion between said lower seat element and seat back, a fixed cushion extending above said upper extremity of attached envelope layers, horizontal back strap means at said upper extremity for removable attachment of said accessory lumbar support to said seat back in a predetermined fixed vertical position accommodating said lower flap retention between seat element and seat back.

4,718,725

SUPPORT-AND ADJUSTING DEVICE FOR SEAT AND BACKREST ON A WORK CHAIR

Heinz-Peter Sahr, Grossbottwar, and Bernd Weinberger, Steinheim, both of Fed. Rep. of Germany, assignors to Firma August Froscher G.m.b.H. & Co. K.G., Steinheim, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 890,768
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527785
Int. Cl.⁴ A47C *1/024*
U.S. Cl. 297—300 **22 Claims**



1. Support and adjusting mechanism for the seat and backrest of a work chair having a pedestal comprising feet and a support column supported by said feet, said mechanism comprising a support part fixed on an upper end of said support column, a seat support mounted on a forward part of said support part and a backrest support pivotally interconnected with a rear part of said seat support, said support part, seat support and backrest support having symmetrically, on opposite sides of a central longitudinal plane of said chair, vertically extending partially overlapping support and connection flanges having therein openings for reception of pivot members, a pair of coupling levers insertable between said support part, seat support and backreat support, each of said coupling levers having therein three pivot openings for reception of pivot members, said pivot openings in said coupling levers and said flanges including pivot openings and pivot members in said pivot openings for pivotally interconnecting forward ends of said coupling levers with said support part, pivotally interconnecting intermediate portions of said coupling levers with said seat support and backrest support and connecting rear ends of said coupling levers with said backrest support.

4,718,726

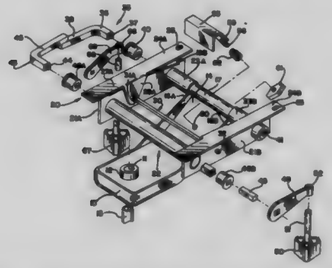
CHAIR SEAT TILT CONTROL

Michael H. Estkowski, 1756 Outer Dr., St. Joseph, Mich. 49085; Jerome C. Caruso, 1165 W. Ash Lawn Dr., Lake Forest, Ill. 60045, and Don E. Minor, 332 S. Church St., Coloma, Mich. 49038

Filed Jul. 7, 1987, Ser. No. 70,415
Int. Cl.⁴ A47C *3/00*
U.S. Cl. 297—313 **7 Claims**

1. A support mechanism for a tiltable chair with separate adjustments for front tilt and rear tilt including a base member adapted to be supported on a chair post, a first tube connected to said base member, said tube having a central axis, a seat support assembly including a pair of side plates, a second tube

connected between and toward the rear of said side plates, a first sleeve member connected to one of said side plates toward the front end thereof, a second sleeve member concentric with said first sleeve member connected to said other of said side plates toward the front end thereof, said first and second sleeve members rotatably supported over ends of said first tube, and a pair of brackets, each bracket associated with one of said side plates and angularly tiltable with respect thereto, each bracket adapted to be connected to support a seat of said chair, a first torsion bar extending through and non-rotatably connected to one end of said first tube, said first torsion bar including an arm disposed external to said first tube, a second torsion bar extending through and rotatably supported within said second tube, said second torsion bar including an arm disposed external to said first tube and adapted to engage said arm of said first



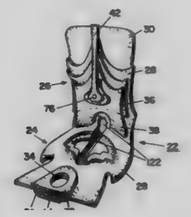
torsion bar, said first and second torsion bars operative to resist counterclockwise rotation of said seat support assembly about said first tube thereby resisting rear tilt of said seat, rear tilt torque adjustment means connected to one of said torsion bars to vary the torque exerted by said torsion bars to resist rearward tilt of said seat about said first tube, a torsion member pivotally supporting said brackets and non-rotatably connected at one end to one of said side plates and, at said other end, engageable with one of said brackets to exert a force resisting clockwise rotation of said seat about said torsion member thereby resisting front tilt of said seat and front tilt torque adjustment means connected between said torsion member and one of said brackets, said adjustment means operable to vary the torque to resist forward tilt of said seat about said torsion member.

4,718,727

REVERSIBLE SEAT CUSHION AND BACKREST

Michael B. Sheppard, 1031 Redondo Blvd., Los Angeles, Calif. 90019

Filed May 29, 1984, Ser. No. 615,122
Int. Cl.⁴ A47C *7/02*
U.S. Cl. 297—458 **2 Claims**



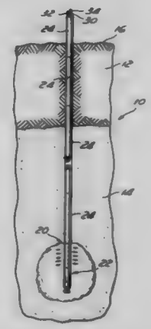
1. A reversible seat cushion compriaing:
a seat cushion which is concave on one side and convex on the other;
said seat cushion having a central front-to-back relieved area;
said concave side sloping down from both sides to the center, from the front to the center, and also sloping down from the rear of the seat cushion on either side of the median line of the cushion, forward toward the center of the cushion;
the convex side of said cushion also being relieved at the center but being raised on either side of the center, both in the side-to-side direction and in the front-to-back direction;
said seat cushion includes wedge-shaped slot means extending forward and outward from the central rear area of said seat portion to relieve pressure on the sciatic nerves.

4,718,728

HYDRAULIC COUPLE ROTATIONAL FORCE HYDRAULIC MINING TOOL APPARATUS

Everett L. Hodges, 49 Royal St. Geroge, Newport Beach, Calif. 92660

Continuation of Ser. No. 631,864, Oct. 5, 1984, abandoned, which is a continuation of Ser. No. 419,230, Sep. 17, 1982, abandoned. This application Apr. 29, 1986, Ser. No. 857,093
Int. Cl.⁴ E21C *45/00*
U.S. Cl. 299—17 **5 Claims**



1. An improved hydraulic mining tool apparatus for recovering minerals from a subterranean deposit comprising:
a drill string formed to extend from ground surface into said subterranean deposit;
a mining tool mounted on one end of said drill string to be disposed within said subterranean deposit;
a cutting jet comprising at least a pair of nozzles mounted on said mining tool for discharging fluid into said subterranean deposit to dislodge minerals from said deposit and form an aqueous mineral bearing slurry, said at least a pair of nozzles positioned to direct fluid flow in opposite and generally parallel directions outward from said mining tool to generate a reactionary rotational force about the axis of said mining tool;
a cutting jet supply conduit for communicating fluid, seperate and independently from ground surface through said drill string to the cutting jet;
a cutting bit mounted on one end of said mining tool for cutting into said subterranean mineral formation, said cutting bit discharging fluid in order to aid said cutting;
a jet pump eductor conduit having one end disposed upon said mining tool for communicating fluid and said aqueous mineral bearing slurry through said drill string to ground surface;
a jet pump supply conduit for communicating fluid separately and independently from ground surface through said drill string to both said cutting bit and said jet pump eductor conduit;
said cutting jet supply conduit including a common high

pressure flow reservoir formed within the interior volume of the mining tool; and

wherein said at least a pair of nozzles each communicate with the common high pressure flow reservoir formed within the interior of said mining tool.

4,718,729

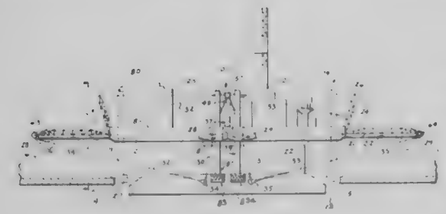
MATERIAL CLEARING AND PILING DEVICE

Carl D. Gilmore, South Milwaukee, and Melvin W. Kraschewski, Racine, both of Wis., assignors to Becor Western Inc., South Milwaukee, Wis.

Filed Sep. 15, 1986, Ser. No. 907,469

Int. Cl.⁴ E21C *41/00*

U.S. Cl. 299—18 **19 Claims**



1. An apparatus for transporting material from one location to a pile at another location comprising:

elevated and elongated self sustaining track means;

means to support said track means above material to be lifted;

a trolley member constructed and arranged to travel over said track means;

a winch member operatively carried by said trolley member;

a material confining member;

a lifting cable connected to said material confining member and said winch member;

a drag cable connected to said material confining member at a point spaced from said lifting cable connection;

a retract cable connected to said trolley member; and

means to retract and pay out said drag and retract cables;

whereby upon activating of said winch member and said retract and pay out means, said trolley member is moved in a reciprocal manner over said track means and said material confining member can be lifted to collect and elevate said material.

4,718,730

CROSS-AXIS CUTTING ASSEMBLY OF A SELECTIVE CUTTING MACHINE

Eberhart Unger, Lünen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Postfach, Fed. Rep. of Germany

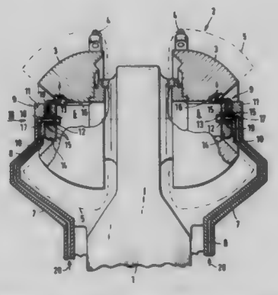
Filed Oct. 9, 1986, Ser. No. 917,009

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536171

Int. Cl.⁴ E21C *7/08*

U.S. Cl. 299—75 **9 Claims**

1. A cross-axis cutting assembly of a selective cutting machine having two cutting heads supported at the end of a boom, the cutting heads each being mounted on and driven by an adjacent end of a shaft oriented transversely to the boom, the cutting heads being formed with internal water ducts for feeding pressurised water to spray nozzles, the water ducts being connected via respective rotary arrangements to an external high pressure water supply line, wherein the water ducts of each cutting head are fed with pressurised water from the high pressure water supply line by a respective connecting member arranged externally on the boom, each connecting member being adapted to the external contour of the associated cutting head and being connected to the adjacent end of the shaft via the respective rotary arrangement, each rotary arrangement having an axial pin on the respective connecting



member fitting sealingly in an axial passage in the adjacent shaft end.

4,718,731

MILLING FIXTURE FOR A SLOTTED WALL MILLING CUTTER

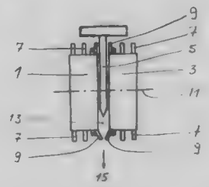
Karlheinz Bauer; Johann Haberer, both of Schrobenhausen, and Maximilian M. Arzberger, Igenhausen, all of Fed. Rep. of Germany, assignors to Karl Bauer Spezialtiefbau GmbH & Co. KG, Schrobenhausen, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 860,817

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519774

Int. Cl.⁴ E21C *27/24*

U.S. Cl. 299—85 **2 Claims**



1. A milling fixture for a slotted wall milling cutter used for excavation work, said milling fixture comprising:

a bearing bracket,

at least one milling wheel positioned laterally of said bearing bracket, said at least one milling wheel being rotatably mounted on said bearing bracket,

substantially radially projecting fixed milling teeth provided on a circumferential surface of said at least one milling wheel,

swingable milling teeth arranged along said circumferential surface of said at least one milling wheel adjacent to said bearing bracket, said swingable milling teeth being pivotable out of their radial extension which is located at right angles to the circumferential rotational direction of said at least one milling wheel,

each of said swingable milling teeth being fixed to a lever arm,

said lever arm forming a bolt opening having a bolt passing therethrough, said bolt being received in a bearing fixed to a hub of said at least one milling wheel, said bolt opening being aligned tangentially to the circumference of said at least one milling wheel,

said lever arm being provided with a stop, said stop, in a swung-in position of said swingable milling teeth, engages said hub of said at least one least one milling wheel,

said lever arm being being further provided with an oblique plane forming an acute angle with said hub in said swung-in position of said swingable milling teeth and engages with said hub in a swung-out position of said swingable milling teeth, and

said stop and said oblique plane are located on opposite sides of a longitudinal axis of said bolt.

4,718,732

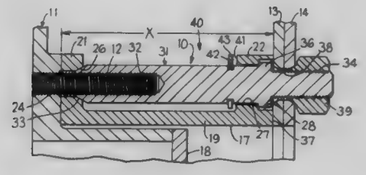
WHEEL ADAPTER

David B. Osborne, Elkhart, Ind., assignor to Centurion-Lehman, Inc. and Eugene Lehman, both of White Pigeon, Mich.

Filed Aug. 15, 1986, Ser. No. 896,901

Int. Cl.⁴ B60B *11/00*

U.S. Cl. 301—36 R **8 Claims**



1. An adapter for facilitating a mounting of one or more wheels on a vehicle wheel hub having plural externally threaded wheel studs of a finite length secured thereon, comprising:

a cylindrical adapter body having a central opening therethrough adapted to receive said wheel hub therein, said adapter body further having means defining plural parallel holes extending therethrough and concentrically arranged about an axis of said central opening, said plural holes each being adapted to receive in one end thereof said externally threaded wheel studs, said plural holes having an effective length greater than said finite length of said wheel studs;

wheel mounting surface means on said adapter;

shoulder means located on said wheel mounting surface means and encircling each of said holes at an end thereof remote from said one end;

means defining a radially facing free space intermediate said shoulder means and said one end and an adjacent abutment surface means, said free space opening into each of said holes;

an elongated bolt snugly received in an end of each of said plural holes remote from said one end, each bolt having an enlarged head intermediate its length and engaging said shoulder means, an internally threaded opening at one end thereof adapted to be threadedly coupled to said wheel stud, and an externally threaded stud at the other end, each said bolt further having a recess means therein intermediate said one end and said enlarged head, said recess means being exposed in said free space;

barrier means fixedly and removably received in said free space and said recess means, said barrier means having a portion positioned adjacent said abutment surface means for preventing a substantial relative axial movement between each said bolt and said adapter body and a withdrawal of said bolts from said plural holes; and

an internally threaded nut threadedly engaged with said externally threaded stud for clamping said one or more wheels between each said nut and said wheel mounting surface means.

4,718,733

AUTOMATIC REVERSE SPEED CONTROL DEVICE INCLUDING PUMP AND BRAKE RESTRICTING MEANS

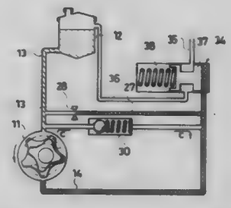
Haruyasu Fujita, Tokyo; Yasunori Ookuma, Asaki, and Kenji Honma, Saiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,002

Claims priority, application Japan, Nov. 8, 1984, 59-234168; Nov. 8, 1984, 59-234169

Int. Cl.⁴ B60T *13/16*

U.S. Cl. 303—2 **3 Claims**



1. A reverse speed control device for a vehicle, comprising:

a pump discharging a fluid in one direction in response to forward movement of the vehicle and in another direction in response to reverse movement of the vehicle, said fluid being discharged at a flow rate proportional to the vehicle speed;

a brake pipe operatively connected to said pump for receiving fluid discharged from said pump when the vehicle is in reverse, said brake pipe being operatively connected to a wheel braking device actuated by fluid pressure applied thereto;

a cutoff valve interposed between said brake pipe and said wheel braking device, such that said cutoff valve is biased to a closed position to operatively cut off fluid pressure in said brake pipe from said wheel braking device when the pressure in said brake pipe is below a predetermined pressure, and such that when the pressure in said brake pipe is greater than said predetermined pressure, said cut off valve is biased to an open position to operatively connect the fluid pressure in said brake pipe with said wheel braking device to allow said fluid to act on said wheel braking device to automatically brake a vehicle wheel when said fluid pressure exceeds said predetermined pressure when said vehicle is in reverse;

a return pipe connected to said cut off valve such that fluid in said wheel braking device is returned to a fluid reservoir when said cut off valve is biased to said closed position;

a brake restricting means for releasing fluid in said brake pipe when a flow rate of the fluid discharged from said pump into said brake pipe is less than a predetermined rate to prevent a rise of fluid pressure in said brake pipe.

4,718,734

DECELERATION AND PRESSURE SENSITIVE PROPORTIONING VALVE

Robert F. Galser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

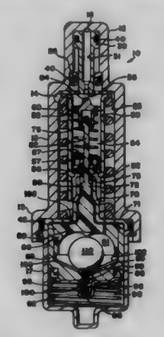
Filed Nov. 18, 1985, Ser. No. 799,219

Int. Cl.⁴ B60T *17/04*

U.S. Cl. 303—24 R **32 Claims**

1. A pressure reducing valve assembly for a vehicle braking system, comprising a housing having an inlet and an outlet, a differential piston in said housing and subject to inlet and outlet pressures so that the valve assembly provides a pressure at said outlet reduced from the pressure at said inlet, a retainer member connected with said differential piston for movement therewith, a second piston disposed within said housing and movable relative to said differential piston, a fluid chamber defined between and end of said housing and said second

piston, said second piston connected with a poppet disposed adjacent said differential piston for cooperation therewith, passage means extending through said second piston, seal means disposed about said second piston and for isolating said chamber from the pressure at said inlet, a stationary retainer secured to said housing and disposed about said second piston, the stationary retainer in position for engagement with said seal means disposed about the second piston and defining with said



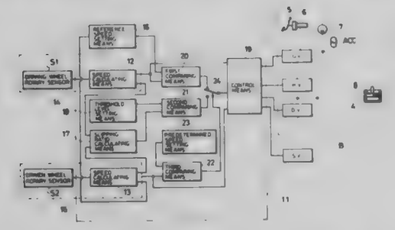
second piston an area for receiving fluid transmitted from said chamber through said passage means, poppet valve means for controlling fluid flow through said passage means, and an inertia-sensitive object engaging said poppet valve means, the inertia-sensitive object being responsive to deceleration of the vehicle to effect closure of said poppet valve means to prevent fluid communication through said passage means and cooperate in reducing the pressure at said outlet.

4,718,735

SYSTEM FOR CONTROLLING MOTOR VEHICLE DRIVING FORCE

Kinji Ogino, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama; both of, Japan

Filed Dec. 9, 1986, Ser. No. 939,729
Claims priority, application Japan, Dec. 10, 1985, 60-277421
Int. Cl.[4] B60T *8/08*
U.S. Cl. 303—93 **14 Claims**



1. A method of controlling motor vehicle driving force for a motor vehicle having a right driving wheel, a left driving wheel, and at least one driven wheel, the method comprising the steps of:

detecting the rotational speeds of said driving wheels and said driven wheels;

comparing the rotational speed of said driven wheel with a first predetermined reference speed;

a first braking step, performed at times when the rotational speed of said driven wheel is less than or equal to said first predetermined reference speed, of decelerating said driving wheels when the rotational speed of said driving wheels exceeds a second predetermined reference speed;

determining a slipping ratio corresponding to the ratio of the rotational speed of said driving wheels to the rotational speed of said driven wheel; and

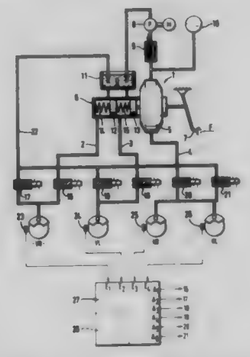
a second braking step, performed at times when the rotational speed of said driven wheel is greater than said first predetermined reference speed, of decelerating said driving wheels when the slipping ratio exceeds a predetermined threshold slipping ratio.

4,718,736

ARRANGEMENT FOR CONTROLLING THE PRESSURE REDUCTION BY MEANS OF AN ANTI-LOCK BRAKE SYSTEM

Helmut Fennel, Bad Soden, and Hans Wupper, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 876,736
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522226
Int. Cl.[4] B60T *8/70*
U.S. Cl. 303—111 **3 Claims**



1. A slip-controlled brake system for automotive vehicles having vehicle wheels and wheel brake cylinders wherein pressure reduction at the wheel brakes is controlled to more closely approximate the pressure versus time characteristic curve of the brake system, wherein said characteristic curve manifests an initial steep slope temporarily followed by a gradual slope relative to said steep slope, said system comprising, in combination:

a pedal-actuated braking pressure generator including a master cylinder;

a pressure supply reservoir;

a plurality of pressure fluid lines respectively connecting each of said wheel brake cylinders with said master cylinder and said pressure supply reservoir;

a plurality of normally open electromagnetically actuated pressure control valves respectively connected in said pressure fluid lines between said master cylinder and said wheel brake cylinders;

a plurality of normally closed electromagnetically actuated pressure control valves respectively connected in said pressure fluid lines between said pressure supply reservoir and said wheel brake cylinders;

a plurality of wheel sensors respectively coupled to said wheels for providing electrical signals indicative of wheel rotational behavior;

means coupled to said sensors for providing an output signal indicative of a predetermined rotational behavior indicating the need for said pressure;

means responsive to said output signal for generating an initial series of pulses during said initial steep slope of said characteristic curve;

means responsive to said initial pulses and coupled to said normally closed valves for opening said normally closed valves during each of said initial pulses; and,

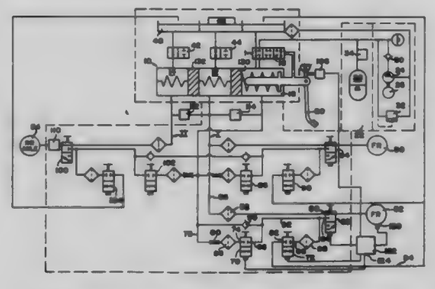
means responsive to said output signal and coupled to said normally closed valves for opening said normally closed valves during said gradual slope of said characteristic curve.

4,718,737

POWER BRAKING SYSTEM WITH REDUCED PEDAL TRAVEL

Lloyd G. Bach, South Bend, and James M. Sypniewski, Granger, both of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 25, 1986, Ser. No. 899,857
Int. Cl.[4] B60T *8/44*
U.S. Cl. 303—114 **5 Claims**



1. In an anti-lock braking system which includes a master cylinder having a hydraulic booster connected to a source of pressurized braking fluid, at least one hydraulic circuit including a wheel cylinder connected to said master cylinder and operable to brake the wheels of a vehicle, anti-lock braking means including means for sensing the rotational behavior of said wheel and a computing circuit for generating control signals, valve means connected to said control circuit and responsive to said control signals for controlling braking of said wheels in response to an incipient lock condition, the improvement comprising: a brake switch operable in response to a predetermined movement of a manually operated brake pedal, said computing circuit being connected to said switch and being responsive thereto to generate a control signal, said valve means including at least one isolation valve and a build valve, said isolation valve and said build valve being operable in response to said control signal to isolate said wheel cylinder from said master cylinder and to connect same to said booster.

4,718,738

FLEXIBLE BANK FOR COINS

Gary M. Bell, Crystal, Minn., assignor to Kapak Corp., St. Louis Park, Minn.

Filed Nov. 14, 1986, Ser. No. 931,530
Int. Cl.[4] F16C *32/06*
U.S. Cl. 383—121 **5 Claims**

1. A coin bank comprising:

(a) flexible bag means having an upper edge, a side wal portion and a base portion;

(i) said side wall portion and said base portion defining an expandable internal coin-receiving chamber in said bag means;

(ii) said upper edge of said flexible bag means being sealed closed by an upper edge seal to substantially completely enclose said coin-receiving chamber; and,

(iii) said side wall portion of said flexible bag means having a coin slot therein, said coin slot being sized and oriented to enable a coin to be selectively transferred into said coin-receiving chamber;

(iv) said coin slot having a flexible upper lip member and a flexible lower lip member; said upper lip member extending generally parallel to said upper edge of said flexible bag means; said lower lip member extending generally parallel to said upper lip member and being spaced apart therefrom by a distance of at least about 0.125 inches; and

(b) retaining means for selectively keeping said slot in a relatively open, coin-receiving, orientation with said lower lip member spaced laterally spaced from said upper



lip member, as said flexible bag is partially filled and swelled with coins;

(i) said retaining means including orienting said upper lip member spaced apart from said upper edge seal by a distance of about 0.25 inches and about 0.75 inches.

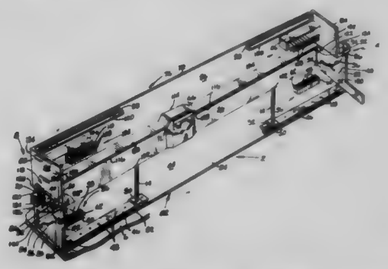
(ii) said retaining means selectively providing for said flexible upper and lower lip members to collapse toward one another, reducing lateral separation of same, when said bag is tipped over.

4,718,739

DOCUMENT STORAGE SYSTEM

Macy J. Price, Golden; Laurence G. Ball, Westminster; Macy J. Price, Jr., Broomfield, and Mack E. Johnson, Littleton, all of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.

Filed Nov. 7, 1986, Ser. No. 928,289
Int. Cl.[4] A47B *63/00*
U.S. Cl. 312—184 **33 Claims**



1. Apparatus for use in supporting a plurality of computer print-out documents having a series of linearly aligned holes along one edge thereof in a storage space comprising:

a main elongated support member having an L-shaped cross-sectional configuration and made of one piece of rigid molded plastic material and being defined, when said main support member is positioned on a supporting surface, by a lower rigid horizontally extending elongated support plate portion having an inner surface and an outer surface and an upwardly extending side flange portion integral therewith and upwardly extending end flange portions integral with said lower rigid horizontally extending elongated support plate portion and said side flange portion and each of said end flange portions having an elongated

slot having a generally linear portion and a generally arcuate portion therein and having a closed end and an open end;

an elongated closure member;

pivot means for pivotally connecting said closure member to said main support member;

said closure member having an L-shaped cross-sectional configuration and made of one piece of molded plastic material and being defined, when in a fully closed position over said main support member when positioned on said supporting surface, by an upper rigid horizontally extending elongated support plate portion having an inner surface and an outer surface and a downwardly extending side flange portion integral therewith and downwardly extending end flange portions integral with said upper rigid horizontally extending elongated support plate portion and said side flange portion and each of said end flange portions having at least one outwardly extending rib portion projecting therefrom and having a portion thereof located in one of said elongated slots for guiding the movement of said closure member between a fully closed position whereat said upper rigid horizontally extending elongated support plate portion of said closure member is located in a vertically spaced parallel relationship to said lower rigid horizontally extending elongated support plate portion of said main support member to define a U-shape slot means therebetween and a fully open position whereat said side flange portion of said closure member is supported on said side flange portion of said main support member and said upper rigid horizontally extending elongated support plate portion of said closure member is laterally offset from said side flange portion of said main support member to enable insertion and removal of documents, the movement comprising a sliding movement between said main support member and said closure member in a linear direction between said fully closed position and an intermediate position and a pivotal movement between said main support member and said closure member from said intermediate position to said fully open position;

at least two, spaced apart, elongated support post means mounted on the inner surface of said lower rigid horizontally extending elongated support plate portion of said main support member for telescopic insertion into at least two spaced holes in the documents or removal from said support post means when in said fully open position and whereby the documents are supported by said support post means in said U-shape slot means when in said fully closed position and placed in said storage space;

said outer surface of said lower rigid horizontally extending elongated support plate portion of said main support member being generally planar so that, when said main support member is positioned on said supporting surface, said elongated support post means will extend in a direction perpendicular to said supporting surface; and

locking means for holding said main support member and said closure member in said fully closed position.

4,718,740

HOUSING AND STOWAGE MECHANISM FOR TERMINAL KEYBOARD AND DISPLAY PANEL

Ronald E. Cox, Margate, Fla., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 28, 1986, Ser. No. 924,079
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—208 **5 Claims**

1. A housing and stowage mechanism for a terminal keyboard and data display panel, comprising

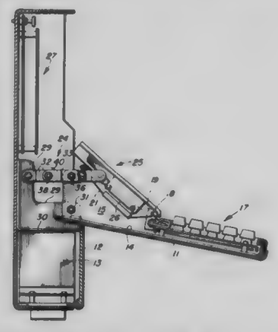
a housing having a generally rectangular body including a back and a face and relatively narrow surrounding sides, said housing being adapted for mounting vertically with the back thereof against a vertical support;

hinge means pivotally securing said housing face to said housing body near the lower edge of said housing face to permit lowering of said face from a closed, vertical position to an open, substantially horizontal position;

means for securing a terminal keyboard to said housing face upon a portion thereof opposite said hinge meand and upon the surface thereof facing said housing back;

means for securing a display panel pivotally to said housing face upon a portion thereof between said keyboard and said hinge means and upon the same surface thereof as said keyboard, said panel securing means being located near the edge of said panel adjacent said keyboard; and

a mechanism linked to said housing face and actuated by motion of said housing face from a closed to an open position for elevating the edge of said display panel opposite said panel securing means above the level of said panel



securing means when said housing face is in an open, substantially horizontal position, said mechanism including:

first and second links pivotally joined together at one end of each said link;

means pivotally securing said first link to said housing body at the end thereof opposite said second link;

means pivotally joining said second link to said housing face at a point intermediate the ends of said second link, the end of said second link opposite said first link being free to rotate and translate during lowering of said housing face from a vertical position to a horizontal position; and

means at said opposite end of said second link for engaging said edge of said display panel opposite said panel securing means.

4,718,741

ELECTRIFIED TABLE AND SUPPORT STRUCTURE

Donald L. Nicholds, Libertyville, Ill., assignor to Luxor Corporation, Waukegan, Ill.

Filed Nov. 6, 1986, Ser. No. 927,673
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—223 **19 Claims**

1. A table wall for use with an upright support means to support objects placed thereon, said table wall comprising:

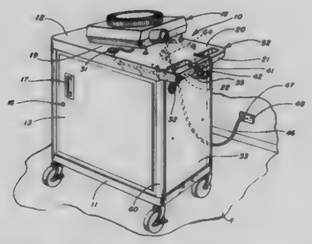
a support portion defining an end;

a pair of handles each having a connecting portion extending from said support portion end and a grasping portion turned from said connecting portion, the grasping portions of the handles defining opposed spaced distal ends, said grasping portions being spaced from said support portion end to receive a user's fingers therebetween;

electrical connection means mounted between said distal ends and having an electrical terminal connector;

means for passing an electrical cord through said support portion and to adjacent said electrical connection means for selective connection thereof to said electrical terminal connector; and

means for electrically energizing said terminal connector from an electrical power source to provide electrical power to an electrical cord connected to said terminal connector for providing electrical power therethrough to



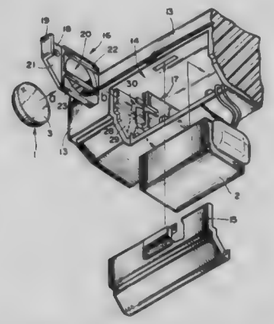
electrically operable objects supported on said support portion of the table wall.

4,718,742

BATTERY FITTING DEVICE USABLE FOR ELECTRONIC APPLIANCE

Yoshikiro Utoh; Shinichi Shibata, both of Hino, and Hiroyuki Kitahara, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tokai Communication Industry Co., Ltd., Tokyo, both of, Japan

Filed Sep. 27, 1985, Ser. No. 780,796
Claims priority, application Japan, Sep. 29, 1984, 59-204230
Int. Cl.[4] H01R *33/945, 17/00*; H01M *2/10*
U.S. Cl. 439—627 **12 Claims**



1. A device for fitting a button-shaped battery in a casing of an electric appliance such as a telephone or the like, comprising:

a battery holder including a plate-shaped member having a bore for receiving the button-shaped battery, said battery holder being detachable from the casing and including guide members arranged across the bore for receivably supporting the battery on one side of the plate-shaped member;

a holder retaining means disposed in the casing, said holder retaining means including

a cavity for receiving said holder, said cavity including an opening and four longitudinally extending walls, and

contact leaf springs arranged on two opposing walls of said four longitudinally extending walls of the cavity; and

guide means extending in opposing parallel relation to the two opposing longitudinally extending walls of the cavity for guidingly receiving the battery holder;

wherein the guided members on the battery holder are parallel to one another in a longitudinal direction corresponding to the longitudinally extending guide means and vertically offset from a center of the bore at different distances from the center of the bore, and wherein said guide means are configured such that said guide means guidably receive the guide members of said battery holder when said battery holder is inserted at a proper orientation and said guide means block the guide members of said battery holder when said battery holder is inserted at an improper orientation.

4,718,743

REFLECTOR FOR SPOKED WHEEL

Michael D. Leitzke, 8633 W. Ruby Ave., Milwaukee, Wis. 53225

Filed Aug. 27, 1986, Ser. No. 900,724
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 **9 Claims**





1. A reflector for mounting on a spoke of a vehicle wheel, comprising a plate member having a longitudinally extending body portion disposed between opposed end portions, said body portion having a recess adjacent to the respective end portions and opening to the side of the member, said recesses extending transversely inwardly beyond the longitudinal centerline of the body portion and being adapted to receive a spoke to extend generally along the longitudinal centerline of the body portion with the body portion disposed on one side of the spoke and the respective end portions on the opposite side of the spoke, and tab means on the respective end portions of the member to generally preclude a dislodgement of the reflector during operation of the wheel.

4,718,744

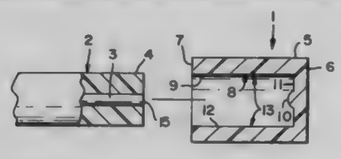
COLLIMATING LENS AND HOLDER FOR AN OPTICAL FIBER

Randy M. Manning, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 16, 1985, Ser. No. 766,857
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.20 **14 Claims**

1. A connector for an optical fiber comprising a light transmissive body, a cavity in the body having an entrance for receiving an end of an optical fiber, an aspheric lens, and a holder in the cavity for axially aligning the fiber with the lens, characterized in that, the body is of one piece construction, the cavity and the holder and the lens are formed on an internal

surface of the body with the lens being axially aligned with the holder and positioned between the holder and a light transmissive end of the body, and the holder and the lens are formed as one piece with the body.



4,718,745

OPTICAL FIBER CONNECTOR

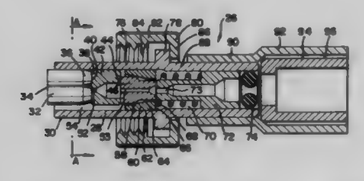
Ross W. Strait, Jr., Madison, Conn., assignor to Times Fiber Communications, Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 503,165, Jun. 10, 1983, Pat. No. 4,614,401. This application Jul. 6, 1984, Ser. No. 628,518

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.21 **9 Claims**



1. A connector for coupling the ends of two lengths of optical fiber in contiguous, aligned position comprising:

(i) two connector assemblies, each connector assembly comprising:

(a) a three-pin sub-assembly comprising three like-size, generally cylindrical, rigid pins extending parallel to each other in contiguous relationship, said pins having a diameter such that an inscribed circle extending tangent to the pin circumferences in the interior space between the pins substantially corresponds to the diameter of a length of optical fiber, said three-pin, sub-assembly partially protruding from the proximal end of said connector assembly;

(b) first retaining means surrounding the non-protruding portion of said three-pin sub-assembly for securely retaining the pins of the sub-assembly in contiguous relationship, the interior space extending between the circumferences of the pins defining a chamber for receiving a length of optical fiber;

(c) second retaining means for providing a stress relieving space for the optical fiber adjacent to the distal end of the three-pin sub-assembly;

(d) spring-loaded retaining means for securing an optical fiber within the chamber defined by the three pins of the sub-assembly by exertion of a radial compressive force on said optical fiber; and

(e) coupling means for connecting the connector assembly to its mating connector assembly;

(ii) first alignment means for connecting the coupling means of each connector assembly and including abutment means which abuts against the first retaining means of each connector assembly when they are connected by said alignment means; and

(iii) second alignment means for securely retaining the protruding portions of each three-pin sub-assembly in contiguous relationship when the connector assemblies are connected by said first alignment means.

4,718,746

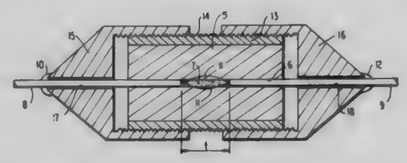
OPTICAL FIBER GRADED INDEX CONNECTOR

Metro M. Chrepta, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1982, Ser. No. 432,224

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **1 Claim**



1. An optical fiber graded index connector comprising: a graded index cylindrical rod, a longitudinal fiber receiving bore extending through said rod along the longitudinal axis thereof, a pair of optical fibers to be connected being positioned within opposite ends of said bore, the end faces of said optical fibers being spaced from each other and positioned at a focal length at which a maximum light intensity is provided at the required destination for which the connection is made, a refractive index matching gel between said end faces having the same index of refraction as the highest index of said rod and equal to the core index of said fibers, said gel filling said bore against foreign matter and reducing the fresnel reflection at the fiber faces, a concentric cylindrical sleeve surrounding and rigidly secured to the outer wall of said rod, said sleeve having a threaded outer wall, and a pair of caps threadably mounted over and engaging respective ends of said sleeve, each cap having an axially extending fiber receiving bore aligned with said rod bore, said optical fibers extending through said cap bores into said rod bore, each of said fibers being adhesively secured to respective said caps, each cap being rotatable on said sleeve to adjustably position said fibers in said rod bore to the desired focal length spacing between respective fiber ends.

4,718,747

OPTICAL FIBER AND CABLE WITH HYDROGEN COMBINING LAYER

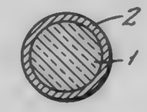
Giuseppe Bianchi, Milan; Laura Gherardi, Monza; Pietro Anelli, Milan, and Marco Santini, Monza, all of Italy, assignors to Società Cavi Pirelli S.p.A., Milan, Italy

Filed Apr. 16, 1985, Ser. No. 723,901

Claims priority, application Italy, Apr. 27, 1984, 20700 A/84; Apr. 27, 1984, 20699 A/84

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **25 Claims**



1. An optical fiber structure comprising an optical signal transmitting core surrounded by at least one protective layer, wherein the improvement comprises including in at least one of the protective layers at least one gaseous hydrogen absorbing powder of a metal selected from Groups III, IV, V and VIII of the periodic system for protecting the core with respect to the absorption of gaseous hydrogen.

4,718,748

OPTICAL GLASS FIBRE HAVING A SYNTHETIC RESIN CLADDING AND METHOD OF MANUFACTURING SAME

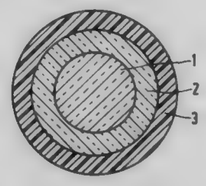
Dirk J. Broer, and Gritje N. Mol, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1985, Ser. No. 708,186

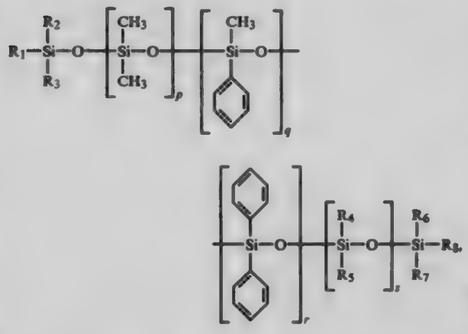
Claims priority, application Netherlands, Mar. 7, 1984, 8400727

Int. Cl.⁴ B32B *9/00*; C02B *6/00, 6/10*

U.S. Cl. 350—96.30 **11 Claims**



1. An optical fibre having a synthetic resin cladding, comprising a glass fibre and an enveloping layer of a synthetic rubber having a refractive index which is higher than the refractive index of the outermost layer of the glass fibre, the synthetic rubber being formed from a curable synthetic resin composition which comprises a copolymer which has monomeric units comprising dimethyl siloxane and at least one siloxane selected from the group consisting of methyl phenyl siloxane and diphenyl siloxane, characterized in that the copolymer is a compound of the formula



where R_1 and R_8 are organic groups which are selected from the group consisting of alkyl groups, aryl groups and acrylate-containing alkyl groups, wherein R_2, R_3, R_4, R_6 and R_7 are organic groups which are selected from the group consisting of alkyl groups and aryl groups, and wherein R_5 is an acrylate-containing organic group, the average molecular weight of the polymer molecules being between 1,000 and 1,000,000, the average fractions of the monomeric units per polymer molecule being within the following limits:

$$0.005 \leqq p \leqq 0.995$$
$$0 \leqq q \leqq 0.995$$
$$0 \leqq r \leqq 0.49$$
$$0 \leqq s \leqq 0.1$$

wherein $0.005 \leqq (q+2r) \leqq 0.995$ and wherein the monomeric units may be distributed in the molecule blockwise, alternatingly or randomly and in which the copolymer comprises at least two acrylate groups per molecule.

4,718,749

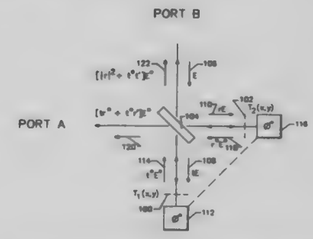
PHASE-CONJUGATE INTERFEROMETRIC COHERENT IMAGE SUBTRACTION

Arthur E. Chiou, Newbury Park, and Pochi A. Yeh, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 17, 1986, Ser. No. 944,033

Int. Cl.⁴ G02B *27/10*

U.S. Cl. 350—163 **7 Claims**



1. A phase conjugate interferometer for combining first and second two dimensional images, comprising:

a source of coherent light;

a beam splitter for dividing the coherent light into an outgoing transmitted beam and an outgoing reflected beam, with the outgoing transmitted beam oriented to traverse the first image and the outgoing reflected beam oriented to traverse the second image;

a first phase-conjugate reflector positioned to reflect the outgoing transmitted beam toward the beam splitter as a first incoming reflected beam;

a second phase-conjugate reflector positioned to lock in phase with the first reflector and reflect the outgoing reflected beam toward the beam splitter as a second incoming reflected beam;

the incoming beams being merged at and split by the beam splitter, resulting in a first combined beam containing the difference between the intensities of the first and second images and a second combined beam containing the sum of the intensities of the first and second images.

4,718,750

FLUID SEALED LENS MOUNTING SYSTEM

Richard E. Forkey, 175 East Rd., Westminster, Mass. 01473

Filed Apr. 18, 1986, Ser. No. 853,631

Int. Cl.⁴ G02B *7/10*

U.S. Cl. 350—255 **10 Claims**

1. A fluid sealed mounting system for a lens having an optical axis, comprising:

a cylindrical carrier having a longitudinal axis and carrying the lens, the carrier having an axial slot and a helical cam slot, the lens optical axis and the carrier axis coinciding;

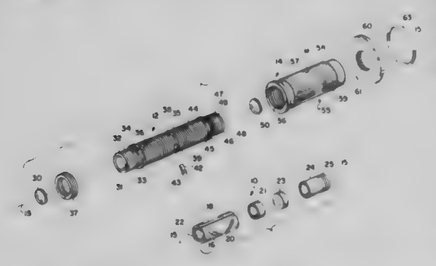
an externally threaded cylindrical body assembly having a cylindrical body within which the carrier is mounted coaxially with the body for relative slidable coaxial motion, the body being sealed from fluid penetration except for a circumferential opening;

a sleeve internally threaded to match the external threads of the body and axially spanning the body opening;

a first internally projecting pin carried by the body and entering in and engaging one of the slots;

a second internally projecting pin sealed to the sleeve and

penetrating the body opening to enter and engage the other slot;



whereby a rotation of the sleeve and the body cams the carrier axially, and whereby a sealing lubricant between the matching threads of the body and the sleeve completes the seal of the body from external fluid.

4,718,751

OPTICAL PANEL AND METHOD OF FABRICATION

Koichi Kamijo; Yukihiro Iwashita, and Koji Sumi, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,089

Claims priority, application Japan, Nov. 16, 1984, 59-241935; Nov. 30, 1984, 59-254453

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—336 **14 Claims**



1. In an optical panel including at least one transparent substrate and a selectively patterned transparent electrode disposed on the interior surface of the substrate to form an electrode-substrate composite, the improvement which comprises an electrode-substrate composite which has been heated in a vacuum to a temperature within the range of from about 200° to 600° C. in order to increase the corrosion resistance of the electrodes.

4,718,752

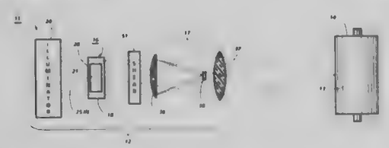
INTERPIXEL NULL SUPPRESSION FOR POLARIZED OPTICAL IMAGE BARS

Robert A. Sprague, Saratoga; David L. Hecht, Menlo Park, and L. Prasadam Flores, Santa Cruz, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1985, Ser. No. 818,580

Int. Cl.⁴ G02F *1/29*; G02B *27/18*; G01D *9/42*

U.S. Cl. 350—385 **15 Claims**



1. In combination with a coherent optical image bar for converting a spatial input pattern into a corresponding output image; said image bar including a spatial light modulator for spatially modulating a polarized coherent light beam in accordance with said spatial input pattern to provide a spatially modulated output beam, and imaging optics for reading out the spatial modulation of said output beam onto an output image plane; said image bar having a predetermined nominal image plane pixel pitch and providing individual pixels having image plane diameters equal to approximately one half said pixel pitch, the improvement comprising

a birefringent shearing means optically interposed between said modulator and said image plane for decomposing said output beam into a pair of laterally offset, redundantly modulated, orthogonally polarized, optical field distributions of substantially equal intensities, whereby said field distribution sum with each other on an intensity basis on said output image plane to form said image,

said shearing means being selected to laterally offset said field distributions from each other on said output image plane by approximately one half the nominal image plane pixel pitch of said image bar, whereby said image is essentially free of interpixel intensity nulls.

4,718,753

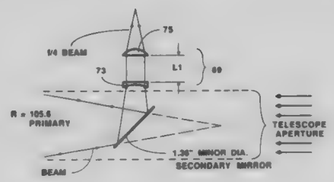
TELESCOPE WITH CORRECTING LENS

Rolin J. Gebelein, 291 Martin, Santa Cruz, Calif. 95060

Continuation-in-part of Ser. No. 660,916, Oct. 15, 1984, Pat. No. 4,571,036, which is a division of Ser. No. 316,134, Nov. 22, 1981, Pat. No. 4,477,156. This application Sep. 30, 1985, Ser. No. 781,284

Int. Cl.⁴ G02B *17/08, 9/10*

U.S. Cl. 350—503 **4 Claims**



1. A telescope comprising:

a housing;

image means at one end of said housing for forming a focused image of light incident on said telescope; and

a meniscus lens having a concave surface and a convex surface placed along an optical path of said telescope to receive light from said image means, said meniscus lens having a positive power and located to correct spherical aberration and coma in said image produced by said image means by collimating said light between said concave surface and said convex surface.

4,718,754

OPTICAL LINE SIMULATOR

Graham D. McIntosh, Reading, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 6, 1986, Ser. No. 860,156

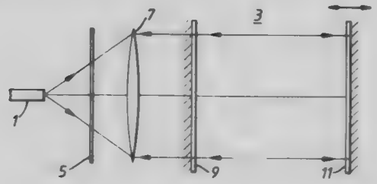
Claims priority, application United Kingdom, May 8, 1985, 8511591

Int. Cl.⁴ G02B *7/00, 9/00, 5/08*; G01N *21/00*

U.S. Cl. 350—574 **5 Claims**

1. An optical line simulator comprising: input and output fiber coupling means for coupling light from an input fiber interface to an output fiber interface; a partially transmissive plane mirror interposed in the optical path between the input and output fiber interface; a reflector, displaced from the plane mirror, arranged to reflect light transmitted through the plane mirror, back towards the plane mirror; adjustment means,

co-operative with the mirror and the reflector, for varying the displacement therebetween; and, a variable density neutral



filter, located in the optical path but not in the portion of the optical path between the mirror and the reflector.

4,718,755

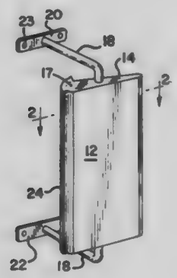
MIRROR TURNING VANE

M. Eugene Olson, and Lester L. Zehr, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Jun. 4, 1984, Ser. No. 616,641

Int. Cl.⁴ G02B *00/00*

U.S. Cl. 350—584 **1 Claim**



1. In a mirror assembly of the type extending outwardly from a motor vehicle with its mirror surface disposed generally downstream of the direction of forward travel of said vehicle, said mirror assembly having a frame including a vertical peripheral edge on the vehicle side thereof and a vertical turning vane attached to said frame and disposed adjacent said vertical peripheral edge and defining therewith an air passage having an entrance section generally transverse to said direction of travel and curved to redirect, without abrupt change in direction, downstream airflow generated by forward vehicle movement against said mirror surface, the improvement wherein said turning vane substantially overlaps said mirror surface such that the entire section of said air passage is defined between said turning vane and said mirror surface is unobstructed, and the cross sectional area of said exit section is smaller than the cross sectional area of said entrance section, said passage being characterized by the absence of abrupt changes in cross sectional area between said entrance section and said exit section.

4,718,756

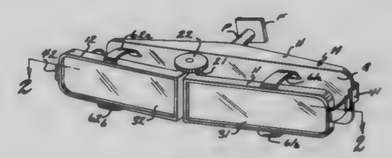
MULTISEGMENTED REAR VIEW MIRROR

Benjamin H. Lancaster, 3922 Snowden, Long Beach, Calif. 90808

Filed Nov. 21, 1986, Ser. No. 933,128

Int. Cl.⁴ B60R *1/08, 1/04*; G02B *5/08, 7/18*

U.S. Cl. 350—616 **4 Claims**



1. A hinged mirror adaptor conformed for mounting on the rear view mirror assembly of an automobile, comprising:

a frame including a first portion moveably engaged to a second portion;

a first mirror segment received in said first portion of said frame;

a second mirror segment received in said second portion of said frame, said first and second segments having adjacently spaced proximate edges;

engagement means extending from said first and second portions for engaging the distal ends of said mirror assembly; and

a cam interposed between said proximate edges of said segments and said mirror assembly for selecting the spacing therebetween.

4,718,757

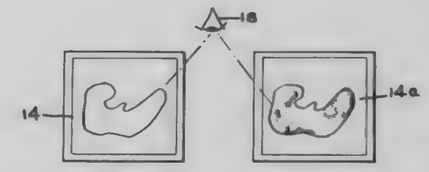
IMAGING ENHANCEMENT METHOD

Clarence C. Edwards, 4256 E. Capitol St., Washington, D.C. 20019

Filed Aug. 12, 1986, Ser. No. 895,901

Int. Cl.⁴ G03B *17/50, 29/00*

U.S. Cl. 354—76 **10 Claims**



1. A method of enhancing the understanding of the information provided by the image of an object such as an image displayed on an oscilloscope display comprising:

(a) photographing the object with instant color photographic film containing materials which exhibit different colors upon exposure and subsequent development by developer material associated with the film, the film being fully developed after a predetermined time;

(b) initiating development of said film;

(c) stopping development of said film after a predetermined time following initiation of development;

(d) photographing the object with a second instant color photographic film as in step (a);

(e) initiating development of said second instant film;

(f) stopping the development of said second film after a predetermined time following initiation of development of said second instant film, said time of development of said second instant film being different from the time of devel-

opment of said first instant film sufficient to provide an observable color distinction between said two films, and at least one of said times of development being less than the full development time of said film; and

(g) viewing said films to thereby obtain enhancement of the understanding of the information provided by the image of said object.

4,718,758

CAMERA

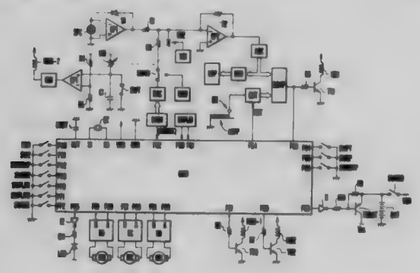
Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,346

Claims priority, application Japan, Dec. 25, 1985, 60-296447

Int. Cl.⁴ G03B *1/12*

U.S. Cl. 354—173.11 **7 Claims**



1. A continuously photographable camera, comprising:

(a) a shutter release button;

(b) shutter operating means for causing a shutter device to operate;

(c) preparatory operation means for causing a preparatory operation device to operate prior to the travel of the shutter; and

(d) continuous photographing operation control means including:

(d-1) means for making for the first of consecutive frames a period of time between a release operation on said shutter release button and the start of operation of said shutter device a predetermined length of time, which is set to be somewhat longer than a maximum length of time required for the operation of said preparatory operation device operating prior to said shutter travel; and

(d-2) means for controlling, for the second and subsequent frames, the start of operation of said shutter operating means on the basis of completion of operation of said preparatory operation device operating prior to said shutter travel.

4,718,759

APPARATUS FOR THE ALIGNMENT AND BALANCE OF THE WHEELS OF A MOTOR VEHICLE

Louis L. Butler, 12489 Lockhaven Ave., Baton Rouge, La. 70815

Filed May 13, 1985, Ser. No. 733,603

Int. Cl.⁴ G01B *11/275*

U.S. Cl. 356—152 **14 Claims**

1. In a wheel unit sensor assembly, each of a pair of which can be mounted via a wheel clamp assembly upon parallelly disposed wheels of a motor vehicle for the alignment and balance of said wheels of the vehicle, a sensing unit for measuring front wheel set back and toe which comprises

a housing formed by enclosing walls,

a first frame rigidly mounted upon a wall of said housing,

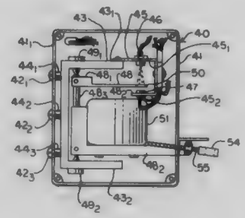
a light emitting diode mounted on said first frame,

a light detector mounted opposite said light emitting diode, in-line therewith, and upon which light from the light emitting diode is directed,

a second frame pivotally mounted upon said first frame,

an apertured shield mounted upon an arm of said second frame and pivotable therewith, the apertured portion of the apertured shield extending between said light emitting diode and said light detector, through which aperture light can be transmitted from the light emitting diode to the detector,

a tape reel affixed to said second frame,



a slot located within a wall of said housing through which the tape from said reel can be extended and joined to an end of tape from the reel of a corresponding wheel unit sensor assembly mounted on the alternately disposed wheel,

whereby front wheel set back, and toe can be detected and measured via differences in the intensity of light transmitted through the aperture of said apertured shield, and picked up by the light detector.

4,718,760

APPARATUS FOR OPTICALLY INSPECTING OBJECT HAVING REFLECTING SURFACE

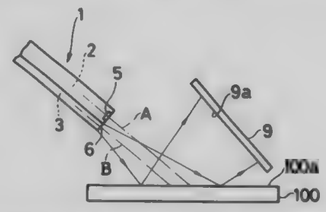
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,670

Claims priority, application Japan, Aug. 18, 1984, 59-170997; Aug. 18, 1984, 59-125023[U]; Aug. 18, 1984, 59-125024[U]

Int. Cl.⁴ G01N *21/88*

U.S. Cl. 356—237 **4 Claims**



1. An apparatus for optically inspecting defects on and/or within an object having a reflecting surface comprising:

(a) irradiating means for emitting illuminating light;

(b) shield means having a reflecting surface for reflecting the illuminating light to irradiate the object, and

(c) an image-transmitting optical system including light-receiving means for receiving an image of the object irradiated through the reflection of the illuminating light by said shield means, and means for optically transmitting the image of the object received by said light-receiving means, and said shield means covering an extent of a field of vision of said light-receiving means through the reflection of the reflecting surface, in which said shield means comprises a concave mirror, the focus of said concave mirror being disposed at said light-receiving means, and in which said irradiating means is directed toward the reflection surface of the object, said shield means being disposed in opposed relation to said irradiating means in such a manner that the illuminating light is fed to said shield means through the reflection by the reflection surface of the object.

4,718,761

INSTRUMENT FOR CONCURRENTLY MEASURING ULTRA-HIGH-SPEED LIGHT SIGNALS ON A PLURALITY OF CHANNELS

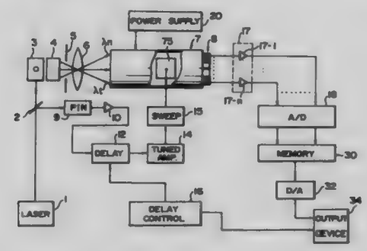
Yutaka Tsuchiya, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 7, 1986, Ser. No. 827,067

Claims priority, application Japan, Feb. 8, 1985, 60-22874

Int. Cl.⁴ G01N *21/64*

U.S. Cl. 356—318 **8 Claims**



1. An instrument for receiving repetitive ultra-high-speed light signals from a sample and concurrently measuring said light signals on a plurality of channels, comprising:

optical means for projecting said repetitive light signals in a first direction;

a streaking tube including

a photocathode for receiving the light signals projected by said optical means and generating an electron image corresponding thereto;

a phosphor layer spaced from said photocathode;

deflection electrodes interposed between said photocathode and said phosphor layer, said deflection electrodes sweeping electrons forming said electron image in a second direction perpendicular to said first direction; and

a first slit plate having a first slit therein interposed between said deflection electrodes and said phosphor layer, said first slit extending in said first direction;

deflection voltage generation means coupled to said deflection electrodes, said voltage generation means generating a series of deflection voltages which are synchronized with the light signals from said sample and whose phases are shifted slightly each time a repetitive light signal is received at said photocathode;

a photodiode array arranged adjacent and facing said phosphor layer, said photodiode array comprising a plurality of photodiodes extending in said first direction; and

processing means for processing the outputs of said photodiode array.

4,718,762

SPECTROPHOTOMETRIC METHOD AND APPARATUS

Peter Wiget, Küssnacht, and Robert Wolf, Lucerne, both of Switzerland, assignors to Kontron Holding A.G., Zurich, Switzerland

Filed Aug. 19, 1986, Ser. No. 897,966

Claims priority, application Switzerland, Aug. 30, 1985, 3753/85

Int. Cl.⁴ G01J *3/42*

U.S. Cl. 356—319 **14 Claims**



1. A spectrophotometric method employing a two-beam spectrophotometer, comprising:

a. transmitting a beam of incident light to a monochromator;

b. producing a light beam having a narrowly restricted spectral range with the monochromator, wherein the incident light beam is dispersed within the monochromator to thereby define an optical plane by a resulting dispersion of the incident light beam, and wherein the light beam which is produced by the monochromator exits the monochromator traveling in a straight line which defines and optical axis;

c. intercepting the beam exiting the monochromator in a beam splitter wherein the beam is divided into a measuring beam and a reference beam, the measuring beam passing through the beam splitter and continuing to travel rectilinearly along the optical axis, and the reference beam being deflected by the beam splitter through an angle α to the optical axis and also through an angle β with respect to the optical plane with the proviso that the values of α and β are such that the reference beam is taken out of the optical plane and away from the optical axis;

d. passing the measuring beam through a sample;

e. detecting the intensity of the measuring beam with a measuring detector after the measuring beam has passed through the sample;

f. detecting the intensity of the reference beam with a reference detector; and

g. analyzing the respective intensities of the measuring beam and reference beam.

4,718,763

ATOMIC ABSORPTION SPECTROPHOTOMETER

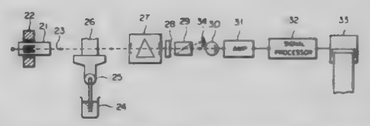
Kousuke Oishi, Mito; Masataka Koga, and Kazuo Yasuda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,460

Claims priority, application Japan, Apr. 8, 1985, 60-73813

Int. Cl.⁴ G01N *21/72*; G01J *3/42*

U.S. Cl. 356—326 **4 Claims**



1. An atomic absorption spectrophotometer comprising:

means for atomizing a sample;

a light source for emitting an emission spectral light ray of an atom to be analyzed toward said sample atomized by said atomizing means;

magnet means for supplying a magnetic field to said light source to cause the Zeeman effect, said magnet means including means for supplying said light source with a magnetic field having such a magnitude as to generate an emission spectrum having a peak at a wavenumber substantially equal to the wavenumber whereat the absorption spectrum of said atom to be analyzed is maximized;

means for measuring the intensity of the atomic spectrum of said atom to be analyzed which has been transmitted through said atomized sample so as to enable expansion of the linear range of a working curve of absorbance versus concentration; and

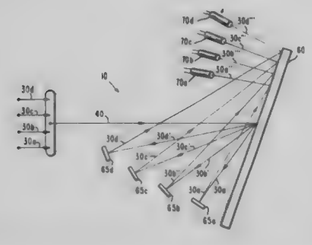
means for determining the absorbance of said atom to be analyzed in accordance with the working curve on the basis of the measurement reults by said measuring means.

4,718,764

FREQUENCY AGILE SPECTROMETER

David Fink, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 27, 1986, Ser. No. 822,511
Int. Cl.[4] G01J *3/18*
U.S. Cl. 356—328 **30 Claims**



1. A spectrometer with an arbitrarily programmable dispersion for a known set of electromagnetic spectral lines, comprising:

(a) first dispersive means operative to receive a beam of radiation that is a subset of the set of spectral lines for disassembly in unique directions to a locus of predetermined areas for each of the lines;

(b) tilted reflective means equal in number to the known set of spectral lines each of said reflective means positioned at a predetermined tilt orientation, said reflective means being operative to receive the disassembled lines from said first dispersive means at their respective predetermined areas for retransmission in a direction determined by said tilt of each of said reflective means; and

(c) second dispersive means operative to receive each of the retransmitted lines from said reflective means at preselected separated areas of said second dispersive means for reassembly to a predetermined area that is wavelength independent.

4,718,765

INTERFEROMETRIC GAS DETECTOR

Gérard Fortunato, Lyons; André Galais, Paris, and Dominique Laurent, Lyons, all of France, assignors to ELF France, Paris, France

Filed Jun. 20, 1985, Ser. No. 746,648
Claims priority, application France, Jun. 22, 1984, 84 09882
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 **3 Claims**

1. An interferometric gas detector intended for detecting and/or specifically identifying at least one gas in a gaseous mixture, comprising:

aligned on a single axis,

a light source,

an interference filter for isolating a specific absorption band of the at least one gas to be identified,

a gas tank,

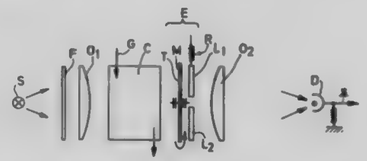
an optical focusing system,

an interferometry and modulation assembly, and

a detector,

said optical system forming an image of said source on said detector through said filter, said tank and said interferometry and modulation assembly,

wherein said interferometry and modulation assembly includes:



a first plate of a material for supplying a brilliant fringe on said detector, said first plate having planar parallel faces for introducing a path difference $\Delta=2ne$, wherein e is the thickness and n is the index of refraction of said first plate, whereby the absorption band of the at least one gas is equal to an absorption maxima of said first plate,

a second plate, in the same plane as said first plate and made of the same material as said first plate, having planar faces that form a prism for supplying an average illumination on said detector, and

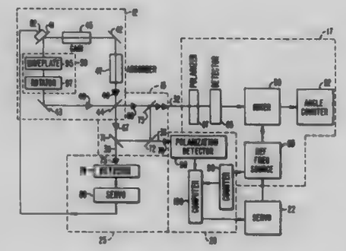
a rotary modulation disk rotating opposite the planar faces of said first and second plates, said rotary disk having a window for permitting light from said light source to pass through the window wherein the light is alternately passed through said first and second plate as the window rotates.

4,718,766

STABILIZED RING LASER BIAS SYSTEM

Howard B. Greenstein, P.O. Box 993, Palo Alto, Calif. 94302

Filed Feb. 5, 1985, Ser. No. 698,509
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **68 Claims**



1. A method of operating a ring laser whose structure includes an excited gain medium disposed in a ring cavity, and whose operational state is characterized in that only two traveling waves are generated, the two waves being of different frequencies and propagating in opposite directions, the difference in frequency being responsive to rotation but representing a bias frequency for the ring laser at rest, comprising the steps of:

disposing in the cavity a plurality of birefringent elements, whereupon the cavity is birefringent and certain cavity modes are polarization modes characterized by polarization and axial mode number;

generating the two traveling waves on adjacent first and second polarization modes;

measuring one or more optical properties relating to at least one of the traveling waves, extracted from the cavity;

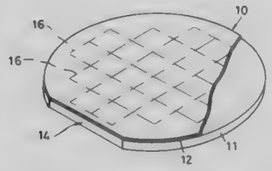
deriving a bias error signal based on the optical properties thus measured, the bias error signal being responsive to changes in bias frequency, but substantially insensitive to rotation rate; and nulling the bias error signal.

4,718,767

METHOD OF INSPECTING THE PATTERN ON A PHOTOGRAPHIC MASK

Junji Hazama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 657,068
Claims priority, application Japan, Oct. 3, 1983, 58-183136
Int. Cl.[4] G01K *11/00*
U.S. Cl. 356—381 **8 Claims**



1. A method of inspecting a pattern on a photomask or a reticle disposed at a first position on an exposure apparatus used in the manufacture of semiconductor devices for printing the pattern onto a wafer disposed at a second position on said exposure apparatus, said method comprising the steps of:

(a) providing a photosensitive member at said second position of said exposure apparatus instead of said wafer, said member being formed by a transparent substrate and a photosensitive layer of a photosensitive material provided on said transparent substrate, said photosensitive material having light transmittance lower than said substrate;

(b) successively exposing a plurality of different areas in said photosensitive member by using said exposure apparatus and said photomask or reticle for printing a plurality of identical patterns on said areas, respectively;

(c) developing said exposed photosensitive member and forming on said photosensitive member printed patterns provided by said transparent substrate and said photosensitive layer;

(d) inspecting said developed photosensitive member in a transmitted illuminating light and generating an image signal corresponding to said printed patterns and detecting defects in said printed patterns in accordance with said image signal; and

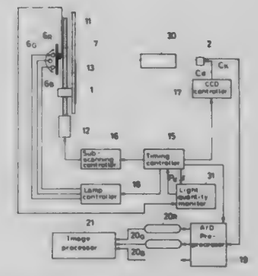
(e) comparing said printed patterns with each other in relation to said defects and discriminating that the defects are caused by said photomask or reticle when said defects have been detected in common within said printed patterns.

4,718,768

IMAGE DATA CORRECTION

Tetsuo Houki, Kyoto; Ikuo Mitsuka; Akira Kuwabara, both of Shiga; Hitoshi Haibara, and Takashi Sakamoto, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 6, 1985, Ser. No. 731,142
Claims priority, application Japan, May 10, 1984, 59-94047; May 10, 1984, 59-94048
Int. Cl.[4] G01J *3/50*; H04N *1/46*
U.S. Cl. 356—402 **12 Claims**



1. In an apparatus using a CCD line photosensor for scanning an original image in a main scanning direction and a subscanning direction orthogonal to the main scanning direction, a method for correcting Red (R), Green (G) and Blue (B) color component data obtained by the CCD line photosensor from light emitted by R, G and B light source lamps and transmitted through or reflected at an original, comprising the steps of:

(a) generating CCD line photosensor control pulses for enabling said line photosensor for integration periods;

(b) turning on one of the three lamps at predetermined times after the occurrence of said control pulses;

(c) detecting an effective light quantity emitted from the lamp selected in step (b);

(d) turning off the lamp selected in step (b) when the effective light quantity emitted therefrom is at a setup quantity within a time period between the occurrences of two successive said control pulses;

(e) repeating steps (b), (c) and (d) on the other two lamps and thereafter on each of the three lamps, and outputting each color component data obtained by the CCD line photosensor; and

(f) repeating steps (a)-(e) for each scanning line in the subscanning direction of the original image.

4,718,769

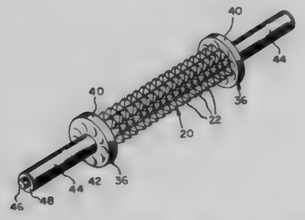
DOUGH PREPARATION APPARATUS

Ronald J. Conkey, Victoria, Tex., assignor to Domino's Pizza, Inc., Ann Arbor, Mich.

Filed Sep. 12, 1986, Ser. No. 906,387
Int. Cl.[4] B29B *1/06*
U.S. Cl. 366—69 **14 Claims**

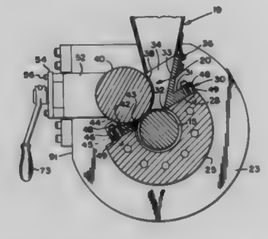
1. Dough preparation apparatus for kneading and rolling dough characterized by its uniformity of kneading comprising, in combination, a shaft having an axially extending central region, axially extending end regions and ends defining the terminus of said end regions, a plurality of rollers mounted upon said shaft central region for separate and individual rotation thereon together defining a roller stack having ends, each of said rollers including a periphery and lateral sides, dough kneading means defined upon said periphery of said rollers, a circular gauge roller rotatably mounted upon each shaft end

region located adjacent a roller stack end having a diameter slightly greater than the diameter of said rollers, said shaft end



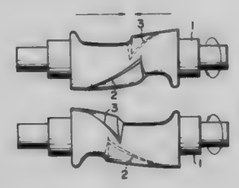
regions defining handles whereby said rollers may be rolled over dough to be prepared.

4,718,770
EXTRUDER FOR ELASTOMERIC MATERIAL
Raymond L. Christy, Akron, Ohio, assignor to NRM Corporation, Columbiana, Ohio
Filed May 16, 1986, Ser. No. 863,887
Int. Cl.[4] B29B *7/60*
U.S. Cl. 366—71 **31 Claims**



1. An extruder for rubber materials and the like comprising: an extruder screw; a feed box for said screw operative to receive feed stock for the extruder, one side of said feed box being formed by a feed roll; and means mounting said feed roll for linear sliding movement toward and away from said screw and said feed box to permit cleaning of the roll and feed box.

4,718,771
CLOSED MIXING MACHINE
Toshihiro Asai, and Katsunobu Hagiwara, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Aug. 15, 1986, Ser. No. 896,962
Claims priority, application Japan, Aug. 22, 1985, 60-184506
Int. Cl.[4] B01F *7/00*; B29B *1/06*
U.S. Cl. 366—97 **1 Claim**

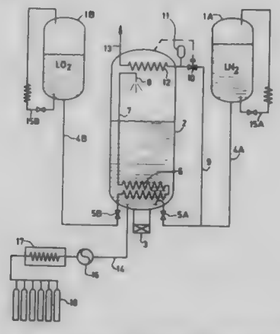


1. A closed mixing machine, comprising:

a closed mixing chamber formed by a casing and a pair of end frames;

a pair of rotors disposed in parallel in the mixing chamber for rotating in opposite directions with respect to each other, each said rotor having at least one longer vane and at least one shorter vane, wherein a ratio α of a tip clearance ho to a rotor diameter R[(=ho/R)] is represented by the relationship $0.015<\alpha<0.04$, a rotation speed of said rotors is 70–250 rpm, a rotation speed ratio of one of said rotors to the remaining rotor is 1.0–1.2, a rotor length/diameter ratio is 1.2–2.2, a rotor inclusion angle is 15°–35°, a rotor vane length ratio Ls/Ll is 0.1–0.48, a helix angle θl is 20°–45°, and helix angle θs is 0°–45° wherein Ls is the length of the shorter vane, Ll is the length of the longer vane, θs is the helix angle of the shorter vane, and θl is the helix angle of the longer vane.

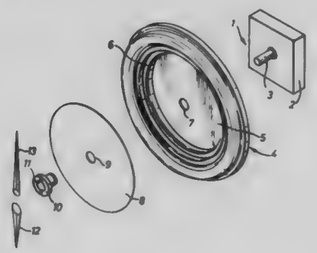
4,718,772
PROCESS AND APPARATUS FOR OBTAINING A MIXTURE OF SUBSTANCES HAVING LOW BOILING POINTS
Pierre Delacour, Noyaret, and Roger Prost, Saint-Egreve, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Oct. 15, 1985, Ser. No. 792,695
Claims priority, application France, Oct. 19, 1984, 84 16015
Int. Cl.[4] B01F *3/00, 13/00*
U.S. Cl. 366—348 **7 Claims**

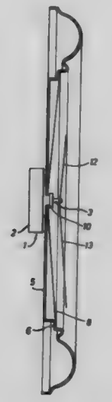


1. A process for producing a mixture of given composition of a first fluid substance having a comparatively low cryogenic boiling point and at least one second fluid substance having a higher cryogenic boiling point, said process comprising subjecting said second substance in liquid phase to indirect heat exchange with said first substance in liquid phase, thereby sub-cooling said second substance, and then mixing said sub-cooled second substance with said first substance in proportions corresponding to said given composition.

4,718,773
CLOCK
Colin N. O'Donoghue, New Barnet, England, assignor to The Brampton Clock Company Limited, London, England
Filed May 23, 1985, Ser. No. 737,289
Claims priority, application United Kingdom, Jul. 18, 1984, 8418290; Sep. 19, 1984, 8423661
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—276 **4 Claims**

1. A clock comprising a clock movement with a fixed member and protruding nested drive shafts, the housing member having a wall formed with an aperture; a planar dial which rests against the wall and which is formed with an aperture in register with the aperture of the wall, the nested shafts extending through the apertures, and a securing device which engages the front face of the dial, extends through the aligned apertures, and engages a fixed member of the movment thereby holding the dial against the wall, a portion of said dial surrounding the aperture in the dial and being positioned





against the wall, the wall having a ridge which is forwardly offset from the remainder of the wall, a periphery of said dial resting and being held against said ridge thereby tensioning the dial so as to form a concave surface.

4,718,774
SCALE MONITORING MEANS AND METHOD
Carlton M. Slough, Spring, Tex., assignor to Texaco Inc., White Plains, N.Y.
Filed Apr. 23, 1986, Ser. No. 855,038
Int. Cl.[4] G01N *25/44*
U.S. Cl. 374—7 **9 Claims**

1. A system for determining the onset of scale in a pipeline carrying a petroleum liquid stream comprising:

means for providing electrical energy;

housing means mounted in said pipeline for affecting the transfer of heat to and from the petroleum liquid stream as a function of scale forming on the housing means, said housing means includes:

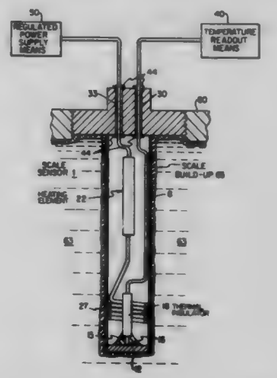
heating means connected to the electrical means for periodically providing heat in accordance with the received electrical energy,

first heat transfer means for transferring heat from the heating means to the petroleum stream,

sensing means for sensing temperature before each providing of heat and after each providing of heat;

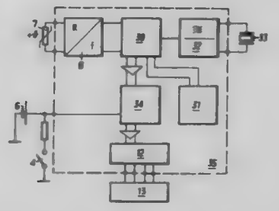
second heat transfer means for transferring heat from the petroleum stream to the sensing means so that the sensing means is sensing the temperature of the petroleum stream; and

monitor means connected to the sensing means in the housing means for providing an indication of the temperatures sensed



by the sensing means so as to provide an indication of the onset of scale in the pipeline.

4,718,775
FEVER THERMOMETER
Eduard Kezmicki, Vienna, Austria, assignor to Elkon Erzeugung Von Elektronischen Geraten Gesellschaft m.b.H., Vienna, Austria
Filed Jun. 6, 1983, Ser. No. 501,280
Claims priority, application Austria, Jun. 8, 1962, 2226/82
Int. Cl.[4] H05B *7/144*; G01K *1/08*
U.S. Cl. 374—104 **8 Claims**



1. An electronic fever thermometer comprising a substantially rod-shaped housing containing at one end an electric temperature sensor, switching circuitry, a measured value memory for storing a maximum temperature value measured, a reset device for said measured value memory, a display for indicating the stored content of the memory, and an inertial switch in the housing comprising a mass movable in the direction of the longitudinal axis of the rod-shaped housing upon the imposition of inertia greater than the force of gravity, to a position in which the switch resets the memory to delete the indication of the maximum value of temperature.

4,718,776
PORTABLE MONITORING DEVICE AND METHOD
Jerry R. Gilland, Boulder; Christopher L. Sweeney, Denver, and Ronald D. Wertz, Boulder, all of Colo., assignors to Ball Corporation, Broomfield, Colo.
Continuation of Ser. No. 764,658, Aug. 12, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 932,446
Int. Cl.[4] G01K *7/00*
U.S. Cl. 374—170 **23 Claims**

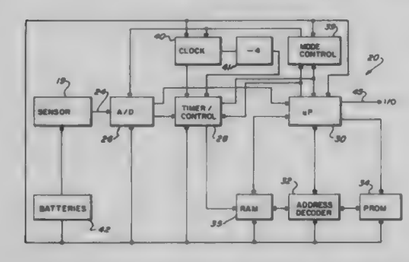
1. A miniaturized monitoring device capable of being posi-

tioned at a preselected monitoring area, including small and relatively otherwise inaccessible monitoring areas, with said device being electrically isolated when at said monitoring area, said device comprising:

housing means providing a sealed compartment of compact size suitable for positioning at said monitoring area;

sensing means within said sealed compartment of said housing means for sensing a predetermined parameter at said monitoring area and providing electrical output signals indicative thereof;

signal processing means within said sealed compartment of said housing means, said signal processing means including digital storage means connected with said sensing means for storing in digital form electrical output signals received from said sensing means, and control means including microprocessor means for automatically controlling operation of said sensing means and said storage



means so that output signals are caused to be periodically produced by said sensing means at predetermined times as programmed into said microprocessor means and stored at said storage means when said housing means is at said monitoring area;

power means within said sealed compartment of said housing means for totally powering said signal processing means; and

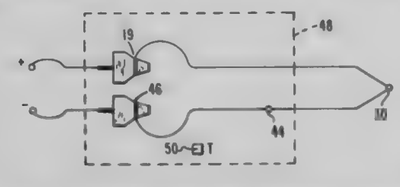
signal transfer enabling means at said housing means and accessible outside said sealed compartment for enabling at least preselected programming of said microprocessor means and for enabling transfer of electrical signals stored at said storage means when said monitoring device is positioned at a console unit remote from said monitoring area, with said monitoring device being operationally independent of said console unit while said monitoring device is at said monitoring area.

4,718,777

ISOTHERMAL BLOCK FOR TEMPERATURE MEASUREMENT SYSTEM USING A THERMOCOUPLE

Steven T. Mydynski, Bothell; John M. Redfield, Jr., Seattle; Bryan L. Sparrowhawk, Everett, and Alfred T. Volberding, Bellevue, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Feb. 28, 1986, Ser. No. 834,778
Int. Cl.⁴ G01K *7/00, 7/12*
U.S. Cl. 374—181 **12 Claims**



1. For use in compact, temperature measurement instrumentation, a temperature measurement system comprising first and second wires of dissimilar metals joined together at one end to form a temperature measurement junction, opposite ends of said first and second wires are connected respectively to third and fourth wires for applying voltage developed by said measurement junction to a voltage measurement means in circuit with said third and fourth wires for making a measurement of output voltage developed by said temperature measurement junction, connections between said first wire and said third wire and between said second wire and said fourth wire forming at least one additional reference junction tending to introduce an error into said output voltage measurement, means for monitoring the temperature of said at least one additional reference junction and in response developing a reference voltage to be combined with said error containing output voltage measurement thereby providing a temperature measurement indicative of the temperature of said temperature measurement junction, and an isothermal block, comprising: an integral block of thermally conductive, electrically insulative alumina ceramic material;

said block having first, second and third similarly sized openings extending therethrough adjacent and in close thermal communication with each other; and

electrical connectors in said first and second openings for connecting together said first and third wires and said second and fourth wires, respectively,

wherein ends of said connectors are formed for mounting said connectors and retaining said block to a printed circuit board,

said additional reference junction temperature monitoring means located in said third opening,

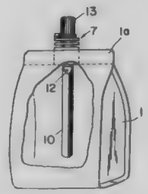
whereby said isothermal block causes the temperatures of said at least one additional reference junction and said junction temperature monitoring means in said alumina ceramic block to remain substantially the same and closely track each other in response to changes in ambient temperature.

4,718,778

LIQUID CONTAINER

Tooru Ichikawa, Misato, Japan, assignor to Kabushiki Kaisha Hosokawa Yoko, Tokyo, Japan

Filed Feb. 5, 1986, Ser. No. 826,388
Claims priority, application Japan, Feb. 14, 1985, 60-19574
Int. Cl.⁴ B65D *33/01*
U.S. Cl. 383—100 **5 Claims**



1. A liquid container comprising:

a bag-shaped main body comprising a flexible film and having a sealed top; and

a delivery device secured to said sealed top for allowing contents contained in the main body to pass therethrough,

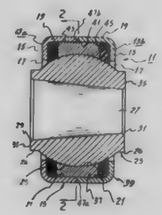
said delivery device comprising a mouth portion extending outside of the main body through which the contents contained in the main body can be sucked and discharged from the main body, a conduit portion extending from said mouth portion within the bag-shaped main body and through which the contents pass to the mouth portion, and a pair of ribs extending parallel to one another along said conduit member from a location adjacent the sealed top of the main body, said conduit portion having at least one opening extending radially therethrough between said pair of ribs.

4,718,779

SEALED COMPOUND BEARING

William H. Tradeau, Brighton, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

Filed Sep. 2, 1986, Ser. No. 902,507
Int. Cl.⁴ F16C *23/04, 33/74*
U.S. Cl. 384—206 **16 Claims**



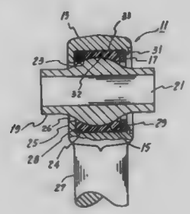
1. A bearing comprising an inner member having a peripheral surface of a first regular predetermined contour, an outer member having an inner surface of a second regular predetermined contour, a metallic ring insert disposed between said peripheral surface of said inner member and said inner surface of said outer member, said ring insert having an inner surface generally conforming to said peripheral surface of said inner member and a peripheral surface generally conforming to and having a first predetermined dimension slightly larger than said inner surface of said outer member, a pair of resiliently deformable rings, each of said pair of rings disposed on one side of said ring insert, said outer member comprising two generally cup-shaped members, each of said cup-shaped members having a tubular portion forming said inner surface of said second predetermined contour and having a radially inwardly directed flange at one end, said second predetermined contour of said two cup-shaped members having a second predetermined being dimension smaller than said first predetermined dimension of said peripheral surface of said ring insert, said pair of two cup-shaped members being press-fitted over said ring insert in fixedly abutting contact whereby the flange of each of said cup-shaped members holds each of said deformable rings under compression such as to firmly engage each of said deformable rings with a portion of said peripheral surface of said inner member, a portion of said inner surface of said outer member and a lateral surface of said ring insert.

4,718,780

SEALED COMPOUND BEARING AND METHOD FOR MAKING THE SAME

William H. Tradeau, Brighton, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

Filed Sep. 2, 1986, Ser. No. 902,508
Int. Cl.⁴ F16C *27/02, 23/04, 33/20*
U.S. Cl. 384—206 **4 Claims**



1. A bearing comprising:

an outer shell having a cylindrical bore;

an inner member disposed in said cylindricalbore, said inner member having a spherical peripheral surface;

a bearing ring interposed between said cylindrical bore and said inner member, said bearing ring being an elongated extruded strip of UHMW polymer having an inner surface and an outer surface extending between a pair of biased edges, said inner surface having a cylindrical groove, said extruded strip being wrapped about said inner member such that said pair of biased edges are positioned adjacent to each other, said cylindrical groove forming a concave spherical surface in engagement with said spherical peripheral surface of said inner member when said extruded strip is wrapped about said inner member; and

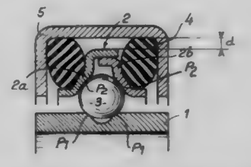
means retaining said bearing ring in said shell.

4,718,781

PRE-STRESSED BALL BEARING AND METHOD AND TOOL FOR ITS MANUFACTURE

Stephan Gérard, Croissy, France, assignor to Nadella, Vierzon, France

Filed Feb. 3, 1987, Ser. No. 10,394
Claims priority, application France, Feb. 7, 1986, 8601718
Int. Cl.⁴ F16C *23/08*
U.S. Cl. 384—495 **7 Claims**



1. A pre-stressed rolling bearing comprising a case, an inner ring, an outer ring, rolling balls disposed between the inner and outer rings, at least one elastically yieldable element compressed and thus prestressed in the case between the case and one of the rings for applying the rolling members in contact with the inner rings and outer rings along circular raceways on the rings, each ball travelling along four raceways, two of said raceways being located on the inner ring and two of said raceways being located on the outer ring, one of said rings comprising two parts on each of which parts is located one of the two raceways of said one ring, said ring parts being freely movably engaged one inside the other whereby to transmit the pre-stress of the elastically yieldable element to the balls, and set-back depressions being provided on the raceways to ensure that a pre-stressing of the balls is locally avoided.

4,718,782

THERMAL PRINTER

Mitsuo Tsushima, Iwate, and Hiroshi Abe, Iwaki, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 17, 1986, Ser. No. 943,383
Claims priority, application Japan, Jan. 30, 1986, 61-10947
Int. Cl.⁴ B41J *11/08*
U.S. Cl. 400—23 **2 Claims**

1. In a printer having a housing having a paper input side, a paper exit side, and printer components arranged in said housing including a translatable carriage, a printing head mounted on the carriage for printing on a paper, and means including a feed roller for feeding paper from the paper input side, past the printing head, and out the paper exit side,

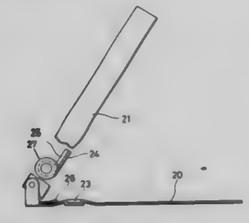
the improvement comprising:

said housing having a body portion housing said printer components, a hinge portion, and a bottom plate which is substantially planar, wherein said body portion is hinged by said hinge portion to said bottom plate at said paper exit side such that said body portion is openable rotatively

VOL 1086 ISS 2 JA 12 1988 UMI

away from said bottom plate to provide a wide space for insertion and removal of the paper into and from said printer; and

said body portion having said printing components arranged therein such that respective paper contacting surfaces of said printing head and feed roller are substantially in one plane facing said bottom plate, and such that said feed roller is located downstream in a paper feeding direction from said printing head toward said paper exit side, and



said bottom plate having provided thereon a flat paper-pressing spring member located opposite the paper contacting surface of said feed roller and a flat platen located opposite the paper contacting surface of said printing head, whereby paper can be conveniently loaded in said printer by opening said body portion away from said bottom plate, setting the paper on said bottom plate from the paper input side overlapping said spring member, then closing said body portion against said bottom plate.

4,718,783

THERMAL PRINTER

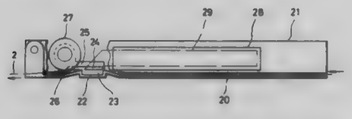
Mitsuo Tsushima, Iwate, and Hiroshi Abe, Iwaki, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 17, 1986, Ser. No. 943,384

Claims priority, application Japan, Jan. 30, 1986, 61-10946; Jan. 30, 1986, 61-10948

Int. Cl.[4] B41J *11/08*

U.S. Cl. 400—23 **3 Claims**



1. In a printer having a housing provided with paper input side, a paper exit side, and printer components arranged in said housing including a ribbon cassette having an ink ribbon wound on reels therein, a translatable carriage, a printing head mounted on the carriage for printing by transferring ink from the ink ribbon onto a paper, means for moving the ink ribbon in front of the printing head from and to the ink ribbon cassette, and means including a feed roller for feeding paper from the paper input side, past the printing head, and out the paper exit side,

the improvement comprising:

said housing having a body portion containing all of said printer components on one side thereof, and a bottom paper guide plate facing said body portion which is substantially planar extending from said paper input side to said paper exit side;

said body portion having said printing components arranged therein such that respective paper contacting surfaces of said printing head, ink ribbon, and feed roller are substantially in one plane facing said bottom paper guide plate, and such that said feed roller is located downstream in a paper feeding direction from said printing head toward said paper exit side, said ink ribbon cassette having a longitudinal side is parallel with said one plane of said paper contacting surfaces, and said bottom plate having provided thereon a flat paper-pressing spring member located opposite the paper contacting surface of said feed roller and a flat platen located opposite the paper contacting surfaces of said ink ribbon and printing head, whereby said printer can be formed with a thin shape and paper can be fed into said printer, printed on, and fed out of said printer along a substantially planar path.

4,718,784

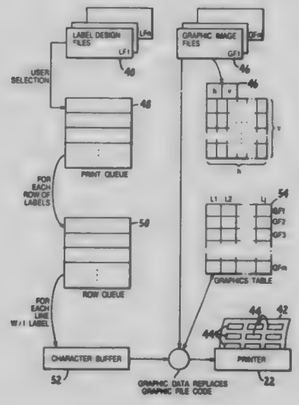
RATING PLATE PRINTING APPARATUS AND METHOD

James E. Drinko, Santa Rosa, Calif., assignor to Electronic Programming Corporation, Santa Clara, Calif.

Filed Nov. 10, 1986, Ser. No. 929,560

Int. Cl.[4] B41J *5/30, 3/12*

U.S. Cl. 400—68 **10 Claims**



4. A method of printing labels with a computer controlled impact printer, said printer having a text mode and a graphics mode of operation, said printer responding in text mode to predefined text codes by printing text images and responding in graphics mode to packets of pixel data by printing said pixel data; said printer including memory means for storing data and input means for receiving input and instructions from the user of said printer; the steps of the method comprising:

storing a multiplicity of label designs, each label design specifying one or more text strings and the position of said text strings in said label design, and one or more graphic images and the position of said graphic images in said label, wherein said text and said graphic images can be positioned side by side; and

controlling the printing of a specified quantity of specified one of said stored label designs, in a specified order, on blank sheets of labels having labels organized in rows with a plurality of blank labels in each row, by repetitively performing the steps of

positioning said printer at the beginning of a row of blank labels;

selecting, in accordance with said specified order, the labels to printed on the current row of blank labels; and

for each line of said selected labels, sending said printer instructions for

positioning said printer at the beginning of the line to be printed;

for each graphic image on the current line to be printed, selecting the portion of the graphic image to be printed on the current line; and

commanding said printer to print the text in the current line in text mode, and to print the graphic images in the current line in graphics mode.

4,718,785

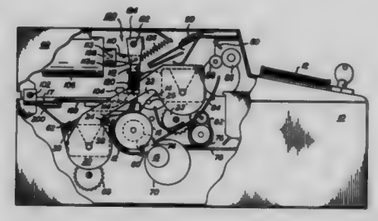
COMPLIANT HEAD LOADING MECHANISM FOR THERMAL PRINTER

Mark J. Speth, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1987, Ser. No. 13,989

Int. Cl.[4] B41J *3/20*

U.S. Cl. 400—120 **5 Claims**



3. Compliant head loading mechanism for a thermal printer which compliantly loads at a print zone the heating elements of a print head against a dye carrier and a receiver mounted on a platen to form a nip at a heat line, comprising:

(a) flexure having two ends and pivotably mounted at one end to permit said other end to be raised and lowered;

(b) a mounting bracket including the head and a pin and being fixed to said flexure so that said head can be raised and lowered;

(c) a loading rod having a slot for receiving said pin so that said pin can translate in said slot;

(d) a compression spring engaging said rod and said pin; and

(e) means coupled to said rod and effective to move said rod downwardly from an unloaded position into a loaded position when the head is lowered so that the head engages the carrier and said compression spring compliantly loads the head against the carrier and the receiver mounted on the platen to constrain said print head for rotation about a roll axis tangent to the drum at the nip and orthogonal to the heat line, whereby a uniform pressure is applied along the heat line across the width of the receiver.

4,718,786

TRANSPORT DEVICE FOR A PRINT UNIT OF PRINTING MACHINES

Musso Pietro, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

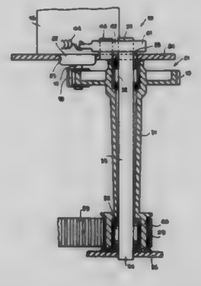
Filed May 23, 1986, Ser. No. 866,255

Claims priority, application Italy, May 29, 1985, 67490 A/85

Int. Cl.[4] B41J *25/28*

U.S. Cl. 400—320 **7 Claims**

1. A transport device for a print unit of a printing machine comprising a platen; a toothed belt connected with the print unit for its movement along the platen; a toothed pulley engaging with said toothed belt; a motor having a stator and a motor shaft rotatable with respect to said stator and fixing a driving pinion thereon; a sleeve unit having a first end portion fixing said toothed pulley and a second end portion fixing a gear wheel in engagement with said driving pinion; a support shaft for rotatably supporting said sleeve unit; a pair of supports displaced apart from each other for supporting the ends of said support shaft, wherein one support fixes one end of the support shaft adjacent to said driving toothed pulley and the other support fixes the stator of said motor adjacent to the other end of the support shaft and said gear wheel, and wherein said toothed pulley is located in the space between the one and the other support; a belt tensioning device for holding a given tension on the engagement of the toothed pulley with said belt; and a back-lash taking-up device for taking up the radial clearance between said driving pinion and said gear wheel, said back-lash taking-up device comprising: guide means operative on said other end of the support shaft for radially adjusting said other end with respect to said motor shaft, wherein the action



of the given tension of said belt on the toothed pulley causes the tilting of said unit and the support shaft around said one end for approaching of the toothed gear toward the driving pinion; and spring means operative on said guide means for tilting of said support shaft concurrent with the action of said toothed belt on said sleeve unit.

4,718,787

CONNECTOR FOR SCAFFOLDING OR SIMILAR STRUCTURE AND PROCESS OF ASSEMBLY THEREOF

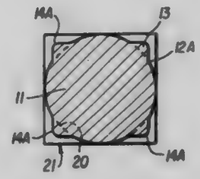
Kamel Bahloul, Boulogne, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Feb. 26, 1986, Ser. No. 832,900

Claims priority, application France, Feb. 27, 1985, 85 03319

Int. Cl.[4] E04G *7/00*

U.S. Cl. 403—175 **17 Claims**



1. A scaffolding connector comprising:

a star-shaped element having a central bore through which a vertical pole may be inserted, and having a plurality of arms having openings therein, and

hooking elements connectable to transverse scaffolding members, and each of said hooking elements having hooks fittable in said openings,

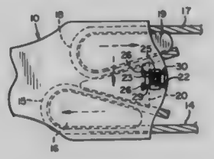
wherein an interior surface of said openings and an exterior surface of said hooks each have a pyramid-conical shape, said pyramid-conical shape comprising a pyramid and cone superimposed on one another such that a periphery of a section transverse to a longitudinal axis of one of said hooks and through said one of said hooks, as well as a periphery of a section transverse to a central axis of one of said openings and through said one of said openings, has at least one of conical shape portions and pyramid shape portions.

4,718,788

WIRE ROPE EQUALIZER SOCKET

Terry L. Briscoe, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Aug. 5, 1986, Ser. No. 893,246
Int. Cl.⁴ F16G *11/00*
U.S. Cl. 403—211 **9 Claims**



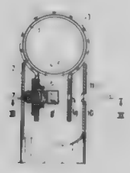
1. A wire rope equalizer socket comprising a relatively elongatged housing having first and second ends, means adjacent said first end for connecting said housing to chain means, an opening extending inwardly of said housing from said second end for the receipt of a pair of looped wire ropes, first and second wedges positioned in said opening, each wedge having an outwardly-facing groove adapted to receive a loop of a wire rope, a first wire rope having a loop received in the groove of said first wedge and a second wire rope having a loop received in the groove of said second wedge, said first and second rope and said first and second wedges being disposed in side-by-side relation in said opening with said loops being coplanar and with said wedges being tapered toward said second end, a third grooved wedge in said opening in bearing relation to said first and second rope loops and being tapered toward said first end, and pin means removably mounted in said housing extending generally perpendicularly to the plane of said loops for maintaining said third wedge against longitudinal movement out of said opening but to permit lateral movement in said plane for equalizing the tension in said first and second ropes upon longitudinal outward movement of one of said loops in said opening.

4,718,789

JOINT BETWEEN A TUBE AND A ROD OR OTHER TUBE BEING AT AN ANGLE TO THE FORMER

Dirk J. G. Kuenen, Anna van Saksenstraat 14, 7051 BD Varsseveld, Netherlands

Filed Sep. 3, 1985, Ser. No. 771,910
Claims priority, application Netherlands, Mar. 20, 1984, 8400881
Int. Cl.⁴ F16B *13/10*
U.S. Cl. 403—233 **18 Claims**



1. A joint construction comprising the combination of a support member, a tube having an end portion substantially abutting the support member and angularly extending from said support member and clamp means embracing said support member for supporting the tube relative to the support member;

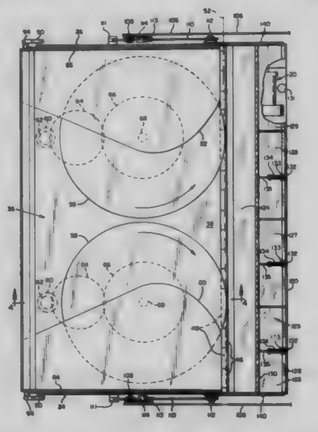
said clamp means comprising first and second saddle portions seated upon said support member, the first saddle portion contacting a first outer surface portion of the support member and the second saddle portion contacting a second outer surface portion of the support member which is generally opposite to said first outer surface portion, said clamp means also including a first limb projecting from said first saddle portion into said end portion of the tube generally parallel to the axis thereof and a second limb projecting from said second saddle portion into said end portion of the tube generally parallel to the axis thereof but in spaced relation to said first limb, said first limb having opposite side edge portions defining a width which is less than the internal dimension of said tube and said second limb having opposite side edge portions defining a width less than the internal dimension of said tube so that the two limbs are receivable within said end portion of the tube, said first limb having an opening therein provided with internal thread means and said second limb having an opening therein aligned with the opening of the first limb, said tube having an opening therein remote from said end portion of the tube and opposite the opening in the second limb, and screw thread means having an end portion seated against that inner surface of the tube opposite the opening in the tube and a threaded portion engaged with said internal thread means for forcing said first limb away from said inner surface of the tube due to reaction of said end portion of the screw thread means against said inner surface of the tube while forcing the second limb into engagement with the opposite inner surface of the tube and forcibly clamping said first and second saddle portions against said supporting member.

4,718,790

PAVER WITH ROTATING DISC FLOOR

Jack D. Layton, 4468 Medina La. SE., Salem, Oreg. 97301

Filed Feb. 9, 1987, Ser. No. 12,299
Int. Cl.⁴ E01C *19/48*
U.S. Cl. 404—101 **10 Claims**



1. In a paver which includes a collecting hopper for collecting aggregate dumped thereinto from a supply of aggregate:

a screed mounted on said paver and extending transversely of the paver and spaced longitudinally from said collecting hopper;

an elongate opening defined in the paver which is substantially parallel to and spaced from the screed for feeding aggregate in advance of the screed;

a rotary disc forming a portion of the floor in said collecting hopper rotatable about an upright axis and having a margin thereof disposed above and adjacent said opening, the disc being operable on rotation to move aggregate located in the hopper hopper toward said opening, and

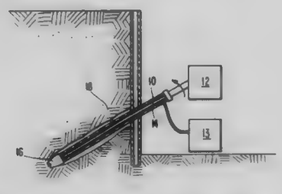
an elongate feed hopper mounted on said paver substantially paralleling said screed and in advance of the screed, said opening forming formed in the top of said feed hopper.

4,718,791

HIGH CAPACITY TIEBACK INSTALLATION METHOD

David E. Weatherby, Potomac, Md., assignor to Schnabel Foundation Company, Bethesda, Md.

Continuation of Ser. No. 798,621, Nov. 15, 1985. This application Mar. 23, 1987, Ser. No. 29,045
Int. Cl.⁴ E02D *29/00*
U.S. Cl. 405—262 **9 Claims**



1. A method of installing a high capacity tieback comprising:

connecting a unitary hollow casing to a drill;

inserting prestressing steel within the casing;

fixing a lost bit to one end of the casing;

positioning the drill and casing at the desired location of the tieback;

rotating the casing into the ground with the drill and removing soil with a drilling fluid as the casing is advanced into the ground;

releasing the bit from the casing and pumping grout down the hollow interior of the casing at a pressure of at least 150 psi forcing water in the grout to bleed from the grout;

extracting the casing from the ground by developing a torque of at least 12,000 ft./lbs on the casing with the drill to overcome the frictional engagement between the grout and the casing and by applying a pulling force to the casing generally along the axis of the casing with the drill; and

anchoring the prestressing steel.

4,718,792

PREFABRICATED RETAINING-WALL ELEMENTS FOR PROTECTION, CONSOLIDATION AND/OR FACING OF EXCAVATIONS, GROUND ANCHOR AND ASSEMBLY DEVICES, AND PROCEDURE FOR APPLICATION OF THESE ELEMENTS AND DEVICES

Claude C. Louis, 40 Bis, Avenue Bosquet, 75007 Paris, France

Continuation of Ser. No. 746,064, Jun. 18, 1985, abandoned. This application Feb. 12, 1987, Ser. No. 14,170
Claims priority, application France, Jun. 29, 1984, 84 10336
Int. Cl.⁴ E02D *29/02*
U.S. Cl. 405—262 **17 Claims**

1. A method for facing and/or supporting, with prefabricated facing elements, natural or artificial slopes of an excavation in the ground such as a cut, bank, trench, pit, tunnel, comprising the steps of:

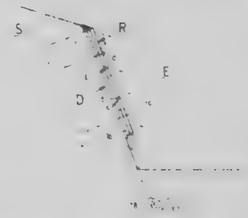
(a) making in the ground an excavation having a face;

(b) providing a plurality of ground anchors having outer ends;

(c) driving the anchors into the ground, through the face of the excavation, and cementing the anchors into the ground, so that portions of the outer ends of the anchors project from the face to provide exposed ends;

(d) providing an adjustable stop on the outer end of each anchor, and adjusting the stop;

(e) positioning against the stops, on the exposed ends of the anchors, facing elements comprised of primarily solid



prefabricated facing elements whose edges are provided with means for joining with adjacent elements, so that the adjusted stops align the prefabricated elements, and space the elements from the excavated face;

(f) providing drainage over the height of the excavation, between the face of the excavation and the prefabricated facing elements;

(g) injecting a filling material in the space between the facing elements and the excavated face; and

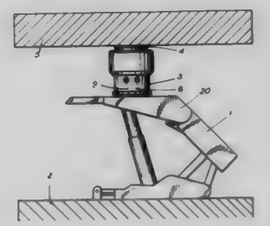
(h) fixing the prefabricated elements to the ground anchors.

4,718,793

GENERATOR FOR DYNAMIC LOADING OF A MINE LINING

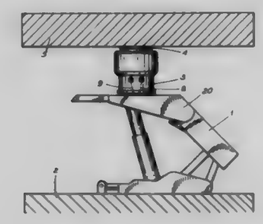
Waclaw Werachim, Gliwice; Wojciech Skoczynski, Katowice; Jan Debiec; Hubert Niesyto, both of Gliwice; Marek Wojtaszczyk, Katowice; Edward Wlodarczyk, Warsaw; Roman Krzewinski, Warsaw; Mieczyslaw Zielinski, Warsaw; Kazimierz Kowalczyk, Kazun Nowy, and Andrzej Spychala, Warsaw, all of Poland, assignors to Gwarectwo Mechanizacji Gornictwa "POLMAG" and Centrum Mechanizacji Gornictwa "KOMAG", both of Gliwice, Poland

Filed Jan. 7, 1986, Ser. No. 816,754
Claims priority, application Poland, Jan. 17, 1985, 251573
Int. Cl.⁴ E21D *11/00*
U.S. Cl. 405—303 **4 Claims**



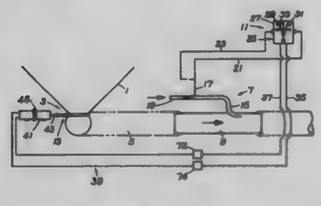
1. Apparatus for dynamically testing a section of mine lining comprising:

a mine lining section spragged between a lower supporting surface and an upper support;
a bump simulating means connected between said mine lining section and said upper support, said pump simulating means comprising:
a cylinder;
a piston disposed within said cylinder;
a collar encompassing said cylinder and said piston for limiting the stroke of said piston;
a chamber in the bottom of said cylinder for an explosive charge;
a port in said cylinder wall for supplying explosive to said chamber, whereby said bump simulating means can be recharged in situ.



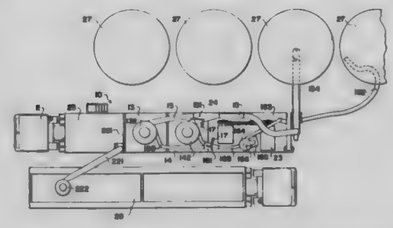
4,718,794
Patent Not Issued For This Number

4,718,795
UNLOADING OUTLET ASSEMBLY
Richard H. Dugge, St Louis, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.
Continuation of Ser. No. 740,632, Jun. 3, 1985, abandoned, which is a division of Ser. No. 349,789, Feb. 18, 1982, Pat. No. 4,544,306. This application May 18, 1987, Ser. No. 52,185
Int. Cl.[4] B65G *53/66*
U.S. Cl. 406—30 3 Claims



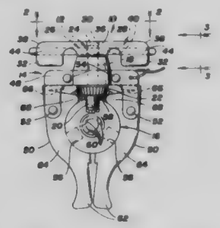
1. An unloading system for the discharge of a particulate material from a covered railway hopper car holding a supply of said particulate material to be unloaded, said railway car having at least one discharge opening in communication with said particulate material within said railway car, said unloading system comprising; pneumatic conveying means operatively connectable with said at least one discharge opening, said pneumatic conveying means including a discharge conduit; pressure sensing means for least periodically determining a pressure change within said discharge conduit downstream from said at least one discharge outlet with said pressure change being defined by a first predetermined pressure level within said conduit corresponding to a first flow rate of said particulate material greater than zero and a second predetermined pressure level within said conduit corresponding to a second flow rate of said particulate material greater than said first flow rate; said pressure sensing means being operatively connected to control means so as to control the opening and closing of said at least one discharge outlet for maintaining the flow of lading therefrom between said first and second flow rates until the lading in operative association with said at least one outlet is substantially unloaded.

4,718,796
BULK CROP TRANSPORTATION
William F. Shiers, Moose Jaw, and John V. Cross, Saskatoon, both of Canada, assignors to Davaar Delphic Systems Limited, Regina, Canada
Continuation of Ser. No. 683,029, Dec. 18, 1984, abandoned. This application Apr. 7, 1987, Ser. No. 35,432
Int. Cl.[4] B65G *53/34*
U.S. Cl. 406—34 1 Claim



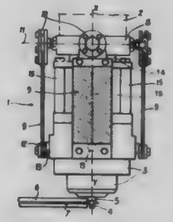
1. An apparatus for use in transporting bulk crops from a production area to a transportation center comprising a vehicle having road wheels by which the vehicle can be transported to a bulk crop storage container in the production area, extracting means mounted on said vehicle for movement relative to the vehicle to said storage container of said bulk crop for extracting said bulk crop from said container, said extracting means comprising a screw auger having an auger tube and an auger flight mounted therein and means mounting the auger tube for movement relative to the vehicle from a storage position to a collection position projecting outwardly from the vehicle for engaging said bulk crop and a vacuum suction system including a hose separate from said auger tube and movable separately therefrom and relative to the vehicle so as to engage said bulk crop, and fan means for generating an air flow in said suction hose, crop weighing means mounted on said vehicle and comprising a first and a second weigh hopper, duct means for transporting said collected crop from said auger tube and from said suction hose for transportation of said crop to one or other of said weigh hoppers, means in said duct means for controlling feed of said crop to a chosen one of said hoppers, means for measuring the weight of material in each of said hoppers, each of said hoppers having air lock means at a bottom thereof operable to discharge crop in said hopper therefrom into a discharge duct, cleaning means for receiving said crop from said discharge duct and for extracting dockage therefrom, and a discharge assembly comprising a duct member pivotal about a vertical axis such that it is movable to one side of the vehicle and including a cyclone for discharging the crop downwardly into a bulk transport trailer for transportation.

4,718,797
SNAP-ON PAD FOR CHUCK KEY
John R. Purviance, 29530 Highmeadow Rd., Farmington Hills, Mich. 48024
Filed Dec. 7, 1981, Ser. No. 327,841
Int. Cl.[4] B23B *31/06*
U.S. Cl. 408—241 R 6 Claims



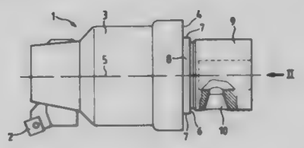
1. A pad for mounting on a chuck key of the type including a shaft having a gear and a handle extending in opposite directions from the shaft to permit manual application of torque for rotating the key about the shaft, said pad comprising: a unitary body of resilient material; said body having an elongated shape that extends transversely to the shaft upon mounting thereon; said body including a central hole that receives the shaft of the chuck key upon mounting thereon; the body also including spaced retainers that engage the handle of the chuck key on opposite sides of the shaft thereof upon mounting thereon; and the retainers including locking portions that resiliently deflect over the handle of the key upon mounting thereon so as to cooperate with the hole in locating the pad on the key.

4,718,798
ELASTICALLY CONNECTED, TWO-PART TOOL SUPPORT, PARTICULARLY FOR A ROBOT
Guy Damargue, Boulogne, and Jean-Yves Haelloc, Fontenay-Aux-Roses, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France
Filed Jan. 17, 1986, Ser. No. 819,397
Claims priority, application France, Jan. 24, 1985, 85 01013
Int. Cl.[4] B23C *1/16*
U.S. Cl. 409—97 7 Claims



1. A tool support for a robot having a reference axis, said tool support supporting a tool having a tool axis and said tool axis having to be permanently parallel to said reference axis, and further said tool support comprising:
a first part rigidly connected to said robot;
a second part support supporting a motor capable of driving said tool through rotation and supporting a guide for guiding said tool along a template, and
a plurality of elastic blades which are disposed around said motor and around said reference axis and parallel thereto and which connect said first and second parts and with which, when said motor is rotated, said tool merges and which enables, when rotation of said motor is ceased, said second part to move with respect to said reference axis, each of said plurality of elastic blades being connected to one part of said first and second parts via a swivel joint assembly and to the other part of said first and second parts via an articulation which axis is of right angles to said reference axis.

4,718,799
CUTTING TOOL COMPRISING A CUTTING HEAD AND A HOLDING SHANK CONNECTED THERETO
Hans R. Hubacher, Rupperswil, Switzerland, assignor to CAD Engineering Rupperswil AG., Rupperswil, Switzerland
Filed Apr. 1, 1985, Ser. No. 718,098
Claims priority, application European Pat. Off., Apr. 7, 1984, 84103914.2
Int. Cl.[4] B23B *31/06*
U.S. Cl. 409—234 4 Claims



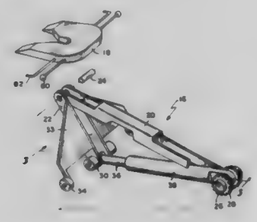
1. A cutting tool having a central axis comprises a cutting head and a holding shank, said cutting head having a supporting surface and said holding shank having a bearing surface

wherein both the supporting surface and said bearing surface lie in a plane at right angles to the tool axis and means for connecting and fixing the cutting head to the holding shank by pulling the supporting surface against the bearing surface, said means for fixing includes a pair of opposed, substantially straight parallel stop faces on a shoulder projecting from the supporting surface which engage with corresponding faces provided in a recess provided on the holding shank, said stop faces form partial surfaces on the circumferential surface of the shoulder and are connected together by a pair of arcuate partial surfaces which are arranged centrally with respect to the axis of the cutting tool so as to form a closed circumferential surface and match central partial surfaces on the inner circumferential surface of the recess provided on said holding shank such that said arcuate partial surfaces and said central partial surfaces abut so as to form a circumferential connection wherein the pair of opposed substantially straight parallel stop faces and the central partial surfaces of the recess are set back with respect to the bearing surface of the holding shank.

4,718,800
STANCHION

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 18, 1986, Ser. No. 853,561
Int. Cl.[4] B60P *7/13*
U.S. Cl. 410—61 15 Claims



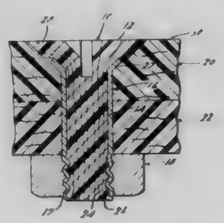
1. A stanchion for a trailer to be transported on a railroad car comprising:
- mating means for mating with a king pin of a trailer;
- first and second strut means pivotally connected to said mating means at a first end and surface engaging means mounted on a second;
- motive means interconnecting said second ends of said first and second strut means for moving said second end of said second strut means relative to said second end of said first strut means to raise and lower said mating means; and
- propulsion means connected to said engaging means on said first strut means for driving said engaging means on said first strut means to move said stanchion along a surface of a railroad car when activated and for maintaining said second end of said first strut means stationary when deactivated.

4,718,801
COMPOSITE CORE FASTENER

Imre Berecz, Laguna Beach, Calif., assignor to Microdot Inc., Darien, Conn.

Filed Jul. 24, 1986, Ser. No. 888,700
Int. Cl.[4] F16B *35/00*
U.S. Cl. 411—378 3 Claims

1. A fastener comprising a composite core having an enlarged head portion at one end and a shank portion at the other end said head portion being of a diameter greater than that of said shank portion, and a metal sleeve encapsulating the shank portion of said core and a portion of the head portion and an outer surface of said sleeve being threaded for the acceptance of a nut, said metal sleeve being spaced axially from an axial end face of the head portion whereby said metal sleeve is



electrically isolated from the end surface on the head portion of said fastener.

4,718,802
SAWTOOTH-PROFILE NAIL

Gottfried Rockenfeller, Hilchenbach, and Wolfgang Rockenfeller, Hilchenbach-Helberhausen, both of Fed. Rep. of Germany, assignors to Rockenfeller KG Befestigungselemente, Hilchenbach, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,157
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516479
Int. Cl.[4] F16B *35/04*
U.S. Cl. 411—421 8 Claims

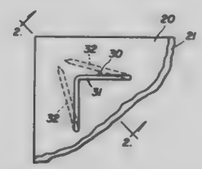


1. A nail comprising:
- an elongated metal body;
- a nail head formed on one end of said body;
- a nail point formed on an opposite end of said body and converging from a crest to a tip;
- a plurality of mutually adjoining annular ridges of generally frustoconical configuration formed on said body and imparting thereto a sawtooth profile over a major portion of the length of said body from said point and each tapering toward said point so as to have a crest and a root, said ridges being of generally triangular cross section and each having a relatively steep flank turned toward said head and a relatively shallow flank turned toward said point, a one of said ridges most distal from said point having a crest diameter greater than the crest diameter of said nail point, said crests of the ridges between said most-distal ridge and said point lying along an imaginary conical crest surface converging toward said point, a one of said ridges most proximal to said nail point having a root diameter less than the root diameter of said most-distal ridge and the roots of said ridges lying along an imaginary conical root surface converging toward said point, a plurality of steep-pitch helical flutes being formed to cross said ridges in said sawtooth profile over the length thereof, said flutes having a maximum depth along the the lengths thereof equal to the difference between the root and crest radii of the ridges crossed thereby.

4,718,803
FRANGIBLE STAPLE

Frederick T. Reitse, 5532 South Kenwood Ave, Apt. 301, Chicago, Ill. 60637

Continuation of Ser. No. 604,441, Apr. 27, 1984, abandoned, which is a continuation of Ser. No. 83,862, Oct. 11, 1979, abandoned. This application Nov. 1, 1985, Ser. No. 794,270
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—476 3 Claims

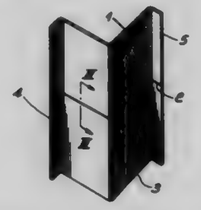


1. A system for fastening together a plurality of sheets having a frangible staple and a stapling machine comprising:
- a stable having a non-linear bight lying in a first plane, two substantially parallel spaced-apart legs depending from the ends of said bright, said legs being disposed in a second plane which is substantially perpendicular to said first plane;
- a pair of material weakening nicks disposed in said bight adjacent said legs, such that said bight is easily grasped, broken and separated from said legs by rotation; and
- a stapling machine having an anvil with a pair of spaced-apart grooves, said grooves extending obliquely in a plane which is substantially perpendicular to said legs when said legs are disposed in said stapling machine.

4,718,804
METALLIC LAMELLA FASTENER FOR WOOD

Antoine Cassese, Les Essarts n° 7, Saint Germain Laxis, Maincy, Seine-et-Marne, France

Continuation of Ser. No. 701,807, Feb. 19, 1985, abandoned, which is a continuation of Ser. No. 336,439, Dec. 31, 1981, abandoned. This application Nov. 26, 1986, Ser. No. 935,134
Claims priority, application France, Feb. 16, 1981, 81 02957
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—478 5 Claims

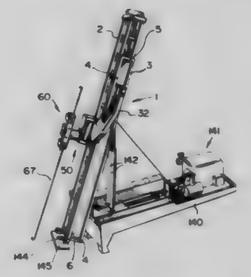


1. A series of fasteners especially for wood and arranged in face-to-face relation in a stack adapted to be received in the magazine associated with a distribution device prior to being driven into the wood, each of said fasteners comprising a lamella being of constant thickness and having first and second main opposite faces which are smooth, wherein only said first face has a protuberance extending in a direction substantially perpendicular to the direction said fastener is driven into wood, said protuberance being located in a central portion of said fastener and projecting slightly beyond said first face, said protuberance bearing on the smooth second face of an adjacent fastener in said stack, said protuberance being exclusively for the purpose of correctly positioning said fastener relative to an adjacent fastener in said stack when received in a magazine associated with the distribution device.

4,718,805
PIPE HANDLING APPARATUS

Floyd W. Becker, R.R. #9, Site 1, Box 15, Calgary, Alberta, Canada

Filed Jan. 27, 1986, Ser. No. 822,975
Claims priority, application Canada, Sep. 13, 1985, 490639
Int. Cl.[4] E21B *19/14*
U.S. Cl. 414—22 6 Claims



1. A pipe handling apparatus for mounting on a derrick of the type including drive means for rotating the derrick between the horizontal and vertical positions, said apparatus comprising track means on one side of said derrick extending longitudinally thereof; carriage means slidable on said track means; drive means for moving said carriage means along said track means; first swing arm means pivotally connected to said carriage means for rotation around a first axis perpendicular to the longitudinal axis of said derrick means; first actuator means for rotating said first swing arm means around said first axis; second swing arm means pivotally connected to the outer free end of said first swing arm means for rotation around a second axis generally normal to said first axis and generally parallel to the longitudinal axis of the derrick when said first swing arm is generally parallel to the longitudinal axis of the derrick; second actuator means for rotating said second swing arm means around said second axis; third swing arm means pivotally connected to the outer free end of said second swing arm means for rotation around a third axis perpendicular to the longitudinal axis of said derrick and perpendicular to said first and second axes; third actuator means for rotating said third swing arm means around said third axis; and jaw means on said third swing arm means for gripping a pipe section, whereby the pipe section can be gripped in a horizontal position, moved upwardly along said track means with said carriage, rotated with said first swing arm means to a position in which said first swing arm means is parallel to said derrick, rotated with said third swing arm means to a position parallel to a said derrick, rotated with said second swing arm means into alignment with an existing pipe string in the center of said derrick, and moved downwardly with said carriage so that said pipe section engages the existing pipe string.

4,718,806
CYLINDRICAL BALE LOADING AND TRANSPORT APPARATUS

Roger D. Chambers, Rte. 1, Box 334, Pioneer, Tenn. 37847

Filed Jul. 18, 1986, Ser. No. 886,831
Int. Cl.[4] A01D *87/12*; B60P *1/48*
U.S. Cl. 414—24.5 9 Claims

1. A cylindrical bale loading and transport apparatus

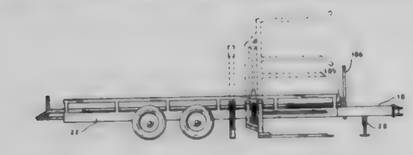
adapted for being towed by a conventional tractor or the like having a hydraulic system, said apparatus comprising:

a frame having a forward end portion, an aft end portion and side portions;

wheel means rotatably mounted on said frame to facilitate movement of said apparatus over a supporting surface;

loading means pivotally carried by one of said side portions of said frame proximate said forward end portion thereof for loading bales on said apparatus, said loading means having a loading fork formed of a plurality of tines for movement into engagement with a lower surface of said bales and a hydraulic pivoting means attached between said frame and said fork to move said fork from a stored position above said frame to an extended position to engage said bales and to load said bales upon said apparatus, said hydraulic pivoting means operatively connected to a first control unit of said hydraulic system for operation by a user of said apparatus;

conveyor means for sequentially receiving said bales loaded onto said apparatus by said loading means and for conveying said bales toward said aft end portion to a preselected location along the length of said frame for storage during transport, said conveyor means including first and second



parallel moving rail means adapted to be reciprocated along said frame, and individual hydraulic means fastened between said frame and each of said moving rail means and operatively connected to a second control unit of said hydraulic system, said second control unit providing for movement of said moving rail means toward said aft end portion simultaneously and return toward said forward end portion one at a time to minimize forward movement of said bales as said moving rail means are retracted toward said forward end portion; and

passive stop means for stopping movement of said bale, after being loaded, toward said forward end portion as said moving rail means are retracted to a position for receiving another bale from said loading means, said stop means comprising a plurality of gravity-biased dowels pivotally mounted from said frame, each dowel having a first end projecting above said frame in the absence of said bale and being retracted toward a top surface of said frame in the presence of said bale and during movement of said bale toward said aft end portion, said first end pivoting into engagement with said bale during any movement of said bale toward said forward end portion to stop further forward movement of said bale during said retraction of said moving rail means.

4,718,807

SIGNATURE STACKING APPARATUS

Michael S. Baxter, Swanton, Vt., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Jul. 14, 1986, Ser. No. 885,268
Int. Cl.[4] B65H *31/34*
U.S. Cl. 414—36 **4 Claims**

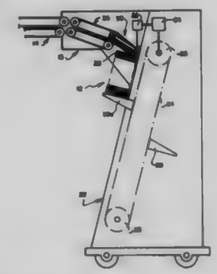
4. A stacker for stacking folded signatures, said stacker comprising:

a support onto which the signatures are fed;

means for lowering said support as signatures are fed thereon to form a stack;

at least one precompressor for engaging the folded end portions of the signatures and applying a downward force thereto to flatten the top of the stack on said support, said precompressor comprising at least one pair of paddles having curved surfaces for engaging the folded leading end portion of the top signature on the stack; and

means for rotating said paddles about an axis as the signatures are fed to said support, said means for rotating said



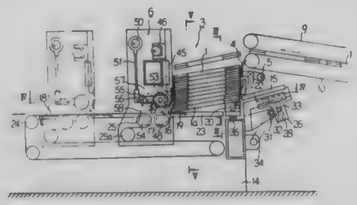
paddles about said axis maintaining the rotational speed of said paddles to have a linear velocity component near the periphery of said paddles greater than the velocity of the signatures fed onto the stack.

4,718,808

DELIVERY DEVICE OF PILED CORRUGATED FIBERBOARD BOXES

Noriyuki Hoshino, and Tsugio Tsutsura, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,417
Int. Cl.[4] B65G *59/06*
U.S. Cl. 414—37 **2 Claims**



1. A delivery device for delivering stacked sheets of sheet materials singly, the device comprising:

a hopper for receiving and holding a stack of sheets of sheet material;

a front portion attached to said hopper at the front thereof, said front portion being vertically adjustable and receiving and guiding front edges of stacked sheets;

a rear sheet guide attached to said hopper at the rear thereof, said rear sheet guide being vertically adjustable and receiving and guiding rear edges of stacked sheets;

a front sheet receiver attached to said hopper at the lower front thereof, said front sheet receiver receiving, guiding and supporting the front edges of the stacked sheets, said front sheet receiver being disposed below a lower edge of said front portion;

a rear sheet receiver attached at a fixed position to said hopper at the lower rear thereof, said rear sheet receiver being vertically adjustable and receiving, guiding and supporting rear edges of stacked sheets;

a reciprocally movable kicker attached to said hopper at the lower rear thereof, said kicker being vertically adjustable and being disposed below a lower edge of said rear sheet guide and substantially rearwardly of said rear sheet receiver, said kicker reciprocating forwardly and rearwardly for pushing a lowermost sheet of the stacked sheets forwardly;

said rear sheet receiver being higher than said front sheet receiver, said sheet receivers holding the stacked sheets in a forwardly and downwardly oriented position; and

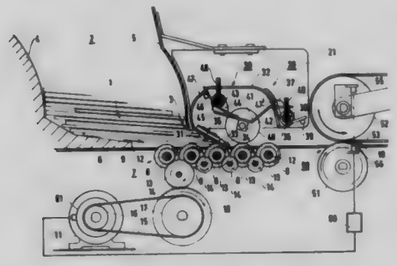
said rear sheet guide, said kicker, and said rear sheet receiver being respectively vertically adjusted according to the thickness of the sheets being handled, such that said kicker contacts substantially the entire thickness of the lowermost sheet of the stacked sheets when pushing the lowermost sheet.

4,718,809

DEVICE FOR UNSTACKING FLAT OBJECTS

Marek Krawski, Fontenay Aux Roses; Michel Serraya, Paris, and Pierre Milet, Champigny, all of France, assignors to SMH Alcatel, Paris

Filed Mar. 13, 1986, Ser. No. 839,241
Claims priority, application France, Mar. 13, 1985, 8503685
Int. Cl.[4] B65H *3/54*
U.S. Cl. 414—129 **6 Claims**



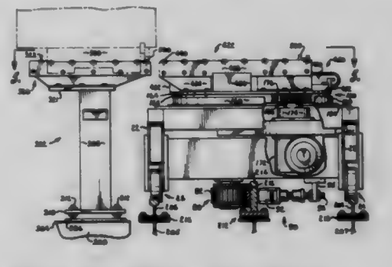
1. In a device for unstacking flat objects, said device comprising a magazine for storing a stack of said objects and having an object outlet at the bottom of the stack, a transport conveyor for the objects constituted by a series of rolls which are driven in rotation and which are disposed beneath the object outlet both upstream and downstream thereof, an object separator means disposed downstream from said object outlet and resiliently mounted above said transport conveyor, an object retainer element disposed between said object outlet and said separator means and resiliently mounted above said transport conveyor, and separate object extractor means disposed downstream from said separator means, the improvement wherein said retainer element is constituted by at least one flexible end tongue (34) carried by a part (30) which includes firstly an inclined rigid deflector flap (31) substantially at the same height as said object outlet and extending said outlet and having an end which is substantially tangential to one of the rolls of said transport conveyor (7) thereby constituting an inclined smooth surface presser against said objects, which deflector flap is equipped with said tongue which overhangs said flap and falls onto said conveyor upstream from said separator means (40), and secondly a substantially C-shaped arcuate arm (32) above said object outlet having a terminal portion opposite to the retainer element which is pivotally mounted about a first fixed shaft (36) and a first return spring (38) for biasing said deflector flap towards said conveyor, said separator means is constituted by another part having a portion facing the conveyor forming a separator shoe (40), said separator shoe being of a material having a high coefficient of friction and being fixedly mounted onto a lever arm (41) having one end portion pivotally mounted about a second fixed shaft (43) and a second return spring (35) biasing the part constituting the separator shoe against said conveyor, and detector means (55, 56) for detecting an object engaged by said extractor means (50) and controlling the stopping of said transport conveyor (7) on each occasion that an object is detected as being engaged in said extractor means.

4,718,810

HIGH SPEED TRANSPORTER FOR MULTIPLE STATION PRODUCTION LINE

Robert A. Hudis, Monticello Township, Johnson County; Thomas B. Doyle, Overland Park, both of Kans., and Donald L. Van Pelt, Blue Springs, Mo., assignors to Lico, Inc., Kansas City, Mo.

Filed Dec. 6, 1985, Ser. No. 806,287
Int. Cl.[4] B65G *1/00*
U.S. Cl. 414—286 **18 Claims**



1. In a material handling system having a plurality of spaced work stations, apparatus for transporting material to and from each of said stations comprising:

a track defining a predetermined course;

a plurality of stands spaced along said track on both sides thereof, each of said stands being adapted to receive a material-laden pallet thereon;

a transporter movable along said track;

first control means for propelling said transporter along said track and for selectively stopping said transporter at any of said stands;

a turntable on said transporter for carrying a pallet thereon;

an extensible and retractable arm;

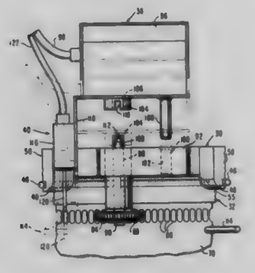
means mounting said arm on said turntable for rotation therewith;

second control means for selectively rotating said turntable through an arc traversing said track to swing said arm to an aligned, pickup and deposit position with respect to a selected stand on one side of said track or to said aligned position with respect to a selected stand on the other side of said track, and including means for moving said arm between extended and retracted positions toward and away from any selected stand;

means on said arm for releasably coupling a pallet with said arm for transfer of a coupled pallet from a selected stand to said turntable upon retraction of said arm, and for transfer of a coupled pallet from said turntable to a selected stand upon extension of said arm, said releasable coupling means including a dog engageable with a pallet; and

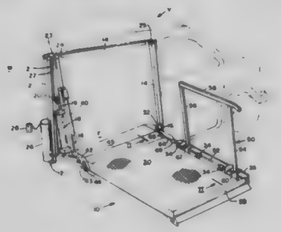
said second control means further including means for rotating said turntable to an angular position misaligning the turntable and selected stand to preclude engagement of said dog with a pallet thereon during extension of said arm to pick up a pallet, or after deposit of a pallet to effect disengagement of said dog from the deposited pallet.

4,718,811
SILAGE DISTRIBUTOR APPARATUS
Henry S. Stoltzfus, Mount Joy, Pa., assignor to Lancaster Level FLO, Inc., Lancaster, Pa.
Filed Jan. 21, 1986, Ser. No. 820,036
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—301 26 Claims



1. Silage distributor apparatus for receiving and distributing within a silage storage facility a stream of silage flowing out of a discharge pipe into said storage facility, said silage distributor apparatus comprising:
(a) a first annular member stationarily disposed about said flowing silage stream;
(b) a silage distributing chute;
(c) a second annular member rotatably mounted to said first member about a rotational axis;
(d) means interconnecting said chute to said second annular member for disposing said chute in the path of said flowing silage stream; and
(e) drive means intercoupling said first and second annular members for rotating said second member relative to said first member so as to move said chute to different angular positions relative to said flowing silage stream for distributing silage toward different regions of said storage facility;
(f) said drive means including a drive track defined on one of said first and second annular members, a support structure mounted to the other of said first and second annular members, a shaft rotatably mounted on said support structure and a drive element mounted on said shaft for rotation therewith, said shaft disposing said drive element in a drivingly engaged relation with said drive track;
(g) said drive means further including a drive motor having attached thereto a nonthreaded mounting element releasably and nonfixedly matable with a portion of said support structure for adapting said motor to be removably mounted on said other of said first and second annular members by said support structure, said drive motor also having a rotary output element which is drivingly interengaged with said shaft when said mounting element of said motor is mated with said support structure and thus said motor is mounted on said other of said members and becomes disengaged from said shaft when said mounting element of said motor is unmated from said support structure and thus said motor is dismounted from said other of said members, said drive element being maintained by said shaft in said drivingly engaged relation with said drive track regardless of whether said motor is mounted to or dismounted from said other of said first and second annular members.

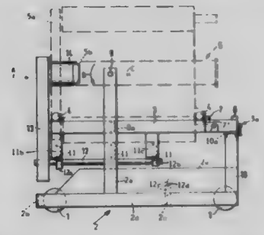
4,718,812
WHEELCHAIR LIFT WITH POSITIVE AUTOMATIC HANDRAIL
Raymond L. Smalley, and Melvin G. Risner, both of Carey, Ohio, assignors to REB Manufacturing, Inc., Carey, Ohio
Filed Feb. 24, 1986, Ser. No. 832,228
Int. Cl.[4] B60P *1/44*
U.S. Cl. 414—540 9 Claims



6. An optional manual, gravity, and power operated wheelchair lift comprising:
(A) an outer inverted U-shaped frame having depending hollow legs,
(B) an inner U-shaped frame having legs with upper ends telescoping into the dependng hollow legs of said outer frame,
(C) a first reciprocating piston motor means mounted on said outer frame having a pair of sprocket wheels connected to the outer upper end of its piston,
(D) a pair of sprocket chains anchored at one end to said outer frame and at said other end to the upper ends of said telescoping inner frame after passing around said pair of sprocket wheels on said piston for raising said inner frame,
(E) a foldable platform pivoted to the lower end of said inner frame,
(F) a second reciprocating piston motor mounted on said outer frame for engagement with said platform for folding and unfolding said platform,
(G) manual means to engage and disengage said second motor with said platform,
(H) a foldable handrail rigidly mounted on a shaft which shaft is slidable and pivoted along one side of said platform, the shaft being the sole support for the handrail,
(I) means pivoted to said lower frame adjacent the pivot for said platform for positively reciprocating said shaft, and
(J) cam means for positively oscillating said shaft for folding and unfolding said handrail with the folding and unfolding of said platform.

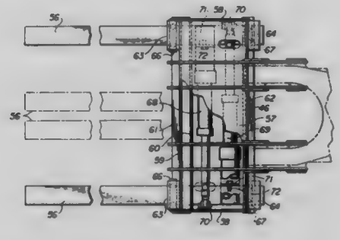
4,718,813
TRANSPORT CART
Guenther Kehlenbach, Weeresten, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany
Filed Apr. 16, 1986, Ser. No. 852,538
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513728
Int. Cl.[4] B62B *3/00*
U.S. Cl. 414—684 9 Claims

1. A cart for transporting a material carrier having rollers, comprising cart frame means, wheel means rotatably secured to said cart frame means for rolling said cart frame means along a floor, skid means for supporting said carrier rollers and said material carrier, tilting frame means for mounting said skid means, journal means (9) for tilting securing said skid mounting tilting frame means to said cart frame means, said journal means having a journal axis extending substantially through a zone in which the center of gravity of said material carrier is located, wherein said skid means comprise two parallel skid rails (3, 3'), and traverse means interconnecting said parallel skid rails, a shaft connected to and extending perpendicularly to said traverse means, an arm (13) journalled through said



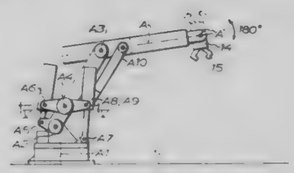
shaft to said traverse means for holding said material carrier, said arm further comprising an engaging member (14) secured to said arm for entering into an opening of said material carrier to hold said material carrier on said skid rails.

4,718,814
FORKLIFT VARIABLE REACH MECHANISM
Jeffrey L. Addleman, Chambersburg, Pa., assignor to Kidde, Inc., Saddle Brook, N.J.
Division of Ser. No. 6,813,852, Dec. 27, 1985, Pat. No. 4,674,944. This application Dec. 11, 1986, Ser. No. 940,734
Int. Cl.[4] B66F *9/14*
U.S. Cl. 414—705 7 Claims



1. A forklift variable reach mechanism comprising a forklift assembly adapted to be bodily carried by a boom-supported low profile self-leveling means, said assembly comprising a transversely elongated low profile carriage member having transverse rails fixed on its bottom and extending along its forward and rear sides, a pair of parallel longitudinal laterally adjustable load-engaging and lifting tines having portions extending beneath said transverse rails, spaced hanger elements secured to each tine and extending thereabove and having portions overlying the top faces of said rails and adapted to traverse the rails in opposite directions, a pair of opposing parallel axis extensible and retractable power devices disposed substantially within the confines of the carriage member and having opposite ends connected with the end walls of the carriage member and each being connected to one of said tines between said rails and said spaced hanger elements and being operable to move the tines toward and away from each other laterally along said rails, said tines and said pair of power devices being disposed substantially in a common horizontal plane near the bottom of the carriage member, and supporting means on the carriage member adapted for connection with said self-leveling means.

4,718,815
DEVICE FOR CARRYING AND ADJUSTING A TOOL
Kenneth Lindgren, Borlänge, Sweden, assignor to AVP Robot AB, Borlänge, Sweden
PCT No. PCT/SE85/00487, § 371 Date Jul. 16, 1986, § 102(e) Date Jul. 16, 1986, PCT Pub. No. WO86/03157, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 27, 1985, Ser. No. 887,806
Claims priority, application Sweden, Nov. 28, 1984, 8405998
Int. Cl.[4] B25J *9/06*
U.S. Cl. 414—729 5 Claims



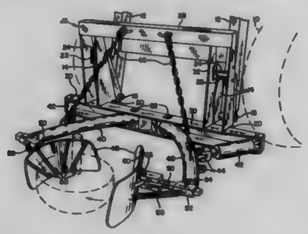
1. A device for carrying and adjusting a tool, characterized by a frame (2), a base member (3) rotatably connected to the frame (2) about a first axis (A1), a main arm (5) which at one end is pivotally connected to the base member (3) about a second axis (A2) perpendicular to said first axis and which at the other end is pivotally connected to a lifting-arm holder (8) about a third axis (A3) parallel to said second axis, a yoke (7), having arms (7*a*, 7*b*) which at its central portion is pivotally connected to said main arm (5) at some distance from said one end of the main arm about a fourth axis (A4) parallel to said second axis, a first cylinder assembly (11) having a cylinder part (11*b*) and a piston rod part (11*a*) movable relative to the cylinder part, one (11*a*) of said parts being pivotally connected to a projection (6) protruding at an angle from said main arm, about a fifth axis (A5) parallel to said second axis, and the other (11*b*) of said parts being pivotally connected to one arm (7*a*) of said yoke (7) about a sixth axis (A6) parallel to said second axis, a second cylinder assembly (12) having a cylinder part (12*b*) and a piston rod part (12*a*) movable relative to the cylinder part, one (12*a*) of said parts being pivotally connected to said base member (3) about a seventh axis (A7) parallel to said second axis, and the other (12*b*) of said parts being pivotally connected to the other arm (7*b*) of said yoke (7) about an eighth axis (A8) parallel to said second axis, a link arm (13) pivotally connected at one end to said other arm (7*b*) of said yoke (7) about a ninth axis (A9) parallel to said second axis, and pivotally connected at its other end to said lifting-arm holder (8) about a tenth axis (A10) parallel to said second axis, a lifting arm (9) which is rotatably mounted in said lifting-arm holder for rotation about its own axis (A) extending perpendicularly to said third and said tenth axis, and a tool holder (14) carried by said lifting arm (9) for holding the tool (15).

4,718,816
LOAD HANDLING ATTACHMENT FOR VEHICLES
Carl M. King, 1629 NW. 113th Ave., Portland, Oreg. 97201
Filed May 19, 1986, Ser. No. 864,541
Int. Cl.[4] B66C *3/00*
U.S. Cl. 414—739 4 Claims

1. A handling attachment for bailed trees arranged to be mounted on a vehicle of the type having a support portion movable vertically by powered boom means and rotatable on a transverse horizontal axis by power drive means on the boom means, said attachment comprising:
a rigid main frame having top and bottom horizontal frame members with opposite ends,
upright frame members secured between said top and bottom frame members adjacent the ends thereof,
attaching means on said main frame arranged to attach it to a support portion of a vehicle,

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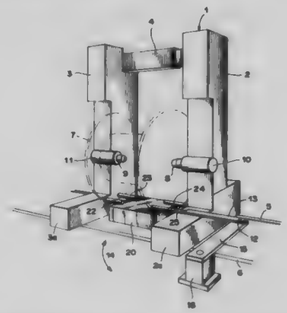
a pair of support arms extending forwardly from said bottom frame member and each having an inner end pivotally supported at a central portion on said bottom frame member and also having an outer free end,
power means pivotally connected between said main frame and said support arms arranged to pivotally drive said arms toward each other,
a pair of support lines secured one each between said top frame member and an outer portion of said respective arms,
said support lines being secured to said top frame member in vertical alignment above the respective pivot supports of said arms,
opposed load engaging pads having a vertical axis pivot support on the outer ends of said support arms arranged to



engage the ball of a balled tree from opposite directions upon powered movement of said arms toward each other and provide a lifting grip on the ball,
said load engaging pads having front and rearward ends and a convex-concave curvature from front to rear with said concave portions facing each other and comprising ball engaging surfaces,
said ball engaging pads being tipped outwardly from bottom to top to form a cup-like support for the ball of a balled tree,
and resilient means resiliently holding said pads normally in an open pivotal position toward the front for receiving a ball,
said resilient means being arranged to be overcome by the clamping force of said arms whereby said pads pivot to the shape of the ball when gripping the latter.

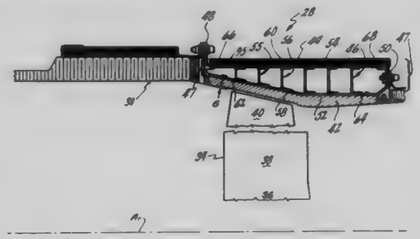
4,718,817
DRUM LOADING AND UNLOADING APPARATUS
Charles E. Maillefer, Buchillon, Switzerland, assignor to Maillefer S.A., Switzerland
Filed Aug. 5, 1986, Ser. No. 893,260
Claims priority, application Switzerland, Aug. 28, 1985, 3692/85
Int. Cl.[4] B65H 75/00
U.S. Cl. 414—744 R 7 Claims

1. Apparatus for loading and unloading a drum having two flanges on a winding machine, comprising:
a carriage,
two pairs of carrier elements disposed on said carriage and aligned along two parallel horizontal axes for supporting the drum by its flanges,
means for moving said carriage in a direction perpendicular to said horizontal axes, said means for moving said carriage comprising:
drive means for moving said carriage along a path between a first, drum-receiving position and a second, drum-loading or -unloading position, and



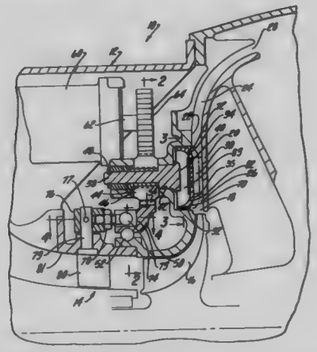
an arm having one end pivoted about a fixed vertical axis and the other end joined to said carriage such that said path is arcuate.

4,718,818
CONTAINMENT STRUCTURE
Emile J. Premont, South Hadley, Mass., assignor to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 332,695, Dec. 21, 1981, Pat. No. 4,490,092.
This application Sep. 4, 1984, Ser. No. 647,195
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] F01B 25/16; F01D 5/14
U.S. Cl. 415—9 11 Claims



1. A containment structure for a rotary machine having a rotor assembly, the containment structure extending circumferentially about the machine outwardly of the rotor assembly and including:
a support structure;
a fabric extending circumferentially about the support structure under a tension in the installed condition under normal operative conditions wherein the fabric has a free length and an installed length and the installed length of the fabric is greater than the free length of the fabric such that the fabric has said tension.

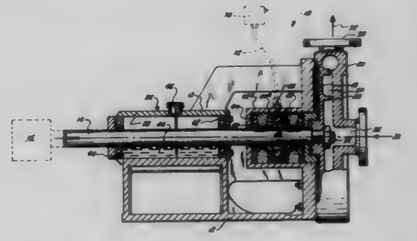
4,718,819
VARIABLE GEOMETRY DEVICE FOR TURBINE COMPRESSOR OUTLET
Casimir Rogo, Mt. Clemens, and Herman N. Lenz, Lambertville, both of Mich., assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Feb. 25, 1983, Ser. No. 469,649
Int. Cl.[4] F04D 27/00
U.S. Cl. 415—149 R 9 Claims



1. A variable geometry compressor assembly for a turbine engine comprising:
a support housing,
a compressor means contained within the support housing and having a compressed air inlet and compressed air outlet,
said support housing having a pair of spaced diffuser walls which form an annular diffuser passageway having its inner end open to said compressed air outlet,
said diffuser passageway having an annular recessed channel formed along one diffuser wall,
a ring mounted in said channel,
means for moving said ring transversely across said passageway between a retracted position in which said ring is nested within said channel and an extended position in which said ring protrudes into and restricts said diffuser passageway,
a plurality of inlet guide vanes and means for pivotally mounting said inlet guide vanes relative to said support housing at circumferentially spaced positions in said compressd air inlet,
a plurality of circumferentially spaced diffuser vanes secured to the other diffuser wall and protruding through said diffuser passageway,
wherein said ring includes a plurality of closed slots which register with and slidably receive said diffuser vanes,
wherein said moving means comprises a gear ring rotatably mounted to said housing and means for selectively rotatably driving said gear ring and wherein said pivoting means comprises a plurality of rods, each rod secured at one end to one inlet guide vane, means for pivotally securing the other ends of said rods to said gear ring, and
means for adjusting the length of each rod and for locking each such rod at the adjusted length.

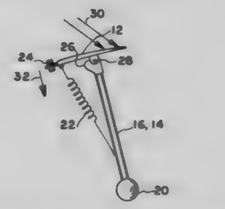
4,718,820
PUMPING APPARATUS
Robert K. Jaques, Rt. 5, 90-A, Florence, Miss. 39073
Continuation of Ser. No. 901,724, Aug. 29, 1986, abandoned.
This application Jun. 15, 1987, Ser. No. 61,729
Int. Cl.[4] F04D 29/10
U.S. Cl. 415—174 3 Claims

1. A fluid pump apparatus, comprising:
a. a pump housing;
b. a shaft housed longitudinally in said housing;
c. impeller means at a first end of said shaft for driving fluid pump through said apparatus;
d. a first pair of oil bearings on the second end of said shaft for allowing free rotation of said shaft during pumping;
e. a single bearing interposed between said shaft and said housing rigidly supporting said shaft and preventing flexing of said shaft during the pumping;
f. first and second collapsible U-shaped grease seal members surrounding said shaft, on either side of said bearing member, so that upon being injected internally with grease, said collapsible grease seal members move from an empty non-sealing collapsed position to an upright, grease filled substantially rigid sealing position between the shaft and said housing said grease injected into said grease seal members occupying the space within the U-shaped member; and



g. means for providing a quantity of grease to the grease seal members at all times during the operation of the pump for maintaining the grease seal members in the upright substantially rigid sealing position during the pumping action.

4,718,821
WINDMILL BLADE
Brian D. Clancy, 2409 4th Ave. North, St. Petersburg, Fla. 33713
Filed Jun. 4, 1986, Ser. No. 870,738
Int. Cl.[4] F03D 7/06
U.S. Cl. 416—44 1 Claim



1. A windmill rotor of the vertical axis type, comprising:
a rotatably mounted, upstanding shaft member;
a plurality of elongate upstanding blade members of airfoil design arranged in a helical configuration in surrounding relation to said shaft member;
said plurality of blade members being three in number and being spaced one hundred twenty degrees from one another and each blade member extending about twenty degrees of arc about an imaginary circle that is swept when said blade members rotate about said shaft member;
a plurality of horizontally disposed, radially extending upper strut members, each upper strut member connecting its associated blade member to said shaft member near the upper end of said shaft member, there being as many upper strut members as there are blade members;

a plurality of horizontally disposed, radially extending lower strut members, each lower strut member connecting its associated blade member to said shaft member near the lower end of said shaft member, there being as many lower strut members as there are blade members:

constant speed means for maintaining constant speed rotation of said blade members during conjoint rotation of said blade members, their associated strut members, and said shaft member;

said constant speed means including a blade member pivotal mounting means for pivotally mounting each of said blade members with respect to their respective vertical axes;

said constant speed means further including biasing means for counteracting the effects of wind impinging upon said blade members;

said biasing means including a weight member fixedly secured to a leading edge of each of said blade members;

said biasing means further including a spring member that interconnects each of said blade members to its associated strut member;

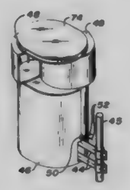
and said pivotal mounting means including a pivotal connection between each of said blade members and their associated strut members at a point that is mid-width of said blade members.

4,718,821

VERTICALLY ORIENTED WIND DRIVEN ASSEMBLY

Thomas Riezinstein, Palmer, Ak., assignor to Riezinstein and Malone Industries, Willow, Ak.

Filed Sep. 25, 1986, Ser. No. 911,529
Int. Cl.[4] F03D 7/06
U.S. Cl. 416—119 13 Claims



1. A self-governing wind driven assembly comprising:

a rotor having a first and a second terminal point;

a bottom plate rigidly attached to said first terminal point;

a top plate being similar in shape to said bottom plate, said top plate being supported in a parallel orientation to said bottom plate by a first and a second vertical post, said first and said second post being oppositely located between said top plate and said bottom plate;

a first and a second scoop, said first and said second scoop each being generally convexo-concave shaped and mounted between said top plate and said bottom plate, said first scoop having a first concave side and a first convex side, said second scoop having a second concave side and a second convex side, said first concave side defining a first open face, said second concave side defining a second open face, said first scoop being pivotally mounted on said first post, said second scoop being pivotally mounted on said second post, said first post having a first axis of rotation located near said first convex side, said second post having a second axis of rotation near said second convex side, said first scoop having a generally closed first and second end, said second scoop having a generally closed third and fourth end, said first, said second, said third and said fourth end being modified to permit said first and said second scoop to be placed with said first open face positioned against said second open face, said first, said second, said third and said fourth end permitting said first and said second scoop to achieve a generally closed configuration, said first, said second, said third and said fourth end permitting said first and said second scoop to slide cooperatively towards either an open or a closed configuration, said first and said second scoop being able to pivot in unison about said first and said second post respectively to and from an open configuration where said first face is oriented partially towards said second face and said first face and said second face are partially extended outward to receive forces from the wind, said closed configuration occurring when said first scoop and said second scoop form an approximate cylinder, said rotation being slower when said assembly is in said closed configuration than when said assembly is in an open configuration; and

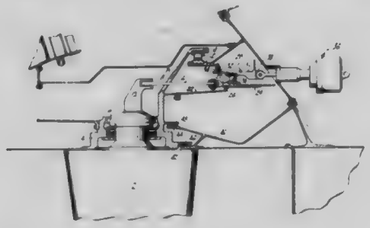
a control means controlling the orientation of said first and said second scoop between said open and said closed configuration, said orientation of said first and said second scoop being related to the rotational speed of said assembly.

4,718,823

PITCH CHANGING MECHANISM FOR FAN BLADES

William T. Dennison, Vernon, Conn., assignor to United Technologies Corporation, Harford, Conn.

Filed Feb. 24, 1987, Ser. No. 18,117
Int. Cl.[4] B64C 11/38
U.S. Cl. 416—162 5 Claims



1. A variable pitch control for a bypass fan in a turbine engine installation including:

a row of fan blades, each having at its inner end a crank arm by which the pitch of the fan may be changed,

a supporting ring for the fan blades, each blade being mounted at its base in the ring and in a position to rotate on a radial axis,

a fixed support structure for the ring, a first bearing supporting the ring to rotate on the fixed structure,

a translatable sleeve splined to the support ring to rotate therewith and to slide axially relative thereto, a row of links connecting said sleeve with the crank arms and the blades, and each link being pivotally attached to the sleeve at one end and to the crank arm at the other end,

a non-rotating translatable actuating sleeve within said first sleeve,

a second bearing between said sleeves to cause said sleeves to move axially in unison,

splines between the fixed structure and said second sleeve to support the second sleeve against rotation and means for actuating said second sleeve axially to change the pitch of the blades in unison.

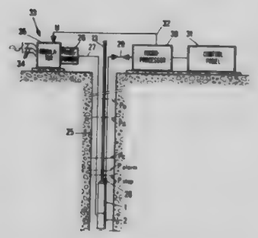
4,718,824

USABLE DEVICE, IN PARTICULAR FOR THE PUMPING OF AN EXTREMELY VISCOUS FLUID AND/OR CONTAINING A SIZEABLE PROPORTION OF GAS, PARTICULARLY FOR PETROL PRODUCTION

Henri Cholet, Le Pecq; Francois-Jean Trocquemé, Saint Martory, and Jean Garraux, Bousseus, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison & Courbevoie, France

Filed Sep. 12, 1984, Ser. No. 649,606
Claims priority, application France, Sep. 12, 1983, 83 14589
Int. Cl.[4] F04B 49/06; F04C 15/00
U.S. Cl. 417—14 9 Claims





1. A pumping device, especially for pumping of a very viscous fluid containing a sizeable proportion of gas, particularly for the production of petrol, the pumping device comprising a unit immersed in the fluid, said unit including at least one delivery pump coupled to an electric drive motor, the delivery pump having at least one admission opening and one opening communicating with a fluid delivery pipe, characterized in that the pumping device includes at least one volumetric helicoid rotary pump and a motor for driving the helicoid rotary pump at a speed substantially proportional to a frequency of an electric current feeding the motor, and means for automatically adjusting a flow delivered by the helicoid rotary pump, said adjusting means comprising at least one pressure sensor means for deliverying an electric measuring signal linked to a dynamic submergence level of the helicoidal rotary pump in service and a set of electrical circuit means for determining a production pressure from a flow rate of the helicolidal rotary pump and for processing a measuring and control signal of the frequency of the current supplying the drive motor of the helicoidal rotary pump in accordance with a determined pressure differential of said measuring signal and said production pressure.

6. A control process of a rotary expansible chamber pump immersed in a fluid produced by a well, the pump being rotary driven by a variable speed motor, characterized in that the process comprises determining a pressure differential Δp existing between a pressure of the fluid measured in a proximity of the rotary pump and a production pressure P of the well, with the production pressure P of the well being determined in accordance with the following relationship:

$$P = P_G - Q/I_p$$

wherein:

P_G = pressure of the fluid contained in the well;

Q = pump flow rate according to the rotational speed of the motor; and

I_p = well productivity indication; and

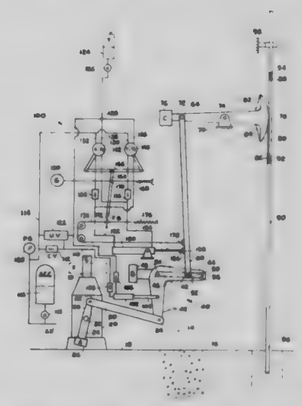
controlling a rotational speed of the variable speed motor in accordance with the determined pressure differential for enabling an automatic control of the rotary pump.

4,718,825

ACTIVE CONTROL SYSTEM FOR HIGH SPEED WINDMILLS

Don E. Avery, 45-437 Akimala St., Honolulu, Hi. 96744

Continuation of Ser. No. 678,708, Dec. 6, 1984, abandoned. This application Jan. 19, 1986, Ser. No. 875,931
Int. Cl.[4] F04B 49/00, 17/02; F16H 35/08
U.S. Cl. 417—218 8 Claims



1. In a windmill having a wind driven element operating a piston pump, a control system comprising:

lever means interposed between said element and said pump for varying the length of stroke of the piston in said pump,

control means, responsive to changes in the velocity of the wind driven element to operate said lever means to vary the length of stroke and hence the effective displacement of said pump in accordance with available wind energy, said control means comprising means connected to the wind driven element for sensing speed of the wind driven element and response means connected to the speed sensing means and to the lever means for changing the lever means to vary length of the stroke of the pump in response to the speed of the wind driven element, wherein the wind driven element comprises a vertical shaft, a gear box further connected to the shaft, a crank connected to the gear box, a connecting rod connected to the crank and a first lever arm connected to the connecting rod remote from the crank and wherein the lever means comprises a second adjustable lever arm connected to the first lever arm and wherein the piston pump comprises a pump rod, a pump jack connected to the pump rod, a second con-

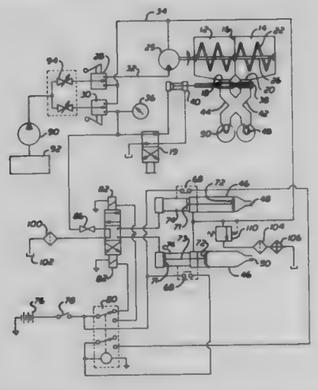
necting rod connected to the pump jack remote from the pump rod and connected to the adjustable lever arm.

4,718,826

MOBILE PUMPING APPARATUS FOR ABRASIVE SLURRIES

Richard C. Simmer, 9518 Six Mile Ck. Rd., Tampa, Fla. 33610

Filed Dec. 23, 1985, Ser. No. 812,543
Int. Cl.[4] F04B 7/04
U.S. Cl. 417—234 7 Claims



1. A pumping apparatus for abrasive slurries mounted on a mobile carrier comprising:

(a) a dual hopper mixing tank fixedly mounted on a top surface of the mobile carrier, the mixing tank containing mixing blades mounted on a shaft operated by a hydraulic motor;

(b) a carrier tube leading downwardly from the bottom of each hopper to a pair of pump housings mounted beneath the mobile carrier;

(c) a hydraulically operated slide gate mounted between a bottom opening in each hopper and a top of each carrier tube to direct the delivery of slurry to the carrier tube, the slide gate allowing the selective connection of either hopper to both pump housings;

(d) each pump housing integral with a cylinder housing attached by mounting brackets to a bottom surface of the mobile carrier;

(e) a hydraulically operated piston within each pump housing and each cylinder housing;

(f) a means for controlling the stroke length of the pistons in each pump on different cycles selected from the group consisting of a reed switch mounted on the exterior surface of each pump and an I.C. chip installed within an electrical system for the apparatus; and

(g) the piston within each pump housing alternately pumping slurry to an outlet end at each pump housing through a check valve assembly to a hose for continuous delivery to a work site.

4,718,827

FUEL PUMP

Stephen J. Sutton, Fenton; John E. Creager, Linden, and Richard F. Kostelic, Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 7, 1986, Ser. No. 882,687
Int. Cl.[4] F04B 21/00; B23Q 3/18
U.S. Cl. 417—244 3 Claims

1. In a submerged fuel pump assembly having

a tubular cylindrical housing defining a longitudinal axis of said pump assembly,

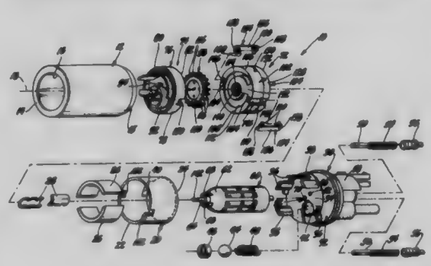
an electric motor including a cylindrical flux ring disposed within said housing and an armature rotatable within said flux ring about said longitudinal axis, and

a pump within said tubular housing including a first cylindrical pump body having a first end surface abutting an edge of said flux ring and a second cylindrical pump body disposed between an end of said tubular housing and said first pump body having a second end surface on the opposite side of said pump from said first end surface and an impeller rotatable in a cavity defined between said first and said second pump bodies,

said impeller being drivingly connected to said armature, the improvement comprising:

means on said first pump body defining a pair of first axially extending grooves in an outer cylindrical surface thereof extending across the full length of and non-symmetrically angular spaced around said outer cylindrical surface,

means on said second pump defining a pair of second axially extending grooves in an outer cylindrical surface thereof extending across the full length of and non-symmetrically angular spaced around said outer cylindrical surface,



the angular spacing between said pair of first grooves being equal to the angular spacing between said pair of second grooves so that said pair of first grooves registers with said pair of second grooves only in a single predetermined angular positional relationship between said first and said second pump bodies,

a pair of keying members extending between said first and said second pump bodies and disposed within said pairs of said first and said second grooves when said first and said second pump bodies are in said predetermined angular positional relationship so that relative angular displacement between said first and second pump bodies is prevented, and

means on each of said keying members operative to resiliently bias said first pump body against said second pump body and to retain said keying members in said pairs of said first and said second grooves prior to insertion of said pump in said housing so that said pump is unitized for efficient handling prior to insertion in said housing.

4,718,828

TAMPER-PROOF ADJUSTMENT SCREW ARRANGEMENT FOR VEHICLE FUEL SUPPLY SYSTEMS AND THE LIKE

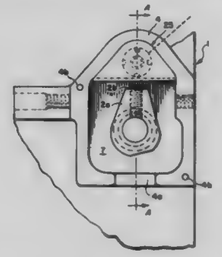
Philip L. Breeck, and George L. Muntean, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 23, 1986, Ser. No. 910,517
Int. Cl.[4] F04B 21/00; F02M 59/44
U.S. Cl. 417—313 12 Claims

1. A tamper-proof adjustment screw arrangement for vehicle fuel supply systems and the like, comprising:

(a) a housing having a bore formed in a wall portion that is situated at the bottom of a recess formed in an outer surface of the housing;

(b) an adjustment screw, said adjustment screw being received in said bore and being provided with tool engaging means for adjusting the position of said adjustment screw within the bore, and with means for fixing the position of said adjustment screw within said bore, said means for adjusting and means for fixing being located on a portion of the adjusting screw that projects outwardly from said bore into said recess; and



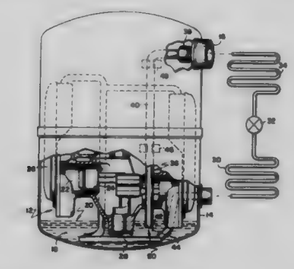
(c) a tamper-proofing shield having a perimeter which is smaller than that of said recess and only partially conforming in shape to that of said recess, said tamper-proofing shield being mounted within said recess in an overlying relationship with respect to the means for adjusting and means for fixing in a manner that blocks access thereto and that precludes rotation of the tamper-proofing shield.

4,718,829

NOISE REDUCTION USING SUCTION GAS TO FOAM OIL

Wei-Ming W. Ma, Williamsville, N.Y., assignor to American Standard Inc., New York, N.Y.

Filed Jan. 20, 1987, Ser. No. 4,935
Int. Cl.[4] F25B 43/02
U.S. Cl. 417—372 12 Claims



1. A compressor comprising:

a shell having a suction gas inlet, said inlet opening into the interior of said shell and said shell defining an oil sump;

a motor-compressor disposed in the interior of said shell and operable to compress the gas entering said shell through said inlet; and

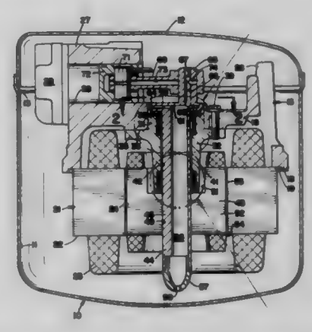
means disposed in said shell and at least partially immersed in the oil in said sump, for internally converting the velocity head of gas entering said shell inlet into static pressure, said converting means having an inlet end, the immersed portion of said converting means defining an aperture through which at least a portion of said gas entering said shell is delivered into the oil in said sump under the impetus of the static pressure developed within said converting means and said inlet end of said converting means being positioned and aligned in said shell so as to face generally into the flow of gas entering said shell inlet, said inlet end of said converting means being spaced apart from and physically uncommunicative with said shell inlet so that upon the occlusion of said converting means the flow of suction gas into said shell continues essentially unaffected and the starvation of said motor-compressor of suction gas is prevented from occurring.

4,718,830

BEARING CONSTRUCTION FOR REFRIGERATION COMPRESSSOR

Marc G. Middleton, Wyoming, Mich., and Richard T. Nelson, Worthington, Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,024
Int. Cl.[4] F04B 35/04, 39/02
U.S. Cl. 417—372 10 Claims



1. A hermetic refrigeration compressor comprising a shell, a cylinder block mounted in said shell, a stator mounted on said cylinder block, piston and cylinder means on said cylinder block, a crankshaft operable to reciprocate said piston in said cylinder, a rotor secured to said crankshaft concentric with said stator, and bearing means for journaling said crankshaft for rotation about a vertical axis, said bearing means including a bearing housing, means securing said bearing housing to said cylinder block, said bearing housing having an axial bore to receive said crankshaft, said bearing housing carrying a pair of axially spaced rolling element bearings in said bore to journal said crankshaft, a flange on said crankshaft, and a rolling element thrust bearing between said flange and said bearing housing whereby all bearings for said crankshaft are positioned between said crankshaft and said bearing housing, the rolling elements of all of said bearings rolling directly on surfaces of said crankshaft, said crankshaft including an axially extending oil passage and separate oil passages connecting said axially extending oil passage to the surfaces of said crankshaft adjacent each bearing, said axially spaced bearings being drawn cup bearings having caged rollers therein and said drawn cups being non-rotationally secured to said bearing housing.

4,718,831

APPARATUS FOR COOLING A PRESSURE MEDIUM

Karl Gessberger, St. Ingbert, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Gerate GmbH, Sulzbach, Fed. Rep. of Germany

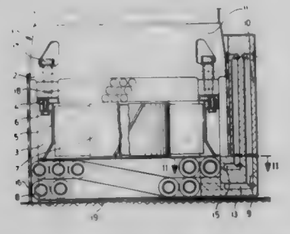
Filed Apr. 11, 1986, Ser. No. 850,661
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513324
Int. Cl.[4] F04B 17/00
U.S. Cl. 417—372 5 Claims

1. An apparatus for cooling pressure medium, especially hydraulic fluid, comprising:

pump means, powered by a first motor, for conveying pressure medium, said pump means being supported by four columns and including a pump housing;

fan means, powered by a second motor separated from said

first motor, for conveying cooling air, said fan means including a fan housing;
a cooling pipe mounted adjacent said fan means and located between said columns;
two crosspieces connecting two pairs of said columns to define two U-shaped supports, said fan housing being



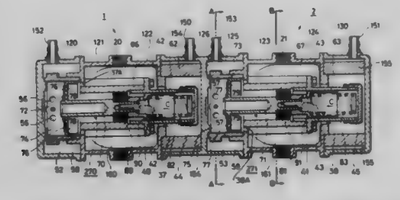
attached only to said U-shaped supports such that said fan means is located between said columns and is not fixedly connected directly to said cooling pipe; and
a connection member, overlapping and outside of said fan housing, connecting said pump means and said cooling pipe in fluid communication.

4,718,832

ELECTROMAGNETIC RECIPROCATING PUMP

Shiro Takahashi, Tokyo, Japan, assignor to Mas Design Co., Ltd., Japan

Filed Feb. 10, 1986, Ser. No. 828,445
Claims priority, application Japan, Mar. 11, 1985, 60-46494
Int. Cl.[4] F04B *17/04, 35/04*
U.S. Cl. 417—417 **1 Claim**



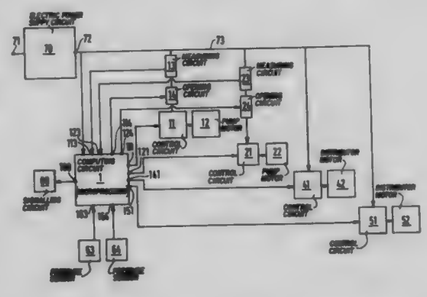
1. An electromagnetic reciprocating pump assembly having a pair of pumps integrally joined, said pumps each comprising:
a piston provided with a piston head and a magnetic armature, and having an axis of movement,
a cylinder to accommodate said piston head and define a compression chamber in combination with said piston head,
a suction hole and a discharge hole formed through the wall of said compression chamber,
a suction valve and a discharge valve disposed respectively in said suction hole and discharge hole so as to open and close selective said suction hole and discharge hole in accordance with the reciprocation of said piston in the axial direction and thereby to transfer a fluid in a prescribed direction,
a return spring to bias said piston in one direction,
a stationary electromagnet to attract said magnetic armature in the opposite direction,
a suction inlet communicating with said suction hole and serving to admit said fluid therethrough,
and a discharge outlet communicating with said discharge hole and serving to discharge said fluid therethrough wherein axes of said pistons in the pair of pump forming the pump assembly are aligned on a common straight line, and each of their pistons is urged in the same direction by their respective return springs, and said stationary electromagnets of the pumps in said pair are alternately excited by the successive half waves of an alternating current, the pistons thereby being movable independently of each other and moving oppsitely from each other during operation so the vibrations of each of the pistons is offset by opposite direction movement of the other piston along the same axis.

4,718,833

ELECTROPNEUMATIC CONVERTER

Henri Berger, Argenteuil, France, assignor to Societe d'Applications Generales d'Electricite, et de Mecanique SAGEM, Paris, France

Filed Apr. 14, 1986, Ser. No. 851,519
Claims priority, application France, Apr. 16, 1985, 85 05697
Int. Cl.[4] F04B *49/00, 9/08, 17/06*
U.S. Cl. 417—16 **4 Claims**



1. An electropneumatic converter to be inserted between an electric power supply and at least two gas bags, said converter comprising an electrically driven pump having an input and an output; means for connecting periodically each of said bags to said input and said output to periodically aspirate and deliver gas in each of said bags; said pump comprising a gear displacement pump with two toothed wheels, a pair of electric motors for driving respective ones of said toothed wheels, two independent electronic circuits for controlling respective ones of said motors, a computing means connected to said electronic circuits, said toothed wheels having teeth which are always in contact with one another, each of said toothed wheels and each of said motors being adapted so that each of said motors may drive the pump alone and permanently; measuring means, connected to said computing means, for measuring a power supply current to each of said electronic circuits; external signalling means, connected to said computing means; opening means, connected to said computing means, for opening the power supply connection of each of said electronic circuits; and said computing means comprising means for controlling said signalling means and said opening means in response to the power supply current to at least one of said electric circuits having a magnitude outside a given range.

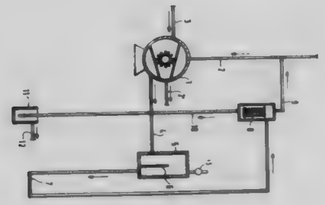
4,718,834

METHOD AND APPARATUS FOR CONVEYING GAS

Karl Ebner, and Stefan Ebner, both of Oberursel/Ts., Fed. Rep. of Germany, assignors to Ebner & Co. KG Anlagen und Apparate, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 891,336
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1985, 3533017
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—54 **11 Claims**

1. A process for conveying gas by means of a liquid ring pump, comprising the steps of:
providing an inlet flow of said gas, to be conveyed by said liquid ring pump to a gas outlet connected to gas convey tubing;
providing a continuous flow of a cooling liquid at an inlet temperature to said liquid ring pump through a cooling liquid inlet, said cooling liquid also serving as a working liquid within said liquid ring pump, said cooling liquid thereafter leaving said liquid ring pump through a cooling liquid outlet, at an exhaust liquid temperature and an exhaust pressure with an amount of said conveyed gas dissolved therein;
removing a portion of said dissolved gas from said exhaust cooling liquid flow;
dicharging said cooling liquid flow after removal of dissovled gas therefrom; and



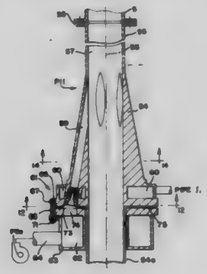
flowing said removed dissolved gas to join said inlet flow of gas to be conveyed by said liquid ring pump.
8. An apparatus for conveying gas, comprising:
a liquid ring pump provided with a gas intake, a gas outlet, a cooling liquid intake and a cooling liquid outlet, whereby a flow of gas and a flow of cooling liquid which also serves as a working liquid are effected through said liquid ring pump by operation thereof; and
degassing means connected to said liquid ring pump for receiving said cooling liquid flow from said cooling liquid outlet of said liquid ring pump for degassing of any gas dissolved therein and directing the flow of said removed gas to said gas intake of said liquid ring pump.

4,718,835

MINING APPARATUS AND JET PUMP THEREFOR

Masaku Maruyama, Yokohama, Japan, assignor to IDC Kabushiki Kaisha and Kabushiki Kaisha Miwa Suzukako, both of Yokohama, Japan

Filed Feb. 21, 1986, Ser. No. 831,591
Claims priority, application Japan, Feb. 23, 1985, 60-35117
Int. Cl.[4] F04F *5/42, 5/46*
U.S. Cl. 417—171 **2 Claims**



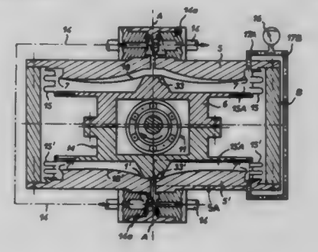
1. A jet pump comprising a main body having a linear passage through its center, a plurality of independent spray passages formed in said body and arranged around the circumference of said linear passage and slanting inwardly toward and connecting with said linear passage, each of said spray passages being provided with an interior nozzle for spraying pressurized water, and an exterior nozzle outside of said first nozzle for spraying compressed air, said exterior nozzle extending around substantially the entire outer periphery of said interior nozzle.

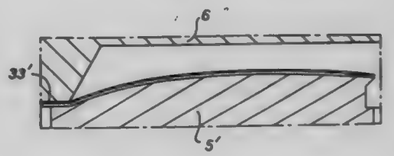
4,718,836

RECIPROCATING COMPLETELY SEALED FLUID-TIGHT VACUUM PUMP

Daniel Pottier; Rémi Leclaire, and Paul Vallies, all of Pont Audemer, France, assignors to NORMETEX, Pont Audemer, France

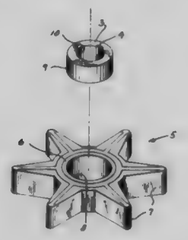
Filed Jul. 15, 1985, Ser. No. 754,738
Claims priority, application France, Jul. 23, 1984, 84 11652
Int. Cl.[4] F04B *23/12, 45/00*
U.S. Cl. 417—205 **19 Claims**





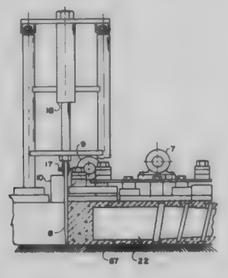
1. A completely dry fluid-tight vacuum pump comprising at least one variable volume pumping chamber having an intake, an outlet, a fixed axial end wall and a mobile axial end wall, non-return means adapted to procure one-way flow of fluid from said intake to said outlet, one or two radially stiff and axially flexible circular metal members in said chamber having an outer part fixed relative to said fixed end wall and another part fixed relative to said mobile axial end wall,
said circular metal members having opposite faces, said circular metal members being axially reciprocably movable between a first position in which said axial end walls are relatively axially remote from each other and a second position in which said axial end walls are relatively axially close together, one of the faces of said circular metal members being substantially entirely in intimate overlying relation with at least one of said end walls and having matching diametrical profiles with said at least one of said end walls in said second close together position,
and minimal residual space being defined between said one face of said circular metal members and said at least one axial end wall in said second close together position while maintaining a very small clearance between said one face of said circular metal members and said at least one axial end wall.

4,718,837
MARINE DRIVE WATER PUMP IMPELLER
Michael E. Franzell, 756 Kensington Rd., Neenah, Wis. 54956
Filed Aug. 18, 1986, Ser. No. 897,628
Int. Cl.[4] F04C *5/00*; B28B *7/20*; B29C *65/00*
U.S. Cl. 418—154 5 Claims



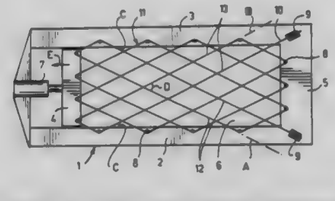
1. A marine drive water pump impeller for a marine rotary vane positive displacement water pump having a pump driveshaft, comprising a filament wound annular drive hub around said driveshaft and keyed thereto to rotate therewith, and vane means comprising an annular base bonded to said hub and having a plurality of flexible vanes extending radially outwardly therefrom, such that said filament wound annular drive hub has sufficient circumferential hoop strength, without sacrificing the strength of bond adhesion to said annular base of said vanes, to crush ice in said pump in a freezing environment.

4,718,838
AUTOCUTTING EXTRUSION MACHINE FOR PRODUCING PRESTRESSED CONCRETE CORED ARTICLES
Deguo Ren, and Lu Yonghong, both of Fuxing Men, China, assignors to Building Machines Developing Company of the Ministry of Nuclear Energy Industry, Beijing, China
Filed Mar. 31, 1986, Ser. No. 846,028
Claims priority, application China, Apr. 8, 1985, 85102514
Int. Cl.[4] B28B *1/08, 3/20*
U.S. Cl. 425—64 10 Claims



1. An extrusion machine for making prestressed concrete cored slab sections, said extrusion machine comprising:
movable support means for extruding an outside surface of a molded concrete slab;
a spiral conveyor rotatably mounted to said support means for transferring and compacting concrete within said movable support means and producing cores in said molded concrete slab;
drive means for driving said spiral conveyor, said drive means being supported by said support means;
position-restraining means for guiding said extrusion machine along a pathway on a work surface on which said concrete cored slab is being formed, said position restraining means being operably associated with said movable support means;
a movable hopper for feeding concrete to said movable support means, said movable hopper having support means for providing independent support and movement of said hopper with respect to said movable support means, wherein said movable hopper is operably associated with said support means; and
cutting means having core-plugging means attached thereto for cutting said molded concrete slab into sections with said cores of each section being plugged at both ends.

4,718,839
APPARATUS FOR PRODUCING A CONCRETE PRODUCT PRESTRESSED IN AT LEAST TWO DIRECTIONS
Ilmari Paakkinen, Helsinki, Finland, assignor to OY Partek AB, Toijala, Finland
PCT No. PCT/FI85/00033, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04361, PCT Pub. Date Oct. 10, 1985
PCT Filed Apr. 1, 1985, Ser. No. 822,427
Claims priority, application Finland, Apr. 2, 1984, 841311
Int. Cl.[4] B29C *39/14, 45/26*
U.S. Cl. 425—111 5 Claims

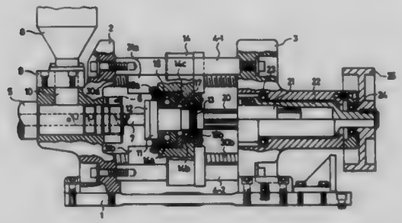


1. A casting bed for a concrete product prestressed in two directions, the casting bed comprising a mould including four sides, the sides including means for supporting crossing tendon wire extending obliquely between said sides, three sides of the mould being stationary and one side of mould being displaceable away from an opposite stationary side to stress the wires for the formation of prestressed concrete which is stressed in two directions within the mould.

4,718,840
INJECTION/MEASUREMENT MECHANISM OF INJECTION MOLDING MACHINE
Yoshiharu Inaba, Kawasaki, and Yamamura Maseto, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP85/00649, § 371 Date Jul. 23, 1986, § 102(e) Date Jul. 23, 1986, PCT Pub. No. WO86/03160, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 22, 1985, Ser. No. 890,772
Claims priority, application Japan, Nov. 24, 1984, 59-247011
Int. Cl.[4] B29C *45/77*
U.S. Cl. 425—145 3 Claims

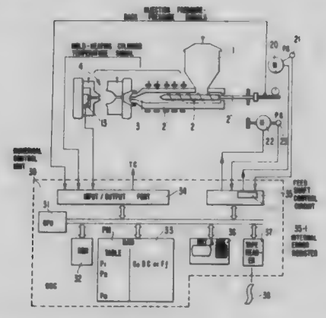
1. An injection/measurement mechanism of an injection molding machine, comprising:
(a) at least two ball screws rotatably provided between a front plate and a rear plate, said plates being fixed to a base of said injection molding machine;
(b) an injection servo motor for driving said at least two ball screws;
(c) a first transmission unit for operatively coupling said at least two ball screws with said injection servo motor;
(d) ball nuts engaged with said at least two ball screws, respectively;
(e) a pressure plate for fixing said ball nuts thereon;

(f) a screw sleeve rotatably fixed on said pressure plate;
(g) a screw fixed on said screw sleeve;
(h) a spline shaft fixed on said screw sleeve;
(i) a rotational drive pipe spline-coupled with said spline shaft;



(j) a measurement servo motor for driving said rotational drive pipe;
(k) and a second transmission unit for operatively coupling said rotational drive pipe with said measurement servo motor.

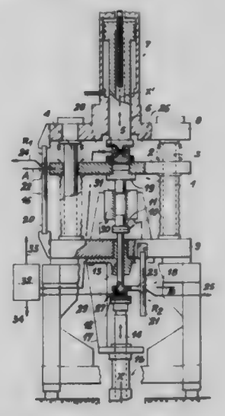
4,718,841
ROTATION CONTROL SYSTEM FOR SCREW OF INJECTION MOLDING MACHINE
Nobuyuki Kiya, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP85/00495, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01454, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 4, 1985, Ser. No. 863,890
Claims priority, application Japan, Sep. 4, 1984, 59-185048
Int. Cl.[4] B29C *45/80*
U.S. Cl. 425—149 11 Claims



1. A rotation control system for a screw of an injection molding machine in which raw material chips in a hopper are fed into a cylinder by the screw which is rotated by an electric motor and the raw material inside the cylinder is injected into a mold by movement of the screw, said system comprising:
a first electric motor for rotatively driving an injection shaft having a screw;
first control means for controlling said first electric motor;
movement means for moving the injection shaft longitudinally inside the cylinder;
means for sensing the longitudinal position of the injection shaft;
memory means for storing an override value stipulating a rotational speed of said first electric motor corresponding to the longitudinal position of the injection shaft when said first electric motor is being rotatively driven; and
second control means for sensing the position of the injection shaft when said first electric motor is being rotatively driven, for reading an override value corresponding to a predetermined position out of said memory means, and for correcting the rotational speed of said first electric motor by the override value.

6. A rotation control system for an injection molding machine having an injection shaft with a screw for feeding raw material for injection into a mold, comprising:
an electric motor for rotatively driving the injection shaft having a screw;
means for moving the injection shaft longitudinally in the injection molding machine;
means for sensing the longitudinal position of the injection shaft and for providing an output; and
a numerical control unit including:
first control means for controlling said electric motor;
memory means for storing override values for rotational speeds of said electric motor corresponding to the longitudinal position of the injection shaft when said electric motor is being rotatively driven; and
second control means for reading in the output of said sensing means when said electric motor is being rotatively driven, for reading one of the override values corresponding to the sensed position from said memory means, and for correcting the rotational speed of said electric motor in accordance with the override value which is read.

4,718,842
AUTOMATIC PRESS FOR CONTROLLING THE FORCE ON EACH MOVABLE PLATE
Philippe Labbe, 40, avenue de la Dame Blanche, 94120 Fontenay-Sous-Bois, and Patrick Reynier, 24-26, rue Silvet, 75012 Paris, both of France
Filed Sep. 10, 1985, Ser. No. 774,305
Claims priority, application France, Sep. 11, 1984, 84 13934
Int. Cl.[4] B30B *9/28*
U.S. Cl. 425—149 2 Claims



1. An automatic press comprising:
a first plate movable in translation parallel to a vertical axis,
a hydraulic jack, of which a piston secured to the first plate commands the translational movement of the first plate to bring it into a predetermined position, referenced in relation to a fixed reference position, along the vertical axis, the jack being supported by a frame,
a second plate which supports an object to be pressed, the second plate being situated facing the first plate,
wherein the jack includes internal hydro-mechanical means for controlling the position of the first plate in relation to the predetermined position, and an opto-electronic means

for indicating momentary positions of the first plate during its movement, the opto-electronic means being connected to the hydro-mechanical means for controlling the jack commanding the movement of the first plate,

wherein the second plate is movable in translation parallel to said vertical axis, the second plate being secured to a piston of another hydraulic jack, the piston of the other jack commanding the movement of the second plate to bring it into another predetermined position, referenced in relation to the fixed reference position, the other jack being directly supported by said frame and including other internal hydro-mechanical means for controlling the position of the second plate in relation to the fixed reference position, other opto-electronic means, indicating the momentary positions of the second plate during its movement, being connected to the other control means of the other jack which commands the movement of the second plate, and

wherein the first and second plates include, respectively, detectors of forces, giving, respectively, signals indicating forces exerted on the first and second plates during the pressing and during the distancing of the plates, the detectors being connected to means for control of the forces, the jacks being connected to the control means to stop movement of the plate for which the force indicated by the detector is greater than a predetermined limit force.

4,718,843

HOT PRESS FOR TREATING A WEB OF MATERIAL

Bengt J. Carlsson, Enebyberg, and Rolf T. Larsson, Kil, both of Sweden, assignors to Sunds Defibrator AB, Sundsvall, Sweden

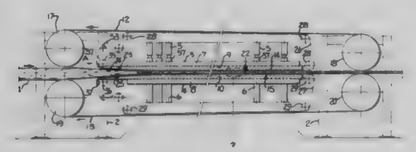
PCT No. PCT/SE86/00096, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO86/05441, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 7, 1986, Ser. No. 934,447

Claims priority, application Sweden, Mar. 13, 1985, 8501238

Int. Cl.⁴ B29C *43/42*

U.S. Cl. 425—371 **11 Claims**



1. A hot press for continuous treating a continuous web of material which is rolled into rolls or cut into boards, said hot press comprising an upper and a lower press platen, both of which are horizontal, an upper press belt running between the press platens in an upper loop over guide rolls and a corresponding lower press belt running between the press platens in a lower loop over guide rolls, and an upper movable bed of rolling bodies arranged between the upper press platen and the upper press belt, and a lower movable bed of rolling bodies arranged between the lower press platen and the lower press belt, said rolling bodies consisting of solid, elongate, cylindrical rods arranged to be conveyed in a course of circuit through the hot press, said press belts defining between them within the region of the press platens a pressing zone having an entry section converging in the direction of movement of the web, for introducing said web, wherein an aligning and feeding means is arranged for each bed of rods in connection to said entry section of the pressing zone, and comprises a rotatable wheel unit arranged within the entry section of the pressing zone and having a horizontal, rotatable shaft journalled perpendicularly to the direction of movement of the press belt, and a plurality of wheels secured to said shaft, each of said wheels peripherally supporting a plurality of relatively short cylindrical rollers which are rotatably journalled with their central axes parallel to the shaft of the wheel unit, said rollers of one wheel being coaxially aligned with the rollers of the other wheels to form rows of rollers located transverse to the direction of movement of the press belt, and that the rows of rollers in the rotatable wheel unit are arranged to be brought into contact with the rods recirculated to the entry section in such a manner that, upon contact with one rod, one row of rollers retards the movement of said one rod in relation to the press platen, thus packing the other rods located next upstream closely together, and then delivers said one rod to the pressing zone for free rolling with a predetermined pitch between the rods.

4,718,844

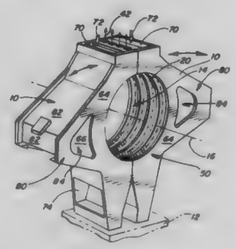
CORRUGATED MOLD BLOCK

Heinrich Dickhut, Charleston, and John S. Berns, Cleveland, both of Tenn., assignors to Callim Machine Tool & Die, Inc., Cleveland, Tenn.

Filed Feb. 27, 1987, Ser. No. 19,581

Int. Cl.⁴ B29C *49/34*

U.S. Cl. 425—522 **17 Claims**



1. A corrugated mold block for a vacuum machine for molding corrugated tubes, said block being movable about an endless path, comprising:

a sheet metal face member substantially arcuate about a longitudinal axis and corrugated with alternating circumferential grooves and lands, said member having openings through to the back thereof and communicating with said grooves;

a housing around the back of said face member;

bracing members secured to and extending between the rear of said face member and said housing;

channel members about the back of said face member adjacent said grooves and communicating therewith, said channel members defining vacuum passageways for removal of gases through said face member openings; and

vacuum ports through said housing and communicating with said vacuum passageways.

4,718,845

RACK AND PINION GEAR STACK MOLD CONTROL

James Sheffield, 184 Mackenzie Street, Alliston, Ontario, Canada (L0M 1A0), and John Rathbun, 3721 Gary Dr., Castalia, Ohio 44824

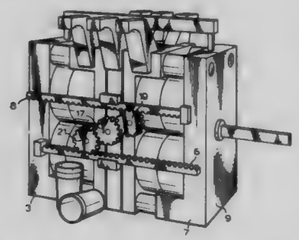
Continuation of Ser. No. 847,247, Apr. 2, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 18,856

Int. Cl.⁴ B29C *45/64, 45/66*

U.S. Cl. 425—589 **2 Claims**

1. A rack and pinion gear arrangement for movement of first and second outside mold parts relative to a centre mold part in a stack mold, said rack and pinion gear arrangement comprising pinion gear means located at said centre mold part, said pinion gear means including a drive gear, first and second follower gears driven off said drive gear and first and second free ended racks extending in opposite directions from said first and second outside mold parts respectively and in engagement with said first and second follower gears, said follower gears reaching above and below said drive gear and said first follower gear being offset to a first side of said drive gear opposite

that to which the free end of said first rack extends and said second follower gear being offset to a second side of said drive



gear opposite that to which the free end of said second rack extends for opening and closing said stack mold.

4,718,846

COMBUSTION SAFETY DEVICE FOR A GAS HEATER

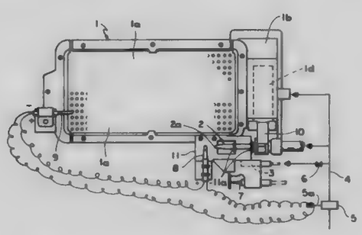
Minoru Oguri, Gifu, and Wakizi Sugimoto, Aichi, both of Japan, assignors to Rinnai Corporation, Japan

Filed Feb. 28, 1985, Ser. No. 707,117

Claims priority, application Japan, Apr. 14, 1984, 59-75568

Int. Cl.⁴ F23N *5/00*

U.S. Cl. 431—76 **19 Claims**



1. A safety apparatus for interrupting the supply of a gaseous fuel to an air-fuel combustion burner when the air which is supplied to the burner is oxygen-deficient comprising:

a main burner including an air-fuel mixing chamber and a combustion surface having a plurality of orifices in fluid communication with said chamber through which an air-fuel mixture can flow out of said chamber;

a second burner including an air-fuel mixing chamber and at least one orifice in fluid communication with said chamber through which an air-fuel mixture can flow out of said mixing chamber;

a means placing said main burner and second burner air-fuel mixing chambers in fluid communication to allow distribution of air from one of said chambers to the other of said chambers;

a means for supplying a gaseous fuel to said mixing chambers of said main burner and said second burner, said gaseous fuel supply means being in fluid communication with both of said chambers;

a means for igniting and combusting said air-fuel mixture flowing out through said orifices of said main burner and said second burner; and

a means for sensing the combustion of said air-fuel mixture at said orifice of said second burner for detecting said oxygen deficiency of said air and for closing said gaseous fuel supply means in response to a detection of an oxygen deficiency in said air-fuel mixture.

4,718,847

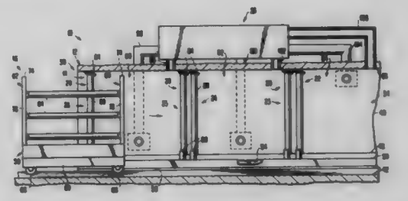
KILN SYSTEM

Ian Manson, P.O. Box 889, Arden, N.C. 28704

Filed Mar. 24, 1987, Ser. No. 29,676

Int. Cl.⁴ F27D *3/12*

U.S. Cl. 432—241 **23 Claims**



1. A material treating system, the combination comprising:

an insulated housing having first and second open ends, and a through passageway extending from said first open end to said second open end, said passageway having an inwardly facing surface and a longitudinal axis;

a kiln car adapted to be received in and pass through said passageway along said longitudinal axis and to support the material to be treated;

said kiln car having an insulated leading wall, an insulated trailing wall and an insulated bottom wall coupled to said leading and trailing walls, said leading and trailing walls being oriented substantially perpendicular to said longitudinal axis;

sealing means, coupled to said inwardly facing surface and engageable with said leading and trailing walls when said kiln car is received in a predetermined position in said passageway, for resisting heat transfer along said longitudinal axis and across said leading and trailing walls; and

means, coupled to said housing, for heating or cooling said passageway between said leading and trailing walls.

4,718,848

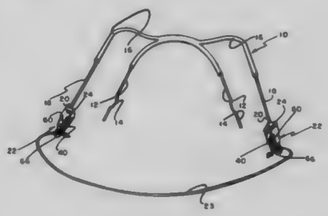
ORTHODONTIC HEADGEAR AND A METHOD FOR PREVENTING INJURIES TO PATIENTS UNDERGOING ORTHODONTIC TREATMENT WITH AN ORTHODONTIC HEADGEAR

John H. Hickham, and David A. Hickham, both of 326 23rd St., Kenner, La. 70062

Filed Apr. 28, 1986, Ser. No. 856,282

Int. Cl.⁴ A61C *7/00*

U.S. Cl. 433—5 **5 Claims**



1. An orthodontic headgear for preventing injuries to patients undergoing orthodontic treatment comprising an inner orthodontic bow means adapted to be secured to braces; an outer orthodontic bow means integrally bound to said inner orthodontic bow means and formed with a pair of arms terminating into a pair of arm ends; a pair of safety hook means connected stationarily respectively to said pair of arm ends; and safety line means bound to each of said pair of safety hooks

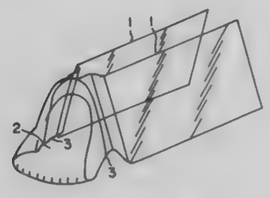
means in order to limit the distance the outer bow can be displaced forward; each safety hook comprises a male member and a female member releasably secured to said male member; said male member comprises a male body having a structure defining a cylindrical recess that accommodates an arm end of the outer orthodontic bow means; said cylindrical recess extends through the entire male body to define generally a cylindrical opening; said male member additionally comprises a resilient bifurcated fork means integrally bound to said male body; said fork means comprises a pair of fork arms protruding from said male body with a first predetermined distance separating the fork arms at the point of where the fork arms protrude from the male body; each of said fork arms terminate into a fork end, each fork end has a structure defining an outside flange means that flanges outwardly at the closest point to the male body and terminates into a beveled flange end at a point farthest from the male body; each of said fork ends has a tapering inside surface that tapers outwardly and toward the flange means and terminates into the beveled flange end at a flange extremity point such that there is a second predetermined distance separating respective flange extremity point of respective fork ends, said second predetermined distance being greater than said first predetermined distance; said female member comprises a female body with a predetermined width and open at both ends for slidably, releasably receiving the pair of fork arms of said fork means; said female member additionally comprises a generally U-shaped female end means open to the atmosphere on opposed sides and having a pair of female arms with a predetermined width and integrally bound to the female body; said predetermined width of said female arms are less than said predetermined width of said female body; and said female member additionally comprises a hook integrally bound to the generally U-shaped female end, said hook has a structure defining an aperture for receiving a safety line.

4,718,849

SHEET-LIKE DENTAL DIE

Hans von Weissenfluh, CH-6573 Magadino, and Giacomo Richner, Via Lucino 20, CH-6932 Breganzona, both of Switzerland

Filed Mar. 6, 1986, Ser. No. 836,960
Int. Cl.[4] A61C 5/04
U.S. Cl. 433—39 5 Claims



1. Sheet-like dental die made from light- and UV-transparent material not adhering to radiation-curing single-component synthetics for the external shaping of fillings in the whole coronal region of teeth, comprising:

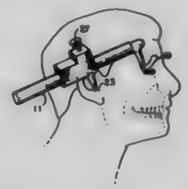
an essentially preshaped U-shaped foil having a middle portion (2) shaped to the typical anatomical features of substantially the entire tooth to be filled, and having two flat fins (1), one at each side of and connected to said middle portion (2), said fins (1) adapted to be grasped and squeezed to tighten said foil by means of a suitable instrument.

4,718,850

METHOD FOR DETERMINING VERTICAL DIMENSION

Stanley Knobelman, 20 Overbrook Pkwy., Overbrook Hills, Pa. 19151

Filed Aug. 22, 1986, Ser. No. 899,005
Int. Cl.[4] A61C 19/04
U.S. Cl. 433—72 6 Claims



1. A method for determining vertical dimension of occlusion comprising the steps of:

providing a gauging device comprising a first probe terminating in a first tip portion affording registry of said first tip with selected anatomical parts, and a second probe adjustably mounted substantially parallel to said first probe for adjustment relative to said first probe and said second probe having a second tip portion affording registry of said second tip with selected anatomical parts;

first registering one of said tips with the external auditory meatus, and adjusting said gauging device to register the other of said tips with the lateral corner of the ocular orbit to establish a first measurement;

then positioning the tip of the second probe spaced relative to the tip of said first probe a factored distance based on said first measurement;

thereafter, without changing said positioning of the tips, registering one of said tips with the nasal spine and positioning the other of said tips adjacent the anterior part of the undersurface of the mandible; and

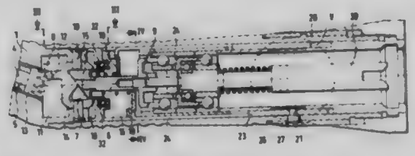
then positioning the mandible to engage said other tip.

4,718,851

HANDPIECE, ESPECIALLY FOR DENTAL PURPOSES

Bernhard Kuhn, Schemmerhofen, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Oct. 17, 1986, Ser. No. 920,831
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540621
Int. Cl.[4] A01C 3/08
U.S. Cl. 433—122 10 Claims



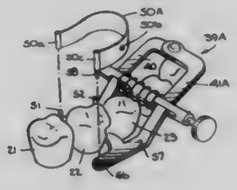
1. Handpiece, especially for dental purposes, comprising a gripping sleeve; a treating implement supported at one end of said gripping sleeve for limited reciprocating pivotal movement about its axis; an intermediate drive shaft for driving said treating implement arranged in the gripping sleeve and being reciprocably pivotable about its axis to a limited extent; wobble surface means for effecting the reciprocable pivotability of said intermediate drive shaft, said wobble surface means being arranged at the end a drive shaft towards said implement which is rotatably supported within the handpiece and operatively cooperating with the end of said intermediate drive shaft which is distant from the implement; converting means arranged between the end of the intermediate drive shaft which is distant from the implement and the wobble surface means for converting the rotational movement of the drive shaft into a pivoting movement of the intermediate drive shaft, said converting means including an intermediate element reciprocably pivotable about a pivoting axis extending transversely of the axis of said drive shaft, a toothed-segment follower on said intermediate element transmitting the reciprocating pivoting movement engaging a spur gear on said intermediate drive shaft, and a rooflike engaging element for cooperation with the wobble surface means of the drive shaft.

4,718,852

KIT OF ARMAMENTARIUM FOR RESTORING POSTERIOR TEETH WITH INTERPROXIMAL DECAY

Jeffrey M. Geller, 18 Copper Beech Ln., Lawrence, N.Y. 11516

Division of Ser. No. 640,803, Aug. 14, 1984, Pat. No. 4,601,662.
This application Apr. 2, 1986, Ser. No. 847,286
Int. Cl.[4] A61C 7/00
U.S. Cl. 433—148 11 Claims



1. A dental separator for spreading apart from each other at their contact point two posterior teeth at least one of which is affected by interproximal decay, comprising a pair of elongated arms pivotally connected to each other and having respective sections extending away from the pivot connection generally alongside each other at a spacing sufficient to enable one of said sections to be disposed on the lingual side and the other of said sections to be disposed on the buccal side of the teeth to be spread apart, each of said arms carrying in said section thereof intermediate the pivot connection and the free extremity of said section a respective wedge element having an apex, each of said wedge elements extending from its associated arm toward the other arm and having its apex in confronting relation to the apex of the other wedge element, both said wedge elements being shaped and dimensioned to be able to enter into the gingival space between the teeth to be spread apart, actuator means interconnected with said arms for selectively displacing said sections thereof toward and away from each other for forcing said wedge elements into and retracting them from said gingival space, and respective first means carried by said section of said one arm, one between the associated wedge element and the pivot connection and one between the associated wedge element and the free extremity of said section of said one arm, for enabling one end of a matrix strip to be anchored to said one arm.

4,718,853

FOUR POLE, VEHICLE-TRAILER ELECTRICAL CONNECTOR

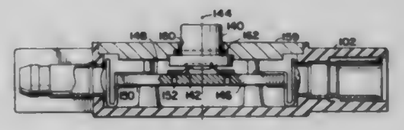
Robert S. Orbanic, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 1, 1986, Ser. No. 914,042
Int. Cl.[4] H01R 13/70
U.S. Cl. 439—35 13 Claims

1. An electrical connector for interconnecting first and second electrical circuits of two vehicles, said first circuit terminating in a four pole flat plug and said second circuit terminating in a four pole flat socket, said connector comprising:

a housing having a generally parallelepipedonal form with opposed major surfaces separated by and joined to minor surfaces, said major surfaces defining a given plane;

a plurality of first conenctors coupled to said housing and projecting from a first minor surface, each of said first connectors of said first plurality of first conenctors being electrically connectable to a separate first vehicle electrical circuit of a plurality of first vehicle electrical circuits via said four pole flat plug;



a plurality of second connectors coupled to said housing and projecting from a second minor surface, each of said second connectors of said plurality of second connectors being electrically connectable to a separate second vehicle electrical circuit of a plurality of second vehicle electrical circuits via said four pole flat socket; and

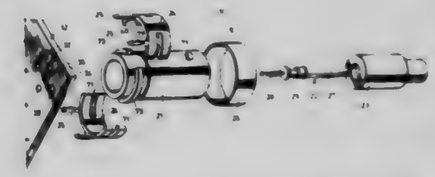
means coupled to said housing for selectively electrically connecting each first vehicle electrical circuit to any one of the second vehicle electrical circuits, said means having selectors projecting from one of said major surfaces and each having an axis of rotation transverse to said given plane.

4,718,854

LOW PROFILE PRESS FIT CONNECTOR

Randolph E. Cupp, Mechanicsburg; Douglas M. Johnescu, York; Ronald C. Landig, Mechanicsburg; George W. Michael, III, Harrisburg, and Charles D. Pearl, Grantville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1986, Ser. No. 943,534
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—63 15 Claims



1. In an electrical connector for mounting on a printed circuit board and for connection to conductive coatings of the printed circuit board in apertures extending through the printed circuit board, the coenector comprising, a conductive shell encircling an insulative body, a conductive contact having a portion surrounded by the insulative body, and having a portion projecting outwardly from the shell, and conductive further electrical contacts integral with a conductive corresponding strip and projecting from an edge of the corresponding strip parallel to a thickness of the corresponding strip for insertion into corresponding apertures, the improvement comprising:

the further electrical contacts extend from an edge of the corresponding strip perpendicular to a length of the corresponding strip, the length of the corresponding strip is transverse to the axis of the shell,

a conductive ring overlaps the length of the corresponding strip,

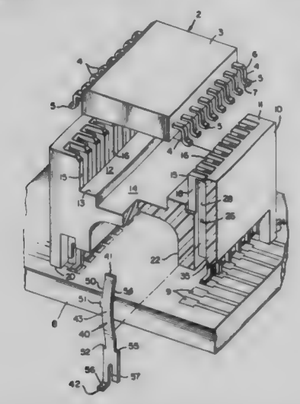
and the length of the corresponding strip is overlapped by and between the shell and the ring.

4,718,855

SOCKET FOR INTEGRATED CIRCUIT COMPONENT

Timothy B. Billman, King; James R. Coller, Kernersville, and Gary R. Marpoe, Jr., Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 677,154, Dec. 3, 1984, Pat. No. 4,560,218. This application Oct. 31, 1985, Ser. No. 793,516
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—70 **23 Claims**



1. Apparatus for socketing integrated circuit components, in which the integrated circuit components each have a plurality of component leads extending in rows on opposite sides of an integrated circuit component body, the apparatus comprising:

an insulative socket housing having a plurality of cavities extending inwardly from the top thereof, the cavities being arranged along and adjacent opposite outer sides of the housing, and having centerline spacings equivalent to the centerline spacings of the component leads, each cavity being open along the top of the housing and partially open along an inwardly oriented face of the housing, the housing defining a component seating ledge at the bottom of the inwardly open portions of the cavities, each cavity having first and second opposite endwalls extending from said inwardly oriented face toward the outer housing side; and

a plurality of resilient contact terminals received within corresponding cavities, each terminal having an arcuately deformed intermediate section restrained within the corresponding cavity and a component lead contact surface preloaded toward the first endwall, the terminals being oriented to engage a corresponding lead insertable between the terminal and the first endwall only along one interstitial edge of the lead; the opposite interstitial edge of each leading engaging the first endwall.

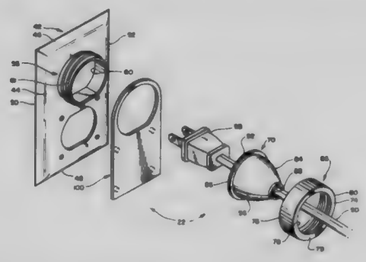
4,718,856

SAFETY COVERS FOR ELECTRICAL OUTLETS (II)

Michael B. Pinkerton, 2015 144th SE., Bellevue, Wash. 98007, and David Moskowitz, 1803 127th SE., Bellevue, Wash. 98005

Continuation-in-part of Ser. No. 815,528, Jan. 2, 1986, Pat. No. 4,691,974. This application Aug. 18, 1986, Ser. No. 897,083
Int. Cl.[4] H01K *13/44*
U.S. Cl. 439—147 **4 Claims**

1. A protective cover for an electrical outlet having first and second exposed female connectors, said cover including: a base plate which is adapted to fit over and be attached to said outlet, there being an aperture through said plate which is then aligned with said one of said female connectors and thereby allows a male connector to be plugged into that female connector; an externally threaded boss protruding outwardly from said base plate and surrounding said aperture; means which is or comprises an internally threaded safety cap adapted to be threaded onto said boss to prevent access to said female connector through said aperture, the external threads on said boss and the internal threads in said safety cap being so related that



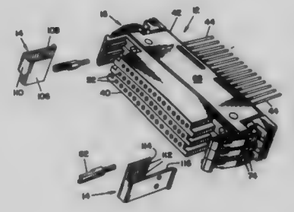
pressure must be exerted on said safety cap and said cap simultaneously rotated to engage said external and internal threads and allow said cap to be removed from said boss; and a protective shield which is dimensioned to overlie, and thereby deny access to, the second of said female connectors, said shield being journalled on said outwardly protruding boss between said base plate and said internally threaded safety cap and thereby being adapted to be clamped to said base plate by said cap to retain said protective shield in overlying relation to said second female connector.

4,718,857

ELECTRICAL CONNECTORS AND CLIPS AND METHODS OF USE

Rocco Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Apr. 10, 1987, Ser. No. 37,047
Int. Cl.[4] H01R *13/28*
U.S. Cl. 439—292 **21 Claims**



1. In combination, a plurality of like connectors in an aligned stack and a pair of clips coupling together said connectors, each of said connectors comprising a housing molded of an electrically insulating material and shaped with parallel upper and lower surfaces and with spaced front and rear

faces and with spaced edges, a plurality of apertures formed into said front face in a linear array with their axes in a plane parallel with and between said upper and lower surfaces, an electrically conductive female contact located in each of said apertures adapted to receive associated electrically conductive male contacts, each said housing having a latch plate secured to its upper surface with resilient edge latches positioned adjacent its edges and within its plane, each said edge latch having a central extent being movable toward said housing upon the application of pressure and being resiliently movable away from said housing upon the removal of the pressure; and

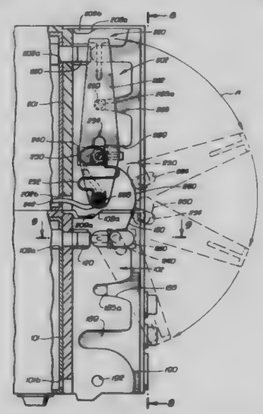
each clip of said pair of clips comprising an internal section, an external section parallel with said internal section and an intermediate section joining said internal and external sections in a U-shaped configuration, each clip also being positioned with its internal and external sections positioned in association with edge latches along one edge of said plurality of connectors in the aligned stack so as to couple together said connectors and to apply an inwardly directing compressive pressure to a plurality of edge latches in the stack whereby only one edge latche along each said edge of the stack is resiliently biased outwardly for the removable coupling of said stack of connectors and their clips to an associated electronic machine.

4,718,858

MECHANICAL INTERCONNECT SYSTEM FOR ELECTRONIC UNITS ENCLOSED IN STACKABLE HOUSINGS

Richard J. Godfrey, Tustin, and Ray N. Dushane, Fullerton, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 16, 1986, Ser. No. 874,599
Int. Cl.[4] H01R *13/629*
U.S. Cl. 439—296 **32 Claims**



1. An inter-unit coupling mechanism for coupling a first electronic unit housed in a first enclosure to a second electronic unit housed in a second enclosure comprising:

a first connector that is movable externally of the first enclosure from a first predetermined position which is fixed relative to the first enclosure to a second predetermined position which is also fixed relative to the first enclosure;

a second connector engageable with the first connector and fastened to the second electronic unit;

communicating means for coupling the first connector to the first electronic unit housed in the first enclosure; and

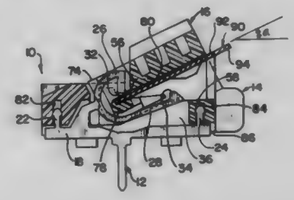
guide means for guiding the first connector along a predetermined controlled path into engagement with the second connector when the first and second enclosures are aligned in a predetermined relationship, wherein the controlled path links the first enclosure to the second enclosure in a substantially complete manner and wherein the controlled path includes the first and second positions.

4,718,859

ZERO INSERTION FORCE CONNECTOR FOR FLEXIBLE FLAT CABLE

Michael J. Gardner, Rochester Hills, Mich., assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 16, 1987, Ser. No. 25,916
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—329 **16 Claims**



1. A zero insertion force connector for a flat cable, said cable having opposed top and bottom surfaces, said connector comprising:

a base comprising an initial fulcrum, an actustor channel and an anti-overstress fulcrum;

a plurality of electrical contacts mounted to said base, each said contact including first and second contact arms terminating respectively at first and second spaced apart contact points, said contact points being disposed within the actuator channel of said base; and

an actuator having a cable channel for receiving a flat cable therein, said actuator being dimensioned to be inserted in the actuator channel of said base, said actuator including an initial stop engageable with the initial fulcrum of said base when said actuator is disposed within the actuator channel of the base, said actuator being pivotable about the engagement between said initial stop and said initial fulcrum to urge said cable into contact with said anti-overstress fulcrum of said base, said actuator and said flat cable being further pivotable about said anti-overstress fulcrum to urge the top and bottom surfaces of said flat cable into said first and second contact points respectively.

4,718,860

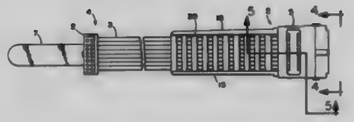
TAPERED STRAIN RELIEF ELECTRICAL INTERCONNECTION SYSTEM

Roy A. Gobets, and John N. Tengler, both of Chico, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 14, 1986, Ser. No. 897,112
Int. Cl.[4] H01R *13/56*
U.S. Cl. 439—447 **20 Claims**

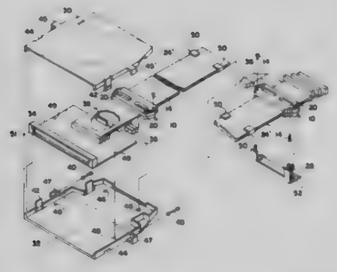
1. A strain relief for a cable termination assembly that includes a flat cable and a cable termination, comprising tapered beam means for undergoing controlled bending according to a prescribed function, securing means at one end of said tapered beam means for securing said tapered beam means to the cable termination, and holding means for holding said tapered beam means with respect to the cable to control the bending of the cable, said holding means including means defining a passage-

way for sliding receipt of the cable, and said tapered beam means including a pair of laterally spaced-apart, tapered beams



of rail-like configuration extending generally parallel to said passageway at respective opposite edges of said passageway.

4,718,861
DETACHABLE CABLE STRAIN RELIEF CLAMP
Brian J. Wood, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Jun. 23, 1986, Ser. No. 877,589
Int. Cl.⁴ H01R 9/07, 13/58
U.S. Cl. 439—460 **3 Claims**



1. A cable clamp assembly disposed for providing strain relief for at least one flat cable of an electronic instrument, said assembly comprising:

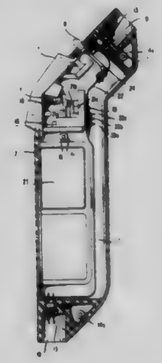
two identical clamp halves defining an aperture through the assembly when the two clamp halves are placed in opposing relationship to each other for capturing the stack of said at least one flat cables, said aperture having an outline that complements the various widths of said at least one flat cable, each of said clamp halves also defining means for mounting the clamp assembly at each end of the assembled clamp perpendicular to the normal cable forces;

means for fastening said two clamp halves together;

a pair of snap fasteners disposed to be captured by the mounting means at each end of the assembled clamp and disposed to be mounted to a fixable mechanical portion of the electronic instrument; and

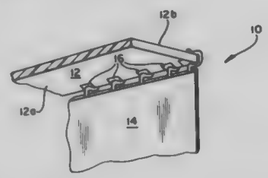
a chassis bracket attachable to the electronic instrument disposed to capture said snap fasteners to provide strain relief to said at least one stacked flat cable as they pass through the chassis wall of the electronic instrument, said chassis bracket defines at least one of a groove and tongue around its perimeter where the chassis bracket attaches to said electronic instrument, with the electronic instrument having complementary mating surfaces to capture said chassis bracket in tongue and groove fashion.

4,718,862
TWO-WAY ELECTRICAL APPARATUS HANDLE
Dean A. Beeman, Fair Haven Township, Monmouth County, N.J., assignor to AT&T, New York, N.Y.
Filed Apr. 18, 1986, Ser. No. 853,497
Int. Cl.⁴ H01R 11/09
U.S. Cl. 439—482 **5 Claims**



1. A handle for an electrically operated apparatus comprising a body portion for gripping said handle, said body having an elongated portion and a shorter portion extending at an angle from said elongated portion, connector means at each end of said body for connecting an electrical cord and an electrical device through said handle, said connector means allowing said cord and device to be insertable in either end of said handle interchangeably, means within said handle for electrically coupling said connector means at each end of said handle, a switch actuator extending from said body and a switch mounted within said body in a manner so as to be activated by said switch actuator, said switch being electrically coupled to said connector means so as to make and break the circuit between said connector means, and wherein said switch actuator extends along the top of said body in the region bridging where said elongated portion meets said shorter portion.

4,718,863
JUMPER CABLE HAVING CLIPS FOR SOLDER CONNECTIONS
Amir-Akbar Sadigh-Behzadi, Van Nuys, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed May 2, 1986, Ser. No. 859,105
Int. Cl.⁴ H01R 9/07
U.S. Cl. 439—496 **4 Claims**



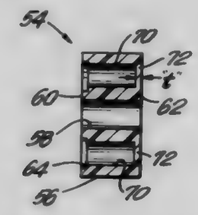
1. A multiconductor jumper cable for solder connection to opposing surfaces of an electrical component, comprising:

a plurality of elongate, transversely spaced conductors surrounded by a casing of insulation, each of said conductors being formed of a substantially non-resilient metal,

each conductor including an integral clip portion extending outwardly from said casing, each clip portion having a substantially circular cross-section and having a generally

U-shaped configuration formed by two spaced legs connected by a curved bridging portion, said U-shaped configuration defining a pocket for receipt therein of said electrical component, said legs being spaced for engaging opposing surfaces of said electrical component upon receipt of said electrical component and for contacting said opposing surfaces thereof with sufficient force to hold said clip onto said electrical component but with insufficient force to provide an electrical pressure connection thereto, the engagement locations of said legs defining a throat of said pocket that has a spacing less than the spacing of said legs in the interior of said pocket adjacent said bridging portion.

4,718,864
HIGH FREQUENCY COAXIAL CONNECTOR AND MOLDED DIELECTRIC HEAD THEREFOR
James R. Flanagan, New Britain, Conn., assignor to Sealectro Corporation, Trumbull, Conn.
Filed Jul. 30, 1986, Ser. No. 891,738
Int. Cl.⁴ H01R 17/18
U.S. Cl. 439—578 **5 Claims**



1. An injection molded dielectric support bead for use in a high frequency electrical connector, said injection molded dielectric support bead being formed from a plastic material and being of uniform density, said injection molded dielectric support bead being of cylindrical configuration including first and second parallel end faces and a central aperture extending therethrough, said injection molded dielectric support bead further including an array of apertures extending through said first end face and disposed concentrically about the central aperture, each aperture of said array of apertures extending a major portion of the distance between said first and second end faces of said injection molded dielectric support bead but terminating short of the second end thereof to define a continuous shroud at the second end of said dielectric support bead, said apertures in said array of apertures being parallel to the central aperture thereof, said bead further comprising an undercut portion at the first end thereof concentric with said central aperture and aligned with the ends of the apertures in said array of apertures.

4,718,865
INSULATED ELECTRICAL PLUG
August V. Cordeiro, East Greenwich, R.I., assignor to Electric Terminal Corporation, Warwick, R.I.
Continuation of Ser. No. 693,041, Jan. 22, 1985, abandoned. This application Aug. 14, 1986, Ser. No. 896,669
Int. Cl.⁴ H01R 19/04
U.S. Cl. 439—606 **3 Claims**

1. An electrical plug comprising

a wire,

a blade,

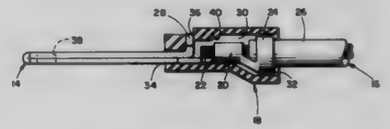
a preformed cover, and

a housing,

said wire comprising a multiplicity of stranda covered by insulation, end portions of said strands being exposed,

said blade including a first gripping portion engaging said exposed end portions of said strands, a contact portion, a bent tab extending transversely from said blade between said first gripping portion and said contact portion, and a second gripping portion engaging said insulation,

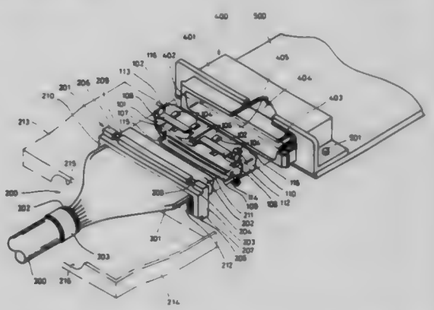
said cover completely surrounding said exposed end portions, first and second gripping portions and insulation so as to prevent loose exposed strands from extending from said cover, and including a cavity for receiving said gripping portions and attached wire, a first opening



at one end of said cavity through which said wire passes, and a second opening at the other end of said cavity from which said contact portion of said blade extends, a recess extending from said cavity, and an inclined surface leading to said recess for flexing said tab prior to being received in said recess.

said housing being of insulating material and being molded over said cover completely thereabound.

4,718,866
ELECTRICAL CONNECTOR SHIELD CASE AND METHOD OF MAKING SAME
Masao Yamaguchi, Tokyo, Japan, assignor to Hirose Electric Co., Tokyo, Japan
Filed Dec. 22, 1986, Ser. No. 945,037
Claims priority, application Japan, Dec. 27, 1985, 60-292937
Int. Cl.⁴ H01R 13/648
U.S. Cl. 439—607 **6 Claims**



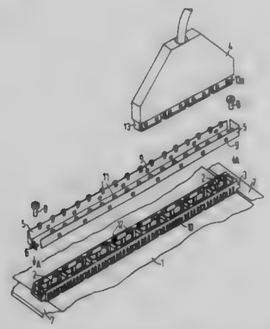
1. An electrical connector shield case for covering a protuberance of an insulating housing with a plurality of contacts therein, which comprises:

a cylindrical metal member with parallel major sides, one of which has a pair of mating portions;

at least one boss projected outwardly from at least one of said major sides so as to make shielding contact with a shield member of another connector;

a pair of engaging means each extending from an edge of a said mating portion for engagement with said insulating housing so that said mating portions are brought into close contact with each other.

4,718,867
MULTI-POLE PLUG MECHANISM COMPRISING A CENTERING STRIP WITH A SHIELDING DEVICE
Peter Seidel, Groebenzell; Leo Pelzl, Holzkirchen, and Karl Zell, Niederpoecking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 11, 1986, Ser. No. 873,594
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521890
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—609 10 Claims



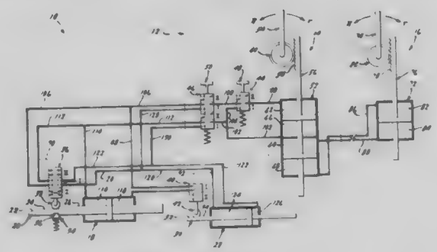
1. A multi-pole plug mechanism comprising a centering strip having side walls which can be put in place on a motherboard and serves for the acceptance in a plug-in direction of a plug equipped with a shielding, said centering strip having a shielding device which is electrically connected to regions of a subrack holding said motherboard that lie at grounded potential wherein said shielding device is formed by at least one separate shielding element comprising shielding surfaces aligned parallel to the plug-in direction which lie at least approximately flush against the side walls of said centering strip; and in that spring elements are arranged such at said shielding surfaces that said spring elements press resiliently against the shielding of the plug in the plugged condition of said plug.

4,718,868
ANNULAR COILED SPRING ELECTRICAL CONTACT
Robert A. Williams, 55 Bounty Rd. East, Fort Worth, Tex. 76116
Filed Aug. 31, 1982, Ser. No. 413,540
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—840 22 Claims



1. An annular spring, comprising:
a first coiled spring having two ends, and
a second coiled spring located within said first coiled spring and having two ends,
one end of said second coiled spring being connected to one end of said first coiled spring and the other end of said second coiled spring being connected to the other end of said first coiled spring such that said first coiled spring is formed to an annular configuration with its two ends coupled together and said second coiled spring forms a generally annular configuration within said first coiled spring.

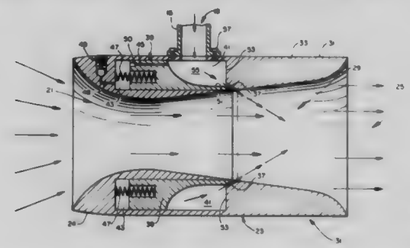
4,718,869
MARINE ENGINE THROTTLE/TRANSMISSION HYDRAULIC ACTUATOR
Robert C. Fisher, 4200 N. Dixie Highway, West Palm Beach, Fla. 33407
Filed Jan. 30, 1987, Ser. No. 8,754
Int. Cl.[4] B63H *23/04*
U.S. Cl. 440—1 6 Claims



1. In a propulsion system comprising
an engine having a throttle, and
a transmission connected to said engine, the improvement comprising a hydraulic system for controlling the operation of said throttle and said transmission, said hydraulic system comprising
a reciprocating bidirectional pump having an input shaft;
a first reciprocating bidirectional motor having an output shaft connected to said throttle;
a second reciprocating bidirectional motor having an output shaft connected to said transmission;
first fluid control means mechanically engaged with the output shaft of said first motor, whereby fluid communication between said pump and said second motor is controlled by the position of the output shaft of said first motor; and
second fluid control means mechanically engaged with the output shaft of said second motor, whereby fluid communication between said pump and said first motor is controlled by the position of the output shaft of said second motor.

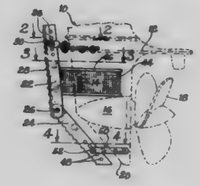
4,718,870
MARINE PROPULSION SYSTEM
Leonard Watts, North Miami Beach, Fla., assignor to Technet Corporation, Greenwich, Conn.
Continuation of Ser. No. 466,657, Feb. 15, 1983, abandoned.
This application Nov. 22, 1985, Ser. No. 800,102
Int. Cl.[4] B63H *11/103*
U.S. Cl. 440—47 5 Claims

1. A fluid flow amplifier for a marine propulsion water jet system including the injection of a high velocity principal water flow into a slower velocity secondary water flow to form a water jet, said amplifier comprising:
an adjustable orifice through which said principle water flow is injected into said secondary water flow;
hydraulically balanced means for automatically adjusting the size of said orifice so as to maintain relatively constant primary water injection velocity;
a water jet pod for channeling said a secondary water flow, wherein said hydraulically balanced means includes a compensating annular sleeve mounted in said pod, and said adjustable orifice includes an annular shoulder on the inner surface of said pod and a lip on one end of said annular sleeve interacting with the shoulder, and wherein said hydraulically balanced means also includes a primary annular chamber formed between the end of said sleeve



including said lip and said pod for receiving said principal water flow, a secondary annular chamber formed between the other end of said sleeve and said pod, and a constricted water flow channel interconnecting said annular chamber through said sleeve.

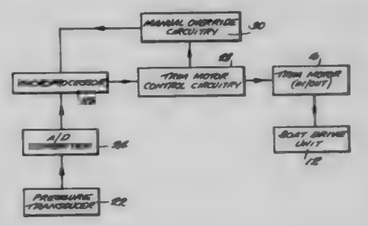
4,718,871
AQUATIC GROWTH CUTTER
Eli Mendelevitch, 1920 Una St., San Diego, Calif. 92113
Filed Mar. 24, 1986, Ser. No. 843,309
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—71 8 Claims



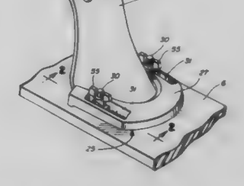
1. An aquatic growth cutter for a submerged, water-parting portion of a vessel comprising:
(a) an upper blade having a sharp leading edge:
(b) a lower blade having a sharp leading edge and rigidly depending from said upper blade a fixed, wide oblique angle thereto;
(c) upper mounting means mounting said upper blade to said vessel;
(d) lower mounting means mounting said lower blade to said vessel, said upper and lower mounting means mounting said blades such that same are substantially in advance of said water-parting portion of a vessel to cut aquatic growth as said vessel moves through the water; and
(e) said upper blade and lower blade being adjustably pivotally fastened together to be releasable from their fixed relation with one another to pivot in the same plane and including means to fix same together, after being released and adjusted, at a selected angle.

4,718,872
AUTOMATIC TRIM SYSTEM
Jeffrey A. Olson, and M. Jeremy Lieb, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Sep. 9, 1985, Ser. No. 773,591
Int. Cl.[4] B63H *5/06*
U.S. Cl. 440—1 9 Claims

1. Apparatus for trimming a drive unit on a boat, said apparatus comprising means for sensing an increase in boat speed, means for changing the trim of the drive unit, and control means connected to said sensing means and to said trim changing means for changing the trim of the drive unit until said sensing means senses the absence of boat speed increase.



4,718,873
LOCK FOR WATER SKI BINDING
Charles L. Shaw, Kirkland; Ray Elder, Seattle, and Douglas A. Barchek, Issaquah, all of Wash., assignors to O'Brien International, Inc., Redmond, Wash.
Filed Aug. 30, 1985, Ser. No. 771,214
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—70 8 Claims



1. A lock assembly for a water ski having a binding assembly including a heel cup provided with an elongated slot, a stud extending upwardly from the ski through the slot in the heel cup for slidably mounting the heel cup relative to the ski, and a serrated surface on said heel cup, the lock assembly including a bottom part mounted on the stud, means on the bottom part engageable with the heel cup for preventing rotation of the bottom part relative to the heel cup, the bottom part including a serrated surface which is engageable with the serrated surface of the heel cup, a top part rotatably mounted on the stud above the bottom part, means on the stud for retaining the top part on the stud, each of the bottom part and the top part having inter-engaging camming surfaces whereby the bottom part may be forced downwardly against the heel cup by rotating the top part about the stud.

4,718,874
ROTARY FLIGHT DEVICE
Marc R. Warren, 77 Cook Hill Rd., Windsor, Conn. 06095
Filed Aug. 27, 1986, Ser. No. 900,703
Int. Cl.[4] A63H *27/12*
U.S. Cl. 446—36 20 Claims

1. A hand-launched rotary flight device comprising:
(a) a central hub having an axis of rotation and comprising a finger grip portion;
(b) a plurality of spaced-apart blades joined to the hub at a blade-mounting portion thereof, and extending radially therefrom and terminating in respective blade tips; the hub being rotatable with the finger grip portion, the finger grip portion adjoining the blades at the hub and extending axially from the blade-mounting portion and being dimen-

sioned and configured to enable manual gripping thereof between thumb and forefinger by the operator to impart



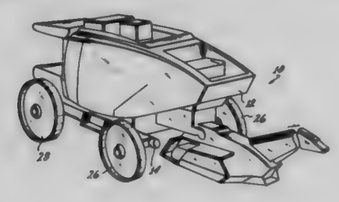
to the device free-flight and rotary motion about the axis of rotation of the hub.

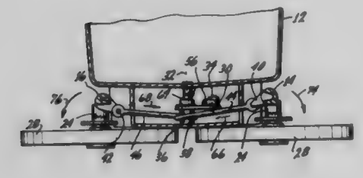
4,718,875

TOY VEHICLE WITH FOLDABLE WHEELS

Michael McKittrick, Torrance; David L. Maurer, Lawndale, and Howard R. Stern, Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 3, 1986, Ser. No. 882,008
Int. Cl.[4] A63H *17/267*
U.S. Cl. 446—231 6 Claims





1. A toy vehicle comprising:

a body portion;

two elongated axle members rotatably engaged to said body portion, said axle members located at opposite sides of said body portion;

front and rear wheels rotatably engaged to said elongated axle members, one each of said front and rear wheels being engaged to each of said axle members;

folding means operably mounted on said body portion for rotating said wheels from a vertical position to a substantially horizontal position; and

hand grip means for activating said folding means, said folding means including (a) a pivot plate rotatably mounted to said body portion, said plate having pins attached thereto, (b) two slotted links each having an elongated slot passing through one end thereof, each of said elongated slots operably engaging one of said pins attached to said plate and the other end of each of said slotted links rotatably engaged to one of said elongated axle members, and (c) a trigger link having one end thereof engaged to one of said pins attached to said plate and the other end thereof engaged to said hand grip means.

4,718,876

CHILD CALMING TOY WITH RYTHMIC STIMULATION

Min J. Lee, CPO Box 7068, Seoul, Rep. of Korea

Filed Jan. 27, 1986, Ser. No. 822,530
Claims priority, application Rep. of Korea, Oct. 7, 1985, 12993
Int. Cl.[4] A61B *19/00*
U.S. Cl. 446—295 26 Claims



1. A child pacifying doll, comprising:

(a) a skin defining doll body configured and dimensioned to allow the doll body to be hugged;

(b) stuffing means disposed in said skin, and filling said skin into a soft doll body form and defining an internal volume within said doll body;

(c) a vibrator element having a mass, disposed in said internal volume; and

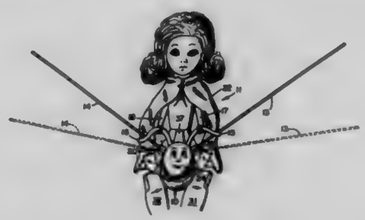
(d) an electromagnetic inertial pulsating device secured to said vibrator element, said inertial device having a vibrating mass coupled resiliently to the mass of the vibrator element and comprising switch means for sensing the proximity of a child and pulsating in response thereto.

4,718,877

WINGED TOY

Charles W. Girsch, and B. J. Maria Girsch, both of 294 Summit Ave., St. Paul, Minn. 55102

Filed Sep. 22, 1986, Ser. No. 909,916
Int. Cl.[4] A63H *3/00, 3/06, 3/20*
U.S. Cl. 446—313 20 Claims



1. A winged toy having a flexible, hollow body portion designed to be held in a hand of an operator;

a plurality of wings designed to be secured to and projecting from opposite sides of the body portion; and

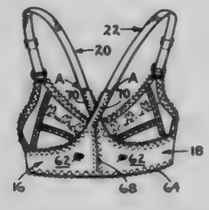
means for securing said wings to opposite walls of said body portion in such a manner that said wings normally project from the body portions at a predetermined angle with respect to a horizontal plane through the body portion, said predetermined angle being changed upon squeezing of said body portion due to distortion of the body wall changing the angle at which the securing means hold the wings, thus causing the wings to give the appearance of flapping.

4,718,878

FRONT-OPENING BRASSIERE WITH RACER STYLE BACK

Flavia Di Tullio, New York, N.Y., assignor to Bali Company, Winston-Salem, N.C.

Filed Nov. 12, 1986, Ser. No. 929,491
Int. Cl.[4] A41C *3/02*
U.S. Cl. 450—58 3 Claims



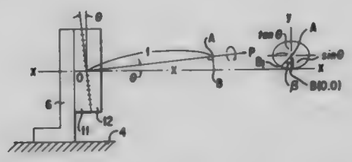
1. A brassiere construction including a pair of front sections, each front section including a cup and a front band secured to the cup, each said front band including a first portion extending vertically between the cups of said first sections, and a second portion extending along marginal lower edges of an adjacent cup, means for releasably coupling said first portions of said front bands for securing the brassiere in encircling relation upon a wearer, said coupling means including vertically spaced first and second discreet pairs of hook and loop elements secured to said first portions of said front bands adjacent upper and lower marginal edge portions of said first portions, a pair of back band assemblies, said back band assemblies including first portions connected to said second portions of said front bands, each said back band assembly further including a second portion having a first section and an elongated second section, means securing together said first sections, said second sections extending generally vertically upwardly substantially perpendicular to lower marginal edges of said first section, and centrally of the back of a wearer to define a racer style, said second sections being independently displaceable relative to each other and said second sections, and disposed in crossed fashion, and a pair of adjustable strap assemblies secured to said front sections and to said second sections.

4,718,879

DEVICE FOR FITTING AND ADJUSTING AN ENCODER

Yasuyuki Wada, Osaka, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Kyoto, Japan

Filed Jan. 3, 1986, Ser. No. 870,329
Claims priority, application Japan, Jan. 7, 1985, 60-124901
Int. Cl.[4] F16D *1/12*
U.S. Cl. 464—185 1 Claim



1. A device for fitting and adjusting an encoder having a flange and an encoder rotation shaft connected to a rotation shaft of a rotatable body through a diaphragm type coupling means to obtain rotation of the encoder shaft at equal angular speed to that of said rotation shaft, comprising a bracket receiving a coupling shaft of the coupling; a first inclined plate and a second inclined plate both rotatably disposed between an encoder fitting surface of the bracket and the flange, a joined surface formed by and between the first inclined plate and the second inclined plate being slightly inclined with respect to a surface orthogonal to the axis of the rotation shaft of the rotatable body, while surfaces of said first and second inclined plates on the opposite sides, respectively, of said joined surface being respectively generally orthogonal to the axis of said rotation shaft, so that the rotation shaft of the rotatable body may be generally parallel to the rotation shaft of the encoder through adjustment by turning one of the first inclined plate and the second inclined plate, said first annular inclined plate having a projecting engaging portion comprising one portion section adapted to engage with an inner peripheral surface of the bracket and another portion section adapted to engage with the second annular inclined plate; the second annular inclined plate being formed thereon with a plurality of arcuate slots circumferentially spaced from each other for reception of set screws for rotatable connection with the first annular inclined plate, and means in the second annular inclined plate formed intermediate two of the arcuate slots for fitting the encoder to the second annular inclined plate; the first annular inclined plate also being formed with a plurality of circumferentially spaced arcuate slots for reception of set bolts for rotatable connection to the bracket, and plural tapped holes for reception of set bolts, said tapped holes being formed on the circumference thereof; said bracket having tapped holes circumferentially spaced from each other for reception of said set bolts.

4,718,880

POWER TRANSMISSION CHAIN-BELT

George A. Zimmer, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 3, 1962, Ser. No. 304,449
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—201 3 Claims



1. A metal chain-belt especially adapted to provide a drive between the pulleys of a variable ratio transmission, said pulleys being each constructed of a pair of pulley flanges, comprising:

a plurality of sets of interleaved links, some of said sets of links having a pitch which is different from and larger than the pitch of other sets of links;

pivot means joining the adjacent sets of links to permit articulation of said sets of links; and

a plurality of generally trapezoidal load blocks encircling said links and located between said pivot means for each set of links, said blocks having opposite edge surfaces adapted to contact the pulley flanges to transmit power between the pulleys, the number of the blocks encircling said some sets of links being greater than the number of blocks encircling said other sets of links and thus presenting a larger edge surface area for contacting said pulley flanges.

4,718,881

FRICTIONAL TRANSMISSION CHAIN

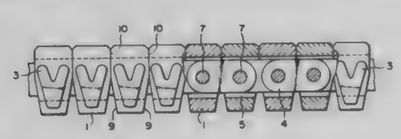
Yoshiaki Sugimoto, Tokorozawa; Kazumi Ohmura, Minoo; Masaaki Matsumoto, Hanno; Hisaharu Terajima, Kasai, and Nobuto Konakura, Hanno, all of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Feb. 10, 1986, Ser. No. 828,201

Claims priority, application Japan, Feb. 12, 1985, 60-16981; Oct. 31, 1985, 60-166742; Oct. 31, 1985, 60-166743; Oct. 31, 1985, 60-166744; Oct. 31, 1985, 60-166745; Oct. 31, 1985, 60-166746; Dec. 25, 1985, 60-198364

Int. Cl.⁴ F16G *5/18, 5/20*

U.S. Cl. 474—242 **19 Claims**



1. A frictional chain, comprising:

an endless transmission chain formed from link plates and link plate connection pins;

a plurality of frictional V blocks, each having a hollow interior through which a portion of the endless transmission chain extends, each having inner lateral surfaces with holes therein for receiving opposite ends of at least one of the connection pins, and each having inclined, generally trapezoidal, outer lateral surfaces; and,

outwardly projecting frictional transmission contact surfaces on the outer lateral surfaces of the blocks, the contact surfaces having a centrally disposed recessed portion and a generally V-shaped configuration, being transversely symmetrical about the centrally disposed recessed portion, the contact surfaces being engageable with a V-groove pulley with which the transmission chain is adapted to tightly frictionally engage by means of the V blocks, power being transmitted along the chain only by the link plates and connection pins of the endless chain and each of the V blocks transmitting power only between its respective at least one connection pin and the pulley, each of the contact surfaces being thereby engageable with such a V-groove pulley at a plurality of locations, whereby overall engagement pressure is substantially increased but more uniformly distributed.

4,718,882

CARTON STOP ASSEMBLY

Allen K. Bressler, and Keith D. Hixson, both of Cedar Rapids, Iowa, assignors to Cherry-Burrell Corporation, Cedar Rapids, Iowa

Filed Oct. 15, 1986, Ser. No. 919,068

Int. Cl.⁴ B31B *1/28*

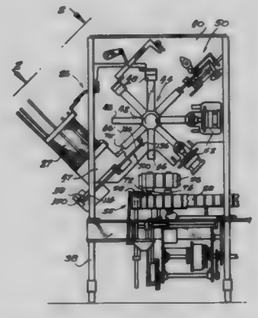
U.S. Cl. 493—164 **6 Claims**

1. An adjustable stop in a machine for performing operations on a series of tubular blanks, the machine including a rotatable hub supporting a plurality of spaced outwardly directed mandrels for carrying said tubular blanks, and insertion means for telescopically inserting a tubular blank over one of the mandrels which is at a preselected radial position, said adjustable stop comprising:

a shaft extending generally parallel to said one mandrel having a first end at least partially overlying said one mandrel and a second end remote from said mandrel;

means for mounting said shaft in a generally fixed position as plural mandrels are successively positioned at said preselected radial position;

blank engaging means at a preselected fixed position along said shaft adjacent the first end thereof for engaging tubular blanks inserted over plural mandrels which are at said preselected radial position to limit the extent of insertion thereof, said blank-engaging means remaining at said preselected fixed position while said plural mandrels are successively brought into said preselected radial position to receive respective tubular blanks; and



means for axially repositioning and locking said shaft so as to selectively position said blank engaging means at a plurality of preselected positions along a mandrel located at said preselected radial position.

4,718,883

PROCESS FOR MANUFACTURING ARTICLES OF FILTER PAPER

Heinrich Schmidt, Porta Westfalica, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 788,736, Oct. 17, 1985, abandoned. This application Jan. 17, 1986, Ser. No. 861,819

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438213

Int. Cl.⁴ B31B *1/60, 1/74, 1/88;* **B05D** *3/12*

U.S. Cl. 493—328 **3 Claims**



1. In a process for manufacturing articles of filter paper, the process including: effecting mechanical working of a piece of filter paper to form a seam at which two parts of the piece of filter paper are joined together, the mechanical working resulting in the formation of weak points at the seam; and strengthening the paper with the aid of a wet strengthener of cross-linked cationic polyalkylenimines, the improvement wherein said step of strengthening comprises applying the wet strengthener only to the regions of the weak points after said step of effecting mechanical working.

4,718,884

METHOD AND APPARATUS FOR FORMING A FILTER ELEMENT

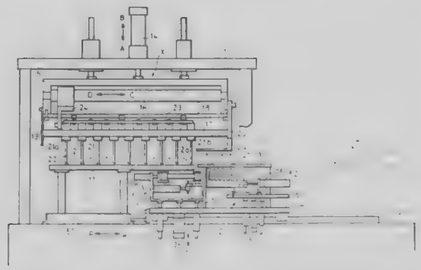
Takatoshi Iwase, Anjo, and Kouhei Hakamada, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 4, 1986, Ser. No. 893,083

Claims priority, application Japan, Aug. 12, 1985, 60-175654

Int. Cl.⁴ B65H *45/20, 45/16*

U.S. Cl. 493—419 **9 Claims**



1. Method for forming a filter element, the steps comprising:

providing a sectorial-shaped sheet of filter material having parallel curved ends, straight sides converging at an included angle of less than 180° toward the smaller concave end and curved alternating uniformly spaced ridges and valleys extending between the sides parallel to the ends;

inserting a holding wedge in and at substantially the mid-length of each of the valleys in one side of the sheet and against and at substantially the mid-length of each end while the sheet is supported from below;

reducing the length of said sheet along a radius of the ends located midway between the sides by simultaneously uniformly reducing the pitch between adjacent holding wedges;

partially rounding the reduced sheet so that the included angle of the sides increases to substantially 180° by forcing the larger convex end of the sheet toward generally the mid-length of the smaller concave end while such mid-length is fixed in position and while said reduced length is substantially maintained; and

reforming the ridges and valleys of the partially rounded sheet to substantially true arcs of a circle by moving reforming wedges along predetermined paths conforming to a true arc of a circle while the wedges are inserted in and slide along respective valleys in one side of the sheet while the latter is retained in place.

3. Apparatus for forming a filter element comprising:

a first working table for supporting a sectorial-shaped sheet of filter material having parallel curved ends, straight sides converging toward the smaller concave end with an included angle less than 180° and alternating uniformly spaced curved ridges and valleys extending between the sides parallel to the ends;

means for reducing the length of the sheet along a radius of the ends located midway between the sides including a plurality of holding wedges insertable in and at the mid-length of the valleys in the upper side of the sheet and at the mid-length and against the ends of the sheet while it is supported on said table and means for uniformly reducing the pitch between adjacent of said holding wedges while the wedge positioned against the smaller end is fixed in position;

a second working table adjacent said first table for receiving the reduced sheet;

means for partially rounding the reduced sheet while supported on said second table into a semi-circular shape having an included angle of substantially 180°, including an upright circular post mounted to said second table and engageable with and at the mid-length of the smaller concave end of the sheet, means for engaging a belt with the larger convex end of the sheet and forcefully partially wrapping said belt thereabout while the smaller end is engaged with said post to reduce the radii of curvature of both ends, and upright stop plate means supported on said second table on opposite sides of said post and engageable by the sides of the sheet to limit the included angle of the partly rounded sheet to not more than substantially 180°; and

means for reforming the shape of the ridges and valleys of the partially rounded sheet into true arcs of a circle while the sheet is partially embraced by said belt including a plurality of reforming wedges insertable into the valleys in the underside of the sheet, means for sliding said wedges along said valleys and means for guiding each of said wedges along a predetermined path conforming substantially to a true arc of a circle.

4,718,885

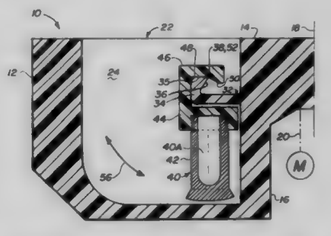
SWINGING-BUCKET CENTRIFUGE ROTOR HAVING AN UNINTERRUPTED KNIFE EDGE PIVOT

Raymond G. Potter, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1986, Ser. No. 943,136

Int. Cl.⁴ B04B *5/02*

U.S. Cl. 494—20 **5 Claims**



1. A centrifuge rotor for subjecting a sample of a material carried in a container to a centrifugal force, the rotor comprising a sample container pivot support member defined on one of the rotor or the container with a corresponding pivot surface being defined on the other of the rotor or container, the pivot support member having a knife edge adapted to engage the pivot surface to support pivotal motion of the container along a single uninterrupted line of contact with the pivot surface.

4,718,886

CONTINUOUS-OPERATION CENTRIFUGE BOWL FOR CONCENTRATING SUSPENDED SOLIDS

Wilfried Mackel, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Feb. 2, 1987, Ser. No. 10,036

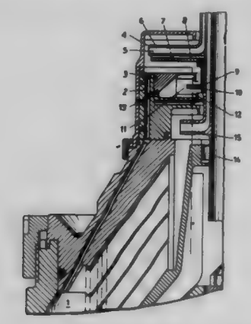
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603355

Int. Cl.⁴ B04B *11/08*

U.S. Cl. 494—58 **8 Claims**

1. In a continuous-operation centrifuge bowl for concentrating suspended solids, including channels having nozzle-like orifices for conveying separated solids from the periphery of the bowl to a skimming chamber disposed radially inwardly relative to the outside diameter of the bowl, a first skimmer in the skimming chamber having a skimming channel for diverting with the concentrate out under pressure, and wherein each channel communicates through a communicating channel with

a distribution chamber, the improvement comprising: a second skimmer in the skimming chamber for returning a portion of



the concentrate conveyed into the skimming chamber directly back into the distribution chamber.

4,718,887

CENTRIFUGAL SEPARATOR WITH A VERTICAL AXIS AND A SKIMMER

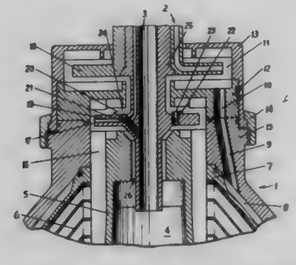
Michael L. A. Gunn, Milton Keynes, England, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Feb. 2, 1987, Ser. No. 10,022

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604312

Int. Cl.[4] B04B *11/08*

U.S. Cl. 494—58 4 Claims



1. In a centrifugal separator having a vertical axis, a basket and a skimmer above the basket for separating mixtures of liquid including a central intake for receiving liquid, an upper skimming disk in an upper skimming chamber, a lower skimming disk in a lower skimming chamber, and an annular catch chamber above the lower skimming disk and open towards the upper skimming disk, the improvement comprising liquid diversion channels providing liquid communication between the annular catch chamber and the intake.

4,718,888

CENTRIFUGE BOWL MOUNT

Lawrence W. Darnell, Cypress, Tex., assignor to Cardiovascular Systems, Inc., The Woodlands, Tex.

Filed Mar. 10, 1986, Ser. No. 838,660

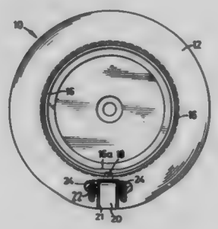
Int. Cl.[4] B04B *9/00*

U.S. Cl. 494—85 13 Claims

1. A centrifuge bowl mount for holding a centrifuge bowl, the mount comprising,

base means for receiving said bowl,

seal means disposed within said base means and configured to sealingly contact said bowl upon receipt of said bowl by said base means,



toggle means movably connected to said base means and disposed so that said toggle means is movable into contact with said seal means thereby forcing said seal means against said bowl to secure said bowl on said base means.

4,718,889

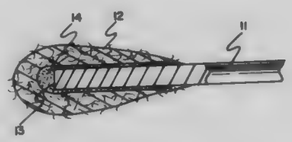
APPLICATOR SWAB

William G. Blasius, Jr., Higganum, and Joseph F. Zygmont, Jr., Clinton, both of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Apr. 25, 1986, Ser. No. 855,668

Int. Cl.[4] A61F *13/00*

U.S. Cl. 604—1 12 Claims



1. An improved applicator swab which comprises:

(a) an applicator stick;

(b) a resilient cushion element mounted on at least one end of the stick; and

(c) a swab tip mounted over the cushion element; such that the cushion element is mounted on the stick to lie between the applicator stick and the swab tip.

4,718,890

CONTINUOUS FLOW PERITONEAL DIALYSIS SYSTEM AND METHOD

Alan M. Peabody, 102 Meadow Creek Ct., Greer, S.C. 29651

Continuation-in-part of Ser. No. 629,130, Jul. 9, 1984, Pat. No. 4,586,920. This application Mar. 17, 1986, Ser. No. 840,142

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—29 11 Claims

1. A continuous flow peritoneal dialysis process comprising:

providing a supply of dialysis fluid;

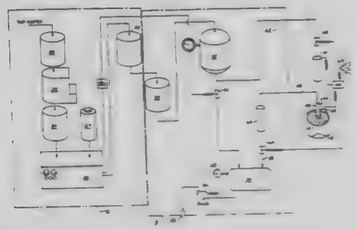
sterilizing said dialysis fluid;

delivering said dialysis fluid to a head vessel;

providing an inflow and outflow line for connection to a double catheter having an inflow and outflow catheter implanted in the peritoneal cavity of a patient through which said dialysis fluid continuously flows;

delivering a flow of sterilized dialysis fluid from said head vessel to said inflow line;

monitoring a function of the volume of said sterile dialysis fluid in said peritoneal cavity and simultaneously controlling the inflow and outflow of said sterilized dialysis fluid respectively in said inflow and outflow lines so that a desired volume is maintained in said cavity in a manner that proper distension of said cavity is maintained during dialysis; and



delivering said outflow of sterilized dialysis fluid to a disposal means so that a single pass open circuit for the continuous flow of dialysis fluid is provided through the peritoneal cavity of said patient.

4,718,891

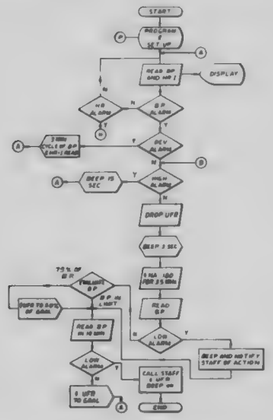
AUTOMATED HEMODIALYSIS CONTROL BASED UPON PATIENT BLOOD PRESSURE AND HEART RATE

Ben J. Lipps, Lafayette, Calif., assignor to Henry Ford Hospital, Detroit, Mich.

Continuation of Ser. No. 606,707, May 3, 1984, abandoned. This application May 6, 1986, Ser. No. 860,083

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—31 2 Claims



1. A method of controlling hemodialysis as a continuous function of vital signs of a patient connected to a hemodialysis machine which includes means for controlling dialysate composition and rate of fluid extraction from the patient, said method comprising the steps of:

(a) intially maintaining sodium electrolyte concentrations in said dialysate at 140 meq/l,

(b) intermittently sampling patient blood pressure at predetermined first sample intervals,

(c) detecting decrease in patient blood pressure below a first alarm limit to initiate a first alarm mode of operation and provide a first alarm signal, and

(d) responsive to said first alarm signal, automatically increasing sodium electrolyte concentration in said dialysate to 180 meq/l for a first predetermined time duration, and thereafter reducing said concentration to 140 meq/l.

4,718,892

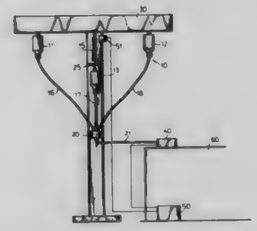
DRIP INFUSION SYSTEM

Liu Yung-Ho, 14th Room, 13th Fl., No. 4, Hsi-ning S. Road, Taipei City, Taiwan

Filed Mar. 10, 1986, Ser. No. 837,205

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—65 7 Claims



1. In a drip infusion system for the drip infusion of a solution into a vein of a patient, the system being of the type having a stand, a drip source containing the solution mounted on the stand, a needle removably inserted into the patient, and a conduit connected to the drip source and the needle for passing solution from the drip source to the needle and into the vein of the patient, the improvement comprising, in combination therewith, pulling means operatively connected to the needle for automatically pulling the needle out of the vein, and actuating means for actuating said pulling means to pull the needle out of the vein responsive to the amount of solution in the drip source.

4,718,893

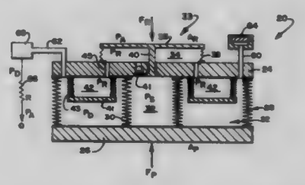
PRESSURE REGULATED IMPLANTABLE INFUSION PUMP

Frank D. Dorman, and Henry Buchwald, both of Minneapolis, Minn., assignors to University of Minnesota, St. Paul, Minn.

Filed Feb. 3, 1986, Ser. No. 825,246

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—67 16 Claims



1. An infusion pump for implantation in a living body, comprising:

(a) a housing having a variable volume, drug chamber for holding a drug solution;

(b) outlet port means for conducting the drug solution from the drug chamber to a first site outside the housing;

(c) inlet port means for introducing the drug solution into the drug chamber from a second site outside the housing;

(d) force means including a diaphragm for exerting a force on the drug solution in the drug chamber;

(e) fluid piston means for opposing the force exerted by the diaphragm of the force means on the drug solution; and

(f) regulator means for regulating the pressure of the fluid of the piston means such that a constant total force is exerted on the drug solution in the drug chamber.

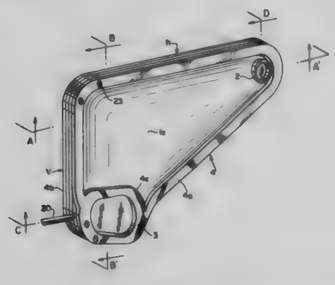
VOL 1086 ISS 2 JAN 12 1988 UMI

4,718,894

MANUALLY ACTUATED, IMPLANTABLE DEVICE TO SEQUENTIALLY FEED DOSES OF A SUBSTANCE, IN PARTICULAR A THERAPEUTANT

Guy Lazorthes, Toulouse, France, assignor to Applied Precision Limited, London, England

Filed May 21, 1986, Ser. No. 865,413
Claims priority, application France, May 21, 1985, 85 08068
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—93 21 Claims



1. A manually actuated, sequential feed device for implantation in an accessible subcutaneous region for sequentially feeding liquid doses comprising a reservoir (1) having a capacity of plural doses, a filling site (2) for the reservoir and including a filling chamber (8), a septum (7) for injecting a liquid into said chamber and communication means (9) between the filling chamber and the reservoir, and a manual pump (3) having a volume chamber (13) the capacity of which corresponds to one dose, first communication means (15) between the reservoir and said chamber for filling said chamber and second communication means (16) between said volume chamber and an external catheter (20), said reservoir comprising a flexible pouch (1) having a first external wall (1*a*) and a second, internal wall (1*b*) opposite said first wall and impermeably bonded to each other along the edges thereof, said manual pump including an integral rigid body (10) having a concave recess (11) opening toward an active side of said body in order to form said volume chamber (13), and placed between said flexible walls (1*a*, 1*b*) of said reservoir, said pump further including on its active side an expulsion membrane (12) for sealing the volume chamber and located on the side of the external flexible wall (1*a*), and fastened by its opposite side to the internal flexible wall, said second communication means including a one-way valve (18) with a pressure threshold designed to open the communication between the chamber and the catheter when the chamber is subjected to an excess pressure higher than a given threshold Pc, said first communication means including a check valve (21) preventing the liquid from flowing back from the chamber into the reservoir, and a safety valve (17) designed to allow gravity draining the reservoir into the volume chamber and closing off the communication if the excess pressure in the reservoir exceeds a value Pr less than or equal to Pc.

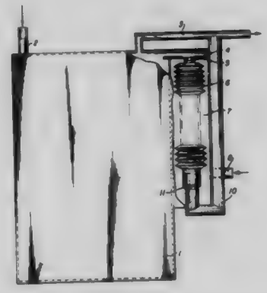
4,718,895

SUCTION REGULATOR

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to Bioresearch Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 821,530, Jan. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 667,814, Nov. 2, 1986, abandoned. This application Jan. 6, 1987, Ser. No. 780
Int. Cl.[4] A61M *1/04*
U.S. Cl. 604—119 5 Claims

1. A suction regulator for regulating the degree of suction in a drainage device having a collection chamber with an opening in the upper end thereof connected to a thoracotomy tube and a passageway connected with a source of suction, valve means disposed between said source of suction and said collection chamber for applying all available suction from the source of suction to the collection chamber in the event the suction level in the collection chamber falls below a desired level, said valve means comprising a bellows, duct means providing communication between the interior of the bellows and the interior of the collection chamber, the exterior of the bellows being in communication with atmospheric air, a feedback passageway having one end thereof connected to the passageway to the



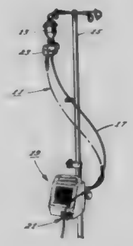
suction source downstream of the duct means connection to the collection chamber and the other end of said feedback passageway being positioned to be closed by the lower end of the bellows whereby when the degree of negativity within the collection chamber becomes less than a predetermined value the bellows closes the feedback passageway to prevent atmospheric air from entering the feedback passageway to suction so as to apply all available suction from the suction source directly to the collection chamber and the feedback passageway being open to atmosphere when the suction level in the collection chamber is at the desired or greater value due to no excess of air passing through the thoracotomy tube.

4,718,896

APPARATUS AND METHOD FOR CONTROLLING THE FLOW OF FLUID THROUGH AN ADMINISTRATION SET

Robert G. Arndt, Waukegan, Ill.; William Atkinson, Cincinnati, Ohio; Travis C. Carr, Sandy, Utah; Michael J. Haun, Kenosha, Wis.; Phillip Loeb, Palatine, Ill., and Stanley D'Souza, Cincinnati, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 10, 1986, Ser. No. 817,812
Int. Cl.[4] A61M *5/00*; G01F *1/00*
U.S. Cl. 604—253 25 Claims



1. A system for controlling the resistance to fluid flow in an administration set which includes a drop chamber, said system comprising in combination:

a drop detector for sensing drops of fluid falling in said chamber;

a controller responsive to said drop detector for determining the actual flow rate of fluid in said administration set and comparing said actual flow rate with a predetermined desired flow rate;

clamping means responsive to said controller for opening or closing a clamp pinching the tubing of said administration set, thereby adjusting the resistance to fluid flow in said administration set; and

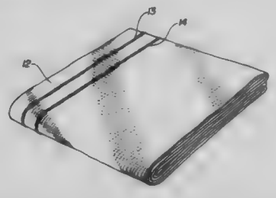
said controller including (1) first means for determining if the interval between successive drops is greater than a given percentage of the drop interval associated with said predetermined desired flow rate, (2) second means responsive to said first means to sequentially command said clamping means to open said clamp a predetermined amount, fully close said clamp, reopen said clamp and again close said clamp, and (3) third means for aborting the sequential movement of said clamp initiated by said second means if a drop is detected by said drop detector.

4,718,897

NONWOVEN SURGICAL SPONGE WITH X-RAY DETECTABLE ELEMENT

John Elves, Venray, Netherlands, assignor to Chicopee, New Brunswick, N.J.

Filed Sep. 18, 1985, Ser. No. 777,142
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—362 18 Claims



1. A surgical sponge including an integral x-ray detectable element, said sponge comprising a fibrous, nonwoven fabric consisting essentially of entangled fibers arranged in an interconnecting patterned relationship in the plane of the fabric, and at least one x-ray detectable element comprising a roving of radio opaque fibers, said roving being on one surface of said nonwoven fabric and the fibers of said roving being entangled with the fibers of said fabric.

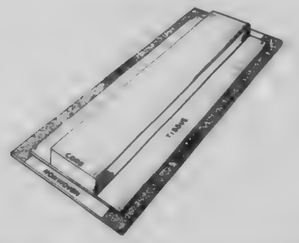
4,718,898

HOT MELT ADHESIVE WASTE BARRIER

Paul P. Puletti, and Stanley J. Decowski, Jr., both of Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 719,196, Apr. 3, 1985, Pat. No. 4,627,847. This application Jan. 26, 1986, Ser. No. 878,907
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 3 Claims

1. A sanitary napkin comprising an absorbent core encased in an outer layer wherein the outer layer comprises a liquid permeable nonwoven topsheet and a liquid impermeable backsheet portion; the napkin being provided with a leakage resistant waste barrier formed by coating a water insoluble or water impermeable hot melt adhesive onto the lateral end portions of the surface of the nonwoven topsheet which is in contact with



the core, the barrier extending over a portion of the lateral end of the absorbent core.

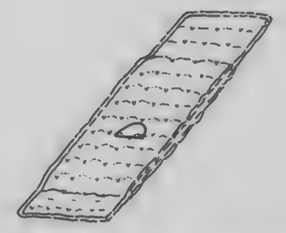
4,718,899

URINE ABSORBING AND HOLDING MATERIAL

Hiroshi Itoh; Atsuhiko Nitta, both of Yokohama; Tomio Tanaka, Tokyo, and Hideo Kanio, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,452
Claims priority, application Japan, Oct. 11, 1984, 59-211246
Int. Cl.[4] A61F *13/16, 13/18, 13/20*
U.S. Cl. 604—368 11 Claims





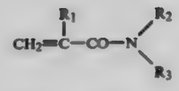
1. A urine absorbing and holding material comprising a supporting layer for a urine absorbing and holding component and a layer of a component:

said supporting layer consisting of woven or non-woven fabrics, or a woven or non-woven fabric and a moisture-permeable waterproof film or cloth;

said component being in the form of a powder, granules, flakes, fibers or a film, which is spread throughout the entire or a partial area of the supporting layer;

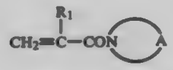
wherein said component is selected from the group consisting of:

(a) a homopolymer of a monomer selected from N-alkyl-or N-alkylene-substituted (meth)arcrylamides represented by the following general formula (I) or (II):



(I)

wherein R_1 means a hydrogen atom or methyl group, R_2 denotes a hydrogen atom or methyl or ethyl group, and R_3 is a methyl, ethyl or propyl group, or



(II)

wherein R_1 means a hydrogen atom or methyl group and A denotes $-(CH_2)_n-$, with n=4–6 or $-(CH_2)_2O(CH_2)_2$;

(b) a copolymer of two or more monomers selected from said N-alkyl- or N-alkylene-substituted (meth)acrylamides; or

(c) a copolymer of at least one monomer selected from said N-alkyl- or N-alkylene-substituted (meth)acrylamides and one or more hydrophilic or ionic monomers other than said N-alkyl- or N-alkylene-substituted (meth)acrylamides but copolyermizable with said N-alkyl- or N-alkylene-substituted. (meth)acrylamides;

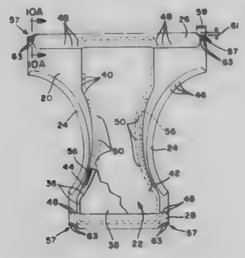
said component being a water-insolubilized product of said homopolymer or said copolymers; and having such properties that even in the presence of a large excess of water said product shrinks and releases the absorbed water upon exposure to the atmosphere within the temperature range of 50°–120° C.

4,718,900

FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH STRAIGHT WAIST APPEARANCE

Leona G. Boland, Neenah, and Georgia L. Zehner, Larsen, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,744
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R 12 Claims



1. An anatomically form-fitting, generally self-adjusting disposable garment having leg and waist sections, comprising:

an outer cover with a front waist section having a hemmed edge, a back waist section and a crotch section therebetween;

absorbent means, disposed within and secured to said outer cover, for absorbing and containing body fluids and other exudates;

waist straightening non-expandable tucks in outermost portions of at least said front waist section for straightening at least one of said front waist section and said back waist section;

said nonexpandable tucks comprising folded and bonded portions of said hemmed edge located at selected locations on said hemmed edge from said outermost portions of at least said front waist section to a center portion of at least said front waist section;

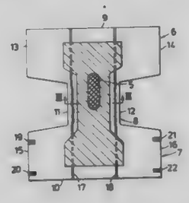
said tucks extending along said hemmed edge for a preselected length.

4,718,901

INCONTINENCE DIAPER

Stig Ake Roland Singheimer, Halmstad, Sweden, assignor to Dani Bila AB, Sweden

PCT No. PCT/SE84/00356, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/02530, PCT Pub. Date May 9, 1986
PCT Filed Oct. 24, 1984, Ser. No. 881,684
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A 4 Claims



1. Incontinence diaper comprising a barrier layer (1) e.g. of polyethylene film, and a nonwoven layer (2) fixed thereto and including two portions (6, 7) surrounding the lower part of the part of the body with a crotch portion (8) connecting these two portions, intended for placing between the legs of a wearer, there extending an area of fluff (4) surrounding by soft tissue (3) over the longitudinal direction of the diaper, a large part of the portions (6, 7) and nearly the entire width of the crotch portion (8) between the barrier layer (1) and the nonwoven layer (2), there also being at least one elastic band (17, 18) along the opposing sides (11, 12) of the portion (8) outside the fluff (4) for pulling together the crotch portion (8) about the thighs of the wearer when the diaper is in use, characterized in that from the crotch portion (8) the elastic band (17, 18) continues in over both portions (6, 7) and along the entire length of the diaper with the elastic band (17, 18) fastened with a continuously varying tension in the diaper material, said tension being greatest at the central part of the crotch portion (8) wherefrom said tension decreases somewhat in a direction towards the junction between the crotch portion (8) and both portions (6, 7), after which junction the tension diminishes to approximately half of the original tension at the central part of the crotch portion (8) for optionally increasing once again at the area immediately before the end edges (9, 10) of the portions (6, 7) to a value which is close to the value at the central part of the crotch portion (8) for subsequently returning to approximately half the original tension at the end edges (9, 10).

4,718,902

ENDOMETRIOSIS PANTY

Ruth Bonito, 29 Heather La., Windsor Locke, Conn. 06096

Filed May 9, 1986, Ser. No. 861,277
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—396 3 Claims

1. A panty for use by a woman during a menstrual flow period and by a person with an incontinence problem, comprising:

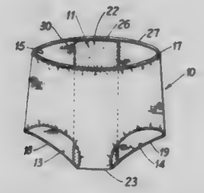
a panty (10) made of fabric and having an upper section defining a waist opening (15), and having a lower section defining a pair of leg openings (13 and 14) and having a crotch section intermediate said pair of leg openings;

a first elastic binding affixed to said panty about said waist opening;

a second elastic binding affixed to said panty about one of said pair of leg openings;

a third elastic binding affixed to said panty about the other of said pair of leg openings;

a panty liner (11) made of a flexible vinyl backed terry cloth and having a rectangular configuration with a pair of concave cutouts (20 and 21) with each one of said pair of concave cutouts being affixed about a respective one of said pair of leg opening, and having a back section (22) which extends from said waist opening down to said crotch section to form a substantially liquid-proof back liner extending across a substantial rear portion of said panty, and having a front section (24) which extends from said waist opening down to said crotch section to form a



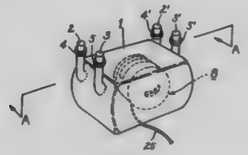
substantially liquid-proof front liner extending across a substantial front portion of said panty, and having a crotch (section) member (23) to form a substantially liquid-proof crotch portion of said panty liner, said panty liner being stitched about its periphery into said panty with an overcast stretch stitch (30) to facilitate flexibility and wearing with the terry cloth facing inwardly and the flexible vinyl facing said panty, said panty liner being dimensioned for having an upper rear edge portion (26) of said back section extending approximately to and along a predetermined rear portion of the waist opening of said panty and for having a front edge portion (25) of said front section extending approximately to and along a predetermined front portion of the waist opening of said panty.

4,718,903

ARTIFICIAL HEART

Byoung G. Min; Chang-Soon Koh; Jun-Lyang No; Gil-Jung Chun; Hi-Chan Kim; Dong-Chul Han, and Sung-Wan Kim, all of Seoul, Rep. of Korea, assignors to Seoul National University Hospital, Seoul, Rep. of Korea

Filed Sep. 15, 1986, Ser. No. 906,849
Claims priority, application Rep. of Korea, Sep. 18, 1985, 6828
Int. Cl.[4] A61F *2/22*
U.S. Cl. 623—3 4 Claims



1. An artificial heart comprising:

a hollow pump body having two sides, at each side there being an inlet provided with an inlet valve and an outlet provided with an outlet valve, said pump body having a body guide rail, a pair of opposed side guide rails, and a toothed rack opposite said body guide rail, all extending along inner surfaces of said pump body in a side-to-side direction;

elastomeric films attached to the inner surface of said pump body near the sides so as to define, together with the side walls of said pump body, left and right ventricles;

a movable body within said pump body generally between said elastomeric films, said movable body including a cylindrical case, an end portion rotatably connected to each end of said cylindrical case, said cylindrical case having a semi-circumferential guide groove slidably engaging said body guide rail, said cylindrical case having a semi-circumferential row of body gear teeth diametrically opposite said guide groove engaging said toothed rack, and said end portions each having a groove slidably engaging a respective one of said side guide rails so as to prevent rotation of said end portions within and relative to said pump body;

buffer plates generally interposed between said movable body and said elastomeric films, said buffer plates being connected to said end portions;

a bidirectional drive motor located within said cylindrical case and having a shaft, said drive motor fixed to said cylindrical case such that relative rotation therebetween is prevented; and

power transmitting means connecting said motor shaft and one of said end portions so as to provide bidirectional relative rotation between said cylindrical case and said one of said end portions;

whereby as said drive motor rotates in one direction causing relative rotation between said cylindrical case and said one of said end portions, said cylindrical case rotates within said pump body and said body gear teeth engaging said toothed rack cause said movable body to roll towards one side such that one of said buffer plates presses against one of said elastomeric films to discharge blood from one of said ventricles, and as said drive motor rotates in the opposite direction said movable body rolls towards the other side such that the other of said buffer plates presses against the other of said elastomeric films to discharge blood from the other of said ventricles.

4,718,904

INTRAOCULAR LENS FOR CAPSULAR BAG IMPLANTATION

Spencer P. Thornton, Nashville, Tenn., assignor to Eye Technology, Inc., St. Paul, Minn.

Filed Jan. 15, 1986, Ser. No. 819,230
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 12 Claims



1. An intraocular lens for implantation in the capsular bag of an eye upon which extracapsular cataract surgery has been performed, said intraocular lens comprising in combination:

(a) an optic, said optic including a thin, rounded, polished perimeter edge having a radius of 0.12 millimeters with a tolerance of plus or minus 0.01 millimeters;

(b) a pair of curved haptics extending in generally opposed directions from diametrically opposed locations of said optic for contactingly engaging the inner circumference of the capsular bag;

(c) each haptic of said pair of haptics being angled anteriorly of said optic at an angle of seven degrees (7°) and at a location outwardly of the perimeter of said optic for locat-

ing said optic adjacent the posterior capsule of said capsular bag; and

(d) each haptic of said pair of haptics being configured of a material having plastic memory for urging said optic against the posterior capsule upon implantation.

4,718,905

HAPTIC ELEMENT USING ION BEAM IMPLANTATION FOR AN INTRAOCULAR LENS

Jerre M. Freeman, 1509 Peabody, Memphis, Tenn. 38104

Filed Aug. 13, 1986, Ser. No. 895,944
Int. Cl.[4] A61F 2/16; A01N 1/02
U.S. Cl. 623—6 21 Claims



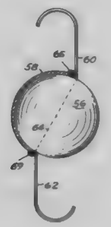
1. An intraocular lens for surgical implantation within a human eye, said intraocular lens comprising a lens body and a plurality of haptic member radiating outwardly from the lens body which are sized for operably contacting peripheral margin areas of a patient's eye to allow proper positioning, said haptic members comprising a biocompatible protective ion coating of relatively inert material placed upon the haptic element by ion beam implantation to enhance the longevity or in-vivo service life of the haptic element and to shield the haptic material from the detrimental and bioerodable effects of body fluids and tissue contact.

4,718,906

INTRAOCULAR LENS

Richard J. Mackool, 31-27 41st St., Astoria, N.Y. 11103

Filed Mar. 11, 1986, Ser. No. 838,545
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 4 Claims



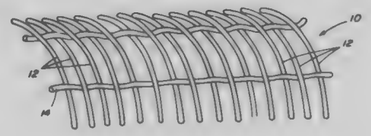
1. A plastic intraocular lens capable of being inserted into an eye through an incision which is smaller than the diameter of the lens comprising a first plastic capable of being folded by an ophthalmic surgeon during the process of inserting the intraocular lens during eye surgery, a second plastic harder than the first plastic capable of resisting folding when the first plastic is folded; the second plastic forming a thin bar across a part of the surface of the first plastic; one or more haptics connected to the second plastic; and positioning means on the second plastic to permit the positioning of the intraocular lens in the eye after insertion by the surgeon.

4,718,907

VASCULAR PROSTHESIS HAVING FLUORINATED COATING WITH VARYING F/C RATIO

Theodore Karwoski, and Yasuo Matsuzawa, both of Nashua, N.H., assignors to Atrium Medical Corporation, Hollis, N.H.

Filed Jun. 20, 1985, Ser. No. 747,034
Int. Cl.[4] A61F 2/04, 2/06
U.S. Cl. 623—12 15 Claims



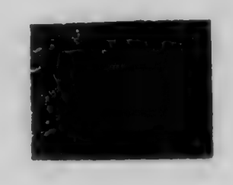
1. An implantable device comprising a hollow porous tubular substrate having a non-thrombogenic inside surface and a biocompatible outside surface, said inside surface comprising a first cross-linked substantially uniform coating of a fluorine-containing polymer bonded to said substrate and characterized by a first F/C ratio greater than 1.5, said outside surface comprising a second cross-linked coating of a fluorine-containing polymer bonded to said substrate and characterized by an F/C ratio lower than said first ratio.

4,718,908

HIGH-STRENGTH, COLD-FORGED TYPE 316L STAINLESS STEEL FOR ORTHOPEDIC IMPLANT

Robert E. Wigginton, Collierville, Tenn.; Barry Gordon, Hernando, Miss.; Imogene Boswell, and Steve Garner, both of Memphis, Tenn., assignors to Richards Medical Company, Memphis, Tenn.

Filed Jun. 4, 1984, Ser. No. 616,659
Int. Cl.[4] A61F 5/04
U.S. Cl. 623—16 12 Claims



1. A corrosion resistant, austenitic, stainless steel prosthetic device, adapted to be implanted in animals, and formed as a result of a method comprising the step of cold forging a starting material consisting essentially of biocompatible 316L stainless steel with a maximum carbon content of about 0.03% until it has a microstructure comprising an ASTM grain-size index above about 14 and having an absence of discernible slip planes at a magnification of about 600×.

4,718,909

METHOD AND APPARATUS FOR CEMENTING A FEMORAL STEM PROSTHESIS WITHIN A FEMORAL CANAL

Byron L. Brown, 2315 Hendricks, Fort Smith, Ark. 72903

Filed Jul. 16, 1985, Ser. No. 755,600
Int. Cl.[4] A61F 2/28
U.S. Cl. 623—16 6 Claims

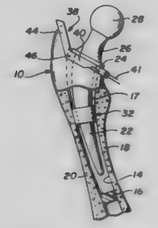
1. A method of cementing a femoral stem prosthesis within a femoral canal, said prosthesis having a head, neck and stem, said method comprising the steps of:

a. preparing the femoral canal for receiving the prosthesis,

b. placing a spacing sleeve over said stem of said prosthesis,

c. inserting said stem in said femoral canal with said sleeve holding said stem in a correct spaced relationship with the canal cortical bone such that a spacing exists everywhere between the stem of said prosthesis and the cortical bone of said femur,

d. attaching a guide to said femur to support said stem in said correctly spaced position in said canal,



e. removing said stem from said canal,

f. removing said spacing sleeve from said stem,

g. replacing a stem in said canal supported by said guide such that said correct stem position is established and maintained by said guide, and

h. filling said space between said stem and said cortical bone with cement to hold said prosthesis in said femoral canal.

4,718,910

BONE CEMENT AND PROCESS FOR PREPARING THE SAME

Klaus Draenert, Gabriel-Maxstr. 3, 8000 Munchen 90, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,086
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525362
Int. Cl.[4] A61L 25/00; C08L 33/06; C08K 5/09, 7/00
U.S. Cl. 623—16 30 Claims

1. A bone cement consisting essentially of a mixture of component (a) and component (b), said component (a) is particles of a prepolymer which is a bead-shaped polyacrylate, a methacrylate prepolymer or mixtures thereof, said prepolymer particles having been treated prior to mixing with said component (b) mechanically by crushing said bead-shaped particles to polymorphous fragments or chemically by treatment with an inorganic or organic solvent to etch the surface and to increase the specific surface thereof or both mechanically and chemically to increase their specific surface, said component (b) is monomeric acrylic acid, monomeric methacrylic acid, derivatives thereof or mixtures thereof, and (c) a polymerization catalyst.

4,718,911

ACETABULAR CUP ASSEMBLY

Robert V. Kenna, Saddle River, N.J., assignor to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Feb. 19, 1986, Ser. No. 831,246
Int. Cl.[4] A61F 2/34
U.S. Cl. 623—22 6 Claims

1. A three component acetabular cup assembly for receiving and releasably retaining the femoral head component of a prosthesis, said cup assembly comprising:

a metal shell defining an opening about a peripheral edge and adapted to removably fit within the natural anatomical acetabulum;

a cup-shaped inner bearing of substantially rigid plastic fixedly secured within said opening of said metal shell, the inner surface of said bearing being substantially hemispherical with a cylindrical apron and adapted to accept said femoral head, said apron having a plurality of resilient leaves formed by longitudinal slits extending to a distal end, whereby said leaves are adapted to move outwardly to allow passage of said femoral head into said inner bearing, the outer surface of said bearing having a groove running circumferentially around the apron, and a circumferential ridge adjacent said groove, the distal end of each leaf terminating in an outwardly projecting lip; and

a locking ring made from the same plastic as the inner bearing and having a substantially cylindrical configuration terminating in an outwardly projecting lip which overlaps the peripheral edge of said metal shell in the locked position, the inner wall of said ring having inwardly projecting first and second flanges, said first flange being adapted



to pass over said circumferential ridge in said inner bearing in order to snap into said groove while said second flange butts against the distal end of each leaf when said locking ring is pushed over the outer wall of said inner bearing, preventing the leaves of said bearing from moving outward and thereby releasably locking said bearing around said femoral head, there being an annular gap left between said lip of the locking ring and the adjacent periphery of the metal shell, whereby said locking ring may be readily disengaged and said femoral head removed while leaving said bearing fixedly secured within said shell by prying said lip away from said shell periphery.

4,718,912

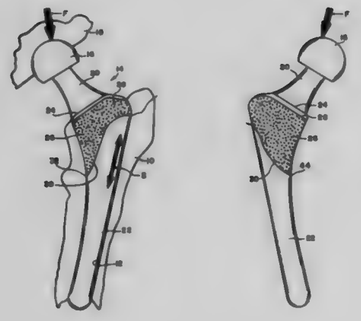
FEMORAL COMPONENT AND THE METHOD OF CONSTRUCTING THE SAME

Roy D. Crowninshield, Warsaw, Ind., assignor to Zimmer Inc., Warsaw, Ind.

Filed Nov. 12, 1985, Ser. No. 796,684
Int. Cl.[4] A61F 2/36, 2/32
U.S. Cl. 623—23 7 Claims

7. A femoral component for a hip prosthesis comprising a stem region and a head region interconnected by a neck region, said stem region coated with a porous surface which extends substantially from the junction of said neck and said stem to an inferior border which is a predetermined, curvilinear, asymmetrical contour that has been determined by stress analysis of said component while axially loading said component in compression, said contour being defined as concave on the lateral face of said stem, convex on the medial face of said stem and transitionally convex to concave on the anterior and posterior faces of said stem when traversing said stem from said medial to said lateral face, such that the area of said porous surface covering said medial face is substantially greater than the area of said porous surface covering said lateral face and the area of said porous surface covering said posterior face is substantially greater than the area of said porous surface covering said anterior face, and said coated anterior surface is substantially

asymmetrical to said coated posterior surface, said porous surface being selectively disposed on said stem with said asymmetrical boundary circumventing that portion of the stem subjected to the highest stress.

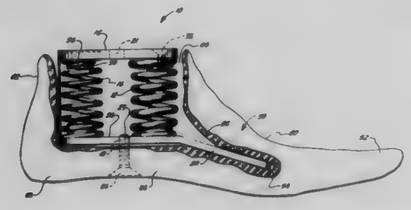


4,718,913

DUAL, ANKLE, SPRINGS PROSTHETIC FOOT AND ANKLE SYSTEM

Jerome P. Voisin, 143 "B" Isle of Cuba Rd., Schriever, La. 70395

Filed May 27, 1986, Ser. No. 867,209
Int. Cl.[4] A61F 2/66
U.S. Cl. 623—49 4 Claims



1. An artificial ankle and foot apparatus in combination comprising:

a. an artificial foot member having a hollow portion substantially within the ankle portion of the foot member;

b. an artificial ankle insertable into the hollow portion, further comprising:

i. a lower plate member insertable into the foot portion;

ii. an upper ankle plate member;

iii. posterior and anterior compression members rigidly secured intermediate the upper and lower plate members;

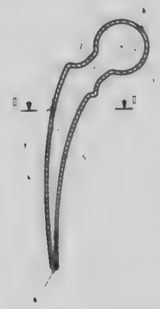
said posterior and anterior compression members serving as the sole load bearing attachment between the ankle portion and the foot portion for achieving both plantar/dorsi flexion and inversion/eversion flexion are provided.

4,718,914

METAL BONE IMPLANT

Otto Frey, and Manfred Semlitsch, both of Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 22, 1986, Ser. No. 821,399
Claims priority, application Switzerland, Feb. 7, 1985, 558/85
Int. Cl.[4] A61F 2/36, 2/34, 2/28
U.S. Cl. 623—23 17 Claims



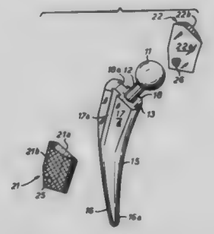
14. A femur head prosthesis having a pair of sheet-metal shells joined together to define a substantially rigid closed hollow body with an exterior surface defining a joint head, a neck extending from said joint head and a shank extending from said neck, said shells having a substantially constant wall thickness along said surface.

4,718,915

FEMORAL COMPONENT OF A HIP PROSTHESIS

Jean-Alain Epinette, 27 rue Lamandin, 62700 Bruay-en-Artois, France

Filed Mar. 27, 1986, Ser. No. 844,551
Claims priority, application France, Mar. 27, 1985, 85 04548
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—23 13 Claims



6. A femoral component of a hip prosthesis comprising a shaft and adapted to be implanted into a meduallary cavity of the femur after removal of its head, said shaft tapering from an upper end to a lower end, a neck projecting from the upper end of said shaft, and a head carried on said neck for forming a ball-and-socket joint with a cotyloid component, said shaft having a longitudinal axis and comprising a core from which said neck projects, said core being bounded by generally planar front and rear plane bearing faces extending parallel to a frontal plane which contains said longitudinal axis, at least along a trochanter region part of said core there being disposed two packing pieces having generally planar complementary bearing faces in sliding relation with said front and rear plane bearing faces of said core, said packing pieces also having external convex faces complementary to the medullary cavity, said external convex faces having a nonsmooth surfaces condition suitable for bonding by ingrowth of spongy bone thereby allowing longitudinal elastic play of said prosthesis while preventing rotation of the core relative to the femur.

4,718,916

FEMUR HEAD PROSTHESIS

Erwin W. Morscher, Basel, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur and Protek AG, Berne, both of, Switzerland

Filed Jun. 3, 1986, Ser. No. 870,091
Claims priority, application Switzerland, Jun. 12, 1985, 2476/85
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—23 13 Claims

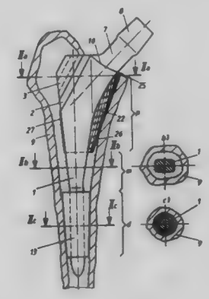
1. In combination

a femur head prosthesis having a straight blade-type shank, a neck and a collar-like projection between said shank and said neck with a convex cylindrical partial surface on a side facing a femur bone;

a plastic insert for elastically supporting a proximal region of said shank in a medial direction, said insert having a concave counter-surface to receive said convex surface of said projection;

a deformable sheet metal jacket for enveloping said insert and said prosthesis and being open on a lateral narrow side, said jacket having a proximal edge being bent at an angle near said insert for seating on a cortical; and

a pair of wedges for positioning between said shank and said jacket to laterally widen said jacket after positioning of said prosthesis, insert and jacket in place.



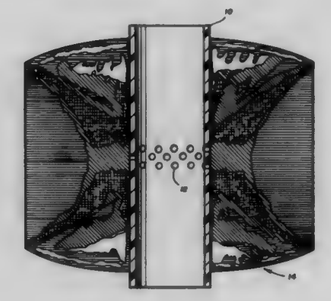
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4,718,917

MULTICOLOR PACKAGE DYEING

John Harbison, La Grange, Ga., assignor to West Point Pepperell, Inc., West Point, Ga.

Filed Oct. 17, 1985, Ser. No. 788,410
Int. Cl.[4] D06B *5/18*
U.S. Cl. 8—149 2 Claims



2. A process for package dyeing yarn in multicolors comprising:

a. winding the yarn as a first package on a first tube perforated along only a portion of its length, said yarn being wound at a density sufficient to cause dye liquor to flow through the package in different paths when circulated in a first direction from the interior of the tube through the perforations and then the yarn, and when circulated in a second direction from outside the package through the yarn and then the perforations to the interior of the tube;

b. circulating dye liquor of one color through the package in one of said directions and allowing it to absorb to a predertermined amount;

c. circulating dye liquor of the same or another color through the package in the other of said directions and allowing it to absorb to a predetermined amount;

d. repeating steps a–c with yarn being wound on a second tube to form a second like package; and

e. removing the dyed yarn from the respective perforated tubes of said two like packages and winding the yarn on four yarn receiving devices as follows:

i. beginning with the outside of said first package, winding yarn onto the first device, the winding continuing until the middle of the first package is reached;

ii. beginning with the middle of the first package, winding yarn onto the second device, the winding continuing until the remainder of the first package is wound thereon;

iii. winding all the yarn from the second package onto an intermediate yarn-receiving device;

iv. beginning with that portion of the second package wound onto the outside of the intermediate device, winding yarn onto the third device, the winding continuing until the middle of the yarn wound on the intermediate device is reached; and

v. beginning with the middle of the yarn wound on the intermediate device, winding the yarn onto the fourth device, the winding continuing until the remainder of the yarn on the intermediate device is wound thereon.

4,718,918

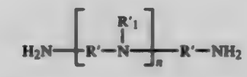
TREATMENT OF TEXTILE MATERIALS TO IMPROVE THE FASTNESS OF DYEINGS MADE THEREON AND POLYMERS USEFUL THEREFOR

Jürg Heller, Oberwil; Bruno Kindling, Hagendorf; Tibor Robinson, Basel, and Salvatore Valenti, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 686,136, Dec. 24, 1984, Pat. No. 4,599,087.
This application Jun. 16, 1986, Ser. No. 874,984
Int. Cl.[4] C08G *73/02*; D06L *3/12*; D06P *1/52, 5/08*
U.S. Cl. 8—495 23 Claims

1. A linear polymer prepared by reacting 1.5 to 2.5 moles of epihalohydrin or a precursor thereof with 1 mole of a polyalkylene polyamine of formula Ia

Ia



where

each R′, independently, is C_{2-4}alkylene,

each R_1′, independently, is phenyl, C_{1-4}alkyl or C_{1-4}alkyl substituted by —OH, —C_{1-4}alkoxy, halogen or phenyl, and n is an integer from 1 to 5

in water or an organic solvent at a temperature not exceeding 40° C., and not remaining at 40° C. for longer than 1 hour after all the epihalohydrin has been added.

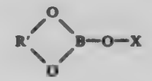
4,718,919

FUEL ADDITIVE

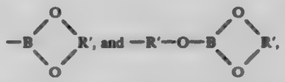
Norman R. DeLue, Akron, Ohio, and William R. Roberts, Wexford, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1986, Ser. No. 913,892
Int. Cl.[4] C10L *1/18, 1/30*
U.S. Cl. 44—76 10 Claims

1. A hydrocarbon fuel additive composition comprising an ethylene glycol monoalkyl ether of the formula $RO(CH_2CH_2O)_nH$ wherein R is a C_1 to C_4 alkyl and n is a number from 1 to 3, and at least one organoborate compound having from 3 to 25 carbon atoms and having the formula

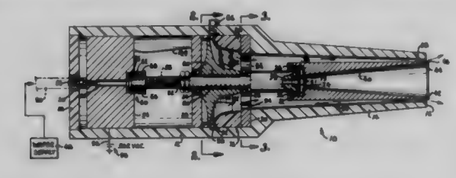


wherein X is selected from the group consisting of hydrogen,



and R′ is selected from the group consisting of alpha and beta alkylene radicals having from 3 to 20 carbon atoms, the weight ratio of ethylene glycol monoalkyl ether to organoborate compound in said composition being from 10:1 to 1:5, said ratio also being such that when the composition is added to water-containing hydrocarbon fuel, there is introduced into said fuel from 100 to 1,000 ppm of ethylene glycol monoalkyl ether and from 100 to 500 ppm of organoborate compound.

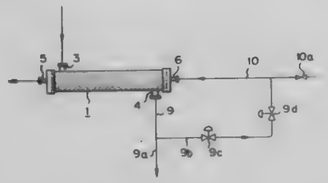
4,718,920
METHOD AND APPARATUS FOR SMOKE SUPPRESSION
John S. Kinsey, Lee's Summit, and Frank J. Peadleton, Kansas City, both of Mo., assignors to Midwest Research Institute, Kansas City, Mo.
Filed Apr. 18, 1986, Ser. No. 853,707
Int. Cl.[4] B03C 3/16
U.S. Cl. 55—10 20 Claims



9. Smoke suppression apparatus comprising:
a housing;
a shaft supported for rotation in said housing;
means for rotating said shaft;
a cup mounted on said shaft for rotation therewith, said cup presenting a flared surface which terminates in an annular lip concentric with the axis of the shaft;
means for supplying electrically charged water to said flared surface of the cup at a rate permitting the liquid to flow along said surface to said lip under the influence of centrifugal force;
an air nozzle on the housing defining an annular air channel around said lip; and
means for applying compressed air to said nozzle from a source external to said housing in a manner to pass the air at high speed through said channel and against the water discharging from said lip, thereby helping atomization of the water and projecting same in a spray of electrically charged droplets for capturing smoke particles.

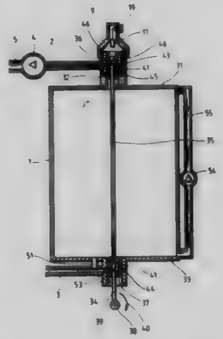
15. A method of suppressing smoke containing smoke particles having a diameter less than about 2 microns, said method comprising spraying into the smoke a water spray of electrically charged water droplets having a diameter of approximately 10–100 microns and a charge to mass ratio greater than about 40×10^{-6} Coulombs per gram.

4,718,921
METHOD FOR REMOVING WATER VAPOR FROM WATER VAPOR-CONTAINING GAS
Hiroshi Makino, and Kanji Nakagawa, both of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan
Filed Oct. 10, 1986, Ser. No. 918,006
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 8 Claims



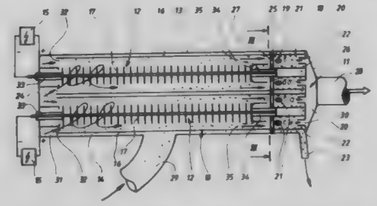
1. A method for removing water vapor from a water vapor-containing feed gas by means of a gas separating device comprising at least one gas separating membrane in the form of a hollow filament, comprising an aromatic imide polymer, having a gas feed surface and a gas delivery surface thereof, exhibiting a permeating rate of water vapor P_{H2O} of 1×10^{-5} cm^3/cm^2-sec-cmHg or more and a ratio P_{H2O}/P_{CH4} of a permeating rate of water vapor P_{H2O} to a permeating rate of methane P_{CH4} of 200 or more, and contained in a closed gas tight container, comprising the steps of:
feeding a water vapor-containing feed gas to a feed side of the gas separating device,
flowing the fed feed gas along the gas feed surface of the gas separating membrane to allow a fraction of the feed gas to permeate through the gas separating membrane,
feeding a drying gas in an amount of 10% or less, based on the volume of the water vapor-containing feed gas, and containing water vapor in a restricted amount of 300 ppm or less to a delivery side of the gas separating device,
flowing the fed drying gas along the delivery surface of the gas separating membrane to promote the permeation of water vapor through the gas separating membrane,
collecting a gas fraction permeated through the gas separating membrane and having an increased content of water vapor, together with the flowed drying gas at the delivery side of the gas separating device, and
recovering a gas fraction not permeated through the gas separating membrane and having a decreased content of water vapor from the feed side of the gas separating device.

4,718,922
METHOD OF AND APPARATUS FOR THE DEAERATION OF LIQUID FLOWING IN A CLOSED CIRCULATION SYSTEM
Franciscus Roffelsen, AE Helmond, Netherlands, assignor to Spiro Research B.V.
Filed Dec. 20, 1985, Ser. No. 811,703
Int. Cl.[4] B81D 19/00
U.S. Cl. 55—55 24 Claims



1. Method of deaerating a closed liquid circulation system for use in a heating system including a water boiler and a circulation system for receiving liquid from and returning liquid to said boiler, including maintaining the circulation system at a high pressure above atmospheric pressure and pressure degasing the liquid by periodically depressurizing the liquid, wherein the improvement comprises subjecting the entire contents within the boiler alternately to the high pressure of the circulation system and at least to atmospheric pressure, deaerating the liquid in the boiler while it is subjected at least to atmospheric pressure and during the deaeration operation preventing the flow of the liquid from the boiler into the circulation system, after deaeration, while preventing the flow of liquid from the boiler into the circulation system, bringing the liquid within the boiler up to the high pressure of the circulation system and when the high pressure has been attained in the boiler directing the liquid from the boiler into the circulation system.

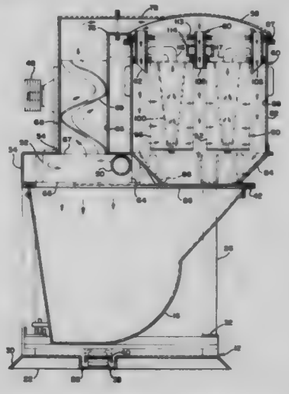
4,718,923
DEVICE FOR REMOVING SOLID PARTICLES FROM EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE
Gottlob Haag, Markgröningen; Hubert Dettling, Waiblingen; Rolf Leonhard, Schwieberdingen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 18, 1985, Ser. No. 810,858
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1985, 3500373
Int. Cl.[4] B03C 3/06, 3/14
U.S. Cl. 55—124 12 Claims



1. A device for removing solid particles, particularly soot particles, from exhaust gas of an internal combustion engine, comprising an electrofilter including a plurality of filter tubes positioned parallel to each other, and a high voltage source, each filter tube including a separator tube connected to a positive terminal of said high voltage source and a corona discharge electrode axially extended in said separator tube and connected to a negative terminal of said high voltage source; a housing surrounding said filter tubes so that a hollow space extending approximately over the whole length of said filter tubes is defined between an inner surface of said housing and said filter tubes; and a centrifugal separator connected to said electrofilter in a direction of an exhaust gas flow, said centrifugal separator being formed as a multi-cyclone and including a plurality of cyclones arranged so that a number of cyclones correspond to each separator tube, each cyclone having in an axial direction thereof an exhaust gas inlet opening, each separator tube being immediately connected to said number of cyclones which are arranged on a circle concentrical to an axis of a respective separator tube.

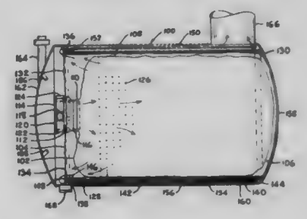
4,718,924
TWO COMPARTMENT FOUR STAGE INDUSTRIAL DUST COLLECTOR
Thomas M. DeMarco, 5815 N. Cicero, Chicago, Ill. 60646
Filed May 30, 1986, Ser. No. 868,695
Int. Cl.[4] B01D 46/04
U.S. Cl. 55—302 18 Claims

1. A two compartment, four stage, industrial dust collector, comprising:
a first solids-gas separating compartment containing solids-gas separator means for removing larger particulates of dust from a dusty gas stream;
an inlet conduit connected to said solids-gas separating compartment for feeding said dusty gas stream to said solids-gas separating compartment;
a second filtering compartment having a filtering chamber and an upper chamber in communication with said filtering chamber, said filtering chamber having at least one filter for substantially filtering said dusty gas stream, and said upper chamber having at least one downwardly facing nozzle for injecting said dusty gas stream substantially downwardly with sufficient kinetic energy to remove a substantial amount of particulates of dust from said dusty gas stream before said dusty gas stream is filtered by said filter in said filtering chamber;
intermediate conduit means for conveying said gas stream from said first solids-gas separating compartment to said second filtering compartment; and



a discharge conduit connected to said filtering compartment for discharging said filtered gas stream.

4,718,925
PRIMARY MATERIAL COLLECTION RECEIVER
Thomas M. DeMarco, 5815 N. Cicero, Chicago, Ill. 60646
Filed Sep. 22, 1986, Ser. No. 910,073
Int. Cl.[4] B01D 46/02
U.S. Cl. 55—367 8 Claims

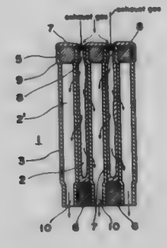


1. A bag assembly providing a primary material collection receiver, comprising:
a perforated inner bag defining an array of fluid flow passageways fpr passage of fluid containing asbestos or other particulates;
a substantially imperforate outer bag positioned about said inner bag;
a substantially rigid perforated inner shell annularly surrounding said outer bag;
a substantially rigid imperforate outer tank comprising a substantially solid outer shell spaced radially outwardly and substantially enclosing said rigid perforated inner shell; and
a substantially solid shroud having an annular end extending annularly outwardly from said inner shell and a substantially rigid, elongated annular skirt, said skirt being positioned between said inner and outer shells and providing a protective barrier for covering said inner shell to substantially prevent backflow contamination of the exterior surface of said outer bag.

4,718,926
EXHAUST GAS FILTER FOR DIESEL ENGINE

Mitsuyoshi Nakamoto, Nara; Takao Kuzuda, Ashiya; Masaaki Yonemura, Nara, and Koichi Shimmura, Nerima, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1986, Ser. No. 837,768
Claims priority, application Japan, Mar. 8, 1985, 60-47195; Mar. 8, 1985, 60-47196
Int. Cl.[4] B01D *39/20*
U.S. Cl. 55—523 18 Claims



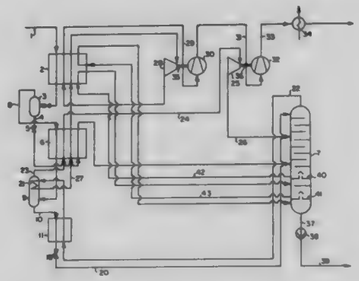
1. An exhaust gas filter for r diesel engine comprising:
a corrugated sheet of porous ceramic material bonded to a flat sheet of porous ceramic material which together form a composite sheet, said composite sheet being wound in overlapping layers to form a honeycomb structure containing a plurality of cell channels formed by spaces between said corrugated sheet and said flat sheet for passage of exhaust gas therethrough which extend from an upstream end to a downstream end of said honeycomb structure with respect to the direction of flow of exhaust gas through said honeycomb structure; and
a plurality of plugs, each of which is fitted into either said upstream end or said downstream end of each channel, said plugs being arranged such that every other one of said channels at the upstream end thereof is filled with one of said plugs and every other one of said channels at the downstream end thereof is filled with one of said plugs, with each of said channels being open at either said upstream end or said downstream end of said honeycomb structure, said plugs being of a porous ceramic material and each of said plugs having a cross-sectional area greater than the cross-sectional area of said cell channels through which exhaust gas passes.

4,718,927
PROCESS FOR THE SEPARATION OF C_{2+} HYDROCARBONS FROM NATURAL GAS

Heinz Bauer, Munich, and Rainer Sapper, Neuried, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,850
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1985, 3531307
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—39 25 Claims

1. In a process for the separation of C_{2+} hydrocarbons from a feed stream of natural gas under pressure, wherein
(a) said feed stream is cooled to partially condense said natural gas thereby forming a liquid fraction and a gaseous fraction;
(b) said liquid fraction and said gaseous fraction are separated;
(c) said liquid fraction is delivered to a rectifying column wherein there is produced a product stream consisting essentially of C_{2+} hydrocarbons and a residual gas stream comprising lower-boiling components;
(d) said gaseous fraction is delivered to an expansion engine wherein said gaseous fraction is expanded and work is extracted therefrom, said gaseous fraction is then supplied to said rectifying column; and
(e) said residual gas stream is discharged from said rectifying column and is heated by heat exchange with said feed stream in step (a),
the improvement comprising subjecting said residual gas stream, prior to the heat exchange in step (e), to heat exchange with said gaseous fraction, prior to delivery of

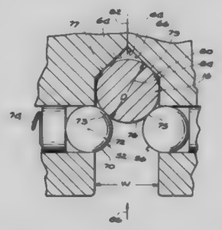


said gaseous fraction to said expansion engine, wherein said gaseous fraction is partially condensed to form an additional liquid fraction; separating said additional liquid fraction from said gaseous fraction, prior to delivery of said gaseous fraction to said expansion engine, wherein step (b) and the latter separation of said additional liquid fraction from said gaseous fraction are performed at substantially the same pressure; and delivering said additional liquid fraction to said rectifying column.

4,718,928
QUICK ACCESS CONTACT MOUNTING FIXTURE

Leslie M. Borsuk, Los Alamitos, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 13, 1987, Ser. No. 2,885
Int. Cl.[4] C03B *23/09*; G02B *5/14*
U.S. Cl. 65—2 9 Claims



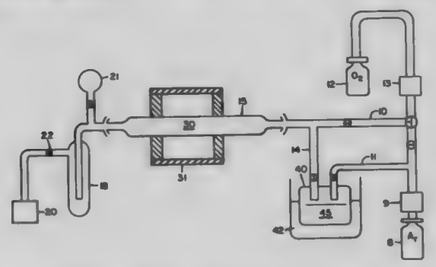
1. A fixture for holding an elongated optical fiber connector contact so an optical fiber therein can be positioned with its forward end at a heating device that melts the fiber end into a lens comprising:
a frame which has a front and a vertical slot extending into said front, and which has a vertically extending slot bottom and slot sides, said frame having a pair of plunger holes including a hole extending into each side of the slot, said contact having a width which allows it to pass into said slot and lie closely within said slot;
a plunger sideably mounted at each plunger hole and having an outer end which can enter said slot,
means for biasing each plunger toward said slot;
said plunger holes located so when one side of the contact abuts the slot bottom, the plungers press against contact

locations closer to a second side of the contact which is opposite said one side than to said one side.

4,718,929
VAPOR PHASE METHOD FOR MAKING METAL HALIDE GLASSES

Joseph M. Power, Corning, and Ahmad Sarkhangi, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,129
Int. Cl.[4] C03B *37/018, 19/06*
U.S. Cl. 65—3.12 18 Claims



1. A method for making a metal halide product which comprises the steps of:
(a) introducing into a reaction zone a reactant vapor stream which comprises vapors of a halogenated metal beta-diketonate containing the metal and the halogen to be incorporated into the metal halide product; and
(b) supplying energy to the reactant vapor stream at a rate sufficient to cause the decomposition of the metal beta-diketonate and the formation of a vapor deposition product therefrom which consists essentially of the metal halide of the metal and the halogen, the metal beta-diketonate being the principal source of both metal and halogen in the metal halide.

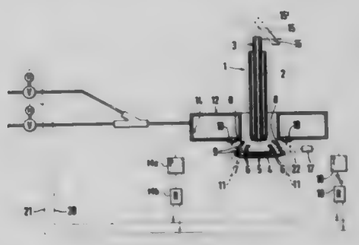
15. In a method for forming a metal halide optical fiber preform comprising the steps of providing a hollow tubular substrate, flowing reactive vapors into a reaction zone within the tubular substrate, and reacting the vapors to form a metal halide precursor material which is deposited onto the inner surface of the substrate, the improvement characterized in that the reactive vapors compriae a halogenated beta-diketonate containing the halogen and the metal to be incorporated as a metal halide into the precursor, and in that the halogenated beta-diketonate constitutes the principal source of both metal and halogen in the metal halide.

4,718,930
METHOD OF AND APPARATUS FOR PRODUCING FIBERS FROM THERMOPLASTIC MATERIALS, IN PARTICULAR FROM GLASS FIBERS

Hans Gertner, Darmstadt-Schneeraheim, and Dietrich Schulz, Ludwigshafen, both of Fed. Rep. of Germany, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Oct. 10, 1986, Ser. No. 917,537
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536137
Int. Cl.[4] C03B *37/04, 37/07*
U.S. Cl. 65—6 3 Claims

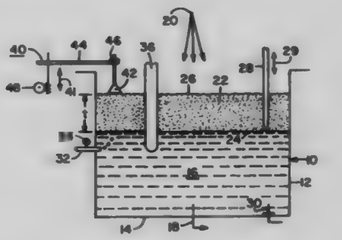
1. A method of producing fibers from molten glass materials, comprising the steps of:
radially outwardly discharging molten glass material via outlet orifices in a peripheral wall of a drum-like centrifugal ring;
forming a high velocity flow of high temperature gas by combustion of fuel gas and air and impinging said flow of gas on said peripheral wall and said discharged molten material to draw said molten material into a bell like veil;
using radiation sensing means for measuring a maximum temperature of said peripheral wall, wherein said measuring step comprises sucessively measuring limited vertically spaced portions of said peripheral wall by continuously moving a vertically pivotable spot lens over the height of said peripheral wall and measuring the maximum temperature detected in each pivot cycle; and
using said measured maximum temperature to control said gas flow as a function of said maximum temperature, whereby said peripheral wall is not overheated.



4,718,931
METHOD OF CONTROLLING MELTING IN A COLD CROWN GLASS MELTER

George B. Boettner, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 5, 1987, Ser. No. 11,031
Int. Cl.[4] C03B *3/00*
U.S. Cl. 65—29 15 Claims



1. A method of controlling the thickness of a batch blanket on the surface of molten glass contained within a glass melting furnace which comprises:
measuring the height of said batch blanket;
regulating the fill rate to maintain a desired blanket height;
measuring the fusion line level at the surface of the molten glass;
measuring the effective hydrostatic head of the molten glass and batch material within said furnace above a predetermined level at the known fusion line level; and
regulating the power input to said furnace so as to maintain the desired effective hydrostatic head and maintain the predetermined fusion line between the molten glass and the batch blanket so as to control the thickness of said blanket.

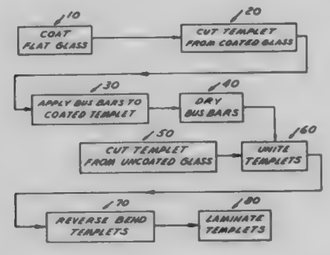
VOL 1086 ISS 2 JA 12 1988 UMI

4,718,932

METHOD FOR MAKING AN ELECTRICALLY HEATABLE WINDSHIELD

Eugene P. Pharms, Romulus, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 24, 1986, Ser. No. 934,984
Int. Cl.[4] C03C 17/23; C03B 23/023
U.S. Cl. 65—42 **3 Claims**



1. A method of manufacturing a curved windshield with an electrically conductive film thereon which comprises the steps of:

placing an electrically conductive film on a flat glass sheet;

placing an oxidizable metal layer on said electrically conductive film, said oxidizable metal layer being of such thickness that when the flat glass sheet is subjected to a heating operation of a specific predetermined time and temperature for the purpose of bending the same, said oxidizable metal layer will be oxidized throughout its width as the heating of the glass sheet is being terminated;

placing an oxidized metal layer on said oxidizable metal layer;

cutting a glass templet from the resulting coated glass sheet;

applying electrically conductive bus bars to said electrically conductive film on said glass templet;

drying said bus bars to bond said bus bars to said electrically conductive film on said glass templet;

cutting a glass templet from an uncoated glass sheet;

uniting said coated and uncoated glass templet in a manner such that said coating on said coated glass templet is exposed to the ambient;

heating said glass templet to a temperature whereat said united glass templets are bendable using said specific time and temperature;

reverse bending said united glass templets, said oxidation of said oxidizable metal layer during said heating of said united glass templets protecting said electrically conductive film;

placing a laminating interlayer between said glass templets with the coating on the coated glass templet being placed in contact with the laminating interlayer; and

laminating said glass templets with said laminating interlayer thereby to achieve a shaped laminated windshield which is heatable by the flow of electrical energy therethrough.

4,718,933

INTERNALLY COOLED GOB CHUTE

John E. Sacomain, Westogue, and Robert J. Dega, Enfield, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 8, 1986, Ser. No. 916,579
Int. Cl.[4] C03B 7/09
U.S. Cl. 65—327 **4 Claims**

1. A gob distributor comprising

housing means, and

at least one gob guide means rotatably supported by said housing means, said gob guide means including

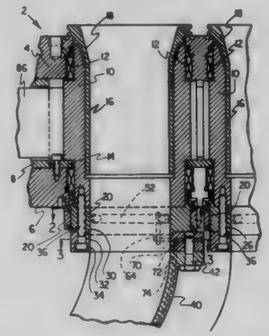
funnel means for receiving gobs from a gob feeder,

scoop means below said funnel means for redirecting a gob received by said funnel means,

said scoop means including a conduit having an inlet and an outlet for directing cooling liquid therethrough and

distributor means intermediate said scoop means and said funnel means,

said distributor means being cylindrical and having a pair of grooves defined at opposed locations in said cylindrical surface and having inlet and outlet conduits communicating with the respective end of said scoop means conduit and with one of said grooves,



said housing means including a manifold having a cylindrical bore matingly engaging with the cylindrical portion of said distributor means whereby opposed volumes will be defined therebetween, said opposed volumes having a range of displacement as said gob guide means is rotated relative to said housing means, and

said manifold means including inlet and outlet conduit means communicating with said respective volume throughout its range of displacement.

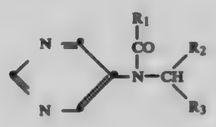
4,718,934

5-ACYLAMINOPYRIMIDINES

Helmut Zondler, Bottmingen; Hans Tobler, Allschwil, and Urs Müller, Münchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 775,971, Sep. 13, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,308
Claims priority, application Switzerland, Sep. 20, 1984, 4495/84; Jun. 5, 1985, 2382/85
Int. Cl.[4] A01N 43/54; C07D 239/50
U.S. Cl. 71—76 **18 Claims**

1. A 5-acylaminopyridine of the general formula I



(I)

wherein

R_1 is C_1–C_8alkyl, C_1–C_8alkoxy, C_1–C_4alkoxy-C_1–C_8alkyl, or halogen; phenyl or phenoxy, each unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_6carboxylalkyl, C_1–C_4haloalkoxy, C_1–C_4alkoxy, C_1–C_4haloalkylthio, cyano or nitro; C_2–C_4alkenyl or C_2–C_4alkynyl, or is C_3–C_6cycloalkyl which is unsubstituted or substituted by halogen or C_1–C_4alkyl,

R_2 is C_1–C_8alkyl which is unsubstituted or substituted by halogen, cyano or C_1–C_4alkoxy; phenyl or C_1–C_8phenylalkyl, in each of which the phenyl nucleus is unsubstituted or substituted as defined for R_1; pyridyl, thienyl or furyl, in which the nucleus is unsubstituted or substituted in the same manner as phenyl as defined for R_1; or is pyranyl, dihydropyranyl, C_3–C_7cycloalkyl or C_3–C_7alkenyl, and

R_3 is hydrogen or C_1–C_8alkyl and R_2 and R_3, together with the carbon atom to which they are attached, may form a C_5–C_7cycloalkyl radical.

13. A method of regulating plant growth, which method comprises applying to the plant or the locus thereof an effective amount of a compound of formula I as defined in claim 1.

4,718,935

METHOD FOR THE PREPARATION OF MYCOHERBICIDE-CONTAINING PELLETS

Harrell L. Walker, Ruston; William J. Connick, Jr., New Orleans, both of La.; Paul C. Quimby, Jr., Leland, Miss.; Harrell L. Walker, Ruston; William J. Connick, Jr., New Orleans, both of La., and Paul C. Quimby, Jr., Leland, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 506,952, Jun. 22, 1983, abandoned. This application Sep. 6, 1985, Ser. No. 773,264
Int. Cl.[4] A01N 63/04, 37/18
U.S. Cl. 71—79 **5 Claims**

1. Alginate gel pellets containing living fungus, said pellets comprising effective concentrations of living fungus as the active ingredient dispersed throughout an alginate gel matrix carrier, said fungus selected from the group consisting of *Alternaria cassiae, Fusarium lateritium, Alternaria macrospora, Colletotrichum malvarum* and Phyllosticta sp. NRRL #15549, said fungus targeted to the control of specific weeds.

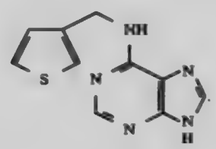
4,718,936

6-(3-THIENYLMETHYLAMINO)-PURINE, ITS PREPARATION AND ITS USE

Jens-Uwe Blisener, Deidesheim; Hubert Sauter, Mannheim; Norbert Goetz, Worms; Johann Jung, Limburgerhof, and Klaus Grossmann, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 13, 1985, Ser. No. 711,205
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409272
Int. Cl.[4] C07D 473/26; A01N 43/90
U.S. Cl. 71—92 **4 Claims**

1. 6-(3-Thienylmethylamino)-purine of the formula



(I)

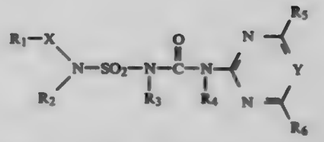
4,718,937

N-ALKOXYAMINOSULFONYLUREAS AND N-ALKYLSULFONYLAMINOSULFONYLUREAS

Lothar Willms, Unkel; Hilmar Mildenberger, Kelkheim; Klaus Bauer, Rodgau, and Helmut Börstell, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 627,763, Jul. 5, 1984, Pat. No. 4,601,747. This application Apr. 9, 1986, Ser. No. 849,737
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324882
Int. Cl.[4] C07D 251/52, 251/46; A01N 43/66, 43/70
U.S. Cl. 71—93 **4 Claims**

1. A compound of the formula I



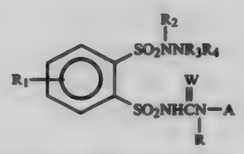
4,718,938

HERBICIDAL SULFONAMIDES

Donald J. Dumas, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 802,269, Nov. 27, 1985, Pat. No. 4,662,932, which is a continuation-in-part of Ser. No. 705,913, Feb. 26, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 938,144
Int. Cl.[4] C07D 251/46, 401/12; A01N 43/66, 43/70
U.S. Cl. 71—93 **15 Claims**

1. A compound of the formula



and their agriculturally suitable salts, wherein:

W is O or S;

R is H or CH_3;

R_1 is H, C_1 to C_3 alkyl, C_1 to C_3 haloalkyl, halogen, nitro, C_1 to C_3 alkoxy, $SO_2NR_eR_f$, C_1 to C_3 alkylthio, C_1 to C_3 alkylsulfinyl, C_1 to C_3 alkylsulfonyl, CN, CO_2R_c, C_1 to C_3 haloalkoxy, C_1 to C_3 haloalkylthio, C_2 to C_3 alkoxyalkyl, C_2 to C_3 haloalkoxyalkyl, C_2 to C_3 alkylthioalkyl, C_2 to C_3 haloalkylthioalkyl, C_2 to C_3 cyanoalkyl or NR_eR_e;

R_e is H, C_1 to C_4 alkyl, C_2 to C_3 cyanoalkyl, methoxy or ethoxy;

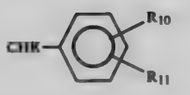
R_f is H, C_1 to C_4 alkyl or C_3 to C_4 alkenyl; or

R_e and R_f can be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$or $—CH_2CH_2OCH_2CH_2—$;

R_c is C_1 to C_4 alkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl, C_2 to C_4 haloalkyl, C_2 to C_3 cyanoalkyl, C_5 to C_6 cycloalkyl, C_4 to C_7 cycloalkylalkyl or C_2 to C_4 alkoxyalkyl;

R_d and R_e are independently H or C_1 to C_2 alkyl;

R_2, R_3 and R_4 are independently H, C_1 to C_4 alkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl, C_1 to C_4 haloalkyl, $C(O)R_5$, CO_2R_6, $C(O)NR_7R_8$, $C(S)NR_7R_8$, $C(NR)NR_7R_8$, Q, CHRQ, CH_2CH_2Q, C_2 to C_3 alkyl substituted with OR_9, phenyl which may be optionally substituted with R_{10} and R_{11} or



the total number of carbon atoms in R_2, R_3 and R_4 not exceeding 10;

R_3 and R_4 can be taken together to form $-(CH_2)_4-$, $-(CH_2)_5-$, $[CH_2CH_2OCH_2CH_2$, $CH=CHCH=CH$, $CH=N-N=CH]$ $-CH_2CH_2OCH_2CH_2-$, $-CH=CHCH=CH-$, $-CH=N-N=CH-$, or



R_5 is C_1 to C_3 alkyl or phenyl which can be optionally substituted with R_{10} and R_{11};

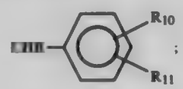
R_6 is C_1 to C_3 alkyl;

R_7 and R_8 are independently H or C_1 to C_3 alkyl;

R_9 is H, SO_2R_6, $C(O)R_6$, CO_2R_6 $C(O)NR_7R_8$, C_1 to C_3 alkyl, C_1 to C_3 haloalkyl or $P(O)(OR_6)_2$;

R_{10} and R_{11} are independently H, C_1 to C_3 alkyl, Cl, F, Br, NO_2, CF_3, CN or C_1 to C_3 alkoxy;

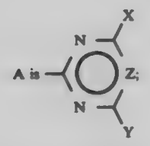
R_{12} and R_{13} are independently H, C_1 to C_3 alkyl, phenyl which can be optionally substituted with R_{10} and R_{11} or



R_{12} and R_{13} can be taken together to form $-(CH_2)_4$ or $-(CH_2)_5-$;

Q is a pyridinyl, pyrimidinyl, oxadizolyl, thienyl or tetrahydrofuranyl ring optionally substituted by one or more groups selected from L;

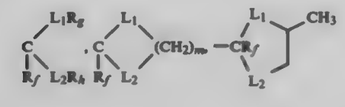
L is C_1 to C_4 alkyl, C_1 to C_3 haloalkyl, halogen, C_1 to C_3 alkoxy, C_1 to C_3 alkylthio, C_3 to C_4 alkenyloxy, C_3 to C_4 alkenylthio, C_1 to C_2 haloalkoxy or C_1 to C_2 haloalkylthio;



A-1

X is H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 haloalkyl, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino or di(C_1 to C_3 alkyl)amino;

Y is H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino, di(C_1 to C_3 alkyl)amino, C_3 to C_4 alkenyloxy, C_3 to C_4 alkynyloxy, C_2 to C_5 alkylthioalkyl, C_1 to C_4 haloalkyl, C_3 to C_5 cycloalkyl, C_2 to C_4 alkynyl, $C(O)R_f$;



or $N(OCH_3)CH_3$;

neither X nor Y being OCF_2H;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_f is H or CH_3;

R_g and R_h are independently C_1 to C_8 alkyl; and

Z is N.

8. A composition for the control of undesirable vegegation consisting essentially of a compound of claim 1 and at least one of (a) a surface active agent, and (b) a solid or liquid diluent.

4,718,939

RECYCLING SUPERALLOY SCRAP BY VAPOR PHASE ZINC EMBRITTLEMENT

Henry E. Hilliard, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 24, 1986, Ser. No. 946,470

Int. Cl.⁴ C22B *7/00*; B02C *23/18*

U.S. Cl. 75—0.5 R **9 Claims**

1. A method of preparing superalloy scrap for recovery of the metal values therein comprising the step of treating the scrap with zinc vapor to form a friable product.

4,718,940

METHOD OF MANUFACTURING ALLOY FOR USE IN FABRICATING METAL PARTS

Kerry A. McPhillips, 3780 Olive Ave., Long Beach, Calif. 90807

Filed May 5, 1986, Ser. No. 859,616

Int. Cl.⁴ C21C *7/10*

U.S. Cl. 75—10.18 **13 Claims**

1. A method of producing a quantity of a nickel based alloy for investment casting containing aluminum, titanium and nickel including no less than about 0.3% aluminum, no less than about 0.1% titanium and no greater than about 12% aluminum and titanium in the aggregate, the said method comprising forming a first metal ingot containing the entire amount of aluminum and titanium in a nickel matrix by vacuum melting, forming a second air-melting grade ingot containing nickel, and mechanically joining said first and second ingots together by welding to produce an investment casting charge.

4,718,941

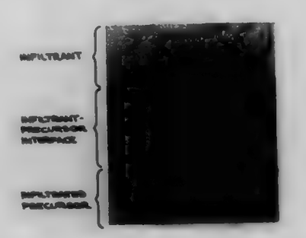
INFILTRATION PROCESSING OF BORON CARBIDE-, BORON-, AND BORIDE-REACTIVE METAL CERMETS

Danny C. Halverson, Manteca, and Richard L. Landingham, Livermore, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 17, 1986, Ser. No. 875,419

Int. Cl.⁴ C22C *29/02*

U.S. Cl. 75—236 **24 Claims**



1. A method of fabricating metal-ceramic composites from previously formed ceramic precursor starting constituents selected from boron-carbide, boron and borides and metals reactive therewith selected from reactive metals, alloys thereof, and compounds thereof which reduce to reactive metals or alloys thereof, comprising:

chemically pretreating the previously formed starting constituents of a ceramic precursor;

consolidating the chemically pretreated starting constituents into a porous ceramic precursor;

infiltrating molten reactive metal into the chemically pretreated ceramic precursor;

wherein the step of chemically pretreating the starting constituents of the ceramic precursor alters the surface chemistry to enhance infiltration of the precursor by the molten reactive metal by slowing the kinetics of reaction relative to the kinetics of densification.

4,718,942

THIXOTROPIC OVERBASED ALKALINE EARTH METAL INORGANIC-ORGANIC COMPOSITIONS CONTAINING ALKOXYLATED OXIDIZED PETROLATUMS

Paul E. Lasra, Southport, Conn., and Gerard Vinches, Seine Maritime, France, assignors to Witco Corporation, New York, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,518

Int. Cl.⁴ C04B *9/02*; C09K *3/00*

U.S. Cl. 106—14.29 **22 Claims**

1. A corrosion-inhibiting coating composition including, as essential ingredients, (a) an inorganic-organic complex in the form of a thixotropic overbased alkaline earth metal organic sulfonate, and (b) a minor proportion of a C_2–C_8 alkoxylated oxidized petrolatum selected from the group of natural and synthetic petrolatums.

4,718,943

WOOD PRESERVING IMPREGNATING OIL AND USE THEREOF

Arnold Aischer, Essen, and Gernot Lochnert, Hamminkeln, both of Fed. Rep. of Germany, assignors to Verkaufsgesellschaft fuer Teererzeugnisse (VfT), Duisburg, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 873,893

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522633

Int. Cl.⁴ C09D *5/14*

U.S. Cl. 106—15.05 **6 Claims**

1. A composition comprising:

10–90 weight % of coal conversion oil,

10–90 weight % of coal tar impregnating oil,

0–75 weight % of mineral oil fraction in the boiling range of 200°–400° C.,

0–60 weight % of alkyl- or cycloalkyl-substituted aromatics with 2 to 4 rings wherein the coal conversion oil is a middle oil fraction having a boiling range of 200° to 400° C. which is recovered from the direct hydrogenation liquid phase process or from coal solvent extraction of low ash coal.

4,718,944

COUPLING AGENT COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

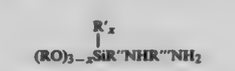
Filed Oct. 7, 1986, Ser. No. 916,260

Int. Cl.⁴ C08K *5/09*, *5/54*, *9/06*

U.S. Cl. 106—287.11 **4 Claims**

1. A composition comprising:

(A) the reaction product of about (i) 1.7 to 2 mole parts maleic anhydride with (ii) 1 mole part of a silane represented by the general formula



where

R denotes an alkyl radical with 1 to 6 carbon atoms or an alkoxyalkyl radical with 2 to 8 carbons,

R′ denotes an alkyl radical with 1 to 6 carbon atoms,

R″ and

R‴ denote alkylene radicals with 1 to 6 carbon atoms, or alkylarylene radicals, arylalkylene radicals, or arylene radicals with 6 to 10 carbon atoms and x is 0 or 1, and

(B) sufficient solvent to solubilize (A).

4,718,945

SUGAR CENTRIFUGE

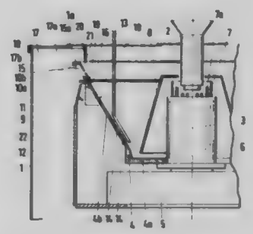
Helmut Schaper, Brunswick, and Heinrich Kurland, Erkerode-Lucklum, both of Fed. Rep. of Germany, assignors to Braunschweigische Maschinenbauanstalt AG, Brunswick, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,956

Claims priority, application European Pat. Off., Jan. 18, 1986, 86710002.6

Int. Cl.⁴ C13F *1/06*

U.S. Cl. 127—9 **9 Claims**



1. A continuous sugar centrifuge, comprising feeding means for massecuite, a frustum-shaped screen drum (4), a housing (1) surrounding said screen drum, means for driving said screen drum for rotation about its central axis, massecuite distribution and acceleration means arranged centrally in said screen drum for rotation with said screen drum and for uniformly distributing massecuite onto said screen drum in a bottom zone of said screen drum, covering water jets (14) arranged in a fixed position in a narrower cross-sectional zone of said screen drum, separate collection means (22) for sugar exiting over an annular drum edge (10b) near an open drum end, and discharge collecting means (12) for liquid run-off flowing through liquid discharge openings (11) in a drum wall (4b), air guide means for venting air from the screen drum (15) arranged at an open, widened end of said screen drum (4), said air guide means widening conically as an extension of said drum wall (4b), said air guide means defining together with said annular drum edge an annular passage gap (16) for the sugar, said air guide means for venting air from the screen drum having an edge (15a) extending away from said screen drum and reaching into a ring-shaped air scoop and collecting space (17) which is open along the air guide means toward an interior of said screen drum said collecting space being substantially sealed from the collection means (22) such that air flows out of the drum into the collecting space and is vented therefrom.

4,718,946

SELECTIVE REMOVAL OF SULFONIC RESIN EXTRACTABLES WITH ACRYLIC ANION EXCHANGE RESINS

William Fries, Southampton, Pa., assignor to Rohm and Haas Co., Philadelphia, Pa.

Continuation of Ser. No. 414,173, Sep. 2, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 601,145

Int. Cl.⁴ C13J *1/06*

U.S. Cl. 127—46.2 **9 Claims**

1. A process for removing sulfonic resin extractables from an

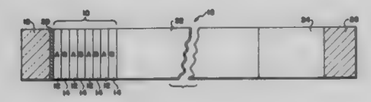
aqueous sugar solution treated with sulfonated ion exchange resin which comprises the steps of contacting the sugar solution, at a temperature from about 0° C. to about 100° C., subsequent to treatment with sulfonated cation exchange resin, with an acrylic, anion exchange resin, the anion exchange resin being derived by polymerization from a monomer mixture comprising polyvinyl crosslinking monomer and one or more monovinyl acrylic monomers selected from the group consisting of acrylic acid, methacrylic acid, C_1–C_8 alkyl esters of acrylic acid and C_1–C_8 alkyl esters of methacrylic acid, until the sulfonic resin extractables are reduced to a level below 1 part per million parts of solution, and subsequently separating the sugar solution from the anion exchange resin.

4,718,947

SUPERLATTICE DOPED LAYERS FOR AMORPHOUS SILICON PHOTOVOLTAIC CELLS

Rajeewa R. Arya, Doylestown, Pa., assignor to Solarex Corporation, Rockville, Md.

Filed Apr. 17, 1986, Ser. No. 853,032
Int. Cl.⁴ H01L *31/06*
U.S. Cl. 136—258 **19 Claims**



1. A photovoltaic cell, comprising:
a. a transparent superstrate;
b. a layer of transparent conductive oxide formed on said superstrate;
c. a superlattice p-layer of amorphous silicon carbide formed on said conductive oxide layer, said p-layer including a plurality of first and second lattices alternatingly formed on one another, each of said first and second lattices having a thickness of approximately 12–30 Å, each of said first lattices having a first optical bandgap greater than or equal to about 2.25 eV, and each said second lattices having a second optical bandgap of about 1.7–2.0 eV.
d. an i-layer of amorphous silicon formed on said p-layer;
e. an n-layer of amorphous silicon formed on said i-layer; and
f. a back contact layer of conductive material formed on said n-layer.

4,718,948

ROLLED ALUMINUM ALLOY SHEETS FOR FORMING AND METHOD FOR MAKING

Toshio Komatsubara; Toshiki Muramatsu, and Mamoru Matsuo, all of Saitama, Japan, assignors to Sky Aluminium Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 833,376
Int. Cl.⁴ C22F *1/04*
U.S. Cl. 148—2 **10 Claims**

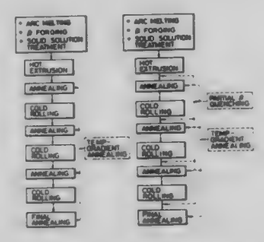
9. A method for making a rolled aluminum alloy sheet comprising the steps of
casting an aluminum alloy consisting essentially of, on a weight basis,
1.25% to 2.5% of Si, 0.25% to 0.85% of Mg, 0.05% to 0.4% of Fe, 0.1% to 1.5% of Cu, and
at least one member selected from the group consisting of 0.05% to 0.6% of Mn, 0.05% to 0.3% of Cr, and 0.05% to 0.15% of Zr,
balance essentially aluminum,
homogenizing the resulting ingot at a temperature in the range of 450 to 560° C. for about 1 to about 48 hours,
rolling the ingot into a sheet having a predetermined thickness,
annealing the sheet at a temperature in the range of to 570° C. for at least 5 seconds,
subsequently quenching the sheet, and allowing the sheet to age at room temperature.

4,718,949

METHOD OF PRODUCING A CLADDING TUBE FOR REACTOR FUEL

Iwao Takase, Toukai; Toshimi Yoshida, Mito; Shinzo Ikeda, Toukai; Isao Masaoka, and Junjiro Nakajima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 699,560, Feb. 8, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 915,555
Claims priority, application Japan, Feb. 8, 1984, 59-19980
Int. Cl.⁴ C22F *1/18*
U.S. Cl. 148—11.5 F **12 Claims**



1. A method of producing a cladding tube for reactor fuel comprising hot-extruding a zirconium-based alloy to form a hot-extruded tube and effecting cold rolling and annealing at least once, wherein said annealing is effected at least once by heating the inner surface of said cladding tube to a temperature higher than the recrystallization temperature of said zirconium-based alloy, while cooling the outer surface of said cladding tube.

4,718,950

PROCESS FOR SELECTIVELY ANNEALING METAL STRIPS

Kiyoaki Nishikawa, Kanagawa, Japan, assignor to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1986, Ser. No. 827,301
Claims priority, application Japan, Feb. 15, 1985, 60-26373; Feb. 15, 1985, 60-26374
Int. Cl.⁴ C22F *1/00*
U.S. Cl. 148—13.1 **14 Claims**

1. A process for selective annealing metal strips, which comprises forming a deposit in the form of a continuous or intermittent stripe or stripes of graphite powder at least 50% of which is 20 μm or less in particle diameter, on one side or both sides of a metal strip, and then heating the deposit by laser or a high-luminance light source to form a selectively annealed portion or portions.

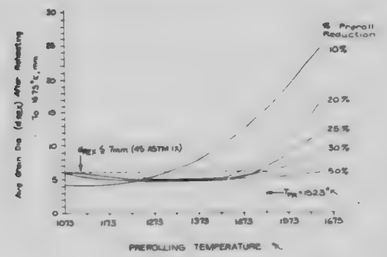
4,718,951

METHOD OF PRODUCING CUBE-ON-EDGE ORIENTED SILICON STEEL FROM STRAND CAST SLAB

Jerry W. Schoen, Hamilton, Ohio, assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 704,702, Feb. 25, 1985, abandoned. This application Aug. 27, 1986, Ser. No. 902,094
Int. Cl.⁴ H01F *1/04*
U.S. Cl. 148—111 **12 Claims**

1. A method of controlling strain rate during prerolling of silicon steel strand cast slabs, comprising the steps of providing a strand cast slab containing from 2% to 4% silicon and having a thickness of about 10 to about 30 centimeters, prerolling the slab while at a temperature not exceeding 1673° K. (1400° C.) with a reduction in thickness up to 50%, reheating said prerolled slab to a temperature between about 1533° and 1673° K. (1260° and 1400° C.), and correlating the slab prerolling temperature, percentage of reduction in prerolling, and the reheat temperature, whereby to control the strain rate during prerolling and to obtain an average grain diameter not exceeding about 9 mm after said reheating, in accordance with the equation:



$$(K^*)^{-1} = (T_{SR}) \times \ln\left[\frac{\epsilon^{0.15}}{\exp\left(\frac{7616}{T_{PR}}\right)} \ln\left(\frac{t_i}{t_f}\right)\right] \geq 6400$$

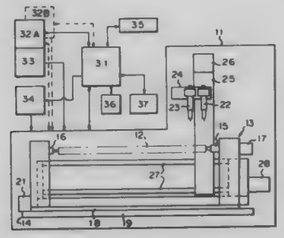
where
$(K^*)^{-1}$=strain/recrystallization parameter
T_{SR}=slab reheating temperature °K.
ϵ=strain rate in prerolling
T_{PR}=slab prerolling temperature °K.
t_i=as-cast slab thickness
t_f=prerolled slab thickness.

4,718,952

PROCESS FOR PRODUCING A REMELTED AND CHILLED CAMSHAFT

Toshiharu Fukuizumi, and Hideo Nonoyama, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 8, 1986, Ser. No. 894,830
Claims priority, application Japan, Aug. 9, 1985, 60-174334
Int. Cl.⁴ C21D *9/30*
U.S. Cl. 148—152 **2 Claims**



1. A process for producing a remelted and chilled camshaft with cams, which comprises the steps of melting a sliding cam surface of the camshaft by TIG arc and forming a chill layer by self-cooling, wherein in order to substantially simultaneously subject two adjacent cams which are mutually spaced by a distance of less than 45 mm from each other to a remelting treatment by using tungsten torches for the cams, respectively, a melting current is applied to one tungsten torch for one cam to melt the sliding cam surface thereof, and simultaneously, a nonmelting current of 10–30A is applied to the other tungsten torch for the other cam without producing magnetic arc blow influence on the TIG arc generated at the tungsten torch, and said current applications are alternately repeated on said cams.

4,718,953

HIGH EXPLOSIVE COMPOUND IN NITRATE SALT MATRIX

Anh D. Nguyen, Brossard; William B. Evans, Beaconsfield, and Donald G. Ballantyne, Markham, all of Canada, assignors to C-I-L Inc., North York, Canada

Filed Jul. 10, 1987, Ser. No. 71,770
Claims priority, application Canada, Aug. 6, 1986, 515450
Int. Cl.⁴ C06C *45/04*
U.S. Cl. 149—17 **10 Claims**

1. A high explosive detonable by blasting cap in small diameter cartridges comprising an intimate mixture of a major amount of an inorganic nitrate oxidizer salt in crystalline form and a minor amount of a hydroxyalkyl nitrate fuel, the said hydroxyalkyl nitrate fuel being dispersed in the crystalline matrix of the said oxidizer salt.

4,718,954

EXPLOSIVE COMPOSITIONS

Oldrich Machacek, Dallas; Neil E. Gehrig, Richardson, both of Tex., and Gary R. Eck, Sarcoxie, Mo., assignors to Thermex Energy Corporation, Dallas, Tex.

Filed Mar. 26, 1986, Ser. No. 844,459
Int. Cl.⁴ C06B *31/28*
U.S. Cl. 149—46 **8 Claims**

1. An improved explosive composition comprising an admixture of
(a) from 5 to 60 parts by weight of a gelled concentrate formed by mixing a sensitizer, an oxidizer, water and a gelling agent and
(b) from 95 to 40 parts by weight of a particulate oxidizer.

4,718,955

METHOD OF RECOVERING POWERED ALUMINUM FROM ALUMINUM-POLYMER MIXTURES

Ralph C. Raisor, Brigham City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Dec. 4, 1985, Ser. No. 804,551
Int. Cl.⁴ D03D *23/00*
U.S. Cl. 149—109.6 **4 Claims**

1. A method of recovering aluminum powder from a solid composite propellant comprising a polymeric binder and an oxidizer comprising the steps of:
dissolving the composite propellant in a solvent to remove soluble polymer and the oxidizer,
drying the insoluble residue, and
heating the dried insoluble residue in an oxidizing gas to a temperature at which the polymer oxidizes but below the melting temperature of aluminum to remove the polymer by oxidation to innocuous gaseous products and to leave a residue of free flowing aluminum powder.

4,718,956

METHOD OF PREPARING A GLASS RELEASE SURFACE FOR MANUFACTURING AN ANTI-LACERATIVE WINDOW ASSEMBLY

George H. Armstrong, Holland, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Feb. 28, 1986, Ser. No. 833,802
Int. Cl.⁴ B32B *17/00*
U.S. Cl. 156—99 **8 Claims**

1. In a method of producing an optically transparent anti-lacerative window assembly comprising:
(a) assembling into a stacked relationship individual layers including a transparent glass substrate sheet having a predetermined curvature, a thermoplastic polyurethane anti-laceration film abutting one surface of the glass substrate sheet, and a glass cover plate having substantially

the same curvature as the glass substrate sheet and abutting the polyurethane film; and

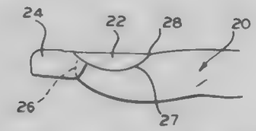
(b) compressing the stacked assemblage, the glass cover plate providing optical properties to the polyurethane layer; the improvement comprising; before compressing, providing octadecyltriethoxysilane as a parting agent coating on the glass cover plate to produce an optically transparent window assembly in which the polyurethane layer has good optical properties and good anti-lacerative properties.

4,718,957

PROCESS OF CREATING AN ARTIFICIAL FINGERNAIL

Kenneth C. Sensenbrenner, 919 W. Kirby, Champaign, Ill. 61820

Filed Jul. 24, 1986, Ser. No. 889,822
Int. Cl.[4] B29C *41/02*
U.S. Cl. 156—152 **36 Claims**



1. A process of creating an artificial fingernail intimately complimentary to and juxtaposed to the primary substrate of a natural fingernail and with said artificial nail extending outwardly beyond the terminal extremity of said natural nail, comprising the steps of:

(a) applying a secondary substrate means to the fleshy extremity of a natural finger to provide support means subjacent the area to be covered by the artificial finger nail;

(b) contouring the upper surface of said secondary substrate;

(c) applying a continuous release coat over the natural nail substrate and the secondary substrate;

(d) applying a curable continuous coating of acrylic simultaneously over the release coat covering both the natural nail substrate and the secondary substrate;

(e) curing said acrylic until it hardens into the initial shape of the desired artificial nail;

(f) removing said acrylic nail from the natural nail and secondary substrates by activating and softening said release coat;

(g) finishing the artificial nail to its desired shape; and

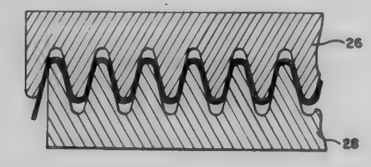
(h) re-applying the artificial nail to the natural nail by adhesion means adapted to permit electable removal.

4,718,958

VACUUM-TYPE INSULATION ARTICLE HAVING AN ELASTIC OUTER MEMBER AND A METHOD OF MANUFACTURING THE SAME

Franz J. Kugelmann, Sr., Juneau, Ak., assignor to Nudvack Enterprises, Juneau, Ak.

Division of Ser. No. 841,855, Mar. 20, 1986. This application Oct. 14, 1986, Ser. No. 918,386
Int. Cl.[4] B31C *1/00*
U.S. Cl. 156—163 **3 Claims**



1. A method for manufacturing an article of insulation, comprising the steps of:

securing a first layer of material which is deformable and elastic to one surface of a base layer of material which is relatively rigid, deformable and inelastic in such a manner as to define substantial unbonded areas on said base layer;

deforming the combination of said first layer and said base layer, such that a pattern of raised portions of said base layer is produced; and

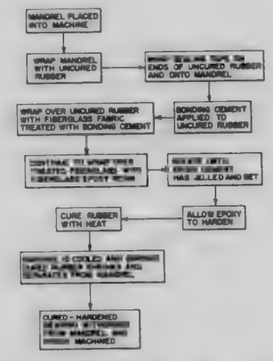
permitting said first layer to relax adjacent said unbonded areas, thereby creating compartments defined by adjacent raised portions of said base layer and said first layer in which a partial vacuum exists.

4,718,959

METHOD OF MAKING A BEARING ASSEMBLY

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 2, 1985, Ser. No. 803,441
Int. Cl.[4] B21D *53/10*; B31C *13/00*
U.S. Cl. 156—188 **5 Claims**



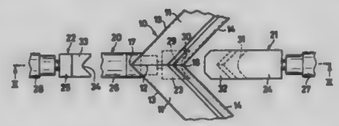
1. A method of fabricating a bearing assembly comprising the steps of first wrapping an uncured layer of an elastomer onto a mandrel having a polygonal outer surface in cross section to form a layer of an elastomeric material, thence wrapping a sealing tape around the respective ends of said uncured layer of elastomer and adjacent surfaces of said mandrel, thence coating the outer surface of said elastomeric layer with a thin film of cement adhesive, thence wrapping fiberglass fabric onto said cement coated elastomeric layer for adherence thereto, thence wrapping onto said fiberglass layer additional layers of fiberglass while impregnating said additional fiberglass layers with a plastic resin, curing said resin to form a rigid plastic outer shell, and thence curing said elastomeric layer after the curing of said outer shell to form a bearing assembly.

4,718,960

METHOD FOR PRODUCING RIGID PLASTIC FRAMES

Bruno Pasqualini, Varese, Italy, assignor to Pantasote Inc., Greenwich, Conn.

Filed Jan. 27, 1986, Ser. No. 822,463
Int. Cl.[4] B29C *49/00*; B31F *1/00*; B25G *3/34*; F16B *11/00*
U.S. Cl. 156—198 **3 Claims**



1. In a method for the production of frames having rigid profiles of plastic material for use in regrigerator cabinets and

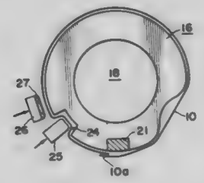
particularly chest freezers, wherein said plastic profiles are mitered and welded at their ends to form a frame having sharp-edged welded corners, said profiles having an elongated base portion and a side wall depending from one edge of said base portion and providing the inner wall of said welded corners of said frame, the improvement which comprises rounding said inner wall of at least one of said sharp-edged welded corners of said frame by means of thermo-forming.

4,718,961

METHOD AND DEVICE FOR THE FABRICATION OF PLASTIC SLEEVES

Yoshihiro Yamato; Masayuki Takasaka; Takeshi Sasaki, all of Yokohama, and Masatoshi Kishida, Noda, all of Japan, assignors to Toyo Garasu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1986, Ser. No. 857,485
Claims priority, application Japan, Apr. 30, 1985, 60-91140
Int. Cl.[4] B32B *31/00*; B29C *53/42*
U.S. Cl. 156—218 **3 Claims**



1. A method of fabricating plastic sleeves which comprises steps of:

cutting a long web of plastic film into blanks of specific length;

wrapping each blank around a cylindrical outer surface of a respective mandrel having a tensioning groove formed in the cylindrical outer surface thereof and extending parallelly to the cylindrical axis thereof, said tensioning groove having a cross-sectional profile of a total length which is longer than the length of the cross-sectional profile of said cylindrical outer surface extended across said tensioning groove, said specific length being such that the ends of the blank thus wrapped mutually overlap to form an overlap;

applying a vacuum to the inner surface of the blank thus wrapped thereby to draw the blank tightly against the mandrel;

pressing a welder seam bar against said overlap thereby to heat seal the same to form a seam and thereby to form a plastic sleeve;

vitiating the vacuum;

pressing and holding stationary a part of the sleeve against the cylindrical outer surface of the mandrel by means of a holding plate;

simultaneously pressing the sleeve into the tensioning groove by means of a pressing-in bar thereby to pull the sleeve sidewise and peel away from the mandrel surface any part of the overlap which has melted and is adhering to the mandrel surface; and

stripping the sleeve off the mandrel.

4,718,962

SHOWER CURTAIN REPAIR KIT

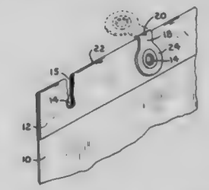
Albert C. Goodwin, 11610 Cleveland Ave., Fort Myers, Fla. 33907

Continuation of Ser. No. 725,230, Apr. 19, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 23,919
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—227 **1 Claim**

1. The method of reinforcing a supporting aperture in a shower curtain comprising:

(a) providing a shower curtain having along a top edge thereof a reverse fold of the curtain to provide a folded region, and a series of supporting apertures in said folded region,

(b) providing a reinforcement member, said reinforcement member comprising a thin transparent plastic member having two apertures separated by a central uninterrupted area, a layer of adhesive on one side of the plastic member, and a removable back tab overlying the adhesive,



(c) removing the back tab from the reinforcing member,

(d) positioning the central uninterrupted area of the reinforcement member on the top edge the curtain at one of the supporting apertures,

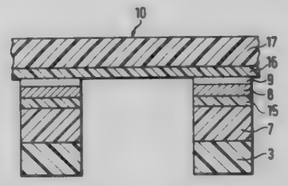
(e) adhering the reinforcement member to both sides of the curtain adjacent the top edge of the curtain so as to align the apertures in the reinforcement member with a supporting aperture in the shower curtain.

4,718,963

METHOD FOR PRODUCING A DECORATIVE MATERIAL

Martin Pöll, Fritzens, and Serge Amstutz, Tirol, both of Austria, assignors to D. Swarovski & Co., Austria

Filed Jan. 16, 1986, Ser. No. 819,266
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501815
Int. Cl.[4] B44C *3/02*
U.S. Cl. 156—232 **8 Claims**



1. A method for producing a multilayer decorative material including at least a melt adhesive layer and an effect layer comprising:

(a) providing a die having one or more raised and depressed areas, the raised areas corresponding to the desired shape of the decorative material and the die being made of a material from which a melt adhesive layer is easily detachable;

(b) applying the melt adhesive layer to the raised areas across their surface;

(c) applying the effect layer to the melt adhesive layer;

(d) providing a thermally non-activatable transparent protective layer or color lacquer layer on the effect layer;

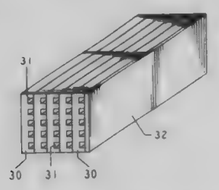
(e) removing from the raised areas of the die the melt adhesive layer, the effect layer and the protective layer or color lacquer layer as a multilayer decorative material with a least the melt adhesive layer exposed.

4,718,964

METHOD FOR PRODUCING SOUND BAR FOR PERCUSSIVE MUSICAL INSTRUMENTS

Shuichi Sawada, and Yoshihiko Murase, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Division of Ser. No. 736,569, May 21, 1985, Pat. No. 4,649,791. This application Dec. 2, 1986, Ser. No. 936,906
Claims priority, application Japan, May 30, 1984, 59-110124
Int. Cl.[4] B32B *31/18*; G10D *13/08*
U.S. Cl. 156—252 **7 Claims**



1. A method for producing a sound bar for percussive musical instruments comprising the steps of

forming a plate like FRP component by orienting in a resin matrix a number of reinforcing fibers at least in the longitudinal direction of said FRP component,

forming at least an array of longitudinal pores in said FRP component,

laminating and bonding together a plurality of said FRP component into a face to face combination, and

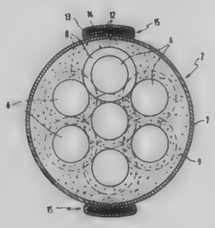
forming a bottom cutout for tonal pitch adjustment in one face of said combination.

4,718,965

PROCESS OF MAKING A STRUCTURAL CABLE

Ulrich Finsterwalder, Pagodenbergstr. 8, D-8000 München 5, and Xaver Lipp, D-7091 Tannhausen, both of Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,635
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431973; Oct. 11, 1984, 3437350
Int. Cl.[4] B32B *31/04*; E01D *11/00*
U.S. Cl. 156—294 **14 Claims**



1. A process for making a cable for a suspension structure comprising:

providing at least one tension element, anchoring the ends of the same to the suspension structure, and tensioning the tension element;

providing at least one continuous strip with a longitudinal axis and a curved shape along said longitudinal axis of said continuous strip, said continuous strip positioned in an arcuate position about the tension element; and

progressively forming said at least one continuous strip into a sheath about the tension element with a space therebetween, confronting longitudinal edges along the continuous strip being bonded together;

advancing the sheath along the tension element as so progressively formed; and

filling the space between the tension element and the sheath with a filling material.

4,718,966

BONDING METHOD UTILIZING CYANOACRYLATE ADHESIVE HAVING CALIXARENE ACCELERATOR

Stephen J. Harris; M. Anthony McKervey; David P. Melody; John Woods, all of Dublin, and John M. Rooney, Kildare, all of Ireland, assignors to Loctite (Ireland) Ltd., Dublin, Ireland

Division of Ser. No. 776,536, Sep. 16, 1985, Pat. No. 4,636,539, which is a division of Ser. No. 673,621, Nov. 21, 1984, Pat. No. 4,556,700, which is a continuation-in-part of Ser. No. 575,257, Jan. 30, 1984, abandoned. This application Oct. 2, 1986, Ser. No. 914,491
Int. Cl.[4] C09J *3/14*
U.S. Cl. 156—331.2 **4 Claims**

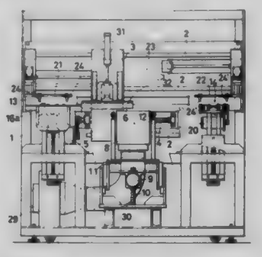
1. In a method of bonding a pair of substrates comprising applying a cyanoacrylate adhesive to at least one of the substrates and joining the substrates for sufficient time to permit the adhesive to fixture, the improvement comprising that said adhesive includes a calixarene compound additive stable to cyanoacrylate monomers.

4,718,967

CONTROL APPARATUS FOR REDUCING ADHESIVE FORCE OF ADHESIVE AGENT ADHERING BETWEEN SEMICONDUCTOR WAFER AND SUBSTRATE

Eiichi Irie, Washimiya, Japan, assignor to Efuesukei Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1986, Ser. No. 940,328
Claims priority, application Japan, Dec. 12, 1985, 60-190304[U]; Nov. 4, 1986, 61-168197[U]
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—379.6 **5 Clr'ms**



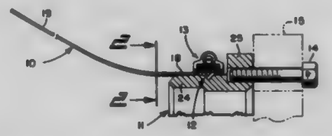
1. A control apparatus for reducing an adhesive force of an adhesive agent adhering between a semiconductor and a substrate, said apparatus comprising: a treating container having a light transmission window and a closure member for closing and opening said container, said container being charged with a workpiece formed by adhering the semiconductor wafer to a substantially light transparent substrate by a photo-setting adhesive agent, a light source positioned opposite said light transmission window, and a deoxygenating means connected to said container for removing at least a substantial portion of the oxygen of an internal atmosphere of the container.

4,718,968

FINGER PLY DOWN FOR TIRE BUILDING MACHINE

George E. Enders, Salem; Anand P. Singh, Youngstown, and Gary R. Naylor, Canfield, all of Ohio, assignors to NRM Corporation, Columbiana, Ohio

Filed Apr. 18, 1985, Ser. No. 724,579
Int. Cl.[4] B29D *30/32*
U.S. Cl. 156—400 **7 Claims**



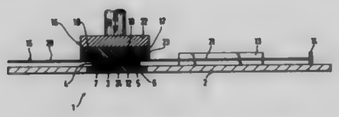
1. A finger ply down for a tire building machine comprising an annular array of generally axially extending fingers, an annular support for said fingers, an axial interference between said support and each finger of the array located within the edges of said support, and constrictable clamp means radially to constrict and secure each finger of the array respectively at the axial interference, said axial interference including radially interfitting protrusions and grooves which interfere axially to lock the fingers to the support.

4,718,969

APPARATUS FOR MANUFACTURING A BINDING

Peter Lázár, Tannenstr. 11, D-4040 Neuss 21, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 780,830
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435704
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—500 **20 Claims**



1. Apparatus for the manufacture of a binding, characterized by a mold (4) comprising a bottom (5) and side walls (6, 7, 8, 9) and open at one longitudinal side, by a stamp system (16) to force a binding back (19) into the open longitudinal side of the mold (4), by means for holding and liquefying a supply of a hot-melt adhesive, by means operably associated with said holding means for supplying a predetermined quantity of a liquefied hot-melt adhesive to said mold, said bottom of said mold having an elevation greater near the center longitudinal line than at the edges.

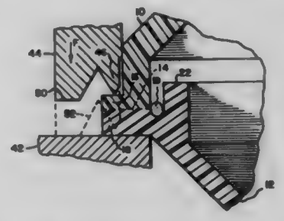
4,718,970

APPARATUS FOR STRESS RELIEF AND EDGE SEALING OF WELDED JOINTS IN PLASTIC PARTS

John V. Bouyoucos, Pittsford, and David W. Durfee, Rochester, both of N.Y., assignors to Hydroacoustics, Rochester, N.Y.

Division of Ser. No. 609,361, May 11, 1984, Pat. No. 4,663,206. This application Apr. 21, 1986, Ser. No. 840,272
Int. Cl.[4] B29C *65/08, 65/74*
U.S. Cl. 156—510 **8 Claims**

1. In a welding machine, the improvement comprising: apparatus for relieving stresses in a welded joint securing plastic parts which have flanges extending therefrom, adjoining surfaces of which flanges provide, in part, said joint, which comprises a pair of members having opposed surfaces between which said flanges are located after said joint is formed and is solidified, and means for applying forces to at least one of said members in a direction toward the other said members and said solidified joint sufficient to compress said flanges beyond the yield strength of the material thereof said members being plates, one of said plates having a shearing blade along one edge thereof, said one plate having its surface extending outwardly from said flange and engageable with a generally flat opposing surface of the other of said plates when said blade shears said flange, said surface of said member having said blade being closer to said flat opposing surface of said other plate than the apex of said blade, to stop the blade before it shears completely through said flanges.

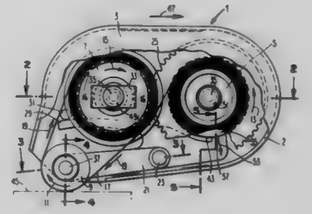


4,718,971

DISPENSER FOR A TRANSFER ADHESIVE

Frank P. Summers, Medford, N.J., assignor to Moore Push-Pin Company, Wyndmoor, Pa.

Filed Oct. 9, 1986, Ser. No. 917,010
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—540 **25 Claims**



1. A dispenser for applying a transfer adhesive material to a surface, comprising:

(a) a supply reel,

(b) a take-up reel, the supply reel and take-up reel being geared such that rotational motion of the take-up reel is transmitted to the supply reel, the supply reel also having a toothed wheel, and

(c) a tape of transfer adhesive material, the tape including a backing and a transfer adhesive attached thereto, the tape being wound around the supply reel, around a tape roller, and onto the take-up reel,

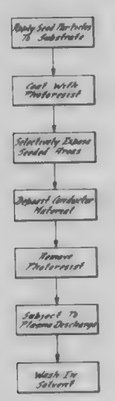
(d) the tape roller being attached to one end of a lever, the lever being mounted to pivot about its fulcrum, the other end of the lever having a first position wherein the lever engages the supply reel so as to prevent rotational movement of the supply reel, and a second position wherein the lever is disengaged from the supply reel so as to allow the supply reel to rotate, the lever being pivotable from the first position to the second position by pressure applied to the dispenser towards the surface, the lever being spring-biased to assume the first position when the dispenser is not in use.

4,718,972

METHOD OF REMOVING SEED PARTICLES FROM CIRCUIT BOARD SUBSTRATE SURFACE

Suryadevara V. Babu, Potsdam; William F. Herrmann, Endicott; Joseph G. Hoffarth, Binghamton; Voya Markovich, Endwell, and Robert T. Wiley, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,216
Int. Cl.[4] H05K *3/18, 3/22;* B05D *3/04*
U.S. Cl. 156—628 8 Claims



1. A method of making a printed circuit board comprising the steps of:

(a) applying metallic seed particles onto a surface of a dielectric substrate;

(b) applying a maskant layer onto the substrate surface over the seed particles;

(c) selectively removing portions of the maskant layer to expose seeded areas on the substrate desired for conductor formation;

(d) electrolessly depositing metallic conductors on the exposed seeded areas on the substrate;

(e) removing the remaining maskant;

(f) subjecting the substrate surface to a plasma discharge formed from a gaseous mixture comprised of oxygen and a halocarbon to convert the metallic seed particles to their salt forms; and

(g) washing the substrate in a solvent which effectively removes said seed particles converted to their salt form from the substrate surface but does not adversely affect the desposited conductors.

4,718,973

PROCESS FOR PLASMA ETCHING POLYSILICON TO PRODUCE ROUNDED PROFILE ISLANDS

Thomas Abraham, Kanata, and Robert E. Theriault, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 19, 1986, Ser. No. 864,668
Claims priority, application Canada, Jan. 28, 1986, 500503
Int. Cl.[4] H01L *21/308*
U.S. Cl. 156—628 11 Claims

1. In a silicon integrated circuit fabrication process the steps in order of:

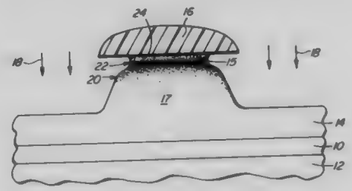
depositing a layer of polysilicon;

forming a thin oxide layer on said polysilicon;

implanting an n-type dopant within said polysilicon layer so that the dopant is heavily concentrated at the polysilicon surface;

removing the oxide layer; and

plasma etching through a mask to form islands of polysilicon wherein the n-type dopant concentration profile is selected to produce a rounded upper outer edge profile in said polysilicon islands.

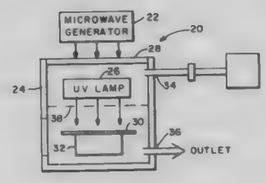


4,718,974

PHOTORESIST STRIPPING APPARATUS USING MICROWAVE PUMPED ULTRAVIOLET LAMP

Behrooz Minaee, Campbell, Calif., assignor to Ultraphase Equipment, Inc., San Jose, Calif.

Filed Jan. 9, 1987, Ser. No. 1,645
Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* B29C *37/00*
U.S. Cl. 156—643 13 Claims



1. Photoresist and surface contaminant stripping apparatus, comprising

a microwave energy source; and

a reaction chamber housing an ultraviolet lamp and a platform for holding a semiconductor wafer, said chamber having an exterior portion between said ultraviolet lamp and said microwave energy source which is permeable to microwaves;

wherein

said reaction chamber has an inlet and an outlet for passing a reaction gas through said reaction chamber;

said platform is situated so that the full surface of a semiconductor wafer thereon is exposed to light emitted by said ultraviolet lamp; and

said ultraviolet lamp responds to microwave stimulation from said microwave energy source by emitting UV radiation having a preselected wavelength between 100 and 300 angstroms;

whereby photoresist can be stripped from a semiconductor wafer on said platform by energizing said ultraviolet lamp while passing a reaction gas through said reaction chamber and thereby ablating organic polymers and impurities from the surface of said semiconductor wafer.

4,718,975

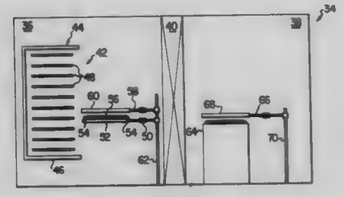
PARTICLE SHIELD

Robert A. Bowling, Garland; Graydon B. Larrabee, Dallas, both of Tex., and Benjamin Y. H. Liu, North Oaks, Minn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1986, Ser. No. 915,608
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C23C *14/00;* B05D *3/06*
U.S. Cl. 156—643 19 Claims

17. A method of preventing adhesion of small foreign particles on the surface of a device during vacuum processing comprising the steps of:

positioning the device at a predetermined position during the vacuum processing; and



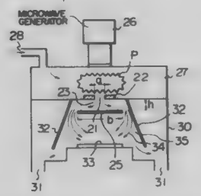
positioning a particle impervious shield adjacent to the surface undergoing processing, said shield being a fixed distance from and positioned sufficently close to the surface to prevent contact by the particles to the surface.

4,718,976

PROCESS AND APPARATUS FOR PLASMA TREATMENT

Shuzo Fujimura, Narashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 767,709, Aug. 22, 1985, abandoned, which is a continuation of Ser. No. 687,052, Oct. 3, 1984, abandoned, which is a continuation of Ser. No. 478,703, Mar., 1983, abandoned. This application Aug. 19, 1986, Ser. No. 898,845
Claims priority, application Japan, Mar. 31, 1982, 57-52992
Int. Cl.[4] C23C *14/22, 14/00;* C23F *1/00, 1/08*
U.S. Cl. 156—643 16 Claims



1. A process for plasma treatment of a material in a treating chamber using a separate plasma generating chamber, comprising the steps of:

(a) introducing an activated gas, excited in the plasma generating chamber, into the treating chamber through an activated gas opening, so that the activated gas impinges upon a gas diffusing device positioned in front of the activated gas opening perpendicular to the direction of the activated gas flow and parallel to the material in the treating chamber;

(b) distributing the activated gas within the treating chamber using the gas diffusing device after the activated gas has impinged upon the gas diffusing device, said distributing step comprising distributing the activated gas in a limited treating region defined by a barrier positioned within the treating chamber and extending from an upper portion at either side of the plasma generating chamber adjacent the activated gas opening to a lower portion at either side of the material to be treated; and

(c) bringing the activated gas into contact with the surface of the material to be treated downstream of the gas diffusing device within the treating chamber.

3. A plasma treatment apparatus having a plasma generating chamber in which an activated gas is excited, and a separate treating chamber having a treating region for plasma treatment of a material, comprising:

a gas passageway connecting the plasma generating chamber to the treating chamber and having an opening for introducing the activated gas which is excited in the plasma generating chamber, into the treating chamber;

gas diffusing means, positioned laterally in front of the opening of the gas passageway upstream of the treating region within the treating chamber and perpendicular to the flow of the activated gas, for distributing the activated gas within the treating chamber; and

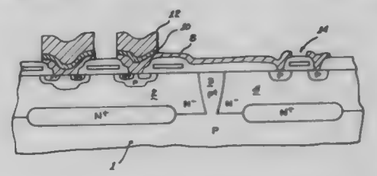
a barrier, positioned in the treatment chamber so as to surround said gas diffusing means, extending from an upper portion located adjacent the gas passageway to a lower portion adjacent the material to be treated, for defining the treating region.

4,718,977

PROCESS FOR FORMING SEMICONDUCTOR DEVICE HAVING MULTI-THICKNESS METALLIZATION

Claudio Contiero, Buccinasco; Giulio Ismunni, Vimercate; Giorgio De Santi, Milan, and Fabrizio Andreani, Parma, all of Italy, assignors to SGS Microelettronica S.p.A., Agrate, Italy

Filed Sep. 6, 1985, Ser. No. 773,319
Claims priority, application Italy, Dec. 20, 1984, 24139 A/84
Int. Cl.[4] H01L *21/28, 29/44;* C23F *1/02*
U.S. Cl. 156—652 3 Claims



1. A method of forming an integrated circuit metallization pattern including a first conductor portion having a relatively fine conductor pattern and a second metal portion thicker than said first conductor portion and having a relatively coarse conductor pattern comprising the steps of:

depositing an aluminum comprising first metal layer having a first thickness;

depositing a titanium comprising second metal layer having a thickness substantially less than said first metal layer on said first metal layer;

depositing an aluminum comprising third metal layer having a thickness substantially greater than said first metal layer on said second metal layer;

forming a first photoreaist mask on said first metal layer;

etching said first layer using said first photoresist mask to form said relatively fine conductor pattern;

forming a second photoresist mask on said third metal layer; and

etching said third metal layer using said second photoresist mask to form said relatively coarse conductor pattern and using only said second metal layer to prevent attack of said first metal layer in said first conductor portion having a relatively fine conductor pattern.

4,718,978

SPENT PULPING LIQUOR RECOVERY PROCESS

Robert J. Spanuth, Washougal, and Robert A. Dumon, Vancouver, both of Wash., assignors to James River Corporation of Nevada, San Francisco, Calif.

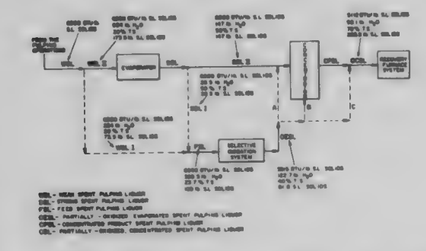
Continuation of Ser. No. 592,032, Mar. 21, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,709
Int. Cl.[4] D21C *11/10, 11/12, 11/14*
U.S. Cl. 162—29 10 Claims

1. A process for increasing the capacity of a spent pulping liquor recovery furnace, which comprises:

(a) forming an unoxidized strong spent pulping liquor stream

and dividing the stream into first and second unoxidized strong spent pulping liquor streams;

(b) partially-oxidizing and evaporating said first strong spent pulping liquor stream, said partial-oxidation step being conducted employing oxygen, or a mixture of oxygen and an inert gas, so that the amount of bicarbonate material produced during said partial-oxidation is minimized, a partially-oxidized spent pulping liquor being produced having an increased total solids, and a gross heating value which is at least twenty percent less than the gross heating value of said second unoxidized strong spent pulping liquor stream without significantly increasing the viscosity thereof;



(c) adding said partially oxidized evaporated spent pulping liquor either to the second stream and then concentrating the mixture, or to the second stream after the second stream has been concentrated to form a partially-oxidized, concentrated, high total solids spent pulping liquor product having a substantially lower gross heating value than, but a substantially similar viscosity as, said second unoxidized spent pulping liquor stream, said heating value being at least about 3400 BTUs/pound of liquor, said product, upon combustion in said furnace, significantly increasing the effective capacity thereof.

4,718,979

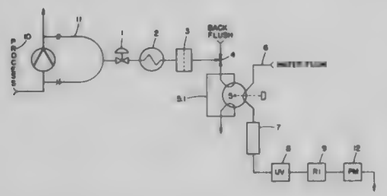
METHOD FOR RAPID DETERMINATION OF THE CONTENTS OF LIGNIN, MONOSACCHARIDES AND ORGANIC ACIDS IN THE PROCESS SOLUTIONS OF SULFITE PULPING

Pasu Tikka, Espoo, and Nils-Erik Virkola, Helsinki, both of Finland, assignors to Oy Advanced Forest Automation Ab, Finland

Continuation-in-part of Ser. No. 543,120, Oct. 18, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 819,136

Int. Cl.⁴ D21C *3/04, 3/22*

U.S. Cl. 162—49 **4 Claims**



1. A method for controlling a sulfite cooking process by determining the lignin, monosaccaride and organic acid contents of sulfite cooking liquior comprising:

(a) passing a quantity of sulfite cooking liquor containing lignin and monosacharides, lignin and organic acid, or lignin, monosaccharides and organic acids from a sulfite cooking process through a body of cation exchange material under ion-exclusion separation conditions effective to provide an effluent containing a substantially ionic portion and a substantially non-ironic portion;

(b) determining the content of lignin by UV light analysis and refractive index analysis of said ionic portion, determining the context of monosaccharides by polarimetric analysis of said non-ionic portion, and determining the content of organic acids by refractive index analysis of said non-ionic portion; and

(c) terminating the sulfide cooking process when the lignin, monosaccharide and organic acid contents reach desired values.

4,718,980

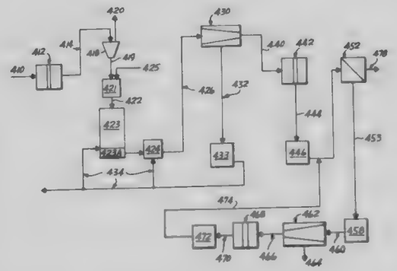
INTERSTAGE TREATMENT OF MECHANICAL PULP

Leonard E. Lowrie, Rainier, Oreg., and William L. Duncan, Tacoma, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 30, 1985, Ser. No. 815,360

Int. Cl.⁴ D21C *3/00*; D21B *1/16, 1/04*

U.S. Cl. 162—78 **5 Claims**



1. A process for improving the physical properties of two-stage refiner pulp consisting essentially of

refining wood chips in a first stage of refining to form fibers and fiber bundles,

soaking said fibers and fiber bundles in an alkaline peroxide bleach at a temperature of 32°–96° C., at a consistency in the range of 15–25% for from 30–120 minutes,

decreasing the consistency of said fibers and fiber bundles to below 15%,

increasing the consistency of said fibers and fiber bundles to a consistency of at least 20%,

refining said latter fibers and fiber bundles in a second stage of refining.

4,718,981

BLEACHED KRAFT PAPERBOARD BY DENSIFICATION AND HEAT TREATMENT

Roy S. Swenson, Ringwood, N.J.; Donald M. MacDonald, Monroe, and Michael Ring, Warwick, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Aug. 23, 1985, Ser. No. 768,642

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.⁴ D21F *11/00*

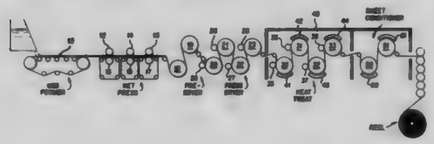
U.S. Cl. 162—206 **11 Claims**

1. A method of maximizing the folding endurance of linerboard produced from bleached kraft pulp while improving its wet strength by heat treatment, comprising steps of:

forming a wet web of cellulose fibers from an aqueous suspension of fibers; then, without first drying the web,

press drying said wet web, by compressing it sufficiently to produce a product having a density of at least 700 kg/m^3 and drying the product until its water content by weight is less than 10%; and then

heat treating the product at an internal temperature of at least 420° F. (216° C.) for a time sufficient to increase both the wet strength and the folding endurance thereof as compared to a like product heat treated at the same internal temperature, but not press dried.



4,718,982

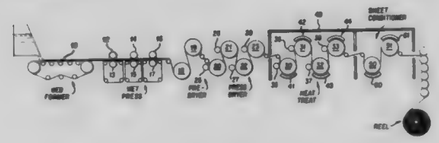
DENSIFICATION AND HEAT TREATMENT OF PAPERBOARD PRODUCED FROM SCMP AND OTHER SULFITE PULPS

Roy S. Swenson, Ringwood, N.J.; F. Keith Hall, Tuxedo Park, N.Y.; Donald M. MacDonald, Monroe, N.Y., and Michael Ring, Warwick, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Aug. 23, 1985, Ser. No. 768,598

Int. Cl.⁴ D21F *11/00*

U.S. Cl. 162—206 **10 Claims**



1. A method of minimizing the degradation of paperboard produced from semichemical-mechanical pulp while improving its wet strength by heat treatment, comprising steps of

forming a wet web of cellulose fibers from an aqueous suspension of fibers; then, without first drying the web,

press drying said wet web, by compressing it sufficiently to produce a product having a density of at least 700 kg/m^3 and drying the product until its water content by weight is less than 10%; and then

heat treating the product at an internal temperature of at least 420° F. (216° C.) for a time sufficient to increase both the wet strength and folding endurance thereof as compared to a like product heat treated at the same temperature, but not press dried.

4,718,983

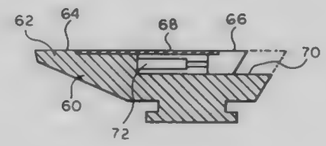
FORMING BOARD STRUCTURE HAVING AN ADJUSTABLE LEADING FORMING BOARD STRIP

Ahmed A. Ibrahim, Westerville, Ohio, assignor to Papyrus Inc., Westerville, Ohio

Division of Ser. No. 883,729, Jul. 9, 1986, Pat. No. 4,684,441. This application Dec. 29, 1986, Ser. No. 946,835

Int. Cl.⁴ D21F *1/54, 7/00*

U.S. Cl. 162—252 **8 Claims**



1. An improved papermaking apparatus of the type having a headbox for impinging a jet of papermaking slurry from its slice onto the upper surface of a porous wire moving longitudinally over and supported by a forming board which includes a leading forming board strip extending laterally across the wire and having a continuous top surface, wherein the improvement comprises:

said leading forming board strip having means for adjustably varying the longitudinal length of the top surface of the strip.

4,718,984

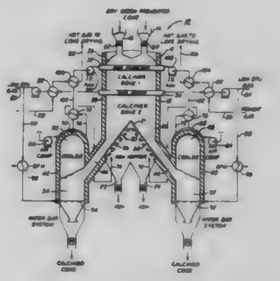
APPARATUS FOR CALCINING COKE

James R. McConaghy, Jr., and Charles J. Swartz, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 18, 1986, Ser. No. 886,851

Int. Cl.⁴ C10B *49/04, 57/00*

U.S. Cl. 202—99 **4 Claims**



1. An apparatus for calcining delayed petroleum coke comprising:

a vertical shaft kiln having an upper section, a midsection and a lower section;

means for introducing delayed petroleum coke into the upper section of said shaft kiln for forming a downwardly moving coke bed therein;

means for introducing a stream of downwardly moving hot gas in said upper section of said shaft kiln;

an inclined grate disposed in said lower section of said shaft kiln for supporting said downwardly moving coke bed in said shaft kiln;

means for introducing preheated combustion air through said grate to create by internal burning in said kiln a calcining temperature of at least 2000° F. and to create a stream of upwardly moving combustion gases in said downwardly moving coke bed;

means for removing said upwardly moving stream of combustion gases and said downwardly moving stream of hot gases at said midsection of said shaft kiln;

a cooling chamber connected to said lower section of said shaft kiln by an enclosed inclined passage which extends from said inclined grate so that coke which has moved over said grate will move by gravity downwardly into said cooling chamber;

heat exchange conduit means extending over a top of said cooling chamber for passing said combustion air therethrough to preheat same and to cool the top of said chamber;

means for cooling calcined coke in said cooling chamber by passing a cooling gas stream therethrough; and

means for discharging cooled calcined coke from the cooling chamber.

4,718,985

SYSTEM FOR DIAPHRAGM DISTILLATION

Nils Kjellander, Hasslen, Sweden, assignor to Svenska Utvecklings AB, Sweden

PCT No. PCT/SE85/00229, § 371 Date Jan. 29, 1986, § 102(e) Date Jan. 29, 1986, PCT Pub. No. WO86/00026, PCT Pub. Date Jan. 3, 1986
PCT Filed May 31, 1985, Ser. No. 840,969
Claims priority, application Sweden, Jun. 7, 1984, 8403081
Int. Cl.[4] B01D 3/04
U.S. Cl. 202—172 5 Claims



1. In a system for diaphragm distillation of a liquid, which system includes a diaphragm through which a vapor but not a liquid can pass and a condensation surface for condensing said vapor after said vapor has passed through said diaphragm, the improvement comprising;

at least one unit having a first inner pipe, said first pipe having a first passageway located longitudinally therein, a second pipe surrounding said first pipe and defining therewith a second passageway substantially parallel to and surrounding said first passageway, and a third pipe surrounding said second pipe and defining therewith a third passageway substantially parallel to and surrounding said second passageway; and

a fourth pipe surrounding said at least one unit and defining with said third pipe a fourth passageway substantially parallel to and surrounding said third passageway;

said first pipe having a wall consisting essentially of a material through which neither vapor nor liquid can permeate, said first passageway being used for transporting a heated medium for heating said first pipe, said second pipe comprising said diaphragm, said second passageway being used for transporting said liquid to be distilled, said liquid being heated by said first pipe, said third pipe having a wall consisting essentially of a material through which neither vapor nor liquid can permeate, said third passageway being used for condensing and collecting vapor from said liquid which passes through said second pipe, said fourth pipe having a wall consisting essentially of a material through which neither vapor nor liquid can permeate, said fourth passageway being used for transporting a cold medium for cooling said third pipe to facilitate the condensing of said vapor.

4,718,986

PROCESS FOR PRODUCTING HIGH PURITY BUTENE-1 WITH A LOW ENERGY CONSUMPTION

Renzo Comiotto, and Bruno De Maglie, both of Milan, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 633,879, Jul. 24, 1984, abandoned. This application Sep. 4, 1986, Ser. No. 904,046
Claims priority, application Italy, Jul. 28, 1983, 22293 A/83
Int. Cl.[4] B01D 1/28
U.S. Cl. 203—26 15 Claims

1. A process for the production of high purity butene-1 at low energy consumption comprising the steps of:

etherifying an isobutene component of a raw material C_4 stream with a saturated aliphatic alcohol to substantially eliminate the etherified isobutene from said C_4 stream;

submitting the C_4 stream to a selective hydrogenation to reduce the content of butadiene and acetylenic derivatives to a total of from 30 to 200 ppm of the C_4 stream;

feeding the selectively hydrogenated C_4 stream to a first stage of fractionation at a pressure in the range of from 4 to 20 abs. atm. from which a top stream product consisting of isobutane and a portion of butene-1 and a bottom stream of residual components from the C_4 stream are obtained from the first fractionation stage;

feeding the bottom stream from the first stage of fractionation of residual components to a second stage of fractionation at a pressure in the range of from 4 to 12 abs. atm. from which a top stream comprising high purity butene-1 and a bottom stream comprising n-butane, trans- and cis-butene-2 and a remaining portion of butene-1 are obtained;

compressing the top butene-1 stream from the second stage of fractionation;

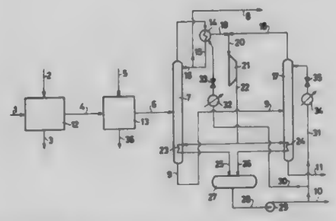
feeding a portion of the compressed butene-1 stream to a reboiler of the first fractionation stage and the other portion of the compressed butene-1 stream to a reboiler of the second fractionation stage, whereby the butene-1 stream portions are condensed; and

discharging the condensed butene-1 streams as an end product.

15. A process for the production of high purity butene-1 at low energy consumption comprising the steps of:

etherifying an isobutene component of a raw material C_4 stream with a saturated aliphatic alcohol to substantially eliminate the etherified isobutene from said stream;

submitting the C_4 stream to a selective hydrogenation to reduce the content of butadiene and acetylenic derivatives to a total of from 30 to 200 ppm of the C_4 stream;



feeding the selectively hydrogenated C_4 stream to a first stage of fractionation at a pressure in the range of from 4 to 20 abs. atm. from which a top stream product consisting of isobutane and a portion of butene-1 and a bottom stream of residual components from the C_4 stream are obtained from the first fractionation stage;

feeding the bottom stream from the first stage of fractionation of residual components to a second stage of fractionation at a pressure in the range of from 4 to 12 abs. atm. from which a top stream comprising high purity butene-1 and a bottom stream comprising n-butane, trans-, and cis-butene-2 and a remaining portion of butene-1 are obtained;

compressing the top butene-1 stream from the second stage of fractionation;

feeding a portion of the compressed butene-1 stream to a reboiler of the first fractionation stage and the other portion of the compressed butene-1 stream to a reboiler of the second fractionation stage, whereby the butene-1 stream portions are condensed;

utilizing at least a portion of the condensed butene-1 stream in operations of the process including use as a reflux for the second fractionation stage and a coolant for condensing isobutane obtained in the top stream of the first fractionation stage, wherein a portion of the condensed butene-1 is expanded to create a vapor and is fed to a top section of the second fractionation stage and utilized as a reflux for said second fractionation stage and a second portion of the condensed butene-1 is fed to a top section of the first fractionation stage, wherein, the butene-1 is subjected to expansion and utilized as a coolant vapor for condensing the top stream product of the first fractionation stage;

compressing the coolant vapor butene-1 and feeding the compressed butene-1 to supply heat to at least one reboiler of the first and second fractionation stages; and

discharging the condensed butene-1 streams as end product.

4,718,987

SEPARATION OF ISOPROPANOL FROM ISOPROPYL ACETATE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and Mark G. Vosburgh, 522 W. Main St., both of Bozeman, Mont. 59715

Filed Feb. 12, 1987, Ser. No. 13,948
Int. Cl.[4] B01D 3/40; C07C 29/84
U.S. Cl. 203—51 1 Claim

1. A method for recovering isopropanol from a mixture of isopropyl acetate, isopropanol and water which comprises distilling a mixture of isopropyl acetate, isopropanol and water in a rectification column in the presence of about one to two parts of extractive agent per part of isopropyl acetate—isopropanol—water mixture, recovering isopropanol as overhead product, obtaining the extractive agent, isopropyl acetate and water from the stillpot, separating the isopropyl acetate and water from the extractive agent in another rectification column, separating the isopropyl acetate from the water by phase separation of the two liquid phases, the extractive agent comprises a benzoate containing from eight to fourteen carbon atoms and at least one material from the group consisting of benzoic acid, diisopropylethanolamine, nitromethane, nitroethane, 1-nitropropane, 2-nitropropane, salicylic acid, n-decanol, adiponitrile, ethylene glycol diacetate, hexylene glycol diacetate, n-amyl alcohol, glycerol triacetate, diethylene glycol diethyl ether, ethylene carbonate, propylene carbonate, 2-ethyl hexyl amine, hexylene glycol and benzonitrile.

4,718,988

SEPARATION OF 3-BUTYL ACETATE FROM 2-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 South Third Ave., Bozeman, Mont. 59715

Filed Mar. 27, 1986, Ser. No. 844,683
The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.
Int. Cl.[4] B01D 3/40; C07C 67/48
U.S. Cl. 203—51 4 Claims

1. A method for recovering 2-butyl acetate from a mixture of 2-butyl acetate, 2-butanol and water which comprises distilling a mixture of 2-butyl acetate, 2-butanol and water in a rectification column in the presence of about one part of an extractive agent per part of 2-butyl acetate—2-butanol—water mixture, recovering 2-butyl acetate and water as overhead product and obtaining the 2-butanol and extractive agent from the stillpot, the extractive agent comprises acetamide.

4,718,989

SEPARATION OF ISOPROPANOL FROM ISOPROPYL ACETATE BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Mark G. Vosburgh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 782,842, Sep. 30, 1985, Pat. No. 4,675,080. This application Feb. 26, 1987, Ser. No. 19,423
Int. Cl.[4] B01D 3/40; C07C 29/84
U.S. Cl. 203—51 1 Claim

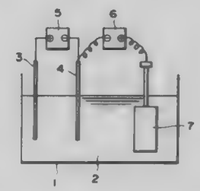
1. A method for recovering isopropanol from a mixture of isopropyl acetate, isopropanol and water which comprises distilling a mixture of isopropyl acetate, isopropanol and water in a rectification column in the presence of about one to two parts of extractive agent per part of isopropyl acetate-isopropanol-water mixture, recovering isopropanol as overhead product and obtaining the extractive agent, isopropyl acetate and water from the stillpot, the extractive agent comprises a phthalate containing from ten to twenty-eight carbon atoms and at least one material from the group consisting of benzyl benzoate, ethyl benzoate, methyl benzoate, glycerol triacetate, nitroethane, nitromethane, 1-nitropropane, 2-nitropropane, ethylene glycol diacetate, hexylene glycol diacetate, adiponitrile, diethylene glycol diethyl ether and propylene carbonate.

4,718,990

METHOD FOR DETECTING START OF ELECTROLESS PLATING

Shigeo Hashimoto, Hirakata, and Yutaka Sugiura, Kobe, both of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Filed Feb. 27, 1986, Ser. No. 833,198
Claims priority, application Japan, Feb. 28, 1985, 60-39952; May 22, 1985, 60-110862
Int. Cl.[4] G01N 27/46; B05D 3/10
U.S. Cl. 204—1 T 8 Claims



1. A method of detecting a start point of electroless plating, comprising the steps of:

immersing a couple of metal electrodes in an electroless plating solution;

connecting said metal electrodes to a DC power supply to serve as an anode and a cathode;

applying an electric current across said metal electrodes at least immediately before immersing an object to be electroless plated in said plating solution, to cause metal deposition from said plating solution at said cathode to activate the same;

measuring the potential difference between the activated cathode and said object to be plated; and

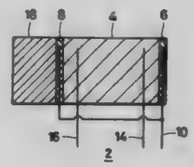
detecting the start of the electroless plating of the object from the measured value of said potential difference between the activated cathode and the object.

4,718,991

PROTON CONDUCTOR GAS SENSOR AND METHOD OF DETECTING GAS USING PROTON CONDUCTOR GAS SENSOR

Noboru Yamazoe, and Norio Miura, both of Hukuoka, Japan, assignors to Figaro Engineering Inc., Japan

Filed Jan. 20, 1987, Ser. No. 5,245
Claims priority, application Japan, Jan. 27, 1986, 61-15222
Int. Cl.[4] G01N 27/56
U.S. Cl. 204—1 T 10 Claims



1. A proton conductor gas sensor comprising a proton con-

ductor and a pair of electrodes connected to the conductor, characterized in that one of the electrodes is an ionization electrode for decomposing a gas in an atmosphere by an electrode reaction to produce protons and supplying the protons to the proton conductor, the other electrode being a reference electrode for accepting the protons from the proton conductor, reacting the protons with oxygen in the atmosphere and releasing the resulting water, the sensor having at least one detection electrode for detecting the internal potential difference of the proton conductor produced by the travel of protons between the ionization electrode and the reference electrode when the ionization and reference electrodes are short-circuited.

10. A method of detecting a gas with use of a proton conductor sensor characterized by short-circuiting a pair of electrodes connected to the proton conductor to cause protons to travel through the conductor from one of the electrodes to the other electrode, and detecting the potential difference produced, in the conductor by the travel of the protons.

4,718,992

TEST MEDIUM AND METHOD FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

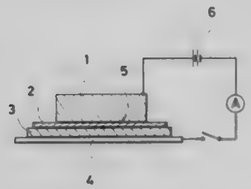
Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Soniehi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo and Kawasaki Steel Techno-Research Corporation, Tokyo, both of, Japan

Filed Aug. 19, 1986, Ser. No. 897,833

Claims priority, application Japan, Aug. 20, 1985, 60-182765; Dec. 25, 1985, 60-296120

Int. Cl.[4] C25F *3/06;* **G01N** *33/20*

U.S. Cl. 204—1 T **15 Claims**



1. A method for detecting phosphorus segregates in a metallic material, comprising the steps of:

(a) applying a test sheet against a surface area of the metallic material to be examined for segregation,

(b) introducing an aqueous electrolytic solution comprising 0.1 to 20% by weight of a molybdate ion and an oxidizing agent between at least the metallic material surface area and the sheet,

(c) contacting a cathode plate with said sheet,

(d) effecting electrolysis with said metallic material made anode,

(e) removing the sheet from the metallic material surface area, and

(f) treating the sheet with a reagent comprising a reducing agent.

4,718,993

PROCESS FOR PREPARING THE THROUGH HOLE WALLS OF A PRINTED WIRING BOARD FOR ELECTROPLATING

Glenn W. Capte, Clifton, and Anthony M. Piano, Lodi, both of N.J., assignors to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Filed May 29, 1987, Ser. No. 55,562

Int. Cl.[4] C25D *5/02, 5/54*

U.S. Cl. 204—15 **28 Claims**

1. A process for electroplating the walls of through holes in a laminated printed wiring board comprised of at least one non-conducting layer laminated to at least two separate conductive metal layers, which comprises the steps:

(a) contacting said printed wiring board with an aqueous alkaline silicate solution, followed by;

(b) contacting said printed wiring board with a dispersion of carbon black comprising:

(1) carbon black particles having an average particle size of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) a liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of the non-conducting portions of said hole walls and is less than about 4% by weight of said liquid dispersion; then

(c) separating substantially all of the liquid dispersing medium from said dispersion, thereby depositing said carbon black particles in a substantially continuous layer on said non-conducting portions of said hole walls; and

(d) electroplating a substantially continuous metal layer over the deposited carbon black layer on said non-conducting portions of hole walls, thereby electrically connecting said metal layers of said printed wiring board.

4,718,994

METHOD FOR PREPARING HYDROXY COMPOUNDS OF AROMATIC AND HETEROAROMATIC SERIES

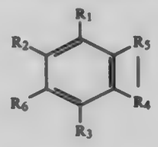
Andrei K. Zhagars; Voldemar Y. Grinshtein, both of Riga; Saiedzite A. Ozola, Riziaky raion; Andris K. Zitsmanis, and August K. Arens, both of Riga, all of U.S.S.R., assignors to Latvitsky Gosudarstvenny Universitet Imeni P. Stuchki, Riga, U.S.S.R.

Filed Jun. 14, 1985, Ser. No. 745,267

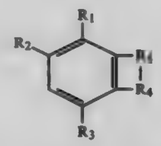
Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—73 R **6 Claims**

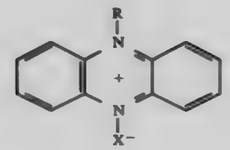
1. A method for preparing hydroxy compounds of the aromatic and heteroaromatic series of the general formula:



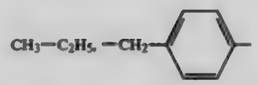
wherein when R_1=—COOH/or —$CH_2CH(NH_2)COOH$; then R_2=—OH, —H, —COOH; R_3=—H, or —OH; if R_2=—OH, —COOH, R_4, R_5=—H; R_6=—OH and when R_1, R_6, R_3=—H, then R_2=—OH; R_4=⫞NH; R_5=—CR_7=CHR_4, where R_7=—CH_2—CH_2—NH_2, —CH_2—$CH(NH_2)COOH$, consisting essentially of hydroxylation of aromatic and heteroaromatic compounds of the general formula:



wherein when R_1=—COOH, —CH_2/or $CH(NH_2)COOH$, then R_2=—OH, —H/or —COOH; R_3=—H/or —OH; if R_2=—OH, —COOH, R_4, R_5=—H; and when R_1, R_2, R_3=—H, then R_4=⫞NH; R_5=—CR_7=CHR_4, where R_7 is —CH_2—CH_2—NH_2, —CH_2—$CH(NH_2)COOH$, in the presence of oxygen, a phenazine radical-oxygen complex of the general formula:



wherein R is



Styrene-benzene-divinyl copolymer;

X^-=CH_3SO_4, $C_2H_5SO_4$, Cl^-, and which was obtained by performing a one-electron reduction of the heterocyclic nitrogen of the phenazinium cycle, at a pH of the reaction medium ranging from 2.0 to 5.5 by reaction with oxygen, followed by isolation of the desired product.

4,718,995

RECOVERY OF TUNGSTEN, SCANDIUM, IRON, AND MANGANESE FROM TUNGSTEN BEARING MATERIAL

Clarence D. Vanderpool; Martin B. MacInnis, both of Towanda, and Judith A. Ladd, Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 838,482, Jan. 24, 1986, Pat. No. 4,626,280. This application Sep. 5, 1986, Ser. No. 903,940

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.[4] C22B *34/36, 59/00*

U.S. Cl. 204—112 **11 Claims**

1. A process for recovering tungsten and scandium from a material containing tungsten, scandium, iron, and manganese, comprising:

(a) digesting said material in an aqueous solution selected from the group consisting of a solution saturation with sulfur dioxide and a sulfuric acid solution is the presence of a reducing agent at a sufficient temperature for a sufficient time to form a digestion solution containing the major portion of the scandium, iron and manganese and a digestion residue containing the major portion of the tungsten;

(b) separating said digestion solution from said digestion residue;

(c) extracting the major portion of the scandium from said digestion solution with an organic solution consisting essentially of an extracting agent which is essentially a mixture of a tertiary alkyl primary amines which are present in an amount sufficient to extract the major portion of the scandium without extracting iron and manganese, and the balance an essentially aromatic solvent;

(d) separating the resulting scandium containing organic from the resulting raffinate;

(e) stripping essentially all of the scandium from the scandium-containing organic solution by contacting said scandium-containing organic solution with hydrochloric acid to form a scandium containing hydrochloric acid solution;

(f) separating said scandium containing hydrochloric acid solution from the resulting stripped organic solution.

4,718,996

RECOVERY OF TUNGSTEN, SCANDIUM, IRON, AND MANGANESE VALUES FROM TUNGSTEN BEARING MATERIAL

Clarence D. Vanderpool; Martin B. MacInnis, both of Towanda, and Judith A. Ladd, Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 821,932, Jan. 24, 1986, Pat. No. 4,624,703. This application Sep. 4, 1986, Ser. No. 903,804

The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.

Int. Cl.[4] C22B *34/36, 59/00*

U.S. Cl. 204—112 **10 Claims**

1. A process for recovering tungsten and scandium from a material containing tungsten, scandium, iron and manganese, said process comprising:

(a) digesting said material in an aqueous solution selected from the group consisting of an aqueous solution saturated with sulfur dioxide and sulfuric acid in the presence of a reducing agent at a sufficient temperature and for a sufficient time to form a digestion solution containing the major portion of said scandium, iron, and manganese, and a digestion residue containing the major portion of said tungsten;

(b) separating said digestion solution from said digestion residue;

(c) extracting essentially all of said scandium from said digestion solution with an organic solution consisting essentially of an extracting agent which is a dialkyl phosphoric acid which is present in an amount sufficient to extract essentially all of the scandium without extracting iron and manganese, and the balance an essentially aromatic solvent;

(d) separating the resulting scandium-containing organic from the resulting raffinate;

(e) stripping the scandium from the scandium-containing organic with an aqueous solution of ammonium carbonate to form a scandium-containing ammonium carbonate solution;

(f) separating said scandium-containing ammonium carbonate from the resulting stripped organic solution.

4,718,997

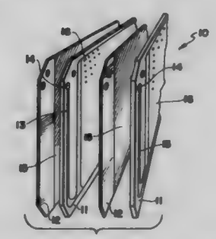
ELECTROCHEMICAL DEVICE

Patrick G. Grimes, Westfield; Harry Einstein, Springfield, and Richard J. Bellows, Westfield, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 443,536, Nov. 22, 1982, abandoned. This application Jan. 23, 1986, Ser. No. 821,758

Int. Cl.[4] C25B *15/06, 15/08;* **H01M** *8/24, 2/14*

U.S. Cl. 204—228 **11 Claims**



1. An electrochemical device having improved auxiliary power requirements for hydraulic pumping and shunt current protection comprising:

(a) a plurality of cells, said cells being connected electrically at least in part in series, and connected hydraulically at least in part in parallel;

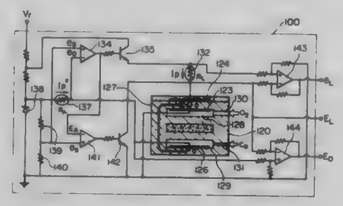
(b) at least one common manifold fluidically communicating with said cells;

(c) respective channels connecting each cell with said manifold, said channels having a hydraulic pressure drop and an electric resistance greater than that of said manifold;
(d) at least one tunnel interconnecting said channels; and
(e) means for applying a current through said tunnel to provide current nodes at the intersections of said tunnel and said channels whereby the device has improved auxiliary power requirements for hydraulic and shunt current protection.

4,718,998
ELEMENT FOR ELECTROPHORESIS
Masashi Ogawa, and Naohiko Sugimoto, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 19, 1987, Ser. No. 52,579
Claims priority, application Japan, May 20, 1986, 61-115422; May 20, 1986, 61-115423
Int. Cl.⁴ G01N *27/26*; B01D *17/06*
U.S. Cl. 204—299 R **13 Claims**

1. An element for electrophoresis comprising:
(I) a plastic film;
(II) a layer for electrophoresis comprising an aqueous polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a crosslinking agent in the presence of water;
(III) an adhesive layer containing gelatin; and
(IV) a plastic film, which are superposed in order.

4,718,999
AIR-FUEL RATIO DETECTOR
Seiko Suzuki, Hitachiohta; Masayuki Miki, Katsuta; Takao Sasayama; Toshitaka Suzuki, both of Hitachi; Nobuo Sato, Iwaki; Sadayasu Ueno, Katsuta, and Akira Ikegami, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 9, 1985, Ser. No. 764,070
Claims priority, application Japan, Aug. 13, 1984, 59-167854
Int. Cl.⁴ G01N *27/56*
U.S. Cl. 204—406 **17 Claims**



1. An air-fuel ratio detector comprising:
a solid electrolyte;
a first electrode, a second electrode and a third electrode, each being disposed on said solid electrolyte;
means for supplying an exhaust gas by limited diffusion to said first and third electrodes so as to provide a combined lean detecting cell and stoichiometric detecting cell construction;
voltage supply means for supplying an exciting voltage across said first and second electrodes, whereby a lean air-fuel ratio is detected from a pumping current flowing when oxygen diffused by said exhaust gas supplying means is pumped from said first electrode to said second electrode;
current supply means for causing a predetermined current to flow between said first and said third electrodes; and
control means for controlling the exciting voltage supplied by said voltage supply means in accordance with a difference between the potential of said third electrode and a predetermined voltage, whereby a stoichiometric air-fuel ratio is detected from an electromotive force produced between said first and second electrodes or between said second and third electrodes when oxygen passes from said first electrode to said third electrode and said third electrode is placed under an oxygen atmosphere.

4,719,000
UPGRADING PETROLEUM ASPHALTENES
LaVern H. Beckberger, Markham, Ill., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Apr. 2, 1984, Ser. No. 596,173
Int. Cl.⁴ C10G *1/20, 19/08, 45/10*
U.S. Cl. 208—44 **9 Claims**

1. A process for reducing the sulfur content of petroleum asphaltenes containing sulfur comprising:
(1) forming a mixture in a proportion of about 1:0.3 to 1.3 of petroleum asphaltenes containing sulfur and a liquid selected from the group consisting of water, methanol, carbon dioxide and mixtures thereof;
(2) raising the temperature and pressure of the mixture to a temperature and pressure above the critical temperature and pressure of the liquid to convert the liquid to a supercritical fluid.
(3) maintaining the mixture above the critical temperature and pressure of the liquid for only a short time less than about 30 seconds and sufficient to effect sulfur reduction;
(4) reducing the pressure to a second lower pressure of less than about 75 pounds per square inch (psia); and
(5) recovering petroleum asphaltenes reduced in sulfur.

4,719,001
ANTIFOULANT ADDITIVES FOR HIGH TEMPERATURE HYDROCARBON PROCESSING
Louis M. Dvoracek, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Mar. 26, 1986, Ser. No. 844,462
Int. Cl.⁴ C10G *9/16*
U.S. Cl. 208—48 AA **26 Claims**

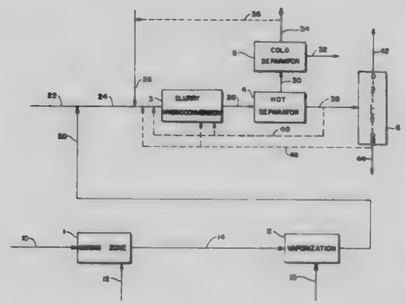
1. A method comprising reducing fouling of heated surfaces contacted with a hydrocarbon oil during petrochemical or refinery processing thereof by adding to said hydrocarbon oil a foulant-inhibiting amount of an additive comprising at least one aluminum compound and at least one thiadiazole compound.

7. A method for reducing fouling of heated surfaces contacted with a hydrocarbon oil during petrochemical or refinery processing thereof, said method comprising the step of contacting a hydrocarbon oil with said surfaces during said petrochemical or refinery processing, said hydrocarbon oil containing a foulant-inhibiting amount of an additive comprising at least one aluminum coupound, at least one thiadiazole compound and at least one compound in addition to said thiadiazole compound that contains ionizable hydrogen.

22. A method comprising reducing fouling of heated surfaces contacted with a hydrocarbon oil during refinery or petrochemical processing thereof by adding to said hydrocarbon oil a foulant-inhibiting amount of an additive comprising at least one aluminum compound and at least one compound containing ionizable hydrogen and wherein the mole ratio of ionizable hydrogen, calculated as H, in said compound containing ionizable hydrogen to said aluminum, calculated as Al, contained in said aluminum compound, is in the range from about 30:1 to about 0.01:1.

25. A method comprising reducing heated surfaces contacted with a substantially anhydrous hydrocarbon oil during petrochemical or refinery processing thereof by adding to said hydrocarbon oil a foulant-inhibiting amount of an additive comprising at least one thiadiazole compound.

4,719,002
SLURRY HYDROCONVERSION PROCESS
Francis X. Mayer, and William E. Lewis, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Apr. 21, 1986, Ser. No. 854,308
Int. Cl.⁴ C10G *69/00*
U.S. Cl. 208—85 **9 Claims**



1. A slurry hydroconversion process for converting the heavy constituents of a hydrocarbonaceous oil to lower boiling products which comprises the steps of:
(a) forming a mixture of a heavy hydrocarbonaceous oil and an aqueous solution of phosphomolybdic acid in an amount to provide in said mixture from about 0.2 to 2 weight percent molybdenum, calculated as elemental metal, based on said hydrocarbonaceous oil to produce a catalyst precursor concentrate;
(b) contacting said catalyst precursor concentrate with a hot hydrogen-containing gas to vaporize water from said catalyst precursor concentrate;
(c) introducing at least a portion of the catalyst precursor concentrate resulting from step (b) into a hydrocarbonaceous chargestock;
(d) heating the mixture resulting from step (c) in the presence of an added hydrogen-containing gas at conditions to convert said phosphomolybdic acid to a solid molybdenum-containing catalyst; and
(e) hydroconverting the resulting slurry comprising said hydrocarbonaceous chargestock and said solid molybdenum-containing catalyst at a temperature from about 800° to 900° F. and a hydrogen partial pressure ranging from about 100 psig to about 5000 psig, wherein at least a portion of the heavy constituents of the oil are converted to lower boiling products.

4,719,003
PROCESS FOR RESTORING ACTIVITY OF DEWAXING CATALYSTS
David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 621,981, Jun. 18, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 853,384
Int. Cl.⁴ C10G *67/06*
U.S. Cl. 208—91 **20 Claims**

10. A process for decreasing the aging rate of a dewaxing catalyst used in a multicycle dewaxing process for preparing a high quality lube base stock oil from a waxy chargestock having an initial boiling point of at least about 450° F., which process comprises,
contacting said chargestock, with a sorbent and then contacting said chargestock, with a dewaxing catalyst
wherein said sorbent removed components from the chargestock which alter the diffusion properties of the zeolite and increase the aging rate of the dewaxing catalyst after regeneration
wherein the condition under which said chargestock is contacted with said sorbent include a temperature greater than 350° F., a pressure of about 0 to 3000 psig at a LHSV of 0.1 to 100; and
wherein said dewaxing catalyst comprises a crystalline aluminosilicate zeolite having a Constraint Index within the range of 1 to 12 and
wherein the temperature at which said chargestock is contacted with said dewaxing catalyst ranges from 400° F. to 1000° F. and the pressure, during said contact with said dewaxing catalyst, ranges from 0 to 3000 psig.
regenerating said dewaxing catalyst in a unit isolated from said sorbent and then passing addition chargestock, contacted with sorbent, over said regenerated dewaxing catalyst under conditions of temperature and pressure substantially identical to those in said contacting said chargestock with dewaxing catayist prior to said regeneration.

4,719,004
CRACKING/DEWAXING WITH HIGH SILICA ZEOLITE MULLED WITH WATER AND BINDER
Pochen Chu, West Deptford, and William E. Garwood, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 792,349, Oct. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 620,365, Jun. 13, 1984, Pat. No. 4,563,435, which is a continuation-in-part of Ser. No. 391,212, Jun. 23, 1982, abandoned. This application Oct. 17, 1986, Ser. No. 920,015
Int. Cl.⁴ C10G *11/05, 45/64, 47/20*
U.S. Cl. 208—111 **17 Claims**

1. A process for cracking a feedstock comprising paraffin hydrocarbon compounds to lower molecular weight hydrocarbon compounds, which process comprises contacting said feedstock at cracking conditions with a catalyst composition prepared by a method for enhancing the acid activity of a high silica-containing crystalline zeolite containing from about 50 ppm to less than about 1000 ppm alumina and having an alpha value of less than about 5, which method comprises the steps of:
(1) mulling said zeolite with an inorganic oxide binder selected from the group consisting of alumina, zirconia, titania and mixtures thereof in the presence of water,
(2) forming or shaping the composition of step (1) at a pressure of from about 2 to about 50 tons per square inch,
(3) calcining the formed or shaped composition of step (2) in a non-oxidizing atmosphere at from about 900° F. to about 1200° F. for from about 1 hour to about 5 hours,
(4) treating said calcined compoeition from step (3) by base exchange if the sodium content thereof is greater than about 0.02 wt. % in order to reduce the sodium content thereof to less than about 0.02 wt. %, and, if treated,
(5) calcining said treated composition of step (4) at elevated temperature.

4,719,005
CATALYTIC REFORMING PROCESS
William C. Baird, Jr., and George A. Swan, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Continuation-in-part of Ser. No. 873,589, Jun. 16, 1986, abandoned, which is a continuation of Ser. No. 782,113, Sep. 30, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 943,736
Int. Cl.⁴ C10S *35/08*
U.S. Cl. 208—138 **13 Claims**

1. A process for improving the octane quality of a naphtha which process comprises contacting the naptha, at pressures ranging from about 25 psig to about 175 psig, with hydrogen introduced at a rate ranging from about 1000 SCF/B to about

VOL 1086 ISS 2 JA 12 1988 UMI

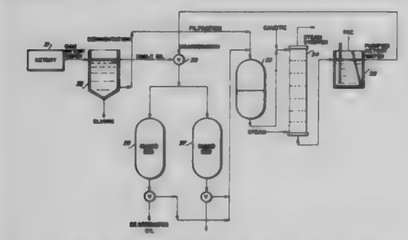
5000 SCF/B, at a temperature from about 800° F. to about 1100° F., and a space velocity ranging from about 1 W/H/W to about 5 W/H/W, and with a catalyst comprised of the metals platinum, rhenium, and iridium on a refractory porous inorganic oxide support, wherein the concentration of each of platinum and rhenium is at least 0.1 percent to about 1.2 percent, and that of iridium is at least 0.15 percent to about 1.2 percent, and at lest one of said metals is present in a concentration of at least 0.3 percent, and the sum total of said metals is present in a concentration greater than 0.9 percent.

4,719,006

PROCESS AND SYSTEM CONTINUOUSLY REMOVING ARSENIC FROM SHALE OIL WITH A CATALYST AND REGENERATING THE CATALYST

Sarl K. Goyal, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 31, 1985, Ser. No. 761,198
Int. Cl.⁴ C10G *25/00*
U.S. Cl. 208—251 R **17 Claims**



9. A process for producing and upgrading shale oil, comprising the steps of:

(a) retorting raw shale oil containing arsenic therein to liberate an effluent product stream comprising hydrocarbons and retort water;

(b) separating shale oil containing said arsenic from said effluent product stream;

(c) passing a portion of said shale oil through a first fixed guard bed comprising a catalytic absorber capable of substantially removing the arsenic therefrom at dearsenating conditions until the absorber in said first guard bed is substantially spent;

(d) passing another portion of said shale oil through a second fixed guard bed comprising a catalytic absorber capable of substantially removing the arsenic therefrom at dearsenating conditions while substantially stopping the flow of oil to said first guard bed; and

(e) regenerating the spent catalytic absorber in said first guard bed in situ while said shale oil is being passed through said second guard bed by

(i) drying the spent absorber in said first guard bed at a temperature of from 400–600° F; thereafter,

(ii) contacting the dried, spent catalytic absorber with recycled oil shale retort water for from 30 minutes to two hours at a temperature of from 70° F. to 150° F. under pressures of from 20–50 p.s.i.g. at a space velocity of from 6–10 hr^{-1} thereby substantially removing the arsenic contained in said spent catalytic absorber; and thereafter

(iii) drying said catalytic absorber at a temperature of from 400° F. to 600° F.; and

(iv) sulfiding said regenerated, dried catalytic absorber in said first bed.

4,719,007

PROCESS FOR HYDROTREATING A HYDROCARBONACEOUS CHARGE STOCK

Russell W. Johnson, Elmhurst; Walter F. Hriblk, La Grange Park, and Lee Hiltman, Mount Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

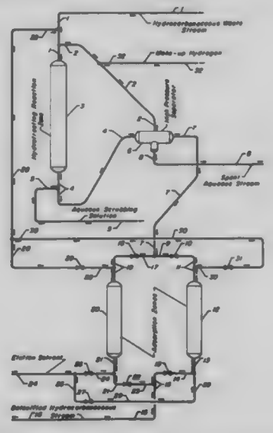
Filed Oct. 30, 1986, Ser. No. 924,953
Int. Cl.⁴ C10G *67/06, 67/10*
U.S. Cl. 208—251 H **16 Claims**

8. A process for hydrotreating a hydrocarbonaceous charge stock comprising hydrocarbonaceous compounds selected from the group consisting of halogenated hydrocarbons and organometallic compounds which process comprises the steps of:

(a) contacting said hydrocarbonaceous charge stock in the presence of hydrogen with a hydrogenation catalyst in a hydrotreating reaction zone to thereby remove at least a portion of the halogen or metal entity from said hydrocarbonaceous charge stock;

(b) contacting the resulting reaction zone effluent with an aqueous scrubbing solution;

(c) introducing a resulting admixture of said reaction zone effluent and said aqueous scrubbing solution into a separation zone to provide a hydrotreated hydrocarbonaceous stream having trace quantities of hydrocarbonaceous compounds selected from the group consisting of halogenated hydrocarbons and organometallic compounds and a spent aqueous stream;



(d) contacting said hydrotreated hydrocarbonaceous stream with an adsorbent to remove at least a portion of said trace quantities of hydrocarbonaceous compounds from said hydrotreated hydrocarbonaceous stream;

(e) removing said hydrocarbonaceous compounds selected from the group consisting of halogenated hydrocarbons and organometallic compounds from spent adsorbent with an elution solvent and thereby regenerating said adsorbent; and

(f) passing said elution solvent containing hydrocarbonaceous compounds which were removed from said spent absorbent in step (e) into said hydrotreating reaction zone of step (a).

4,719,008

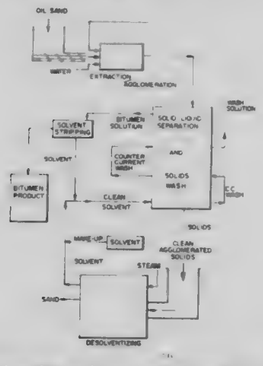
SOLVENT EXTRACTION SPHERICAL AGGLOMERATION OF OIL SANDS

Bryan D. Sparks; F. Weldon Meadus, both of Ottawa, and Enrique O. Hoefele, Calgary, all of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Filed Jun. 4, 1986, Ser. No. 870,422
Claims priority, application Canada, Jun. 28, 1985, 486032
Int. Cl.⁴ C10G *1/04*
U.S. Cl. 208—390 **24 Claims**

1. A process for continuous concurrent solvent extraction and agglomeration of materials containing intimate mixtures of oil or tar and particulate hydrophilic mineral solids, comprising

(a) mixing said materials with a solvent for the oil or tar and with an aqueous bridging liquid, said solvent and liquid being immiscible, to provide a water to solids weight ratio within the range of 0.08 to 0.5, in a vessel slowly rotating about a substantially horizontal axis at a speed selected within the range of 10% to 40% of the critical speed, under selected conditions which favor the agglomeration of solids including any fines and formation of large agglomerates of the solids; and continuously breaking down the agglomerates by a controlled light milling action provided by gently tumbling mixing media present in from 3.6 to 20% of the vessel volume, the weight of each element of the mixing media being large enough to overcome the cohesive forces binding the hydrophilic particles together and to the media elements and where the impact forces involved are not large enough to comminute the solids significantly, thereby causing the bridging liquid to displace internally occluded solvent, oil and tar from the agglomerates and form small agglomerates of reduced size distribution which are substantially free of solvent, oil and tar, and of rapid draining character;



(b) discharging the agglomerated mixture to a solid/liquid separating stage, and separating the agglomerates from the solvent phase;

(c) washing the separated solid agglomerates using a solvent for the oil or tar and separating the wash solvent from said agglomerates;

(d) recycling at least part of the wash solvent recovered from the washing step (c) to the extraction step (a); s

(e) stripping solvent from the solution of oil or tar from step (b) and separately recovering solvent and bitumen or other oil or tar product;

(f) desolventizing the washed agglomerates to recover residual solvent;

(g) recycling recovered solvent from (e) and (f) to the washing step (c); and

(h) disposing of the waste solids from the desolventized agglomerates as either a dry solid, or heavy slurry in water.

4,719,009

SILICA DEPRESSANT IN FROTH FLOTATION OF SULFIDE ORES

James T. Furey; Richard J. Lobban, both of Kimberley, Canada, and Michael Palmer, Kingsport, Tenn., assignors to Cominco Ltd., British Columbia, Canada and Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,946
Int. Cl.⁴ B03D *1/02*
U.S. Cl. 209—167 **9 Claims**

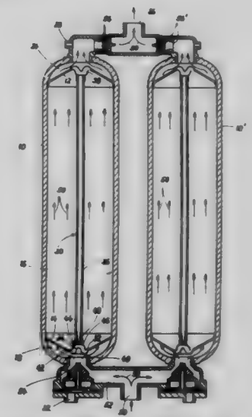
1. A froth flotation process for concentrating zinc sulfide from complex sulfide ores containing siliceous gangue materials wherein the flotation is carried out in an aqueous system in the presence of a depressant for siliceous gangue materials said depressant consisting of water-dissipatable polyester material containing ether groups and metal sulfonate groups and having an inherent viscosity in the range of about 0.1 to 1.5 deciliters per gram, said polyester material being dispersed in said aqueous system and acting to depress said gangue materials therein.

4,719,010

APPARATUS FOR RINSING A FIXED BED ION EXCHANGER

Heinrich Selbel, Hardthausen-Lampoldshausen, Fed. Rep. of Germany, assignor to Cillich nie Ernst Vogelmann GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 930,511
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540257
Int. Cl.⁴ B01J *49/00*
U.S. Cl. 210—189 **6 Claims**



1. An ion exchange arrangement comprising

confining means including liquid-permeable upper and lower retaining elements, said lower retaining element being a funnel-shaped sieve bottom;

at least one fixed bed of a particulate ion exchange resin confined by said confining means;

means for bounding an inlet chamber situated at a lower region of said fixed bed and open toward said fixed bed,

said bounding means including a bottom bulge having said particulate ion exchange resin admitted thereto upwardly of said funnel-shaped sieve bottom, and a dome-shaped lid member extending over said bottom bulge;

means for causing liquid to be treated to flow substantially vertically through said fixed bed during a treating phase of operation of the arrangement;

means for regenerating the particulate ion exchange resin after the same has been contaminated by contaminants captured from the liquid being treated during said treating phase, including

a conveying and cleansing pipe extending between said upper and lower retaining elements and having at least one inlet opening situated in the vicinity of said lower retaining element at said inlet chamber, and at least one one outlet opening situated in the vicinity of said upper retaining element, and open toward said fixed bed, and

means for directing a stream of a transporting and rinsing liquid through said inlet opening into said conveying and cleansing pipe for continuously withdrawing the particulate ion exchange resin from said fixed bed at the vicinity of said inlet opening, for continuously conveying the withdrawn particulate ion exchange resin through said conveying and cleansing pipe with attendant loosening and cleansing thereof, and for continuously discharging the particulate ion exchange resin from said outlet opening for deposit on said fixed bed while the remaining particulate ion exchange resin of said fixed bed is caused to gradually advance to said inlet opening,

said directing means including an injector aimed across

said inlet chamber at said inlet opening of said conveying and cleansing pipe and including a propelling jet nozzle which penetrates through said bottom bulge and opens substantially vertically from below into said inlet chamber, and a receiving nozzle situated oppositely to said propelling jet nozzle at an upper region of said inlet chamber and carried by said dome-shaped lid member and diverging toward said conveying and cleansing pipe, and means for supplying the transporting and rinsing liquid to said injector; and

means for removing the transporting and rinsing liquid, which has become contaminated by the contaminants released from said contaminated particulate ion exchange resin during the regeneration of the latter, from said fixed bed, including at least one removing outlet situated externally of said retaining elements and vertically spaced from said fixed bed and separated therefrom by one of said retaining elements.

4,719,011

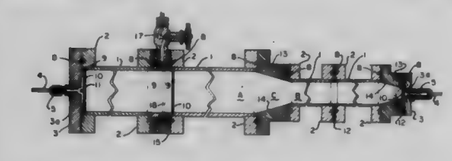
HIGH PRESSURE LIQUID CHROMATOGRAPHY COLUMNS

Yehuda Shalon, Clayton, and Danny D. Meyer, St. Louis, both of Mo., assignors to H. T. Chemicals, Inc., St Louis, Mo.

Continuation of Ser. No. 714,730, Mar. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 492,802, May 9, 1983, Pat. No. Des. 285,290. This application Jan. 21, 1987, Ser. No. 5,641

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **2 Claims**



1. A chromatography column incorporating at least a pair of column sections and with each column section having terminal flange-like means intergrally connecting at each of its ends, said column sections capable of modularly and axially joining together through their terminal flange-like means, a porous frit, a pair of column sections internally separated by said porous frit, said porous frit incorporating handle means extending approximately centrally and integrally therefrom to facilitate its manipulation, an adapter arranged intermediate a pair of column sections to connect said column sections together, each column section having an internal channel arranged therethrough, and each column section having an inlet and an outlet end, and wherein said adapter arranged connecting intermediate a pair of adjacent column sections, said adapter having a cone-shaped chamber arranged therethrough and being of decreasing diameter along its length, said adapter having O-rings adjacent each side to provide a fluid tight seal with the contiguous flange-like means of the pair of adjacent connecting column sections, said adapter provided for joining modular columns together having differing internal diameters for their formed channels, and end plates for use in conjunction with each column section, each end plate having a central aperture provided therethrough to provide for the entrance or exiting of fluids from the chromatographic column sections during performance of a chromatographic procedure, said end plate having an interior surface connecting against the flange-like means of the adjacent column section, each end plate upon its internal surface having a funnel-like shape communicating with the central aperture formed through the said end plate, a connector attaching with the central aperture formed through the said end plate, and tubing connecting with the connector to facilitate the entrance or removal of fluids from the chromatographic column sections during performance of a chromatographic procedure.

4,719,012

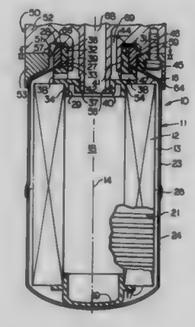
TWIST ON DISPOSABLE FILTER

John J. Groezinger, Dunlap, and Philip E. Moldenhauer, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 30, 1986, Ser. No. 868,482

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—232 **27 Claims**



1. A twist on disposable filter having a generally cylindrical housing and a filter element disposed in the housing defining a chamber therebetween, said filter element having a longitudinally extending axis, opposite end portions and a longitudinally extending central passage open at one of the end portions and being closed at the other end portion comprising:

means defining an opening in one end of the housing;

twist-lock connector means extending through the opening in the housing and being sealably connected to the housing adjacent the opening, said connector means having an outer surface, a plurality of circumferentially spaced lugs extending radially outwardly from the outer surface, and a cylindrical bore coaxial with the longitudinal axis of the filter element, said connector means engaging the one end portion of the filter element;

means defining another bore concentric with the bore in the connector means and opening into the central passage of the filter element; and

passage means communicating the bore in the connector means with the chamber.

4,719,013

CERAMIC FOAM FILTER

Jerry W. Brockmeyer, Hendersonville, N.C., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 654,391, Sep. 26, 1984, Pat. No. 4,610,832. This application May 12, 1986, Ser. No. 862,268

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[4] C04B *35/10*

U.S. Cl. 210—510.1 **3 Claims**

1. A ceramic foam filter for use in filtering molten metal prepared from a reticulated, organic polymer foam impregnated with an aqueous slurry of a thixotropic ceramic composition including a gelled alumina hydrate binder which comprises a substantially phosphate-free, open cell structure with a plurality of interconnected voids surrounded by a web of said ceramic wherein said structure is characterized by having a solid state, sintered ceramic bond substantially binder free and substantially free of glassy phases.

4,719,014

CYCLONE SEPARATOR

Noel Carroll, Sherbrooke Road, Sherbrooke, Victoria, Australia

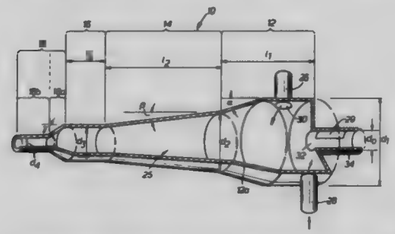
Continuation of Ser. No. 754,395, Jul. 11, 1985, which is a continuation-in-part of Ser. No. 472,015, Mar. 4, 1983, Pat. No. 4,544,486, which is a continuation-in-part of Ser. No. 449,395, Dec. 13, 1982, Pat. No. 4,464,264. This application Feb. 6, 1987, Ser. No. 11,455

Claims priority, application Australia, Mar. 4, 1982, PF2973/72; Mar. 11, 1982, PF3061/82; May 14, 1982, PF4016/82; May 14, 1982, PF4017/82; Aug. 10, 1982, PF5314/82

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] B01D *17/038*

U.S. Cl. 210—512.1 **20 Claims**



1. A cyclone separator comprising elements designed, sized and arranged for treating a mixture of fluids and more particularly an oil/water mixture for separating a more dense component from a less dense component thereof, said separator comprising a separating chamber having a primary portion which has a greater cross-sectional diameter at one end than at its other end and further having an overflow outlet at said one end thereof and an underflow outlet at said other end; at least one tangentially directed feed inlet proximate to said one end, said separator further including means designed, sized and arranged for acting to preclude contamination of the more dense component emerging from the underflow outlet by the less dense component, said means having an inlet end downstream of said other end of said primary portion with respect to the direction of flow of said separated more dense component, and an outlet end, said means presenting a passageway for throughflow of the more dense component, the diameter of which passageway has a diameter at said outlet end thereof which is from ½ to 0.8 the diameter thereof at said inlet end thereof.

4,719,015

APPARATUS AND METHOD FOR PROCESSING SEWAGE SCUM

William G. Urbani, Stockton, Calif., assignor to Industrial Innovations, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 736,629, May 25, 1985, Pat. No. 4,647,383. This application Jul. 3, 1986, Ser. No. 881,885

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] C02F *1/02, 1/40*; B01D *21/00*

U.S. Cl. 210—608 **17 Claims**

1. A sewage scum processor comprising:

cooking means for maintaining raw sewage scum at an elevated temperature to render the scum separable into aqueous, solid, and oily phases, the cooking means including an inlet for receiving the raw scum, a liquified scum outlet and a gas outlet for removing gases escaping from the scum;

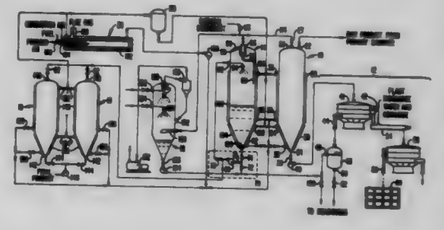
separator means coupled to the liquified scum outlet for receiving liquified scum from the cooking means and for separating solids from the aqueous and oily phases of the scum;

vacuum drying means fluidly coupled to the separator means for receiving and separating the aqueous and oily phases into a volatile phase and a non-volatile phase, the vacuum drying means including a non-volatile phase outlet and a gas vapor outlet for removal of the volatile phase; and

condenser means fluidly coupled to the vacuum drying means to receive the volatile phase for condensing at least a portion of the volatile phase to form a condensate, the condenser means including a discharge outlet for discharging condensable portions of the volatile phase.

17. A method of processing sewage scum comprising the steps of:

cooking the scum at a cooking temperature to render the scum separable into a solid phase, an oily phase, and an



aqueous phase, the cooking temperature being maintained with a circulating, heated exchange fluid;

separating the solid phase from the oily phase and the aqueous phase;

washing the separated solid phase by adding water and a germicide to the separated solid phase to form a slurry;

separating solids from the slurry for disposal; and

digesting the oily phase and the aqueous phase.

4,719,016

PERVAPORIZATION METHOD AND APPARATUS

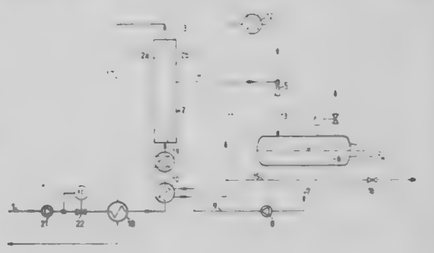
Christoph Storkebaum, Brunswick, and Uwe Tegtmeier, Wittmar, both of Fed. Rep. of Germany, assignors to Starcosa GmbH, Brunswick, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,341

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531834

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—640 **4 Claims**



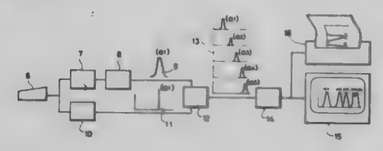
1. A pervaporation method for separating a liquid/liquid suspension, comprising the following steps: supplying said suspension to one side of a solution diffusion membrane, producing by means of a jet pump a reduced pressure on the other, permeate side of said membrane for evaporating a permeate coming through said membrane, passing evaporated permeate to said jet pump for condensating evaporated permeate in the driving jet of said jet pump, introducing condensated permeate into a closed circuit flow in which said condensated permeate is supplied as a drive means to said jet pump, cooling said condenssated permeate in said closed circuit flow, and transferring condensated permeate into a collecting container.

4,719,017

METHOD OF CHROMATOGRAM ANALYSIS AND AN APPARATUS THEREFOR

Koichi Uchino, and Yoshimasa Hamano, both of Katsuta, Japan, assignors to Hitachi, Ltd., Toyko, Japan

Filed Mar. 20, 1985, Ser. No. 713,848
Claims priority, application Japan, Mar. 21, 1984, 59-52177
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—656 **4 Claims**



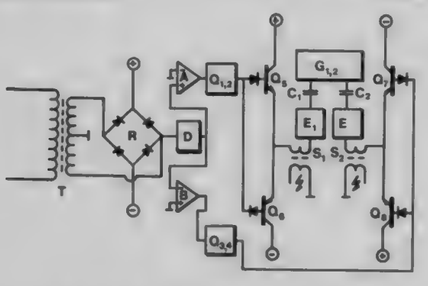
1. A method of chromatogram analysis comprising:
passing a sample comprising a plurality of components through a separation column packed with a filler;
separating the components in the sample depending upon their moving speeds relative to the filler;
allowing the separated components to reach a detector to measure retention times of the components;
storing retention times of various components related to various fillers on memory means;
storing widths of various components related to various fillers on memory means;
producing schematic chromatograms related to particular fillers and particular object components, relying upon stored retention times and half widths of various object components related to various fillers by means for producing schematic chromatograms;
displaying schematic chromatograms related to particular fillers and particular object components relying upon stored retention times and half widths of the various object components related to the various fillers on displaying means;
selecting displayed schematic chromatograms from groups of displayed schematic chromatograms, wherein the selected schematic chromatograms are completely separated;
determining a filler by the selected schematic chromatograms; and
charging a determined filler into the separation column to analyze the sample.

4,719,018

AUTOMATIC WATER PURIFIER

Aleksander Przybylski, 5801 SW. 47 St., Miami, Fla. 33155

Continuation-in-part of Ser. No. 581,266, Feb. 17, 1984, abandoned. This application Sep. 6, 1984, Ser. No. 647,876
Int. Cl.⁴ C02F *1/48, 1/50, 1/78*
U.S. Cl. 210—748 **2 Claims**



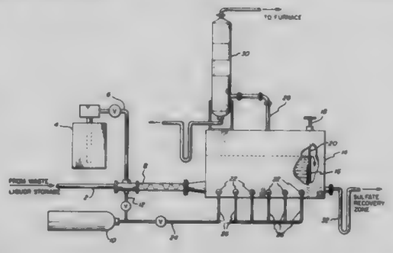
1. An apparatus for purifying water by supplying low frequency square waves and higher frequency square waves of mutually opposed polarity and ozone to the water comprising:
electrodes;
means for supplying water between said electrodes;
an AC or a DC power source with its respective converter;
means for supplying power to control means; said control means comprising a frequency divider, two coupled operational amplifiers, two pairs of transistors working in a push-pull mode, two pairs of coupled power switching transistors and of about 2 kHz oscillators of square waves connected in such a manner as to produce and simultaneouly apply square wave impulses of a low frequency and a higher frequency to the electrodes;
means to produce spark; means to connect said means to produce spark to said impulses in such a manner as to supply a spark to a stream of air to produce ozone; and
means to deliver the stream of air and the produced ozone to the water.

4,719,019

TREATMENT OF THIOCYANATE CONTAINING WASTE LIQUOR

Srini Vasan, 170 Weeburn Dr., New Canaan, Conn. 06840

Filed Dec. 10, 1986, Ser. No. 939,952
Int. Cl.⁴ B01D *17/00*
U.S. Cl. 210—752 **15 Claims**



15. In a continuous process which includes, treating waste liquor containing a mixture comprising alkali metal or ammonium thiocyanates and polysulfides the steps comprising:
continuously feeding separate streams of waste liquor and concentrated sulfuric acid to a mixing zone and subjecting said streams to mixing therein under turbulent conditions in an inert atmospher;
continuously passing said mixed streams from said mixing zone through a stripping zone in which said mixed liquid streams are stripped of gaseous by-products by purging with a plurality of streams of an inert gas;
continuously removing overhead a stream of inert gas having said gaseous by-products entrained therein; and
continuously passing said liquid streams from said stripping zone to a sulfate recovery zone.

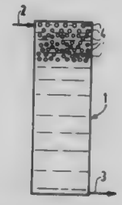
4,719,020

PROCESS FOR CONCENTRATING A SUSPENSION OF MICROSCOPIC PARTICLES

Samuel Elmaleh, Casteinau le Lez, France, assignor to Mornex Limited, Londres, France

Filed Nov. 27, 1984, Ser. No. 675,200
Claims priority, application France, Nov. 30, 1983, 83 19150
Int. Cl.⁴ B01D *37/00*
U.S. Cl. 210—807 **13 Claims**

1. A process for concentrating microscopic particles suspended in a liquid comprising:
(a) passing the liquid suspension from the top to the bottom of a closed container comprising:
(i) a bottom,
(ii) at least one liquid inlet at the top thereof,
(iii) at least one liquid outlet at the bottom thereof,
(iv) granular medium with a density less than that of the liquid;
(b) imparting a velocity to said liquid through said container sufficient to press said microscopic particles and said granular medium into a mixed bed at said bottom;
(c) continuing passage of said liquid suspension through said bed until the bed becomes clogged with flocculated aggregates of the microscopic particles;
(d) interrupting passage of the liquid, whereby the granular medium with a density less than that of the liquid rises in



the container, and the flocculated aggregates remain near the bottom of the container; and
(e) recovering the flocculated aggregates at the outlet at the bottom of the container.

4,719,021

SHALE-STABILIZING DRILLING FLUIDS AND METHOD FOR PRODUCING SAME

Homer Branch, III, New Orleans, La., assignor to Sun Drilling Products Corporation, Belle Chasse, La.

Continuation of Ser. No. 675,832, Nov. 28, 1984, abandoned. This application Oct. 16, 1986, Ser. No. 919,587
Int. Cl.⁴ C09K *7/02*
U.S. Cl. 252—8.514 **8 Claims**

1. A solids-containing fluid composition comprising a mixture of:
(a) an aqueous-based solids-containing fluid having at least one ingredient selected from the group consisting of bentonite, lignite, lignosulfonate, ferrite, lime, gypsum, fluorite, hematite, sodium carbonate, barite, and carboxymethylcellulose, and
(b) a mixture in an amount effective to stabilize colloidal clays comprising:
(1) 1 to 15% sodium hydroxide;
(2) 1 to 15% potassium hydroxide;
(3) 1 to 15% thinner;
(4) 1 to 15% cationic starch;
(5) at least one member selected from the group consisting of:
(i) polyethylene glycol having an average molecular weight in the range of 200 to 4,000;
(ii) polypropylene glycol having an average molecular weight in the range of 200 to 4,000;
(iii) polybutylene glycol having an average molecular weight in the range of 200 to 4,000; and
(iv) ethylene glycol;
(6) 5 to 20% of at least one complex from the group consisting of:
(i) complexes of guanidine and aluminum hydroxide gel;
(ii) complexes of guanidine and sodium aluminate;
(iii) complexes of guanidine hydrochloride and aluminum sulfate; and
(iv) complexes of guanidine hydrochloride and aluminum phosphate; and
(7) 60 to 90% water.

4. A drilling fluid composition comprising
(a) a aqueous-based solids-containing fluid having at least one ingredient selected from the group consisting of bentonite, lignite, lignosulfonate, ferrite, lime, gypsum, fluorite, hematite, sodium carbonate, barite, and carboxymethylcellulose, and
(b) a mixture forming a complex of guanidine and aluminum, said mixture including by weight:
10–90% aluminum hydroxide;
0–50% of a glycol with an average molecular weight between 200 and 4000 and selected from the group consisting of polyethylene glycol, polypropylene glycol, polybutylene gylcol, and mixtures thereof;
10–60% of a starch selected from the group consisting of cationic starches and mixtures thereof;
1–50% guanidine;
0–50% aluminum phosphate; and
0–50% aluminum sulfate.

4,719,022

LIQUID LUBRICATING AND STABILIZING COMPOSITIONS FOR RIGID VINYL HALIDE RESINS AND USE OF SAME

Jeffrey R. Hyde, West Chester, Ohio, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 808,038, Dec. 12, 1985, abandoned. This application May 14, 1987, Ser. No. 50,597
Int. Cl.⁴ C10M *101/02*
U.S. Cl. 252—35 **32 Claims**

1. In a process for adding to rigid vinyl halide resin one or more processing, stabilizing and formulation additives the improvement comprising adding to the resin as substantially the only necessary external lubricant additive an oil derived esaentially from petroleum, which oil is liquid at ambient room temperature and meets the criteria:

$$(\text{molecular weight}) \times (\%\ \text{paraffin content}) \times (10^{-4}) \geq 2.0,$$

said oil being added to the resin in an amount sufficient to produce the external lubrication properties necessary to permit satisfactory molding and extrusion of the resulting resin composition.

4,719,023

GREASE COMPOSITION

Alexander C. B. MacPhail, Little Sutton, and Henry Rutherford, Doddleston Chester, both of United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1986, Ser. No. 940,384
Int. Cl.⁴ C10M *129/50, 129/54*
U.S. Cl. 252—39 **4 Claims**

1. A grease composition comprising a base fluid, a thickening agent and from 0.1 to 10.0 percent weight of an over-based calcium alkyl salicylate based on the weight of the total grease composition having a basicity of from 1 to 15, wherein said alkyl moiety has from 5 to 50 carbon atoms and from 0.05 to 5.0 weight percent of an over-based magnesium alkyl salicylate based on the weight of the total grease composition having a basicity index of from 1 to 8, wherein said alkyl moiety has from 5 to 50 carbon atoms.

4,719,024

METHYLALKYLCYCLOSILOXANES

John L. Speier, and James R. Malek, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 5, 1986, Ser. No. 859,547
Int. Cl.⁴ C10M *105/76*
U.S. Cl. 252—49.6 **16 Claims**

1. A methylalkylcyclosiloxane having the general formula $((CH_3)_2SiO)_a(CH_3R'SiO)_b(CH_3R''SiO)_c(CH_3R'''SiO)_d(CH_3R''''SiO)_e$ and wherein R', R'', R''', and R'''' are each alkyl radicals different from each other and having from two to twenty carbon atoms, and wherein b, c, d, and e are each, independently zero, one, two or three, and wherein at least two of the values of b, c, d, and e are each greater than zero, and wherein a+b+c+d+e equals 3 or 4, and wherein the value of a can be zero, or one when a+b+c+d+e equals 3, and wherein the value of a can be zero, one or two when a+b+c+d+e equals 4.

4,719,025

SYNTHETIC LUBRICATION OIL COMPOSITIONS

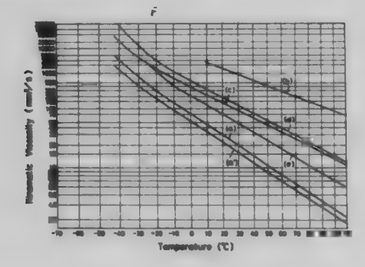
Kenyu Akiyama, Toyota; Sadao Wada, Seki, and Michihide Tokashiki, Kawagoe, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toa Nenryo Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,665

Claims priority, application Japan, Aug. 7, 1984, 59-165521; Aug. 9, 1984, 59-167037

Int. Cl.⁴ C10M *101/04*

U.S. Cl. 252—56 S **15 Claims**



1. A wear-resistant, synthetic lubricating oil composition for automobiles comprising as a base oil a synthetic oil mixture consisting of

(A) a diester of an aliphatic dibasic acid having 4 to 14 carbon atoms in the molecule and an alcohol having 4 to 14 carbon atoms or a mixture of several such diesters and having a viscosity at 100° C. of 2 to 7 centistokes

(B) a polyoxyalkylene glycol whose alkylene group contains 2 to 5 carbon atoms or a mixture of several such glycols and having a viscosity at 100° C. of at least 20 centistokes, said base oil exhibiting viscosity values of 9 centistokes or above at 100° C. and 6×10^4 centipoise or below at −40° C.

4,719,026

ELECTROPHORETIC METHOD OF PRODUCING HIGH-DENSITY MAGNETIC RECORDING MEDIA AND A COMPOSITION AND A SUSPENSION FOR PRACTICING THE SAME

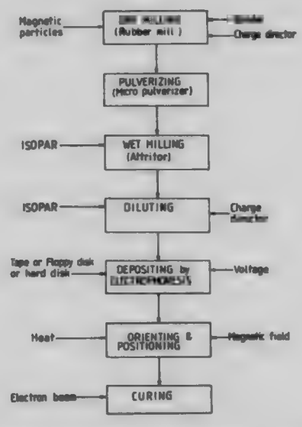
Arden Sher, Belmont, and Karen Sabo, Fremont, both of Calif., assignors to Savin Corporation, Stamford, Conn.

Division of Ser. No. 710,586, Mar. 11, 1985, Pat. No. 4,585,535. This application Jan. 27, 1986, Ser. No. 822,833

Int. Cl.⁴ C04B *35/04*; H01F *1/00, 1/26*

U.S. Cl. 252—62.54 **32 Claims**

1. A magnetic recording medium comprising in combination a carrier and a coating of ferromagnetic particles deposited thereon, said ferromagnetic particles being encapsulated in a binder comprising a thermoplastic polymer which is insoluble in a low-boiling low dielectric constant, high resistivity aliphatic hydrocarbon liquid at a temperature of less than about 40 degrees C. and is softenable at temperatures above 70 degrees C., said binder having a plurality of functional sites and having a minor amount of a charge director capable of controlling said functional sites incorporated therein, said ferromagnetic particles having substantially the same orientation.



4,719,027

ARTICLE HAVING MAGNETIC PROPERTIES AND PRODUCTION THEREOF

James H. Raistrick, 71 Ashbourne Drive, Runcorn, Cheshire WA7 4YL, and Stephen J. Battersby, Park Farm, Beare Green, Near Dorking, Surrey RH5 4PX, both of England

PCT No. PCT/GB84/00114, § 371 Date Jan. 30, 1986, § 102(e) Date Jan. 30, 1986, PCT Pub. No. WO84/02445, PCT Pub. Date Jul. 5, 1984

PCT Filed Apr. 2, 1984, Ser. No. 817,740

Claims priority, application, Apr. 2, 1984, United Kingdom, 84-00114

Int. Cl.⁴ C04B *35/04*; H01F *1/06, 1/26*

U.S. Cl. 252—62.54 **14 Claims**

1. A shapeable composition capable of being shaped on rubber or plastics processing equipment and comprising a homogeneous mixture of

(a) at least one particulate ferrite material having magnetic properties,

(b) at least one water-soluble or water-dispersible organic polymeric material, and

(c) water, in the composition the components (a), (b) and (c) being present in a proportion by volume of the composition of respectively, 40 to 90%, 2 to 25%, and not more than 30%.

4,719,028

THERMAL ENERGY STORAGE MEDIA

Timothy W. James, P.O. Box 20091, Santa Barbara, Calif. 93120, and Arnold L. Adams, P.O. Box 783, Goleta, Calif. 93116

Filed Nov. 19, 1985, Ser. No. 799,399

Int. Cl.⁴ C09K *3/18*

U.S. Cl. 252—70 **13 Claims**

1. A generally noncorrosive heat storage material having a melting temperature below 5° C. consisting essentially of:

30% to 80% ethylene diamine;

20% to 70% of a material having a heat of fusion in the range of 20 cal/g to 200 cal/g, whereby said material is noncorrosive to metal; and 0% to 20% water.

4,719,029

SOLUBLE OIL EMULSIFIER WITH BIORESISTANCE

Bryant J. Hardy, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jan. 15, 1987, Ser. No. 3,674

Int. Cl.⁴ C10M *135/08*

U.S. Cl. 252—78.1 **7 Claims**

1. A method for imparting bioresistance to continuous water phase hydraulic fluids comprising utilizing as an emulsifier for said continuous water phase hydraulic fluid an ammonium salt of a sulfated ethoxylated alcohol wherein the alcohol contains fro· . 6 to 20 carbon atoms and which has been ethoxylated to a level of from about 20 percent by weight to about 90 percent by weight, based upon the weight of the ethoxylated alcohol.

4,719,030

TRANSPARENT OR TRANSLUCENT TOILET SOAP BARS CONTAINING WATER-INSOLUBLE SILICA OR SILICATES

Michael K. Williams, Newcastle upon Tyne; Geoffrey G. Dawson, Ponteland, both of England, and Ralph F. Medcalf, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 5, 1986, Ser. No. 836,668

Claims priority, application United Kingdom, Mar. 5, 1985, 8505607

Int. Cl.⁴ C11D *9/18, 17/00*

U.S. Cl. 252—133 **10 Claims**

1. A translucent or transparent milled toilet bar composition comprising from about 45% to about 95% alkali metal soap and from about 0.1% to about 3.5% of water-insoluble synthetic amorphous particulate silica or silicate having a specific surface area of at least about 25 square meters per gram, at least about 50% of the said soap being in the beta phase.

4,719,031

POLYMERIC ALKYLENE DIPHOSPHONATE ANHYDRIDES, THEIR PRODUCTION AND USE

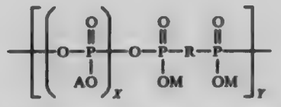
James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 766,724, Aug. 19, 1985, Pat. No. 4,663,432. This application Feb. 2, 1987, Ser. No. 9,442

Int. Cl.⁴ C02F *5/14*; C11D *3/36, 3/37*

U.S. Cl. 252—180 **4 Claims**

1. A method for inhibiting the formation of scale in an aqueous solution containing scale-forming ions, by incorporating into the aqueous solution an effective amount of phosphate-phosphonate anhydride copolymer of the following formula:



where M is an alkali metal; R is an unsubstituted alkylene group; A is hydrogen, an alkali metal, or an ammonium group; X averages from 0 to about 5; and Y is an integer of at least 5.

4,719,032

CYCLOHEXANE DERIVATIVES

Andreas Wächtler, Griesheim; Joachim Krause, Dieburg; Reinhard Hittich, Modautal, and Bernhard Schenble, Alsbach, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,692

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510312

Int. Cl.⁴ C09K *19/34*; G02F *1/13*; C07C *43/184, 69/013*

U.S. Cl. 252—299.63 **17 Claims**

1. A cyclohexane derivative of the formula

$$R^1—Cy—CH_2—Q—(Cy)_m—O—(CO)_n—CH_2—R^2$$

wherein

R^1 is alkyl of 1 to 12 C atoms or alkyl of 1–12 C atoms wherein one or two non-adjacent CH groups are replaced by —O—, —O—CO— or —CO—O—,

R^1 is H, alkyl of 1 to 12 C atoms or alkyl of 1–12 C atoms wherein one or two non-adjacent CH_2 groups are replaced by —O—,

Cy is 1,4-cyclohexylene,

Q is $—CH_2—$,

m is 1 or 2, and

n is 0 or 1.

4,719,033

PROCESS FOR PRODUCING EUROPIUM ACTIVATED STRONTIUM TETRABORATE UV PHOSPHOR

Charles F. Chenot, Towanda, Pa., and Michael A. Krebs, Waverly, N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 28, 1986, Ser. No. 903,181

Int. Cl.⁴ C09K *11/465*

U.S. Cl. 252—301.4 R **10 Claims**

1. A process for producing a europium activated strontium tetraborate UV emitting phosphor, said process comprising:

(a) adding $SrCO_3$ and Eu_2O_3 to an aqueous solution of H_3BO_3 which is at a temperature of at least about 70° C., to form a mixture wherein the mole ratio of $SrCO_3$ to H_3BO_3 is from about 1:4 to about 1:4.5 and the Eu_2O_3 content is from about 0.003 moles to about 0.015 moles;

(b) digesting said mixture at a temperature of at least about 90° C. for a sufficient time to form a solid precipitate comprising a strontium borate hydrate intermediate having the formula $SrB_6O_{10}.5H_2O$ and a liquor;

(c) separating said solid from said liquor;

(d) drying said solid: and

(e) firing the resulting dried solid in an atmosphere consisting essentially of from about 0.3% to about 3.0% by volume hydrogen and the balance nitrogen at a temperature of at least about 800° C. for a sufficient time to produce the final phosphor the major portion of which consists essentially of strontium tetraborate as a host material doped with europium ions substituted for strontium ions, said final phosphor having a composition in percent by weight of from about 34.72% to about 35.80% strontium, from about 17.66% to about 17.78% boron, from about 0.37% to about 1.86% europium, and the balance oxygen, with said europium being relatively uniformly distributed throughout the balance of said phosphor.

4,719,034

SOLID SILICONE DEFOAMING AGENT AND METHOD FOR ITS PRODUCTION

Takuteru Yamada, and Keiichi Kishimoto, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 801,449
Claims priority, application Japan, Dec. 5, 1984, 59-256746
Int. Cl.[4] B01D *19/04*
U.S. Cl. 252—358 9 Claims

1. A solid silicone defoaming composition consisting essentially of:

(a) 20 to 80 weight % nonionic surfactant selected from the group consisting of glycerol aliphatic acid esters which are solid at room temperature and propylene glycol aliphatic acid esters which are solid at room temperature;

(b) 5 to 50 weight % water-soluble polymer compound selected from the group consisting of carboxyvinyl polymers which are solid at room temperature and a poly(vinyl alcohol) which is solid at room temperature; and

(c) 5 to 50 weight % silicone composition composed of 1 to 20 weight % fine powdery silica and 99 to 80 weight % silicone oil having a viscosity of at least 100 cS at 25° C.

4,719,035

CORROSION INHIBITOR FORMULATION FOR MOLYBDENUM TUNGSTEN AND OTHER METALS

Miles R. Palmer, Kirtland, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 675,115, Jan. 27, 1984. This application Sep. 26, 1986, Ser. No. 913,612
Int. Cl.[4] C09K *3/00;* C23F *11/04*
U.S. Cl. 252—390 5 Claims

1. An aqueous cooling system contacting molybdenum or tungsten laser mirrors, wherein the improvement comprises an aqueous corrosion inhibiting composition having a pH of less than 4 and consisting essentially of:

(a) a triazole selected from the group consisting of benzotriazole and tolyltriazole, said triazole having a concentration of 0.0002 to 0.1 moles per liter;

(b) an organic biocide having a concentration of 0.005 to 0.1 moles per liter; and

(c) a buffering agent selected from the group consisting of benzoic acid, tartaric acid, phosphorous acid, citric acid, phthalic acid, acetic acid and formic acid, at a concentration of 0.01 to 0.1 moles per liter.

4,719,036

COMPOSITIONS CONTAINING HETEROCYCLIC CORROSION INHIBITORS

Brian G. Clubley, Wilmslow, and Emyr Phillips, Sale, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

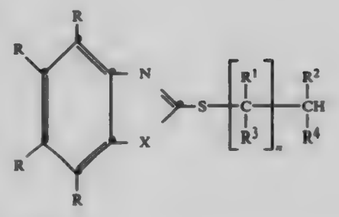
Filed May 8, 1985, Ser. No. 731,816
Claims priority, application United Kingdom, May 11, 1984, 8412064
Int. Cl.[4] C09K *15/30*
U.S. Cl. 252—391 26 Claims

1. A composition which comprises

(A) (a) an aqueous or non-aqueous coating composition suitable for preparing a surface coating which is a paint, or (b) a wholly or partly aqueous non-coating system which is a cooling water system, an air-conditioning system, a steam-generating system, a seawater evaporator, a hydrostatic cooker, a closed circuit heating or refrigerant system, an aqueous scouring or metal-working formulation, an antifreeze composition or a water-based hydraulic fluid composition, and

(B) an effective corrosion-inhibiting amount of a compound of formula II

II



in which

X is sulfur;

R is each independently of one another hydrogen, alkyl, haloalkyl, alkoxy, alkylthio, alkylsulfonyl, cycloalkyl, phenyl, alkylphenyl, phenylalkyl, halogen, cyano, nitro, hydroxy, —COOH, —COOalkyl or a primary-, secondary- or tertiary-amino or carbamoyl group;

n is 0 or 1;

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl, hydroxyalkyl, haloalkyl, cyanoalkyl, alkoxyalkyl, phenyl, phenylalkyl, said phenyl or said phenylalkyl substituted by one or two of halogen, of nitro, of alkyl, of alkoxy, of carboxy or of hydroxy; cyano, carboxy, alkyl substituted by carboxy or by $—CONZ_1Z_2$; or $—CONZ_1Z_2$ where

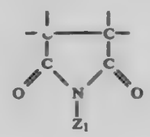
Z_1 and Z_2 are independently hydrogen, C_1–C_{18}-alkyl, said alkyl interrupted by one or more O or S atoms or by one or more NR^o groups where R^o is C_1–C_{18}-alkyl, C_3–C_{12}-cycloalkyl, phenyl, naphthyl, C_7–C_9-phenylalkyl or C_7–C_{18}-alkylphenyl; or said alkyl substituted by —SH, by $—NH_2$, by —COOH, by $—COOR^o$, by $—CONH_2$, by —CN or by halogen; C_2–C_{10}-hydroxyalkyl or said hydroxyalkyl interrupted by one or more NR^o groups or by one or more oxygen atoms; C_3–C_{18}-alkenyl, C_3–C_{12}-cycloalkyl or said cycloalkyl substituted by C_1–C_4-alkyl, by —OH, by —SH, by —COOH, by $—COOR^o$, by $—CONH_2$, by —CN or by halogen; C_7–C_9-phenylalkyl, C_7–C_{18}-alkylphenyl, or C_6–C_{10}-aryl or said phenyl or said aryl substituted by C_1–C_{12}-alkoxy, by C_1–C_{12}-alkylthio, by halogen or by nitro; or Z_1 and Z_2 together form a straight or branched alkylene of 3 to 7 carbon atoms or said alkylene interrupted by O, by S or by NR^o; or

(B) is a compound of formula II where the moiety

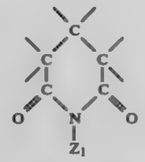
$$[C(R^1)(R^3)]_nCH(R^2)(R^4)$$

contains a group of formula III or IIIa

III



IIIa

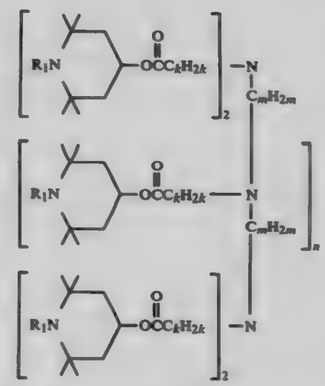


or where R^1 and R^2 or R^1 and R^3 together form a straight or branched alkylene, or said alkylene substituted by one or two —COOH or by one or two $—CONZ_1Z_2$; or where R^1 and R^2 form a direct bond;

with the proviso that at least two of R^1, R^2, R^3 and R^4 must contain a carboxy group or a derivative thereof which is a $—CONZ_1Z_2$ group, —CN or an imide of formula III or IIIa with the further proviso that at least one of $—CONZ_1Z_2$, —CN or imide groups must be present, or

(B) is a non-toxic base addition salt of a compound of formula II which contains a free carboxy group.

(1)



(wherein R_1 is a hydrogen atom, an alkyl group of 1 to 3 carbon atoms or a C_1–C_{17} alkylcarbonyl group and k, m and n each are an integer of 1 to 3).

4,719,037

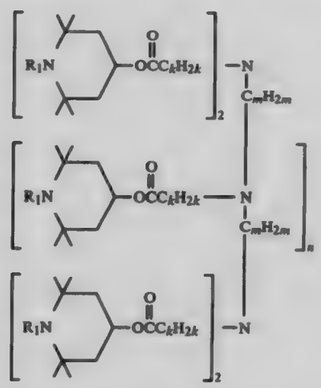
PIPERIDINE DERIVATIVES, PRODUCTION PROCESS THEREFOR, AND STABILIZERS FOR ORGANIC SUBSTANCES CONTAINING SAID DERIVATIVES AS AN ACTIVE COMPONENT

Yukoh Takahashi, Toyonaka; Yuzo Maegawa, Osaka; Hiroki Yamamoto, Nishinomiya; Tatsuo Kaneoya, Toyonaka; Haruki Okamura, Osaka; Shinichi Yachigo, Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 21, 1986, Ser. No. 887,813
Claims priority, application Japan, Aug. 7, 1985, 60-173817
Int. Cl.[4] C07D *401/14;* C08K *5/34;* C09D *7/06*
U.S. Cl. 252—401 36 Claims

1. A piperidine represented by the formula (1)

(1)



(wherein R_1 is a hydrogen atom, an alkyl group of 1 to 3 carbon atoms or a C_1–C_{17} alkylcarbonyl group and k, m and n each are an integer of 1 to 3).

26. A stabilizer for organic substances which contains, as an active component, a piperidine represented by formula (1)

4,719,838

CORROSION RESISTANT, COATED METAL LAMINATE, ITS PREPARATION AND COATING MATERIALS

Tamotsu Sobata; Masaaki Takimoto, both of Osaka, and Yuichi Yoshida, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 687,004, Dec. 27, 1984, abandoned. This application May 28, 1986, Ser. No. 869,857
Claims priority, application Japan, Dec. 27, 1983, 58-248312; Dec. 29, 1983, 58-245747; Dec. 29, 1983, 58-245748; Jan. 21, 1984, 59-008678; Mar. 2, 1984, 59-040874; Mar. 29, 1984, 59-062555; Mar. 29, 1984, 59-062556
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 6 Claims

1. A coating composition suitable for precoating a metal comprising, as solid,

(A) 10 to 35% by weight of at least one binder resin whose aromatic ring content in its molecule is less than 50% by weight and which is selected from the group consisting of epoxy resin, alkyd resin, acryl resin, melamine resin, urethane resin, phenol resin, vinyl resin, polyvinyl butyral resin, polyvinyl acetate resin, chlorinated rubber, oil-free polyester resin, phthalic acid resin, styrene resin and polyolefin resin,

(B) 4 to 50% by weight of polyethylene wax capable of being decomposed exothermically at 300° to 500° C., and

(C) 15 to 86% by weight of electrically conductive pigment having a mean diameter of less than 20 microns, which is selected from the group consisting of stainless steel, gold, silver, cadmium, aluminum, zinc, tin, copper and graphite powders; iron, nickel, titanium, tungsten, niobium and manganese carbides; and ferromanganese, ferromolybdenum, ferrosilicon, ferrochromium, ferrotitanium and ferrophosphorous ferroalloys.

4. A coating composition suitable for precoating a metal comprising, as solid,

(A) 10 to 35% by weight of at least one binder resin whose aromatic ring content in its molecule is less than 50% by weight and which is selected from the group consisting of epoxy resin, alkyd resin, acryl resin, melamine resin, urethane resin, phenol resin, vinyl resin, polyvinyl butyral resin, polyvinyl acetate resin, chlorinated rubber, oil-free polyester resin, phthalic acid resin, styrene resin and polyolefin resin,

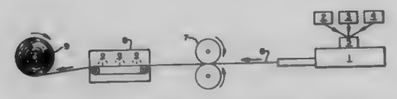
(B) 4 to 30% by weight of polyethylene wax capable of being decomposed exothermically at 300° to 500° C.,
(C) 15 to 85% by weight of electrically conductive pigment which is essentially of di-iron phosphide and has a mean diameter of less than 20 microns,
(D) 1 to 71% by weight of iron phosphide decomposition inhibitor whose aqueous suspension has a pH of 6 to 13 and which is selected from the group consisting of alkaline earth metal petroleum sulfonates, zinc chromate, zinc potassium chromate, lead chromate, basic lead chromate, calcium chromate, strontium chromate, zinc phosphate, iron phosphate, aluminum tripolyphosphate, lead silicate, talc, calcium carbonate, silica and zinc powder wherein the amount of zinc powder is less than the iron phosphide amount, and
(E) 0 to 70% by weight of other inorganic pigment selected from the group consisting of zinc chromate, lead chromate, calcium chromate, strontium chromate, zinc phosphate, iron phosphate, aluminium tripolyphosphate, lead silicate, silica, calcium carbonate, talc, alumina, chromium oxide, iron oxide and lead oxide, provided that the total amount of (C), (D) and (E) is 35 to 86% by weight of the total solids of the composition.

4,719,039

ELECTRICALLY CONDUCTIVE POLYETHYLENE FOAM

Nicholas J. Leonardi, North Andover, Mass., assignor to Dynamit Nobel of America, Inc., Rockleigh, N.J.

Continuation of Ser. No. 688,413, Jan. 2, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 857,301
Int. Cl.[4] C08J 9/06; H01B 1/06
U.S. Cl. 252—511 **10 Claims**



1. A method for producing an electrically conductive crosslinked polyethylene foam sheet having a closed cell foam structure and exibiting a surface resistivity of not more than 10^5 ohms/square, which comprises extruding a resinous composition containing per 100 parts by weight of a mixture containing about 100–0% by weight of polyethylene and about 100–0% by weight of an ethylene copolymer, 12 to 20 parts by weight of conductive carbon black, 2 to 15 parts by weight of a chemical blowing agent and 0.1 to 1.5 parts by weight of a crosslinking agent, said polyethylene having a melt index of about 10–40 and the ethylene copolymer having a melt index of about 10–40, to produce a non-crosslinked, non-foamed sheet preform at a temperature above the melt temperature of the resinous composition and below the decomposition temperatures of the crosslinking agent and the blowing agent, and then heating the sheet preform to higher temperatures than the extrusion temperature to activate the crosslinking agent and the blowing agent to thereby effect crosslinking and foaming of the composition.

4,719,040

PROCESS FOR THE PREPARATION OF AIR-FRESHENER GELS

Petrus C. Traas, and Ernst-Ludwig Roehl, both of Naarden, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Feb. 12, 1985, Ser. No. 700,763
Claims priority, application Netherlands, Feb. 17, 1984, 8400516
Int. Cl.[4] A61K 7/46; C11B 9/00
U.S. Cl. 512—4 **12 Claims**

1. Process for the preparation of aqueous air freshener gels comprising the steps of:
preparing a premix comprising at least 5% by weight of a finely divided porous water-insoluble synthetic polymer and at most 95% by weight of a perfume;
preparing a mixture comprising at least 5.1% by weight of this premix and aqueous gel-forming components comprising at least 0.5% by weight of a gelling agent and at most 94.4% by weight of water; and preparing a gel from the mixture.

4,719,041

1-ALKYL/ALKENYL CYCLOHEXAN-1-OLS AS PERFUMES

Ulf-Armin Schaper, Krefeld; Siegfried Bloesl, Schwaebisch-Gmuend; Klaus Bruns, Krefeld-Traar, and Beano Streschnak, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,288
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609525
Int. Cl.[4] A61K 7/46; C07C 35/08
U.S. Cl. 252—174.11 **11 Claims**

1. A method for perfuming a composition containing active chlorine, or capable of generating active chlorine, comprising incorporating within said composition at least a perfume-effective amount of at least one compound of the formula:



wherein:
R is a C_{1-4} alkyl or C_{2-4} alkenyl;
0 to 3 of the 10 substituents R′ are methyl; and
the balance of the 10 substituents R′ are hydrogen.

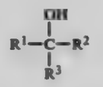
4,719,042

TERTIARY ALKYL-SUBSTITUTED ALCOHOLS AS PERFUMES

Ulf-Armin Schaper, Krefeld; Siegfried Bloesl, Schwaebisch-Gmuend; Klaus Bruns, Krefeld-Traar, and Beano Streschnak, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,290
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609523
Int. Cl.[4] A61K 7/46; C07C 31/13
U.S. Cl. 512—25 **14 Claims**

1. A method for perfuming a composition containing active chlorine, or capable of generating active chlorine, comprising incorporating within said composition at least a perfume-effective amount of at least one compound of the formula:



wherein:
R^1 and R^2 are independently each a C_{1-3} alkyl; and
R^3 is a C_{4-9} alkyl.

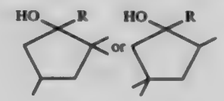
4,719,043

ISOMERIC 1-ALKYL/ALKENYL-2,2,4(2,4,4)-TRIMETHYL CYCLOPENTAN-1-OLS AS PERFUMES

Ulf-Armin Schaper, Krefeld; Klaus Bruns, Krefeld-Traar; Siegfried Bloesl, Schwaebisch-Gmuend, and Beano Streschnak, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,289
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609524
Int. Cl.[4] A61K 7/46; C07C 35/08
U.S. Cl. 512—8 **25 Claims**

1. Isomeric 1-alkyl/alkenyl-2,2,4(2,4,4)-trimethyl cyclopentan-1-ols corresponding to general formulae I a/b below



(I)

(a) (b)

in which R is a C_{2-5} alkyl or a C_{3-5} alkenyl.

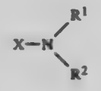
4,719,044

POLYGLYCOL ETHERS CONTAINING AMINO GROUPS AS FOAM-DEPRESSING ADDITIVES IN LOW-FOAM DETERGENT PREPARATIONS

Robert Piorr, Ratingen-Hoesel, and Gilbert Schenker, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,926
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614834
Int. Cl.[4] C11D 3/30
U.S. Cl. 252—548 **19 Claims**

1. A method for depressing foam in detergent preparations comprising adding to said preparations a foam-depressing-effective amount of at least one compound of the formula



I

wherein:
X is R^3—CHOH—CHR^4—$(OCH_2CH_2)_n$—;
R^1 is a linear or branched C_{1-6} alkyl;
R^2 is R^1 or X;
R^3 is a linear C_{6-18} alkyl;
R^4 is H or a C_{1-8} alkyl; and
n is an average number of about from 3 to 20;
with the proviso that the sum of the carbon atoms in R^3 and R^4 is of about from 6 to 18.

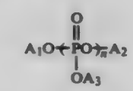
4,719,045

FLAME RETARDANTS FOR POLYOLEFINS

Yoshikatsu Ogawa, Takatsuki; Haruhiko Hisada, Yao; Takeshi Kasahara, Sakai; Fumihiko Kizaki, Kaizuka, and Masahide Yoshiya, Fujiidera, all of Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha, Osaka, Japan

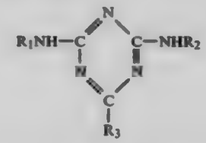
Filed Apr. 11, 1986, Ser. No. 850,743
Int. Cl.[4] C09K 21/00; C07D 251/00
U.S. Cl. 252—609 **6 Claims**

1. A flame retardant for polyolefins, which comprises as an effective ingredient a hardly water-soluble or water-insoluble, nitrogen-containing phosphorus compound obtained by mixing 100 parts by weight of a condensed phosphoric acid compound represented by the following general formula (1):



(I)

wherein n is a number of at least 20, and A_1, A_2 and A_3, which may be the same or different, stand for H, NH_4 or $CONH_2$, with the proviso that the case where all of A_1, A_2 and A_3 simultaneously stand for H or $CONH_2$ is excluded, with 10 to 100 parts by weight of a triazine compound represented by the following general formula (II):



(II)

wherein R_1 and R_2, which may be the same or different, stand for H or CH_2OH and R_3 stands for NH_2, NH—CH_2OH or a phenyl group, and heating the mixture at 100° to 200° C. in the presence or absence of water.

4,719,046

CRYSENE DERIVATIVES

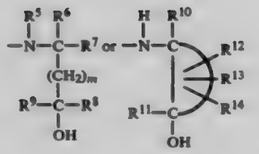
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 495,512, May 17, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 662,379
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] C07C 93/00, 87/28, 87/64
U.S. Cl. 760—501.18 **7 Claims**

1. A compound of formula (I)

(I)

wherein Ar is a chrysene ring optionally substituted by one or two substitutents, said substituents containing not more than four carbon atoms in total when taken together, being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the chrysene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group



wherein
m is 0 or 1;
R^5 is hydrogen;
R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy;
R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;



is a five- or six-membered saturated carbocyclic ring;
R^{10} is hydrogen, methyl or hydroxymethyl;
R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;
R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl, or a C_{1-6} alkylcarboxylic acid ester, ether therefrom or a pharmaceutically acceptable salt thereof.

4,719,047

ANTHRACENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 499,332, May 17, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,157

Claims priority, application United Kingdom, May 17, 1983, 8313571

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[4] C07C *93/00, 87/28, 87/64*

U.S. Cl. 260—501.18 **4 Claims**

1. A pharmaceutically acceptable salt of 2-((10-(2-hydroxyethyloxy)-9-anthracenylmethyl)amino)-2-methyl-1,3-propanediol.

4,719,048

CRYSENE COMPOUND

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 495,512, May 17, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 663,039

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[4] C07C *93/00, 87/28, 87/64*

U.S. Cl. 260—501.18 **8 Claims**

1. 2-((6-chrysenylmethyl)amino)2-methyl-1,3-propanediol or a C_{1-6} alkylcarboxylic acid ester derived therefrom or a pharmaceutically acceptable acid addition salt thereof.

4,719,049

ANTHRACENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 499,332, May 31, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,802

Claims priority, application United Kingdom, May 16, 1984, 8105584

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

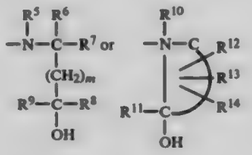
Int. Cl.[4] C07C *93/00, 87/28, 87/64*

U.S. Cl. 260—501.18 **7 Claims**

1. A compound of formula (I)

$$ArCH_2R^1$$

wherein
Ar is an anthracene ring optionally substituted by one or two substituents, said substituents containing not more than four carbon atoms in total when taken together, being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer of 0,1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the antracene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group
R^1 contains not more than eight carbon atoms and is a group



wherein
m is 0 or 1;
R^5 is hydrogen;
R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy;
R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;
—C═C— is a five-or six-membered saturated carbocyclic ring;
R^{10} is hydrogen, methyl or hydroxymethyl;
R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;
R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl; or a C_{1-6} alkylcarboxylic acid ester, ether therefrom or a pharmaceutically acceptable acid addition salt thereof and wherein the compound portion R^1 contains at least two hydroxy groups.

4,719,050

DIPHOSPONYLATED OXONITRILES, PROCESSES AND USES THEREFOR, AND COMPOSITIONS CONTAINING THEM

Helmut Blum, Duesseldorf, and Siglinde Hemmann, Moerbasch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

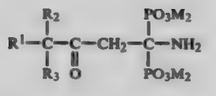
Filed Mar. 16, 1987, Ser. No. 26,098

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611522

Int. Cl.[4] C07F *9/38*; A61K *7/16, 7/48*

U.S. Cl. 260—502.5 C **5 Claims**

1. A 3-alkyl-3-oxo-1-aminopropane-1,1-diphosphonic acid or water-soluble salt thereof of the formula



(III)

in which R^1 represents an unbranched or branched C_1–C_8 alkyl group, R^2 and R^3 independently of one another represent methyl or ethyl, and each M can be H or a cation of a water-soluble base.

4,719,051

PROCESS FOR THE PREPARATION OF 4,4'-DINITROSTILBENE-2,2'-DISULFONIC ACID AND ITS SALTS

Leonardo Guglielmetti, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

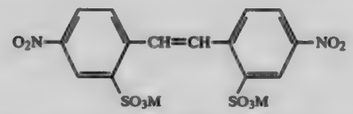
Continuation of Ser. No. 782,617, Oct. 1, 1985, abandoned, which is a continuation of Ser. No. 699,496, Feb. 8, 1985, abandoned, which is a continuation of Ser. No. 294,954, Aug. 21, 1981, abandoned, which is a continuation of Ser. No. 154,338, May 29, 1980, abandoned. This application Aug. 13, 1986, Ser. No. 896,561

Claims priority, application Switzerland, Jun. 8, 1979, 5369/79

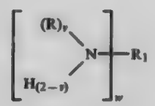
Int. Cl.[4] C07C *143/24*

U.S. Cl. 260—505 R **15 Claims**

1. A process for the preparation of 4,4'-dinitrostilbene-2,2'-disulfonic acid, or salt thereof, of the formula



in which M is hydrogen or an alkali metal cation, which process comprises:
a. oxygenating a reaction medium comprising:
(i) a solvent selected from the group consisting of N-methylpyrrolidone; dimethylsulfoxide; sulfolane; acetonitrile; tetramethylurea; aprotic dipolar solvents of the formula



wherein R is a C_1–C_4-alkyl group, R_1 is a C_1–C_4-carboxylic acid or phosphoric acid radical, w is the basicity of the acid and the v's are 0, 1, or 2; and mixtures thereof, which solvent or solvent mixture is pure or combined with one or more C_1–C_4 alcohols;
(ii) a catalytically-effective amount of a catalyst selected from the group consisting of salts, oxides, hydroxides and organic compounds of heavy metals; inorganic or organic bromine or iodine compounds; and phase transfer catalysts; and
(iii) a catalytically effective amount of a strongly basic compound of aluminum, an alkali metal or an alkaline earth; or strongly basic ion exchanger; or mixture of any or all of these;
b. dissolving 4-nitro-2-toluene sulfonic acid or alkali metal salt thereof in a solvent of step (a-i); and
c. combining the solution of step (b) with the reaction medium of step (a) while continuously oxygenating the resulting mixture.

4,719,052

2,2-DIFLUOROPROPIONIC ACID DERIVATIVES

Yohsosuke Ohsaka; Takashi Tohzuka; Shoji Takaki; Yoshio Negishi, and Satoru Kohno, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Dec. 20, 1984, Ser. No. 684,344

Claims priority, application Japan, Dec. 26, 1983, 58-251070; Nov. 29, 1984, 59-253884

Int. Cl.[4] C07C *53/18*

U.S. Cl. 260—544 F **7 Claims**

1. A 2,2-difluoropropionic acid derivative of the formula:

$$XCH_2CF_2COY$$

wherein X is bromine, iodine, a group of the formula:

$$R_1O—$$

or

$$R_2COO—$$

wherein R_1 and R_2 are each an aliphatic or halogenated aliphatic hydrocarbon group having 1 to 8 carbon atoms or an aromatic hydrocarbon group selected from the group consisting of phenyl, toluyl, trifluoromethylphenyl, chlorophenyl, and bromophenyl, or a group of the formula:

$$X'CH_2CF_2CF_2O—$$

wherein X' is fluorine, chlorine, bromine, iodine, the group of the formula: R_1O— and R_2COO—; and Y is fluorine.

4,719,053

BETA-CHLOROETHYLSULFONYLMETHYL-BENZOIC HALIDES AS INTERMEDIATES

Ludwig Schläfer, Kelkheim, and Reinhard Hähnle, Kleigstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

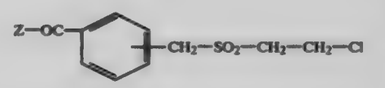
Division of Ser. No. 288,386, Jul. 30, 1981. This application Jan. 31, 1983, Ser. No. 462,340

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029383

Int. Cl.[4] C07C *63/10*

U.S. Cl. 260—544 S **6 Claims**

1. A compound of formula



(3)

in which Z is halogen.

4,719,054

PROCESS FOR THE PRODUCTION OF 17α-ETHYNYL-17β-HYDROXY-18-METHYL-4,15-ESTRADIEN-3-ONE, AND NOVEL 3,5-ESTRADIEN-17-ONE STARTING COMPOUNDS FOR THIS PROCESS

Helmut Hofmeister; Henry Laurent; Hans-Peter Lorenz, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

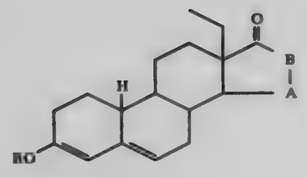
Filed May 9, 1986, Ser. No. 861,775

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3517466

Int. Cl.[4] C07J *1/00*

U.S. Cl. 260—397.4 **19 Claims**

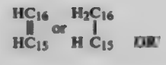
1. A compound of the formula



wherein R is C_{1-3}-alkyl,



is the grouping



wherein R' is a C_{1-10}-acyl group of a hydrocarbon carboxylic acid.

4,719,055

PHENANTHRENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 499,856, Jun. 1, 1983, Pat. No. 4,511,582. This application Oct. 10, 1984, Ser. No. 659,268

Claims priority, application United Kingdom, May 16, 1984, 8313571

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] C07C *93/00, 87/64, 87/28*

U.S. Cl. 260—501.12 11 Claims

1. A compound of formula (I)

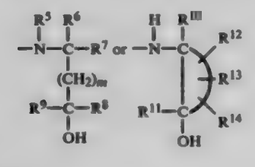


(I)

wherein

Ar is a phenanthrene ring optionally substituted by one or two substituents, said substituents containing not more than four carbon atoms in total when taken together, being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the phenanthrene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy;

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;



is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl.

4,719,056

FLUID TREATMENT

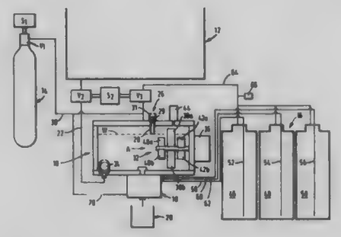
Alistair Scott, Cambridge, United Kingdom, assignor to Isoworth Limited, England

Filed Jun. 21, 1985, Ser. No. 747,553

Claims priority, application South Africa, Jun. 25, 1984, 101/84

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—80 33 Claims



13. Carbonation apparatus for carbonating relatively small amounts of water comprising from about six to about 16 ounces of water, said apparatus comprising a carbonation vessel for holding relatively small amounts of water, water supply means connected to said carbonation vessel, control means for controlling said water supply means to cause said water supply means to fill said carbonation vessel with said water to a predetermined water level, said predetermined level being selected so as to leave a space above said predetermined water level, carbon dioxide supply means for forming an atmosphere of carbon dioxide gas in said space at a predetermined elevated pressure of at least about 60 psig, a rotor mounted in said carbonation vessel for rotation about a generally horizontal axis, a plurality of vane means arranged on said rotor so that, upon rotation of said rotor, with said vessel filled to said predetermined water level, said vane means intermittently enters said water and said space above said predetermined water level, a motor operable to cause said rotor to rotate at a speed of at least about 500 r.p.m. to carbonate said water sufficiently to produce carbonated water suitable for making at least one carbonated drink, said motor operable to cause said rotor to rotate for a predetermined period of time on the order of several seconds, and discharge means connected to said carbonation vessel for discharging substantially the entire contents of said carbonation vessel.

4,719,057

HUMIDIFIER BLOWOFF PORTION

Saburo Mizoguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

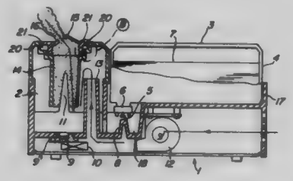
Continuation of Ser. No. 718,228, Apr. 1, 1985, Pat. No. 4,640,804. This application Aug. 29, 1986, Ser. No. 901,777

Claims priority, application Japan, Apr. 2, 1984, 59-48705[U]

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] B01F *3/04, 11/02*

U.S. Cl. 261—81 11 Claims



9. A humidifier, comprising:

a first chamber means for storing water;

a second chamber means in communication with said first chamber means for receiving water therefrom;

means for atomizing water supplied from said first chamber means to said second chamber means;

a cylinder, provided on an upper wall of said second chamber means, for providing communication between said second chamber and the atmosphere, the upper portion of said cylinder having a step-like configuration comprising at least two horizontal walls and at least two vertical walls; and

a cap, having a side wall and an opening for discharging atomized water into the atmosphere, said cap being rotatably and detachably secured in the step-portion of said cylinder so as to form a groove between said side wall of said cap, and said second horizontal wall and said second vertical wall of said cylinder.

4,719,058

PROCESS OF PRODUCING MULTIPLE-LAYER FILTER MEDIUM

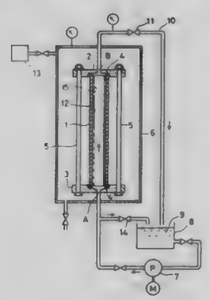
Tadanori Komoda, Toyoake, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Apr. 9, 1986, Ser. No. 849,760

Claims priority, application Japan, Apr. 12, 1985, 60-79106

Int. Cl.[4] B28B *1/26;* B29B *17/00*

U.S. Cl. 264—38 13 Claims



1. A process of producing a multiple-layer filter medium comprising a porous support and a filtering layer formed on one surface of said porous support, comprising the steps of:

providing a porous support having a plurality of pores filled with a gas;

immersing said porous support in an aqueous liquid, thereby filling said pores in said porous support with said aqueous liquid, so as to remove said gas from said pores;

preparing a suspension containing particles of a ceramic powder for said filtering layer;

disposing said porous support such that said one surface is exposed to a flow of said suspension, said one surface partially defining a conduit for the flow of said suspension;

holding an opposite surface of said porous support under a first pressure lower than a second pressure acting on said one surface, and effecting said flow of said suspension in contact with said one surface for a predetermined time, to permit said particles to be deposited on said one surface and thereby form an unfired layer for said filtering layer;

draining said conduit of the flow of said suspension, and introducing into said conduit a gas having a third pressure higher than said first pressure, and to thereby remove aqueous components from said porous support and said unfired layer of said particles; and

firing said porous support and said unfired layer to produce the multiple-layer filter medium having said filtering layer.

4,719,059

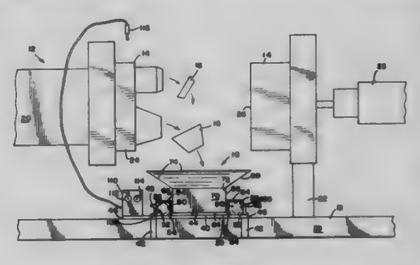
PROCESS OF HANDLING AND TRANSFERRING A MOLDED PRODUCT

Robert C. Braun, Roselle, and Lyle L. Bigelow, Palatine, both of Ill., assignors to Duraco Products, Inc., Streamwood, Ill.

Filed Dec. 23, 1985, Ser. No. 812,356

Int. Cl.[4] B29C *45/40, 45/43;* B65G *65/02*

U.S. Cl. 264—40.1 3 Claims



1. A method of making articles in an injection molding machine and transferring said articles from said machine, said method comprising the steps of:

moving horizontally apart a female and a male portion of a mold carried by said machine to open said mold,

ejecting from said opened mold a just formed, still hot article immediately after said mold opening,

closing said mold immediately after said ejection to begin making a further article in said mold,

dropping said ejected article from said opened mold into a basket positioned below said mold,

catching in a damage resistant manner said dropped article by interacting said article with a clean, cushiony surface of said basket and thereby causing said article to come to rest in said basket,

energizing operative means to move said basket with said article to a point remote of said machine immediately upon said article coming to rest therein,

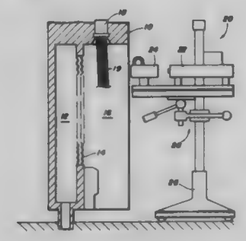
removing said article from said basket to empty said basket,

holding said basket at said remote location as said further article is being formed, and

energizing said operative means to return empty basket to said position below said mold immediately before formation of said further article is complete and in time to catch

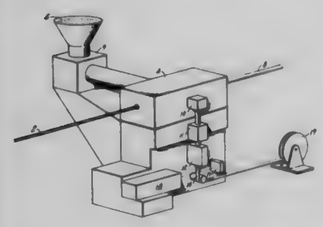
said further article upon said further article being ejected from said mold.

4,719,060
METHOD OF PREDICTING YARN PROPERTIES
Anthony S. Ragone, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 17, 1986, Ser. No. 886,389
Int. Cl.[4] D01H *1/09, 13/30*
U.S. Cl. 264—40.2 3 Claims



1. A method of predicting the modification ratio of trilobal filaments being extruded in a path into an air quenching zone below the spinneret, said method comprising the steps of:
(a) measuring the velocity of a portion of said filaments extruded from said spinneret at a location where said filaments are partially quenched;
(b) averaging the velocities of said filaments measured;
(c) determining the modification ratio of said filaments using the perimeter of the image of each filament from which modification ratio is calculated in a known manner;
(d) plotting average filament velocity versus modification ratio values determined according to step (c) for a range of velocities to establish a calibration curve, said curve being a straight line function with a high correlation coefficient, and
(e) determining the modification ratio of said filaments from velocity measurements only as specified in steps (a) and (b) from said calibration curve.

4,719,061
SYSTEM AND METHOD FOR IN-PROCESS DETECTION OF CONTAMINATION IN ELECTRICAL CONDUCTOR INSULATION
Edward K. Duffy, West Lafayette, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.
Filed Aug. 12, 1985, Ser. No. 764,811
Int. Cl.[4] B29C *47/92*
U.S. Cl. 264—40.2 3 Claims



1. A method for inspecting extrudable, optically transparent, polymeric electrical insulation for electrical cable comprising:
passing an electrical conductor through an extruder head;
introducing heated optically transparent polymeric insulating material into the extruder head,
separating the heated polymeric material into two portions such that one portion is extruded onto the conductor and the other portion is formed into a ribbon;
passing the ribbon of optically transparent polymeric material out of the extruder head and in front of a laser energy source;
immediately passing a laser energy beam through the ribbon;
detecting the amount of radiation loss of the beam which passes through the ribbon;
classifying the insulation as acceptable or unacceptable based on the amount and size of laser radiation detected contaminants contained in the ribbon.

4,719,062
EXTRACTANT-SURFACTANT POST-TREATMENTS OF PERMSELECTIVE COMPOSITE MEMBRANES
Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 23, 1986, Ser. No. 854,927
Int. Cl.[4] C08J *9/42, 9/28*
U.S. Cl. 264—41 4 Claims

1. A process for improving the flux of an interfacially polymerized polyaramide permselective membrane supported on a microporous support comprising contacting said membrane with an aqueous solution of 2.5 to 25 weight percent of an alcohol having 1 to 5 carbon atoms, under a pressure of 50 to 250 psi for a period of 15 minutes to two hours.

4,719,063
METHOD OF MAKING IMPLEMENT HANDLE FOR CRIPPLED PERSONS
Robert C. White, Beamsville, Canada, assignor to Ontario Research Foundation, Mississauga, Canada
Filed Nov. 6, 1985, Ser. No. 795,544
Int. Cl.[4] B29C *39/10, 67/22*, ; C08G *18/14*; B25G *1/10*
U.S. Cl. 264—45.2 4 Claims

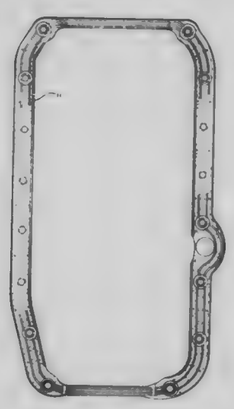


1. A method of making, for use by a crippled person, a handle for an implement having an engagement end, the method comprising the steps:
(a) providing a cap adapted to receive the said engagement end, and an initially flexible bag attached to the cap,
(b) inserting into the bag a material in the non-rigid state which becomes rigid with the passage of time, the material and the bag being of materials that will adhere together when the material becomes rigid,
(c) placing the bag in the hand of the crippled person, and
(d) having the crippled person maintain a substantially constant grip on the bag while the said material becomes rigid.

4,719,064
VOLTAGE NON-LINEAR RESISTOR AND ITS MANUFACTURE
Masami Nakata, Chita, and Osamu Imai, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Mar. 20, 1987, Ser. No. 28,394
Claims priority, application Japan, Nov. 28, 1986, 61-282139
Int. Cl.[4] H01C *7/10*
U.S. Cl. 264—61 4 Claims

1. A process for manufacturing a voltage non-linear resistor, which comprises applying a mixture comprising 45–60 mol. % silicon oxides calculated as SiO_2, 30–50 mol. % zinc oxides calculated as ZnO, 1–5 mol. % bismuth oxides calculated as Bi_2O_3 and antimony oxides for the remainder on a peripheral side surface of a disclike voltage non-linear resistance element comprising zinc oxides as a main ingredient, 0.1–2.0 mol. % bismuth oxides calculated as Bi_2O_3, 0.1–2.0 mol. % cobalt oxides calculated as Co_2O_3, 0.1–2.0 mol. % manganese oxides calculated as MnO_2, 0.1–2.0 mol. % antimony oxides calculated as Sb_2O_3, 0.1–2.0 mol. % chromium oxides calculated as Cr_2O_3, 0.1–2.0 mol. % nickel oxides calculated as NiO, 0.001–0.05 mol. % aluminum oxides calculated as Al_2O_3, 0.005–0.1 mol. % boron oxides calculated as B_2O_3, 0.001–0.05 mol. % silver oxides calculated as Ag_2O and 7–11 mol. % silicon oxides calculated as SiO_2, and then sintering the element, whereby an insulating covering layer is provided integrally on said surface.

4,719,065
METHOD OF BONDING SILICONE RUBBER TO METAL
Robert M. Gibbon, Fort Worth, Tex., assignor to JMK International, Inc.
Continuation of Ser. No. 800,557, Nov. 21, 1985. This application Feb. 25, 1987, Ser. No. 18,066
Int. Cl.[4] B29C *39/12, 45/16*; B32B *15/08*; C23C *8/06*
U.S. Cl. 264—135 3 Claims

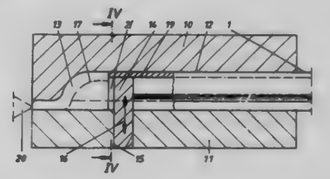


2. A method of forming a silicone rubber gasket of the type having reinforcing metal rails bonded to the silicone rubber, comprising the steps of:
first, treating unroughened metal rails by heating the metal rails in an atmospheric oven in the range of about 500°–600° F. for about 10 to 15 minutes to produce a change in coloration in the outer surface of the metal rails which is visually distinguishable and which is characteristic of an oxide layer on the outer surface of the metal rails;
allowing the treated metal rails to cool to room temperature;
applying a primer to the metal rails;
placing the treated and primed metal rails between the upper and lower platens of a mold with the rails in a mold cavity of the desired configuration for the gasket which is to be formed;
injecting an uncured silicone rubber composition into the mold cavity so that the uncured silicone rubber composition contacts the treated and primed metal rails, the silicone rubber composition comprising an organopolysiloxane elastomer, fumed silica filler, and peroxide catalyst; and
thereafter, heat curing the silicone rubber composition in the mold to bond the treated and primed metal rails to the silicone rubber composition and form a reinforced gasket of the desired shape.

4,719,066
METHOD OF PRODUCING FLAME RETARDANT POLYAMIDE FIBER
Rodney L. Wells, and Charles J. Cole, both of Chester, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 609,606, May 14, 1984, abandoned. This application Jan. 2, 1986, Ser. No. 869,511
Int. Cl.[4] D01F *1/02*
U.S. Cl. 264—211 2 Claims

1. In a process for melt-spinning yarn from fiber-forming polyamide polymer, the improvement comprising: adding to the polymer prior to spinning a sufficient amount of zinc, molybdenum and chlorine as compounds to achieve in the spun fiber about 0.01 to 2.9 weight percent zinc, about 0.002 to 0.58 weight percent molybdenum, and about 0.05 to 1.3 weight percent chlorine;
whereby a polyamide yarn is produced which exhibits enhanced flame retardance without adverse breaking strength retention.

4,719,067
METHOD AND APPARATUS FOR FORMING END PIECES ON PLASTIC MOLDING STRIPS
Manfred Thiel, Hagen, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany
Filed May 24, 1985, Ser. No. 738,012
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420848
Int. Cl.[4] B29C *45/00*
U.S. Cl. 264—259 3 Claims



1. A method of forming an end piece on an end face of a hollow molding strip wherein the strip has a longitudinally extending, open ended, hollow chamber within the strip;
the strip having an end region extending longitudinally back from the end face, a longitudinally extending bottom region which is cut out to define a longitudinally extending cut out region, and a top region which extends longitudinally over the cut out region and together with the bottom region defines the hollow chamber;
the method comprising positioning the end region of the molding strip in an injection mold having a molding cavity, placing a capping element in the molding cavity for the capping element to extend through the cut out region of the bottom region of the strip and to extend toward the top region of the strip, so that the top region of the strip protrudes over the capping element;

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the injection mold comprising bottom and top halves and the method further comprising closing the top half of the mold over the strip for pressing the top region of the strip against the capping element, said top region protruding over the capping element, whereby the capping element seals the end region and the hollow chamber of the molding strip; and

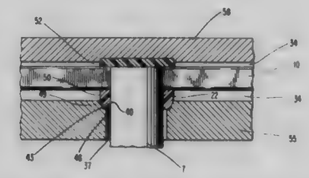
injecting molding compound into the mold cavity on the side of the capping element which faces out of the hollow chamber to form the end piece.

4,719,068

METHOD FOR THE PRODUCTION OF PEDESTAL STRUCTURES

Daniel A. Hartman, Sunman, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jun. 19, 1986, Ser. No. 876,102
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—263 **10 Claims**



1. A method for the production of a pedestal assembly which includes a molded collar portion comprising the steps of:

(a) providing a pedestal assembly having multiple elongated component members joined together at a joint and oriented at an angle to one another, one of said multiple component members comprising in normal use orientation a vertically oriented first component supporting member and another of said multiple component members comprising in normal use orientation at least one horizontally oriented second component base member, said pedestal assembly further including a precast collar having an aperture in an upper extent thereof through which said first component supporting member extends, the inner dimension and shape of said collar aperture being substantially identical to the outer dimension and cross-sectional configuration of the portion of said first component member extending through and positioned adjacent said precast collar, and a lower extent of said collar being open ended and so configured to permit said collar to be positioned in encompassing relationship to the joint between said first component member and said at least one second component member;

(b) positioning said pedestal assembly within a mold of such configuration and in such a manner whereby at least a portion of said at least one second component base member and said joint are positioned within said mold and said portion of said first component supporting member extending through said precast collar extends from said cold through a mold aperture;

(c) urging the upper extent of said precast collar into cooperative engagement with both a shoulder portion of said mold adjacent said mold aperture and the portion of said first component supporting member extending through said mold aperture and adjacent said shoulder portion to effect an annular seal around said portion of said first component supporting member, said precast collar also causing said second component base member to be spaced from the portion of said mold adjacent said mold aperture, said collar thus preventing molding material injected into said mold during the molding process from exiting from said mold through said mold aperture while permitting said injected material during the molding process to surround at least a portion of the external surface of said at least one second component base member within said mold and at least a portion of the lower extent of said precast collar;

(d) introducing molding material into the interior of the mold under molding conditions sufficient to coat at least a portion of the external surface of said at least one second component base member within said mold and at least a portion of the lower extent of said collar;

(e) permitting said injected molding material to cure; and

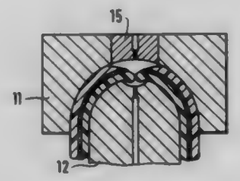
(f) subsequently removing said coated pedestal assembly from said mold.

4,719,069

METHOD FOR MAKING A PREFORM CONSISTING OF AT LEAST THREE LAYERS OF THERMOPLASTIC MATERIAL

Wolfgang Reymann, and Günter Kleimenhagen, both of Hamburg, Fed. Rep. of Germany, assignors to Krupp Corpoplast Maschinenbau GmbH, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,713
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518441
Int. Cl.[4] B29C *31/08, 43/20, 47/06, 57/10*
U.S. Cl. 264—296 **6 Claims**



1. Method of making a preform consisting of at least three layers of thermoplastic material from a tube comprised of inner and outer layers and a centre barrier layer for blow-moulding a hollow body comprising the steps of heating said tube at one end region to deformation temperature and inserting said tube with said heated end region into a mould cavity having a closed bottom, formed by a mandrel and an outer mould, pushing said heated end region of said tube into said closed bottom of said mould cavity such that on said insertion said outer layer remains behind while said inner layer flows together first, leaving a gap in said outer layer which is closed by exerting a weld pressure on said outer layer.

4,719,070

PROCESS AND MOLDING PRESS FOR PRODUCING FLAT MOLDINGS

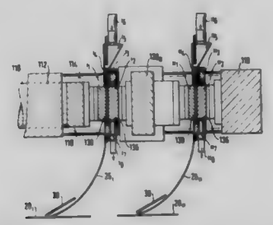
Klaus Strobel; Karl Schwarzmeier, both of Selb, and Eugen Bühler, Schleifweg 3, D-8871 Burtenbach, all of Fed. Rep. of Germany, assignors to Hutschenreuther AG, Selb and Eugen Bühler, Burtenbach, both of, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,730
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425392
Int. Cl.[4] B29C *43/04, 43/34*
U.S. Cl. 264—319 **19 Claims**

1. A process for producing flat moldings comprising arranging a plurality of upright press molds in series with each other with the press molds maintained next to one another in a horizontal direction, each press mold having relatively movable mold parts, effecting relative movement of the mold parts of each of the press molds in the horizontal direction to an open position and introducing particulate molding material into mold cavities so formed; simultaneously effecting relative movement of the mold parts of each press mold to a closed position in which the molding material in each mold cavity is

pressed in the horizontal direction to form a flat molding and preventing flow of the particulate molding material into the mold cavity; and effecting relative movement of the mold parts of each press mold to a position in which the flat moldings are removed from the mold cavities.

6. An installation for producing flat moldings from a particulate material comprising two terminal cross pieces (10, 12) interconnected by at least two connection bars (14), a plurality of press mold units (i, ii, iii) in series along said connection bars (14) between said terminal cross pieces (10, 12), a press unit (16, 18) allocated to one (12) of said terminal cross pieces (10, 12) for exerting pressure onto said series of press mold units (i, ii, iii) in a direction parallel to said connection bars (14) such as to compress said particulate material within said press mold units (i, ii, iii), each of said press mold units (i, ii, iii) comprising two mold parts (i_1, i_2; ii_1, ii_2; iii_1, iii_2) opposite to each other in a



direction parallel to said connection bars (14), a first terminal mold unit (iii) having one mold part (iii_2) thereof axially supported by the other terminal cross piece (10), a second terminal mold unit (i) having one mold part (i_1) thereof subject to the action of said press unit (16, 18), respective other mold parts (iii_1, i_2) of said terminal mold units (iii, i) and the mold parts (ii_2, ii_2) of at least one intermediate mold unit (ii) being guided on said connection bars (14) by at least two intermediate cross pieces (20_a, 20_b), each said intermediate cross piece (20_a, 20_b) carrying the mutually adjacent mold parts (i_2, ii_1; ii_2, iii_1) of subsequent mold units (i, ii, iii) and—between said mutually adjacent mold parts (i_2, ii_1)—a mold unit operating device (20_{ab}, 20_{ac}, 20_{ac}, 20_{ad}) for opening and closing at least one of a particulate material inlet opening (i_4), an evacuation opening (i_7) and a molding withdrawal opening of at least one (i) of the mold units (i, ii) adjacent the respective intermediate cross piece (20_a).

4,719,071

METHOD FOR MONITORING THE PRODUCTION OF ELONGATE PROFILES

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,274
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434904
Int. Cl.[4] B29C *47/92*
U.S. Cl. 264—40.2 **3 Claims**

1. A method of monitoring shrinkage during production of elongate profile strips comprised of two or more mixtures of rubber which are separately extruded through extruding nozzles and thereafter combined in an extrusion head to form such profile strip, such profile strip undergoing substantial shrinkage when cooled after passing from said extrusion head, the method comprising the steps of:

(a) providing and storing in a central control unit the predetermined desired weight per unit length of the extruded profile strip and the desired shrinkage of the profile strip in a cooling zone;

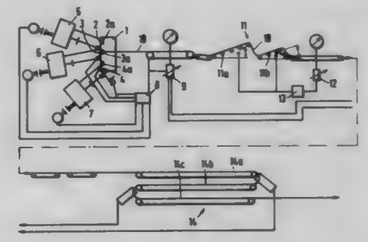
(b) extruding a strip comprised of said two or more mixtures, and passing said strip over a weighing device to determine the weight per unit length of the strip;

(c) comparing the actual weight per unit length of said strip with the desired weight per unit length of said strip stored in said central control unit;

(d) modifying the feed rate of one or more of said mixtures to correlate said actual weight per unit length with the desired weight per unit length;

(e) passing said strip through a cooling zone in which longitudinal shrinkage occurs, said strip passing over a plurality of vertically spaced conveyor belts;

(f) measuring such shrinkage in said cooling zone as the strip



passes from one conveyor belt to the next lower conveyor belt, and transmitting such measurement to said central control unit;

(g) comparing in said central control unit the actually measured shrinkage of said strip with the predetermined desired shrinkage stored in said central control unit; and

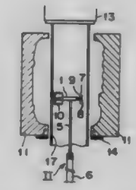
(h) adjusting the feed rate of one or more of said mixtures based on the measured discrepancy between the actual and desired shrinkage in said strip so as to bring such shrinkage within a predetermined desired value.

4,719,072

METHOD FOR DISPOSING INNER INSERT IN BLOW MOLDING

Kinshiro Kojima, Kawasaki; Akira Iwawaki, and Yoshiharu Shitara, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 23, 1986, Ser. No. 854,894
Int. Cl.[4] B29C *49/20, 49/30*
U.S. Cl. 264—515 **4 Claims**



1. A method for disposing an inner insert in blow molding comprising:

providing a pair of movable molds which have inner surfaces and which are movable toward each other to have the inner surfaces thereof form a closed molding chamber;

providing a head from which a parison can be extruded between the molds;

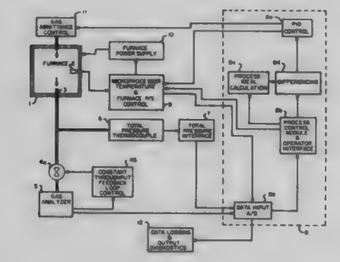
providing an inner supporting device;

adapting the inner supporting device to have a dimension that is extendable and contractable;

biasing the ends of the inner supporting device extendably to have a length dimension greater than the spacing between the molds when such molds are closed with the spacing being at a predetermined location in the molding chamber;

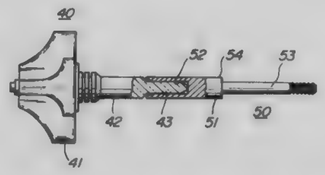
releasably positioning an inner insert on one end of the inner supporting device;
releasably mounting the inner supporting device on an outer supporting device;
moving the outer supporting device with the inner supporting device and inner insert thereon into a position between the molds so that the inner supporting device is at a predetermined location between the molds with its biasedly extended dimension transverse to the mold inner surfaces;
extruding a parison between the molds and between the molds and the inner supporting device and inner insert;
after completion of the parison extrusion, moving the molds toward each other;
forcing the mold inner surfaces against the parison and forcing such parison against the inner insert on the extendably biased inner supporting device;
causing the inner supporting device to contract against the bias therein and causing the inner insert on the biasedly extended inner supporting device to be held in position against the parison;
withdrawing the outer supporting device from the parison;
closing the parison;
blowing compressed air into the parison in the closed mold chamber after the mold has been completely closed to form a blow molded product;
embedding the inner insert into the parison and securely welding that insert to the blow molded product being formed in the closed chamber; and
withdrawing the inner supporting device from the blow molded product.

4,719,073
METHOD OF MONITORING AN ARTICLE IN SINTERING FURNACE
John D. Langan, 6895 Sabado Tarde, Goleta, Calif. 93117
Filed Jan. 30, 1986, Ser. No. 824,123
Int. Cl.[4] C22C *1/04*
U.S. Cl. 419—1 6 Claims



1. A method of determining the dimensional shrinkage characteristics and part uniformity of an article being sintered in real time in a metallurgical or ceramic furnace during said operations comprising:
a. withdrawing a gas sample from the atmosphere of said furnace; and,
b. measuring the percent composition of a component of said gas sample, said component being comprised of a gas at least in part undergoing attenuation in conductance from said part due to pore closure during densification.

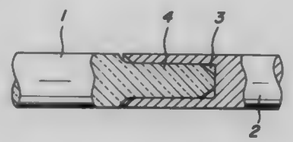
4,719,074
METAL-CERAMIC COMPOSITE ARTICLE AND A METHOD OF PRODUCING THE SAME
Nobuo Tsuno, Kasugai, and Minoru Matsui, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Feb. 11, 1985, Ser. No. 700,104
Claims priority, application Japan, Mar. 29, 1984, 59-59524; Aug. 15, 1984, 59-169254
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] B22F *7/02*
U.S. Cl. 419—5 16 Claims



1. A metal-ceramic composite article, comprising a metallic member having a hole formed therein and a ceramic member including a projection, the projection of the ceramic member having been positioned within the hole of the metallic member through fitting, the improvement comprising the metallic member having a hardened region and an unhardened region on its surface, wherein the unhardened region is located on a portion of the metallic member which is deformed due to the fitting of the projection of the ceramic member into the hole of the metallic member.

9. A method of producing a metal-ceramic composite article comprising:
forming a hole with an inner diameter in a metallic member;
forming a projection with an outer diameter on a ceramic member; and
surface hardening the metallic member at all portions except a portion wherein the inner diameter of the hole is less than the outer diameter of the ceramic member to be fitted therein, thereby forming a hardened surface region and an unhardened surface region and fitting the projection of the ceramic member into the hole of the metallic member, such that an increase in an outer diameter of the metallic member due to the fitting occurs within the unhardened surface region of the metallic member.

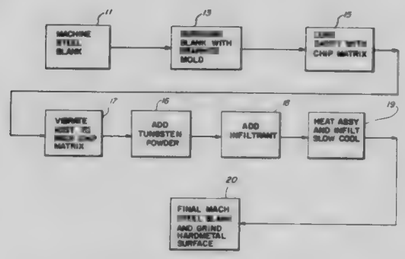
4,719,075
METAL-CERAMIC COMPOSITE ARTICLE AND A PROCESS FOR MANUFACTURING THE SAME
Nobuo Tsuno, Kasugai, and Minoru Matsui, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Feb. 11, 1985, Ser. No. 700,102
Claims priority, application Japan, Aug. 3, 1984, 59-162790
Int. Cl.[4] B22F *7/02*
U.S. Cl. 419—5 21 Claims



1. A metal-ceramic composite article comprising a metallic member made of a precipitation hardenable alloy and a ceramic member, wherein a projection of the ceramic member is fitted into a hole or a through hole formed in the metallic member, and after said fitting is effected, the metallic member of the composite article is hardened by precipitation hardening.

10. A process for manufacturing a metal-ceramic composite article, which comprises the steps of: fitting a projection of a ceramic member into a hole formed in a metallic member to form a metal-ceramic composite body, said metallic member comprising a precipitation hardenable alloy, wherein precipitation-hardening has not occurred, and subjecting the thus formed metal-ceramic composite body to a precipitation hardening treatment to harden the metallic member.

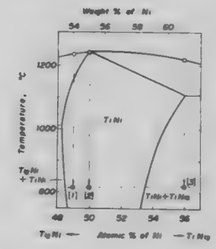
4,719,076
TUNGSTEN CARBIDE CHIPS-MATRIX BEARING
Bela Geczy, and Robert G. Toth, both of Orange, Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Nov. 5, 1985, Ser. No. 795,218
Int. Cl.[4] B22F *7/08*; B21D *53/10*
U.S. Cl. 419—8 7 Claims



1. A process of bearing manufacture comprising the steps of:
blending together a mixture of macro-crystalline tungsten carbide powder and cemented tungsten carbide cobalt chips;
sandwiching a layer of said mixture between an upright blank metal surface and an upright mold surface;
vibrating the mixture to obtain maximum density thereof;
adding a tungsten powder layer above the layer of said mixture;
loading a coper base infiltrant above the tungsten powder layer;
heating the mixture layer, infiltrant, and tungsten powder layer to achieve infiltration of the heated mixture with the copper base infiltrant; and; cooling the mixture.

4,719,077
METHOD FOR THE PREPARATION OF AN ALLOY OF NICKEL AND TITANIUM
Yoshikazu Suzuki, and Hidero Unuma, both of Sapporo, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan
Filed Jun. 9, 1987, Ser. No. 59,811
Claims priority, application Japan, Jun. 12, 1986, 61-137950
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—23 4 Claims

1. A method for the preparation of a shaped body of an alloy of nickel and titanium in an alloying ratio in the range from 49:51 to 56:44 by the atomic ratio which comprises the successive steps of:
(a) mixing powders of nickel and titanium in an atomic ratio in the range from 49:51 to 56:44 to give a powdery mixture;
(b) molding the powdery mixture by compression into a green compact;
(c) heating the green compact in an atmosphere of vacuum under a pressure not exceeding 1×10^{-3} torr at a rate of temperature elevation in the range from 5° to 30° C. per minute from about 200° C. up to a temperature in the range from 580° to 650° C.; and
(d) heating the green compact after the step (c) in an atmosphere of vacuum under a pressure not exceeding

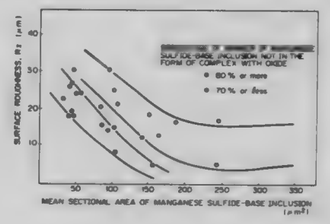


1×10^{-5} torr at a rate of temperature elevation of at least 40° C. per minute from a temperature in the range from 580° to 650° C. up to a temperature in the range from 815° to 900° C.

4,719,078
METHOD OF SINTERING COMPACTS
Tsuneo Miyashita; Hiroaki Nishio, and Michitaka Sato, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 16, 1986, Ser. No. 907,981
Claims priority, application Japan, Sep. 26, 1985, 60-211082
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—53 5 Claims

1. A method of sintering a compact produced by compressing a metal powder, ceramic power or the like comprising the steps of:
pre-sintering only the surface portion of the compact by means of a plasma sintering method wherein only the surface portion of a compact is sintered and the core thereof is left unsintered; and thereafter
completely sintering the entire inner portion of the compact by a hot isostatic press process.

4,719,079
CONTINUOUS-CAST LOW-CARBON RESULFURIZED FREE-CUTTING STEEL
Sakae Katayama; Tatsuya Imai, both of Segamihara; Norio Onodera, and Yasushi Ishibashi, both of Muroran, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Jul. 23, 1986, Ser. No. 888,977
Claims priority, application Japan, Jul. 24, 1985, 60-162047
Int. Cl.[4] C22C *38/60*
U.S. Cl. 420—84 6 Claims



1. A continuous-cast low-carbon resulfurized free-cutting steel which consists, in weight percentage, of
C: 0.05–0.15,
Mn: 0.5–1.5,

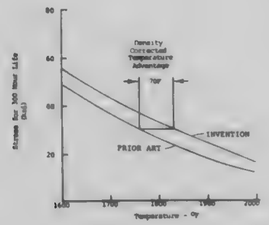
P: 0.05–0.10,
S: 0.15–0.40,
C: 0.010–0.020,
one or more of Pb, Bi, and Te as accompanying elements for improving a machinability at a following content:
Pb: 0.05–0.40,
Bi: 0.05–0.40, and
Te: 0.003–0.10,
Si: 0.003 or less,
Al: 0.0009 or less, and
the remainder consisting of Fe and unavoidable impurities, and contains a manganese sulfide-base inclusion with the provision that:
a mean sectional area of the manganese sulfide-base inclusion present in a sectional area of 1 mm^2 in the rolling direction of the steel is not less than 30 μm^2; and
a rate of the number of manganese sulfide-base inclusions not in the form of a complex with oxide is not less than 80% of the total amount of manganese sulfide-base inclusion.

4,719,080

ADVANCED HIGH STRENGTH SINGLE CRYSTAL SUPERALLOY COMPOSITIONS

David N. Duhl, Newington, and Alan D. Cetel, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 10, 1985, Ser. No. 743,138
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—443 **16 Claims**



1. A high strength, heat treatable, stable nickel base superalloy composition particularly suited for fabrication of single crystal articles, consisting essentially of
3–12% Cr, 0–3% Mo, 3–10% W, 0–5% Re, 6–12% Ta, 4–7% Al, 0–15% Co, 0–0.02% B, 0–0.1% Zr, 0–0.045% C, 0–0.8% Hf, 0–2% Nb, 0–1% V, 0–0.7% Ti, 0–10% (Ru+Rh+Pd+Os+Ir+Pt), 0–0.1% Y, La, Sc, Ce, lanthanide or actinide series, balance Ni;
said composition characterized in that where
$-200\ Cr+80\ Mo-20\ Mo^2-250\ Ti^2-50(TixTa)+15\ Cb+200\ W-14\ W^2+30\ Ta-1.5\ Ta^2+2.5\ Co+1200\ Al-100\ Al^2+100\ Re+1000\ Hf-2000\ Hf^2+700\ Hf^3-2000\ V-500\ C-15000\ B-500\ Zr=P$ (where all elemental values are in weight percent), P is from about 3360 to about 4850.

4,719,081

PALLADIUM ALLOY FOR JOINING CERAMICS AND METHOD OF USE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 12, 1986, Ser. No. 940,893
Int. Cl.[4] C22C *5/04*
U.S. Cl. 420—463 **12 Claims**

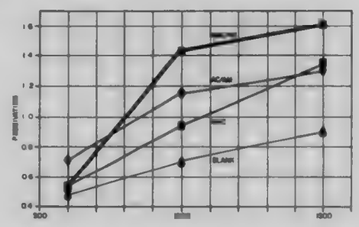
1. An alloy for joining ceramics consisting of the following composition by weight: 65 to 98% palladium; 1 to 20% nickel; 0.5 to 20% chromium; 0.5 to 10% titanium or zirconium; 0 to 10% molybdenum, the composition having a liquidus temperature above 1300° C.

4,719,082

VINYL SULFONIC ACID - METHACRYLIC ACID COPOLYMER PASSIVATORS FOR HIGH PRESSURE BOILERS

Robert S. Robinson, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 15, 1986, Ser. No. 896,790
Int. Cl.[4] C23F *11/06*
U.S. Cl. 422—13 **2 Claims**



1. A method of passivating the ferrous metal surfaces in contact with boiler waters having a pH of at least 10.5 under a pressure of at least 1,000 psi by causing the formation of a magnetite film on such ferrous metal surfaces which comprises treating the boiler water with from 0.5–500 ppm of a water soluble copolymer which contains from about 5–20 mole percent vinyl sulfonate and from 80–95 mole percent of methacrylic acid, which water-soluble copolymer has a molecular weight between 20,000–50,000.

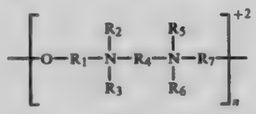
4,719,083

COMPOSITION USEFUL AS CORROSION INHIBITOR, ANTI-SCALANT AND CONTINUOUS BIOCIDE FOR WATER COOLING TOWERS AND METHOD OF USE

Gary L. Baker, Covington, Ky., and Ronald J. Christensen, Montgomery, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Continuation of Ser. No. 728,287, Apr. 29, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 12,604
Int. Cl.[4] C23F *11/16, 11/14*
U.S. Cl. 422—15 **33 Claims**

1. A composition adapted to prevent scale and corrosion and to act as a continuous bacteriostat and algicide, comprising:
2% to 20% by weight of an aromatic azole corrosion inhibitor;
20% to 85% by weight of an organophosphorous antiscalant; and
5% to 60% of a polymeric quaternary ammonium compound having the following general formula:



wherein
R_1, R_4, and R_7 represent C_1–C_{10} alkylene; and
R_2, R_3, R_5, R_6 represent C_1–C_5 alkyl; and
n represents 5–12;
wherein the +2 charge is offset by anionic halogen;
said aromatic azole and said organophosphorous antiscalant provided in amounts relative to said polymeric quaternary ammonium compound which are effective to provide corrosion inhibition and antiscaling activity in a water cooling system when said polymeric quaternary ammonium compound is present at a use concentration from at least about 2ppm to about 15ppm.

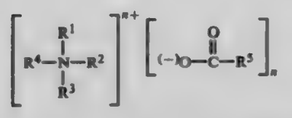
4,719,084

MIXTURES OF FATTY ACID AMMONIUM SALTS WITH ANTIFOAMING AND ANTICORROSION ENHANCING POLYOL FATTY ACIDS OR SALTS THEREOF

Karl H. Schmid, Mettmann; Alfred Meffert, Monheim, and Bert Gruber, Bedburg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

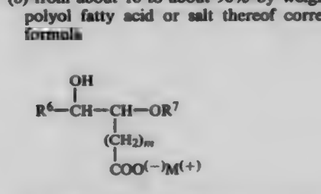
Filed Mar. 20, 1987, Ser. No. 28,379
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609401
Int. Cl.[4] C23F *11/04*
U.S. Cl. 422—16 **15 Claims**

1. A corrosion-inhibiting composition comprising
(a) from about 10 to about 90% by weight of at least one ammonium salt of a fatty acid corresponding to the formula



(I)

in which n=1 or 2; R^1, R^2, R^3 and R^4 can be the same or different and represent hydrogen, an unbranched or branched C_1–C_6 alkyl group, a C_1–C_6 hydroxyalkylene group, or a C_1–C_6 aminoalkylene group; and R^5 represents an unbranched or branched C_6–C_{10} alkyl group; and
(b) from about 10 to about 90% by weight of at least one polyol fatty acid or salt thereof corresponding to the formula



(II)

in which R^6 is a straight-chain or branched-chain C_1–C_{19} alkyl or alkylene group; R^7 is an organic residue formed from a dihydroxy or polyhydroxy compound by elimination of a hydroxyl group; $M^{(+)}=H^{(+)}$, $Na^{(+)}$, $K^{(+)}$ or the ammonium ion $[R^1R^2R^3R^4N]^{n+}$ as defined in (a) above; and m is an integer of from 0 to 18;
wherein the quantities by weight are based on the total weight of components (a) and (b).

14. In a drilling oil, cutting oil, rolling oil, grinding oil, metal-cleaning solution, coolant, or lubricant, the improvement comprising the presence therein of a corrosion-inhibiting quantity of the composition of claim 1.

15. A method for inhibiting corrosion of ferrous based metal substrates comprising contacting said substrate with a corrosion-inhibiting quantity of the composition of claim 1.

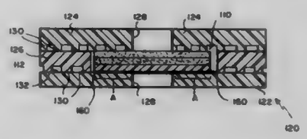
4,719,085

MOUNT FOR AMMONIA-SENSITIVE TEST ELEMENTS

Merritt N. Jacobs, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1985, Ser. No. 813,218
Int. Cl.[4] G01N *31/22, 33/50*; C12Q *1/58*
U.S. Cl. 422—56 **2 Claims**

1. In a test element comprising a generally planar chemistry unit that is ammonia-sensitive, and a plastic mount surrounding and supporting said chemistry unit, said chemistry unit comprising a transparent, non-absorbent layer and at least one layer in which ammonia-sensitive reagents are disposed, said mount comprising a base sheet and a cover sheet assembled with said chemistry unit sandwiched between said sheets, said base sheet including a viewing aperture generally centered therein, and said cover sheet including a dispensing aperture generally centered therein, and means for securing said base sheet, said chemistry unit, and said cover sheet into an integral test element, said means for securing comprising ultrasonic energy-directing ribs on one of said base sheet and said cover sheet for bonding said base sheet to said cover sheet;
the improvement wherein the surface of said base sheet in



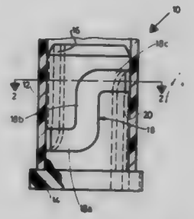
contact with said chemistry unit is essentially smooth to provide a uniform contact area with said chemistry unit, said chemistry unit is disposed within said mount with said transparent layer being adjacent said smooth base sheet surface, and wherein an adhesive is positioned under said transparent layer and disposed between said base sheet and said chemistry unit at said contact area and encircling said viewing aperture,
whereby any ammonia gas leakage into said test element from an adjacnet test element via said viewing aperture is stopped at said contact area.

4,719,086

BURET APPARATUS INCLUDING A STOPPER CONTAINING A SIPHON PASSAGE

Karl Lang, Jona, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Apr. 9, 1984, Ser. No. 598,038
Claims priority, application Switzerland, Jul. 19, 1983, 3938/83
Int. Cl.[4] B01L *3/02, 11/00*
U.S. Cl. 422—100 **3 Claims**



1. A buret titration apparatus, comprising:
(a) a conduit (12) containing a through bore defining a conduit inner surface, said conduit having at one end a vertically arranged free end portion; and
(b) a generally cylindrical stopper member a major portion of which is removably mounted in said conduit end portion, said stopper member being arranged with its longitidinal axis extending vertically, said stopper member having upper and lower ends and an external surface containing a groove which extends generally the length of said stopper member between said upper and lower ends, said stopper member external surface cooperating with the inner surface of said conduit end portion to define a single siphon passageway means for transferring liquid relative to said conduit bore, said siphon passageway means being generally S-shaped and including a vertical

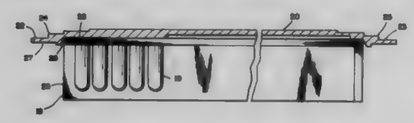
intermediate portion (18*b*) having upper and lower ends, said intermediate portion upper and lower ends being spaced from the upper and lower ends of the stopper member, respectively, a vertical first portion (16) extending downwardly from the upper end of, and terminating in spaced relation to the lower end of, said stopper member, a vertical second portion (2) extending upwardly from the bottom end of, and terminating in spaced relation to the upper end of, said stopper member, and means connecting the lower and upper ends of said intermediate portion with the lower and upper ends of said first and second vertical portions, respectively.

4,719,087

TRAY FOR ANALYZING SYSTEM

Richard W. Hanaway, Roseville, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 1, 1985, Ser. No. 750,794
Int. Cl.[4] B01L *3/00*; G01N *35/00*
U.S. Cl. 422—102 **9 Claims**



1. A specimen tray assembly, said assembly being adopted to contain a plurality of separate specimens for analysis, said assembly comprising:

a container tray having a plurality of microcuvettes having a desired diameter and being arranged in a spaced apart grid-like pattern;

a cover member seated over a top surface of said container tray, said cover member includng means for automatically centering the container tray relative to the cover member to provide proper feeding of the cover member on the container tray, said cover member including tab portions extending substantially outwardly from said container tray a distance greater than said desired diameter in a plane of said cover member solely from a first and an opposing edge of said cover member, said tab portions being adapted with said tray assembly as inserted in an analyzing system to control the movement of said cover member so that the container tray can be readily removed without the cover member for analysis.

4,719,088

APPARATUS FOR REMOVING AT LEAST ONE ACIDIC COMPONENT FROM A GAS

Fumio Itoh, Sakai; Tutomu Sasaki, Takarazuka; Ikuhisa Kuroh, Osaka, and Takaaki Fukumoto, Kishiwada, all of Japan, assignors to Mitsubish Denki Kabushiki Kaisha, Tokyo and Taiyo Sanso Kabushiki Kaisha, Osaka, both of, Japan

Filed Feb. 11, 1986, Ser. No. 828,124
Claims priority, application Japan, Feb. 12, 1985, 60-25402
Int. Cl.[4] G05D *9/00*; B01D *50/00*
U.S. Cl. 422—106 **1 Claim**

1. An apparatus for removing at least one acidic component from a gas comprising:

a first countercurrent gas-liquid contact absorption device having at least one first gas inlet, at least one first gas outlet, at least one first liquid inlet including a first sprayer means, and at least one first liquid outlet,

a second countercurrent gas-liquid contact absorption device having at least one second gas inlet connected to said at least one first gas outlet, at least one second gas outlet, at least one second liquid inlet including a second sprayer means, and at least one second liquid outlet,

gas-introduction means connected to said at least one first gas inlet for introducing a gas having at least one acidic component therein into said first absorption device,

a first tank means for preparation and supply of high concentration alkali-containing aqueous solution, said first tank means having a first tank outlet,

a second tank means for preparation and supply of medium concentration alkali-containing aqueous solution, said second tank means having a second tank outlet,

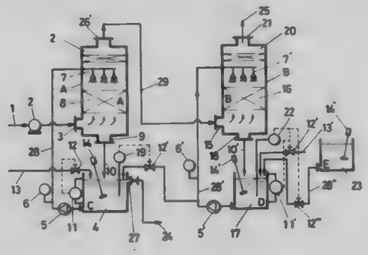
means directly connecting said first tank outlet to said second tank means including a first controllable valve means,

first water supply means connected to said second tank means including a second controllable valve means,

specific gravity control means operatively associated with said second tank means and connected to said first controllable valve means and said second controllable valve means for controlling the specific gravity of said medium concentration alkali-containing aqueous solution within a range of about 0.3 to about 2.5N by adding high concentration solution thereto,

first liquid level control means operatively associated with said second tank means and connected to said second controllable valve means for controlling the level of solution within said second tank means about a predetermined level,

first recirculating means connected between said second tank outlet and said at last one second liquid inlet and between said at least one second liquid outlet and said second tank means for circulating said medium concentration alkali-containing aqueous solution through said second absorption device to absorb reamining portions of said at least one acidic component from said gas, said first recirculating means including first pump means disposed between said second tank outlet and said at least one second liquid inlet,



a third tank means for preparation and supply of low concentration alkali-containing aqueous solution, said third tank means having a third tank outlet and a waste aqueous solution overflow outlet means for discharging aqueous solution from said third tank means exceeding a second predetermined constant level in said third tank means,

second water supply means connected to said third tank means including a third controllable valve means,

second liquid level control means operatively associated with said third tank means and connected to said third controllable valve means for controlling the level of solution within said third tank means,

means connecting said first recirculating means downstream of said first pump means to said third tank means and having fourth controllable valve means therein for supplying medium concentration solution to said third tank means,

pH control means operatively associated with said third tank means and connected to said fourth controllable valve means for controlling the pH of saaid low concentration alkali-containing aqueous solution with in a range of about 6 to about 13 by adding medium concentration solution thereto,

second recirculating means connected between said third tank outlet and said at least one first liquid inlet and between said at least one first liquid outlet and said third tank means for circulating said low concentration alkali-containing aqueous solution through said first absorption device to absorb a major portion of said at least one acidic component from said gas, and

first, second, and third agitator means in said first, second, and third tank means, respectively.

4,719,089

INTERNALLY COATED REACTION VESSEL FOR USE IN OLEFINIC POLYMERIZATION

Keith L. Gardner, Avon, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 648,925, Sep. 11, 1984, Pat. No. 4,659,791. This application Jan. 29, 1987, Ser. No. 8,492
Int. Cl.[4] C08F *1/00*
U.S. Cl. 422—131 **11 Claims**

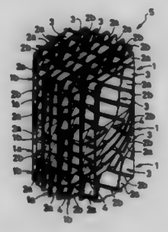
1. A polymerization reaction vessel having on the internal surfaces thereof a coating comprised of: (a) at least one phenolic compound selected from the group consisting of self condensed phenols condensed with amines, phenols condensed with aromatic aldehydes and phenols condensed with aliphatic aldehydes; (b) at least one water phase polymerization inhibitor selected from the group consisting of nitrites and phosphites; and (c) at least one chelating agent selected from the group of salts consisting of aluminum and magnesium.

4,719,090

POROUS STRUCTURE FOR FLUID CONTACT

Hideyuki Masuki, Gifu, Japan, assignor to NGK Insulators, Ltd., Aichi, Japan

Filed Feb. 20, 1985, Ser. No. 703,483
Claims priority, application Japan, Feb. 28, 1984, 59-36908
Int. Cl.[4] B01D *53/36*
U.S. Cl. 422—310 **7 Claims**



1. A porous structure through which at least one fluid flows, comprising:

a plurality of stacked packings, each stacked packing including a plurality of adjacently located honeycomb blocks, each honeycomb block comprising:

a plurality of first partition walls extending in a first direction and having a longitudinal axis, each of said first partition walls being spaced apart from each other in a second direction which is substantially perpendicular to said first direction, and said plurality of first partition walls being in a substantially parallel relationship;

a plurality of second partition walls extending in said second direction, such that each second partition wall contacts two adjacent first partition walls along a substantial length of each of said second partition walls, said second partition walls being spaced apart from each other and being inclined relative to said longitudinal axis of the first partition walls, said first and second partition walls cooperating to form a plurality of inclined parallel channels in each honeycomb block; and

said adjacently located honeycomb blocks in each of said stacked packings having all longitudinal axes of the first partition walls of each honeycomb block in a substantially parallel relationship with each other and said inclined parallel channels of adjacent honeycomb blocks are inclined with regard to each other, and when said packings are superposed, inclined channels of honeycomb blocks in a first packing communicate with inclined channels of corresponding honeycomb blocks in a second packing in a zigzag manner, thereby forming a plurality of zigzag fluid passages through the porous structure.

4,719,091

PREPARATION OF MONO-SIZED ZIRCONIA POWDERS BY FORCED HYDROLYSIS

Raja R. Wusirika, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 1, 1986, Ser. No. 880,804
Int. Cl.[4] C01G *25/02*
U.S. Cl. 423—82 **12 Claims**

1. A method of producing zirconia in the form of substantially spherical powder particles, said particles having a mean particle size of about 0.05–0.2 micron with a geometric standard deviation of up to about 30% comprising:

(a) providing an aqueous solution of zirconyl chloride having a molarity up to about 0.4;

(b) heating the solution at conditions substantially equivalent to heating at a temperature at least about 95° C. for a period of at least about 72 hours to generate solid particles of hydrated zirconium oxide;

(c) recovering the solid material; and

(d) calcining the recovered material at a temperature of at least about 400° C.

4,719,092

REDUCTION OF NITROGEN-BASED POLLUTANTS THROUGH THE USE OF UREA SOLUTIONS CONTAINING OXYGENATED HYDROCARBON SOLVENTS

Wayne E. Bowers, Clearwater, Fla., assignor to Fuel Tech, Inc., Stamford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,828
Int. Cl.[4] C01B *21/00*
U.S. Cl. 423—235 **13 Claims**

1. A process for maintaining low ammonia concentrations, while reducing the concentration of nitrogen oxides in an oxygen-rich effluent from the combustion of a carbonaceous fuel, the process comprising:

injecting an aqueous solution of urea and an oxygenated hydrocarbon into said effluent as a dispersion of droplets therein at an effluent temperature above 1600° F., the concentration of the urea in solution and the size of the droplets in the dispersion being effective to achieve reduction of nitrogen oxide levels in the effluent and the concentration of the oxygenated hydrocarbon being effective to reduce the level of ammonia in said effluent from the level which would result without said oxygenated hydrocarbon.

4,719,093

PROCESS FOR THE CLEAVAGE OF CHLOROSILOXANES

Bernhard Falk, Rheinfelden-Minseln; Klaus Ruff, Troisdorf, and Klaus Schrage, Königswinter, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 43,155
Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615309
Int. Cl.[4] C01B *33/08*, *33/12*
U.S. Cl. 423—335 **17 Claims**

1. A process for the cleavage of chlorosiloxanes comprising: subjecting the chlorosiloxane in the gas phase to a temperature of from 350° to 1450° C. to form chlorosilane and SiO_2.

4,719,094

PROCESS FOR THE SELECTIVE CATALYTIC REMOVAL OF NITROGEN OXIDES FROM THE WASTE GASES OF FURNACES

Lothar Rieckert, Karlsruhe, and Michael Kotter, Bruchsal, both of Fed. Rep. of Germany, assignors to Kraftanlagen Ag, Fed. Rep. of Germany

PCT No. PCT/EP85/00429, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01431, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 22, 1985, Ser. No. 865,036

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431730

Int. Cl.[4] B01J 8/00; C01B 21/00

U.S. Cl. 423—239 **1 Claim**

1. In a process for the selective elimination of nitrogen oxides from furnace exhaust gases by reduction with ammonia which has the reaction accelerated by a catalyst which is traversed by the exhaust gases in a first zone and is regenerated in a second zone by fresh air to be fed to the furnace with the position of the first and second catalyst zones being changed continuouly, the improvement which comprises mixing the ammonia with the fresh air before that fresh air-ammonia mixture contacts the catalyst with the ammonia being admixed with the fresh air at such a rate that it is bound to the surface of the catalytically active material in the zone of the catalyst which is traversed by fresh air and is consumed in the reduction of the nitrogen oxides contained in the exhaust gases during the subsequent traversal by the latter.

4,719,095

PRODUCTION OF SILICON CERAMIC POWDERS

Susumu Abe, Toyota, and Masahiro Ogawa, Toyoake, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 3, 1986, Ser. No. 825,571

Claims priority, application Japan, Feb. 2, 1985, 60-18999; Feb. 2, 1985, 60-19000

Int. Cl.[4] C01B 31/36

U.S. Cl. 423—346 **10 Claims**

10. A process for producing silicon ceramic powder, which comprises:

(a) forming a dust cloud of metallic silicon and an oxidizing gas;

(b) explosively oxidizing said silicon dust thereby forming silicon monoxide in the form of ultrafine particles or a gas; and

(c) reducing said silicon monoxide in a reducing gas atmosphere containing at least nitrogen or carbon, thereby producing silicon nitride, silicon carbide or mixtures thereof in a particle size range of 100 Å to 1000 Å.

4,719,096

CONTINUOUS TWO-STAGE VACUUM PROCESS FOR RECOVERING BROMINE

Kenneth C. Lesher, and Herbert W. Henry, both of Magnolia, Ark., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 622,197, Jun. 19, 1984. This application Jun. 20, 1985, Ser. No. 747,170

Int. Cl.[4] C01B 7/09; B01D 3/10

U.S. Cl. 423—504 **11 Claims**

1. A continuous process for recovering elemental bromine from a bromide-containing brine, said process comprising:

(a) continuously introducing said bromide-containing brine into the upper portion of a first stage enclosed chamber, said first stage enclosed chamber being an upright fiberglass-reinforced plastic tower;

(b) continuously introducing chlorine and recovered steam, recovered bromine and recovered chlorine into the lower portion of said first stage enclosed chamber whereby said chlorine contacts said bromide-containing brine in a stripping zone in a counter current manner;

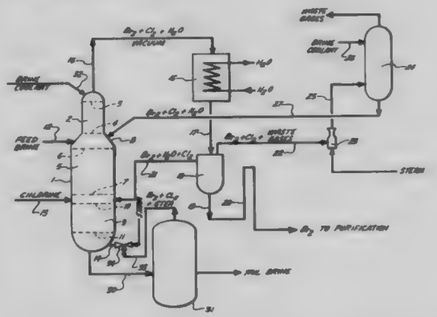
(c) continuously removing gaseous bromine, chlorine and water from the top of said first stage enclosed chamber;

(d) maintaining a subatmospheric pressure within said first stage enclosed chamber said subatmospheric pressure being in the range of from about 6 to about 12 psia;

(e) continuously removing tail brine from the bottom of said first stage enclosed chamber;

(f) continuously introducing said tail brine into a second stage enclosed chamber;

(g) maintaining a subatmospheric pressure within said second stage enclosed chamber sufficiently low to cause boiling of said tail brine;



(h) continuously recovering additional steam, chlorine and bromine not recovered in said stripping section of said first stage enclosed chamber from said second stage enclosed chamber by maintaining a pressure in said second stage enclosed chamber that is less than the vapor pressure of said tail brine in said second stage enclosed chamber; and

(i) continuously introducing the recovered steam, chlorine and bromine from said second stage enclosed chamber into the bottom of said first stage enclosed chamber.

4,719,097

PHOSPHATES OF RESORUFIN DERIVATIVES AND COMPOSITIONS THEREOF FOR THE DETERMINATION OF THE ACTIVITY OF PHOSPHATASES

Klaus Mühlegger, and Herbert von der Eltz, both of Weilheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,395

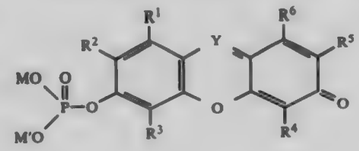
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534927

Int. Cl.[4] A61K 31/675; C07F 9/65

U.S. Cl. 424—2 **12 Claims**

1. A phosphate of resorufin derivative of the formula:

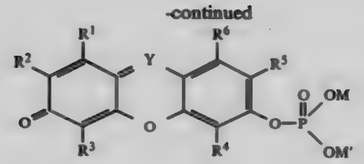
(Ia)



or

-continued

(Ib)



wherein

R^2 and R^5, which can be the same or different, are hydrogen, halogen, C_1–C_5 alkyl;

R^1, R^3, R^4 and R^6, which can be the same or different, are hydrogen, halogen, a cyano group or a carboxy group of C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_5 alkoxy-carbonyl, carboxy-C_1–C_5-alkyl or C_1–C_5 alkoxy-carbonyl-C_1–C_5alkyl, or carboxamide which is optionally mono or disubstituted with C_1–C_5 alkyl, C_1–C_5 alkoxy-C_1–C_5 alkyl, carboxy-C_1–C_5 alkyl, C_1–C_5-alkoxy-carbonyl-C_1–C_5 alkyl, or the disubstituted carboxamide optionally substituted with substituents joined together to form a ring which can be interrupted by oxygen, nitrogen or sulphur, or radicals of the formula —COO—$(CH_2CH_2O)_n$—R^7, R^7 being hydrogen or C_1–C_5 alkyl and n being an integer number of from 1 to 4; and wherein R^6 can additionally also be sulpho or nitro;

Y is a nitrogen atom or an N→O group; and

M and M′, which can be the same or different, are hydrogen atoms, alkali metal, alkaline earth metal or ammonium ions said ammonium ions being optionally substituted one or more times by C_1–C_5 alkyl or aralkyl, each substituent being independently selected.

11. Composition for the detection of phosphatase containing at least one chromogenic and/or fluorogenic substrate and a buffer, wherein said substrate is a phosphate of claim 1.

4,719,098

ENTERAL CONTRAST MEDIUM USEFUL FOR NUCLEAR MAGNETIC RESONANCE IMAGING AND ITS PREPARATION

Hanns-Joachim Weinmann; Heinz Gries, and Heinrich Michel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Berkgamen, Fed. Rep. of Germany

Continuation of Ser. No. 607,108, May 4, 1984. This application Dec. 29, 1986, Ser. No. 946,615

Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316703

Int. Cl.[4] A61K 49/00; A61B 5/05, 6/00

U.S. Cl. 424—9 **24 Claims**

1. An enterally administrable aqueous contrast medium useful for proton NMR imaging of a body cavity, comprising an amount of a physiologically compatible, paramagnetic compound effective to enhance the contrast of a proton NMR image; an amount of a compound different therefrom which is compatible both physiologically and with NMR imaging and which is substantially not absorbed by the tissue surrounding the body cavity, whereby the osmotic pressure in the contrast medium in the body is substantially the same as or is greater than that in the adjacent tissue of the body cavity such that water absorption out of the body cavity is substantially retarded or eliminated; and an amount of a physiologically compatible base or buffer effective to maintain a pH of 3–8 in the contrast medium in the body cavity.

4,719,099

COMPOSITION AND PROCESS FOR THE TREATMENT OF KERATIN MATERIALS WITH POLYMERS

Jean-Francois Grollier; Claire Piquet; Chantal Fourcadier, all of Paris; Claude Dubief, Versailles, and Daniele Canwet, Crosne, all of France, assignors to L'OREAL, Paris, France

Continuation of Ser. No. 587,008, Mar. 7, 1984, which is a continuation of Ser. No. 180,443, Aug. 22, 1980, which is a continuation of Ser. No. 806,554, Mar. 14, 1978, Pat. No. 4,240,450. This application Jan. 27, 1985, Ser. No. 749,440

Claims priority, application Luxembourg, Mar. 15, 1977, 76955

The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.

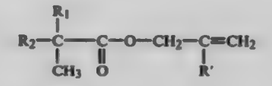
Int. Cl.[4] A61K 7/06, 7/08, 9/12

U.S. Cl. 424—47 **28 Claims**

1. A composition for the cosmetic treatment of hair, skin or nails consisting essentially of an anionic polymer, a cationic polymer and a solvent medium, said anionic and cationic polymers being present in an amount from about 0.01 to 10% by weight, wherein said anionic polymer is selected from the group consisting of:

(a) The terpolymers which result from the copolymerization of: (a) crotonic acid, (b) vinyl acetate, and (c) an allyl or methallyl ester corresponding to the following formulae:

(11)



in which R′ represents a hydrogen atom or a —CH_3 radical; R_1 represents a linear or branched saturated hydrocarbon chain having 1 to 6 carbon atoms and R_2 represents either the —CH_3 radical or the —$HC(CH_3)_2$ radical, provided that R_1+R_2 must have not more than 7 carbon atoms, the salts thereof or the said polymers which have been cross-linked;

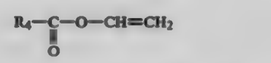
(b) The tetra- and penta-polymers which comprise the copolymers which result from the copolymerization of:

(a) an unsaturated acid which is crotonic acid or allyloxyacetic acid; (b) vinyl acetate or vinyl propionate; (c) at least one branched allyl or methallyl ester corresponding to formulae (11) defined above, and (d) a monomer selected from the group consisting of: (i) a vinyl ether of the formulae:



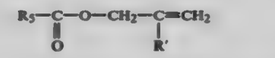
(12)

in which R_3 is a linear or branched alkyl radical having 1 to 12 carbon atoms, (ii) a fatty chain vinyl ester of the formulae:



(13)

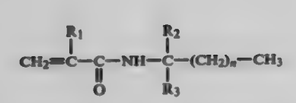
in which R_4 is a linear alkyl radical having 7 to 12 carbon atoms, and (iii) a linear allyl or methallyl ester of the formulae:



(14)

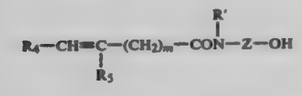
in which R′ is a hydrogen atom or a —CH_3 radical and R_5 is a linear alkyl radical having 1 to 11 carbon atoms;

(c) The ter-, tetra- and penta-polymers and higher polymers resulting from the copolymerization of (i) at least one water-insoluble monomer of the formulae:



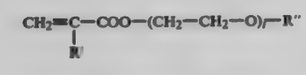
(15)

in which R_1, and R_2 and R_3 represent either a hydrogen atom or a methyl radical and n is 0 or an integer from 1 to 10 inclusive and (ii) at least one water-soluble monomer of the formulae:



(16)

in which R' represents a hydrogen atom or a methyl radical, Z represents a linear or branched alkylene radical having 1 to 6 carbon atoms, which is unsubstituted or substituted by one or two hydroxymethyl groups, and m is 0 or 1 and R_4 denotes H or —COR_6, R_6 being OH or —NH—R_7 and R_7 denoting H or —Z—OH, and R_5 denotes H or —CH_3 when m=0, and R_4 denotes H and R_5 denotes CO-R_6 when m=1, and (iii) at least one further monomer selected from the group consisting of: acrylic acid, methacrylic acid, maleic anhydride, N-vinylpyrrolidone and the acrylates and methacrylates of the formulae:



(17)

in which R' represents a hydrogen atom or a methyl radical, 2 is 3 or 4 and R" is a methyl or ethyl radical;

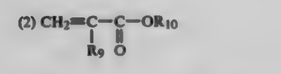
(d) The tetrapolymers, pentapolymers or higher polymers which result from the copolymerization of more than one monomer of the formulae (15) and/or more than one monomer of the formulae (16) and/or more than one monomer from the third group (iii);

(e) The copolymers resulting from the copolymerization of a monomer of the formulae (15), a monomer of the formulae (16), a monomer of group (iii) and at least one further monomer, selected from the group consisting of: styrene and a monomer corresponding to one of the formulae (18) to (22) which follow:



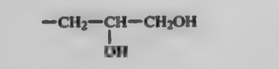
(18)

in which R_8 represents a hydrogen atom or a methyl radical;



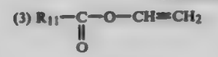
(19)

in which R_9 represents a hydrogen atom or a methyl radical and R_{10} represents a linear or branched alkyl radical having 1 to 18 carbon atoms, or a —CH_2—CH_2OH group or



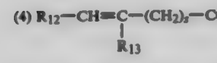
(20)

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(3)

in which R_{11} represents a linear or branched alkyl radical having 1 to 16 carbon atoms or a phenyl radical



(4) (21)

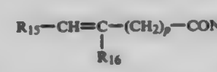
in which R' is an alkyl radical having 1 to 3 carbon atoms and s is 0 to 1, and

(5) (22)

in which R_{14} represents a saturated linear or branched alkyl radical having 1 to 17 carbon atoms;

(f) The tetrapolymers, pentapolymers or higher copolymers which result from the copolymerization of more than one monomer of the formulae (15) and (16) and more than one monomer of group (iii) in the presence of styrene or of another monomer of the formulae (18) to (22) above;

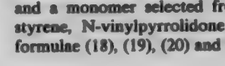
(g) The polymers resulting from the copolymerization of (i) at least one monomer of the formulae (15), (ii) at least one monomer of the formulae (23)



(23)

in which p is 0 or 1 and R_{15} denotes H or COOH and R_{16} denotes H or CH_3 when p is 0, and R_{15} denotes H and R_{16} denotes COOH when p=1, and (iii) at least one monomer selected from the group consisting of maleic anhydride and the monomers of the formulae (16) and (17);

(h) The copolymers resulting from the copolymerization of a monomer (15), a monomer (23), a monomer of group (iii) and a monomer selected from the group consisting of styrene, N-vinylpyrrolidone and the monomers of the formulae (18), (19), (20) and (22), defined above, and (24)

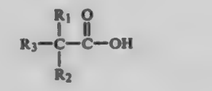


(24)

in which R_{17} represents an alkyl radical having 1 to 3 carbon atoms, R_{17} being in the salt from and cross-linked;

(i) The terpolymers of vinyl acetate, crotonic acid and the vinyl ester of a saturated aliphatic monocarboxylic acid which is branched in the alpha-position and has at least 5 carbon atoms in the carboxylic radical,

said branched esters being derived from an acid of the formulae:



in which R_1 and R_2 are an alkyl radical and R_3 denotes H or an alkyl, alkaryl, aralkyl or aryl radical;

(j) The tetrapolymers which comprise about 70 to 80% of N-t-butylacrylamide or N-isopropylacrylamide, about 5 to 15% of acrylamide or methacrylamide, about 5 to 15% of N-vinylpyrrolidone and about 1 to 10% of acrylic acid or methacrylic acid, the percentages being by weight relative to the total weight of the composition;

(k) The copolymers of the sodium salt of acrylic acid and acrylamide;

(l) The polyacrylamides which contain carboxylate groups;

(m) The copolymers of acrylic or methacrylic acid in the form of an alkali metal salt thereof, and vinyl alcohol;

(n) Non-crosslinked water soluble polymers of acrylic acid or methacrylic acid or a copolymer of said acrylic acid or said methacrylic acid with a monoethylenically unsaturated monomer;

(o) A polymer derived from an ethylene α,β-dicarboxylic acid which is: a copolymer of said acid with a compound containing a



group, which is a vinyl ester, a C_1–C_4 alkyl vinyl ether, or acrylic acid, a C_1–C_8 half-ester of a said copolymer defined above, a copolymer of said acid with an olefine having 2 to 4 carbon atoms, which copolymers are partially esterified with an alkanol, a copolymer of said acid with an allyl or methallyl ester, which copolymers are monoesterified with an aliphatic alcohol or amidified with an aliphatic, cyclic or heterocyclic amine or, a terpolymer of said acid with an allyl or methallyl ester and an acrylamide or methacrylamide, in which the acid groups are mono-esterified or amidified, or a polymer derived from said monomers and an α-olefine, vinyl ether or acrylic or methacrylic ester and optionally acrylic or methacrylic acid or N-vinylpyrrolidone.

4,719,100

PREPARATION FOR ORAL HYGIENE

Franz Frosch, Taunusstein, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 702,582, Feb. 19, 1985, Pat. No. 4,622,220. This application Aug. 29, 1986, Ser. No. 901,778
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 3406005; Sep. 5, 1984, 3432571
Int. Cl.[4] A61K 7/16
U.S. Cl. 424—49 7 Claims

1. A mouthwash composition effective against the formation of dental plaque containing a flavored mouthwash formulation and a member selected from the group consisting of zinc aspartate, copper aspartate and mixtures thereof.

4,719,101

DEODORANT COMPOSITION TO PROTECT AGAINST THE DEVELOPMENT OF BODY ODOR

Keith Morrison, 2970 Pasadena, Detroit, Mich. 48238

Filed Nov. 28, 1986, Ser. No. 935,921
Int. Cl.[4] A61K 7/32
U.S. Cl. 424—65 3 Claims

1. A deodorant composition, comprising:

from about 0.01 to 0.10 percent by weight of methyl salicylate;

from about 70 to 75 percent by weight of water;

from about 1 to 10 percent by weight of oleyl alcohol;

from about 1 to 10 percent by weight of stearic acid;

from about 1 to 5 percent by weight of lanolin; and

a sufficient amount of peanut oil to dissolve the methyl salicylate into the composition, said composition forming a cream for external application.

4,719,102

ACID STABLE DIBENZYL MONOSORBITOL ACETAL GELS

Munawar H. Randhawa, Butler, and Thomas J. Schamper, Ramsey, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 466,756, Feb. 15, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,748
Int. Cl.[4] A61K 7/34, 7/38
U.S. Cl. 424—66 3 Claims

1. A solid gelled antiperspirant composition comprising:

(a) 1 to 50 percent by weight of a solvent which is a small, polar organic and organic compatible compound selected from the group consisting of lactones, lactams cyclic ketones, urea, cyclic carbamates, cyclic sulfoxides, cyclic sulfones, or the open chain analogs thereof, having no more than 5 carbon atoms;

(b) 0 to 80 percent by weight of a cosolvent alcohol selected from the group consisting of primary or lower substituted alcohols having up to 4 carbon atoms and secondary and higher substituted alcohols having at least 5 carbon atoms;

(c) 1 to 10 percent by weight of dibenzyl monosorbitol acetal;

(d) 0 to 35 percent by weight of an emollient;

(e) 5 to 25 percent by weight of an acidic anitperspirant-active metal salt;

(f) 0.05 to 15 percent by weight of a gel stabilizer selected from the group consisting of N-(2-hydroxyethyl)fatty (C_8–C_{15}) acid amide, magnesium sulfate, zinc acetate and hexamethylenetetramine acetamide monoethanol amine and mixtures thereof.

4,719,103

METHOD FOR THE PREPARATION OF WATER-IN-OIL EMULSION ANTIPERSPIRANTS

Helga Krevald, Tarrytown, N.Y., and Joseph C. Hourihan, Little Falls, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 621,122, Jun. 13, 1984, abandoned, which is a continuation of Ser. No. 353,731, Mar. 1, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 815,187
Int. Cl.[4] A61K 7/34, 7/38
U.S. Cl. 424—66 5 Claims

1. In an antiperspirant stick composition of the water-in-oil emulsion type consisting essentially of,

(a) 10 to 70 parts by weight of an aqueous solution of an astringent compound as a discontinuous phase dispersed in a solid matrix consisting essentially of,

(b) 0.1 to 35 parts be weight of a volatile cyclic dimethylsiloxane liquid,

(c) 10 to 30 parts by weight of at least one solid alkanol containing at least 12 carbon atoms,

(d) 1 to 5 parts by weight of a C_4 to C_8 alkanediol,

(e) wherein the improvement comprises 0.5 to 5 parts by weight of at lease one C_{12} to C_{20} fatty acid ester of a polyglycerol, said ester having a resultant HLB value of 6 to 9 to improve the application aesthetics; the total of (a) through (e) being 100 parts by weight.

4,719,104

HAIR CONDITIONING COMPOSITION AND METHOD

Chaitanya Patel, Hanover Park, Ill., assignor to Helene Curtis, Inc., Chicago, Ill.

Continuation of Ser. No. 667,740, Nov. 2, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,026
Int. Cl.[4] A61K 7/06, 7/09, 7/42
U.S. Cl. 424—70 15 Claims

1. A human hair conditioner consisting essentially of an aqueous composition containing about 0.25 to about 4 weight percent of a static-reducing agent comprised of a nonionic, water-insoluble, non-oily organic material having a Brookfield viscosity at 26° C. of less than about 50 centipoises, that is a liquid at 20° C. and has a refractive index at 25° C. of about 1.4

to about 1.5, about 0.05 to about 1.0 weight percent of a cationic, film-forming polymer containing a plurality of quaternary nitrogen atoms, and about 0.25 to about 4 weight percent of a distearyldimethylammonium salt, the weight ratio of said static-reducing agent to said cationic polymer being about 2:1 to about 20:1.

4,719,105

METHOD, COMPOSITIONS AND COMPOUNDS USEFUL IN ROOM FRESHENERS EMPLOYING CYCLOHEXYL ALCOHOL AND ESTER DERIVATIVES

Alfred A. Schleppnik, St. Louis, Mo., assignor to Bush Boake Allen, Inc., London, England

Division of Ser. No. 581,772, Feb. 21, 1984, Pat. No. 4,622,221, which is a continuation-in-part of Ser. No. 352,642, Feb. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 352,643, Feb. 26, 1982, abandoned, said Ser. No. 352,643, is a continuation of Ser. No. 102,383, Nov. 12, 1979, abandoned, which is a continuation of Ser. No. 936,296, Aug. 23, 1978, abandoned, which is a division of Ser. No. 640,614, Dec. 15, 1975, abandoned, said Ser. No. 352,643, is a continuation of Ser. No. 127,658, Mar. 6, 1980, abandoned, which is a continuation of Ser. No. 761,750, Jan. 24, 1977, abandoned, which is a division of Ser. No. 628,855, Nov. 5, 1975, abandoned. This application May 7, 1986, Ser. No. 860,466

Int. Cl.[4] A61L *9/01, 9/04*

U.S. Cl. 424—76.21 **6 Claims**

1. A method of counteracting a malodor in the air caused by a compound selected from the group consisting of lower carboxylic acids, thiols, thiophenols, phenols, lower amines, phosphines and arsines which comprises introducing into the air an effective malodor counteracting amount of cyclohexyl-1-ethanol whereby the perceived total odour intensity in the air is reduced and the perceived malodor intensity in the air is substantially eliminated.

4,719,106

IODOPHOR COMPOSITION WITH IMMEDIATE AND LONG ACTION MICROBICIDAL ACTION

Bela V. Shetty, Stamford, Conn., and Peter Hofer, Liestal, Switzerland, assignors to Euroceltique S.A., Luxembourg, Luxembourg

Filed Apr. 11, 1986, Ser. No. 850,522

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/79, 33/18*

U.S. Cl. 424—80 **8 Claims**

1. Iodophor composition with immediate and long lasting microbicidal action, comprising povidone-iodine and polydextrose-iodine wherein the ratio by weight of povidone to polydextrose is about 20–80:80–20.

4,719,107

IMMUNOMODULATING MEDICATION BASED ON FC FRAGMENTS OF HUMAN IGG

Edgardo D. Carosella, Lyons, and Jacques B. Armand, St Germain, both of France, assignors to Institut Merieux, Lyons, France

Filed Dec. 7, 1984, Ser. No. 679,445

Claims priority, application France, Dec. 7, 1983, 83 19568

Int. Cl.[4] A61K *39/395;* C07K *15/00*

U.S. Cl. 424—85 **4 Claims**

1. A process for the treatment of autoimmune diseases and for the prevention of organ transplant rejections, comprising administering to a human patient having an autoimmune disease or having undergone an organ transplant, an effective amount of an immunomodulating medicine composition comprising a pharmaceutically acceptable carrier and an effective amount of, as the active ingredient, Fc fragments of human IgG, said Fc fragments being free of intact IgG and/or Fab fragments or containing no more than 2 percent by weight of intact IgG and/or Fab fragments with respect to the total weight of Fc+Fab+IgG, and said Fc fragments being characterized in that they (a) activate the differentiation of suppressive cells, (b) inhibit antibody-dependent cytotoxicity and (c) do not acitvate NK cells.

4,719,108

CHYMOPAPAIN COMPOSITION AND METHOD FOR ITS USE

William S. Smith, Libertyville, Ill., assignor to Smith Laboratories, Inc., Rosemont, Ill.

Division of Ser. No. 263,197, May 13, 1981, Pat. No. 4,439,423. This application Mar. 26, 1984, Ser. No. 593,158

Int. Cl.[4] A61K *37/547*

U.S. Cl. 424—94.2 **6 Claims**

1. A method of treating an intervertebral spinal disc to dissolve the nucleus pulposus in a mammalian subject which disc exhibits an abnormal condition, characterized by a reduced risk of toxic effect to the mammalian subject, which method comprises the step of injecting into said disc an amount of pharmaceutically acceptable solution of a purified chymopapian essentially free of proteolytically inactive and toxic protein components, said purified chymopapain also characterized by the absence of precipitate formation when a 10% weight/volume solution is acidified with hydrochloric acid followed by treatment with barium chloride, said purified chymopapain being used in amounts sufficient to selectively dissolve the nucleus pulposus of said disc.

4. A pharmaceutical composition consisting essentially of a purified proteolytically active chymopapain admixture of chymopapain fractions I and II and characterized by the absence of precipitate formation when a 10% weight/volume solution is acidified with hydrochloric acid followed by treatment with barium chloride.

4,719,109

EM5596—AN ANTIBIOTIC

Donald R. Kirsch, Princeton; Edward Meyers, East Brunswick, and Joseph E. Biskupiak, Plainsboro, all of N.J., assignors to E. R. Squibb & Sons, Inc., Lawrenceville, N.J.

Filed Mar. 27, 1987, Ser. No. 30,536

Int. Cl.[4] H61C *35/70;* C12P *1/06*

U.S. Cl. 424—117 **3 Claims**

1. EM5596, having the approximate elemental analysis C, 56.87; H, 6.56; N, 11.14; S, 3.3; having a 400 MHz ^{1}H NMR spectrum in deuterated dimethylsulfoxide as in FIG. 1, having an infrared spectrum in potassium bromide as in FIGS. 2 and 3 and having an ultraviolet spectrum in acetonitrile as in FIG. 4.

4,719,110

BORON-CONTAINING WOOD PRESERVATIVES

Keshav P. Patel, Oklahoma City; William C. Laughlin, Edmond, and Roger A. Baldwin, Oklahoma City, all of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Aug. 26, 1985, Ser. No. 769,279

Int. Cl.[4] A01N *59/14*

U.S. Cl. 424—148 **9 Claims**

1. Aqueous sodium borate solutions for use in treating unseasoned woods by a dip-diffusion process, wherein said sodium borate solutions are prepared by heating a dispersion comprising a disperse phase of a particulated sodium tetraborate and a continuous liquid phase of phosphoric acid and water, said particulated sodium tetraborate and said phosphoric acid being present in said dispersion in a molar ratio of said borate to said acid of 5:3, wherein said heating is carried out at a temperature ranging from about 70° C. up to about the atmospheric boiling point of said dispersion, said heating being continued for a period sufficient to effect a substantially complete reaction between said tetraborate and said acid and provide single phase liquid products comprising said aqueous sodium borate solutions and which aqueous sodium borate solutions are characterized as being noncrystallized at ambient temperatures.

4,719,111

NOVEL COMPOSITION FOR TREATMENT OF DECUBITUS ULCERS

Lynn M. Wilson, 3731 Nelson Ave., Bluedell, N.Y. 14219

Filed Jun. 14, 1985, Ser. No. 744,619

Int. Cl.[4] A61K *35/78, 31/685*

U.S. Cl. 424—195.1 **10 Claims**

1. A composition for treatment of decubitus ulcers comprising an admixture of from about 10 to about 50 parts lechithin, from about 10 to about 50 parts goldenseal root or rhizome, and from about 10 to about 50 parts myrrh gum.

4,719,112

FOAM CAPSULES

Jean P. Mayer, Colmar, France, and Fritz Wittwer, Lupsingen, Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 589,836, Mar. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 484,723, Apr. 13, 1983, Pat. No. 4,500,358, which is a division of Ser. No. 438,147, Oct. 29, 1982, abandoned. This application Aug. 19, 1985, Ser. No. 766,475

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] A61K *9/48, 3/07;* C08J *9/30;* C08L *89/04*

U.S. Cl. 424—456 **4 Claims**

1. A physiologically acceptable hard gelatin foam capsule adapted to be filled with a medicament, which comprises a body and a cap, said body and said cap being constructed of a material having a pore size of about 0.1 to 70 microns and a density of about 0.6 to 0.95 g/cc.

4,719,113

YOGURT FOOD PRODUCT RESEMBLING CHEESE

Nourollah M. Kharrazi, P.O. Box 3336, Santa Barbara, Calif. 93130

Filed May 27, 1986, Ser. No. 867,016

Int. Cl.[4] A23C *9/12, 19/076, 20/00*

U.S. Cl. 426—35 **2 Claims**

1. The method of making a food product from yogurt resembling cheese in color, consistency and taste comprising the steps of:

selecting a quantity of liquid selected from the group consisting of water, milk and mixtures thereof;

heating the liquid to a temperature of approximately one hundred eighty degrees Fahrenheit;

gradually blending a quantity of a dry mixture into the heated liquid until a viscous mixture is obtained wherein the dry mixture comprises dehydrated yogurt powder, casein, tofu, vegetable fat, skim milk powder, whey, soy protein solids, cheese flavor, lecithin, lipase, salt, citric acid, lactic acid, sorbic acid and gum;

decreasing the temperature of the viscous mixture to approximately one hundred degrees Fahrenheit;

evenly mixing with the viscous mixture a quantity of yogurt with the yogurt comprising approximately seventy-five percent by weight of the viscous mixture; and

removing sufficient moisture from the viscous mixture to obtain a solid firm mass.

4,719,114

ENCAPSULATED YEAST

Phillip J. Percel, Olmsted Falls, Ohio, assignor to Durkee Industrial Foods, Corp., Iselin, N.J.

Filed Jan. 4, 1985, Ser. No. 688,839

Int. Cl.[4] C12N *1/16, 1/04, 1/18;* A23L *1/28*

U.S. Cl. 426—62 **8 Claims**

5. An active dry yeast coated with water soluble polyethylene glycol having a molecular weight in the range of about 3350 to about 4600, the amount of polyethylene glycol being a preserving amount.

4,719,115

PROCESS FOR SWEETENING BAKED COMESTIBLE AND PRODUCT PRODUCED THEREBY

Thomas P. Calandro, Paterson, and Jan Karwowski, Franklin Lakes, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 21, 1984, Ser. No. 673,788

Int. Cl.[4] A23L *1/236, 1/10;* A23P *1/08*

U.S. Cl. 426—302 **27 Claims**

1. A process for sweetening a dry, baked comestible with an L-aspartic acid sweetening derivative, which process comprises applying to the baked comestible a sweetening solution comprising water and at least one L-aspartic acid sweetening derivative, said solution having a pH in the range of from about 1.5 to about 4.0 and substantially all of said at least one sweetening derivative being dissolved in the water, so as to substantially uniformly distribute said sweetening derivative onto the surface of said comestible and to provide a sweetening amount of said sweetening derivative which is absorbed beneath the surface of said comestible thereby precluding the appearance of a coating upon the comestible, wherein the moisture content of the baked comestible before application of said sweetening solution is sufficiently low so that application of the sweetening solution raises the moisture content to a shelf stable level.

4,719,116

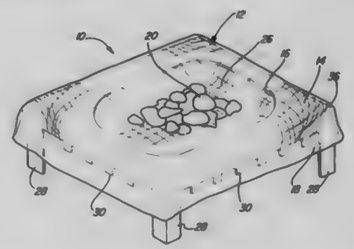
SMOKED MEAT PRODUCT AND METHOD AND APPARATUS FOR MAKING THE SAME

Gary A. Crevasse, Rochester Hills, Mich., assignor to Naturin-Werk Becker & Co., Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,817

Int. Cl.[4] A23B *4/04*

U.S. Cl. 426—315 **4 Claims**



1. The method for making a smoked meat product comprising:

(a) placing an edible film on an elastic netting secured over an opening in a smoke permeable mold;

(b) placing meat product parts on top of said edible film over said opening to fill said net;

(c) wrapping said meat products with said edible film;

(d) compressing the meat product parts in said mold;

(e) placing the mold in a smoke house and keeping the mold in the smoke house for sufficient time to smoke the meat;

(f) removing the mold from the smoke house after said period of time to smoke the meat; and

(g) removing the meat product from the mold.

VOL 1086 ISS 2 JA 12 1988 UMI

4,719,117

HIGH PRODUCTION METHOD FOR FORMING FILLED EDIBLE PRODUCTS

William J. Simeluane, Glen Rock, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 719,566, Apr. 3, 1985, abandoned, Division of Ser. No. 540,982, Oct. 11, 1983, Pat. No. 4,528,900. This application Dec. 18, 1986, Ser. No. 942,056
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] A21D *6/00*
U.S. Cl. 426—502 3 Claims

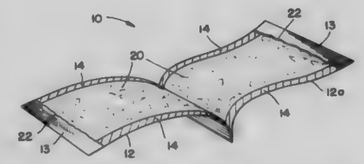
1. The method of forming dough pieces having dissimilar inner and outer portions wherein the inner portion is enveloped by the outer portion, said dough pieces each having a respective center and substantially the same diametric dimension, comprising the steps of continuously coextruding two dissimilar materials to form an extrudate rope in which the dissimilar materials are arranged to provide an inner core surrounded by an outer tube, said outer tube consisting of a dough; depositing the extrudate rope upon a continuously moving horizontal conveyor; cutting a rope section with a length equal to approximately twice said dimension from the end of said rope by displacing the inner core material in a substantially longitudinal direction away from a first elongate zone extending transversely of the extrudate rope at a first cutting station along said conveyor, sealing the outer tube to itself along said zone, and severing the outer tube along a first line within said zone, said line extending in a substantially transverse direction with respect to said rope and said conveyor; and cutting said rope section into dough pieces by displacing the inner core material in a substantially longitudinal direction away from a second elongate zone extending transversely of the extrudate rope at a second cutting station along said conveyor, sealing the outer tube to itself along said second elongate zone, and severing the outer tube along a second line within said second elongate zone, said second cutting station being spaced from said first cutting station by an odd multiple of the distance separating the centers of said dough pieces, said second line extending in a substantially transverse direction with respect to said rope and said conveyor.

4,719,119

CYANOACRYLATE FINGERPRINT DEVELOPMENT METHOD

Richard T. Thompson, Haddam; Philip Hinkle, West Hartford, both of Conn., and Robert B. Carroll, South Paris, Me., assignors to Loctite Corporation, Newington, Conn.

PCT No. PCT/US84/01354, § 371 Date Oct. 17, 1984, § 102(e) Date Oct. 17, 1984, PCT Pub. No. WO85/00963, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 24, 1984, Ser. No. 743,858
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] A61B *5/10*
U.S. Cl. 427—1 8 Claims



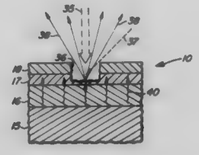
1. A method of developing latent fingerprints comprising subjecting an article containing latent prints to cyanoacrylate vapors generated from a thin film of a storage stable cyanoacrylate monomer composition which is substantially nonflowable on a vertical surface.

4,719,120

DETECTION OF OXYGEN IN THIN FILMS

Arold K. Green, Ridgecrest, and Robert H. Hammond, Palo Alto, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1986, Ser. No. 913,793
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—8 7 Claims



1. A method for detecting a quantity of a substance in a layer deposited on a substrate, said quantity being present in a first layer of a first material during deposition at a first temperature of the first layer on the substrate in a vacuum first environment, by analysis of a layer deposited on the substrate and containing said quantity subsequent to transfer of the substrate together with any layer deposited thereon through a second environment which is at a second temperature lower than said first temperature and in which said quantity escapes from the first layer in a direction oppositely of the substrate, said second environment containing said substrate and such analysis being unable to distinguish between said quantity present during such deposition and said substance entering from the second environment into a layer deposited on the substrate and transferred therewith through the second environment, the method comprising the steps of:

depositing over said first layer, while the substrate and the first layer are in the first environment and at said first temperature, a continuous second layer of a second material which captures said quantity upon such escape thereof from the first layer;

depositing over the second layer oppositely thereof from the substrate, while the substrate, the first layer, and the second layer are in the first environment, a continuous third layer of a third material which seals the second layer form the second environment when the second layer is transferred thereinto together with the substrate and the first layer deposited thereon;

transferring the substrate, together with the first layer as deposited thereon, the second layer as deposited on the first layer, and the third layer as deposited on the second layer, through the second environment to means for analyzing the second layer for said substance so that said quantity escapes from the first layer and is captured in the second layer; and

analyzing the second layer quantity by said analyzing means.

4,719,118

LOW CALORIE DAIRY SNACK PRODUCT

Walter A. Thomas, Rte. 1, Box 123, Barneveld, Wis. 53507

Filed Dec. 23, 1985, Ser. No. 812,079
Int. Cl.[4] A23C *9/00, 19/00*
U.S. Cl. 426—580 5 Claims

1. A process for preparing a puffed, lowfat dairy food product wherein the steps consist of:

(a) forming a mixture consisting of water and a dairy product selected from the group consisting of cottage cheese and skim milk curd;

(b) blending said mixture of step (a) to form a homogeneous, semi-fluid mass;

(c) sheeting said mass of step (b) to a thickness of about $\frac{1}{8}$ inch;

(d) drying said sheeted mass in a ventilated oven at a temperature no greater than 125° F. to achieve a moisture content of approximately 8 percent; and

(e) expanding said dried sheet mass of step (d) in an air dehydration chamber at a temperature of approximately 225° F.

4,719,121

METHOD OF MAKING A MAGNETIC RECORDING MEDIUM AND COMPOSITION

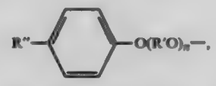
David J. Kimball, Remus, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 16, 1986, Ser. No. 874,751
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—48 22 Claims

1. A composition comprising the reaction product of: (a) from about 40 to about 80 parts by weight of a phosphate ester represented by the formula

$$X_mP{=}O$$
$$|$$
$$(OH)_{3-m}$$

wherein X is independently selected from the group consisting of RO—, RO(R′O)$_n$— and



in which R represents an alkyl radical having from 1 to 25 carbon atoms, R′ is an alkylene group having 2 to 4 carbon atoms, R″ is an alkyl radical having 5 to 15 carbon atoms, n is an integer between 1 and 100 and the average value of m is between 1 and 2; and (b) from about 20 to about 60 parts by weight of a silicon compound selected from the group consisting of diphenylsilanediol and a silane represented by the formula

$$ZSi(OR''')_3$$

wherein R‴ is an alkyl group having from 1 to 3 carbon atoms and Z is selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, a haloalkyl group having 2 to 6 carbon atoms, an alkenyl group having 2 to 6 carbon atoms, acryloxypropyl, methacryloxypropyl and phenyl.

4,719,122

CVD METHOD AND APPARATUS FOR FORMING A FILM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Apr. 8, 1986, Ser. No. 849,291
Claims priority, application Japan, Apr. 8, 1985, 60-75048; Apr. 8, 1985, 60-75049; May 7, 1985, 60-96386
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 11 Claims

1. A CVD method in which a substrate having a surface to be deposited with a film is placed in a reaction chamber and a reactive gas introduced into the reaction chamber is excited by irradiation with flat light and scattered light to thereby deposit the film on the substrate surface, wherein the flat light is directed along the substrate surface in close proximity thereto, and wherein the scattered light is directed to the substrate surface perpendicularly thereto.

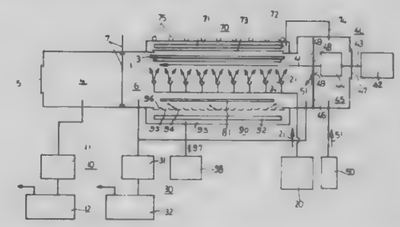
6. Apparatus for forming a film, comprising;

a reaction chamber in which a substrate having a surface to be deposited with a film is placed by a substrate holding means;

a means for introducing a reactive gas into the reaction chamber;

a means for evacuating the reaction chamber;

a first light irradiating means for exciting the reacive gas by irradiation with flat light;



wherein the first light irradiating means comprising a first light source, an optical means for forming the light from the first light source into the flat light, a first light irradiation chamber which is linked with the reaction chamber through a first partition means having first slits communicating with the reaction chamber and a first light-transparent window, and a means for introducing a first unreactive gas into the first light irradiation chamber;

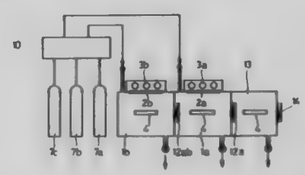
wherein the optical means is disposed in the first light irradiation chamber so that it directs the flat light along the substrate surface in close proximity thereto through the first light-transparent window of the first portition means.

4,719,123

METHOD FOR FABRICATING PERIODICALLY MULTILAYERED FILM

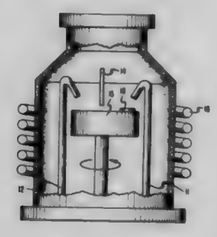
Hisao Haku, Neyagawa; Yukio Nakashima, Hirakata; Kazuo Watanabe, Yawata, and Tsugufumi Matsuoka, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 31, 1986, Ser. No. 891,758
Claims priority, application Japan, Aug. 5, 1985, 60-172570; Sep. 27, 1985, 60-215261
Int. Cl.[4] B05D *3/06*
U.S. Cl. 437—101 12 Claims



1. A method for fabricating a periodically multilayered film having a plurality of amorphous thin layers of different kinds stacked periodically to form a stack, comprising the step of assuring a more definite periodicity in the composition of said stack by forming at least one type of said layers in said stack by photo CVD, whereby defects in the stack are reduced.

4,719,124
LOW TEMPERATURE DEPOSITION UTILIZING ORGANOMETALLIC COMPOUNDS
Po-Yen Lu, Westfield, N.J.; Chi-Hua Wang, Taiwan, Taiwan, and Larry M. Williams, Piscataway, N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 28, 1986, Ser. No. 851,255
Int. Cl.[4] H01L *21/365*
U.S. Cl. 437—126 11 Claims



1. A process for forming a device comprising the steps of (1) subjecting a heated substrate to at least two precursor gases whereby the deposition of a II-VI semiconductor material on said substrate is induced, and (2) completing said device CHARACTERIZED IN THAT at least one of said precursor gases substantially decomposes only at temperatures above 300° C. and each of said precursor gases that substantially decomposes only at temperatures above 300° C. is precracked.

4,719,125
CYCLOSILAZANE POLYMERS AS DIELECTRIC FILMS IN INTEGRATED CIRCUIT FABRICATION TECHNOLOGY
Louis G. Anello, Hamburg; Satish K. Gupta, Amherst, both of N.Y.; Stephen W. Kirtley, Sunnyvale, Calif.; George S. Wooster, Hamburg, and Ralph L. DePreuda, Amherst, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Continuation of Ser. No. 786,421, Oct. 11, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 924,111
Int. Cl.[4] B05D *5/12*
U.S. Cl. 437—231 16 Claims

1. In a method for forming dielectric films on substrates wherein a solution of a polymeric material is deposited onto a silicon substrate and the substrate is rotated at a high speed whereby a uniform film of polymeric material is formed on the substrate, the improvement which comprises employing as the polymeric material a polymer or copolymer of a cyclosilazane soluble in organic solvents and having the formula $(R_1R_2SiNH)_n$, wherein R_1 and R_2 are hydrogen or aliphatic groups of 1–12 carbon atoms or aryl groups of 6–15 carbon atoms and n is 3 or 4 and curing said film at an elevated temperature for a period of time sufficient to crosslink said polymer and render it insoluble.

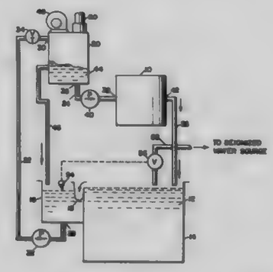
4,719,126
PYROLYTIC DEPOSITION OF METAL OXIDE FILM FROM AQUEOUS SUSPENSION
Vern A. Henery, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 2, 1983, Ser. No. 463,195
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—165 10 Claims

1. A method for depositing a metal-containing film on a substrate which comprises the steps of:
a. dispersing a relatively water-insoluble coating reactant with vigorous mixing into an aqueous medium to physically suspend said reactant in said aqueous medium to form an aqueous suspension; and
b. contacting a surface of the substrate with said aqueous suspension at a temperature sufficient to cause said coating reactant to react thereby depositing a film on said substrate surface.

4,719,127
AQUEOUS CHEMICAL SUSPENSION FOR PYROLYTIC DEPOSITION OF METAL-CONTAINING FILM
Charles B. Greenberg, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 2, 1983, Ser. No. 463,194
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—165 14 Claims

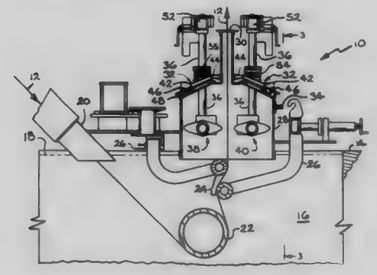
1. A method for depositing a metal-containing film on a substrate which comprises the steps of:
a. dispersing a relatively water-insoluble coating reactant into an aqueous medium containing a wetting agent to chemically suspend said reactant in said aqueous medium to form an aqueous suspension; and
b. applying said aqueous suspension of chemically suspended coating reactant to a surface of a substrate at a temperature sufficient to cause said coating reactant to react thereby depositing a film on said substrate surface.

4,719,128
METHOD OF AND APPARATUS FOR BAILOUT ELIMINATION AND FOR ENHANCING PLATING BATH STABILITY IN ELECTROSYNTHESIS/ELECTRODIALYSIS ELECTROLESS COPPER PURIFICATION PROCESS
Gerald A. Krulik, Laguna Hills, Calif., assignor to Morton Thiokol, Inc., Chicago, Ill.
Filed Oct. 27, 1986, Ser. No. 923,233
Int. Cl.[4] C23C *3/02*; C25D *21/16*
U.S. Cl. 427—345 6 Claims



1. In a process for the replenishment and maintenance of stability of an electroless copper plating solution in a plating bath, which solution tends to become depleted as the result of the reduction of a water soluble cupric salt in an alkaline solution under copper plating and reducing conditions and which is replenished by an electrosynthesis/electrodialysis purification process,
wherein in the operation of such process the normal rate of evaporation of water from the surface of the electroless copper plating solution in the bath is insufficient to preclude growth in the volume of said solution, resulting from liquid additions thereto to replace consumed constituents, to an extent requiring bailout,
and wherein increase in the amount of oxygen in the electroless copper plating solution and purging of waste hydrogen therefrom contribute to enhanced stability of said solution,
the method of eliminating the need for bailout of the plating bath and for enhancing the stability of the electroless copper plating solution comprising the step of passing the solution through a forced air ambient temperature, atmospheric evaporator whereby to increase the rate of evaporation of water from the solution to at least a level where the amount of water evaporated from the solution substantially matches the liquid additions to the plating bath required to replace consumed constituents in the solution, to saturate the solution with oxygen, and to purge the solution of waste hydrogen.

4,719,129
MULTIPLE NOZZLE JET FINISHING
Forrester Caudill, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio
Filed Feb. 9, 1987, Ser. No. 12,581
Int. Cl.[4] B05D *1/40, 1/42, 1/18*
U.S. Cl. 427—348 14 Claims



1. A method of controlling and providing different coating thicknesses on at least one side of a web as the web moves along a feedpath in a coating line, the coating line including a jet finishing assembly, the assembly including a support means, at least two rotatably mounted jet finishing knives and including a valve, the nozzle of each knife having a different orifice height, comprising the steps of:
passing said web having excess coating from a coating pot,
discharging pressurized gas from one of said knives adjacent said web having a first orifice height to remove said excess coating leaving a coating of a first thickness,
blocking said gas from passing through said remaining knives by said valve,
rotating said knives until another of said knives having a different orifice height is adjacent said web,
discharging said gas from said other knife to remove said excess coating leaving a coating of a second thickness,
blocking said gas from passing through said remaining knives by said valve.

4,719,130
METHOD FOR PRODUCING A TONER-FIXER ROLL
Koji Shimizu; Haruki Wakita, and Mitsuo Hazuda, all of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan
Filed Jun. 9, 1986, Ser. No. 871,935
Claims priority, application Japan, Jun. 17, 1985, 60-131601
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—380 5 Claims

1. A method for producing a toner-fixing roll, comprising
(A) forming a layer of silicone rubber, containing from 1 to 30 weight percent thermal stabilizer selected from the group consisting of ferric oxide, cerium oxide, and cerium hydroxide, either directly or indirectly on the circumference of a core, then
(B) curing said silicone rubber, then
(C) heating said cured silicone rubber for 20 minutes to 16 hours at from 300° C. to 370° C. in an air flow.

4,719,131
THERMALLY CURABLE POLYACRYLATE COMPOSITIONS
Richard R. Kemmerer, Louisville, and Byron K. Christmas, Jeffersontown, both of Ky., assignors to Interez, Inc., Jeffersontown, Ky.
Filed Jun. 2, 1986, Ser. No. 869,544
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—386 7 Claims

1. A coating process which consists of:
(a) forming a coating from a mixture of a polyacrylate and phosphoric acid;
(b) applying the coating to a metal substrate; and
(c) heating the coating at a temperature of about 300° F. to about 500° F. for a time sufficient to cure the coating, wherein the polyacrylate is comprised of the diacrylic acid ester of the diglycidyl ether of a dihydric phenol.

4,719,132
PROCESS FOR THE PREPARATION OF MULTI-LAYERED COATINGS AND COATED ARTICLES DERIVED THEREFROM
Samuel Porter, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 653,735, Sep. 21, 1984, abandoned. This application Apr. 29, 1987, Ser. No. 45,704
Int. Cl.[4] B05D *3/02*; B32B *15/04*
U.S. Cl. 427—409 22 Claims

1. A process for applying a composite coating to a substrate comprising:
(1) applying to the surface of the substrate an aqueous-based film-forming composition containing color pigments and a water-dilutable polyurethane binder,
(2) forming a basecoat on the surface of the substrate from the composition applied from step 1,
(3) applying to said basecoat a film-forming composition,
(4) forming a transparent topcoat from the composition applied in step 3 over the basecoat.

4,719,133
PROCESS FOR TREATING WOOD AS WELL AS PRODUCT FOR TREATING WOOD
Jacob Woudsma, Vogezenlaan 23, 5801 PX Venray, Netherlands
Filed Aug. 5, 1985, Ser. No. 762,481
Int. Cl.[4] B05D *1/18*; C09K *15/00*; B65D *85/84*
U.S. Cl. 427—440 16 Claims



1. A process for treating wood having at least one recess, comprising inserting a wood preservative and a solid material having a lower water content than the wood into at least one recess in the wood so as to at least partially fill and outwardly close the at least one recess, whereby the solid material exerts a reinforcing effect on the wood when water is absorbed by the solid material.

3. The process of claim 1, wherein the solid material has fibers and the wood preservative is impregnated in the solid material and is delivered to the recessed wood in the direction of the fibers of the solid material.

4,719,134
SOLDERABLE CONTACT MATERIAL
Brian W. Ely, Braintree, England, assignor to The General Electric Company p.l.c., London, England
Continuation of Ser. No. 755,420, Jul. 16, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 914,544
Claims priority, application United Kingdom, Jul. 31, 1984, 8419490
Int. Cl.[4] H05K *3/00*
U.S. Cl. 428—1 20 Claims

1. A method of fabricating an electrical element comprising the steps of
choosing a substrate selected from the group consisting of glass and a synthetic resin;
bonding a contact pad to said substrate, said contact pad being formed by a layer which is overall an alloy consisting essentially of copper and manganese only; and
soldering an electrical connector directly to the alloy forming said contact pad.

4,719,135
FUEL IMPERVIOUS POLYMERIC ARTICLE
Ernst Gerdes, Dorsten; Friedhelm Mutzberg, Mülheim/Ruhr, and Franz Pellengahr, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Filed Dec. 20, 1985, Ser. No. 811,849
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447022
Int. Cl.[4] B65D *1/00*; B32B *27/08, 27/38*
U.S. Cl. 428—35 21 Claims

1. A coated polymeric article having reduced permeability to fuels, comprising a polymer substrate coated with a cured varnish agent comprising:
(a) an effective amount of an epoxy resin based on a monomer having at least two epoxy groups and having an epoxy equivalent weight of about 150–280; and
(b) an effective amount of a curing agent comprising an amine

$H_2N—CH_2—R_1—NH_2$, or (I)

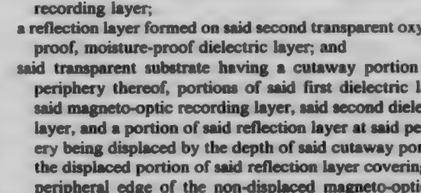
$H_2N—R_2—CH_2—R_3—NH_2$; (II)

wherein R_1, R_2 and R_3 are each, independently, substituted alkylene or cycloalkylene of 5–10 carbons, the amine having a molecular weight of about 100 to 200.

4,719,136
HIGH FREQUENCY WELDABLE TEXTILE MATERIAL
Gerhard Zwirner, Haan, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany
Continuation of Ser. No. 632412, Jul. 19, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,068
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327232
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—58 50 Claims

21. A solid-plastic backed textile material comprising a web of plastic fibers that is weldable by dielectric heating in a high frequency field, the solid-plastic backed textile material having a composite weight of at least approximately 300 grams per square meter and including a butt weld at a weld seam in which substantially all of the plastic fibers are integrally welded together.

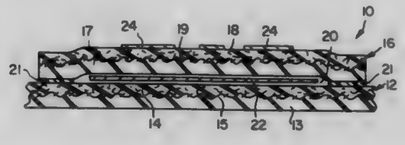
4,719,137
MAGNETO-OPTIC MEMORY ELEMENT
Kenji Ohta, Yao; Akira Takahashi; Hiroyuki Katayama, both of Nara; Junji Hirogane, Tenri, and Yoshiteru Murakami, Nishinomiya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 10, 1985, Ser. No. 721,707
Claims priority, application Japan, Apr. 13, 1984, 59-75541; May 22, 1984, 59-104207
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—67 8 Claims



1. A magneto-optic memory element comprising:
a transparent substrate;
a first transparent oxygen-proof, moisture-proof dielectric layer formed on said transparent substrate;
an alloy thin-film magneto-optic recording layer formed on said transparent oxygen-proof, moisture-proof dielectric layer;
a second transparent oxygen-proof, moisture-proof dielectric layer formed on said alloy thin-film magneto-optic recording layer;
a reflection layer formed on said second transparent oxygen-proof, moisture-proof dielectric layer; and
said reflection layer including an extended portion making said reflection layer larger than said magneto-optic recording layer, said extended portion being disposed over the peripheral edge of said magneto-optic recording layer so as to protect said peripheral edge from oxidation and moisture.

5. A magneto-optic memory element comprising;
a transparent substrate;
a first transparent oxygen-proof, moisture-proof dielectric layer formed on said transparent substrate;
an alloy thin-film magneto-optic recording layer formed on said transparent oxygen-proof, moisture-proof dielectric layer;
a second transparent oxygen-proof, moisture-proof dielectric layer formed on said alloy thin-film magneto-optic recording layer;
a reflection layer formed on said second transparent oxygen-proof, moisture-proof dielectric layer; and
said transparent substrate having a cutaway portion at a periphery thereof, portions of said first dielectric layer, said magneto-optic recording layer, said second dielectric layer, and a portion of said reflection layer at said periphery being displaced by the depth of said cutaway portion, the displaced portion of said reflection layer covering the peripheral edge of the non-displaced magneto-optic recording layer so as to protect said periphera ledge from oxidation and moisture.

4,719,138
RADIANT HEAT RESISTANT STENCILIBLE INFLATABLE FABRIC AND METHOD
Lowell W. Roemke, Wadsworth, and Hildreth W. Stevenson, Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed May 27, 1986, Ser. No. 866,656
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—72 4 Claims

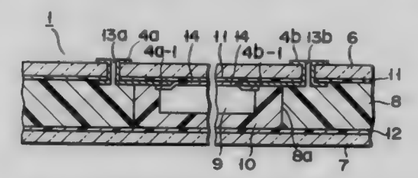


1. A stenciling zone of radiant heat resistant inflatable structure comprising: at least one ply of a structural fabric having an aluminum coating thereover; a stenciling surface ply having an aluminum coating thereover; and adhesive bond between edge portions of the surface ply and the structural fabric ply, the structural ply and the surface ply defining therebetween a cavity; and a spacer element received in the cavity.

4,719,139
PAPERMAKER'S FABRIC CONSTITUTED BY PLASTIC SPIRALS
Maurice Gauthier, Hiersac, France, assignor to COFPA Feutres pour Papeteries, France
Continuation of Ser. No. 715,195, Mar. 22, 1985, Pat. No. 4,567,077, which is a continuation of Ser. No. 403,733, Jul. 14, 1982, abandoned. This application Dec. 20, 1985, Ser. No. 811,509
Claims priority, application France, Nov. 14, 1980, 80 24221
Int. Cl.[4] D21F *1/10*; F26B *13/08*
U.S. Cl. 428—114 10 Claims

1. In a papermaker's fabric comprising a plurality of transverse synthetic spirals connected together serially to define a supporting surface for transporting a paper web through papermaking machinery, said supporting surface having a predetermined permeability, the improvement comprising:
at least one generally flat synthetic bar disposed within each of said spirals such that a desired reduction in the permeability of said papermaker's fabric is achieved.

4,719,140
ELECTRONIC MEMORY CARD
Kazuya Hara, and Kenji Rikuna, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 782,865, Oct. 2, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 935,605
Claims priority, application Japan, Nov. 5, 1984, 59-232834
Int. Cl.[4] B32B *3/10*; G06K *19/06*
U.S. Cl. 428—138 8 Claims



1. An electronic memory card comprising:
a base sheet having a predetermined surface including an accomodation space sized for receiving an integrated semiconductor circuit pellet;
first electric conductive means which is formed on one surface of said base sheet and includes a plurality of first conductive leads each having a portion extended into said accomodation space formed in said base sheet;
at least one integrated semiconductor circuit pellet seated in said accomodation space and having a plurality of electrode terminals each of which is connected to a corresponding one of said plurality of first conductive leads;
an insulating film having substantially the same size of surface area as said base sheet and including a plurality of holes receiving therein input/output terminals, respectively, said insulating film including removable opaque means secured in a portion opposed to said Erasable and Programmable Read Only Memory for blocking light thereto;
second electric conductive means which is formed on an inner side of said insulating film and includes second conductive leads each having one end in contact with said corresponding first conductive lead and the other end extended into each of said plurality of holes.

4,719,141
MATTING LACQUER, PAINT AND LIGHT-TRANSMITTING MATTE FILM
Charles P. Collier, 1488 Crestline Dr., Santa Barbara, Calif. 93105
Division of Ser. No. 890,500, Jul. 30, 1986, Pat. No. 4,684,675. This application Apr. 21, 1987, Ser. No. 42,106
Int. Cl.[4] B41L *7/00, 9/00, 23/00, 25/00*
U.S. Cl. 428—144 13 Claims

1. An improved matte surface film for artists' overlays, said film comprising, in combination:
(a) an at least translucent polymeric base film; and,
(b) a dried film of matting lacquer adhering to the top surface of said base film,
(c) said lacquer comprising:
(i) a film-forming plastic resin agent;
(ii) a relatively soft matting agent comprising a plurality of discrete substantially uniformly spherical, smooth-surfaced fingernail-depressible non-elastomeric polyethylene particles;
(iii) a relatively hard matting agent comprising a plurality of discrete particles of an average diameter approximately comparable to that of said polyethylene particles and particles sufficiently hard to prevent fingernail indentation of a dried film when formed from said lacquer;
(iv) an organic solvent for said film-forming agent; and,
(v) plasticizer for said film-forming agent.

4,719,142
TRANSPARENT MEMBRANE STRUCTURES
Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.
Division of Ser. No. 593,455, Mar. 26, 1984, which is a division of Ser. No. 511,704, Jul. 7, 1983, Pat. No. 4,500,584. This application Jun. 20, 1986, Ser. No. 876,573
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—145 42 Claims

1. A roofing fabric membrane article of manufacture comprising:
(a) a base fabric material,
(b) a base coating composition applied to at least one surface of said base fabric material, and
(c) a silicone coating composition applied to at least one surface of said base fabric material already having thereon said base coating composition which is resistant to dirt pickup comprising:

(i) 100 parts of a liquid vinyl chainstopped polysiloxane having the formula,



wherein R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation with at least 50 mole percent of the R^1 groups being methyl, and where n has a value sufficient to provide a viscosity up to about 2,000,000 centipoise at 25° C.;

(ii) 100–200 parts of a resinous organopolysiloxane copolymer comprising:

(i) $(R^2)_3SiO_{0.5}$ units and SiO_2 units,

(ii) $(R^3)_3SiO_{0.5}$ units, $(R^3)_2SiO$ units and SiO_2 units, or

(iii) mixtures thereof, where R^2 and R^3 are selected from the group consisting of vinyl radicals and monovalent hydrocarbon radicals free of aliphatic unsaturation, where from about 1.5 to about 10 mole percent of the silicon atoms contain silicon-bonded vinyl groups, where the ratio of monofunctional units to tetrafunctional units is from about 0.5:1 to about 1:1, and the difunctional units are present in an amount of up to about 10 mole percent based on the total number of moles of siloxane units in the copolymer;

(iii) a platinum or platinum-containing catalyst; and

(iv) a liquid organohydrogenpolysiloxane having the formula,

$$(R)_a(H)_bSiO_{\frac{4-a-b}{2}}$$

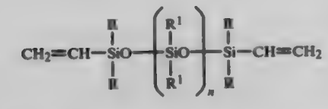
sufficient to provide from about 0.5 to about 1.0 silicon-bonded hydrogen atoms per silicon-bonded vinyl group, R is a monovalent hydrocarbon radical free of aliphatic unsaturation, a has a value of from about 1.0 to about 2.1, b has a value of from about 0.1 to about 1.0, and the sum of a and b is from about 2.0 to about 2.7, there being at least two silicon-bonded hydrogen atoms per molecule.

23. A method for making a roofing fabric membrane structure comprising the steps:

I. applying to at least one side of a base fabric material, a base coating composition,

II. applying to at least one side of said base fabric material coated with said base coating composition, a silicone coating composition which is resistant to dirt pickup comprising:

(a) 100 parts of a liquid vinyl chainstopped polysiloxane having the formula,



wherein R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation with at least 50 mole percent of the R^1 groups being methyl, and where n has a value sufficient to provide a viscosity up to about 2,000,000 centipoise at 25° C.;

(b) 100 to 200 parts of a resinous organopolysiloxane copolymer comprising:

(i) $(R^2)_3SiO_{0.5}$ units and SiO_2 units,

(ii) $(R^3)_3SiO_{0.5}$ units, $(R^3)_2SiO$ units and SiO_2 units, or

(iii) mixtures thereof, where R^2 and R^3 are selected from the group consisting of vinyl radicals and monovalent hydrocarbon radicals free of aliphatic unsaturation, where from about 1.5 to about 10 mole percent of the silicon atoms contain silicon-bonded vinyl groups, where the ratio of monofunctional units to tetrafunctional units is from about 0.5:1 to about 1.1, and the difunctional units are present in an amount of up to about 10 mold percent based on the total number of moles of siloxane units in the copolymer;

(c) a platinum or platinum-containing catalyst; and

(d) a liquid organohydrogenpolysiloxane having the formula,

$$(R)_a(H)_bSiO_{\frac{4-a-b}{2}}$$

sufficient to provide from about 0.5 to about 1.0 silicon-bonded hydrogen atoms per silicon-bonded vinyl group, R is a monovalent hydrocarbon radical free of aliphatic unsaturation, a has a value of from about 1.0 to about 2.1, b has a value of from about 0.1 to about 1.0, and the sum of a and b is from about 2.0 to about 2.7, there being at least two silicon-bonded hydrogen atoms per molecule, and

III. curing said silicone coating composition which is resistant to dirt pickup to said base coating composition.

4,719,143

MULTILAYER POLYETHYLENE ARTICLES

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Nov. 3, 1986, Ser. No. 926,257

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—212 **5 Claims**

1. A multilayer polyethylene structure comprising at least a first and a second layer of high density polyethylene wherein,

the said first layer containing about 80 weight percent of the structure and includes a high density polyethylene having a density of at least about 0.959 grams per cubic centimeter and a melt index of about 10.0 grams per ten minutes or less, and

said second layer containing about 20 weight percent of the structure and including a high density polyethylene having a density less than 0.959 grams per cubic centimeter and a melt index of about ten grams per ten minutes or less.

4,719,144

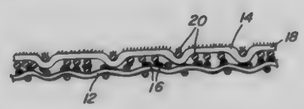
FUSIBLE INTERLINING FABRIC USING HIGH WET MODULUS RAYON

Dattatraya V. Kamat, Yardley, Pa., assignor to Crown Textile Company, Jenkintown, Pa.

Filed Feb. 18, 1986, Ser. No. 830,221

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—257 **12 Claims**



1. A fusable interlining fabric adapted to be fused to a shell fabric and characterized by a soft drapable hand, said fabric being woven and having warp yarn and filling yarn, said warp yarn comprising fibers of high wet modulus rayon and other fiber, and said filling yarn comprising high wet modulus rayon.

4,719,145

CATALYTIC PROCESS AND SYSTEMS

James W. Neely, Dresher, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 536,925, Sep. 28, 1983, abandoned. This application Feb. 21, 1986, Ser. No. 833,423

Int. Cl.[4] B01J *31/00;* **B05D** *5/12, 3/10;* **B32B** *5/16*

U.S. Cl. 428—327 **24 Claims**

1. A process for catalyzing or conducting a reaction of one or more chemicals on a surface comprising:

(a) forming a stable aqueous dispersion of positively charged polymer particles having distributed throughout at least one active agent capable of reacting with or catalyzing the reaction of said one or more chemicals at said surface by admixing an effective amount of said active agent with said dispersion of positively charged polymers, where said active agent is selected from the group consisting of one or more catalytically active metals or salts thereof, an oxidizing agent, a reducing agent, and a chemical containing oxidative or reductive functional groups, and where said particles have a particle size diameter less than about three micrometers

(b) contacting said surface with said stable aqueous dispersion to deposit an adherent monolayer of said particles on said surface without chemically reacting said particles with said surface; and

(c) contacting said deposited monolayer with one or more of said chemicals.

7. A catalyst system comprising an aqueous dispersion of positively charged polymers and a catalytically effective amount of at least one active agent distributed throughout said polymers, where said polymers containing said effective amount of said active agents have particle size diameters less than about 3 micrometers, said active agent being selected from the group consisting of one or more catalytically active metals or salts thereof, an oxidizing agent, a reducing agent, and a chemical containing oxidative or reductive functional groups, said active agent for agents being catalytically active for the reaction of one or more chemicals on a surface onto which said catalyst system is deposited, and where the polymer particles adhere to said surface without chemical bonding or reaction therewith.

11. A surface comprising a monolayer of positively charged polymers having an effective amount of at least one active agent distributed throughout where the active agent is selected from the group consisting of one or more catalytically active metals or salts thereof, an oxidizing agent, reducing agent, and a chemical containing oxidative or reductive functional groups, and where the particle size diameter of the positively charged polymers containing said active agent or agents is less than about three micrometers.

4,719,146

SCRATCH RESISTANT ANTIREFLECTIVE COATINGS FOR SYNTHETIC RESINS

Heinz-Jürgen Hohage, Muehltal, and Rolf Neeb, Pfungstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,613

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439482

Int. Cl.[4] B05D *7/02;* **C08J** *7/04;* **C09D** *3/82;* **G02B** *1/10*

U.S. Cl. 428—331 **11 Claims**

1. A scratch resistant antireflecting coating having a refractive index differing from the value 1.45 by at least 0.01, said coating comprising a matrix film, from 1 to 40 microns thick, of

(1) (a) an acrylate and/or methacrylate polymer, and/or

(b) an organosilicon polymer, or

(c) a melamine resin; and, in said matrix film,

(2) from 0.1 to 10 percent, by weight of the coating, of amorphous, porous silica having a large pore volume from 0.1 to 5 ml/g and consisting of primary particles having an average diameter from 1 to 50 microns, at least 40 percent of the silica primary particles having an average diameter at least 10 percent greater than the thickness of the matrix film.

4,719,147

COUPLED PACKAGING SHEETS IMPERMEABLE TO GASES AND VAPORS AND BASED ON POLYOLEFINIC FILMS

Luigi Mauri, Terni, Italy, assignor to Mopiefas S.p.A., Milan, Italy

Continuation of Ser. No. 707,833, Mar. 4, 1985, abandoned, which is a continuation of Ser. No. 444,516, Nov. 26, 1982, abandoned. This application Aug. 19, 1986, Ser. No. 897,809

Claims priority, application Italy, Nov. 26, 1981, 25289 A/81

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—336 **18 Claims**

1. Coupled packaging films which are impermeable to gases and vapors and consist of two olefinic polymer films, at least one of which is an oriented film, coupled to each other, with or without the interposition of an adhesive, at least one of said films being coated with a lacquer acting as a barrier for gases and vapors and metallized on the face thereof in contact with the other of said films, the lacquer being selected from the group consisting of vinylidene copolymers having a content in vinylidene units greater than 75% by weight and polymeric mixtures containing polyvinyl alcohol of medium to high degree of hydrolysis.

4,719,148

MAGNETIC HEAD HAVING A CORE OF MN-ZN-CO FERROUS FERRITE

Doeko Stoppels, and Leonardus A. H. Van Hoof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

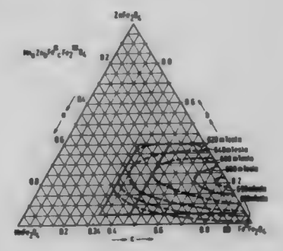
Filed Feb. 28, 1983, Ser. No. 470,832

Claims priority, application Netherlands, Dec. 20, 1982, 8204897

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

Int. Cl.[4] G11B *7/12*

U.S. Cl. 428—336 **7 Claims**



1. A magnetic head for a magnetic recording and playback device, said magnetic head comprising a magnetic core of two core portions with a transducing gap therebetween, characterized in that:

the core is formed of a material having the composition

$$Mn_aZn_bFe_c^{II}Co_xFe_2^{III}O_4,$$

where

$0<a\leqq 0.55$;

$0.06\leqq b\leqq 0.4$;

$0.34\leqq c<0.9$;

x is chosen to shift the maximum magnetic permeability of the core as close as possible to an operating temperature range of the magnetic head;

$a+b+c+x=1$; and

the core has a thickness not greater than 200 microns.

4,719,149

METHOD FOR PRIMING HARD TISSUE

Steven M. Aasen, Lakeland, and Joel D. Oxman, St. Louis Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1986, Ser. No. 835,034

Int. Cl.⁴ C09K *3/00;* **A61C** *5/04;* **A61K** *6/08;* **B32B** *9/02*

U.S. Cl. 428—473 **22 Claims**

14. A primer film, said film lying on the surface of hard human or animal tissue, and comprising a mixture of adhesively effective amounts of an acid and a water-soluble film former, said acid having a pK_a less than or equal to that of phenol and said acid and its calcium salt(s) being soluble in said film former, said mixture being free of adhesively detrimental quantities of calcium salts that are not soluble in said film former.

4,719,150

MONOFILS AND BRISTLES OF HOMOPOLYMERS OR COPOLYMERS OF ACRYLONITRILE, AND A PROCESS FOR THEIR MANUFACTURE

Bernd Huber, Kelheim, and Walter Fester, Saal, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 704,781, Feb. 25, 1985, abandoned. This application Feb. 7, 1986, Ser. No. 827,328

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406910

Int. Cl.⁴ D02G *3/00;* **C08F** *20/44;* **D01F** *6/18*

U.S. Cl. 428—397 **5 Claims**

1. A monofil or a bristle of a homopolymer or copolymer of acrylonitrile consisting of at least 90% by weight of acrylonitrile units and having a relative viscosity, as measured in a solution of 0.5 g of the polymer in 100 ml of dimethylformamide at 20° C., of 1.7 to 6.0,

and the monofil or bristle having a tear strength (tenacity) of from 20 to 60 CN/tex and an initial modulus, for 100% extension, of more than 700 to 1,800 cN/tex and a linear density (denier) of from 2.5 to about 30 tex.

4,719,151

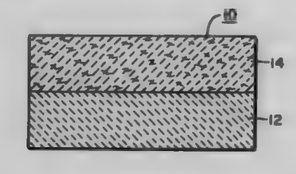
LAMINATED CERAMIC STRUCTURE

Kenneth Chyung, Painted Post, N.Y.; Reid F. Cooper, Madison, Wis.; Kishor P. Gadkaree; Ronald L. Stewart, both of Big Flats, N.Y., and Mark P. Taylor, Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 9, 1986, Ser. No. 861,303

Int. Cl.⁴ B32B *5/12*

U.S. Cl. 428—428 **14 Claims**



1. A laminated ceramic structure comprising a facing member bonded to a backing member, the facing member being composed of a very hard ceramic having a KHN_{100} value in excess of 700 kg/mm² selected from the group consisting of SiC, B_4C, TiB_2, SiON, and Al_7O_3, each in monolithic form, and a glass-ceramic reinforced through the presence therein of whiskers, and the backing member being a composite having an impact energy absorbing capacity in excess of 10 KJ/m² in an unnotched condition composed of a glass or glass-ceramic matrix reinforced through the presence therein of fibers.

4,719,152

TRANSPARENT CONDUCTIVE LAYER BUILT-UP MATERIAL

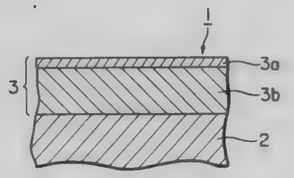
Tatsuo Ohta; Mayumi Okasato, and Hideo Watanabe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,565

Claims priority, application Japan, Sep. 21, 1984, 59-198155; Sep. 21, 1984, 59-198156

Int. Cl.⁴ B32B *15/00, 7/02, 9/00;* **H01J** *1/62*

U.S. Cl. 428—432 **11 Claims**



1. A transparent conductive device comprising a support and a transparent conductive layer comprising a metal oxide, wherein said device has a surface layer comprising a metal or an oxide thereof on said transparent conductive layer on the side opposite to said support and which degree of oxidation is lower than that of said transparent conductive layer.

4,719,153

LAMINATED ARTICLE AND PROCESS FOR PRODUCTION THEREOF

Toshiyuki Akasawa, Kurashiki; Takuji Okaya, Nagaokakyo; Masamitsu Nakabayashi, Osaka, and Yuzo Furukawa, Kawanishi, all of Japan, assignors to Kuraray Co., Ltd., Okayama and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Filed Nov. 12, 1985, Ser. No. 796,778

Claims priority, application Japan, Nov. 12, 1984, 59-238767; Dec. 7, 1984, 59-259647; Dec. 10, 1984, 59-261347; Dec. 10, 1984, 59-261348

Int. Cl.⁴ B32B *27/36;* **C08F** *263/04;* **B65D** *75/00*

U.S. Cl. 428—515 **9 Claims**

1. A laminated article which comprises

a layer (A) of a saponified ethylene-vinyl acetate copolymer resin having an ethylene content of 20–55 % by mole and a degree of saponification of not less than 90 % by mole; laminated with

a layer (B) of a hydrophobic thermoplastic resin; through the medium of

a layer (C) of an adhesive resin; said adhesive resin contains

a polymer (X) comprising ethylene component-vinyl acetate component-ethylenically unsaturated carboxylic acid component or anhydride thereof-styrene type vinyl compound component, and

a copolymer (Y) comprising ethylene component-vinyl acetate component, in an amount satisfying the following formulae (I), (II), (III), (IV) and (V)

$$|V_X - V_Y| \leq 0.30 \quad \text{(I)}$$

$$0.15 \leq V_X \cdot W_X + V_Y \cdot W_Y \leq 0.45 \quad \text{(II)}$$

$$0.01 \leq C_X \cdot W_X \leq 1 \quad \text{(III)}$$

$$1.0 \leq n \cdot S_X / C_X \leq 2.0 \quad \text{(IV)}$$

$$0.1 \leq W_X / W_Y \leq 10 \quad \text{(V)}$$

wherein,

V_X: content of vinyl acetate in the polymer (X) (weight fraction)

V_Y: content of vinyl acetate in the polymer (Y) (weight fraction)

C_X: content of carboxylic group of the ethylenically unsaturated carboxylic acid or anhydride component thereof in the polymer (X); (meq/g),

S_X: content of the styrene vinyl compound component in the polymer (X); (m.mole/g),

W_X: content of the polymer (X) (weight fraction),

W_Y: content of the polymer (Y) (weight fraction), and

n : number of carboxyl group contained in one molecule of the ethylenically unsaturated carboxylic acid or anhydride thereof.

4,719,154

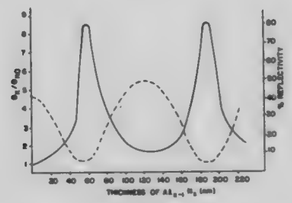
MAGNETO-OPTIC RECORDING ELEMENT WITH AMORPHOUS ALUMINUM-NITROGEN ALLOY LAYER

Tukaram K. Hatwar, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1986, Ser. No. 908,365

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 428—694 **6 Claims**



1. A magneto-optic recording element of the type comprising a magneto-optic layer disposd on a substrate, said layer having a contiguous overlayer of an aluminum-nitrogen alloy, characterized in that said alloy overlayer is amorphous, and in that the stoichiometry of the aluminum-nitrogen alloy is $Al_{1-x}N_x$ where x is between about 0.30 to 0.45.

4,719,155

EPITAXIAL LAYER STRUCTURE GROWN ON GRADED SUBSTRATE AND METHOD OF GROWING THE SAME

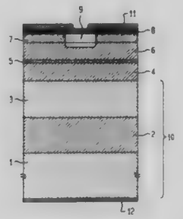
Takashi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,628

Claims priority, application Japan, Oct. 17, 1984, 59-217747

Int. Cl.⁴ B32B *9/00;* **H01L** *29/161*

U.S. Cl. 428—700 **7 Claims**



1. A crystal structure comprising:

a single crystal bulk substrate having a first lattice constant,

a graded-composition layer formed on said bulk substrate,

a constant-composition layer formed on said graded-composition layer, said graded-composition layer and said constant composition layer having a second lattice constant which is different from said first lattice constant, and

an epitaxial layer grown on said constant-composition layer with an intentional lattice mismatch $\Delta a/a$ therebetween (wherein Δa is a difference in the lattice constant between said constant-composition layer and said epitaxial layer, and a is the lattice constant of said constant-composition layer), the value of $\Delta a/a$ being in the range of 1×10^{-3} to 5×10^{-3} so as to alleviate a strain stored in said graded-composition layer and constant-composition layer due to the difference of said first and second lattice constants.

4,719,156

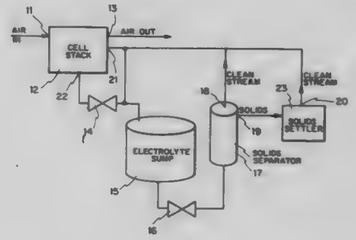
EFFICIENT ELECTRICAL POWER GENERATION SYSTEM

Marilyn J. Nikas, Concord; Kenneth J. Branchick, and Thomas R. Turk, both of Mentor, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Mar. 5, 1987, Ser. No. 17,806

Int. Cl.⁴ H01M *8/04*

U.S. Cl. 429—14 **11 Claims**



1. A method for improving the efficiency of electrical power generation from at least one battery comprising at least one metal electrode and a liquid electrolyte wherein solid particulate is produced and suspended in said liquid electrolyte during the operation of said battery, comprising:

feeding said liquid electrolyte containing solid particulate from said battery to a solid separation means;

said solid separation means comprising a container having an axis and an impeller; wherein said impeller is operated at a speed sufficient to concentrate said solid particulate in an annulus zone of fluid within said container opposite to the zone containing said impeller;

withdrawing liquid electrolyte depleted of solid particulate from said container; and,

recirculating said liquid electrolyte depleted of solid particulate to said battery.

4,719,157

FUEL CELL STACK ASSEMBLY

Masaru Tsutsumi, Hyogo; Hideo Hagino, Otsu; Osamu Fujiwara, Kobe, and Hitoshi Goto, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 6, 1986, Ser. No. 871,335

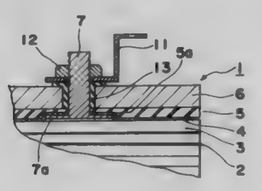
Claims priority, application Japan, Jun. 7, 1985, 60-124751; Feb. 7, 1986, 61-26102

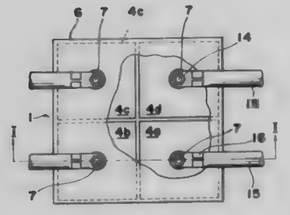
Int. Cl.⁴ H01M *2/30, 8/02*

U.S. Cl. 429—34 **6 Claims**

1. A fuel cell stack assembly comprising a fuel cell stack, thin current collectors arranged on opposite ends of the fuel cell stack, and end plates arranged on the current collectors, said end plates being insulated from the current collector by a heat resisting insulator arranged therebetween, each of said current collectors comprising a plurality of independent current col-

lecting sections, said current collecting sections on each end of the fuel cell stack being spaced from each other and each





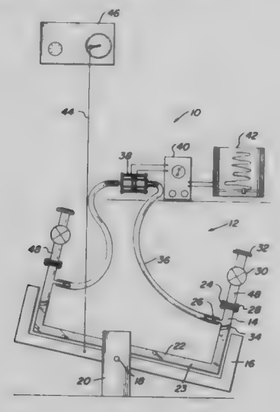
provided with a single terminal extending therefrom through said insulator and end plate.

4,719,158

PROCESS AND APPARATUS FOR CONVERTING ROCKING MOTION INTO ELECTRICAL ENERGY

Robert E. Salomon, Philadelphia, Pa., assignor to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Mar. 27, 1987, Ser. No. 31,692
Int. Cl.[4] H01M *14/00*
U.S. Cl. 429—50 8 Claims



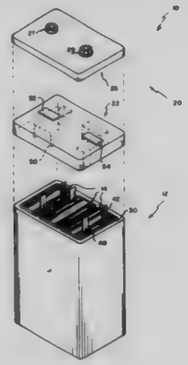
1. A device for converting wave energy into electricity comprising:
(a) a U-shaped tube having a base and two arms, said base being filled with a liquid and said arms being filled with hydrogen gas;
(b) support means for holding the U-shaped tube;
(c) a gas concentration cell containing a protonically conducting membrane having two electrocatalytical electrodes, said cell being in communication with the hydrogen gas in the arms of the U-shaped tube; and
(d) means for floating the device on the surface of the ocean thereby imparting a rocking motion thereto, said rocking motion varying the pressure of the hydrogen gas in communication with the gas concentration cell, thereby generating an electric voltage across said electrodes in accordance with the Nernst equation.

4,719,159

SEALED LITHIUM BATTERY

Peter S. Clark, Penfield, and Richard T. Cataldi, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1986, Ser. No. 864,385
Int. Cl.[4] H01M *2/04, 2/06*
U.S. Cl. 429—159 19 Claims



1. A battery comprising:
a container having a plurality of cell cavities;
an electrode assembly in each of said cavities including a pair of electrodes and a separator material between the electrodes, one of said electrodes in each pair being a lithium anode;
an electrolyte in each of said cell cavities, said electrolyte containing a lithium salt;
a cover on said container and fused thereto to hermetically seal each of said cell cavities, said cover being formed from a chemically modified polyolefin and having conductive inserts molded therein, said inserts being bonded to said polyolefin, and said inserts forming electrical connections between electrodes in adjacent cell cavities and between electrodes and battery terminals.

4,719,160

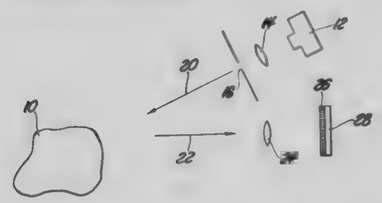
METHOD AND APPARATUS FOR MAKING WHITE LIGHT HOLOGRAMS

Grant R. Gerhart, 916 Candlestick Ct., Bloomfield Hills, Mich. 48013, and Gregory Arutunian, 17190 Fenelon, Detroit, Mich. 48212

Filed Jun. 11, 1986, Ser. No. 874,199
Int. Cl.[4] G03H *1/06*
U.S. Cl. 430—2 9 Claims

9. A method for forming a transmission holographic image of a three dimensional object on a photosensitive material including the steps of:
generating a beam of noncoherent white light of the desired intensity;
focusing the beam of white light at a point;
spatially filtering the focused beam of white light to form a more spatially coherent light beam;

directing the spatially coherent beam onto the three dimensional object to be imaged;
focusing the light reflected from the object;
diffracting the focused reflected light to form various orders of interference patterns; and



exposing a photographic emulsion to the diffraction pattern's light to record the interference patterns of the diffracted light as a holographic image.

4,719,161

MASK FOR X-RAY LITHOGRAPHY AND PROCESS FOR PRODUCING THE SAME

Takeshi Kimura; Kozo Mochiji; Hiroshi Okamoto; Takao Iwayanagi; Tetsuichi Kudo, and Shinji Kuniyoshi, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,780
Claims priority, application Japan, Aug. 16, 1985, 60-179422
Int. Cl.[4] G03F *9/00*
U.S. Cl. 430—5 6 Claims



1. A mask for X-ray lithography comprising a thin film capable of transmitting soft X-rays and a pattern formed thereon and made of a material hardly capable of transmitting soft X-rays, wherein at least part of said material hardly capable of transmitting soft X-rays is a heat-cured product of a peroxopolytungsten compound containing at least tungsten as a heavy metal.

4,719,162

ELECTROPHOTOGRAPHICALLY SENSITIVE MATERIAL FOR A LITHO PRINTING PLATE

Shiro Nakano; Tuyoshi Ozaki, both of Nichinan, and Kenji Noguchi, Tokyo, all of Japan, assignors to Oji Paper Company, Ltd., Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,840
Claims priority, application Japan, Nov. 4, 1986, 61-81985; Aug. 9, 1985, 60-174342
Int. Cl.[4] G03G *13/26*
U.S. Cl. 430—49 6 Claims

1. An electrophotographically sensitive material for a litho printing plate, comprising:
(A) a substrate sheet;
(B) an intermediate coating layer formed on a surface of the substrate sheet and comprising (a) white mica fine particles which have been prepared by means of a wet-grinding method and have an average particle size of from 5 to 50 μm, (b) a waterproofing agent comprising at least one organic silane compound of the formula (1):

$$R_nSiX_{4-n} \quad (1)$$

wherein n represents an integer of 1 or 2, R represents a member selected from the group consisting of aliphatic, cycloaliphatic, aromatic and heterocyclic radicals containing 1 to 30 carbon atoms, at least one radical represented by R being a chemically reactive radical selected from the group consisting of vinyl, glycidyl, mercapto, amino, epoxy and ester radicals, halogen atoms and alkyl radicals having at least one substituent consisting of a member selected from the above-mentioned radicals and atoms, and X represents a hydrolyzable substituent selected from halogen atoms, amino radical, hydroxyl radical, and alkoxyl radicals having 1 to 4 carbon atoms, and
(c) a thermoplastic resin binder; and
(C) a photoconductive coating layer formed on the intermediate coating layer and containing photoconductive pigment particles and an electrically insulating polymeric binder.

4,719,163

MULTI-ACTIVE PHOTOCONDUCTIVE INSULATING ELEMENTS EXHIBITING FAR RED SENSITIVITY

William J. Staudenmayer, Pittsford, and Michael T. Regan, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 19, 1986, Ser. No. 875,915
Int. Cl.[4] G03G *5/14, 5/06*
U.S. Cl. 430—58 33 Claims

1. A multi-active photoconductive insulating element which exhibits sensitivity in the far red region of the spectrum; said element comprising an electrically-conductive support having at least two active layers disposed thereon; said active layers including a charge-generation layer in electrical contact with a charge-transport layer; said charge-generation layer containing N,N'-bis[2-(3-methylphenyl)ethyl]perylene-3,4:9,10-bis(dicarboximide) as a charge-generating agent; and said charge-transport layer being an organic composition comprising, as a charge-transport agent, an organic photoconductive material which is capable of accepting and transporting injected charge carriers from said charge-generation layer.

4,719,164

LIQUID ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER COMPRISES PIGMENT COATED WITH POLYCYANOACRYLATE INNER SHELL AND ADDITIONAL SHELL OF COPOLYMER

Wolfgang Podszus; Helmut Waniczek, and John Goossens, all of Cologne, Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,489
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514867
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—114 6 Claims

1. An electrostatographic suspension developer containing a dispersed pigment in an electrically insulating carrier liquid having a volume resistance of at least 10^9 ohm.cm and a dielectric constant below 3,
having a pigment with a coating compriaed of
an inner shell of polycyanoacrylate and an additional shell of a copolymer of
A. cationic monomers which contain ammonium, phosphonium or sulfonium groups and of which the anions are derived from CH-acid compounds containing at least one C_6–C_{24} hydrocarbon radical and

B. radically polymerizable olefinically unsaturated compounds as comonomers.

4,719,165

PROCESS FOR PREPARATION OF CHARGE-REGULATORY AGENT AND LIQUID DEVELOPER FOR ELECTROSTATIC IMAGE CONTAINING SAID AGENT

Katsugi Kitatani; Hiroaki Yokoya; Nobuo Suzuki, and Masataka Murata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

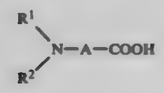
Continuation of Ser. No. 767,452, Aug. 20, 1985. This application Sep. 24, 1986, Ser. No. 912,142

Claims priority, application Japan, Aug. 20, 1984, 59-172955

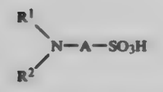
Int. Cl.⁴ G03G *9/12*

U.S. Cl. 430—115 **14 Claims**

1. A liquid developer for development of an electrostatic image, comprising a dispersion of resin-containing toner particles dispersed in a carrier solution having an electric resistance of 10^9 Ω-cm or more and a dielectric constant of 3.5 or less, characterized in that said liquid developer contains a charge-regulatory agent prepared by reacting an amino acid with a titanium compound in an organic solvent to form a reaction mixture and further reacting the resultant mixture with water which is equimolar or more to said titanium compound, wherein the amino acid used in the preparation of the charge-regulatory agent is an amino acid represented by the following formula (I) or (II)



(I)



(II)

wherein R^1 and R^2 independently represent a hydrogen atom; an alkyl group having 1–22 carbon atoms; an alkyl group substituted by one or more substituents selected from a dialkylamino group, an alkyloxy group and an alkylthio group; an aryl group having 6–24 carbon atoms; an aryl group substituted by one or more substituents selected from a dialkylamino group, an alkyloxy group, an alkylthio group, a chlorine atom, a bromine atom, a cyano group, a nitro group and a hydroxyl group; an aralkyl group; and acyl group having 1–22 carbon atoms; an alkylsulfonyl group or an arylsulfonyl group having 6–24 carbon atoms; these R^1 and R^2 may be same or different from each other, and R^1–R^2 may form a ring, with the proviso that both R^1 and R^2 must not be a hydrogen atom at the same time; and A is an alkylene group having 1–10 carbon atoms or a substituted alkylene group.

4,719,166

POSITIVE-WORKING PHOTORESIST ELEMENTS CONTAINING ANTI-REFLECTIVE BUTADIENYL DYES WHICH ARE THERMALLY STABLE AT TEMPERATURES OF AT LEAST 200° C.

Richard W. Blevins, and Robert C. Daly, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

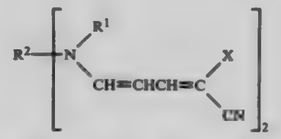
Filed Jul. 29, 1986, Ser. No. 890,220

Int. Cl.⁴ G03C *1/60, 1/84*

U.S. Cl. 430—166 **14 Claims**

1. In a positive-working photosensitive element comprising a support, a photosensitive layer on said support comprising a photosensitive compound responsive to activating radiation, which results in the photosensitive layer having increased solubility to selected solvents in the radiation exposed areas, and an anti-reflective dye disposed in a layer between said photosensitive layer and said support in an amount effective to absorb radiation reflected from said support,

the improvement wherein said anti-reflective dye is a butadienyl dye having the structural formula:



whereby said anti-reflective dye is thermally stable at temperatures of at least 200° C.,

wherein

R^1 is alkyl, cycloalkyl or aryl; and

R^2 is a linking group selected from the group consisting of arylene, alkylene and arylenealkylene and arylene, alkylene, and arylenealkylene interrupted with one or more oxygen atoms or



groups

where

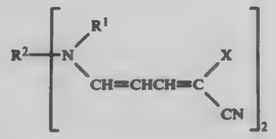
R^3 is alkyl;

provided that the sum of the carbon atoms for both R^1 groups plus the R^2 group is at least 13; and

X is an electron withdrawing group.

8. A positive-working photosensitive element comprising a support, a photosensitive layer on said support comprising in admixture a photosensitive compound responsive to activating radiation, which results in the photosensitive layer having increased solubility to selected solvents in the radiation-exposed areas, and an anti-reflective dye disposed in said photosensitive layer in an amount effective to absorb radiation reflected from said support,

characterized in that said anti-reflective dye is a butadienyl dye having the structural formula:



whereby said anti-reflective dye is thermally stable at temperatures of at least 200° C.,

wherein

R^1 is alkyl, cycloalkyl or aryl; and

R^2 is a linking group selected from the group consisting of arylene, alkylene and arylenealkylene and arylene, alkylene and arylenealkylene interrupted with one or more oxygen atoms or



groups

where

R^3 is alkyl;

provided that the sum of the carbon atoms for both R^1 groups plus the R^2 group is at least 13; and

X is an electron withdrawing group.

4,719,167

POSITIVE PHOTORESIST COMPOSITION WITH 1,2 NAPHTHOQUINONE DIAZIDE AND NOVOLAK RESIN CONDENSED FROM MIXTURE OF M-CRESOL, P-CRESOL, AND 2,5-XYLENOL WITH FORMALDEHYDE

Konee Miura, Yokohama; Tameichi Ochiai, Sagamihara, and Yasuhiro Kameyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,902

Claims priority, application Japan, Feb. 13, 1985, 60-25660

Int. Cl.⁴ G03C *1/60, 1/54*

U.S. Cl. 430—192 **3 Claims**

1. A positive photoresist composition consisting essentially of an admixture of (a) a photosensitizer of 1,2-naphthoquinone diazides photosensitive-material comprising an ester of 2,3,4,4'-tetrahydroxybenzophenone in which on the average, not less than two hydroxy groups of 2,3,4,4'-tetrahydroxybenzophenone have been esterified by 1,2-naphthoguinonediazide-5-sulfonic acid in a photosensitizing amount, and (b) a novolak resin obtained by condensing a mixture of about 10 to 80 mol percent m-cresol, about 10 to 80 mol percent p-cresol and about 10 to 80 mol percent 2,5-xylenol with formaldehyde, wherein the weight ratio of (a) to (b) is 15–35 parts to 100 parts.

4,719,168

DYE-FIXING MATERIAL

Koichi Nakamura, and Toshiaki Aono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

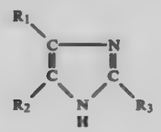
Continuation of Ser. No. 596,133, Apr. 2, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 858,910

Claims priority, application Japan, Mar. 31, 1983, 58-56423; Apr. 1, 1983, 58-55173

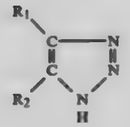
Int. Cl.⁴ G03C *5/54, 5/24*

U.S. Cl. 430—203 **11 Claims**

1. A method for forming images which comprises forming a mobile hydrophilic dye in an imagewise distribution by exposing to an imagewise pattern of light, and subsequently or simultaneously heat-developing, a heat developable light-sensitive material comprising at least a light-sensitive silver halide, a binder and a dye providing substance, wherein said heat developable light-sensitive material is provided on a support capable of forming the hydrophilic dye by the reaction with a light-sensitive silver halide upon heating under a substantially water-free condition, and subsequently transferring and fixing said mobile hydrophilic dye, by heating in the presence of a hydrophilic thermal solvent, on a single or multiple dye-fixing layer which contains at least a dye-fixing agent and a compound capable of reacting with or absorbing a silver halide, wherein said dye-fixing layer is provided on a distinct support from the support for said heat developable light-sensitive material, and wherein said compound is a 5- or 6-membered nitrogen-containing heterocyclic compound selected from the group consisting of the following formula (III) to (XVI) or a thiourea compound represented by the following formula (XVII):

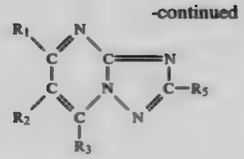


(III)

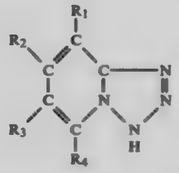


(IV)

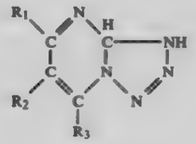
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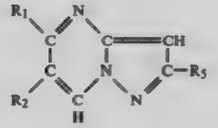
(V)



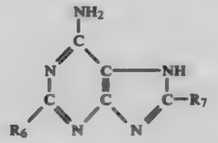
(VI)



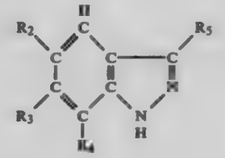
(VII)



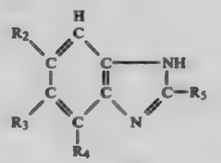
(VIII)



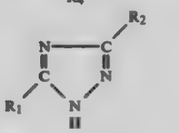
(IX)



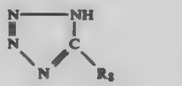
(X)



(XI)

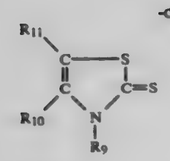


(XII)

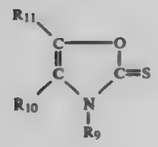


(XIII)

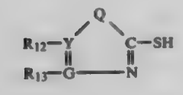
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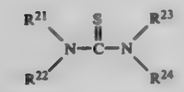
(XIV)



(XV)



(XVI)



(XVII)

wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an alkyl group, an aralkyl group, an alkenyl group, an alkoxy group, an aryl group, —NRR′, —COOR, —SO_3M, —CONRR′, —$NHSO_2R$, —SO_2NRR', —NO_2, a halogen atom, —CN or a hydroxy group, wherein R and R′ each represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group, and M represents a hydrogen atom or an alkali metal atom, and when both R_1 and R_2 represent an alkyl group, they may combine with each other to form an aliphatic hydrocarbon ring;

R_5 represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, or —S—R″, wherein R″ represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group;

R_6 represents a hydrogen atom or an alkyl group;

R_7 represents a hydrogen atom, an alkyl group or an aryl group;

R_8 represents an alkyl group, an aryl group, a benzyl group, or a pyridyl group;

R_9 represents an alkyl group, an alkenyl group, or an aryl group;

R_{10} and R_{11} both represent an alkyl group, an alkenyl group, or an aryl group, and when both R_{10} and R_{11} are an alkenyl group, they may combine with each other to form an aromatic ring;

Q represents an oxygen atom, a sulfur atom or —NR‴, wherein R″ represents a hydrogen atom, an alkyl group, an unsaturated aliphatic hydrocarbon residue, or a substituted or unsubstituted aryl or aralkyl group;

Y and G each represents a carbon atom or a nitrogen atom;

R_{12} and R_{13} each represents a hydrogen atom, an alkyl group, an unsaturated aliphatic hydrocarbon residue, a substituted or unsubstituted aryl group, substituted or unsubstituted aralkyl group, —SR⁗ or —NH_2, wherein R⁗ represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, an alkylcarboxylic acid or its alkali metal salt, or an alkylsulfinic acid or its alkali metal salt, and when Y and G both represent a carbon atom they may combine with each other to form an aromatic ring; and

R^{21} and R^{24} may be the same or different, and each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a nitrogen-containing heterocyclyl group or an acyl group.

4,719,169

PROTECTIVE COATING FOR IMAGES

Stephan J. W. Platzer, Califon; Mehmet U. Yener, Rahway, and Stanley F. Wanat, Scotch Plains, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 18, 1986, Ser. No. 853,782

Int. Cl.⁴ G03C *11/12*

U.S. Cl. 430—258 **19 Claims**

1. A method for protecting an image with a thin, substantially non-blocking protective layer which comprises providing a colored image on a substrate and either:

A. Applying an antiblocking coating to a release surface of a temporary support; bonding a thermoplastic adhesive layer to said antiblocking coating; laminating said applied support to said colored image via said adhesive; and peeling away said temporary support from said antiblocking coating; or

B. applying a thermoplastic adhesive layer to a release surface of a first temporary support; applying an antiblocking coating onto a release surface of a second temporary support, laminating said adhesive onto said colored image and peeling away said first temporary support; and laminating said antiblocking coating onto said adhesive layuer and peeling away said second temporary support;

wherein said adhesive layer is transparent, colorless and substantially nontacky at room temperature, is laminated with pressure such that the adhesive is directly on the surface of the image and the anti-blocking coating is on the other surface of the adhesive, at temperatures between about 60° C. and 90° C.; and comprises in a major portion one or more thermoplastic polymers or copolymers capable of forming a flexible film; and

wherein said antiblocking coating is transparent, colorless and comprises one or more organic polymers or copolymers, which coating does not cohesively block at about 50° C. or less; and wherein said lamination is conducted at a temperature of from about 60° C. to about 90° C.

4,719,170

OPTICAL RECORDING MATERIAL

Wolfgang Schrott, Ludwigshafen, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellshaft, Ludwigshafen, Fed. Rep. of Germany

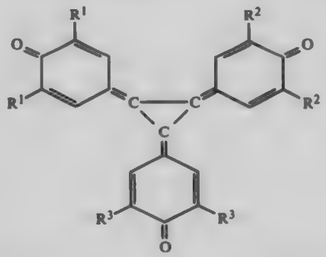
Filed Feb. 27, 1986, Ser. No. 833,259

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507379

Int. Cl.⁴ B32B *9/04*; G03C *1/495*; G01D *15/10, 9/00*

U.S. Cl. 430—270 **11 Claims**

1. An optical recording material consisting of a base and a dye-containing polymer layer, said polymer layer containing at least one triquinocyclopropane of the formula:



wherein R^1, R^2 and R^3 independently of one another are each straight-chain or branched C_1–C_{12}-alkyl.

4,719,171

OPTICAL DISC

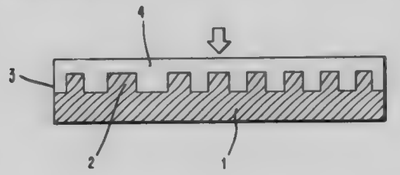
Yukio Ikenaga; Katsuhiko Takahashi, both of Fuji; Tsuneyoshi Okada, Kawasaki; Kenji Hijikata, and Toshio Kasoe, both of Fuji, all of Japan, assignors to Polyplastics Co., Inc., Japan

Continuation of Ser. No. 784,271, Oct. 4, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 31,215

Claims priority, application Japan, Oct. 9, 1984, 59-210585

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 430—271 **22 Claims**



1. An optical disc which comprises a substrate comprising a melt-processable polymer which is capable of forming an anisotropic melt phase, a recording layer having pits and grooves formed on said substrate, and a metal coating layer formed on said recording layer.

4,719,172

DESENSITIZING GUM FOR LITHOGRAHIC PRINTING PLATES

Hiroshi Matsumoto, and Tadao Toyama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jul. 7, 1986, Ser. No. 882,514

Claims priority, application Japan, Jul. 10, 1985, 60-151924

Int. Cl.¹ G03T *7/02*

U.S. Cl. 430—309 **11 Claims**

1. In a gumming-up process comprising applying to an imagewise exposed and developed presensitized plate, a desensitizing gum comprising an aqueous solution of a hydrophilic high molecular compound, the improvement characterized in that said hydrophilic high molecular compound comprises at least one of film-forming starches esterified with phosphoric acid or its derivatives.

4,719,173

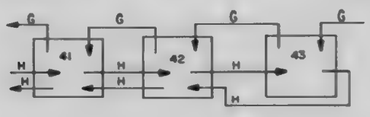
PROCESS FOR MULTISTAGE CONTACTING

Paul T. Hahn, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1985, Ser. No. 784,981

Int. Cl.⁴ G03C *7/00, 5/24, 5/38*

U.S. Cl. 430—398 **11 Claims**



1. A multistage contacting process wherein a first material is contacted, in a series of stages, with a second material containing at leat one component whose concentration therein is reduced by such contact, wherein: replenishment material is introduced to at least one of the stages to compensate for such concentration reduction; the concentration of the component in the second material is highest in one of the stages; and the first material carries a part of the second material out of each stage, which process comprises:

contacting the first material with the second material at least once in each stage of the series, in a sequential manner such that in respect to said first material, the contacting occurs in at least one of the stages other than the stage having highest component concentration, then in the stage having highest component concentration, and then in at least one of the stages other than the stage having highest component concentration;

introducing the replenishment material to the stage having highest component concentration; and

transferring second material from the stage having highest component concentration to at least one of the other stages.

4,719,174

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL DEPRESS FORMATION OF RE-REVERSED NEGATIVE IMAGE

Shigeo Hirano; Tsutomu Miyaoka, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 621,654, Jun. 18, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,144

Claims priority, application Japan, Jun. 17, 1983, 58-108693

Int. Cl.⁴ G03C *1/485, 1/34*

U.S. Cl. 430—609 **17 Claims**

1. An internal latent image-forming direct positive silver halide photographic light-sensitive material wherein the direct positive silver halide is an internal latent, image-forming silver halide which has not been pre-fogged, containing a weak electron donative, adsorptive compound represented by the formula (I) or (II):

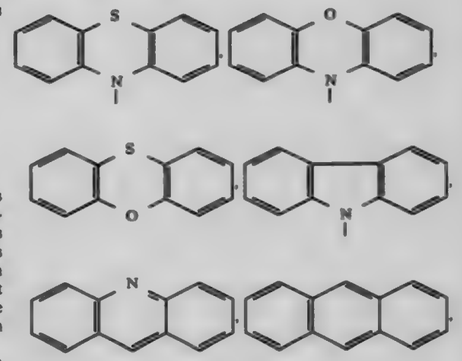
D—L—X (I)

D—X (II)

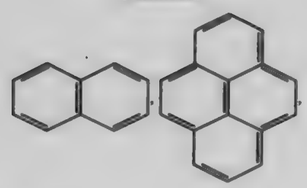
wherein L represents a linking group selected form the group consisting of alkylene group, an alkenylene group, an arylene group, —O—, —S—, —CO—, —NH— and —N= which is unsubstituted or substituted, alone of in combination;

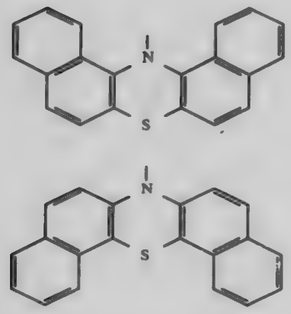
X represents a group which is adsorptive with respect to silver halide and contains at least one of C, N, S, O and Se; and

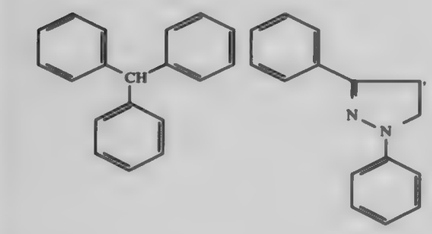
D represents an electron donative group comprising an aromatic ring or hetero ring, which is unsubstituted or substituted, having the following skeleton:



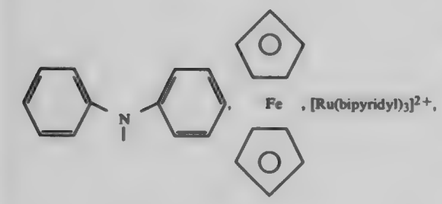
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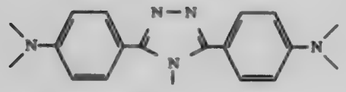


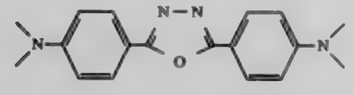




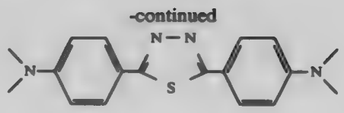


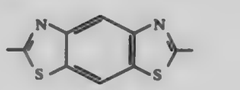


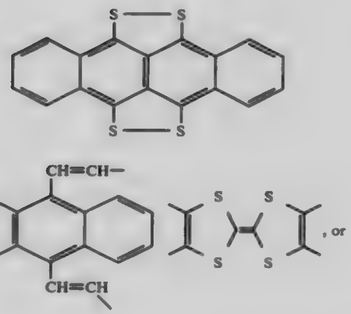


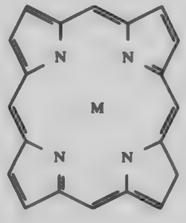


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wherein M represents a heavy metal such as Zn, Pd, Cu, Ni or Fe;

said adsorptive compound represented by formula (I) of (II) being effective for depressing formation of a re-reversed negative image and not being a spectral sensitizing agent for silver halide or a nucleating agent.

4,719,175

NOVEL PYRAZOLE COMPOUNDS HAVING SILVER HALIDE DEVELOPMENT GROUPS

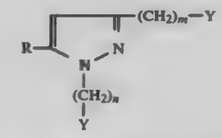
Efthimios Chinoporos, Belmont; Elbert M. Idelson, West Newton, and Patrick F. King, Needham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 3, 1982, Ser. No. 374,275

Int. Cl.⁴ G03C *5/30*

U.S. Cl. 430—440 **1 Claim**

1. A photographic method which comprises treating an exposed silver halide emulsion with an aqueous alkaline processing composition including a silver halide developing agent which is represented by the formula



where R is —OH, —NH_2, or —$NHSO_2$—R_1; R_1 is alkyl having from 1 to 6 carbon atoms or phenyl; Y is a silver halide developing substituent or a precursor thereof; and m and n are the same or different and each is an integer of from 1 to 6.

4,719,176

ENZYME-FREE DIAGNOSTIC BINDING REAGENTS

Irving M. Klotz, 2515 Pioneer Rd., Evanston, Ill. 60201

Filed Oct. 31, 1983, Ser. No. 547,232

Int. Cl.⁴ C12Q *1/68*; G01N *33/566, 33/53, 33/542*

U.S. Cl. 435—6 **42 Claims**

19. A method of carrying out a binding assay comprising the steps of

(a) providing an enzyme-free diagnostic reagent for determining the presence of an entity to be assayed in a homogeneous assay comprising an enzyme-free hydrolytic catalyst coupled by a linking group to a first binding agent, said catalyst having a molecular weight together with the linking group of about 75 to about 2000 daltons, wherein said catalyst catalyzes a hydrolytic chemical reaction with successive preselected hydrolyzable co-reactant molecules when said co-reactant molecules and said catalyst are admixed. in homogeneous solution and said catalyst is coupled to said first binding agent as said diagnostic reagent; said diagnostic reagent specifically binding in aqueous medium to a second binding moiety to form a binding complex, said second binding moiety being (a) the entity to be assayed in a direct assay, or (b) an entitity needed for the assay in an indirect assay, said diagnostic reagent indicating the amount of said second binding moiety present in said binding complex by means of the catalytic reactivity of said catalyst with said co-reactant molecules, said catalytic reactivity being changed when said binding complex is formed;

(b) providing a first aqueous composition containing said second binding moiety;

(c) admixing in an aqueous medium a known, predetermined amount of said diagnostic reagent and a known, predetermined amount of said first aqueous composition to form a binding complex between said diagnostic reagent and said second binding moiety;

(d) admixing a plurality of hydrolyzable co-reactant molecules with the admixture of step (c); and

(e) measuring the reaction between said enzyme-free catalyst and said co-reactant molecules.

4,719,177

PRODUCTION OF COMPLEMENTARY DNA REPRESENTING RNA VIRAL SEQUENCES BY RECOMBINANT DNA METHODS AND USES THEREFOR

David Baltimore, Cambridge, and Vincent R. Racaniello, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 255,879, Apr. 20, 1981, abandoned. This application Nov. 12, 1981, Ser. No. 320,525

Int. Cl.⁴ C12P *19/34*; C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—91 **21 Claims**

3. A method for the bacterial production of infectious poliovirus cDNA, comprising:

a. reverse transcribing poliovirus RNA to provide essentially full-length ss poliovirus cDNA;

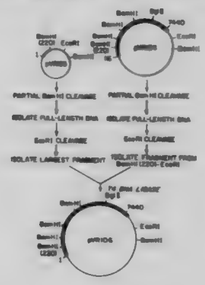
b. forming ds cDNA from said ss poliovirus cDNA;

c. inserting said ds poliovirus cDNA into a bacterial plasmid to create a chimeric plasmid;

d. transforming bacterial cells with said chimeric plasmid;

e. cloning a transformed bacterial cell to produce a clonal bacterial cell line capable of replicating said poliovirus ds cDNA;

f. culturing said clonal bacterial cell line in cell culture under conditions conductive to the production of essentially full-length and infectious poliovirus ds cDNA; and



g. harvesting said infectious poliovirus ds cDNA from said cell culture.

4,719,178

REARRANGEMENT PROCESS

Alasdair R. Macrae, and Peter How, both of Bedford, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 490,641, May 2, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 817,751

Claims priority, application United Kingdom, Apr. 30, 1982, 8212688

Int. Cl.⁴ C12P *7/62, 7/64*; C12N *11/14, 9/20*; A23D *5/02*

U.S. Cl. 435—135 **7 Claims**

1. A continuous interesterification process comprising the steps of:

(a) precipitating a 1,3-specific lipase on inert particulate support material;

(b) activating the lipase by addition of water in an amount effective to activate the lipase;

(c) packing the inert support material carrying the precipitated lipase in a fixed bed;

(d) mixing a fatty reactant selected from the group consisting of fatty acids containing 3 to 20 carbon atoms, their esters including triglyceride oils and fats, their fractionated and hydrogenated derivatives, and mixtures thereof and dissolving the mixture in a water-immiscible organic solvent to obtain a resulting solution;

(e) dissolving water in the resuling solution in an amount sufficient to favor interestification and minimize hydrolysis;

(f) continuously flowing said solution of step(e) through the fixed bed whereby a total contact time of less than two hours is achieved and glycerides enriched in the 1,3-positions are formed; and

(g) recovering from the solution of step (f), the glycerides enriched in the 1,3-positions.

4,719,179

SIX BASE OLIGONUCLEOTIDE LINKERS AND METHODS FOR THEIR USE

Francis Barany, Baltimore, Md., assignor to Pharmacia P-L Biochemicals, Inc., Milwaukee, Wis.

Filed Nov. 30, 1984, Ser. No. 676,935

Int. Cl.⁴ C12N *15/00*; C12P *19/34*; C07H *15/12*

U.S. Cl. 435—172.1 **6 Claims**

1. A method for inserting a selected restriction site into a double stranded genetic sequence at a selected tab site comprising:

treating a double stranded DNA genetic sequence with a type II restriction enzyme that cleaves both strands at a selected tab site and produces complementary single stranded termini on each strand of said genetic sequence;

exposing said cleaved genetic sequence to two hexameric

single stranded DNA oligonucleotide linkers in the presence of a ligating enzyme, wherein said linkers have the same nitrogenous base sequence, and wherein said linker sequence is palindromic complementary to both ends of said linker sequence with respect to only either two or four bases per end and wherein said linker sequence is a recognition site for a restriction enzyme; and

selecting said genetic sequence, wherein said linker sequence has been inserted and ligated complementary to said single stranded termini.

4,719,180

SYNTHETIC UROGASTRONE GENE, CORRESPONDING PLASMID RECOMBINANTS, TRANSFORMED CELLS, PRODUCTION THEREOF AND URGASTRONE EXPRESSION

Michael A. W. Eaton, Bledlow; Michael T. Doel, Studley Green; Norman H. Carey, Chinnor; John C. Smith, High Wycombe; David M. J. Lilley, Downley, and Leslie D. Bell, Thame, all of England, assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 289,596, Aug. 3, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 649,885

Claims priority, application United Kingdom, Aug. 5, 1980, 8025440

Int. Cl.[4] **C12N** *1/00, 15/00, 1/20;* **C12P** *21/02, 21/04, 19/34;* **C07H** *21/04*

U.S. Cl. 435—320 **1 Claim**

1. The plasmid pUrI.

4,719,181

FREE FLOWING GRANULAR INDICATOR MATERIAL FOR PEROXIDASE-LIKE ACTIVITY

Alexander M. Schobel, North Plainfield, and Raymond L. Mohrle, Denville, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1985, Ser. No. 811,579

Int. Cl.[4] **G01N** *33/52, 33/72*

U.S. Cl. 436—66 **16 Claims**

1. A free-flowing granular indicator material comprising a granular component selected from the group consisting of sorbitol, mannitol and mixtures thereof having gum guaiac coated thereupon, wherein said granular indicator material has increased solubility in an aqueous-organic indicator solution.

4,719,182

FLUORESCENT LABELS AND LABELED SPECIES AND THEIR USE IN ANALYTICAL ELEMENTS AND DETERMINATIONS

Brent A. Burdick, and Susan J. Danielson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1985, Ser. No. 713,206

Int. Cl.[4] **G01N** *33/533, 33/546, 33/547*

U.S. Cl. 436—501 **18 Claims**

1. A fluorescent labeled physiologically reactive species comprising

a conjugate of a physiologically reactive species bound to a polysaccharide,

said conjugate bound through said polysaccharide to a polymeric particle which is derived from a loadable latex having a discontinuous phase which consists essentially of a polymer prepared from one or more ethylenically unsaturated polymerizable monomers, and an aqueous continuous phase, said polymeric particle having incorporated therein a fluorescent rare earth chelate.

4,719,183

FORMING SINGLE CRYSTAL SILICON ON INSULATOR BY IRRADIATING A LASER BEAM HAVING DUAL PEAK ENERGY DISTRIBUTION ONTO POLYSILICON ON A DIELECTRIC SUBSTRATE HAVING STEPS

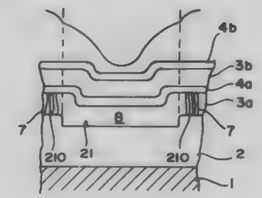
Masashi Mackawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1985, Ser. No. 783,105

Claims priority, application Japan, Oct. 3, 1984, 59-209196; Oct. 19, 1984, 59-220684; Sep. 3, 1985, 60-195580

Int. Cl.[4] **H01L** *21/265;* **C30B** *33/00*

U.S. Cl. 437—19 **7 Claims**



1. A process for the production of semiconductor devices, comprising the steps of:

(1) forming a first oxide film on a semiconductor substrate;

(2) forming a groove structure or groove structures on said first oxide film;

(3) forming a first polycrystalline silicon film to serve as an active layer on said first oxide film so as to maintain said groove structures;

(4) forming a second oxide film on said first polycrystalline silicon film so as to maintain said groove structures;

(5) forming a second polycrystalline silicon film on said second oxide film so as to maintain said groove structures, said second polycrystalline silicon film serving as a buffer layer which absorbs the fluctuation of a scanning laser beam;

(6) forming an anti-reflection film on said buffer layer so as to maintain said groove structures; and

(7) irradiating said first polycrystalline silicon film through said anti-reflection film, said buffer layer and said second oxide film, with a scanning laser beam having a dual peak type power distribution to melt said first polycrystalline silicon film in such a manner that both peaks in the power distribution of said laser beam are positioned at outer sides of said groove structures, said outer sides of said groove structures corresponding to portions of said first oxide film that are thicker than those portions of said first oxide film with groove structures, thereby achieving a single crystallization of said first polycrystalline silicon film within each of said groove structures in which said semiconductor devices are to be formed.

4,719,184

PROCESS FOR THE FABRICATION OF INTEGRATED STRUCTURES INCLUDING NONVOLATILE MEMORY CELLS WITH LAYERS OF SELF-ALIGNED SILICON AND ASSOCIATED TRANSISTORS

Daniele Cantarelli, Monza; Giuseppe Crisenza, Trezzo Sull-'Adda, and Pierangelo Pansana, Muggio', all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Continuation of Ser. No. 784,323, Oct. 4, 1985, abandoned. This application Mar. 6, 1987, Ser. No. 22,482

Claims priority, application Italy, Nov. 26, 1984, 23737 A/84

Int. Cl.[4] **H01L** *21/26*

U.S. Cl. 437—24 **2 Claims**

1. Process for the fabrication of integrated structures including nonvolatile memory cells with self-aligned silicon layers and associated transistors comprising sequentially:

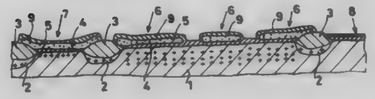
(a) forming insulation areas on a monocrystalline silicon substrate, doping the insulation areas with a positive conductivity type modifier and growing field oxide on the area so doped,

(b) doping the remaining portions of the monocrystalline silicon substrate with a positive type conductivity modifier and growing a gate oxide layer on the entire substrate structure,

(c) depositing a first polycrystalline silicon layer and doping said layer with a negative conductivity type modifier, characterized in that the process also comprises:

(d) masking of the first polycrystalline silicon layer and





removal thereof at the sides of the zones which will constitute the memory cell and transistor areas,

(e) growth of a dielectric oxide layer,

(f) removal of said dielectric oxide from the transistor areas,

(g) deposit of a second polycrystalline silicon layer,

(h) masking and etching of the second polycrystalline silicon layer and of the underlying dielectric oxide at the sides of the cell and transistor areas, and

(i) subsequent etching with identical masking of the first polycrystalline silicon layer and of the underlying gate oxide at the sides of the cell and transistor areas until drain and source areas are uncovered.

4,719,185

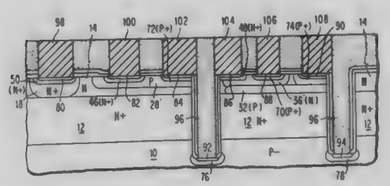
METHOD OF MAKING SHALLOW JUNCTION COMPLEMENTARY VERTICAL BIPOLAR TRANSISTOR PAIR

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,521

Int. Cl.[4] **H01L** *21/425, 21/225, 21/265*

U.S. Cl. 437—31 **23 Claims**



1. Process for forming an integrated circuit structure including a complementary pair of vertical bipolar transistor comprising;

providing a semiconductor substrate having first and second active regions formed of an epitaxial layer thereon;

simultaneously forming, by a first conductivity type ion implantation, precursors of a first transistor base and a second transistor collector reach-through in said first and second regions, respectively;

forming the collector of said second transistor by deep second conductivity type ion implantation into said second active region;

forming a base precursor of said second transistor in correspondence with a portion of said second transistor collector by selective first conductivity type ion implantation of said second active region;

forming, by selective first conductivity type doping, emitter of said first transistor in a surface portion of said first transistor base precursor;

annealing to simultaneously form first and second transistor bases and second transistor collector reach-through from their respective precursors; and

forming, by selective second conductivity type doping, emitter of said second transistor in a surface portion of said second transistor base.

4,719,186

OPTICAL AND OPHTHALMIC GLASS WITH REFRACTIVE INDICES GREATER THAN OR EQUAL TO 1.56, ABBE NUMBERS GREATER THAN OR EQUAL TO 40 AND DENSITIES LESS THAN OR EQUAL TO 2.70 G/CM^3

Karl Mennemann, Taunustein; Georg Gliemeroth, Mainz-Finthen; Ludwig Ross, Klein-Winternheim; Burkhard Speit, Mainz-Mombach; Volkmar Geller, Mainz-Finthen; Hans-Georg Krolla, Mainz, and Lothar Meckel, Oestrich-Winkel, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 731,246, May 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 467,722, Feb. 18, 1983, Pat. No. 4,562,161. This application Apr. 16, 1986, Ser. No. 854,715

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206226; Feb. 20, 1982, 3206227

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.[4] **C03C** *3/093, 3/091, 3/118, 4/00*

U.S. Cl. 501—67 **12 Claims**

1. An optical and ophthalmic glass with a refractive index greater than or equal to 1.56, an Abbe number greater than or equal to 40 and a density less than or equal to 2.70 g/cm^3, consisting essentially of (in % by weight):

SiO_2	49 to 68
B_2O_3	3 to 8
Al_2O_3	0.5 to 3
P_2O_5	0 to 1.5
sum of SiO_2, B_2O_3, Al_2O_3 and P_2O_5	60 to 78
Li_2O	3 to 8
Na_2O	5 to 7
K_2O	5 to 7
MgO	0 to 3
CaO	0 to 3
ZnO	0 to 2.97
sum of MO	0 to 3
TiO_2	9.5–12.8
ZrO_2	0 to 2
Nb_2O_5	0 to 3
Y_2O_3	0 to 3
F^-	0 to 1.

4,719,187

DENSE SINTERED BODIES OF NITRIDE MATERIALS

Pronob Bardhan, Corning, and Gregory A. Merkel, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 785,953, Oct. 10, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 937,209

Int. Cl.[4] **C04B** *35/58, 35/50*

U.S. Cl. 501—97 **10 Claims**

1. A sintered nitride-based ceramic body of near theoretical

density selected from the group consisting of AlN containing, as analyzed by weight, about 0.02–25% of a metal selected from the group consisting of Al, Ba, Ca, Sr, Y, a lanthanide rare earth metal, and mixtures of those metals, and about 0.005–10% fluorine, and Si_3N_4 containing, as analyzed by weight, about 0.02–25% of a metal selected from the group consisting of Al, Ba, Ca, Sr, Y, a lanthanide rare earth metal, and mixtures of those metals, and about 0.005–10% fluorine.

4,719,188

ALUMINA-BASE ABRASION RESISTANT MATERIAL

Keiichiro Kobu; Akira Matsumoto; Yoshito Morita, all of Tochigi, and Tomomi Miyamoto, Fukuoka, all of Japan, assignors to Mitsui Mining Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,831
Int. Cl.⁴ C04B *35/10*
U.S. Cl. 501—133 **2 Claims**

1. An alumina-base abrasion resistant material comprising a sintered product of 100 parts by weight of Al_2O_3 powder and an admixure of sintering agents consisting essentially of 0.5–4.0 parts by weight of each of TiO_2 a CuO, of Fe_2O_3, MnO_2 and SiO_2, said sintering being conducted at 1,200°–1,350° C.

4,719,189

REACTIVATION OF NOBLE METAL-CONTAINING ZEOLITE CATALYST MATERIALS

Sowmithri Krishnamurthy, Glen Mills, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 774,214, Sep. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 604,268, Apr. 26, 1984, Pat. No. 4,555,495. This application Oct. 19, 1986, Ser. No. 919,527
Int. Cl.⁴ B01J *29/38, 23/96, 38/18, 38/14*
U.S. Cl. 502—50 **19 Claims**

1. A process for regenerating a coke-deactivated noble metal-containing zeolite catalyst material containing at least about 0.5 weight percent coke whereby noble metal agglomeration is minimized, which process consisting essentially of removing coke from the deactivated catalyst material without sulfiding by contacting said catalyst material with a gas stream consisting essentially of nitrogen, oxygen and sulfur dioxide under oxidizing conditions to provide a catalyst material which contains less than about 0.3 weight percent coke, and exposing the resulting catalyst material to a reducing gas under reducing conditions; said oxidizing conditions include temperatures ranging from about 100° to 500° C., pressures ranging from about 100 to 400 psig, and exposure to a gas stream containing about 100ppm to 2 volume percent SO_2 and about 1 to 10 volume percent oxygen, and said reducing conditions comprise exposing the resulting catalyst material which contains less than about 0.3 weight percent coke to a reducing gas comprising hydrogen at temperatures ranging from about 300° to 500° C., pressure ranging from about 100 to 400 psig, and contact times ranging from about 0.5 to 10 hours.

4,719,190

HYDROCARBON CONVERSION AND POLYMERIZATION CATALYST AND METHOD OF MAKING AND USING SAME

Russell S. Drago, and Edward E. Getty, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Oct. 22, 1986, Ser. No. 921,688
Int. Cl.⁴ B01J *29/06, 27/125, 27/10*
U.S. Cl. 502—64 **23 Claims**

1. A method of preparing a catalyst comprising reacting an adsorbent solid containing surface hydroxyl groups with a Lewis acid selected from the group consisting of aluminum halides, antimony halides and mixtures thereof in a halogenated organic solvent selected from the group consisting of CCl_4, $CHCl_3$ and mixtures thereof at a temperature at atmospheric pressure below about 250° C. and for a time sufficient for said aluminum or antimony halide to react with at least a portion of said surface hydroxyl groups.

3. The method of claim 1 or 2 wherein said adsorbent solid containing surface hydroxyl groups is selected from the group consisting of materials containing silica, alumina, titania, boron oxide, a zeolite, magnesia or mixtures thereof.

4,719,191

PILLARED INTERLAYERED CLAY PRODUCTS OF INCREASED STABILITY

David R. Battiste; Jesse R. Harris; George D. Parks, and Brent J. Bertus, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 17, 1986, Ser. No. 908,276
Int. Cl.⁴ B01J *21/16*
U.S. Cl. 502—84 **16 Claims**

7. A process of preparing a pillared interlayered clay product having increased stability at high temperatures and in the presence of steam comprising the steps of:

reacting a smectite clay with an aqueous solution of a polymeric cationic hydroxy aluminum or zirconium complex;

seperating the resulting pillared clay product from the reaction mixture;

calcining said pillared clay product at a temperature in the range of from about 300° C. to about 800° C.;

cooling said calcined pillared clay product to a temperature in the range of from about 23° C. to about 500° C.;

contacting said cooled pillared clay product with a stability increasing compound selected from the group consisting of silicon, titanium, phosphorus and antimony halides and ethyl silicates whereby said stability increasing compound is adsorbed on said pillared clay product to substantial saturation;

heating said pillared clay product to a temperature in the range of from about 300° C. to about 500° C. while continuing to contact said product with said stability increasing compound; and

calcining the resulting reaction pillared clay product at a temperature in the range of from about 300° C. to about 800° C.

12. A pillared interlayered smectite clay composition prepared in accordance with the process of claim 7.

4,719,192

CATALYST FOR DECREASING THE CONTENT OF NITROGEN OXIDES IN FLUE GASES

Michael Schneider, Ottobrunn-Riemerling; Hans J. Wernicke, Geretsried; Karl Kochloefl, Bruckmühl/Heufeld, and Gerd Maletz, Landshut, all of Fed. Rep. of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 11, 1986, Ser. No. 895,558
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3529060; Sep. 10, 1985, 3532226
Int. Cl.⁴ B01J *20/12, 21/16*
U.S. Cl. 502—84 **14 Claims**

1. A catalyst for decreasing the content of nitrogen oxides in flue gases comprising at least one metal selected from the group consisting of titanium, zirconium, vanadium, tungsten, molybdenum and cerium in the form of one or more of their oxides and a three-layer silicate comprising talc, the atomic ratio of the silicon in the talc to the metal in the oxide being between 0.2 50, wherein said talc is acid-activated, while partly retaining its crystalline layer structure, and being not yet X-ray amorphous, the acid activation increasing the BET surface area at least 15% in terms of the BET surface area of the talc before acid activation.

7. A catalyst according to claim 1, wherein the metal oxides are individually present in the following ranges of concentration:

TiO_2:	10–80% by weight,
WO_3 and/or MoO_3:	1–25% by weight,
V_2O_5:	0.1–25% by weight, and
CeO_2:	1–25% by weight,

with the acid-activated three-layer silicate accounting for the rest of the active constituents.

8. A catalyst according to claim 1, wherein when present in a ternary combination, the metal oxides are present in one of the following percentages by weight:

(a)	(TiO_2 + WO_3 + and/or MoO_3 + V_2O_5)	= 10–80
(b)	(TiO_2 + CeO_2 + V_2O_5)	= 10–80
(c)	(TiO_2 + ZrO_2 + V_2O_5)	= 10–80
(d)	(WO_3 and/or MoO_3 + CeO_2 + V_2O_5)	= 10–25
(e)	(WO_3 and/or MoO_3 + ZrO_2 + V_2O_5)	= 10–25

with the acid-activated three-layer silicate accounting for the rest of the actve constituents.

4,719,193

PROCESSES FOR PREPARING POLYETHYLENE CATALYSTS BY HEATING CATALYST PRECURSORS

Isaac J. Levine, and Frederick J. Karol, both of Belle Mead, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1986, Ser. No. 913,735
Int. Cl.⁴ C08F *4/64*
U.S. Cl. 502—107 **12 Claims**

1. A process for improving the productivity of catalysts used in process for homopolymerizing ethylene or copolymerizing ethylene with alpha monoolefins having 3 to 8 carbon atoms employing a catalyst system comprising:

(a) a solid, supported titanium (III)-containing precursor of the formula

$$Mg_mTiX_p[ED]_g$$

wherein

x is selected from the group consisting of Cl, Br, I and mixtures thereof,

ED is an electron donor compound,

m is 0.5 to 56,

p is 4 to 115,

g is 3 to 85; and

(b) an organoaluminum activator, which process comprises heating the precursor, prior to activating said precursor with the organoaluminum activator, at a temperature of from about 140° C.–200° C. for a sufficient time to reduce the electron donor level of the precursor by at least about 20 percent to about 80 percent below the electron donor level achieved by drying to constant weight at a temperature up to about 85° C.

4,719,194

SELF-EMULSIFIABLE PAPER RELEASE CATALYST BLEND

Timothy J. Cletek, Clifton Park, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 634,445, Jul. 25, 1984, abandoned, which is a continuation of Ser. No. 356,797, Mar. 10, 1982, abandoned. This application May 21, 1987, Ser. No. 53,552
Int. Cl.⁴ B01J *31/12*; C08G *77/08*; C08L *83/04*
U.S. Cl. 502—155 **2 Claims**

1. A water dispersible catalyst blend effective for promoting condensation curing of organopolysiloxanes, comprising:

(A) 50 to 87 percent by weight of said catalyst blend of an organo tin compound selected from the group consisting of dibutyl tin dithioacetic acid ester and di(n-octyl tin S,S' bis(isooctyl mercapto acetate); and

(B) 13 to 50 percent by weight of said catalyst blend of an emulsifier, wherein said emulsifier is selected from the group consisting of polyoxyethylene 20 sorbitan monooleate and polyoxyethylene 20 sorbitan trioleate;

said components (A) and (B) being mutually soluble and forming a stable, high solids catalyst blend capable of remaining catalytically active after prolonged storage.

4,719,195

PROCESS FOR PRESULFURIZING A HYDROGEN TREATMENT CATALYST

Hervé Toulhoat, Houilles, and Georges Berrebi, Bourg les Valence, both of France, assignors to Europeenne de Retraitement de Catalyseurs (Eurecat), La Voulte sur Rhone, France

Filed Oct. 30, 1985, Ser. No. 793,043
Claims priority, application France, Oct. 30, 1984, 84 16540; Jul. 4, 1985, 85 10396
Int. Cl.⁴ B01J *27/02, 38/56, 38/12, 38/48*
U.S. Cl. 502—216 **21 Claims**

1. A process for a two step treatment of a fresh or regenerated catalyst containing (a) a carrier consisting essentially of at least one metal or metaloid oxide and (b) at least one active metal wherein, in a first step performed ex-situ at a temperature from about 0 to 50° C. and in absence of hydrogen, the catalyst is treated with at least one sulfurization agent, so as to partially or completely incorporate said agent in the catalyst pores, the sulfurization agent being a polysulfide of general formula:

$$R—S_{(n)}—R'$$

wherein n is an integer from 3 to 20 and R' is a hydrogen atom or another radical identical to or different from radical R, these two radicals thus representing each an organic radical containing 1 to 150 carbon atoms per molecule, said radicals being selected from the group consisting of alkyl radicals, saturated or unsaturated, linear or branched radicals or radicals of the naphthenic type, aryl radicals, alkylaryl radicals and arylalkyl radicals, said sulfurization agent being used in solution in a solvent, said process further comprising a second step of treating the catalyst obtained in the first step by a method wherein: (a) the catalyst, in the first part of second step, is treated, in the absence of hydrogen and in the presence of an inert or noninert gas, for at least about 5 minutes, "in-situ" or ex-situ at a temperature from 65° to 275° C., under a pressure from about 0.5 to 70 bars, to convert oxides of active metal to black catalytically inactive sulfides and (b) said catalyst is then treated, in the second part of said second step, in the presence of hydrogen, for at least about 1 minute at a temperature higher than 275° C., said temperature being also sufficiently high to activate the catalyst.

4,719,196

PROCESS FOR MAKING A CARRIER-SUPPORTED CATALYST

Wilhelm Vogt, Hürth; Hermann Glaser, Erftstadt, and Eitel Goedicke, Bergheim, all of Fed. Rep. of Germany, assignors to Hoechst AG, Hürth, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 903,666
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533250
Int. Cl.⁴ B01J *21/04, 23/10, 23/40*
U.S. Cl. 502—304 **13 Claims**

1. A process for making a carrier-supported catalyst by applying a noble metal selected from the group consisting of ruthenium, palladium, rhodium, iridium and platinum on to a ceramic honeycomb structure coated with an aluminum oxide layer which comprises: impregnating the honeycomb structure by continuously flowing an aqueous solution containing a substituted acetic acid selected from the group consisting of nitrilotriacetic acid and ethylenediaminotetraacetic acid, ammonia and at least one noble metal compound therethrough over a period of up to 60 minutes, and drying the honeycomb structure so impregnated at temperatures within the range 20°

to 250° C. and heat-treating it at temperatures within the range 250° to 1000° C.

4,719,197

PROCESS FOR MAKING A CARRIER-SUPPORTED CATALYST

Wilhelm Vogt, Hürth; Hermann Glaser, Erftstadt, and Eitel Goedicke, Bergheim, all of Fed. Rep. of Germany, assignors to Hoechst AG, Hurth Knapsack, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 922,058

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1985, 3539125

Int. Cl.⁴ B01J *23/42, 23/44, 23/46*

U.S. Cl. 502—339 **5 Claims**

1. A process for making a carrier-supported catalyst wherein a ceramic honeycomb structure having a layer of a heat resistant metal oxide applied to it is impregnated with the aqueous solution of a compound of at least one metal selected from platinum, rhodium or palladium, the impregnated honeycomb structure is dried and annealed, which comprises: flowing a drying gas through the impregnated honeycomb structure, regularly distributed across its entire cross-sectional area at a temperature of from 20° to 400° C., the temperature and quantity of the drying gas being so selected that water ceases to be evaporated from the impregnated honeycomb structure after a period of 30 to 300 seconds and heat-treating the dried impregnated honeycomb structure over a period of 1 to 3 hours at temperatures up to 1000° C.

4,719,198

HEAT-SENSITIVE RECORDING SHEET

Masuhiko Sato, and Toshimi Satake, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 382,341, May 26, 1982, abandoned. This application Jun. 4, 1986, Ser. No. 870,453

Claims priority, application Japan, Jun. 4, 1981, 56-85011

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—209 **6 Claims**

1. A heat sensitive recording sheet with color-forming layer on a base sheet, characterized in that the color-forming layer comprises 3–10 parts by weight of organic color-developing agent, 1–8 parts by weight of p-benzyloxybenzoic aacid benzylester and 1–20 parts by weight of filler per 1 part by weight of a chromogenic dyestuff and 10–25 parts by weight of a binder per total solid content thereof.

4,719,199

DIURETIC COMPOSITIONS AND METHODS OF PRODUCING DIURESIS

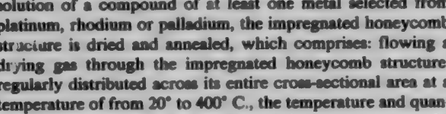
Nelson C. Yim, Ambler, Pa., assignor to Smithkline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 681,461, Dec. 14, 1984, Pat. No. 4,597,901. This application Apr. 16, 1986, Ser. No. 852,697

Int. Cl.⁴ A61K *37/34*

U.S. Cl. 514—9 **4 Claims**

1. A pharmaceutical composition having vasopressin antagonist activity comprising a pharmaceutical carrier and, dispersed therein, a water diuretically effective quantity of a compound having the formula:



in which:

X is TRP, D-Phe, D-Phe(4'-Alk), D-Tyr, L-Tyr, D-Tyr-(Alk) or L-Tyr(Alk);

P is Phe, Phe(4'-Alk) or TRP;

A is Val, Ile, Abu, Ala, Gly, Lys, Cha, Nle, Phe, Leu, Chg or Nva:

W is D-Pro or L-Pro;

Z is D-Arg, L-Arg, D-Lys, L-Lys or Harg;

Y is NH_2, NHAlk, OH, Gly, Gly(NH_2) or Gly(NHAlk); and

n is 0, 1 or 2, with the provisions that one of X and P must be TRP and each Alk contains from 1–4 carbons,

or a pharmaceutically acceptable salt thereof.

4,719,200

AMINO ACID DERIVATIVES AND ANTIHYPERTENSIVE DRUGS CONTAINING THE SAME

Chikahiko Eguchi, Yokohama; Masahiko Kurauchi, Nagashino, and Shumpei Sakakibara, Saita, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,029

Claims priority, application Japan, Aug. 24, 1984, 59-176355

Int. Cl.⁴ A61K *37/02;* **C07K** *5/08, 5/10*

U.S. Cl. 514—18 **11 Claims**

1. An amino acid derivative having the formula:



wherein one of X or Y represents an acyl group RCO—, wherein said R is an amino acid residue selected from the group consisting of glycyl, alanyl, valyl, leucyl, isoleucyl, phenylalanyl, methionyl, prolyl, ceryl, threonyl, arginyl, lysyl, histidyl, aspartyl, asparaginyl, tyrosyl, cysteinyl, tryptophyl, and hydroxyprolyl, and the other group is H; R^1 and R^2 are the same or different from each other, and each represents H, lower alkyl having 1 to 6 carbon atoms, aryl having 6 to 12 carbon atoms, any of which are unsubstituted or substituted by one or more lower alkyl, lower alkoxy, hydroxy, amino, carboxy or mercapto groups; Z represents —OH, RO—, RS—, RNH—, NONH—, RONH—, RSO_2NH—, RCONH—, or RCSNH—; and wherein R as defined above for the moiety Z is H, lower alkyl having 1 to 6 carbon atoms, aryl having 6 to 12 carbon atoms or aralkyl having 6 to 12 carbon atoms, any of which are unsubstituted or substituted by one or more lower alkyl, lower alkxoy, hydroxy, amino, carboxy or mercapto groups.

4,719,201

METHOD FOR STIMULATING RECOVERY FROM ISCHEMIA

John E. Foker, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 699,037, Feb. 7, 1985, Pat. No. 4,605,644. This application Feb. 6, 1986, Ser. No. 826,857

Int. Cl.⁴ A61K *31/70*

U.S. Cl. 514—23 **6 Claims**

1. A method for reducing the recovery time of tissue function following ischemic insult comprising:

(a) perfusing said tissue with an adenine-free solution incorporating ribose for about 24 hours in an amount effective to restore the tissue ATP level and tissue function to levels substantially equal to those present in the preischemic tissue; and

(b) continuing said perfusion until the tissue maintains its restored function and ATP level when the perfusion is discontinued.

4,719,202

DISACCHARIDE AND TRISACCHARIDE DERIVATIVES OF THE "LIPID A" TYPE

Constant A. A. van Boeckel, Oss, and Tom Beetz, Lith, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

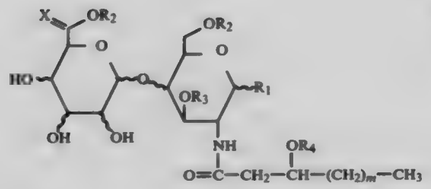
Filed Feb. 11, 1986, Ser. No. 828,277

Claims priority, application Netherlands, Feb. 22, 1985, 8500499

Int. Cl.⁴ A61K *31/70;* **C07H** *5/04*

U.S. Cl. 514—61 **19 Claims**

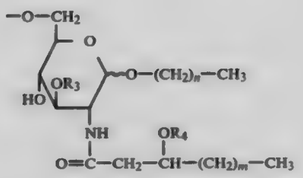
1. A disaccharide or trisaccharide derivative of the Lipid A type, having the formula:



(I)

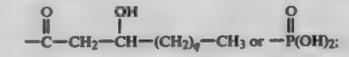
wherein

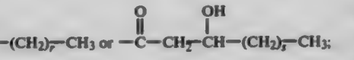
R_1=OH, the group —$O(CH_2)_n$—CH_3 or a β-1,6-bonded glucosamine derivative having the formula:

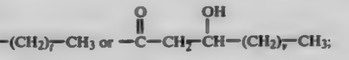


II

R_2 = H, 



R_3 = H,  or  ;

R_4 = H,  or  ;

m, q, s and v each independently is 6–14

n, p, r and t each independently is 0–16, and

X represents two hydrogen atoms or—when R_2=H— also oxygen, as well as pharmaceutically acceptable salts thereof.

14. A pharmaceutical composition having an immunomodulating action, which contains as active ingredient, an immuno-modulating effective amount of one or more compounds as defined in claim 1 in a pharmaceutically acceptable carrier.

4,719,203

DIPHOSPHONIC ACID DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Elmar Bosies, Weinheim, and Rudi Gall, Hirschberg, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

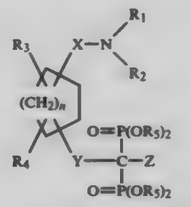
Filed Nov. 12, 1986, Ser. No. 930,331

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540150

Int. Cl.⁴ C07F *9/38;* **A61K** *31/045, 31/13, 31/185*

U.S. Cl. 514—108 **20 Claims**

1. A diphosphonate of the formula



(I)

wherein R_1 and R_2, which can be the same or different, are hydrogen, C_2–C_5 acyl, C–C_4 alkyl or C–C_4 alkyl substituted by aryl, pyridyl, imidazolyl or thienyl, R_3 and R_4, which can be the same or different, are hydrogen or C–C_6 alkyl or R_3 and R_4 together represent alkylene with up to 4 carbons, R_5 is hydrogen or C–C_4 alkyl, X is a valency bond or alkylene with up to 4 carbons, Y is a valency bond, C–C_4 alkylene or C–C_4 alkylene substituted by —NR_1R_2, in which R_1 and R_2 have the same meanings as above, Z is hydrogen, or hydroxy and n is 1, 2 or 3; or the pharmacologically salts thereof.

19. A method for treating calcium metabolism disorder comprising administering, enterally or parenterally, an effective amount of the diphosphonate of claim 1.

4,719,204

FOWL BONE MINERALIZATION WITH 26-NOR 1α-HYDROXYVITAMIN D_2 ANALOGS

Hector F. DeLuca; Heinrich K. Schnoes, both of Madison, Wis.; Rafal R. Sicinski, Warsaw, Poland, and Yoko Tanaka, Delmar, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 586,160, Mar. 5, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 784,142

Int. Cl.⁴ A61K *31/59*

U.S. Cl. 514—167 **3 Claims**

1. A method for inducing the mineralization of the bones of fowl which comprises administering to said fowl an effective amount of 1α-hydroxy-28-norvitamin D_2 or 1α, 25-dihydroxy-28-norvitamin D_2.

4,719,205

SIDE-CHAIN UNSATURATED 1-HYDROXYVITAMIN D COMPOUNDS

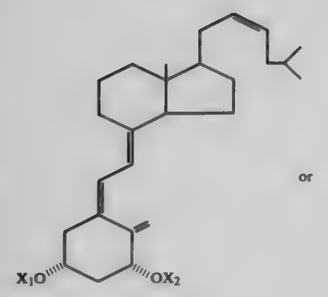
Hector F. DeLuca; Heinrich K. Schnoes; Rafal R. Sicinski, and Yoko Tanaka, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 575,116, Jan. 30, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,325

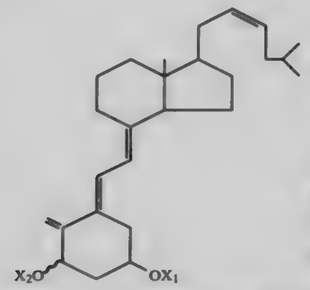
Int. Cl.⁴ A61K *31/59;* **C07J** *9/00*

U.S. Cl. 514—167 **13 Claims**

1. Compounds having the formula



or



wherein X_1 and X_2 is hydrogen or acyl and where the substituent at carbon 1 may have the α or β stereochemical orientation.

4,719,206

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Takashi Masugi, Ikeda; Takashi Ogino, Kobe; Hisashi Takasugi, Osaka, and Hideaki Yamanaka, Hirakata, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

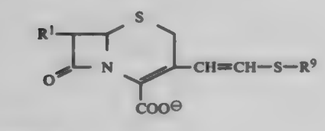
Division of Ser. No. 556,413, Nov. 30, 1983, Pat. No. 4,584,290. This application Jan. 31, 1986, Ser. No. 824,969

Claims priority, application United Kingdom, Dec. 6, 1982, 8234755; Jan. 5, 1983, 8300122; Jun. 28, 1983, 8317496; Nov. 8, 1983, 8329768

Int. Cl.[4] C07D *501/24;* A61K *31/54*

U.S. Cl. 514—202 **6 Claims**

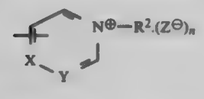
1. A cephem compound of the formula:



wherein

R^1 is amino, and

R^9 is a group of the formula:



wherein

R^2 is lower alkyl, amino(lower)alkyl, hydroxy(lower)alkyl, carboxy(lower)alkyl, di(lower)alkylamino(lower)alkyl, morpholino(lower)alkyl, lower alkylpiperazinyl(lower)alkyl, lower alkylpiperazinylcarbonyl(lower)alkyl or formimidoylamino(lower)alkyl,

X is CH or N,

Z is alkanoyloxy, azido or halogen,

Y is CH or N and n is 0; or

Y is $N^{\oplus}$—R^2 wherein R^2 is as defined above and n is 1, or a group of the formula:

$$—A—N^{\oplus}(R^{10})_3$$

wherein

R^{10} is lower alkyl and

A is lower alkylene,

and pharmaceutically acceptable salts thereof.

4,719,207

CNS ACTIVE SUBSTITUTED AZETIDINONE COMPOUNDS

Toshinari Tamura; Makoto Yoshida, both of Saitama; Shin-ichi Tsukamoto, Tokyo; Hidenori Iwamoto, Saitama; Minoru Yamamoto, Kanagawa, and Soichi Kagami, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

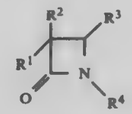
Filed Jun. 20, 1985, Ser. No. 747,018

Claims priority, application Japan, Jun. 25, 1984, 59-129220; Jul. 17, 1984, 59-148173; Sep. 25, 1984, 59-199827; Sep. 25, 1984, 59-199828

Int. Cl.[4] A61K *31/415;* C07D *403/12, 403/14*

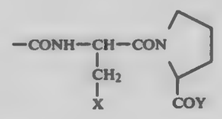
U.S. Cl. 514—210 **7 Claims**

1. A substituted azetidinone compound shown by the formula (I):

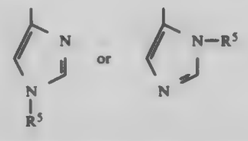


(I)

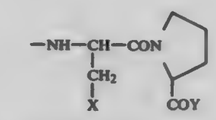
wherein one of R^1 and R^2 represents a hydroxy lower alkyl group, a phenyl lower alkyl group, an azido group, an amino group, a lower alkanoyl amino group, a mercapto group or a lower alkylthio group and the other represents a hydrogen group, or, both represent a hydrogen atom or a lower alkyl group; R^3 represents a hydrogen atom or a group shown by the formula:



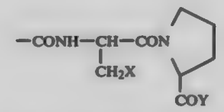
wherein X represents



wherein R^5 represents a hydrogen atom or a lower alkyl group and Y represents a hydroxy group, a lower alkoxy group, an amino group, a mono- or di-lower alkylamino group; R^4 represents a hydrogen atom, lower alkyl group, a hydroxy lower alkyl group or a group shown by the formula: —CH_2CO—A wherein A represents an amino group or a group shown by formula:



wherein X and Y are as defined above, provided that when R^1 and R^2 are the same or different and each is a hydrogen atom or a methyl group, R^4 represents a group other than a hydrogen atom or methyl; and provided that when R^3 is a hydrogen atom, R^4 is a group shown by formula —CH_2CO—A; and when R^4 is a hydrogen atom, R^3 is a group shown by formula



wherein A, X and Y are as defined above, or a salt thereof.

7. A medicament formulation which has a beneficial action on the central nervous system, said formulation comprised of, in single dose form, from 0.001 to 10 milligrams of the azetidinone compound of claim 1, and a pharmaceutically acceptable carrier.

4,719,208

1,2,3,4,5,6-HEXAHYDROAZEPINO(4,5-B)INDOLE DERIVATIVES, THEIR PREPARATION, INTERMEDIATE COMPOUNDS, AND THEIR APPLICATION IN THERAPEUTICS

Jean-Alfred A. Hannart, Dion-Valmont; Jean-Paul Dejonghe, Wavre; Danielle De Campeneere, Rixensart, and Jean-Marie Maloteaux, Les Bons Villers, all of Belgium, assignors to Omnichem Societe Anonyme, Brussels, Belgium

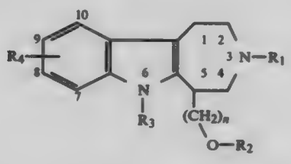
Filed May 9, 1986, Ser. No. 861,524

Claims priority, application Luxembourg, May 10, 1985, 85894

Int. Cl.[4] A61K *31/55;* C07D *487/04*

U.S. Cl. 514—215 **22 Claims**

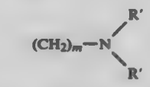
1. A 1,2,3,4,5,6-hexahydro-5-hydroxyalkylazepino[4,5-b]-indole of the formula:



I

in which

R_1 denotes a hydrogen atom, a lower alkyl radical having from 1 to 5 carbon atoms, a lower akenyl radical having from 1 to 5 carbon atoms, benzyl radical, an alkylamino radical of the formula



where the groups R′ are either hydrogen atoms or lower alkyl radicals having from 1 to 5 carbon atoms of form, together with the nitrogen atom to which they are attached, a heterocyclic nucleus of the morpholinyl, piperidinyl, pyrrolidinyl or piperazinyl type, and m is 2 or 3,

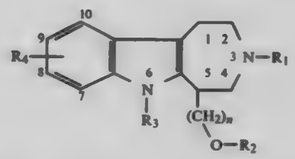
R_2 denotes a hydrogen atom or acyl radical of from 1 to 7 carbon atoms,

R_3 denotes a hydrogen atom or a lower alkyl having from 1 to 2 carbon atoms or benzyl radical,

R_4 denotes a hydrogen or halogen atom, a lower alkyl radical having from 1 to 5 carbon atoms, a lower alkoxy radical having from 1 to 5 carbon atoms or a trifluoromethyl radical, and n is 1 or 2, and pharmaceutically acceptable acid addition salts.

21. Pharmaceutical preparation for the treatment of vigilance disorders including behavioral disorders attributable to cerebral vascular damage and to cerebral sclerosis in geriatrics comprising at least one of the compounds or salts thereof comprising:

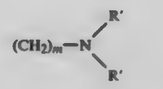
1,2,3,4,5,6-hexahydro-5-hydroxalkylazepino[4,5-b]-indole of formula:



I

in which

R_1 denotes a hydrogen atom, a lower alkyl radical having from 1 to 5 carbon atoms, a lower alkenyl radical having from 1 to 5 carbon atoms, a benzyl radical, an alkylamino radical of the formula



where the groups R′ are either hydrogen atoms or lower alkyl radicals having from 1 to 5 carbon atoms or form, together with the nitrogen atom to which they are attached, a heterocyclic nucleus of the morpholinyl, piperidinyl, pyrrolidinyl or piperazinyl type, and m is 2 or 3;

R_2 denotes a hydrogen atom or acyl radical of from 1 to 7 carbon atoms;

R_3 denotes a hydrogen atom or a lower alkyl having from 1 to 2 carbon atoms or benzyl radical;

R_4 denotes a hydrogen or halogen atom, a lower alkyl radical having from 1 to 5 carbon atoms, a lower alkoxy radical having from 1 to 5 carbon atoms or a trifluoromethyl radical; and n is 1 or 2, and pharmaceutically acceptable acid addition salts wherein n=1 including the steps of:

a lower alkoxy radical having from 1 to 5 carbon atoms or a trifluoromethyl radical; and n is 1 or 2, and pharmaceutically acceptable acid addition salts in combination with conventional excipients for permitting oral or parenteral administration.

4,719,209

ANTIATHEROSCLEROTIC AGENT COMPOSITIONS

Tadashi Sasaki, Tokyo; Yoshihiro Fujikawa, Funabashi; Ryozo Sakoda, Kashiwa; Mitsuaki Sakashita, Urawa, and Morihide Hibi, Sagamihara, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 640,120, Aug. 13, 1984, Pat. No. 4,624,950. This application Jul. 2, 1986, Ser. No. 862,965

Claims priority, application Japan, Aug. 19, 1983, 58-152339; Jan. 26, 1984, 59-13044

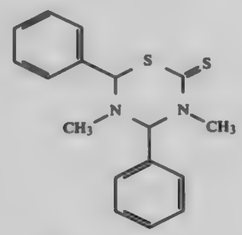
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/38*

U.S. Cl. 514—222 4 Claims

1. An atherosclerosis reducing pharmaceutical composition comprising an atherosclerosis reducing effective amount of 3,5-dimethyl-4,6-diphenyl-tetrahydro-2H-1,3,5-thiadiazine-2-thione having the formula:

(I)



and a pharmaceutically acceptable carrier.

4,719,210

3-VINYL AND 3-THYINYL-BETA-CARBOLINES, AND THEIR USE AS BENZODIAZEPINE RECEPTOR ANTAGONISTS OR AGONISTS

Dieter Seidelmann; Andreas Huth; Ralph Schmiechen; Rudolf Wiechert; Herbert Schneider, and David N. Stephens, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,360

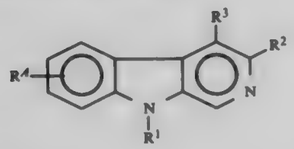
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535927

Int. Cl.[4] A61K *31/435, 31/38, 31/495;* C07D *471/04*

U.S. Cl. 514—222 14 Claims

1. A compound of the formula

(I)



wherein

R^1 is hydrogen or an alkyl, acyl, aralkyl, arylsulfonyl, or trialkylsilyl amino protective group,

R_2 is $-CH=C(R^6)_2$ or $-=CR^4$

R^4 is hydrogen or halogen,

R^3 is hydrogen, lower alkyl or lower alkoxyalkyl,

R^4 is OR^7, lower alkyl, or lower alkyl which is substituted by C_{6-10} aryl, substituted C_{6-10}-aryl as defined below, lower alkoxy or, NR_5R_6,

R_5 and R_6 are the same or different and are hydrogen, lower alkyl or together with the connecting nitrogen atom form pyrrolidine, piperazine, morpholine, thiomorpholine or piperidine,

R^7 is lower alkyl, C_{6-10}-aryl, C_{6-10}-ar-C_{1-4}-alkyl, or C_{6-10}-aryl or C_{6-10}-ar-C_{1-4}-alkyl each substituted by halogen, C_{1-2}-alkyl or C_{1-2}-alkoxy,

n is 0–4 and

C_{6-10}-aryl is phenyl or naphthyl.

11. A method of binding a benzodiazepine receptor in a patient in need of such treatment comprising administering to the patient an amount of a compound of claim 1 effective for such treatment.

4,719,211

2,3,4,9-TETRAHYDRO-2-HETEROARYLALKYL-1H-PYRIDO(3,4-B)INDOLES HAVING ANTIHYPERTENSIVE PROPERTIES

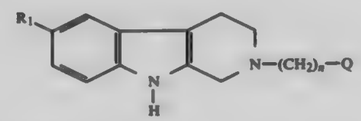
Magid A. Abou-Gharbia, Wilmington, Del., and Meier E. Freed, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 605,944, May 1, 1984, abandoned. This application Mar. 7, 1986, Ser. No. 837,612

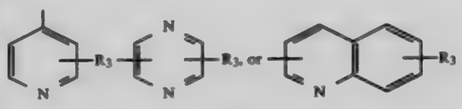
Int. Cl.[4] A61K *31/495;* C07D *471/06*

U.S. Cl. 514—253 21 Claims

1. A compound of the formula:



wherein Q represents

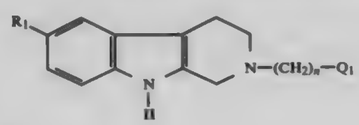


in which R_3 is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, or —COO(C_{1-2}) alkyl, and n is an integer from 1 to 7; and R_1 is a hydrogen, halogen, hydroxy, or C_{1-3} alkyl, or physiologically acceptable acid addition salts thereof, providing however, that when n is 1, Q may not be quinolinyl.

9. A method of treating hypertension comprising administering to a mammal in need thereof an antihypertensively effective amount of a compound of claim 1.

17. A method of producing a psychotropic response in a human or animal subject suffering from a condition for which a psychotropic response would be therapeutic, coprising parentally adminsistering the said subject a psychotropically effective, non-toxic amount of a compound of the formula

XX



wherein

n is an interger from 1 to 7;

R_1 is hydrogen, halogen, hydroxy, or C_{1-3} alkyl; and

Q_1 is 2- or 3-pyridinyl,

or physiologically acceptable acid addition salts thereof.

4,719,212

THERAPEUTIC AGENT FOR MEMORY DISTURBANCE

Masayoshi Goto, Tokyo; Nobutaka Demura, Kawagoe, and Takashi Sakaguchi, Tokorozawa, all of Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 783,080, Oct. 2, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 948,444

Claims priority, application Japan, Apr. 5, 1985, 60-71188

Int. Cl.[4] A61K *31/52*

U.S. Cl. 514—263 10 Claims

1. A method for treating a patient suffering from Alzheimer's dementia which comprises administering to such patient a pharmaceutical composition comprising as the essential ingredient an effective amount of 1,2,3,6-tetrahydro-3-methyl-1-(5-oxohexyl)-7-propyl-purine-2,6-dione.

4,719,213

ANTI-CANCER COMPOSITION FOR DELIVERING 5-FLUOROURACIL

Setsuro Fujii, Toyonaka; Norio Uneni, and Setsuo Takeda, both of Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Division of Ser. No. 591,459, Mar. 20, 1986, Pat. No. 4,622,325, which is a division of Ser. No. 214,022, Dec. 8, 1980, Pat. No. 4,507,301, which is a continuation-in-part of Ser. No. 15,161, Feb. 26, 1979, Pat. No. 4,328,229, which is a continuation-in-part of Ser. No. 891,343, Mar. 29, 1977, abandoned. This application Aug. 28, 1986, Ser. No. 901,202

Claims priority, application Japan, Apr. 5, 1977, 52-39341; Jan. 10, 1978, 53-14676

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—274 9 Claims

1. Anti-cancer composition for delivering 5-fluorouracil to cancer tissues in a warm-blooded animal, wherein the cancer is a cancer sensitive to 5-fluorouracil, said composition comprising uradil or pharmaceutically acceptable salt thereof and a 5-fluorouracil pro drug selected from the group consisting of 1,3-bis(2-tetrahydrofuryl)-5-fluorouracil and 3-(2-tetrahydrofuryl)-5-fluorouracil in a small amount of about 0.01 to less than 0.1 mole per mole of the uracil or salt thereof.

4,719,214

CARBOCYCLIC ANALOGUES OF THYMINE NUCLEOSIDES

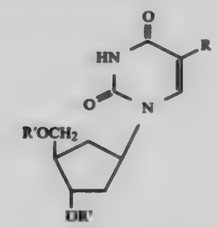
Y. Fulmer Shealy, and C. Allen O'Dell, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Jul. 25, 1985, Ser. No. 758,719

Int. Cl.[4] A61K *31/505;* C07D *239/26*

U.S. Cl. 514—274 15 Claims

1. A compound having the formula



wherein

R is a group having the formula $-C{=}CSi(CH_3)_3$, $-C{=}CH$, $-CH{=}CH_2$, $-CH_2CH_2Si(CH_3)_3$ or $-CH_2X$;

X is bromo, chloro or iodo; and

R′ is hydrogen, an acetyl group or a benzoyl group, with the proviso that when R is $-CH_2X$, R′ is an acetyl group or a benzoyl group.

4,719,215

QUATERNARY DERIVATIVES OF NOROXYMORPHONE WHICH RELIEVE NAUSEA AND EMESIS

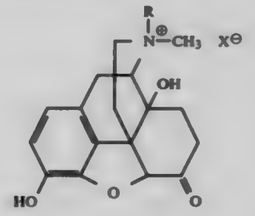
Leon I. Goldberg, Chicago, Ill., assignor to University of Chicago, Chicago, Ill.

Filed Mar. 7, 1986, Ser. No. 837,399

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 11 Claims

1. A method for preveating or relieving nausea and emesis associated with the use of narcotic analgesics in warm-blooded animals, which comprises administering to an animal prone towards nausea or emesis on receiving narcotic analgesics, an effective amount of at least one nausea and emesis relieving compound of the formula:



wherein

R is allyl or a related radical such as chloroallyl, cyclopropylmethyl or propargyl, and

X is the anion of an acid, especially a chloride, bromide, iodide or methylsulfate anion, prior to or simultaneously with administration of the narcotic analgesic.

4,719,216

HEXAHYDROPYRROLO(2,1-A)ISOQUINOLINE DERIVATIVES AS ANTIDEPRESSANTS

Bruce E. Maryanoff, New Hope, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation of Ser. No. 611,646, Apr. 18, 1984, Pat. No. 4,595,688, which is a continuation-in-part of Ser. No. 507,290, Jun. 23, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 839,746

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/47;* C07D *451/00*

U.S. Cl. 514—292 6 Claims

1. A psychotrophic pharmaceutical composition comprising a psychotropically effective amount of the free base or acid addition salt of 1,2,3,5,6,10bβ-hexahydro-6α-[(3-trifluoromethyl)phenyl]pyrrolo[2,1-a]isoquinoline in combination with a pharmaceutically acceptable diluent or carrier.

4. A method of treating depression in a mammal which comprises administering to the mammal the pharmaceutical composition of claim 1.

4,719,217

CERTAIN N-AZABICYCLOALKYL-BENZAMIDES USEFUL IN THE TREATMENT OF IMPAIRED GASTRO-INTESTINAL MOTILITY OR EMESIS

Francis D. King, Bishop's Stortford, and Michael S. Hadley, Sawbridgeworth, both of England, assignors to Beecham Group p.l.c., Brentford, England

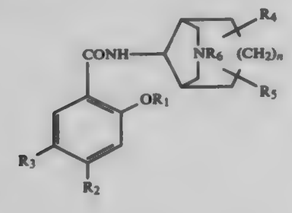
Filed Jun. 26, 1986, Ser. No. 878,993

Claims priority, application United Kingdom, Jun. 28, 1985, 8516371

Int. Cl.[4] A61K *31/445;* C07D *471/08*

U.S. Cl. 514—299 8 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

R_1 is C_{1-6} alkyl;

R_2 is amino or C_{1-7} acylamino;

R_3 is halo or C_{1-6} alkylthio;

R_4 and R_5 are independently selected from hydrogen, C_{1-6} alkyl, phenyl or phenyl C_{1-4} alkyl any of which phenyl moieties may be substituted by one or two of halo, CF_3, C_{1-6} alkoxy or C_{1-6} alkyl;

R_6 is C_{1-7} alkyl, $—(CH_2)_tR_8$, t being 0 to 2 and R_7 being C_{3-8} cycloalkyl, $—(CH_2)_tR_8$, t being 1 or 2 and R_8 being thienyl or phenyl optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy and C_{1-4} alkyl optionally substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolysable acyloxy, wherein esterified carboxy is selected from the group consisting of C_{1-4} alkoxy carbonyl, phenoxy carbonyl or benzyloxy carbonyl, either being optionally substituted in the phenyl ring by one or two substituents selected from C_{1-4} alky, C_{1-4} alkoxy, trifluoromethyl, halogen or nitro and in vivo hydrolysable acyloxy is selected from the group consisting of C_{2-6} alkanoyloxy, benzoyloxy or benzene sulphonloxy, either being optionally substituted in the phenyl ring by one or two substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, trifluoromethyl, halogen or nitro, or sulphonyloxy groups; and n is 0 to 3.

3. A method of treatment or prophylaxis of disorders relating to impaired gastro-intestinal motility or emesis in mammals, which comprises the administration of an effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,719,218

PYRROLO[1,2-A]IMIDAZOLE AND PYRROLO[1,2-A]PYRIDINE DERIVATIVES AND THEIR USE AS 5-LIPOXYGENASE PATHWAY INHIBITOR

Paul E. Bender, Cherry Hill, N.J., and Nabil Hanna, Berwyn, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

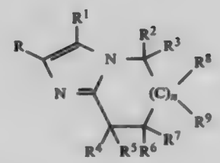
Continuation-in-part of Ser. No. 806,595, Dec. 12, 1985, abandoned. This application Apr. 28, 1986, Ser. No. 856,928

Int. Cl.[4] A61K *31/415;* C07D *471/04, 487/04*

U.S. Cl. 514—300 32 Claims

1. A compound of the formula

FORMULA (I)



wherein:

n is 0 or 1;

one of R or R^1 must be pyridyl and the other is selected from:

(a) monosubstituted phenyl wherein said substitutent is selected from H, halo, C_{1-3} alkoxy, C_{1-3} alkylthio, C_{1-4} alkyl, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl, C_{1-3} alkylamino, C_{1-3} dialkylamino, CF_3, [N-(C_{1-3} alkyl)-N-(C_{1-3} alkanamido),] N-(azacyclo C_{5-6} alkyl), prop-2-ene-1-oxy or 2,2,2-trihaloethoxy;

(b) disubstituted phenyl wherein said substituents are the same and are selected from halo, C_{1-3} alkoxy, C_{1-3} alkylamino, C_{1-3} dialkylamino, N-(azacyclo C_{5-6} alkyl), 2,2,2-trihaloethoxy, prop-2-ene-1-oxy, or the disubstituents together form a methylene dioxy group; or

(c) disubstituted phenyl wherein said substituents are not the same and are independently selected from C_{1-3} alkylamino, C_{1-3} dialkylamino, or N-(azacyclo C_{5-6} alkyl); and

(d) disubstituted phenyl wherein one of said substituents must be C_{1-3} alkoxy, hydroxy, 2,2,2-trihaloethoxy or prop-2-ene-1-oxy and the other substitutent is independently selected from halo, C_{1-3} alkylamino, N-(C_{1-3}alkyl)-N-C_{1-3}alkanamido), C_{1-3}dialkylamino, amino, or N-(azacyclo C_{5-6}alkyl); and R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are H, or one or two of R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are independently selected from H or C_{1-2} alkyl; provided that:

(1) when R^1 is 2 or 3-pyridyl and R is monosubstituted phenyl, the substituent is selected from other than bromo, iodo, C_{1-3} alkylthio, C_{1-3} alkylsulfinyl or C_{1-3} alkylsulfonyl;

(2) when R^1 is 2 or 3-pyridyl and R is disubstituted phenyl, the disubstituents are both selected from other than bromo, or iodo;

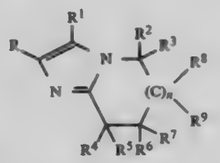
(3) when R is 2, 3 or 4-pyridyl and R^1 is monosubstituted phenyl, the substituents are selected from other than bromo, iodo, C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl; and

(4) when R is 2, 3 or 4-pyridyl and R^1 is disubstituted phenyl, the substituents are both selected from other than bromo, or iodo;

or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical composition comprising a pharmaceutically acceptable carrier or diluent and an effective, non-toxic 5-lipoxygenase pathway inhibiting amount of a compound of the formula

FORMULA (IA)



wherein:

n is 0 or 1;

One of R or R^1 must be pyridyl and the other is selected from:

(a) monosubstituted phenyl wherein said substitutent is selected from H, halo, C_{1-3} alkoxy, C_{1-3} alkylthio, C_{1-4} alkyl, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl, C_{1-3} alkylamino, C_{1-3} dialkylamino, CF_3, N-(azacyclo C_{5-6} alkyl), prop-2-ene-1-oxy or 2,2,2-trihaloethoxy;

(b) disubstituted phenyl wherein said substituents are the same and are selected from halo, C_{1-3} alkoxy, C_{1-3} alkylamino, C_{1-3} dialkylamino, N-(azacyclo C_{5-6} alkyl), 2,2,2-trihaloethoxy, prop-2-ene-1-oxy, or the disubstituents together form a methylene dioxy group; or

(c) disubstituted phenyl wherein said substituents are not the same and are independently selected from C_{1-3} alkylamino, C_{1-3} dialkylamino, or N-(azacyclo C_{5-6} alkyl), or

(d) disubstituted phenyl wherein one of said substituents must be C_{1-3} alkoxy, hydroxy, 2,2,2-trihaloethoxy or prop-2-ene-1-oxy and the other substituent is independently selected from halo, C_{1-3} alkylamino, N-(C_{1-3} alkyl)-N-(C_{1-3} alkanamido), C_{1-3} dialkylamino, amino, or N-(azacyclo C_{5-6} alkyl); and R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are H or one or two of R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are independently selected from H or C_{1-2} alkyl; provided that:

(1) when R^1 is 2 or 3-pyridyl and R is monosubstituted phenyl, the substituent is selected from other than bromo, iodo, C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl;

(2) when R^1 is 2 or 3-pyridyl and R is disubstituted phenyl, the disubstituents are both selected from other than bromo or iodo;

(3) when R is 2, 3 or 4-pyridyl and R^1 is monosubstituted phenyl, the substituents are selected from other than bromo, iodo, C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl; and

(4) when R is 2, 3 or 4-pyridyl and R^1 is disubstituted phenyl, the substituents are both selected from other than bromo or iodo;

or a pharmaceutically acceptable salt thereof.

4,719,219

PHENYL-AZACYCLOALKANES AND USE THEREOF IN TREATMENT OF CENTRAL NERVOUS SYSTEM DISORDERS

Folke L. E. Arvidsson, Upsala; Per A. E. Carlsson, Torild Wulffgatan, 50 S-413 19 Gothenburg; Uli A. Hacksell, Upsala; John S. M. Hjorth, Gothenburg; Per L. Lindberg, Askim; John L. G. Nilsson, Tullinge; Domingo Sanchez, Floda; Nils U. E. Svensson, Brunna, and Hakan V. Wikstrom, Gothenburg, all of Sweden, assignors to Per A. E. Carlsson, Gothenburg, Sweden

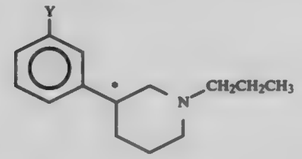
Continuation-in-part of Ser. No. 480,089, Mar. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 461,504, Jan. 27, 1983, abandoned, which is a continuation of Ser. No. 213,633, Dec. 5, 1980, Pat. No. 4,426,386. This application Oct. 1, 1984, Ser. No. 656,616

Claims priority, application Sweden, Mar. 30, 1982, 82-02023; Sep. 30, 1983, 83-05362

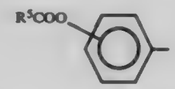
Int. Cl.[4] C07D *211/20, 211/32, 211/34, 211/22*

U.S. Cl. 514—317 20 Claims

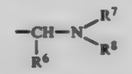
1. A pure (−)-enantiomer having an asymmetric carbon atom (*) of the formula



wherein Y is OH, R^1COO, R^2R^3NCOO—or R^4O whereby R^1 is an aliphatic hydrocarbon residue having 1–17 carbon atoms, a phenyl, 2,6-dimethylphenyl or 3- or 4-hydroxyphenyl group or a 3- or 4-alkanoyloxyphenyl group with the formula



wherein R^5 is an alkyl group having 1–6 carbon atoms, or R^1 is a group



wherein R^6 is hydrogen, an alkyol group having 1 to 5 carbon atoms or a phenyl group, R^7 is hydrogen, an alkyl group having 1 to 5 carbon atoms or a formyl, acetyl, benzoyl, methoxycarbonyl, phenoxycarbonyl or benzyloxycarbonyl group, and R^8 is hydrogen or an alkyl group having 1 to 5 carbon atoms, R^2 is hydrogen, an alkyl group having 1–5 carbon atoms, a phenethyl, benzyl or phenyl group which may be mono- or disubstituted in the aromatic part with a methyl, methoxy, hydroxy, nitro or cyano group or a halogen, R^3 is H, and alkyl group having 1 to 5 carbon atoms or a phenyl group or R^2 and R^3 together form the group $—(CH_2)_5—$, and R^4 is an allyl or benzyl group, as the base or a pharmaceutically acceptable acid addition salt thereof.

7. A method of treatment of disorders in the central nervous system associated with a pathological increase in central dopamine transmission comprising administering to a host in need of treatment a therapeutically effective amount of a pure (−)-enantiomer according to claim 1.

4,719,220

15(R)-5-FLUOROPROSTACYCLINS, PHARMACEUTICAL COMPOSITIONS AND ANTI-THROMBOTIC METHODS OF USE THEREOF

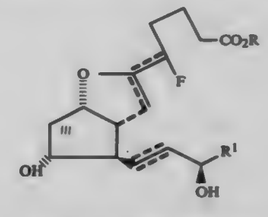
Stevan W. Djuric, Evanston, and Robert B. Garland, Northbrook, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 706,806, Feb. 28, 1985, Pat. No. 4,616,034. This application Jun. 25, 1986, Ser. No. 876,131

Int. Cl.[4] A61K *31/557;* C07D *307/935*

U.S. Cl. 514—337 9 Claims

1. A platelet anti-aggregatory compound of the formula:



wherein R represents hydrogen, lower alkyl, or a pharmaceutically acceptable cation;

wherein R^1 represents phenyl; or pyridyl;

and wherein the symbol ? between the 5-, 6-, and 7-positions indicates that a single or double bond exists between either the 5- and 6-positions or the 6- and 7-positions; and the symbol ? between the 13- and 14-positions indicates that a single, double, or triple bond exists between the 3- and 14-positions.

9. A method of promoting a platelet anti-aggregatory effect in a mammal in need thereof comprising administering thereto

an effective platelet anti-aggregatory non toxic amount of at least one compound according to claim 1.

4,719,221

2-ACETYLPYRIMIDINE-5-[(DIMETHYLAMINO)THIOCARBONYL]THIOCARBONOHYDRAZONE AND SALTS THEREOF

Jr. Morrison, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 27, 1984, Ser. No. 635,310

Claims priority, application United Kingdom, Jul. 28, 1983, 8320308

Int. Cl.[4] A61K *31/44*; C07D *213/59*

U.S. Cl. 514—357 **5 Claims**

1. 2-Acetylpyridine 5-[(dimethylamino)thiocarbonyl]thiocarbonohydrazone.

4. A topical pharmaceutical preparation comprising the compound of claim 1 together with a pharmaceutically acceptable topical carrier therefor.

4,719,222

PHARMACOLOGICALLY ACTIVE 5-OXO-1-IMIDAZOLIDINE ACETAMIDE COMPOUNDS

Mario Piazza, Milan; Carlo Farina, Como; Silvano Banfi, and Ugo Pfeiffer, both of Milan, all of Italy, assignors to Societe I.S.F. S.p.A., Milan, Italy

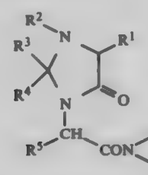
Filed Jun. 20, 1986, Ser. No. 876,959

Claims priority, application Italy, Jun. 21, 1985, 21235 A/85

Int. Cl.[4] C07D *233/36*; A61K *31/415*

U.S. Cl. 514—385 **13 Claims**

1. A compound of Structure (1)



(1)

wherein

R^1 is H, C_{1-5} alkyl (straight or branched), or a phenyl or benzyl group optionally substituted by C_{1-5} alkyl (straight or branched), C_{1-4} alkoxy (straight or branched) or hydroxy;

R^2 is H, OH, C_{1-5} alkyl (straight or branched), phenyl or naphthyl optionally substituted by C_{1-5} alkyl (straight or branched), C_{1-4} alkoxy (straight or branched), or hydroxy or C_{1-5} alkanoyl (straight or branched), benzoyl, or 4-methoxybenzoyl;

R^3 is H, C_{1-5} alkyl (straight or branched) or phenyl and R^4 is C_{1-5} alkyl (straight or branched) or phenyl, or R^3 and R^4 can together form a 1,4-butylene or 1,5-pentylene group, with the proviso that when R^3 is H, R^4 is C_{2-5} alkyl (straight or branched);

R^5 is H or C_{1-5} alkyl (straight or branched);

R^6 is H, C_{1-5} alkyl (straight or branched), $—CHR^8CONH_2$ or $—CHR^8CONHCHR^9CONH_2$; where R^8 and R^9 (which can be the same or different) are H or C_{1-5} alkyl (straight or branched); and

R^7 is H or C_{1-5} alkyl (straight or branched),

or a pharmaceutically acceptable salt thereof.

13. A method of restoring learning and treating memory difficulties which comprises administering to a mammal in need thereof a non-toxic effective amount of a compound of structure (1) or a pharmaceutically acceptable salt thereof.

4,719,223

IMIDAZOLETHIOL DOPAMINE-BETA-HYDROXYLASE INHIBITORS

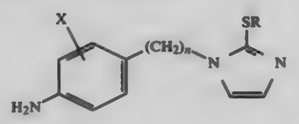
Carl Kaiser, Haddon Heights; Lawrence I. Kruse, Haddonfield, both of N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Oct. 31, 1985, Ser. No. 793,512

Int. Cl.[4] A61K *31/415*; C07D *233/42*

U.S. Cl. 514—392 **13 Claims**

1. A compound of the Formula:



in which:

X is hydrogen, bromo, chloro, fluoro, iodo or any combination thereof of up to four substituents;

n is 0–5; and

R is hydrogen or C_{1-4} alkyl; or a pharmaceutically acceptable salt or hydrate thereof.

6. A pharmaceutical composition for inhibiting dopamine-β-hydroxylase activity, comprising a pharmaceutically acceptable carrier and an amount sufficient to produce said inhibition of a compound of claim 1.

4,719,224

ANTI-INFLAMMATORY AND ANALGESIG THIOPHENE ACETIC ACID DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Francois Clemence; Odile Le Martret, both of Paris, and Francoise Delevallee, Fontenay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

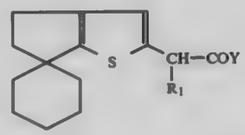
Filed Mar. 6, 1986, Ser. No. 836,844

Claims priority, application France, Mar. 12, 1985, 85 03584

Int. Cl.[4] A61K *31/38*; C07D *401/12, 413/12, 333/78*

U.S. Cl. 514—443 **22 Claims**

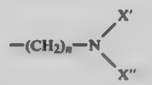
1. A compound selected from the group consisting of optically active isomers or racemic mixtures of thiophene acetic acid derivatives of the formula



wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, Y is selected from the group consisting of $—OR_2$ and



R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and



is an integer from 2 to 5, X' and X'' are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_3 and R_4 are individually selected from the

group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable salts with acids and bases.

12. An analgesic and anti-inflammatory composition comprising an analgesically and anti-inflammatorily effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

14. A method of relieving pain and inflammation in warm-blooded animals comprising administering to warm-blooded animals an analgesically and anti-inflammatorily effective amount of at least one compound of claim 1.

4,719,225

THIOPHENE RING-SUBSTITUTED α-(ALKYLAMINOPROPIONYL)-THIOPHENES AND THE METHOD FOR PREPARING THE SAME

Rafael Fogset; Ernesto Forne; Aurelio Sacristan, and Jose A. Ortiz, all of Barcelona, Spain, assignors to Ferrer Internacional S.A., Barcelona, Spain

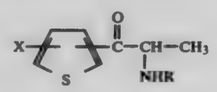
Continuation-in-part of Ser. No. 840,651, Mar. 17, 1986, abandoned. This application Dec. 1, 1986, Ser. No. 936,706

Claims priority, application Spain, Mar. 20, 1985, 541911

Int. Cl.[4] A61K *31/38*; C07D *333/22*

U.S. Cl. 514—448 **11 Claims**

1. Thiophene ring-substituted α-(alkylaminopropionyl)thiophenes represented by the general formula (I):



(I)

wherein X is methyl or chlorine,

R is alkyl, linear or branched, having 3 to 4 carbon atoms and pharmacologically-acceptable salts thereof.

4,719,226

PERCUTANEOUS ABSORPTION TYPE PREPARATION AND PROCESS FOR PREPARING THE SAME

Saburo Otsuka; Yusuke Ito; Shoichi Tokuda; Takashi Kinoshita, and Keisuke Shibata, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 31, 1984, Ser. No. 687,898

Claims priority, application Japan, Mar. 5, 1984, 59-42641

Int. Cl.[4] A61F *13/00, 13/02, 15/03*; A61L *9/70*

U.S. Cl. 514—449 **10 Claims**

1. A percutaneous absorption type preparation which comprises:

a backing which is readily conformable to skin or mucosa and is substantially impermeable to a drug absorbed through the skin or mucosa; and

an adhesive layer provided on the backing, which comprises a polymer which is pressure-adhesive at room temperature, and a drug present in the polymer, wherein the drug is present in the adhesive layer in an amount of at least 1.2 times its saturated solubility in the polymer and the excess amount of the drug greater than the saturated solubility is dispersed in the polymer in the form of recrystallized fine particles having a substantial uniform size, said percutaneous absorption type preparation having been produced by a process comprising the steps of:

dissolving uniformly a polymer which is pressure-adhesive at room temperature and a percutaneous absorption type drug which is solid at room temperature in an amount of at least 1.2 times its saturated solubility in the polymer in a good solvent to prepare a coating solution having a solids content of from about 10 to about 35% by weight;

coating the coating solution on the surface of a backing which is conformable to skin or mucosa and is substantially impermeable to the drug;

drying the coating solution, and recrystallizing and dispersing an amount of the drug greater than its saturated solubility in the polymer in the form of recrystallized fine particles having substantially uniform particle sizes.

4,719,227

IODOPROPARGYL CYCLIC ETHERS USEFUL AS MICROBICIDAL AGENTS

Gerold Schade, Cologne; Wilfried Paulus, Krefeld, and Hans-Georg Schmitt, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

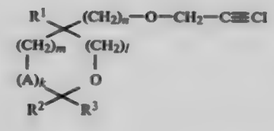
Filed Feb. 27, 1986, Ser. No. 834,287

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510203

Int. Cl.[4] A01N *43/32*; C07D *319/06*

U.S. Cl. 514—452 **9 Claims**

1. An iodopropargyl ether of the formula



wherein

A represents oxygen,

R^1 denotes hydrogen or lower alkyl,

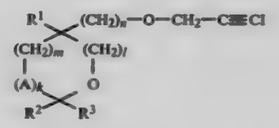
R^2 and R^3 are identical or different and represent hydrogen, lower alkyl, alkenyl or unsubstituted or halogen-substituted phenyl, or R^2 and R^3 together form a carbocyclic ring with 5 to 6 carbon atoms,

l and m represent 1,

k denotes 1, and

n denotes an integer from 0 to 4.

7. A microbicidal composition comprising a microbicidally effective amount of an iodopropargyl ether of the formula



wherein

A represents oxygen,

R^1 denotes hydrogen or lower alkyl,

R^2 and R^3 are identical or different and represent hydrogen, lower alkyl, alkenyl or unsubstituted or halogen-substituted phenyl, or together form a carbocyclic ring with 5 to 6 carbon atoms,

l and m represent 1,

k denotes 1, and

n denotes an integer from 0 to 4, and an extender, said extender selected from the group consisting of a liquid solvent, a solid carrier, a surface active agent and mixtures thereof.

4,719,228

PHARMACEUTICAL COMPOSITION

David A. Rawlins, 23 Harwood Close, Tewin, Hertfordshire, England, assignor to David A. Rawlins, Hertfordshire, England

Filed May 21, 1985, Ser. No. 736,337

Claims priority, application United Kingdom, May 23, 1984, 8413191

Int. Cl.[4] A61K *31/35, 47/00*

U.S. Cl. 514—456 **12 Claims**

1. A pharmaceutical composition comprising a freely flowable powder, the powder comprising a porous, high absorption silica or silicate having a mean particle size of at least 10 μm in

diameter and having absorbed therein at least 10% by volume of a liquid, anti-hypertensive composition, based on the weight of powder plus liquid; said liquid, pharmacuetically active composition comprising the pharmaceutically active ingredient in a liquid diluent of carrier.

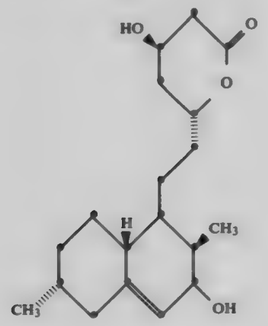
4,719,229

ANTIHYPERCHOLESTEROLEMIC AGENTS

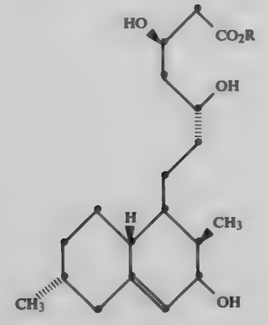
Robert A. Reamer, Bloomfield, and Laszlo R. Treiber, Gillette, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 13, 1987, Ser. No. 49,191
Int. Cl.[4] A61K *31/365*
U.S. Cl. 514—460 **7 Claims**

1. A compound represented by the following general structural formulae (I) or (II):



(II)



(I)

wherein R is hydrogen, C_{1-5} alkyl or C_{1-5} alkyl substituted with a member of the group consisting of phenyl, dimethylamino or acetylamino, or a pharmaceutically acceptable salt of the compound (I) in which R is hydrogen.

6. A hypocholesterolimic, hypolipidemic pharmaceutical composition comprising a nontoxic therapeutically effective amount of a compound of claim 1 in combination with a pharmaceutically acceptable nontoxic cationic polymer capable of binding bile acids in a non-reabsorbable form in the gastrointestinal tract and a pharmaceutically acceptable carrier.

Patent Not Issued For This Number
4,719,230

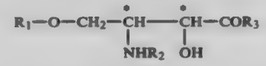
4,719,231

3-[N-(MERCAPTOACYL)]AMINO-4-ARYLBUTANOIC ACID DERIVATIVES AND AN ANALGESIC AGENT COMPRISING THE SAME

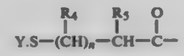
Hanao Umezawa; Tomio Takeuchi, both of Tokyo; Takaaki Aoyagi, Fujisawa; Mitsugu Hachisu, Yokohama; Manao Hirayama, Yokosuka; Shinjiro Murata, Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed May 20, 1985, Ser. No. 735,643
Claims priority, application Japan, May 25, 1984, 59-104669
Int. Cl.[4] C07C *153/017, 153/023, 149/41, 149/43*
U.S. Cl. 514—513 **6 Claims**

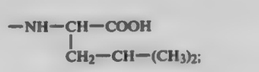
1. A 3-[N-(mercaptoacyl)]amino-4-arylbutanoic acid derivative of the general formula (1):



wherein R_1 is a hydrogen atom or a hydroxyl group; R_2 is an S-substituted or unsubstituted mercaptoloweralkanoyl group of the formula:



where Y is a hydrogen atom, a lower alkanoyl group or a benzoyl group; n is a whole number of zero or 1; R_4 is a hydrogen atom, a lower alkyl group or a phenyl group; R_5 is a hydrogen atom, a lower alkyl group, a phenyl group, a hydroxyl group or an amino group; and R_3 is a hydroxyl group, a lower alkoxyl group or a glycine residue of the formula —NH'CH_2—COOH or a leucine residue of the formula



and the asterik (*) denotes the R-configuration or the S-configuration or a combination thereof, or a pharmaceutically acceptable salt of said 3-[N-(mercaptoacyl)]amino 4-arylbutanoic acid derivative.

5. A method of therapeutically treating an animal feeling pain, including humans feeling pain, which comprises administering to the animal, a compound of the formula (1) as claimed in claim 1 or a compound of the formula (1a) as claimed in claim 2 or a pharmaceutically acceptable salt thereof, in a non-toxic and effective amount sufficient to reduce or eliminate the pain.

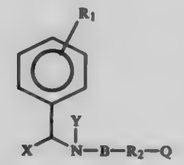
4,719,232

BENZOIC ACID AND BENZOIC ACID ESTER DERIVATIVES TO TREAT HEADACHES

Michael F. Rafferty, and Graham Johnson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 811,567, Dec. 20, 1985, Pat. No. 4,689,182.
This application Nov. 10, 1986, Ser. No. 928,956
Int. Cl.[4] A61K *31/24, 31/195*
U.S. Cl. 514—534 **1 Claim**

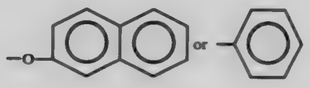
1. A method for treating headaches in mammals suffering therefrom which comprises administering to such mammal an antiheadache effective amount of a pharmaceutical composition comprising an effective amount of a compound of the formula:



wherein:
(a) R_1 is COOR' wherein R' is H or lower alkyl of one to four carbons, inclusive;
(b) B is



(c) X and Y are independently H or lower alkyl of one to four carbons, inclusive;
(d) R_2 is alkylene, alkenylene, alkynylene branched or linear chains of 1 to 11 carbons, inclusive;
(e) Q is CH_3, COOH, Br, NH_2, H, cyclohexyl,



or nontoxic, pharmaceutically acceptable acid addition or base salt thereof; and a pharmaceutically acceptable carrier.

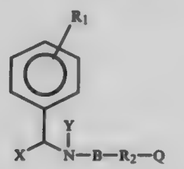
4,719,233

BENZOIC ACID AND BENZOIC ACID ESTER DERIVATIVES TO TREAT PAIN

Michael F. Rafferty, and Graham Johnson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 811,567, Dec. 20, 1985, Pat. No. 4,689,182.
This application Nov. 10, 1986, Ser. No. 929,035
Int. Cl.[4] A61U *31/24, 31/195*
U.S. Cl. 514—534 **1 Claim**

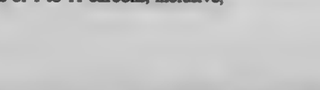
1. A method for treating pain in mammals suffering therefrom which comprises administering to such mammal an analgesic effective amount of a pharmaceutical composition comprising an effective amount of a compound of the formula:



wherein:
(a) R_1 is COOR' wherein R' is H or lower alkyl of one to four carbons, inclusive;
(b) B is



(c) X and Y are independently H or lower alkyl of one to four carbons, inclusive;
(d) R_2 is alkylene, alkenylene, alkynylene branched or linear chains of 1 to 11 carbons, inclusive;
(e) Q is CH_3, COOH, Br, NH_2, H, cyclohexyl,



or nontoxic, pharmaceutically acceptable acid addition or base salt thereof; and a pharmaceutically acceptable carrier.

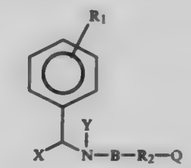
4,719,234

BENZOIC ACID AND BENZOIC ACID ESTER DERIVATIVES TO TREAT INFLAMMATION

Michael F. Rafferty, and Graham Johnson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 811,567, Dec. 20, 1985, Pat. No. 4,689,182.
This application Nov. 10, 1986, Ser. No. 929,258
Int. Cl.[4] A61K *31/24, 31/195*
U.S. Cl. 514—534 **1 Claim**

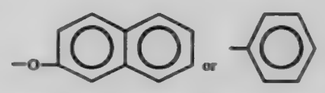
1. A method for treating pain in mammals suffering therefrom which comprises administering to such mammal an analgesic effective amount of a pharmaceutical composition comprising an effective amount of a compound of the formula:



wherein:
(a) R_1 is COOR' wherein R' is H or lower alkyl of one to four carbons, inclusive;
(b) B is



(c) X and Y are independently H or lower alkyl of one to four carbons, inclusive;
(d) R_2 is alkylene, alkenylene, alkynylene branched or linear chains of 1 to 11 carbons, inclusive;
(e) Q is CH_3, COOH, Br, NH_2, H, cyclohexyl,



or nontoxic, pharmaceutically acceptable acid addition or base salt thereof; and a pharmaceutically acceptable carrier.

4,719,235

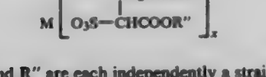
METHODS AND COMPOSITIONS FOR TREATING VIRAL INFECTION

Gerald N. Kern, 4631 Louis Ave., Encino, Calif. 91316, assignor to Gerald N. Kern, Encino, Calif.

Continuation-in-part of Ser. No. 661,396, Oct. 16, 1984, abandoned. This application May 8, 1985, Ser. No. 732,363
Int. Cl.[4] A61K *31/19, 9/70*
U.S. Cl. 514—547 **37 Claims**

1. A method for treating viral infections of animals and

humans caused by an enveloped virus, the method comprising the steps of administering to a human or animal infected with said enveloped virus an anti-viral dosage of a compound of the following formula:



wherein R' and R'' are each independently a straight chain or branched chain alkyl group having from 5 to 8 carbon atoms, M is Na, K or Ca, and x is 1 when M is Na or K and x is 2 when M is Ca.

4,719,236

PERYLENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 499,813, Jun. 1, 1983, Pat. No. 4,530,800. This application Oct. 17, 1984, Ser. No. 661,803

Claims priority, application United Kingdom, May 16, 1984, 8410584

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.[4] C07C *67/02, 87/455*

U.S. Cl. 514—577 **11 Claims**

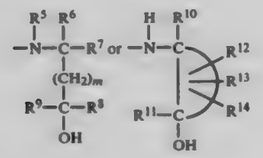
1. A compound of formula (I)

$ArCH_2R^1$ (I)

wherein

Ar is a perylene ring optionally substituted by one or two substituents, the substituents containing not more than four carbon atoms in total when taken together being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the perylene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy;

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;



is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl, and the ether, esters and acid addition salts thereof wherein said compounds of formula (I) contain no more than 30 carbon atoms.

4,719,237

CARDIAC ANTIARRYTHMIC METHOD EMPLOYING PROBUCOL

Donald McCaughan, Groveland, Mass., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 28, 1986, Ser. No. 823,551

Int. Cl.[4] A61K *31/10*

U.S. Cl. 514—712 **1 Claim**

1. A method for treating cardiac arrhythmias which comprises administering to an animal in need thereof a therapeutically effective amount of the compound probucol.

4,719,238

TREATMENT OF DISEASES WHICH CAUSE PATHOLOGICAL CORNIFICATION OF THE EPIDERMIS OF THE SKIN

Werner Bollag, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 874,935, Jun. 16, 1986, Pat. No. 4,689,350. This application Jun. 1, 1987, Ser. No. 56,072

Claims priority, application Switzerland, Jun. 28, 1985, 2753/85

Int. Cl.[4] A61K *31/015*

U.S. Cl. 514—765 **10 Claims**

1. A process for the treatment of diseases which cause pathological cornification of the epidermis of the skin comprising administering to patients suffering from said diseases, the compound 1,2,3,4-tetrahydro-1,1,4,4-tetramethyl-6-(alpha-methylstyryl)napthalene, said compound being administered in an amount effective to treat the disease.

4,719,239

PHARMACEUTICAL MULTICOMPONENT SYSTEMS AND METHOD OF PREPARING SAME

Bernd W. W. Muller, Schlotfeldtuberg 14a, 2302 Flintbek; Hans-Jurgen Franzky, von-Coels-Str. 1, 5100 Aachen, and Claus-Jurgen Kölln, Eichofstr. 9, 2300 Kiel, all of Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,424

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406497

Int. Cl.[4] A61K *47/00*

U.S. Cl. 514—785 **25 Claims**

1. A multicomponent system for pharmaceutical use comprising:

at least one pharmaceutically active agent,

0 to 70% by weight of at least one oil component,

2 to 60% by weight of at least one physiologically acceptable surfactant selected from the group consisting of non-ionic surfactants with an HLB value higher than 8 and amphoteric surfactants, and

0 to 78% by weight of at least one cosurfactant selected from the group consisting of partial esters and ethers of polyhydric alcohols with saturated or unsaturated fatty acids and fatty alcohols with 6 to 22 C-atoms said at least one cosurfactant being liquid below 40° C.,

wherein the individual components are present in such quantities in said system that at room temperature stable, liquid, single-phase systems are formed, which contain said at least one pharmaceutically active agent in dissolved form, and wherein the sum of said at least one oil component and said at least one cosurfactant is at least 10% by weight.

4,719,240

CERIUM PROMOTED FISCHER-TROPSCH CATALYSTS

Rocco A. Fiato, Scotch Plains, N.J.; Ronny Bar-Gadda, Palo Alto, Calif., and Sabato Miseo, Pittstown, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 754,004, Jul. 11, 1985, Pat. No. 4,657,885. This application Nov. 6, 1986, Ser. No. 927,700

Int. Cl.[4] C07C *1/04*

U.S. Cl. 518—717 **7 Claims**

1. A hydrocarbon synthesis process comprising contacting a feed stream of CO and H_2 in a molar ratio of about 0.5 to about 4:1 with a catalyst at a temperature in the range of about 200° to 350° C., a pressure in the range of about 1 to 50 atmospheres, a space velocity in the range of about 10 to 10,000 v/v/hour to produce a hydrocarbon product containing ethylene and ethane in which the ethylene/ethane mole ratio is greater than one, and recovering the product; the catalyst being comprised of a sintered composition containing:

(a) about 5–80 wt.% Fe oxide,

(b) about 4–20 wt.% Zn oxide,

(c) about 10–40 wt.% Ti and/or Mn oxide,

(d) about 1–5 wt.% of a Group IA metal oxide selected from the group consisting of K, Rb and Cs, and mixtures thereof,

(e) about 1–10 wt.% Ce oxide such that said sintered combination comprises a series of spinels of Fe, Zn and/or Ti, and/or Mn and said Group I A metal oxide in a Cerium oxide matrix.

4,719,241

DEIONIZATION SORBENT COMPRISED OF ION EXCHANGE RESIN AND POLYMER BINDER AND FERROMAGNETIC SUBSTANCE

Stephen F. Yates, Arlington Heights, Ill., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 20, 1985, Ser. No. 811,614

Int. Cl.[4] C08D *5/20*

U.S. Cl. 521—28 **9 Claims**

1. A method for the manufacture of a sorbent comprising at least one weakly basic ion exchange resin, a ferromagnetic substance, and a water permeable organic polymer binder, which method comprises

(a) mixing together said ferromagnetic substance with a polyurethane prepolymer;

(b) mixing together said ion exchange resin with water ;

(c) combining the mixture of step (a) with the mixture of step (b) to form a malleable mixture;

(d) drying said malleable mixture of step (c) to obtain a solid; and

(e) forming said solid to the desired size and shape and recovering the resultant sorbent.

4,719,242

DEIONIZATION SORBENT COMPRISED OF ION EXCHANGE RESIN AND POLYMER BINDER AND FERROMAGNETIC SUBSTANCE

Stephen F. Yates, Arlington Heights, and Santi Kulprathipanja, Hoffman Estates, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 20, 1985, Ser. No. 811,622

Int. Cl.[4] C08D *5/20*

U.S. Cl. 521—28 **17 Claims**

1. A method for the manufacture of a sorbent comprising at least one weakly basic ion exchange resin, a ferro-magnetic substance, and a water permeable organic polymer binder, which method comprises

(a) mixing together said resin, said ferromagnetic substance, said binder, and an organic solvent capable of dissolving said binder thereby forming a malleable mixture, said binder being selected from the group consisting of cellulose esters and cellulose ethers;

(b) removing said solvent from said mixture to obtain a dry solid;

(c) forming said solid to the desired size and shape; and

(d) recovering the resultant sorbent.

4,719,243

ORGANOSILOXANE FOAMS

David Pocknell, Antibes, France, assignor to Dow Corning France S.A., Valbonne, France

Filed Nov. 10, 1986, Ser. No. 928,939

Claims priority, application France, Nov. 12, 1985, 85 16653

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—91 **6 Claims**

1. A foamable composition comprising an organosilicon polymer including siloxane units providing a silicon-bonded hydroxyl group, an organosilicon polymer including siloxane units having a silicon-bonded hydrogen atom, a catalyst and finely divided filler material, the organosilicon polymers being such that they are capable of chemical reaction at room temperature in presence of the catalyst whereby hydrogen is evolved to cause the composition to foam and the composition becomes cured thus to provide a resilient foam characterised in that the foamable composition consists essentially of (a) 100 parts by weight α,ω-di-hydroxy polysiloxane having a viscosity in the range 0.5 to 25 Pa.s at 25° C., (b) 5 to 35 parts by weight trialkyl-siloxy endblocked alkylhydrogen polysiloxane, (c) 0 to 60 parts by weight of a low molecular weight dihydroxy polysiloxane containing no more than 25 R_2SiO units wherein R represents a lower alkyl group of 1 to 6 carbon atoms or a phenyl group, (d) 0 to 7 parts by weight of a cross-linking agent capable of combining with three or more hydroxy polysiloxane molecules, (e) 0 to 20 parts by weight of a monohydroxy silanol or siloxanol, (f) 5 to 35 parts by weight of finely divided filler which includes a major amount of silica which has been treated to render it hydrophobic, (g) 3 to 8 percent by weight of the ingredients (a) to (f) of a tin salt of a carboxylic acid as catalyst, optionally in admixture with material intended to provide propellant gas.

4,719,244

POLYISOCYANATE PREPARATIONS AND THEIR USE FOR THE PRODUCTION OF POLYURETHANE PLASTICS

Hanns P. Müller, Odenthal-Blecher; Bernhard Janssen, Cologne, and Rudolf Hombach, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,902

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610198

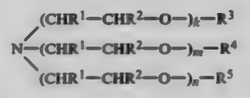
Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—115 **14 Claims**

1. A polyisocyanate composition comprising

(a) at least one organic polyisocyanate and

(b) at least one catalyst present in solution and corresponding to the formula



wherein

R^1 and R^2 are identical or different and denote hydrogen or a methyl group, provided that R^1 and R^2 do not both stand for a methyl group,

R^3, R^4 and R^5 denote identical or different organic groups which are inert in isocyanate addition reactions, and

k, m and n are identical or different integers having values from 1 to 5.

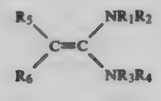
4,719,245

FLEXIBLE POLYISOCYANURATE-URETHANE FOAM

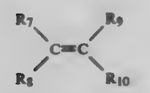
Dale F. Regelman, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 737,837, May 28, 1985, Pat. No. 4,632,989, which is a division of Ser. No. 587,429, Mar. 8, 1984, Pat. No. 4,536,490. This application Sep. 22, 1986, Ser. No. 909,546
Int. Cl.[4] C08J 9/00
U.S. Cl. 521—128 5 Claims

1. A flexible polyisocyanurate-urethan foam prepared by the reaction of an organic polyol, a blowing agent, a urethane catalyst, and a polyisocyanate prepolymer containing isocyanurate linkages prepared by catalytically trimerizing an aromatic polyisocyanate in the presence of a composition comprising a solution of the product obtained by reacting, in an inert solvent, substantially equimolar proportions of a ketene-aminal and an olefin having the respective formulae (I) and (II)



(I)



(II)

wherein R_1, R_2, R_3, and R_4 when taken separately are independently selected from the group consisting of lower-alkyl, aralkyl, cycloalkyl, and, when taken together as R_1 with R_2 and R_3 with R_4 with the respective nitrogen atoms to which they are attached represent independently heterocyclic groups having 6 or 7 ring atoms, R_5 and R_6 are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, R_7 and R_8 when taken separately are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, provided that R_7 and R_8 are not both hydrogen at the same time, and, R_7 and R_8, when taken together with the carbon atom to which they are attached represent a cyclic hydrocarbon group having 5 or 6 carbon atoms in the ring, and R_9 and R_{10} represent the same or different electron withdrawing groups.

4,719,246

POLYLACTIDE COMPOSITIONS

Joseph R. Murdoch, Wilmington, Del., and Gary L. Loomis, Drexel Hill, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1986, Ser. No. 944,588
Int. Cl.[4] C08J 9/28
U.S. Cl. 521—134 16 Claims

1. A porous polymeric composition comprising segments of poly(R-lactide) interlocked with segments of poly(S-lactide).

4,719,247

DEFORMABLE POLYURETHANE HAVING IMPROVED CURE TIME

Nai W. Lin, Mickleton, and Richard W. Niedt, Woodbury, both of N.J., assignors to ICI Americas Inc., Wilmington, Del.

Filed Feb. 10, 1987, Ser. No. 12,972
Int. Cl.[4] C09G 18/14
U.S. Cl. 521—159 52 Claims

1. A reaction system for use in making molded objects by an open or closed casting process, said system comprising the following components:

(A) an aromatic polyisocyanate; and

(B) an active hydrogen-containing composition comprising

(i) a polyhydric alcohol having an average molecular weight in the range of about 1000 to about 8000 and an average functionality of about 2 to about 4;

(ii) a polyhydric alcohol having 2 to 12 carbon atoms and an average functionality of about 2 to about 3; and

(iii) a secondary monoamine of the formula

R—NH—R'

wherein R and R' are independently saturated aliphatic groups having 1 to 20 carbon atoms, provided that R and R^1 together contain at least 4 carbon atoms,

the ratio of (A) to (B) being such that the reaction of said system is conducted at an isocyanate index between about 0.90 and about 1.15,

wherein said system, components (A) and (B), react to form a polyurethane partially capped with disubstituted urea groups.

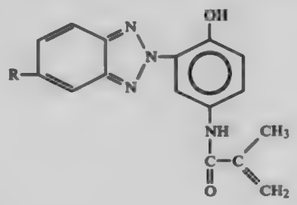
4,719,248

ULTRAVIOLET BLOCKING AGENTS FOR CONTACT LENSES

Ronald E. Bambury, Fairport, N.Y.; Jeon S. Park, Arlington, Tex., and Doug J. Choo, Seoul, Rep. of Korea, assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,947
Int. Cl.[4] G02B 1/04; G02C 7/04
U.S. Cl. 523—106 9 Claims

1. In a contact lens comprising a polymer formed by copolymerizing a first monomer suitable for use in making such lenses and a copolymerizable monomeric ultraviolet absorber, the improvement which comprises employing as the monomeric ultraviolet absorber about 0.25 to about 2% by weight of a compound selected from the group of compounds having the formula:



wherein R is Cl or OCH_3.

4,719,249

INTUMESCENT FOAMABLE COMPOSITIONS

John E. Dietlein, 528 Webb Dr., Bay City, Mich. 48603, and Thomas C. Hampton, 3008 Bay City Rd., Midland, Mich. 48640

Division of Ser. No. 942,746, Dec. 18, 1986, Pat. No. 4,686,244. This application Apr. 27, 1987, Ser. No. 43,266
Int. Cl.[4] C09K 21/14
U.S. Cl. 523—179 11 Claims

1. An intumescent material capable of forming and maintaining a barrier to the transmission of flame and smoke, said material comprising

100 parts by weight of a curable, filled polyorganosiloxane composition which is convertible upon curing to a flame retardant elastomer; and

from 1 to 70 parts by weight of expandable hollow microspheres formed from a thermoplastic organic polymer and containing therein a liquid having a boiling point of from 50° to about 200° C. under atmospheric pressure.

4,719,250

ENCAPSULATION OF ELECTRONIC COMPONENTS

Nancy C. Eickman, Mountainside; Charles E. McChesney, Monmouth Junction; Gary E. Williams, Short Hills, and Hyun-Nam Yoon, Summit, all of N.J., assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Division of Ser. No. 619,608, Jun. 18, 1984, Pat. No. 4,632,798, which is a continuation-in-part of Ser. No. 517,870, Jul. 27, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 872,009
Int. Cl.[4] C08K 3/34
U.S. Cl. 523—212 21 Claims

1. A molding composition which is particularly suited for use in the impervious encapsulation of an electronic component via injection molding comprising (a) a melt processable polyester which optionally may include amide linkages, is capable of forming an anisotropic melt phase and was formed through a polymerization reaction in a polymerization zone of ester-forming and optionally also amide-forming monomers to yield a polymer having recurring moieties selected from the group consisting of the following where in each instance Ar comprises at least one aromatic ring:

(a)



(b) —O—Ar—O—,

(c)



(d) —Y—Ar—Z—, where Y is O, NH, or NR, and Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group,

(e)



where Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group, and

(f) mixtures of the foregoing;

and wherein there was provided in the polymerization zone during said polymerization reaction an approximately 1 to 4 percent molar excess of aromatic dicarboxylic acid monomer and/or an esterified derivative thereof which during the polymerization reaction imparted dicarboxyaryl units to the interior of the polymer chains of the resulting polymer and caused the polymer chains to terminate in carboxylic acid end groups and/or an esterified derivative thereof wherein the polymer chains achieved the required molecular weight through the depletion of other monomers present in the polymerization zone to yield a polyester product which was substantially incapable of additional chain growth upon subsequent heating, has a weight average molecular weight of approximately 4,000 to 25,000, and which is substantially incapable of further chain growth upon heating, and (b) approximately 40 to 80 percent by weight based upon the total weight of the molding composition of a particulate inorganic material substantially uniformly dispersed in component (a) which is capable of decreasing the volumetric coefficient of thermal expansion and increasing the thermal conductivity of component (a).

4,719,251

SILICONE WATER BASE FIRE BARRIERS

John E. Dietlein, Bay City, and Jack R. Harper, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 19, 1985, Ser. No. 766,620
Int. Cl.[4] C08J 9/32; C08K 7/26, 7/02; C08L 83/04
U.S. Cl. 523—218 11 Claims

1. A composition, useful as a fire barrier, consisting essentially of a mixture of

(A) 100 parts by weight of an anionically stabilized silicone emulsion which is an aqueous, oil-in-water emulsion that cures upon drying at ambient temperature to an elastomeric film, the emulsion having a solids content of greater than 50 percent by weight,

(B) greater than 5 parts by weight of an expanded vermiculite, and

(C) greater than 0.2 parts by weight of fiber selected from the group consisting of ceramic fiber and aramid fiber,

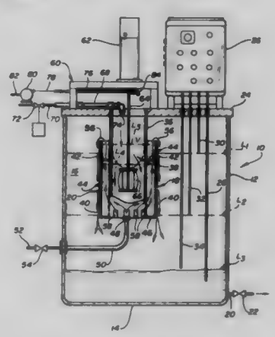
the composition being an emulsion having a viscosity such that it is trowelable and non-slump and capable of producing a cured, continuous fire barrier at a thickness of 10 mm when the water is removed at room temperature.

4,719,252

PROCESS AND APPARATUS FOR FORMING POLYMERIC SOLUTIONS

James P. Dutton, Vienna, N.J., and Ronald Beech, Zanesville, Ohio, assignors to Drew Chemical Co., Boonton, N.J.

Filed Jul. 22, 1986, Ser. No. 889,119
Int. Cl.[4] C08F 2/04
U.S. Cl. 523—318 4 Claims



1. A process for admixing a hydrophilic polymer with a solvent therefor to form a polymeric solution thereof, which comprises:

(a) forming an agitated body of said solution in a mixing zone disposed in a vessel having a storage zone;

(b) introducing said hydrophilic polymer and said solvent at a predetermined rate into said agitated body of said solution in said mixing zone to form said solution; and

(c) continuing steps (a) and (b) to force said solution into a lower portion of a solution zone in fluid communication with said mixing zone and formed about said mixing zone to cause said solution to rise upwardly through said solution zone and overflow into said storage zone of said vessel.

4,719,253

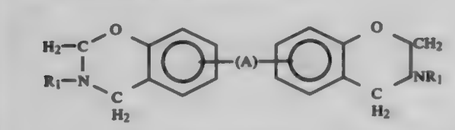
SELF-CURABLE BENZOXAZINE FUNCTIONAL CATHODIC ELECTROCOAT RESINS AND PROCESS

Edward T. Turpin, Elyria, and David T. Thrane, Fairview Park, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

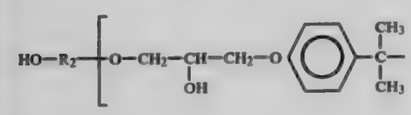
Filed Aug. 1, 1986, Ser. No. 891,895
Int. Cl.[4] C08L 63/00; C09D 3/58, 5/44
U.S. Cl. 523—403 12 Claims

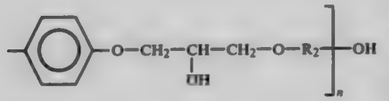
1. A stable electrocoating vehicle which comprises water having dispersed therein a self-curable benzoxazine functional cathodic electrcoat resin having a minor amount of secondary amino functionality, said resin adapted to self-cure after application to a substrate primarily by self-addition of excess oxazine groups in the resin wherein said resin comprises the reaction product of

(a) a dioxazine having the structure:



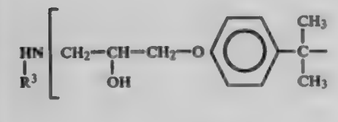
wherein R_1 is an aliphatic, aromatic, or cycloaliphatic hydrocarbon radical; and (A) is a polyepoxide residue derived from the structure:

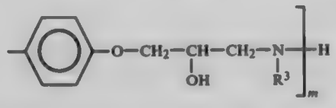




wherein R_2 is a bisphenol residue and n =0 to 4; with

(b) an amine or polyamine having the structure:





wherein R^3 is a radical selected from the group consisting of lower alkyl and di-(lower alkyl) amino alkyl radicals;

m=0 to 4,

wherein said reaction product is prepared by heating components (a) and (b) at 50° to 100° C. for 1 to 8 hours: and wherein said resin is acidified with an inorganic or organic acid and has sufficient residual oxazine groups to effect cure after application of said vehicle dispersion to a substrate; and said resin has a number average molecular weight of from about 6700 to about 10,000; wherein the dioxazine is used in an amount in excess of the equivalent amount required for reaction with the secondary amino functionality of said amine or polyamine.

4. The self-curable electrocoating resin of claim 1 wherein (b) is a polyamine that has a multiplicity of secondary amino functional groups derived from the reaction of a bisphenol A epoxide and a primary amine and said resin vehicle has a number average molecular weight of from about 1,000 to about 5,000.

4,719,254

EPOXY ESTER-MODIFIED ALKYD RESIN ENAMEL FORMULATIONS

Stanley W. Levine, Phoenix, Ariz., assignor to International Coating & Chemical Company, Inc., Fairfield, Conn.

Filed May 23, 1986, Ser. No. 867,240
Int. Cl.[4] C08L 67/08, 63/10
U.S. Cl. 523—435 20 Claims

1. Epoxy ester-modified alkyd resin formulations comprising:

(i) from about 70 to 90 wt % medium oil length soya modified alkyd resin;

(ii) from about 4.75 to 10 wt % epoxy ester resin, comprising an epoxy resin esterified with fatty or rosin acids;

(iii) from about 4.75 to 10 wt % silicone modified alkyd resin produced by modification of a said soya modified alkyd resin (i) with at least about 30 wt. % of silicone; and

(iv) from about 0.5 to 10 wt % compatible solvent.

4,719,255

EPOXY RESIN COMPOSITION FOR ENCAPSULATION OF SEMI-CONDUCTOR DEVICE

Akira Yoshizumi, Yokohama; Hisayuki Hirai, Chiba; Kazutaka Matsumoto, Yokohama; Shinetsu Fujieda, and Michiya Higashi, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 31, 1985, Ser. No. 760,770
Claims priority, application Japan, Aug. 23, 1984, 59-174147; Mar. 26, 1985, 60-59457
Int. Cl.[4] C08L 63/00
U.S. Cl. 523—436 13 Claims

1. An epoxy resin composition for encapsulation of semiconductor device, comprising the components (a), (b), (c) and at least one of the components (d) and (e) as shown below:

(a) 100 parts by weight of an epoxy resin having at least two epoxy groups in one molecule;

(b) 8 to 65 parts by weight of a novolak phenolic resin with an ortho ratio less than 50%;

(c) 1.2 to 4.0 parts by weight of a polyvinyl acetal resin;

(d) 0.8 to 30 parts by weight of a silicone oil;

(e) 4 to 80 parts by weight of a rubber-modified phenolic resin, which resin (e) is distinct from resin (b); and

(f) silica powder in an amount ranging between about 260 to 850 parts by weight,

said resin composition having a glass transition temperature of 150° C. or higher.

4,719,256

FIRE RETARDANT THERMOPLASTIC POLYESTER AND POLYESTERETHER COMPOSITIONS

Ronald L. Markezich, Williamsville, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,563
Int. Cl.[4] C08L 67/02
U.S. Cl. 524—89 5 Claims

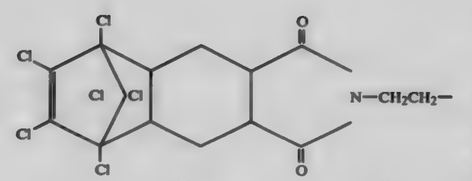
1. A non-blooming flame retardant thermoplastic polyester composition comprising

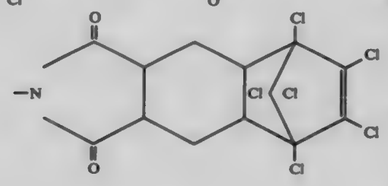
(a) from about 40% to about 75% by weight of polybutylene terephthalate,

(b) from about 0 to about 10% by weight of antimony trioxide,

(c) from about 0 to about 35% by weight of glass fiber, and

(d) from about 5% to about 20% by weight of a chlorinated bisimide of formula





4,719,257

POLYOLEFIN RESIN COMPOSITION

Tamaki Ishii, Suita; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Haruki Okamura, Osaka, and Masahisa Shionoya, Izumi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Apr. 4, 1986, Ser. No. 848,114
Claims priority, application Japan, Apr. 9, 1985, 60-76272
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] C08K 5/59
U.S. Cl. 524—108 4 Claims

1. A method for improving the thermal stability of polyolefin resin and preventing said resin from yellowing by nitrogen oxide gases which comprises blending a polyolefin resin with 0.001 to 5 parts by weight of 3,9-bis[2-{3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionyloxy}-1,1-dimethylethyl]-2,4,8,10-tetraoxaspiro[5.5]undecane based on 100 parts by weight of said resin.

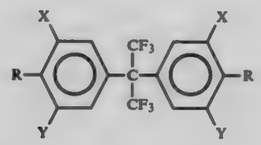
4,719,258

DERIVATIVES OF DIPHENYLHEXAFLUOROPROPANE AND RESINS THEREOF

Kreisler S. Y. Lau, Alhambra, and William J. Kelleghan, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 862,742, May 13, 1986, Pat. No. 4,649,207, which is a continuation-in-part of Ser. No. 646,999, Sep. 4, 1984, abandoned. This application Dec. 1, 1986, Ser. No. 936,675
Int. Cl.[4] C08K 5/02, 5/03
U.S. Cl. 524—462 3 Claims

1. A resin material comprising a mixture of (1) a compound having the formula:



where R is selected from the group consisting of vinyl, β-chlorovinyl, β-methylvinyl, (β-acetoxy)vinyl, β-phenylvinyl, β,β-dimethylvinyl, α-chlorovinyl, and (β-methoxycarbonyl-β-methyl)vinyl and where X and Y are hydrogen or a halogen and (2) a polymer selected from the group consisting of polyethylene, polystyrene and polybutadiene.

4,719,259

PROCESS FOR PRODUCING ETHYLENE/VINYL ALCOHOL COPOLYMERS

Waylon L. Jenkins, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1985, Ser. No. 727,982
Int. Cl.[4] C08F 16/06
U.S. Cl. 525—60 12 Claims

1. The method of producing copolymers of ethylene and vinyl alcohol having less than 0.5 mol % vinyl acetate repeat units and an ash content from residual catalyst of less than 0.05% comprising

(a) forming a solution of ethylene/vinyl acetate copolymer containing about 20–50 mol % of ethylene repeat units in an alcohol having 1 to 8 carbon atoms,

(b) introducing a catalytic amount of a base catalyst into said solution,

(c) reacting said ethylene/vinyl acetate copolymer with said alcohol to form ethylene/vinyl alcohol copolymer and the acetate of said alcohol,

(d) removing said acetate,

(e) adding water to the reaction mixture to form an alcohol/-water solvent for said copolymer to completely dissolve the compolymer,

(f) adjusting the concentration of base to a point where the number mols of base is at least as great as the number mols of acetate in the copolymer to further hydrolyze the acetate groups remaining in said copolymer to an acetate content of less than 0.5 mol %,

(g) neutralizing the reaction mixture to a pH of about 5–7, and

(h) precipitating and isolating the polymer.

4,719,260

HOT-MELT ADHESIVE COMPOSITIONS

Richard K. Stuart, Jr., and Bruce W. Foster, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1987, Ser. No. 12,471
Int. Cl.[4] C08L 51/06, 23/14, 23/16, 23/10
U.S. Cl. 525—74 5 Claims

1. A hot-melt adhesive composition comprising

(1) from about 55 to about 95 weight % of an amorphous polymer containing at least 30% propylene, and

(2) from about 45 to about 5 weight % of a graft copolymer of

(a) a saturated, polycyclic hydrocarbon resin having a viscosity of about 100–2000 cps at 190° C. and a ring and ball softening point of about 75°–150° C., and

(b) maleic anhydride, said graft copolymer having an acid number of about 0.5–60.

4,719,261

HOT MELT ADHESIVE FOR ELASTIC BANDING AND METHOD FOR UTLIZING THE SAME

William L. Bunnelle, Stillwater, and Richard C. Lindmark, Jr., Coon Rapids, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 141,959, Apr. 21, 1980, abandoned, which is a division of Ser. No. 36,858, May 7, 1979, Pat. No. 4,259,220, which is a continuation-in-part of Ser. No. 966,794, Dec. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 944,845, Sep. 22, 1978, abandoned. This application Mar. 26, 1981, Ser. No. 247,998
The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.
Int. Cl.[4] C08L 53/02
U.S. Cl. 525—97 10 Claims

1. A viscoelastic hot melt pressure-sensitive adhesive-elastic composition consisting essentially of:

a major amount by weight, not exceeding 70% by weight, of a rubbery block copolymer which copolymer includes a rubbery midblock portion and which is terminated with crystalline vinyl arene end blocks; about 70 to about 80%

by weight of said rubbery block copolymer comprising said rubbery midblock portion and about 20 to about 30% by weight of said rubbery block copolymer comprising said vinyl arene end blocks;

a minor amount by weight, not less than 30% by weight, of a tackifying resin generally compatible with and generally associated with said midblock portion;

2–9% by weight of an aromatic, essentially hydrocarbon resin having a glass transition temperature and a softening point above those of said vinyl arene end blocks and said tackifying resin; said aromatic, essentially hydrocarbon resin being generally compatible with and generally associated with said end blocks; and

0–5% by weight of essentially inert extenders, fillers, pigments, and antioxidants that do not substantially affect the adhesive or elastic properties of the composition;

the foregoing proportions being selected to provide the following pressure-sensitive adhesive and rheological properties:

(i) a tensile strength at 500% elongation, determined at 20°–25° C., of at least 50 pounds per square inch;

(ii) a 180° peel resistance, according to PSTC-1, determined at 20°–25° C. 24 hours after formation of the pressure-sensitive adhesive bond, of at least about 450 grams per 25.4 mm-width;

(iii) a dead load deformation, tested at room temperature, 37.8° C., 43.3° C., and 48.9° C. for 3 hours under 1500 g/cm^2, of less than 50%, where dead load deformation=the increased length minus the original length divided by the original length of a sample at least 25 mm in length;

(iv) the following loss modulus, storage modulus, and loss tangent values at 0.01–0.25 Hz throughout the temperature range of 25°–50° C.:

loss modulus: 4×10^4 to 35×10^4 dynes/cm^2

storage modulus: 75×10^4 to 200×10^6 dynes/cm^2

loss tangent: 0.03 to 0.3

4,719,262

ORGANOSILICON PRIMER COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 844,057, Mar. 26, 1986, Pat. No. 4,659,851. This application Nov. 28, 1986, Ser. No. 922,380

Int. Cl.^{4} C08F *8/00*

U.S. Cl. 525—105 **10 Claims**

1. A primer composition for adhering a curable polyorganosiloxane elastomer composition to an inorganic substrate, said primer composition comprising an organosilicon compound having a general formual selected from the group consisting of

$$(R^1O)_n(R^2O)_{4-n-p}R^3_pSi,$$

$$R^4[OSi(OR^2)_{3-p}R^3_p]_2,$$

$$(R^1O)_n(R^2O)_{3-n}SiR^5Si(OR^1)_2(OR^2)_{3-n}$$

and

$$R^4[OSi(OR^2)_2R^5Si(OR^2)_3]_2,$$

where

R^1 represents a radical selected from the group consisting of

$$CH_2{=}CHCH_2R^6{-},$$

$$CH_2{=}CHR^6OR^7{-},$$

$$CH_2{=}CHR^6OC(O)R^8{-},$$

$$CH_2{=}CHR^9C(O)OR^7{-},$$

and

$$(CH_2{=}CHR^6O)_2R^{10}{-};$$

R^2 and R^3 are methyl;

R^4 represents a radical selected from the group consisting of

$$CH_2{=}CHR^{10}<,$$

$$CH_2{=}CHR^6OR^{10}<,$$

$$CH_2{=}CHR^6OC(O)R^{10}=$$

and

$$CH_2{=}CHR^9C(O)OR^{10}=;$$

R^5 represents ethylene;

R^6 represents a hydrocarbylene or substituted hydrocarbylene radical where the substituent is hydroxyl or alkoxy;

R^7 is selected from the same group as R^6 or represents an allyloxy-substituted hydrocarbylene radial, with the proviso that R^7 contains at least 2 carbon atoms;

R^8 is selected from the same group as R^6;

R^9 represents a single bond or a radical selected from the same group as R^6;

R^{10} represents a trivalent hydrocarbon radical;

n is 1 or 2;

p is 0 or 1; r is 0 or 1; and 4—n—p is at least 2.

4,719,263

ANTISTATIC PLASTIC MATERIALS CONTAINING EPIHALOHYDRIN POLYMERS

James P. Barnhouse, and Simon H. Yu, both of North Ridgeville, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 10, 1985, Ser. No. 732,541

Int. Cl.^{4} C08L *71/02*

U.S. Cl. 525—187 **5 Claims**

1. Composition of matter comprising a plastic material and an effective amount of an antistatic agent distributed throughout said plastic material to improve antistatic properties of said plastic material, said antistatic agent is selected from the group consisting essentially of homopolymers of an epihalohydrin and copolymers of an epihalohydrin with at least one other copolymerizable monomer, and said plastic material is selected from the group consisting essentially of a chlorinated polyvinyl chloride, a polycarbonate, a polyester, an epoxy, a phenolic, and mixtures thereof.

4,719,264

WATER-REDUCIBLE, WATER-REMOISTENABLE ADHESIVE COMPOSITION

Edward L. Lotz, Jr., Louisville, Ky., assignor to Interez, Inc., Louisville, Ky.

Filed Jul. 23, 1986, Ser. No. 889,315

Int. Cl.^{4} C08L *39/04, 3/02*; C08K *5/07*

U.S. Cl. 525—203 **8 Claims**

1. A remoistenable adhesive composition comprising a blend of:

(a) a aqueous emulsion of a polymer of vinyl acetate and a dextrin compatible hydrophilic colloid;

(b) an organic solvent solution of a copolymer of vinyl acetate and vinyl pyrrolidone having dextrin dispersed therein;

(c) an aqueous emulsion of an ester gum tackifier, and

(d) sufficient water to adjust the solids content of the composition to about 40 to about 55 weight percent and the viscosity of 25° C. to about 1,000 to about 3,000 cps, wherein (a), (b) and (c) are present in the weight ratio of about 35 to about 45 parts of (a), about 35 to about 45 parts of (b) and about 10 to about 30 parts of (c).

4,719,265

PROCESS FOR THE PRODUCTION OF A POURABLE POLYVINYL CHLORIDE WITH HIGH PROPORTIONS OF ACRYLATE ELASTOMERS

Dieter Thunig, and Rolf-Walter Terwoane, both of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 26, 1986, Ser. No. 844,440

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510899

Int. Cl.^{4} C08L *51/00, 51/04, 27/06, 33/08*

U.S. Cl. 525—243 **18 Claims**

1. A process for the production of a pourable polyvinyl chloride having an acrylate polymer content of at least 30 percent by weight, comprising emulsion polymerizing an acrylic acid ester or ether, having at least two ethylenically unsaturated, unconjugated double bonds, in the presence of a water-soluble catalyst and an unconjugated diene monomer to produce a polyacrylic acid ester emulsion, and then subsequently suspension polymerizing vinyl chloride in the presence of said polyacrylic acid ester emulsion,

wherein the acrylic acid ester in the emulsion polymerization is one whose homopolymer has a glass transition temperature of less than −15° C., wherein the emulsion polymerization is conducted

(a) in the presence of an alkali metal salt of a fatty acid of about 12–18 carbon atoms as the emulsifying agent with an initial pH greater than 9, or

(b) in the presence of an alkali metal lauryl sulfate emulsifying agent, wherein the process is conducted by batchwise or continuous addition during the polymerization, of the acrylate monomer pre-emulsified in an aqueous alkali metal lauryl sulfate solution,

and wherein after completion of the emulsion polymerization, the vinyl chloride polymerization is conducted in the presence of a methylcellulose suspension agent having a viscosity in a 2% aqueous solution of 40 to 3,000 mPa's and a degree of methoxy substitution of about 1.6 to 2.0, and after addition of the suspension agent, a $Ca(OH)_2$ suspension is added thereto and then (1) the vinyl chloride polymerization charge is neutralized by the addition of a compatible acid, followed by the addition, in dissolved or suspended form, of an organic peroxide initiator; or, (2) and azo catalyst is added to the vinyl chloride polymerization charge an in dissolved or suspended form.

4,719,266

VULCANIZATION FORMULATIONS WITH COBALT COMPOUNDS

David P. Craig, Ettelbruck, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 477,060, Mar. 21, 1983, abandoned. This application Jul. 22, 1986, Ser. No. 888,913

Int. Cl.^{4} C08C *19/20*

U.S. Cl. 525—346 **5 Claims**

1. An elastomer formulation, consisting essentially of:

a sulfur curable elastomer selected from the group consisting of natural rubber, copolymers of styrene and butadiene, polybutadiene, synthetic polyisoprene, and chlorinated rubbers;

a quantity of sulfur;

conventional compounding ingredients other than accelerators; and

at least one cobalt salt accelerator consisting essentially of a salt selected from the group consisting of cobalt octoate, cobalt naphthenate, cobalt sterate, cobalt abietate and cobalt hydroxide, said at least one cobalt salt accelerator being present in the formulation in an amount of from about 2 to about 12 parts per 100 parts by weight of said elastomer, said at least one cobalt salt accelerator being the sole accelerator present;

said formulation being curable and adherent to the surface of a metal selected from the group consisting of steel and zinc.

4,719,267

HEAT CURABLE ONE PACKAGE POLYURETHANE RESIN COMPOSITION

Sidky Rizk, Westfield, and Harry W. S. Hsieh, Edison, both of N.J., assignors to Essex Specialty Products, Inc., Sayreville, N.J.

Division of Ser. No. 738,898, May 29, 1985, Pat. No. 4,624,996, which is a continuation of Ser. No. 580,886, Feb. 16, 1984, abandoned. This application Aug. 6, 1986, Ser. No. 893,733

Int. Cl.^{4} C08F *283/04*; C08L *77/00*

U.S. Cl. 523—453 **10 Claims**

1. A one-package, solventless heat curable polyurethane resin composition consisting essentially of

(1) an isocyanate terminated polyurethane prepolymer having pendant epoxy groups along the polymer chain and prepared by reacting an excess of a polyisocyanate with a mixture of a polyol and a di-o-methylol derivative of Bisphenol A diglycidyl ether, the isocyanate groups of which prepolymer are blocked by reaction with an oxime; and

(2) a curing agent having at least two active hydrogen atoms per molecule.

4,719,268

POLYMER MODIFIED VINYL ESTER RESIN COMPOSITIONS

Robert E. Hefner, Jr., and Virginia B. Mesnick, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 734,516, May 16, 1985, Pat. No. 4,618,658. This application Mar. 31, 1986, Ser. No. 846,186

Int. Cl.^{4} C08L *63/10*

U.S. Cl. 525—454 **34 Claims**

1. A thermosettable polymer modified vinyl ester composition which comprises the reaction product of

(I) a polymer modified epoxy resin composition which comprises a copolymerization product of

(A) from about one to about 99 percent by weight of an epoxy resin wherein from about 0.01 to about 10 mole perpcent of the epoxide groups have been reacted to provide groups containing polymerizable ethylenic unsaturation;

(B) from about one to about 99 percent by weight of at least one vinyl terminated urethane oligomer; and

(C) from about zero to about 75 percent by weight of one or more polyerizable ethylenically unsaturated compounds; and

(II) a monounsaturated monocarboxylic acid or mixture of such acids.

4,719,269

EPOXY RESIN COMPOSITION

Toshiharu Ando; Kazuo Yasuda; Yoshifumi Itabashi, and Masaru Tsuchikashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

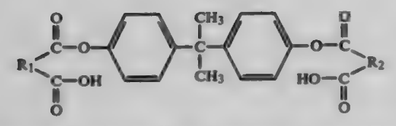
Filed Apr. 24, 1986, Ser. No. 855,389

Claims priority, application Japan, Jan. 12, 1985, 60-127462

Int. Cl.^{4} C08G *59/04*; C08K *3/10, 3/22, 3/36*

U.S. Cl. 525—524 **3 Claims**

1. An epoxy resin composition comprising an epoxy resin which is a mixture (A) of an epoxy resin having an epoxy equivalent of 200 or below and a phenoxy resin having a molecular weight of approximately 30,000, a curing agent which is made of a polybasic carboxylic acid anhydride and an aromatic ester, and an inorganic filler powder, wherein the epoxy resin in the mixture (A) is 3,4-epoxycyclohexylmethyl-(3,4-epoxy)cyclohexanecarboxylate and wherein the aromatic ester is a diester of Formula (I):



(I)

wherein R_1 and R_2 are each a saturated or unsaturated cyclic hydrocarbon group having 6–8 carbon atoms.

4,719,270

PROCESS FOR PRODUCTION OF POLYETHYLENE

Yukimasa Miwa, Nagoya; Takeo Shimada, Yokkaichi; Shigekazu Hayashi, Yokkaichi; Yoshio Kobayashi, Yokkaichi, and Yoshitoru Kageyama, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 506,588, Jun. 22, 1983, abandoned.
This application Mar. 17, 1986, Ser. No. 840,545
Claims priority, application Japan, Jun. 24, 1982, 57-108970
Int. Cl.[4] C08F *6/02, 10/02*
U.S. Cl. 526—68 9 Claims

1. A process for the high pressure production of homopolymers of ethylene, which comprises:

(a) introducing a feed material comprising ethylene in a non-batchwise manner into a polymerization zone which does not contain a dispersant, which is maintained at a pressure of at least 200 atmospheres and at a temperature of 150°–320° C. and which contains a catalyst comprised of a titanium compound and an organoaluminum derivative combined in such amounts that the atomic ratio Al/Ti ranges from 6–20;

(b) polymerizing the monomer reactants in a non-batchwise manner;

(c) withdrawing polymerized material at a temperature of 150°–250° C. from said polymerization zone and adding from 0.08–0.20 mole of an organic peroxide per gram atom of the sum of the gram atoms of aluminum and titanium in said catalyst, said organic peroxide having a decomposition temperature of 90°–150° C. to said withdrawn polymerization material in order to deactivate the catalyst therein;

(d) separating the polymer product component of the withdrawn material from any unreacted monomer under superatmospheric pressure, thereby affecting polymer produce recovery; and

(e) recycling the separated unreacted monomer of step (d) to said polymerization zone.

4,719,271

POLYMERIZATION OF OLEFINS

Richard E. Dietz, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 380,788, May 21, 1982, abandoned. This application Sep. 9, 1983, Ser. No. 530,849
Int. Cl.[4] C08F *4/02, 4/64*
U.S. Cl. 526—114 16 Claims

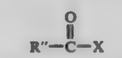
1. A process comprising contacting at least one alpha-olefin with a polymerization catalyst under polymerization conditions, wherein the polymerization catalyst comprises a particulate diluent and a product precipitated in the presence of the particulate diluent, the product being formed by mixing under precipitation conditions a component solution and a precipitating agent,

wherein the component solution is formed by the combination of:

(1) a metal halide compound selected from the group consisting of metal dihalide compounds and metal hydroxyhalide compounds and the metal of the metal halide compound is selected from the group consisting of Group IIA metals and Group IIB metals of the Periodic Table, and

(2) a transition metal compound in which the transition metal is selected from the group consisting of Group IVB and Group VB transition metals of the Periodic Table and the transition metal is bonded to at least one atom selected from the group consisting of oxygen, nitrogen and sulfur, and said oxygen, nitrogen and sulfur atoms are in turn bonded to a carbon atom of a carbon containing radical, in a suitable solvent;

wherein the precipitating agent is selected from the group consisting of organometallic compounds wherein the metal is selected from the group consisting of Group I, Group II, and Group III metals of the Periodic Table, metal halides and oxygen containing halides of elements selected from the group consisting of Group IIIA, Group IVA, Group IVB, Group VA, and Group VB of the Periodic Table, hydrogen halides, and organic acid halides selected from the group consisting of compounds having the formula



wherein R'' is an alkyl, aryl, or cycloalkyl group or combinations thereof containing from 1 to about 12 carbon atoms and X is a halide.

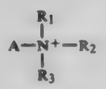
4,719,272

MONOMERIC CATIONIC GLYCOSIDE DERIVATIVES

John J. Tsai, Belle Mead, and Martin M. Tessler, Edison, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 625,289, Jun. 27, 1984, abandoned. This application Feb. 5, 1987, Ser. No. 11,170
Int. Cl.[4] C08F *10/00*
U.S. Cl. 526—238.2 16 Claims

1. A cationic glycoside monomer having the structure:

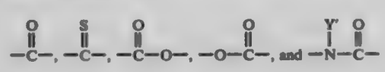


wherein A is $(saccharide)_n$—O—B and $(saccharide)_n$—O— represents a mono- or polysaccharide of no more than 20 saccharide units, where O is attached to a glycosidic carbon atom in the terminal saccharide ring of $(saccharide)_n$, B is $—CH_2CH(OH)CH_2—$ or $—CH_2CH_2—$, and n is 1 to 20;

wherein R_1 is selected from the group consisting of H; C_1–C_6 alkyl; C_2–C_6 alkenyl or alkynyl; benzyl; and A;

R_2 is selected from the group consisting of H; C_1–C_6 alkyl; C_2–C_6 alkenyl or alkynyl; benzyl; and A;

R_3 is —Z—C(Y)=CH_2 or —Z—C≡CH wherein Y is H or C_1–C_3 alkyl and z is —Q—P— with Q being an alkyl group which divalently joins the cationic nitrogen atom with P wherein P is a polar activating group juxtapositional to the unsaturated group and is selected from the group consisting of



wherein Y' is H or C_1–C_3 alkyl; or R_3 is C_2–C_7 alkenyl or alkynyl with the proviso that R_1 and R_2 are independently H, A, or a hydocarbon group which together with R_3 contain a maximum of 7 carbon atoms; or R_2 and R_3 together with the nitrogen atom to which they are bonded form a 5 to 6 member saturated heterocyclic ring substituted with a group represented by the formula —C(Y)=CH_2 or —C≡CH;

wherein R_4 and R_5 together with the nitrogen atom to which they are bonded form a 5 or 6 member unsaturated heterocyclic ring substituted with a group represented by the formula —C(Y)=CH_2 or —C≡CH; and

M is an anion.

4,719,273

METHOD FOR FORMING NEW PRECERAMIC POLYMERS CONTAINING SILICON

Dietmar Seyferth, Lexington, Mass.; Yuan-Fu Yu, Dayton, Ohio, and Gudrun E. Koppetsch, Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 772,375, Sep. 4, 1985, Pat. No. 4,639,501. This application Mar. 24, 1986, Ser. No. 843,139
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 70 Claims

1. A method for preparing preceramic organosilicon polymers, where the method comprises:

(a) mixing an organic polysilane having a plurality of Si—H functional groups with a sufficient quantity of an organosilicon compound containing at least two alkenyl groups or a cyclic organic compound containing at least three alkenyl groups, to undergo a hydrosilylation reaction;

(b) allowing the mixture of step (a) to react, thereby forming said preceramic organosilicon polymer.

4,719,274

ARTICLE CONTAINING A STABILIZED SILICONE GEL

Ching P. Wong, Lawrence Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 805,599, Dec. 10, 1985, Pat. No. 4,665,148, which is a continuation-in-part of Ser. No. 677,681, Dec. 3, 1984, abandoned. This application Oct. 30, 1986, Ser. No. 925,047
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 2 Claims

1. An article of manufacture comprising a cured silicone gel, a platinum catalyst dispersed in said silicone gel and ammonia having been added to said gel to prevent continued polymerization of said gel.

4,719,275

HEAT STABLE FLUORINATED POLYORGANOSILOXANE COMPOSITIONS

Kathleen F. Benditt, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 2, 1986, Ser. No. 881,303
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 8 Claims

1. An organosiloxane composition curable to a clear, thermally stable fluorosilicone gel, said composition comprising

A. a liquid diorganovinylsiloxy terminated polydiorganosiloxane wherein at least 25 percent of the silicon atoms are bonded to a fluorine containing hydrocarbon radical of the formula $RfCH_2CH_2$—, where Rf represents a perfluorinated hydrocarbon radical containing from 1 to 10 carbon atoms, and said polydiorganosiloxane is prepared by the ammonia-catalyzed polymerization of at least one cyclic diorganosiloxane followed by reaction of the resultant liquid silanol terminated polydiorganosiloxane with at least a stoichiometric amount of a hexaorganodisilazane wherein a vinyl radical is bonded to each of the two silicon atoms;

B. a compatible liquid fluorine containing organohydrogensiloxane containing said $RfCH_2CH_2$—radical and an average of more than two silicon-bonded hydrogen atoms per molecule in an amount sufficient to provide a molar ratio of silicon-bonded hydrogen atoms to vinyl radicals in said composition of from 0.5 to about 1.0; and

C. an amount sufficient to promote curing of said composition of a platinum-containing catalyst.

4,719,276

NEUTRALIZATION OF CATALYST IN POLYMERIZATION OF POLYDIORGANOSILOXANE

Leo F. Stebleton, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 27, 1986, Ser. No. 923,468
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—24 6 Claims

1. A method of neutralizing the catalyst used in the alkaline polymerization of diorganocyclosiloxane in which the neutralizing agent is a composition of the formula $R'_3SiOC(O)R''$, where R' is a hydrocarbon radical of from 1 to 6 carbon atoms inclusive and R'' is a hydrocarbon radical of from 1 to 8 carbon atoms inclusive which comprises admixing the neutralizing agent with the catalyst.

4,719,277

LINEAR SEGMENTED POLYURETHANE AND PROCESS FOR ITS PRODUCTION

Joachim Behnke, Wuppertal, and Christoph Josefiak, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to AKZO NV, Arnhem, Netherlands

Filed Jul. 9, 1982, Ser. No. 396,688
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127464
Int. Cl.[4] C08G *18/08, 18/18*
U.S. Cl. 528—48 20 Claims

1. Process for the production of linear segmented polyurethane through simultaneous reaction of macrodiols, low-molecular diols as chain-lengthener and aromatic diisocyanates in an inert solvent in the presence of catalyst, comprising reacting at temperature from about 70° to 120° C. and in the presence of catalytic amounts of a magnesium or calcium salt, an aromatic carboxylic acid, macrodiol, monomeric, low-molecular diol and aromatic diisocyanate, the macrodiol being used in such amounts as to adjust in prepared polyurethanes a weight ratio of soft segment to hard segment from about 4:1 to 1:4.

4,719,278

PROCESS FOR THE PREPARATION OF THIXOTROPIC BINDERS, THE BINDER OBTAINABLE BY THIS PROCESS AND THEIR USE FOR THE PREPARATION OF COATING AND SEALING COMPOUNDS

Wolfgang Wellner, Bergisch Gladbach; Hermann Gruber, Leverkusen, and Alois Fehlbier, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,928
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610729
Int. Cl.[4] C08G *18/10*
U.S. Cl. 528—64 9 Claims

1. A process for the preparation of an air drying binder containing free isocyanate groups and having thixotropic properties which comprises reacting either

(a1) a prepolymer or semi-prepolymer containing free isocyanate groups, having an isocyanate content of about 0.5 to 20% by weight and based on (i) a polyisocyanate mixture of the diphenylmethane series containing at least 20% by weight of 2,4'-diisocyanatodiphenyl methane and (ii) an organic polyhydroxyl compound having an average molecular weight of about 500 to 7,000 and an average hydroxyl functionality of about 1.5 to 6 or

(a2) a mixture of said prepolymer or semi-prepolymer of (a1) and a prepolymer or semi-prepolymer containing free isocyanate groups, having an isocyanate content of about

0.5 to 20% by weight and based on (i) an organic polyisocyanate other than those set forth under component (a1) and having an average molecular weight below about 300 and (ii) a subequivalent quantity of an organic polyhydroxyl compound having an average molecular weight of about 500 to 7,000 and an average hydroxyl functionality of about 1.5 to 6, provided that at least 3% by weight, based on the total weight of component (a2) is a prepolymer or semiprepolymer of component (a1) with

(b) an aromatic diamine having at least one alkyl substituent in the ortho position to each amino group

at an NCO/NH_2 equivalent ratio, based on the isocyanate groups of component (a1) or on the portion of component (a1) present in component (a2) and the amino groups of component (b), of about 0.5:1 to 50:1, provided that the equivalent ratio of isocyanate groups to amino groups, based on all of the isocyanate groups present in component (a1) or (a2) and the amino groups in component (b), is at least 10:1.

4,719,279

PROCESS FOR THE PREPARATION OF COPOLYPHOSPHONATES HAVING HIGH TOUGHNESS

Hermann Kauth, Krefeld; Klaus Reinking, Wermelskirchen, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 869,085

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520296

Int. Cl.[4] C08G *79/04*

U.S. Cl. 528—169 **10 Claims**

1. Process for the preparation of aromatic polyester-phosphonate, polycarbonatophosphonate or polyester-carbonatophosphonate, each having a number average molecular weight of 5,000 to 200,000 and with molar phosphonate groups/(carboxylate plus carbonate groups) ratio of 95:5 to 5:95 from (1) at least one diphenol, (2) at least one phosphonic acid derivative and (3) at least one aromatic dicarboxylic acid derivative, phosgene or a mixture of both;

wherein in a first stage, phosphonic acid diaryl ester is reacted in the melt with diphenol until an oligomeric product having a number average molecular weight of 460 to 20,000 and an OH number of 5 to 240 has been formed, and then, in a second stage, the oligomeric product is condensed by the phase boundary process with aromatic dicarboxylic acid dichloride or phosgene, or a mixture of both, until the phenolic OH content is less than 0.1% by weight relative to the resulting condensate product.

4,719,280

ANISOTROPIC MELT POLYESTERS WITH IMPROVED GLASS TRANSITION TEMPERATURE

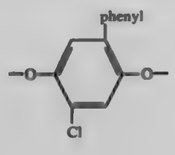
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1986, Ser. No. 912,082

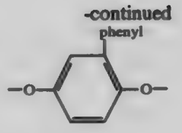
Int. Cl.[4] C09G *63/60*

U.S. Cl. 528—176 **9 Claims**

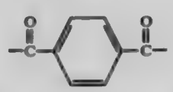
1. A melt-spinnable polyester of fiber-forming molecular weight consisting essentially of recurring units of the formula

a.  50–10 mol %

-continued

b.  0–40 mol %

and

c.  50 mol %.

3. Poly(2-chloro-5-phenyl-1,4-phenylene terephthalate).

4,719,281

PENDANT QUINODIMETHANE-CONTAINING POLYMER

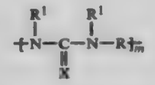
Eai W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Bridgewater, N.J.

Filed Apr. 21, 1986, Ser. No. 854,282

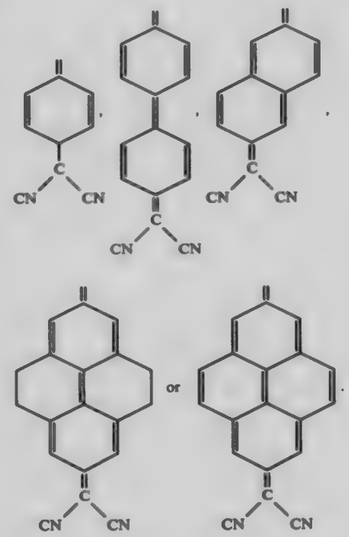
Int. Cl.[4] C08G *73/06*

U.S. Cl. 528—310 **23 Claims**

1. A polymer which is characterized by a recurring structural unit corresponding to the formula:



where R is a divalent organic radical containing between about 2–20 carbon atoms; R^1 is hydrogen or a C_1–C_{20} alkyl group; m is an integer of at least 3; and X is a pendant quinoid substituent selected from



4,719,282

POLYCATIONIC BLOCK COPOLYMER

Richard J. Nadolsky, Clarksburg, and Bharat B. Desai, Belle Mead, both of N.J., assignors to Miranol Inc., Dayton, N.J.

Filed Apr. 22, 1986, Ser. No. 855,118

Int. Cl.[4] C08G *69/00, 69/02*

U.S. Cl. 528—310 **16 Claims**

1. Block copolymer of the formula:

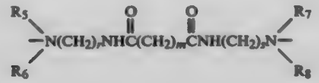
$$[Q_wL(AL)_x(BL)_yQ_w]^{2(x+y)+2(x+y)}D^-$$

wherein

A is



and B is

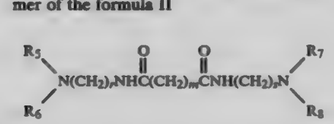


wherein:

R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are the same or different and are selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 hydroxyalkyl, or hydroxy polyoxyalkylene;

D is a halide ion;

L is a linkage derived from a dihalide after removal of the halogen atoms, x and y are integers ranging from 1–100 and Q is $(BL)_y$ where the bonds between L and A or B are carbon-nitrogen bonds formed by quaternization of the tertiary amine functions of A or B by the organic dihalides from which L is derived and W is 0 or 1 which are obtained by first forming a block of units by reacting a monomer of the formula II



wherein

each of R_5, R_6, R_7 and R_8 are the same or different and is selected from the group consisting of C_{1-3} alkyl, C_{1-3} hydroxy alkyl hydroxy polyoxyalkylene,

m is an integer from 0 to 34 and

r and s are the same or different and are integers from 1 to 6,

with a molar excess of a dihalide of the formula

Hal—L—Hal

wherein Hal represents a halogen atom and L is selected from $—CH_2CH_2—O—CH_2CH_2—$, $—CH_2CH_2—O—CH_2CH_2—O—CH_2CH_2—$, $—(CH_2)_t—$ or $—CH_2CHOHCH_2—$ where t is an integer from 2 to 6 and thereafter reacting the product so formed with a compound of the formula III



wherein R_1, R_2, R_3 and R_4 are each individually selected from the group consisting of C_{1-3} alkyl, C_{1-3} hydroxyalkyl and polyoxyalkylene and p, and q are each individually integers of from 1 to 6 and, if the amount of compound of the formula Hal—L—Hal used in the first reaction was not sufficient to ensure a total molar ratio of compounds of Formulae II and III to those of the formula Hal—L—Hal of 1:1, reacting the product with further compound of the formula Hal—L—Hal.

4,719,283

PREPARATION OF POLYIMIDE FROM BIS-IMIDE AND BENZOCYCLOBUTENE

Martin Bartmann, Recklinghausen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

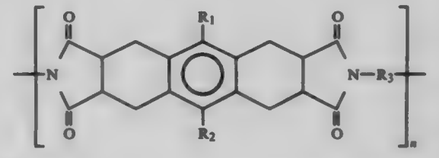
Filed Mar. 6, 1986, Ser. No. 836,877

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507879

Int. Cl.[4] C08G *69/00, 73/12*

U.S. Cl. 528—322 **18 Claims**

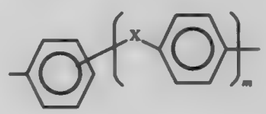
1. A process for the production of a polyimide having recurring units of the formula



wherein

R_1 and R_2 each independently is an alkyl group of 1–3 carbon atoms, hydrogen, or halogen;

R_3 is straight chain or branched alkylene group of 2–12 carbon atoms or

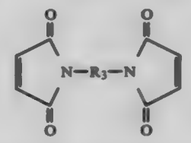


wherein

m is 0 or 1,

X is CH_2, $C(CH_3)_2$, CO, O, S or SO_2, and

n is an integer from 5 to 500, said process comprising reacting an N,N'-bis-maleic acid imide of the formula



with a benzodicyclobutene of the formula



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4,719,284

MULTISTAGE PROCESS FOR THE PREPARATION OF POLY(TETRAMETHYLENE-ADIPAMIDE)

Werner Nielinger; Hermann Brinkmeyer; Rudolf Binsack; Ludwig Bottenbruch, all of Krefeld, and Heinz-Josef Füllmann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,061

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3526931

Int. Cl.[4] C08G *69/28*

U.S. Cl. 528—335 10 Claims

1. A process for the production of polyamide from 1,4-diaminobutane monomer and adipic acid monomer, wherein a 40 to 70% strength aqueous solution of the monomers is heated at 280° to 320° C. for a period of 5 to 30 minutes under a pressure of less than 8 bar to give a precondensate having a relative viscosity of 1.05 to 2.0 as measured on a 1% strength solution in m-cresol at 25° C. and thereafter condensing the precondensate at 180° to 260° C.

4,719,285

PROCESS FOR THE MANUFACTURE OF POLYAMIDE FROM DIAMINES AND DIAMIDES CATALYZED BY SILICON COMPOUNDS

Benedict S. Curatolo, Maple Heights; Robert C. Sentman, Macedonia, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 17, 1986, Ser. No. 908,492

Int. Cl.[4] C08G *69/28*

U.S. Cl. 528—336 10 Claims

1. A process for the manufacture of a polyamide comprising contacting at least one α,ω-diamine, at least one α,ω-diamide and a catalyst comprising a silicon compound at an elevated temperature and pressure.

4,719,286

CLASS OF CONDUCTIVE POLYMERS

Sheldon L. Matlow, San Jose, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 14, 1985, Ser. No. 711,984

Int. Cl.[4] C08G *79/14*

U.S. Cl. 528—362 8 Claims

1. A conductive polymer comprising a plurality of interconnected units positioned in a three-dimensional array, each of which units comprises:

a generally centrally positioned moiety, said moiety being a metal atom or ion, a phosporo halide, or a sulfuro halide and having valence level d-orbitals or f-orbitals; and

a ligand or set of ligands having a total dentation capability of three or more non-coplanar dentations and being positioned about said centrally positioned moiety, at least two of said dentations being parts of conjugated systems, said ligand or set of ligands being dentated to said centrally positioned moiety via π-bonding of C, N or O atoms of said ligand or set of ligands, said C, N or O atoms having available p-orbitals for π-bonding; and

wherein said units are interconnected by having at least one ligand in common and wherein the conjugation of said conjugated systems is via π-bonding and extends three-dimensionally from one centrally positioned moiety to an adjacent centrally positioned moiety.

4,719,287

HIGHER ALKYL PYRROLIDONE EXTRACTANTS FOR WATER SOLUBLE PHENOLIC OR CARBOXYLIC ANTIBIOTICS

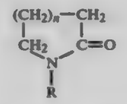
Robert B. Login, Oakland, and Ratan K. Chaudhuri, Butler, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 879,776, Jun. 27, 1986, abandoned. This application Feb. 12, 1987, Ser. No. 13,839

Int. Cl.[4] C07K *5/12*; C07D *407/00*; C07H *15/24*; A61K *35/00*

U.S. Cl. 530—317 19 Claims

1. An aqueous composition comprising an aqueous fermentation broth having a pH of from 6 to 8 and containing (a) a fermentation product in an amount not more than 10% by weight of said broth said fermentation product having a phenolic and/or a carboxylic group and (b) between about 0.2% and about 10% by weight based on said broth of a N-alkyl-lactam extraction agent having the formula



wherein n is an integer having a value of from 1 to 3 and R is alkyl having 8 to 14 carbon atoms.

4,719,288

SUBSTITUTED 5-AMINO-4-HYDROXYVALERYL DERIVATIVES

Walter Fuhrer, Frenkendorf; Peter Bühlmayer, Ariesheim; Vittorio Rasetti, Basle, and Bernhard Riniker, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

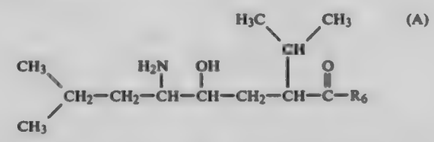
Division of Ser. No. 671,261, Nov. 14, 1984, Pat. No. 4,613,676. This application Jun. 2, 1986, Ser. No. 869,800

Claims priority, application Switzerland, Nov. 23, 1983, 6285/83

Int. Cl.[4] C07K *5/08*; C07C *103/34, 103/12, 103/20, 101/30*; C07D *277/20, 209/18, 233/64, 207/12, 211/70*

U.S. Cl. 530—331 6 Claims

1. A compound of the formula



(A)

wherein R_6 is selected from amino; lower alkylamino; dimethylamino; 4-carboxy-n-butylamino; 7-carboxy-n-heptylamino; 4-tert.-butoxycarbonyl-n-butylamino; 7-tert.-butoxycarbonyl-n-heptylamino; 7-pivaloyloxymethoxy-carbonyl-n-heptylamino; 3-(2-oxo-1-pyrrolidinyl)propylamino; -Ala- which is c-terminally substituted by 2-(4-imidazolyl)-ethylamino or 2-(2-pyridyl)-ethylamino; Ile- which is c-terminally substituted by dicarbamoylmethylamino, 3-carbamoylbenzylamino, 4-carbamoylmethyl-2-thiazolylamino, 2-(2-pyridyl)ethylamino, 2-pyridylmethylamino, or 2-(3-indolyl)ethylamino; -Ile-His- which is c-terminally substituted by amino; -Ile-Sta- which is c-terminally substituted by amino; and -Ala-Sta- which is c-terminally substituted by methoxy; or a salt of such a compound having a salt forming group.

4,719,289

GLYCOPEPTIDES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Cenek Kolar; Friedrich R. Seiler, both of Marburg, and Ursula Knödler, Ebsdorfergrund, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,380

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434039

Int. Cl.[4] C07K *5/06, 5/08*; C07H *5/04*

U.S. Cl. 530—331 6 Claims

1. A compound of the formula I, II or III

$$R^1—A^1—T—NH—R^2—COR^3 \quad \text{I}$$

$$R^1—A^1—T—A^2—NH—R^2—COR^3 \quad \text{II}$$

$$R^1—A^1—T—A^2—A^3—T—A^4—NH—R^2—COR^3 \quad \text{III}$$

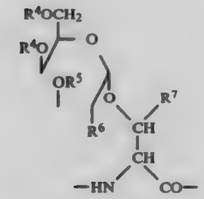
in which

R^1 denotes a hydrogen atom, an alkoxycarbonyl or arylalkoxycarbonyl group conventionally used for protecting amino groups, or $CH_3—(CH_2)_m—CO$, in which m=0–16,

R^2 denotes $—(CH_2)_n—$ or $—(CHOH)_n—$, in which n=1–10,

R^3 denotes a hydroxyl group, OCH_3, O-tert.-butyl, O-benzyl, an active ester, or a carrier,

A^1, A^2, A^3 and A^4 denote a valency bond or an amino acid radical selected from the group consisting of Ala, Val, Leu, Ile, Ser, Pro, Glu and Arg, in which, if appropriate, the reactive groups not forming part of the peptide bond are protected by protecting groups, and the radical T denotes



in which

R^4 is a hydrogen atom or an acyl protecting group,

R^5 is a hydrogen atom, an acyl protecting group or the 2,3,4,6-tetra-O-acetyl-beta-D-galactopyranosyl or beta-D-galactopyranosyl radical,

R^6 is N_3, NH_2 or NHAc and

R^7 is a hydrogen atom or a methyl group.

4,719,290

COMPOSITION OF INTRAVENOUS IMMUNE GLOBULIN

Willie M. Curry, New Rochelle, and David L. Farb, LaGrangeville, both of N.Y., assignors to Armour Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 529,079, Sep. 2, 1983, Pat. No. 4,482,483, which is a continuation-in-part of Ser. No. 482,699, Apr. 6, 1983, abandoned. This application May 25, 1984, Ser. No. 614,005

Int. Cl.[4] C07G *7/00*; A61K *35/10, 39/00*

U.S. Cl. 530—387 12 Claims

1. A process for the preparation of an unmodified, native gamma immune globulin for intravenous administration comprising the steps of:

a., suspending of IgG Cohn Fraction II in an aqueous solution of about 2 to 10% w/v ethanol at a protein concentration of about 1 to 4% w/v at a temperature of 2°–5° C.;

b., adjusting the pH of the suspension to about 7.6±0.2;

c., adding NaCl to the suspension to obtain salt concentration of 0 to 2 mM NaCl;

d., allowing the suspension to stand for 6 to 18 hrs. to precipitate IgM, IgA, enzymes, polymeric forms of IgG impurities and to obtain equilibrium between precipitated impurities and dissolved IgG;

e., removing the precipitated impurites to obtain a dilute IgG solution;

f., stabilizing the dilute IgG solution by adding Human Serum Albumin to obtain an IgG/albumin ratio of 1/1 to 2/1;

g., adjusting NaCl concentration of the solution to 0 to 0.9% w/v NaCl;

h., adjusting the pH of the solution to about 6.9±0.4;

i., concentrating the solution by ultrafiltration to obtain a concentration of about 4% w/v IgG;

j., removing the ethanol and concentrating the solution to about 4 to 6% w/v IgG by diafiltration; and

k., formulating the solution with the addition of sodium chloride, carbohydrates or combinations thereof.

4,719,291

PHENOLIC COMPOUND-MODIFIED SPENT SULFITE LIQUOR AND PROCESS FOR PREPARING SAME

Shui-Tung Chin, Coquitlam, Canada, assignor to Borden Company Limited, West Hill, Canada

Filed Sep. 16, 1985, Ser. No. 776,668

Claims priority, application Canada, May 9, 1985, 481180

Int. Cl.[4] C07G *1/00*

U.S. Cl. 530—502 28 Claims

1. A modified spent sulfite liquor which comprises a spent sulfite liquor by product of sulfite pulping processes having 4%–25% reacted phenolic compound based on the dry weight of said spent sulfite liquor, a decreased sugars content of at least 20% based on the sugars content of said spent sulfite liquor and a reduced number of sulfonic acid groups of at least 20% based on the sugars content of said spent sulfite liquor.

4,719,292

β-MODIFIED CRYSTALLINE RED PIGMENT

Franz Schui, Frankfurt am Main; Reinhold Deubel, Soden am Taunus, and Norbert Wester, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,720

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 32223888

Int. Cl.[4] C09B *67/24, 67/48, 11/02*; D06P *1/44*

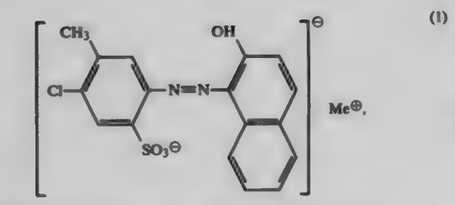
U.S. Cl. 534—575 4 Claims

1. Crystal modification (β-modification) of C.I. Pigment Red 53:1 the X-ray diffraction plattern of which obtained by means of Cu-K_α radiation has the following characteristic reflection values (relative intensity depending on the glancing angle θ):

°θ:	2.41	3.41	3.83	5.42	6.20	6.90	7.08	7.30	7.68
rel. int.:	100	16	16	10	12	6	9	6	8

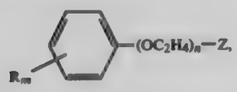
°θ:	8.17	8.62	9.25	9.77	10.48	10.92	12.22	12.48
rel. int.:	7	8	4	9	9	8	14	11

2. A process for the preparation of the modification (β-modification) of C.I. Pigment Red 53:1 as claimed in claim 1, which comprises reacting an aqueous solution or aqueous suspension of the salt of the formula 1



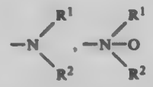
(1)

in which Me is an alkali metal or ammonium, in the presence of a compound of the formula 2



(2)

in which
R represents identical or different alkyl radicals having 1 to 12 carbon atoms,
m is 2 or 3,
n is an integer of from 1 to 50, and
Z is —OH,



(R^1 and R^2 each being alkyl having from 1 to 4 carbon atoms), with an excess of a water-soluble barium salt.

4,719,293

(2,5-DIISOPROPOXYCARBONYLBENZENE-AZO-2-HYDROXY-3-CARBAMOYL NAPHTHALENE) PIGMENT

Karl Ronco, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

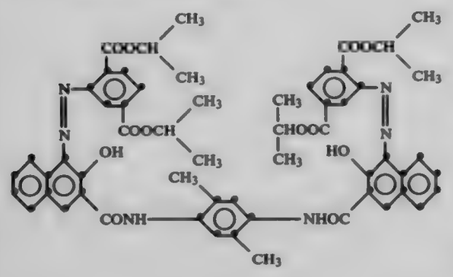
Continuation of Ser. No. 299,321, Apr. 30, 1981, abandoned. This application Oct. 17, 1984, Ser. No. 661,876

Claims priority, application Switzerland, May 7, 1980, 3552/80

Int. Cl.⁴ C09B *33/048, 35/033, 35/30, 31/075*

U.S. Cl. 534—828 **1 Claim**

1. The compound of the formula



4,719,294

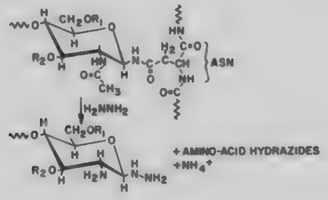
ISOLATION OF UNREDUCED OLIGOSACCHARIDES

Thomas W. Rademacher, and Raymond A. Dwek, both of Oxford, United Kingdom, assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 6, 1985, Ser. No. 772,988

Int. Cl.⁴ C07H *19/00, 21/00*

U.S. Cl. 536—22 **17 Claims**



1. A method for isolating unreduced oligosaccharides from a glycoprotein or glycohormone having an N-linked oligosaccharide structure comprising the steps of:
(a) hydrazinolyzing the glycoprotein or glycohormone by heating an essentially water-free and essentially salt-free glycoprotein or glycohormone in the presence of essentially water-free hydrazine under reaction conditions sufficient to cause cleavage at the N-linked sites to produce a mixture having as a major component a de-N-acetylated hydrazone derivative of an oligosaccharide;
(b) N-acylating the hydrazone derivative of (a) with acylating agent to form a N-acylated hydrazone derivative of said oligosaccharide;
(c) subjecting the hydrazone derivative of (b) to acid catalysis to produce said unreduced oligosaccharides; and
(d) subjecting the unreduced oligosaccharides of (c) to cellulose column chromatography to remove contaminants and recover therefrom said unreduced oligosaccharides.

4,719,295

COMPOUND 2-IODO-2'-DEOXYADENOSINE

Phillip D. Cook, Ann Arbor, Mich.; Roland K. Robins, Irvine, Calif., and Dennis J. McNamara, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 812,564, Dec. 31, 1985, which is a continuation-in-part of Ser. No. 699,391, Feb. 5, 1985, abandoned. This application Jun. 27, 1986, Ser. No. 879,215

Int. Cl.⁴ C07H *19/16*

U.S. Cl. 536—26 **1 Claim**

1. 2-Iodo-2'-deoxyadenosine.

4,719,296

SPIROXAZINE COMPOUNDS

Masahiro Irie, Osaka, and Shuichi Maeda, Saitama, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

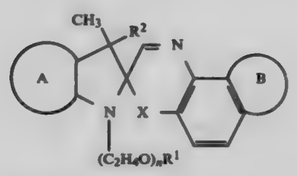
Filed Jan. 27, 1986, Ser. No. 822,449

Claims priority, application Japan, Jan. 25, 1985, 60-12191

Int. Cl.⁴ C07D *413/02, 417/02*

U.S. Cl. 544—71 **16 Claims**

1. A spiroxazine compound represented by the formula:



wherein R^1 and R^2 each represents an alkyl group, an allyl group, an aryl group or an aralkyl group; rings A and B each represents a substituted or unsubstituted benzene ring, a substituted or unsubstituted pyridine ring, or a substituted or unsubstituted pyrimidine ring; X represents an oxygen atom; and n represents an integer of from 1 to 6; and wherein the substituents for the substituted rings are one or more of the group consisting of an alkyl group, a halogen atom, an alkoxy group or an alkoxycarbonyl group.

4,719,297

ACYLPHOSPHINE COMPOUNDS AND THEIR USE AS PHOTOINITIATORS

Andreas Henne, Ludwigshafen; Anton Heese, Weisheim; Manfred Jacobi, Frankenthal; Guenter Wallbillich, Schifferstadt, and Bernd Bronstert, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

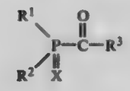
Continuation of Ser. No. 365,965, Apr. 6, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,218

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114341

Int. Cl.⁴ C07F *9/32, 9/40, 9/65*

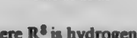
U.S. Cl. 544—107 **6 Claims**

1. An acylphosphine compound of the formula



(I)

where R^1 is R^4 or OR^4, R^2 is $—O^-M^+$, where M^+ is one equivalent of a cation, with an atomic weight of less than 138, of the main groups 1 to 3 of the Periodic Table, or the ammonium ion



(II)

where R^8 is hydrogen, R^5, R^6 and R^7 are identical or different and each is hydrogen or straight-chained or branched alkyl of up to 4 C atoms which is unsubstituted or substituted by a hydroxyl group, or is cyclohexyl, cyclopentyl, allyl, phenyl, β-acryloxyethyl or β-methacryloxyethyl or two of these substituents together with the nitrogen to which they are attached form morpholinium, R^3 is a substituted phenyl or naphthyl radical which carries C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkylthio, chloro or bromo substituents at least at the two positions ortho to the carbonyl group, R^4 is hydrogen or straight-chain or branched alkyl or alkenyl of up to 8 carbon atoms, which is unsubstituted or substituted by the group $—NR^5R^6$, or is phenyl, cyclohexyl or cyclopentyl, or phenyl which is monosubstituted or trisubstituted by straight-chain or branched alkyl, alkoxy, alkylthio groups of up to 6 carbon atoms, or NR^5R^6 wherein R^5 and R^6 have the above mentioned meaning or by halogen atoms having an atomic weight of up to 80, and X is oxygen.

4,719,298

SIDE CHAIN CHLORINATION PROCESS OF HETEROCYCLES

Günter E. Jeromin, Heidelberg; Winfried Orth, Hassloch/Pfalz, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,630

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519364

Int. Cl.⁴ C07B *39/00;* **C07D** *241/42, 213/26, 215/12*

U.S. Cl. 544—182 **5 Claims**

1. A method of chlorinating alkyl side chains of nitrogen heterocycles consisting essentially of reacting an α-alkyl side chain quasi aromatic nitrogen heterocycle in an inert solvent with trichloroisocyanuric acid at 20° to 200° C. whereby the side chain carbon atom attached to the nitrogen heterocycle is chlorinated.

4,719,299

PROCESS FOR PREPARING PYRIMIDINE

Roland E. Van Der Stoel, Buchten, Netherlands, assignor to Stamicarbon B. V., Geleen, Netherlands

Filed Oct. 10, 1985, Ser. No. 785,998

Claims priority, application Netherlands, Oct. 26, 1984, 8403258

Int. Cl.⁴ C07D *239/26*

U.S. Cl. 544—242 **8 Claims**

1. Process for preparing pyrimidine by reacting in the gas phase 1,3-diaminopropane with a C_1 reagent in the presence of an excess of methanol and/or carbon monoxide and of a metallic catalyst, wherein the reaction is carried out in the presence of a palladium catalyst promoted with from 0.5–2% (wt) alkali metal calculated on the total catalyst, and subsequently recovering pyrimidine from the resulting reaction mixture.

4,719,300

ISOINDOLINE COLORANTS

Wolfgang Lotsch, Beindersheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

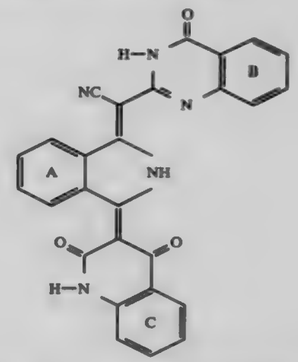
Filed Jul. 7, 1986, Ser. No. 882,358

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524393

Int. Cl.⁴ C07D *401/14*

U.S. Cl. 544—284 **9 Claims**

1. An isoindoline colorant of the formula



wherein the rings A, B and C are unsubstituted or, independently of one another are monosubstituted or disubstituted by a member selected from the group consisting of methyl, ethyl,

methoxy, ethoxy, chloro, bromo, nitro and trifluoromethyl groups.

4,719,301
PROCESS FOR PREPARING NOVEL 3-HALO-2-HYDROXYALKYL CARBAMATES

Joseph W. Hanafin, Framingham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 639,174, Aug. 9, 1984, Pat. No. 4,629,791. This application Sep. 4, 1986, Ser. No. 903,638
Int. Cl.[4] C07C *125/06*
U.S. Cl. 544—387 **14 Claims**

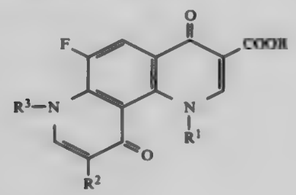
1. A process for the preparation of a 3-halo-2-hydroxyalkyl carbamate which comprises contacting an epihalohydrin carbonate with a secondary amine-containing compound, wherein the secondary amine has a pKa at which the secondary amine will react with the epihalohydrin carbonate and will not catalyze the formation of unwanted by-products, in a polar organic solvent under conditions such that a 3-halo-2-hydroxyalkyl carbamate, or a poly-(3-halo-2-hydroxyalkyl)polycarbamate is formed.

4,719,302
1,7-PHENANTHROLINES AND THEIR USE AS ANTIFUNGAL AGENTS

Jerauld S. Skotnicki, Chadds Ford; Donald P. Strike, St. Davids, and Bruce A. Steinbaugh, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 13, 1987, Ser. No. 25,316
Int. Cl.[4] C07D *471/04*
U.S. Cl. 546—88 **7 Claims**

1. A compound having the formula



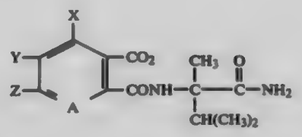
wherein
R is hydrogen or lower alkyl;
R^1 is hydrogen or lower alkyl, lower alkenyl, lower alkynyl, phenyl or any of the foregoing substituted with halo;
R^2 is hydrogen, carboxy or lower alkoxy carbonyl; and
R^3 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl or any of the foregoing substituted with carboxy, methoxycarbonyl, hydroxy, amino, dilower alkyl amino, cyano, nitro or lower alkoxy.

4,719,303
PREPARATION OF SUBSTITUTED AND UNSUBSTITUTED 2-[(1-CARBAMOYL-1,2-DIMETHYLPROPYL)-CARBAMOYL]-3-QUINOLINECARBOXYLIC, NICOTINIC AND BENZOIC ACIDS

William H. Gastrock, Vicksburg, Miss.; Timothy F. Mason, Plainsboro, and Gregory P. Withers, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

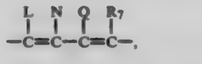
Filed Nov. 21, 1983, Ser. No. 553,933
Int. Cl.[4] C07B *43/06*; C07D *213/81*; C07C *101/42*
U.S. Cl. 546—169 **20 Claims**

1. A method for the preparation of compounds having the structure,

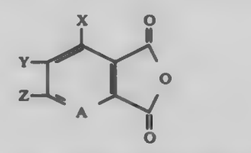


(I)

wherein A is N or CX^1; X and X^1 are each independently hydrogen, halogen, or C_1–C_4 alkyl, Y is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, trichloromethyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, phenyl, phenoxy, or phenyl or phenoxy substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; Z represents hydrogen, C_1–C_4 alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure, $-(CH_2)_n-$, where n is an integer selected from 3 to 5, provided that X is hydrogen; or YZ is

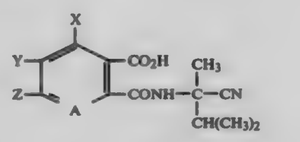


where L, M, Q and R_7 each represent hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl, phenoxy, or mono-substituted phenyl or phenoxy where the substitution is one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, said method comprising: reacting a compound having the structure,



(II)

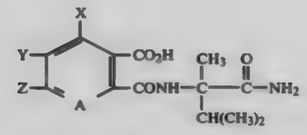
wherein X, Y, Z and A are defined as above, with from about 1.0 to about 1.5 molar equivalents of 2-amino-2,3-dimethylbutyronitrile in the presence of a hydrocarbon or chlorinated hydrocarbon solvent containing 1.0 to 3.0 molar equivalents of the polar aprotic co-solvent dimethylsulfoxide, dimethylformamide, acetonitrile, acetone, nitrobenzene, or mixtures thereof, at a temperature range of about 25° C. to 60° C. for about one to four hours; hydrolyzing the thus-formed compound having the structure,



(III)

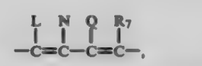
wherein X, Y, Z and A are as described above, with about 1.0 to 1.5 molar equivalents of water in the presence of catalytic molar equivalents of sulfuric, hydrochloric, toluene sulfonic acid, or mixtures thereof, in a hydrocarbon or chlorinated hydrocarbon solvent in the presence of 1.0 to 3.0 molar equivalents of the polar aprotic co-solvent dimethylsulfoxide, dimethylformamide, acetonitrile, acetone, nitrobenzene, or mixtures thereof, at a temperature of 20° C. to 60° C., for about one to five hours.

9. A method for the preparation of compounds having the structure,

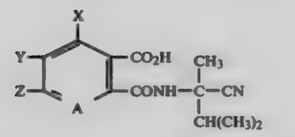


(Ia)

wherein A is N or CX^1; X and X^1 are each independently hydrogen, halogen or C_1–C_4 alkyl, Y is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, trichloromethyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, phenyl, phenoxy, or phenyl or phenoxy substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; Z represents hydrogen, C_1–C_4 alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure, $-(CH_2)_n-$, where n is an integer selected from 3 to 5, provided that X is hydrogen; or YZ is



where L, M, Q and R_7 each represent hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl, phenoxy, or mono-substituted phenyl or phenoxy where the substituent is one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, said method comprising: reacting a compound having the structure,



(IIIa)

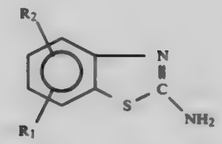
wherein A, X, Y and Z are as described above with 1.0 to 1.5 molar equivalents of water in the presence of catalytic molar equivalents of sulfuric, hydrochloric, p-toluenesulfonic acid, or mixtures thereof, in a hydrocarbon or chlorinated hydrocarbon solvent in the presence of about 1.0 to 3.0 molar equivalents of the polar aprotic solvent dimethylsulfoxide, dimethylformamide, acetonitrile, acetone, nitrobenzene, or mixtures thereof, at a temperature range of about 20° C. to 60° C. for about one to five hours.

4,719,304
PROCESS FOR PREPARING 2-AMINOBENZOTHIAZOLES

Heinz Rentél, Kronberg im Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

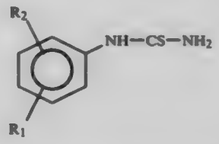
Filed Jun. 25, 1986, Ser. No. 878,191
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522941
Int. Cl.[4] C07D *277/82*
U.S. Cl. 548—164 **3 Claims**

1. A process for preparing 2-aminobenzothiazoles of the formula (1)



(1)

in which R_1 and R_2 denote hydrogen or halogen atoms or $alkyl_{C1-C4}$, $alkoxy_{C1-C4}$ or nitro groups, by reacting phenylthioureas of the formula (2)



(2)

in which R_1 and R_2 have the above-mentioned meanings, at temperatures of 20° C. to 130° C. in a reaction medium comprising the phenylthiourea of formula (2) and 70–100% strength sulfuric acid, the reactions being catalyzed by a bromine-containing catalyst, which comprises adding to the reaction mixture 0.1 to 0.01 percent by weight, based on the starting phenylthiourea of formula (2), of amorphous, pyrogenic or precipitated silica; silica gel; kieselguhr; bleaching earth; vulcanic liparite or quartz porphyric glasses or activated carbon as a finely divided solid having a large specific area and being inert under the reaction conditions, and subsequently adding a catalytic amount of the bromine-containing catalyst, which consists essentially of bromine, hydrogen bromide, sodium bromide, potassium bromide or ammonium bromide.

4,719,305
PROCESS FOR THE PREPARATION OF N,N-DIISOPROPYLBENZOTHIAZYL-2-SULFENAMIDE

Kevin L. Rollick, Munroe Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 18, 1985, Ser. No. 713,066
Int. Cl.[4] C07D *277/80*
U.S. Cl. 548—168 **8 Claims**

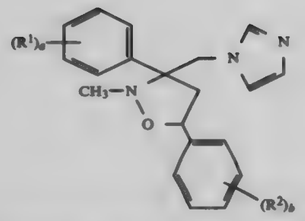
1. A process for the preparation of N,N-diisopropylbenzothiazyl-2-sulfenamide consisting of:
(a) forming a premix of diisopropylamine and 2-mercaptobenzothiazole (MBT) in a molar ratio of at least 1.5:1, amine:MBT, in sufficient water to form a pumpable slurry;
(b) adding to the premix 1.1 to 1.5 molar equivalents based on the MBT of a aqueous oxidizing agent solution selected from the group of solutions consisting of alkali metal hypohalites and alkaline earth metal hypohalites containing a stabilizing amount of a base, in the presence of a sufficient quantity of an acid to neutralize the base contained in the oxidizing agent solution;
(c) controlling the temperature during the oxidizing agent solution addition from 35° C. to 65° C.; and
(d) recovering the product.

4,719,306
SUBSTITUTED 3,5-DIPHENYL-3-(1H-IMIDAZOL-1-YLMETHYL)-2-METHYLISOXAZOLIDINES

Vasil St. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Penwalt Corporation, Philadelphia, Pa.

Filed Aug. 27, 1986, Ser. No. 900,852
Int. Cl.[4] C07D *233/60*
U.S. Cl. 548—240 **11 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in the form of their enantiomers or mixtures of their enantiomers including diastereoisomeric pairs of such enantiomers, wherein;

a=1 or 2,

b=1 or 2,

R^1 is selected from hydrogen, halogen, lower alkyl, lower alkoxy, and combinations thereof, provided that the ortho position is hydrogen, and

R^2 is selected from hydrogen, halogen, lower alkyl, lower alkoxy, and combinations thereof.

4,719,307

PROCESS FOR THE PREPARATION OF β-HYDROXYETHYL-(1,2,4-TRIAZOLE) DERIVATIVES

Reinhard Lantzsch, Leverkusen, and Karl-Julius Reubke, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 672,553, Nov. 19, 1984, Pat. No. 4,639,527. This application Oct. 6, 1986, Ser. No. 916,077

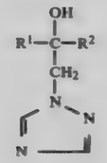
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342693

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.⁴ C07D *249/08*

U.S. Cl. 548—262 **9 Claims**

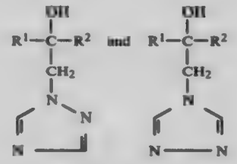
1. A process for the preparation of a β-hydroxyethyl-(1,2,4-triazole) derivative of the formula



in which

R^1 is methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl, or methyl, ethyl, propyl, isopropyl, n-butyl, iso butyl, sec.-butyl or tert.-butyl which is substituted by 1 to 3 fluorine and/or chlorine atoms, or represents cyclopropyl, cyclopentyl or cyclohexyl which is optionally substituted by methyl, or represents phenyl, which can be mono-, di- or tri-substituted by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenethyl, which can be 1-, 2- or 3-substituted in the phenyl part by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl

which process comprises stirring a mixture consisting essentially of a β-hydroxyethyl-(1,2,4-triazole) and a β-hydroxyethyl-(1,3,4-triazole) of the respective formulas



in the presence of a base and an aprotic dipolar diluent.

4,719,308

IMIDAZOLYLMETHOXY NAPHTHALENE COMPOUNDS AS ANTIALLERGIC AGENTS

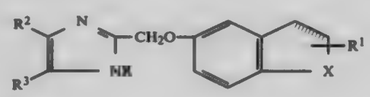
Anthony F. Kreft, III, Devon; John H. Musser, Malvern; Thomas W. Pattison, and John P. Yardley, both of King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 784,141, Oct. 3, 1985, Pat. No. 4,661,596, which is a continuation-in-part of Ser. No. 703,788, Feb. 21, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 915,443

Int. Cl.⁴ C07D *233/64*

U.S. Cl. 548—330 **1 Claim**

1. A compound having the formula:



wherein

X is $-CH_2CH_2-$, $-CH=CH-$,



R is hydrogen or loweralkyl;

R^1 is hydroxy, amino, loweralkyl sulfonamido, perfluoro loweralkyl sulfonamido or OR;

R^2 is hydrogen or loweralkyl;

R^3 is hydrogen or loweralkyl; or

R^2 and R^3 taken together form a benzene ring; and

the dotted line represents an optional double bond;

or a pharmaceutically acceptable salt thereof.

4,719,309

PREPARATION OF IMIDAZOLES

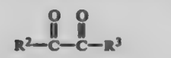
Walter Mesch, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 25, 1985, Ser. No. 801,569

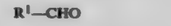
Int. Cl.⁴ C07D *233/58*

U.S. Cl. 548—335 **20 Claims**

1. In a process for the preparation of an imidazole by the Radziazewski reaction in which, using water as a solvent, an α,β-dicarbonyl compound of the formula



wherein R^2 and R^3 are alkyl of 1 to 10 carbon atoms, aryl of 6 to 10 carbon atoms or hydrogen, is simultaneously condensed with ammonia and with an aldehyde of the formula



wherein R^1 is alkyl of 1 to 10 carbon atoms, aryl of 6 to 12 carbon atoms or hydrogen, the improvement which comprises:

subjecting the crude reaction mixture obtained from the Radziszewski reaction to catalytic hydrogenation either directly or after replacing water with another solvent which is inert to the hydrogenation.

4,719,310

ESTER AND AMIDE SUBSTITUTED (2,3-DIHYDRO-4-(3-OXO-1-CYCLOHEXEN-1-YL)PHENOXY)ALKANOIC ACIDS AND THEIR SALTS

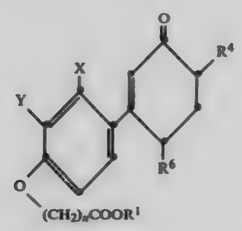
Adolph M. Pietraszkiewicz, North Wales; Otto W. Wolterstorff, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 23, 1985, Ser. No. 812,671

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—53 **10 Claims**

1. A compound of the formula:



(I)

wherein:

R^1 is hydrogen, lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, or a carboxyalkyl group containing from 2 to 6 carbon atoms;

R^4 is alkoxycarbonyl, containing from 1 to 6 carbon atoms, aminocarbonyl, alkylaminocarbonyl, containing from 2 to 7 carbon atoms, or dialkylaminocarbonyl, containing from 3 to 13 carbon atoms;

R^6 is hydrogen, lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, cycloalkyl containing from 3 to 6 nuclear carbon atoms, or aryl;

X, Y are each independently hydrogen, halo or lower alkyl containing from 1 to 5 carbon atoms; and

n is 1 to 4;

or the pharmaceutically acceptable salts thereof.

4,719,311

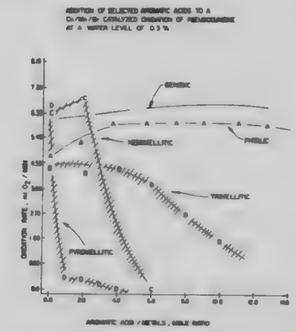
PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLIC ACIDS

Walter Partenheimer, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 23, 1985, Ser. No. 790,538

Int. Cl.⁴ C07C *51/21*

U.S. Cl. 562—413 **12 Claims**



1. A process for oxidizing polyalkylaromatic hydrocarbons having between 3 and 6 methyl groups on each benzene ring to their corresponding acids which comprises catalytically oxidizing the polyalkylaromatic hydrocarbon feedstock with air in the presence of an aliphatic acid in an oxidation zone wherein liquid-phase conditions are maintained and wherein the weight ratio of aliphatic acid to the polyalkylaromatic hydrocarbon is in the range of about 0.5–4.0:1.0 and the catalyst comprises cobalt, manganese and bromine, the process comprises addition of a combination of cobalt, manganese, and bromine components to provide about 0.05 to about 2.0 weight percent total metals based on the polyalkylaromatic hydrocarbon feedstock wherein there is present a weight ratio of bromine ions to total metal ions of about 0.5–8.0:1.0, a manganese content of about 10–50 percent by weight of the total metals, and the reaction is conducted at a temperature of about 100° C. to about 275° C. and about 0.3 to about 0.7 grams of water are added during the last third of the reaction per gram of total reactants.

VOL 1086 ISS 2 JA 12 1988 UMI

4,719,312
LYSOSOMETROPIC DETERGENT THERAPEUTIC AGENTS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 536,139, Sep. 26, 1983, abandoned, which is a continuation of Ser. No. 297,443, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 250,372, Apr. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 209,815, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 176,238, Aug. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 947,374, Oct. 2, 1978, abandoned. This application Sep. 2, 1986, Ser. No. 902,136

Int. Cl.⁴ C07C *87/22*

U.S. Cl. 564—510 **3 Claims**

1. A novel lysosomotropic detergent having a pK of from 3.5 to 8 of the formula:



(I.)

wherein:

R_1 is C_{8-30} alkyl;

4,719,313
GEM-DIHALO AND TETRAHALO-1,12-DIAMINO-4,9-DIAZA-DODECANES

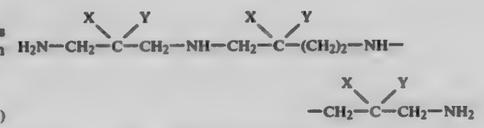
Fritz Gerhart, Kehl Leutesheim, Fed. Rep. of Germany, and Pierre Mamont, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 767,934, Aug. 21, 1985. This application Feb. 12, 1986, Ser. No. 828,925

Int. Cl.⁴ C07C *87/20*

U.S. Cl. 564—512 **5 Claims**

1. A gem-dihalo or tetrahalo-1,12-diamino-4,9-diaza-dodecane derivative having the formula



wherein X and Y represent hydrogen or halogen, with the proviso that in the case of the dihalo derivatives both halogens are present on one and only one carbon atom, and in the case of the tetrahalo derivatives the compounds are 2,2,11,11-halo-substituted; and the pharmaceutically acceptable salts thereof.

4,719,314
CABLE TRANSITION INTO THE HOUSING OF A DEVICE

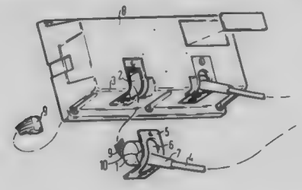
Gerd Nothnagel, Munich, and Heiner Thomfohrde, Hohenschaftlarn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,508

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 8510161[U]

Int. Cl.⁴ H05K *5/02*

U.S. Cl. 174—65 R **6 Claims**



1. A cable transition into a housing of a communications device, comprising:

a housing including first and second adjacent walls disposed at an angle with respect to one another;

an angular opening extending through said first and second walls;

a barrel-shaped element having a cable extending therethrough;

a cage mounted in said housing adjacent said opening for receiving said barrel-shaped element; and

an angle element including an oblong hole therethrough receiving the cable therethrough, said angle element secured to said housing and closing said opening with said barrel-shaped element mounted in said cage, whereby said cable is provided with a pivotal securement to said housing.

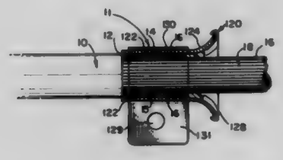
4,719,315
CABLE CONNECTORS

Leopold Gregorac, Kranj, Yugoslavia, assignor to United Ropeworks (U.S.A.) Inc., Montgomeryville, Pa.

Division of Ser. No. 824,487, Jan. 31, 1986, Pat. No. 4,704,498. This application Apr. 29, 1987, Ser. No. 44,082

Int. Cl.⁴ H02G *15/02*; H01R *4/00*

U.S. Cl. 174—73 R **8 Claims**



1. A connection for terminating at least a portion of a cable comprising:

a cable having a core comprising synthetic filaments, a polymeric sheath covering said core, an inner sheath comprising braided metallic filaments covering said polymeric sheath and a polymeric outer jacket covering said inner sheath, a portion of said inner sheath being terminated and exposed between ends of the cable, said exposed portion of the inner sheath having a first predetermined length, and at least a portion of the polymeric sheath being exposed adjoining the exposed portion of inner sheath;

a generally tubular outer sleeve surrounding the exposed portion of the inner sheath, said outer sleeve having an axial length at least slightly greater than the first predetermined length of the exposed inner sheath portion, said outer sleeve being positioned so that either sleeve end extends axially beyond the exposed portion of the inner sheath, the outer sleeve further being generally cylindrical and having a one bell mouth at one end, said bell mouth end being oriented towards the exposed portion of the polymeric sheath;

expansion means disposed between said polymeric sheath and said exposed portion of said inner sheath for expanding at least a portion of said braided metallic filaments of the inner sheath radially outwardly to engage said outer sleeve; and

sealing means between said exposed polymeric sheath and said outer tubular sleeve proximate said bell mouth end.

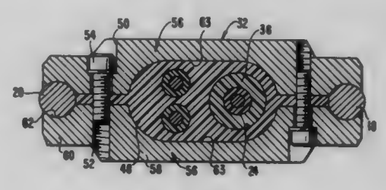
4,719,316
SPLICE FOR PUSHING AND PULLING CABLE

Ernest G. Hoffman, Middlefield; David H. Neuroth, Hamden, and Fernando Tabak, Norwalk, all of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Sep. 30, 1986, Ser. No. 913,849

Int. Cl.⁴ H02G *15/08*

U.S. Cl. 174—88 R **30 Claims**



1. A spliced pushing and pulling cable having a longitudinal axis, comprising:

first and second cables, each of said cables having a plurality of gripping members defining a longitudinal cavity, a bendable power conveying line housed in said cavity, a bendable power conveying line housed in said cavity and at least one elongated tensile element enclosed and compressed by said gripping members;

tensile element splicing means connecting adjacent ends of the tensile elements of said first and second cables;

power conveying line splicing means connecting adjacent ends of said power conveying lines of said first and second cables; and

a plurality of splice blocks located end to end along the longitudinal axis enclosing and compressing said tensile element splicing means and said tensile element ends, said blocks defining a longitudinally extending chamber housing said power conveying line splicing means and said power conveying line ends.

4,719,317
FILM-TYPE ELECTRICAL ELEMENT AND CONNECTION WIRE COMBINATION AND METHOD OF CONNECTION

Quentin Reynolds, Worplesdon, Great Britain, and Karl Deckelmann, Aschaffenburg, Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,923

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512158

Int. Cl.⁴ H01R *4/04*

U.S. Cl. 174—94 R **34 Claims**

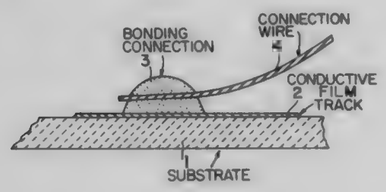
1. Electrical or electronic component having

a substrate (1) having an essentially insulating surface;

a film-type conductive track (2) in layer form of conductive material (2) applied to the insulating substrate (1);

a connection wire (4); and

further comprising a unitary mechanical and electrical bonding connection (3) between the conductive track (2) and the connection wire (4),
which bonding connection is characterized by
a unitary element (3) of electrically conductive metal particles and glass particles,
wherein the metal particles ensure electrical connection between the conductive track (2) and the connection wire (4),



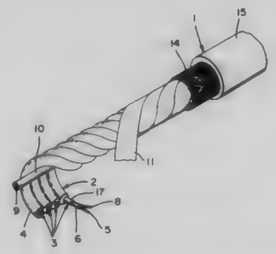
said unitary element (3) being bonded to the conductive track (2)
wherein at least in part, an end portion of said connection wire (4) is surrounded by and embedded in said unitary element; and
wherein the metal particles comprise metal powder present in between 40 to 80% (by weight) of the unitary element (3).

4,719,318
INSULATED CONDUCTORS AND METHOD OF MAKING SAME
Hans D. Achtsnit, Elsenfeld; Hans U. Herwig, Erlenbach, and Reinhold Kolb, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands
Filed Nov. 15, 1985, Ser. No. 798,414
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442160; Oct. 3, 1985, 3535267
Int. Cl.[4] H01B *7/18;* **C03C** *25/06*
U.S. Cl. 174—102 R **23 Claims**

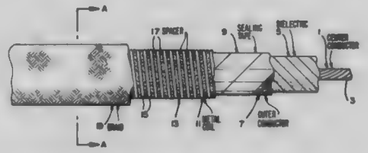
4. A mineral insulated conductor comprising a conducting core, an insulating material surrounding said conducting core, and a metallic jacket sheathing surrounding said insulating material, said insulating material comprising fibers containing SiO_2 in an amount greater than 99% by weight, said insulating material further including a binder which joins said fibers, said SiO_2 fibers being free of alkalies and having an average length of approximately 50 to 2000 μm and a non-crystalline structure.

4,719,319
SPIRAL CONFIGURATION RIBBON COAXIAL CABLE
Charles I. Tighe, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 11, 1986, Ser. No. 838,641
Int. Cl.[4] H01B *11/18, 7/22*
U.S. Cl. 174—103 **8 Claims**

1. A flexible electrical cable comprising, an elongated cord extending the length of the cable, an insulative jacket extending the length of the cable, spaced apart electrical conductors aligned parallel with one another within the jacket and surrounded respectively by the jacket, a conductive sheath surrounding the jacket, the improvement comprising,
the jacket and the conductors within the jacket being helically coiled around the cord and along the length of the cord and constructed for uncoiling from around the cord and assuming a flat planar configuration to position the conductors within the jacket coplanar with one another,
said conductive sheath engaging the helically coiled jacket and preventing the helically coiled jacket from uncoiling, and
said conductive sheath including a helically wrapped conductive film surrounding the helically coiled jacket and providing continuous overlying coverage thereof and a tubular envelope of wires surrounding and electrically engaging the conductive film.



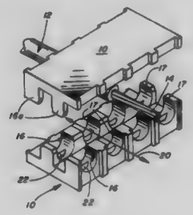
4,719,320
COAXIAL CABLE WITH COIL SUPPORTED BRAID STRUCTURE
Ross W. Strait, Jr., Madison, Conn., assignor to Times Fiber Communications, Inc., Wallingford, Conn.
Filed Apr. 28, 1986, Ser. No. 856,377
Int. Cl.[4] H01B *7/22*
U.S. Cl. 174—106 R **2 Claims**



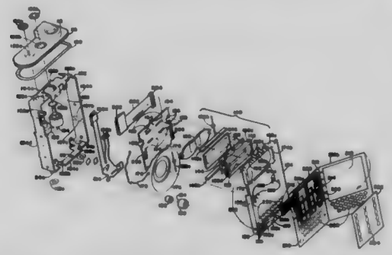
1. A coaxial cable comprising:
(i) a center conductor,
(ii) a flexible dielectric surrounding the center conductor,
(iii) a flexible outer conductor surrounding the dielectric,
(iv) A metal coil in the shape of a semi-close wound tension spring surrounding the outer conductor,
(v) at least one load bearing braid surrounding the coil, and
(vi) means for maintaining said metal coil in a semi-close configuration.

4,719,321
WIRE LOCATOR AND STRAIN RELIEF DEVICE
Charles A. Kozel, McHenry, and John T. Scheitz, Barrington, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.
Filed Jul. 28, 1986, Ser. No. 889,753
Int. Cl.[4] H01R *13/514*
U.S. Cl. 174—135 **11 Claims**

1. A wire locator and strain relief device which comprises a pair of plastic strip members, locking means holding said strip members together, said strip members together defining a plurality of parallel, coplanar channels, each for receiving separate, insulated wires, to firmly hold said wires in a single-plane, precisely positioned configuration, in which each strip member includes a pair of spaced channel-forming members for each coplanar channel present, said channel-forming members being positioned in asymmetric manner in the direction of the axes of the channels, and the channel-forming members of one strip member fitting together in alternating relation with the channel-forming members of the mating strip member to form said channels, whereby ends of wires may be precisely located relative to each other, for installation into an electronic circuit member.



4,719,322
RADIO HOUSING AND EXPANDABLE CHASSIS WITH INTEGRAL KEYPAD AND ACOUSTIC SPEAKER SEAL
Andrzej T. Guzik, Pompano Beach; Charles E. Kline, Sunrise, and Irving H. Holden, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 22, 1986, Ser. No. 866,014
Int. Cl.[4] G10K *5/04;* **H01H** *13/70;* **H04B** *1/38;* **H05K** *5/00*
U.S. Cl. 200—5 A **31 Claims**



19. A housing and chassis assembly with integral keypad and acoustic speaker seal, comprising in combination:
a conductive plate having first and second surfaces and at least one speaker aperture, and including a plurality of spring fingers integrally formed with said plate;
a flexible circuit type switch assembly unit attached to said first surface of said plate and including at least one switch and at least one speaker aperture;
a housing having at least one speaker aperture wherein the speaker apertures of said plate, said switch assembly unit, and said housing are in substantial alignment, said housing including at least one actuator aperture positioned over said switch;
an actuator pad attached to the outside of said housing and having at least one key wherein said key has a switch actuator in alignment with and for insertion into said actuator aperture of said housing, said switch actuator contacts said switch assembly unit and activates said switch when said key is depressed;
a speaker mounted to said second side of said plate and positioned over said speaker aperture of said plate;
a conductive frame having a central opening for receiving said plate and including support means, integrally formed with said frame, for supporting said spring fingers; and
means for captivating said plate in said frame and for restricting the travel of said plate within said frame between predetermined first and second positions;
whereby said spring fingers hold said switch assembly unit against the inside of said housing, thereby forming an acoustic seal between said plate and said housing, and said plate is electrically connected to said frame by said spring fingers and said support means.

4,719,323
SIMPLIFIED VEHICLE LIGHTING SWITCH
John A. Drain, 5045 E. Outer Dr., Apt. K-308, Detroit, Mich. 48234
Filed Dec. 12, 1986, Ser. No. 941,233
Int. Cl.[4] H01H *19/58*
U.S. Cl. 200—11 R **9 Claims**



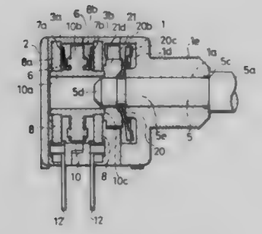
1. A rotary selector switch comprising a housing; a circuit board immovably disposed within the housing; a series of spaced electrical contacts located on one face of the circuit board in a circumferential pattern around a central axis normal to the plane of the circuit board; a switch element arranged for rotary motion around said central axis; said switch element comprising a dielectric disk having at least one electrically conductive bridge member thereon oriented to span the spaces between selected electrical contacts on the circuit board; manual means for operating the rotary switch element so that different circuits are completed in different selected positions of the switch element; said manual means comprising a manual knob located in an external position near a front wall of the housing and a shaft extending from the knob through an opening in the housing front wall, said shaft having a slidable key-type connection with the rotary switch element whereby the knob-shaft assembly can slide axially along the aforementioned central axis while maintaining a rotary driving connection with the switch element; and releasable retainer means for holding the knob-shaft assembly in selected positions of rotary adjustment; said retainer means comprising a radial wall structure carried on the shaft in near adjacency to an internal surface of the housing front wall, a detent on one of said radial wall structure and housing internal surface, and a series of circumferentially spaced recesses in the other of said wall structure and housing internal surface; said recesses being circumferentially spaced so that when a manual turning force is applied to the knob the detent is caused to pass across successive ones of the recesses; and a compression coil spring encircling the shaft for urging the radial wall structure toward said housing internal surface, whereby the detent is normally engaged in one of the recesses to prevent rotation of the knob-shaft assembly; said knob being manually movable toward the housing front wall so that the radial wall structure is moved axially to disengage the detent from any of the associated recesses.

4,719,324

ROTARY VARIABLE RESISTOR WITH SHAFT RETAINING SPRING MEMBER

Junichi Kuratani, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 31, 1986, Ser. No. 926,367
Claims priority, application Japan, Nov. 6, 1985, 60-169742[U]
Int. Cl.[4] H01H 19/00
U.S. Cl. 200—11 R 1 Claim



1. In a rotary type electronic device having a stationary casing including a front wall, a rotatable operating shaft having one end disposed through an opening in the front wall inwardly of the casing and its other operating end disposed outwardly of the casing, and a rotary electronic unit in the casing including a rotatable slider retainer which is engaged with the one end of the operating shaft such that a slider member mounted on the slider retainer is rotated in accordance with rotation of the operating shaft,

the improvement wherein said shaft has an inner retaining groove formed between the one end of the shaft and the front wall of the casing, and an outer retaining portion bearing against an outside surface around the opening in the front wall of the casing, wherein the spacing between the inner retaining groove and outer retaining portion is substantially the same as the length along the shaft through the front wall opening;

a fastening member disposed adjacent an inside surface of the front wall of the casing having a central opening shaped to be engaged with the one end of the shaft inserted therethrough, and engaging parts for engaging the rotatable slide retainer to rotate the same in conjunction with rotation of the shaft; and

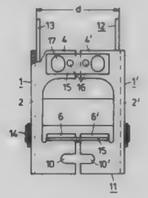
a spring washer disposed between said fastening member and the front wall having elastic engagement portions forming a central opening with a clearance smaller the dimensions of the one end of the shaft, wherein said one end of the shaft is inserted through the central opening by elastically deforming the engagement portions, and the engagement portions become engaged in the inner retaining groove of the shaft to retain the shaft axially through the opening in the front wall, said washer being secured by securing portions non-rotatively to said fastening member, and being tightly pressed by said fastening member against the inner surface of the front wall to provide a feel of torque resistance to rotation of the shaft, and having a protrusion on an annular spring part thereof bearing against the inner surface of the front wall to provide a click feeling in conjunction with rotation of the shaft.

4,719,325

CONTACT ARRANGEMENT WITH CONTACT LEVERS PIVOTED RELATIVE TO EACH OTHER IN A HOLDER

Joachim Kroll; Reinhard Kugler, and Bernd Rambotzki, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 28, 1986, Ser. No. 924,681
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539786
Int. Cl.[4] H01H 33/12
U.S. Cl. 200—146 R 6 Claims



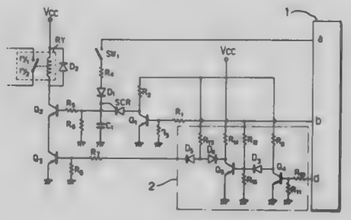
1. A contact arrangement having a plurality of contact levers which are pivoted relative to each other in a holder, the holder being movable about a stationary bearing for switching the contact arrangement on and off, the bearing comprising a bearing strap which surrounds the holder and which comprises at least two parts which are matched to each other and spaced at a fixed distance adapted to the holder.

4,719,326

MICROPROCESSOR POWER RELAY CONTROL CIRCUIT FOR A MICROWAVE OVEN

Wook Y. Yoo, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 23, 1986, Ser. No. 888,371
Claims priority, application Rep. of Korea, Jul. 25, 1985, 1985-5473
Int. Cl.[4] H05B 6/68
U.S. Cl. 219—10.55 B 2 Claims



1. A power relay control circuit for a microwave oven including a microprocessor as its controller, the circuit comprising:

two driving transistors connected in series to a power relay;

a switching means between one of said driving transistors and two output terminals of said microprocessor, and

a stabilizing circuit between the other of said driving transistors and another output terminal of said microprocessor,

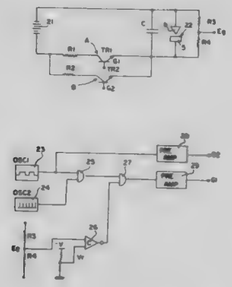
said stabilizing circuit including two transistors, which are connected with a diode interposed between them and operates reversely to each other, bias resistors; and two reverse-biased switching diodes, one of said bias diodes biasing the bee of the other of said driving transistors upon receipt of a signal from said microprocessor.

4,719,327

ELECTRICAL DISCHARGE MACHINING POWER SUPPLY

Ohara Haruki, Sagamihara, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00347, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00250, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 19, 1985, Ser. No. 834,242
Claims priority, application Japan, Jun. 22, 1984, 59-128827
Int. Cl.[4] B23H 1/02
U.S. Cl. 219—69 C 7 Claims



1. An electrical discharge machining power supply, connected to receive first and second pulse signals, for controlling a charging current of a discharge capacitor having a discharge current with a discharge current pulse width, by switching elements, comprising:

a small current charging circuit, coupled to the discharge capacitor and connected to receive the first pulse signal, whose switching is controlled by the first pulse signal, the first pulse signal having a pulse width larger than the discharge current pulse width of the discharge capacitor;

a large current charging circuit connected in parallel with said small current charging circuit and connected to receive the second pulse signal, said large current charging circuit switched on the basis of the second pulse signal, the second pulse signal having a pulse width smaller than the pulse width of the first pulse signal; and

control means for controlling operation of at least said large current charging circuit so that said large current charging circuit is switched to a charging state only when the small current charging circuit is in a charging state.

4,719,328

TOUCH-UP WELDING APPARATUS FOR MOTORCAR BODY

Takashi Yanagisawa, Hidakamachi, and Genzo Fuse, Higashimatsuyama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Jul. 21, 1986, Ser. No. 887,472
Claims priority, application Japan, Jul. 22, 1985, 60-160372; Jul. 23, 1985, 60-161153
Int. Cl.[4] B23K 11/00, 37/02
U.S. Cl. 219—79 4 Claims

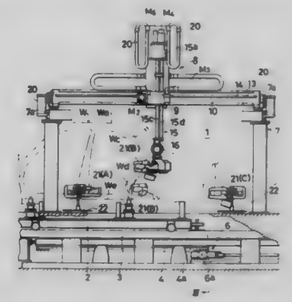
1. A touch-up welding apparatus for welding such portions of a motorcar body which remain unwelded after the body has passed along a main welding portion of a motorcar body assembly line comprising:

a welding station including means for moving a motorcar body into the station after passing along a main welding portion of an assembly line and means for setting the motorcar body at a predetermined setting position;

plural welding gun magazines for supporting respective differing welding guns disposed adjacent said setting position;

a framework surrounding said welding station and supporting horizontally spaced guide rails above said setting position and a frame member mounted for movement along said guide rails above said motorcar body in one of a lateral or longitudinal direction relative to said motorcar body; and

a welding robot including a robot main body mounted to said frame member for movement along said frame member in the other of said lateral or longitudinal direction relative to said motorcar body, means for moving said frame member in said one direction, means for moving said robot main body in said other direction, a robot arm extending downwardly from said robot main body, means for rotating said robot arm about a vertical axis, means for moving said arm upwardly and downwardly, a wrist



portion provided on a lower end of said robot arm, and means for rotating said wrist portion about a horizontal axis for swinging said wrist portion up and down, and

means for rotating said wrist portion about a vertical axis for turning movement of said wrist portion independently of said robot arm, said welding guns being selectively attachable to said wrist portion,

whereby selective replacement of the welding guns on the wrist portion of the welding robot arm from the plural welding gun magazines and movement of the robot main body laterally and longitudinally relative to the motorcar body and the robot arm upwardly and downwardly permits access to all areas of the motorcar body and enables welding of the remaining unwelded portions of the motorcar body.

4,719,329

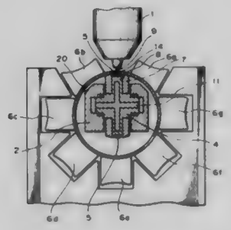
CAN BODY AND METHOD OF MAKING THE SAME

Kenji Matsuno, Yokohama; Hiroshi Matsubayashi, Kamakura; Kazuhisa Ishibashi, Tokyo; Kazuma Kase, and Nobuyuki Sato, both of Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 895,928
Claims priority, application Japan, Jul. 7, 1986, 61-159468
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121 LD 8 Claims

1. A can body having a continuous laser-welded seam of adjacent longitudinally extending edges of a tubular shaped member formed of surface-treated, steel plate having 0.12–0.35 mm thickness wherein an external width W1 and an internal width W2 of a molten-solidified zone of the welded part will meet the requirement specified by the formula $W1 \leqq 0.3$ mm.

and W1/5≦W2 , characterized in that the height of a portion of the internal surface of said welded part and adjacent area



thereof projecting from the internal surface of said tubular shaped member is maintained less than 20 μm,

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4,719,330
WELDING ELECTRODE
Stanley E. Ferree, Hanover, Pa., assignor to Alloy Rods Corporation, Hanover, Pa.
Continuation of Ser. No. 270,160, Jun. 3, 1981, abandoned. This application Oct. 10, 1986, Ser. No. 918,602
Int. Cl.[4] B23K *35/30*
U.S. Cl. 219—146.32 **8 Claims**

1. A welding electrode having a generally tubular ferrous metal sheath, and a core defined within the sheath for use in gas shield welding wherein the shielding gas is selected from the group consisting of carbon dioxide, inert gas, oxygen and inert gas mixtures and mixtures thereof, said core consisting of, by total weight of the electrode,
from about 3.0 to 12.0% titanium dioxide;
from about 0 to less than 0.2% magnesium oxide;
up to about 2.0% calcium fluoride;
from about 0.1 to 1.0% sodium oxide;
from about 0.5 to 4.5% manganese;
from about 0.003 to 0.08% boron; and
the balance consisting of an alloy powder selected from the group consisting of nickel, chrome, molybdenum, iron and mixtures thereof, whereby an electrode having a core within the above range is less moisture absorbent than is the electrode with at least 0.2% MgO in its core.

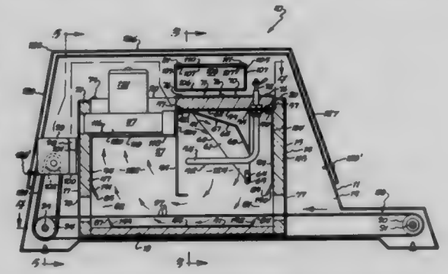
4,719,331
CERAMIC GLOW PLUG HAVING A TUNGSTEN-RHENIUM ALLOY HEATING WIRE
Masatoshi Ito, and Katsuhiko Tanaka, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan
Continuation of Ser. No. 624,071, Jun. 25, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,261
Claims priority, application Japan, Jul. 29, 1983, 58-137489
Int. Cl.[4] H05B *3/00*; F02P *19/00*; F02B *9/08*
U.S. Cl. 219—270 **1 Claim**

1. A ceramic glow plug comprising: a ceramic heater including a sintered ceramic body and a heating wire of a high melting point metal embedded in said ceramic body, a metal sheath, said ceramic heater being secured to one end of said metal sheath with an outer end portion of said ceramic heater protruding from said one end of said metal sheath, and a mounting shell, said mounting shell receiving the other end of said metal sheath, said heating wire being made of a tungsten alloy containing rhenium, in an amount selected to provide a desired



resistance of said wire, wherein said tungsten alloy contains 5 to 30 wt% rhenium.

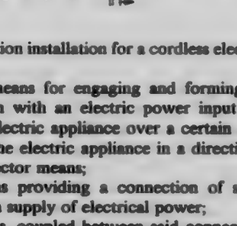
4,719,332
TUBE SHRINKING OVEN
Arthur W. Markuson, Jr., Rochester, N.Y., assignor to Strategic Products, Inc., Rochester, N.Y.
Filed May 5, 1986, Ser. No. 859,836
Int. Cl.[4] H05B *3/62*; F27D *7/04*
U.S. Cl. 219—388 **29 Claims**



1. A conveyor oven for applying predetermined amounts of heat to an article comprising a housing, entry and exit openings in said housing, conveyor means in said housing and extending through said entry and exit openings of said housing for conveying said article through said housing, means for supplying heated air to said article on said conveyor means within said housing, motor means for driving said conveyor means, and control means for intermittently energizing said motor means for driving said conveyor means for predetermined fixed time intervals and for selectively deenergizing said motor means for selectively variable time intervals between said fixed time intervals to thereby determine the length of time of passage of said conveyor means through said housing and thus determine the length of heating time of said article.

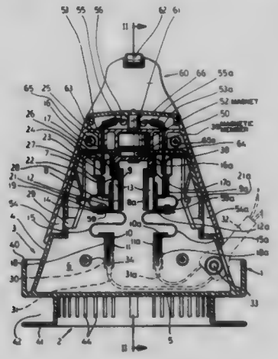
4,719,333
FIRING OF CERAMIC WARE
Philip J. White, Staffordshire, United Kingdom, assignor to Portmeirion Potteries, Limited, England
Filed Feb. 19, 1985, Ser. No. 702,839
Int. Cl.[4] A21B *1/00*
U.S. Cl. 219—400 **11 Claims**

1. A method of firing ware in an intermittent kiln, said method comprising initially firing the ware to substantially a predetermined temperature by simultaneously applying radiant heat from electric heating means within the kiln, heating air from externally of the kiln by means of a heat source independent of the kiln heating means, and introducing the heated air into the kiln so as to create heated air flow around the ware,



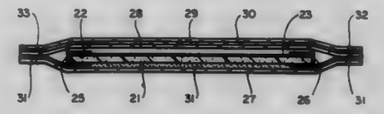
removing the air, and subsequently completing firing by a continued application of radiant heat from the electric heating means.

4,719,334
CONNECTION INSTALLATION FOR A CORDLESS ELECTRIC APPLIANCE
Joachim Rebel, D-Reinchenbach/Fils, Fed. Rep. of Germany, assignor to Geka-Werk Reinhold Klein AG, Gemuendeal, Fed. Rep. of Germany
Filed Jul. 12, 1985, Ser. No. 754,435
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517830
Int. Cl.[4] H05B *1/02*; D06F *75/28, 79/02*; H01R *33/96*
U.S. Cl. 219—518 **17 Claims**



1. A connection installation for a cordless electric appliance, comprising:
connector means for engaging and forming an electrical connection with an electric power input terminal of a cordless electric appliance over a certain separation distance of the electric appliance in a direction away from said connector means;
power means providing a connection of said connector means to a supply of electrical power;
switch means, coupled between said connector means and said power means, for selectively electrically connecting and disconnecting said connector means from said power means, said switch means including first and second switch contacts relatively movable between a first position in which said contacts are engaged and a second position in which said contacts are separated;
biasing means, including first and second switch springs formed of curved strips of sheet metal coupled to said first and second switch contacts, respectively, for applying a force to said switch contacts towards said second position, one of said switch springs being a compression spring and the other of said switch springs being a tension spring; and
a contact actuating member, coupled to said switch contacts, for moving said switch contacts against said biasing means to said first position, said contact actuating member including magnetic reaction means for moving said contact actuating member against said biasing means in response to proximity of a magnet in the cordless appliance, said certain separation distance being greater than a distance at which proximity of the magnet in the appliance to said magnetic reaction means is sufficient to cause said contact actuating member to move said switch contacts to said first position against the force of said biasing means as the appliance is moved toward and away from said connector means, whereby the switch contacts are in said first position only after coupling of said connector means with the electric power input terminal of the appliance and said switch contacts move to said second position while said connector means still engages the electric power input terminal of the appliance.

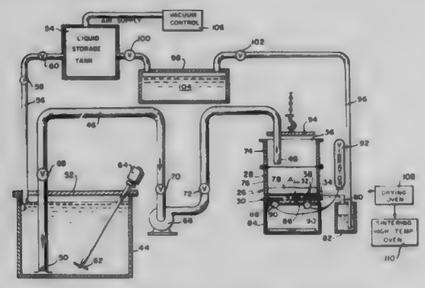
4,719,335
DEVICES COMPRISING CONDUCTIVE POLYMER COMPOSITIONS
Neville S. Batliwalla, Foster City; Michael C. Jones, Fremont; Ravinder K. Oswal, Union City; Jeff Shafe, Redwood City, and Bernadette A. Trammell, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 820,276, Jan. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 780,524, Sep. 26, 1985, abandoned, Ser. No. 650,918, Sep. 14, 1984, abandoned, Ser. No. 650,919, Sep. 14, 1984, abandoned, Ser. No. 735,409, May 17, 1985, abandoned, and Ser. No. 735,408, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 663,014, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 650,920, Sep. 14, 1984, abandoned, said Ser. No. 780,524, is a continuation of Ser. No. 573,099, Jan. 23, 1984, abandoned. This application May 19, 1987, Ser. No. 51,439
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—528 **13 Claims**



1. An electrical sheet heater which comprises:
(1) a laminar resistive element which is composed of a conductive polymer composition which comprises an organic polymer, and dispersed in the polymer, a particulate filler;
(2) a plurality of electrodes at least two of which can be connected to a source of electrical power to cause current to pass through the laminar element, and which are dimensioned and positioned on a surface of the element so that when current passes between the electrodes, a substantial proportion of the current is parallel to the faces of the laminar element; and
(3) a dielectric layer positioned over at least part of the electrodes, the dielectric layer having been applied directly onto the electrodes in liquid form, and then solidified so that a solidified layer is formed having a first surface which is intimately bonded to at least part of the electrodes, and a second surface, facing away from the electrodes, with the proviso that if another member is bonded to the second surface of the solidified dielectric layer, at least one of the following conditions is satisfied (a) the peel strength of the bond between the said another member and the second surface of the dielectric layer is less than the peel strength of the bond between the first surface of the dielectric layer and the electrode; and (b)

the peel strength of the bond between the said another member and the second surface of the dielectric layer is less than 3 lbs. per inch at 20° C.

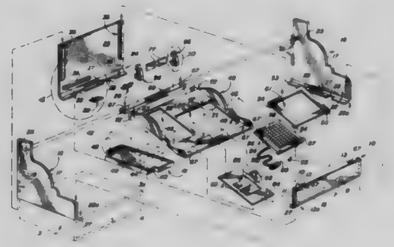
4,719,336
METHOD OF MAKING THERMAL INSULATING BLOCKS AND ELECTRICAL HEATING UNITS AND THE PRODUCTS THEREOF
Duane L. Sterwald, Watertown, Wis., assignor to General Signal Corporation, Stamford, Conn.
Filed May 30, 1986, Ser. No. 868,651
Int. Cl.[4] H05B *3/44, 3/50*
U.S. Cl. 219—544 **10 Claims**



1. The process of producing a thermal insulating block comprising the steps of mixing a mass of elongated inorganic fibers, water and a binder to form a slurry, the mass of the water being greater than the mass of the inorganic fibers and the fibers being substantially randomly disposed in the slurry, thereafter transferring the slurry to a mold having a confined area over a filter screen and passing a part of the slurry through the filter screen to trap and accumulate the inorganic fibers in a mat on one side of the filter screen and divide the liquid component of the slurry into two portions, the first portion of the liquid component of the slurry passing through the filter screen and the second portion of the liquid component of the slurry remaining on the one side of the filter screen with the mat, maintaining the filter screen in contact with the mat and positioned beneath the mat and subjecting the filter screen to mechanical vibration, whereby a part of the second portion of the liquid component flows by gravity downwardly through the filter screen and the mat settles on the filter screen, thereafter removing the mat from the screen, and evaporating water from the mat.

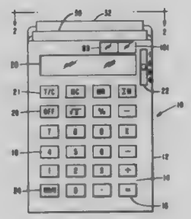
4,719,337
CASH REGISTER COVER
Kenneth Hudson, Rte. 2, Box 203, Lowell, Ark. 72745; David E. Gormley, 309 NE. G St., Stigler, Okla. 74462; James E. Dowdy, Rte. 1, Box 390 H, Huntington, Ark. 72940, and Edward F. Vampola, 4408 S. 35 Dr., Fort Smith, Ark. 72903
Filed Jan. 9, 1987, Ser. No. 1,834
Int. Cl.[4] G06F *1/00*
U.S. Cl. 235—7 R **41 Claims**

1. A cash register cover for enclosing and operating a cash register having a cash box and a keyboard, said cash register cover comprising a front panel; a rear panel spaced from said front panel; a pair of side panels disposed in spaced, substantially parallel relationship with respect to each other, said side panels disposed in substantially perpendicular relationship with respect to said front panel and said rear panel and said side panels interconnecting said front panel and said rear panel to define a cover perimeter; a keyboard panel engaging said front panel and abutting said side panels and partially closing said cover perimeter for receiving the keyboard; and indication means closing said cover perimeter between said keyboard panel and said rear panel for supporting and enclosing at least one indication printed circuit board and displaying selected



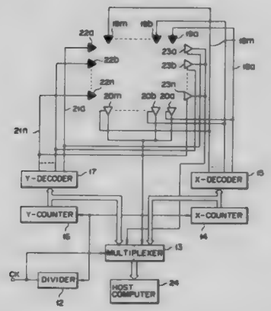
indicia on the indication printed circuit board responsive to operation of the keyboard.

4,719,338
POCKET CALCULATOR WITH CREDIT CARD CONTROLLER AND DISPENSER
James M. Avery, Austin, Tex., and Madhu C. Patel, Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio
Filed Aug. 12, 1985, Ser. No. 764,903
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **3 Claims**



1. A transaction processing device comprising a
hand held calculator having keyboard means and display means operably associated to input data and to display said data, a
first credit card carried by the calculator and being electrically alterable and having memory means therein and accessible by the calculator for providing a plurality of functions, a
second credit card carried by the calculator and usable to transact operations remote from the calculator,
first and second slots for containing said first and second credit cards in positions wherein said first credit card is positioned between said second credit card and said calculator, and
switch means on the calculator slidable to one of a plurality of positions for making a selection of normal calculator operation or for reading information from the first credit card for processing thereof relative to said functions including display of information, reading and accessing information, and setting of information.

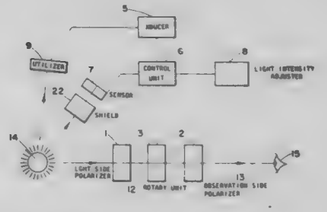
4,719,339
COORDINATES DETECTOR WHEREIN X AND Y EMITTING ELEMENTS ARE ENABLED INDEPENDENTLY OF EACH OTHER
Sakuyuki Mizuno, Kunitachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 25, 1985, Ser. No. 715,401
Claims priority, application Japan, Mar. 31, 1984, 59-63591
Int. Cl.[4] G01V *9/04*; H01J *40/14*
U.S. Cl. 250—221 **8 Claims**



1. A coordinate detector comprising:
X and Y direction light beam detection means comprised of a plurality of pairs of light beam emitting and receiving elements arranged parallel to X and Y axes in a orthogonal coordinates plane where a designation position is detected;
first means for sequentially enabling the X direction light detection means;
second means separate from said first means for sequentially enabling the Y direction light detection means independently of the first means so that each one of the enabled X direction light detection means is simultaneously enabled with one of the enabled Y direction light detection means; and
means for storing a detection output of the X and Y direction light detection means and for permitting a designation position to be obtained from the position of a pair of light emitting and receiving elements where X and Y direction light beam emitted from light emitting elements in the X and Y direction light detection means is blocked;
wherein the X direction emitting elements and the Y direction emitting elements are enabled independently of each other so that any range of X emitters and Y emitters may be selected.

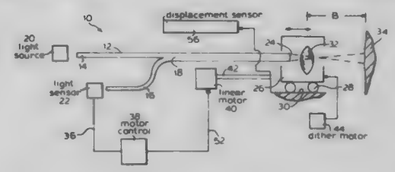
4,719,340
METHOD AND APPARATUS FOR THE OBSERVATION OF LUMINOUS PHENOMENA
Zoltán Páfi, Keselyü u.l., H-1025 Budapest; István Fledrich, Munkácsy Mihály u. 3/A C/16, H-2100 Gödöllö; Sándor Krekács, Juhász Gy. u.2., H-1039 Budapest, all of Hungary, and Sánder Bihary, 6690 Görding, Denmark
Filed Jan. 22, 1987, Ser. No. 9,618
Claims priority, application Hungary, Aug. 25, 1982, 2735/82
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **5 Claims**

1. Method for controlling the light intensity transmitted through a light tranmsitting equipment (3,23,24) from a light source (14), comprising the sets of sensing the light intensity of the light source (14), controlling the light transmitting power of the light transmitting equipment in dependency of the sensing signal, said sensing of the light source (14) is is performed operatively before the light transmitting equipment (3,23,24) and said controlling of the light transmitting power of the light transmitting equipment is performed in comparison to a present value and said controlling of the light transmitting equipment (3,23,24) is effected at the beginning of a high intensity



light effect by a start signal,which is different from and higher than the normal control signal,whereby an instantaneous decrease of light intensity transmission is effected.

4,719,341
FIBER OPTIC DISPLACEMENT SENSOR WITH OSCILLATING OPTICAL PATH LENGTH
Leo Hoogenboom, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.
Filed Oct. 1, 1986, Ser. No. 914,138
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **10 Claims**



1. A proximity sensor for determining the distance to a target comprising:
a light source;
a bifurcated bundle of optical fibers with a first arm arranged to receive light from said light source, a second arm, and a common leg terminating in a bundle face:
an imaging lens disposed in a light path between said bundle face and said target for generating a first image of said face on a surface of said target, and for generating a second image of the target on said face, the fibers of said bundle being arranged and constructed to conduct light received from the target through said second arm, the light received through said second arm having a minimal intensity when said face is at a predetermined position from said target;
a light sensor coupled to said second arm for generating a sensor signal corresponding to the received light;
a control circuit for generating a control signal corresponding to said sensor signal;
oscillating means for oscillating a length of the light path between said bundle face and said target without moving said bundle face and imaging lens, and for generating an AC component in said sensor signal, said AC component being indicative of an instantaneous distance between said face and said predetermined position; and
wherein said leg is disposed generally in parallel with said target surface, the proximity sensor comprises a mirror disposed in the light path between the bundle face and the target and said oscillating means comprises an oscillating linear motor which reciprocates the mirror along a preselected axis for changing the length of the path.

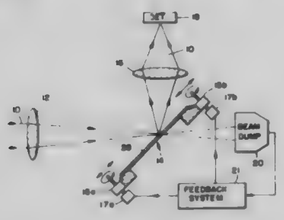
VOL 1086 ISS 2 JA 12 1988 UMI

4,719,342

ELECTROMAGNETIC ENERGY DIVERSION DEVICE WHEREIN PELLICLE OBLATES RESPONSIVE TO VERY STRONG POWER DENSITY

David B. Coles, San Pedro, and Lorna C. Flamm, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 9, 1986, Ser. No. 883,875
Int. Cl.[4] G01J *1/20*; B23K *9/00*; G02F *1/00*
U.S. Cl. 250—201 7 Claims



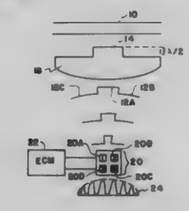
1. A method of diverting electromagnetic radiation from sensitive optical apparatus, including the steps of:
directing incident electromagnetic radiation onto a reflective surface supported beneath a medium which ablates upon heating;
sensing in the medium a power density of the electromagnetic energy;
reflecting said electromagnetic radiation off said reflective surface and towards said optical apparatus when said electromagnetic radiation has a power density below a predetermined threshold;
producing a hole in said ablative medium and in said reflective surface when said electromagnetic radiation has a power density above said threshold; and
passing said electromagnetic radiation through said hole in said reflective surface.

4,719,343

PHASE RETARDING LASER RADIATION DETECTION SYSTEM

John H. Tressler, III, Chagrin Falls, Ohio, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 3, 1986, Ser. No. 835,819
Int. Cl.[4] G02B *27/42*
U.S. Cl. 250—203 R 16 Claims



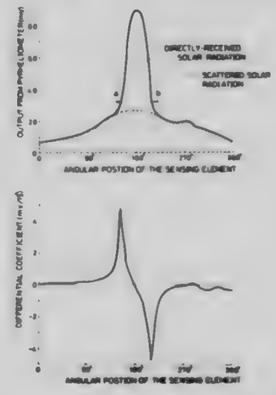
1. A laser radiation detection system comprising:
phase retarder means for retarding less than all of the radiation incident on the system;
optical focusing means for focusing the radiation incident on the system;
detector means for detecting the presence of incident radiant energy and producing a plurality of electrical output signals in response to the incident radiant energy and in proportion to the intensity of the incident radiant energy the detector means being located in the focal plane of the optical focusing means;
electrical circuit means for providing differencing of the plurality of electrical output signals of the detector means in pairs, and for outputting a signal indicating the presence of laser radiation when the sum of the differences of the electrical output signals of the detector means is greater than a preselected threshold, the electrical circuit means being selectively coupled to the detector means.

4,719,344

METHOD OF AND APPARATUS FOR MEASURING AMOUNT OF SOLAR RADIATION RECEIVED DIRECTLY

Tozawa Hiroyuki, Tokyo, Japan, assignor to Eko Instruments Trading Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 532,738, Sep. 15, 1983, abandoned. This application Aug. 21, 1986, Ser. No. 898,883
Claims priority, application Japan, Sep. 17, 1982, 57-162049
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—203 R 2 Claims



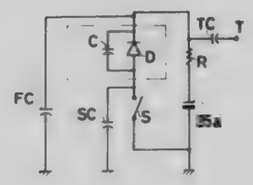
1. A method for measuring the amount of direct solar radiation, comprising the steps of: rotating a light sensor at a constant speed in a manner such that the light sensor scans the sky including the sun so as to receive both direct and scattered components of solar radiation; and obtaining the differential coefficient of electric outputs from the light sensor with respect to time so as to substantially eliminate the scattered component of the radiation received.

4,719,345

READING APPARATUS WITH IMPROVED CLARITY

Hirotaka Arita, Kagoshima, Japan, assignor to Kyocera Corporation, Japan

Filed Jun. 20, 1985, Ser. No. 747,062
Claims priority, application Japan, Jun. 21, 1984, 59-128530
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J 5 Claims



1. A document-reading apparatus comprising:

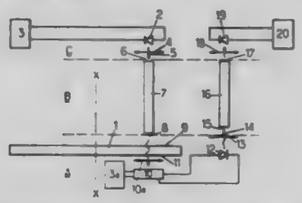
a photo-electric converter uait having a photo-electric diode, and a charge storing means connected in parallel to the photo-electric diode;
a switch having one end connected to one end of the photo-electric converter unit;
a DC power supply having one end connected to the other end of the switch, and directionally-coupled to supply a voltage in reverse bias across the photo-electric diode; and
output means interposed between the other end of the photo-electric converter unit and the other end of the DC power supply for detecting a reading output signal to be supplied from the connecting point of the photo-electric converter unit and the output means;
wherein the capacitance of said charge storing means is larger than the parasitic capacitance of said switch.

4,719,346

OPTICAL POSITION LOCATING APPARATUS WITH BIDIRECTIONAL LIGHT TRANSMISSION

Jacques Taillebois, Plaisir; Jean-Marie Renaud, Courbevoie; Jean-Claude Perrot, Montigny en Cormeilles, and Paul Gambs, Ecully, all of France, assignors to M.C.B., Courbevoie, France

Filed Dec. 19, 1985, Ser. No. 810,722
Claims priority, application France, Dec. 21, 1984, 84 19711
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE 9 Claims



1. A position locating apparatus comprising:
(a) a data sensor for cooperating with a position code carrying element comprising optically coded tracks;
(b) an optoelectronic module with an electronic signal processing unit; and
(c) bidirectional optical transmission means;
(i) said sensor including:
a first optoelectronic reader disposed opposite said optically coded tracks for receiving light passing through transparent zones of said optically coded tracks and for transforming said light into electric signals,
a first optoelectronic light emitter electrically excited by said optoelectronic reader, and
a self-contained power source for supplying power to said optoelectronic reader and said optoelectronic emitter;
(ii) said optoelectronic module including:
a second optoelectronic light emitter,
a second optoelectronic reader,
a processing unit associated with said second optoelectronic reader for processing electric signals emitted by said second optoelectronic reader,
a power supply for supplying power to said optoelectronic emitter and said optoelectronic reader; and
(iii) said bidirectional optical transmission means including:
at least a first optical fiber for transmitting light emitted by said second optoelectronic emitter to said optically coded tracks of said code carrying element, and
at least a second optical fiber for transmitting light signals emitted by said first optoelectronic emitter to said second optoelectronic reader.

4,719,347

METHOD AND APPARATUS FOR INVESTIGATING A SAMPLE UNDER TENSION

Hans-Peter Kugler, Stadlerstr. 34, D-7519 Zaisenhausen; Norbert Eisenreich, Amselstr. 16, D-7307 Pfinztal 1; Adam Geisler, Lachenweg 10, D-7529 Karlsdorf-Neuthard, and Klaus Fabry, Goetheestrasse 3, D-7519 Walzbachtal, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 746,896, Jun. 18, 1985. This application Dec. 23, 1985, Ser. No. 812,842
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509163
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R 16 Claims



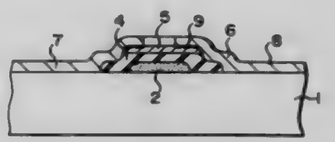
1. Method for investigating a volume change of a sample under tension, the method comprising the steps of:
scanning the sample by a first light beam,
detecting the light beam reflecting from the sample and further processing the detected reflected light beam,
irradiating the sample by at least one additional light beam of a finite width,
converting the light beam into a first voltage behind the sample,
scanning a transverse pattern with a different reflectivity mounted on the sample by the first light beam in a longitudinal direction,
converting a change in frequency caused by stretching of the sample in the reflected light thus intensity-modulated into a corresponding second voltage, and
comparing the first and second voltages with each other.

4,719,348

OPTICAL SENSOR HAVING HEATING ELEMENT TO HEAT AMORPHOUS SEMICONDUCTOR FILM

Tamio Saito, Tokyo, and Hiroui Kobayashi, Ichikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1986, Ser. No. 911,981
Claims priority, application Japan, Sep. 30, 1985, 60-216566
Int. Cl.[4] H01J *7/24*, *40/14*
U.S. Cl. 250—238 8 Claims



1. An optical sensor comprising:
an insulative substrate having a first surface and a second surface opposing the first surface;
an amorphous semiconductor film formed on the first surface of the substrate, for converting light rays into electrical signals;

a first electrode and a second electrode both formed on the amorphous semiconductor film and separated from each other; and

a heating element formed on either the first or second surface of the substrate, for heating the amorphous semiconductor film, when supplied with an electrical current.

4,719,349

ELECTROCHEMICAL SAMPLE PROBE FOR USE IN FAST-ATOM BOMBARDMENT MASS SPECTROMETRY

Lawrence R. Phillips, Gaithersburg, Md., and John E. Bartmess, Knoxville, Tenn., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 27, 1986, Ser. No. 867,013
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—288 **14 Claims**



1. In an f.a.b. mass spectrometer, the improvement wherein the electrode sample proble is of the dual-electrode type with at least two electrodes insulated from each other,

potential means is provided for applying a potential difference between said electrodes,

an ion beam produced by said mass spectrometer bombards said sample probe with a sample distributed across adjoining surfaces of said at least two electrodes, and

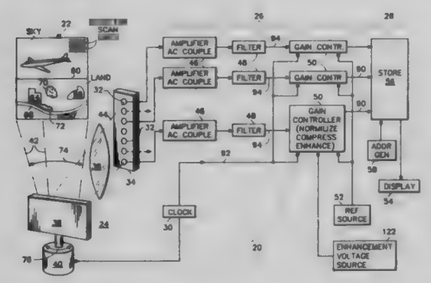
said at least two insulated electrodes of said dual-electrode type of sample are arranged so that current flows via said sample between said at least two electrodes as a result of said potential difference.

4,719,350

RADIATION IMAGING ENHANCEMENT

Ake W. Alm, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Co., Los Angeles, Calif.

Filed Jan. 30, 1986, Ser. No. 824,381
Int. Cl.[4] G02F *1/01*; H01L *25/00*; G02B *26/10*
U.S. Cl. 250—330 **19 Claims**



1. An imaging system comprising:

an array of radiation detectors arranged along the vertical dimension of a scanning pattern;

means for directing radiation from a subject, distant from said system, toward said array of detectors to permit a viewing of said subject by said system, said directing means including means for scanning said radiation along a set of scan lines sweeping out adjacent regions of the subject with a scan interval of predetermined duration to provide a two-dimensional raster scan of a scene including said subject, each of said detectors providing a signal in response to radiation incident upon the detector;

means for displaying data to be carried by signals of respective ones of said detectors to present an image of the scene containing said subject;

signal processing means interconnecting said displaying means with said array of detectors, said signal processing means including gain normalizing means for amplifying individual ones of said detector signals with a gain varying inversely to average signal strength; and wherein

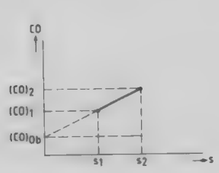
said normalizing means is configured as a feedback loop and includes nonlinear means for introducing a nonlinear gain characteristic, said normalizing means including enhancement means for clarifying edge lines of said subject, said nonlinear means coacting with said enhancement means to provide an adaptive enhancement characteristic dependent on the strength of signals from the corresponding detectors.

4,719,351

PROCESS FOR DETERMINING OXIDATION-DEPENDENT CHARACTERISTICS OF SIMILAR PLASTIC ARTICLES, AS WELL AS USES OF THE PROCESS AND APPARATUS FOR PERFORMING THE PROCESS ON LARGE INJECTION MOULDED PRODUCTS, PARTICULARLY BOTTLE CRATES

Christoph Schoeller, and Martin Schoeller, both of Zaoz, Switzerland, assignors to Alexander Schoeller & Co. AG, Romont, Switzerland

PCT No. PCT/CH85/00068, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/05183, PCT Pub. Date Nov. 21, 1985
PCT Filed May 1, 1985, Ser. No. 822,404
Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416594
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—339 **14 Claims**



1. A method for determining oxidation characteristics of similar plastic articles made from at least one of polyethylene and propylene and to classify from said characteristics at least one of whether said articles are made from plastic which has been regenerated or a non-regenerated plastic, how high a degree of depth-distribution is present in the case of said articles being formed from said regenerated plastic, and how high a degree of surface oxidation is present independent of whether said plastic articles are formed from said regenerated or non-regenerated plastic, said method comprising measuring an IR-transmission absorption in the carbonyl group band range as an indication of said oxidation characteristics at at least two different plastic thicknesses of the same plastic material, and determining from said measurements a part of said measured transmission-absorption within the carbonyl groups band range which emanates from a surface zone, said determination being made in accordance with the following equation:

$$(CO)_{ob} = \frac{S_2(CO)_1 - S_1(CO)_2}{S_2 - S_1}$$

wherein

$(CO)_{ob}$=the part of the measured transmission-absorption in the carbonyl group band range which emanates from the surface zone;

S_1=a thickness at a first point;

S_2=a thickness at a second point;

$(CO)_1$=the transmission-absorption measured over the thickness at the first point; and

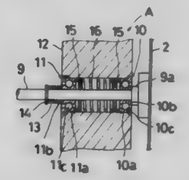
$(CO)_2$=the transmission-absorption measured over the thickness at the second point such that said $(CO)_{ob}$ value is used to classify said oxidation characteristics of said plastic articles.

4,719,352

APPARATUS FOR INTERMITTING BEAM OF LIGHT FOR USE IN GAS ANALYZER

Kinio Miyatake, and Kenji Takeda, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Mar. 25, 1986, Ser. No. 844,017
Claims priority, application Japan, Jun. 4, 1985, 60-85106[U]
Int. Cl.[4] G02B *26/04*
U.S. Cl. 250—351 **14 Claims**



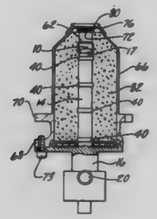
1. An apparatus for intermitting beams of light for use in a gas analyzer, characterized by that a rotary shaft of a chopper is supported by two ball bearings, an outside ring of one ball bearing being fixedly mounted on a bearing housing, and an outside ring or inside ring of another ball bearing being adapted to be movable in the thrust direction relative to said bearing housing or rotary shaft and movably energized in the thrust direction by an elastic member.

4,719,353

INTEGRATED INFRARED DETECTOR AND CRYOENGINE ASSEMBLY

Leonard E. Peck, Jr., Goleta; Fred J. Neitzel, Santa Barbara; Wesson P. Sargeat, Goleta, and James P. McDonald, Solvang, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Sep. 3, 1985, Ser. No. 771,948
Int. Cl.[4] G01J *5/06*
U.S. Cl. 250—352 **14 Claims**



1. An apparatus for cooling a device for detecting infrared radiation comprising:

means for housing said device;

an expander;

means for mounting said device on the cold tip of the expander; and

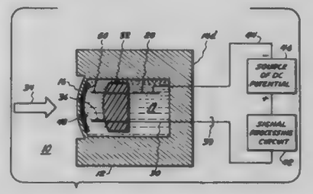
insulating means comprising polymeric foam disposed between said means for housing and said expander, said insulating means operable to allow said device to function without requiring evacuation of said means for housing.

4,719,354

HIGH EFFICIENCY DETECTOR FOR ENERGETIC X-RAYS

Nathan R. Whetten, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1986, Ser. No. 839,481
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—385 **32 Claims**



1. A high efficiency, computerized tomography x-ray detector, comprising:

a housing having an x-ray permeable window therein;

one voltage plate in the form of a sheet of electrically conductive material;

a collector plate including an array of side-by-side discrete, electrically conductive collector plate elements; and

a liquefied noble gas contained within said housing, said liquefied noble gas being substantially opaque to electromagnetic radiation at x-ray frequencies;

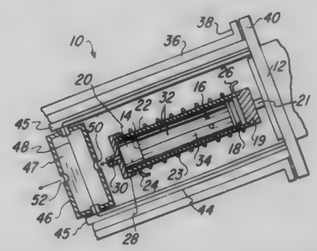
whereby x-ray energy entering said housing through said window in the presence of an electric field between said voltage plate and said collector plate elements excites said liquefied noble gas to achieve current conduction by transport of holes and electrons between each said voltage plate and the most proximate of said collector plate elements.

4,719,355

ION SOURCE FOR AN ION IMPLANTER

Victor Meyers, Houston, and Michael Reise, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 10, 1986, Ser. No. 850,181
Int. Cl.[4] H01J *27/00*
U.S. Cl. 250—425 **7 Claims**



1. An ion source for an ion implanter, comprising:

a housing having an orifice at one end, and having a removable cap;

a graphite crucible disposed within said housing, said crucible having a hollow interior for holding an ion source metal, having a channel formed into and along the side of the crucible, and having a hole for providing fluid com-

munication between the interior and exterior of said crucible, said hole positioned above a portion of the interior in which the ion source metal is to be held, and said hole also positioned within said channel so that the interior of said crucible is in fluid communication with said orifice through said hole and along the side of said crucible in said channel, said crucible removable from said housing when said removable cap is removed therefrom; and

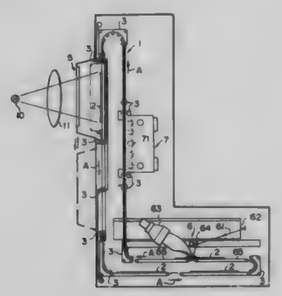
a heater assembly for heating said crucible to a temperature at which said ion source metal will produce a vapor.

4,719,356

ENDLESS CIRCULATING CONVEYING SYSTEM FOR RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Makoto Ohgoda, and Tokukazu Saito, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 31, 1985, Ser. No. 739,592
Claims priority, application Japan, Jun. 1, 1984, 59-112379
Int. Cl.⁴ G01T *1/105*
U.S. Cl. 250—484.1 **4 Claims**



1. In a radiation image recording and read-out apparatus including:

(i) a circulating conveying means defining a predetermined circulation path for conveying stimulable phosphor sheets for recording a radiation image therein,

(ii) an image recording section positioned along said circulation path for recording a radiation image of an object on each of said stimulable phosphor sheets by exposing said stimulable phosphor sheet to a radiation passing through said object,

(iii) an image read-out section positioned along said circulation path and provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored therein at said image recording section, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned by said stimulating rays to obtain an electric image signal, and

(iv) an erasing section positioned along said circulation path for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted at said image read-out section, exposing said stimulable phosphor sheet to erasing light to release the radiation energy remaining in said stimulable phosphor sheet,

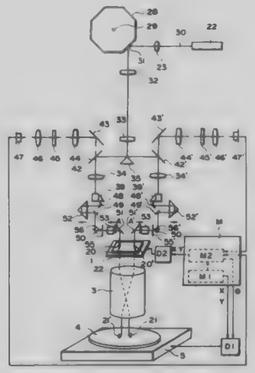
the improvement comprising means for adjusting the erasing conditions at said erasing section so that said stimulable phosphor sheets are conveyed out of said erasing section at time intervals approximately equal to the image read-out time at said image read-out section.

4,719,357

SEMICONDUCTOR CIRCUIT MANUFACTURING APPARATUS HAVING SELECTIVELY OPERABLE DETECTORS FOR EFFECTING AUTOMATIC ALIGNMENT

Naoki Ayata, Machida; Tadashi Konuki, Tokyo, and Masao Kosugi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 633,347, Jul. 23, 1984, abandoned. This application Jan. 22, 1987, Ser. No. 8,134
Claims priority, application Japan, Aug. 1, 1983, 58-140896; Aug. 18, 1983, 58-151024; Nov. 10, 1983, 58-209940; Nov. 10, 1983, 58-209941
Int. Cl.⁴ G01B *11/27*
U.S. Cl. 250—548 **13 Claims**



1. An alignment device for bringing, one by one, different zones on an object into a predetermined positional relation with a reference by use of marks provided for the zones, respectively, said device comprising:

driving means for moving the object so that the different zones are placed, one by one, in an alignment region in which each of the zones is to be brought into the predetermined positional relation with the reference;

detecting means for detecting a said mark associated with one of the zones which is placed in said alignment region by said driving means, said detecting means producing an output;

discriminating means for discriminating a state of existence of the said mark associated with the one zone placed in said alignment region; and

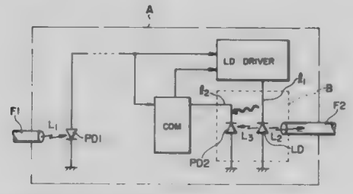
aligning means for bringing the one zone placed in said alignment region into the predetermined positional relation with the reference, wherein said aligning means is adapted to execute a predetermined aligning operation in response to the output of said detecting means when the said mark associated with the one zone is discriminated as being proper by said discriminating means and wherein said aligning means is adapted to execute a portion of the predetermined aligning operation in response to the output of said detecting means when the said mark associated with the one zone is discriminated as being partially defective by said discriminating means.

4,719,358

PHOTOELECTRONIC DEVICE WITH AN ELECTROMAGNETIC SHIELDING MEMBER FOR ELECTROMAGNETICALLY ISOLATING A HIGHT EMITTING ELEMENT FROM A LIGHT RECEIVING ELEMENT

Yoshitoshi Matsumoto, and Fuyuhiko Murofushi, both of Komoro, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,760
Claims priority, application Japan, Mar. 25, 1985, 60-58422
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **19 Claims**



1. A photoelectronic device comprising:

light emitting means;

light receiving means for receiving light emitted from said light emitting means and providing an output signal indicative thereof;

first conductor means for applying a signal to said light emitting means, said light emitting means being responsive to said signal for emitting light in accordance therewith;

second conductor means coupled to said light receiving means for extracting said output signal from said light receiving means;

electromagnetic shielding means including an electromagnetic shield member for electromagnetically isolating said light emitting means and said first conductor means from said light receiving means and said second conductor means;

optical transmitting means including a transparent member disposed in said electromagnetic shield member between said light emitting means and said light receiving means for guiding light emitted from said light emitting means to said light receiving means;

sealing means delimiting a chamber for receiving said light emitting means and said light receiving means therein, said shielding member being disposed in said chamber for separating said chamber into one compartment in which said light emitting means is disposed and another compartment into which said light receiving means is disposed; and

an optical fiber provided within said sealing means for extracting light emitted by said light emitting means and for guiding the extracted light exteriorly of said sealing means.

4,719,359

SENSING PROBE FOR SLUDGE DETECTORS

Thomas A. Rose, LaGrange, Ill., assignor to Ecolotech Inc., LaGrange, Ill.

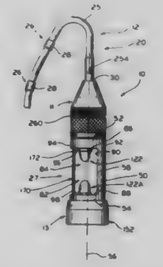
Continuation-in-part of Ser. No. 761,433, Aug. 1, 1985, Pat. No. 4,673,819. This application May 15, 1986, Ser. No. 863,294
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.⁴ G01N *21/01*
U.S. Cl. 250—573 **8 Claims**

1. In a sensing probe for slude detectors connected to the end of an insulated cable for immersion in liquids to sense sludge levels therein, with the probe including an elongate cylindrical housing having upper and lower ends and defining a centrally disposed longitudinally extending axis and a cylindrical peripheral side wall, with the housing being formed intermediate its ends to define a re-entrant indentation at one side of the probe forming a pair of opposed spaced apart housing walls and a gap in the housing side wall separating said pair of housing walls, and including a source of illumination mounted in sealed relation to said housing in one of the housing walls, a light sensitive device mounted in sealed relation to the housing in the other of the housing walls, with said source of illumination and said light sensitive device being disposed in opposed relation lengthwise of said housing and across said gap in light transmitting relation therebetween, and with the cable containing leads for extending between a source of electrical energy and the probe source of illumination and its light sensitive device,

the improvement wherein:

said housing upper end defines a tubular stud portion,

an end cap threaded on the housing upper tiubular stud portion in sealed relation to the housing and defining an



upstanding stud portion at the upper end thereof having a through bore with an annular internal sealing surfacing adjacent the upper end of said upper end cap stud portion,

an elastomeric grommet seated against said upper end cap stud portion sealing surfacing and having an upper bearing surface,

a gland ring seated on said grommet bearing surface,

a nut member threaded on said upper end cap stud portion and having an annular internal surface for compressing said gland ring against said grommet to bias said grommet in sealing relation to said upper end cap stud portion sealing surface and into gripping relation to the cable,

and including a washer through which the cable leads are individually threaded seated against said end cap about said bore thereof,

with said leads being bonded to said washer.

4,719,360

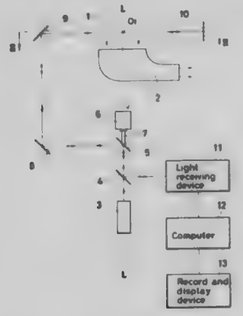
METHOD FOR DETERMINATION OF CONCENTRATION OF SMOKE EMANATING FROM COMBUSTION ENGINE AND APPARATUS FOR WORKING SAID METHOD

Kazuo Kontani, and Shinichi Goto, both of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,585
Claims priority, application Japan, Mar. 11, 1985, 60-47980; Aug. 26, 1985, 60-186819
Int. Cl.⁴ G01N *15/06*
U.S. Cl. 250—574 **4 Claims**

1. A method for the determination of concentration of smoke emanating from a combustion engine, which comprises projecting, into a flow of smoke in a plurality of directions traversing said flow of smoke, beams of light having a single wavelength capable of causing Rayleigh scattering relative to said fine carbon particles contained in said flow of smoke, detecting intensities of beams of light from the plurality of directions with a light receiving device, which beams of light have traversed said flow of smoke and attenuated due to the

Rayleigh scattering, and determining absolute values of volume concentration and weight concentration of the fine carbon



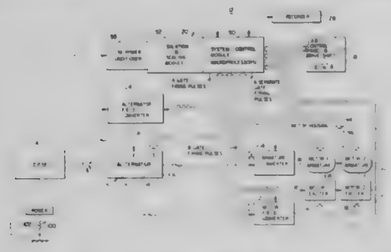
particles in said flow of smoke by calculating a cross-sectional image of said flow of smoke based on detection signals issued by said light receiving device.

4,719,361

MOBILE, OFF-ROAD, HEAVY-DUTY HAULAGE VEHICLE

Richard R. Brubaker, Peoria, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 18, 1986, Ser. No. 897,598
Int. Cl.[4] B60L *11/06*
U.S. Cl. 290—45 **35 Claims**



1. An off-road, heavy-duty, haulage vehicle comprising:
(a) a vehicle having an electrical motor driven wheel means including a voltage monitoring means for continuously monitoring the motor voltage; and
(b) a generator means for producing electrical power, said generator means including a power control means responsive to the motor voltage for producing a tracking voltage which tracks the motor voltage always at a higher increment up to the maximum allowable voltage output of the generator means.

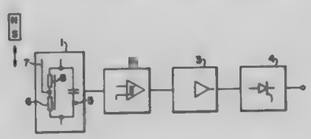
4,719,362

ELECTRONIC PROXIMITY SWITCH DEPENDENT UPON A MAGNETIC FIELD

Andreas Nest, Herne, and Jens Müller, Radevormwald, both of Fed. Rep. of Germany, assignors to Werner Turck GmbH & Co., KG, Halver, Fed. Rep. of Germany

Filed Oct. 2, 1986, Ser. No. 914,675
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535123; Dec. 18, 1985, 3544809
Int. Cl.[4] H01H *36/00*; G08B *13/26*
U.S. Cl. 307—116 **16 Claims**

1. An electronic proximity switch dependent upon a magnetic field and adapted to be operated by an approaching magnetic trigger means, the electronic proximity switch including an HF tank circuit means adapted to be acted upon by the magnetic trigger means and associated with an oscillator circuit means having a coil arrangement including a tank circuit coil means and a coupling coil means, being associated with a magnetizable member which, starting with a specific



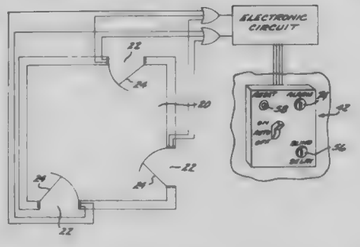
magnetic field strength, can be driven into a magnetic saturation by an external magnetic field of the magnetic trigger means with an undamping of the tank circuit means, wherein the magnetizable member includes a predominantly amorphous metal band, and wherein the tank coil means and the coupling coil means are seated on a joint bobbin means.

4,719,363

SYSTEM FOR AUTOMATICALLY CONTROLLING LIGHTS IN A ROOM

Douglas L. Gallacher, P.O. Box 6569, Crestline, Calif. 92325

Filed Apr. 3, 1987, Ser. No. 34,395
Int. Cl.[4] H05B *37/02*
U.S. Cl. 307—117 **21 Claims**



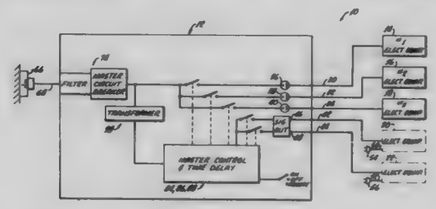
1. A system adapted for establishing whether one or more persons are present in a room, and for switching a lighting fixture or an electrical appliance on or off depending on the presence of one or more persons, the system comprising:
sensing means installed in operative association with each entryway into a room for sensing passage of a person through the entryway, the sensing means being adapted to send a first signal when a person enters through the entryway and a second signal when a person leaves through the entryway;
first counting register means connected to the sensing means for receiving the first signals sent by the sensing means and for counting and storing the number of such first signals received, thereby counting the number of persons who have entered the room;
second counting register means connected to the sensing means for receiving the second signals sent by the sensing means and for counting and storing the number of such second signals received, thereby counting the number of persons who have exited from the room;
comparator means for comparing the status of the first counting register means and the status of the second counting register means, the comparator means providing an output signal only when the status of the first and second counting register means are not equal, and
switching means operatively connected with the comparator means for receiving the output signal of the comparator means and for turning the lighting fixture or appliance on or off depending on whether there is such output signal sent by the comparator means.

4,719,364

MULTIPLE TIME DELAY POWER CONTROLLER APPARATUS

John D. Pequet, Laguna Niguel, Michael B. Pulizzi, Anaheim, and Roger Cork, Garden Grove, all of Calif., assignors to Pulizzi Engineering, Inc., Santa Ana, Calif.

Filed Oct. 1, 1985, Ser. No. 782,307
Int. Cl.[4] H02J *7/00*
U.S. Cl. 307—141 **12 Claims**



1. Time delay power controller apparatus which comprises:
(a) a power stage and means for connecting said power stage to a conventional power source;
(b) a plurality of time delayed outputs;
(c) a D.C. voltage bus and a ground;
(d) a D.C. power supply connected to said D.C. bus;
(e) a plurality of time delay timing stages connected between said D.C. bus and ground,
each of said timing stages including a timer initiating voltage input line, a time delay voltage output line, a control relay connected to a corresponding one of the time delayed outputs and having an energizing coil connected to said time delay voltage output line and timing means connected between said timer initiating voltage input line and the time delay voltage output line for causing, a predetermined time interval after a change in voltage state appears on said timer initiating voltage input line, a voltage state change on said time delay voltage output line, said voltage state change on said time delay voltage output line causing the energizing of said control relay coil and thereby causing a time delayed control signal to be provided by the control relay to a corresponding one of the time delay outputs;
(f) means for interconnecting said time delay timing stages in electrical series with one another, the time delay voltage output line of each said timing stage, except the last-in sequence one thereof, being connected to the timer initiating input line of the next-in-sequence one of the timing stages; and
(g) means for changing the voltage state on the timer initiating voltage input line of the first-in-sequence one of the timing stages to thereby initiate the timing sequence.

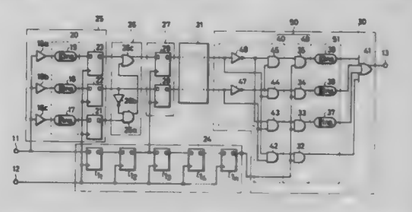
4,719,365

CLOCKED LOGIC DELAY DEVICE WHICH CORRECTS FOR THE PHASE DIFFERENCE BETWEEN A CLOCK SIGNAL AND AN INPUT BINARY SIGNAL

Toshiaki Misono, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,542
Claims priority, application Japan, Dec. 29, 1983, 58-251522
Int. Cl.[4] H03K *1/17, 17/00*
U.S. Cl. 307—269 **15 Claims**

1. A clocked logic delay device which is supplied with an input binary signal of successive input pulses and which operates in synchronism with a clock signal which has a period To shorter than the width of each of the successive input pulses and which is asynchronous with respect to the input binary signal, for issuing an output binary signal of successive output pulses respectively corresponding to the successive input pulses, said clocked logic delay device comprising:
a phase detector circuit, supplied with the input binary signal and the clock signal, for detecting a phase difference between each of the input pulses of the input binary signal and the clock signal as a value corresponding to one of k time lengths into which the period To is divided, and for producing a phase difference signal jTo/k indicating the one of the k time lengths in which the phase difference falls, where k is an integer greater than or equal to 2 and j is an integer such that $0 \leqq j \leqq (k-1)$;
a logic delay circuit including n cascade-connected stages of flip-flops, supplied with the input binary signal and the clock signal, for successively shifting the logic states of the input binary signal through said n cascade-connected stages of flip-flops in synchronism with the clock signal and for outputting the logic states as a delayed binary signal formed by delayed pulses which have been delayed with respect to corresponding one of the successive input



pulses by a delay time D, where $(n-1)\,To \leqq D < nTo$ and n is an integer greater than or equal to 2;
matching delay means connected to the output of said phase detector circuit for delaying the phase difference signal from said phase detector circuit for a predetermined period of time; and
corrective output means, connected to the outputs of said logic delay circuit and said matching delay means, for further delaying each of the delayed pulses by a delay of jTo/k with respect to the clock signal in accordance with the delayed phase difference signal from said matching delay means, so that the sum of the further delay jTo/k of each of the delayed pulses and the time length corresponding to the phase difference detected with respect to the input pulse corresponding to the delayed pulse is a constant, the predetermined period by which the phase difference signal is delayed by said matching delay means being predetermined so that the phase difference signal reaches said corrective output means slightly before the corresponding one of the delayed pulses from said logic delay circuit.

4,719,366

OUTPUT STATE PROTECTION NETWORK FOR D-TYPE FLIP-FLOP

Sherman M. Tan, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 11, 1985, Ser. No. 786,885
Int. Cl.[4] H03K *3/289, 3/29*
U.S. Cl. 307—272.2 **8 Claims**

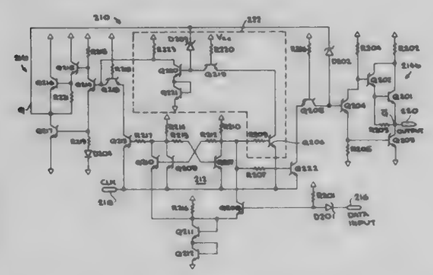
1. A D-type master-slave flip-flop including an output terminal comprising:
a master section having a data input node, a clock input node, a true master data output node, a complementary master data output node, and a collector master data output node associated with said true master data output node ;
a slave section being formed of a true output buffer portion and a complementary output buffer portion;
said true output buffer portion having a first data input node, a second data input node and a true data output node;

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said complementary output buffer portion having a first data input node, a second data input node and a complementary data output node;

said true output buffer portion having its first data input node being connected to the complementary master data output node and having its true data output node being connected to the second data input node of said complementary output buffer portion;

said complementary output buffer portion having its first data input node being connected to the true master data output node and its complementary data output node connected to the output terminal;



protection network means having a first data input node, a second data input node, and an output node for preventing a change in logic state at the complementary data output node when it is initially in a high logic state and is pulled to a low logic state due to transient noise, said protection network means toggling said complementary output buffer portion so that the complementary data output node is returned to its initial logic state when the output terminal is free of the transient noise; and

said protection network having its first input node connected to the collector master data output node, its second input node connected to the true data output node of said true output buffer portion and its output node connected to the second input node of said true output buffer portion.

4,719,367

SCHMITT TRIGGER CIRCUIT

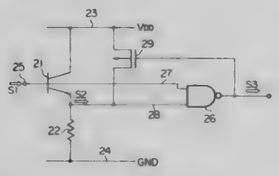
Akira Denda, Tokyo, Japan, assignor to NEC Corportion, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 5,989

Claims priority, application Japan, Jan. 22, 1986, 61-12377

Int. Cl.⁴ H03K *3/29, 19/092, 17/60, 5/153*

U.S. Cl. 307—290 **3 Claims**



1. A Schmitt trigger circuit comprising

(a) a high-voltage supply line,

(b) a low-voltage supply line,

(c) a series combination of a bipolar transistor and a resistor provided between said high-voltage supply line and said low-voltage supply line, said bipolar transistor having a base node connected to an input terminal,

(d) an intermediate node provided between said bipolar transistor and said resistor,

(e) a logic gate having an output node and two input nodes connected to said input terminal and said intermediate node, respectively, and

(f) a field effect transistor operative to establish or block a current path between said intermediate node and one of said high-voltage supply line and said low-voltage supply line, said field effect transistor having a gate node connected to the output node of said logic gate.

4,719,368

POWER SUPPLY CONTROL ARRANGEMENT FOR A WATCH STEPPING MOTOR

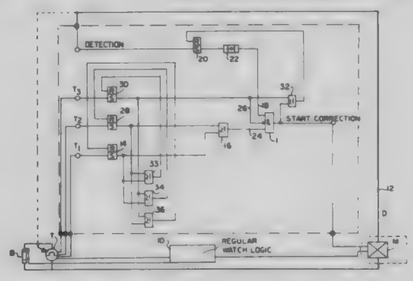
Wolfgang Burkhardt, Ispringen, Fed. Rep. of Germany, assignor to Pforzheimer Uhren-Rohwerke Porta GmbH, Pforzheim, Fed. Rep. of Germany

Filed May 12, 1986, Ser. No. 861,848

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3519008

Int. Cl.⁴ H03K *5/04, 17/08, 19/007*

U.S. Cl. 307—442 **2 Claims**



1. A power supply control arrangement for a stepping motor of a watch, comprising

an integrated circuit structure disposed between an energy source and said stepping motor for controlling the supply of drive pulses of predetermined duration from said energy source to said stepping motor, said circuit structure comprising means for detecting non-response of said stepping motor to the application of a drive pulse, means for applying at least one correction pulse upon detection of non-response of said stepping motor, said means for applying said at least one correction pulse including means for applying a drive pulse of increased duration upon application of such correction pulse for overcoming excessive loads as they may be caused by disturbances, said means for detecting non-response of said stepping motor connected to said means for applying said at least one correction pulse; and

at least one AND gate operably connected to said detection means and said drive pulse applying means so as to cause shut off of at least one of said correction pulse from said means for applying said at least one correction pulse and integrated circuit structure from said energy source.

4,719,369

OUTPUT CIRCUIT HAVING TRANSISTOR MONITOR FOR MATCHING OUTPUT IMPEDANCE TO LOAD IMPEDANCE

Michio Asano, Tokorozawa; Akira Masaki, Musashino, and Kenichi Ishibashi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,103

Claims priority, application Japan, Aug. 14, 1985, 60-177509; Nov. 8, 1985, 60-248811

Int. Cl.⁴ H03K *17/16, 17/687*

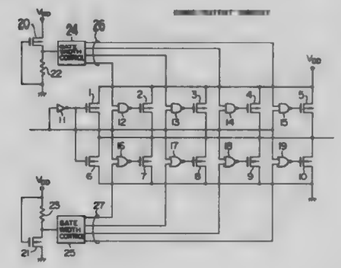
U.S. Cl. 307—443 **13 Claims**

1. An output circuit comprising:

output transistor means for applying an output signal to a transmission line connected to an output terminal;

drive means for driving said output transistor means in response to an input signal supplied from an input terminal; and

control means for controlling said output transistor means so that the output impedance of said output transistor means



is approximately equal to the characteristic impedance of said transmission line, said control means having a transistor circuit which is connected to a power supply and which is provided in the same chip as said output transistor means, and a control circuit for generating a control signal for said output transistor means in accordance with the magnitude of the current which flows in said transistor circuit from said power supply.

4,719,370

DIMOS HIGH SPEED INVERTER CIRCUIT

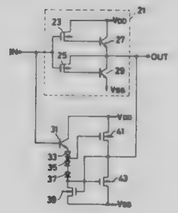
Yasuhiro Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1985, Ser. No. 804,473

Claims priority, application Japan, Jul. 1, 1985, 60-142585

Int. Cl.⁴ H03K *19/02, 5/12, 5/01, 17/60*

U.S. Cl. 307—446 **7 Claims**



1. An inverter circuit comprising:

a first bipolar transistor having a base terminal, a collector terminal connected with a high voltage source and an emitter terminal connected with an output terminal;

a second bipolar transistor having a base terminal, an emitter terminal connected with a low voltage source and a collector terminal connected with said output terminal;

a first p-channel MOS transistor having a gate terminal connected with an input terminal, a source terminal connected with the high voltage source and a drain terminal connected with the base terminal of said first bipolar transistor;

a first n-channel MOS transistor having a gate terminal connected with said input terminal, a drain terminal connected with said output terminal and a source terminal connected with the base terminal of said second bipolar transistor;

a second p-channel MOS transistor having a gate terminal, a drain terminal connected with the high voltage source and a source terminal connected with said output terminal;

a second n-channel MOS transistor having a gate terminal, a drain terminal connected with said output terminal and a source terminal connected with the low voltage source;

a third bipolar transistor having a collector terminal connected with the high voltage source, an emitter terminal connected with the gate terminals of said second p- and second n-channel MOS transistors and a base terminal connected with said input terminal;

a third n-channel MOS transistor having a drain terminal connected with the emitter terminal of said third bipolar transistor, a gate terminal connected with said output terminal and a source terminal connected with the low voltage source.

4,719,371

DIFFERENTIAL TYPE GATE CIRCUIT HAVING CONTROL SIGNAL INPUT

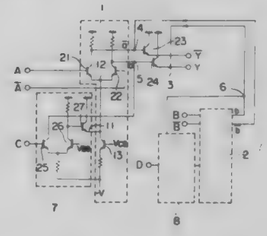
Bunichi Fujita, and Seiichi Kawashima, both of Hatano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,765

Claims priority, application Japan, Dec. 30, 1983, 58-247652

Int. Cl.⁴ H03K *19/086*

U.S. Cl. 307—455 **9 Claims**



1. A differential type gate circuit comprising:

first and second transistors in which complementary signal inputs are applied to each base;

a current source connnected to emitters of said first and second transistors;

output lines coupled to respective collectors of said first and second transistors, one of said output lines outputting a positive output signal and the other outputting its inverted output signal; and

a control circuit which receives a control signal and cuts off currents flowing to said current source through said first and second transistors in response to said control signal and which sets a voltage at said output line for outputting the positive output signal to a low level,

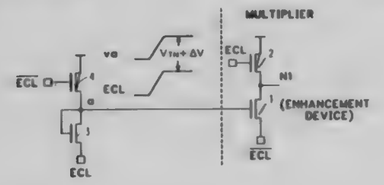
wherein said control circuit includes a third transistor in which said control signal is applied to its base, a fourth transistor in which a certain constant voltage is applied to its base, and a fifth transistor which is connected between a certain voltage level and a connection point of said current source and the emitters of said first and second transistors, which fifth transistor is switched by a collector voltage of the fourth transistor, wherein the emitters of said third and fourth transistors are coupled to one another, and wherein either one of said third and fourth transistors is made conductive in dependence upon the presence and absence of said control signal and the collector of said third transistor is connected to the output line for outputting said positive output signal.

4,719,372

MULTIPLYING INTERFACE CIRCUIT FOR LEVEL SHIFTING BETWEEN FET AND TTL LEVELS

Barbara A. Chappell, Amawalk, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,420
Int. Cl.[4] H03K 17/16, 19/094, 19/092; H03L 5/00
U.S. Cl. 307—475 7 Claims



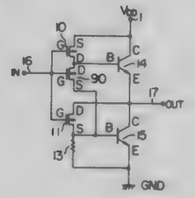
1. An interface circuit for driving an FET logic circuit from an ECL transistor logic circuit comprising:
first and second input terminals for receiving, respectively, a first ECL logic level signal and a second input signal from said ECL transistor logic circuit,
a level shifting and multiplying circuit for shifting an ECL input level connected to said input terminals including a level shifting stage with a first load transistor having source, gate and drain electrodes, said gate electrode being connected to said second input signal on said second input terminal, and said source electrode connected to a voltage source, and a first enhancement transistor having source, gate and drain electrodes, said gate and drain electrodes of said first enhancement transistor being connected in common to said drain electrode of said first load transistor and said source electrode of said first enhancement transistor being connected to said first ECL logic level signal on said first input terminal and a multiplying stage connected to said common connection of said gate and drain electrodes of said first enhancement transistor and said drain electrode of said first load transistor.

4,719,373

GATE CIRCUIT OF COMBINED FIELD-EFFECT AND BIPOLAR TRANSISTORS

Ikuro Masuda, Hitachi; Kazuo Kato, Ibaraki; Takao Sasayama; Yoji Nishio, both of Hitachi; Shigeo Kuboki, Nakaminato, and Masahiro Iwamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 513,056, Jul. 12, 1983, abandoned. This application Apr. 30, 1987, Ser. No. 45,216
Claims priority, application Japan, Jul. 12, 1982, 57-119815
Int. Cl.[4] H03K 17/60, 3/33, 19/01
U.S. Cl. 307—570 23 Claims



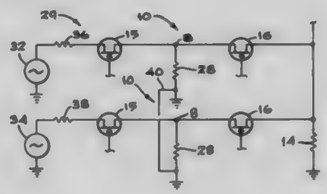
1. A bipolar transistor-field effect transistor copmosite circuit comprising:
an output circuit including
a pair of first and second bipolar transistors each having a collector of one conductivity type, a base of the other conductivity type and an emitter of the one conductivity type, and
collector-emitter current paths of said pair of bipolar transistors connected in series to each other between first and second potentials, of which a connection node provides an output of the composite circuit;
an input circuit including
at least one field effect transistor of the one conductivity type,
said input circuit being responsive to a predetermined input to output a signal to the base of said first bipolar transistor for rendering said first bipolar transistor in an on or off state, and
said field effect transistor being responsive to said predetermined input to output another signal to the base of said second bipolar transistor for rendering said second bipolar transistor in an on or off state in an opposite relation to the on-off state of said first bipolar transistor,
a first discharge means comprising a field effect transistor of the one conductivity type having a gate coupled to receive said predetermined input applied to the input circuit, said field effect transistor having its source-drain path conencted between the base of said first bipolar transistor and a discharge potential point for discharging from the base charges accumulated in said first bipolar transistor when it is turned into the off state; and
a second discharge means for discharging charges accumulated in said second bipolar transistor when it is turned into the off state, wherein
said second discharge means includes a field effect transistor of the one conductivity type connected between the base and the emitter of said second bipolar transistor, whose drain and source are connected to the base side and the emitter side of the second bipolar transistor, respectively, and
wherein said second discharge means field effect transistor has its gate coupled to the base of said first bipolar transistor for discharging will be switched into an on state when said first bipolar transistor is on, and will be switched into an off state when said first bipolar transistor is off.

4,719,374

BROADBAND ELECTRIC FIELD CONTROLLED SWITCHING CIRCUIT

Charles A. Bialo, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1986, Ser. No. 851,035
Int. Cl.[4] H03K 17/687, 3/33, 17/56; H01P 1/10
U.S. Cl. 307—571 32 Claims



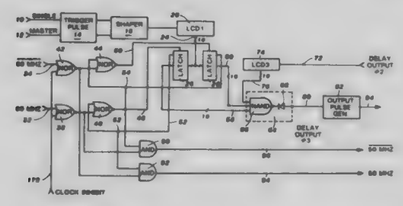
1. A switching circuit comprising:
at least two electric field controled switch elements coupled in series between an input and an output terminal;
a passive, lossy shunt element coupled between a junction of said series coupled switch elements and a virtual ground, said shunt element providing a substantially resistive path for a signal received at said input terminal during a non-conducting state of said switches; and
control means coupled to each series coupled switch element for selectively applying a control voltage for controlling said switch element.

4,719,375

HIGH RESOLUTION DIGITAL DELAY TIMER

Albert D. Martin, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1986, Ser. No. 861,380
Int. Cl.[4] H03K 17/28, 17/296
U.S. Cl. 307—600 14 Claims



1. A high resolution delay timer for generating an output pulse following a trigger pulse at a time delay interval preset with a resolution which is high relative to a low resolution available from supplied clock pulses, comprising:
first lumped constant delay means for inputting said trigger pulse and generating a first output signal at predetermined interpolation intervals corresponding to said high resolution;
first latch means in series connection with said first lumped constant delay means for detecting edges of said supplied clock pulse and latching said first output signal in response to a first one of said edges after said trigger pulse to form first high resolution synchronizing delay data;
input means for presetting a selected time delay interval with a first timing portion having a relatively low resolution and with a second timing portion having said high resolution;
timer means in series with said input means and including counter means responsive to said first timing portion for relatively low resolution timing and second lumped constant delay means responsive to said second timing portion for timing at said high resolution wherein an internal pulse is generated at a delay temporally related to said preset time interval;
circuit means in series with said timer means and receiving said internal pulse for initiating generation of second high resolution synchronizing delay data; and
logic circuit means connected to receive said first and second synchronizing delay data in parallel for logically combining said first and second delay data and generating said output pulse synchronized with said trigger pulse and delayed by said preset high resolution time delay interval.

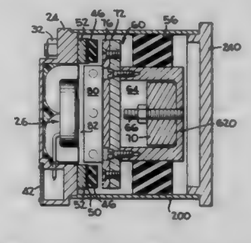
4,719,376

ELECTROMAGNETIC VIBRATORY EXCITER

Arthur L. Dean; Robert E. Kraft, and Kenneth M. Marshall, all of Indiana, Pa., assignors to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 584,695, Feb. 29, 1984, abandoned, Division of Ser. No. 352,284, Feb. 25, 1982, Pat. No. 4,455,496. This application Oct. 24, 1985, Ser. No. 790,792
Int. Cl.[1] H02K 33/00
U.S. Cl. 310—29 16 Claims

1. An electromagnetic exciter for a vibratory conveyor comprising:
an elongated housing capped at opposite longitudinal ends by end caps, one of the end caps carrying an electromagnet inside of the housing, an elongated free mass resiliently supported on the inside of the housing and carrying an armature assembly on a side facing the electromagnet, a non-linear elastomeric compression means mounted on the one end cap and encircling the electromagnet, the elastomeric compression means having curved outer and elongated inner peripheries in four quadrants laterally spaced from the electromagnet, and having a planar base surface in the four quadrants for mounting to the one end cap, and having a contact surface in the four quadrants for



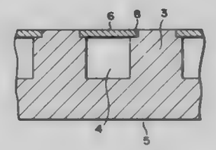
contacting the armature assembly during electromagnetic conduction and for preventing armature strike against the electromagnet, the contact surfaces in lateral opposite quadrants of a different height than the contact surfaces in the adjacent lateral opposite quadrants for providing selectable non-linear stiffening and deflection rates for storing input energy.

4,719,377

ARMATURE ANNULAR CORE

Hiromichi Horie, Yokosuka; Kuni Ochiai, Yokohama; Itsuo Arima, Kawasaki, and Mikio Morita, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 30, 1985, Ser. No. 781,886
Claims priority, application Japan, Sep. 29, 1984, 59-204869; Dec. 25, 1984, 59-271706
Int. Cl.[4] H02K 15/12
U.S. Cl. 310—44 15 Claims



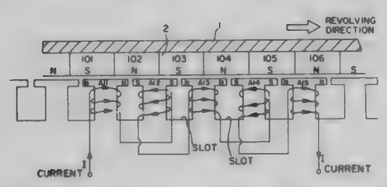
1. An armature annular core comprising:
an annular molded body comprising:
a compressed molded body of a mixture of a magnetic metal powder and an electrically insulating resin as major constituents, said annular molded body being provided with slots and teeth alternately formed on an upper surface of said compressed molded body along a circumferential direction thereof;
a winding mounted in said slots; and
a molded plate comprising a compressed molded body of a mixture of a magnetic metal powder and an electrically insulating resin as major constituents, said molded plate being adapted to close upper portions of said slots of said annular molded body to constitute a fully closed slot structure wherein said resin comprises:
an inorganic compound powder selected from the electrically insulated powder materials contained in the group of Al_2O_3, SiO_2, $CaCO_3$, $CaSiO_3$, glass powder, mica powder and mixtures of the compounds in this group.

4,719,378

BRUSHLESS MOTOR HAVING PERMANENT MAGNET ROTOR AND SALIENT POLE STATOR

Takashi Katsuma, and Masao Kitoh, both of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakasho, Kitakyushu, Japan

Continuation-in-part of Ser. No. 723,889, Apr. 16, 1985, abandoned. This application Aug. 21, 1986, Ser. No. 899,752
Claims priority, application Japan, Apr. 23, 1984, 59-81504
Int. Cl.[4] H02K *29/06*
U.S. Cl. 310—67 R **1 Claim**



1. A brushless motor having a rotor magnet with a number of P of magnetic poles and a stator core facing the rotor magnet across an air gap, the stator core having a number S of salient poles about which stator windings are respectively wound for m phases, the rotor magnet being driven into rotation by detecting the rotary position of the rotor magnet relative to the stator core and by sequentially changing over phase currents passing through the stator windings, wherein said numbers P and S are defined as

$$P=2\times(m\times k+1)$$

$$S=2\times m\times k$$

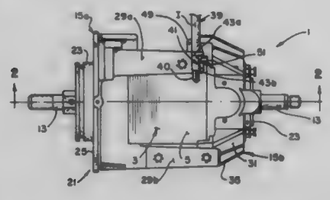
wherein k represents an integer greater than 2, and each said salient pole having said stator windings of only one phase and 2×m salient groups of k said salient poles, each said salient pole of each group having said stator windings of the same phase, the direction of winding varying for alternate salient poles.

4,719,379

STRAIN RELIEF FOR ELECTRIC MOTOR POWER CORD

Nicholas R. Daniels, and Roy C. Eliason, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 20, 1987, Ser. No. 28,567
Int. Cl.[4] H01K *13/58*
U.S. Cl. 310—71 **4 Claims**



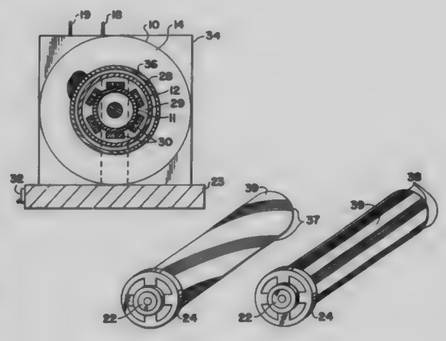
1. In a dynamoelectric machine comprising a stator having a core, the latter having a central bore extending longitudinally therethrough, a plurality of slots extending radially outwardly from a central bore, windings inserted in said slots, said dynamoelectric machine further having a rotor insertable in and rotatable within said central bore, said rotor having a rotor body disposed within said central bore and a rotor shaft extending endwise from said rotor body, said dynamoelectric machine further having a power cord electrically connected to said windings for energization thereof, a bearing support at each end of said stator, said bearing supports each having a bearing for receiving and journaling a respective end of said rotor shaft, and means for securing said endshields in firm engagement with said core, wherein the improvement comprises: means for gripping said power cord so as to provide positive strain relief for said power cord relative to said dynamoelectric machine, said power cord gripping means comprising a ledge on one of said bearing supports, an abutment on said one bearing support substantially perpendicular to said ledge and facing axially with respect to said dynamoelectric machine toward said other bearing support, said abutment having a relatively narrow bead thereon for engagement with said power cord, said other bearing support having an arm thereon extending generally axially toward said abutment, the outer end of said arm having a pair of spaced fingers, with each of these fingers having a bead on the inner face thereof for engaging said power cord on opposite sides thereof, said spaced fingers defining an opening therebetween for receiving said power cord, said beads on said fingers being spaced apart a distance somewhat less than the thickness of said power cord, said abutment being in substantial axial alignment with said opening, said power cord being disposed on said ledge and being bent with respect to said ledge so as to pass between said fingers and in front of said abutment such that upon securing said bearing supports to said core, said abutment at least in part enters said opening between said fingers and forces said power cord into engagement with said beads on said fingers and forces said power cord into engagement with said bead on said abutment such that said abutment bead engages said power cord in one direction along said power cord and such that said finger beads engage said power cord on substantially opposite sides thereof generally perpendicular to the direction said abutment bead engages said cord.

4,719,380

ELECTRIC GENERATOR FOR INDUCING CURRENT IN THE FIELD COIL

Berry E. Smith, Jr., Star Rte. 1, Box 3921, and Nathan N. Sharrow, Star Rte. 1, Box 5220, both of Tallahassee, Fla. 32304

Continuation-in-part of Ser. No. 731,476, May 7, 1985, Pat. No. 4,612,470. This application Aug. 4, 1986, Ser. No. 892,914
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] H02K *16/02*
U.S. Cl. 310—114 **20 Claims**



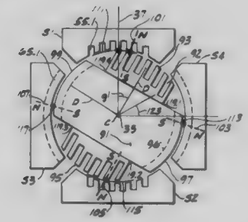
1. An electric generator including a stationary field coil of copper wire, an armature rotatable within the field coil, and a warp sleeve rotatable between said coil and said armature, said armature comprising a cylindrical core structure containing on its outside surface a plurality of spaced parallel lengthwise strips of magnetic material having one polarity alternating with a plurality of spaced parallel lengthwise strips of opposite polarity, said warp sleeve comprising a hollow cylinder positioned in close proximity to and spaced apart from the inner surface of said coil and the outer surface of said armature, said sleeve having over its entire length alternating lengthwise strips of material transparent to magnetic flux and material attractive to magnetic flux; and means to rotate one of said armature and said warp sleeve while maintaining the other stationary.

4,719,381

ELECTRICAL MACHINES AND APPARATUS FOR ROTATION AROUND MULTIPLE AXES

Arturo R. Miles, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Aug. 21, 1985, Ser. No. 767,962
Int. Cl.[4] H02K *1/06, 5/04*
U.S. Cl. 310—166 **27 Claims**



1. An electrical machine comprising:
a first assembly including first and second windings both of which windings are approximately equally displaced from an axis, said first winding having conductors which are approximately parallel to the axis over most of their length, and the second winding having conductors which are approximately perpendicular to the axis over most of their length; and
a second assembly surrounding the first assembly and having a winding arrangement, the first assembly being rotatable within the second assembly around more than one axis upon electrical energization of said winding arrangement and of said first and second windings in said first assembly and said first assembly further including means for holding said first and second windings apart.

4,719,382

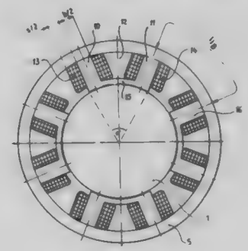
DIRECT-CURRENT MOTOR

Volkmar Listing, Nestroystrasse 10, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,454
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521241
Int. Cl.[4] H02K *1/12*
U.S. Cl. 310—187 **5 Claims**

1. A DC motor having a common cylindrical armature for responding to symmetrical magnetic fields for rotation of same, said motor further comprising a predetermined number of poles with pole shoes on the armature side thereof, said pole shoes being integrally connected to said poles, and each pole including two pole halves separated from each other in the peripheral sense by a predetermined space, with each such pole half being surrounded by its own individual field coil and said pole halves of a given pair being integral with a common pole shoe so that each pole is approximately U-shaped in its radial cross-section, whereby the legs of such U point radially outward from said armature;

whereby the overall size of said motor is reduced for a given application thereof by reducing the ohmic resistance of



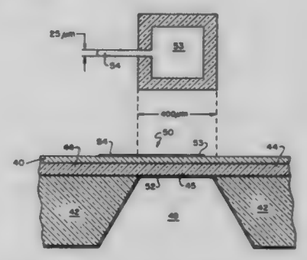
the individual field coils while increasing the surface area thereof to reduce heating of said motor.

4,719,383

PIEZOELECTRIC SHEAR WAVE RESONATOR AND METHOD OF MAKING SAME

Jin S. Wang, Harbor City, Calif.; Kenneth M. Lakin, and Allen R. Landin, both of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 736,164, May 20, 1985, Pat. No. 4,640,756. This application Sep. 30, 1986, Ser. No. 913,192
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—324 **7 Claims**



1. A piezoelectric shear wave resonator having a predetermined temperature coefficient of resonance comprising:
a composite comprising a first film of piezoelectric material having a 6 mm symmetry, said film having its C-axis substantially inclined at an acute angle with respect to the film normal, such that the shear wave coupling coefficient of said film significantly exceeds the longitudinal wave coupling coefficient of said film, and a second film of p^+ silicon semiconductor material having a positive temperature coefficient of resonance, and a substrate supporting the composite at its periphery, the ratio of thickness of the semiconductor film to the piezoelectric film determining the temperature coefficient of resonance.

4,719,384

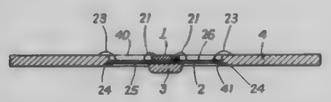
MINIATURE THERMOSTATTED OSCILLATOR

Daniel B. Hauden, and Gilles D. Marianneau, both of Besancon, France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Sep. 22, 1986, Ser. No. 909,970
Claims priority, application France, Sep. 24, 1985, 85.14141
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—343 **13 Claims**

1. In a miniature thermostatted oscillator, comprising:

an assembly support including a printed circuit board provided with an opening therein having an edge;
a secondary support made of an electrically insulating material having first and second principal faces mounted within said board opening at a reduced number of points in the vicinity of said edge;
a piezo-electric resonator mounted on said first principal face;

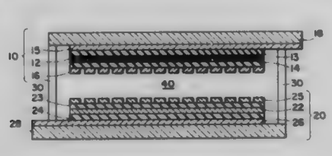


an integrated circuit including an electronic circuit for regulating the supply voltage of said piezo-electric resonator, an electronic circuit for maintaining and amplifying the oscillations of said resonator, and electronic circuit means for regulating the temperature of said resonator, all mounted as parts within said integrated circuit which, in turn, is mounted on said second principal face.

4,719,385
MULTI-COLORED THIN-FILM ELECTROLUMINESCENT DISPLAY

William A. Barrow, 1400 NW. Compton Dr., Beaverton, Oreg. 97006, and Richard T. Tuenge, Rte. 2, Box 1018, Hillsboro, Oreg. 97123

Filed Apr. 26, 1985, Ser. No. 727,663
Int. Cl.[4] H01J *1/62*
U.S. Cl. 313—463 7 Claims



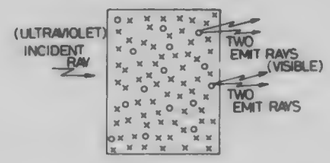
1. A multi-colored thin-film electroluminescent (TFEL) device comprising:
(a) a first independently addressable TFEL matrix array comprising a light-emitting phosphor of a first color sandwiched between a first set of electrodes, said electrodes comprising orthogonally disposed front and rear electrode groups;
(b) a second independently addressable TFEL matrix array comprising a light-emitting phosphor of a second color, said second color differing from said first color, sandwiched between a second set of electrodes, said electrodes comprising orthogonally disposed front and rear electrode groups; and
(c) spacer means for maintaining said first and second matrix arrays in uniform, closely spaced apart relation wherein both matrix arrays are congruent with one another.

4,719,386
PHOTOCONVERTER AND LAMP UTILIZING MULTI-QUANTUM EMISSION

Makoto Toho, Yawata, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 22, 1985, Ser. No. 790,250
Claims priority, application Japan, Nov. 24, 1984, 59-248412
Int. Cl.[4] H01J *1/62, 61/42*
U.S. Cl. 313—485 23 Claims

1. A photoconverter for absorbing incident light from an irradiating source to be excited and emitting light having a wavelength lower than that of said incident light, wherein luminous substances are dispersed among transparent intermediate substances permeable to visible light, said luminous substances being substantially disposed to be individually independent of each other and as fixed along with said intermediate substances, said luminous substances having excitation energy



levels corresponding substantially to those of isolated atoms of the luminous substances, the excitation of an atom of the luminous substances producing a multi-quantum emission of photons substantially in the visible spectrum from said atom.

4,719,387
INFRA-RED PHOSPHORS AND FLUORESCENT LAMP CONTAINING THE SAME

Colin L. R. Catherall, Enfield, England, assignor to Thorn EMI plc, London, England

Filed Nov. 13, 1986, Ser. No. 929,792
Claims priority, application United Kingdom, Nov. 13, 1985, 8527992
Int. Cl.[4] H01J *61/44*; C09K *11/463*
U.S. Cl. 313—486 11 Claims

1. A phosphor emitting in the region of the electromagnetic spectrum between 650 and 800 nm when excited by 254 nm radiation consisting of chromium activated cerium manganese aluminate having a hexagonal crystal structure and represented by the general formula:

$$(Ce_xR_yCr_z)O.(\tfrac{1x}{2}+\tfrac{3y}{2}+y)6Al_2O_3$$

where
x is from 0.3 to 3.0,
y is from 0.01 to 2.0,
z is from 0.001 to 0.3 and
R is manganese, in which up to 95 atomic percent of the manganese is replaceable by an equivalent amount of zinc or magnesium or both, said phosphor emitting a greater luminance in said region than the same phosphor absent manganese when excited by 254 nm radiation.

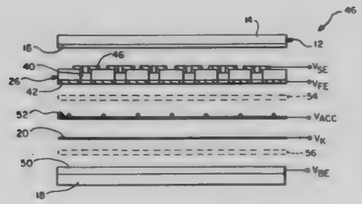
4,719,388
FLAT ELECTRON CONTROL DEVICE UTILIZING A UNIFORM SPACE-CHARGE CLOUD OF FREE ELECTRONS AS A VIRTUAL CATHODE

Frederick G. Oess, San Mateo County, Calif., assignor to Source Technology Corporation, Los Gatos, Calif.

Filed Aug. 13, 1985, Ser. No. 765,413
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.1 30 Claims

1. A flat visual display device, comprising:
(a) a flat face plate having a front face, an opposite back face, and means on the latter which, as a result of the impingement of electrons thereon, provides a visual image at said front face;
(b) an arrangement including cathode means for establishing a uniform space-charge cloud of free electrons defining a planar band which functions as a virtual cathode, which is spaced-apart from said cathode means and which is parallel with and rearward of the back face of said display face plate, said arrangement including means other than said cathode means for causing some of said free electrons to

oscillate back and forth more than once between said planar band and a second spaced-apart location,; and
(c) address means disposed in spaced-apart, confronting relationship with the back face of said face plate between the latter and said uniform space-charge cloud for acting

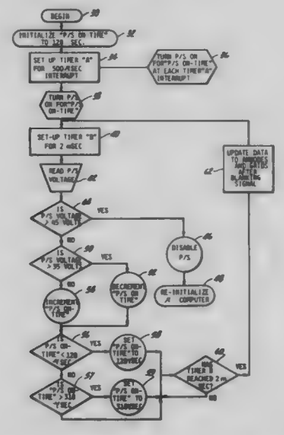


on electrons within said cloud in a controlled way so as to cause the electrons acted upon to impinge on specific areas of the electrically positive screen of said face plate in order to produce a desired image at the front face of said face plate.

4,719,389
METHOD FOR ENERGIZING VACUUM FLUORESCENT DISPLAYS

Frederick O. R. Miesterfeld, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 23, 1985, Ser. No. 812,473
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—169.1 5 Claims

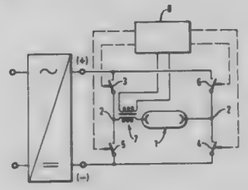


1. A method of controlling a power supply for a vacuum fluorescent display to regulate voltage to the display, the method being implemented in an electronic circuit with a display driver, and a microcomputer with timer means and comparator means, the steps comprising:
initializing a first variable corresponding to the minimum amount of on-time the power supply is to be energized;
setting up a first timer for an interrupt and turning on the power supply for the time period specified in the first variable each time the first timer forces an interrupt of the method;
turning the power supply on for the time period indicated in the first varisble;
setting up a second timer for a second time period;
reading the power supply voltage;
comparing the power supply voltage to a maximum amount of voltage acceptable for the particular design;
comparing the power supply voltage to a minimum amount of acceptable voltage if the maximum amount of voltage is not exceeded;
decrementing the first variable corresponding to the power supply on-time if the power supply voltage is greater than the minimum amount;
incrementing the first variable corresponding to the power supply on-time if the power supply voltage is less than a minimum amount;
checking to see whether the first variable, corresponding to the power supply on-time, is less than a minimum amount;
setting the first variable corresponding to the power supply on-time to the minimum amount if the variable is below it as read;
checking the first variable corresponding to the power supply on-time against a maximum amount if the minimum amount was exceeded;
setting the first variable corresponding to the power supply on-time to the maximum amount if the first variable as read exceeded the maximum;
checking the condition of the second timer, to see if the second timer has reached the second time period, after the condition of the first variable corresponding to the power supply on-time has been set;
waiting for the second timer to reach the second time period;
updating data to the vacuum fluorescent display after blanking the display;
returning to set up the second timer for the second time period, if the second timer has reached its second period limit.

4,719,390
ELECTRONIC MAINS CONNECTION DEVICE FOR A GAS DISCHARGE LAMP

Martti Sairanen, Vantaa, Finland, assignor to Helvar Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 381,417, May 24, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 667,201
Int. Cl.[4] H05B *41/16, 41/24*
U.S. Cl. 315—246 9 Claims



1. An electronic mains connection device for a gas-discharge lamp electrically connected to a direct current source, said device comprising:
an inverter circuit electrically connecting said lamp to said direct current source for converting the service current of said lamp to a high frequency alternating current whereby the impedence of said lamp is resistive, said inverter circuit including a plurality of switches;
current measuring means in electrical communication with said lamp for sensing the high frequency alternating current of said lamp;
control means in electrical communication with said current measuring means for controlling the on/off ratio of said switches in said inverter circuit in response to the measurement of lamp current whereby the current of said lamp remains constant, said control means including a means for setting the maximum value of the on/off ratio, which also sets the maximum lamp current;
the current of said lamp being significantly limited only by

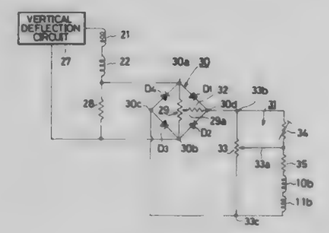
the resistance-like impedance of said lamp present therein at said high inverting frequency, the other impedances of the circuit being considerably smaller than the lamp impedance so that the total impedance of the circuit is not capable of limiting the lamp current during several half cycles of the high frequency alternating current.

4,719,391

CONVERGENCE CIRCUIT

Korehisa Maruta, Tokyo, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,721
Claims priority, application Japan, May 30, 1984, 59-109995
Int. Cl.⁴ H01J *29/70, 29/50*
U.S. Cl. 315—368 **5 Claims**



1. An improved convergence circuit for correcting a misconvergence which takes place in a cathode ray tube in which three electron beams are emitted in an in-line arrangement, said circuit comprising:

(a) a pair of vertical deflection coils supplied with a deflection current having a sawtooth waveform from a vertical reaction circuit;

(b) a rectifying circuit which is formed as a bridge circuit having a pair of input terminals series-connected to said coils and a pair of output terminals, said rectifying circuit converting said deflection current to a correction current having a parabolic waveform;

(c) a first adjusting means for alternatively varying the parabolic waveform of said correction current every half cycle of said deflection current;

(d) a series circuit which comprises resisting means and a correction coil and is connected across said output terminals of said rectifying circuit, said correction coil generating a magnetic correction field for correcting the misconvergence;

(e) a second adjusting means which has a slide connected between said correction coil and said resisting means and is connected to said output terminals to adjust a value of correction current which flows in said correction coil by the movement of said slide; and

(f) wherein said resisting means further operates to extend a range of movement of said slide, thereby enabling fine adjustment to eliminate said misconvergence.

4,719,392

RASTER CORRECTION CIRCUIT

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 18, 1986, Ser. No. 875,708
Claims priority, application United Kingdom, Feb. 27, 1986, 8604845
Int. Cl.⁴ H01J *29/56*
U.S. Cl. 315—371 **27 Claims**

1. A deflection apparatus with inside pincushion distortion correction, comprising:

a source of an input signal at a frequency that is related to a deflection rate;

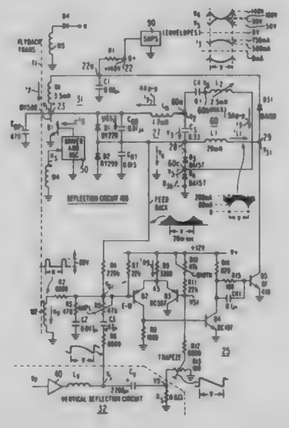
a deflection winding for generating, at said deflection rate, scanning current in said deflection winding during a trace interval and during a retrace interval of a deflection cycle;

switching means coupled to said deflection winding and responsive to said input signal for generating, during said retrace interval, a retrace voltage and for generating said scanning current in said deflection winding;

a source of modulation signal at a second frequency;

means responsive to said retrace voltage and to said modulation signal for generating a modulated voltage during said retrace interval that is modulated in accordance with said modulation signal;

a trace capacitance coupled to said deflection winding to form with said deflection winding a first trace resonant circuit during said trace interval such that said scanning current that flows in said trace capacitance develops during said trace interval a parabolic voltage in said trace capacitance; and



a circuit branch, including a second capacitance and a modulation inductance coupled to said trace capacitance to form a second resonant circuit for generating in said modulation inductance a modulation current at an amplitude that is modulated by said modulated voltage during said retrace interval, said modulation current being coupled to said trace capacitance to vary said parabolic voltage in said trace capacitance in accordance with the amplitude of said parabolic voltage in a manner to reduce inside pincushion distortion, such that said trace capacitance acts as a low impedance bypass capacitance for said scanning current around said modulation inductance substantially throughout said retrace interval.

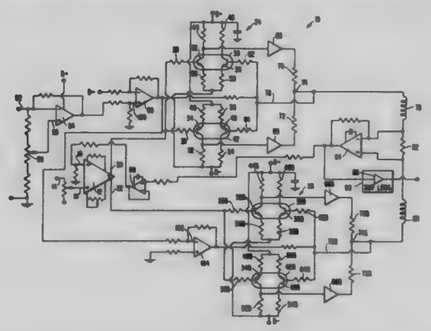
4,719,393

DEFLECTION AMPLIFIER

Neil R. McCanney, 15406 Timberline Dr., Tampa, Fla. 33624

Filed Sep. 2, 1986, Ser. No. 902,637
Int. Cl.⁴ H01J *29/70, 29/76*
U.S. Cl. 315—397 **10 Claims**

1. A deflection amplifier adapted to drive the deflection yoke coil means of a cathode ray tube, said deflection yoke coil means having a first terminal at one end thereof and a second terminal at a second opposed end thereof, said deflection amplifier comprising input means for receiving a deflection input signal and producing first and second complementary output signals indicative thereof, first and second amplifier means connected in a push-pull configuration to receive said complimentary output signals, said first and second amplifier means being connected to said deflection yoke coil means and operative to provide a compliance voltage to said deflection yoke coil means, said first amplifier means being connected to receive said first complementary output signal and to provide a first compliance voltage to said first terminal of the deflection yoke coil means and said second amplifier means being connected to receive said second complementary output signal and to provide a second compliance voltage to the second terminal of said deflection yoke coil means, said first and second compliance voltages being complementary signals, a resistor means connected in series with said deflection yoke coil means to provide a current indicative of said compliance voltage provided to said deflection yoke coil means, negative feedback means connected to said resistor means and operative to generate a negative feedback signal from the current indicative of said compliance voltage, said negative feedback means operating to feed said feedback signal to said input means.

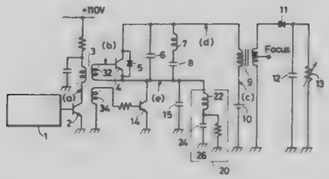


4,719,394

HORIZONTAL OUTPUT CIRCUIT

Kiyoshi Watanuki, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1986, Ser. No. 824,096
Claims priority, application Japan, Jan. 30, 1985, 60-14204
Int. Cl.⁴ H01J *29/70, 29/76*
U.S. Cl. 315—408 **14 Claims**



1. A horizontal output circuit for a cathode ray tube comprising:

a horizontal deflection coil;

a first capacitor connected in series with said horizontal deflection coil;

switching means, including a horizontal output transistor and a switching element connected in series, said horizontal output transistor being connected in parallel with the series circuit of said horizontal deflection coil and said first capacitor, for conducting a horizontal deflection current therethrough during a horizontal scan period;

a resonating capacitor connected in parallel with said series circuit for resonating with said series circuit to generate a flyback pulse during a horizontal retrace period;

a DC voltage source having first and second ends;

means including inductive means connected between said horizontal deflection coil and said first end of said DC voltage source for supplying to said horizontal deflection coil a DC component which is dependent upon the beam current of the cathode ray tube;

voltage generating means conected between one end of said series circuit and said second end of said DC voltage source and being responsive to said DC component for generating a voltage in accordance with said beam current to reduce the voltage across said first capacitor in response to an increase in said beam current;

said switching element being connected between said one end of said series circuit and said other end of said DC voltage source for alternately turning on and off at the horizontal scan frequency, wherein said horizontal output transistor and said switching element have a fixed switching phase relationship, and also the time at which said switching element is turned off from its conductive state by said control means precedes the turn-off time of said horizontal output transistor; and

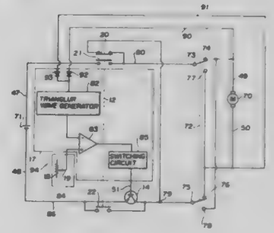
superimposing means connected to said series circuit for compensating any adverse change of the flyback pulse by superimposing on said flyback pulse during said horizontal retrace period a pulse, whose amplitude is responsive to said beam current, in order to maintain substantially constant the amplitude of said flyback pulse.

4,719,395

VARIABLE SPEED CONTROL SWITCH FOR AN ELECTRIC TOOL INCLUDING A DC MOTOR

Tatsuo Aoi, Ibaragi; Haruo Atsumi, Shizuoka; Takeshi Kikukawa, Izumo; Kunio Nagata, Kyoto; Yasuhiro Kiyono, Nagaokakyo, and Sueaki Honda, Kurayoshi, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 22, 1986, Ser. No. 944,220
Int. Cl.⁴ H02P *5/17*
U.S. Cl. 318—349 **6 Claims**



1. A variable speed control switch for an electric tool including a DC motor having an armature circuit, comprising:

a means for turning off and on the armature circuit of said DC motor;

an upper heat dissipation cover which covers a top surface of said turning off and on means;

a lower heat dissipation cover which covers a bottom surface of said turning off and on means;

a printed circuit board located on a lower surface of said lower heat dissipation cover and carrying a control circuit imprinted on it;

a resistor element provided on the lower surface of said printed circuit board and constituting a part of a speed variation control circuit for said DC motor;

a movable contact assembly, comprising a first contact member for short circuiting terminals of said DC motor, a second contact member for turning ON a power source, a third contact member for short circuiting said turning off and on means, and a brush for varying a resistive value by sliding over said resistor element;

a means for biasing the movable contact assembly to a position which short circuiting the terminal of said DC motor;

a box like casing which receives the above mentioned components in its upper opening, which further receives on

one of its sides the power source terminals and a motor terminal, and provides on its lower side a depending support portion; and

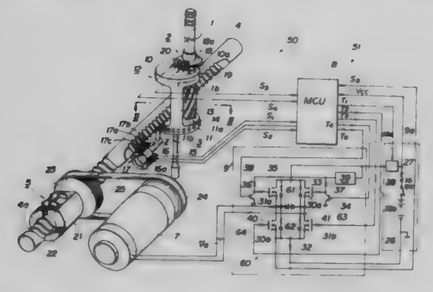
an operation lever which is drivingly engaged to said movable contact assembly at the upper portion thereof and pivoted said depending support portion of casing at the lower pivoted portion thereof, thereby adapted to operatively rock about its pivoted portion.

4,719,396

ELECTRIC MOTOR DRIVE CIRCUIT FOR ELECTRIC POWER STEERING SYSTEMS FOR VEHICLES

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1986, Ser. No. 866,504
Claims priority, application Japan, May 27, 1985, 60-113498
Int. Cl.⁴ B62D *5/04*; H02P *1/22*
U.S. Cl. 318—432 **4 Claims**



1. An electric drive circuit for controlling an electric motor used in an electric power steering system for vehicles, said electric drive circuit comprising:

a bridge circuit comprising first input terminal, second input terminal, first output terminal, second output terminal, first FET, connected between said first input terminal and said first output terminal, second FET connected between said first input terminal and said second output terminal, third FET connected between said second input terminal and said second output terminal, fourth FET connected between said second input terminal and said first output terminal, and electric power connected between said first and second input terminals;

said electric motor being connected between said first and second output terminals;

control means for supplying a first control signal via a first line to said first FET to drive the same, a second control signal via a second line to said second FET to drive the same, a third control signal via a third line to said third FET to drive the same, and a fourth control signal via a fourth line to said foruth FET to drive the same; and

said first and third control signals being generated concurrently with each other to drive said electric motor in a first direction, said second and fourth control signals being generated concurrently with each other to drive said electric motor in a second direction, and said first and third control signals and said second and fourth control signals being generated independently of each other;

said power steering system further comprises an input shaft operatively connected to a steering wheel, an output shaft operatively connected to a steered wheel to which said electric motor operatively supplies auxiliary torque, torque detecting means for detecting steering torque acting on said input shaft, and steering velocity detecting means for detecting steering velocity of the input shaft; and

said control means generates said first, second, third and fourth control signals dependent upon detection signals from said torque detecting means and said steering speed detecting means.

4. An electric drive circuit for controlling an electric motor used in an electric power steering system for vehicles, said electric drive circuit comprising:

a bridge circuit comprising first input terminal, second input terminal, first output terminal, second output terminal, first FET, connected between said first input terminal and said first output terminal, second FET connected between said first input terminal and said second output terminal, third FET connected between said second input terminal and said second output terminal, fourth FET connected between said second input terminal and said first output terminal, and electric power connected between said first and second input terminals;

said electric motor being connected between said first and second output terminals;

control means for supplying a first control signal via a first line to said first FET to drive the same, a second control signal via a second line to said second FET to drive the same, a third control signal via a third line to said third FET to drive the same, and a fourth control signal via a fourth line to said fourth FET to drive the same;

said first and third control signals being generated concurrently with each other to drive said electric motor in a first direction, said second and fourth control signals being generated concurrently with each other to drive said electric motor in a second direction, and said first and third control signals and said second and fourth control signals being generated independently of each other; and

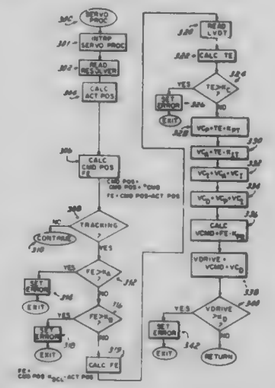
said bridge circuit further comprises an additional four FET's each respectively connected in parallel to one of said four initial FET's and to have said control signals as they are input from said control means to said one of said four initial FET's, likewise input thereto.

4,719,397

METHOD AND APPARATUS FOR TAPE DISPENSING SERVO TRACKING CONTROL

Ralph W. Kneifel, II, Cincinnati, and David C. Swope, North Bend, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 6, 1987, Ser. No. 34,887
Int. Cl.⁴ G05B *19/100*
U.S. Cl. 318—567 **23 Claims**



1. In a method of applying material to a surface, a contour of said surface characterized between less severe and more severe, by traversing said surface with a material dispensing apparatus adapted to apply said material thereto, a method of maintaining a desired spatial relationship between said material dispensing apparatus and said surface comprising:

generating a position signal indicative of a working position of said material dispensing apparatus along an axis transverse said surface;

generating a command signal correlated to (1) a following error difference between said working position and an actual position of said material dispensing apparatus along said axis and (2) a first programmable gain factor;

generating a tracking signal correlated to (1) a tracking error difference between said actual position and said surface along said axis as said material dispensing apparatus traverses said surface and (2) a second programmable gain factor;

effecting movement of said material dispensing apparatus along said axis toward said desired spatial relationship in response to said command and tracking signals;

programming said first and second programmable gain factors such that said command signal predominates over said tracking signal as said contour is chracterized as more severe; and

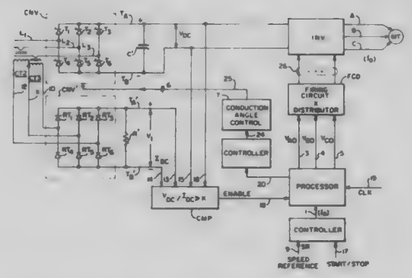
programming said first and second programmable gain factors such that said tracking signal predominates over said command signal as said contour is characterized as less severe.

4,719,398

COASTING AC MOTOR RESTART SYSTEM AND METHOD

Derek A. Paice, Palm Harbor, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 9, 1986, Ser. No. 871,979
Int. Cl.⁴ H02P *1/26*
U.S. Cl. 318—778 **4 Claims**



1. In a coasting AC motor restart system for a variable frequency adjustable speed AC motor drive including a voltage-controlled AC/DC converter providing a voltage source of adjustable DC voltage, an inverter controlled in frequency and responsive to said voltage source, and an AC motor energized by said inverter; the combination of:

first means operable on said converter to reduce said DC voltage;

second means responsive to said first means and operable on said inverter for raising the frequency thereof to a predetermined high level at a fast rate;

voltage measuring means for driving a voltage signal representative of a voltage applied across said inverter;

current measuring means for driving a current signal representative of a current flowing under said voltage between the voltage source and the motor;

divider means for establishing the ratio between said voltage signal and said current signal;

means for decelerating said inverter in frequency at a predetermined search rate from said high level;

means for detecting a discontinuity in said ratio under operation of said decelerating means; and

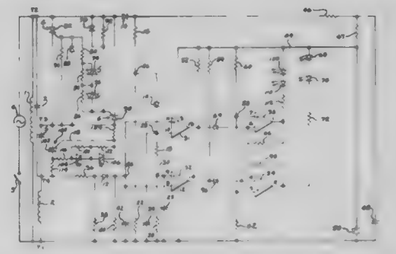
means for controlling the speed of said motor from an initial frequency of said inverter matching the occurrence of said discontinuity.

4,719,399

QUICK DISCHARGE MOTOR STARTING CIRCUIT

Richard A. Wrege, Muskego, Wis., assignor to PT Components, Inc., Milwaukee, Wis.

Filed Sep. 24, 1986, Ser. No. 910,932
Int. Cl.⁴ H02P *1/44*
U.S. Cl. 318—786 **9 Claims**



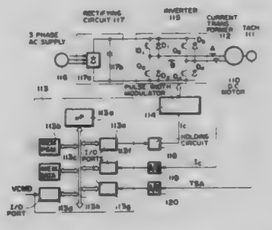
1. In a single phase AC induction motor having a main winding and an auxiliary winding both connectable to an AC power source, and having a start capacitor for providing a phase shifted field for starting torque, and having start switch means for automaticaly connecting and disconnecting said start capacitor to and from said AC source in starting and running modes, respectively, auxiliary switch means connected across said start capacitor for quickly discharging said start capacitor upon disconnection of said start capacitor from said AC source.

4,719,400

MOTOR CONTROL APPARATUS

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP83/00364, § 371 Date Jun. 11, 1984, § 102(e) Date Jun. 11, 1984, PCT Pub. No. WO84/01677, PCT Pub. Date Apr. 26, 1984
Continuation of Ser. No. 621,914, Jun. 11, 1984, abandoned.
This PCT application Oct. 19, 1983, Ser. No. 11,353
Claims priority, application Japan, Oct. 19, 1982, 57-183334
Int. Cl.⁴ H02P *5/40*
U.S. Cl. 318—811 **6 Claims**



1. A motor control apparatus including:

pulse-width modulating means having a dead zone, for receiving a control input signal and for pulse-width modulating said control input signal;

amplifying control means for controlling the motor in accordance with said pulse-width modulated control input signal;

arithmetic circuit means for receiving a command signal indicating a desired motor velocity, for calculating a

current command in accordance with said command signal, the current command having a polarity, and for generating said control input signal by modifying said current command signal by a predetermined amount in accordance with the polarity of the current command signal so as to compensate for said dead zone of said pulse-width modulating means; and

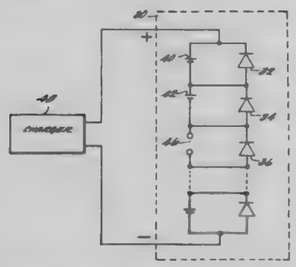
holding circuit means, operatively connected between said pulse-width modulating means and said arithmetic circuit means, for holding said control input signal.

4,719,401

ZENER DIODE LOOPING ELEMENT FOR PROTECTING A BATTERY CELL

Morrie Altmejd, Toronto, Canada, assignor to Powerplex Technologies, Inc., Downsville, Canada

Filed Dec. 4, 1985, Ser. No. 804,467
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—13 **21 Claims**



1. A battery system comprising:

a plurality of battery cells, each having an anode and a cathode connected in series; and

a plurality of zener diode looping elements, each connected in parallel across an associated one of said cells and each looping element including a zener diode p-n junction, and a package formed so that failure of the package will not occur during high current conditions, each said looping element having its cathode connected to the anode of each said cell and said looping element having its anode connected to the cathode of each said cell;

said zener diode looping element being constructed so that when a predetermined amount of current is passed therethrough in a forward biasing direction, said p-n junction fuses permanently into a short circuit state, thereby shorting across said associated battery cell.

4,719,402

VAR GENERATOR SYSTEM WITH MINIMAL STANDBY LOSSES

Michael B. Brennen, Pittsburgh, and Mark G. Gerhardt, Herminie, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 18, 1986, Ser. No. 943,215
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—211 **9 Claims**

1. In a static VAR compensator for high voltage AC transmission lines, including in parallel to two of said transmission lines:

(a) a plurality of switchable capacitors and a plurality of capacitor thyristor units for connecting a corresponding switchable capacitor of said plurality for each polarity across said two transmission lines;

(b) a fixed capacitor connected across said two transmission lines; and

(c) reactor means and a reactor thyristor unit for connecting said reactor means across said two transmission lines for each polarity;

said switchable capacitors, fixed capacitor and reactor means concurring in providing a compensating reactive current path between said two transmission lines;

means being provided for deriving in relation to said transmission lines a VAR demand representative signal; and

means responsive to said VAR demand signal for controlling selectively said capacitor thyristor units and said reactor



thyristor unit to adjust the compensating current in said path in relation to said error signal;

the combination of:

fixed hysteresis means and variable hysteresis means within said controlling means;

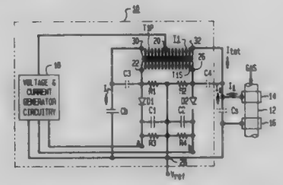
with said fixed hysteresis and variable hysteresis means being activated when said VAR demand error signal calls for switching one of said switchable capacitors OFF to provide a reduced capacitive current in said reactive current path.

4,719,403

R. F. GLOW DISCHARGE CONSTANT CURRENT SOURCE

Philip F. Beischer, Florham Park, N.J., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Nov. 3, 1986, Ser. No. 926,279
Int. Cl.[4] G05F *1/10*
U.S. Cl. 323—234 **16 Claims**



1. Apparatus coupled to a load device having a load impedance and a parasitic impedance associated therewith comprising:

a balancing element having an impedance essentially equal to the parasitic impedance;

first circuit means, which is coupled to the balancing element and to the load device, for generating an output signal which is proportional to current flowing only through the load impedance;

error signal generating means, which is coupled to an output terminal of the first circuit means and to a reference signal having a level which is proportional to a desired level of current flow through the load impedance, for comparing the output signal of the first circuit means with the reference signal and generating an error signal representative of the difference of the two signals; and

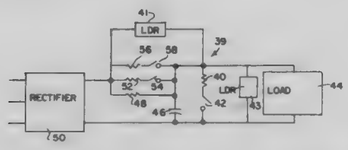
power generating means, which is coupled to the error signal generating means and to the load device and is responsive to the error signal, for generating a potential level(s) which selectively results in an essentially constant current flow through the load impedance.

4,719,404

SWITCHED RESISTOR REGULATOR WITH LINEAR DISSIPATIVE REGULATOR

John P. Ekstrand, Palo Alto, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 754,036, Jul. 11, 1985, Pat. No. 4,668,906. This application Dec. 23, 1986, Ser. No. 945,924
Int. Cl.[4] G05F *1/656*
U.S. Cl. 323—297 **20 Claims**



1. Apparatus for regulating power from a power supply means to a load comprising:

(a) a switching resistor regulator, comprising:

resistive means and capacitive means electrically connected between the power supply means and the load, the resistive means including at least a switching resistor;

switching means connected in series with the switching resistor for opening and closing the electrical connection through the switching resistor in the resistive means from the supply means to the load, the resistive means having a resistor in series between the supply means and the load when the switching means is closed, the capacitive means having a capacitor electrically connected to the load when the switching means is open;

control means connected to the switching means for opening and closing the switching means at a frequency and duty cycle to selectably vary average current flow through the switching resistor to regulate current flow to the load; and

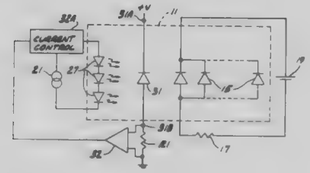
(b) a linear dissipative regulator connected between the the supply means and the load in parallel with the resistor in series between the supply means and the load to provide a current shunt path between the supply and the load.

4,719,405

HIGH VOLTAGE CURRENT REGULATOR

C. Wendell Boucher, San Luis Obisop County, Calif., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 22, 1986, Ser. No. 944,226
Int. Cl.[4] G05B *24/02*
U.S. Cl. 323—352 **20 Claims**



1. A high voltage power supply current regulator comprising:

at least one high voltage rectifier diode having a plurality of pn junctions and adapted to be connected between a high voltage power supply whose current is to be regulated and a load such that the diode is reversed biased; and

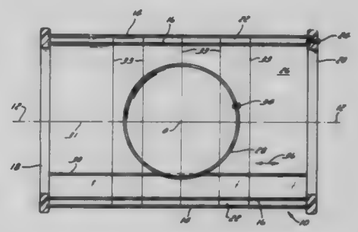
control means operating at a voltage which is relatively low compared with the power supply voltage for controlling the reverse current through the diode to the load, which reverse current constitutes the load current, said control means including means for illuminating the pn junctions of the diode with a predetermined flux of photons, the reverse current through the diode being a function of the photon flux on the diode junctions.

4,719,406

PHANTOM FOR PERFORMANCE EVALUATION OF A NUCLEAR MAGNETIC RESONANCE SCANNER

Daniel J. Schaefer, Waukesha, and Robert W. Newman, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 7, 1986, Ser. No. 827,846
Int. Cl.[4] G01R *33/24*
U.S. Cl. 324—318 **27 Claims**



1. A phantom for measuring a performance parameter of a nuclear magnetic resonance (NMR) scanner capable of acquiring NMR data from a study object, said phantom comprising:

a first medium;

a second medium capable in use of generating an NMR test signal useful in measuring a performance parameter of said NMR scanner;

a first means positionable in use within a radio-frequency (RF) coil forming part of said NMR scanner, said first means including an outer shell defining a volume for supporting said first medium;

second means for containing said second medium;

said first means further including support means capable of supporting said second means; and

said first medium and the geometrical configuration of said first means being selected for jointly loading said RF coil in a manner similar to that of a predetermined study object and for predetermined NMR properties, said predetermined NMR properties being chosen such that an NMR signal, if any, generated by said first medium decays substantially to zero prior to the detection of the NMR signal generated by said second medium;

whereby said first medium and said first means are substantially invisible to said NMR scanner and interference with the NMR signal generated by said second medium is substantially avoided.

4,719,407

AUTOMATED SEARCH APPARATUS FOR LOCATING LEAKS IN GEOMEMBRANE LINERS

Merle E. Converse, Helotes, and David W. Shultz, San Antonio, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jan. 31, 1986, Ser. No. 824,440
Int. Cl.[4] G01R *31/08; G08B 21/00*
U.S. Cl. 324—546 **13 Claims**

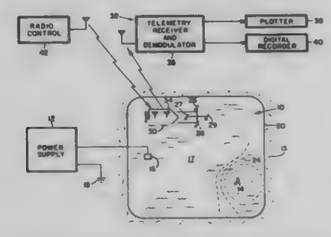
1. An automated search apparatus for locating a leak in a geomembrane liner having a high electrical resistivity, said liner having one face in contact with a conductive liquid con-

tained by said liner and having the opposite face in contact with a conducting material, comprising:

means for producing a voltage drop between said contained liquid and said conducting material, thereby creating a voltage gradient on the surface and in the interior volume of said liquid, said voltage gradient having a distribution correlatable with a leak in said geomembrane liner;

a propelled, steerable vehicle;

voltage gradient sensing means carried on said vehicle, said sensing means operable to detect a voltage gradient on the surface of said liquid, said voltage gradient sensing means comprising first and second electrode pairs, said first electrode pair being aligned along a longitudinal axis of said vehicle, said second electrode pair being aligned



along an axis transverse to said longitudinal axis, said first and said second electrode pairs each being connected to first and second differential amplifiers, respectively, whereby first and second output signals are generated which correlate to the voltage potential difference between said first and said second electrode pairs, respectively;

means for monitoring the position of said vehicle with respect to a reference point and for generating a position reference signal correlatable with the location of said vehicle with respect to said reference point; and

signal processing means responsive to said output signals and said position reference signal and operable to correlate said output signal and said position reference signal with the location of a leak in said liner.

4,719,408

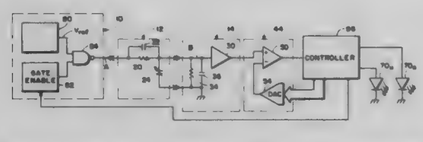
APPARATUS FOR INDICATING PROPER COMPENSATION OF AN ADJUSTABLE FREQUENCY COMPENSATION NETWORK

Dale E. Carlton, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 23, 1985, Ser. No. 812,481

Int. Cl.⁴ G01R *27/28;* **H03L** *5/00;* **H03K** *5/00*

U.S. Cl. 324—57 PS **9 Claims**



1. Apparatus for indicating proper compensation of an adjustable frequency compensation network having a predetermined time constant, comprising:

a signal source operable in a first operating mode to apply a constant voltage to the frequency compensation network for a time longer than one time constant of the frequency compensation network and in a second operating mode to apply rectangular pulse having a preselected peak magnitude and a duration less than said predetermined time constant to the frequency compensation network, and

measurement means for measuring the peak value of the output voltage of the frequency compensation network when the signal source is in its first operating mode and when the signal source is in its second operating mode and comparing the peak value of the output voltage provided by the frequency compensation network when the signal source is in the first operating mode with the peak output voltage provided by the frequency compensation network when the signal source is in the second operating mode

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4,719,409

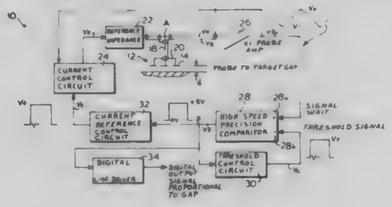
DIGITAL SIGNAL OUTPUT CAPACITANCE SENSOR DISPLACEMENT GAUGING SYSTEM

Richard A. Dorman, Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Oct. 2, 1985, Ser. No. 782,887

Int. Cl.⁴ G01H *11/00;* **G01R** *27/02*

U.S. Cl. 324—60 CD **2 Claims**



1. A system for producing signals compatible with digital circuits indicative of a physical parameter comprising:

a sensor/transducer having an impedance which varies in accordance with said physical parameter;

a reference impedance connected in series with an output of said sensor transducer;

a current control circuit having an output providing an excitation signal which is connected in series to said reference impedance;

means for amplifying an output signal from said sensor/-transducer and for conveying a signal through a feedback path to said current control circuit;

a comparator having an input from said amplifying means and another input which is a reference voltage;

a threshold control circuit having an input from an output of said comparator and providing an output constituting said reference voltage to said another input of said comparator; and

a current reference control circuit having an input connected to an output of said comparator and an output connected to an input of said current control circuit;

said system functioning such that an ouput voltage from said amplifying means equaling or exceeding said reference voltage causes said output of said comparator to switch to the higher of one of two possible voltage output states and causes said output of said current reference control circuit to switch to the lower of one of two possible output voltage states, said switching causing said output of said current control circuit to switch polarities which in turn causes a reversal to current flow in said sensor/transducer and reference impedance, said switching also causing said threshold control circuit ouput to switch to the lower of one of two possible voltage states, and simultaneously with said switching said amplifying means output voltage begins to decline until it reaches a level below that of said threshold control circuit output at which time said switching reverses whereby said system operates in a cyclical manner and is thus self-oscillatory and wherein said current control circuit comprises a first operational amplifier having said input connected to said feedback path from said amplifying means and a second operational amplifier which has an input which combines and output signal from said first operational amplifier with said current

reference control circuit output, and said output of said current control circuit connected to said reference impedance.

4,719,410

REDUNDANCY-SECURED SEMICONDUCTOR DEVICE

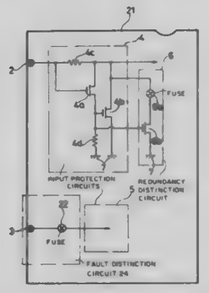
Yasumasa Nishimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,571

Claims priority, application Japan, Aug. 31, 1984, 59-183072

Int. Cl.⁴ G01R *31/28;* **G08B** *29/00*

U.S. Cl. 324—73 R **3 Claims**



1. A redundancy-secured semiconductor device comprising:

primary semiconductor circuit means for performing predetermined functions in the semiconductor device;

secondary semiconductor means for performing the same predetermined functions as said primary semiconductor circuit means when said primary semiconductor circuit means is detected to be faulty;

means for selectively disabling said primary semiconductor circuit means in order to substitute said secondary circuit means for said faulty primary circuit means as an operative component in said device; and

fault distinction circuit means for distinguishing whether said faulty primary semiconductor circuit means is substituted by said secondary semiconductor circuit means as an operative component in said device or not, which fault distinction means is marked when it is found that the substitution is not applicable or it is found that said replaced secondary semiconductor circuit means is inoperable as a result of a performance test of said semiconductor device which is conducted just after said disabled primary semiconductor circuit means is replaced by said secondary semiconductor circuit means.

4,719,411

ADDRESSABLE TEST MATRIX FOR MEASURING ANALOG TRANSFER CHARACTERISTICS OF TEST ELEMENTS USED FOR INTEGRATED PROCESS CONTROL AND DEVICE EVALUATION

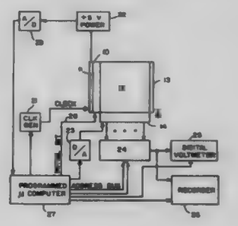
Martin G. Buehler, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed May 13, 1985, Ser. No. 733,110

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 324—73 R **3 Claims**

1. A method for testing the electrical analog transfer characteristics of elements in an addressable test structure produced on a wafer together with integrated circuits before dicing and packaging said integrated circuits, said method comprising the steps of developing on said wafer at least one addressable test structure having an array of probeable test contact pads, said test structure comprising a plurality of elements, addressing each element in sequence while measuring and recording the electrical transfer characteristics of each element to analog signals, and determining the extent of uniformity of said elements in respect to their electrical transfer characteristics as a



test of quality of said integrated circuits produced on the same wafer as the addressable test structure before dicing.

4,719,412

SYSTEM FOR ANALYZING TRANSIENTS IN A NON-LUMINOUS SIGNAL

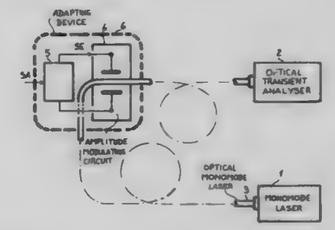
Etienne d'Humieres, Versailles; Jean M. Bernet, La Celle St. Cloud, and Cregoire Esmurian, Argenteuil, all of France, assignors to Thomson CSF, Paris, France

Filed Dec. 10, 1985, Ser. No. 807,461

Claims priority, application France, Dec. 18, 1984, 84 19361

Int. Cl.⁴ G01R *23/16*

U.S. Cl. 324—77 K **11 Claims**



1. A transient analyzing system for the analysis of a non-luminous signal to be analyzed comprising:

an optical transient analyzer; and

means for converting the signal to be analyzed into a luminous form of information,

including (a) a monomode laser source emitting a luminous signal in a continuous manner

(b) means, coupled to receive said luminous signal, for amplitude modulating said laser luminous signal to produce said luminous form of information as an output, said producing means having an optical amplitude modulating integrated circuit with an optical input, an optical output and a modulating input, said modulating input being adapted to receive a non-luminous signal which has a characteristic varying in accordance with the signal to be analyzed

and (c) a monomode optical fibre light conductor for connecting the laser source to said optical input, and the said optical output to the optical transient analyzer.

4,719,413

RF CROSSPOINT TESTER

Philip C. Basile, Washington Township, Gloucester County, N.J., assignor to RCA Corporation, Princeton, N.J.

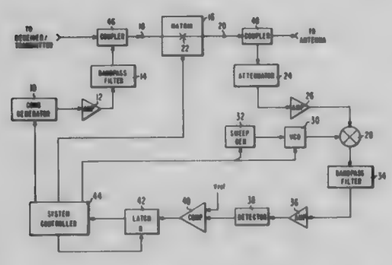
Filed Oct. 30, 1986, Ser. No. 924,784

Int. Cl.⁴ G01R *23/16*

U.S. Cl. 324—77 B **18 Claims**

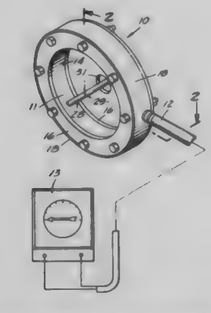
1. An apparatus for determining the quality of signal trans-

mission through an array, said array having an input and an output port, said apparatus comprising:
means coupled to said input port for generating a composite signal into said array, said composite signal comprising a multiplicity of substantially equal-amplitude frequency components;
means for generating a frequency-varying signal in which the frequency of said signal is periodically swept uniformly across a predetermined frequency range;
means coupled to said array output port and responsive to a signal received from said array, said received signal being the consequent of said composite signal passing through said array, for combining said received signal with said



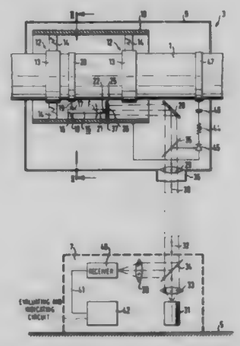
frequency-varying signal, such that the output signal of said combining means includes components having frequencies which are the frequencies of the components of said received signal subtracted from the instantaneous frequency of said frequency-varying signal;
means coupled to said combining means for enabling an output signal comprising a fixed band of frequencies of said combining means output signal;
means for detecting the energy of said enabling means output signal and for providing an output signal having amplitude indicative of said signal energy; and
means for analyzing the amplitude of said detecting means output signal during the period of said frequency-varying signal.

4,719,414
CURRENT DETECTION DEVICE HAVING AN EXTENDED FREQUENCY RANGE OF RESPONSE
John S. Miller, 8023 Naylor Ave., Los Angeles, Calif. 90045, and Michael K. Van Brunt, 9754 Big Horn, Ventura, Calif. 93004
Filed Jul. 14, 1986, Ser. No. 885,271
Int. Cl.⁴ G01R *21/04, 1/20*
U.S. Cl. 324—95 **6 Claims**



1. A coaxial electric current detecting device effective over a range of D.C. to 1 gigahertz, comprising:
an annular dielectric substrate;
first and second annular metal rims affixed to the respective sides of the substrate;
metal foil laid down on the radially inwardly directed surface of the substrate extending completely about the substrate circumferential surface, said foil having edge portions extending radially outwardly and in contact with the rims;
dielectric means covering the foil;
a strip of conductive material extending about the periphery of the rims and in contact with the outer edges of said rims; and
a resistive material securing the strip to the edges of the rims such that the electrical resistance as measured across the strip through the resistive material at both rims exceeds that of the foil.

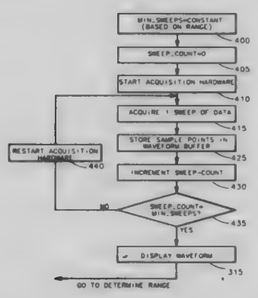
4,719,415
ARRANGEMENT FOR THE MEASUREMENT OF THE ELECTRIC VOLTAGE PARAMETERS OF A HIGH VOLTAGE CONDUCTOR
Walter Mehnert, Ottobrunn, Fed. Rep. of Germany, assignor to MITEC Moderne Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany
Filed May 21, 1985, Ser. No. 736,626
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419429; Feb. 13, 1985, 3504945
Int. Cl.⁴ G01R *31/00, 29/22, 29/12*
U.S. Cl. 324—96 **38 Claims**



1. Arrangement for measuring electric voltage parameters of a high voltage conductor which, when high voltage energy is transmitted therethrough, is surrounded by an electric field, wherein said arrangement comprises
a sensor unit which is arranged in the close proximity of said high voltage conductor and which comprises
two electric field conductors which are arranged spaced apart and electrically isolated from each other in such a manner that said electric field generates a voltage drop therebetween,
a sensor means having two electric connection terminals, and
two electric connection conductors one of which connects one of said two electric connection terminals of said sensor means with one of said electric field conductors and the other one of which connects the second one of said two electric connection terminals of said sensor means with the second one of said electric field conductors,
a measuring device which is arranged remote from said high voltage conductor and which comprises
a light source emitting a light bundle,
a projection device projecting said light bundle onto said sensor means, and

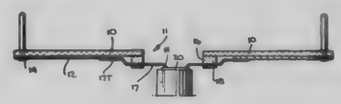
a photo-electric receiver receiving at least part of said light bundle after its reflection from said sensor means which modifies said light bundle in dependence on said electric field surrounding said high voltage conductor, said photo-electric receiver generating output signals which are evaluated for measuring said electric voltage parameters,
a generator means for generating an excitation signal which generator means is arranged remote from said high voltage conductor,
a transmitter means for transmitting said excitation signal to said sensor unit, and
a receiving and exciting means which is arranged in said sensor unit for receiving said transmitted excitation signal and, upon receipt thereof, for exciting said sensor means to a modification of said light bundle which modification is independent of any high voltage energy transmitted in said high voltage conductor.

4,719,416
METHOD FOR DETERMINING THE MINIMUM NUMBER OF ACQUISITION SWEEPS TO MEET THE RISETIME SPECIFICATIONS OF A DIGITAL OSCILLOSCOPE
Patricia A. Desautels, Colorado Springs, Colo., assignor to Hewlett Packard Company, Palo Alto, Calif.
Filed Nov. 10, 1986, Ser. No. 929,551
Int. Cl.⁴ G01R *13/20*
U.S. Cl. 324—121 R **3 Claims**



1. A method for determining and executing the minimum number of sample acquisition sweeps necessary to meet the risetime specification of a digital oscilloscope which uses randomrepetitive sampling, wherin said minimum number can be specified by the variable MIN_SWEEPS, comprising the steps of:
(a) determining the range setting of the oscilloscope;
(b) if the quotient of the range setting divided by the number of time-buckets is less than or eual to one-half of the risetime specification of the oscilloscope, iteratively performing steps (d) through (h) with the MIN_SWEEPS variable set by a risetime criterion;
(c) if the quotient of the range setting divided by the number of time-buckets is greater than one-half of the risetime specification of the oscilloscope, iteratively performing the steps (d) through (h) with MIN_SWEEPS variable set by a percentage-filled criterion;
(d) setting the MIN_SWEEPS variable to the value determined by the criterion of step (a) or step (b);
(e) initializing a counter variable, which can be known as SWEEP_COUNT, to zero;
(f) performing an acquisition sweep;
(g) incrementing the counter variable, SWEEP_COUNT; and
(h) repeating steps (f) through (g) until SWEEP_COUNT is equal to MIN_SWEEPS.

4,719,417
MULTI-LEVEL TEST PROBE ASSEMBLY FOR IC CHIPS
Arthur Evans, Broofield Center, Conn., assignor to Wentworth Laboratories, Inc., Brookfield, Conn.
Continuation-in-part of Ser. No. 757,502, Jul. 22, 1985, Pat. No. 4,599,559, which is a continuation-in-part of Ser. No. 491,233, May 3, 1983, abandoned. This application Apr. 11, 1986, Ser. No. 850,629
The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.
Int. Cl.⁴ G01R *1/073*
U.S. Cl. 324—158 P **6 Claims**



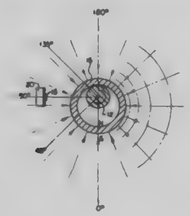
1. A multi-level test probe assembly for testing an integrated circuit chip provided with contact pads before leads are applied to the contact pads thereof which are deployed on said chip in a common plane, said assembly comprising:
(A) a planar insulation card provided with a port having a central region, said card having on its underface traces which are connected to a plurality of test terminals connectable to test equipment for testing the chip;
(B) a mounting ring of uniform thickness formed of dielectric material surrounding said port and secured to said card at the underface thereof, said ring having a planar face parallel to the planar card;
(C) a first radial array of fine cylindrical wires having a predetermined diameter supported on the planar face of the ring and maintained in planar position thereon by a molded first layer of dielectric material adherent to said planar face of the ring, said first layer having a face parallel to said planar face, the wires of the first array being embedded in said first layer to define a first level, the wires in the first array being connected to respective traces and being cantilevered from the mounting ring across the port and converging toward the central region thereof, below which is disposed the chip to be tested, the leading end of each cantilevered wire being tapered and being double bent to define a needle having a shank section which is downwardly inclined relative to the planar face of the ring and terminating at a junction leading into a tip section terminating in a tip which engages a respective contact pad on the chip; said tip section forming an obuse angle with the shank section, the diameter of the wire at the junction of the shank section and the tip section being substantially smaller than said predetermined diameter to make possible a high needle density; and
(D) a like second radial array of fine wires supported on the face of the first layer and maintained in planar position thereon parallel to the wires in the first array by a molded second layer of dielectric material, the wires of the second array being embedded in said second layer to define a second level.

4,719,418
DEFECT LEAKAGE SCREEN SYSTEM
Roy C. Flaker, and Russell J. Houghton, both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 19, 1985, Ser. No. 703,001
Int. Cl.⁴ G01R *31/30*
U.S. Cl. 324—158 R **23 Claims**

1. A test circuit for a cross-coupled transistor cell having first and second storage nodes with a given offset voltage therebetween storing a given digit of binary data comprising

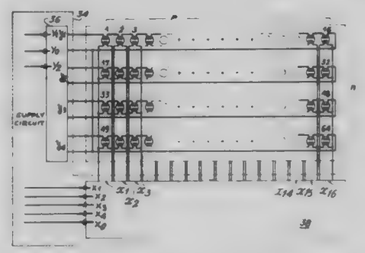
means for decreasing said offset voltage during a given period of time,
a point of reference potential,
means for increasing a voltage difference between said reference potential point and one of said nodes during said given period of time simultaneously with said offset decrease, and
means for reading data from said cell after said given period of time.

4,719,419
APPARATUS FOR DETECTING A ROTARY POSITION OF A SHAFT
Douglas J. Dawley, Arlington, Tex., assignor to Harris Graphics Corporation, Melbourne, Fla.
Filed Jul. 15, 1985, Ser. No. 755,172
Int. Cl.[4] G01B 7/30; H02K 17/42; H01F 7/02
U.S. Cl. 324—208 **2 Claims**



1. An apparatus comprising:
a shaft;
a ring-shaped magnetic member fixed to the shaft for joint rotation therewith, said ring-shaped magnetic member having a radially oriented magnetic pole pair for producing a monopolar continuous magnetic field having a uniform magnetic flux density around the entire periphery of said ring-shaped magnetic member at spaced equidistant locations extending radially outwardly of said ring-shaped magnetic member; and
field measuring means supported adjacent said ring-shaped magnetic member radially outwardly thereof for measuring the intensity of said monopolar magnetic field acting on said field measuring means;
said ring-shaped magnetic member encircling said shaft and being mounted eccentrically of the axis of the shaft so that the intensity of the monopolar magnetic field acting on said field measuring means varies in different rotary positions of the shaft.

4,719,420
APPARATUS FOR MEASURING THE POSITION OF A MOVING MEMBER RELATIVE TO A FIXED MEMBER
Guy Boimond, Puyricard, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 23, 1983, Ser. No. 564,759
Claims priority, application France, Dec. 23, 1982, 82 21666
Int. Cl.[4] G01B 7/14; G21C 17/00; G01R 33/12; G01N 27/72
U.S. Cl. 324—208 **13 Claims**

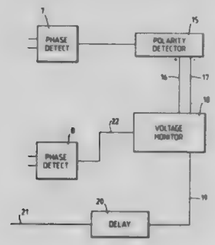


1. An apparatus for measuring the position of a moving member in a given direction relative to a fixed member, comprising:
a magnetic flux generating mark carried by the moving member; and
at least one alignment of transducers changing state under the effect of said magnetic flux, the transducers being positioned at regular intervals on the fixed member in said given direction, in such a way that at least one transducer changes state under the effect of the magnetic flux, wherein the transducers of the same alignment are electrically grouped according to a matrix of n rows and p columns, whose n rows are supplied in turn by supply means and whose p columns are processed in turn by reading means, wherein the supply means comprise n transformers, each having a primary winding connected to an alternating current supply source via first multiplexing means and a secondary winding each of said secondary windings being connected in series with the transducers of the same matrix row.

4,719,421
METAL DETECTOR FOR DETECTING PRODUCT IMPURITIES
Bruce G. Kerr, Gerrards Cross, England, assignor to Goring Kerr PLC, England
Filed Jul. 7, 1986, Ser. No. 882,250
Claims priority, application United Kingdom, Jul. 8, 1985, 8517257
Int. Cl.[4] G01N 27/72; G01R 33/12; B07C 5/344
U.S. Cl. 324—233 **15 Claims**

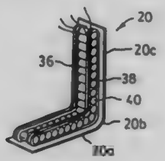
1. A detector, said detector comprising: a first coil;
means for energizing the first coil to produce an electromagnetic field;
means for passing an item to be inspected through the field of the first coil;
a second coil arrangement within the field of the first coil, said second coil arrangement producing an output signal based in part upon said electromagnetic field;
phase detector means;
means for providing as input signals to said phase detector means, the signal energising the first coil, and the output signal of the second coil;
at least a 90° phase shifter means for shifting the phase of one input of said phase detector means;

an adjustable phase shifter means, responsive to a control signal, for adjustable phase shifting one input of said phase detector;



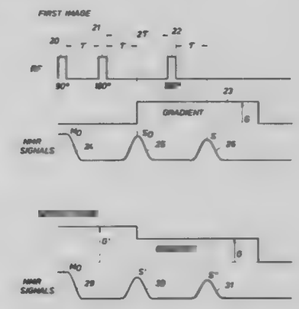
means for monitoring the output of said phase detector means and for producing said control signal, said control signal being fed to said adjustable phase shifter to control the phase shift thereof.

4,719,422
EDDY-CURRENT PROBES ESPECIALLY FOR THE SCANNING OF NON-FLAT PROFILED SURFACES
Stewart deWalle, and Richard T. deWalle, both of Rexdale, Canada, assignors to Miep Holdings Inc., Rexdale, Canada
Continuation of Ser. No. 736,059, May 20, 1985, abandoned, which is a division of Ser. No. 433,294, Oct. 7, 1982, Pat. No. 4,547,962. This application Jun. 27, 1986, Ser. No. 879,513
Claims priority, application Canada, Oct. 9, 1981, 387668
Int. Cl.[4] G01N 27/82; G01R 33/12; H01F 1/00
U.S. Cl. 324—238 **6 Claims**



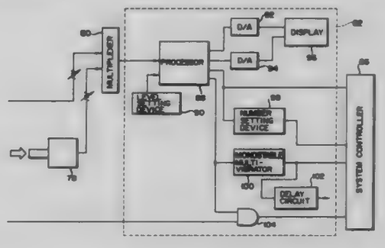
1. An eddy-current probe having an active probe surface and for the scanning of a test surface, the probe active surface and the test surface having corresponding profiles in a plane which intercepts the test and probe surfaces so as to include the said corresponding profiles, the probe comprising:
a support member having parallel front and back surfaces with the said surfaces conforming in the said plane to the active probe and test surface profiles,
a probe electrical test coil having a first portion thereof disposed immediately adjacent to the support member back surface and shaped to conform to said support member back surface and thus to the probe active surface and the test surface profiles in the said plane, and
a probe core constituted by a plurality of separate narrow elongated ferrite core elements of circular or other cross-section mounted inside the probe test coil with their direction of elongation transverse to the plane of the coil, disposed with their longitudinal axes parallel to one another and perpendicular to the said plane of the coil, the elements being disposed immediately adjacent to one another and to the said first portion of the coil and conforming to the probe active profile and to the test surface profile in the said plane, so as together to constitute a unitary ferrite core shaped to the probe active profile.

4,719,423
NMR IMAGING OF MATERIALS FOR TRANSPORT PROPERTIES
Harold J. Vinegar, Houston, and William P. Rothwell, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Aug. 13, 1985, Ser. No. 765,407
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—303 **9 Claims**



1. A method for determining spatial transport characteristics of a subsurface earth specimen, comprising:
NMR imaging said specimen with a constant magnetic field and with a zero applied field gradient and, then MMR imaging said specimen with a constant magnetic field and with a non-zero applied field gradient.

4,719,424
MAGNETIC RESONANCE IMAGING SYSTEM
Masao Jimbo, and Yukio Nanjyo, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 18, 1986, Ser. No. 897,311
Claims priority, application Japan, Aug. 21, 1985, 60-181851; Aug. 22, 1985, 60-183052
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 **11 Claims**



1. A magnetic resonance imaging system for producing an image of an object corresponding to magnetic resonance (MR) signals from a portion of the object of interest, said MR signals collected in synchronization with a periodic displacement of the object comprising:
magnetic resonance signal acquisition means for exciting a magnetic resonance phenomenon in said portion of interest of the object including at least a selected slice of said object to be examined, and for detecting magnetic resonance (MR) signals generated by the MR phenomenon;
imaging processing means for forming an image based on said detected magnetic resonance signals induced from said selected slice;
monitoring means for monitoring said displacement of the object, said monitoring means generating a predetermined

detectable signal caused by said displacement, and producing a control signal representative of said periodic displacement of the object; and

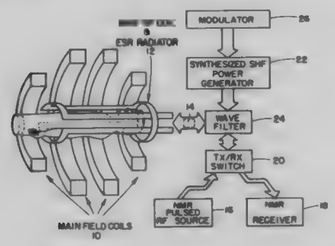
control means for controlling an excitation operation and collection of said induced MR signals in accordance with said control signal, said control means including means for inhibiting at least one of (1) collection of said MR signals and (2) reconstruction of the image of the object when the periodic displacement of the object occurs irregularly.

4,719,425

NMR IMAGING METHOD AND APPARATUS

Kamil V. Ettinger, Aberdeen, Scotland, assignor to Scientific Innovations, Inc., Wainscott, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,435
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—316 **23 Claims**



7. An apparatus for imaging the concentration of paramagnetic species inside a sample comprising:

means for applying a main magnetic field to the sample;

means for applying a RF pulse signal to excite to resonance a plurality of nuclear spins in said sample to produce an NMR signal;

means for applying a microwave pulse signal to excite to resonance a plurality of electron spins in said sample;

means for modulating the intensity of said MW pulse signal thereby modulating the intensity of said NMR signal;

means for extracting the modulation from said NMR signal to produce an image representative of the local ESR and thereby the concentration of paramagnetic species in said signal.

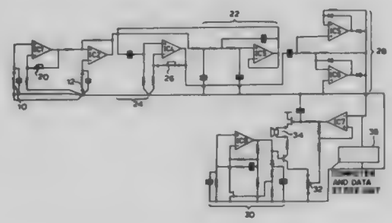
4,719,426

METHOD FOR MAGNETICALLY DETECTING A LOCALIZED DISTURBANCE OF THE GROUND

Oscar Weiss, London, England, assignor to Scopemoor Limited, England

Filed Jan. 19, 1984, Ser. No. 572,149
Claims priority, application United Kingdom, Jan. 20, 1983, 8301529; Apr. 27, 1983, 8311464; May 31, 1983, 8314804
Int. Cl.[4] G01V 3/00, 3/08
U.S. Cl. 324—345 **10 Claims**

1. A method of detecting the presence of a localized disturbance of the ground comprising the steps of sweeping an area of the ground with a detector which is responsive to a magnetic gradient and which comprises a plurality of mutually spaced apart detector units, detecting a change in the output from the detector units due to a change in magnetic gradient caused by the localized disturbance and not by any magnetic



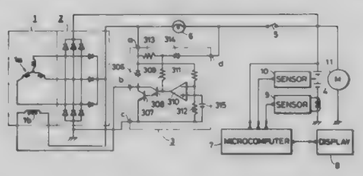
object and producing a signal capable of direct human perception when such change is detected.

4,719,427

VEHICLE BATTERY DIAGNOSTIC DEVICE

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 506,260, Jun. 20, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,135
Int. Cl.[4] G01N 27/46; H02J 7/04
U.S. Cl. 324—427 **1 Claim**



1. A battery diagnostic device comprising:

voltage detecting means for detecting the terminal voltage of a battery charged by a generator, and for producing a first output signal proportional to the detected terminal voltage;

current detecting means for detecting the charge and discharge currents of said battery, and for producing a second output signal, I_1, proportional to the detected battery current;

specific gravity detecting means for detecting the specific gravity of the battery electrolyte, and for producing a third output signal S_t proportional to the detected specific gravity;

microcomputer data processing means, responsive to said first, second and third output signals, for calculating and then outputting signals indicating the battery charge condition, said microcomputer data processing means including,

means for calculating the battery internal resistance r_B from the difference between said first output signal when the battery terminals are in an open circuit condition, V_1, and said first output signal when the battery terminals are in a closed circuit state, V_2, and said second output signal, I_1, from the relationship,

$$r_B = \frac{V_1 - V_2}{I_1},$$

means for calculating a temperature corrected specific gravity S from the third output signal S_t and the temperature t° C. of the electrolyte at the time the specific gravity was detected from the relationship, $S = S_t + 0.0007\ (t° C. - 20)$,

means for calculating the amount the battery has discharged $I_D(Ah)$ from its rated capacity (Ah) from to the relationship,

$$I_D(Ah) = \frac{\text{Rated capacity of the battery } (Ah) \times (1.260 - S_m)}{0.2},$$

means for calculating the percent of discharge D_C from the relationship,

$$D_C = \frac{I_D}{\text{Rated capacity of the battery}} \times 100\%,$$

and

means for producing signals proportional to the calculated resistance r_B, temperature corrected specific gravity S, discharge amount I_D and percent of discharge D_C; and

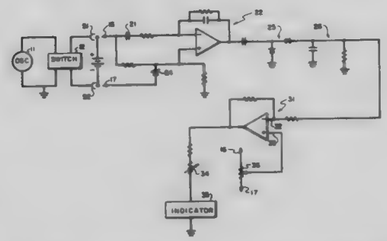
means for displaying the charge condition of the battery determined from at least said signals proportional to said calculated internal resistance r_B and percent of discharge D_C.

4,719,428

STORAGE BATTERY CONDITION TESTER UTILIZING LOW LOAD CURRENT

Leonard Liebermann, La Jolla, Calif., assignor to TIF Instruments, Inc., Miami, Fla.

Filed Jun. 4, 1985, Ser. No. 741,126
Int. Cl.[4] G01N 27/46
U.S. Cl. 324—436 **15 Claims**



1. A battery condition tester for a battery having positive and negative terminals, said battery condition tester comprising:

means comprising a switching circuit for periodically switching on and off a low constant current load between said battery terminals through a first set of battery terminal contacts; and

means comprising a separate detection circuit including:

first amplifier means coupled to said positive and negative terminals through a second set of battery terminal contacts to amplify the AC component of the battery voltage resulting from the switched battery current;

means for providing a DC voltage derived from the AC component of switched battery voltage;

means for providing an output signal related to battery condition as determined by said DC voltage; and

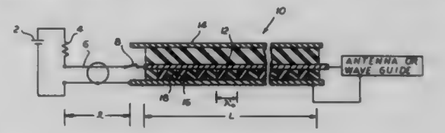
indicator means adapted to provide a reading indicative of the value of the battery voltage under heavy load.

4,719,429

TRANSMISSION LINE MICROWAVE GENERATOR

Hiroyuki Ikezi, Rancho Santa Fe, and Torkil H. Jensen, Del Mar, both of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Apr. 14, 1986, Ser. No. 851,977
Int. Cl.[4] H03K 3/01, 3/53, 3/86
U.S. Cl. 328—65 **8 Claims**



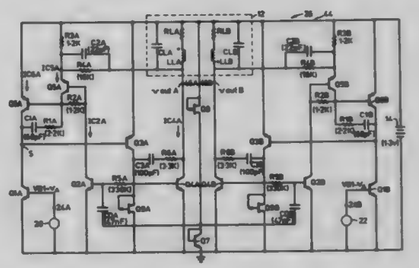
1. A microwave generator for receiving high energy input pulses and for dispersing said high energy pulses so as to generate high power microwave pulses in a first direction, comprising an outer conductor extending in said first direction defining an enclosed volume, an inner conductor within said outer conductor and spaced therefrom, means for receiving high energy input pulses and for connecting high energy input pulses to said inner and said outer conductors, first and second insulator materials disposed in respective first and second portions of said enclosed volume, said first and second insulator materials providing different propagation rates for said high energy input pulses when said input pulses travel therealong, said second insulator material having a non-linear field-dependent characteristic providing a nonlinear field-dependent propagation rate for portions of said input pulses, so as to selectively disperse said input pulses along said microwave generator.

4,719,430

LOW VOLTAGE CLASS B AMPLIFIER WITH LOW VALUE DECOUPLING CAPACITORS

William A. Cole, Moseley, Canada, assignor to Linear Technology Inc., Burlington, Canada

Filed Jun. 25, 1986, Ser. No. 878,467
Int. Cl.[4] H03F 3/26, 3/45
U.S. Cl. 330—265 **13 Claims**



1. A class B push-pull integrated circuit amplifier suitable for operation with a low voltage power supply and for amplifying an input signal comprising a first AC input signal and a second AC input signal identical to said first signal but 180 degrees out of phase with respect thereto, said amplifier comprising:

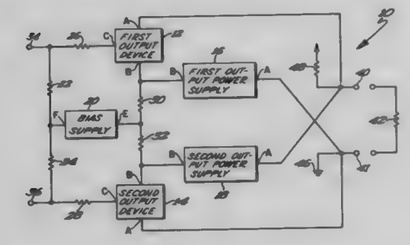
(a) two half circuits, each half circuit being the same as the other and each comprising:

(i) first and second opposite conductivity type transistors each having an emitter, a base and a collector and having their collectors connected together at a summing node,

(ii) a third transistor connected to said summing node for

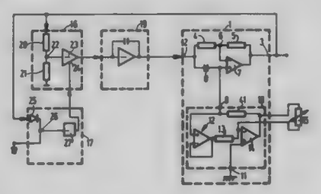
amplification of a signal received by said third transistor from said summing node,
(iii) a fourth transistor connected to said third transistor for amplifying a signal received from said third transistor and having an output for producing an output signal,
(iv) a DC feedback loop for controlling the idle current of said fourth transistor, said DC feedback loop comprising a fifth transistor connected to said fourth transistor, and means connecting said fifth transistor to the base of said second transistor,
(v) an AC feedback loop for controlling the AC gain from said first transistor to said fourth transistor and comprising voltage level shifting means connected between said output of said fourth transistor and said base of said second transistor,
(vi) and a decoupling capacitor connected to said fifth transistor,
(b) the emitters of said first transistors and said decoupling capacitors being adapted to be connected to one pole of said power supply,
(c) the emitters of said second transistors being adapted to be connected to the other pole of said power supply,
(d) the base of said first transistor of one said half circuit being adapted to receive said first AC input signal and the base of said first transistor of the other said amplifier half being adapted to receive said second AC inut signal,
(e) said outputs of said fourth transistors being adapted to be connected to a load.

4,719,431
AUDIO POWER AMPLIFIER
Ralph R. Karsten, 160 S. Wheeler, St. Paul, Minn. 55105
Filed Apr. 21, 1986, Ser. No. 854,120
Int. Cl.[4] H03F *3/26*
U.S. Cl. 330—273 23 Claims



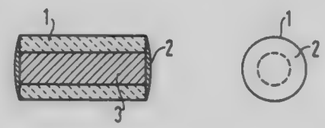
19. A push-pull power amplifier of the type having first and second output device means each having first and second terminals forming a main current flow path and a control terminal, and a pair of power supplies, connected in a bridge circuit between a pair of input terminals and a pair of output terminals, wherein the amplifier is characterized by floating bias means coupled between the second and control terminals of the first and second output device means, for providing a floating bias potential, first feedback impedance means for opposing the flow of electric current connected between the floating bias means and the second terminal of the first output device means, and second feedback impedance means for opposing the flow of electric current coupled between the floating bias means and the second terminal of the second output device means.

4,719,432
OSCILLATOR FOR MEASURING TEMPERATURE
Bernd Heck, and Dierk Schröder, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 4, 1986, Ser. No. 892,604
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529145
Int. Cl.[4] G01K *7/16*
U.S. Cl. 331—66 12 Claims



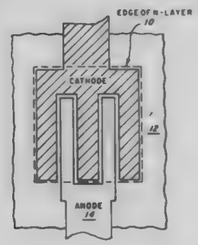
1. A measuring oscillator for measuring temperature and which produces a signal having a temperature-dependent frequency, said measuring oscillator comprising: an amplifier fed back positively through an all-pass filter, the all-pass filter comprising a bipolar phase-determining circuit arrangement providing a temperature-dependent ohmic resistance which varies the frequency of the oscillator signal in dependence upon temperature, characterized in that the bipolar circuit arrangement is connected to a measuring resistor having a temperature-dependent ohmic resistance value such that the ohmic resistance of the bipolar circuit arrangement varies more strongly with the temperature than does the resistance of the measuring resistor.

4,719,433
ATTENUATION BEAD FOR THE SUPPRESSION OF INTERFERENCE RADIATION
Hans Häckel, and Josef Schindler, both of Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 31, 1985, Ser. No. 761,236
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3433831
Int. Cl.[4] H03H *7/00, 7/24*
U.S. Cl. 333—12 2 Claims



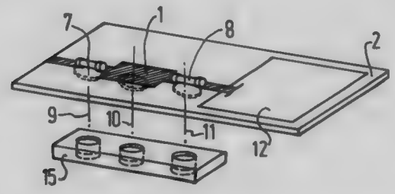
1. An attenuation bead for the suppression of interference radiation, in particular in the short-wave and ultra short-wave radio frequency range, in the form of a chip component, which due to its physical form is loadable in a magazine, the attenuation bead comprising a tubular ferrite body having end faces and a hollow interior extending through the body, the end faces of the ferrite body are metallized and covered with a soft solder, the inner wall of the hollow interior is metallized and the hollow interior of the body is filled with soft solder, and the soft solders on the end faces are electrically connected together via the filling of soft solder.

4,719,434
VARACTOR TRIMMING FOR MMICS
Bentley N. Scott, Richardson, and Gallon E. Breham, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 548,182, Nov. 1, 1983, abandoned, which is a continuation of Ser. No. 292,862, Aug. 14, 1981, abandoned. This application Oct. 8, 1986, Ser. No. 917,270
Int. Cl.[4] H03H *11/28*
U.S. Cl. 333—32 8 Claims



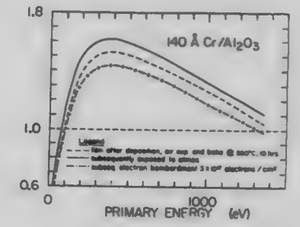
7. A monolithic microwave integrated circuit comprising:
(a) an output circuit element formed on a monolithic substrate.
(b) an output terminal on said substrate and connected to said circuit element; and
(c) an impedance matching network including a varactor on said substrate and connected to said output terminal, the bias for said varactor supplied by an adjustable voltage supply external to said substrate, the supplied bias adjusting the impedance of said network to make the output impedance of said circuit element plus network at said output terminal equal to a predetermined value.

4,719,435
RESONANT MICROSTRIP-LINE CIRCUIT
Thierry Maitre, Rueil Malmaison, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 5, 1986, Ser. No. 859,300
Claims priority, application France, Nov. 5, 1985, 85 16378
Int. Cl.[4] H01P *7/08, 1/203*
U.S. Cl. 333—224 7 Claims



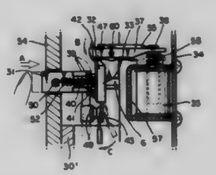
1. An adjustable-frequency resonant device comprising:
(a) a dielectric substrate having first and second opposing sides;
(b) a strip transmission line disposed on the first side of the dielectric substrate;
(c) at least one electrically-controlled, variable-capacity diode disposed on the first side of the dielectric substrate and electrically connected to the strip transmission line;
(d) a conductive ground plane on the second side of the dielectric substrate having respective openings therein aligned with the strip transmission line and the diode, said dielectric having corresponding holes in the second side communicating with said openings; and
(e) mechanical adjusting means for providing local adjustments of the reactance of the strip transmission line and the at least one diode, said mechanical adjusting means being disposed adjacent to the conductive ground plane and including a plurality of moveable elements each having a conductive surface which is moveable through a respective one of the openings in the ground plane and into the corresponding hole, said conductive surface being moveable between positions on opposite sides of the ground plane and being electrically connected to ground, said local adjustments enabling establishment of a predefined frequency response of the resonant device as a function of a control signal applied to the at least one diode.

4,719,436
STABILIZED CHROMIUM OXIDE FILM
Edward L. Garwin, Los Altos, and Ali R. Nyaiesh, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 4, 1986, Ser. No. 893,056
Int. Cl.[4] H01P *1/08*; C23C *14/00, 16/00*
U.S. Cl. 333—252 13 Claims



1. A coated ceramic RF window and metal sleeve of a klystron comprising a stabilized chromium oxide film less than 200 angstroms thick deposited on a ceramic RF window and metal sleeve.

4,719,437
ELECTRICAL GROUND FAULT RECEPTACLE ASSEMBLY
Byung H. Yun, Chungcheong Buk-Do, Rep. of Korea, assignor to Goldstar Instrument & Electric Co., Seoul, Rep. of Korea
Filed Sep. 12, 1985, Ser. No. 775,361
Claims priority, application Rep. of Korea, Mar. 6, 1985, 3530[U]
Int. Cl.[4] H01H *73/00*
U.S. Cl. 335—18 4 Claims



1. In a ground fault receptacle assembly having a ground fault detecting circuit and a trip mechanism for sensing ground fault signals and for interrupting a protection circuit, said trip mechanism comprising:
a housing having a pair of fixed contacts and a groove therein;
a pushbutton movable in said housing;

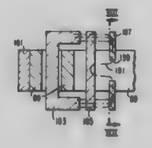
a cross bar having a pair of movable contacts;
a pin for connecting said cross bar to said pushbutton, said pin extended into and moving along said groove when said cross bar is moved with the movement of said pushbutton;
a pair of springs connected between said pin and said housing, said springs normally biasing said movable contacts of said cross bar against said fixed contacts of said housing to thereby complete an electrical circuit;
means for normally biasing said cross bar at an angle to thereby separate said movable and said fixed contacts;
a frame secured to said housing;
a trip cross bar movably connected to said frame, said trip cross bar engaging said cross bar to thereby hold said movable and fixed contacts in engagement with one another;
a trip coil connected to said frame and being energized upon the detection of ground fault current; and
a trip coil pin movable with respect to said trip coil and connected to said trip cross bar for disengaging said trip cross bar from said cross bar when ground fault current is detected to thereby remove the engagement of said fixed and movable contacts.

4,719,438

CIRCUIT BREAKER WITH FAST TRIP UNIT

Stephen A. Mrenna, Brighton Township, Beaver County; Kurt A. Grunert, Beaver; Jonathan Weiss, Pittsburgh, and Vijay K. Garg, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1986, Ser. No. 913,877
Int. Cl.⁴ H01H *75/10, 77/04, 81/00, 83/00*
U.S. Cl. 335—38 **10 Claims**



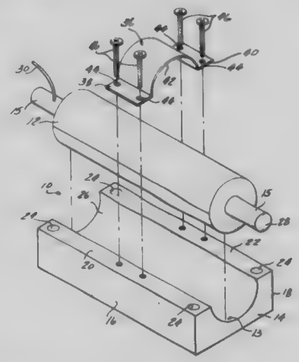
1. A circuit breaker structure having a faster trip action, comprising:
a circuit breaker mechanism having separable contacts and having a releasable member movable to an unlatched position from a latched position to effect opening of the contacts;
a latch lever movable between latched and unlatched positions of the releasable member and being biased in the latched position;
a trip bar movable to unlatch the latch lever and being biased in the latched position;
a trip unit comprising a stationary magnetic structure for each conductor of the distribution system and including a coil and first magnetic core assembly and an armature;
lever means associated with each stationary magnetic structure for moving the trip bar to the unlatched position;
the lever means comprising the armature and movable toward the core in response to abnormal currents in at least one of the conductors; and
a flux concentrating magnetic plate separated from the magnetic core assembly and spaced from and on the side of the armature opposite the core and for concentrating a magnetic field in an ambient space between the core and the armature.

4,719,439

CAMERA TUBE DEFLECTION YOKE THERMAL SADDLE

Juan F. Velasquez, Saline, Mich., assignor to Applied Intellegent Systems, Inc., Ann Arbor, Mich.

Filed Nov. 23, 1985, Ser. No. 801,240
Int. Cl.⁴ H01F *7/00*
U.S. Cl. 335—210 **1 Claim**



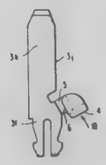
1. In a camera having a camera tube deflection yoke, the improvement having a thermal heat sink, the heat sink comprising:
a base, the base having a bottom, upstanding side walls, and spaced top surfaces formed on the side walls and extending longitudinally along the length of the base, the base being formed of a thermal conductive material;
a recessed concave, central portion formed in the base and extending between the top surfaces of the side walls along the entire length of the base to receive the camera tube deflection yoke;
a clamp having first and second outwardly extending flanges with a central arcuate portion configured to surround a portion of the deflection yoke; and
means for securing the flanges to the top surfaces of the base.

4,719,440

ELECTRICAL COIL AND TERMINAL WITH CLIP

Mamoru Nakamura, Takahama, and Hideo Haneda, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 5, 1985, Ser. No. 772,804
Claims priority, application Japan, Sep. 6, 1984, 59-135525
Int. Cl.⁴ H01F *15/10*
U.S. Cl. 336—192 **1 Claim**



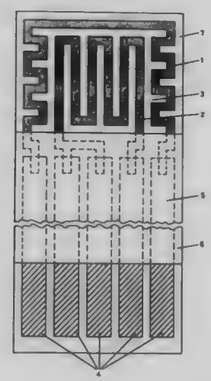
1. An electrical coil comprising:
a bobbin (1), a winding of coil (2) formed on said bobbin and having terminal end wires (2_1, 2_2);
a pair of terminal members (3_1, 3_2) having means to secure said members to the bobbin;
means for connecting said terminal end wires to said terminal members, each of said terminal end wires being joined by resistance welding to said connecting means, said connecting means includes a U-shaped clip portion which is integrally formed with each of said terminal members; and each clip portion has an end wire receiving surface with a first receiving end and a second receiving end, said receiving ends having convex surfaces in contact with said wire end, and said first receiving end comprises a first curvature of at least 0.5 mm radius contiguous with an angled portion extending in a direction away from said second receiving end and inclined at an angle of less than 90° with respect to the axis of said wire end and which in turn is contiguous with a second curvature of at least 0.5 mm radius whereby the residual stress is reduced between the wire end and clip.

4,719,441

SENSOR FOR MEASURING ELECTRICAL CONDUCTIVITY

Petr Horn, Oberhasli, Switzerland, assignor to Navasina AG, Zerich, Switzerland

Filed Feb. 14, 1986, Ser. No. 830,516
Claims priority, application Switzerland, Feb. 26, 1985, 872/85
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—20 **11 Claims**



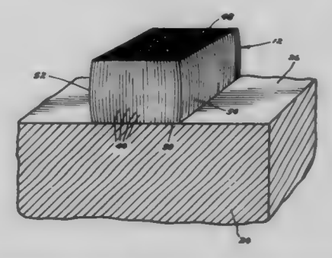
1. A sensor for measuring electrical conductivity, comprising:
an electrically-insulating substrate, the substrate being one of heat and corrosion resistant
at least two, spaced electrodes exposed on the substrate, the electrodes being one of heat and corrosion resistant;
at least two electrically-conductive leads on the substrate, one end of each lead overlapping a portion of a respective one of the electrode; and
a dielectric covering the leads, the dielectric being one of heat and corrosion resistant whereby to define a measuring area of the exposed electrodes on one side of the one, dielectric-covered, lead-overlapped ends of the electrodes, except for a contact-point portion of each lead at the other end thereof, remote from the one end overlapping the electrode, whereby to define a contact point thereat.

4,719,442

PLATINUM RESISTANCE THERMOMETER

Robert C. Bohara, Eden Prairie, and James A. Ruf, Maple Grove, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 636,142, Jul. 31, 1984, abandoned. This application Jan. 12, 1987, Ser. No. 2,196
Int. Cl.⁴ H01C *3/04*
U.S. Cl. 338—25 **15 Claims**



1. A batch fabricated thin film platinum resistance thermometer comprising:
substrate means for supporting the platinum; and
a resistive strip formed in a serpentine pattern on the substrate means and having an outer surface spaced from the substrate and side surfaces extending outwardly from the substrate means to join the outer surface and defining a length, a predetermined thickness on the substrate means and opposite outer side edges where the outer surface and respective side surfaces join, said side edges defining a width of the strip, characterized in that the strip comprises a substantially uniform structure of closely spaced columnar grains of platinum throughout the length, thickness and width of the strip, said structure being substantially unchanged adjacent its outer side edges from other portions of the strip with columnar grains defining the side surfaces.

4,719,443

LOW CAPACITANCE POWER RESISTOR USING BERYLLIA DIELECTRIC HEAT SINK LAYER AND LOW TOXICITY METHOD FOR ITS MANUFACTURE

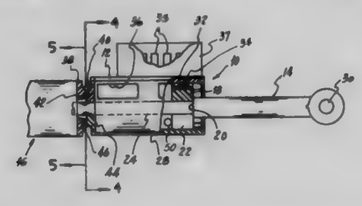
Steven J. Salay, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 3, 1986, Ser. No. 847,689
Int. Cl.⁴ H01C *1/012*
U.S. Cl. 338—314 **11 Claims**



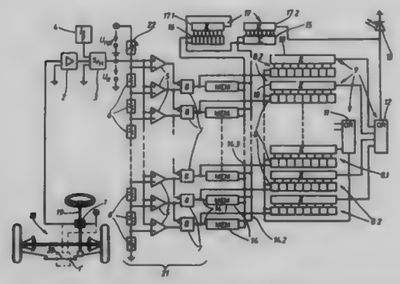
6. A resistor comprising:
a metallic heat sink;
a dielectric heat sink layer comprising BeO bonded on top of said metallic heat sink;
a heat sink support substrate comprising alumina bonded on its bottom side to the top side of said dielectric heat sink layer; and
a resistive film deposited on the top side of said support substrate.

4,719,444
HYDRAULIC MASTER CYLINDER SWITCH
Keith V. Leigh-Monstevens, Troy, and Richard A. Nix, Rochester Hills, both of Mich., assignors to Automotive Products plc, Warwickshire, England
Continuation-in-part of Ser. No. 590,168, Mar. 16, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 878,121
Int. Cl.[4] H04Q 1/00
U.S. Cl. 340—71 5 Claims



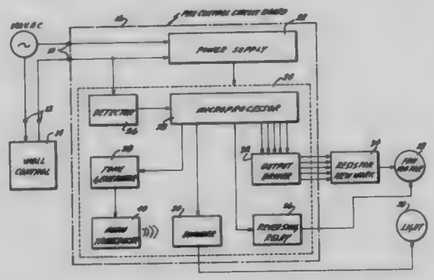
1. In combination with a hydraulic master cylinder having a linearly displaceable input member, wherein said input member has a longitudinal axis disposed at a progressively variable angle relative to the longitudinal axis of said master cylinder during displacement of said input member from a home position to an operative position, an electrical switch including a hollow housing positioned around said input member and slidably passing said input member and switching means within said housing operable by said input member during displacement of said input member from said home position to said operable position, said cylinder having an abutment end surface and one end of said switch housing being provided with an end abutment surface in engagement wtih said cylinder abutment surface, said abutment surfaces being formed as complementary spherical surfaces whereby angulation of said switch housing relative to the longitudinal axis of said master cylinder is allowed.

4,719,445
METHOD AND DEVICE FOR SIMULTANEOUSLY DETERMINING STEERING AND WHEEL SUSPENSION GEOMETRIES AND STATE OF BALANCE OF STEERING LINKAGE ROTATING PARTS
Rainer Freund, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Nov. 21, 1986, Ser. No. 933,395
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541901
Int. Cl.[4] B60Q 9/00
U.S. Cl. 340—52 R 16 Claims



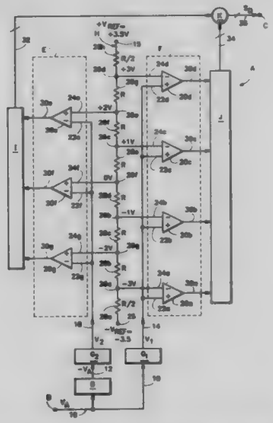
1. Method for simultaneous monitoring, while a motor vehicle is in motion, the state of its steering and wheel suspension geometries and the state of balance of rotating parts connected to the kinematic steering linkage of the motor vehicle comprising:
sensing the steering angles as the positions of the steering linkage relative to the bodywork of the motor vehicle;
classifying the steering angles into classes graduated according to steering angle magnitude and direction;
counting frequencies of occurrence of each class;
continuously determining and analyzing the position of the absolute maximum of the class of steering angle frequency distribution determined relative to the straight ahead position of the steering linkage during the journey as a criterion of the state of the steering linkage;
continuously determining movements of the steering linkage from said sensed steering angle;
continuously analyzing the movement of the steering linkage by comparison with specified values as a criterion of the state of balance of the rotating parts connected to the steering linkage; and
providing a warning signal to the vehicle driver both in the case of a position of the distribution maximum deviating beyond a tolerance range from the straight ahead position of the steering linkage and in the case of unbalance of the rotating parts connected to the steering linkage being determined by the comparison.

4,719,446
REMOTE CONTROL FOR COMBINED CEILING FAN AND LIGHT FIXTURE
Edward F. Hart, Yorba Linda, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed May 7, 1984, Ser. No. 607,952
Int. Cl.[4] H04M 11/04
U.S. Cl. 340—310 A 27 Claims



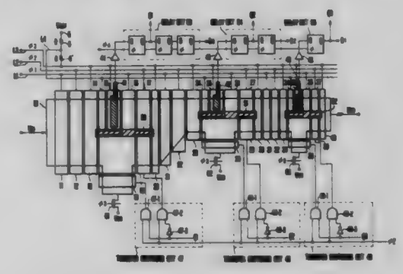
1. A remote control system for a combined ceiling fan and light fixture for use with existing AC current house wiring between a wall switch and a ceiling fixture including
a wall control for electrical substitution of the wall switch in series with the AC current house wiring and with the wall control including at least two separate control members for producing separate signals at a particular area of the AC wave on the existing AC current house wiring representing a separate control for the speed of the fan and the light intensity of the light,
a control unit mounted on and electrically interconnected with the combined ceiling fan and light fixture and with the control unit electrically connected in series with the AC current house wiring at the ceiling fixture when the combined ceiling fan and light fixture is mounted on the ceiling fixture,
the control unit including means for detecting the separate signals on the existing AC current house wiring in accordance with the actuation of the separate control members at the wall control, and
the control unit additionally including fan speed control means and light intensity control means each responsive to one of the detected separate signals to produce an individual control of the speed of the motor to a number of different speeds other than zero and the intensity of the light to a number of different light intensities other than zero in accordance with the individual actuation of the separate control members at the wall control.

4,719,447
ANALOG-TO-DIGITAL CONVERTER WITH PUSH-PULL INPUT SIGNAL CONFIGURATION
Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Feb. 9, 1987, Ser. No. 12,755
Int. Cl.[4] H03M 1/36
U.S. Cl. 340—347 AD 12 Claims



1. An analog-to-digital converter circuit, comprising:
means for providing a first analog input signal and a second analog input signal of equal magnitude but opposite polarity;
means for providing a plurality of different reference voltages;
a first set of voltage comparators each of which has an analog input electrically connected to said means for providing input signals for receiving said first analog input signal, a reference input electrically connected to said means for providing reference voltages for receiving a reference voltage and an output for supplying an output signal representative of the comparative relationship between said first analog input signal and the reference voltage provided to each such comparator;
a second set of voltage comparators each of which has an analog input electrically connected to said means for providing input signals for receiving said second analog input signal, a reference input electrically connected to said means for providing reference voltages for receiving a reference voltage, and an output for supplying an output signal representative of the comparative relationship between said second analog input signal and the reference voltage provided to each such comparator; and
means electrically connected to the outputs of said comparators of said first and second sets for forming a digital output signal corresponding to the number of comparators providing related output signals.

4,719,448
SEMICONDUCTOR A/D CONVERTER USING CHARGE COUPLED DEVICE
Osamu Yoshimura, and Masahisa Nomoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Oct. 25, 1985, Ser. No. 791,229
Claims priority, application Japan, Oct. 30, 1984, 59-228608
Int. Cl.[4] H03M 1/44
U.S. Cl. 340—347 AD 4 Claims



1. An A/D converter comprising: charge transfer means including a transfer channel serving as a charge shift path and a plurality of transfer electrodes aligned on said transfer channel along a transfer direction and adapted to transfer a charge in a predetermined direction upon reception of a predetermined transfer clock signal, said charge transfer means being provided with 2n (where n is the number of bits of a digital signal to be generated) charge transfer stages each of which includes said plurality of transfer electrodes, an area of a last transfer electrode of an odd-numbered one of said plurality of charge transfer stages being ½ of an area of a last transfer electrode of an immediately preceding odd-numbered one of said plurality of charge transfer stages, respectively, even-numbered ones of said plurality of charge transfer stages being provided with a first charge transfer path for transferring a charge at a potential exceeding a predetermined channel potential and a second charge transfer path for transferring a charge below the channel potential to parallel process the charges having respective potentials exceeding and not exceeding the predetermined charge potential; charge detecting means for detecting the charge transferred along said first charge transfer path at each even-numbered charge transfer stage and generating a charge detection signal representing a value of bit; charge transfer switching means for switching between transfer of the charge on said second charge transfer path to a next one of said plurality of charge transfer stages and sweeping of the charge outside said charge transfer means from said second charge transfer path in accordance with an output signal from said charge detecting means; and a delay circuit for delaying each output signal from said charge detecting means for an mth (where m is an even number) transfer stage by (n+1−m/2) and generating each bit value of the digital signal.

4,719,449
TRANSPORT APPARATUS FOR TRANSPORTING PART-CARRYING MEMBERS TO VARIOUS WORK STATIONS AND FOR READING DATA ENCODED ON SAID PART-CARRYING MEMBER
Joseph Cousseau, Cerizay, France, assignor to Jice Automation, Chantonnay, France
Filed Aug. 18, 1986, Ser. No. 897,265
Claims priority, application France, Oct. 1, 1985, 85 14514
Int. Cl.[4] H03M 1/26
U.S. Cl. 340—347 P 4 Claims

1. A transport apparatus for transporting part-carrying members to various work stations and for reading encoded

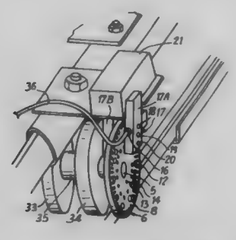
data from said part-carrying members, said apparatus comprising:

a first plurality of movable part-carrying members, each said movable part-carrying member having a shaft mounted thereon, each said shaft having a disc mounted on said shaft, said disc being rotatable about said shaft, each said disc having a pair of main faces, at least one of said main faces having a first annular area concentric with said shaft having substantially radial grooves therein and a second plurality of annular coding and reading areas of different diameters disposed concentrically about said shaft and provided with detectable points;

a general transporter, having a third plurality of work stations therealong, for movably supporting said first plurality of movable part-carrying members, each work station having

a descending guide path for moving said movable part-carrying members from said general transporter to said work station,

a stop length, connected to said descending guide path, for stopping said movable part-carrying member at said work station,



a raising guide path for returning said movable part-carrying to said general transporter from said work station,

a connection connecting said stop length to said raising guide path,

a read station situated at said connection,

a pneumatic actuator for moving a raising device to and fro along said raising guide path and having an air orifice for exhaust of air when said raising device is moved towards said read station;

wherein said read station comprises

a pressurized gas blast nozzle for sending a jet of gas in a direction transverse to said radial grooves of said first area of said disc for a movable part-carrying member stopped at said read station, said gas blast nozzle having an air inlet fitting connected by a pipe to said air orifice of said pneumatic actuator,

at least one read branch disposed generally radially facing said disc of said movable part-carrying member stopped at said read station, said read branch carrying detectors in correspondence with said coding and reading areas of said disc for reading information encoded thereon.

4,719,450

METHOD AND SYSTEM FOR BINARY-TO-DECIMAL INTERCONVERSION

Shingo Yamauchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,616

Claims priority, application Japan, Feb. 16, 1985, 60-29885

Int. Cl.⁴ H03M *7/00*

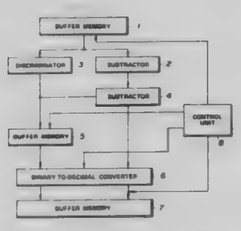
U.S. Cl. 340—347 DD **12 Claims**

1. A code processor for converting first coding system codes established according to one coding system, which codes represent at least mutually distinct first and second types of information in different first and second ranges of values, into second coding system codes established according to the other coding system, the minimum value of said second range of values being greater than the maximum value of said first range of values, said processor comprising:

memory means for storing said first coding system codes;

means for distinguishing each of said first coding system codes stored in said memory means between said first and second types of information and for generating an identification code to distinguish said first and second types of information;

means for deriving another first coding system codes having said first types of information in a third range of values corresponding to said first coding system codes in said



first range of values and another first coding system codes having said second types of information in a fourth range of values corresponding to said first coding system codes in said second range of values, the minimum value of said third range of values being less than the maximum value of said fourth range of values;

means for converting said another first coding system codes in said third and fourth range of values and said identification code into said second system codes according to said second coding system; and

storing means for storing converted second coding system codes.

4,719,451

PREDICTIVE ENCODING

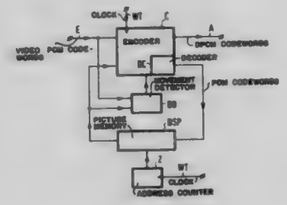
Berthold Heck, Nuremberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,655

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524069

Int. Cl.⁴ H03M *7/36*

U.S. Cl. 340—347 DD **2 Claims**



1. In a video digital imaging system for receiving sequences of codewords from a video signal source corresponding to sequential elements of a video picture, all codewords having the same codeword period and successive codewords for a given picture element being produced in successive picture periods, and in which the codewords for each picture period are stored in a read-write picture memory; an improved arrangement for predictive encoding of such received codewords, comprising:

a picture memory for storing codewords for the number N of picture elements in each picture period, the codewords

of a given picture element in successive picture periods being stored in the same address in such memory, such memory having an input for receiving codewords to be stored therein and an output at which a stored codeword is produced N codeword periods after it was received from the video signal source;

an encoder having a first input connected to said video signal source to receive codewords therefrom, a second input connected to the output of said memory to receive stored codewords therefrom, and an output at which it produces replacing encoded codewords for each picture element in successive picture periods corresponding to the difference between the codewords received at said first and second input terminals;

a decoder connected to said encoder for decoding the replacing codewords produced thereby and supplying such decoded replacing codewords to the input of said picture memory for storage therein; and

an address counter cyclically operated by clock pulses occurring at the codeword period and connected to said picture memory for generating N-K memory addresses therein for the codewords to be stored in said picture memory, wherein N>K and K is the number of codeword periods required for the encoder and decoder to produce a decoded codeword in response to a codeword received from said video signal source.

4,719,452

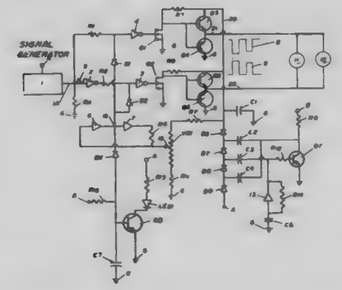
AUDIO SIGNAL GENERATOR

William K. Logsdon, Louisville, Ky., assignor to Bluegrass Electronic, LaGrange, Ky.

Filed Jun. 20, 1984, Ser. No. 622,661

Int. Cl.⁴ G08B *3/00*

U.S. Cl. 340—384 E **3 Claims**



1. An audio frequency generator to generate signals in a selected band of frequencies including:

(a) signal generator means to generate first cyclical signals of selected frequency having a first output to supply said first cyclical signals;

(b) electrical power source means;

(c) first switch means having first switch actuation means input to receive said first signals, power input means to receive electrical power from said power source means and a power output wherein said first switch means is operated between first state and second state, in response to signals received at said first switch actuation input means, to supply electrical power at said power output when said first switch is in said first state whereby power is cycled at a rate determined by the frequency of said first signal wherein said first switch means includes:

(i) first transistor means to receive said first cyclical signals at the actuating input thereof and having said power source connected to an input thereof and an output connected to ground means so said first transistor is switched between first state wherein said first switch is in conductive status and said second state where said first switch is in nonconductive status by said first cyclical signals to provide a second cyclical signal at said input proportional to said first cyclical signal;

(ii) second and third transistor means in series with each other where the actuation means of said second transistor means and said third transistor means are connected to said input to said first transistor means to be actuated by said second cyclical signal as said first transistor switches between conductive and nonconductive states in response to said first cyclical signal wherein said second transistor means is actuated to conductive state by a relatively positive portion of each of said second cyclical signal and third transistor means is actuated to conductive state by the relatively negative portion of said second cyclical signal and where the collector of said second transistor is connected to said power supply means, the emitter of said second transistor is connected to the collector of said third transistor and the emitter of said third transistor is connected to ground means and where said speaker means is connected to said collector of said second transistor whereby power is supplied to said speaker means when said second transistor means is conductive and said third transistor means is nonconductive.

(d) speaker means adapted to be actuated by said power output whereby said speaker provides audio signals of selected amplitude at frequencies generally corresponding to the frequency of said first signals;

(e) where said power source includes a source of electrical current and capacitor means to be charged when said first switch means is in said first state and discharged through said speaker means when said first switch is in said second state whereby the amplitude of said audio signals is proportional to the voltage imposed on said capacitor so the amplitude of said audio signal decreases as the voltage of said capacitor diminishes;

(f) second switch operable between first state in response to first voltage at said capacitor means and second state in response to second voltage at said capacitor means where said second voltage is higher than said first voltage and wherein said second switch means prevents transmission of signals generated by operation of said first switch to said speaker means when said second switch is in said first state and allows transmission of signals generated by said first cyclical signals to said speaker means when said second switch means is in said second state whereby audio signals of variable frequency are provided from said speaker means at amplitudes depending on the voltage at said capacitor means for a period of time equal to the time required for the voltage at said capacitor to decrease from said second voltage to said first voltage.

4,719,453

CARD CARRIER HAVING AN ALARM

Steven B. Beck, San Rafael, Calif., and Albert Wong, Kowloon, Hong Kong, assignors to Kwik Find, Ltd., San Rafael, Calif.

Filed May 23, 1986, Ser. No. 866,382

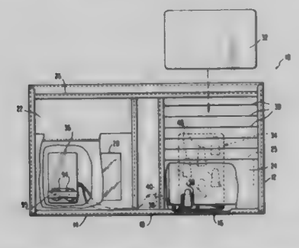
Int. Cl.⁴ G08B *13/00, 13/14*

U.S. Cl. 340—568 **40 Claims**

1. A card carrier, comprising:

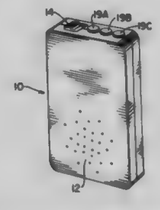
means for receiving a card and for triggering an alarm when (i) the card is missing from the card carrier, and (ii) the

card carrier is placed in one's pocket, purse, or other enclosure; and



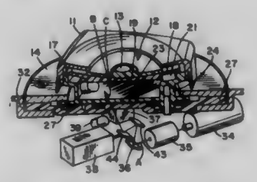
location sensing means for generating a signal responsive to the disposition of the card carrier in one's pocket, purse or other enclosure.

4,719,454
PERSONAL ALARM
Harry C. Hopkins, Williamston, N.C., and Joseph K. Power, Alpine, Ala., assignors to Hopkins International, Williamston, N.C.
Filed Oct. 30, 1985, Ser. No. 792,897
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—574 **7 Claims**



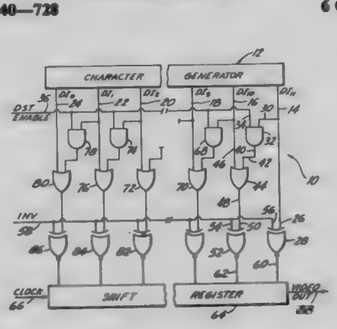
1. A portable alarm device comprising:
a miniature audio generating device having maximum recommended continuous voltage and power ratings;
a source of voltage at least twice as great as the maximum voltage rating;
a timer circuit means connectable to said source of voltage for periodically generating voltage pulses of substantially the same value as said source of voltage when connected thereto, and applying said pulses to said audio generating device so as to cause said audio generating device to operate and produce a loud sound, said pulses having a repetition rate and width such that the energy delivered to the audio generating device exceeds the maximum continuous power rating; and
means for connecting said timer circuit means to said source of voltage, said means for connecting including a latch circuit means for causing said source of voltage to be connected to said timer circuit means whenever the latch circuit means is set and causing the removal of such connection whenever it is reset, a first switch means for setting said latch circuit means, and a second switch means for resetting said latch circuit means, said latch circuit being resettable in operation only by means of said second switch means.

4,719,455
INTEGRATING POINTING DEVICE
William M. Louis, 543 Cerro St., Encinitas, Calif. 92024
Filed Jan. 24, 1986, Ser. No. 821,962
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—709 **16 Claims**



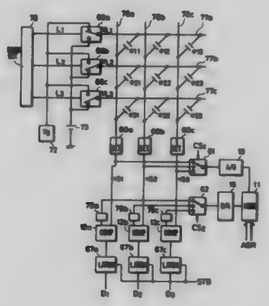
1. A hand-operated pointing and control device comprising:
a cover having an aperture, said cover of suitable size and shape to be grasped by the human hand and said cover movable relative to a fixed supporting base;
a puck movable within said aperture and having upper and lower surfaces, said puck having on its upper surface means for retaining contact with one or more fingertips of the user's hand;
means for detecting the location and displacement of the cover and puck; and
means for generating an electrical signal corresponding to the detected displacement of the cover and puck.

4,719,456
VIDEO DOT INTENSITY BALANCER
James D. Sproch, Rocky Point, and Morton B. Herman, Huntington, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.
Filed Mar. 8, 1985, Ser. No. 709,438
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—728 **6 Claims**



1. In a digital video display system wherein information is represented by a series of logic bits in a video stream corresponding to dots to be displayed on a CRT, a video dot intensity balancer comprising means for generating a plurality of logic bits and defining an output on N output lines, wherein N is an integer greater than 1 and a plurality of logic means respectively coupled to said N ouput lines of said bit generating means for comparing adjacent logic bits and outputting an information-defining signal in response thereto, said information-defining signal comprising a plurality of information-defining logic bits, said logic means including an OR gate, one input of which is connected to a first one of said N lines and the other input of which is connected to the ouptut of an AND gate, the inputs of said AND gate connected to a dot stretching enabling line and to an adjacent second of said N lines, the logic bit on said first line being logically ORed with the logic bit on said second adjacent line when there is an enabling signal on said enabling line, whereby each of said information-defining logic bits of a preselected logic value are adjacent at least one bit of identical logic value in said video stream.

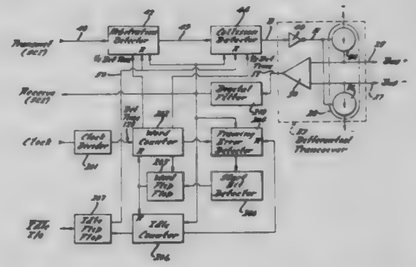
4,719,457
INFORMATION INPUT/OUTPUT DISPLAY DEVICE
Masaaki Kitajima; Masahiro Takasaka, both of Hitachiohta, and Yoshiharu Nagae, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 15, 1985, Ser. No. 702,225
Claims priority, application Japan, Feb. 22, 1984, 59-30259
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **16 Claims**



1. An information input/output display device comprising a dielectric which is held between one electrode and another electrode positioned opposite to each other and which has at least a first state and a second state of unequal capacitances, means for changing the state of said dielectric between said first and second states to change the capacitance of said dielectric, means for detecting the capacitance of said dielectric and for producing a signal indicative of the value thereof, capacitance value holding means for holding at least temporarily the signal produced by said detecting means representing a value of the capacitance of said dielectric in the first or the second state, and means for comparing the signal produced by said detecting means representing a present value of the capacitance of said dielectric with the signal held by said holding means representing a previous value of the capacitance of that dielectric and for producing an output signal representing the result of said comparison.

4,719,458
METHOD OF DATA ARBITRATION AND COLLISION DETECTION IN A DATA BUS
Frederick O. R. Miesterfeld, Troy; Ronald E. Fassnacht, Rochester, and John M. McCambridge, Northville, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Feb. 24, 1986, Ser. No. 832,909
Int. Cl.[4] H04Q *9/00*; H04J *3/02*
U.S. Cl. 340—825.5 **3 Claims**

1. In a communication system for transmission of digital messages through a data bus between two or more user microprocessors coupled to the data bus by means of a data bus interface integrated circuit, a method for blocking data transmission from the user microprocessor to the data bus when the data bus is busy comprising:
synchronizing the communication system with the occurrence of a bus idle condition;
waiting until the synchronization occurs before transmitting or receiving data messages;
if the data bus is in an idle condition, determining whether the user microprocessor has a message available to send;
attempting to win bus arbitration if a message is available to send by sending a message ID byte;
checking to see whether the message ID byte was received from the data bus;
checking to see whether the arbitration was won or lost if the message ID byte was received from the data bus, by comparing the received message ID byte to see whether it is equal to the transmitted ID byte;
sending the rest of the message if the received message ID byte is equal to the transmitted message ID byte;
determining whether any more message bytes are to be sent to the data bus and sending the next message byte if needed;
deleting the transmitted message fromthe input queue if the message is complete and returning to resynchronize with the bus idle condition;
checking to see whether the next message byte was received from the data bus if more messages need to be sent;



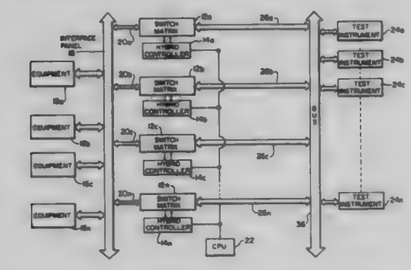
checking to see whether the received byte is equal to the transmitted byte and returning to check whether any more message bytes need to be sent if the received byte is equal to the transmitted byte and terminating the message transmission due to a collision if the received byte is not equal to the transmitted byte and returning to resynchronize with the bus idle condition;
checking to see whether any message ID byte is to be received if the data bus is in an idle condition;
checking to see whether the message is of interest to the user microprocessor, returning to resynchronize with the bus idle condition if it is not and saving the received byte if it is;
checking to see if there is a next byte to be received if the received byte is saved;
checking to see whether the data bus is in an idle condition and processing the received message if the data bus is in an idle condition before returning to resynchronize with the bus idle condition, but returning to look for the reception of the next byte if the bus is not in an idle condition.

4,719,459
SIGNAL DISTRIBUTION SYSTEM SWITCHING MODULE
Eddie T. Kovacs, Kings Park, and Donald J. Elvers, Massapequa, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Mar. 6, 1986, Ser. No. 836,929
Int. Cl.[4] H04Q *11/00*; G01R *31/28*
U.S. Cl. 340—825.800 **13 Claims**

1. In a signal distribution system having multiple switching matrix means for effecting connection between an equipment under test and at least one of a plurality of instruments, an interfacing means for connecting the equipment under test to a switching matrix means, each of the switching matrix means including a plurality of relays adapted to be selectively controlled by at least one controller means, each switching matrix means comprising:
a plurality of I/O ports connected to the interfacing means,

at least one of the I/O ports communicating with the equipment under test;

a corresponding number of first data lines each connectable directly to one of the I/O ports for providing digital signals from the equipment under test to at least one digital test instrument for measurement, at least one of the first data lines being connected to a switch means adaptable to connect that data line to a first analog instrument so that analog parameters of the digital signals transmitted on that data line are measured by the first analog instrument;



an instrument-to-bus matrix means for effecting communication between the switching matrix means and an intercard signal bus, the instrument-to-bus matrix means including a plurality of second data lines each having a relay means;

multiple matrix buses, corresponding in number to the I/O ports, each connectable to a particular I/O port for selectively providing a signal path between that I/O port and one of the second data lines of the instrument-to-bus matrix means, the one second data line connectable to at least an instrument means.

4,719,460

KEYLESS ENTRY SYSTEM FOR AUTOMOTIVE VEHICLE DEVICES WITH THEFT-PREVENTION FEATURE

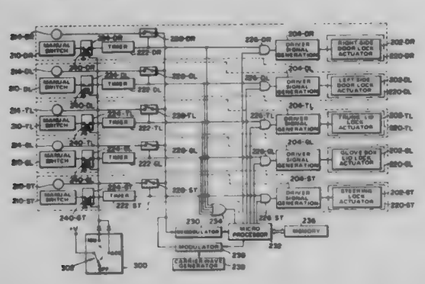
Mikio Takeuchi; Kinichiro Nakano, both of Zama, and Motoki Hirano, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 18, 1984, Ser. No. 651,782

Claims priority, application Japan, Sep. 19, 1983, 58-172685; Sep. 26, 1983, 58-177484

Int. Cl.⁴ G06F *7/04*; G08C *19/00*; B60R *25/00*

U.S. Cl. 340—825.31 **24 Claims**



23. A keyless entry system for an automotive vehicle lock device for selectably actuating the lock device to either of a first position which is a locked position or a second position which is an unlocked position, comprising:

an electrical actuator associated with the corresponding lock device and responsive to a control signal to reverse the position of said lock device;

a manual switch;

a transmitter outputting, in response to a demand signal, a radio signal indicative of a unique code which identifies the transmitter;

controller means responsive to manual operation of said manual switch for transmitting said demand signal, for receiving said radio signal from said transmitter, for comparing the unique code indicated by said radio signal with a preset code, and for producing said control signal when said unique code matches said preset code so as to reverse the position of said lock device between said first position and said second position; and

disabling means detecting a presence of an ignition key inserted in an ignition key cylinder of an ignition switch for disabling said controller means from producing said control signal so as to prevent said actuator from actuating said lock device to said first locked position when the presence of the ignition key in the ignition key cylinder is detected.

4,719,461

METHOD OF SELECTIVE CONTROL OF ELECTRICAL CIRCUITS AND A CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD

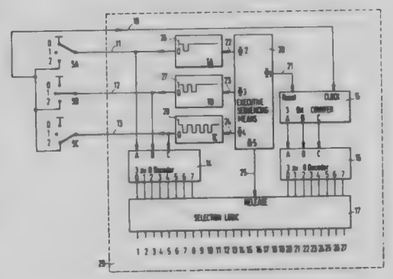
Herbert Keller, Übersee, Fed. Rep. of Germany, assignor to Wilhelm Ruf KG, Munich, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,467

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518327

Int. Cl.⁴ H04Q *1/20, 1/39*

U.S. Cl. 340—825.57 **8 Claims**



1. A circuit arrangement comprising: a plurality of n different control terminals, where n is an integer greater than one;

n different pulse generators, each generator being connected to a corresponding one of the terminals, each generator supplying a different number of pulses;

sequencing means connected to all of said generators to insure that the pulses are interleaved in time so that each generator produces its pulses in such manner that pulses from any one generator cannot be in time coincidence with pulses from any other generator;

first and second like decoders, each decoder having n inputs, each input of the first decoder being connected to a corresponding one of the control terminals;

a serial input, parallel output clock counter, the counter having n outputs, each clock output being connected to a corresponding one of the inputs of the second decoder;

said sequencing means selecting at least one of said generators and supplying the pulses from the selected generator in series to said counter; and

selection logic means connected to the outputs of both decoders.

4,719,462

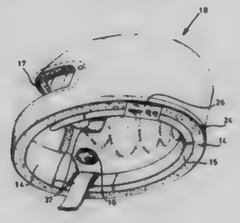
RADAR DETECTION HELMET

David E. Hawkins, P.O. Box 10333, Knoxville, Tenn. 37939-0333

Filed Nov. 17, 1986, Ser. No. 931,729

Int. Cl.⁴ G01S *7/40*

U.S. Cl. 342—20 **13 Claims**



1. A safety helmet for use by an operator of a motorcycle or like sports vehicle, said helmet for providing to said operator a warning of radar signals, said helmet comprising:

an impact resistant helmet shell to provide safety protection to said operator, said shell having a forward portion defining a face opening surrounding the face of said operator, a rearward portion, a top portion and opposite side portions, said shell having a peripheral edge;

at least one radar signal receiving means for receiving said radar signals mounted within at least said forward portion of said shell;

a radar signal detection circuit connected to said receiving means and mounted within said shell, said detection circuit providing an output signal corresponding to a detection of said radar signals by said receiving means;

visual indicator means mounted within said shell proximate said face opening within view of eyes of said operator, said visual indicator means connected with said signal detection circuit, said indicator means visually displaying information to said operator as to said output signal of said detection circuit; and

padding material encasing said at least one radar signal receiving means and said detection circuit, said padding substantially conforming on one surface with an inner surface of said shell, and substantially conforming on an opposite surface to the head of said operator, said padding extending substantially to said peripheral edge of said shell.

4,719,463

MICROWAVE RECEIVER MAKING DEVIATION MEASUREMENTS MORE ESPECIALLY IN COMBINATION WITH A SECONDARY AIRBORNE RADAR AND A SECONDARY RADAR CONTAINING IT

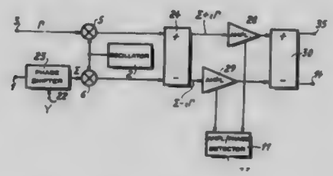
Maurice Chabah, Paris, France, assignor to Thomson CSF, Paris, France

Filed Apr. 1, 1980, Ser. No. 132,662

Claims priority, application France, May 2, 1979, 79 11022

Int. Cl.⁴ G01S *13/87, 13/44*

U.S. Cl. 342—43 **3 Claims**



1. A microwave receiver making deviation measurements, combined with an airborne secondary rader, with an antenna delivering Σ and control Γ signals, the latter being defined by $\Gamma=\Delta_1+i\Delta_2$ in which Δ_1 and Δ_2 correspond to deviation measurement signals along two orthogonal directions, elevation and bearing for example, comprising:

a local oscillator

a first and a second mixer receiving the output signal of said local oscillator and respectively the sum signal Σ and the control signal Γ,

a first operator supplied with the output signals of the first and second mixers for delivering the output signals $\Sigma+i\Gamma$ and $\Sigma-i\Gamma$ respectively to

a first and a second logarithmic amplifier, the output signals of which are applied to the input of

a second operator delivering a first and a second output signal $\log(|\Sigma^2|+|\Gamma^2|)$ and

$$\log\frac{\Sigma-i\Gamma}{\Sigma+i\Gamma}$$

containing respectively the presence information and a first angle error information; and

a third operator delivering the second angle error information from the two signals $\Sigma+i\Gamma$ and $\Sigma-i\Gamma$.

4,719,464

ANGULAR SCINTILLATION REDUCTION DEVICE IN A RADAR AND A RADAR CONTAINING SUCH A DEVICE

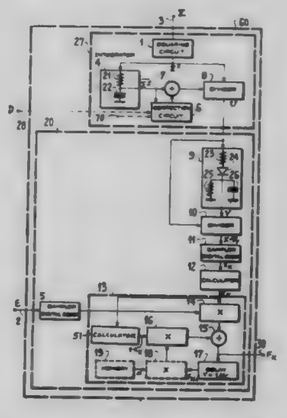
Robert Gendron, Paris, France, assignor to Thomson CSF, Paris, France

Filed Mar. 13, 1980, Ser. No. 129,372

Claims priority, application France, Apr. 26, 1979, 79 10647

Int. Cl.⁴ G01S *13/44*

U.S. Cl. 342—149 **6 Claims**



1. A device for reducing the angular scintillation of moving targets, which is used more especially in electromagnetic equipment making deviation measurements and containing a reception circuit, which reception circuit delivers to terminals of said device the sum signal Σ, the difference signal Δ, the deviation measurement signal ε calculated from said sum Σ and difference Δ signals, a signal D representing the radar target range and a signal Vr representing the radial speed of the detected target, said device further comprising a first circuit which receives the sum signal Σ and delivers signal U representing the normalized fluctuations of the signal Σ^2 with regard to its mean value Σ^2 and a second circuit which receives signal U and the deviation measurement signal ε and contains a peak detector circuit which delivers the signal V corresponding to the peak values of U, a first means which is supplied with the

output signal U of the first circuit and with the output signal V of the peak detector circuit and delivers a signal $x_k=U/V$, a first calculating circuit connected at the output x_k of the first means and calculating the signal $K_k=f(x_k)$ where f is such a predetermined non-linear function that the signal K_k tends rapidly towards 1 or 0 for a small variation of the input signal x_k, and a second means, supplied with the output signal K_k of the first calculating circuit and with the deviation measurement signal ϵ from the reception circuit, delivering the values $F_k=K_k\epsilon+u(1-K_k)F_{k-1}$ of ϵ which correspond to the maximum values of the sum signal Σ, F_{k-1} being the preceding filtered value of ϵ and u a predetermined positive number less or equal to 1.

4,719,465

MONOPULSE RADAR EQUIPMENT

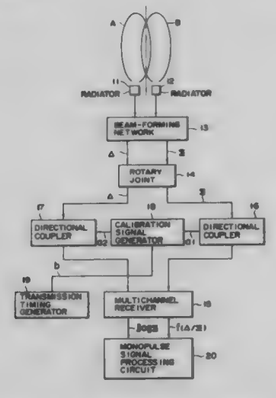
Yuichi Kuroda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 22, 1985, Ser. No. 790,083

Claims priority, application Japan, Nov. 1, 1984, 59-230653

Int. Cl.⁴ G01S *13/00*

U.S. Cl. 342—151 **25 Claims**



1. A monopulse radar equipment comprising:

first and second radiators arranged in symmetrical positions with respect to a boresight axis for radiating radar pulses in a predetermined cycle and for producing first and second directional radiation patterns;

beam forming means for synthesizing the first and second directional radiation patterns, in an in-phase and opposite-phase relation and for producing a sum radiation pattern signal and a difference radiation pattern signal;

a multichannel receiver for generating, from the sum and difference pattern signals, an off-boresight signal representing a deviation of a target object from the boresight axis;

first and second directional couplers arranged in sum and difference pattern signal transmission channels between the beam forming means and the multichannel receiver;

calibration signal generating means connected to the first and second directional couplers for injecting first and second calibration signals into the sum and difference pattern signal transmission channels; and

compensating means connected to an output of the multichannel receiver for detecting the calibration signal and for compensating for a phase characteristic and/or an amplitude characteristic of the sum and difference pattern signal transmission channels in accordance with a result of detection.

4,719,466

ADAPTIVE RADAR SIGNAL PROCESSOR FOR THE DETECTION OF USEFUL ECHO AND THE CANCELLATION OF CLUTTER

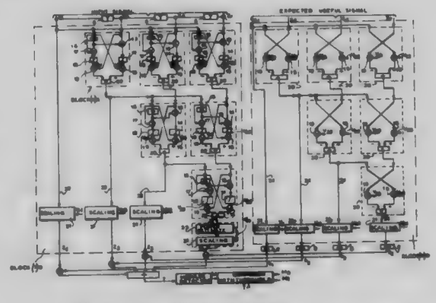
Alfonso Farina, and Flavio A. Studer, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Dec. 13, 1984, Ser. No. 681,497

Claims priority, application Italy, Dec. 13, 1983, 49499 A/83

Int. Cl.⁴ G01S *7/66*

U.S. Cl. 342—159 **2 Claims**



1. An adaptive radar signal processor for the detection of a useful signal of received signals in the presence of an additive disturbance in the form of clutter and noise comprising a modular structure of decorrelators and of a series of power normalizers through which parameters of said processor can be modified automatically as a function of the characteristics of the disturbance and of the useful signal, each of said decorrelators having a lattice structure comprising:

calculating means for calculating the complex conjugate function of expected useful signals forming complex conjugate signals;

a first multiplier coupled to an output of said calculating means for multiplying said complex conjugate signals with said expected useful signals;

a second multiplier coupled to said calculating means for multiplying said complex conjugate signals with said received signals;

first integrating means coupled to said first multiplier;

second integrating means coupled to said first multiplier;

a third multiplier coupled to said first integrator for multiplying an output of said first integrator with said received signals;

a fourth multiplier coupled to said second integrator for multiplying an output of said second integrator with said expected useful signals; and

summing means coupled to said third multiplier and said fourth multiplier for adding outputs of said third multiplier and said fourth multiplier forming power and correlation estimate signals whereby said power and said correlation estimate signals are utilized both for power normalization and for linear processing of samples of an expected target signal.

4,719,467

DOPPLER IMAGING OF TARGETS

Roger Voles, London, England, assignor to EMI Limited, Hayes, England

Filed Oct. 29, 1982, Ser. No. 440,237

Claims priority, application United Kingdom, Oct. 31, 1981, 8132875; Sep. 1, 1982, 8224903

Int. Cl.⁴ G01S *13/89*

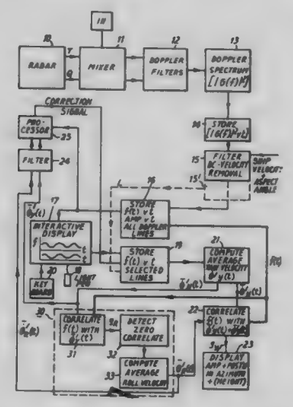
U.S. Cl. 342—179 **4 Claims**

1. A radar for producing an image of a rotating target, the radar including,

means for transmitting a succession of radar pulses and for receiving corresponding returns from a target,

means for evaluating the Doppler frequency of returns received from at least two scatterers at the target,

means for monitoring, as a function of time, a variation in the Doppler frequency of returns received from each said scatterer to detect a pair of scatterers whose returns have Doppler frequencies which vanish simultaneously and which otherwise vary with time in opposite senses, said pair of scatterers exhibiting rotational motion about a single axis only of the target,



means for deriving a data signal representing the instantaneous angular velocity of said pair of scatterers about said single axis,

means for correlating said data signal with returns derived simultaneously from other scatterers at the target to generate respective correlation signals representing the locations of said other scatterers with respect to said single axis,

and means for utilising said correlation signals to evaluate data indicative of the target.

4,719,468

RADAR SYSTEM WITH REDUCED DISTANCE ERROR

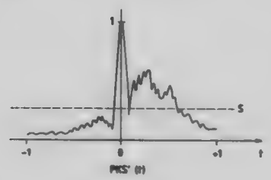
Franz Jehle, and Jürgen Mutschler, both of Ulm, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,428

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417073

Int. Cl.⁴ G01S *7/28*

U.S. Cl. 342—201 **8 Claims**



1. A radar system, particularly for ground tracking, comprising equipment for transmitting frequency modulated pulses and for receiving echo pulses having main lobes at a zero time point for each of the echo pulses, and a compression filter for compressing the echo pulses by cross-correlating the received echo pulses to a weighting function of the compression filter, the compression filter generating an asymmetrical weighting function with respect to the zero point for each echo pulse for producing the effect in the cross-correlated echo pulses that side lobes leading the zero point in time of the weighting function are reduced, while side lobes lagging the zero point in time are raised.

4,719,469

DIRECTION-DETERMINING SYSTEM

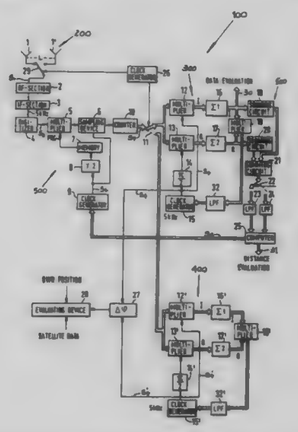
Wolfgang Beier, Weil der Stadt, and Helmut Graf, Stuttgart, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 929,935

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540212

Int. Cl.⁴ G01S *1/38*

U.S. Cl. 342—434 **7 Claims**



1. A direction-determining system comprising, in combination:

a linear antenna array having at least first and second antenna elements, each for receiving an input signal from a Global Positioning System transmitter;

Global Positioning System receiver means including

signal processing means for receiving said input signal from said linear antenna array and for converting it to an intermediate frequency signal, and

a first phase-locked loop adapted to lock with the phase of the input signal received from said first antenna element and having a first output signal representative of the phase thereof;

a second phase-locked loop adapted to lock with the phase of the input signal received from said second antenna element and having a second output signal representative of the phase thereof;

synchronized switching means for selectively providing a first or second path from a selected said first or second antenna element to an input of said signal processing means and in synchronization therewith a third or fourth path from an output of said signal processing means to a corresponding said first or second phase-locked loop; and

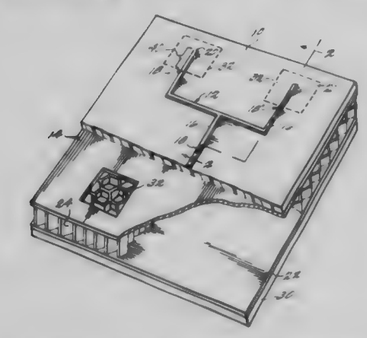
means responsive to the phase difference between said phase locked loop output signals for determining the pointing angle of said linear antenna array,

wherein said signal processing means includes a single radio frequency section,

wherein each said selected one of said antenna elements is in intermittent electrical communication with its said corre-

sponding phase-locked loop through said single radio frequency section and
wherein said synchronized switching means functions sufficiently rapidly that each phase-locked loop remains locked to its said corresponding received input signal.

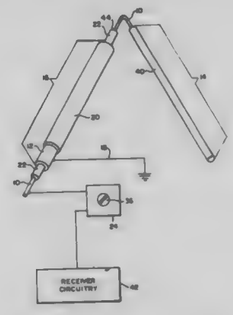
4,719,470
BROADBAND PRINTED CIRCUIT ANTENNA WITH DIRECT FEED
Robert E. Munson, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.
Filed May 13, 1985, Ser. No. 733,612
Int. Cl.[4] H01Q *1/38, 1/48*
U.S. Cl. 343—700 MS **24 Claims**



1. An improved radio frequency antenna adapted for connection to a two conductor r.f. transmission line and comprising an array of individual radiator structures formed by two shaped printed circuit conductive structures registered with one another and cladded to respective opposite sides of a single dielectric sheet, said improvement comprising:
one of said conductive structures having shaped opening(s) therein;
the other one of said conductive structures having a microstrip transmission line leading from a common r.f. input-/output terminal to non-shorted terminal end(s);
said shaped opening(s) being registered over said non-shorted terminal end(s) of said microstrip transmission line in the other conductive structure so as to cause each non-shorted end portion in registry with a corresponding said opening to become an individual radiator structure and to produce r.f. radiation to/from the antenna on both sides of said dielectric sheet and wherein said shaped conductive structures are each adapted for direct electrical connection to one respectively corresponding conductor of said two conductor r.f. transmission line.

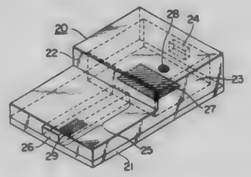
4,719,471
ANGULATED FM ANTENNA
Emmett D. Killingsworth, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 21, 1986, Ser. No. 820,357
Int. Cl.[4] H01Q *9/16*
U.S. Cl. 343—792 **7 Claims**

1. An FM antenna of a load control device, comprising:
a dipole segment comprising a conductive rod having a first capacitive value associated therewith;
a capacitive segment having a central conductor disposed within a cylindrical conductor, said central and cylindrical conductors being arranged in coaxial association, said central conductor being electrically insulated from said cylindrical conductor, said central conductor being connected in electrical communication with said conductive rod;
an inductor being connected in electrical communication with said central conductor, said central conductor being connected serially between said conductive rod and said inductor;
said dipole segment and said capacitive segment being selectively balanced in length so as to achieve a summed capacitive value which, in conjunction with said inductor, establishes a preselectable resonant frequency at which said FM antenna is operable;



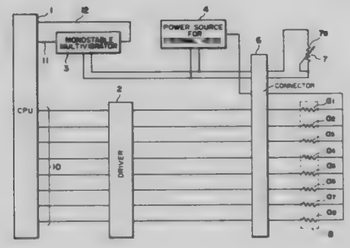
said cylindrical conductor being connected in electrical communication with an electrical ground; and
said cylindrical rod is disposed at an angle relative to said conductive rod so that the length of said FM antenna is reduced sufficiently to be disposed within said load control device.

4,719,472
INK JET RECORDING HEAD
Junichi Arakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 501,565, Jun. 6, 1983, abandoned. This application Mar. 27, 1986, Ser. No. 843,818
Claims priority, application Japan, Jun. 18, 1982, 57-103970
Int. Cl.[4] G01D *5/18*
U.S. Cl. 346—140 R **7 Claims**



1. An ink jet recording head in which ink supplied from an ink supply source is dischargeable from an orifice, the head comprising:
a substrate;
a lid member attached to said substrate to form therewith a reservoir for accepting ink from the ink supply source and a liquid flow path leading from an inlet at said reservoir to the orifice;
first heating means disposed on said substrate to provide a heating surface in said liquid flow path for applying heat to ink therein to cause discharge of ink from the orifice;
second heating means disposed on said substrate to provide a heating surface in said reservoir for applying heat to ink therein to adjust the viscosity of ink entering said inlet of said liquid flow path, wherein said first and second heating means have substantially the same configuration; and
a temperature sensor for providing a signal corresponding to the temperature of the ink in said reservoir to control the heat applied to the ink by said second heating means.

4,719,473
RECORDING APPARATUS
Yoshiyuki Shimamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 823,738, Jan. 29, 1986, abandoned. This application May 13, 1987, Ser. No. 51,258
Claims priority, application Japan, Feb. 8, 1985, 60-21937; Feb. 8, 1985, 60-21938
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**



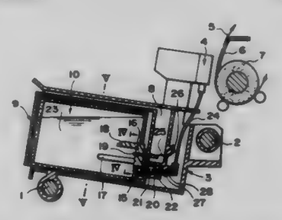
1. A recording apparatus for recording an image on a recording medium, comprising:
a recording head for recording on the recording medium at a density determined by the width and voltage level of a print pulse applied to said recording head;
manual operation means for manually setting the voltage level of the print pulse to provide a desired density of the recorded image;
output means, responsive to said manual operation means, for generating an output signal representing the voltage level set by said manual operation means; and
control means, responsive to the output signal from said output means, for setting the width of the print pulse to effect recording at the desired density provided by said manual operation means.

4,719,474
APPARATUS FOR IMAGING TEXT AND GRAPHICS ON PHOTOSENSITIVE MATERIAL
Walter I. Hansen, Cold Spring Harbor, and Herbert Klepper, Westbury, both of N.Y., assignors to Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany
Filed Jul. 19, 1985, Ser. No. 757,129
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—108 **17 Claims**



1. Image setting apparatus for producing a two dimensional image on photosensitive sheet material comprising:
means for transporting such photosensitive sheet material past an image point to provide a first dimension of said two-dimensional image on said photosensitive material;
a light source for producing a modulated beam of light;
a rotatable prism, having two mirror facets whose planes intersect in a common line and having its axis of rotation perpendicular to said line, for reflecting said light beam into a scanning beam with a substantially constant angular velocity; and
scan lens means in the path of said scanning beam such that a focused beam spot moves repeatedly in a linear direction across said photosensitive material at said image point to provide the other dimension of said two-dimensional image on said photosensitive material.

4,719,475
INK-JET RECORDING APPARATUS AND INK TANK USED THEREIN
Takehiko Kiyohara, Zama, and Hideo Fukazawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 1, 1986, Ser. No. 846,809
Claims priority, application Japan, Apr. 10, 1985, 60-076201; Apr. 10, 1985, 60-076202; Apr. 10, 1985, 60-076203; Apr. 10, 1985, 60-076204; Apr. 10, 1985, 60-076205; Apr. 10, 1985, 60-076206
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **31 Claims**

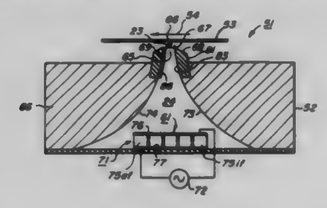


1. An ink tank suitable for use in an ink-jet recording apparatus, said ink tank comprising:
a closed ink bladder of a flexible material formed by assembling at least one sheet with peripheral matched portions being bonded together to form a tubular member having a portion with a substantially U-shaped or V-shaped cross-section and portions with substantially flat sides, and
a plug member sealingly attached to said ink bladder where said peripheral portions of said ink bladder are bonded together.

4,719,476
SPATIALLY ADDRESSING CAPILLARY WAVE DROPLET EJECTORS AND THE LIKE
Scott A. Elrod, Menlo Park; Butrus T. Khuri-Yakub, Palo Alto, and Calvin F. Quate, Stanford, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 17, 1986, Ser. No. 853,252
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **12 Claims**

1. In combination with a volume of liquid having a free surface, and means for generating a capillary wave on said free

surface; said capillary wave having a periodic wave structure including crests and troughs; the improvement comprising



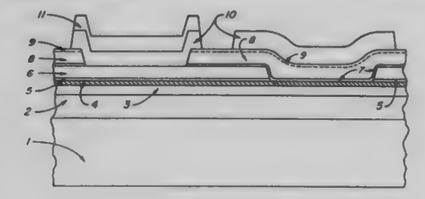
means for individually and selectively addressing selected crests of said capillary wave to locally alter a surface property of the liquid within said selected crests.

4,719,477

INTEGRATED THERMAL INK JET PRINTHEAD AND METHOD OF MANUFACTURE

Ulrich E. Hess, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 17, 1986, Ser. No. 820,754
Int. Cl.[4] G01D *15/18*; H01L *21/00*; B05D *5/12*
U.S. Cl. 346—140 R 9 Claims



9. An integrated circuit wherein driver circuitry and printhead resistor interconnect circuitry are fabricated on a common substrate, including:

a. a substrate having a layer of resistive material thereon, said resistive material being selected from the group consisting of polycrystalline silicon and a refractory metal silicide,

b. a layer of refractory metal disposed on said resistive material and having an opening therein defining one dimension of a thermal ink jet resistor, said refractory metal being selected from the group consisting of tungsten and titanium and tantalum and molybdenum,

c. a passivation layer or layers disposed on the surface of said refractory metal and having an opening therein exposing a surface area of said refractory metal,

d. driver interconnect metallization disposed in said opening in said passivation layer and in electrical contact with said refractory metal, whereby said interconnect metallization and said refractory metal may be formed in immediately adjacent layers in an MOS multi-level metal integrated circuit, and

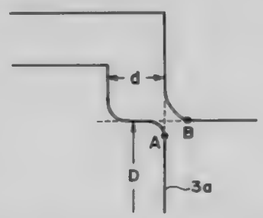
e. a metal barrier layer disposed on the surface of said passivation layer or layers and above an ink jet resistor to provide enhanced insulation from ink which is disposed above said thermal ink jet resistor, said metal barrier layer is tantalum, said interconnect metallization is aluminum, and one of said passivation layers is phosphorous doped glass.

4,719,478

HEAT GENERATING RESISTOR, RECORDING HEAD USING SUCH RESISTOR AND DRIVE METHOD THEREFOR

Masayoshi Tachihara, Atsugi; Shinichi Hirosawa, Hiratsuka; Masami Ikeda; Akira Asai, both of Tokyo, and Hirokazu Komuro, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1986, Ser. No. 910,727
Claims priority, application Japan, Sep. 27, 1985, 60-212703; Oct. 31, 1985, 60-242868; Oct. 31, 1985, 60-242869
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 10 Claims



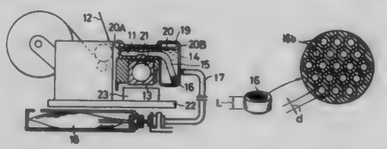
2. A liquid jet recording head comprising an orifice for discharging liquid, a liquid flow path communicating with the orifice, a heat generating resistor arranged in the liquid flow path for generating thermal energy to discharge the liquid, the heat generating resistor including a heat generating resistor layer formed on or above a support member and a pair of opposing electrodes formed on the heat generating resistor layer, a width of the heat generating resistor layer at an electrode area being larger than a width of the electrodes, a voltage being applied across the electrodes, the heat generating resistor having a ratio of no larger than 1.4 of a maximum value of a gradient ϕ, $\sqrt{(\partial\phi/\partial x)^2+(\partial\phi/\partial y)^2}$ to a value of $\sqrt{(\partial\phi/\partial x)^2+(\partial\phi/\partial y)^2}$ at a center of the resistor when a Laplace equation $\partial^2\phi/\partial x^2+\partial^2\phi/\partial y^2=0$ is solved for the heat generating resistor area when an orthogonal coordinate system X-Y is defined on a surface of the resistor, a potential at a point (x,y) on the resistor surface is represented by $\phi(x,y)$, a boundary value is imparted to an area of a circumferential boundary of the resistor which contacts to one of the electrodes, a different boundary value is imparted to an area which contacts to the other electrode, and a boundary condition in which a differential coefficient of ϕ to a normal direction of the circumferential boundary is imparted to an area which does not contact to any of the electrode.

4,719,479

BUNDLED-TUBE FILTER FOR RECORDING APPARATUS

Hiroshi Kyogoku, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 600,396, Apr. 16, 1984, abandoned. This application Aug. 5, 1986, Ser. No. 894,501
Claims priority, application Japan, Apr. 22, 1983, 58-70998; Apr. 22, 1983, 58-70999
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 2 Claims



1. A recording apparatus in which ink can flow from the end

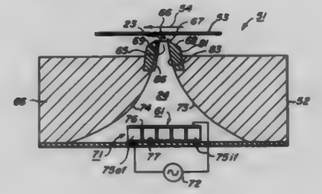
of a recording head to effect recording on a recording medium, comprising an ink supply path leading from an ink container to the recording head, and a filter disposed in said supply path and having a number of minute communication bores extending linearly and substantially parallel to the direction of liquid flow in said supply path, said bores being formed by a number of tubes of a ceramic material having hydrophilic properties bundled and integrally shaped in cross-section into the form of a honeycomb substantially without spaces between said tubes, wherein the diameter d of each of said communication bores of said filter is 10–50 μm, the number of communication bores per 1 mm^2 is 20–800 and the ratio of the length L of each of said communication bores to the diameter d of each of said communication bores is at least 10.

4,719,480

SPATIAL STABLIZATION OF STANDING CAPILLARY SURFACE WAVES

Scott A. Elrod, Menlo Park; Butrus T. Khuri-Yakub, Palo Alto, and Calvin F. Quate, Stanford, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 17, 1986, Ser. No. 853,253
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 15 Claims



1. In a combination with a volume of liquid having a free surface, and means for generating a standing capillary wave on said free surface; said capillary wave having a periodic wave structure including crests and troughs; the improvement comprising another means for periodically varying a wave propagation characteristic of said free surface along at least one axis at a spatial frequency selected to cause the the crests of said standing wave to preferentially align at predetermined spatial locations along said axis.

4,719,481

ELECTROGRAPHIC ION WRITING HEAD DRIVER SYSTEM

Haing C. Tuan, and Malcolm J. Thompson, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 678,145, Dec. 4, 1984, Pat. No. 4,588,997. This application May 9, 1986, Ser. No. 861,472
Int. Cl.[4] G01D *15/06*, *15/18*
U.S. Cl. 346—159 2 Claims

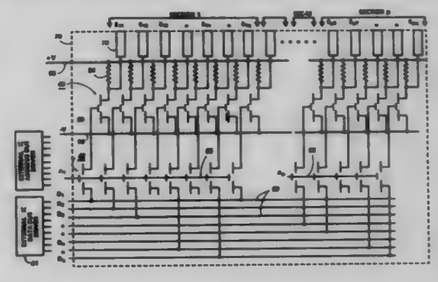
1. An ionographic marking apparatus including a housing, means for generating a supply of marking ions within said housing, means for transporting said marking ions through and out of said housing, and means for controlling the transport of said ions out of said housing, said means for controlling comprising an integral marking head including a substrate upon which are integrally formed as thin film elements:

an array of closely spaced charge storage elements, each element switchable between a charge storage state for inhibiting transport of said ions out of said housing so as to prevent marking and an absence of charge state for allowing transport of said ions out of said housing so as to cause marking,

first bus means connectable to a first reference potential and to said array of charge storage elements for transferring to said array of charge storage elements a voltage sufficient to cause said charge storage elements to achieve one of said two states,

second bus means connectable to a second reference potential and to said array of charge storage elements for transferring to said array of charge storage elements a voltage sufficient to cause said charge storage elements to achieve the other of said two states,

inverter circuit means connected between said first and second bus means, said inverter circuit means comprising



a voltage divider having a load resistor in one leg and a transistor in the other leg and each of said marking elements is connected to the node of said voltage divider,

latching means comprising a pass transistor connected to said inverter circuit means for changing the state of said inverter circuit, and

information loading means, comprising a multiplexed array of data lines and address lines, connected to said latching means for selectively changing the state of said latching means.

4,719,482

THREE-DIMENSIONAL COLOR TELEVISION

Heinrich W. Hora, 553 VanAllen Hall, Iowa City, Iowa 52242

Filed May 8, 1986, Ser. No. 860,793
Int. Cl.[4] H04N *13/00*
U.S. Cl. 350—91 3 Claims



1. A three dimensional television display comprising:

(a) a video source for producing frames of video wherein a first series of frames represent pictures taken from a first location and a second series of frames represent pictures taken from a second location, wherein said first and second series of frames of video are produced by said video source one at a time in alternating sequence at a relatively high frame repetition rate that is substantially greater than the normal frame repetition rate for a conventional video source;

(b) plane polarizing screen means for plane polarizing the light from each frame of video produced by said video source;

(c) electro-optical means for selectively rotating the plane of polarization of said light passing through said plane polarizing screen means by 90°, said electro-optical means

comprising a plurality of layers of optical fiber material having a sufficiently strong optical effect that an electric field applied perpendicularly to the direction of light propogation produces a Kerr effect thereby rotating said plane of polarization and including transparent electrode means comprising thin layers of electrically conductive material interleaved between said layers of optical fiber material and having predetermined polarities of alternating sequence for selectively providing said electric field; and

(d) synchronizing means for supplying electrical potential to said electrodes on alternate frames of video such that said Kerr effect is created in said electro-optical means when video frames from said first series of frames are produced by said video source, and for turning off said electrical field when video frames from said second series of frames are produced by said video source.

4,719,483

CONTROL STRIP SUPPLY APPARATUS

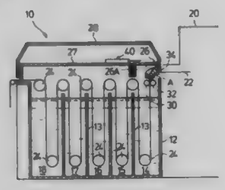
Seiichi Yamazaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 31, 1986, Ser. No. 891,024

Claims priority, application Japan, Jul. 31, 1985, 60-117813[U]

Int. Cl.⁴ G03D *3/13*

U.S. Cl. 354—310 **7 Claims**



1. In a developing machine for photographic paper having a plurality of processing tanks for processing the photographic paper, inside cover means enclosing the processing tanks, photographic paper driving means for feeding the paper sequentially through the processing tanks, and first aperture means disposed in the developing machine for permitting photographic paper to be introduced into the developing machine, the improvement comprising:

control strip supply means adapted to feed a control strip to the paper driving means to be sequentially fed through the processing tanks prior to the feeding of the photographic paper for inspection of development conditions in the developing machine, said control strip supply means including a cassette accommodating said control strip and mounting means for mounting said cassette on the inside cover means;

second aperture means disposed in the inside cover means for permitting said control strip to be introduced into the developing machine;

outside cover means mounted on said developing machine and overlying said control strip supply means to shield said supply means from light; and

guide means disposed adjacent said first and second aperture means for guiding the control strip drawn out of said cassette to the paper driving means.

4,719,484

PHOTOSENSITIVE MATERIAL GUIDE STRUCTURE FOR DEVELOPING APPARATUS

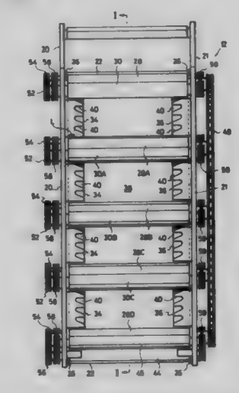
Toshiro Tahara; Kaoru Uchiyama; Seiichi Yamazaki, and Kichiro Sakamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 6, 1986, Ser. No. 893,745

Claims priority, application Japan, Aug. 6, 1985, 60-172999; Oct. 3, 1985, 60-220904

Int. Cl.⁴ G03D *3/08*

U.S. Cl. 354—320 **20 Claims**



1. A photographic material guide structure for feeding a web of photosensitive material in a developing apparatus adapted to accommodate a developer and develop a photosensitive material having been subjected to light exposure, which comprises:

at least one pair of feed rollers disposed within said developing apparatus and adapted to feed forward said web of photosensitive material while clamping it therebetween, said rollers have a given diameter over a length less than the width of the web being fed therebetween, and wherein, there is a reduction in diameter at both axial end portions thereof, over distances which when added to the length of at least one roller portion of given diameter, is equal to or wider than the width of said web and wherein said guide structure further comprises guide means for maintaining said web positioned laterally centered between said rollers, such that the side edges of the web are aligned with the reduced diameter portions at the axial ends of said at least one feed roller,

whereby the clamping force exerted on said web at its center portion, is in excess to that exerted on the lateral edges of said web.

4,719,485

AUTOMATIC FOLLOW-UP DEVICE FOR CAMERA

Masao Shikaumi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Jun. 4, 1986, Ser. No. 870,618

Claims priority, application Japan, Jun. 6, 1985, 60-123051; Jun. 14, 1985, 60-129481

Int. Cl.⁴ G03B *3/00, 29/00*

U.S. Cl. 354—400 **3 Claims**

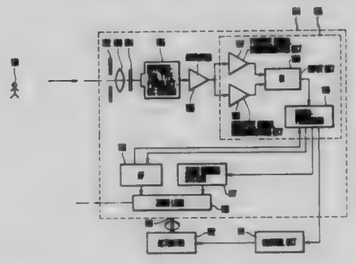
1. An automatic follow-up device for a camera, comprising:

detecting means for detecting a moving direction of a heat source which is an object located within a field of a camera as an object to be photographed;

follow-up means arranged to cause a photo-taking optical system to follow said heat source by changing a direction of an optical axis thereof according to a result of detection made by said detecting means;

distance measuring means for detecting a distance to said object; and

control means arranged to have a magnification value of said photo-taking optical system changed according to the distance detected by said distance measuring means to a



magnification value at which an image of said object being followed up can be obtained on an image plane of the camera approximately in a constant size.

4,719,486

FOCUS DETECTING APPARATUS FOR CAMERA

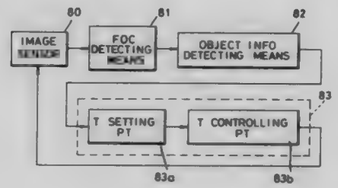
Kunihisa Hoshino, Urawa; Ken Utagawa, Kawasaki; Yosuke Kusaka, Yokohama, and Shozo Yamano, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,408

Claims priority, application Japan, Dec. 20, 1984, 59-268776

Int. Cl.⁴ G03B *3/00;* **H04N** *5/335*

U.S. Cl. 354—408 **35 Claims**



1. A focus detection apparatus for a camera including:

(a) image sensor means for detecting a light intensity distribution on a predetermined surface of two light rays reflected from an object and passing through two different regions of an exit pupil of a photographing lens of the camera and for generating a photoelectric output, said image sensor means being provided with a plurality of charge storage type photoelectric conversion elements;

(b) object information detecting means for detecting object information which relates to contrast of the object in accordance with the photoelectric output and generating an object information signal, said object information detecting means including correlation calculating means for calculating a correlation between the photoelectric output representing a light intensity distribution of one of the two light rays on said predetermined surface and the photoelectric output representing a light intensity distribution of the other of the two light rays on said predetermined surface; and

(c) control means for controlling a charge storage time of said plurality of photoelectric elements in response to the object information signal.

4,719,487

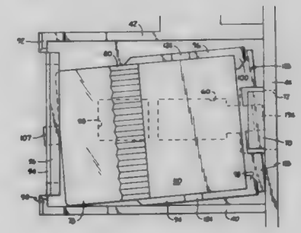
CAMERA HAVING TILTABLE PHOTOCELL LENS ASSEMBLY

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 20, 1986, Ser. No. 920,733

Int. Cl.⁴ G03B *7/099*

U.S. Cl. 354—481 **4 Claims**



1. A photographic camera comprising:

an objective lens for directing image-bearing light toward a focal plane, said objective lens having an optical axis;

a photocell unit for varying the exposure of a film unit in accordance with the intensity of scene light measured thereby, said photocell unit including a light sensitive element and a photocell lens assembly for directing scene light onto said light sensitive element; and

means for supporting said photocell lens assembly for angular movement relative to said light sensitive element between first and second positions, as said photographic camera is rotated substantially ninety degrees about an axis parallel or coincident with said optical axis, from a substantially horizontally orientated picture taking attitude to a substantially vertically orientated picture taking attitude, said relative angular movement being in addition to said ninety degree rotation of said photographic camera.

4,719,488

IMAGING OPTICAL SYSTEM USING DISTRIBUTED INDEX OPTICAL ELEMENTS

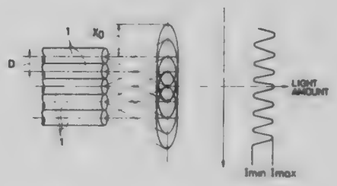
Michitaka Setani, Kawasaki; Mitsuhiro Tokuhara, Chigasaki; Hiroaki Tsuchiya, and Haruhisa Honda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,486

Claims priority, application Japan, Jun. 22, 1984, 59-129669

Int. Cl.⁴ G03B *27/00*

U.S. Cl. 355—1 **2 Claims**



1. A copying apparatus comprising:

a carriage for supporting an original thereon;

illuminating means for illuminating the original; and

an imaging optical system for forming the image of the original on a photosensitive drum, said optical system being formed by a plurality of distributed index optical elements of erect one-to-one magnification arranged in a

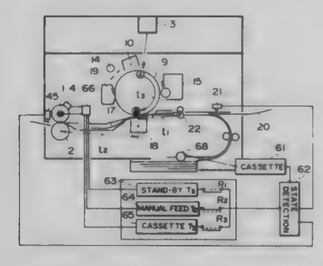
row, the angular aperture θ of said optical elements being $9° \leq \theta \leq 13°$, and wherein when the effective diameter of each of said optical elements is D and the field radius thereof is X_0 and the degree of superposition M of the images of the original formed on a light-receiving surface by said optical elements is defined as X_0/D, said M has a value of approximately $M = 2.75 + 0.5x$, where x is 0 or a greater integer.

4,719,489

RECORDING APPARATUS HAVING MATERIAL FEED MODE DEPENDENT FIXING CONTROL

Masaharu Ohkubo; Yasumasa Ohtsuka; Jun Asai, all of Yokohama, and Yoshihiro Murasawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 695,807, Jan. 28, 1985, abandoned. This application Jun. 16, 1987, Ser. No. 62,430
Claims priority, application Japan, Feb. 3, 1984, 60-17946; Feb. 14, 1984, 60-26285; Feb. 21, 1984, 60-31797
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 FU 16 Claims



1. A recording apparatus comprising:

a couple of rollers for fixing an image to be recorded on a recording material selectively under a first fixing condition or a second fixing condition;

means defining first and second recording material inlets, wherein the first recording material inlet and the second material inlet are located at different positions;

means for feeding the recording material between said couple of rollers selectively in a first recording material feed mode or a second recording material feed mode wherein the recording material is fed from said first inlet in the first recording material feed mode and from said second inlet in the second recording material feed mode;

means, responsive to the change of the recording material feed modes, for bringing said couple of rollers under the first fixing condition upon selection of the first recording material feeding mode and under a second fixing condition, which is different from the first fixing condition, upon selection of the second recording material feed mode, wherein said mode responsive means includes means for setting a pressure between said couple of rollers, the pressure being higher in the second fixing condition than in the first fixing condition.

4,719,490

COLOR IMAGE PROCESSING APPARATUS

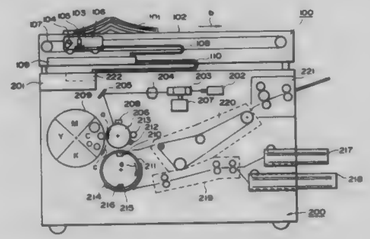
Tadashi Yoshida, Ichikawa; Naoto Kawamura, Yokohama, and Toru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 794,130, Nov. 1, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 56,299
Claims priority, application Japan, Nov. 6, 1984, 59-232291
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 10 Claims

1. A color image processing apparatus comprising:

input means for receiving a plurality of color component signals in parallel;

color correction means for receiving said plurality of color component signals and a signal representing the kind of a corrected color signal and for outputting a selected kind of corrected color signal to sequentially obtain different corrected color signals for respective colors from said plurality of color component signals, said color correction means including a plurality of multiplication means for



multiplying the respective color component signals by correction factors, adder means for adding the results of the multiplication by said plurality of multiplication means and selection means for selecting said correction factors in accordance with said signal representing the kind of the corrected color signal; and

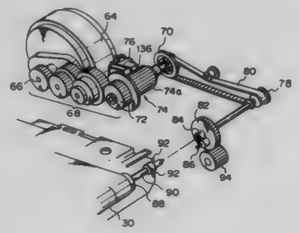
color image forming means for forming respective color images sequentially using the corrected color signals output from said color correction means.

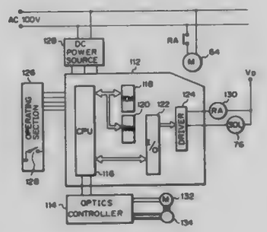
4,719,491

COPIER

Eiichi Katoh, Tokyo, and Hiroshi Yasuda, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,425
Claims priority, application Japan, Feb. 19, 1986, 61-32902
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 2 Claims





1. A copier comprising:

an optical system and a first motor for driving said optical system;

various units installed in said copier and a second motor for driving said various units, said second motor comprising a synchronous motor;

clutch means interposed between said second motor and a load which is continuously operated by a drive force which is produced by said second motor in one direction; and

drive force interrupting means for interrupting the transmission of the drive force to said load by uncoupling said clutch means for a predetermined period of time;

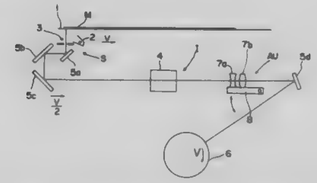
said second motor, clutch means and drive force interrupting means being controlled such that said drive force interrupting means maintains said clutch means uncoupled until said second motor reaches a predetermined synchronous rotation speed after a start of rotation so as to interrupt the transmission of the dirve force to said load, said clutch means being coupled upon a lapse of said predetermined period of time to drive said load.

4,719,492

SCAN TYPE ANAMORPHIC MAGNIFYING APPARATUS

Haruhiro Hyodo, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1986, Ser. No. 895,131
Claims priority, application Japan, Aug. 13, 1985, 60-178295
Int. Cl.[4] G03B *27/68*
U.S. Cl. 355—52 4 Claims



1. a scan type anamorphic magnifying apparatus, comprising;

a scanning device for scanning through a slit an original document in a direction perpendicular to a longitudinal direction of said slit,

a photosensitive member shifted in a certain direction at a substantially constant speed,

an image forming device for projecting and forming an image of said original document scanned by said scanning device on said photosensitive member,

a speed change means for varying a speed ratio between the scanning speed of said scanning device and the shifting speed of said photosensitive member in order to permit the image of the original document to be formed on said photosensitive member by a magnifications different in the scanning direction and in the direction perpendicular thereto respectively,

a first anamorphic optical element having a negative refracting power in the scanning direction and disposed in a projection optical path extending toward said photosensitive member,

a second anamorphic optical element having a positive refracting power and disposed in the projection optical path extending toward said photosensitive member, and

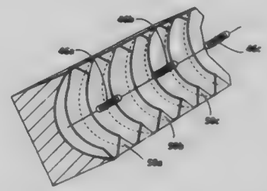
an anamorphic magnification change mechanism for varying a relative distance between said first and second anamorphic optical elements.

4,719,493

IMAGING SYSTEM INCLUDING A SEGMENTED FILAMENT LIGHT SOURCE WITH IMPROVED ILLUMINATION OUTPUT UNIFORMITY

Dominick J. Maiorano, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1987, Ser. No. 22,151
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—67 5 Claims



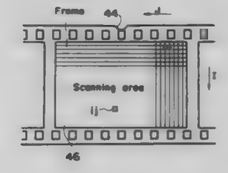
1. An imaging system comprising, in combination a linear, short focal length lens array, a segmented filament lamp, a reflector assembly positioned adjacent said lamp, said reflector comprising a series of specular hybrid cylindrical/roof mirror segments, each segment positioned with respect to the filament segments of said lamp so as to form an image of a portion of each filament in the spaces adjacent the lamp filaments, and an addressable image bar placed between said lamp and said array.

4,719,494

METHOD OF DETECTING NEGATIVE FILM FRAME WHICH NEED NOT BE PRINTED

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 718,122, Mar. 29, 1985, abandoned. This application Mar. 27, 1987, Ser. No. 31,192
Claims priority, application Japan, Mar. 30, 1984, 59-064804
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 18 Claims



1. A method of detecting any negative film frame of a film which need not be printed, said method comprising the steps of:

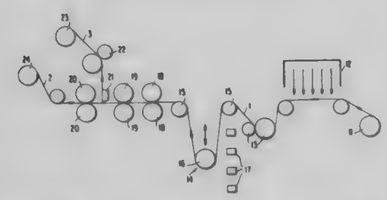
dividing a negative film frame into a multiplicity of small regions;

measuring a photographic density value at each of said small regions, wherein said photographic density value is a weighted mean value of respective photographic densities of certain color elements, said weighted mean value being obtained by giving more weight to the photographic density of the color element in the color developing layer closest to the base of the film than to the photographic densities of the other color elements;

determining whether a minimum value of the photographic densities measured in relation to any portion or the whole of the frame is higher than a predetermined value; and

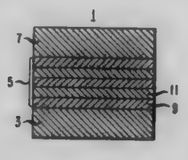
if the minimum value is higher than the predetermined value, excluding the negative film frame from printing.

4,719,495
EXPOSURE DEVELOPMENT DEVICE FOR LONG BASE MEMBER
Kazuo Obuchi; Chiharu Miyaake, and Yutaka Yamamura, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 25, 1986, Ser. No. 889,534
Claims priority, application Japan, Sep. 18, 1985, 60-206788
Int. Cl.⁴ G03B *27/30*
U.S. Cl. 355—100 **1 Claims**



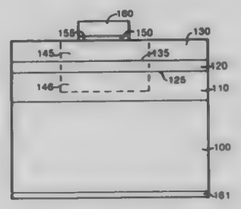
1. An exposure and development device comprising intermittent feed means for intermittently feeding a continuous laminate comprised of a substrate and image forming material to light exposing means, synchronous connecting means for intermittently receiving said laminate from said exposing means and converting the intermittent feeding of the laminate to continuous feeding and peel development means receiving said laminate from said synchronous connecting means for continuously peeling said image forming means from said substrate.

4,719,496
REPEATED VELOCITY OVERSHOOT SEMICONDUCTOR DEVICE
Federico Capasso, 205 Aylliffe Ave., Westfield, N.J. 07090; James A. Cooper, Jr., 25 Upper Warren Way, Warren, N.J. 07060, and Karvel K. Thornber, 23 Mercier Pl., Berkeley Heights, N.J. 07922
Continuation of Ser. No. 444,237, Nov. 24, 1982, abandoned. This application Feb. 12, 1986, Ser. No. 631,041
Int. Cl.⁴ H01L *45/00, 29/205*
U.S. Cl. 357—4 **20 Claims**



1. A semiconductor device comprising a repeated overshoot structure, said structure comprising at least two sections, each section comprising a first semiconductor region having a rapid change in potential, said change being produced by alternate n-type and p-type periodic doping profiles comprising alternating planar doped barrier layers or a staircase potential and a dimension such that the carrier transit time is shorter than or comparable to the electron scattering time and a second semiconductor region having a more gradual change in potential and a dimension such that the carrier transit time is sufficient to allow energy relaxation to occur.

4,719,497
HIGH EFFICIENCY LIGHT-EMITTING DIODE
Ming-Jong Tsai, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 620,978, Jun. 15, 1984, abandoned. This application May 27, 1986, Ser. No. 868,161
Int. Cl.⁴ H01L *33/00*; H01S *3/19*
U.S. Cl. 357—17 **12 Claims**

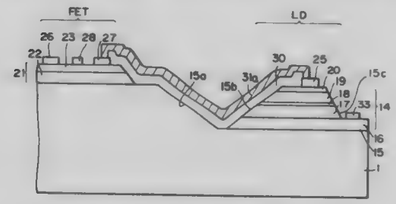


1. A device for emitting light of a predetermined frequency range, said device comprising:
a semiconductor base layer of a predetermined conductivity type and band gap;
a semiconductor active layer forming a first heterojunction with said base layer, said active layer having a conductivity type opposite to that of said base layer and having a band gap narrower than that of said base layer;
a semiconductor window layer forming a second heterojunction with said active layer, said window layer having a band gap wider than that of said active layer;
current means for supplying a current through said layers so that light can be generated in at least a portion of said active layer, said current means being electrically coupled to said window layer and said base layer; and
a dopant region extending generally orthogonally through said window and active layers and at least partially through said base layer, said dopant region being of conductivity type opposite that of said base layer so that a p-n junction is defined within said base layer, said p-n junction including the boundary of said region located within said base layer and including the portion of said first heterojunction outside said region so that when light is generated in said active layer at most a negligible amount of light is generated within said dopant region.

4,719,498
OPTOELECTRONIC INTEGRATED CIRCUIT
Osamu Wada, Ischara; Tatsuyuki Sanada, Yokohama; Shuichi Miura; Hideki Machida, both of Atsugi; Shigenobu Yamakoshi, Ebina, and Teruo Sakurai, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed May 14, 1985, Ser. No. 734,319
Claims priority, application Japan, May 18, 1984, 59-098542; May 18, 1984, 59-098543; May 18, 1984, 59-098544; May 19, 1984, 59-099691; Jun. 29, 1984, 59-133298
Int. Cl.⁴ H01L *27/14, 31/00*
U.S. Cl. 357—30 **4 Claims**

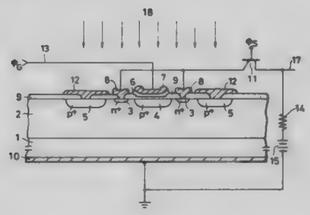
1. An optoelectronic integrated circuit semiconductor device comprising:
a semiconductor substrate having a first planar surface and a recess area therein having a lower planar surface and a first gentle slope between said first planar surface and said lower planar surface;
a multilayer optoelectronic semiconductor element formed on said lower planar surface and having a second planar surface nearly level with said first planar surface and a second gentle slope facing said first slope;
an electronic semiconductor element formed on said first planar surface;

electrode areas formed on said optoelectronic semiconductor element and said electronic semiconductor element; and
a wiring layer formed on said first and second slopes for con-



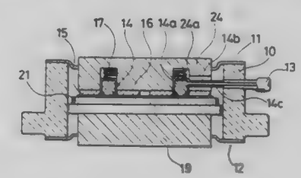
necting said electrode areas to form said optoelectronic integrated circuit semiconductor device;
said first and second gentle slopes each having an angle with said planar surfaces in the range 5° to 15°.

4,719,499
SEMICONDUCTOR IMAGING DEVICE
Junichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi; Takashige Tamamushi, and Sobei Suzaki, both of Miyagi, all of Japan, assignors to Junichi Nishizawa, Japan
Continuation of Ser. No. 782,141, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 561,105, Dec. 13, 1983, abandoned. This application Jul. 8, 1986, Ser. No. 882,454
Claims priority, application Japan, Dec. 13, 1982, 57-218588
Int. Cl.⁴ H01L *27/14*; H04N *3/14*
U.S. Cl. 357—30 **7 Claims**



1. A semiconductor imaging device comprising a plurality of pixels each comprising a static induction transistor comprising: a pair of principal electrode regions of one conduction type disposed facing each other through a channel region formed of high-resistivity semiconductor material; first and second gate regions of the other conduction type formed in contact with said channel region for controlling current flow between said two principal electrode regions; and a transparent electrically conductive electrode formed over at least part of said first gate region, a capacitor thereby being formed having as electrodes said transparent electrode and first gate region and having at least a nitride layer between said transparent electrode and said first gate region, carriers generated by light excitation being stored in said first gate region so as to effect control over current flowing between said two principal electrode regions; wherein said transparent electrode is transparent to the electromagnetic waves of a wavelength to be detected and serves as an electrode to connect said first gate region to an output of a gate control circuit, wherein said pair of principal electrode regions constitute the two principal electrodes of said transistor and said first and second gate regions jointly constitute the gate of said transistor.

4,719,500
SEMICONDUCTOR DEVICE AND A PROCESS OF PRODUCING SAME
Futoshi Tokunoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,823
Claims priority, application Japan, Mar. 15, 1984, 59-51623
Int. Cl.⁴ H01L *29/74, 23/48, 23/42*
U.S. Cl. 357—38 **7 Claims**

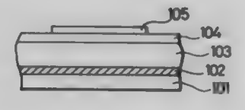


1. A semiconductor device which comprises:
a first main electrode on a first main surface of a semiconductor substrate, and a second main electrode on a second main surface thereof, said first main surface including a substrate control electrode;
a first outer electrode and a second outer electrode provided on said first and second main surfaces, respectively, wherein said first and second outer electrodes are connected to said first main electrode and said second main electrode, respectfully;
an external control electrode adapted for connection to said substrate control electrode;
an access electrode which connects said substrate control electrode to said external control electrode, said access electrode including a ring-shaped body which has a contact portion on an undersurface of said ring-shaped body, and which has a lead for connection to said external control electrode, wherein said ring-shaped body is covered with an insulating film, said insulating film being provided on said ring-shaped body in a thin and uniform manner, and said insulating film being excluded from said contact portion, and wherein said ring-shaped body is kept in contact with said substrate control electrode at said contact portion, and wherein said ring-shaped body is contained in a ring-shaped groove produced in said first outer electrode, and is kept in contact with said substrate control electrode by means of a spring contained in said ring-shaped groove.

4,719,501
SEMICONDUCTOR DEVICE HAVING JUNCTION FORMED FROM TWO DIFFERENT HYDROGENATED POLYCRYSTALLINE SILICON LAYERS
Katsumi Nakagawa, Tokyo; Toshiyuki Komatsu, Yokohama; Yutaka Hirai, Tokyo; Yoshiyuki Osada, Yokosuka; Satoshi Omata, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 453,158, Dec. 27, 1982, abandoned. This application Dec. 26, 1985, Ser. No. 815,113
Claims priority, application Japan, Jan. 6, 1982, 57-807; Jan. 6, 1982, 57-808; Jan. 6, 1982, 57-809
Int. Cl.⁴ H01L *29/04*
U.S. Cl. 357—59 **8 Claims**

1. A semiconductor device comprising, in sequence, a substrate, a polycrystalline silicon thin film on the substrate having a semiconductor junction formed by an interface of a first polycrystalline layer having a first type of electroconductivity and a second polycrystalline layer having a second type of

electroconductivity, wherein the film surface at the interface has an uneveness substantially not more than 800 Å at its maxi-



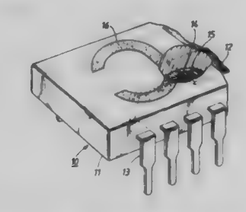
mum and wherein the layers constituting the film each contain from about 0.01 to 3 atomic percent of hydrogen.

4,719,502

EPOXY RESIN COMPOSITION, AND RESIN-SEALED SEMICONDUCTOR DEVICE IN WHICH THIS COMPOSITION IS USED

Hirotoshi Ikeya, Yokosuka, and Michiya Higashi, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 4, 1986, Ser. No. 892,436
Claims priority, application Japan, Aug. 7, 1985, 60-172396
Int. Cl.⁴ H01L *23/30*
U.S. Cl. 357—72 **11 Claims**



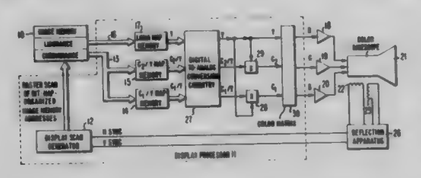
1. A resin-sealed type semiconductor device, in which the semiconductor element is sealed with resin, characterized in that the said resin is an epoxy resin composition comprising an epoxy resin, a curing agent having at least two phenolic hydroxyl groups per molecule, an organic phosphine compound and a metal complex dye.

4,719,503

DISPLAY PROCESSOR WITH COLOR MATRIXING CIRCUITRY AND TWO MAP MEMORIES STORING CHROMINANCE-ONLY DATA

Thomas R. Craver, Cranbury, and James H. Arbeiter, Hopewell, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 14, 1986, Ser. No. 918,565
Claims priority, application United Kingdom, Jun. 18, 1986, 861877
Int. Cl.⁴ H04N *11/12*; G09G *1/28*
U.S. Cl. 358—12 **11 Claims**



1. A display processor for color video signals comprising:
first and second map memories addressed in parallel, for storing values of first and second chrominance-only signals respectively, each normalized respective to luminance;
means for synchronously providing during display line trace intervals first and second streams of data, the first stream of data being descriptive of display luminosity fully sampled at a given spatial density, and the second stream of data being descriptive of display chromaticity fully sampled at said given spatial density and being applied as read addresses to said first and second map memories;
means responsive to said first stream of data for supplying a luminance-only signal;
means responsive to the read-outs of said first and second map memories for supplying first and second color-difference signals normalized respective to luminance;
means for multiplying, by said luminance signal, each of said first and second color-difference signals normalized respective to luminance, thereby to generate first and second color-difference signals; and
color matrixing circuitry for linearly combining these said first and second color-difference signals with said luminance-only signal for generating video drive signals in each of three primary colors.

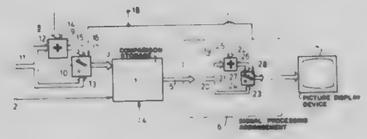
11. Apparatus for generating signals descriptive of color imagery comprising:
means for supplying a relatively wideband luminance signal;
means for supplying first and second color difference signals having narrower spatial bandwidths than said luminance signal, in all directions;
means for filtering said luminance signal to the same spatial bandwidth as each of said color difference signals;
means for dividing each of said color-difference signals by luminance signal filtered to the same narrower spatial bandwidth as its own; and
means responsive to the resulting quotients for generating chrominance-descriptive codes to accompany said relatively wideband luminance signal, as said signals descriptive of color imagery.

4,719,504

METHOD FOR CONVERTING AN ANALOG PICTURE SIGNAL INTO AN AMPLITUDE-DISCRETE OUTPUT SIGNAL

Peter E. Drabeim; Walter H. Demmer, and Otto L. Warmuth, all of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,432
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309080
Int. Cl.⁴ H04N *11/04, 9/65, 9/66*
U.S. Cl. 358—13 **8 Claims**



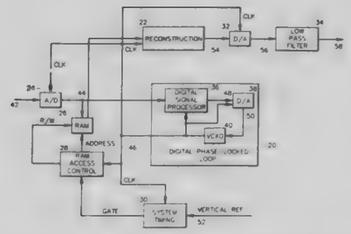
1. A method for converting an analog picture signal, corresponding to consecutive fields, into an amplitude-discrete output signal, comprising comparing the picture signal with a plurality of equispaced reference values having value intervals between them, producing from said comparison an amplitude-discrete intermediate signal which denotes the value interval in which the value of the picture signal is located, periodically changing the positions of the picture signal and the reference values relative to each other by a fraction of a value interval, and generating an amplitude-discrete output signal from an average value of the amplitude-discrete intermediate signal values of mutually corresponding picture elements, wherein the change in the position of the values of the picture signals relative to the reference values corresponds to the sum of the fraction and a first integral number of value intervals, characterized in that said method further comprises changing the value of the amplitude-discrete intermediate signal before the averaging operation is performed, by a value of an amplitude-discrete correction signal corresponding to the associated change in the relative positions of the picture signal and the reference values in the same direction as the change in the positions of the reference values relative to the picture signal.

4,719,505

COLOR BURST REGENERATION

Ron D. Katznelson, San Diego, Calif., assignor to M/A-COM Government Systems, Inc. and Cable/Home Communication Corp., both of San Diego, Calif., part interest to each

Filed Sep. 19, 1986, Ser. No. 909,511
Int. Cl.⁴ H04N *9/455*
U.S. Cl. 358—19 **5 Claims**



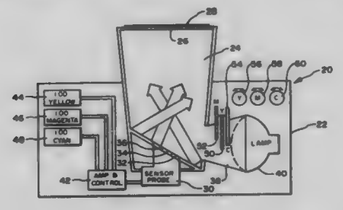
1. A system for regenerating a standard-length color burst signal from a less-than-standard-length color burst information signal of a given frequency and phase, comprising
means for generating a system clock signal from the color burst information signal, with said clock signal having a clock frequency related to and at least twice the given frequency of the color burst information signal;
means for sampling and storing phase information from the color burst information signal, wherein said sampling is clocked by the system clock signal; and
means for regenerating a standard-length color burst signal at the given frequency and in phase with the color burst information signal by retrieving and extrapolating the stored phase information, wherein said retrieval is clocked by the system clock signal.

4,719,506

METHOD FOR PREDICTABLY DETERMINING HALFTONE DOT SIZES WHEN ALTERING COLOR IN A COLOR SEPARATION PROCESS PRIOR TO SCANNING

Keith E. Van Buren, 24832 W. Lake Shore Dr., Round Lake, Ill. 60073

Continuation-in-part of Ser. No. 537,984, Sep. 30, 1983, abandoned. This application May 5, 1986, Ser. No. 859,656
Int. Cl.⁴ G03F *3/08, 3/10*
U.S. Cl. 358—80 **6 Claims**



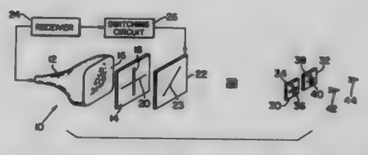
1. In a color separation process wherein a color transparency is scanned in order to generate separate yellow, magenta, and cyan halftone color separation films from which separate yellow, magenta, and cyan printing plates are made, said yellow, magenta, and cyan printing plates being used to reproduce said color transparency with yellow, magenta, and cyan printing inks, a method of predictably determining adjusted halftone dot sizes for said halftone color separation films such that said color transparency is reproduced with a desired color balance, said method comprising the steps of:
(a) determining initial relative intensities of yellow, magenta, and cyan components of white light passing through said color transparency when said color transparency is illuminated to have said desired color balance;
(b) determining initial respective dot sizes for each of said yellow, magenta, and cyan halftone color separation films in accordance with respective ones of said initial relative intensities of said yellow, magenta, and cyan components of said white light;
(c) determining amounts of correction to be made to said initial respective dot sizes for each of said yellow, magenta, and cyan halftone color separation films in order to compensate for contamination of said yellow, magenta, and cyan printing inks;
(d) adjusting said initial respective dot sizes for each of said yellow, magenta, and cyan halftone color separation films in accordance with said amounts of correction to be made to said initial respective dot sizes in order to yield respective adjusted dot sizes for each of said yellow, magenta, and cyan halftone color separation films, said respective adjusted dot sizes causing said color transparency to be reproduced with said desired color balance; and
(e) generating said separate yellow, magenta, and cyan halftone color separation films in accordance with said respective adjusted dot sizes for each of said yellow, magenta, and cyan halftone color separation films.

4,719,507

STEREOSCOPIC IMAGING SYSTEM WITH PASSIVE VIEWING APPARATUS

Philip J. Bos, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 26, 1985, Ser. No. 727,481
Int. Cl.⁴ H04N *13/00*
U.S. Cl. 358—92 **41 Claims**



1. A stereoscopic imaging system, comprising:
a light source that produces different views of a scene, the views including first and second images; and
image encoding means and passive image decoding means that are separated by a transmission medium,
the image encoding means including light polarizing means and variable optical retarding means for providing optical retardation selectively in first and second amounts that differ by substantially one-half wavelength, the first amount encoding the first image in light of a first polarization sense and the second amount encoding the second image in light of a second polarization sense, and
the image decoding means receiving the first and second images that propagate through the transmission medium and including first and second viewing means, the first viewing means comprising first optical retarding means for transmitting light of the first polarization sense and blocking light of the second polarization sense, and the second viewing means comprising second optical retarding means for transmitting light of the second polarization sense and blocking light of the first polarization sense, thereby selectively decoding the first and second images.

4,719,508

ENDOSCOPIC PHOTOGRAPHING APPARATUS

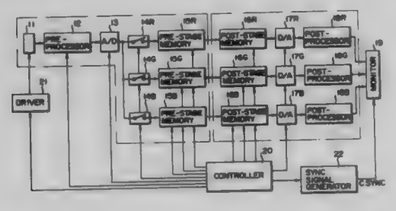
Masahiko Sasaki; Shinichi Kato; Tadashi Kato; Masahide Kanno; Yutaka Takahashi, and Katsuyuki Saito, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Oct. 1, 1986, Ser. No. 914,183

Claims priority, application Japan, Oct. 2, 1985, 60-219536; Oct. 8, 1985, 60-224395; Oct. 8, 1985, 60-224396; Oct. 18, 1985, 60-233083

Int. Cl.⁴ A61B *1/04, 1/06*

U.S. Cl. 358—98 **8 Claims**



1. An endoscopic photographing apparatus comprising:

image signal circuit means provided in an endoscope and including an image sensor for successively generating image signals, with every scanning line;

first memory means for successively storing the image signals, in synchronism with drive signals for driving said image sensor;

first readout means for successively reading the image signals from the first memory means by the interlacing method;

second memory means for successively storing the image signals, read by the readout means, by the interlacing method; and

an output section including second readout means for reading the image signals from the second memory means, in synchronism with television synchronizing signals.

4,719,509

VIDEO DATA INTERPOLATION APPARATUS

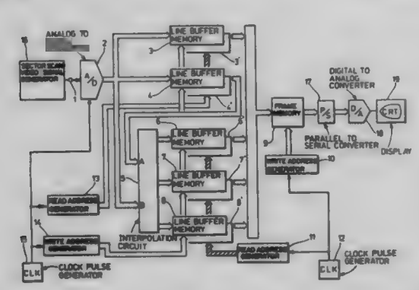
Tomosada Sakamoto, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP85/00010, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/04176, PCT Pub. Date Jul. 17, 1986

PCT Filed Jan. 10, 1985, Ser. No. 908,809

Int. Cl.⁴ H04N *5/30, 7/01*

U.S. Cl. 358—112 **6 Claims**



1. A video data interpolation apparatus for inserting one or more video data sets between a plurality of video data sets by interpolation and for storing all the data sets including the inserted data sets in a video memory, the inserted video data sets being associated with the plurality of video, data sets which are successively given by a predetermined length, said apparatus comprising:

two first buffer memories each of which has a storage capacity sufficient to store one video data set and each of which receives the video data sets not interpolated;

two second buffer memories each of which has a storage capacity sufficient to store one video data set and each of which receives the video data sets not interpolated;

an interpolating means having two inputs one of which receives a video data set not interpolated, the other receiving the video data set read from the second buffer memories by a reading means, the interpolating means producing one or more sets of video/data sets by interpolation, based on the video data sets applied to the two inputs;

one or more pairs of third buffer memories including two buffer memories each of which has a storage capacity sufficient to store one video data set, the third buffer memories being provided corresponding to number of interpolated video data sets delivered from the interpolating means, the third buffer memories receiving their respective interpolated video data sets;

a writing means for writing the input video data set alternately to the two buffer memories of each pair of the first, second, and third buffer memories;

said reading means for reading video data from those of the first, second, and third buffer memories to which data is not written by the writing means; and

said video memory for storing the video data sets read from the first and third buffer memories by the reading means.

4,719,510

TELETEXT DECODERS

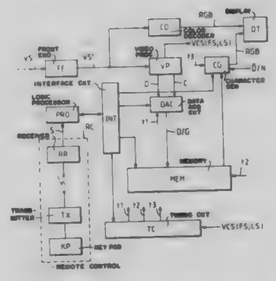
John R. Kinghorn, Ashtead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1986, Ser. No. 916,920

Claims priority, application United Kingdom, Oct. 16, 1985, 8525436

Int. Cl.⁴ H04N *7/04*

U.S. Cl. 358—147 **8 Claims**



1. A teletext decoder for teletext information comprising pages which are transmitted in a recurrent cycle, each page comprising a plurality of data rows containing character data codes, of which the first data row as transmitted includes the page number and each data row includes an individual row address, said teletext decoder further comprising means for selecting each of said pages by its page number, means for detecting a selected page number when received, and a page memory for storing the character data codes in each received data row of a selected page in respective character locations of a respective memory portion which is identified by the row address of the data row, the page memory being a random access memory into which character data codes can be written and read from at the respective character locations and each data code can over-write and thereby replace and data code already written into its character location by a previous writing action; and said teletext decoder being characterised by further comprising control means for permitting utilisation of only the stored data rows of the selected page, said control means comprising a "row-found" register having an individual flag position for each data row of each page, means for re-setting this register in response to the detection of the page number of a selected page, means for entering a flag into the relevant flag position responsive to each newly received data row of the selected page, and means for producing an inhibiting signal for any data row that does not have a flag in the flag position for that data row.

4,719,511

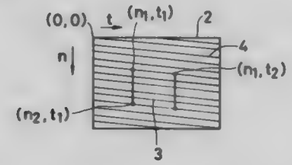
EXPOSURE CONTROLLING METHOD FOR TELEVISION CAMERA

Hitoshi Hirobe; Hideo Morita, and Takeharu Shia, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,749, Apr. 4, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 878,516

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213.19 **3 Claims**



1. A method of exposure control for a television camera, comprising the steps of:

providing a first signal for specifying a portion of an overall image pickup range of said television camera to be utilized for exposure photometry;

providing a range specifying signal when a scanning beam of said television camera is within said portion of the overall image pickup range specified by said first signal; said range specifying signal being produced by

(a) counting pulses of a horizontal synchronizing signal produced by said television camera;

(b) counting pulses of a vertical synchronizing signal produced by said television camera; and

(c) comparing said first signal with current values produced by said steps of counting said pulses of said horizontal and vertical synchronizing signals; said counting and comparing operations being effected through the use of a microcomputer; and

setting an exposure of said camera in response to a luminance signal output of said television camera when said range specifying signal is present.

4,719,512

NOISE CANCELLING IMAGE SENSOR

Yukio Endo, and Nozomu Harada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 661,683, Oct. 17, 1984. This application Jun. 10, 1986, Ser. No. 872,409

Claims priority, application Japan, Oct. 18, 1983, 58-195080; Nov. 11, 1985, 60-252193

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213.18 **7 Claims**

1. An image-sensing apparatus comprising:

(a) image sensor means for receiving an incident image light to generate an electrical CCD output signal, said image sensor means including a solid-stage image sensor which has,

a substrate,

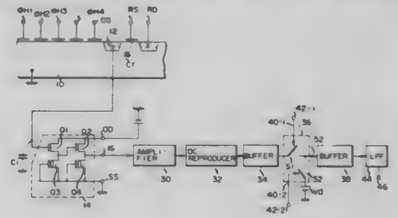
a photosensing picture element section formed on said substrate, for photoelectrically converting the image light to produce one set of signal carriers,

a carrier detecting section formed on said substrate so as to be electrically floating, said carrier detecting section receiving the signal carriers transmitted thereinto,

sense amplifier circuit means for detecting the variation in a voltage due to the transfer of said carriers into said carrier detecting section, thereby outputting a detection signal, and

resetting means formed on said substrate, for resetting the potential of said carrier detecting section to a predetermined potential at every read-out period of said photosensing picture element section; and

(b) noise-eliminating means connected to said image sensor device, for dividing one picture element period of the CCD output signal into a first period during which the



CCD output signal consists of a noise component generated in said image sensor itself and a second period during which the CCD output signal consists of a mixture of a noise componet and an effective image signal component and which is longer than the first period, for amplifying the CCD output signal at first and second amplification gains which are determined to be different from each other during the first and second periods in such a manner that the first gain is large enough to make an integration value of the noise component appearing in the first period substantially equal to that in the second period, for inverting the differently amplified CCD output signal only during one of the first and second periods, and for adding signal waveforms of said CCD output signal to which are generated during the first and second periods to each other, to whereby cancel out the noise components appearing in the first and second periods.

4,719,513

COMPACT VIDEO SYSTEM

Dean M. Peterson, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,324

Int. Cl.⁴ H04N *5/655, 5/74*

U.S. Cl. 358—254 **4 Claims**

1. A compact video system comprising:

a cart including a lower housing and a separate upper housing;

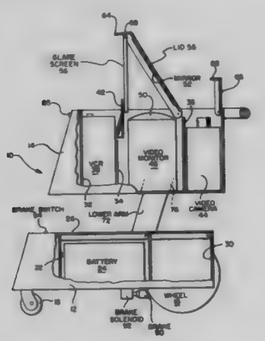
wheel means mounted on said lower housing for moving said cart;

means for adjustably supporting said upper housing relative to said lower housing;

drive means associated with said support means for selectively driving said support means to raise and lower said upper housing relative to said lower housing;

brake means cooperatively associated with said wheel means

for locking said wheel means against rotation to prevent movement of said cart; and

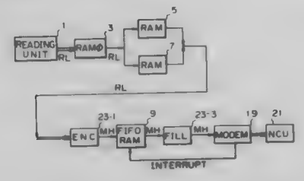


means for actuating said brake means to lock said wheel means when said upper housing is lowered into contact with said lower housing.

4,719,514
METHOD AND APPARATUS FOR IMAGE TRANSMISSION

Sadasuke Kurahayashi, Niiza; Tsunehiro Watanabe, Tokyo; Masahiro Sakamoto, Tokyo; Yasuhide Ueno, Tokyo; Takeshi Ono, Yokohama; Shigeo Miura, Tokyo; Tsuneo Negi, Yokohama, and Masatomo Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,780
Claims priority, application Japan, Mar. 1, 1985, 60-41408; Mar. 1, 1985, 60-41409; Mar. 1, 1985, 60-41410
Int. Cl.[4] H04N *1/419*
U.S. Cl. 358—261 17 Claims

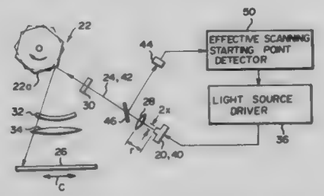


1. An image transmission method comprising the steps of:
obtaining an image signal by reading an original image;
compression-encoding the obtained image signal;
temporarily storing the encoded image data in a temporary storage memory;
receiving, prior to transmission of the encoded data, process time data of a receiving side and a capacity of a buffer memory for temporarily storing the received image data at the receiving side;
presuming an amount of empty capacity of the buffer memory at the receiving side based on the process time and the capacity of the buffer memory; and
transmitting the encoded image data in accordance with the presumed empty capacity.

4,719,515
METHOD OF GENERATING SYNCHRONIZING SIGNALS

Ichirou Miyagawa, and Noboru Arai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1986, Ser. No. 899,356
Claims priority, application Japan, Aug. 23, 1985, 60-185096
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—268 3 Claims



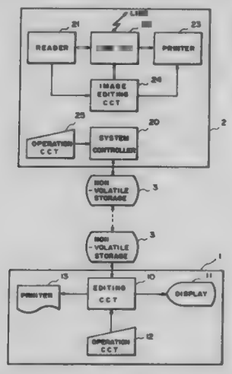
1. A method of generating a synchronizing signal in relation to the scanning of a recording medium with a scanning light beam emitted from a scanning light source and deflected by a light deflector, said synchronizing signal having an output power, and said method comprising the steps of:
(i) emitting a synchronizing-signal generating laser beam from a synchronizing-signal generating laser source;
(ii) deflecting the synchronizing-signal generating laser beam with said light deflector in synchronous relation to the deflection of said scanning light beam;
(iii) applying the synchronizing-signal generating laser beam deflected by said light deflector back to said synchronizing-signal generating laser source at least once when the synchronizing-signal generating laser beam is deflected through a prescribed angle during one scanning cycle; and
(iv) detecting a change in said output power of said synchronizing-signal generating laser source which is caused upon application of the synchronizing-signal generating laser beam back to said synchronizing-signal generating laser source, for thereby generating the synchronizing signal.

4,719,516
IMAGE PROCESSING APPARATUS

Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 451,263, Dec. 20, 1982, abandoned.
This application Mar. 10, 1986, Ser. No. 837,745
Claims priority, application Japan, Dec. 25, 1981, 56-209034; Dec. 25, 1981, 56-209035; Dec. 25, 1981, 56-209036; Dec. 25, 1981, 56-209037; Dec. 25, 1981, 56-209038; Dec. 25, 1981, 56-209039
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—780 25 Claims

1. An image processing apparatus comprising:
image processing means operable to execute different forms of image processing;
storage means comprising a solid-state memory, detachable from said image processing apparatus and adapted to store data related to image processing to be executed by said image processing means; wherein said image processing means is arranged to process the image in accordance with the data stored in said storage means when it is attached to said processing apparatus and wherein said image processing means is arranged to be incapable of image processing when there is no said storage means attached thereto; and

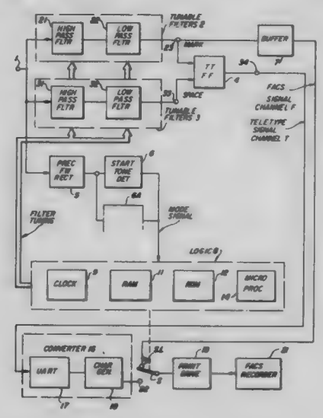


indicator means for providing an indication when said image processing means cannot perform the image processing operation.

4,719,517
TELETYPE COMPATIBLE FACSIMILE RECORDER

Gerald L. Vano, Brockton, Mass., assignor to Aldea Research Foundation, Brockton, Mass.

Filed Feb. 24, 1986, Ser. No. 831,842
Int. Cl.[4] H04N *1/21, 1/40, 1/32*
U.S. Cl. 358—296 5 Claims

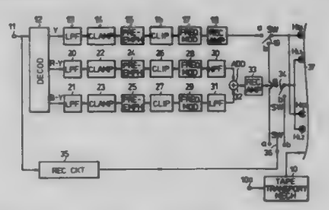


1. A facsimile system for recording graphic signals comprising:
a facsimile signal channel carrying electrical signals in raster format;
a teletype signal channel carrying electrical signals in pulse code format;
a graphic signal printer for recording electrical signals in a raster format; and
switch means for selectively connecting the facsimile channel or the teletype channel to the printer;
wherein the teletype channel includes signal conversion means responsive to teletype signals to produce corresponding signals in raster format utilized by the printer so that both facsimile and teletype signals can be printed at the selection of the switch means.

4,719,518
MAGNETIC RECORDING APPARATUS FOR CARRYING OUT RECORDING BY SELECTIVELY USING ONE OF TWO KINDS OF RECORDING SYSTEMS

Koichi Kido, Yokosuka; Kenji Shibayama, Tokyo; Masahiko Tsuruta, Yokohama; Akira Hirota, Chigasaki; Masato Mihara, Hiratsuka, and Osamu Inoue, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 22, 1986, Ser. No. 899,545
Claims priority, application Japan, Aug. 23, 1985, 60-185588; Aug. 26, 1985, 60-187030; Aug. 30, 1985, 60-191155; Aug. 30, 1985, 60-191156; Sep. 18, 1985, 60-205804
Int. Cl.[4] H04N *980*
U.S. Cl. 358—330 11 Claims



1. A magnetic recording apparatus for carrying out a recording by selectively using one of two kinds of recording systems, said magnetic recording apparatus comprising:
first and second rotary magnetic heads mounted on a rotary body at mutually opposing positions on a rotational plane of said rotary body, said rotary body being wrapped obliquely with a magnetic tape on an outer peripheral surface thereof for a predetermined angular range, said first and second rotary magnetic heads having identical height positions along an axial direction of said rotary body and respectively having gaps with first and second azimuth angles, said first and second azimuth angles being identical to standardized azimuth angles of gaps of rotary magnetic heads used in an existing magnetic recording and/or reproducing apparatus employing a low band conversion color recording and reproducing system, said low band conversion color recording and reproducing system recording and reproducing a frequency division multiplexed signal comprising a frequency modulated luminance signal and a frequency converted carrier chrominance signal which has been frequency-converted into a frequency band lower than a frequency band of the frequency modulated luminance signal;
third and fourth rotary magnetic heads mounted on said rotary body at mutually opposing positions respectively close to said first and second rotary magnetic heads on the rotational plane of said rotary body along a rotating direction of said rotary body, said third and fourth rotary magnetic heads having height positions different from the height positions of said first and second rotary magnetic heads and respectively having gaps with said first and second azimuth angles;
first signal producing means for producing a frequency modulated luminance signal by frequency-modulating a carrier by a luminance signal;
second signal producing means for producing a first frequency division multiplexed signal at least including one or two frequency modulated color difference signals;
third signal producing means for producing a second frequency division multiplexed signal comprising a frequency modulated luminance signal and a frequency converted carrier chrominance signal, said second frequency division multiplexed signal having a frequency spectrum identical to a frequency spectrum of the frequency division multiplexed signal recorded and reproduced in said existing magnetic recording and/or reproducing appara-

tus employing the low band conversion color recording and reproducing system; and

switching means for selectively supplying said frequency modulated luminance signal from said first signal producing means to said first and second rotary magnetic heads and supplying said first frequency division multiplexed signal from said second signal producing means to said third and fourth rotary magnetic heads when a luminance/color separation recording system is selected as the recording system, and for selectively supplying said second frequency division multiplexed signal from said third signal producing means to one pair of rotary magnetic heads out of a first pair constituted by said first and second rotary magnetic heads and a second pair constituted by said third and fourth rotary magnetic heads, said luminance/color separation recording system independently but simultaneously recording a luminance signal and a color signal on two parallel tracks of the magnetic tape,

when said luminance/color separation recording system is selected as the recording system a track recorded with said frequency modulated luminance signal from said first signal producing means being formed by one of said first and second rotary magnetic heads and a track recorded with said first frequency division multiplexed signal being formed by one of said third and fourth rotary magnetic heads simultaneously at different parts on the magnetic tape,

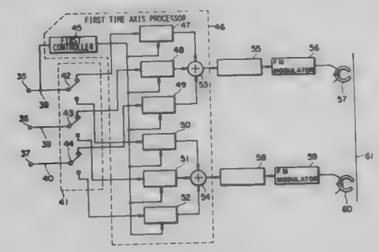
when said low band conversion color recording system is selected as the recording system tracks recorded with said second frequency division multiplexed signal being successively formed on the magnetic tape by one of said first and second pairs of rotary magnetic heads constituted by two rotary magnetic heads which alternately scan the magnetic tape.

4,719,519

COMPONENT VIDEO SIGNAL MAGNETIC RECORDING AND REPRODUCING APPARATUS INCLUDING MEANS FOR EXPANDING AND COMPRESSING LUMINANCE AND COLOR DIFFERENCE SIGNALS

Akifumi Ide, Kadoma, and Chojuro Yamamitsu, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 19, 1985, Ser. No. 714,017
Int. Cl.⁴ H04N *9/80*
U.S. Cl. 358—310 **7 Claims**



1. A component video signal magnetic recording and reproducing apparatus comprising:

for a recording part

a signal divider for dividing a luminance signal and a pair of color difference signals into two groups of respective signals, each of said groups of respective signals being generated at the output of said divider during alternate horizontal scan periods;

a first time axis processor for expanding the time axis of said divided luminance signals, compressing the time axis of the divided color difference signals, and multiplexing the time axis expanded luminance signals and the time axis compressed color difference signals to produce two multiplexed signals having durations of two horizontal scan periods respectively; and

means for processing the two multiplexed signals for recording on different tracks; and

for a reproducing part

means for reproducing the multiplexed signals from said tracks;

a timing compensator for compensating for a timing difference between said two reproduced multiplexed signals, the outputs of said timing compensator being luminance and color difference signal components;

a second time axis processor for compressing the time axis of the luminance signal component of the multiplexed signals from said timing compensator to recover the divided luminance signals and expanding the time axis of the color difference signal components of the multiplexed signals from said timing compensator to recover the color difference signals; and

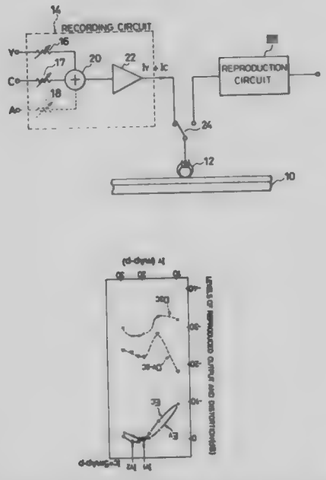
means for producing a continuous luminance signal and a pair of continuous color difference signals by combining the recovered respective signals from said second time axis processor.

4,719,520

METHOD AND APPARATUS FOR SETTING RECORDING CURRENT IN PERPENDICULAR MAGNETIC RECORDING APPARATUS

Masanori Isshiki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 11, 1985, Ser. No. 721,890
Claims priority, application Japan, May 10, 1984, 59-93188
Int. Cl.⁴ H04N *9/79, 9/83;* **G11B** *5/03*
U.S. Cl. 360—20 **20 Claims**



1. Perpendicular magnetic recording method for recording a first signal current and a second signal current having a frequency lower than that of the first signal current, comprising the steps of:

setting the recording level of said first signal current to be a level greater than the current level at which a reproduced output level of said first signal current is maximized, said maximum of said reproduced output level being determined by varying said first input current while holding said second input current constant;

setting the recording level of said second signal current to a level at which the reproduced output level of said second signal current is approximately equal to the reproduced output level of said first signal current;

superimposing said first and second signal currents;

supplying said superimposed currents to a magnetic head; and

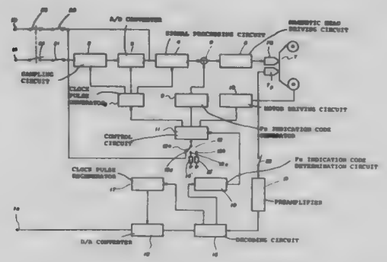
magnetizing a magnetic recording medium with said magnetic head supplied with said superimposed currents, said medium having an axis of easy magnetization perpendicular to its surface.

4,719,521

PCM RECORDING AND REPRODUCING APPARATUS

Hiromi Juso, Gose, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1985, Ser. No. 740,532
Int. Cl.⁴ G11B *5/00, 15/46*
U.S. Cl. 360—32 **7 Claims**



1. A PCM recording and reproducing apparatus for recording a digital signal, obtained by sampling and quantizing analog signals, on a recording medium after adding a control word and a synchronizing signal to said digital signal in a signal processing circuit, said apparatus comprising:

sampling frequency setting means for selecting a sampling frequency,

control means for controlling the speed of recording said digital signal on said recording medium to correspond with the sampling frequency set by said sampling frequency setting means,

sampling frequency indication code generating means for generating a sampling frequency indication code representative of said sampling frequency, and

means for adding said sampling frequency indication code to said digital signal.

4,719,522

METHOD OF MAGNETIC RECORDING

Kiyotaka Kaneko; Chikuni Kawakami, and Yasuhito Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

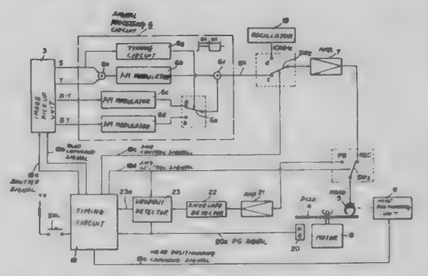
Filed Aug. 5, 1985, Ser. No. 762,614
Claims priority, application Japan, Aug. 9, 1984, 59-165575
Int. Cl.⁴ H04N *5/78, 9/491*
U.S. Cl. 360—38.1 **3 Claims**

1. A method of magnetic recording still pictures onto an annular track of a magnetic disc using an FM recording signal that provides, for the purpose of tracking, a signal having a pre-determined frequency extracted from a reproducing output of a magnetic head which is brought into a position in which the amplitude said recorded signal of pre-determined frequency becomes substantially maximum, said method comprising the steps of:

recording said FM recording signal onto said annular track of said magnetic disc by use of a magnetic recording reproducing head;

without moving the recording reproducing head, immediately reproducing said recorded signal to detect the presence and absence of drop-outs in the thusly recorded signal;

when the result of detection proves that said recording signal recorded on said track includes a drop-out, then, using said recording reproducing head, and without moving said recording reproducing head, to record a signal on



said annular track having a frequency different from said predetermined frequency, and, in superposed relation with said recorded signal, to modify the first recorded signal comprised of said pre-determined frequency to an unintelligible form when reproduced by said recording reproducing head; and,

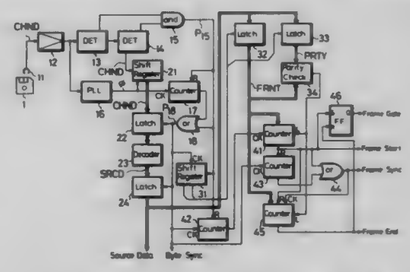
then moving said recording reproducing head and recording the same FM recording signal of said predetermined frequency as that recorded on said drop-out-including track, onto a separate of said disc.

4,719,523

SYNCHRONIZING SIGNAL DETECTING CIRCUIT

Ken Kutaragi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1986, Ser. No. 857,258
Claims priority, application Japan, May 28, 1985, 60-114692
Int. Cl.⁴ G11B *5/09*
U.S. Cl. 360—51 **10 Claims**



1. A synchronizing signal detecting circuit for digital data reproducing apparatus comprising: reproducing means for deriving digital signals from a storage medium; phase locked loop means connected to said reproducing means for generating clock signals based on said derived digital signals; synchronizing counter means for generating synchronizing timings by counting said clock signals; a plurality of synchronizing pattern detecting means connected to said reproducing means for detecting synchronizing patterns included in said digital signals; and logic circuit means connected to said plurality of synchronizing pattern detecting means for supplying an initialize pulse to said synchronizing counter means upon detecting

successive synchronizing patterns in said digital signals at said plurality of synchronizing pattern detecting means.

4,719,524

SIGNAL REPRODUCTION APPARATUS INCLUDING TOUCHED STATE PATTERN RECOGNITION SPEED CONTROL

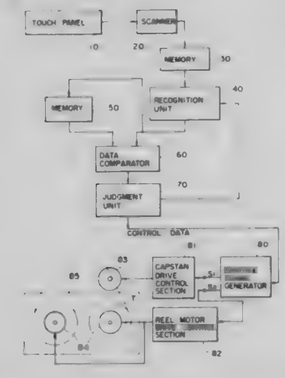
Shinichi Morishima; Syousuke Tanaka, both of Kanagawa, and Takahide Ohtani, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 784,752

Claims priority, application Japan, Oct. 8, 1984, 59-211035; Mar. 30, 1985, 60-47970

Int. Cl.⁴ G11B *15/46*

U.S. Cl. 360—73 **7 Claims**



1. Signal reproduction apparatus for reproducing one of a video signal and an audio signal from a recording medium, comprising:

panel means having a plurality of detection regions;

touch detection means for detecting a touched state of each of said detection regions and producing detectio output data in response thereto;

first memory means for temporarily storing said detection output data from said touch detection means;

recognition means for recognizing composite touched states of said panel means as respective patterns in response to detection output data read out from said first memory means and producing pattern data corresponding to the recognized patterns;

second memory means for temporarily storing said pattern data obtained from said recognition means;

data comparison means for comparing first pattern data corresponding to the pattern recognized from a prevailing composite touched state and obtained from said recognition means with second pattern data corresponding to the pattern recognized from a preceding composite touched state and obtained from said second memory means and detecting a change between said first and second pattern data, said data comparison means producing comparison output data corresponding to the detected change in response thereto;

control data generating means for providing control data according to said comparison output data obtained from said data comparison means;

data reading means for reading the one signal from said recording medium;

drive means for producing relative movement between said data reading means and said recording medium at respective relative speeds; and

drive control means for controlling the relative speeds of said data reading means and said recording medium in response to said control data so as to reproduce the one signal from said recording medium at a corresponding speed.

4,719,525

TRACK POSITION CORRECTION FOR A HELICAL SCAN MAGNETIC PLAYBACK

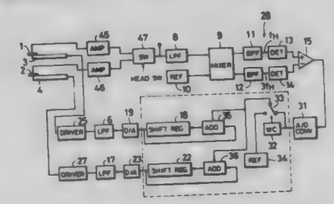
Tsunao Hasegawa; Ichiro Miyake, and Ryuichiro Yoshimura, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,291

Claims priority, application Japan, Apr. 17, 1985, 60-81693; Apr. 24, 1985, 60-87841

Int. Cl.⁴ G11B *5/58*

U.S. Cl. 360—77 **8 Claims**



1. A helical scan magnetic playback for recording data on tracks of a tape and playing back the data by means of at least one rotary head, the tracks being inclined to a direction of movement of said tape, said playback comprising:

means for moving said rotary head in a direction transverse to said tape movement direction in the plane of said tape; and

a circuit for producing a plurality of different, successive values of a driving signal, during a time said rotary head traverses a location data portion of said tape located in a traansverse portion of said tape, for controlling said moving means, wherein said driving signal can cause said head to move a distance selected from a plurality of non-zero distances of a given sign in one rotation of said rotary head, said driving signal being produced once during a complete movement of said rotary head across a width of said tape and being produced only when said tape is moved at a higher of two tape movement speeds, said circuit not causing said rotary head to move in transverse portions of said tape outside said location data portion.

4,719,526

DISK MEMORY DEVICE

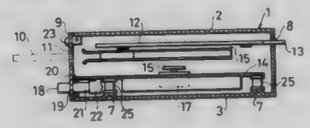
Masao Okita, and Atsushi Iwanaga, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 12, 1985, Ser. No. 797,248

Claims priority, application Japan, Nov. 10, 1984, 59-169811[U]

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—97 **7 Claims**



1. A disk memory device comprising:

a housing including a bottom wall;

a front panel attached to a front part of the housing and having a lateral slot therein for insertion of a replaceable memory disk into the housing;

a disk memory device mechanism including a movable guide member for receiving a memory disk inserted through the slot into the housing, a disk drive unit for driving a memory disk lowered by the guide member to a loading position thereon, and a support chassis supporting the guide member and the disk drive unit which is resiliently mounted on the bottom wall of the housing; and

vibroisolating means mounted between the bottom wall and the support chassis for resiliently holding the support chassis in place and isolating the disk memory device mechanism from the housing such that vibrations applied to the housing are not applied to the disk memory device mechanism,

whereby the disk memory device mechanism can be operated resiliently isolated from vibrations applied to the housing and with a minimum of any positional error between the insertion slot and the guide member to allow smooth insertion of the memory disk in the housing.

4,719,527

COMPOSITE MAGNETIC HEAD HAVING ACCURATELY ALIGNED GAPS

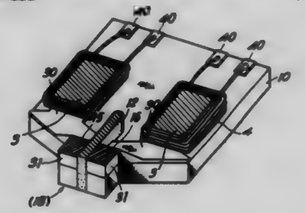
Yorinobu Yoshisato, Hirakata; Hideki Yoshikawa, Osaka; Kazuhiko Taketa, Hirakata; Isao Yasuda, Katano; Kenji Kubota, Hirakata, and Kazuhiko Takahashi, Amagasaki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 30, 1985, Ser. No. 793,007

Claims priority, application Japan, Oct. 31, 1984, 59-229807; May 14, 1985, 60-102071; May 16, 1985, 60-104248; May 17, 1985, 60-106382; May 17, 1985, 60-106383

Int. Cl.⁴ G11B *5/29, 5/31, 5/17*

U.S. Cl. 360—121 **9 Claims**



1. A magnetic head, comprising:

a pair of head chips disposed adjacent one another, each head chip including,

(a) a pair of plate-like magnetic cores joined together, and

(b) a gap provided at the junction of said magnetic cores such that said gap from each pair of magnetic cores lie in a common plane with the other gap, said common plane being generally perpendicular to the direction of travel of an associated recording medium,

wherein said magnetic cores of each pair are superposed on one another, each in a plane generally parallel to said common plane;

wherein each magnetic core includes,

(a) a head with a small width substantially equal to the width of recording tracks on the recording medium

(b) an end portion having a larger width than said head and located opposite said head, and

(c) a stud portion disposed on at least one of said pair of magnetic cores at the increased witdth portion thereof and projecting toward the other core,

wherein the end portion, of at least one of said magnetic cores of each pair of cores, is offset with respect to said head, and said stud portion is disposed on the magnetic core having said offset end portion;

a shield portion generally perpendicular to said common plane and being interposed between said head chips for separating said head chips from one another;

a coil wound around said stud portion of each headchip; and

a pair of base plates, each base plate being disposed on one side of said pair of head chips, said base plates being generally parallel to said common plane and having a small width head portion substantially equal to the width of each head of said magnetic cores.

4,719,528

GUIDE DRUM

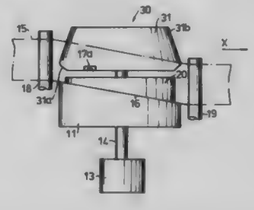
Fumiaki Sato, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Dec. 17, 1985, Ser. No. 810,869

Claims priority, application Japan, Dec. 24, 1984, 59-195676[U]

Int. Cl.⁴ G11B *15/60*

U.S. Cl. 360—130.24 **12 Claims**



1. A guide drum comprising at least one magnetic head for recording and/or reproducing a signal on and/or from a magnetic tape, said magnetic tape travelling in a spirally wrapped path having ends around an outer peripheral surface of the guide drum over a predetermined circumferential range which has an entrance part at one end and an exit part at the other end thereof, said guide drum comprising:

a stationary drum having a tape guide for guiding the magnetic tape along a predetermined tape path; and

a rotary drum provided rotatable with respect to said stationary drum, said magnetic head being provided on said rotary drum and projecting from an outer peripheral surface of said rotary drum by a predetermined projecting quantity,

said rotary drum having a first tapered part which is formed below a reference position having a specific height from a lower edge of said rotary drum and a second tapered part which is formed above said reference position, said first tapered part having an outer peripheral surface with a diameter which gradually decreases toward said stationary drum, said second tapered part having an outer peripheral surface with a diameter which gradually decreases in a direction away from said stationary drum,

said magnetic tape opposing said first and second tapered parts of said rotary drum at said entrance part of said guide drum and opposing substantially said first tapered part of said rotary drum and said stationary drum at said exit part of said guide drum.

4,719,529

MAGNETIC TAPE CASSETTE INCORPORATING PREVENTION OF UNWANTED ROTATION DURING TRANSPORTATION

Kengo Oishi, and Choji Komiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1985, Ser. No. 783,397

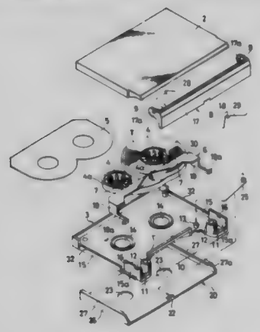
Claims priority, application Japan, Oct. 12, 1984, 59-153111[U]

Int. Cl.⁴ G11B *23/08*

U.S. Cl. 360—132 **5 Claims**

1. In a magnetic tape cassette of the type incorporating a pair of hubs on which a magnetic tape is wound, an opening through which said magnetic tape can be pulled out of said cassette, and a swingable guard panel having right and left-hand end pieces, said guard panel being adapted to close the front part of said opening; the improvement comprising a locking member having arms engaged with said right and

left-hand end pieces of said guard panel, wherein each of said pair of elongated engaging parts comprises flexible bridge means for flexibly holding an engaging end of the respective engaging part in positive engagement with the respective hub so that said engaging end is elastically retractable towards the



front end of said cassette, a pair of elongated engaging parts adapted to lock said hubs, and spring means for urging said engaging parts into contact with said hubs when said guard panel is closed, said end pieces of said guard panel camming said engaging parts out of engagement with said hubs as said guard panel is opened.

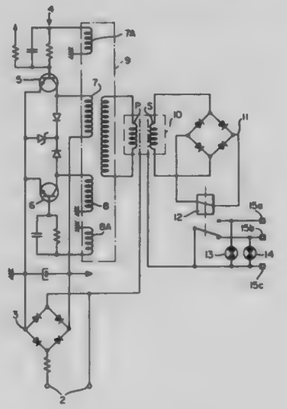
4,719,530

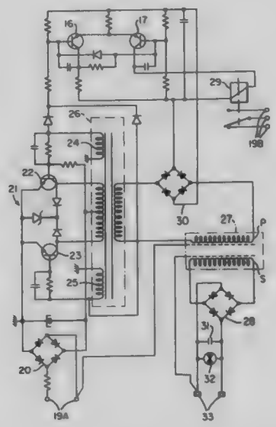
LIGHTNING PROTECTION SYSTEM FOR A REMOTE CONTROL CIRCUIT UTILIZING AN ISOLATION TRANSFORMER

Guy Berdanos, 25, avenue de Romans, 38360 Sassenage, France

PCT No. PCT/FR83/00054, § 371 Date Nov. 21, 1983, § 102(e) Date Nov. 21, 1983, PCT Pub. No. WO83/03500, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 21, 1983, Ser. No. 562,597
Claims priority, application France, Mar. 22, 1982, 82 05053
Int. Cl.⁴ H02H *7/22*
U.S. Cl. 361—66 3 Claims

1. A remote control system having a sending station and a remote receiving station connected by a signal transmission line subject to overvoltage induced by lightning strikes; said control system including on On—Off signal input means (2), sending oscillator means (4) for converting an input signal into an oscillation in a sending oscillator transformer (9), said sending oscillator transformer (9) including means coupling said sending oscillator transformer to a sending isolation transformer (10) having a high insulation breakdown voltage and a low coupling capacity between the sending isolation transformer windings, said isolation transformer (10) being coupled to a sending rectifier (11), a sending relay (12) coupled to said sending rectifier and including contacts movable between controlling positions, the contacts of said sending relay arranged to control the switching state of said signal transmission line (15a–15c), said remotely located receiving station being connected to said signal transmission line at a signal input terminal (33), said receiving station including continuously energized power input means (19A), receiving oscillator means (21) for converting the power input into an oscillation in a receiving oscillator transformer (26), said receiving oscillator transformer being coupled to a receiving isolation transformer (27) having a primary and a secondary winding similar to said sending isolation transformer (10), a threshold detection circuit (16, 17) coupled to said receiving primary winding of said receiving isolation transformer, a load relay)29), said load relay controlled by said threshold detection circuit, said secondary winding of said receiving isolation transformer (27) being coupled to said signal transmission line whereby short circuiting of said signal transmission line at said sending relay contacts increases current flow in the secondary and primary windings of said receiving isolation transformer (27) to activate said threshold detector and energize said load relay (29) while opening said sending relay contacts and reducing current flow





in said secondary and primary windings of said receiving isolation transformer to deactivate the threshold detector and deenergize said load relay.

4,719,531

OVERCURRENT PROTECTIVE CIRCUIT FOR MODULATED-CONDUCTIVITY TYPE MOSFET

Chihiro Okado, Fuchu; Yoshihiro Yamaguchi, Urawa, and Akio Nakagawa, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 15, 1986, Ser. No. 863,515
Claims priority, application Japan, May 15, 1985, 60-103308; May 15, 1985, 60-103311
Int. Cl.⁴ H02H *3/24*
U.S. Cl. 361—86 14 Claims

1. An overcurrent protective circuit including a BIFET having a source, a drain, and a gate connected to an output terminal of a gate signal generating circuit, comprising:

first voltage detection means for detecting a voltage between the drain and source of said BIFET; and

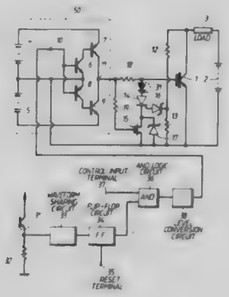
main switching means for instantaneously lowering a voltage between the gate and source of said BIFET according

to the output of said voltage detection means and for preventing the failure of turn-on and the delay of turn-on of said BIFET, comprising:

a thyristor having an anode, a cathode and a gate, said anode connected to the gate of said BIFET;

a first zener diode connected to the gate of said thyristor;

a first MOSFET having a drain connected to the cathode of said thyristor, a source connected to the source of said BIFET, and a gate;



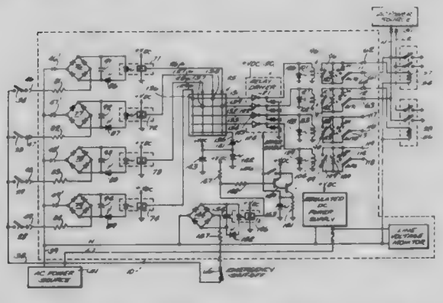
a first resistor means connected between the gate of said first MOSFET and said output terminal of said gate signal generating circuit, said first MOSFET having a gate capacitance which in combination with said first resistor means results in a delay in turn-on of said first MOSFET until after turn-on of said BIFET upon application of a turn-on signal to said output terminal of said gate signal generating circuit.

4,719,532

ELECTRICAL CONTROLLER

Russell E. Schneider, 860 Shorewood Dr., East Troy, Wis. 53130

Filed Feb. 26, 1986, Ser. No. 833,899
Int. Cl.⁴ H01H *47/00, 9/00*
U.S. Cl. 361—189 17 Claims



1. An electrical controller for controlling a plurality of electrical devices in accordance with control inputs received from a plurality of control input sources, said controller comprising:

isolating means coupled to the control input sources for electrically isolating the control input sources from each other and for developing a plurality of individual control voltages corresponding to the individual control inputs developed by the individual control input sources;

a plurality of output means for actuating individual ones of the electrical devices in response to the development of said control voltages; and

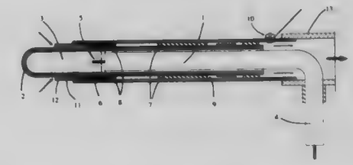
selector means for selectively coupling said isolating means to individual ones of said output means to apply said control voltages to said output means and thereby actuate individual ones of the electrical devices in response to the development of control inputs by selected ones of the control input sources.

4,719,533

DEVICE FOR TREATING SURFACES OF OBJECTS

Artur Koch, Schwalmtal-Brauerschwend, Fed. Rep. of Germany, assignor to Ahlbrandt Systems GmbH, Lauterbach, Fed. Rep. of Germany

Filed Dec. 22, 1986, Ser. No. 944,078
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1986, 3603406
Int. Cl.⁴ H01T *23/00*
U.S. Cl. 361—230 4 Claims



1. A device for treating surfaces of objects by means of electrical corona discharge, comprising:

an external tube formed from an electrically conductive material and connected to a voltage source of ground potential;

a discharge electrode positioned in the external tube out of which a short discharge region projects, the discharge electrode including:

a discharge tube composed of an insulating material, the discharge tube being closed on one end;

a conductive material disposed in the closed end of the discharge tube to define the discharge region; and

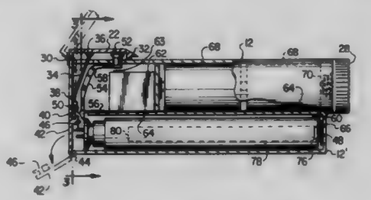
a high frequency ignition cable disposed inside the discharge tube and having a non-insulated end projecting into the conductive material.

4,719,534

ELECTRIC SHOCK SAFETY DEVICE

Gary S. Ward, 7402 Hidden Creek, Dallas, Tex. 75252

Filed May 14, 1986, Ser. No. 863,092
Int. Cl.⁴ B68B *11/00*
U.S. Cl. 361—232 16 Claims



2. An electric shock safety device, comprising:

(a) a housing;

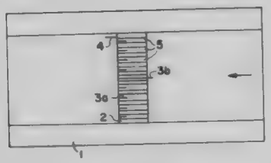
(b) probe means carried by said housing for movement between retracted and extended positions;

(c) energizing means for utilizing a power source to energize said probe means to create an electrical shock charge therein;

(d) a single activating means selectively operable to both move said probe means to said extended position and to activate said energizing means.

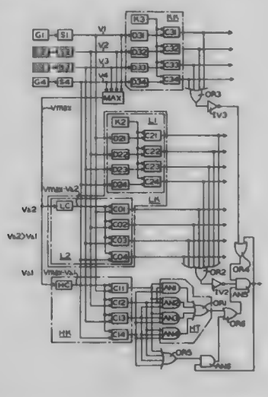
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4,719,535
AIR-IONIZING AND DEOZONIZING ELECTRODE
Huang Zhenjun, and Wang Jianzhen, both of Suzhou, China, assignors to Suzhou Medical College, Suzhou, China
Filed Mar. 18, 1986, Ser. No. 840,673
Claims priority, application China, Apr. 1, 1985, 85102037
Int. Cl.[4] H05F *3/06*
U.S. Cl. 361—232 **4 Claims**



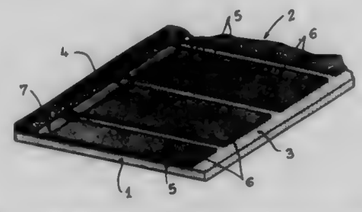
1. An electrode for producing a high concentration of negative ions in air and, at the same time, clearing ozone therefrom, comprising:
a cylindric insulating shell (1);
a cylindric electrode block (2) inside the insulating shell, the electrode block having perforations (5) therethrough between front and rear surfaces of the electrode block, one of the perforations being central of the electrode block;
a conductive needle (3*a*, 3*b*) in each perforation, one end of each needle being pointed and the other end of each needle being bent about 90° to the axis of the needle and fixed to the rear surface of the electrode block for the needle to project along the axis of one of the perforations, the point of the needle in the central perforation so projecting from the front surface of the electrode block, the needle in each other perforation so projecting only within the perforation in which it projects; and
a high tension lead wire (4) connected to the electrode block.

4,719,536
WHEEL-SLIP DETECTION SYSTEM
Asaji Imanaka; Tatsuo Fujiwara, both of Kobe, and Shuichi Osaka, Osaka, all of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan
Filed Apr. 9, 1986, Ser. No. 849,921
Claims priority, application Japan, Apr. 9, 1985, 60-76123
Int. Cl.[4] B60T *8/64*
U.S. Cl. 361—238 **2 Claims**



2. A system for detecting wheel-slip comprising:
(a) means for detecting the speed of at least three wheels of a railroad car,
(b) means for using the wheel with the highest speed as the basic speed,
(c) means for determining the speed differential of each wheel to ascertain the amount of reduction of the speed when the speed exceeds a set level,
(d) means for using the speed differentials to determine when a slip of the wheel will take place,
(e) means for establishing the set value to be a first set value and a second set value with a value higher than the first set value,
(f) means for ascertaining when the first set value is exceeded by the speed differential when all the speeds of the wheels are less than the second set value and the speed differential and all the degrees of acceleration determined by the differentiation of each wheel falling below the basic acceleration slipping is determined to be occurring on all the wheels so that information on all the wheels which are slipping forms a storable output, and
(g) means for causing all the wheel-slipping information to be outputted regardless of the magnitude of the acceleration so that wheel-slipping information is stored and when at least one of the speed differentials has exceeded the first set value and the wheel-slipping information is stored.

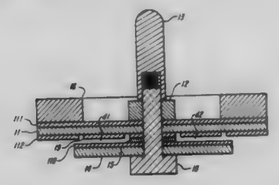
4,719,537
METALLIZED DIELECTRIC FOIL FOR MAKING ELECTRICAL CAPACITORS OF THE COILED TYPE, AND CAPACITORS OBTAINED
Alain Gizolme, Charbonnieres les Bains, France, assignor to Le Condensateur Prelyo, Saint Genis Laval, France
Filed Apr. 14, 1987, Ser. No. 38,066
Claims priority, application France, Apr. 25, 1986, 86 06229
Int. Cl.[4] H01G *1/015*
U.S. Cl. 361—273 **2 Claims**



1. In a metallized dielectric foil for making capacitors of the coiled type, of the type comprising a film-support coated, on one of its faces, with a layer of metal which leaves uncovered a strip along one of the longitudinal edges and transverse strips extending up to the level of the opposite longitudinal edge provided with an extra thickness, consequently determining intermediate compartments,
the transverse strips are connected to one another by a longitudinal zone at the level of which the metallized layer presents only a much reduced thickness, so that this layer is vaporized in each of the zones under the effect of the discharge created by a possible puncture of the dielectric.

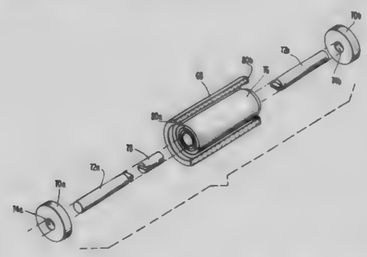
4,719,538
FORCE RESPONSIVE CAPACITIVE TRANSDUCER
John D. Cox, 81 Tremont St., Cambridge, Mass. 02139
Filed Dec. 2, 1986, Ser. No. 936,893
Int. Cl.[4] G01L *9/12*
U.S. Cl. 361—283 **13 Claims**

6. A force-responsive capacitive transducer, comprising:
flexible diaphragm means deflectable in response to a centrally applied moment, said flexible diaphragm means including first electrode means, such electrode means having at least two electrode regions;
second electrode means spaced apart from said first electrode means for defining with the first electrode means a plurality of capacitors having capacitance variable with spacing; and



actuator means for applying moment, connected to the flexible diaphragm means so that applied moment deflects the flexible diaphragm means and varies the spacing between the flexible diaphragm means and the second electrode means, whereby capacitance is varied.

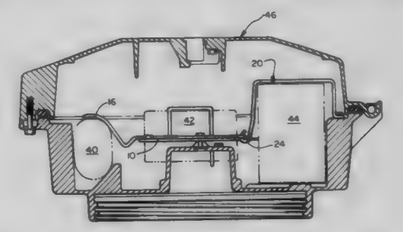
4,719,539
HERMETICALLY SEALED CAPACITOR
Bernard Lavene, Ocean, N.J., assignor to Electronic Concepts, Eatontown, N.J.
Filed Sep. 6, 1985, Ser. No. 773,643
Int. Cl.[4] H01G *1/14, 7/00*
U.S. Cl. 361—307 **26 Claims**



26. A capacitor having substantially high value thermal energy transfer comprising:
a hollow core assembly extending the entire length of the capacitor, the core assembly having a continuous passageway through its entire length for transferring thermal energy from the interior of the capacitor to the exterior,
a capacitor winding wrapped around the core assembly, the core assembly including thermally coupled first and second metal portions electrically separated from each other and forming first and second terminals of the capacitor.

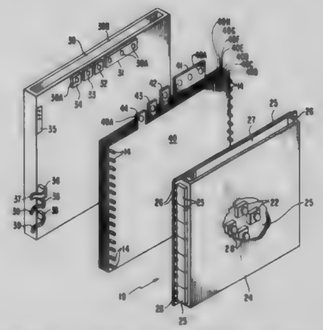
4,719,540
UNITIZED MOUNTING DEVICE FOR MOUNTING ELECTRICAL COMPONENTS OF A LUMINAIRE
Mark Sea George; Robert L. Ewing; Mark A. Rhodes, and Robert D. Zeller, all of Newark, Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Jul. 15, 1986, Ser. No. 885,906
Int. Cl.[4] H02B *1/10*
U.S. Cl. 361—377 **8 Claims**

1. A unitized mounting device securing electrical components of a luminaire such as a ballast, a starter and a capacitor in desired positions in a luminaire housing comprising a central plate adapted to be mounted to the luminaire housing means connected to said central plate securing a capacitor in place and into contact with an inner wall of said housing, means connected to said central plate suspending a starter in place in mid air and means connected to said central plate securing a



ballast in place and into contact with said inner wall of said housing.

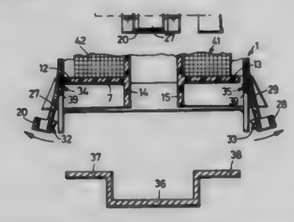
4,719,541
ELECTRONIC APPARATUS MOUNTING STRUCTURE
Izumi Ono, Hachioji; Haruo Takayama, Sagamihara; Yasuo Takahashi, and Eichiro Okumura, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
PCT No. PCT/JP86/00057, § 371 Date Oct. 10, 1986, § 102(e) Date Oct. 10, 1986, PCT Pub. No. WO86/05061, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 12, 1986, Ser. No. 924,847
Claims priority, application Japan, Feb. 13, 1985, 60-025611; Feb. 13, 1985, 60-025612
Int. Cl.[4] H05K *7/20*; H02B *1/20*
U.S. Cl. 361—407 **7 Claims**



1. An electronic apparatus mounting structure, comprising:
a bus plate including:
a plurality of alternating conductive and insulation layers corresponding to a plurality of power supply voltages;
a plurality of conducting posts weld connected to said conductive layers; and
a plurality of connecting pieces formed at different relative positions and one piece from each conductive layer;
a power supply including:
a power supply circuit which supplies said plurality of power supply voltages; and
a plurality of output terminals connected to the power supply circuit, formed at positions respectively corresponding to the plurality of connecting pieces and weld connected to the corresponding connecting pieces; and
a printed wiring board holding electronic parts and having power supply lands weld connected at corresponding positions to the plurality of posts of said bus plate.

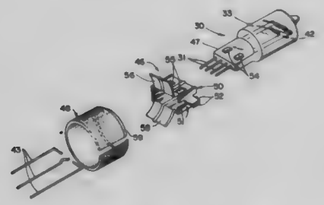
VOL 1086 ISS 2 JA 12 1988 UMI

4,719,542
QUICK-MOUNT DEVICE FOR CONTACTORS
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Fed. Rep. of Germany
Filed Jan. 22, 1986, Ser. No. 821,442
Claims priority, application European Pat. Off., Feb. 1, 1985, #85101091.8
Int. Cl.[4] H05K 7/02
U.S. Cl. 361—417 18 Claims



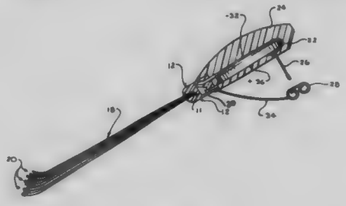
1. A quick-mount device comprising a housing having opposite first and second side walls relatively spaced from each other, a separable component removably housed within said housing, a support rail, first means securing said separable component to each of said side walls, second means securing said support rail to each of said side walls, said first securing means being defined by first and second securing members positioned in opposing relationship to each other and being carried by said first and second side walls; said second securing means being defined by third and fourth securing members positioned in opposing relationship to each other and being carried by said first and second side walls; and means effecting relative movement of said third and fourth securing members away from each other in the absence of like movement of said first and second securing members away from each other whereby said housing can be removed from said support rail while said separable component is retained housed therein by said first and second securing members.

4,719,543
REPLACEABLE LAMP UNIT FOR AUTOMOBILE HEADLIGHT
Chris Collandris, Hillsboro; Paul F. Beilliveau, Peterborough, and Sudhir Parikh, Goffstown, all of N.H., assignors to GTE Products Corporation, Danvers, Mass.
Filed Feb. 6, 1987, Ser. No. 11,668
Int. Cl.[4] B60Q 1/04
U.S. Cl. 362—80 8 Claims



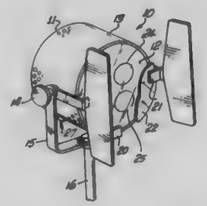
1. In a replaceable lamp unit for use within an automobile headlight wherein said unit includes a plastic holder and a metallic insert to which the lamp of said unit is directly or indirectly attached, said insert being positioned within said holder and secured thereto by induction heating and having an exterior surface for engaging said holder when so positioned therein, the improvement wherein said exterior surface includes a roughened texture to provide enhanced securement to said holder.

4,719,544
ELECTRONIC JEWELRY
Robert M. Smith, 28 Talcott Forest Rd., Farmington, Conn. 06032
Filed Aug. 6, 1986, Ser. No. 893,696
Int. Cl.[4] F21S 1/00; F21L 15/08; A44C 7/00; F21V 8/00
U.S. Cl. 362—104 10 Claims



1. Electronic jewelry comprising:
a housing;
a battery in said housing, said battery having first and second terminals;
light emitting diode (LED) means associated with said housing, said LED means comprising a diode encased in a block of insulative material, said block of insulative material having an opening partially therethrough, said LED means also having first and second leads;
a plurality of fiber-optic strands defining a bundle of strands, said bundle having a first end and a second end, said first end being disposed and retained within said opening in said block of insulative material of said LED means; and
means for selectively connecting and disconnecting said battery from said LED means.

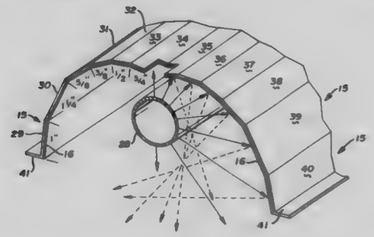
4,719,545
SOURCE LIGHT FOR CAMERAMEN, LIGHTING TECHNICIANS, SET LIGHTING FOR MOTION PICTURES, STAGE AND TELEVISION
Victor M. Cano, 424 N. 12th St., Montebello, Calif. 90640
Filed Jun. 13, 1986, Ser. No. 874,147
Int. Cl.[4] F21V 1/00
U.S. Cl. 362—240 21 Claims



1. An improved source light for professional photographers, for set lighting for motion pictures, stage, television and the like of the type having a vented body including a face, sides and a back, said source light including means for attachment to a stand or to a rack or other mount, and including means for making electrical connection thereto, wherein the improvement comprises:
a plurality of lamps held within said vented body, each lamp having a halogen cycle bulb held in a dichroic reflector, said dichroic reflector being of the type emitting a directed beam and said dichroic reflector having a generally planar face, each of said lamps being mounted so that their beams are directed toward the front of the vented body and the generally planar face of each lamp lies in a single plane; and

lens means held at the face of said vented body, said lens means being adjacent said single plane.

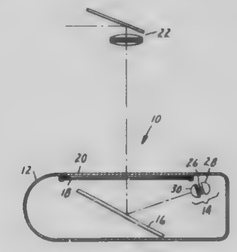
4,719,546
FLUORESCENT LIGHTING APPARATUS
Russell W. Spitz; P.O. Box 287, Mineral Ridge, Ohio 44440
Filed May 21, 1986, Ser. No. 865,411
Int. Cl.[4] F21V 7/02
U.S. Cl. 362—260 11 Claims



1. In fluorescent lighting apparatus of the type having several fluorescent tubes and elongated structures supporting the same wherein conveniently at least two of the fluorescent tubes are disposed on each of said structures, an improved fluorescent lighting apparatus formed by eliminating at least one fluorescent tube from each of said structures without altering the position of the remaining fluorescent tube, the improvement comprising: an elongated reflector means formed of a plurality of elongated planar mirrors arranged in a modified arcuate configuration positioned radially of and partially surrounding said remaining fluorescent tube so that said remaining fluorescent tube is centrally positioned with respect to said reflector means and so that the longitudinaly axis of said remaining fluorescent tube is substantially in the upper half of said elongated downward facing opening of a known width, spaced in the lower half of said elongated reflector means substantially below said remaining fluorescent tube, said elongated planar mirrors being angularly disposed to reflect light from said remaining fluorescent tube in a direction away from said remaining fluorescent tube and outwardly and downwardly through said downward facing opening, whereby said reflected light is distributed in substantially equal amounts across the width of said opening and whereby said fluorescent light apparatus appears to have a light source of a width equal to the known width of said downward facing opening.

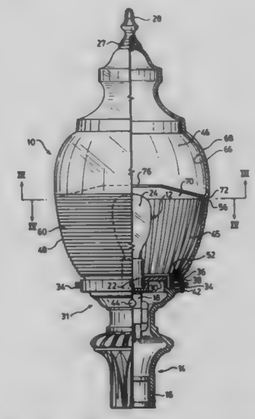
4,719,547
ILLUMINATION SYSTEM FOR OVERHEAD PROJECTOR
Dennis F. Vanderwerf, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 19, 1986, Ser. No. 909,510
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—299 6 Claims

1. An illumination system for an overhead projector comprising a truncated concave reflector, an incandescent filament and a condenser lens, all axially aligned along a common optical axis and disposed such that said filament is between said concave reflector and said condenser lens and an image of said



filament is focused on said optical axis and between said filament and said condenser lens.

4,719,548
PRISMATIC GLOBE FOR STREET LUMINAIRE
Edward G. Orosz, Mayfield Heights, Ohio, assignor to King Luminaire Co., Inc., Willoughby, Ohio
Filed Aug. 27, 1986, Ser. No. 900,836
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—309 21 Claims



1. A globe for a light fixture comprising transparent globe means capable of covering a light fixture and having an opening at one end for introduction of at least part of said light fixture, said globe means being formed from upper and lower portions that are adhered together and having integral prismatic light refracting means extending over at least a substantial portion of the inner and outer surfaces thereof, and a circular reflector integrally formed in the interior of said globe means and adapted to be positioned above a light bulb in said light fixture, said reflector having an opening in the center thereof which during use of said globe is positioned directly above said light bulb.

4,719,549

CONNECTION BETWEEN TWO MECHANICALLY AND ELECTRICALLY RELEASABLY COUPLED PARTS, IN PARTICULAR FOR USE WITH AN ILLUMINATION SYSTEM

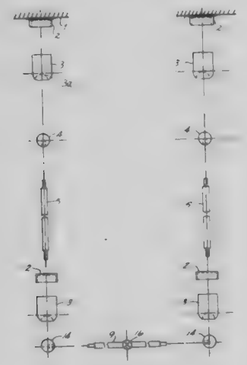
Volker H. P. Apel, Schulstrasse 10, D-8000 München 19, Fed. Rep. of Germany

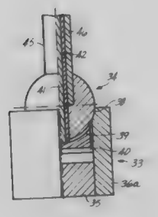
Filed Dec. 12, 1985, Ser. No. 808,039

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447332

Int. Cl.[4] H01R *11/30*

U.S. Cl. 362—398 24 Claims





1. A connection between two mechanically and electrically releasably coupled parts in particular for use with an illumination system with the two parts (3,4) being interconnectable by means of magnetic force and establishing electrical contact through mutual contacting as a result of magnetic frictional contact, characterized by the two parts (3,4) being interconnected in a hinge-type manner, each part comprising two electrically separated sections, the electrical separation of the individual sections being maintained when said pairs are connected, the connections between sections each comprising a magnetic holding member (33) and a ball (34) retained to said holding member by magnetic force, the magnetic holding member (33) being magnetically and physically connected to the ball (34) via an annular surface (38), the ball (34) having an internal contact pin (41) projecting from said ball and being electrically insulated from the ball (34), and a contact surface (39) in an interior of the magnetic holding member (33) and electrically insulated therefrom, said contact surface contacting exclusively the contact pin (41) of the ball (34) when the ball (34) is inserted.

4,719,550

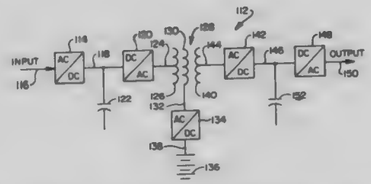
UNINTERRUPTIBLE POWER SUPPLY WITH ENERGY CONVERSION AND ENHANCEMENT

Jeffrey M. Powell, Galena, and Don A. Gephart, Delaware, both of Ohio, assignors to Liebert Corporation, Delaware, Ohio

Filed Sep. 11, 1986, Ser. No. 906,176

Int. Cl.[4] H02M *5/45*

U.S. Cl. 363—37 19 Claims



1. Power supply control apparatus employable with an a.c. source input of given phase, frequency and amplitude to provide a regulated output to a load, comprising:

rechargeable storage battery means having a given energy level and a capacity for providing energy in the form of direct current;

d.c.-to-a.c. converter means for providing a d.c. side coupled with said storage battery means and an a.c. side;

node means in energy transfer communication with said d.c. side of said d.c.-to-a.c. converter means for deriving an a.c. node connection exhibiting a predetermined a.c. energy level;

an input a.c.-to-a.c. converter including a first side connectable with said a.c. source input and a second side associated in energy transfer relationship with said a.c. node connection and controllable to provide at said first side a control a.c. signal in select phase relationship with said given phase and of select amplitude;

an output a.c.-to-a.c. converter having an input side coupled with said a.c. node connection and an output side connectable with said load for employing said energy at said node to derive said output to said load; and

control means responsive to said a.c. source given amplitude, to said node means a.c. energy level, and to said rechargeable storage battery means given energy level for controlling said input a.c.-to-a.c. converter to derive a said control a.c. signal select amplitude of value below said a.c. source given amplitude to effect maintenance of said a.c. node means predetermined a.c. energy level and maintenance of said rechargeable battery means given energy storage capacity.

4,719,551

OPTICALLY CONTROLLED POWER CONVERTING APPARATUS

Junichi Nishizawa; Takashige Tamamushi, both of Sendai; Kimio Miura, Izumi; Kiyoo Mitsui, and Koichi Mitamura, both of Sendai, all of Japan, assignors to Zaidan Hojin Handotai Kenkyu Sinkokai and Tohoku Electric Power Company, Incorporated, both of Sendai, Japan

Filed Jun. 30, 1986, Ser. No. 879,941

Claims priority, application Japan, Jun. 29, 1985, 60-143278

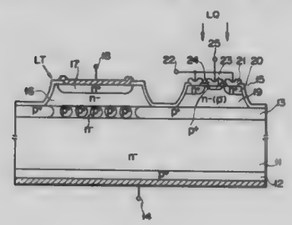
Int. Cl.[4] H02M *7/527*

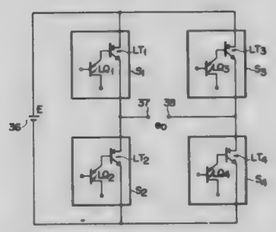
U.S. Cl. 363—41 14 Claims

1. In a power converting apparatus in which power from a source is applied to input terminals of a bridge circuit including switching elements selectively controlled by a control device to switch on and off thereby to produce converted output power at output terminals connected to a load, the improvement comprising:

said bridge circuit being optically controlled and including light triggered and light quenched electrostatic induction (LTQ SI) thyristors as said switching elements; and

said control device including means for producing light





quenching pulses supplied to said thyristors at timings corresponding to a pulse width modulation, thereby allowing predetermined electric power converting operations to be performed.

4,719,552

AC-DC CONVERTER TRIGGERED BY VARIABLE FREQUENCY PULSES

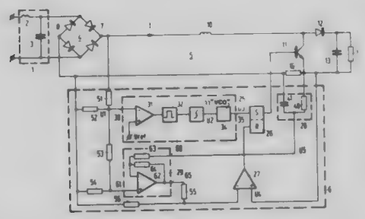
Manfred Albach, and Fritz A. Wegener, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1986, Ser. No. 930,821

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541307

Int. Cl.[4] H02M *3/156*

U.S. Cl. 363—44 10 Claims



1. A circuit arrangement for forming a direct voltage from an essentially sinusoidal input voltage comprising: a filter for suppressing high-frequency interference signals, a switched mode power supply which includes a diode, a coil, a capacitor and a transistor and is coupled to the filter through a rectifier, the power supply elements being connected so that in the conductive state of the transistor the diode is cut off and coil current flows at least through the transistor and in the cut-off state the current flows through the diode and a parallel arrangement of a load and the capacitor, and a pulse generator responsive to the input voltage to form switching pulses for the transistor whose frequency is varied uniformly in time between a minimum frequency at a maximum value of the rectified input voltage and a maximum frequency at the minimum value, characterized in that the pulse generator comprises, a voltage-to-frequency converter responsive to the input voltage to form starting pulses which determine the beginning of the switching pulses and whose frequency is varied between the minimum and maximum values such that the second derivative of the frequency with respect to time is always zero or negative, a first integrator which produces an integrated output signal proportional to the output current of the rectifier and whose time constant is larger than the reciprocal value of the minimum frequency, a superposition circuit forming an output signal equal to the difference between a signal proportional to the rectified input voltage and the output signal of the first integrator, and a first comparison circuit which produces a signal for terminating a switching pulse when a signal proportional to the output current of the rectifier exceeds the output signal of the superposition circuit.

4,719,553

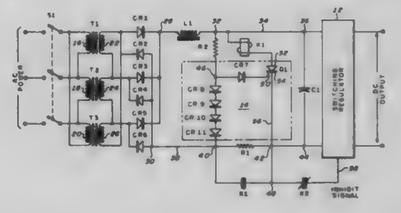
INRUSH-CURRENT LIMITER FOR SWITCHING REGULATOR POWER SUPPLY

Paul Hinckley, Hicksville, N.Y., assignor to Unisys Corporation, Blue Bell, Pa.

Filed May 7, 1987, Ser. No. 46,760

Int. Cl.[1] H02M *1/15, 7/06*

U.S. Cl. 363—49 14 Claims



1. A DC voltage power supply including circuitry for suppressing turn-on transients to limit inrush current to a substantially uncharged capacitive load, comprising:

a rectifier for providing a source of DC potential from a source of AC input voltage,

means for providing a point of reference potential derived from said source of DC potential,

means for coupling said capacitive load to said source of DC potential,

DC voltage regulator means coupled in parallel relationship with said capacitive load and responsive to an inhibit signal for inhibiting or enabling operation of said regulator means,

inrush current suppression means having a relatively high impedance and a main current conduction path in series relationship with said soure of DC potential and said capacitive load, wherein said impedance limits the magnitude of current supplied to said capacitive load, and

control means responsive to said reference potential, said control means being coupled in parallel relationship with said capacitive load and responsive to a potential developed across said inrush current suppression means attaining a predetermined value with respect to said reference potential, whereupon said control means provides a trigger signal, said control means further comprising:

switching means having a first current path coupled in parallel with said current suppression means and a second current path coupled to activate said regulator means, said switching means being responsive to said trigger signal to provide, when activated, a low impedance shunt path across said current suppression means and to enable said

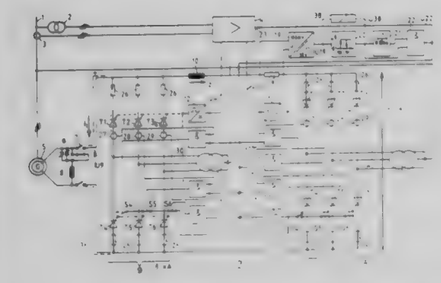
regulator means, and when deactivated to disable said regulator means and apply said inrush current suppression means in said series relationship with said capacitive load.

4,719,554

METHOD FOR PROTECTING TWO STATIC CONVERTERS WITH DIRECT-CURRENT LINK FROM OVERCURRENTS

Rolf Bertschi, Zurich, Switzerland, assignor to BBC Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 24, 1986, Ser. No. 877,863
Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615921
Int. Cl.[4] H02H 7/00
U.S. Cl. 363—51 8 Claims



1. A method for protection of two converters with direct-current link carrying a link current, comprising:
- detecting if the link current exceeds a first predeterminable limit value (i_{G1}); and
- controlling said two converters when it is detected that said link current exceeds said first predeterminable value (i_{G1}) so that said converters operate in a free-wheeling state in which a bridge arm of one bridge half and the bridge arm of the other bridge half connected to the same AC phase in each of the two converters are brought to a current conducting state or maintained in a current conducting state.

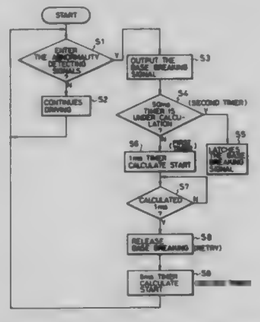
4,719,555

ELECTRIC POWER CONTROL APPARATUS WITH FIRST AND SECOND FIXED TIME INTERVALS

Motonobu Hattori, Funabashi; Noritoshi Tuji, Narashino, and Hideyuki Shimonabe, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,297
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 2 Claims

1. A retry control apparatus of an inverter comprising a power inverter which converts DC into AC and which has an AC motor connected to an output thereof, abnormality detecting means for detecting an electric abnormality at the input and/or output of said power inverter, retry means which starts when said abnormality detecting means detects an abnormality and removes an output interruption of said power inverter after a first fixed time has elapsed during rotating of said AC motor, and a signal latch means which operates by detecting again any abnormality occurring within a second fixed time after the output interruption has been removed by said retry means, so that the operation of said retry means is prevented by the output signal of said signal latch means, wherein said first



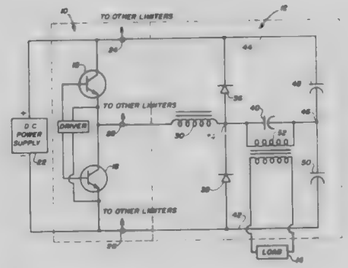
fixed time is several milliseconds and said second fixed time is at least more than ten times the first fixed time.

4,719,556

CURRENT AND VOLTAGE LIMITED INVERTER

Fred W. Wise, Windsor, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 7, 1986, Ser. No. 893,996
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 4 Claims



1. A voltage and current limiter circuit for an alternating current supply comprising:
- (a) first and second input connectors for connection to an alternating current supply;
- (b) an inductance connected in series with the first input connector, the value of the inductance being selected so that its reactance at the frequency of the alternating current supply limits the current through the inductance to a predetermined value;
- (c) a capacitance connected between the second input connector and the inductance, the value of the capacitance being selected so that its reactance at the frequency of the alternating current supply is greater than that of the inductance;
- (d) first and second diodes each connected to a junction point between the inductance and the capacitance, the diodes being connected so that each will conduct current of a different polarity to the junction point;
- (e) direct current power supply means interconnected with the alternating current supply and with each of its positive and negative terminals connected to one of the diodes so that the diodes clamp the voltage of the junction point to approximately the voltage of the direct current power supply means in both the positive and negative polarities, thereby limiting the voltage across the capacitance to a predetermined value; and

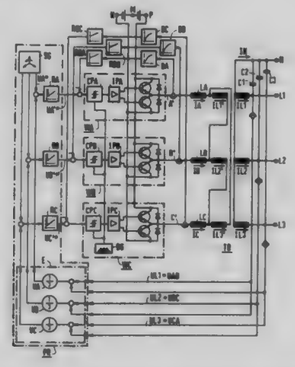
- (f) load connections, electrically connected to the opposite ends of the capacitance, to which a load can be interconnected.

4,719,557

APPARATUS FOR GENERATING A SYMMETRICAL THREE-PHASE VOLTAGE SYSTEM WITH A NEUTRAL WIRE CAPABLE OF CARRYING CURRENT

Wilhelm Forstbauer, and Albert Muller, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,755
Claims priority, application Fed. Rep. of Germany, May 13, 1985, 3517175
Int. Cl.[4] H02P 13/00
U.S. Cl. 363—79 9 Claims



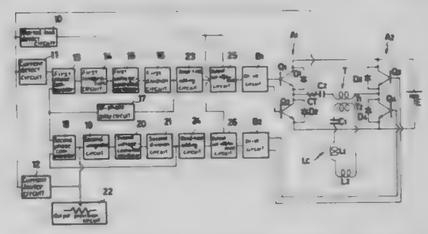
1. A device for generating a symmetrical three-phase output voltage system with a neutral conductor which can carry current, comprising:
- (a) pulse width controlled, six-pulse bridge pulse inverter with a inverter arrangement providing three a-c outputs, each a-c output connected to a pair of bridge arms;
- (b) a separate control unit for each of said pairs of bridge arms, said separate control unit being controlled by a corresponding control voltage;
- (c) a voltage transformer device, having its inputs connected to the outputs of the inverter and having outputs forming the output system with a neutral conductor;
- (d) a filter coupled in series w1th said voltage transformer device;
- (e) a voltage measuring arrangement for measuring an instantaneous value system of said symmetrical output voltage system:
- (f) a reference-value setter for feeding a symmetrical system of reference values into reference inputs of a voltage control device, said voltage control device determining said control voltages of said control units and having instantaneous value inputs connected to said voltage measuring arrangement, and
- (g) a decoupling network which simulates the structure of the voltage transformer device having as inputs values which correspond to said instantaneous value system for forming simulated instantaneous values which correspond to a voltage system at the input of the voltage transformer device; said voltage control device and said decoupling network coupled in series between said voltage measuring arrangement and said control units.

4,719,558

HIGH-FREQUENCY POWER SUPPLY OUTPUT CONTROL DEVICE

Izanu Hanada; Pierre Savary, both of Osaka; Satoshi Nagai, Kobe, and Munetomo Segawa, Osaka, all of Japan, assignors to Kyoei Denseiku Co., Ltd, Osaka, Japan

Filed Oct. 24, 1986, Ser. No. 922,691
Int. Cl.[4] H02M 7/219
U.S. Cl. 363—98 2 Claims



1. A high frequency power supply output control device comprising
- a semiconductor inverter circuit for converting DC power into high frequency power and comprising a pair of arms, each arm comprising a pair of semiconductors, said semiconductors of each arm being connected in a bridge configuration;
- a transformer connected to said pair of arms;
- a resonant circuit comprising at least one coil and a capacitor and connected to said transformer;
- means for activating push-pull operation of said pair of arms simultaneously with alternate ON-OFF drive operation of said pair of arms;
- a pair of phase synchronizing circuits for dealing respectively with said pair of arms and for setting operating frequencies of said semiconductors of each of said pair of arms at a specific value; and
- a phase difference varying circuit for controlling output power by varying phase difference between said pair of phase synchronizing circuits.

4,719,559

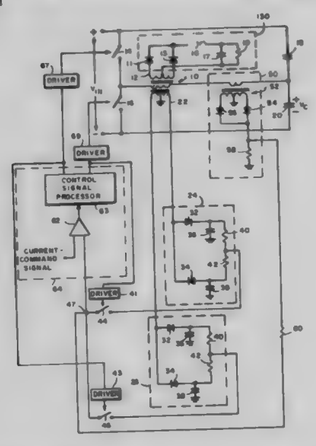
CURRENT-MODE CONTROL OF CAPACITIVELY COUPLED POWER CONVERTERS

Nathan O. Sokal, Lexington, and Richard Redl, Arlington, both of Mass., assignors to Cherry Semiconductor Corporation, Greenwich, R.I.

Filed Oct. 22, 1986, Ser. No. 922,006
Int. Cl.[4] H02M 7/44
U.S. Cl. 363—98 18 Claims

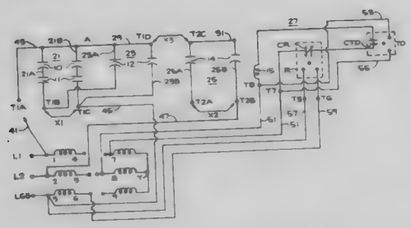
1. A capacitively coupled power converter circuit controlled by a current mode controller comprising:
- first and second switches connected in series;
- means for applying an input voltage across said first and second switches;
- means for providing power to a load;
- capacitor means for capacitively coupling the voltage received from said switches with said power providing means, said capacitor means having a capacitor voltage;
- a pair of sample and hold circuits for comparing the input voltage and the capacitor voltage and for generating a first unbalance signal as a function of the comparison;
- unbalance signal processing means for receiving said first

unbalance signal and for generating a modification signal; and



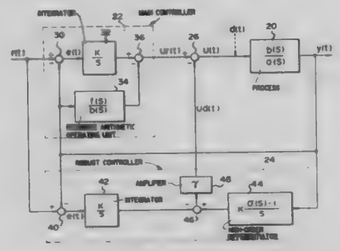
means for providing said modification signal to said current mode controller.

4,719,560
ROTARY PHASE GENERATOR AND SYSTEM
Horace B. Ford, 13 Catherine Dr., Granbury, Tex. 76048
Filed Mar. 28, 1986, Ser. No. 845,569
Int. Cl.[4] H02M *5/32*
U.S. Cl. 363—150 31 Claims



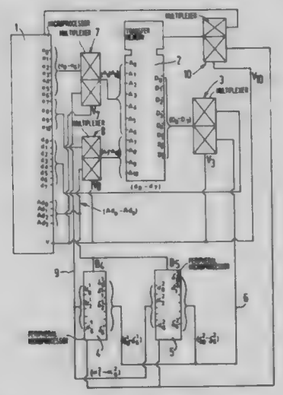
1. A rotary phase generator for generating a three phase voltage output from a single phase voltage input, comprising:
an A-C motor having first, second, and third stator windings connected in the given configuration,
first, second, and third leads connected to said first, second, and third stator windings respectively,
said first and second leads being adapted to have a single phase line voltage applied thereto,
said first, second, and third stator windings being connectable for line voltages of first or second levels,
a starting circuit comprising first and second circuits, each comprising starting capacitor means and contact means,
a running circuit comprising two groups of running capacitor means, each group comprising first and second circuits each of which comprises a capacitor means,
the capacitance of said two groups of running capacitor means of said running circuit being different from each other,
one end of each of said first and second circuits of said starting circuit and of one of said groups of running capacitor means being connected together by a first common lead,
one end of each of said first and second circuits of the other group of running capacitor means being connected together by a second common lead,
the other ends of said first circuits of said starting circuit and of said one group of running capacitor means being connected together,
the other ends of said second circuits of said starting circuit and of said one group of running capacitor means being connected together,
the other end of one of said circuits of said one group of running capacitor means being connected to said third stator winding,
the other end of one of said circuits of the other group of running capacitor means being connected to said second stator winding.,
a starting circuit control means coupled to said stator windings for causing said contact means of said starting circuit to close for starting said A-C motor and then to open after said A-C motor starts, to disconnect said starting capacitor means,
a dual voltage control means for connecting said starting circuit and said running circuit in a manner to allow said motor to operate on line voltages of first or second voltage levels for producing three phase voltage outputs of said first or second voltage levels at said first, second, and third leads, comprising:
first means connectable from said first stator winding to either said first common lead or to the other end of said first circuit of said starting circuit,
second means being connectable to the other ends of said first and second circuits of said starting circuit,
third means being connectable to said first and second common leads, and
fourth means being connectable to the other ends of said first and second circuits of said other group of running capacitor means.

4,719,561
ROBUST CONTROL APPARATUS RESPONSIVE AGAINST DISTURBANCE
Takashi Shigemasa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 8, 1985, Ser. No. 752,593
Claims priority, application Japan, Oct. 3, 1984, 59-206258
Int. Cl.[4] G05B *13/02*
U.S. Cl. 364—148 6 Claims



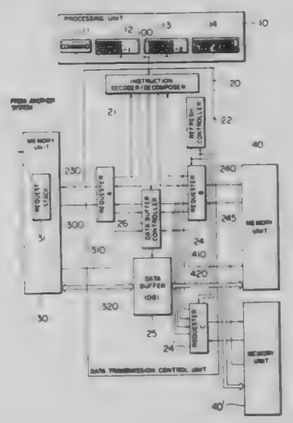
1. A process control apparatus comprising:
main controller means, connected to an input of a process to be controlled, for obtaining a control signal of the process in accordance with a set point and an output of the process and supplying said control signal to the process; and
robust controller means, connected to the output of the process, for high-order differentiating the output of the process and then feeding back the result of said differentiation to said control signal;
wherein said robust controller means comprises a high-order differentiator for high-order differentiating the output of said process, an arithmetic operating unit for executing an arithmetic operation for a difference signal between the set point and the output of the process, a subtractor for subtracting an output of said arithmetic operating unit from an output of said high-order differentiator, and an amplifier for amplifying an output of said subtractor and feeding back said amplified output to said control signal.

4,719,562
MULTIPROCESSOR SYSTEM FOR INTERCOMMUNICATION OF PROCESSORS
Francois P. Bailly, Palaiseau; Alain Bourgoin, and Francois Vaillant, both of Dourdan, all of France, assignors to SAT Societe Anonyme de Telecommunications, France
Filed Jul. 18, 1984, Ser. No. 631,986
Claims priority, application France, Jul. 19, 1983, 83 11892
Int. Cl.[4] G06F *13/00, 15/16*
U.S. Cl. 364—200 2 Claims



1. A multiprocessor system comprising:
a central processor and n peripheral processors communicating with one another;
a transfer memory comprising predetermined distinct zones having unitary elements, each of said zones allocated to and associated with and respectively accessed by its associated peripheral processors;
said central processor and said n peripheral processors each comprising means for mastering said transfer memory;
means for connecting said central processor to said transfer memory comprising a first addressing bus means and a first multiplexer having an input connected to said first addressing bus means and an output connected to said transfer memory, and a second addressing bus means and a second multiplexer having an input connected to said second addressing bus means and an output connected to said transfer memory, said means for connecting said central processor to said transfer memory comprising further bus means connecting said central processor to another input of said second multiplexer for addressing zones allocated to and associated with said peripheral processors when mastered by said central processor and for connecting said central processor to said peripheral processors;
said first and second addressing buses including means for addressing said unitary elements of said transfer memory;
said central processor including means for causing one of said pheripheral processors to master said transfer memory and for addressing a zone of said transfer memory associated with said one peripheral processor;
means for connecting peripheral processors to another input of said first multiplexer comprising addressing buses α^1, $\alpha^2 \ldots \alpha^n$, respectively, each of n peripheral processors including means for addressing directly said unitary elements of said zone of said memory associated therewith; and
means for addressing one of said zones associated with said peripheral processors when a respective one of said peripheral processor masters said transfer memory.

4,719,563
DATA TRANSMISSION CONTROL DEVICE FOR CONTROLLING TRANSFER OF LARGE AMOUNTS OF DATA BETWEEN TWO MEMORY UNITS
Hiroshi Kosuge; Yoshio Kiriu, and Junichi Taguri, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 20, 1984, Ser. No. 684,293
Claims priority, application Japan, Dec. 23, 1983, 58-241957
Int. Cl.[4] G06F *13/00, 12/06*
U.S. Cl. 364—200 7 Claims



1. A data transmission control device for controlling data transfer between first and second memory means based on a primary instruction provided by a processor and including information on a direction of data transfer between said first and second memory means, a data transfer starting address and information on an amount of data to be transferred, said device comprising:
first means for decoding said primary instruction and issuing one or more transfer instructions, each transfer instruction causing transfer of one block of data, depending on the amount of data to be transferred as indicated by said decoded primary instruction;
second means associated with said first memory means for receiving the transfer instructions issued by said first means, when said decoded primary instruction indicates data transfer from the first memory means to the second memory means, and for issuing to said first memory means, in response to each of the received transfer instructions, a first number of transfer requests sequentially, said first number being determined on the basis of a predetermined access unit of said first memory means which consists of the length of data accessible by said first memory means for each of the transfer requests issued thereto and the amount of data in one block of data; and
third means associated with said second memory means and connected to receive the transfer instructions issued by said first means, when said decoded instruction indicates data transfer from the second memory means to the first memory means, for issuing to said second memory means, in response to each of the received transfer instructions, a second number of transfer requests sequentiallly, said second number being determined on the basis of a predetermined access unit of said second memory means which

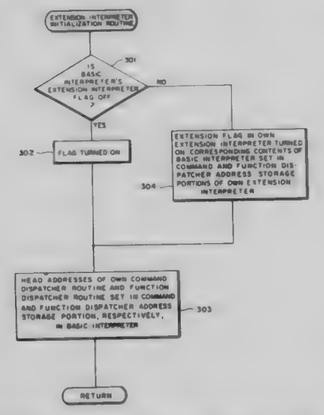
consists of the length of data acessible by said second memory means for each of the transfer requests issued thereto and the amount of data in one block of data.

4,719,564

INTERPRETER LINKAGE SYSTEM FOR LINKING EXTENSION INTERPRETERS TO A BASIC INTERPRETER

Takeshi Hara, Tokyo, Japan, assignor to NEC Corportion, Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,480
Claims priority, application Japan, Dec. 10, 1984, 59-260371
Int. Cl.⁴ G06Z *9/44*
U.S. Cl. 364—200 **3 Claims**



3. A method of linking each of at least one extension interpreters to a basic interpreter in an interpreter linkage system having a bus; first memory means connected to said bus for memorizing an operating system, a user program and a basic interpreter for interpreting and executing statements constituting said user program; second memory means connected to said bus for memorizing at least one extension interpreter, and processing means, connected to said bus, said method comprising the steps, performed prior to execution of said user program, of:

(a) loading, under the control of said operating system, at least one storage area of said first memory means with said at least one extension interpreter, and delivering control to said basic interpreter;

(b) delivering, under the control of said basic interpreter, control to one of said at least one extension interpreters, which is not linked directly or indirectly to said basic interpreter;

(c) memorizing, under control of said one extension interpreter, the content of a first address storage portion provided in one of said first and second memory means into a second storage portion provided in said one extension interpreter, and supplying said first address storage portion with a start address of the extension interpreter, from which an interpreting processing is to be started during execution of said user program, so as to link the extension interpreter to said basic interpreter; and

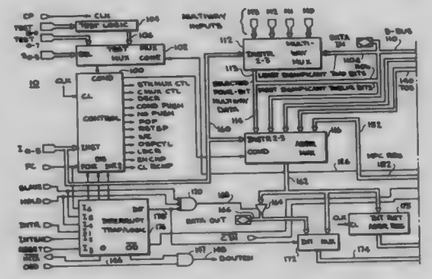
(d) repeating steps (b) and (c) until all of said extension interpreters are linked to said basic interpreter.

4,719,565

INTERRUPT AND TRAP HANDLING IN MICROPROGRAM SEQUENCER

Ole H. Moller, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 1, 1984, Ser. No. 667,242
Int. Cl.⁴ G06F *13/32*
U.S. Cl. 364—200 **4 Claims**



2. A microprogram sequence controller responsive to an interrupt signal and a trap signal having tri-state bidirecrtional output means responsive to an inhibit signal for receiving microinstruction address signals from an interrupt/trap memory element and generating through said output means microinstruction address signals used to access a program memory element containing a plurality of microinstructions, there being a first register means connected to said memory element for receiving and temporarily holding microinstructions accessed from said memory element by said microinstruction address signals and bus means for communicating a portion of said accessed microinstruction from said first register means to said microprogram sequence controller, said microprogram sequence controller comprising:

input means connected to said bus means input means for receiving instruction words and data words;

decode means connected to said input means for receiving said instruction words to generate therefrom a plurality of control signals;

first address generating means, responsive to an enable signal, having second register means and incrementing means operably interconnected to provide sequentially incremented address signals;

last-in, first-out (LIFO) storage means responsive to said control signals and to gating signals for selectively storing address signals;

first multiplex means, having an output terminal at which said microinstruction address signals are generated, connected to said output means, responsive to said control signals, connected to said input means, said first address generating means and said storage means, for selectively coupling said input means, said first address generating means, and said storage means to said output terminal in response to said control signals, said first address generating means and said LIFO storage means further connected to said first multiplex output terminal means for receiving signals therefrom in response to said control signals; and

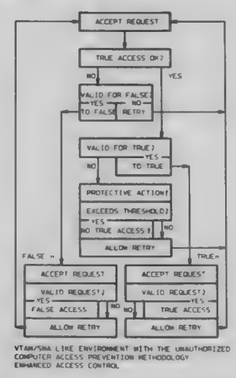
interrupt/trap means for receiving said interrupt signal and for generating therefrom said gating signals that generate said incrementing means enable signal, that generate said inhibit signal disabling communication of the sequential address ("interrupt return address") signals generated by said first multiplex means to said output means, for generating said gating signals that cause to be stored said next sequential address signals in said (LIFO) storage means, said interrupt/trap means further for receiving said trap signal and for generating therefrom gating signals that suppress said incrementing means enable signal, that generate said inhibit signal disabling communication of the address signals, ("trap return address") applied to said output means generated by said address generating means, for generating said gating signals that cause to be stored said trap return address in said LIFO storage means, and means for generating at said output means said "interrupt" and "trap" address signals and for communicating said "interrupt" and "trap" address signals to said memory element in response to said interrupt and trap signals, respectively.

4,719,566

METHOD FOR ENTRAPPING UNAUTHORIZED COMPUTER ACCESS

Henry H. Kelley, Glendale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1985, Ser. No. 790,582
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—200 **11 Claims**



VTAM/SNA LIKE ENVIRONMENT WITH THE UNAUTHORIZED COMPUTER ACCESS PREVENTION METHODOLOGY ENHANCED ACCESS CONTROL

1. A method for entrapping and maintaining a communication relationship between a user seeking unauthorized access to and a system, said system being of the multiprocessing, multiprogramming computing system type, said access and communication being through one of a plurality of logically partitioned and isolated demand/response message interfaces included within said system, each interface manifesting the attributes of a virtual machine having associated computational, storage, and dialog resources, comprising the steps of:

(a) ascertaining whether or not a pattern of access by a user to a target interface managed by the system is unacceptable, and binding the user either (1) to a false interface upon ascertaining any unacceptable pattern or (2) to the target interface if the access is found to be acceptable; and

(b) upon binding the user to said false interface, causing the false interface to respond to messages from the user in a manner otherwise customary among accepted system users and interfaces.

4,719,567

METHOD AND APPARATUS FOR LIMITING BUS UTILIZATION

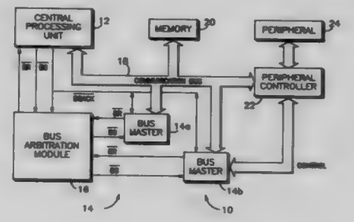
Charles L. Whittington, Buda, and John Zolnowsky, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1982, Ser. No. 373,206
Int. Cl.⁴ G06F *11/34, 13/36*
U.S. Cl. 364—200 **6 Claims**

1. A method for limiting the utilization of a communication bus by a bus master, comprising the steps of:

determining the utilization rate of the bus during a first sample interval; and

disabling the bus master from utilizing the bus during a succeeding second sample interval if the utilization rate



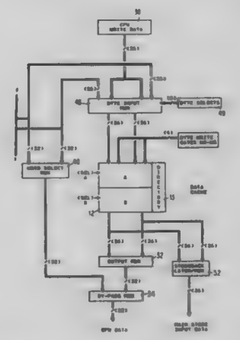
during the preceeding first sample interval was determined to be above a selected limit.

4,719,568

HIERARCHICAL MEMORY SYSTEM INCLUDING SEPARATE CACHE MEMORIES FOR STORING DATA AND INSTRUCTIONS

Francis P. Carrubba, Sunnyvale, Calif.; John Cocke, Austin, Tex., and Norman H. Kreitzer, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US82/01829, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO84/02799, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 30, 1982, Ser. No. 862,348
Int. Cl.⁴ G06F *12/00, 9/38, 13/00*
U.S. Cl. 364—200 **16 Claims**



1. A hierarchical memory system for use with a high speed data processing system including a CPU for performing sequences of operations in response to instructions supplied thereto, a large relatively slow main memory and a smaller high speed cache memory subsystem, said cache memory subsystem comprising;

two separately addressable sections dedicated for storing data and instructions respectively each said section having a directory including an addressable storage location therein for every line stored in its associated cache for accessing the desired cache directory utilizing the "line" field of a main memory address, each said storage location in both directories including means for storing the high order bits of said main memory address of the information stored in the respective cache line, means for comparing said high order bits in the accessed cache directory storage location with the high order bits of a requested address to determine if the information at the requested address in the associated cache is present, each said directory also containing at least one control bit associated

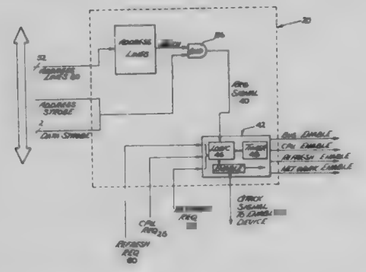
with each line stored in the said cache accessible under system control selectively settable under program control or system control for indicating that the associated line of data stored in the cache is invalid and means for interrogating said bit for indicating that a main memory fetch must occur even though the requested address is present, and means for prohibiting a store back of any data stored in the instruction cache portion of said cache subsystem to the main storage at any time.

4,719,569

ARBITRATOR FOR ALLOCATING ACCESS TO DATA PROCESSING RESOURCES

James J. Ludemann, Mountain View, and Andreas Bechtolsheim, Stanford, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 11, 1985, Ser. No. 786,596
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **14 Claims**



13. In a data processing system wherein a plurality of data processing devices ("agents") are coupled along a common bus having a plurality of address lines and at least one strobe line, an arbitrator coupled to said bus and to a data processing resource for selectively providing one of said agents access to said resource, comprising:

request signal generation means for generating a request signal if an agent transmits an address on said address lines and said strobe line is enabled;

timing means coupled to said request signal generation means for timing predetermined time periods;

logic means coupled to said sensing means for selectively providing access to said resource by an agent generating multiple requests within said predetermined period, and precluding access by other agents so long as said enabled agent continues to generate multiple request signals within said predetermined period;

whereby agents generating multiple requests may maintain access to said resource to the exclusion of selected other agents.

4,719,570

APPARATUS FOR PREFETCHING INSTRUCTIONS

Shun Kawabe, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 238,985, Feb. 27, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,744
Claims priority, application Japan, Feb. 29, 1980, 55-24749
Int. Cl.[4] G06F *9/26*
U.S. Cl. 364—200 **6 Claims**

1. An information processing system employing advanced control techniques comprising: an instruction control and arithmetic unit for preparing data addresses for data and/or instructions related to instruction streams following after a conditional branch instruction in advance of the result of testing for the condition of the conditional branch instruction, said instruction control and arithmetic unit having a plurality of instruction buffers, said instruction buffers holding instructions, said instruction control and arithmetic unit processing an instruction read from one of said instruction buffers corresponding to a specified stream number, supplying a read address of data and/or an instruction accompanying a processing of an instruction, and outputting a result of testing for a condition of a conditional branch instruction;

a main storage for storing data and/or instructions;

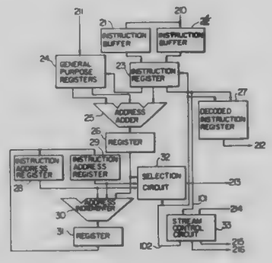
a high speed buffer storage coupled to said main storage having

a data part for storing the data and/or instructions read from the main storage, and

an address part for storing addresses of each of the stored data and/or instructions in said data part;

detecting means coupled to said high speed buffer storage and to said instruction control and arithmetic unit, said detecting means detecting whether a read address of each data and/or instruction related to the instruction streams corresponds or does not correspond to one of said addresses in said address part and for outputting a correspondence or noncorrespondence output of the detection between said addresses;

data read means coupled to said high-speed buffer storage and to said detecting means, said data read means being responsive to a correspondence output from said detecting means for reading each stored data and/or instruction therefrom;



address holding means coupled to said instruction control and arithmetic unit and to said detecting means, said address holding means being responsive to the non-correspondence output from said detecting means for storing said read address, a stream number and an identification indicating whether said read address relates to an instruction after the conditional branch instruction;

stream selection means coupled to said instruction control and arithmetic unit and to said address holding means, said stream selection means being responsive to the result of a testing of the condition of the conditional branch instruction for selecting an instruction stream to be processed, and

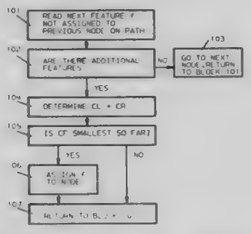
address sending means coupled to said stream selection means, said address holding means, and to said main storage, said address sending means sending said read address to said main storage if said identification held in said address holding means indicates no relation to a conditional branch instruction and said address sending means sending addresses identified by both a specified stream number and an identification from said address holding means to said main storage to read each stored data and/or instruction therefrom if said identification held in said address holding means indicates relation to a conditional branch instruction.

4,719,571

ALGORITHM FOR CONSTRUCTING TREE STRUCTURED CLASSIFIERS

Jorma I. Rissanen, Los Gatos, Calif., and Mati Wax, Haifa, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,677
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—300 **9 Claims**



1. A method implemented in data processing apparatus for assigning features to nodes of a tree structured classifier in response to a training set of objects, each of such objects being determined by a plurality of features, comprising the steps at each current node of the tree of:

determining a selected characteristic of a subset of the plurality of features unused at prior nodes, the selected characteristic being a cost function based on code length; and

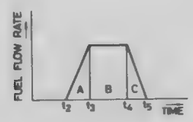
assigning a first feature to the node having a preferred value for the selected characteristic relative to features other than said first feature.

4,719,572

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yuuji Kishimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 406,146, Aug. 9, 1982, abandoned. This application Jul. 26, 1985, Ser. No. 758,848
Claims priority, application Japan, Aug. 10, 1981, 56-125632
Int. Cl.[4] F02M *51/00*
U.S. Cl. 364—431.05 **1 Claim**



1. A fuel injection control system for an internal combustion engine provided with a fuel injection valve comprising: means for detecting the intake manifold pressure of said engine and providing an output signal; fuel flow arithmetic unit means for calculating a fuel flow amount in accordance with said output signal of said engine; memory means having an address input coupled to an output of said arithmetic unit means, said memory means storing values of a driving time for corresponding values applied to said address input from said arithmetic unit means; and means for driving said fuel injection valve with driving times determined in accordance with values outputted from said memory means, said outputted values being used to compensate for the non-linearity of the actual relationship between the driving time of said fuel injection valve and the amount of fuel actually injected;

wherein said values stored in said memory means are determined so that said fuel injection valve is driven with driving times such that a predetermined constant air-to-fuel ratio is maintained; and

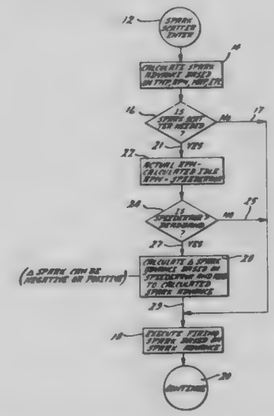
wherein said means for driving said fuel injection valve is synchronized in accordance with output pulses produced by engine speed detecting means.

4,719,573

PROGRAMMED SPARK SCATTER CONTROL METHOD FOR QUICK RESPONSE TO CHANGING LOAD CONDITIONS

William R. Kissel, Milford; Michael F. Michel, Livonia; Thomas Glowczewski, Washington Twp., Macomb County, and Douglas C. Frantz, Berkley, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Continuation of Ser. No. 620,228, Jun. 13, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,440
Int. Cl.[4] F02B *3/04*; F02P *5/04*
U.S. Cl. 364—431.07 **4 Claims**



1. In a vehicle having an engine with fuel and air mixture means, a method of spark advance control having computation means and means for monitoring and storing various engine parameters such as engine temperature, engine revolutions per minute (RPM), and engine manifold absolute pressure (MAP) and means for firing the spark to the appropriate cylinder comprising:

deriving a desired spark advance setting based on the various engine parameters;

determining whether to execute the spark firing based on the derived spark advance setting;

computing a delta spark advance and revising the derived spark advance setting if it is determined not to execute the spark firing based on the derived spark advance setting; and

firing the spark to the appropriate engine cylinder based on either of the derived spark advance setting and revised derived spark advance setting;

said step of computing a delta spark advance and revising the derived spark advance setting comprising:

computing a speed error setting by subtracting a calculated ideal engine idle RPM from the actual engine RPM;

comparing the computed speed error setting with a deadband envelope of previously determined speed error settings;

firing the spark to the appropriate engine cylinder based on the derived spark advance setting if the speed error signal is within the deadband envelope;

deriving a delta spark advance based on the computed speed error setting if the computed speed error setting is outside

the deadband envelope and adding the delta spark advance to the derived spark advance setting;

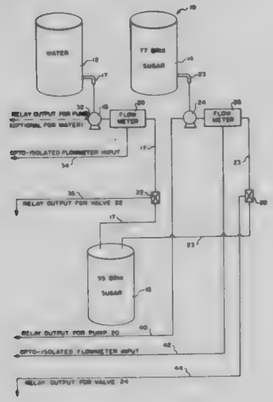
firing the spark to the appropriate engine cylinder based on the revised derived spark advance setting if the speed error signal is outside the deadband envelope.

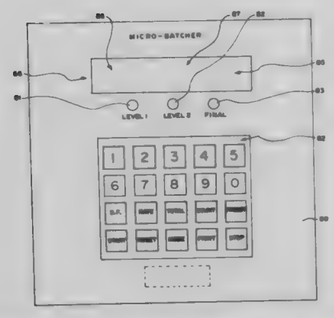
4,719,574

BATCH CONTROL SYSTEM

David W. Duback, Hoffman Estates; Thom D. Carpenter; Mark E. Skeels, both of Elgin, and Christopher Ray, Evanston, all of Ill., assignors to Accurate Metering Systems, Inc., Schaumburg, Ill.

Filed Nov. 18, 1985, Ser. No. 798,900
Int. Cl.[4] G06F *15/56*
U.S. Cl. 364—468 **28 Claims**





1. Control means for use in a batching system for controlling the batching of a fluid material from one container to another container through conduit means having a pump coupled therein, a flowmeter coupled therein and a valve coupled therein, said control means comprising:

a microprocessor;

a control panel;

a keypad coupled to said microprocesor and mounted on said control panel, said keypad including a set of control keys for instantly displaying and/or setting primary operating parameters for controlling a batching operation, said set of control keys including a COUNT key for calling up on the display in a single key actuation, the current batch count or, if entered, the preset count for the next batch and a PRESET key for calling up on the display in a single key actuation the number of units remaining to be delivered in a current batch;

battery backed non-volatile memory means coupled to said microprocessor;

a serial port in said microprocessor;

alphanumeric visual display means coupled to said microprocessor and mounted on said control panel;

relay control output means coupled to said microprocessor and to relays for controlling energization of the pump and the valve, respectively; and

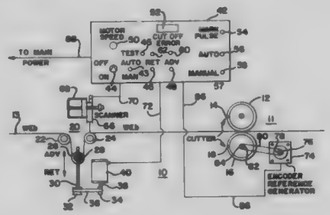
at least one input coupled to said microprocessor for receiving count pulses from the flowmeter.

4,719,575

METHOD AND APPARATUS FOR CONTROLLING WEB HANDLING MACHINERY

Herman C. Gnuechtel, assignor to Web Printing Control Co., Inc., Elk Grove Village, Ill., Arlington Heights, Ill.

Filed Sep. 14, 1984, Ser. No. 650,832
Int. Cl.[4] G06F *15/46; B65H 23/18*
U.S. Cl. 364—469 **55 Claims**



44. A control system for use with an operating apparatus for automatically maintaining a register condition for successive repeat lengths of a sheet substrate having a signature thereon, said control system comprising:

(a) means for scanning the substrate to detect a reflected light level and to digitize into discrete digital samples the detected reflected light level to produce a scanner output and for storing scanner output digital samples representative of a longitudinal cross-sectional profile of the signature of the substrate for substantially an entire repeat length;

(b) means for processing at least a portion of the stored scanner output to generate reference control information from the longitudinal cross-sectional profile of the signature;

(c) means for storing at least a portion of the reference control information to provide stored reference control information;

(d) means for generating control signals responsive to the relationship between the stored reference control information and at least a portion of the scanner output.

4,719,576

APPARATUS FOR MEASURING THE DEGREE OF ENTANGLEMENT IN A YARN

Takao Sano; Toshihiko Oka, both of Moriyama, and Masafumi Ogasawara, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,250
Int. Cl.[4] G06F *15/46; G01L 5/04*
U.S. Cl. 364—470 **20 Claims**

1. An apparatus for measuring the degree of entanglement in a multifilament yarn comprising:

a feed roll connected to a drive means for normal and reverse rotation, the feed roll feeding the yarn to a measuring zone of degree of entanglement;

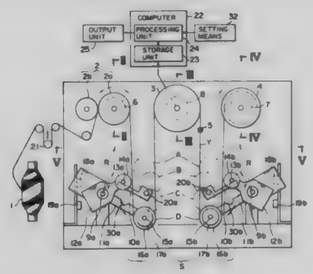
a pulley provided in the measuring zone of degree of entanglement, the yarn sent from the feed roll being threaded on the pulley, said pulley being connected to a rotation meter detecting the amount of rotation of said pulley, said pulley being supported free to rotate;

a yarn-forwarding roll connected to a drive means for rotation, the yarn-forwarding roll forwarding the yarn out of the measuring zone of degree of entanglement;

a first tension roll hung movably in a vertical direction by the yarn threaded from the feed roll through the pulley, a weight being attached to the first tension roll;

a second tension roll hung movably in a vertical direction by the yarn threaded from the pulley through the yarn-forwarding roll, another weight being attached to the second tension roll;

a needle disposed in a position against a yarn path of the yarn



positioned between the pulley and either one of the first tension roll and the second tension roll, the needle being capable of advancing and retracting in the direction of the path of the yarn and capable of piercing the yarn positioned in said yarn path by said advancing;

a first means for adding an auxiliary weight to the first tension roll;

a second means for adding an auxiliary weight to the second tension roll;

a first means for detecting the position of the first tension roll, this first position detecting means being electrically connected to said drive means for normal and reverse rotation;

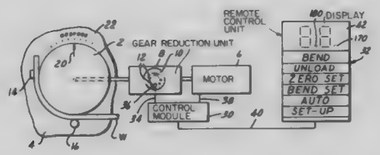
a second means for detecting the position of the second tension roll, this second position detecting means being electrically connected to said drive means for rotation.

4,719,577

BENDING MACHINE WITH DIGITAL ELECTRONIC CONTROL OF BEND ANGLE

David L. Eley, 2433 Wood Dr., Beloit, Wis. 53511

Filed May 29, 1985, Ser. No. 738,726
Int. Cl.[4] B21D *9/00, 7/00; B41F 45/00*
U.S. Cl. 364—474 **7 Claims**



1. In a bending machine having a bending shoe means including a rotatable bending shoe, an electric motor actuated for driving the bending shoe in rotation and means for drivingly connecting the bending shoe and electric motor, the combination of:

(a) sensing means for determining the degree of rotation of the bending shoe by sensing the degree of rotation of the bending shoe means in increments and generating an increment signal for each increment of rotation,

(b) counting means for receiving and counting the increment signals from the sensing means relative to a start reference count,

(c) referencing means for providing the start reference count in the counting means before shoe rotation,

(d) storage means for storing a finish count in the counting means corresponding to the number of increment signal counts relative to the start reference count counted for rotation of the bending shoe to a desired bend angle,

(e) means for transferring said finish count from the counting means to the storage means,

(f) comparator means for comparing said stored finish count to the actual count for the bending shoe during bending,

(g) control means for controlling the motor and responsive to a signal from the comparator means indicative that the actual count equals or exceeds the stored finish count for terminating motor actuation to stop motor driven bending, and

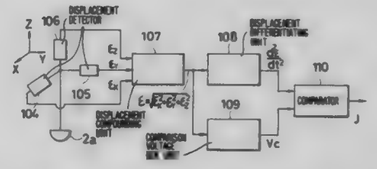
(h) rollover means operative in response to a count in the counting means counted during rotation of the bending shoe in a direction to unload a workpart for permitting rotation of the bending shoe in the unload direction past the start reference count.

4,719,578

PROFILING CONTROL APPARATUS AND CONTROL METHOD THEREOF

Hironari Okitomo; Masaki Nishioka; Kensuke Ide; Hirofumi Yoshikawa, and Yuso Matsunaga, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 9, 1985, Ser. No. 806,791
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 **4 Claims**



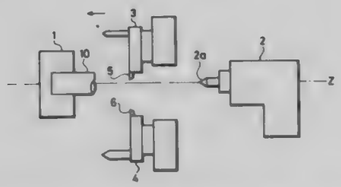
1. A profiling control apparatus which detects a displacement of a stylus pressed on a model surface from a tracer head and controls a profiling machine in accordance with the displacement detection signal, characterized in that said apparatus comprises displacement compounding means for compounding three dimensional displacement signals ϵx, ϵy and ϵz to produce a displacement signal $\epsilon(=\sqrt{\epsilon x^2+\epsilon y^2+\epsilon z^2})$; displacement differentiating means for differentiating the displacement signal ϵ to produce a differentiated value $d^2\epsilon/dt^2$; comparison voltage producing means for producing a comparison voltage Vc corresponding to a maximum acceleration βmax of the pressed stylus; and comparison means for comparing the comparison voltage Vc with the differentiated value $d^2\epsilon/dt^2$ to produce a jumping detection signal when $d^2\epsilon/dt^2=Vc$.

4,719,579

NUMERICAL CONTROL METHOD

Tomomitsu Niwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 613,474, May 23, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,427
Claims priority, application Japan, May 23, 1983, 58-90274
Int. Cl.⁴ G06F *15/46*; G05B *13/02*
U.S. Cl. 364—474 **4 Claims**



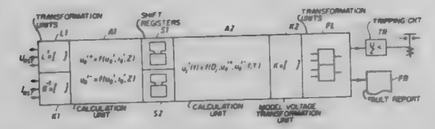
1. A numerical control method for controlling a lathe including a plurality of machine tools having a plurality of turrets, said method comprising the steps of:
supplying data items indicative of cutting conditions for respective tools mounted on the turrets, a machining program, and material conditions of a workpiece to be cut by the machine tools, said cutting conditions including a desired final depth of cut along the workpiece and an incremental depth of cut to be achieved during a given cutting operation;
computing a machining capacity required to cut the workpiece based on said cutting conditions, machining program, and material conditions, said computing step being computed in accordance with at least one of an allowable overall power and an allowable overall torque of all of said tools together;
determining whether said machining capacity is outside a range of one of said allowable overall power and said allowable overall torque;
issuing an output to correct the cutting conditions by varying said incremental depth of cut by the tools with respect to the workpiece when the value of the machining capacity is outside at least one of the allowable overall torque range and the allowable overall power range to correct the machining capacity required to cut the workpiece into the allowable operating parameter range of the machine tools, said varying of incremental depth of cut in turn increasing the number of cutting operations required along the workpiece to achieve said final depth of cut; and
issuing the reduced cutting conditions to the machine tools.

4,719,580

DETECTION AND LOCATION OF A FAULT POINT BASED ON A TRAVELLING WAVE MODEL OF THE HIGH VOLTAGE TRANSMISSION LINE

Gunnar Nimmersjö, Västeras, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 12, 1985, Ser. No. 743,930
Claims priority, application Sweden, Jun. 15, 1984, 8403226
Int. Cl.⁴ G01R *31/08, 19/00*; G06F *15/31*
U.S. Cl. 364—483 **12 Claims**



9. A device for the detection and location of faults on a power transmission line in at least one phase distribution system based on a traveling wave model of the power transmission line from measured voltage and measured current at an end point of the power transmission line, the predetermined wave impedance of the power transmission line, the predetermined wave attenuation factor and transit time based on said travelling wave model of the power transmission line, comprising:
means for periodically generating signals representative of the measured voltage and current;
means for periodically storing the voltage and current signals;
means for calculating a control voltage ($u_1, u_2 \ldots u_j \ldots u_n$) at each of a number of predetermined control points spaced a like number of distances from said end point of the power transmission line along said power transmission line from the following formula:

$$u_j(t)=D_j/2\{u_0(t-T_j)+Zi_0(t-T_j)\}+1/2D_j\{u_0(t-T_j)-Zi_0(t+T_j)\}$$

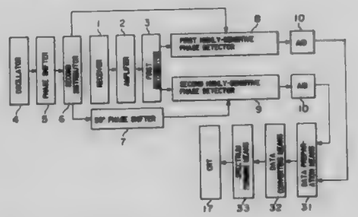
where
u_j=said predetermined attenuation factor of a wave travelling along said power transmission line;
T_j=said predetermined transit time of the travelling wave;
u_0=the measured voltage at said end point of said power transmission line;
i_0=the measured current at said end of said power transmission line;
Z=said predetermined wave impedance of said power transmission line; and
means for determining faults as those locations on said power transmission line where the associated calculated control voltage is constantly zero; and
means for generating output signals representative of the fault locations to provide an indication thereof.

4,719,581

SIGNAL PROCESSING UNIT

Hidenobu Sakamoto, Amagasaki, and Masahiko Shimoda, 11-4, Yoshida 1-chome, Higashi-Osaka-shi, Osaka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Akira Hirai, Kyoto and Masahiko Shimoda, Osaka, all of, Japan

Filed Nov. 13, 1984, Ser. No. 670,579
Claims priority, application Japan, Nov. 11, 1983, 58-213102
Int. Cl.⁴ G01R *23/00, 35/00*; G01V *3/00*
U.S. Cl. 364—485 **3 Claims**



1. A signal processing unit comprising:
a receiver for receiving a signal;
an amplifier coupled to said receiver for amplifying said received signal;
a first distributor means coupled to said amplifier for producing two output signals from said amplified signal;
an oscillator;
a first phase shifter connected to said oscillator;
a second distributor means coupled to said output of said phase shifter for producing a plurality of outputs;

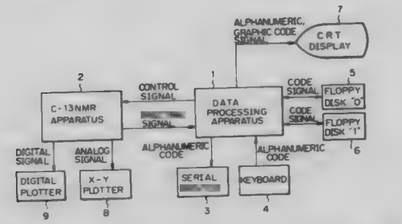
a second phase shifter coupled to one of said outputs of said second distributor means for shifting said signal 90°;
two phase detectors each receiving one of said outputted signals from said first distributor means for performing synchronous detection of the outputted signals with one of said phase detectors being coupled to and responsive to a signal outputted by said second distributor means not passing through said second phase shifter and the other of said phase shifter that shifts said signal by 90°;
two A/D converters each connected respectively to said phase detectors for converting the output of each of said phase detectors to a digital signal; and
a digital processing means for accepting the digital signals produced by said A/D converters and for constantly and automatically producing an automatic error compensation of said received signal.

4,719,582

METHOD AND APPARATUS FOR DETERMINING THE CHEMICAL STRUCTURE OF AN UNKNOWN SUBSTANCE

Yoshiaki Ishida; Keiji Saito, both of Ube, and Tokio Oshima, Tokyo, all of Japan, assignors to UBE Industries, Ltd., Japan

Filed Nov. 2, 1984, Ser. No. 667,628
Claims priority, application Japan, Nov. 16, 1983, 58-214153
Int. Cl.⁴ G06F *15/42*
U.S. Cl. 364—498 **24 Claims**



1. An apparatus for determining the chemical structure of an unknown substance, comprising: a means for detecting spectral data of the unknown substance; a memory means for memorizing at least the chemical shift values corresponding to partial structures of known substances; a means for finding a point-assessment expressing the degree of possibility of partial structures being contained in the unknown substance based on the spectral data of the unknown substance and the data stored in said memory means; comparison means for judging whether said point-assessment is a predetermined threshold value or more; and an output means for displaying the partial structures with a large possibility of being contained in the unknown substance based on the output of said comparison means.

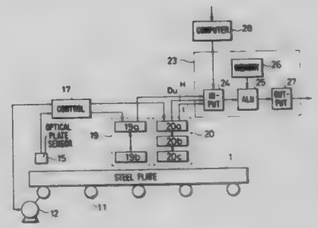
4,719,583

METHOD AND APPARATUS OF EVALUATING MECHANICAL PROPERTIES OF STEEL

Hideo Takafuji; Tsugio Ishida, and Shoichi Sekiguchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,976
Claims priority, application Japan, Oct. 21, 1984, 58-197255
Int. Cl.⁴ G06G *7/68*; G06F *15/20*; G01N *3/00, 3/08*
U.S. Cl. 364—506 **8 Claims**

1. An apparatus for evaluating the mechanical properties of steel which comprises:
a hardness measuring apparatus, grain size measuring apparatus, and emission spectroscopic analyzer provided at the terminal end of a steel rolling line; and
a computer, the computer comprising;
an input section into which signals from the hardness measuring apparatus, grain size measuring apparatus and spectroscopic analyzer are inputted;
a memory in which empirical equations showing a relationship between each of tensile strength, yield point, elongation, shelf energy, transition temperature, and temperature range of an energy transition region for first steel samples and the hardness, grain size and chemical composition of the first steel samples and an energy transition curve plotting shelf energy, transition temperature, and temperature range of an energy transition region of the first steel samples are stored;



an arithmetic logic unit that derives tensile strength, yield point, elongation, shelf energy, transition temperature, and temperature range of an energy transition region from the empirical equations stored in the memory and drives an energy absorbed at a given temperature from the energy transition curve stored in the memory using signals supplied from said measuring apparatuses and said spectroscopic analyzer when measuring hardness, grain size and chemical composition of a second steel sample; and
a display unit showing the results of the operation carried out by the arithmetic logic unit.

4,719,584

DUAL MODE VIDEO TRACKER

Arthur K. Rue, Rancho Palos Verdes; Gordon T. Pope, Culver City, and Earl L. Emerson, Placentia, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

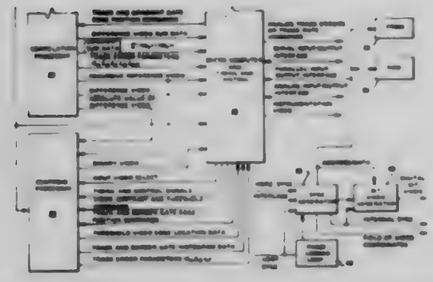
Filed Apr. 1, 1985, Ser. No. 718,602
Int. Cl.⁴ H04N *7/18*; G06G *7/48*
U.S. Cl. 364—516 **16 Claims**

13. A device for automatically tracking a target, and of a type which generates tracking error signals from input electromagnetic video signals derived from a target scene and utilized to form successive video frames of a two dimensional image plane, said image plane being defined by a plurality of pixels each having an intensity value and a discrete location in the image plane, said device comprising:
an input for receiving said input video signals;
a first video processor for processing said input video signals and for generating a first set of tracking error signals, said first video processor including:
(1) first input means for receiving said input video signals from said input,
(2) means connected with said first input means for generating a pixel intensity threshold value,
(3) means for comparing the intensity value of said input video signals with said threshold value and for computing a centroid of pixels in said image plane, the computed centroid being comprised of pixels which, for a desired contrast between the centroid and a background, have an intensity value which is greater than or which is less than said threshold value;
a second video processor for processing said input video signals and for generating a second set of tracking error signals, said second video processor including:
(1) second input means for receiving said input video signals from said input, and for generating therefrom on

a frame by frame basis a current map of pixel intensity values for a current video frame,

(2) storage means connected with said second input means for storing the current map of pixel intensity values for a current video frame, and,





means for delivering said map of pixel intensity values from said storge means to said first input means, whereby the input video signals received by said first processor are combined during a subsequent video frame with said map of pixel intensity values.

4,719,585

DIVIDING CUBES SYSTEM AND METHOD FOR THE DISPLAY OF SURFACE STRUCTURES CONTAINED WITHIN THE INTERIOR REGION OF A SOLID BODY

Harvey E. Cline, Schenectady; Siegwalt Ludke, Scotia, and William E. Lorensen, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1985, Ser. No. 770,164
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—518 8 Claims

1. A system for displaying three dimensional surface structures, said system comprising:

means for storing three-dimensional signal patterns representing the value of at least one physical property associated with a three dimensional body at regularly spaced parallelopiped grid locations defining volume elements within said body;

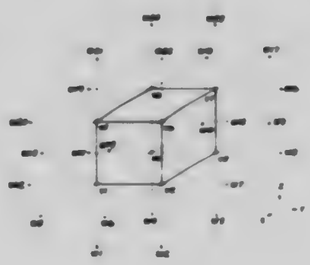
means for retrieving the thirty-two three dimensional signal pattern values associated with each set of eight cubically adjacent grid locations and the twenty-four additional grid locations adjacent to said eight cubically adjacent grid locations, each of said cubically adjacent grid locations being associated with three of said additional grid locations;

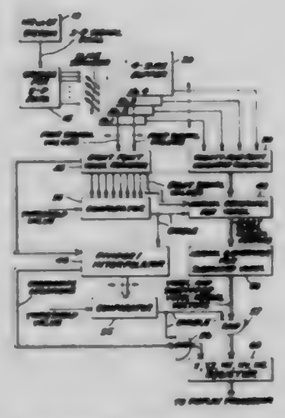
first comparison means for comparing the signal values associated with said eight adjacent grid locations with a predetermined threshhold value to determine those volume elements for which at least one of said eight comparison results is distinct from the other seven comparison results so as to identify selected volume elements through which a surface determined by said threshhold value passes;

first generating means for generating normal vectors from said thirty-two signal pattern values for each of said eight cubically adjacent grid locations associated with each selected volume element;

second generating means for generating, for each selected volume element defined by said eight cubically adjacent grid locations, a plurality of additional signal values associated with additional special locations defined along the edges and within the interior of said selected volume element, said additional special locations corresponding to subdivision of said volume element;

second comparison means for comparing the signal values associated with each set of eight cubically adjacent special locations associated with each of said volume element





subdivisions with said predetermined threshhold value to determine those subdivided volume elements for which at least one of said subdivision comparison results is distinct from the other seven comparison results, so as to generate a sequence of values identifying selected grid and additional special locations which at least approximately lie on a surface determined by said threshhold value;

third generating means for generating normal vectors associated with said additional special locations, said selected grid locations and additionally selected special locations being generated so as to be associated with the corresponding normal vectors for said locations; and

display processor means for receiving said associated location values and normal vectors and providing a shaded image on a screen, said image representing said surface determined by said threshhold.

4,719,586

MANUFACTURING PROCESS CONTROL

John A. Meyer, Fremont, and Jeffrey W. Dugald, Angola, both of Ind., assignors to Meyer Process and Control Company, Inc., Angola, Ind.

Filed Nov. 1, 1985, Ser. No. 794,877
Int. Cl.[4] G06F 15/20; G06G 7/48
U.S. Cl. 364—552 19 Claims



13. A method for controlling an apparatus for manufacturing discrete workpieces comprising:

selecting a centered mean value;

selecting and storing a correction value;

manufacturing a workpiece;

measuring a controlled dimension of said workpiece;

computing an adjustment value for adjusting said apparatus based on the measured controlled dimension of said workpiece and said stored correction value;

adjusting said apparatus in accordance with said computed adjustment value;

computing an expected value of the next workpiece to be produced based on the last produced workpiece;

manufacturing a current workpiece;

measuring the controlled dimension of said current workpiece;

comparing the sign of the measured dimension of said current workpiece relative to a selected centered mean value of a distribution of measured controlled dimensions with the sign of the dimension of the last produced workpiece relative to said selected mean value;

updating said stored correction factor by decrementing if said compared signs are of opposite polarities;

comparing the absolute expected value with the absolute measured value of the current workpiece;

updating said stored correction factor by incrementing if said absolute measured value is greater than said absolute expected value of said measured value is of the same polarity as said expected value;

calculating an updated adjustment value; and

adjusting said apparatus in accordance with said updated adjustment value.

4,719,587

FUTURE BEHAVIOR EQUIPMENT PREDICTIVE SYSTEM

Frank J. Berte, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

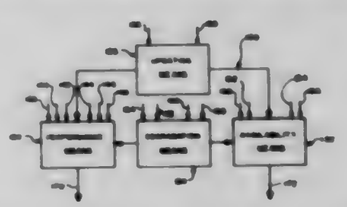
Filed Apr. 16, 1985, Ser. No. 723,782
Int. Cl.[4] G06F 15/20; G06G 7/48
U.S. Cl. 364—552 12 Claims

1. A future boiler behavior predictive system for use for purposes of effectuating an appraisal of the future behavior of a boiler comprising:

a. performance means containing a bank of data relating to performance characteristics of the boiler, said performance means being provided with a plurality of inputs from a variety of sources, said plurality of inputs including a first input consisting of data derived from the manufacturer of the boiler relating to the performance characteristics of the boiler, a second input consisting of data derived from boiler industry and other boiler sources relating to the performance characteristics of the boiler, a third input consisting of data derived from past and present boiler users relating to the performance characteristics of the boiler, a fourth input consisting of data derived from the operator of the boiler relating to the performance characteristics of the boiler, a fifth input consisting of data derived from an inspection of the boiler, and a sixth input consisting of data derived from conducting testing on the boiler;

b. availability means containing a bank of data relating to availability characteristics of the boiler;

c. degradation means containing a bank of data relating to degradation characteristics of the boiler, said degradation means being connected in cross-linked relation to both said performance means and said availability means so as to effectuate the accumulation of the degradation characteristics data of said degradation means with the performance characteristics data of said performance means and the availability characteristics data of said availability means such that the performance characteristics data of said performance means and the availability characteristics data of said availability means are each made to reflect the degradation characteristics data of the boiler; and



d. updating means containing a bank of data relating both to current performance characteristics of the boiler and to current availability characteristics of the boiler, said updating means being connected to both said performance means and said availability means so that data relating to the current performance characteristics of the boiler and the current availability characteristics of the boiler can be provided thereto for purposes of accomplishing an updating of the performance characteristics data of said performance means and the availability characteristics data of said availability means.

4,719,588

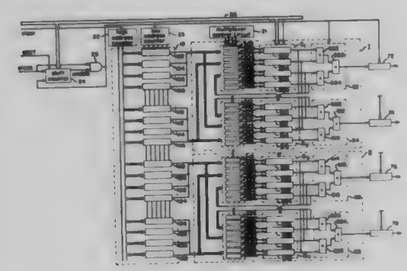
MATRIX MULTIPLICATION CIRCUIT FOR GRAPHIC DISPLAY

Takaomi Tezuichi, and Masato Takahashi, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,430
Claims priority, application Japan, May 6, 1983, 58-79797; Oct. 7, 1983, 58-188917
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—784 16 Claims

1. A matrix multiplication apparatus for a graphic display which transforms line segments into a dot pattern and displays a graphic picture corresponding to the dot pattern, the matrix multiplication apparatus comprising: multiplication means for multiplying transformation matrices with each other and for multiplying a coordinate matrix with a transformation matrix; matrix-storing means for storing bit data representative of the elements of the transformation matrices so as to provide multiplicands and multipliers; and a processor for controlling the multiplication means and the matrix-storing means, said processor including means for supplying bit data representative of the elements of the coordinate matrices to the multiplication means as multiplicands; the multiplication means comprising a

plurality of groups of serial multiplicators, each multiplicator processing in sequence a predetermined bit length not less than a bit length of the coordinate matrix element and less than a bit length of the transformation matrix element, each multiplicator having a direct-connection terminal for receiving the multipliers from the matrix-storing means and a cascade terminal, first change-over means for connecting the plurality of multiplicators of the different groups in a cascade connection at the cascade terminals so as to receive the multiplicands representative of the transformation matrix elements from the matrix-storing means in sequence and for enabling the multiplicators to operate independently of each other to receive the multiplicands representative of the coordinate matrix elements from the processor in sequence, second change-over means connected between the matrix-storing means and respective ones



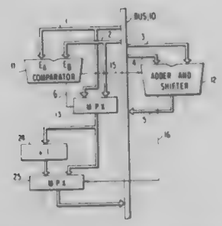
of the direct-connection terminals for multiplexing the different multipliers fed from the matrix-storing means so as to enable the cascade-connected multiplicators to process the different multipliers, and addition means for adding the results of the multiplications obtained by the multiplicators belonging to the same groups; the matrix-storing means being directly connected to the multiplication means and comprising random access memories having a predetermined number of blocks corresponding to the number of transformation matrix elements, each block being divided into at least one area which stores whole bits of one element of one transformation matrix, high address setting means for designating the area, and low address setting means for serially reading out the bit data representative of the transformation matrix element stored in the designated area from the least significant bit.

4,719,589

FLOATING-POINT ADDER CIRCUIT

Hideo Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,336
Claims priority, application Japan, Dec. 28, 1983, 58-247027
Int. Cl.[4] G06F *7/50, 11/00*
U.S. Cl. 364—748 **3 Claims**
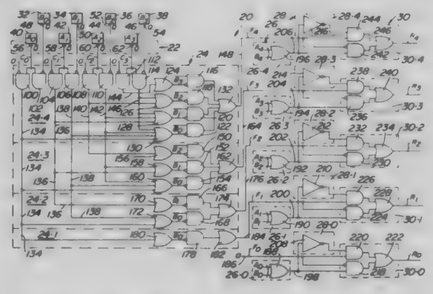


3. An arithmetic processing unit comprising:
a comparator for comparing a scale of an exponent part of a first floating point data with that of an exponent part of a second floating point data,
a multiplexer coupled to said comparator and for selecting either one of the two exponent parts of said first and second floating point data according to a result of said comparison,
an arithmetic circuit for receiving mantissa parts of said first and second floating point data, respectively, and for executing an arithmetic operation of the two mantissa parts,
an incrementer coupled to said comparator, said incrementer incrementing a selected exponent part by 1 in advance when the arithmetic operation is executed by said arithmetic circuit and before a carry signal is generated, and
a selector coupled to said incrementer, said multiplexer and said arithmetic circuit, for selecting an output of said incrementer when said arithmetic circuit applies a carry signal to said selector, and for selecting an output of said multiplexer when said arithmetic circuit does not apply the carry signal to said selector.

4,719,590

APPARATUS AND METHOD FOR PERFORMING ADDITION AND SUBTRACTION

James A. Aman, Box 336, Cathcart Rd., Gwynedd Valley, Pa. 19437

Filed Aug. 14, 1984, Ser. No. 640,736
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—768 **15 Claims**



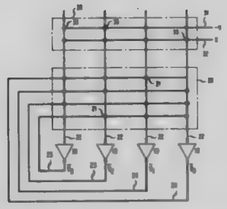
1. A device for adding or subtracting two signals A and B without producing any bit generate signal, each of said signals being composed of a string of n digits in a number system having a predetermined base, each digit defining a respective column, and wherein A_i represents each digit of the A string, B_i represents each digit of the B string and i represents the specific column number from 0 to n, said device comprising first means for adding the A_i and B_i digits in each of said columns without reference to the result of said addition in any other column when said device is performing said addition operation and for subtracting the B_i digits from said A_i digits in each of said columns without reference to the results of said subtraction in any other column when said device is performing said subtraction operation, second means for providing a C string of n digits, said C string being the complement of said A string in the number system having a base one less than said predetermined base when said device is performing the addition operation and being the same as said A string when said device is performing the subtraction operation, third means for comparing substrings of said B signal to the corresponding length substrings of said C string, and fourth means responsive to said first and third means for providing a resultant output signal R composed of at least n digits R_i and representing the results of said addition or subtraction operation.

4,719,591

OPTIMIZATION NETWORK FOR THE DECOMPOSITION OF SIGNALS

John J. Hopfield, Pasadena, Calif., and David W. Tank, Summit, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Labs., Murray Hill, N.J. and Calif. Institute of Technology, Pasadena, Calif.

Filed Nov. 7, 1985, Ser. No. 795,789
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—807 **10 Claims**



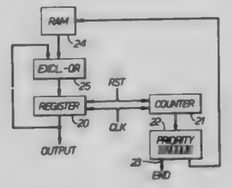
1. A circuit for determining a best fit to input signals with a selected set of basis functions $\hat{e}_k$, which are signal functions of a preselected variable, said circuit comprising:
an N plurality of gain-providing amplifiers, where N is a chosen number with each amplifier A_i having an input terminal and output terminal; and conductance devices of conductance value T_{ij}, with each conductance device connecting said output terminal of amplifier A_i to the input terminal of amplifier A_j, i and j being subscripts that denote a particular of said amplifiers and conductance devices wherein
each of said conductance values T_{ij} is related to the dot product of the ith basis function $\hat{e}_i$ and the jth basis function $\hat{e}_j$.

4,719,592

SEQUENCE GENERATOR

David J. Hunt, Hitchin, England, assignor to International Computers Limited, London, England

Filed Oct. 26, 1983, Ser. No. 545,519
Claims priority, application United Kingdom, Nov. 20, 1982, 8233177
Int. Cl.[4] G06F *7/58*
U.S. Cl. 364—900 **6 Claims**



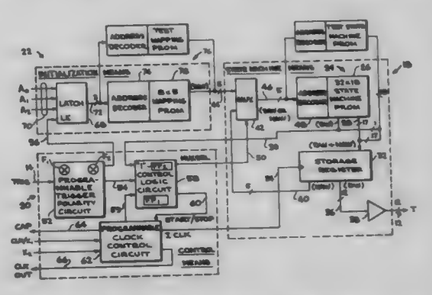
1. A sequence generator comprising:
(a) a counter having an output,
(b) priority encoding means connected to the output of the counter, for producing an output code identifying a first bit of a predetermined value in the output of the counter,
(c) a memory containing a plurality of control words and having an address input for addressing the control words and a data output for outputting the control words, the address input being connected to receive the output code from the priority encoder,
(d) an output register having an input and an output, and
(e) an adder having first and second inputs and an output, the first input being connected to the data output of the memory, the second input being connected to the output of the output register, and the output of the adder being connected to the input of the output register,
whereby a sequence of output values is provided in said output register.

4,719,593

APPARATUS FOR GENERATING DIGITAL TIMING WAVEFORMS

N. Bruce Threewitt, Fremont, and Jimmy R. Madewell, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 9, 1984, Ser. No. 628,707
Int. Cl.[4] G06F *7/70*
U.S. Cl. 364—900 **24 Claims**



1. A programmable event generator, implemented as an integrated circuit, for outputting digital timing waveforms in response to an externally applied triggering signal having a leading edge and a trailing edge, an externally applied address and an externally applied clock, comprising:
(a) state machine means for generating the digital timing waveforms, including
(i) a first addressable and programmable read-only memory means for storing a plurality of words, each one of the words having a data word corresponding to the digital timing waveforms and a next address word to access another of the data words, and at least one of the words having a stop word;
(ii) a storage register, having a clock input and coupled to said first addressable and programmable read-only memory means, for temporarily storing and then outputting a data word and next address word, and
(iii) a multiplexer having a first input, a second input, a select input and an output;
(b) initialization means for producing any one of a plurality of starting addresses in response to the externally applied address, including
(i) a means for temporarily holding the externally applied address; and
(ii) a second addressable and programmable read-only memory means for storing and outputting any one of a plurality of starting address words in response to the externally applied address in the holding means, said first input connected to receive the one starting address word and said second input connected to receive the next address word; and
(c) control means for controlling said state machine means and said initialization means in response to the externally applied triggering signal and the externally applied clock signal, including
(i) trigger circuit means, responsive to the leading edge of the externally applied triggering signal, for generating a first signal to enable said holding means and for generating a second signal;
(ii) control logic circuit means, in communication with the storage register, for generating a select signal and a start signal in response to the second signal and for generating

a stop signal in response to the stop word, said select input receiving the select signal so that said multiplexer couples said first input to said output in the absence of the select signal and couples said second input to said output in the presence of the select signal; and

(iii) programmable clock control circuit means for generating an internal clock at a selected frequency in response to the externally applied clock said programmable clock control circuit means being enabled in response to the start signal and being disabled in response to the stop signal, and said clock input of said storage register receiving the internal clock.

4,719,594

GROOVED OPTICAL DATA STORAGE DEVICE INCLUDING A CHALCOGENIDE MEMORY LAYER

Ross Young, Troy, and Napoleon Formigoni, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 667,294, Nov. 1, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,227

Int. Cl.⁴ G11C *13/00*; G11B *3/70*

U.S. Cl. 365—113 **1 Claim**



1. An optical data storage device comprising:

(a) a first, substantially transparent, substrate;

(b) a first polymeric, adhesive layer, having lands and valleys, the grooves having of about 900 Angstroms, the valleys of the grooves having a width of from about 1.5 to about 2.5 microns, the lands of the grooves have a width of from about 0.5 to about 0.7 microns, and the grooves being on a pitch of from about 2.0 to about 3.2 microns, the lands of the grooves having a thickness above the valleys of the grooves of from about 1500 to about 2500 Angstroms, comprising a polymeric material chosen from the group consisting of polyacrylates and polyepoxides, adherent to the first substrate;

(c) a first inorganic encapsulating layer, having a thickness of from about 1500 to about 2500 Angstroms, comprising a dielectric oxide of germanium, bonded to the concentrically grooved, polymeric layer and conforming thereto;

(d) a layer of state changeable chalcogenide memory material, having a thickness of from about 500 to about 2000 Angstroms, forming an interface with and conforming to the first inorganic encapsulating layer whereby the layer of state changeable memory material has defined therein by the concentrically grooved, polymeric layer a set of concentric lands and a set of concentric valleys, said set of valleys and said set of lands being substantially amorphous after deposition and prior to formation, said set of valleys being substantially crystalline after formation;

(e) a second inorganic encapsulating layer, having a thickness of from about 1500 to about 2500 Angstroms, comprising a dielectric oxide of germanium, deposited atop, conforming to and forming an interface with the layer of state changeable memory material;

(f) an adhesive layer, having a thickness of from about 1000 Angstroms to about 100 microns, comprising a polymeric material chosen from the group consisting of polyacrylates and polyepoxides, forming an interface with and conforming to the second inorganic encapsulating layer; and

(g) a second substantially transparent substrate, adherent to the adhesive layer.

4,719,595

DATA OUTPUT CIRCUIT FOR A DYNAMIC MEMORY

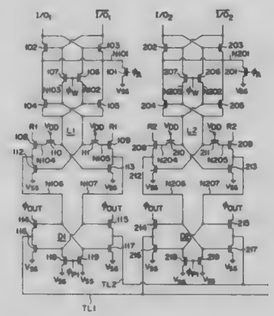
Hiroyuki Koinuma, and Haruki Toda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 4, 1985, Ser. No. 794,542

Claims priority, application Japan, Nov. 5, 1984, 59-232908

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **4 Claims**



1. A circuit for reading out data from a plurality of memory cells in a dynamic memory, comprising:

a plurality of pairs of data transfer nodes coupled to selected memory cells, for receiving data transferred from the selected memory cells, with one node in each pair being set at a high level and the other node being set at a low level at times when data is read out from the selected memory cells;

a plurality of latch circuits, each being coupled to a corresponding pair of the data transfer nodes, to a corresponding one of a plurality of switch signals for selecting one of the latch circuits, and to a corresponding one of a plurality of pairs of intermediate nodes, for setting one intermediate node at a high level and the other intermediate node at a low level in one pair of intermediate nodes at times when the corresponding latch circuit is selected, and for setting both nodes in each pair of intermediate nodes at one of the high level and the low level at times when the corresponding latch circuit for said pair is not selected;

a plurality of data output control circuits, each being coupled to a corresponding one of the pairs of intermediate nodes, to a data output drive signal, and to a pair of transfer lines, and being responsive to the levels of the corresponding intermediate nodes to couple the data output drive signal to one transfer line at times when the corresponding latch circuit is selected, and to decouple the data output drive signal from the transfer lines at times when the corresponding latch circuit is not selected;

an output drive circuit coupled to the pair of transfer lines for driving one of a pair of output transistors at times when the output drive signal is coupled to one of the pair of transfer lines;

a power source having first and second electrodes;

a first output transistor of said pair of output transistors being coupled to a data output node and said first electrode of said power source; and

a second output transistor of said pair of output transistors being coupled to the data output node and said second electrode of said power source, said first and second output transistors being driven by the output drive circuit to set the data output node at a high and a low level in accordance with the data read out form the selected memory cells;

wherein the setting of both intermediate nodes in each of the intermediate node pairs at the one level at times when the corresponding latch circuits are not selected enables the data output drive signal to be set before the switch signals select one of the of latch circuits.

4,719,596

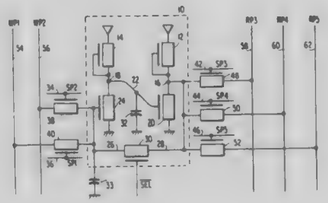
REGISTER PROVIDING SIMULTANEOUS READING AND WRITING TO MULTIPLE PORTS

Kerry Bernstein, Underhill, and Anatol Furman, Jericho, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,416

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **6 Claims**



1. A memory system comprising:

first and second field effect transistors,

first and second loads serially connected to said first and second transistors, respectively, a first common point between said first transistor and said first load being connected to the control electrode of said second transistor,

a third field effect transistor connected from a second common point between said second transistor and said second load to the gate electrode of said first transistor,

means for selectively applying a first control voltage to the control electrode of said third transistor,

a first write line,

a fourth field effect transistor connected between said first write line and the control electrode of said first transistor,

means for selectively applying a second control voltage to the control electrode of said fourth transistor,

a first read line,

a fifth field effect transistor connected between said read line and said second common point, and

means for selectively applying a third control voltage to the control electrode of said fifth transistor concurrently with applying said second control voltage to the control electrode of said fourth transistor.

4,719,597

DRIVING CIRCUIT FOR A SHARED SENSE AMPLIFIER WITH INCREASED SPEED CLOCK GENERATION CIRCUIT FOR READING ADDRESSED MEMORY CELLS

Masaki Kumanoya; Kazuyasu Fujishima; Hideshi Miyatake; Hideto Hidaka, and Katsumi Dosaka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,279

Claims priority, application Japan, Aug. 17, 1984, 59-172004

Int. Cl.⁴ G11C *7/00, 8/00, 7/02*

U.S. Cl. 365—189 **16 Claims**

1. A driving circuit for a shared sense amplifier which drives at a high speed a shared sense amplifier circuit including two pairs of bit lines respectively connected with memory cells, sense amplifier means provided between said two pairs of bit lines for amplifying information read from said memory cells, first switch means interposed between one of said pairs of bit lines and said sense amplifier means and second switch means interposed between the other pair of bit lines and said sense amplifier means thereby to share said sense amplifier means by said two pairs of bit lines, said driving circuit comprising:

cut-off clock generation circuit means for generating a cut-off clock responding at a high speed to addressing of said memory cells;

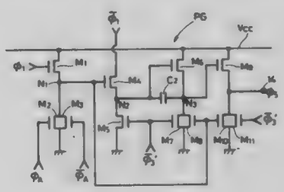
decoder means for decoding said cut-off clock; and

a control clock generation circuit means for generating a first control clock for controlling the on-off operation of said first switch means and a second control clock for controlling the on-off operation of said second switch means,

said cut-off clock generation circuit means including:

a first potential level source,

a second potential level source having a potential level different from that of said first potential level source,



a first transistor having a first conducting terminal connected to said first potential level source,

a second transistor interposed between a second conducting terminal of said first transistor and said second potential level source,

first circuit means for making said first transistor conductive and said second transistor non-conductive in response to addressing of one of said memory cells,

boosting capacitor means interposed between said second conducting terminal of said first transistor and a gate terminal of said first transistor for making said first transistor conductive at a high speed, and

second circuit means for producing said cut-off clock on the basis of potential change at said second conducting terminal of said first transistor.

4,719,598

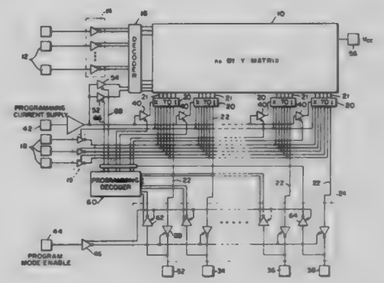
BIT ADDRESSABLE PROGRAMMING ARRANGEMENT

David W. Stockton, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed May 31, 1985, Ser. No. 739,843

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **17 Claims**



1. A programmable matrix, comprising:

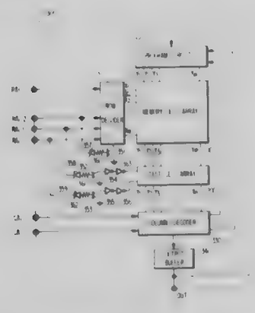
a plurality of memory elements arranged in an array of X by Y intersecting lines;
input means for addressing at least a portion of said X and Y lines;
input/output means for receiving a sensing signal from an addressed memory element when the matrix is operated in a READ mode, and for receiving programming signals when the matrix is operated in a PROGRAM mode, said input/output means including N bi-functional input/output terminals; and
programming means, including a programming decoder, connected to the matrix and to the N bi-functional input-/output terminals, for controlling a flow of programming current to any of said memory elements in response to application of programming signals to less than all of said N bi-functional input/output terminals, and wherein said programming decoder has inputs for receiving said programming signals from said N terminals and has outputs connected to means for controlling said flow of programming current in the matrix in response to said application of programming signals to less than all of said N terminals.

4,719,599

PROGRAMMABLE READ-ONLY MEMORY DEVICE PROVIDED WITH TEST CELLS

Yoshinobu Natsui, and Hiroshi Mayumi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,515
Claims priority, application Japan, Oct. 31, 1983, 58-203975
Int. Cl.⁴ G11C *29/00, 7/00*
U.S. Cl. 365—201 **9 Claims**



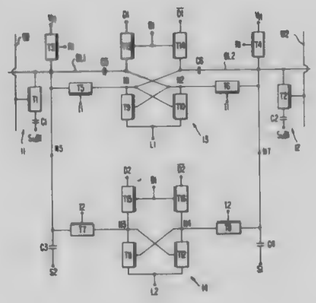
1. A memory device comprising a plurality of row and column lines, a plurality of memory cells disposed at the respective intersections of said row and column lines, first means responsive to a first set of address signals for selecting one of said row lines, second means responsive to a second set of address signals for selecting one of said column lines, and a test circuit including first and second additional row lines, a first diode disposed at the intersection of said first additional row line and a first one of said column lines, a second diode disposed at the intersection of said second additional row line and a second one of said column lines adjacent to said first one of said column lines, a first transistor disposed at the intersection of said second additional row line and said first one of said column lines, the first additional row line and said second one of said column lines being isolated from each other without any transistor or diode being disposed at an intersection thereof, and third means for selecting said first additional row line.

4,719,600

SENSE CIRCUIT FOR MULTILEVEL STORAGE SYSTEM

David R. Huffman, Westford; Scott C. Lewis, Essex Junction, and James E. Rock, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,312
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—208 **10 Claims**



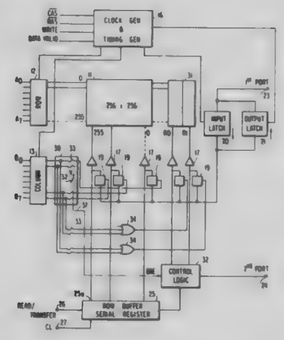
1. A sense circuit for determining the data state of a data input signal corresponding to one of n charges levels, comprising:
means for providing a data input signal voltage level representing a data state corresponding to one of n charge levels, n being an integer greater than 2;
means for generating a first reference voltage having a predetermined level of magnitude;
a first differential voltage level sensing circuit responsive to said data input signal voltage level and to said first reference voltage level, said first differential voltlage level sensing circuit providing at least one first binary data output signal as a function of the relative magnitudes of said data input signal voltage level and said first reference voltage level;
means responsive to said first binary data output and said data input signal voltage level for generating an adjusted data signal voltage having a magnitude corresponding to a function of said data input signal voltage level and said first binary data output signal;
means responsive to said first binary data output signal for generating a second reference voltage having a level of magnitude different from that of said first reference voltage level; and
a second differential voltage level sensing circuit responsive to an adjusted data input signal voltage level and to said second reference voltage level, said second differential voltage level sensing circuit providing at least one second binary data output signal as a function of the relative magnitudes of said adjusted data input signal voltage level and said second reference voltage level;
means responsive to said first binary data output signal and said second binary data output signal for determining the data state of one of said n charge levels as a function of said first binary data output signal and said second binary data output signal.

4,719,601

COLUMN REDUNDANCY FOR TWO PORT RANDOM ACCESS MEMORY

Kenneth S. Gray, Underhill, and Bradley D. Herrman, Williston, both of Vt., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed May 2, 1986, Ser. No. 858,989
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—210 **8 Claims**



8. A read/write memory system including a data storage matrix having columns and rows, write means responsive to column address signals for causing data bits to be stored in predetermined logical columns within data storage matrix, each column address defining a predetermined logical to physical relationship between the logical column defined by the column address and a physical column of the data storage matrix, said memory system having transfer means for transferring data bits between a plurality of physical columns of said data storage matrix and a data input/output means, said data bits being transferred in parallel to or from said data storage matrix and serially through said data input/output means in a sequence corresponding to the logical column order determined by said column address signals, the improvement comprising:
a redundant data storage matrix having at least one column;
a column redundancy means responsive to at least one predetermined column address signal for storing data bits in a column of the redundant data storage matrix; and for signalling that column redundancy has been selected; and
control logic means, responsive to the column redundancy means and said transfer means, for causing data bits sequentially transferred through said data input/output means and having respective predetermined corresponding logical column positions to maintain their respective logical column positions during both reading and writing of data bits from and to said storage matrix when column redundany has been selected.

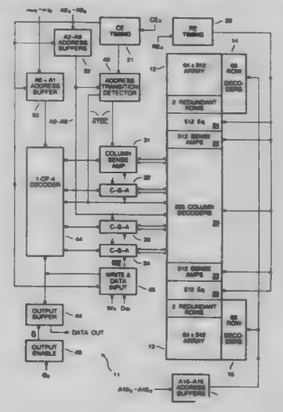
4,719,602

MEMORY WITH IMPROVED COLUMN ACCESS

Mohammed E. U. Haq, Sunnyvale, and Peter J. Bagnall, Cupertino, both of Calif., assignors to Visic, Inc., San Jose, Calif.

Filed Feb. 7, 1985, Ser. No. 699,020
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—230 **8 Claims**

1. In a semiconductor memory device having:
a multiplicity of data storage locations arranged in rows and columns, said storage locations being addressed by a plurality of binary address signals; said address signals being divided into row address signals and column address signals; said column address signals being further divided into low and high order column address signals;
a set of sense amplifiers for latching and transferring data to and from a selected row of said data storage locations; and
data input and output buffers for receiving and transmitting data;
the improvement comprising:
a plurality of secondary sense amplifiers for latching and



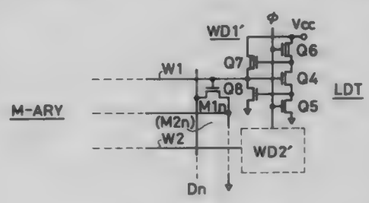
transferring data to and from selected ones of said sense amplifiers, said sense amplifiers being selected in accordance with said high order column address signals; and
decoder means responsive to said low order column address signals for selecting one of said secondary sense amplifiers and connecting it to said data input and output buffers.

4,719,603

SEMICONDUCTOR MEMORY HAVING A DYNAMIC LEVEL DETECTING MEANS FOR DETECTING A LEVEL OF A WORD LINE

Yutaka Shinagawa, Koganei, and Shigeru Shimada, Hoya, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer, both of Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,316
Claims priority, application Japan, Apr. 15, 1985, 60-78364
Int. Cl.⁴ G11C *7/00, 11/24*
U.S. Cl. 365—230 **9 Claims**



1. A semiconductor memory comprising:
a memory array which has a plurality of memory cells and a plurality of selection lines coupled to said memory cells;
a driver circuit whose output terminal is coupled to one end of each selection line for selecting predetermined memory cells by providing an output signal to a predetermined selection line;
a voltage detector circuit constructed of a first MOSFET whose gate receives an output signal of said driver circuit through said predetermined selection line, an output node coupled in series with the source-drain path of the first MOSFET, a second MOSFET which is on/off-controlled

by a timing signal, wherein said first and second MOSFETs are connected in series between the output node and one terminal of a power source, and a third MOSFET which is on/off-controlled complementarily to said second MOSFET and which is connected between another terminal of the power source and the output node; and

a fourth MOSFET which is interposed between said another terminal of the power source and the gate of said first MOSFET, and which is brought into an "on" state by an output of the output node at a predetermined time when said second MOSFET has been brought into an "on" state and when a gate potential of said first MOSFET has exceeded a predetermined level
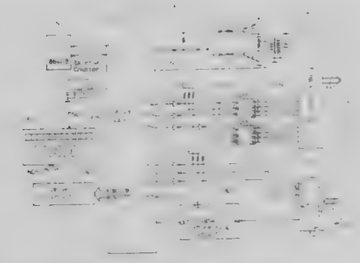
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4,719,604

REFLECTIVE OBJECT DETECTOR WITH COMPENSATED RECEIVER SIGNAL

Yoshibiro Naruse, Tokyo, Japan, assignor to Aisin Seiki Kabushikikaisha, Japan

Filed Jul. 15, 1986, Ser. No. 885,638
Claims priority, application Japan, Jul. 16, 1985, 60-156254
Int. Cl.[4] G08B *13/16*
U.S. Cl. 367—93 **11 Claims**



1. A reflective object detector comprising

object detecting means including signal transmitting means and signal receiving means which receives a reflection of a signal transmitted from the signal transmitting means;

means for energizing the signal transmitting means;

amplifier means responsive to an output signal

from the signal receiving means, an amplification factor thereof changing with time in accordance with a given exponential function when a control signal applied thereto is turned "on";

annunciator means for producing at least one of a visible indication or audible output;

and electronic control means for controlling the energizing means to energize the signal transmitting means, for turning a control signal applied to the amplifier means to an "on" level, and for monitoring an output level from the amplifier means to energize the annunciator means when the output level reaches a given value.

4,719,605

SELF-CALIBRATING ULTRASONIC RANGE FINDER

Kenneth C. Eder, New Brighton, Minn., and Christos M. Koukovinis, Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1984, Ser. No. 681,175
Int. Cl.[4] G01S *9/66, 9/68*
U.S. Cl. 367—98 **16 Claims**

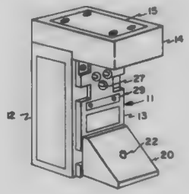
1. An ultrasonic sensor comprising:

transducer means including an electroacoustic transducer for transmitting bursts of acoustic energy in response to electrical drive pulses and converting echoes of the transmitted bursts into corresponding electrical signals;

transmit signal circuitry operable to periodically supply first and second electrical drive pulses to said electroacoustic transducer so as to cause it to transmit first and second bursts of acoustic energy, the first drive pulse being characterized to cause the first burst of acoustic energy to be of a predetermined duration, the second drive pulse being supplied in reponse to a pulse control signal;

a reference target located a predetermined distance from said electroacoustic transducer and adapted to reflect back to said electroacoustic transducer as a reference echo a portion of each burst of acoustic energy transmitted thereby;

receiver circuitry connected to receive electrical signals produced by said electroacoustic transducer, said receiver circuitry including a delay device which passes the first reference echo signal resulting from receipt of an echo of the first burst of acoustic energy from said reference target and furnishes a pulse control signal to said transmit signal circuitry only if the first reference echo signal has a duration at least as long as the predetermined duration of the first burst of acoustic energy, said receiver circuitry further including a peak detector operable to establish a peak reference level in response to a first target echo signal resulting from receipt of an echo of the first burst of acoustic energy from a target object, said receiver circuitry further including comparator means operable to pass a second target echo signal resulting from receipt of an echo of the second burst of acoustic energy from the target object if the level of the second target echo signal



exceeds a predetermined fraction of the peak reference level;

oscillator means for producing periodic clock signals;

first counter means responsive to the transmission of the first burst of acoustic energy to accumulate a first count of clock signals and, upon accumulation of a predetermined first count, to produce a distance simulation signal indicative of the distance between said electroacoustic transducer and said reference target;

control terminal means on said oscillator means connected to receive the distance simulation signal and a first reference echo signal occurring at a predetermined time relative to receipt of an echo of the first burst of acoustic energy from said reference target, said oscillator means being operable to vary the frequency of the clock signals to maintain the distance simulation signal in a predetermined time relationship with the first reference echo signal;

second counter means operable to accumulate a second count of the clock signals occurring during a time interval commencing at a predetermined time relative to transmission of the second burst of acoustic energy and ending at a predetermined time relative to receipt of the second target echo provided that the second target echo signal is passed by said comparator means; and

output means connected to said second counter means for producing an indication of distance to the target object based on the second count of clock signals.

4,719,606

PROCESS AND DEVICE FOR PASSIVE DETECTION OF AIRCRAFT, NAMELY HELICOPTERS

Michel B. Andrieu, Paris, France, assignor to Etat Francais, Paris, France

Filed Mar. 14, 1985, Ser. No. 741,301
Claims priority, application France, Mar. 22, 1984, 84 04424
Int. Cl.[4] H04B *1/06*
U.S. Cl. 367—135 **7 Claims**

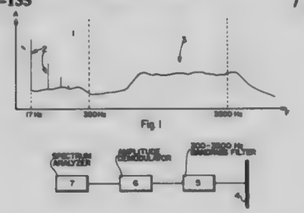


Fig. 1

1. A process for passive detection of helicopters, said process comprising the steps of:

detecting noise of the helicopter and of an ambient environment by means of an electro-acoustic transducer which provides an amplitude modulated signal representative thereof;

amplitude demodulating said signal in the frequency band ranging from about 300 Hz to about 3,500 Hz;

performing a spectral analysis of said demodulated signal; and

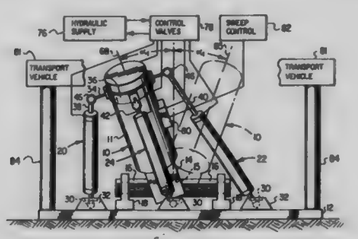
selecting and registering characteristic frequency lines corresponding to periodic modulating components reflective of rotary units of the helicopter.

4,719,607

FULL WAVE FIELD VIBRATORY SEISMIC SOURCE

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 792,531, Oct. 29, 1985. This application Jun. 4, 1987, Ser. No. 58,074
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—189 **3 Claims**



1. Apparatus for imparting seismic vibratory signals to the earth along a selected vector path comprising:

(a) means for producing reciprocal vibrations along a given vibratory axis;

(b) a ground-engaging base plate;

(c) a shaft mounted upon said base plate in spaced parallel relation thereto, said shaft being rotatable about its longitudinal axis, said vibration means being pivotally interconnected with such shaft intermediate the ends thereof for rotation of said means about an axis transverse to the axis of said shaft; and

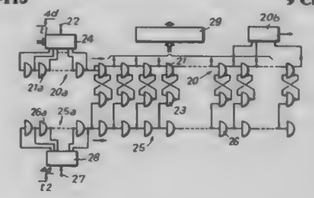
(d) control means for rotation of said vibration means and said shaft about their respective axes of rotation, such that said vibratory axis coincides with said vector path.

4,719,608

ULTRA HIGH-SPEED TIME-TO-DIGITAL CONVERTER

Jean-Francois Genat, Boulogne, and Francois Rossel, Noisy-le-Grand, both of France, assignors to Establissement Public styled: Centre National de la Recherche Scientifique, Paris, France

Filed May 9, 1985, Ser. No. 732,392
Claims priority, application France, May 11, 1984, 84 07344
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—113 **9 Claims**



1. An ultra-high speed time-to-digital converter, comprising:

a first input terminal for receiving a start signal;

a plurality of gate circuits connected in cascade to form a chain having one end connected to the first input terminal to allow the propagation of the start signal through said chain, all of said gate circuits being constituted by the same integrated circuit devices formed on one and the same semiconductor substrate to show a substantially uniform signal propagation time, and each gate circuit having a signal input, a signal output and a control input, said signal output having a first state when the start signal has propagated through the corresponding gate circuit and a second state different from the first state when the start signal has not propagated through the corresponding gate circuit;

a second input terminal for receiving a stop signal; and

locking circuit means having an input connected to the second input terminal and a plurality of outputs each connected to the control input of a respective gate circuit of said chain, said locking circuit means acting in response to the reception of a stop signal to lock the gate circuits through which the start signal has not yet propagated, whereby the number of gate circuits gone through by the start signal is a linear function of the time elaspsed between the time when a start signal is received and the time when a stop signal is received.

4,719,609

HOUR GEAR STRUCTURE OF A WATCH

Wolfgang Kröner, Pforzheim, Fed. Rep. of Germany, assignor to Pforzheimer Uhrenrohwerke PORTA GmbH, Pforzheim, Fed. Rep. of Germany

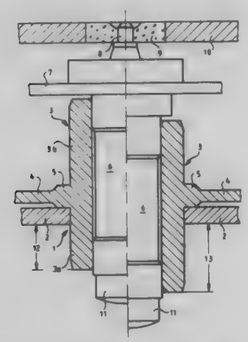
Filed Jun. 25, 1986, Ser. No. 878,344
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522690
Int. Cl.[4] G04B *19/02, 29/00*
U.S. Cl. 368—220 **3 Claims**

1. In the method of manufacturing two different types of watch operating mechanisms each having an hour gear structure comprising a sleeve shaft carrying an hour gear disc and serving as a bearing for the shaft of a minute gear structure, the gear disc being mounted on the sleeve shaft off its axial center such the sleeve has different axial lengths at opposite sides of said gear disc, said method comprising the steps of:

utilizing a single sleeve shaft hour gear structure for the two different types of watch operating mechanisms by appropriate selection of said sleeve lengths,

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mounting the gear structure in one of said different types of watch operating mechanisms such that the longer and shorter sleeve shaft sections are oriented in one sense, and



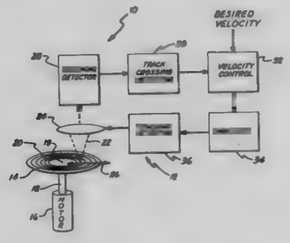
mounting said gear structure in the other of said different types of watch operating mechanisms such the longer and shorter sleeve sections are oriented therein in the opposite sense.

4,719,610

OBJECTIVE LENS VELOCITY CONTROL SYSTEM FOR USE IN AN OPTICAL DATA STORAGE SYSTEM

Everett N. Bates, Fountain, and Gregory V. Hofer, Colorado Springs, both of Colo., assignors to Optotech, Inc., Colorado Springs, Colo.

Filed Apr. 2, 1986, Ser. No. 847,328
Int. Cl.[4] G11B *17/00, 21/10*
U.S. Cl. 369—32 **17 Claims**



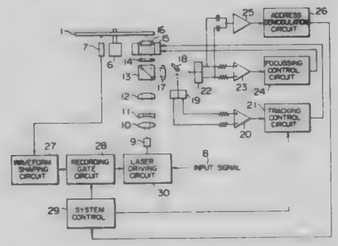
1. Objective lens velocity control apparatus for use in an optical data storage system, including:
- an optical record carrier with servo tracks for storing data;
- an objective lens;
- tracking drive means for driving the objective lens along a tracking axis;
- tracking detector means for producing tracking signals representative of relative movement of the objective lens along the tracking axis with respect to the servo tracks, wherein characteristics of the tracking signals define measurement periods representative of an actual velocity of the relative movement of the objective lens along the tracking axis;
- velocity control means for producing a first tracking drive signal during a first portion of each measurement period but for no longer than a time duration which is a function of a desired velocity, and producing a second tracking drive signal for any remaining second portion of each measurement period; and
- wherein one of the first and second tracking drive signals tends to cause the objective lens to have a velocity less than the desired velocity and the other tends to cause the objective lens to have a velocity greater than the desired velocity, so that the first and second tracking drive signals together tend to cause the objective lens to decelerate during the measurement period when the actual velocity is greater than the desired velocity, and to accelerate during the measurement period when the actual velocity is less than the desired velocity.

4,719,611

APPARATUS FOR CONTROLLING A RECORDING OPERATION OF AN OPTICAL INFORMATION RECORDING APPARATUS

Yoshio Miura, and Motoyuki Suzuki, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,668
Claims priority, application Japan, Jul. 23, 1984, 59-151217
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—47 **5 Claims**



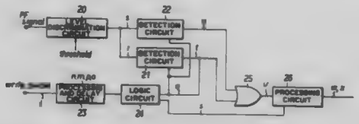
1. An apparatus for controlling a recording operation of an optical information recording apparatus having a recording device for optically recording information signals on at least one recording track of a recording medium in which a positioning mark indicative of a start position of the information is disposed on said recording medium, comprising:
- means for detecting said positioning mark and producing a mark signal in response to the positioning mark by tracing said recording medium;
- counter means for counting to a predetermined number in response to said mark signal and for producing an output signal after counting to said predetermined number;
- means for stopping a recording operation of said recording device when said counter means produces said output signal;
- operation control means for producing a start command signal in response to a first external signal and for producing an interruption command signal in response to a second external signal; and
- driving control means for starting said recording device to record said information signals in response to a first mark signal from said detecting means after said operation control means produces said start command signal, and for interrupting the recording operation of said recording device in response to said first mark signal from said detecting means after said operation control means produces said interruption command signal.

4,719,612

METHOD OF DETECTING DEFECTS ON AN OPTICAL RECORD MEDIUM AND A DEVICE FOR CARRYING OUT THE METHOD

Hideyuki Kenjyo, Koganei, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 745,017
Claims priority, application Japan, Jun. 15, 1984, 59-123259
Int. Cl.[4] G11B *7/00, 20/18*
U.S. Cl. 369—54 **15 Claims**



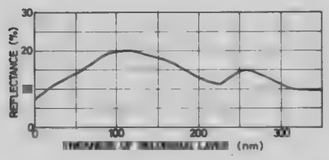
1. A method of detecting different kinds of defects on an optical record medium for use in an optical information recording and reproducing apparatus comprising the steps of producing light output signals from light beams reflected from the record medium at the time of information writing controlled by information write pulses, comparing the light output signals with reference signals having a plurality of different predetermined threshold levels corresponding to the different kinds of defects to produce compared output signals, producing strobe pulses by delaying the information write pulses and subjecting the delayed information write pulses to exclusive-OR processing, and logically processing the compared output signals in synchronization with the strobe pulses to thereby determine the kinds of defects formed on the surface of the record medium.

4,719,613

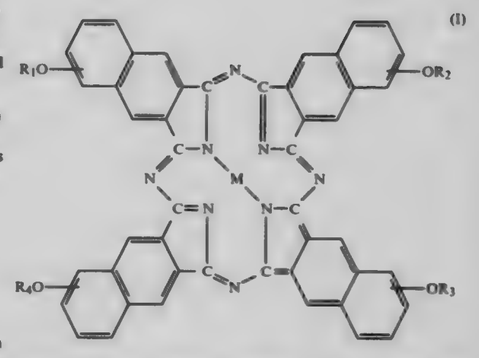
OPTICAL RECORDING MEDIUM HAVING A REFLECTIVE RECORDING LAYER INCLUDING A RESINOUS BINDER AND A NAPHTHALOCYANINE DYE

Sumio Hirose, Yokohama; Hiroshi Ozawa, Isehara; Kenji Abe; Yoichi Hosono, both of Yokohama; Shigeru Takahara, and Tadashi Koike, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo and Yamamoto Chemicals, Inc., Yao, both of, Japan

Filed Aug. 19, 1986, Ser. No. 898,021
Claims priority, application Japan, Aug. 27, 1985, 60-186659
Int. Cl.[4] G11B *7/24*
U.S. Cl. 369—109 **8 Claims**



1. An optical recording medium permitting recording and reading-out of signals, comprising a transparent substrate and an optical reflective recording layer provided directly on the substrate, said recording layer comprising substantially less than 20 wt. % of a resinous binder and a naphthalocyanine dye represented by the following general formula (I):



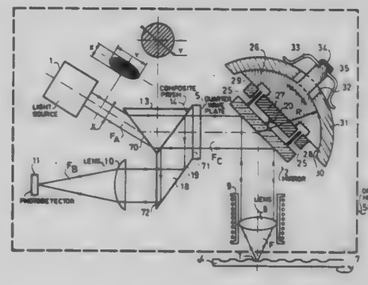
wherein M means a metal, metal oxide or metal halide, and $-OR_1$, $-OR_2$, $-OR_3$ and $-OR_4$ are the same or different and denote ether groups respectively having R_1, R_2, R_3 and R_4 each of which is a saturated or unsaturated hydrocarbon group having 4–12 carbon atoms.

4,719,614

OPTICAL RECORDING-READING HEAD USING AN ADJUSTABLE MOUNT FOR PIVOTING MIRROR

Dominique Leterme, Orsay, and Jean-Pierre Le Merer, Pavillon sous Bois, both of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 873,483, Jun. 12, 1986, abandoned, which is a division of Ser. No. 611,545, May 17, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 21,512
Claims priority, application France, May 20, 1983, 83 08429
Int. Cl.[4] G11B *7/12*
U.S. Cl. 369—110 **18 Claims**



1. Optical device for recording or retrieving information signals at a surface of an information medium, said device comprising:
- solid state laser source means for emitting a collimated beam of rectilinearly polarized radiant energy;
- lens means for focussing said radiant energy at said surface;
- polarization splitting optical means refracting said collimated beam for feeding said lens means;
- quarter wave polarization means arranged between said surface and said polarization splitting optical means for converting the rectilinear polarization of said emitted radiant energy into circular polarization; and
- photodetector means arranged for collecting reflected radiant energy emerging from the portion of said surface illuminated with said focussed radiant energy, said reflected radiant energy being refracted by said lens means,

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said quarterwave polarization means and said polarization splitting optical means;

said polarization splitting optical means having a first and a second prism shaped refracting element fitting one another along a common polarization splitting face; said first refracting element having an entry face for collecting said collimated beam; said second refracting element having an axit face for supplying said reflected radiant energy to said photodetector means, a reflective face and an exchange face optically coupled with said lens means; said entry face being arranged for obliquely receiving said collimated beam; said exit face and said exchange face being arranged for respectively refracting at normal incidence said reflected radiant energy to said photodetector means and said radiant energy to said lens means respectively;

a pivoting mirror arranged downstream of said polarization splitting refringent means for reflecting toward said lens means the radiant energy emerging from said exchange face; and

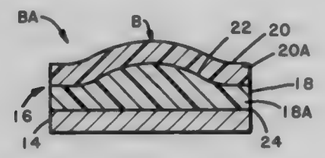
an adjustable mount for said pivoting mirror comprising a cradle shaped base having a sliding surface with a center of curvature O, a pivoting seat having a sliding surface with the same curvature as the preceding surface and against which it is applied, said mirror being supported by the pivoting seat so that the center of curvature O is in the reflecting plane of the mirror.

4,719,615

ERASABLE OPTICAL DATA STORAGE MEDIUM

Clyde D. Feyrer, Portland, Oreg.; N. Ross Gordon, Kennewick, Wash., and W. Eugene Skiens, Wilsonville, Oreg., assignors to Optical Data, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 525,813, Aug. 22, 1983, abandoned. This application Mar. 4, 1986, Ser. No. 835,960
Int. Cl.⁴ G11B *7/24*
U.S. Cl. 369—284 **21 Claims**



1. An optical recording medium comprising:

(a) a first layer of a first material;

(b) a second layer of a second material adjacent to said first material;

(c) said first and second layers cooperating as a medium for forming an optically detectable deformation therein by thermal expansion of said first material without liquefaction or gasification of said first or second materials when said first layer is locally heated with light radiation of a first preselected wavelength;

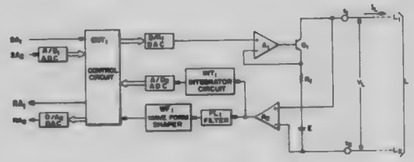
(d) said first material and said second material being sufficiently bonded to each other to enable said second layer to hold said first material in stretched, expanded condition upon cessation of said light radiation and cooling of said first material, retaining said optically detectable deformation, said second layer being sufficiently strong and rigid to hold said first material in stretched, expanded condition.

4,719,616

COMMUNICATION METHOD AND APPARATUS

Shinichi Akano, Shibuya, Japan, assignor to Yamatake Honeywell, Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,647
Claims priority, application Japan, Sep. 14, 1984, 59-191655
Int. Cl.⁴ H04J *9/00, 3/12;* H04M *11/04*
U.S. Cl. 370—11 **27 Claims**



1. In a communication system having a first communication apparatus connected to a second communication apparatus over a 2-wire transmission line, a method of communicating data between the first and second communication apparatus comprising:

transmitting line current from the first communication apparatus to the transmission line with an analog value representing analog data and having superimposed thereon a digital signal representing digital data;

receiving at the second communication apparatus the analog and digital data transmitted by said first communication apparatus;

controlling at the second communication apparatus a voltage across the transmission line at an analog value for transmitting analog data from the second communication apparatus to the first communication apparatus and superimposing on the voltage containing the analog data a digital signal representing digital data; and,

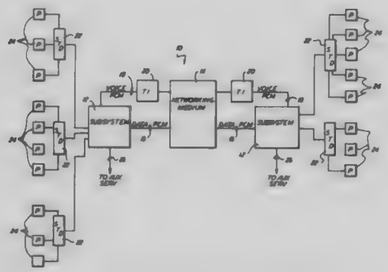
receiving at said first communication apparatus the analog and digital data transmitted by the second communication apparatus.

4,719,617

FULL SERVICE VOICE/DATA SYSTEM

John A. Yanosy, Jr., Stratford; Jitender K. Vij, Trumbull; John P. Hufnagel, Southbury; Paul Oldyzko, Stratford, and Anthony J. Dennett, Shelton, all of Conn., assignors to U.S. Holding Company, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,460
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 370—58 **26 Claims**



1. A voice/data communication system comprising:

a plurality of substantially identical subsystems, each said subsystem including a voice information path and a data information path, said data information path including a masterless multiple access contention bus with collision detection;

means, within each said subsystem, for autonomously controlling all traffic therethrough wherein said autonomous traffic control means includes a multi-microcomputer distributed architecture;

a networking medium;

means for establishing a data link between each said subsystem and said networking medium whereby full data communication between and among said subsystems can be established; and

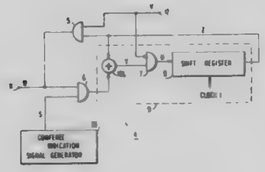
means for establishing a voice link between each said subsystem and said networking medium whereby full voice communication between and among said subsystems can be established.

4,719,618

DIGITAL CONFERENCE CIRCUIT

Yasuo Itoh, and Yuisuke Maruyama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,000
Claims priority, application Japan, May 25, 1984, 59-105752
Int. Cl.⁴ H04J *3/02*
U.S. Cl. 370—62 **3 Claims**



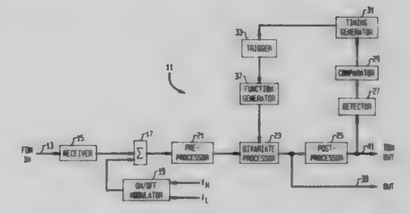
1. A digital conference circuit for use in a digital telephone system in which each user provides an output in the form of a sequence of PCM signals occuring in predefined time slots, comprising: a source of composite PCM signal obtained by time-multiplexing the PCM signals outputted by users participating in conference calls; first means for generating a conferee indicating signal indicating for each user participating in a conference other users than itself participating in said conference; second means for producing for each of said users participating in a conference a conferee voice signal by extracting from said composite PCM signal, in response to said conferee indicating signal, PCM signals from said other users participating in said conference; third means for time-division multiplexing said conferee voice signals into a single conference voice signal, said third means comprising an adder for summing said conferee voice signals with a partial conference voice signal and shift register means responsive to an output of said adder for producing a shifted output of said output of said adder and feeding back the shifted output to said adder as said partial conference voice signal; and fourth means for transmitting said conference voice signal to all said users participating in a conference.

4,719,619

SYNCHRONIZER FOR COMMUNICATIONS PROCESSOR

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 3, 1986, Ser. No. 882,066
Int. Cl.⁴ H04J *4/00*
U.S. Cl. 370—70 **12 Claims**



1. A processor for frequency division multiplexed signals, said processor comprising a frequency division multiplexed signal receiving means, said receiving means having a predetermined bandwidth, said processor being adapted for converting a received frequency division multiplexed signal into a signal being processed and obtaining a desired output at an output means, said processor defining a signal path from said receiving means to said output means, said path including a means for providing an intermediate signal by combining said signal being processed with a second signal originating and being triggered remotely from said signal path, said second signal requiring synchronization with a time-based characteristic of said signal being processed, said processor further comprising:

marker means for adding high and low marker tones to said frequency division multiplexed signal, said high marker tone having a frequency above said bandwidth, said low marker tone having a frequency below said bandwidth, said marker tones being applied alternately and synchronously with said time-based characteristic;

converter means for converting said intermediate signal into a time division multiplexed signal, said time division multiplexed signal comprising a series of segments, each segment including a series of pulses including marker pulses corresponding to said high and low marker tones;

detector means for detecting the amplitudes of said marker pulses;

comparator means for forming discriminates as a function of said amplitudes; and

a timing generator for setting the triggering times of said second signal, said timing generator being responsive to said discriminates.

4,719,620

SIGNAL TRANSMISSION SYSTEM IN A BUS-TYPE NETWORK

Katsuyuki Machino, Abiko; Masahiro Ise, Kashiwa, and Tsuneyuki Iwano, Tokyo, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 6, 1986, Ser. No. 816,337
Claims priority, application Japan, Jan. 11, 1985, 60-3679
Int. Cl.⁴ H04J *3/02;* H04Q *11/04*
U.S. Cl. 370—85 **4 Claims**

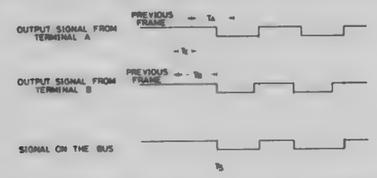
1. A signal transmission system in a bus-type network for transmitting or receiving a data packet of a plurality of start-synchronized data frames whereby a packet with top priority is constantly allowed to pass through a circuit prior to other packets when a plurality of said packets collide with one another, the signal transmission system comprising:

a bus;

a plurality of transmitting/receiving terminals for respec-

tively transmitting a packet of a plurality of frames and for monitoring the bus for a predetermined period after outputting a preceding frame;

each said transmitting terminal monitoring said bus for said predetermined time after the preceding frame and transmitting a subsequent frame having a frame start signal at the end of said predetermined time, each said transmitting



terminal further outputting the next one of said plurality of frames in synchronization with a frame start signal generated by another said transmitting terminal if said frame start signal is detected during said predetermined period;

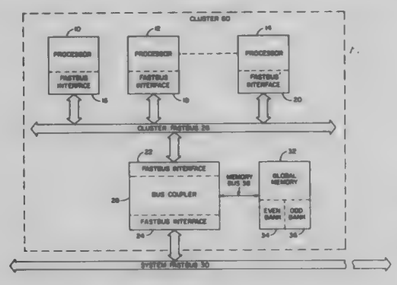
each said transmitting/receiving terminal including predetermined period generating means for counting said predetermined period for each of said plurality of frames.

4,719,621

PACKET FASTBUS

David C. May, Hopkinton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 15, 1985, Ser. No. 755,113
Int. Cl.[4] H04J *3/02, 3/24*
U.S. Cl. 370—85 24 Claims



1. In combination:

a plurality of devices, each of said devices comprising means for generating an information packet;

a first synchronous bus means for interconnecting said plurality of devices forming a cluster and for transferring said information packet on said bus means within one clock cycle time, said generating means of said devices receiving a packet transfer acknowledge signal within said one clock cycle time;

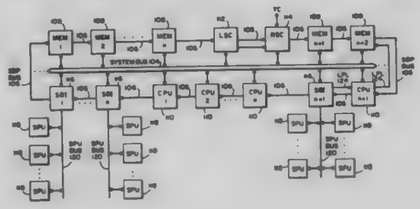
a bus coupler means coupled to said first synchronous bus means and a second synchronous bus means for storing and forwarding said information packet to a specified destination in accordance with said information packet.

4,719,622

SYSTEM BUS MEANS FOR INTER-PROCESSOR COMMUNICATION

David L. Whipple, Braintree, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 15, 1985, Ser. No. 712,492
Int. Cl.[4] H04L *5/20*
U.S. Cl. 370—85 24 Claims



1. A system bus for coupling components of a data processing system which includes a memory component and other components and carrying a communication between at least two of the components,

the system bus comprising:

a first plurality of lines for carrying first codes including

a plurality of memory operation codes specifying a plurality of types of memory communications having an other component as a source and the memory component as the recipient and

a single inter-processor communication code specifying a non-memory communication having one of the other components as a source and another thereof as a recipient;

a second plurality of lines which,

when the first plurality of lines specifies one of the memory communication types, carries an address in the memory component and,

when the first plurality of lines specifies a non-memory communication, carries one of a plurality of type codes specifying a plurality of types of non-memory communications and one of a plurality of recipient address codes specifying an other component as recipient;

a third plurality of lines for carrying signals specifying the status of a current memory communication; and

a fourth plurality of lines for carrying signals specifying the status of a current non-memory communication.

4,719,623

METHOD OF RECEIVING TIME MULTIPLEXED SIGNALS TOGETHER WITH ENERGY REQUIREMENTS OF RECEIVER OVER A MULTIPLEX SIGNAL TRANSMISSION PATH

Klaus Leyser, Barienrode, Fed. Rep. of Germany, assignor to Blaupunkt-Werke Gmbh, Hildesheim, Fed. Rep. of Germany

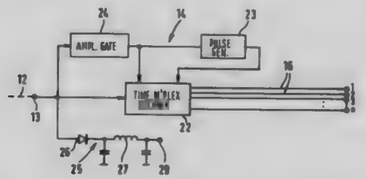
Filed Apr. 10, 1986, Ser. No. 850,148
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520606
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—100 5 Claims

1. Method of receiving, in a receiver, time multiplexed signal transmissions, together with receiver electric power requirements, over a transmission path from a transmitter without requiring said transmission path to pass frequencies outside the bandwidth of said time multiplex transmissions or to pass direct current to said receiver, said transmissions including signals multiplex into channel time slots of equal duration and including framing pulses distinguishable from other signals of said time multiplex transmissions by their greater amplitude and energy content and each occupying an interval not exceeding the duration of a time slot, including the steps of:

rectifying said time multiplexed signal transmissions as received at an input of said receiver, by charging an input filter capacitor through a diode and gradually discharging said input filter capacitor through a filter impedance (27, 127) to charge an output filter capacitor, whereby during normal reception of said transmissions said diode passes rectifier current only when a pulse of the amplitude of said frame pulses is present;

passing said time multiplex signal transmissions from said receiver input through an amplitude gate (24, 124) and thereby detecting at least said framing pulses;

demultiplexing said signals as received at said receiver



input in a time multiplex decoder (22, 122) controlled as to framing by said detected framing pulses and having auxiliary equipment (23, 132, 133) for timing time-slot switching in said demultiplexer under control of the output of said amplitude gate 8;

blocking said time multiplex decoder during the presence of each said detected framing pulse, and

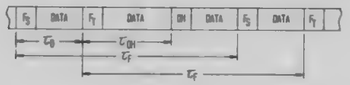
supplying electric energy requirements of said amplitude gate, said time demultiplexing and said auxiliary equipment thereto in the form of direct current obtained from the common connection (29, 129) of said filter impedance and said filter output capacitance.

4,719,624

MULTILEVEL MULTIPLEXING

Jules A. Bellisio, Wall Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed May 16, 1986, Ser. No. 864,037
Int. Cl.[4] H04J *3/12, 3/04*
U.S. Cl. 370—100 12 Claims



1. A multilevel, multiplexed digital transmission system in which all of the digital signals to be multiplexed comprise a conventional framing byte F_S and an auxiliary framing byte, F_T and associated overhead, said system comprising:

a plurality of multiplexers of basic level and higher level, each with a plurality of tributary signals connected thereto, in which the said higher level multiplexers interleave the outputs of two or more multiplexers of lower level, or of basic level,

all of said multiplexers comprising a plurality of preprocessors connected for processing each of said tributary signals, the outputs of all of the preprocessors at a multiplexer connected to a bit interleaver,

each of said preprocessors comprising means for shifting the said auxiliary framing bytes F_T and associated overhead of said incoming tributary signals relative to the said F_S bytes thereof so that all the tributary signals will have synchronized F_T bytes and overhead at the inputs of said bit interleaver, and

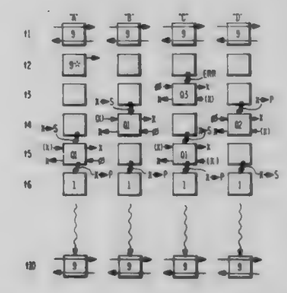
each of said preprocessors further comprising means to read and process said overhead associated with said F_T bytes.

4,719,625

METHOD OF RECOVERING FROM TRANSMISSION ERRORS IN A LOCAL AREA NETWORK BY TRANSMITTING AND RECEIVING SILENCE ON ALL NETWORK PORTS

John L. Bell, Escondido; Thomas J. Dineen, and Dennis J. Mahon, both of San Diego, all of Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,399
Int. Cl.[4] G08C *25/00;* G06F *11/20*
U.S. Cl. 371—11 11 Claims



1. A method of recovering from an error in a station having first and second input-output ports which are respectively coupled to two other stations in a communication network; said method including the steps of:

receiving on said first port, messages which are separated by idle characters and regenerating same on said second port;

detecting said error during said receiving step; and

responding to the detection of said error by (a) transmitting silence on both said first and second ports and (b) waiting for a predetermined response on said ports to said transmitting of said silence, prior to passing any further messages through said station.

4,719,626

DIAGNOSTIC METHOD AND APPARATUS FOR CHANNEL CONTROL APPARATUS

Yasuo Ogasawara, Zama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP84/00621, § 371 Date Aug. 14, 1985, § 102(e) Date Aug. 14, 1985, PCT Pub. No. WO85/03151, PCT Pub. Date Jul. 18, 1985
PCT Filed Dec. 27, 1984, Ser. No. 767,795
Claims priority, application Japan, Dec. 30, 1983, 58-248218
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16 10 Claims

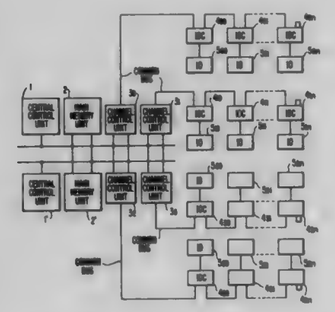
1. An automatic diagnostic method for a channel control unit which controls input/output units through at least one input/output control unit connected to a common bus in accordance with predetermined common bus interface control procedures by receiving commands from a central control unit, said method comprising the steps of:

disconnecting the channel control unit from the common bus and thereby disconnecting the input/output control unit from the channel control unit;

connecting a pseudo-input/output control unit which substitutes for the disconnected input/output control unit, the pseudo-input/output control unit being provided in the channel control unit; and

conducting automatic diagnostic procedures for the channel control unit while said common bus is disconnected from the input/output control units and the pseudo-input/out-

put control unit is activated in accordance with commands from the central control unit by the pseudo-input-



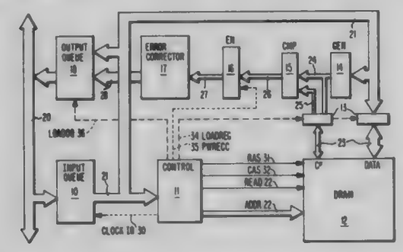
/output control unit simulating the activities of the disconnected input/output control unit.

4,719,627

MEMORY SYSTEM EMPLOYING A LOW DC POWER GATE ARRAY FOR ERROR CORRECTION

LuVerne R. Peterson, and Stephen J. Chung Chan, both of San Diego, Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Mar. 3, 1986, Ser. No. 835,777
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 371—38 **8 Claims**



1. An error-correcting memory system having a storage means which receives an address during a read cycle and which reads data bits and check bits at said address; and a plurality of logic gates which are coupled in parallel to receive input signal, that are derived from said data bits and check bits, for generating multiple minterms therefrom which correct errors in said data bits; wherein:

each logic gate generates a respective one of said minterms by passing a constant power dissipating current to selectively decode said input signals only when said input signals are at a certain voltage level; and wherein said memory system also includes,

a control means for generating a control signal that is in one state during only a small fraction of said read cycle and is otherwise in an opposite state; and

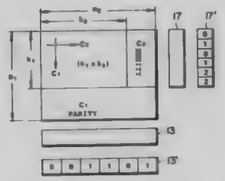
an enabling means, coupled between said control means and said logic gates, for reducing power dissipation in said logic gates by forcing said received input signals out of said certain voltage level whenever said control signal is in said opposite state.

4,719,628

METHOD AND APPARATUS FOR DECODING ERROR CORRECTION CODE

Shinya Ozaki; Kentaro Odaka, and Tadashi Fukumi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP84/00603, § 371 Date Aug. 19, 1985, § 102(e) Date Aug. 19, 1985, PCT Pub. No. WO85/02958, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 19, 1984, Ser. No. 767,783
Claims priority, application Japan, Dec. 20, 1983, 58-240525; Dec. 23, 1983, 58-198079
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—50 **6 Claims**



3. A method for decoding error correction code in which a first error correction code of (n_1, k_1) (where n_1 denotes the code length) is encoded for every k_1 information symbols arranged in each column and a second error correction code of (n_2, k_2) (where n_2 denotes the code length) and encoded for every k_2 information symbols arranged in each row of a two dimentional arrangement of $(k_1 \times k_2)$, the method comprising the steps of:

storing a first pointer formed by decoding said first error correction code in a memory having n_2 bits; and

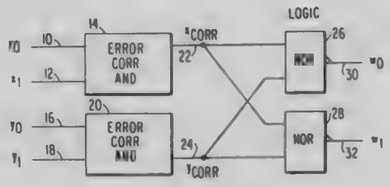
decoding said second error correction code by implementing an erasure correction for each code series of said second error correction code by employing said first pointer and by implementing a calculation for obtaining an error value only once for each code series of said second error correction code in said erasure error correction.

4,719,629

DUAL FAULT-MASKING REDUNDANCY LOGIC CIRCUITS

Wen-Yuan Wang, Hopewell Junction, N.Y., assignor to International Business Machines, Armonk, N.Y.

Filed Oct. 28, 1985, Ser. No. 792,097
Int. Cl.⁴ G06F *11/18*
U.S. Cl. 371—68 **8 Claims**



1. An error correcting circuit comprising:

at least one pair of interconnections for conveying two respective wire signals, said wire signals intended to both represent a logic input signal, said wire signals being of either a first potential state or a second potential state or a floating logic state, whenever any two interconnections conveying two wire signals being of different potential states are shorted together, said shorted interconnections both then conveying said first potential state; and

an input logic circuit for each said pair of interconnections for comparing said wire signal and producing an output signal of:

(a) a third logic state if said two wire signals are both of said first potential state,

(b) a fourth logic state if said two wire signals are both of said second potential state, said fourth logic state being one of said first and second logic states and complementary to said third logic state,

(c) said fourth logic state if said two wire signals are respectively of said first and second potential states, and

(d) said third logic state if said two wire signals are respectively of said first and said floating potential states, and

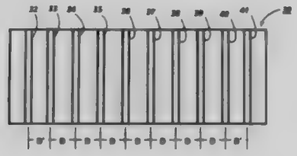
(e) said fourth logic state if said two wire signals are respectively of said second and said floating potential states.

4,719,630

PHASED ARRAY SEMICONDUCTOR LASERS WITH UNIFORM AND STABLE SUPERMODE

William Streifer, Albuquerque, N. Mex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1986, Ser. No. 843,485
Int. Cl.⁴ H01S *3/098*
U.S. Cl. 372—18 **6 Claims**



1. In a phased array semiconductor laser favoring emission in the 1st or N^{th} supermode over other potential supermodes of said laser comprising a plurality of spatially disposed laser elements formed relative to an active region to provide optical cavities for light wave generation and propagation under lasing conditions and wherein the optical field of said laser elements are coupled into the optical cavities of adjacent laser elements to provide a phase locked condition across the array, the improvement comprising the center to center spacing of said laser elements is substantially uniform except for the outer laser element at each end of the array which are spaced closer to its adjacent laser element than said uniform spacing such that optical field coupling is enhanced to produce a single supermode with a nearly uniform and fairly rectangular shaped intensity envelope.

4,719,631

CONDUCTIVELY COOLED LASER DIODE ARRAY PUMPED LASER

Larry K. Conaway, St. Louis County, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1986, Ser. No. 817,637
Int. Cl.⁴ H01S *3/04*
U.S. Cl. 372—34 **10 Claims**

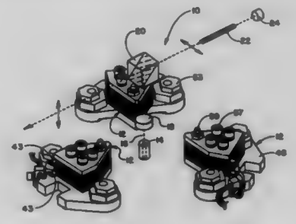
1. A conductively cooled laser diode array comprising:

(a) flat ceramic plates made substantially from heat conducting beryllium oxide;

(b) electrically conductive material applied to a portion of said plates;

(c) laser diodes affixed directly to said plates and electrically connected to said electrically conductive material on said plates; and

(d) clamping means for assembling a stack of said plates into said conductively cooled laser diode array wherein said plates are stacked immediately adjacent to each other and



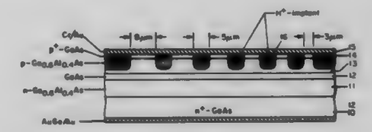
form a heat path for dissipating heat produced by said laser diodes.

4,719,632

SINGLE CONTACT TAILORED GAIN CHIRPED ARRAYS OF DIODE LASERS FOR SUPERMODE CONTROL WITH SINGLE-LOBED FARFIELD PATTERNS

Christopher P. Lindsey, Pasadena, Calif.; Elyahou Kapon, Aberdeen, N.J.; Joseph Katz, Pasadena; Shlomo Margalit, S. Pasadena, both of Calif., and Amnon Yariv, San Marino, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 19, 1985, Ser. No. 746,995
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—50 **12 Claims**



1. In a phase-locked array of diode laser channels fabricated in a body of semiconductor material cleaved at opposite ends to provide facet mirrors which form resonant cavities in said channels, and having a contact for current injection into each channel along at least a majority of its entire length, the improvement of supermode control for a single-lobed farfield pattern comprising means for spatially segregating the supermodes of said array to concentrate the fundamental supermode at one part of the array, means for tailoring the spatial gain profile so as to favor the fundamental supermode, and means for increasing interchannel coupling sufficiently to bring about a single-lobed farfield pattern, wherein said means for spatially segregating the fundamental supermode from the other supermodes is comprised of said channels being nonuniform in width.

4,719,633

BURIED STRIPE-STRUCTURE SEMICONDUCTOR LASER

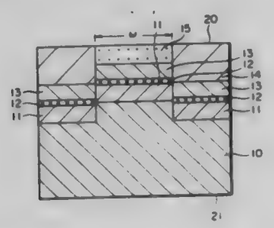
Akio Yoshikawa, Takatsuki, and Takashi Sugino, Kusatsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 25, 1985, Ser. No. 715,392
Claims priority, application Japan, Mar. 27, 1984, 59-58712; Jul. 5, 1984, 59-137932; Aug. 8, 1984, 59-166172
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—46 **3 Claims**

1. A semiconductor laser including a pair of electrodes and a resonant cavity interposed therebetween, said laser having multilayered films with a double heterostructure which are

formed on a conductive substrate with a stripe-shaped projection;

said multilayered film comprising a first group of multilayered films including a first layer portion and a first film portion thereon which are formed above both sides of said projection, and a second group of multilayered films including a second layer portion forming an active layer and



a second film portion thereon which are formed above said projection, said first and second groups of multilayered films being formed in the same order;

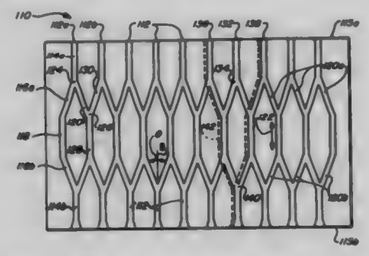
said first group being formed with a top layer of the same conductivity type as that of said substrate, and said second group being formed with a top layer of the opposite conductivity type as that of said substrate.

4,719,634

SEMICONDUCTOR LASER ARRAY WITH FAULT TOLERANT COUPLING

William Streifer; Peter Cross, both of Palo Alto, and Donald R. Scifres, San Jose, all of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Filed Oct. 27, 1986, Ser. No. 924,196
Int. Cl.⁴ H01S 3/19
U.S. Cl. 372—46 **24 Claims**



1. A semiconductor laser array comprising,

a plurality of semiconductor layers disposed on a substrate, at least one of said layers forming an active region for light wave generation and propagation under lasing conditions,

means for injecting current into said active region to produce said light waves,

means for providing optical feedback to sustain laser operation,

a plurality of spaced optical waveguides extending along at least a portion of said array, said optical waveguides allowing light propagation under lasing conditions, and

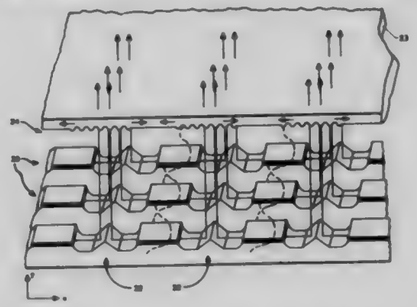
a plurality of interconnecting waveguides for deflecting and coupling light waves propagating in said optical waveguides with light waves propagating in adjacent optical waveguides, each interconnecting waveguide joining two adjacent optical waveguides at respective branching junctions, said interconnecting waveguides being grouped into at least a first set and a second set, each set of interconnecting waveguides coupling all of said optical waveguides, said second set being spaced along a direction of light propagation from said first set.

4,719,635

FREQUENCY AND PHASE LOCKING METHOD FOR LASER ARRAY

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 10, 1986, Ser. No. 827,564
Int. Cl.⁴ H01S 3/10
U.S. Cl. 372—50 **20 Claims**



1. A frequency and phase locking system for an array of lasers which emit beams characterized by a uniform nominal frequency but individual operating frequencies which deviate from the nominal frequency, comprising:

a substantially laser-transparent waveguide structure substrate surmounted by a waveguide core layer in the path of the beams emitted by the lasers, and

a plurality of optical gratings formed in the core layer and aligned with respective laser beams to deflect portions of the beams into propagation along the waveguide core and into cross-coupling with other lasers in the array to establish a common operating frequency and phase for the cross-coupled lasers,

the grating periods being substantially equal to λ/n_1, and the core thickness being at least equal to approximately $\lambda/(4\sqrt{n_2^2-n_3^2})$, where λ is the wavelength of the guided mode, n_1 is the effective index of refraction for the guided mode, and n_2 and n_3 are the indices of refraction of the waveguide core and substrate, respectively.

4,719,636

WAVELENGTH TUNABLE SEMICONDUCTOR LASER DEVICE PROVIDED WITH CONTROL REGIONS

Masayuki Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,048
Claims priority, application Japan, Aug. 24, 1984, 59-176220
Int. Cl.⁴ H01S 3/19
U.S. Cl. 372—50 **15 Claims**

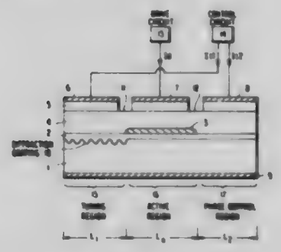
1. A wavelength tunable semiconductor laser device comprising:

a multi-layer semiconductor structure including an active region which includes an active layer for emitting light responsive to stimulation, a first control region including a guide layer for guiding light which is being propagated, and a second control region including a guide layer provided with a diffraction grating for guiding light which is being propagated, said active region, first control region and second control region being arranged in such a manner that said active region is located between said first and second control regions in a row along an axis of resonance and is optically connected to said first and second control regions;

an active electrode adapted to inject current into the active region;

a resonant cavity established by said diffraction grating and a portion of said first control region;

a first control electrode and a second control electrode



adapted to inject currents, respectively, into the first and second control regions;

means for applying a drive current to said active electrode; and

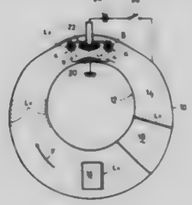
means for applying control currents to the first and second control electrodes in a predetermined ratio.

4,719,637

LASER DOPED WITH TRIPROPYLAMINE

Marco Cavaioli; Giancarlo Salvetti; Renato Marchetti, and Eugenio Ponce, all of Rome, Italy, assignors to Ente Comitato Nazionale per la Ricerca e lo Sviluppo Dell'Energia Nucleare e Delle Energie Alternative and Selenia-Industrie Elettroniche Associate S.p.A., both of Rome, Italy

Filed Mar. 12, 1986, Ser. No. 838,944
Claims priority, application Italy, Mar. 13, 1985, 67806 A/85
Int. Cl.⁴ H01S 3/22, 3/223, 3/097
U.S. Cl. 372—59 **4 Claims**



1. A method for maintaining at a constant level the CO_2 percentage in the laser medium during a laser operation comprising introducing into a laser chamber prior to the laser operation a polymer compound produced through irradiation of tripropylamine by means of ultraviolet photons and/or of energy electrons in the form of a layer on a solid support within said chamber.

4,719,638

DISCHARGE TUBE FOR A GAS LASER

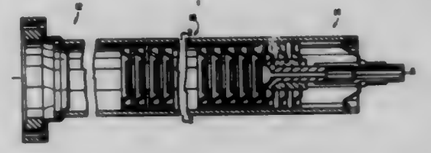
Lee R. Carlson, Pleasanton, and Denes A. Hegedus, Redwood City, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Aug. 1, 1985, Ser. No. 761,746
Int. Cl.⁴ H01S 3/03
U.S. Cl. 372—62 **19 Claims**

1. A discharge tube for a gas laser, comprising:

(a) an elongated cylindrical tube having an inner wall and an axis;

(b) a plurality of annular heat-conduction members spaced apart along said cylindrical tube and about said axis, each of said heat-conduction members having an outer perimeter near said inner wall and at least one gas-flow return hole near said outer perimeter, each of said annular heat conduction members defining a volume within said outer perimeter; and



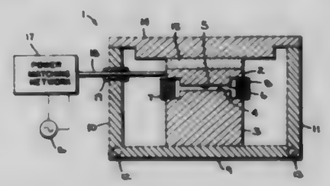
(c) a plurality of blocking means for maintaining gas near said inner wall to flow through each said gas-flow return hole, said plurality of blocking means being positioned, respectively, in the space between adjacent said heat conduction members and outside the volume of said adjacent heat-conduction members, and each said blocking means being unattached to either of said adjacent heat-conduction members.

4,719,639

CARBON DIOXIDE SLAB LASER

John Tulip, 9218 117 St., Edmonton, Alberta, Canada T6G 2G7

Filed Jan. 8, 1987, Ser. No. 1,572
Int. Cl.⁴ H01S 3/06
U.S. Cl. 372—66 **14 Claims**



1. A gas slab laser comprising:

first and second elongated electrodes each including a planar light reflecting surface disposed so as to form a light guide only in a plane perpendicular to the said planar surface and to define a gas discharge gap therebetween;

a laser gas disposed in said gap; and

means for applying a radio frequency current between said first and second electrodes to establish a laser-exciting discharge in said laser gas.

4,719,640

MULTIPLE PARALLEL RF EXCITED CO_2 LASERS

Peter P. Chenausky, Avon; Lanny M. Laughman, Bolton, and Erroll H. Drinkwater, Portland, all of Conn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1985, Ser. No. 761,256
Int. Cl.⁴ H01S 3/082
U.S. Cl. 372—97 **6 Claims**

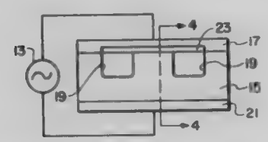
1. Twin laser apparatus of the waveguide type comprising

a block of ceramic material having a pair of oppositely-disposed flat parallel surfaces;

a pair of slots formed in one of said pair of block surfaces, said slots being parallel to each other and extending between the ends of said block;

a first flat metallic electrode disposed on said one surface of said block and covering both of said slots and a second flat electrode disposed on the other surface of said pair of

block surfaces, so that each of said slots cooperates with said first electrode to form a separate laser cavity, said first electrode having at least one recessed portion formed therein extending between and communicating with said pair of slots to form a connecting channel between said slots said at least one recessed portion formed in said first



electrode providing a preferential initial breakdown of a lasing gas in said connecting channel which forces simultaneous initiation of a lasing discharge in both of said laser cavities;

means for coupling said first and second electrodes to a source of RF excitation.

4,719,641

MULTIPLE CHAMBER LASER CONTAINMENT SYSTEM

David F. Muller, Boston, and Peter B. Scott, Bedford, both of Mass., assignors to Summit Technology, Inc., Watertown, Mass.

Filed Nov. 8, 1985, Ser. No. 796,550
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—109 **12 Claims**

1. A laser system comprising a first pressurized containment vessel encasing a high voltage source and a pulse-forming network for generating electrical pulses to excite a laser medium, the first vessel being pressurized with a high dielectric gas and including an output port for a laser beam; and a second higher pressurized containment vessel also disposed within the first containment vessel, said second containment vessel being pressurized with a laser medium and further defining a laser head assembly, said laser head assembly includes two mirrors which define the resonant cavity of the laser wherein one of said mirrors is partially transmissive which allows extraction of the laser beam through said output port and said laser head assembly is electrically connected to said pulse-forming network to induce laser excitation of said medium.

4,719,642

ERROR DETECTION AND CONCEALMENT USING PREDICTED SIGNAL VALUES

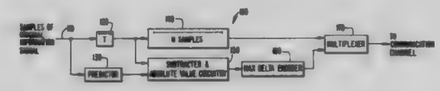
Keith Lucas, Oak Ridges, Canada, assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Feb. 27, 1985, Ser. No. 706,195
Int. Cl.[4] H04B *14/06*
U.S. Cl. 375—30 **18 Claims**

1. A method of enabling the detection of errors introduced in an informal signal during transmission of the informal signal through a communication channel to a receiver, said method comprising the steps of:

predicting from the untransmitted information signal a plurality of actual values of the information signal and generating therefrom a plurality of predicted values;

determining the difference between each of the plurality of actual values and the corresponding predicted value;



developing an error detection signal based on a comparison of the determined differences between each of the plurality of actual values and the corresponding predicted value;

transmitting the plurality of actual values through the channel to the receiver; and

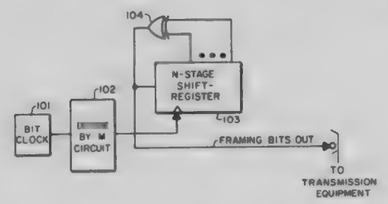
transmitting the error detection signal to the receiver.

4,719,643

PSEUDO RANDOM FRAMING GENERATOR CIRCUIT

Robert H. Beeman, Scottsdale, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 685,701, Dec. 24, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 908,888
Int. Cl.[4] H04L *7/08*; H04J *3/06*
U.S. Cl. 375—115 **5 Claims**



1. In a digital telecommunications system, a pseudo random framing generator circuit for producing periodic framing bit data, said framing bit data being contained one bit at a time in bit positions regularly interleaved with transmission data for transmission to another digital telecommunications system via transmission equipment, said pseudo random framing generator circuit comprising:

clock means being operated to produce a periodic clock signal of a predetermined frequency;

frame sizing means connected to said clock means and being operated in response to said periodic clock signal to produce a second periodic signal, said second frequency being equal to said predetermined frequency divided by the number of bits of said transmission data and said framing bit data, said value of said framing bit data being independent of any values of said transmission data;

exclusive OR gating means connected to said transmission equipment;

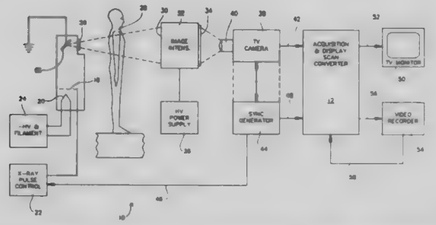
shift-register means connected to said frame sizing means, to said exclusive OR gating means and to said transmission equipment, said shift-register means including a plurality of tap outputs and an input, said shift-register means being cyclically operated in response to said second periodic signal to produce a plurality of tap output signals on said corresponding plurality of tap outputs, at least two of said tap outputs being connected to said input via said exclusive OR gating means and each said connected tap output being a logic one bit positional representation corresponding to any polynomial of maximal length for a particular size of said shift-register means.

4,719,644

VIDEO DATA ACQUISITION AND DISPLAY SCAN CONVERTER

William F. Herzog, San Martin, and William E. Nichols, San Jose, both of Calif., assignors to Apert-Herzog Corporation, San Jose, Calif.

Filed Jul. 9, 1985, Ser. No. 753,324
Int. Cl.[4] H04N *5/32*
U.S. Cl. 378—99 **14 Claims**



1. A video digital data acquisition and display scan converter for use with conventional video recorder means having an interlaced line scan input and output, analog television camera means for scanning frames of pictorial images at a first predetermined scanning rate, and analog display means for displaying said pictorial images at a second predetermined scanning rate selectively and integrally related to said first rate, said converter comprising:

an input for receiving an analog video data stream at a first line scan rate in one of interlaced and progressive scan format,

analog to digital converter means connected to said input for receiving said analog video data stream from a selected one of said camera means in progressive scan format and said conventional video recorder means in interlaced scan format, said analog to digital converter means for converting scanned analog picture values of said data stream into digital words,

first frame memory means connected to said analog to digital converter means for storing said digital words and having a first output connected to first digital to analog converter means for putting out said digital words stored in said first frame memory means in interlaced scan format,

second frame memory means connected for receiving and storing said digital words put out by said first frame memory means at said first output and having a second output connected to second digital to analog converter means for putting out said digital words stored in said second frame memory means at said second line scan rate,

first and second frame memory control means connected to said first frame memory means and to said second frame memory means for controlling the locations at which said digital words are written in said first and second frame memory means and for controlling the locations at which said digital words are read out from said first and second frame memory means and the rate at which said digital words are read out from said second frame memory means, and

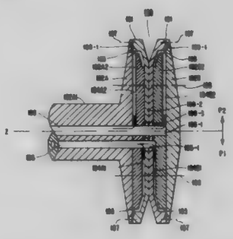
synchronizer means connected to said camera means and to said first and second frame memory control means for synchronizing camera scan rates and memory operations and for providing suitable synchronizing pulses to the analog video lines put out by said first and second digital to analog converter means.

4,719,645

ROTARY ANODE ASSEMBLY FOR AN X-RAY SOURCE

Masaki Yamabe, Tokyo; Yoshitaka Kitamura, Kawasaki; Yasuo Furukawa, Zama, and Toshihiko Osada, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 11, 1986, Ser. No. 895,234
Claims priority, application Japan, Aug. 12, 1985, 60-175662; Jan. 7, 1986, 61-000939
Int. Cl.[4] H01J *35/10*
U.S. Cl. 378—144 **15 Claims**



1. A rotary anode assembly for an X-ray source, the rotary anode assembly rotating around an axis of rotation and having a V-groove constituting a target portion therefor, the V-groove being annular with respect to the axis of rotation, comprising:

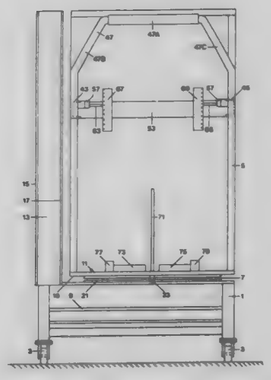
a pair of target members each being a body of rotation with respect to the axis, each of said target members having a coaxially-formed annular tapered surface portion formed at the periphery thereof, and said target members being fabricated separate each other and then coaxially disposed in a manner that respective said annular tapered surface portions thereof face to each other with a predetermined angle therebetween so as to constitute the annular V-groove of said rotary anode assembly.

4,719,646

X-RAY APPARATUS WITH SOURCE DISTORTION COMPENSATION

Gerald A. B. Saunders, Sydenham; Theodore D. V. Cooke, and David W. Siu, both of Kingston, all of Canada, assignors to Queen's University, Kingston, Canada

Filed May 8, 1986, Ser. No. 860,953
Int. Cl.[4] G03B *41/16*
U.S. Cl. 378—179 **23 Claims**



1. An apparatus for taking multiple X-ray photographs of

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the legs and pelvis of a patient, comprising a base member, a platform on which a patient can stand and which is mounted on the base member, guide means restraining the platform to rotation about a vertical axis between a plurality of orientations relative to said base member, two separate weight measuring devices mounted on said platform to indicate respectively the weight borne by the two feet of said patient and racks carried by said platform for the reception of vertically extending flat X-ray film cassettes, the base member, the platform and all parts rotatable with the platform permitting radiation in sequence of X-ray film cassettes in different said racks with only minor vertical and horizontal adjustment of an associated substantially point source of X-rays.

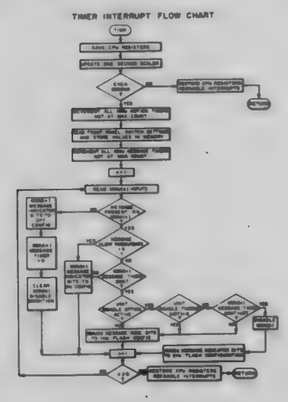
4,719,647

TELEPHONE MESSAGE RETRIEVAL SYSTEM WITH IMPROVED PROCESSOR AND RETRIEVAL CONSOLE

Peter F. Theis, McHenry, and Gregory Buchberger, Mount Prospect, both of Ill., assignors to Morgan Electronics, Gurnee, Ill.

Filed Jan. 30, 1984, Ser. No. 574,880
Int. Cl.[4] H04M *1/64*
U.S. Cl. 379—68 **6 Claims**

MICROFICHE APPENDIX INCLUDED
(3 Microfiche, 138 Pages)



1. In a message retireval system of the type comprising a plurality of telephone answering machines and a plurality of message memory units coupled to the answering machines, each of the message memory units including means for storing a plurality of messages, the improvement comprising:

at least one retieval console coupled to the message memory units to permit an operator at the retrieval console to command playback of messages stored on the message memory units;

means for automatically monitoring a parameter indicative of the age of messages stored in the message memory units and for automatically generating an alarm signal in the event the parameter reaches a range of values indicative of excessive delays between storage and playback of messages stored in the message memory units; and

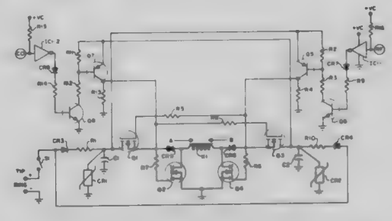
means for automatically modifying the system in response to the alarm signal to adapt the system to excessive delays between message storage and playback.

4,719,648

COIN RELAY DRIVE AND SWITCHING CIRCUIT FOR PAYSTATION TELEPHONE INSTRUMENTS

Eduard F. B. Boeckmann, 815 Eldorado Ave. SE., Huntsville, Ala. 35802

Filed Dec. 13, 1985, Ser. No. 808,773
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—155 **1 Claim**



1. In an intelligent coin operated telephone of the type that is connected to a two wire business line, which includes a tip wire and a common wire, from the telephone central office, and that requires no external control signals from the telephone central office, a coin relay drive and switching circuit comprising:

a coin relay coil having first and second terminals for causing a coin refund operation if supplied current flowing in a first direction and that causes a coin collect operation if supplied current flowing in a second direction;

a first capacitor, having first and second terminals, with the second terminal connected to the common wire,

a second capacitor, having first and second terminals, with the second terminal coupled to the common wire,

charging means, connected to the tip wire and to the first terminals of the first and second capacitors for electrically coupling the first terminals of said first and second capacitors to the tip wire to charge said capacitors;

first current directing means, including an RF terminal, adapted to receive a first signal at said RF terminal for connecting the first terminal of the first capacitor to the first terminal of the coin relay coil and for connecting the second terminal of the coin relay coil to common to direct current from the first capacitor through the relay coil in the first direction to cause a coin refund operation only when the first signal is received; and

second current directing means, including a CO terminal, adapted to receive a second signal at the CO terminal for connecting the first terminal of the second capacitor to the second terminal of the coin relay coil and for connecting the first terminal of the coil relay coil to common to direct current from the second capacitor through the relay coil in the second direction to cause a coin collect operation only when the first signal is received, whereby only the selected capacitor is discharged during a coin collect or coin refund operation.

4,719,649

AUTOREGRESSIVE PEEK-THROUGH COMJAMMER AND METHOD

Harvey C. Woodsum, Nashua, N.H., and Albin A. Hastbacka, Chelmsford, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 22, 1985, Ser. No. 800,873
Int. Cl.[4] H04K *3/00*
U.S. Cl. 455—1 **30 Claims**

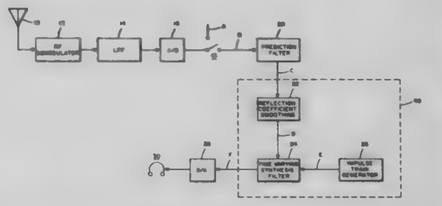
1. An apparatus for receiving and jamming a transmitted signal, comprising:

(a) an analog to digital converter connected to receive a transmitted signal, thereby providing a digital signal;

(b) a transmitter that is alternately switched on and off to jam the transmitted signal;

(c) means, connected to receive as an input the digital signal, for producing a sampled digital signal of value substantially equal to the value of the digital signal when said transmitter is off, and equal to a zero value when said transmitter is on;

(d) a linear prediction filter connected to receive as an input the sampled digital signal, thereby providing an estimate of the correct values of the transmitted signal when said transmitter is on, the estimate in the form of a set of reflection coefficients; and



(e) means for generating a digital synthesized transmitted signal, connected to receive the set of reflection coefficients as an input.

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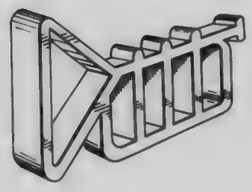
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TRUMPET-SHAPED PASTA PIECE
Frank E. Blatnick, Winthrop Harbor, Ill., assignor to Kraft, Inc., Glenview, Ill.
Filed Apr. 30, 1985, Ser. No. 728,742
Term of patent 14 years
U.S. Cl. D1—106



293,616
SAXOPHONE-SHAPED PASTA PIECE
Frank E. Blatnick, Winthrop Harbor, Ill., assignor to Kraft, Inc., Glenview, Ill.
Filed Apr. 30, 1985, Ser. No. 728,741
Term of patent 14 years
U.S. Cl. D1—106



293,617
JEANS
Joseph B. Barrett, 192 Moore Ave., Buffalo, N.Y. 14223
Filed Jul. 1, 1985, Ser. No. 749,996
Term of patent 36 years
U.S. Cl. D2—28

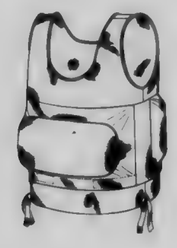




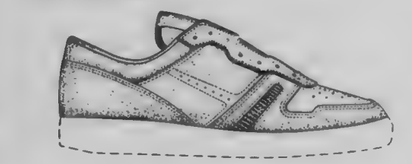


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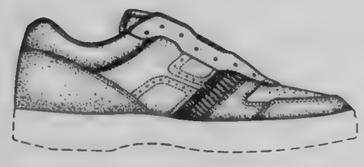
293,618
BUOYANT SWIM VEST
Steven M. Berenson, Sharon, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed May 22, 1985, Ser. No. 736,808
Term of patent 14 years
U.S. Cl. D2—190



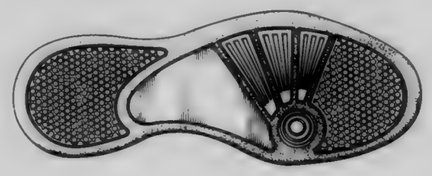
293,619
SHOE UPPER
Jack Curley, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,423
Term of patent 14 years
U.S. Cl. D2—314





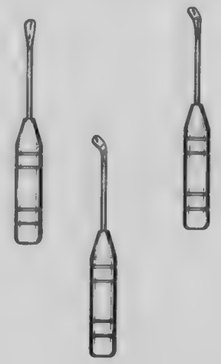


293,620
SHOE SOLE
Steven P. Liggett, North Easton, and Tuan N. Le, Cohasset, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 20, 1985, Ser. No. 805,913
Term of patent 14 years
U.S. Cl. D2—320





293,621
WEAVING TOOL
LeRoy E. Jackson, 219 Squaw Creek Rd., Marshall, Mich. 49068
Filed Oct. 15, 1985, Ser. No. 787,365
Term of patent 14 years
U.S. Cl. D3—18



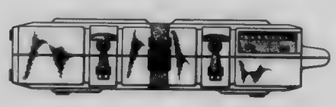
293,622
CAMERA CASE
Hitoshi Suyama, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan
Filed Dec. 2, 1985, Ser. No. 803,835
Claims priority, application Japan, Jun. 5, 1985, 60-23729
Term of patent 14 years
U.S. Cl. D3—33

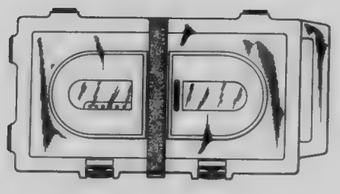




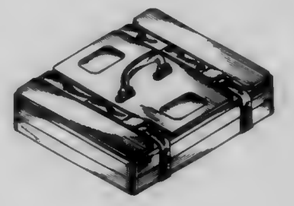


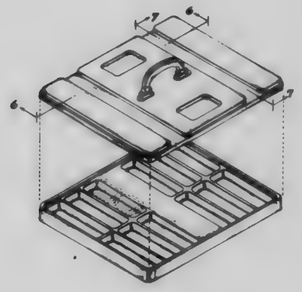
293,623
WEATHERPROOF CARRYING CASE FOR A VIDEO RECORDER OR THE LIKE
Darrell S. Staley, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Apr. 12, 1985, Ser. No. 722,978
Term of patent 14 years
U.S. Cl. D3—33



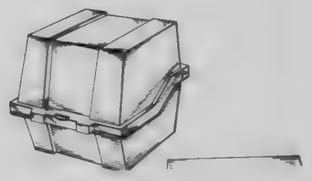


293,624
OPTICAL CASE
Robert A. Sherman, 921 Creekride St., Fullerton, Calif. 92633
Filed Mar. 26, 1984, Ser. No. 593,650
Term of patent 14 years
U.S. Cl. D3—34



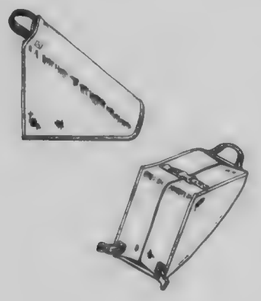


293,625
DISK STORAGE CASE
Jack D. Bankier, Northbrook, Ill., assignor to Bankier Companies, Inc., Northbrook, Ill.
Filed Aug. 20, 1985, Ser. No. 767,838
Term of patent 14 years
U.S. Cl. D3—35



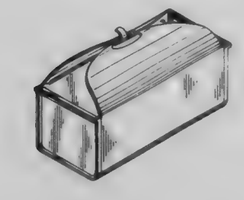
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293,626
SKI BOOT BAG
Mark A. Beran, Niwot, Colo., assignor to BC Creations, Inc., Niwot, Colo.
Filed Mar. 25, 1985, Ser. No. 715,652
Term of patent 14 years
U.S. Cl. D3—36



293,627
CARRYING SACHEL
Daryl L. Westhusin, 1313 S. Maize Rd., Wichita, Kans. 67209
Filed Apr. 8, 1985, Ser. No. 721,079
Term of patent 14 years
U.S. Cl. D3—73





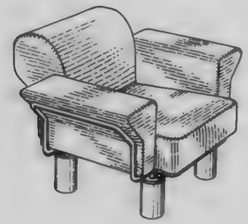
293,628
BELT MOUNTED FLASHLIGHT HOLDER
Jacob A. Teachey, 314 Wood Dale Dr., Wilmington, N.C. 28403
Filed Jul. 17, 1985, Ser. No. 755,875
Term of patent 14 years
U.S. Cl. D3—106



293,629
ROTARY BRUSH
John S. Jordan, Roswell, Ga., assignor to Delta International Marketing, Ltd., Roswell, Ga.
Filed Oct. 15, 1985, Ser. No. 787,604
Term of patent 14 years
U.S. Cl. D4—115



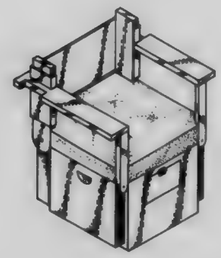
293,630
SEAT
Michael M. Stewart, Toronto, Canada, assignor to Ambiant Systems Limited, Toronto, Canada
Filed Apr. 22, 1985, Ser. No. 726,265
Claims priority, application Canada, Mar. 15, 1985, 15-03-85-3
Term of patent 14 years
U.S. Cl. D6—334



293,631
CHAIR
Giovanni Offredi, Milan, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Jul. 9, 1985, Ser. No. 753,202
Claims priority, application Italy, Jan. 14, 1985, 20493/85[U]
Term of patent 14 years
U.S. Cl. D6—334



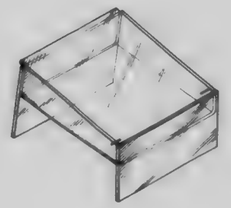
293,632
COMBINED COOLER AND SEAT UNIT
Guy A. Capocasa, 1519 Reaney, St. Paul, Minn. 55106
Filed Apr. 22, 1985, Ser. No. 725,771
Term of patent 14 years
U.S. Cl. D6—336



293,633
FOLDING CHAIR
Roberto Saporiti, Gallarate, Italy, assignor to Saporiti Italia, S.p.A., Italy
Filed Jul. 9, 1985, Ser. No. 753,203
Claims priority, application Italy, Jan. 14, 1985, 20496/85[U]
Term of patent 14 years
U.S. Cl. D6—368



293,634
DISPLAY CASE
Milton S. Rattner, 180 E. End Ave., New York, N.Y. 10128
Filed May 31, 1985, Ser. No. 739,703
Term of patent 14 years
U.S. Cl. D6—440



293,635
TRAY TABLE
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Jul. 22, 1985, Ser. No. 757,269
Term of patent 14 years
U.S. Cl. D6—449

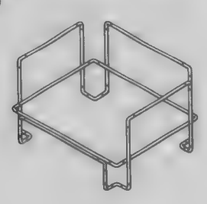


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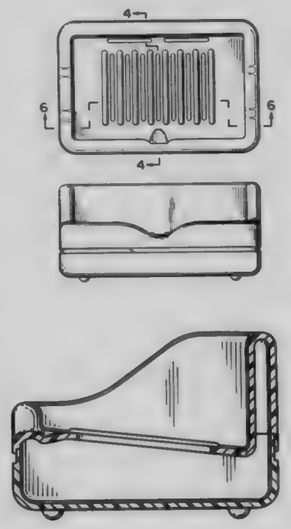
293,636
CHAIR PANEL
Arthur O. Ross, Los Angeles, Calif., assignor to Ross Trading Co., Inc., Los Angeles, Calif.
Filed Jul. 1, 1985, Ser. No. 750,507
Term of patent 14 years
U.S. Cl. D6—494



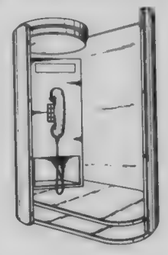
293,637
SUPPORT FRAME FOR A SEAT
Ronald Tallon, Golf Road, Foxrock, Dublin 18, Ireland
Filed Nov. 21, 1984, Ser. No. 673,616
Claims priority, application Ireland, May 21, 1984, D6198/84
Term of patent 14 years
U.S. Cl. D6—500



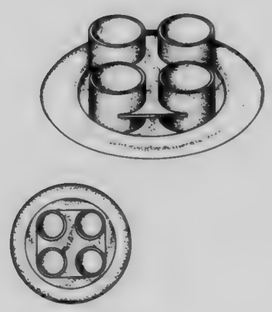
293,638
SOAP DISH
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Oct. 28, 1985, Ser. No. 792,207
Term of patent 14 years
U.S. Cl. D6—536



293,639
WALL MOUNTED SHELF AND TELEPHONE UNIT
Michel R. Lalonde, Laval des Rapides, Canada, assignor to Bell Canada, Montreal, Canada
Filed Nov. 22, 1985, Ser. No. 806,182
Term of patent 14 years
U.S. Cl. D6—574



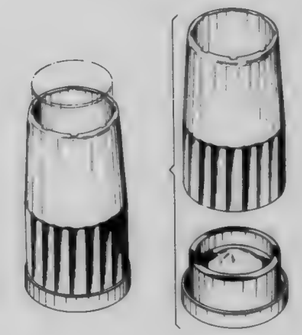
293,640
COMBINED SERVING TRAY AND BEVERAGE CONTAINER HOLDERS
Stephen L. Perry, and Cheryl E. Perry, both of 302 Harrison, Sikeston, Mo. 63801
Filed May 29, 1985, Ser. No. 739,051
Term of patent 14 years
U.S. Cl. D7—27



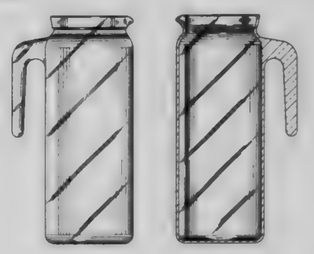
293,641
DECALCOMANIA OR THE LIKE FOR CHINA DINNERWARE
Jeanette Mattson, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 15, 1985, Ser. No. 712,073
Term of patent 14 years
U.S. Cl. D7—39



293,642
BEVERAGE COOLER HOLDER
Harry A. Rubbright, III, 1040 Avanti Dr., Mendota Hts., Minn. 55118, and Debra A. Grice, 24391 Chrisanta, Mission Viejo, Calif. 92691
Filed Jun. 11, 1985, Ser. No. 743,632
Term of patent 14 years
U.S. Cl. D7—70

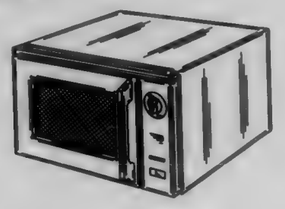


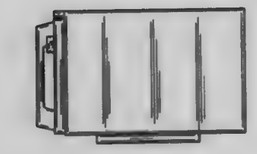
293,643
BEVERAGE JUG OR SIMILAR ARTICLE
Pier L. Bormioli, Mariano, Italy, assignor to Vetreria Parmense Bormioli Rocco, S.p.A., Parma, Italy
Filed Feb. 6, 1985, Ser. No. 698,832
Claims priority, application Italy, Aug. 17, 1984, 29012/84[U]
Term of patent 14 years
U.S. Cl. D7—318



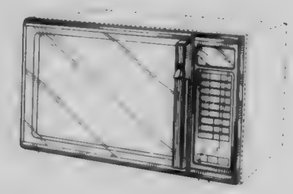
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293,644
MICROWAVE OVEN
Masayoshi Kawaishi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 4, 1985, Ser. No. 719,692
Claims priority, application Japan, Oct. 4, 1984, 59-41454
Term of patent 14 years
U.S. Cl. D7—351





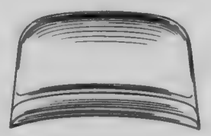
293,645
FRONT PANEL FOR A MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 19, 1984, Ser. No. 662,918
Claims priority, application Japan, Apr. 19, 1984, 59-15844
Term of patent 14 years
U.S. Cl. D7—351

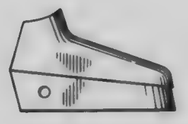




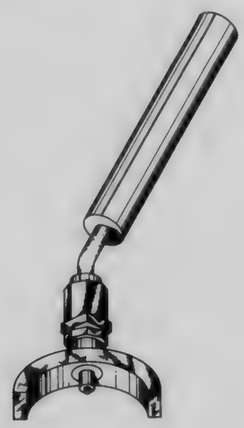
293,646
HANDLE FOR A POT
Raniero Rigoli, Ciampino, Italy, assignor to RISA W.M.C. s.r.l., Albano Laziale, Italy
Filed Jan. 29, 1985, Ser. No. 696,189
Term of patent 14 years
U.S. Cl. D7—393



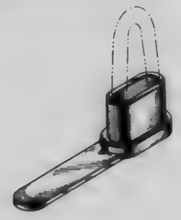




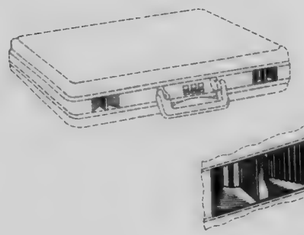
293,647
TOOL FOR REMOVING ROLLPINS FROM HANDHOLE COVER SHAFTS
Victor D. Royce, Rte. 2, Box 75, Osceola, Ark. 72370
Filed Sep. 6, 1984, Ser. No. 647,839
Term of patent 14 years
U.S. Cl. D8—14



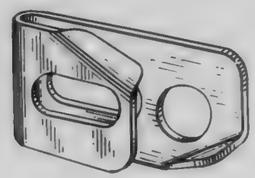
293,648
PORTABLE STAPLE HOLDER
Frank S. Smirne, 1240 Washington St., Whitehall, Pa. 18052
Division of Ser. No. 669,676, Nov. 9, 1984. This application Apr. 29, 1987, Ser. No. 43,996
Term of patent 14 years
U.S. Cl. D8—71



293,649
ATTACHE LOCK LATCH ASSEMBLY
John A. Wickman, Swansea, Mass., and M. Edward Lawing, Columbus, Ohio, assignors to American Tourister, Inc., Warren, R.I.
Filed Feb. 26, 1985, Ser. No. 705,593
Term of patent 14 years
U.S. Cl. D8—330

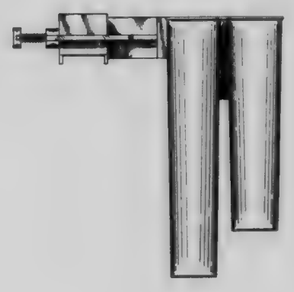


293,650
TRAILER HITCH LOCKING DEVICE
Richard W. Donalies, and Wilma A. Donalies, both of 1545 Newcastle La., Hoffman Estates, Ill. 60194
Filed Apr. 12, 1985, Ser. No. 722,734
Term of patent 14 years
U.S. Cl. D8—343



293,651
LAMP TUBE HOLDER
Walter H. Aeschliman, Bluffton, Ind., assignor to Kar-Gio Industries, Inc., Bluffton, Ind.
Filed Apr. 25, 1985, Ser. No. 727,409
Term of patent 14 years
U.S. Cl. D8—373



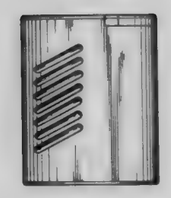


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293,652
STORAGE CONTAINER FOR MOTOR OIL OR THE LIKE
Michael H. B. Peters, 3, Olaf Street, London W114BE, England
Filed Jul. 26, 1984, Ser. No. 634,879
Claims priority, application United Kingdom, Jan. 26, 1984, 1017538
Term of patent 14 years
U.S. Cl. D9—376



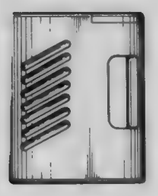




293,653
STORAGE CONTAINER FOR MOTOR OIL OR THE LIKE
Michael H. B. Peters, 3, Olaf Street, London W114BE, England
Filed Jul. 26, 1984, Ser. No. 635,701
Claims priority, application United Kingdom, Feb. 2, 1984, 1017664
Term of patent 14 years
U.S. Cl. D9—376







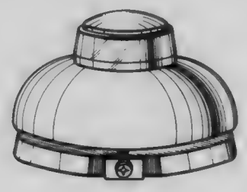
293,654
ELECTRONIC THERMOMETER
Masaki Kawamura, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 5, 1985, Ser. No. 742,104
Claims priority, application Japan, Dec. 6, 1984, 59-50490
Term of patent 14 years
U.S. Cl. D10—57



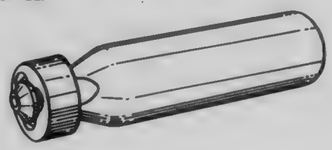
293,655
FLOWMETER
James W. Phillips, Michigan City, and Duane M. Kobos, La-Porte, both of Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Feb. 5, 1985, Ser. No. 698,583
Term of patent 14 years
U.S. Cl. D10—96



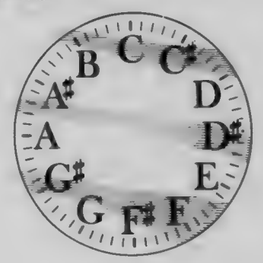
293,656
BELL WITH LAMP
Tatsuya Arai, Kitamoto, Japan, assignor to Kobishi Electric Co., Ltd., Japan
Filed May 8, 1985, Ser. No. 731,960
Term of patent 14 years
U.S. Cl. D10—116



293,657
WHISTLE
Ingvar Petersson, Killeberg, Sweden, assignor to Brio AB, Osby, Sweden
Filed Aug. 8, 1986, Ser. No. 894,819
Claims priority, application Sweden, Feb. 14, 1986, 86-0371
Term of patent 14 years
U.S. Cl. D10—119

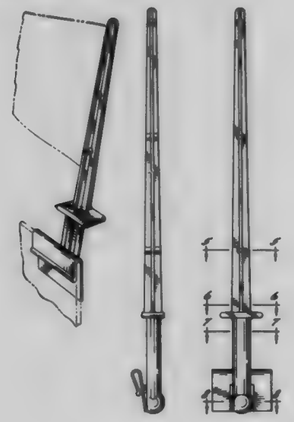


293,658
WATCH DIAL
William T. Hankinson, 328 Vandervoort St., North Tonawanda, N.Y. 14120
Filed May 13, 1985, Ser. No. 733,202
Term of patent 14 years
U.S. Cl. D10—126



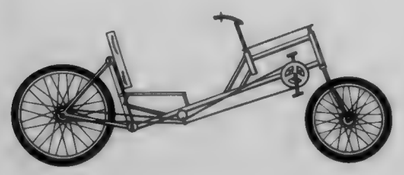
VOL 1086 ISS 2 JA 12 1988 UMI

293,659
COMBINED FLAGSTAFF AND HOLDER BRACKET FOR AN AUTOMOBILE WINDOW
John C. Griffin, 550 Rock Springs Rd., Lancaster, S.C. 29720
Filed Jun. 5, 1985, Ser. No. 741,573
Term of patent 14 years
U.S. Cl. D11—182





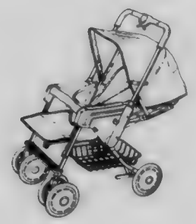
293,660
BICYCLE
David L. Foehner, 9750 Mt. View Ave., San Bernardino, Calif. 92408
Filed Aug. 26, 1985, Ser. No. 769,485
Term of patent 14 years
U.S. Cl. D12—111



293,661
BABY STROLLER
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,793
Claims priority, application Japan, Sep. 28, 1984, 59-40312
Term of patent 14 years
U.S. Cl. D12—129



293,662
BABY STROLLER
Shinroku Nakao, Kanagawa, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,774
Claims priority, application Japan, Sep. 28, 1984, 59-40314
Term of patent 14 years
U.S. Cl. D12—129



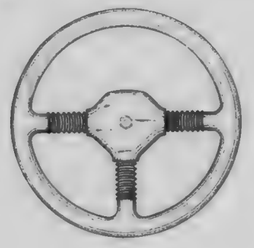
293,663
WHEELED WALKER
Ronald Erfurth, 880 N. Main St., Oregon, Wis. 53575
Filed Jan. 27, 1986, Ser. No. 822,812
Term of patent 14 years
U.S. Cl. D12—130



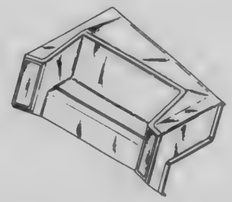
293,664
AUTOMOBILE TIRE
Toshio Hayakawa, and Yutaka Yamaguchi, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed May 21, 1985, Ser. No. 736,891
Claims priority, application Japan, Nov. 21, 1984, 59-47624
Term of patent 14 years
U.S. Cl. D12—146



293,665
STEERING WHEEL
Marco Cattaneo, Pavia, Italy, assignor to Momo S.p.A., Milan, Italy
Filed Nov. 13, 1985, Ser. No. 804,998
Claims priority, application Italy, May 17, 1985, 21842[U]
Term of patent 14 years
U.S. Cl. D12—176



293,666
MOLDED DASHBOARD PANEL
John P. Flowers, Skagit County, Wash., assignor to Bayliner Marine Corporation, Seattle, Wash.
Filed Aug. 2, 1985, Ser. No. 761,978
Term of patent 14 years
U.S. Cl. D12—192



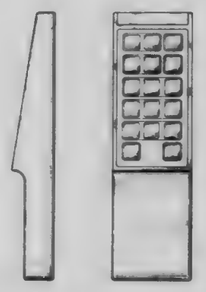
293,667
STEP PLATE
C. Raywood Weller, 34400 Cathedral Canyon Dr., Palm Springs, Calif. 92234
Filed Dec. 30, 1985, Ser. No. 814,585
Term of patent 14 years
U.S. Cl. D12—203



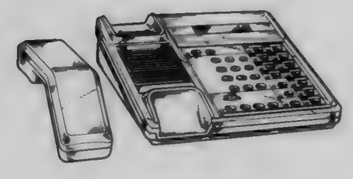
293,668
MOTORBOAT
Keiji Nakagawa, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Jan. 2, 1986, Ser. No. 815,579
Claims priority, application Japan, Jul. 6, 1985, 60-28764; Nov. 27, 1985, 60-49450
Term of patent 14 years
U.S. Cl. D12—307



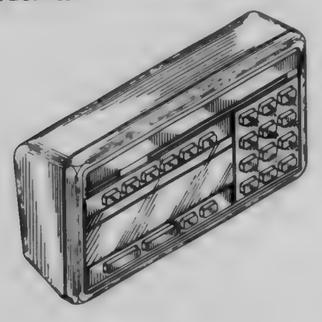
293,669
REMOTE CONTROLLER FOR BATHROOM APPLIANCES
Kenneth A. Ogilvie, Naunton, England, assignor to Caradon Mira Limited, Cheltenham, England
Filed Jan. 17, 1985, Ser. No. 744,974
Claims priority, application United Kingdom, Feb. 15, 1985, 1025083
Term of patent 14 years
U.S. Cl. D13—12



293,670
COMBINATION HANDSET AND STAND TELEPHONE INSTRUMENT
Stig Gauffin, Stockholm, and Peter Lawton, Taby, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Aug. 22, 1985, Ser. No. 768,474
Claims priority, application Sweden, Feb. 22, 1985, 85-0445
Term of patent 14 years
U.S. Cl. D14—58



293,671
RADIO CONTROL UNIT OR SIMILAR ARTICLE
Thomas G. Beaumont, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 26, 1985, Ser. No. 780,498
Term of patent 14 years
U.S. Cl. D14—68

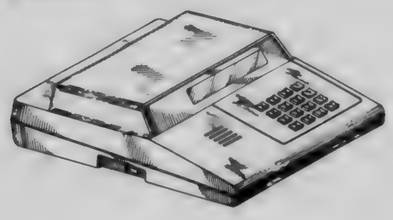


293,672
RADIO RECEIVING ANTENNA
Piergiorgio Redaelli, Vimercate, Italy, assignor to Cobra S.r.l., Vimercate, Italy
Filed Jul. 22, 1985, Ser. No. 757,902
Term of patent 14 years
U.S. Cl. D14—86

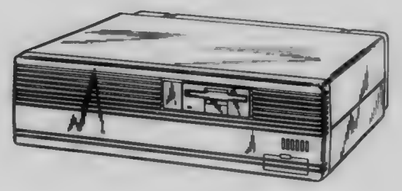


293,673
FACSIMILE
Tomonori Nishio, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 9, 1986, Ser. No. 862,418
Claims priority, application Japan, Nov. 13, 1985, 60-47454
Term of patent 14 years
U.S. Cl. D14—94

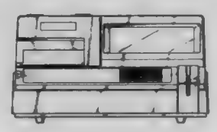
293,674
RADIO ENCODER TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 22, 1985, Ser. No. 806,241
Term of patent 14 years
U.S. Cl. D14—95

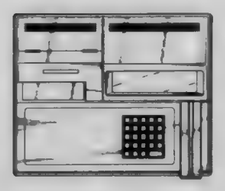


293,675
CENTRAL PROCESSOR UNIT
Kenji Yokoi, Matsudo; Shinji Shibuya, Koganei; Tsuyoshi Nakagawa, Hatano; Kanji Midorikawa, Hatano; Yoshiaki Maeda, Hatano, and Yukio Kuroiwa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 20, 1986, Ser. No. 834,454
Claims priority, application Japan, Aug. 23, 1985, 60-35485; Aug. 23, 1985, 60-35487
Term of patent 14 years
U.S. Cl. D14—100



293,676
POINT-OF-SALE SYSTEM TERMINAL CONSOLE
Masahiro Nogawa, Kawasaki, Japan, assignor to Nitsuko Limited, Kanagawa, Japan
Filed Feb. 8, 1985, Ser. No. 699,640
Claims priority, application Japan, Aug. 9, 1984, 59-33521
Term of patent 14 years
U.S. Cl. D14—105





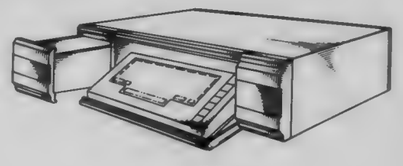
293,677
ELECTRONIC COMPUTER
Masaki Hara; Sadao Shiratani; Masaharu Sawatani, and Masataka Fukunaga, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 713,548
Claims priority, application Japan, Sep. 21, 1984, 59-39260
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—106



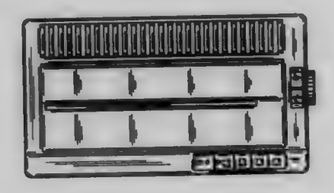
293,678
ELECTRONIC COMPUTER
Masaharu Sawatani; Sadao Shiratani; Masaki Hara, and Masataka Fukunaga, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 713,549
Claims priority, application Japan, Sep. 21, 1984, 59-39259
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—106



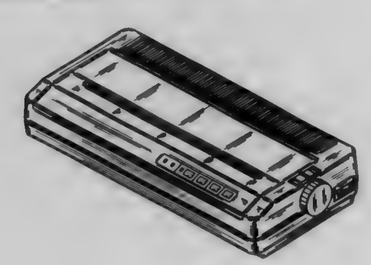
293,679
CONSOLE WITH KEYBOARD
Louis J. Zervakos, Phoenix; Lisa D. Nolan, Scottsdale, and Alan Weiner, Phoenix, all of Ariz., assignors to International Anasazi, Inc., Phoenix, Ariz.
Filed Apr. 2, 1985, Ser. No. 718,940
Term of patent 14 years
U.S. Cl. D14—107



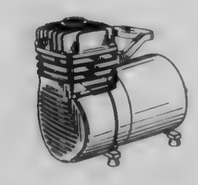
293,680
PRINTER
Kazuo Yamada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 18, 1985, Ser. No. 724,988
Claims priority, application Japan, Oct. 19, 1984, 59-43377
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—111



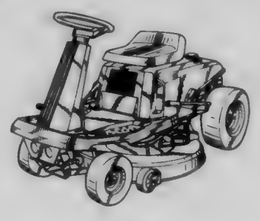
293,681
PRINTER
Kazuo Yamada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 29, 1985, Ser. No. 728,247
Claims priority, application Japan, Oct. 29, 1984, 59-44846
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—111

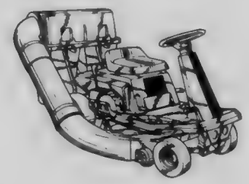


293,682
PORTABLE AIR COMPRESSOR OR SIMILAR ARTICLE
James Liou, No. 261, Sec. 1, Po Ai Rd., Chia I City, Taiwan
Filed Oct. 22, 1986, Ser. No. 922,135
Claims priority, application Taiwan, Apr. 30, 1986, 75302174
Term of patent 14 years
U.S. Cl. D15—9

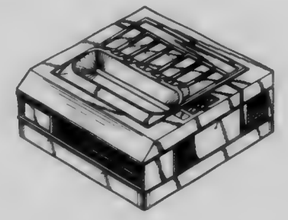


293,683
LAWN TRACTOR
Sadao Mizushima; Masahiro Watanabe, and Shungo Yorozu, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 7, 1985, Ser. No. 709,172
Claims priority, application Japan, Sep. 19, 1984, 59-38961
Term of patent 14 years
U.S. Cl. D15—15

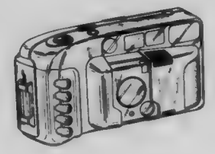




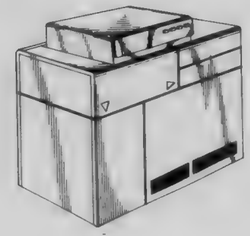
293,684
DOCUMENT SHREDDING MACHINE
Kenneth G. Sadler; Clive J. Southerawood, both of Horsham, and James T. Yeomans, Birmingham, all of England, assignors to Ofrex Group Holdings PLC, West Drayton, United Kingdom
Filed May 23, 1985, Ser. No. 737,180
Claims priority, application United Kingdom, Nov. 27, 1984, 1023524
Term of patent 14 years
U.S. Cl. D15—127

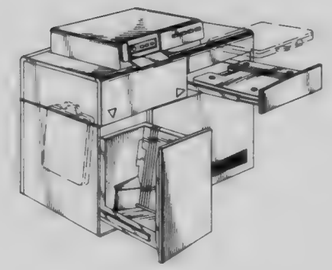


293,685
CAMERA
Noboru Tanaka, Kawasaki; Nobuhiro Ago, and Shuichi Tamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1985, Ser. No. 754,441
Claims priority, application Japan, Jan. 16, 1985, 60-912
Term of patent 14 years
U.S. Cl. D16—5

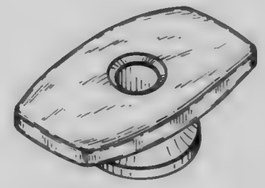


293,686
LASER IMAGE RECORDING MACHINE
Masatoki Satou, Okazaki, and Sadasobu Murasaki, Sagamihara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed May 22, 1985, Ser. No. 736,715
Claims priority, application Japan, Nov. 22, 1984, 59-48255
Term of patent 14 years
U.S. Cl. D16—34

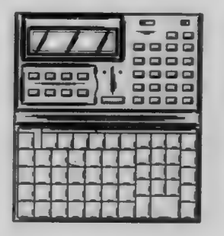




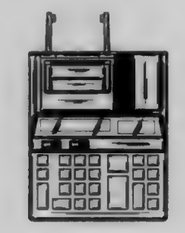
293,687
RETAINING BUTTON FOR A GUITAR STRAP
Joseph C. Nichols, 723 Mount Curve, St. Paul, Minn. 55116
Filed Jun. 21, 1985, Ser. No. 747,341
Term of patent 14 years
U.S. Cl. D17—20

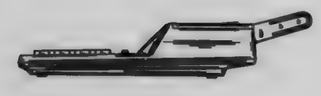


293,688
ELECTRONIC CALCULATOR WITH ELECTRONIC MEMO
Takahisa Yubisui; Hiroshi Sakaguchi, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 24, 1985, Ser. No. 813,099
Claims priority, application Japan, Jun. 28, 1985, 60-27878
Term of patent 14 years
U.S. Cl. D18—2

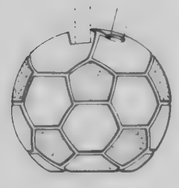


293,689
PRINTING CALCULATOR
Takahiro Yoshiwa; Hiroshi Sakaguchi, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 27, 1985, Ser. No. 806,847
Claims priority, application Japan, May 30, 1985, 60-23112
Term of patent 14 years
U.S. Cl. D18—7



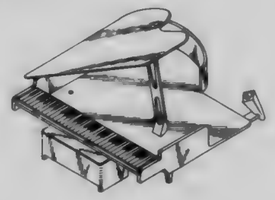


293,690
DESK CADDY
Herbert Adler, Nassau County, N.Y., assignor to Crest Industries Corp., Deer Park, N.Y.
Filed Aug. 22, 1986, Ser. No. 899,499
Term of patent 14 years
U.S. Cl. D19—78





293,691
COMBINED MEMO PAPER CASE AND WRITING INSTRUMENT HOLDER
Dou- Zen Lin, No. 7, Lane Market, Village Shui Li, Nan Tour Hsien, Taiwan
Filed Dec. 18, 1984, Ser. No. 683,317
Term of patent 14 years
U.S. Cl. D19—78



293,692
SIGN
Diane Ippati-Dingli, 217, Rue du Fbg. St. Honore, 75008 Paris, France
Filed Jun. 7, 1985, Ser. No. 742,722
Claims priority, application France, Dec. 6, 1984, 845450
Term of patent 14 years
U.S. Cl. D20—31



293,693
SIGN
Diane Ippati-Dingli, 217, Rue du Fbg. St. Honore, 75008 Paris, France
Filed Jun. 6, 1985, Ser. No. 742,629
Claims priority, application France, Dec. 6, 1984, 845450
Term of patent 14 years
U.S. Cl. D20—31



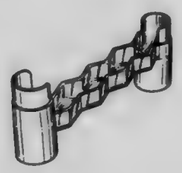
293,694
CARDED TAPE STRIPS
Harry E. Alden, Bedminster, and Thomas D. Policastro, Jr., Raritan, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.
Filed Mar. 14, 1985, Ser. No. 711,557
Term of patent 14 years
U.S. Cl. D20—27



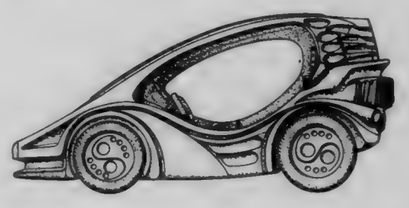
293,695
FLIPPER BAT FOR PINBALL MACHINES
Irwin J. Grabel, 1825 N. 75th Ct., Elmwood Park, Ill. 60635
Filed Apr. 8, 1985, Ser. No. 720,987
Term of patent 14 years
U.S. Cl. D21—10



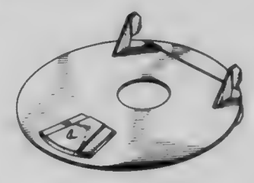
293,696
MARBLE GAME RAMP
William J. Wichman, Glendora, Calif., assignor to Discovery Toys, Inc., Pleasant Hill, Calif.
Filed Jun. 4, 1985, Ser. No. 741,049
Term of patent 14 years
U.S. Cl. D21—59



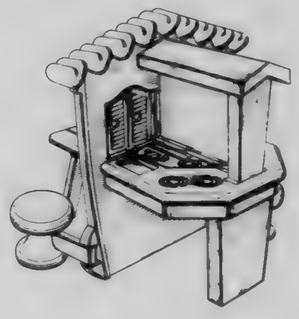
293,697
RIDING TOY VEHICLE
Michael J. Thornalley, Lincoln, United Kingdom, assignor to Fibrecast Limited, United Kingdom
Filed May 20, 1985, Ser. No. 720,002
Claims priority, application United Kingdom, Feb. 5, 1985, 1024825
Term of patent 14 years
U.S. Cl. D21—78



293,698
FLYING DISK TOY
Harold Rose, Provo, Utah, assignor to Incredible Flying Objects, Inc., Provo, Utah
Filed Feb. 28, 1985, Ser. No. 706,965
Term of patent 14 years
U.S. Cl. D21—86



293,699
TOY PLAY SCENE
Ernest L. Thornell, Booneville, Ark., assignor to Spang & Company, Butler, Pa.
Filed Oct. 29, 1985, Ser. No. 792,522
Term of patent 14 years
U.S. Cl. D21—114



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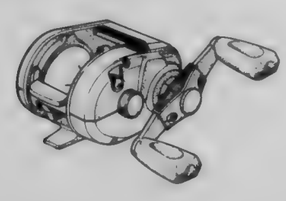
293,700
CUE REST
George Rosewarne, 39 Western Road, Liss, Hampshire, GU33 7AD, United Kingdom
Filed Sep. 13, 1985, Ser. No. 776,005
Claims priority, application United Kingdom, Mar. 15, 1985, 1025585
Term of patent 14 years
U.S. Cl. D21—232



293,701
SHOTGUN HEAD WITH INTEGRAL HANGER HOOK
Larry R. Baum, Hastings, Mich., assignor to Hastings Fiber Glass Products, Inc., Hastings, Mich.
Filed Apr. 26, 1985, Ser. No. 727,499
Term of patent 14 years
U.S. Cl. D22—108



293,702
FISHING REEL
Masakazu Sakamoto, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Nov. 14, 1985, Ser. No. 805,149
Claims priority, application Japan, May 16, 1985, 60-20474
Term of patent 14 years
U.S. Cl. D22—140

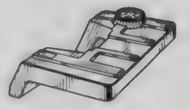


293,703
REMOVABLE INSULATED VALVE COVER
Michael A. Kaye, 2702 Greenway Cir., Lake Orion, Mich. 48035
Filed Jan. 10, 1985, Ser. No. 690,177
Term of patent 14 years
U.S. Cl. D23—249

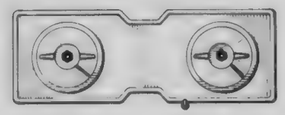


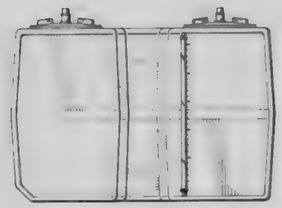


293,704
VEHICLE-MOUNTED SPRAYER TANK
John F. Hart, Palmerston North, and John B. Love, Linton, both of New Zealand, assignors to C-Dax Systems Limited, Palmerston North, New Zealand
Filed Dec. 18, 1985, Ser. No. 811,709
Term of patent 14 years
U.S. Cl. D23—202



293,705
TANK
Michael T. Seyward, 2060 SW. Starlight Landing Rd., Ft. Lauderdale, Fla. 33312
Filed Oct. 6, 1986, Ser. No. 916,092
Term of patent 14 years
U.S. Cl. D23—202

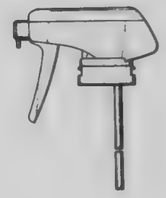




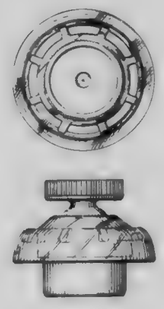
293,706
UNDERGRAVEL FISHTANK FILTER
Ying Y. Ng, Stanley Knoll, Hong Kong, assignor to Venu Plastic Company, Limited, Chaiwan, Hong Kong
Filed Dec. 11, 1985, Ser. No. 807,593
Claims priority, application United Kingdom, Nov. 19, 1985, 1030833
Term of patent 14 years
U.S. Cl. D23—210



293,707
DISPENSING PUMP
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Japan
Filed May 24, 1985, Ser. No. 738,076
Claims priority, application Japan, Feb. 25, 1985, 60-6688; Feb. 25, 1985, 60-6689
Term of patent 14 years
U.S. Cl. D23—226



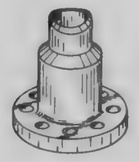
293,708
COMBINED SWIVEL AERATOR AND CONTROL RING
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Jul. 22, 1985, Ser. No. 757,461
Term of patent 14 years
U.S. Cl. D23—230



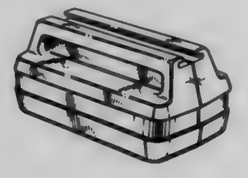
293,709
BALL COCK
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed May 30, 1985, Ser. No. 739,561
Term of patent 14 years
U.S. Cl. D23—236



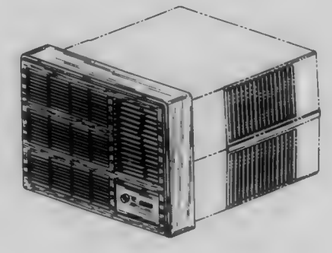
293,710
WELDING OUTLET
Glynn E. Woods, Kingwood, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Feb. 19, 1985, Ser. No. 703,039
Term of patent 14 years
U.S. Cl. D23—265



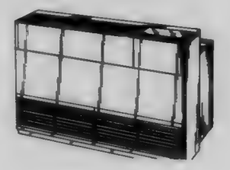
293,711
UTILITY HEATER
Robert E. Hart, Kitchener, Canada, assignor to Heron Cable Industries Limited, Ontario, Canada
Filed Sep. 17, 1984, Ser. No. 651,367
Claims priority, application Canada, Mar. 30, 1984, 30-03-84-6
Term of patent 14 years
U.S. Cl. D23—314



293,712
FRONT PANEL FOR AN AIR CONDITIONER
Robert J. Whitwell, Nedrow, and James E. Napolitano, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 30, 1985, Ser. No. 771,547
Term of patent 14 years
U.S. Cl. D23—354



293,713
AIR-CONDITIONER
Keiichi Morita, Fujinomiya; Toru Nonaka, Tokorozawa; Shinji Watanabe, Ichikawa, and Takuma Watanabe, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 16, 1985, Ser. No. 755,364
Claims priority, application Japan, Jan. 17, 1985, 60-901
Term of patent 14 years
U.S. Cl. D23—353



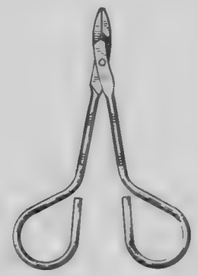
293,714
COMBINED FAN, CALCULATOR, LIGHT AND CLOCK
Hwa S. Jih, 2-4 Fl. No. 13-15, Sec. b Chung Shan N. Rd., Taipei, Taiwan
Filed Dec. 31, 1985, Ser. No. 815,018
Term of patent 14 years
U.S. Cl. D23—370



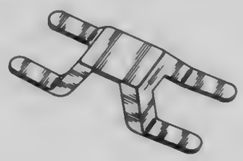
293,715
CARDIO-PULMONARY RESUSITATION PACER
Gerald P. Krasnow, One Mile Rd., Charlotte, Vt. 05445
Filed Jan. 23, 1985, Ser. No. 694,050
Term of patent 14 years
U.S. Cl. D24—17



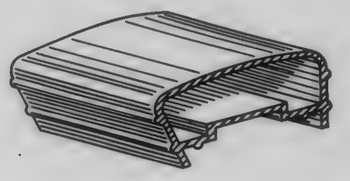
293,716
FORCEPS
Merle E. Nice, Prophetstown, Ill., assignor to Sterling Multi-Products, Inc., Sterling, Ill.
Filed May 28, 1985, Ser. No. 738,479
Term of patent 14 years
U.S. Cl. D24—27



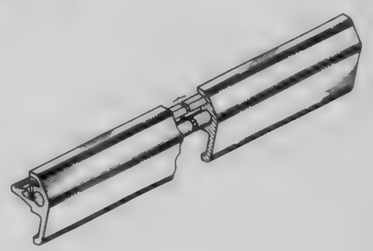
293,717
VENIPUNCTURE SITE PROTECTOR
Raymond E. Proulx, 381 Clark Ave., Upland, Calif. 91786, and Frank J. Rauscher, 4908 Mt. View Ave., San Bernardino, Calif. 92407
Filed May 14, 1985, Ser. No. 733,898
Term of patent 14 years
U.S. Cl. D24—47



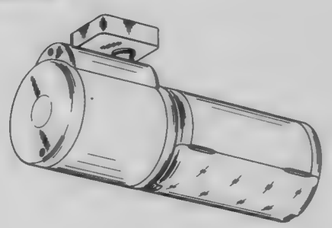
293,718
SPLICE INSERT FOR BALCONY RAILING SYSTEMS
Frank Pona, West Palm Beach, Fla., assignor to Metal Fab Equipment, Inc., Lake Park, Fla.
Filed Nov. 16, 1983, Ser. No. 552,348
Term of patent 14 years
U.S. Cl. D25—122



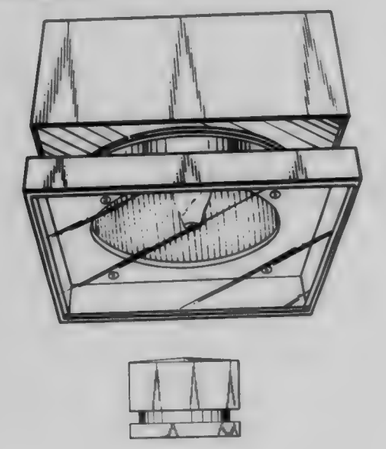
293,719
COMBINED ASTRAGAL EXTRUSION AND SEAL
Edward O. Stepanian, Glendale, Calif., assignor to Adams Rite Manufacturing Co., City of Industry, Calif.
Filed Jan. 22, 1985, Ser. No. 693,386
Term of patent 14 years
U.S. Cl. D25—125



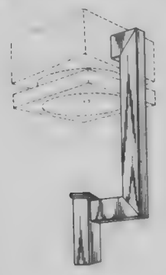
293,720
ADJUSTABLE LIGHT FIXTURE
Dieter Witte, Lindenfels, Fed. Rep. of Germany, assignor to OSRAM Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany
Filed Mar. 11, 1985, Ser. No. 710,140
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, MR 14034
Term of patent 14 years
U.S. Cl. D26—63



293,721
AREA LIGHT
Robert L. Ewing; John W. Harvey; Richard G. Armstrong, all of Newark, Ohio, and Randall P. Crothers, Littleton, Colo., assignors to Manville Corporation, Denver, Colo.
Filed Jan. 29, 1986, Ser. No. 823,883
Term of patent 14 years
U.S. Cl. D26—67



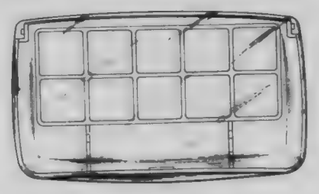
293,722
STANCHION FOR EXTERIOR LUMINAIRE
Robert L. Ewing; Herbert A. Fouke, both of Newark; James S. Hughes, and Bruce G. Bruggeman, both of Columbus, all of Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Feb. 3, 1986, Ser. No. 825,300
Term of patent 14 years
U.S. Cl. D26—68

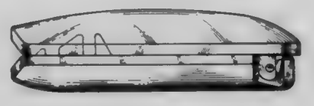


293,723
LAMPSHADE
Jürgen Büttner, Schinkelstr. 11, D-6000 Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 27, 1984, Ser. No. 686,860
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1984, 73MR9295
Term of patent 14 years
U.S. Cl. D26—129

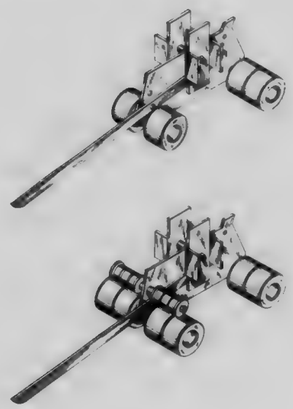


293,724
COSMETIC CONTAINER FOR NON-LIQUID COSMETICS
Ted I. Kingsford, and Robert L. Baumgartner, both of Memphis, Tenn., assignors to Plough, Inc., Memphis, Tenn.
Filed Dec. 10, 1985, Ser. No. 807,397
Term of patent 14 years
U.S. Cl. D28—83

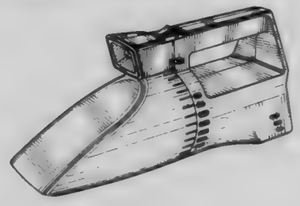




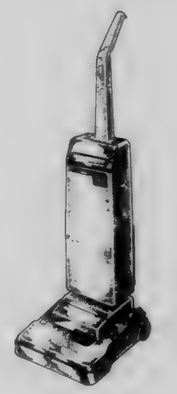
293,725
MACHINE FOR TAPING LINES TO GYMNASIUM FLOORS AND THE LIKE
Allen E. Kriedeman, 202 Greenbriar Ave., Stevens Point, Wis. 54481
Filed Jan. 4, 1985, Ser. No. 688,769
Term of patent 14 years
U.S. Cl. D32—15



293,726
COMBINED HAND-HELD VACUUM CLEANER AND FLASHLIGHT
Chow Shau-Din, 21 A-F Provident Centre, 41 Wharf Rd., Hong Kong, Hong Kong
Filed Sep. 30, 1985, Ser. No. 781,491
Term of patent 14 years
U.S. Cl. D32—18



293,727
VACUUM CLEANER
Richard A. Wareham, North Canton, Ohio, and Paul L. Moss, Leatherhead, United Kingdom, assignors to The Hoover Company, North Canton, Ohio
Filed Aug. 8, 1985, Ser. No. 763,645
Term of patent 14 years
U.S. Cl. D32—22





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293,728
VACUUM CLEANER
Yoshikuni Ohhira, Hoya; Kouichi Hasegawa, Tachikawa; Tomoyuki Miyata, Tokyo, and Masao Sunagawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 6, 1985, Ser. No. 773,299
Claims priority, application Japan, Jul. 17, 1985, 60-30201
Term of patent 14 years
U.S. Cl. D32—22





293,729
CARPET CLEANER
Eldred E. Soeffker, Plymouth, and Lou Rukavina, Falcon Heights, both of Minn., assignors to Natural Float Sales, Inc., Minneapolis, Minn.
Filed Sep. 23, 1985, Ser. No. 778,923
Term of patent 14 years
U.S. Cl. D32—22



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JANUARY, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & B Industries, Inc.: *See*—
Atkins, John H., Sr., 4,718,585, Cl. 224-238.000.
Aasen, Steven M.; and Oxman, Joel D., to Minnesota Mining and Manufacturing Company. Method for priming hard tissue. 4,719,149, Cl. 428-473.000.
AB UVA: *See*—
Seewald, Heinrich, 4,718,196, Cl. 51-5.00D.
Abbott Laboratories: *See*—
Arndt, Robert G.; Atkinson, William; Carr, Travis C.; Haun, Michael J.; Loeb, Phillip; and D'Souza, Stanley, 4,718,896, Cl. 604-253.000.
Abe, Hiroshi: *See*—
Tsushima, Mitsuo; and Abe, Hiroshi, 4,718,782, Cl. 400-23.000.
Tsushima, Mitsuo; and Abe, Hiroshi, 4,718,783, Cl. 400-23.000.
Abe, Kenji: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,719,613, Cl. 369-109.000.
Abe, Susumu; and Ogawa, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Production of silicon ceramic powders. 4,719,095, Cl. 423-346.000.
Abou-Gharbia, Magid A.; and Freed, Meier E., to American Home Products Corporation. 2,3,4,9-tetrahydro-2-heteroarylalkyl-1H-pyrido(3,4-B)indoles having antihypertensive properties. 4,719,211, Cl. 514-253.000.
Abraham, Thomas; and Theriault, Robert E., to Northern Telecom Limited. Process for plasma etching polysilicon to produce rounded profile islands. 4,718,973, Cl. 156-628.000.
AC Industries, Ltd.: *See*—
Hawker, Brian; and Faggard, Joseph, 4,718,440, Cl. 134-141.000.
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ACF Industries, Incorporated: *See*—
Dugge, Richard H., 4,718,795, Cl. 406-30.000.
Acheson Industries, Inc.: *See*—
Levine, Walter E., 4,718,607, Cl. 239-451.000.
Achtsnit, Hans D.; Herwig, Hans U.; and Kolb, Reinhold, to Akzo NV. Insulated conductors and method of making same. 4,719,318, Cl. 174-102.00R.
Adam, Willibald, to Webasto-Werk W. Baier GmbH & Co. Vehicle heater. 4,718,600, Cl. 237-2.00A.
Adamoli, Anthony R.; Jewett, Robert P.; Friedman, Herbert; and Chalem, Alan A., to Ivy Hill Corporation. Tamper-evident packaging, method of making same, and intermediate therein. 4,718,553, Cl. 206-459.000.
Adams, Arnold L.: *See*—
James, Timothy W.; and Adams, Arnold L., 4,719,028, Cl. 252-70.000.
Addleman, Jeffrey L., to Kidde, Inc. Forklift variable reach mechanism. 4,718,814, Cl. 414-705.000.
Adkison, Frank L., to Oscar Mayer Foods Corporation. Apparatus for sawing turkey breasts and other objects. 4,718,146, Cl. 17-52.000.
Adney, Billy R.; Alworth, Charles W.; Durkee, John B.; and Jeffries, Bryce T., to Conoco Inc. Mass flowmeter apparatus. 4,718,443, Cl. 137-8.000.
Adolph Coors Company: *See*—
Dugan, Larry M., 4,718,465, Cl. 141-89.000.
Adorjan, Alexander S., to Exxon Production Research Company. Underwater cryogenic pipeline system. 4,718,459, Cl. 138-105.000.
Advanced Micro Devices, Inc.: *See*—
Estrada, David; Tran, Danh C.; and Zambo, Alex A., 4,718,548, Cl. 206-329.000.
Moller, Ole H., 4,719,565, Cl. 364-200.000.
Tan, Sherman M., 4,719,366, Cl. 307-272.200.
Threewitt, N. Bruce; and Madewell, Jimmy R., 4,719,593, Cl. 364-900.000.
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Jonsson, Lars; and Johansson, Mats, 4,718,646, Cl. 266-242.000.
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Kontani, Kazuo; and Goto, Shinichi, 4,719,360, Cl. 250-574.000.
Suzuki, Yoshikazu; and Unuma, Hidero, 4,719,077, Cl. 419-23.000.
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Bauer, Walter; and Farber, Heinrich, 4,718,154, Cl. 29-123.000.
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Berg, Lloyd; and Yeh, An-I. Separation of 2-butyl acetate from 2-butanol by extractive distillation. 4,718,988, Cl. 203-51.000.

Berg, Lloyd; and Vosburgh, Mark G. Separation of isopropanol from isopropyl acetate by extractive distillation. 4,718,989, Cl. 203-51.000.

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Boy, Joseph P. Flow path selector valve for use in wind instruments made of metal. 4,718,318, Cl. 84-390.000.

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Rushforth, Calvin; and Brassert, Walter L., 4,718,702, Cl. 285-114.000.

Braun Aktiengesellschaft: *See*—
Mothrath, Georg, 4,718,332, Cl. 99-385.000.
Wunder, Dieter, 4,718,566, Cl. 215-13.100.

Braun, Dieter; Moller, Werner; and Thulig, Werner, to Westfalia-Werke Franz Knobel & Sone Kommanditgesellschaft. Cushioned seat including an impact member. 4,718,720, Cl. 297-216.000.

Braun, Robert C.; and Bigelow, Lyle L., to Duraco Products, Inc. Process of handling and transferring a molded product. 4,719,059, Cl. 264-40.100.

Braunschweigische Maschinenbauanstalt AG: *See*—
Schaper, Helmut; and Kurland, Heinrich, 4,718,945, Cl. 127-9.000.

Breeck, Philip L.; and Muntean, George L., to Cummins Engine Company, Inc. Tamper-proof adjustment screw arrangement for vehicle fuel supply systems and the like. 4,718,828, Cl. 417-313.000.

Bregman, Robert U.; and Soltan, Parviz, to United States of America, Navy. Fiber optics image scope (micro-endoscope), ureteroscope. 4,718,406, Cl. 128-6.000.

Brehm, Gailon E.: *See*—
Scott, Bentley N.; and Brehm, Gailon E., 4,719,434, Cl. 333-32.000.

Brenaan, Edward J., to PTC Aerospace Inc. Energy absorbing aircraft seat frame structure. 4,718,719, Cl. 297-216.000.

Brennen, Michael B.; and Gernhardt, Mark G., to Westinghouse Electric Corp. VAR generator system with minimal standby losses. 4,719,402, Cl. 323-211.000.

Bressler, Allen K.; and Hixson, Keith D., to Cherry-Burrell Corporation. Carton stop assembly. 4,718,882, Cl. 493-164.000.

Brice, Ralph E.; Green, Ronald G.; Lawrence, Ronald L.; and Miller, James D., to Brice, Ralph E. Backcountry ski binding. 4,718,694, Cl. 280-603.000.

Bridgestone Tire Company Limited: *See*—
Kusakabe, Noboru; Morimoto, Masaaki; Koyama, Eiichi; and Kojima, Koichi, 4,718,470, Cl. 152-451.000.

Briet, Gilles, to Hutchinson. Branch coupling on flexible hose. 4,718,636, Cl. 251-145.000.

Brinkmeyer, Hermann: *See*—
Nielinger, Werner; Brinkmeyer, Hermann; Binsack, Rudolf; Bottenbruch, Ludwig; and Fullmann, Heinz-Josef, 4,719,284, Cl. 528-335.000.

Briscoe, Terry L., to ESCO Corporation. Wire rope equalizer socket. 4,718,788, Cl. 403-211.000.

Britax (Wingard) Ltd.: *See*—
McKernon, David A.; and Cunningham, Douglas J., 4,718,148, Cl. 24.170.000.

British Aerospace: *See*—
Thornton, John, 4,718,251, Cl. 62-475.000.

British Aerospace Public Limited Company: *See*—
Reid, Neil M.; and Davidson, William R., 4,718,268, Cl. 73-23.000.

British-American Tobacco Company, Ltd.: *See*—
Luke, John A., 4,718,435, Cl. 131-281.000.
Luke, John A., 4,718,436, Cl. 131-336.000.
Luke, John A., 4,718,437, Cl. 131-336.000.

British Gas Plc: *See*—
Appleby, William, 4,718,454, Cl. 137-624.110.

Brock, Gregory K.: *See*—
Lerouell, Pierre E.; James, R. Kent; and Brock, Gregory K., 4,718,376, Cl. 122-390.000.

Brockmann, Hermann: *See*—
Horch, Frank; Brockmann, Hermann; Barfuss, Herbert; and Schutt, Werner, 4,718,700, Cl. 285-156.000.

Brockmeyer, Jerry W., to Swiss Aluminium Ltd. Ceramic foam filter. 4,719,013, Cl. 210-510.100.

Brody, Deborah S.; Kendall, Robert C.; Murray, Douglas E.; and Weldon, James R., to General Foods Corporation. Beverage dispensing machine. 4,718,579, Cl. 222-129.400.

Broer, Dirk J.; and Mol, Grietje N., to U.S. Philips Corporation. Optical glass fibre having a synthetic resin cladding and method of manufacturing same. 4,718,748, Cl. 350-96.300.

Bronkowski, Udo; Gerst, Micahel; and Maack, Werner, to AMP Incorporated. Apparatus for terminating an electrical wire to an electrical connector. 4,718,159, Cl. 29-564.700.

Bronstert, Bernd: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Wallbillich, Guenter; and Bronstert, Bernd, 4,719,297, Cl. 544-107.000.

Brown, Alan R. W., to Zealtown Limited. Control systems. 4,718,599, Cl. 236-46.00R.

Brown, Alfred; Fontaine, Marc F.; and Hight, Margaret A., to Texaco Inc. Patterns having horizontal and vertical wells. 4,718,485, Cl. 166-50.000.

Brown Boveri Reaktor GmbH: *See*—
Haller, Hans, 4,718,377, Cl. 122-510.000.

Brown, Byron L. Method and apparatus for cementing a femoral stem prosthesis within a femoral canal. 4,718,909, Cl. 623-16.000.

Brown, Dennis N., to Northwest Podiatric Laboratories, Inc. Orthotic and method of making of the same. 4,718,179, Cl. 36-44.000.

Brown, Jackson E.: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; and Nagarwalla, Pheroze J., 4,718,474, Cl. 164-158.000.

Brown, Steven R.; and Fisher, Gene A., to Brown, Steven R. Footwear scraper. 4,718,138, Cl. 15-237.000.

Brown, William E. Step ladder. 4,718,518, Cl. 182-22.000.

Brubaker, Richard R., to Dresser Industries, Inc. Mobile, off-road, heavy-duty haulage vehicle. 4,719,361, Cl. 290-45.000.

Brum, Roger D., to Southwest Aerospace Corporation. Towed decoy system. 4,718,320, Cl. 89-1.110.

Bruns, Klaus: *See*—
Schaper, Ulf-Armin; Bloesl, Siegfried; Bruns, Klaus; and Streschnak, Benno, 4,719,041, Cl. 252-174.110.
Schaper, Ulf-Armin; Bloesl, Siegfried; Bruns, Klaus; and Streschnak, Benno, 4,719,042, Cl. 512-25.000.
Schaper, Ulf-Armin; Bruns, Klaus; Bloesl, Siegfried; and Streschnak, Benno, 4,719,043, Cl. 512-8.000.

Brycki, Bogdan, to RCA Corporation. Contact assembly for distance measuring gauge. 4,718,169, Cl. 33-143.00R.

Brycki, Bogdan, to RCA Corporation. Self-acting dual-mode clamp. 4,718,651, Cl. 269-94.000.

Buchberger, Gregory: *See*—
Theis, Peter F.; and Buchberger, Gregory, 4,719,647, Cl. 379-68.000.

Buchwald, Franz: *See*—
Nussbaumer, Erwin; Gross, Rainer; Botzelmann, Herbert; Haller, Hans; and Buchwald, Franz, 4,718,302, Cl. 74-710.500.

Buchwald, Henry: *See*—
Dorman, Frank D.; and Buchwald, Henry, 4,718,893, Cl. 604-67.000.

Buckley, John E., to Securistyle Limited. Friction supported stays for windows. 4,718,144, Cl. 16-341.000.

Buehler, Martin G., to California Institute of Technology. Addressable test matrix for measuring analog transfer characteristics of test elements used for integrated process control and device evaluation. 4,719,411, Cl. 324-73.00R.

Buhler, Eugen: *See*—
Strobel, Klaus; Schwarzmeier, Karl; and Buhler, Eugen, 4,719,070, Cl. 264-319.000.

Buhlmayer, Peter: *See*—
Fuhrer, Walter; Buhlmayer, Peter; Rasetti, Vittorio; and Riniker, Bernhard, 4,719,288, Cl. 530-331.000.

Building Machines Developing Company of the Ministry of Nuclear Energy Industry: *See*—
Ren, Deguo; and Yonghong, Lu, 4,718,838, Cl. 425-64.000.

Bulanda, John; and Kirsinas, Peter, to Panduit Corp. Terminal strip applicator. 4,718,160, Cl. 29-566.200.

Bunnelle, William L.; and Lindmark, Richard C., Jr., to H. B. Fuller Company. Hot melt adhesive for elastic banding and method for utlizing the same. 4,719,261, Cl. 525-97.000.

Burdick, Brent A.; and Danielson, Susan J., to Eastman Kodak Company. Fluorescent labels and labeled species and their use in analytical elements and determinations. 4,719,182, Cl. 436-501.000.

Burghoff, Heinz-Georg; and Daub, Werner, to Daimler-Benz Aktiengesellschaft. Circuit arrangement for the electro-thermal measurement of the filling level in the tank of a motor vehicle. 4,718,466, Cl. 141-95.000.

Burkhardt, Wolfgang, to Pforzheimer Uhren-Rohwerke Porta GmbH. Power supply control arrangement for a watch stepping motor. 4,719,368, Cl. 307-442.000.

Burndy Corporation: *See*—
Noschese, Rocco, 4,718,857, Cl. 439-292.000.

Burroughs Wellcome Co.: *See*—
Bair, Kenneth W., 4,719,046, Cl. 760-501.180.
Bair, Kenneth W., 4,719,047, Cl. 260-501.180.

Bair, Kenneth W., 4,719,048, Cl. 260-501.180.
Bair, Kenneth W., 4,719,049, Cl. 260-501.180.
Bair, Kenneth W., 4,719,055, Cl. 260-501.120.
Bair, Kenneth W., 4,719,236, Cl. 514-577.000.
Morrison, Jr.; Robert W., 4,719,221, Cl. 514-357.000.

Burstell, Helmut: *See*—
Willms, Lothar; Mildenberger, Hilmar; Bauer, Klaus; and Burstell, Helmut, 4,718,937, Cl. 71-93.000.

Busacchi, Pietro: *See*—
de Concini, Roberto; and Busacchi, Pietro, 4,718,635, Cl. 251-129.180.

Buschulte, Winfried; and Mardorf, Lutz, to Deutsche Forschungs- und Versuchsanstalt fur Raumfahrt e.V.; and Mobile Oil AG. Heat pump system and a method of operating same. 4,718,243, Cl. 62-101.000.

Bush Boake Allen, Inc.: *See*—
Schleppnik, Alfred A., 4,719,105, Cl. 424-76.210.

Butler, Louis L. Apparatus for the alignment and balance of the wheels of a motor vehicle. 4,718,759, Cl. 356-152.000.

Butterfield, Frank M. Decorative beam assembly. 4,718,213, Cl. 52-731.000.

Bye, Richard L., Jr.: *See*—
Das, Santosh K.; Raybould, Derek; Bye, Richard L., Jr.; and Chang, Chin-Fong, 4,718,475, Cl. 164-415.000.

Bystedt, Hjalmar S. I., to Sunds Defibrator, AB. Device for production of mechanical pulp. 4,718,611, Cl. 241-43.000.

B7G Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,718,546, Cl. 206-296.000.

C-I-L Inc.: *See*—
Nguyen, Anh D.; Evans, William B.; and Ballantyne, Donald G., 4,718,953, Cl. 149-17.000.

C. Uyemura & Co., Ltd.: *See*—
Hashimoto, Shigeo; and Sugiura, Yutaka, 4,718,990, Cl. 204-1.00T.

Cable/Home Communication Corp.: *See*—
Katznelson, Ron D., 4,719,505, Cl. 358-19.000.

CAD Engineering Rupperswil AG.: *See*—
Hubscher, Hans R., 4,718,799, Cl. 409-234.000.

Calandro, Thomas P.; and Karwowski, Jan, to Nabisco Brands, Inc. Process for sweetening baked comestible and product produced thereby. 4,719,115, Cl. 426-302.000.

Calif. Institute of Technology: *See*—
Hopfield, John J.; and Tank, David W., 4,719,591, Cl. 364-807.000.

California Institute of Technology: *See*—
Buehler, Martin G., 4,719,411, Cl. 324-73.00R.
Lindsey, Christopher P.; Kapon, Elyahou; Katz, Joseph; Margalit, Shlomo; and Yariv, Amnon, 4,719,632, Cl. 372-50.000.

Camacho, Salvador L., to Plasma Energy Corporation. Apparatus and method for processing reactive metals. 4,718,477, Cl. 164-495.000.

Camco, Incorporated: *See*—
Pringle, Ronald E.; and Morris, Arthur J., 4,718,488, Cl. 166-135.000.

Camp, Daniel D.; Grant, Richard; and Sciulli, Ronald D., to ATECS Corporation. Mast step assembly. 4,718,367, Cl. 114-39.200.

Campora, Giovanni: *See*—
Grotto, Ferdinando; Bassan, Franco; and Campora, Giovanni, 4,718,592, Cl. 228-47.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Gladstone, David H.; Dubois, Jacques; Carbonneau, Raymond; and Drouin, Gedeon, 4,718,323, Cl. 89-41.030.

Canadian Patents and Development Ltd.: *See*—
Sparks, Bryan D.; Meadus, F. Weldon; and Hoefele, Enrique O., 4,719,008, Cl. 208-390.000.

Cano, Victor M. Source light for cameramen, lighting technicians, set lighting for motion pictures, stage and television. 4,719,545, Cl. 362-240.000.

Canon Kabushiki Kaisha: *See*—
Arakawa, Junichi, 4,719,472, Cl. 346-140.00R.
Ayata, Naoki; Konuki, Tadashi; and Kosugi, Masao, 4,719,357, Cl. 250-541.000.
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,718,758, Cl. 354-173.110.
Kiyohara, Takehiko; and Fukazawa, Hideo, 4,719,475, Cl. 346-140.00R.
Kurahayashi, Sadasuke; Watanabe, Tsunehiro; Sakamoto, Masahiro; Ueno, Yasuhide; Ono, Takeshi; Miura, Shigeo; Negi, Tsuneo; and Takahashi, Masatomo, 4,719,514, Cl. 358-261.000.
Kyogoku, Hiroshi, 4,719,479, Cl. 346-140.00R.
Nagashima, Nao, 4,719,516, Cl. 358-780.000.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, 4,719,501, Cl. 357-59.000.
Ohkubo, Masaharu; Ohtsuka, Yasumasa; Asai, Jun; and Murasawa, Yoshihiro, 4,719,489, Cl. 355-3.0FU.
Setani, Michitaka; Tokuhara, Mitsuhiro; Tsuchiya, Hiroaki; and Honda, Haruhisa, 4,719,488, Cl. 355-1.000.
Shikaumi, Masao, 4,719,485, Cl. 354-400.000.
Shimamura, Yoshiyuki, 4,719,473, Cl. 346-76.0PH.
Tachihara, Masayoshi; Hirasawa, Shinichi; Ikeda, Masami; Asai, Akira; and Komuro, Hirokazu, 4,719,478, Cl. 346-140.00R.
Yoshida, Tadashi; Kawamura, Naoto; and Takahashi, Tohru, 4,719,490, Cl. 355-4.000.

Cantarelli, Daniele; Crisenza, Giuseppe; and Pansana, Pierangelo, to SGS Microelettronica S.p.A. Process for the fabrication of integrated structures including nonvolatile memory cells with layers of self-aligned silicon and associated transistors. 4,719,184, Cl. 437-24.000.

Cantrell, Michael P.: *See*—
Conlin, Kevin L.; and Cantrell, Michael P., 4,718,185, Cl. 40-442.000.

Capasso, Federico; Cooper, James A., Jr.; and Thornber, Karvel K. Repeated velocity overshoot semiconductor device. 4,719,496, Cl. 357-4.000.

Capelle, Gerd, to Hermann Berstorff Maschinenbau GmbH. Method for monitoring the production of elongate profiles. 4,719,071, Cl. 264-40.200.

Capp, Randolph E.; Johnescu, Douglas M.; Laudig, Ronald C.; Michael, George W., III; and Pearl, Charles D., to AMP Incorporated. Low profile press fit connector. 4,718,854, Cl. 439-63.000.

Capper, Graham. Meter provers. 4,718,267, Cl. 73-3.000.

Carbonneau, Raymond: *See*—
Gladstone, David H.; Dubois, Jacques; Carbonneau, Raymond; and Drouin, Gedeon, 4,718,323, Cl. 89-41.030.

Cardiovascular Systems, Inc.: *See*—
Darnell, Lawrence W., 4,718,888, Cl. 494-85.000.

Carey, Norman H.: *See*—
Eaton, Michael A. W.; Doel, Michael T.; Carey, Norman H.; Smith, John C.; Lilley, David M. J.; and Bell, Leslie D., 4,719,180, Cl. 435-320.000.

Carlson, David E., to Electro-Voice, Inc. Loudspeaker and acoustic transformer therefor. 4,718,517, Cl. 181-159.000.

Carlson, Lee R.; and Hegedus, Denes A., to Spectra-Physics, Inc. Discharge tube for a gas laser. 4,719,638, Cl. 372-62.000.

Carlsson, Bengt J.; and Larsson, Rolf T., to Sunds Defibrator AB. Hot press for treating a web of material. 4,718,843, Cl. 425-371.000.

Carlsson, Per A. E.: *See*—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hackzell, Uli A.; Hjorth, John S. M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,719,219, Cl. 514-317.000.

Carlton, Dale E., to Tektronix, Inc. Apparatus for indicating proper compensation of an adjustable frequency compensation network. 4,719,408, Cl. 324-57.0PS.

Carlton, William C.; and England, Margaret P. Electrically operated line monitor for tennis. 4,718,669, Cl. 273-29.00R.

Caron, Fabrice; and Loizeau, Eric, to SKF Compagnie d'Applications Mecaniques. Traction-type clutch bearing device. 4,718,528, Cl. 192-98.000.

Carosella, Edgardo D.; and Armand, Jacques B., to Institut Merieux. Immunomodulating medication based on Fc fragments of human IgG. 4,719,107, Cl. 424-85.000.

Carpenter, David P., to M. Michael Carpenter. Portable, light weight exercise machine. 4,718,664, Cl. 272-130.000.

Carpenter, Thom D.: *See*—
Duback, David W.; Carpenter, Thom D.; Skeels, Mark E.; and Ray, Christopher, 4,719,574, Cl. 364-468.000.

Carr, Eric: *See*—
Todd, Harry; and Carr, Eric, 4,718,238, Cl. 60-746.000.

Carr, Travis C.: *See*—
Arndt, Robert G.; Atkinson, William; Carr, Travis C.; Haun, Michael J.; Loeb, Phillip; and D'Souza, Stanley, 4,718,896, Cl. 604-253.000.

Carroll, Noel. Cyclone separator. 4,719,014, Cl. 210-512.100.

Carroll, Robert B.: *See*—
Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., 4,719,119, Cl. 427-1.000.

Carrubba, Francis P.; Cocke, John; and Kreitzer, Norman H., to International Business Machines Corporation. Hierarchical memory system including separate cache memories for storing data and instructions. 4,719,568, Cl. 364-200.000.

Carter, Ernest E., Jr.: *See*—
Lubitz, Eric P.; Szarka, David D.; Carter, Ernest E., Jr.; and Jessup, Robert L., 4,718,495, Cl. 166-387.000.

Caruso, Jerome C.: *See*—
Estkowski, Michael H.; Caruso, Jerome C.; and Minor, Don E., 4,718,726, Cl. 297-313.000.

Carveth, Peter; Stone, Albert; and White, L. Alan, to Baxter Travenol Laboratories, Inc. Apparatus and method for attaching fitments to flexible containers. 4,718,215, Cl. 53-410.000.

Casablanca Fan Company, Inc.: *See*—
Hart, Edward F., 4,719,446, Cl. 340-310.00A.

Case, Richard P., to White Consolidated Industries, Inc. Bimetal actuated lock. 4,718,705, Cl. 292-201.000.

Casio Computer Co., Ltd.: *See*—
Hara, Kazuya; and Rikuna, Kenji, 4,719,140, Cl. 428-138.000.

Caspe, Marc S. Exterior blast protection for buildings. 4,718,356, Cl. 109-27.000.

Cassese, Antoine. Metallic lamella fastener for wood. 4,718,804, Cl. 411-478.000.

Castaneda, Fernando, to Xeltron, S.A. Process and apparatus for sorting samples of material. 4,718,558, Cl. 209-546.000.

Castilia S.p.A.: *See*—
Piretti, Giancarlo, 4,718,354, Cl. 108-68.000.

Castle & Cooke, Inc.: *See*—
Pierce, Frank D.; Knickerbocker, Bradford E.; and Lenker, Don H., 4,718,333, Cl. 99-486.000.

Cataldi, Richard T.: *See*—
Clark, Peter S.; and Cataldi, Richard T., 4,719,159, Cl. 429-159.000.

Caterpillar Inc.: *See*—
Groezinger, John J.; and Moldenhauer, Philip E., 4,719,012, Cl. 210-232.000.

Catherall, Colin L. R., to Thorn EMI plc. Infra-red phosphors and fluorescent lamp containing the same. 4,719,387, Cl. 313-486.000.

Caudill, Forrester, to Armco Inc. Multiple nozzle jet finishing. 4,719,129, Cl. 427-348.000.

Cauwet, Daniele: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,719,099, Cl. 424-47.000.

Cavaioli, Marco; Salvetti, Gianemilio; Marchetti, Renato; and Penco, Eugenio, to Enea-Comitato Nazionale per la Ricerca e lo Sviluppo Dell'Energia Nucleare e Delle Energie Alternative; and Selenia-Industrie Elettroniche Associate S.p.A. Laser doped with tripropylamine. 4,719,637, Cl. 372-59.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Bahloul, Kamel, 4,718,787, Cl. 403-175.000.

Centre National de la Recherche Scientifique: *See*—
Hauden, Daniel B.; and Mariaanneau, Gilles D., 4,719,384, Cl. 310-343.000.

Centrum Mechanizacji Gornictwa "KOMAG": *See*—
Warachim, Waclaw; Skoczynski, Wojciech; Debiec, Jan; Niesyto, Hubert; Wojtaszczyk, Marek; Wlodarczyk, Edward; Krzewinski, Roman; Zielinski, Mieczyslaw; Kowalczyk, Kazimierz; and Spychala, Andrzej, 4,718,793, Cl. 405-303.000.

Centurion-Lehman, Inc.: *See*—
Osborne, David B., 4,718,732, Cl. 301-36.00R.

Cetel, Alan D.: *See*—
Duhl, David N.; and Cetel, Alan D., 4,719,080, Cl. 420-443.000.

Chabah, Maurice, to Thomson CSF. Microwave receiver making deviation measurements more especially in combination with a secondary airborne radar and a secondary radar containing it. 4,719,463, Cl. 342-43.000.

Chadwick, Donald T.: *See*—
Stumpf, William E.; Chadwick, Donald T.; and Gezon, Bruce R., 4,718,716, Cl. 297-85.000.

Chalabian, Jack S., to K-Jack Engineering Co., Inc. Coin operated vending machines for newspapers or the like. 4,718,532, Cl. 194-350.000.

Chalem, Alan A.: *See*—
Adamoli, Anthony R.; Jewett, Robert P.; Friedman, Herbert; and Chalem, Alan A., 4,718,553, Cl. 206-459.000.

Chambers, Roger D. Cylindrical bale loading and transport apparatus. 4,718,806, Cl. 414-24.500.

Chambersburg Engineering Co.: *See*—
Crout, Charles J.; Harris, Ronald N.; and Frame, Charles W., 4,718,263, Cl. 72-8.000.

Chang, Chin-Fong: *See*—
Das, Santosh K.; Raybould, Derek; Bye, Richard L., Jr.; and Chang, Chin-Fong, 4,718,475, Cl. 164-415.000.

Chappell, Barbara A.; and Schuster, Stanley E., to International Business Machines Corporation. Multiplying interface circuit for level shifting between FET and TTL levels. 4,719,372, Cl. 307-475.000.

Chaudhuri, Ratan K.: *See*—
Login, Robert B.; and Chaudhuri, Ratan K., 4,719,287, Cl. 530-317.000.

Chemed Corporation: *See*—
Baker, Gary L.; and Christensen, Ronald J., 4,719,083, Cl. 422-15.000.

Chenausky, Peter P.; Laughman, Lanny M.; and Drinkwater, Erroll H., to United States of America, Army. Multiple parallel RF excited CO_2 lasers. 4,719,640, Cl. 372-97.000.

Chenot, Charles F.; and Krebs, Michael A., to GTE Products Corporation. Process for producing europium activated stronium tetraborate UV phosphor. 4,719,033, Cl. 252-301.40R.

Cherry-Burrell Corporation: *See*—
Bressler, Allen K.; and Hixson, Keith D., 4,718,882, Cl. 493-164.000.

Cherry Semiconductor Corporation: *See*—
Sokal, Nathan O.; and Redl, Richard, 4,719,559, Cl. 363-98.000.

Chesebrough-Pond's Inc.: *See*—
Blasius, William G., Jr.; and Zygmont, Joseph F., Jr., 4,718,889, Cl. 604-1.000.

Chiaramonte, Fran. Garment hanger. 4,718,581. Cl. 223-96.000.

Chicopee: *See*—
Elves, John, 4,718,897, Cl. 604-362.000.

Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Operating mechanism for bendable section of endoscope. 4,718,407, Cl. 128.4.000.

Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Apparatus for optically inspecting object having reflecting surface. 4,718,760, Cl. 356-237.000.

Chike, Paul T. Heating unit. 4,718,601, Cl. 237-16.000.

Child, Robin E., to Concentric Pumps Limited. Transmission coupling. 4,718,378, Cl. 123-41.120.

Chinoporos, Efthimios; Idelson, Elbert M.; and King, Patrick F., to Polaroid Corporation. Novel pyrazole compounds having silver halide development groups. 4,719,175, Cl. 430-440.000.

Chiou, Arthur E.; and Yeh, Pochi A., to Rockwell International Corporation. Phase-conjugate interferometric coherent image subtraction. 4,718,749, Cl. 350-163.000.

Chiu, Shui-Tung, to Borden Company Limited. Phenolic compound-modified spent sulfite liquor and process for preparing same. 4,719,291, Cl. 530-502.000.

Chiyoda, Tsuneyuki: *See*—
Gonda, Tadao; Chiyoda, Tsuneyuki; and Yamada, Keiichi, 4,718,390, Cl. 123-500.000.

Choe, Eui W., to Hoechst Celanese Corporation. Pendant quinodimethane-containing polymer. 4,719,281, Cl. 528-310.000.

Cholet, Henri; Trocqueme, Francois-Jean; and Garraux, Jean, to Institut Francais du Petrole. Usable device, in particular for the pumping of an extremely viscous fluid and/or containing a sizeable proportion of gas, particularly for petrol production. 4,718,824, Cl. 417-14.000.

Choo, Dong J.: *See*—
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Chrzanowski, John G.; and Jaworski, Janice A., to Swingline Inc. Carton for shipping and display. 4,718,545, Cl. 206-45.150.

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Haag, Gottlob; Dettling, Hubert; Leonhard, Rolf; and Linder, Ernst, to Robert Bosch GmbH. Device for removing solid particles from exhaust gas of an internal combustion engine. 4,718,923, Cl. 55-124.000.

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Hachisu, Mitsugu: *See*—
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Hackel, Hans; and Schindler, Josef, to Siemens Aktiengesellschaft. Attenuation bead for the suppression of interference radiation. 4,719,433, Cl. 333-12.000.

Hacksell, Uli A.: *See*—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,719,219, Cl. 514-317.000.

Hadley, Michael S.: *See*—
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Haeszner, Winfried; Junginger, Werner; Jenkner, Karl; Wolf, Robert; and Schiel, Christian, to J. M. Voith, GmbH. Device for condensate removal from a steam-heated drying cylinder. 4,718,177, Cl. 34-119.000.

Haferl, Peter E., to RCA Corporation. Raster correction circuit. 4,719,392, Cl. 315-371.000.

Hag, Mohammed E. U.; and Bagnall, Peter J., to Visic, Inc. Memory with improved column access. 4,719,602, Cl. 365-230.000.

Hagen, James P.: *See*—
Fisher, Patrick W.; Hagen, James P.; and Meyer, Walter E., 4,718,136, Cl. 14-71.300.

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Tsutsumi, Masaru; Hagino, Hideo; Fujiwara, Osamu; and Goto, Hitoshi, 4,719,157, Cl. 429-34.000.
Hagino, Kiyohiko. Swivel fastening device. 4,718,586, Cl. 224-252.000.
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Hahm, Paul T., to Eastman Kodak Company. Process for multistage contacting. 4,719,173, Cl. 430-398.000.
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Haibara, Hitoshi: *See*—
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Hakky, Said I. Surgical implants. 4,718,410, Cl. 128-79.000.
Haku, Hisao; Nakashima, Yukio; Watanabe, Kaneo; and Matsuoka, Tsugufumi, to Sanyo Electric Co., Ltd. Method for fabricating periodically multilayered film. 4,719,123, Cl. 437-101.000.
Halconruy, Hubert T.; and Tixier, Jean-Michel F., to Automobiles Peugeot; and Automobiles Citroen. Bellows sealing sheath for articulated joints. 4,718,680, Cl. 277-212.0FB.
Haley, William J., to Borg-Warner Automotive, Inc. Hydraulic control system for continuously variable transmission. 4,718,308, Cl. 74-866.000.
Hall, F. Keith: *See*—
Swenson, Roy S.; Hall, F. Keith; MacDonald, Donald M.; and Ring, Michael, 4,718,982, Cl. 162-206.000.
Hallam, Richard J.; and Donnelly, John K., to Alberta Oil Sands Technology and Research Authority. Pressure-up/blowdown combustion - a channelled reservoir recovery process. 4,718,489, Cl. 166-259.000.
Haller, Hans, to Brown Boveri Reaktor GmbH. Device for placing a cylindrical body, especially a sleeve, in a tube of a steam generator. 4,718,377, Cl. 122-510.000.
Haller, Hans: *See*—
Nussbaumer, Erwin; Gross, Rainer; Botzelmann, Herbert; Haller, Hans; and Buchwald, Franz, 4,718,302, Cl. 74-710.500.
Haller, Jacob S.: *See*—
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Hallez, Charles P., to Diamant Boart Societe Anonyme. Circular saw for stony materials. 4,718,398, Cl. 125-15.000.
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Halverson, Danny C.; and Landingham, Richard L., to University of California, The Regents of the. Infiltration processing of boron carbide-, boron-, and boride-reactive metal cermets. 4,718,941, Cl. 75-236.000.
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Hanada, Isamu; Savary, Pierre; Nagai, Satoshi; and Sagawa, Munetomo, to Kyoei Densoku Co., Ltd. High-frequency power supply output control device. 4,719,558, Cl. 363-98.000.
Hanafin, Joseph W., to Dow Chemical Company, The. Process for preparing novel 3-halo-2-hydroxyalkyl carbamates. 4,719,301, Cl. 544-387.000.
Hanaway, Richard W., to Baxter Travenol Laboratories, Inc. Tray for analyzing system. 4,719,087, Cl. 422-102.000.
Handschuch, Karl, to Schubert & Salzer. Open-end spinning process and device for its implementation. 4,718,227, Cl. 57-401.000.
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Hannart, Jean-Alfred A.; Dejonghe, Jean-Paul; De Campeneere, Danielle; and Maloteaux, Jean-Marie, to Omnichem Societe Anonyme. 1,2,3,4,5,6-hexahydroazepino(4,5-B)indole derivatives, their preparation, intermediate compounds, and their application in therapeutics. 4,719,208, Cl. 514-215.000.
Hansen, Per C.; and Herrmann, Gero, to Dyckerhoff & Widmann Aktiengesellschaft. Wedge anchorage for a tension member in a prestressed concrete structure. 4,718,209, Cl. 52-223.00L.
Hansen, Walter I.; and Klepper, Herbert, to Rudolf Hell GmbH. Apparatus for imaging text and graphics on photosensitive material. 4,719,474, Cl. 346-108.000.
Hanson, Wallace G. Apparatus for heating and cooling. 4,718,249, Cl. 62-263.000.
Hara, Kazuya; and Rikuta, Kenji, to Casio Computer Co., Ltd. Electronic memory card. 4,719,140, Cl. 428-138.000.
Hara, Takeshi, to NEC Corportion. Interpreter linkage system for linking extension interpreters to a basic interpreter. 4,719,564, Cl. 364-200.000.
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Hardy, Bryant J., to Conoco Inc. Soluble oil emulsifier with bioresistance. 4,719,029, Cl. 252-78.100.
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Harkes, Peter O.; Cramer, Eugene J.; and Whitehouse, Robert A., to Vanguard, Inc. Resilient support for yacht fitting. 4,718,371, Cl. 114-164.000.
Harper, Chester H., to Allen Fruit Co., Inc. Collating conveyor for bagged products. 4,718,534, Cl. 198-401.000.
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Harper, John F., Jr. Orbital barrel finishing machine and automated system therefor. 4,718,199, Cl. 51-164.200.
Harrell, Joe S. Apparatus and method for interconnecting a reservoir with a rubber cup. 4,718,703, Cl. 285-158.000.
Harris Corporation: *See*—
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Hart, Edward F., to Casablanca Fan Company, Inc. Remote control for combined ceiling fan and light fixture. 4,719,446, Cl. 340-310.00A.
Hartl, Winfried; Oppelt, Arnulf; and Sturm, Helmut, to Siemens Aktiengesellschaft. Surface coil with calibration substance for use in a nuclear magnetic resonance apparatus. 4,718,431, Cl. 128-653.000.
Hartman, Daniel A., to Hill-Rom Company, Inc. Method for the production of pedestal structures. 4,719,068, Cl. 264-263.000.
Hartmann, Ernst; and Stuhr, Waldemar, to Matra-Werke GmbH. Multiaxle motor vehicle with a body. 4,718,687, Cl. 280-104.000.
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Hasegawa, Tsunao; Miyake, Ichiro; and Yoshimura, Ryuichiro, to Pioneer Electronic Corporation. Track position correction for a helical scan magnetic playback. 4,719,525, Cl. 360-77.000.
Hashimoto, Shigeo; and Sugiura, Yutaka, to C. Uyemura & Co., Ltd. Method for detecting start of electroless plating. 4,718,990, Cl. 204-1.00T.
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Hattori, Motonobu; Tuji, Noritoshi; and Shimonabe, Hideyuki, to Hitachi, Ltd. Electric power control apparatus with first and second fixed time intervals. 4,719,555, Cl. 363-56.000.
Hatwar, Tukaram K., to Eastman Kodak Company. Magneto-optic recording element with amorphous aluminum-nitrogen alloy layer. 4,719,154, Cl. 428-694.000.
Hauden, Daniel B.; and Marianneau, Gilles D., to Centre National de la Recherche Scientifique. Miniature thermostatted oscillator. 4,719,384, Cl. 310-343.000.
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Hawkins, David E. Radar detection helmet. 4,719,462, Cl. 342-20.000.
Hayakawa, Yoichi; Kawai, Masao; Nishikawa, Seiichi; and Fukumura, Kagenori, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for automatic transmissions. 4,718,311, Cl. 74-868.000.
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Hayashi, Toshihiro, to Minolta Camera Kabushiki Kaisha. Sheet winding apparatus. 4,718,659, Cl. 271-259.000.
Hayes, Norman J. Animal ear tag and identification system. 4,718,374, Cl. 119-156.000.
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Heck, Berthold, to U.S. Philips Corporation. Predictive encoding. 4,719,451, Cl. 340-347.0DD.
Hefner, Robert E., Jr.; and Messick, Virginia B., to Dow Chemical Company, The. Polymer modified vinyl ester resin compositions. 4,719,268, Cl. 525-454.000.
Hefti, Walter; Keller, Urs; and Ammann, Robert, to Maschinenfabrik Rieter AG. Arrangement for holding yarn packages. 4,718,615, Cl. 242-18.0DD.
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Heller, Jurg; Kissling, Bruno; Robinson, Tibor; and Valenti, Salvatore, to Sandoz Ltd. Treatment of textile materials to improve the fastness of dyeings made thereon and polymers useful therefor. 4,718,918, Cl. 8-495.000.
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Herzog, William F.; and Nichols, William E., to Apert-Herzog Corporation. Video data acquisition and display scan converter. 4,719,644, Cl. 378-99.000.
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Hill, Gilman A.; Passamaneck, Richard S.; and Touryan, Kesell J., to Mt. Moriah Trust. Well treating method and system for stimulating recovery of fluids. 4,718,493, Cl. 166-308.000.
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Hills, Karen F., to Pitney Bowes Inc. Prom card arrangement for postal/shipping scale. 4,718,506, Cl. 177-25.000.
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Hirayama, Masao: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Hachisu, Mitsugu; Hirayama, Masao; Murata, Shinjiro; and Fukatsu, Shunzo, 4,719,231, Cl. 514-513.000.

Hirobe, Hitoshi; Morita, Hideo; and Shin, Takeharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure controlling method for television camera. 4,719,511, Cl. 358-213.190.

Hirogane, Junji: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirogane, Junji; and Murakami, Yoshiteru, 4,719,137, Cl. 428-67.000.

Hiroe Electric Co.: *See*—
Yamaguchi, Masao, 4,718,866, Cl. 439-607.000.

Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, to Mitsui Toatsu Chemicals, Inc.; and Yamamoto Chemicals, Inc. Optical recording medium having a reflective recording layer including a resinous binder and a naphthalocyanine dye. 4,719,613, Cl. 369-109.000.

Hirose, Toshihiko; and Neno, Tatsuhiko, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Sheet feeding system using detachable sheet storage unit in image processing device. 4,718,658, Cl. 271-258.000.

Hirota, Akira: *See*—
Kido, Koichi; Shibayama, Kenji; Tsuruta, Masahiko; Hirota, Akira; Mihara, Masato; and Inoue, Osamu, 4,719,518, Cl. 358-330.000.

Hiroyuki, Tozawa, to Eko Instruments Trading Co., Ltd. Method of and apparatus for measuring amount of solar radiation received directly. 4,719,344, Cl. 250-203.00R.

Hirsch, Rolf-Burkhard: *See*—
Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Wagner, Wolfram; and Hilgeroth, Erich, 4,718,257, Cl. 68-5.00E.

Hisada, Haruhiko: *See*—
Ogawa, Yoshikatsu; Hisada, Haruhiko; Kasahara, Takeshi; Kizaki, Fumihiko; and Yoshiya, Masahide, 4,719,045, Cl. 252-609.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Nakajima, Kichio; Honma, Kazuo; and Tokairin, Hiroaki, 4,718,329, Cl. 91-445.000.

Hitachi Kiden Kogyo, Ltd.: *See*—
Fukuwatari, Ichiro; Watanabe, Seiji; Takahashi, Naoyuki; Nitta, Takahisa; and Saito, Yoshio, 4,718,539, Cl. 198-619.000.

Hitachi, Ltd.: *See*—
Asano, Michio; Masaki, Akira; and Ishibashi, Kenichi, 4,719,369, Cl. 307-443.000.
Fujita, Bunichi; and Kawashima, Seiichi, 4,719,371, Cl. 307-455.000.
Fukuwatari, Ichiro; Watanabe, Seiji; Takahashi, Naoyuki; Nitta, Takahisa; and Saito, Yoshio, 4,718,539, Cl. 198-619.000.
Hattori, Motonobu; Tuji, Noritoshi; and Shimonabe, Hideyuki, 4,719,555, Cl. 363-56.000.
Kakehi, Yutaka; Kaji, Ryokichi; Izumi, Hideki; Makino, Toshiaki; Ichihashi, Kazuaki; and Kawashima, Sosuke, 4,718,681, Cl. 279-106.000.
Kawabe, Shun, 4,719,570, Cl. 364-200.000.
Kimura, Takeshi; Mochiji, Kozo; Okamoto, Hiroshi; Iwayanagi, Takao; Kudo, Tetsuichi; and Kuniyoshi, Shinji, 4,719,161, Cl. 430-5.000.
Kitajima, Masaaki; Takasaka, Masahiro; and Nagae, Yoshiharu, 4,719,457, Cl. 340-784.000.
Kobayashi, Minoru; Iizuka, Kenichi; Fujimoto, Ryoichi; and Kobayashi, Morio, 4,718,247, Cl. 62-228.400.
Kosuge, Hiroshi; Kiriu, Yoshio; and Taguri, Junichi, 4,719,563, Cl. 364-200.000.
Masuda, Ikuro; Kato, Kazuo; Sasayama, Takao; Nishio, Yoji; Kuboki, Shigeo; and Iwamura, Masahiro, 4,719,373, Cl. 307-570.000.
Matsumoto, Yoshitoshi; and Murofushi, Fuyuhiko, 4,719,358, Cl. 250-551.000.
Miura, Yoshio; and Suzuki, Motoyuki, 4,719,611, Cl. 369-47.000.
Oishi, Kounosuke; Koga, Masataka; and Yasuda, Kazuo, 4,718,763, Cl. 356-326.000.
Okayama, Masao; Kawauchi, Masataka; Innami, Tamio; Ogasawara, Tsuyoshi; Nagasawa, Yutaka; Sasaki, Shigeru; Fukudome, Yoshio; Shiragai, Yasuo; and Inoue, Katsuaki, 4,718,655, Cl. 271-3.100.
Shinagawa, Yutaka; and Shimada, Shigeru, 4,719,603, Cl. 365-230.000.
Suzuki, Seiko; Miki, Masayuki; Sasayama, Takao; Suzuki, Toshitaka; Sato, Nobuo; Ueno, Sadayasu; and Ikegami, Akira, 4,718,999, Cl. 204-406.000.
Takase, Iwao; Yoshida, Toshimi; Ikeda, Shinzo; Masaoka, Isao; and Nakajima, Junjiro, 4,718,949, Cl. 148-11.50F.
Uchino, Koichi; and Hamano, Yoshimasa, 4,719,017, Cl. 210-656.000.
Watanuki, Kiyoshi, 4,719,394, Cl. 315-408.000.

Hitachi Microcomputer: *See*—
Shinagawa, Yutaka; and Shimada, Shigeru, 4,719,603, Cl. 365-230.000.

Hitchcock, James R., Jr.: *See*—
Di Gianfilippo, Aleandro; Becker, Michael; and Hitchcock, James R., Jr., 4,718,467, Cl. 141-105.000.

Hittich, Reinhard: *See*—
Wachtler, Andreas; Krause, Joachim; Hittich, Reinhard; and Scheuble, Bernhard, 4,719,032, Cl. 252-299.630.

Hixson, Keith D.: *See*—
Bressler, Allen K.; and Hixson, Keith D., 4,718,882, Cl. 493-164.000.

Hjorth, John S. M.: *See*—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Nils U. E.; and Wikstrom, Hakan V., 4,719,219, Cl. 514-317.000.

Ho, Ching-Chou. Adjustable folding baby chair. 4,718,715, Cl. 297-32.000.

Hodges, Everett L. Hydraulic couple rotational force hydraulic mining tool apparatus. 4,718,728, Cl. 299-17.000.

Hoechst AG: *See*—
Vogt, Wilhelm; Glaser, Hermann; and Goedicke, Eitel, 4,719,196, Cl. 502-304.000.
Vogt, Wilhelm; Glaser, Hermann; and Goedicke, Eitel, 4,719,197, Cl. 502-339.000.

Hoechst Aktiengesellschaft: *See*—
Goto, Masayoshi; Demura, Nobutaka; and Sakaguchi, Takashi, 4,719,212, Cl. 514-263.000.
Huber, Bernd; and Fester, Walter, 4,719,150, Cl. 428-397.000.
Rentel, Heinz; and Papenfuhs, Theodor, 4,719,304, Cl. 548-164.000.
Schlafer, Ludwig; and Hahnle, Reinhard, 4,719,053, Cl. 260-544.055.
Schui, Franz; Deubel, Reinhold; and Wester, Norbert, 4,719,292, Cl. 534-575.000.
Willms, Lothar; Mildenberger, Hilmar; Bauer, Klaus; and Burstell, Helmut, 4,718,937, Cl. 71-93.000.

Hoechst Celanese Corporation: *See*—
Choe, Eui W., 4,719,281, Cl. 528-310.000.
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, 4,719,250, Cl. 523-212.000.
Platzer, Stephan J. W.; Yener, Mehmet U.; and Wanat, Stanley F., 4,719,169, Cl. 430-258.000.

Hoefele, Enrique O.: *See*—
Sparks, Bryan D.; Meadus, F. Weldon; and Hoefele, Enrique O., 4,719,008, Cl. 208-390.000.

Hoeffken, Russell W., to SnyderGeneral Corporation. Heat exchanger unit. 4,718,484, Cl. 165-170.000.

Hoehn, Robert A.; Doyle, Thomas B.; and Van Pelt, Donald L., to Lico, Inc. High speed transporter for multiple station production line. 4,718,810, Cl. 414-286.000.

Hofer, Gregory V.: *See*—
Bates, Everett N.; and Hofer, Gregory V., 4,719,610, Cl. 369-32.000.

Hofer, Peter: *See*—
Shetty, Bola V.; and Hofer, Peter, 4,719,106, Cl. 424-80.000.

Hoffarth, Joseph G.: *See*—
Babu, Suryadevara V.; Herrmann, William F.; Hoffarth, Joseph G.; Markovich, Voya; and Wiley, Robert T., 4,718,972, Cl. 156-621.000.

Hoffman, Ernest G.; Neuroth, David H.; and Tabak, Fernando, to Hubbell Incorporated. Splice for pushing and pulling cable. 4,719,316, Cl. 174-88.00R.

Hoffman, John P.; Hill, David G.; Ballock, Thomas Y.; and Mays, Roger E., to Bethlehem Steel Corporation. Slag sensor taphole assembly. 4,718,644, Cl. 266-99.000.

Hoffmann-La Roche Inc.: *See*—
Bollag, Werner, 4,719,238, Cl. 514-765.000.

Hofmeister, Helmut; Laurent, Henry; Lorenz, Hans-Peter; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the production of 17α-ethynyl-17β-hydroxy-18-methyl-4,15-estradien-3-one, and novel 3,5-estradien-17-one starting compounds for this process. 4,719,054, Cl. 260-397.400.

Hoggenstaller, Rolf: *See*—
Hauser, Georg; and Hoggenstaller, Rolf, 4,718,365, Cl. 112-176.000.

Hohage, Heinz-Juerges; and Neeb, Rolf, to Rohm GmbH. Scratch resistant antireflective coatings for synthetic resins. 4,719,146, Cl. 428-331.000.

Hokanson, John M.; and Weispfenning, Ronald, to Hutchinson Technology Inc. Apparatus for aligning wires to solder pads. 4,718,164, Cl. 29-840.000.

Holden, Irving H.: *See*—
Guzik, Andrzej T.; Kline, Charles E.; and Holden, Irving H., 4,719,322, Cl. 200-5.00A.

Holzer, Walter. Procedure and device for the administering of insulin or similar long-term medicaments. 4,718,430, Cl. 128-632.000.

Hombach, Rudolf: *See*—
Muller, Hanns P.; Jansen, Bernhard; and Hombach, Rudolf, 4,719,244, Cl. 521-115.000.

Homecrest Industries Incorporated: *See*—
Bottemiller, Donald L., 4,718,723, Cl. 297-265.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujita, Haruyasu; Ookuma, Yasunori; and Honma, Kenji, 4,718,733, Cl. 303-2.000.
Ito, Katsuhiko; and Tsuchiya, Toshio, 4,718,510, Cl. 180-54.100.
Kiuchi, Takeo, 4,718,388, Cl. 123-478.000.
Shimada, Shinichi; and Otsuka, Kazuo, 4,718,396, Cl. 123-617.000.
Shimizu, Yasuo, 4,719,396, Cl. 318-432.000.
Shinchi, Takashi; and Nishikawa, Takafumi, 4,718,387, Cl. 123-478.000.
Tanaka, Akira, 4,718,382, Cl. 123-425.000.

Honda Giken Kogyo Kabushiki Kasha: *See*—
Yanagisawa, Takashi; and Fuse, Genzo, 4,719,328, Cl. 219-79.000.

Honda, Haruhisa: *See*—
Setani, Michitaka; Tokuhara, Mitsuhiro; Tsuchiya, Hiroaki; and Honda, Haruhisa, 4,719,488, Cl. 355-1.000.

Honda, Sueaki: *See*—
Aoi, Tatsuo; Atsumi, Haruo; Kikukawa, Takeshi; Nagata, Kunio; Kiyono, Yasuhiro; and Honda, Sueaki, 4,719,395, Cl. 318-349.000.

Honeycutt, Fred L., Jr.; and McLean, Howard J., to United Technologies Corporation. Augmentor liner construction. 4,718,230, Cl. 60-261.000.

Honeywell Inc.: *See*—
Eder, Kenneth C.; and Koukovinis, Christos M., 4,719,605, Cl. 367-98.000.
Tressler, John H., III, 4,719,343, Cl. 250-203.00R.

Honig, Emanuel M.; and Nunnally, William C., to United States of America, Energy. Repetitive resonant railgun power supply. 4,718,321, Cl. 89-8.000.

Honig, Emanuel M.; and Nunnally, William C., to United States of America, Energy. Multiple resonant railgun power supply. 4,718,322, Cl. 89-8.000.

Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, to Robert Bosch GmbH. Apparatus for the control of repetitive events dependent on operating parameters of internal combustion engines. 4,718,389, Cl. 123-479.000.

Honjoh, Yoshihisa; and Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition device for an internal combustion engine. 4,718,394, Cl. 123-599.000.

Honma, Kazuo: *See*—
Nakajima, Kichio; Honma, Kazuo; and Tokairin, Hiroaki, 4,718,329, Cl. 91-445.000.

Honma, Kenji: *See*—
Fujita, Haruyasu; Ookuma, Yasunori; and Honma, Kenji, 4,718,733, Cl. 303-2.000.

Hoogenboom, Leo, to Mechanical Technology Incorporated. Fiber optic displacement sensor with oscillating optical path length. 4,719,341, Cl. 250-201.000.

Hopfield, John J.; and Tank, David W., to American Telephone and Telegraph Company, AT&T Bell Labs.; and Calif. Institute of Technology. Optimization network for the decomposition of signals. 4,719,591, Cl. 364-807.000.

Hopkins, Harry C.; and Power, Joseph K., to Hopkins International. Personal alarm. 4,719,454, Cl. 340-574.000.

Hopkins International: *See*—
Hopkins, Harry C.; and Power, Joseph K., 4,719,454, Cl. 340-574.000.

Hora, Heinrich W. Three-dimensional color television. 4,719,482, Cl. 350-91.000.

Horch, Frank; Brockmann, Hermann; Barfuss, Herbert; and Schutt, Werner, to Phoenix Aktiengesellschaft. T-shaped hose. 4,718,700, Cl. 285-156.000.

Horiba, Ltd.: *See*—
Miyatake, Kimio; and Takeda, Kenji, 4,719,352, Cl. 250-351.000.

Horie, Hiromichi; Ochiai, Kumi; Arima, Itsuo; and Morita, Mikio, to Kabushiki Kaisha Toshiba. Armature annular core. 4,719,377, Cl. 310-44.000.

Horinouchi, Arata; and Iseki, Tadao, to Shinko Electric Co., Ltd. Automatic transportation system. 4,718,621, Cl. 246-122.00R.

Hormann KG Amshausen: *See*—
Hormann, Michael, 4,718,472, Cl. 160-229.00R.

Hormann, Michael, to Hormann KG Amshausen. Sectional strip for roll-up, fold-up, and similar gates. 4,718,472, Cl. 160-229.00R.

Horn, Petr, to Navasina AG. Sensor for measuring electrical conductivity. 4,719,441, Cl. 338-20.000.

Hoshino, Kunihisa; Utagawa, Ken; Kusaka, Yosuke; and Yamano, Shozo, to Nippon Kogaku K. K. Focus detecting apparatus for camera. 4,719,486, Cl. 354-408.000.

Hoshino, Noriyuki; and Tanimura, Tsugio, to Mitsubishi Jukogyo Kabushiki Kaisha. Delivery device of piled corrugated fiberboard boxes. 4,718,808, Cl. 414-37.000.

Hosokawa, Mikio, to Maeda Industries, Ltd. Bicycle caliper brake assembly. 4,718,521, Cl. 188-24.190.

Hosono, Yoichi: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,719,613, Cl. 369-109.000.

Houghton, George W. Vertically adjustable patient support table. 4,718,355, Cl. 108-147.000.

Houghton, Russell J.: *See*—
Flaker, Roy C.; and Houghton, Russell J., 4,719,418, Cl. 324-158.000.

Houki, Tetsuo; Mitsuka, Ikuo; Kuwabara, Akira; Haibara, Hitoshi; and Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Image data correction. 4,718,768, Cl. 356-402.000.

Hourihan, Joseph C.: *See*—
Krevald, Helga; and Hourihan, Joseph C., 4,719,103, Cl. 424-66.000.

How, Peter: *See*—
Macrae, Alasdair R.; and How, Peter, 4,719,178, Cl. 435-135.000.

Howlett, Clyde W.; and Mitchell, David E., to Howlett, Clyde W. Electronic scale and length measurement apparatus including a digital readout. 4,718,507, Cl. 177-210.0FP.

Hribik, Walter F.: *See*—
Johnson, Russell W.; Hribik, Walter F.; and Hilfman, Lee, 4,719,007, Cl. 208-251.00H.

Hsieh, Harry W. S.: *See*—
Rizk, Sidky; and Hsieh, Harry W. S., 4,719,267, Cl. 523-453.000.

Hubbell Incorporated: *See*—
Hoffman, Ernest G.; Neuroth, David H.; and Tabak, Fernando, 4,719,316, Cl. 174-88.00R.

Hubbell, Tommy K.: *See*—
Bell, David B.; and Hubbell, Tommy K., 4,718,274, Cl. 73-382.00R.

Huber, Bernd; and Fester, Walter, to Hoechst Aktiengesellschaft. Monofils and bristles of homopolymers or copolymers of acrylonitrile, and a process for their manufacture. 4,719,150, Cl. 428-397.000.

Huber, Jakob. Procedure for controlling a thermal installation. 4,718,478, Cl. 165-1.000.

Hubscher, Hans R., to CAD Engineering Rupperswil AG. Cutting tool comprising a cutting head and a holding shank connected thereto. 4,718,799, Cl. 409-234.000.

Hudson, Kenneth; H.; Gormley, David E.; Dowdy, James E.; and Vampola, Edward F. Cash register cover. 4,719,337, Cl. 235-7.00R.

Huellec, Jean-Yves: *See*—
Dumargue, Guy; and Huellec, Jean-Yves, 4,718,798, Cl. 409-97.000.

Huels Aktiengesellschaft: *See*—
Bartmann, Martin, 4,719,283, Cl. 528-322.000.
Gerdes, Ernst; Mutzberg, Friedhelm; and Pelleagahr, Franz, 4,719,135, Cl. 428-35.000.
Thunig, Dieter; and Terwonne, Rolf-Walter, 4,719,265, Cl. 525-243.000.

Huffman, David R.; Lewis, Scott C.; and Rock, James E., to International Business Machines Corporation. Sense circuit for multilevel storage system. 4,719,600, Cl. 365-208.000.

Hufnagel, John P.: *See*—
Yanosy, John A., Jr.; Vij, Jitender K.; Hufnagel, John P.; Oldyzko, Paul; and Dennett, Anthony J., 4,719,617, Cl. 370-58.000.

Hughes Aircraft Co.: *See*—
Alm, Ake W., 4,719,350, Cl. 250-330.000.
Cohn, David B.; and Finman, Lorna C., 4,719,342, Cl. 250-201.000.
Crookshanks, Rex J., 4,719,619, Cl. 370-70.000.
Fink, David, 4,718,764, Cl. 356-328.000.
Hill, William H., 4,718,591, Cl. 228-1.100.
Lau, Kreisler S. Y.; and Kelleghan, William J., 4,719,258, Cl. 514-462.000.
Rue, Arthur K.; Pope, Gordon T.; and Emerson, Earl L., 4,719,584, Cl. 364-516.000.

Hummel, Peter: *See*—
Raab, Rudolf; Herold, Manfred; and Hummel, Peter, 4,718,342, Cl. 101-409.000.

Hunt, David J., to International Computers Limited. Sequence generator. 4,719,592, Cl. 364-900.000.

Hunter, Edwin J. Reversible gear oscillating sprinkler. 4,718,605, Cl. 239-242.000.

Hutchinson: *See*—
Briet, Gilles, 4,718,636, Cl. 251-145.000.

Hutchinson Technology Inc.: *See*—
Hokanson, John M.; and Weispfenning, Ronald, 4,718,164, Cl. 29-840.000.

Huth, Andreas: *See*—
Seidelmann, Dieter; Huth, Andreas; Schmiechen, Ralph; Wiechert, Rudolf; Schneider, Herbert; and Stephens, David N., 4,719,210, Cl. 514-222.000.

Hutschenreuther AG: *See*—
Strobel, Klaus; Schwarzmeier, Karl; and Buhler, Eugen, 4,719,070, Cl. 264-319.000.

Hyde, Jeffrey R., to Morton Thiokol, Inc. Liquid lubricating and stabilizing compositions for rigid vinyl halide resins and use of same. 4,719,022, Cl. 252-35.000.

Hydraulik-Konsult Yngve Flodin Aktiebolag: *See*—
Flodin, Karl B. Y., 4,718,640, Cl. 254-45.000.

Hydro-Plan Engineering, Ltd.: *See*—
Mehoudar, Raphael, 4,718,608, Cl. 239-542.000.

Hydroacoustics: *See*—
Bouyoucos, John V.; and Durfee, David W., 4,718,970, Cl. 136-510.000.

Hydrolex, Inc.: *See*—
Lanmon, C. P., II, 4,718,487, Cl. 166-82.000.

Hyodo, Haruhiro, to Minolta Camera Kabushiki Kaisha. Scan type anamorphic magnifying apparatus. 4,719,492, Cl. 355-52.000.

Hyodo, Youichi, to Toyota Jidosha Kabushiki Kaisha. Safety steering shaft of a vehicle. 4,718,296, Cl. 74-492.000.

Hyugaji, Teruo: *See*—
Tanaka, Junsuke; Inage, Ikuo; and Hyugaji, Teruo, 4,718,425, Cl. 128-673.000.

Iannuzzi, Giulio: *See*—
Contiero, Claudio; Iannuzzi, Giulio; De Santi, Giorgio; and Andreani, Fabrizio, 4,718,977, Cl. 156-652.000.

Ibrahim, Ahmed A., to Papyrus Inc. Forming board structure having an adjustable leading forming board strip. 4,718,983, Cl. 162-252.000.

Icaro Olivieri & C.S.p.A.: *See*—
Olivieri, Oriviero, 4,718,181, Cl. 36-119.000.
Ichihashi, Kazuaki: *See*—
Kakehi, Yutaka; Kaji, Ryokichi; Izumi, Hideki; Makino, Toshiaki; Ichihashi, Kazuaki; and Kawashima, Sosuke, 4,718,681, Cl. 279-106.000.
Ichikawa, Tooru, to Kabushiki Kaisha Hosokawa Yoko. Liquid container. 4,718,778, Cl. 383-100.000.
Ichikoh Industries Limited: *See*—
Okuda, Haruo; and Murata, Yukiho, 4,718,139, Cl. 15-250.200.
Ichizuka, Akira, to Fuji Photo Film Co., Ltd. Method for feeding film. 4,718,618, Cl. 242-195.000.
ICI Americas Inc.: *See*—
Lin, Nai W.; and Niedt, Richard W., 4,719,247, Cl. 521-159.000.
IDC Kabushiki Kaisha: *See*—
Maruyama, Masuba, 4,718,835, Cl. 417-171.000.
Ide, Akifumi; and Yamamitsu, Chojuro, to Matsushita Electric Industrial Co., Ltd. Component video signal magnetic recording and reproducing apparatus including means for expanding and compressing luminance and color difference signals. 4,719,519, Cl. 358-310.000.
Ide, Kensuke: *See*—
Obitomo, Hironari; Nishioka, Masaki; Ide, Kensuke; Yoshikawa, Hirofumi; and Matsunaga, Yuso, 4,719,578, Cl. 364-474.000.
Ideison, Elbert M.: *See*—
Chinoporos, Efthimios; Ideison, Elbert M.; and King, Patrick F., 4,719,175, Cl. 430-440.000.
Iizuka, Kenichi: *See*—
Kobayashi, Minoru; Iizuka, Kenichi; Fujimoto, Ryoichi; and Kobayashi, Morio, 4,718,247, Cl. 62-228.400.
Ikeda Bussan Co., Ltd.: *See*—
Maruyama, Hidekazu, 4,718,718, Cl. 297-180.000.
Ikeda, Masami: *See*—
Tachihara, Masayoshi; Hiraizawa, Shinichi; Ikeda, Masami; Asai, Akira; and Konuro, Hirokazu, 4,719,478, Cl. 346-140.00R.
Ikeda, Shinzo: *See*—
Takase, Iwao; Yoshida, Toshimi; Ikeda, Shinzo; Masaoka, Isao; and Nakajima, Junjiro, 4,718,949, Cl. 148-11.50F.
Ikegami, Akira: *See*—
Suzuki, Seiko; Miki, Masayuki; Sasayama, Takao; Suzuki, Toshitaka; Sato, Nobuo; Ueno, Sadayasu; and Ikegami, Akira, 4,718,999, Cl. 204-406.000.
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, to Polyplastics Co., Inc. Optical disc. 4,719,171, Cl. 430-271.000.
Ikeya, Hirotoshi; and Higashi, Michiya, to Kabushiki Kaisha Toshiba. Epoxy resin composition, and resin-sealed semiconductor device in which this composition is used. 4,719,502, Cl. 357-72.000.
Ikezi, Hiroyuki; and Jensen, Torkil H., to GA Technologies Inc. Transmission line microwave generator. 4,719,429, Cl. 328-65.000.
Illich, Daniel. Concrete insert. 4,718,212, Cl. 52-699.000.
Imai, Osamu: *See*—
Nakata, Masami; and Imai, Osamu, 4,719,064, Cl. 264-61.000.
Imai, Shigeo: *See*—
Suzuki, Migaku; Kobayashi, Toshio; and Imai, Shigeo, 4,718,152, Cl. 28-104.000.
Imai, Tatsuya: *See*—
Katayama, Sakae; Imai, Tatsuya; Onodera, Norio; and Ishibashi, Yasushi, 4,719,079, Cl. 420-84.000.
Imanaka, Asaji; Fujiwara, Tatsuo; and Osaka, Shuichi, to Nippon Air Brake Co., Ltd. Wheel-slip detection system. 4,719,536, Cl. 361-238.000.
Inaba, Yoshiharu; and Masato, Yamamura, to Fanuc Ltd. Injection/-measurement mechanism of injection molding machine. 4,718,840, Cl. 425-145.000.
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Kolar, Cenek; Seiler, Friedrich R.; and Knodler, Ursula, to Behringwerke Aktiengesellschaft. Glycopeptides, process for their preparation and their use. 4,719,289, Cl. 530-331.000.

Kolb, Reinhold: *See—*
Achtsnit, Hans D.; Herwig, Hans U.; and Kolb, Reinhold, 4,719,318, Cl. 174-102.00R.

Kolln, Claus-Jurgen: *See—*
Muller, Bernd W. W.; Franzky, Hans-Jurgen; and Kolln, Claus-Jurgen, 4,719,239, Cl. 514-785.000.

Kolton, Chester; and Spater, Stuart S., to B7G Plastics, Inc. Display hanger for suspenders. 4,718,546, Cl. 206-296.000.

Komatsu, Toshiyuki: *See—*
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, 4,719,501, Cl. 357-59.000.

Komatsubara, Toshio; Muramatsu, Toshiki; and Matsuo, Mamoru, to Sky Aluminium Co., Ltd. Rolled aluminum alloy sheets for forming and method for making. 4,718,948, Cl. 148-2.000.

Komiyama, Choji: *See—*
Oishi, Kengo; and Komiyama, Choji, 4,719,529, Cl. 360-132.000.

Komoda, Tadanori, to NGK Insulators, Ltd. Process of producing multiple-layer filter medium. 4,719,058, Cl. 264-38.000.

Komossa, Werner; and Hausler, Nikolaus, to Hauni-Werke Korber & Co. KG. Apparatus for grinding cutting edges of knives in tobacco cutting machines. 4,718,198, Cl. 51-33.00W.

Komuro, Hirokazu: *See—*
Tachihara, Masayoshi; Hirasawa, Shinichi; Ikeda, Masami; Asai, Akira; and Komuro, Hirokazu, 4,719,478, Cl. 346-140.00R.

Konishiroku Photo Industry Co., Ltd.: *See—*
Ohta, Tatsuo; Okasato, Mayumi; and Watanabe, Hideo, 4,719,152, Cl. 428-432.000.

Konrath, Karl, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines with exhaust gas recirculation. 4,718,385, Cl. 123-449.000.

Kontani, Kazuo; and Goto, Shinichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for determination of concentration of smoke emanating from combustion engine and apparatus for working said method. 4,719,360, Cl. 250-574.000.

Kontron Holding A.G.: *See—*
Wiget, Peter; and Wolf, Robert, 4,718,762, Cl. 356-319.000.

Konuki, Tadashi: *See—*
Ayata, Naoki; Konuki, Tadashi; and Kosugi, Masao, 4,719,357, Cl. 250-548.000.

Koppetsch, Gudrun E.: *See—*
Seyferth, Dietmar; Yu, Yuan-Fu; and Koppetsch, Gudrun E., 4,719,273, Cl. 528-15.000.

Korppoo, Seppo; and Landtman, Martin, to Oy Wartsila Ab. Wheel driven air cushion vehicle. 4,718,513, Cl. 180-119.000.

Kostelic, Richard F.: *See—*
Sutton, Stephen J.; Creager, John E.; and Kostelic, Richard F., 4,718,827, Cl. 417-244.000.

Kosuge, Hiroshi; Kiriu, Yoshio; and Taguri, Junichi, to Hitachi, Ltd. Data transmission control device for controlling transfer of large amounts of data between two memory units. 4,719,563, Cl. 364-200.000.

Kosugi, Masao: *See—*
Ayata, Naoki; Konuki, Tadashi; and Kosugi, Masao, 4,719,357, Cl. 250-548.000.

Kosugi, Seiji, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Directional control valve. 4,718,451, Cl. 137-596.160.

Kotter, Michael: *See—*
Rieckert, Lothar; and Kotter, Michael, 4,719,094, Cl. 423-239.000.

Kouge, Shinichi: *See—*
Morishita, Mitsuharu; and Kouge, Shinichi, 4,719,427, Cl. 324-427.000.

Koukovinis, Christos M.: *See—*
Eder, Kenneth C.; and Koukovinis, Christos M., 4,719,605, Cl. 367-98.000.

Kovacs, Eddie T.; and Eivers, Donald J., to Grumman Aerospace Corporation. Signal distribution system switching module. 4,719,459, Cl. 340-825.800.

Kowalczyk, Kazimierz: *See—*
Warachim, Waclaw; Skoczynski, Wojciech; Debiec, Jan; Niesyto, Hubert; Wojtaszczyk, Marek; Wlodarczyk, Edward; Krzewinski, Roman; Zielinski, Mieczyslaw; Kowalczyk, Kazimierz; and Spychala, Andrzej, 4,718,793, Cl. 405-303.000.

Koyama, Eiichi: *See—*
Kusakabe, Noboru; Morimoto, Masaaki; Koyama, Eiichi; and Kojima, Koichi, 4,718,470, Cl. 152-451.000.

Koyo Seiko Kabushiki Kaisha: *See—*
Hirakushi, Shuzo, 4,718,514, Cl. 180-142.000.

Kozakura, Nobuto: *See—*
Sugimoto, Yoshiaki; Ohmura, Kazumi; Matsumoto, Masaaki; Terajima, Hisaharu; and Kozakura, Nobuto, 4,718,881, Cl. 474-242.000.

Kozel, Charles A.; and Scheitz, John T., to Methode Electronics, Inc. Wire locator and strain relief device. 4,719,321, Cl. 174-135.000.

Kraeutler, Bernard, to Nergeco. Fixing and protective housing for the drive means of a concertina type door. 4,718,471, Cl. 160-84.00R.

Kraft, Robert E.: *See—*
Dean, Arthur L.; Kraft, Robert E.; and Marshall, Kenneth M., 4,719,376, Cl. 310-29.000.

Kraftanlagen Ag: *See—*
Rieckert, Lothar; and Kotter, Michael, 4,719,094, Cl. 423-239.000.

Kramer, James H., to B. F. Goodrich Company, The. Method of making a bearing assembly. 4,718,959, Cl. 156-188.000.

Kraschnewski, Melvin W.: *See—*
Gilmore, Carl D.; and Kraschnewski, Melvin W., 4,718,729, Cl. 299-16.000.

Krasuski, Marek; Serruya, Michel; and Milet, Pierre, to SMH Alcatel. Device for unstacking flat objects. 4,718,809, Cl. 414-129.000.

Krause, Joachim: *See—*
Wachtler, Andreas; Krause, Joachim; Hittich, Reinhard; and Scheuble, Bernhard, 4,719,032, Cl. 252-299.630.

Krebs, Michael A.: *See—*
Chenot, Charles F.; and Krebs, Michael A., 4,719,033, Cl. 252-301.40R.

Kreft, Anthony F., III; Musser, John H.; Pattison, Thomas W.; and Yardley, John P., to American Home Products Corporation. Imidazolylmethoxy naphthalene compounds as antiallergic agents. 4,719,308, Cl. 548-330.000.

Krehl, Hermann: *See—*
Schmid, Rene; and Krehl, Hermann, 4,718,616, Cl. 242-55.100.

Kreitzer, Norman H.: *See—*
Carrubba, Francis P.; Cocke, John; and Kreitzer, Norman H., 4,719,568, Cl. 364-200.000.

Krekacs, Sandor: *See—*
Palfi, Zoltan; Fledrich, Istvan; Krekacs, Sandor; and Bihary, Sander, 4,719,340, Cl. 250-201.000.

Krevald, Helga; and Hourihan, Joseph C., to American Cyanamid Company. Method for the preparation of water-in-oil emulsion antiperspirants. 4,719,103, Cl. 424-66.000.

Krieger, Max. Drying apparatus for horses and the like. 4,718,375, Cl. 119-160.000.

Krishnamurthy, Sowmithri, to Mobil Oil Corporation. Reactivation of noble metal-containing zeolite catalyst materials. 4,719,189, Cl. 502-50.000.

Kroeger, Edward R.; and Dvorak, Richard C., to Dana Corporation. Friction face for a magnetic coupling. 4,718,529, Cl. 192-107.00R.

Kroll, Joachim; Kugler, Reinhard; and Rambotzki, Bernd, to Siemens Aktiengesellschaft. Contact arrangement with contact levers pivoted relative to each other in a holder. 4,719,325, Cl. 200-146.00R.

Krolla, Hans-Georg: *See—*
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,719,186, Cl. 501-67.000.

Kroner, Wolfgang, to Pforzheimer Uhrenrohwerke PORTA GmbH. Hour gear structure of a watch. 4,719,609, Cl. 368-220.000.

Krones Ag Hermann Kronseder Maschinefabrik: *See—*
Zodrow, Rudolf, 4,718,373, Cl. 118-262.000.

Krulik, Gerald A., to Morton Thiokol, Inc. Method of and apparatus for bailout elimination and for enhancing plating bath stability in electrosynthesis/electrodialysis electroless copper purification process. 4,719,128, Cl. 427-345.000.

Krupp Corpoplast Maschinenbau GmbH: *See—*
Reymann, Wolfgang; and Kleimenhagen, Gunter, 4,719,069, Cl. 264-296.000.

Kruse, Lawrence I.: *See—*
Kaiser, Carl; Kruse, Lawrence I.; and Ross, Stephen T., 4,719,223, Cl. 514-392.000.

Krzewinski, Roman: *See—*
Warachim, Waclaw; Skoczynski, Wojciech; Debiec, Jan; Niesyto, Hubert; Wojtaszczyk, Marek; Wlodarczyk, Edward; Krzewinski, Roman; Zielinski, Mieczyslaw; Kowalczyk, Kazimierz; and Spychala, Andrzej, 4,718,793, Cl. 405-303.000.

Kuboki, Shigeo: *See—*
Masuda, Ikuro; Kato, Kazuo; Sasayama, Takao; Nishio, Yoji; Kuboki, Shigeo; and Iwamura, Masahiro, 4,719,373, Cl. 307-570.000.

Kubota, Kenji: *See—*
Yoshisato, Yorinobu; Yoshikawa, Hideki; Taketa, Kazuhiko; Yasuda, Isao; Kubota, Kenji; and Takahashi, Kazuhiko, 4,719,527, Cl. 360-121.000.

Kubota, Ltd.: *See—*
Suzuki, Hiroshi; Okuyama, Shigeaki; Ueda, Yoshihiro; Yukishige, Yoshifumi; and Hayashi, Masahiko, 4,718,223, Cl. 56-328.100.
Umemoto, Tomeo, 4,718,305, Cl. 74-784.000.

Kudo, Hajime: *See—*
Iwama, Tetsuji; Katsumata, Katashi; Kudo, Hajime; and Takeuchi, Yo, 4,718,482, Cl. 165-133.000.

Kudo, Tetsuichi: *See—*
Kimura, Takeshi; Mochiji, Kozo; Okamoto, Hiroshi; Iwayanagi, Takao; Kudo, Tetsuichi; and Kuniyoshi, Shinji, 4,719,161, Cl. 430-5.000.

Kuehni, Carol C. Cleaning device. 4,718,141, Cl. 15-394.000.

Kuenen, Dirk J. G. Joint between a tube and a rod or other tube being at an angle to the former. 4,718,789, Cl. 403-233.000.

Kugelmann, Franz J., Sr., to Nudvuck Enterprises. Vacuum-type insulation article having an elastic outer member and a method of manufacturing the same. 4,718,958, Cl. 156-163.000.

Kugler, Hans-Peter; Eisenreich, Norbert; Geissler, Adam; and Fabry, Klaus. Method and apparatus for investigating a sample under tension. 4,719,347, Cl. 250-231.00R.

Kugler, Reinhard: *See—*
Kroll, Joachim; Kugler, Reinhard; and Rambotzki, Bernd, 4,719,325, Cl. 200-146.00R.

Kuhn, Bernhard, to Kaltenbach & Voigt GmbH & Co. Handpiece, especially for dental purposes. 4,718,851, Cl. 433-122.000.

Kulish, Stanley J.; Cranage, Bidwell C.; Mariol, James F.; and Swank, Robert P., to Allied Healthcare Products, Inc. Gas system outlet station assembly. 4,718,699, Cl. 285-12.000.

Kulprathipanja, Santi: *See—*
Yates, Stephen F.; and Kulprathipanja, Santi, 4,719,242, Cl. 521-28.000.

Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Driving circuit for a shared sense amplifier with increased speed clock generation circuit for reading addressed memory cells. 4,719,597, Cl. 365-189.000.

Kuniyoshi, Shinji: *See—*
Kimura, Takeshi; Mochiji, Kozo; Okamoto, Hiroshi; Iwayanagi, Takao; Kudo, Tetsuichi; and Kuniyoshi, Shinji, 4,719,161, Cl. 430-5.000.

Kunz, Manfred. Safety armature for a door lock. 4,718,261, Cl. 70-428.000.

Kurahayashi, Sadasuke; Watanabe, Tsunehiro; Sakamoto, Masahiro; Ueno, Yasuhide; Ono, Takeshi; Miura, Shigeo; Negi, Tsuneo; and Takahashi, Masatomo, to Canon Kabushiki Kaisha. Method and apparatus for image transmission. 4,719,514, Cl. 358-261.000.

Kurakake, Mitsuo; and Sakamoto, Keiji, to Fanuc Ltd. Motor control apparatus. 4,719,400, Cl. 318-811.000.

Kuraray Co., Ltd.: *See—*
Akasawa, Toshiyuki; Okaya, Takuji; Nakabayashi, Masamitsu; and Furukawa, Yuzo, 4,719,153, Cl. 428-515.000.

Kuratani, Junichi, to Alps Electric Co., Ltd. Rotary variable resistor with shaft retaining spring member. 4,719,324, Cl. 200-11.00R.

Kurauchi, Masahiko: *See—*
Eguchi, Chikahiko; Kurauchi, Masahiko; and Sakakibara, Shumpei, 4,719,200, Cl. 514-18.000.

Kurihara, Sakuo, to Tochigi-Fuji Sangyo Kabushiki Kaisha. Hub clutch. 4,718,527, Cl. 192-54.000.

Kurland, Heinrich: *See—*
Schaper, Helmut; and Kurland, Heinrich, 4,718,945, Cl. 127-9.000.

Kuroda, Yuichi, to Kabushiki Kaisha Toshiba. Monopulse radar equipment. 4,719,465, Cl. 342-151.000.

Kurtz, Robert J.; and LiCausi, Joseph, to Bioresearch Inc. Suction regulator. 4,718,895, Cl. 604-119.000.
Kusaka, Yosuke: *See*—
Hoshino, Kunihisa; Utagawa, Ken; Kusaka, Yosuke; and Yamano, Shozo, 4,719,486, Cl. 354-408.000.
Kusakabe, Noboru; Morimoto, Masaaki; Koyama, Eiichi; and Kojima, Koichi, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,718,470, Cl. 152-451.000.
Kuse, Kazuma: *See*—
Matsuno, Kenji; Matsubayashi, Hiroshi; Ishibashi, Kazuhisa; Kuse, Kazuma; and Sato, Nobuyuki, 4,719,329, Cl. 219-121.0LD.
Kusuda, Takao: *See*—
Nakamoto, Mitsuyoshi; Kusuda, Takao; Yonemura, Masaaki; and Shinmura, Koichi, 4,718,926, Cl. 55-523.000.
Kutaragi, Ken, to Sony Corporation. Synchronizing signal detecting circuit. 4,719,523, Cl. 360-51.000.
Kuwabara, Akira: *See*—
Houki, Tetsuo; Mitsuka, Ikuo; Kuwabara, Akira; Haibara, Hitoshi; and Sakamoto, Takashi, 4,718,768, Cl. 356-402.000.
Kwik Find, Ltd.: *See*—
Beck, Steven B.; and Wong, Albert, 4,719,453, Cl. 340-568.000.
Kyocera Corporation: *See*—
Arita, Hirotaka, 4,719,345, Cl. 250-211.00J.
Kyoei Densoku Co., Ltd: *See*—
Hanada, Isamu; Savary, Pierre; Nagai, Satoshi; and Sagawa, Munetomo, 4,719,558, Cl. 363-98.000.
Kyogoku, Hiroshi, to Canon Kabushiki Kaisha. Bundled-tube filter for recording apparatus. 4,719,479, Cl. 346-140.00R.
L. Eligass SA: *See*—
Eligass, Louis, 4,718,563, Cl. 212-142.100.
Labbe, Philippe; and Reynier, Patrick. Automatic press for controlling the force on each movable plate. 4,718,842, Cl. 425-149.000.
Lacrex Brevetti SA: *See*—
Pasbrig, Max, 4,718,392, Cl. 123-557.000.
Ladd, Judith A.: *See*—
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,718,995, Cl. 204-112.000.
Vanderpool, Clarence D.; McInnis, Martin B.; and Ladd, Judith A., 4,718,996, Cl. 204-112.000.
Lagally, Hermann O.; and Stevens, John H., to Westinghouse Electric Corp. Antivibration bar installation apparatus. 4,718,479, Cl. 165-69.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Delacour, Pierre; and Prost, Roger, 4,718,772, Cl. 366-348.000.
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Lakin, Kenneth M.: *See*—
Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., 4,719,383, Cl. 310-324.000.
Lambert Corporation: *See*—
Lambert, Stephen K.; and Bliskey, Dean A., 4,718,222, Cl. 56-202.000.
Lambert, Stephen K.; and Bliskey, Dean A., to Lambert Corporation. Universal mower deck boot. 4,718,222, Cl. 56-202.000.
Lancaster, Benjamin H. Multisegmented rear view mirror. 4,718,756, Cl. 350-616.000.
Lancaster Level FLO, Inc.: *See*—
Stoltzfus, Henry S., 4,718,811, Cl. 414-301.000.
Landin, Allen R.: *See*—
Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., 4,719,383, Cl. 310-324.000.
Landingham, Richard L.: *See*—
Halverson, Danny C.; and Landingham, Richard L., 4,718,941, Cl. 75-236.000.
Landtman, Martin: *See*—
Korppoo, Seppo; and Landtman, Martin, 4,718,513, Cl. 180-119.000.
Lang, Karl, to Mettler Instrumente AG. Buret apparatus including a stopper containing a siphon passage. 4,719,086, Cl. 422-100.000.
Langan, John D. Method of monitoring an article in sintering furnace. 4,719,073, Cl. 419-1.000.
Lanmon, C. P., II, to Hydrolex, Inc. Auxiliary well pressure packoff assembly. 4,718,487, Cl. 166-82.000.
Lantzsch, Reinhard; and Reubke, Karl-Julius, to Bayer Aktiengesellschaft. Process for the preparation of β-hydroxyethyl-(1,2,4-triazole) derivatives. 4,719,307, Cl. 548-262.000.
Larking, Andrew R.; and Swincer, Richard N., to Bott, Craig R.; Larking, Andrew R.; and Swincer, Richard N. Combination lock. 4,718,260, Cl. 70-299.000.
Larrabee, Graydon B.: *See*—
Bowling, Robert A.; Larrabee, Graydon B.; and Liu, Benjamin Y. H., 4,718,975, Cl. 156-643.000.
Larsson, Rolf T.: *See*—
Carlsson, Bengt J.; and Larsson, Rolf T., 4,718,843, Cl. 425-371.000.
Laskowski, Len: *See*—
Radek, John R.; Kaminecki, Al; and Laskowski, Len, 4,718,578, Cl. 222-108.000.
Latviisky Gosudarstvenny Universaitet Imeni P. Stuchki: *See*—
Zhagars, Andrei K.; Grinshtein, Voldemar Y.; Ozola, Sniedzite A.; Zitsmanis, Andris K.; and Arens, Avgust K., 4,718,994, Cl. 204-73.00R.
Lau, Kreisler S. Y.; and Kelleghan, William J., to Hughes Aircraft Company. Derivatives of diphenylhexafluoropropane and resins thereof. 4,719,258, Cl. 524-462.000.
Laudig, Ronald C.: *See*—
Capp, Randolph E.; Johnescu, Douglas M.; Laudig, Ronald C.; Michael, George W., III; and Pearl, Charles D., 4,718,854, Cl. 439-63.000.
Laughlin, Darren R., to Applied Technology Associates, Inc. Angular motion sensor. 4,718,276, Cl. 73-516.0LM.
Laughlin, William C.: *See*—
Patel, Keshav P.; Laughlin, William C.; and Baldwin, Roger A., 4,719,110, Cl. 424-148.000.
Laughman, Lanny M.: *See*—
Chenausky, Peter P.; Laughman, Lanny M.; and Drinkwater, Erroll H., 4,719,640, Cl. 372-97.000.
Laura, Paul E.; and Vinches, Gerard, to Witco Corporation. Thixotropic overbased alkaline earth metal inorganic-organic compositions containing alkoxylated oxidized petrolatums. 4,718,942, Cl. 106-14.290.
Laurent, Dominique: *See*—
Fortunato, Gerard; Galais, Andre ; and Laurent, Dominique, 4,718,765, Cl. 356-346.000.
Laurent, Henry: *See*—
Hofmeister, Helmut; Laurent, Henry; Lorenz, Hans-Peter; and Wiechert, Rudolf, 4,719,054, Cl. 260-397.400.
Lautenschlager, Karl, Jr., to Karl Lautenschlager KG. Mobelbeschlagrabrik. Mounting plate for cabinet hinges. 4,718,143, Cl. 16-238.000.
La Vange, Donald, to Polytop Corporation. Child resistant dispensing closure. 4,718,567, Cl. 215-216.000.
Lavene, Bernard, to Electronic Concepts. Hermetically sealed capacitor. 4,719,539, Cl. 361-307.000.
Lawler, James R. Self-trailering hovercraft. 4,718,501, Cl. 180-117.000.
Lawrence, Ronald L.: *See*—
Brice, Ralph E.; Green, Ronald G.; Lawrence, Ronald L.; and Miller, James D., 4,718,694, Cl. 280-605.000.
Layton, Jack D. Paver with rotating disc floor. 4,718,790, Cl. 404-101.000.
Lazar, Peter. Apparatus for manufacturing a binding. 4,718,969, Cl. 156-500.000.
Lazorthes, Guy, to Applied Precision Limited. Manually actuated, implantable device to sequentially feed doses of a substance, in particular a therapeutant. 4,718,894, Cl. 604-93.000.
Le Condensateur Prelyo: *See*—
Gizolme, Alain, 4,719,537, Cl. 361-273.000.
Leclaire, Remi: *See*—
Pottier, Daniel; Leclaire, Remi; and Vulliez, Paul, 4,718,836, Cl. 417-205.000.
Lee, Min J. Child calming toy with rythmic stimulation. 4,718,876, Cl. 446-295.000.
Legge, Gerald A. Method for cutting a boiler tube and apparatus therefor. 4,718,201, Cl. 51-241.00S.
Lehman, Eugene: *See*—
Osborne, David B., 4,718,732, Cl. 301-36.00R.
Leigh-Monstevens, Keith V.; and Nix, Richard A., to Automotive Products plc. Hydraulic master cylinder switch. 4,719,444, Cl. 340-71.000.
Leisner, Ernst; Maier, Gernot; and Rothfuss, Peter, to Robert Bosch GmbH. Chain conveyor for workpieces and workpiece carriers. 4,718,543, Cl. 198-779.000.
Leitzke, Michael D. Reflector for spoked wheel. 4,718,743, Cl. 350-99.000.
Le Martret, Odile: *See*—
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,719,224, Cl. 514-443.000.
Lemaster, Milton R. Apparatus and method for oscillating the form rollers in a printing press. 4,718,344, Cl. 101-426.000.
Le Merer, Jean-Pierre: *See*—
Leterme, Dominique; and Le Merer, Jean-Pierre, 4,719,614, Cl. 369-110.000.
Lemmer, Helmut, to Square D Starkstrom GmbH. Quick-mount device for contactors. 4,719,542, Cl. 361-417.000.
Lemorini, Luciano: *See*—
Clerici, Guido; and Lemorini, Luciano, 4,718,176, Cl. 34-1.000.
Lemp, Michael A. Method and apparatus for trephining corneal tissue in preparation for keratoplasty. 4,718,420, Cl. 128-310.000.
Lenker, Don H.: *See*—
Pierce, Frank D.; Knickerbocker, Bradford E.; and Lenker, Don H., 4,718,333, Cl. 99-486.000.
Lennington, John W.: *See*—
McDougal, John A.; and Lennington, John W., 4,718,381, Cl. 123-406.000.
Lenz, Herman N.: *See*—
Rogo, Casimir; and Lenz, Herman N., 4,718,819, Cl. 415-149.00R.
Leonardi, Nicholas J., to Dynamit Nobel of America, Inc. Electrically conductive polyethylene foam. 4,719,039, Cl. 252-511.000.
Leonhard, Rolf: *See*—
Haag, Gottlob; Dettling, Hubert; Leonhard, Rolf; and Linder, Ernst, 4,718,923, Cl. 55-124.000.
Leoni, Fabrizio: *See*—
Rissotti, Luigi; Morici, Moreno; Leoni, Fabrizio; and Girardi, Adriano, 4,718,549, Cl. 206-334.000.
Leroueil, Pierre E.; James, R. Kent; and Brock, Gregory K., to Weyerhaeuser Company. Boiler sootblowing control system. 4,718,376, Cl. 122-390.000.
Leschonski, Kurt; and Rothele, Stephan. Method and an apparatus for splitting samples of powders and suspensions. 4,718,288, Cl. 73-863.000.

Lesher, Kenneth C.; and Henry, Herbert W., to Ethyl Corporation. Continuous two-stage vacuum process for recovering bromine. 4,719,096, Cl. 423-504.000.
L'Esperance, Francis A., Jr., to LRI L.P. Apparatus for ophthalmological surgery. 4,718,418, Cl. 128-303.100.
Lessard, Philip A.; and Andeen, Bruce R., to Helix Technology Corporation. Cryopump with quicker adsorption. 4,718,241, Cl. 62-55.500.
Leterme, Dominique; and Le Merer, Jean-Pierre, to Thomson-CSF. Optical recording-reading head using an adjustable mount for pivoting mirror. 4,719,614, Cl. 369-110.000.
LeVahn, Bruce A.; and Olson, Robert E., to Minnesota Scientific, Inc. Retractor apparatus. 4,718,151, Cl. 24-535.000.
Lever Brothers Company: *See*—
Macrae, Alasdair R.; and How, Peter, 4,719,178, Cl. 435-135.000.
Levine, Isaac J.; and Karol, Frederick J., to Union Carbide Corporation. Processes for preparing polyethylene catalysts by heating catalyst precursors. 4,719,193, Cl. 502-107.000.
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Matsuno, Kenji; Matsubayashi, Hiroshi; Ishibashi, Kazuhisa; Kuse, Kazuma; and Sato, Nobuyuki, to Toyo Seikan Kaisha, Limited. Can body and method of making the same. 4,719,329, Cl. 219-121.0LD.
Matsuo, Mamoru: *See—*
Komatsubara, Toshio; Muramatsu, Toshiki; and Matsuo, Mamoru, 4,718,948, Cl. 148-2.000.
Matsuoka, Tsugufumi: *See—*
Haku, Hisao; Nakashima, Yukio; Watanabe, Kaneo; and Matsuoka, Tsugufumi, 4,719,123, Cl. 437-101.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Ide, Akifumi; and Yamamitsu, Chojuro, 4,719,519, Cl. 358-310.000.
Nakamoto, Mitsuyoshi; Kusuda, Takao; Yonemura, Masaaki; and Shinmura, Koichi, 4,718,926, Cl. 55-523.000.
Yoshikawa, Akio; and Sugino, Takashi, 4,719,633, Cl. 372-46.000.
Matsushita Electric Works, Ltd.: *See—*
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Matsuura, Osamu: *See—*
Sakamoto, Toshinori; and Matsuura, Osamu, 4,718,713, Cl. 296-192.000.
Matsuzawa, Yasuo: *See—*
Karwoski, Theodore; and Matsuzawa, Yasuo, 4,718,907, Cl. 623-12.000.
Mattarelli, Ennio, to Dynamit Nobel AG. Pivotal connection between break-open action and barrel of a gun. 4,718,186, Cl. 42-75.040.
Mattel, Inc.: *See—*
McKittrick, Michael; Maurer, David L.; and Stern, Howard R., 4,718,875, Cl. 446-231.000.
Maurer, David L.: *See—*
McKittrick, Michael; Maurer, David L.; and Stern, Howard R., 4,718,875, Cl. 446-231.000.
Mauri, Luigi, to Moplefan S.p.A. Coupled packaging sheets impermeable to gases and vapors and based on polyolefinic films. 4,719,147, Cl. 428-336.000.
Maxson, Myron T.: *See—*
Benditt, Kathleen F.; and Maxson, Myron T., 4,719,275, Cl. 526-15.000.
May, David C., to Raytheon Company. Packet fastbus. 4,719,621, Cl. 370-85.000.
Mayer, Francis X.; and Lewis, William E., to Exxon Research and Engineering Company. Slurry hydroconversion process. 4,719,002, Cl. 208-85.000.
Mayer, Jean P.; and Wittwer, Fritz, to Warner-Lambert Company. Foam capsules. 4,719,112, Cl. 424-456.000.
Mays, Roger E.: *See—*
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Mayumi, Hiroshi: *See—*
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Mazda Motor Corporation: *See—*
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Sakamoto, Toshinori; and Matsuura, Osamu, 4,718,713, Cl. 296-192.000.
McCall, Danny, to Exemplar, Inc. Control for water heater system. 4,718,403, Cl. 126-427.000.
McCambridge, John M.: *See—*
Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., 4,719,458, Cl. 340-825.500.
McCanney, Neil R. Deflection amplifier. 4,719,393, Cl. 315-397.000.
McCaughan, Donald, to Merrell Dow Pharmaceuticals Inc. Cardiac antiarrythmic method employing probucol. 4,719,237, Cl. 514-712.000.
McChesney, Charles E.: *See—*
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, 4,719,250, Cl. 523-212.000.
McClure, Alice M. Bottle sling for holding a baby bottle while traveling. 4,718,623, Cl. 248-102.000.
McConaghy, James R., Jr.; and Swartz, Charles J., to Conoco Inc. Apparatus for calcining coke. 4,718,984, Cl. 202-99.000.
McCormack, William H., to Garrett Corporation, The. Combination alpha, static and total pressure probe. 4,718,273, Cl. 73-180.000.
McCourt, James P.; Foley, Cecil L., Jr.; Shuler, Danny L.; and Shuler, Robert J. Fastener for void-forming member. 4,718,210, Cl. 52-309.120.
McDonald, James P.: *See—*
Peck, Leonard E., Jr.; Neitzel, Fred J.; Sargent, Wesson P.; and McDonald, James P., 4,719,353, Cl. 250-352.000.
McDougal, John A.; and Lennington, John W., to McDougal, John A. Internal combustion engine ignition system. 4,718,381, Cl. 123-406.000.
McGrath, David P.: *See—*
Awerbuch, Leon; Van der Mast, Victor; and McGrath, David P., 4,718,236, Cl. 60-641.500.
McInnis, Martin B.: *See—*
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McIntosh, Graham D., to Plessey Overseas Limited. Optical line simulator. 4,718,754, Cl. 350-574.000.
McKeown, Marlene K.: *See—*
Daum, Harry C.; and McKeown, Marlene K., 4,718,441, Cl. 134-201.000.
McKernon, David A.; and Cunningham, Douglas J., to Britax (Wingard) Ltd. Clamping means for a strap. 4,718,148, Cl. 24-170.000.
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Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,718,966, Cl. 156-331.200.
McKittrick, Michael; Maurer, David L.; and Stern, Howard R., to Mattel, Inc. Toy vehicle with foldable wheels. 4,718,875, Cl. 446-231.000.
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Honeycutt, Fred L., Jr.; and McLean, Howard J., 4,718,230, Cl. 60-261.000.
McNamara, Dennis J.: *See—*
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McNeilab, Inc.: *See—*
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McPhillips, Kerry A. Method of manufacturing alloy for use in fabricating metal parts. 4,718,940, Cl. 75-10.180.
MDC Vacuum Products Corporation: *See—*
Contin, Jose L., 4,718,637, Cl. 251-158.000.
Meadus, F. Weldon: *See—*
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Mechanical Technology Incorporated: *See—*
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Meckel, Lothar: *See*—
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Med Bed Technologies, Inc.: *See*—
DiMatteo, Paul; and Chubb, Charles F., 4,718,133, Cl. 5-81.00R.

Medcalf, Ralph F., Jr.: *See*—
Williams, Michael K.; Dawson, Geoffrey G.; and Medcalf, Ralph F., Jr., 4,719,030, Cl. 252-133.000.

Meek, Dale E., to Schlumberger Technology Corporation. Methods and apparatus for selectively controlling fluid communication between a pipe string and a well bore annulus. 4,718,494, Cl. 166-373.000.

Meffert, Alfred: *See*—
Schmid, Karl H.; Meffert, Alfred; and Gruber, Bert, 4,719,084, Cl. 422-16.000.

Mehnert, Walter, to MITEC Moderne Industrietechnik GmbH. Arrangement for the measurement of the electric voltage parameters of a high voltage conductor. 4,719,415, Cl. 324-96.000.

Meboudar, Raphael, to Hydro-Plan Engineering, Ltd. Drip level irrigation emitter. 4,718,608, Cl. 239-542.000.

Meinan Machinery Works, Inc.: *See*—
Koba, Yoshinori, 4,718,338, Cl. 100-121.000.

Meineke, William S., to Rexnord Inc. Hold-down type mechanism. 4,718,632, Cl. 248-681.000.

Melitta-Werke Bentz & Sohn: *See*—
Schmidt, Heinrich, 4,718,883, Cl. 493-328.000.

Melody, David P.: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,718,966, Cl. 156-331.200.

Mendelevitch, Eli. Aquatic growth cutter. 4,718,871, Cl. 440-71.000.

Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, to Schott Glaswerke. Optical and ophthalmic glass with refractive indices greater than or equal to 1.56, Abbe numbers greater than or equal to 40 and densities less than or equal to 2.70 g/cm^3. 4,719,186, Cl. 501-67.000.

Merck & Co., Inc.: *See*—
Firestone, Raymond A., 4,719,312, Cl. 564-510.000.
Pietruszkiewicz, Adolph M.; Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., 4,719,310, Cl. 560-053.000.
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
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Merrell Dow Pharmaceuticals Inc.: *See*—
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McCaughan, Donald, 4,719,237, Cl. 514-712.000.

Mesch, Walter, to BASF Aktiengesellschaft. Preparation of imidazoles. 4,719,309, Cl. 548-335.000.

Messick, Virginia B.: *See*—
Hefner, Robert E., Jr.; and Messick, Virginia B., 4,719,268, Cl. 525-454.000.

Messrs. H. Fahse & Co.: *See*—
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Metacon AG: *See*—
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Methode Electronics, Inc.: *See*—
Kozel, Charles A.; and Scheitz, John T., 4,719,321, Cl. 174-135.000.

Mettler Instrumente AG: *See*—
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Meyer, Danny D.: *See*—
Shalon, Yehuda; and Meyer, Danny D., 4,719,011, Cl. 210-198.200.

Meyer, Walter E.: *See*—
Fisher, Patrick W.; Hagen, James P.; and Meyer, Walter E., 4,718,136, Cl. 14-71.300.

Meyers, Edward: *See*—
Kirsch, Donald R.; Meyers, Edward; and Biskupiak, Joseph E., 4,719,109, Cl. 424-117.000.

Meyers, Victor; and Relue, Michael, to Texas Instruments Incorporated. Ion source for an ion implanter. 4,719,355, Cl. 250-425.000.

Micafil AG: *See*—
Nussbaumer, Manfred; and Fischer, Bruno, 4,718,533, Cl. 198-346.100.

Michael, George W., III: *See*—
Capp, Randolph E.; Johnescu, Douglas M.; Laudig, Ronald C.; Michael, George W., III; and Pearl, Charles D., 4,718,854, Cl. 439-63.000.

Michael Horauf Maschinenfabrik GmbH & Co. KG: *See*—
Muller, Berthold; and Bantleon, Konrad, 4,718,596, Cl. 229-109.000.

Michel, Heinrich: *See*—
Weinmann, Hanns-Joachim; Gries, Heinz; and Michel, Heinrich, 4,719,098, Cl. 424-9.000.

Michel, Michael F.: *See*—
Kissel, William R.; Michel, Michael F.; Glowczewski, Thomas; and Frantz, Douglas C., 4,719,573, Cl. 364-431.070.

Microdot Inc.: *See*—
Berecz, Imre, 4,718,801, Cl. 411-378.000.

Middleton, Marc G.; and Nelson, Richard T., to White Consolidated Industries, Inc. Bearing construction for refrigeration compressor. 4,718,830, Cl. 417-372.000.

Midwest Research Institute: *See*—
Kinsey, John S.; and Pendleton, Frank J., 4,718,920, Cl. 55-10.000.

Miep Holdings Inc.: *See*—
deWalle, Stewart; and deWalle, Richard T., 4,719,422, Cl. 324-238.000.

Miesterfeld, Frederick O. R., to Chrysler Motors Corporation. Method for energizing vacuum fluorescent displays. 4,719,389, Cl. 315-169.100.

Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., to Chrysler Motors Corporation. Method of data arbitration and collision detection in a data bus. 4,719,458, Cl. 340-825.500.

Mihara, Masato: *See*—
Kido, Koichi; Shibayama, Kenji; Tsuruta, Masahiko; Hirota, Akira; Mihara, Masato; and Inoue, Osamu, 4,719,518, Cl. 358-330.000.

Miki, Masayuki: *See*—
Suzuki, Seiko; Miki, Masayuki; Sasayama, Takao; Suzuki, Toshitaka; Sato, Nobuo; Ueno, Sadayasu; and Ikegami, Akira, 4,718,999, Cl. 204-406.000.

Milbrett, Lynn: *See*—
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Miles, Arturo R., to University of Missouri, The Curators of the. Electrical machines and apparatus for rotation around multiple axes. 4,719,381, Cl. 310-166.000.

Milet, Pierre: *See*—
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Miller, Charles P., to Miller Formless Co., Inc. Feeder head assembly. 4,718,537, Cl. 198-513.000.

Miller Formless Co., Inc.: *See*—
Miller, Charles P., 4,718,537, Cl. 198-513.000.

Miller, James D.: *See*—
Brice, Ralph E.; Green, Ronald G.; Lawrence, Ronald L.; and Miller, James D., 4,718,694, Cl. 280-605.000.

Miller, John S.; and Van Brunt, Michael K. Current detection device having an extended frequency range of response. 4,719,414, Cl. 324-95.000.

Miller, Robert E. Improved swimming pool vacuum apparatus. 4,718,129, Cl. 4-490.000.

Milliken Research Corporation: *See*—
Love, Franklin S., III, 4,718,340, Cl. 101-116.000.

Min, Byoung G.; Koh, Chang-Soon; No, Jun-Lyang; Chun, Gil-Jung; Kim, Hi-Chan; Han, Dong-Chul; and Kim, Sung-Wan, to Seoul National University Hospital. Artificial heart. 4,718,903, Cl. 623-3.000.

Minaee, Behrooz, to Ultraphase Equipment, Inc. Photoresist stripping apparatus using microwave pumped ultraviolet lamp. 4,718,974, Cl. 156-643.000.

Ministry of Defence: *See*—
Ashill, Patrick R.; Pierce, Donald; Treadgold, Desmond A.; and Fulker, John L., 4,718,619, Cl. 244-35.00R.

Ministry of International Trade & Industry: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
Assen, Steven M.; and Oxman, Joel D., 4,719,149, Cl. 428-473.000.
Gobets, Roy A.; and Tengler, John N., 4,718,860, Cl. 439-447.000.
Vanderwerf, Dennis F., 4,719,547, Cl. 362-299.000.

Minnesota Scientific, Inc.: *See*—
LeVahn, Bruce A.; and Olson, Robert E., 4,718,151, Cl. 24-535.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hayashi, Toshihiro, 4,718,659, Cl. 271-259.000.
Hyodo, Haruhiro, 4,719,492, Cl. 355-52.000.

Minor, Don E.: *See*—
Estkowski, Michael H.; Caruso, Jerome C.; and Minor, Don E., 4,718,726, Cl. 297-313.000.

Miquelot, Gilles, to SEB S.A. Sharpening sheath combined with a knife. 4,718,200, Cl. 51-214.000.

Miranol Inc.: *See*—
Nadolsky, Richard J.; and Desai, Bharat B., 4,719,282, Cl. 528-310.000.

Miseo, Sabato: *See*—
Fiato, Rocco A.; Bar-Gadda, Ronny; and Miseo, Sabato, 4,719,240, Cl. 518-717.000.

Mishliborsky, Zvy, to Esselte Moreau. Force sensing device for measurement apparatus. 4,718,287, Cl. 73-862.650.

Misono, Toshiaki, to Takeda Riken Kogyo Kabushikikaisha. Clocked logic delay device which corrects for the phase difference between a clock signal and an input binary signal. 4,719,365, Cl. 307-269.000.

Mitamura, Koichi: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Miura, Kimio; Mitsui, Kiyoo; and Mitamura, Koichi, 4,719,551, Cl. 363-41.000.

Mitchell, Charles F. Pressure control override. 4,718,246, Cl. 62-208.000.

Mitchell, David E.: *See*—
Howlett, Clyde W.; and Mitchell, David E., 4,718,507, Cl. 177-210.0FP.

MITEC Moderne Industrietechnik GmbH: *See*—
Mehnert, Walter, 4,719,415, Cl. 324-96.000.

Mitsubish Denki Kabushiki Kaisha: *See*—
Itoh, Fumio; Sasaki, Tutomu; Kanoh, Ikuhisa; and Fukumoto, Takaaki, 4,719,088, Cl. 422-106.000.

Mitsubishi Aluminum Kabushiki Kaisha: *See*—
Iwama, Tetsuji; Katsumata, Katashi; Kudo, Hajime; and Takeuchi, Yo, 4,718,482, Cl. 165-133.000.

Mitsubishi Chemical Industries Limited: *See*—
Irie, Masahiro; and Maeda, Shuichi, 4,719,296, Cl. 544-71.000.
Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, 4,719,167, Cl. 430-192.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ando, Toshiharu; Yasuda, Kazuo; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,719,269, Cl. 525-524.000.
Honjoh, Yoshihisa; and Okuda, Hiroshi, 4,718,394, Cl. 123-599.000.
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Kishimoto, Yuuji, 4,719,572, Cl. 364-431.050.
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; and Dosaka, Katsumi, 4,719,597, Cl. 365-189.000.
Morishita, Mitsuharu; and Kouge, Shinichi, 4,719,427, Cl. 324-427.000.
Nishimura, Yasumasa, 4,719,410, Cl. 324-73.00R.
Niwa, Tomomitsu, 4,719,579, Cl. 364-474.000.
Sakamoto, Hidenobu; and Shimoda, Masahiko, 4,719,581, Cl. 364-485.000.
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Okitomo, Hironari; Nishioka, Masaki; Ide, Kensuke; Yoshikawa, Hirofumi; and Matsunaga, Yuso, 4,719,578, Cl. 364-474.000.

Mitsubishi Petrochemical Company Limited: *See*—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 4,719,270, Cl. 526-68.000.

Mitsui, Kiyoo: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Miura, Kimio; Mitsui, Kiyoo; and Mitamura, Koichi, 4,719,551, Cl. 363-41.000.

Mitsui Mining Co., Ltd.: *See*—
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Mitsui Toatsu Chemicals, Inc.: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,719,613, Cl. 369-109.000.
Itoh, Hiroshi; Nitta, Atsuhiko; Tanaka, Tomio; and Kamio, Hideo, 4,718,899, Cl. 604-368.000.
Tanaka, Junsuke; Inage, Ikuo; and Hyugaji, Teruo, 4,718,425, Cl. 128-673.000.

Mitsuka, Ikuo: *See*—
Houki, Tetsuo; Mitsuka, Ikuo; Kuwabara, Akira; Haibara, Hitoshi; and Sakamoto, Takashi, 4,718,768, Cl. 356-402.000.

Mitton, Bruce W., to Eltra Corporation. Hydraulic cylinder. 4,718,330, Cl. 92-129.000.

Miura, Kimio: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Miura, Kimio; Mitsui, Kiyoo; and Mitamura, Koichi, 4,719,551, Cl. 363-41.000.

Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, to Mitsubishi Chemical Industries Ltd. Positive photoresist composition with 1,2 naphthoquinone diazide and novolak resin condensed from mixture of m-cresol, p-cresol, and 2,5-xylenol with formaldehyde. 4,719,167, Cl. 430-192.000.

Miura, Norio: *See*—
Yamazoe, Noboru; and Miura, Norio, 4,718,991, Cl. 204-1.00T.

Miura, Shigeo: *See*—
Kurahayashi, Sadasuke; Watanabe, Tsunehiro; Sakamoto, Masahiro; Ueno, Yasuhide; Ono, Takeshi; Miura, Shigeo; Negi, Tsuneo; and Takahashi, Masatomo, 4,719,514, Cl. 358-261.000.

Miura, Shuichi: *See*—
Wada, Osamu; Sanada, Tatsuyuki; Miura, Shuichi; Machida, Hideki; Yamakoshi, Shigenobu; and Sakurai, Teruo, 4,719,498, Cl. 357-30.000.

Miura, Yoshio; and Suzuki, Motoyuki, to Hitachi, Ltd. Apparatus for controlling a recording operation of an optical information recording apparatus. 4,719,611, Cl. 369-47.000.

Miwa, Akihiko: *See*—
Sugiura, Yuzuru; and Miwa, Akihiko, 4,718,326, Cl. 91-369.00A.

Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, to Mitsubishi Petrochemical Company Limited. Process for production of polyethylene. 4,719,270, Cl. 526-68.000.

Miyaake, Chiharu: *See*—
Ohuchi, Kazuo; Miyaake, Chiharu; and Yamamura, Yutaka, 4,719,495, Cl. 355-100.000.

Miyagawa, Ichirou; and Arai, Noboru, to Fuji Photo Film Co., Ltd. Method of generating synchronizing signals. 4,719,515, Cl. 358-268.000.

Miyake, Ichiro: *See*—
Hasegawa, Tsunao; Miyake, Ichiro; and Yoshimura, Ryuichiro, 4,719,525, Cl. 360-77.000.

Miyamoto, Tomomi: *See*—
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Miyanaga, Masamichi: *See*—
Kitamura, Ryuzo; Shindo, Masami; Miyanaga, Masamichi; and Fukuda, Yoshimichi, 4,718,131, Cl. 4-663.000.

Miyasaka, Tsutomu: *See*—
Hirano, Shigeo; Miyasaka, Tsutomu; and Fujita, Shinsaku, 4,719,174, Cl. 430-409.000.

Miyashita, Tsuneo; Nishio, Hiroaki; and Sato, Michitaka, to Nippon Kokan Kabushiki Kaisha. Method of sintering compacts. 4,719,078, Cl. 419-53.000.

Miyatake, Hideshi: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; and Dosaka, Katsumi, 4,719,597, Cl. 365-189.000.

Miyatake, Kimio; and Takeda, Kenji, to Horiba, Ltd. Apparatus for intermitting beam of light for use in gas analyzer. 4,719,352, Cl. 250-351.000.

Miyazaki, Takumi, to Nissan Motor Co., Ltd. Instrument panel. 4,718,512, Cl. 180-90.000.

Mizoguchi, Saburo, to Sharp Kabushiki Kaisha. Humidifier blowoff portion. 4,719,057, Cl. 261-81.000.

Mizuhara, Howard, to GTE Products Corporation. Palladium alloy for joining ceramics and method of use. 4,719,081, Cl. 420-463.000.

Mizuno, Sakuyuki, to Kabushiki Kaisha Toshiba. Coordinates detector wherein X and Y emitting elements are enabled independently of each other. 4,719,339, Cl. 250-221.000.

Mizushima, Toyoshi: *See*—
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Mobil Oil Corporation: *See*—
Chu, Pochen; and Garwood, William E., 4,719,004, Cl. 208-111.000.
Krishnamurthy, Sowmithri, 4,719,189, Cl. 502-50.000.
Shihabi, David S., 4,719,003, Cl. 208-91.000.
Uhri, Duane C., 4,718,490, Cl. 166-281.000.

Mobile Oil AG: *See*—
Buschulte, Winfried; and Mardorf, Lutz, 4,718,243, Cl. 62-101.000.

Mochiji, Kozo: *See*—
Kimura, Takeshi; Mochiji, Kozo; Okamoto, Hiroshi; Iwayanagi, Takao; Kudo, Tetsuichi; and Kuniyoshi, Shinji, 4,719,161, Cl. 430-5.000.

Modic, Frank J., to General Electric Company. Transparent membrane structures. 4,719,142, Cl. 428-145.000.

Moertel, George B., to Talon, Inc. Projection cooling of molded slide fastener elements and product. 4,718,150, Cl. 24-427.000.

Mohrle, Raymond L.: *See*—
Schobel, Alexander M.; and Mohrle, Raymond L., 4,719,181, Cl. 436-66.000.

Mol, Grietje N.: *See*—
Broer, Dirk J.; and Mol, Grietje N., 4,718,748, Cl. 350-96.300.

Moldenhauer, Philip E.: *See*—
Groezinger, John J.; and Moldenhauer, Philip E., 4,719,012, Cl. 210-232.000.

Molex Incorporated: *See*—
Gardner, Michael J., 4,718,859, Cl. 439-329.000.
Moore, Robert L.; and Haller, Jacob S., 4,718,167, Cl. 29-861.000.

Moller, Ole H., to Advanced Micro Devices, Inc. Interrupt and trap handling in microprogram sequencer. 4,719,565, Cl. 364-200.000.

Moller, Werner: *See*—
Braun, Dieter; Moller, Werner; and Thulig, Werner, 4,718,720, Cl. 297-216.000.

Moltner, Herrmann; and Gerhards, Hans-Dieter, to Kocks Technik GmbH & Co. Rolling line with measuring means. 4,718,280, Cl. 73-760.000.

Monsanto Company: *See*—
Coleman, James P., 4,719,031, Cl. 252-180.000.
Rademacher, Thomas W.; and Dwek, Raymond A., 4,719,294, Cl. 536-22.000.

Moomaw, David E. Gutter cleaning device. 4,718,613, Cl. 241-60.000.

Moore, Peter E.; and Powell, Brian D., to Graviner Limited. Fire and explosion detection and suppression. 4,718,497, Cl. 169-61.000.

Moore Push-Pin Company: *See*—
Summers, Frank P., 4,718,971, Cl. 156-540.000.

Moore, Robert L.; and Haller, Jacob S., to Molex Incorporated. Semi-automatic electrical harness fabricating apparatus and method. 4,718,167, Cl. 29-861.000.

Moplefan S.p.A.: *See*—
Mauri, Luigi, 4,719,147, Cl. 428-336.000.

Moran, Byron L.: *See*—
Willis, Allan F.; and Moran, Byron L., 4,718,423, Cl. 128-634.000.

Morgan Electronics: *See*—
Theis, Peter F.; and Buchberger, Gregory, 4,719,647, Cl. 379-61.000.

Mori, Katsuhiro: *See*—
Kito, Masahiro; and Mori, Katsuhiro, 4,718,480, Cl. 165-94.000.

Mori, Kohei; and Suzuki, Haruo, to Jidosha Kiki Co., Ltd. Brake booster of tandem type. 4,718,328, Cl. 91-376.00R.

Mori, Masami, to Ingersoll-Rand Company. Reversible percussion device for percussion tool. 4,718,500, Cl. 173-132.000.

Morici, Moreno: *See*—
Rissotti, Luigi; Morici, Moreno; Leoni, Fabrizio; and Girardi, Adriano, 4,718,549, Cl. 206-334.000.

Moriki, Yasumitsu; Numakura, Hirotomo; and Fukui, Masayuki, to Maruma Jyusharyo Kabushiki Kaisha. Apparatus for displacing a line of track chain. 4,718,228, Cl. 59-7.000.

Morimoto, Masaaki: *See*—
Kusakabe, Noboru; Morimoto, Masaaki; Koyama, Eiichi; and Kojima, Koichi, 4,718,470, Cl. 152-451.000.

Morishima, Shinichi; Tanaka, Syousuke; and Ohtani, Takahide, to Sony Corporation. Signal reproduction apparatus including touched state pattern recognition speed control. 4,719,524, Cl. 360-73.000.

Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Vehicle battery diagnostic device. 4,719,427, Cl. 324-427.000.

Morita, Hideo: *See*—
Hirobe, Hitoshi; Morita, Hideo; and Shin, Takeharu, 4,719,511, Cl. 358-213.190.

Morita, Mikio: *See*—
Horie, Hiromichi; Ochiai, Kumi; Arima, Itsuo; and Morita, Mikio, 4,719,377, Cl. 310-44.000.

Morita, Yoshito: *See*—
Koba, Keiichiro; Matsumoto, Akira; Morita, Yoshito; and Miyamoto, Tomomi, 4,719,188, Cl. 501-133.000.

Moriya, Koichi, to Diesel Kiki Co., Ltd. Automatic transmission system for vehicles. 4,718,309, Cl. 74-866.000.

Mornex Limited: *See*—
Elmaleh, Samuel, 4,719,020, Cl. 210-807.000.

Morris, Arthur J.: *See*—
Pringle, Ronald E.; and Morris, Arthur J., 4,718,488, Cl. 166-135.000.

Morris, David B.; Rollett, Andrew C.; Roberts, Donald M.; and Emmerson, Christopher D., to Bayer Aktiengesellschaft. Suspendable dispenser pack container for flowable substances, such as liquids, pastes, powder and fine granules. 4,718,577, Cl. 222-105.000.

Morrison, Jr.; Robert W., to Burroughs Wellcome Co. 2-acetylpyrimidine-5-[(dimethylamino)thiocarbonyl]thiocarbonohydrazone and salts thereof. 4,719,221, Cl. 514-357.000.

Morrison, Keith. Deodorant composition to protect against the development of body odor. 4,719,101, Cl. 424-65.000.

Morscher, Erwin W., to Sulzer Brothers Ltd.; and Protek AG. Femur head prosthesis. 4,718,916, Cl. 623-23.000.

Morton Thiokol, Inc.: *See*—
Hyde, Jeffrey R., 4,719,022, Cl. 252-35.000.
Krulik, Gerald A., 4,719,128, Cl. 427-345.000.
Raisor, Ralph C., 4,718,955, Cl. 149-109.600.

Moscatelli, Saverio: *See*—
Fanti, Cristoforo; Travaglio, Gianclaudio; Ferrario, Luciano; and Moscatelli, Saverio, 4,718,515, Cl. 180-233.000.

Mosig, Ernst: *See*—
Beck, Wolfgang; Lucius, Werner; Mosig, Ernst; and Umlauf, Bernhard, 4,718,602, Cl. 237-32.000.

Moskowitz, David: *See*—
Pinkerton, Michael B.; and Moskowitz, David, 4,718,856, Cl. 439-147.000.

Mothrath, Georg, to Braun Aktiengesellschaft. Electric toaster. 4,718,332, Cl. 99-385.000.

Motorola, Inc.: *See*—
Guzik, Andrzej T.; Kline, Charles E.; and Holden, Irving H., 4,719,322, Cl. 200-5.00A.
Whittington, Charles L.; and Zolnowsky, John, 4,719,567, Cl. 364-200.000.

Moyer, John A.; and Duguid, Jeffery W., to Moyer Process and Control Company, Inc. Manufacturing process control. 4,719,586, Cl. 364-552.000.

Moyer Process and Control Company, Inc.: *See*—
Moyer, John A.; and Duguid, Jeffery W., 4,719,586, Cl. 364-552.000.

Mrenna, Stephen A.; Grunert, Kurt A.; Weiss, Jonathan; and Garg, Vijay K., to Westinghouse Electric Corp. Circuit breaker with fast trip unit. 4,719,438, Cl. 335-38.000.

MRM Security Systems, Inc.: *See*—
Mainiero, Michael R., 4,718,641, Cl. 256-8.000.

Mt. Moriah Trust: *See*—
Hill, Gilman A.; Passamaneck, Richard S.; and Touryan, Kenell J., 4,718,493, Cl. 166-308.000.

Muhlegger, Klaus; and von der Eltz, Herbert, to Boehringer Mannheim GmbH. Phosphates of resorufin derivatives and compositions thereof for the determination of the activity of phosphatases. 4,719,097, Cl. 424-2.000.

Mullen, George B.: *See*—
St. Georgiev, Vassil; and Mullen, George B., 4,719,306, Cl. 548-240.000.

Muller, Albert: *See*—
Forstbauer, Wilhelm; and Muller, Albert, 4,719,557, Cl. 363-79.000.

Muller, Bernd W. W.; Franzky, Hans-Jurgen; and Kolln, Claus-Jurgen. Pharmaceutical multicomponent systems and method of preparing same. 4,719,239, Cl. 514-785.000.

Muller, Berthold; and Bantleon, Konrad, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Folding tray. 4,718,596, Cl. 229-109.000.

Muller, David F.; and Scott, Peter B., to Summit Technology, Inc. Multiple chamber laser containment system. 4,719,641, Cl. 372-109.000.

Muller, Hanns P.; Jansen, Bernhard; and Hombach, Rudolf, to Bayer Aktiengesellschaft. Polyisocyanate preparations and their use for the production of polyurethane plastics. 4,719,244, Cl. 521-115.000.

Muller, Jens: *See*—
Nest, Andreas; and Muller, Jens, 4,719,362, Cl. 307-116.000.

Muller, Konrad: *See*—
Pohlmann, Klaus; Muller, Konrad; Voss, Hartwig; Drescher, Gunter; and Thurow, Gerhard, 4,718,649, Cl. 267-64.240.

Muller, Urs: *See*—
Zondler, Helmut; Tobler, Hans; and Muller, Urs, 4,718,934, Cl. 71-76.000.

Mullican, Randall. Portable luggage carrier for pickup trucks. 4,718,583, Cl. 224-42.42R.

Multinorm BV: *See*—
Genbrugge, Jean, 4,718,606, Cl. 239-251.000.

Munro, Robert A., to Cives Corp. Modular automatic bale tier. 4,718,336, Cl. 100-3.000.

Munson, Robert E., to Ball Corporation. Broadband printed circuit antenna with direct feed. 4,719,470, Cl. 343-700.0MS.

Muntean, George L.: *See*—
Breeck, Philip L.; and Muntean, George L., 4,718,828, Cl. 417-313.000.

Murakami, Yoshiteru: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirogane, Junji; and Murakami, Yoshiteru, 4,719,137, Cl. 428-67.000.

Muramatsu, Toshiki: *See*—
Komatsubara, Toshio; Muramatsu, Toshiki; and Matsuo, Mamoru, 4,718,948, Cl. 148-2.000.

Muraoka, Tsutomu: *See*—
Koide, Teruhiko; Kawaguchi, Teruhiko; Suzuki, Hideyuki; and Muraoka, Tsutomu, 4,718,696, Cl. 280-801.000.

Murasawa, Yoshihiro: *See*—
Ohkubo, Masaharu; Ohtsuka, Yasumasa; Asai, Jun; and Murasawa, Yoshihiro, 4,719,489, Cl. 355-3.0FU.

Murase, Yoshihiko: *See*—
Sawada, Shuichi; and Murase, Yoshihiko, 4,718,964, Cl. 156-252.000.

Murata Kaiki Kabushiki Kaisha: *See*—
Sanagi, Asao, 4,718,225, Cl. 57-328.000.

Murata Kikai Kabushiki Kaisha: *See*—
Kiriake, Masaharu, 4,718,560, Cl. 209-656.000.

Murata, Masataka: *See*—
Kitatani, Katsugi; Yokoya, Hiroaki; Suzuki, Nobuo; and Murata, Masataka, 4,719,165, Cl. 430-115.000.

Murata, Nobuyoshi; and Watanabe, Kozo, to Kawasaki Jukogyo Kabushiki Kaisha. Pinion shift starter for engines. 4,718,290, Cl. 74-7.00A.

Murata, Shinjiro: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Hachisu, Mitsugu; Hirayama, Masao; Murata, Shinjiro; and Fukatsu, Shunzo, 4,719,231, Cl. 514-513.000.

Murata, Yukiho: *See*—
Okuda, Haruo; and Murata, Yukiho, 4,718,139, Cl. 15-250.200.

Murdoch, Joseph R.; and Loomis, Gary L., to Du Pont de Nemours, E. I., and Company. Polylactide compositions. 4,719,246, Cl. 521-134.000.

Murofushi, Fuyuhiko: *See*—
Matsumoto, Yoshitoshi; and Murofushi, Fuyuhiko, 4,719,358, Cl. 250-551.000.

Murray, Douglas E.: *See*—
Brody, Deborah S.; Kendall, Robert C.; Murray, Douglas E.; and Weldon, James R., 4,718,579, Cl. 222-129.400.

Musiani, Mario, to Arcotronics Italia, S.p.A. Device for bending the leads of electrical and/or electronic components. 4,718,461, Cl. 140-105.000.

Musschoot, Albert, to General Kinematics Corporation. Vibratory stress relief apparatus. 4,718,473, Cl. 164-132.000.

Musser, John H.: *See*—
Kreft, Anthony F., III; Musser, John H.; Pattison, Thomas W.; and Yardley, John P., 4,719,308, Cl. 548-330.000.

Muta, Eizo, to Kabushiki Kaisha Yushin Seiki. Slide cylinder device. 4,718,293, Cl. 74-110.000.

Mutschler, Jurgen: *See*—
Jehle, Franz; and Mutschler, Jurgen, 4,719,468, Cl. 342-201.000.

Mutzberg, Friedhelm: *See*—
Gerdes, Ernst; Mutzberg, Friedhelm; and Pellengahr, Franz, 4,719,135, Cl. 428-35.000.

Mydynski, Steven T.; Redfield, John M., Jr.; Sparrowhawk, Bryan L.; and Volberding, Alfred T., to John Fluke Mfg. Co., Inc. Isothermal block for temperature measurement system using a thermocouple. 4,718,777, Cl. 374-181.000.

Myers, Lawrence R., to Allied Corporation. Reaction mechanism for brake booster. 4,718,327, Cl. 91-369.00B.

Myers, W. Neill; Forbes, John C.; and Barnes, Wayne L., to United States of America, National Aeronautics and Space Administration. Orbital maneuvering vehicle end effectors. 4,718,709, Cl. 294-106.000.

N. V. Raychem S.A.: *See*—
Vansant, Jan, 4,718,678, Cl. 277-1.000.

Naarden International N.V.: *See*—
Traas, Petrus C.; and Roehl, Ernst-Ludwig, 4,719,040, Cl. 512-4.000.

Nabisco Brands, Inc.: *See*—
Calandro, Thomas P.; and Karwowski, Jan, 4,719,115, Cl. 426-302.000.
Simelunas, William J., 4,719,117, Cl. 426-502.000.

Nadella: *See*—
Gerard, Stephan, 4,718,781, Cl. 384-495.000.

Nadler, Leroy R.: *See*—
Jurgens, Raymond W., Jr.; Johnson, Richard G.; and Nadler, Leroy R., 4,718,463, Cl. 141-11.000.

Nadolsky, Richard J.; and Desai, Bharat B., to Miranol Inc. Polycationic block copolymer. 4,719,282, Cl. 528-310.000.

Nagae, Yoshiharu: *See*—
Kitajima, Masaaki; Takasaka, Masahiro; and Nagae, Yoshiharu, 4,719,457, Cl. 340-784.000.

Nagai, Satoshi: *See*—
Hanada, Isamu; Savary, Pierre; Nagai, Satoshi; and Sagawa, Munetomo, 4,719,558, Cl. 363-98.000.

Nagaoka, Tatsuo, to Nagaokaseiki Seisakusho Co., Ltd. Apparatus for removing stem and root of bulb. 4,718,334, Cl. 99-636.000.

Nagaokaseiki Seisakusho Co., Ltd.: *See*—
Nagaoka, Tatsuo, 4,718,334, Cl. 99-636.000.

Nagarwalla, Pheroze J.: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; and Nagarwalla, Pheroze J., 4,718,474, Cl. 164-158.000.

Nagasawa, Yutaka: *See*—
Okayama, Masao; Kawauchi, Masataka; Innami, Tamio; Ogasawara, Tsuyoshi; Nagasawa, Yutaka; Sasaki, Shigeru; Fukudome, Yoshio; Shiragai, Yasuo; and Inoue, Katsuaki, 4,718,655, Cl. 271-3.100.

Nagashima, Nao, to Canon Kabushiki Kaisha. Image processing apparatus. 4,719,516, Cl. 358-780.000.

Nagata, Kunio: *See*—
Aoi, Tatsuo; Atsumi, Haruo; Kikukawa, Takeshi; Nagata, Kunio; Kiyono, Yasuhiro; and Honda, Sueaki, 4,719,395, Cl. 318-349.000.

Nakabayashi, Masamitsu: *See*—
Akasawa, Toshiyuki; Okaya, Takuji; Nakabayashi, Masamitsu; and Furukawa, Yuzo, 4,719,153, Cl. 428-515.000.

Nakagawa, Akio: *See*—
Okado, Chihiro; Yamaguchi, Yoshihiro; and Nakagawa, Akio, 4,719,531, Cl. 361-86.000.

Nakagawa, Kanji: *See*—
Makino, Hiroshi; and Nakagawa, Kanji, 4,718,921, Cl. 55-16.000.

Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Semiconductor device having junction formed from two different hydrogenated polycrystalline silicon layers. 4,719,501, Cl. 357-59.000.

Nakagiri, Takashi: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, 4,719,501, Cl. 357-59.000.

Nakajima, Junjiro: *See*—
Takase, Iwao; Yoshida, Toshimi; Ikeda, Shinzo; Masaoka, Isao; and Nakajima, Junjiro, 4,718,949, Cl. 148-11.50F.

Nakajima, Kichio; Honma, Kazuo; and Tokairin, Hiroaki, to Hitachi Construction Machinery Co., Ltd. Control system for hydraulic circuit. 4,718,329, Cl. 91-445.000.

Nakamoto, Mitsuyoshi; Kusuda, Takao; Yonemura, Masaaki; and Shinmura, Koichi, to Matsushita Electric Industrial Co., Ltd. Exhaust gas filter for diesel engine. 4,718,926, Cl. 55-523.000.

Nakamura, Koichi; and Aono, Toshiaki, to Fuji Photo Film Co., Ltd. Dye-fixing material. 4,719,168, Cl. 430-203.000.

Nakamura, Mamoru; and Haneda, Hideo, to Aisin Seiki Kabushiki Kaisha. Electrical coil and terminal with clip. 4,719,440, Cl. 336-192.000.

Nakano, Kinichiro: *See*—
Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, 4,719,460, Cl. 340-825.310.

Nakano, Shiro; Ozaki, Tuyoshi; and Noguchi, Kenji, to Oji Paper Company, Ltd. Electrophotographically sensitive material for a litho printing plate. 4,719,162, Cl. 430-49.000.

Nakashima, Yukio: *See*—
Haku, Hisao; Nakashima, Yukio; Watanabe, Kaneo; and Matsuoka, Tsugufumi, 4,719,123, Cl. 437-101.000.

Nakata, Masami; and Imai, Osamu, to NGK Insulators, Ltd. Voltage non-linear resistor and its manufacture. 4,719,064, Cl. 264-61.000.

Nakatani, Shiroo, to Mazda Motor Corporation. Front structure of vehicle body. 4,718,712, Cl. 296-192.000.

Nakayama, Kiyoshi, to Asahi Steel Industry Co., Ltd. Wire latticework and fence of wire latticework. 4,718,642, Cl. 256-24.000.

Nalco Chemical Company: *See*—
Robinson, Robert S., 4,719,082, Cl. 422-13.000.

Nanaumi, Yasuaki, to Kabushiki Kaisha Toshiba. Laser treatment apparatus. 4,718,416, Cl. 128-303.100.

Nanjyo, Yukio: *See*—
Jimbo, Masao; and Nanjyo, Yukio, 4,719,424, Cl. 324-309.000.

Naruse, Yoshihiro, to Aisin Seiki Kabushikikaisha. Reflective object detector with compensated receiver signal. 4,719,604, Cl. 367-93.000.

National Starch and Chemical Corporation: *See*—
Puletti, Paul P.; and Docowski, Stanley J., Jr., 4,718,898, Cl. 604-366.000.
Tsai, John J.; and Tessler, Martin M., 4,719,272, Cl. 526-238.200.

Natsui, Yoshinobu; and Mayumi, Hiroshi, to NEC Corporation. Programmable read-only memory device provided with test cells. 4,719,599, Cl. 365-201.000.

Naturin-Werk Becker & Co.: *See*—
Crevasse, Gary A., 4,719,116, Cl. 426-315.000.

Navasina AG: *See*—
Horn, Petr, 4,719,441, Cl. 338-20.000.

Navistar International Transportation Corp.: *See*—
Olson, M. Eugene; and Zehr, Lester L., 4,718,755, Cl. 350-584.000.

Naylor, Gary R.: *See*—
Enders, George E.; Singh, Anand P.; and Naylor, Gary R., 4,718,968, Cl. 156-400.000.

Nebel, David J.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,718,609, Cl. 241-33.000.

NEC Corporation: *See*—
Itoh, Yasuo; and Maruyama, Yuisuke, 4,719,618, Cl. 370-62.000.
Matsumoto, Takashi, 4,719,155, Cl. 428-700.000.
Natsui, Yoshinobu; and Mayumi, Hiroshi, 4,719,599, Cl. 365-201.000.
Tanaka, Hideo, 4,719,589, Cl. 364-748.000.
Yamaguchi, Masayuki, 4,719,636, Cl. 372-50.000.
Yoshimura, Osamu; and Nemoto, Masahisa, 4,719,448, Cl. 340-347.0AD.

NEC Corportion: *See*—
Denda, Akira, 4,719,367, Cl. 307-290.000.
Hara, Takeshi, 4,719,564, Cl. 364-200.000.

Neeb, Rolf: *See*—
Hohage, Heinz-Juergen; and Neeb, Rolf, 4,719,146, Cl. 428-331.000.

Neely, James W., to Rohm and Haas Company. Catalytic process and systems. 4,719,145, Cl. 428-327.000.

Negi, Tsuneo: *See*—
Kurahayashi, Sadasuke; Watanabe, Tsunehiro; Sakamoto, Masahiro; Ueno, Yasuhide; Ono, Takeshi; Miura, Shigeo; Negi, Tsuneo; and Takahashi, Masatomo, 4,719,514, Cl. 358-261.000.

Negishi, Yoshio: *See*—
Ohsaka, Yohnosuke; Tohzuka, Takashi; Takaki, Shoji; Negishi, Yoshio; and Kohno, Satoru, 4,719,052, Cl. 260-544.00F.

Neitzel, Fred J.: *See*—
Peck, Leonard E., Jr.; Neitzel, Fred J.; Sargent, Wesson P.; and McDonald, James P., 4,719,353, Cl. 250-352.000.

Nelson, James O. Stock material feed mechanism. 4,718,589, Cl. 226-142.000.

Nelson, Richard T.: *See*—
Middleton, Marc G.; and Nelson, Richard T., 4,718,830, Cl. 417-372.000.

Nemoto, Masahisa: *See*—
Yoshimura, Osamu; and Nemoto, Masahisa, 4,719,448, Cl. 340-347.0AD.

Neno, Tatsuhiko: *See*—
Hirose, Toshihiko; and Neno, Tatsuhiko, 4,718,658, Cl. 271-258.000.

Nergeco: *See*—
Kraeutler, Bernard, 4,718,471, Cl. 160-84.00R.

Nesbitt, William R. Disposable cervical immobilization means. 4,718,412, Cl. 128-87.00R.

Nest, Andreas; and Muller, Jens, to Werner Turck GmbH & Co., KG. Electronic proximity switch dependent upon a magnetic field. 4,719,362, Cl. 307-116.000.

Nestle & Fischer: *See*—
Schlemmer, Harald; and Stuhlmuller, Rainer, 4,718,171, Cl. 33-290.000.

Neumann, Peter: *See*—
Schrott, Wolfgang; and Neumann, Peter, 4,719,170, Cl. 430-270.000.

Neuroth, David H.: *See*—
Hoffman, Ernest G.; Neuroth, David H.; and Tabak, Fernando, 4,719,316, Cl. 174-88.00R.

Newman, Robert W.: *See*—
Schaefer, Daniel J.; and Newman, Robert W., 4,719,406, Cl. 324-318.000.

NGK Insulators, Ltd.: *See*—
Komoda, Tadanori, 4,719,058, Cl. 264-38.000.
Masaki, Hideyuki, 4,719,090, Cl. 422-310.000.
Nakata, Masami; and Imai, Osamu, 4,719,064, Cl. 264-61.000.
Tsuno, Nobuo; and Matsui, Minoru, 4,719,074, Cl. 419-5.000.
Tsuno, Nobuo; and Matsui, Minoru, 4,719,075, Cl. 419-5.000.

NGK Spark Plug Co., Ltd.: *See*—
Ito, Masatoshi; and Tanaka, Katsuhiko, 4,719,331, Cl. 219-270.000.

Nguyen, Anh D.; Evans, William B.; and Ballantyne, Donald G., to C-I-L Inc. High explosive compound in nitrate salt matrix. 4,718,953, Cl. 149-17.000.

Nichoalds, Donald L., to Luxor Corporation. Electrified table and support structure. 4,718,741, Cl. 312-223.000.

Nichols, William E.: *See*—
Herzog, William F.; and Nichols, William E., 4,719,644, Cl. 378-69.000.

Nicoll, Harry G., to Helix Technology Corporation. Cryogenic refrigerator compressor with externally adjustable by-pass/relief valve. 4,718,442, Cl. 137-1.000.

Niedt, Richard W.: *See*—
Lin, Nai W.; and Niedt, Richard W., 4,719,247, Cl. 521-159.000.

Nielinger, Werner; Brinkmeyer, Hermann; Binsack, Rudolf; Bottenbruch, Ludwig; and Fullmann, Heinz-Josef, to Bayer Aktiengesellschaft. Multistage process for the preparation of poly(tetramethyleneadipamide). 4,719,284, Cl. 528-335.000.

Niesyto, Hubert: *See*—
Warachim, Waclaw; Skoczynski, Wojciech; Debiec, Jan; Niesyto, Hubert; Wojtaszczyk, Marek; Wlodarczyk, Edward; Krzewinski, Roman; Zielinski, Mieczyslaw; Kowalczyk, Kazimierz; and Spychala, Andrzej, 4,718,793, Cl. 405-303.000.

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Shore, Daniel B., to J. I. Case Company. Hydraulic swing control for boom assembly. 4,718,325, Cl. 91-189.00R.
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SI Handling Systems, Inc.: *See*—
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Sicinski, Rafal R.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,719,204, Cl. 514-167.000.
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Hartl, Winfried; Oppelt, Arnulf; and Sturm, Helmut, 4,718,431, Cl. 128-653.000.
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Low, Martin; and Hertrich, Wolfgang, 4,718,538, Cl. 198-575.000.
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Silchenstedt, Albert B., to Southern Seafoods. Apparatus and method for eviscerating scallops. 4,718,145, Cl. 17-45.000.
Simelunas, William J., to Nabisco Brands, Inc. High production method for forming filled edible products. 4,719,117, Cl. 426-502.000.
Simmer, Richard C. Mobile pumping apparatus for abrasive slurries. 4,718,826, Cl. 417-234.000.
Simpson, Bobby R. Time and moisture-responsive sprinkler control system. 4,718,446, Cl. 137-78.300.
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Singheimer, Stig Ake Roland, to Duni Bila AB. Incontinence diaper. 4,718,901, Cl. 604-385.00A.
Siu, David W.: *See*—
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SKF Compagnie d'Applications Mecaniques: *See*—
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Skoog, Kurt, to Stubinen Utveckling Ab. Process and a means for burning solid fuels, preferably coal, turf or the like, in pulverized form. 4,718,359, Cl. 110-264.000.
Skotnicki, Jerauld S.; Strike, Donald P.; and Steinbaugh, Bruce A., to American Home Products Corporation. 1,7-phenanthrolines and their use as antifungal agents. 4,719,302, Cl. 546-88.000.
Sky Aluminium Co., Ltd.: *See*—
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Slay, Ronald P. Flashlight holding apparatus. 4,718,126, Cl. 2-175.000.
Slough, Carlton M., to Texaco Inc. Scale monitoring means and method. 4,718,774, Cl. 374-7.000.
Smalley, Raymond L.; and Risner, Melvin G., to REB Manufacturing, Inc. Wheelchair lift with positive automatic handrail. 4,718,812, Cl. 414-540.000.
SMH Alcatel: *See*—
Krasuski, Marek; Serruya, Michel; and Milet, Pierre, 4,718,809, Cl. 414-129.000.
Smidt, Udo. Method of reducing fatty deposits in the human body. 4,718,429, Cl. 128-400.000.
Smith, Berry E., Jr.; and Sharron, Nathan N. Electric generator for inducing current in the field coil. 4,719,380, Cl. 310-114.000.
Smith International, Inc.: *See*—
Geczy, Bela; and Toth, Robert G., 4,719,076, Cl. 419-8.000.
Smith, John C.: *See*—
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Smith, Robert M. Electronic jewelry. 4,719,544, Cl. 362-104.000.
Smith, William S., to Smith Laboratories, Inc. Chymopapain composition and method for its use. 4,719,108, Cl. 424-94.200.
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Kaiser, Carl; Kruse, Lawrence I.; and Ross, Stephen T., 4,719,223, Cl. 514-392.000.
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Sobata, Tamotsu; Takimoto, Masaaki; and Yoshida, Yuichi, to Nippon Paint Co., Ltd. Corrosion resistant, coated metal laminate, its preparation and coating materials. 4,719,038, Cl. 252-511.000.
Societa Cavi Pirelli S.p.A.: *See*—
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Societe d'Applications Generales d'Electricite, et de Mecanique SAGEM: *See*—
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Societe I.S.F. S.p.A.: *See*—
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Solar Signage, Inc.: *See*—
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Solarex Corporation: *See*—
Arya, Rajeewa R., 4,718,947, Cl. 136-258.000.
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Soma Dynamics Corporation: *See*—
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Source Technology Corporation: *See*—
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Spannuth, Robert J.; and Damon, Robert A., to James River Corporation of Nevada. Spent pulping liquor recovery process. 4,718,978, Cl. 162-29.000.
Sparks, Bryan D.; Meadus, F. Weldon; and Hoefele, Enrique O., to Canadian Patents and Development Ltd. Solvent extraction spherical agglomeration of oil sands. 4,719,008, Cl. 208-390.000.
Sparrowhawk, Bryan L.: *See*—
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Spater, Stuart S.: *See*—
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Specktor, John; and Specktor, Gerald A., to Shim-A-Line, Inc. Device for adjusting toe of a vehicle wheel. 4,718,691, Cl. 280-661.000.
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Sprague, Robert A.; Hecht, David L.; and Flores, L. Prasadam, to Xerox Corporation. Interpixel null suppression for polarized optical image bars. 4,718,752, Cl. 350-385.000.
Sproch, James D.; and Herman, Morton B., to Standard Microsystems Corporation. Video dot intensity balancer. 4,719,456, Cl. 340-728.000.
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Standard Microsystems Corporation: *See*—
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Staudenmayer, William J.; and Regan, Michael T., to Eastman Kodak Company. Multi-active photoconductive insulating elements exhibiting far red sensitivity. 4,719,163, Cl. 430-58.000.
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Schoonover, Kevin G., 4,718,456, Cl. 137-625.370.
Stebleton, Leo F., to Dow Corning Corporation. Neutralization of catalyst in polymerization of polydiorganosiloxane. 4,719,276, Cl. 528-24.000.
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Steer, John E., to Allied Corporation. Fast fill valving mechanism for a master cylinder. 4,718,234, Cl. 60-562.000.
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Stewart, Edward T. Male erecting device. 4,718,411, Cl. 128-79.000.
Stewart, Robert B., to Shell Oil Company. Method of drilling a borehole. 4,718,503, Cl. 175-70.000.
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Stoppels, Doeko; and Van Hoof, Leonardus A. H., to U.S. Philips Corporation. Magnetic head having a core of Mn-Zn-Co ferrous ferrite. 4,719,148, Cl. 428-336.000.

Storkebaum, Christoph; and Tegtmeier, Uwe, to Starcosa GmbH. Pervaporization method and apparatus. 4,719,016, Cl. 210-640.000.
Storr, Bernard, to Coulter Electronics, Ltd. Porosimeter and methods of assessing porosity. 4,718,270, Cl. 73-38.000.
Strait, Ross W., Jr., to Times Fiber Communmications, Inc. Optical fiber connector. 4,718,745, Cl. 350-96.210.
Strait, Ross W., Jr., to Times Fiber Communications, Inc. Coaxial cable with coil supported braid structure. 4,719,320, Cl. 174-106.00R.
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Streifer, William; Cross, Peter; and Scifres, Donald R., to Spectra Diode Laboratories, Inc. Semiconductor laser array with fault tolerant coupling. 4,719,634, Cl. 372-46.000.
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Strobel, Klaus; Schwarzmeier, Karl; and Buhler, Eugen, to Hutschenreuther AG; and Buhler, Eugen. Process and molding press for producing flat moldings. 4,719,070, Cl. 264-319.000.
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Stude, Rodney C. Fishing spear tip. 4,718,189, Cl. 43-6.000.
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Stumpf, William E.; Chadwick, Donald T.; and Gezon, Bruce R., to Herman Miller, Inc. Reclining chair. 4,718,716, Cl. 297-85.000.
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Sugimoto, Yoshiaki; Ohmura, Kazumi; Matsumoto, Masaaki; Terajima, Hisaharu; and Kozakura, Nobuto, to Tsubakimoto Chain Co. Frictional transmission chain. 4,718,881, Cl. 474-242.000.
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Sugiura, Yuzuru; and Miwa, Akihiko, to Aisin Seiki Kabushiki Kaisha. Tandem brake booster. 4,718,326, Cl. 91-369.00A.
Suhr, Heinz-Peter; and Weinberger, Bernd, to August Froscher G.m.b.H. & Co. K.G., Firma. Support-and adjusting device for seat and backrest on a work chair. 4,718,725, Cl. 297-300.000.
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Morscher, Erwin W., 4,718,916, Cl. 623-23.000.
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Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Okamura, Haruki; and Shionoya, Masahisa, 4,719,257, Cl. 524-108.000.
Takahashi, Yukoh; Maegawa, Yuzo; Yamamoto, Hiroki; Kaneoya, Tatsuo; Okamura, Haruki; Yachigo, Shinichi; and Ishii, Tamaki, 4,719,037, Cl. 252-401.000.
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Sun Drilling Products Corporation: *See*—
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Sun Microsystems, Inc.: *See*—
Ludemann, James J.; and Bechtolsheim, Andreas, 4,719,569, Cl. 364-200.000.
Sundet, Sherman A., to Du Pont de Nemours, E. I., and Company. Extractant-surfactant post-treatments of permselective composite membranes. 4,719,062, Cl. 264-41.000.
Sunds Defibrator, AB: *See*—
Bystedt, Hjalmar S. I., 4,718,611, Cl. 241-43.000.
Carlsson, Bengt J.; and Larsson, Rolf T., 4,718,843, Cl. 425-371.000.
Sundstrand Data Control, Inc.: *See*—
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Suomala, John E.; and Duga, Robert J., to Emhart Industries, Inc. Internally cooled gob chute. 4,718,933, Cl. 65-327.000.
Sutton, Stephen J.; Creager, John E.; and Kostelic, Richard F., to General Motors Corporation. Fuel pump. 4,718,827, Cl. 417-244.000.
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Zhenjun, Huang; and Jianzhen, Wang, 4,719,535, Cl. 361-232.000.
Suzuki, Haruo: *See*—
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Suzuki, Hideyuki: *See*—
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Suzuki, Hiroshi; Okuyama, Shigeaki; Ueda, Yoshihiro; Yukishige, Yoshifumi; and Hayashi, Masahiko, to Kubota, Ltd. Fruit harvesting apparatus. 4,718,223, Cl. 56-328.100.
Suzuki, Masayuki: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,718,758, Cl. 354-173.110.
Suzuki, Migaku; Kobayashi, Toshio; and Imai, Shigeo, to Uni-Charm Corporation. Method for producing patterned non-woven fabric. 4,718,152, Cl. 28-104.000.
Suzuki, Motoyuki: *See*—
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Suzuki, Nobuo: *See*—
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Suzuki, Seiko; Miki, Masayuki; Sasayama, Takao; Suzuki, Toshitaka; Sato, Nobuo; Ueno, Sadayasu; and Ikegami, Akira, to Hitachi, Ltd. Air-fuel ratio detector. 4,718,999, Cl. 204-406.000.
Suzuki, Sobei: *See*—
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Suzuki, Toshitaka: *See*—
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Suzuki, Yoshikazu; and Unuma, Hidero, to Agency of Industrial Science and Technology. Method for the preparation of an alloy of nickel and titanium. 4,719,077, Cl. 419-23.000.
Svenska Utvecklings AB: *See*—
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Swanson, John F. Locking system for gas cylinders. 4,718,569, Cl. 220-212.000.
Swartz, Charles J.: *See*—
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Sweeney, Christopher L.: *See*—
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Swenson, Roy S.; MacDonald, Donald M.; and Ring, Michael, to International Paper Company. Bleached kraft paperboard by densification and heat treatment. 4,718,981, Cl. 162-206.000.
Swenson, Roy S.; Hall, F. Keith; MacDonald, Donald M.; and Ring, Michael, to International Paper Company. Densification and heat treatment of paperboard produced from SCMP and other sulfite pulps. 4,718,982, Cl. 162-206.000.
Swincer, Richard N.: *See*—
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Swingline Inc.: *See*—
Chrzanowski, John G.; and Jaworski, Janice A., 4,718,545, Cl. 206-45.150.
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Swope, David C.: *See*—
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Syndet Products, Inc.: *See*—
Gorra, William; O'Neil, Kenneth J.; and Dawson, Jeffrey S., 4,718,439, Cl. 134-57.00R.
Sypniewski, James M.: *See*—
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Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrosa, William P., 4,718,609, Cl. 241-33.000.
Tabak, Fernando: *See*—
Hoffman, Ernest G.; Neuroth, David H.; and Tabak, Fernando, 4,719,316, Cl. 174-88.00R.
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Tachihara, Maseyoshi; Hirasawa, Shinichi; Ikeda, Masami; Aosi, Akira; and Komuro, Hirokazu, to Canon Kabushiki Kaisha. Heat generating resistor, recording head using such resistor and drive method therefor. 4,719,478, Cl. 346-140.00R.
Taguri, Junichi: *See*—
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Tahara, Toshiro; Uchiyama, Kaoru; Yamazaki, Seiichi; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. Photosensitive material guide structure for developing apparatus. 4,719,484, Cl. 354-320.000.
Taiho Pharmaceutical Company Limited: *See*—
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Taillebois, Jacques; Renaud, Jean-Marie; Perrot, Jean-Claude; and Gamba, Paul, to M.C.B. Optical position locating apparatus with bidirectional light transmission. 4,719,346, Cl. 250-231.05E.
Taiyo Sanso Kabushiki Kaisha: *See*—
Itoh, Fumio; Sasaki, Tutomu; Kanoh, Ikuhisa; and Fukumoto, Takaaki, 4,719,088, Cl. 422-106.000.
Takafuji, Hideo; Ishida, Tsugio; and Sekiguchi, Shoichi, to Nippon Steel Corporation. Method and apparatus of evaluating mechanical properties of steel. 4,719,583, Cl. 364-506.000.
Takahara, Shigeru: *See*—
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Takahashi, Akira: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirogane, Junji; and Murakami, Yoshiteru, 4,719,137, Cl. 428-67.000.
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Takahashi, Masato: *See*—
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Takahashi, Naoyuki: *See*—
Fukuwatari, Ichiro; Watanabe, Seiji; Takahashi, Naoyuki; Nitta, Takahisa; and Saito, Yoshio, 4,718,539, Cl. 198-619.000.
Takahashi, Shiro, to Man Design Co., Ltd. Electromagnetic reciprocating pump. 4,718,832, Cl. 417-417.000.
Takahashi, Tadao: *See*—
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Takahashi, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Fuel injector for use in an internal combustion engine. 4,718,384, Cl. 123-447.000.
Takahashi, Tohru: *See*—
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Takahashi, Yukoh; Maegawa, Yuzo; Yamamoto, Hiroki; Kaneoya, Tatsuo; Okamura, Haruki; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. Piperidine derivatives, production process therefor, and stabilizers for organic substances containing said derivatives as an active component. 4,719,037, Cl. 252-401.000.
Takahashi, Yutaka: *See*—
Sasaki, Masahiko; Kato, Shinichi; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,719,508, Cl. 358-98.000.
Takaki, Shoji: *See*—
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Takase, Iwao; Yoshida, Toshimi; Ikeda, Shinzo; Masaoka, Isao; and Nakajima, Junjiro, to Hitachi, Ltd. Method of producing a cladding tube for reactor fuel. 4,718,949, Cl. 148-11.50F.
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Takaya, Takao; Masugi, Takashi; Ogino, Takashi; Takasugi, Hisashi; and Yamanaka, Hideaki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,719,206, Cl. 514-202.000.
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Takeuchi, Mikio; Nakano, Kimichiro; and Hirano, Motoki, to Nissan Motor Company, Limited. Keyless entry system for automotive vehicle devices with theft-prevention feature. 4,719,460, Cl. 340-825.310.
Takeuchi, Tomio: *See*—
Umezawa, Hameo; Takeuchi, Tomio; Aoyagi, Takaaki; Hachisu, Mitsugu; Hirayama, Maeao; Murata, Shinjiro; and Fukatsu, Shunzo, 4,719,231, Cl. 514-513.000.
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Tamura, Paul S.; Hadley, Ted A.; and Kelsey, Wayne R., to Oximetrix, Inc. Fluid infusion pumping apparatus. 4,718,576, Cl. 222-63.000.
Tamura, Toshinari; Yoshida, Makoto; Tsukamoto, Shin-ichi; Iwamoto, Hidenori; Yamamoto, Minoru; and Kagami, Soichi, to Yamanouchi Pharmaceutical Co., Ltd. CNS active substituted azetidinone compounds. 4,719,207, Cl. 514-210.000.
Tan, Sherman M., to Advanced Micro Devices, Inc. Output state protection network for D-type flip-flop. 4,719,366, Cl. 307-272.200.
Tanaka, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Device for controlling ignition timing in internal combustion engine. 4,718,382, Cl. 123-425.000.
Tanaka, Hideo, to NEC Corporation. Floating-point adder circuit. 4,719,589, Cl. 364-748.000.
Tanaka, Junsuke; Inage, Ikuo; and Hyugaji, Teruo, to Mitsui Toatsu Chemicals Incorporated. Catheter with pressure sensor. 4,718,425, Cl. 128-673.000.
Tanaka, Katsuhiko: *See*—
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Tanaka, Yoko: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,719,204, Cl. 514-167.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,719,205, Cl. 514-167.000.
Tanemori, Nozomu: *See*—
Yamauchi, Takao; Nishimoto, Kyoya; and Tanemori, Nozomu, 4,718,242, Cl. 62-467.000.
Tanimura, Tsugio: *See*—
Hoshino, Noriyuki; and Tanimura, Tsugio, 4,718,808, Cl. 414-37.000.
Tanino, Masaharu; and Ogiso, Masaru, to Toyota Jidosha Kabushiki Kaisha. Vehicle support structure for a detachable roof. 4,718,714, Cl. 296-214.000.
Tank, David W.: *See*—
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Tayco Developments, Inc.: *See*—
Taylor, Douglas, 4,718,648, Cl. 267-64.130.
Taylor, Douglas, to Tayco Developments, Inc. Tension-compression liquid spring unit. 4,718,648, Cl. 267-64.130.
Taylor, Lawrence H. Dwelling construction. 4,718,205, Cl. 52-79.800.
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Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,719,151, Cl. 428-428.000.

Technet Corporation: *See*—
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Tegtmeier, Uwe: *See*—
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Tektronix, Inc.: *See*—
Bos, Philip J., 4,719,507, Cl. 358-92.000.
Carlton, Dale E., 4,719,408, Cl. 324-57.0PS.
Garuts, Valdis E., 4,719,447, Cl. 340-347.0AD.
Wood, Brian J., 4,718,861, Cl. 439-460.000.
Tele-Cue Limited: *See*—
Desmond, Peter A.; and Rich, James S., 4,718,671, Cl. 273-68.000.
Teledyne Industries, Inc.: *See*—
Rogo, Casimir; and Lenz, Herman N., 4,718,819, Cl. 415-149.00R.
Temme, Helmut; and Redder, Manfred, to Gewerkschaft Eisenhutte Westfalia. Fixing of attachments to the side walls of the pans of scraper-chain conveyors. 4,718,542, Cl. 198-735.000.
Temple University-of the Commonwealth System of Higher Education: *See*—
Salomon, Robert E., 4,719,158, Cl. 429-50.000.
Tengler, John N.: *See*—
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Terashima, Tutomu; Kawasaki, Hiroyuki; and Takahashi, Tadao, to Tone Boring Co., Ltd. Trench excavator. 4,718,504, Cl. 175-96.000.
Tervola, Pentti J. Driving and steering system. 4,718,508, Cl. 180-6.440.
Terwonne, Rolf-Walter: *See*—
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Tessier, Martin M.: *See*—
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Tetra Pak Finance & Trading S.A.: *See*—
Popp, Herwig; Soukup, Franz; and Reil, Wilhelm, 4,718,598, Cl. 229-52.00A.
Texaco Inc.: *See*—
Brown, Alfred; Fontaine, Marc F.; and Hight, Margaret A., 4,718,485, Cl. 166-50.000.
Slough, Carlton M., 4,718,774, Cl. 374-7.000.
Texaconc Company, The: *See*—
Wheeler, Wallace T., 4,718,170, Cl. 33-228.000.
Texas Instruments Incorporated: *See*—
Bowling, Robert A.; Larrabee, Graydon B.; and Liu, Benjamin Y. H., 4,718,975, Cl. 156-643.000.
DeFilippis, Pietro; Salvatore, Amedeo; and Biscione, Marios, 4,718,166, Cl. 29-845.000.
Meyers, Victor; and Reise, Michael, 4,719,355, Cl. 250-425.000.
Scott, Bentley N.; and Brehm, Geilon E., 4,719,434, Cl. 333-32.000.
Thalenfeld, David R.; and Glickman, Joel I., to Trion Industries, Inc. Display device with label mount or the like. 4,718,626, Cl. 244-225.105.
Thein, Peter F.; and Buchberger, Gregory, to Morgan Electronics. Telephone message retrieval system with improved processor and retrieval console. 4,719,647, Cl. 379-68.000.
Theriault, Robert E.: *See*—
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Thermex Energy Corporation: *See*—
Machacek, Oldrich; Gehrig, Neil E.; and Eck, Gary R., 4,718,954, Cl. 149-46.000.
Theurer, Josef; and Gruber, Leopold R., to Franz Plasser Bahnbaumaschinen Industrie-Gesellschaft m.b.H. Rescue vehicle with emergency engine actuation. 4,718,352, Cl. 105-62.100.
Thiel, Manfred, to Gebr. Happich GmbH. Method and apparatus for forming end pieces on plastic molding strips. 4,719,067, Cl. 264-259.000.
Thomas A. Schutz Co., Inc.: *See*—
Eckert, Ronald P., 4,718,561, Cl. 211-13.000.
Thomas & Betts Corporation: *See*—
Sadigh-Behzadi, Amir-Akbar, 4,718,863, Cl. 439-496.000.
Thomas, Walter A. Low calorie dairy snack product. 4,719,118, Cl. 426-580.000.
Thomfohrde, Heiner: *See*—
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Thompson, Malcolm J.: *See*—
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Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., to Loctite Corporation. Cyanoacrylate fingerprint development method. 4,719,119, Cl. 427-1.000.
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Berland, Robert; and Dumont, Bernard, 4,718,163, Cl. 29-837.000.
Chabah, Maurice, 4,719,463, Cl. 342-43.000.
d'Humieres, Etienne; Bernet, Jean M.; and Esmurian, Cregoire, 4,719,412, Cl. 324-77.00K.
Gendreu, Robert, 4,719,464, Cl. 342-149.000.
Leterme, Dominique; and Le Merer, Jean-Pierre, 4,719,614, Cl. 369-110.000.
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Catherall, Colin L. R., 4,719,387, Cl. 313-486.000.
Thornber, Karvel K.: *See*—
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Thornton, John, to British Aerospace. De-contaminated fluid supply apparatus and cryogenic cooling systems using such apparatus. 4,718,251, Cl. 62-475.000.
Thornton, Spencer P., to Eye Technology, Inc. Intraocular lens for capsular bag implantation. 4,718,904, Cl. 623-6.000.
Thrall Car Manufacturing Co.: *See*—
Schaller, James J.; and Gramse, Harold E., 4,718,353, Cl. 105-406.100.
Thrasse, David T.: *See*—
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Threewitt, N. Bruce; and Madewell, Jimmy R., to Advanced Micro Devices, Inc. Apparatus for generating digital timing waveforms. 4,719,593, Cl. 364-900.000.
Thulig, Werner: *See*—
Braun, Dieter; Moller, Werner; and Thulig, Werner, 4,718,720, Cl. 297-216.000.
Thunig, Dieter; and Terwonne, Rolf-Walter, to Huels Aktiengesellschaft. Process for the production of a pourable polyvinyl chloride with high proportions of acrylate elastomers. 4,719,265, Cl. 525-243.000.
Thurow, Gerhard: *See*—
Pohlmann, Klaus; Muller, Konrad; Voss, Hartwig; Drescher, Gunter; and Thurow, Gerhard, 4,718,649, Cl. 267-64.240.
Thyssen Industrie Aktiengesellschaft: *See*—
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TIF Instruments, Inc.: *See*—
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Tighe, Charles L., Jr., to AMP Incorporated. Spiral configuration ribbon coaxial cable. 4,719,319, Cl. 174-103.000.
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Times Fiber Communications, Inc.: *See*—
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Times Fiber Communications, Inc.: *See*—
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Tinier, Jean-Michel F.: *See*—
Halcoussy, Hubert T.; and Tixier, Jean-Michel F., 4,718,680, Cl. 277-212.0FB.
Ton Nenryo Kogyo Kabushiki Kaisha: *See*—
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Toby, Edward P., to Toby Enterprises. Stack storage elevator for sliced, stacked comestible products. 4,718,536, Cl. 198-469.100.
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Toby, Edward P., 4,718,536, Cl. 198-469.100.
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Todd, Harry; and Carr, Eric, to Lucas Industries Public Limited Company. Liquid fuel combustor. 4,718,238, Cl. 60-746.000.
Toho, Makoto, to Matsushita Electric Works, Ltd. Photoconverter and lamp utilizing multi-quantum emission. 4,719,386, Cl. 313-485.000.
Tohoku Electric Power Company, Incorporated: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Miura, Kimio; Mitsui, Kiyoo; and Mitamura, Koichi, 4,719,551, Cl. 363-41.000.
Tohzuka, Takashi: *See*—
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Tokai Communication Industry Co., Ltd.: *See*—
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Nakajima, Kichio; Honma, Kazuo; and Tokairin, Hiroaki, 4,718,329, Cl. 91-445.000.
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Tokunoh, Futoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and a process of producing same. 4,719,500, Cl. 357-38.000.
Tokyo Gas Housing Company, Ltd.: *See*—
Kitamura, Ryuzo; Shindo, Masami; Miyasaga, Masamichi; and Fukuda, Yoshimichi, 4,718,131, Cl. 4-663.000.
Tokyo Rope Manufacturing Co., Ltd.: *See*—
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Toomey, Jeffery M.; and Toomey, John J., to Sausar Holdings Pty. Limited. Trencher with adjustable chisel. 4,718,182, Cl. 37-98.000.
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Toomey, Jeffery M.; and Toomey, John J., 4,718,182, Cl. 37-98.000.
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Toray Silicone Co., Ltd.: *See*—
Shimizu, Koji; Wakita, Haruki; and Hamada, Mitsuo, 4,719,130, Cl. 427-380.000.
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Toto Ltd.: *See*—
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Toulhoat, Herve ; and Berrebi, Georges, to Europeenne de Retraitement de Catalyseurs (Eurecat). Process for presulfurizing a hydrogen treatment catalyst. 4,719,195, Cl. 502-216.000.
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Hayakawa, Yoichi; Kawai, Masao; Nishikawa, Seiichi; and Fukumura, Kagenori, 4,718,311, Cl. 74-868.000.
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Iwamura, Tooru; and Yoshikawa, Hirokazu, 4,718,710, Cl. 296-37.100.
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Shindo, Yoshio; and Iwatsuki, Kunihiro, 4,718,310, Cl. 74-867.000.
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Tanino, Masaharu; and Ogiso, Masaru, 4,718,714, Cl. 296-214.000.
Traas, Petrus C.; and Roehl, Ernst-Ludwig, to Naarden International N.V. Process for the preparation of air-freshener gels. 4,719,040, Cl. 512-4.000.
Traex Corporation: *See*—
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Trammell, Bernadette A.: *See*—
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Treadgold, Desmond A.: *See*—
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Treiber, Laszlo R.: *See*—
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Tressler, John H., III, to Honeywell Inc. Phase retarding laser radiation detection system. 4,719,343, Cl. 250-203.00R.
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Trudeau, William H., to O & S Manufacturing Company. Sealed compound bearing. 4,718,779, Cl. 384-206.000.
Trudeau, William H., to O & S Manufacturing Company. Sealed compound bearing and method for making the same. 4,718,780, Cl. 384-206.000.
Tsai, John J.; and Tessler, Martin M., to National Starch and Chemical Corporation. Monomeric cationic glycoside derivatives. 4,719,272, Cl. 526-238.200.
Tsai, Ming-Jong, to Hewlett-Packard Company. High efficiency light-emitting diode. 4,719,497, Cl. 357-17.000.
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Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Instrument for concurrently measuring ultra-high-speed light signals on a plurality of channels. 4,718,761, Cl. 356-318.000.
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Tsuno, Nobuo; and Matsui, Minoru, to NGK Insulators, Ltd. Metal-ceramic composite article and a process for manufacturing the same. 4,719,075, Cl. 419-5.000.
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Tsutsumi, Masaru; Hagino, Hideo; Fujiwara, Osamu; and Goto, Hitoshi, to Sanyo Electric Co., Ltd. Fuel cell stack assembly. 4,719,157, Cl. 429-34.000.
Tuan, Hsing C.; and Thompson, Malcolm J., to Xerox Corporation. Electrographic ion writing head driver system. 4,719,481, Cl. 346-159.000.
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Tulip, John. Carbon dioxide slab laser. 4,719,639, Cl. 372-66.000.
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Turpin, Edward T.; and Thrane, David T., to Glidden Company, The. Self-curable benzoxazine functional cathodic electrocoat resins and process. 4,719,253, Cl. 523-403.000.
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Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Hachisu, Mitsugu; Hirayama, Masao; Murata, Shinjiro; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 3-[N-(mercaptoacyl)-]amino-4-arylbutanoic acid derivatives and an analgesic agent comprising the same. 4,719,231, Cl. 514-513.000.

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Honig, Emanuel M.; and Nunnally, William C., 4,718,322, Cl. 89-1.000.
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van Boeckel, Constant A. A.; and Beetz, Tom, to Akzo N.V. Disaccharide and trisaccharide derivatives of the "Lipid A" type. 4,719,202, Cl. 514-61.000.
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Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., to GTE Products Corporation. Recovery of tungsten, scandium, iron, and manganese from tungsten bearing material. 4,718,995, Cl. 204-112.000.
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Van Der Stoel, Roland E., to Stamicarbon B. V. Process for preparing pyrimidine. 4,719,299, Cl. 544-242.000.
Vanderwerf, Dennis F., to Minnesota Mining and Manufacturing Company. Illumination system for overhead projector. 4,719,547, Cl. 362-299.000.
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Van Laar, Hermanus G., to Shell Oil Company. Process for passing carbon dioxide through a cased, cemented and perforated well. 4,718,492, Cl. 166-295.000.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JANUARY, 1988

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Coppens, Anton: *See*—
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167 4,719,009
546 4,718,558
571 4,718,559
656 4,718,560

CLASS 210

189 4,719,010
198.2 4,719,011
232 4,719,012
510.1 4,719,013
512.1 4,719,014
[illegible] 4,719,015
[illegible] 4,719,016
656 4,719,017
748 4,719,018
752 4,719,019
[illegible] 4,719,020

CLASS 211

13 4,718,561
94.5 4,718,562

CLASS 212

142.1 4,718,563
179 4,718,564

CLASS 215

1 C 4,718,565
13.1 4,718,566
216 4,718,567

CLASS 219

10 55 B 4,719,326
69 C 4,719,327
79 4,719,328
121 LD 4,719,329
146.32 4,719,330
270 4,719,331
388 4,719,332
400 4,719,333
518 4,719,334
528 4,719,335
[illegible] 4,719,336

CLASS 220

[illegible] H 4,718,568
212 4,718,569
253 4,718,570
270 4,718,571
324 4,718,572

CLASS 221

202 4,718,573
203 4,718,574

CLASS 222

53 4,718,575
63 4,718,576
105 4,718,577
108 4,718,578
129.4 4,718,579
600 4,718,580

CLASS 223

96 4,718,581

CLASS 224

42.21 4,718,582
42.42 4,718,584
42.42 R 4,718,583
238 4,718,585
252 4,718,586
328 4,718,587

CLASS 226

127 4,718,588
142 4,718,589

CLASS 227

67 4,718,590

CLASS 228

1.1 4,718,591
47 4,718,592
123 4,718,593

CLASS 229

1.5 B 4,718,595
1.5 H 4,718,594
52 A 4,718,598
52 B 4,718,597
109 4,718,596

CLASS 235

7 R 4,719,337
380 4,719,338

CLASS 236

46 R 4,718,599

CLASS 237

2 A 4,718,600
16 4,718,601
32 4,718,602

CLASS 238

[illegible] 4,718,603
349 4,718,604

CLASS 239

242 4,718,605
251 4,718,606
451 4,718,607
542 4,718,608

CLASS 241

33 4,718,609
37.5 4,718,610
43 4,718,611
55 4,718,612
60 4,718,613
189 R 4,718,614

CLASS 242

18 DD 4,718,615
55.1 4,718,616
84.2 G 4,718,617
129 4,718,633
195 4,718,618

CLASS 244

35 R 4,718,619
130 4,718,620

CLASS 246

122 R 4,718,621
169 R 4,718,622

CLASS 248

102 4,718,623
158 4,718,624
222.1 4,718,625
225.1 4,718,626
4,718,627
354.3 4,718,628
363 4,718,629
444.1 4,718,630
615 4,718,631
[illegible] 4,718,632

CLASS 250

201 4,719,340
4,719,341
4,719,342
203 R 4,719,343
4,719,344
211 J 4,719,345
221 4,719,339
231 R 4,719,347
231 SE 4,719,346
238 4,719,348
288 4,719,349
330 4,719,350
339 4,719,351
351 4,719,352
352 4,719,353
385 4,719,354
425 4,719,355
484.1 4,719,356
548 4,719,357
551 4,719,358
573 4,719,359
574 4,719,360

CLASS 251

117 4,718,634
129.18 4,718,635
145 4,718,636
158 4,718,637
297 4,718,638
366 4,718,639

CLASS 252

8.514 4,719,021
35 4,719,022
39 4,719,023
49.6 4,719,024
56 S 4,719,025
62.54 4,719,026
4,719,027
70 4,719,028
78.1 4,719,029
133 4,719,030
174.11 4,719,041
180 4,719,031
299 63 4,719,032
301.4 R 4,719,033
[illegible] 4,719,034
390 4,719,035
391 4,719,036
[illegible] 4,719,037
511 4,719,038
4,719,039
548 4,719,044
[illegible] 4,719,045

CLASS 254

45 4,718,640

CLASS 256

8 4,718,641
24 4,718,642

CLASS 260

397.4 4,719,054
501.12 4,719,055
501.18 4,719,047
4,719,048
4,719,049
502.5 C 4,719,050
505 R 4,719,051
544 F 4,719,052
544 S 4,719,053

CLASS 261

80 4,719,056
81 4,719,057

CLASS 264

38 4,719,058
40.1 4,719,059
40.2 4,719,060
4,719,061
4,719,071
41 4,719,062
45 2 4,719,063
61 4,719,064
135 4,719,065
211 4,719,066
259 4,719,067
263 4,719,068
296 4,719,069
319 4,719,070
515 4,719,072

CLASS 266

44 4,718,643
99 4,718,644
142 4,718,645
242 4,718,646

CLASS 267

64.11 4,718,647
64.13 4,718,648
64.24 4,718,649
64.27 4,718,650

CLASS 269

[illegible] 4,718,651
296 4,718,652
327 4,718,653

CLASS 270

52.5 4,718,654

CLASS 271

3.1 4,718,655
4,718,656
[illegible] 4,718,657
258 4,718,658
259 4,718,659
305 4,718,660

CLASS 272

1 B 4,718,661
95 4,718,662
118 4,718,663
130 4,718,664
132 4,718,665
137 4,718,666

CLASS 273

1 GC 4,718,667
29 A 4,718,668
29 R 4,718,669
61 R 4,718,670
68 4,718,671
143 R 4,718,672
162 E 4,718,673
186 C 4,718,674
243 4,718,675
324 4,718,676
412 4,718,677

CLASS 277

1 4,718,678
112 4,718,679
212 FB 4,718,680

CLASS 279

[illegible] 4,718,681
116 4,718,682

CLASS 280

6 R 4,718,683
20 4,718,684
91 4,718,685
95 R 4,718,686
[illegible] 4,718,687
278 4,718,688
289 WC 4,718,689
480 4,718,690
[illegible] 4,718,694
[illegible] 4,718,691
707 4,718,695
713 4,718,692
718 4,718,693
[illegible] 4,718,696

CLASS 283

107 4,718,697

CLASS 285

12 4,718,699
21 4,718,698
91 4,718,701
114 4,718,702
156 4,718,700
158 4,718,703

CLASS 290

45 4,719,361

CLASS 292

169 4,718,704
201 4,718,705
337 4,718,706

CLASS 294

1.4 4,718,707
57 4,718,708
106 4,718,709

CLASS 296

37.1 4,718,710
136 4,718,711
192 4,718,712
4,718,713
214 4,718,714

CLASS 297

32 4,718,715
85 4,718,716
135 4,718,717
180 4,718,718
216 4,718,719
4,718,720
219 4,718,721
250 4,718,722
265 4,718,723
284 4,718,724
300 4,718,725
313 4,718,726
458 4,718,727

CLASS 299

17 4,718,728
18 4,718,729
75 4,718,730
[illegible] 4,718,731

CLASS 301

36 R 4,718,732

CLASS 303

2 4,718,733
24 R 4,718,734
93 4,718,735
111 4,718,736
114 4,718,737

CLASS 307

116 4,719,362
117 4,719,363
141 4,719,364
269 4,719,365
272.2 4,719,366
290 4,719,367
442 4,719,368
443 4,719,369
446 4,719,370
455 4,719,371
475 4,719,372
570 4,719,373
571 4,719,374
600 4,719,375

CLASS 310

29 4,719,376
[illegible] 4,719,377
67 R 4,719,378
71 4,719,379
114 4,719,380
166 4,719,381
187 4,719,382
324 4,719,383
343 4,719,384

CLASS 312

184 4,718,739
[illegible] 4,718,740
223 4,718,741

CLASS 313

463 4,719,385
485 4,719,386
486 4,719,387

CLASS 315

169.1 4,719,388
4,719,389
246 4,719,390
368 4,719,391
371 4,719,392
397 4,719,393
[illegible] 4,719,394

CLASS 318

349 4,719,395
432 4,719,396
567 4,719,397
778 4,719,398
[illegible] 4,719,399
811 4,719,400

CLASS 320

13 4,719,401

CLASS 323

211 4,719,402
234 4,719,403
297 4,719,404
352 4,719,405

CLASS 324

57 PS 4,719,408
60 CD 4,719,409
73 R 4,719,410
4,719,411
77 B 4,719,413
77 K 4,719,412
95 4,719,414
96 4,719,415

121 R 4,719,416
[illegible] P 4,719,417
158 R 4,719,418
208 4,719,419
4,719,420
233 4,719,421
238 4,719,422
303 4,719,423
309 4,719,424
316 4,719,425
318 4,719,406
345 4,719,426
427 4,719,427
436 4,719,428
546 4,719,407

CLASS 328

65 4,719,429

CLASS 330

265 4,719,430
273 4,719,431

CLASS 331

66 4,719,432

CLASS 333

12 4,719,433
32 4,719,434
224 4,719,435
252 4,719,436

CLASS 335

18 4,719,437
38 4,719,438
210 4,719,439

CLASS 336

192 4,719,440

CLASS 338

20 4,719,441
25 4,719,442
314 4,719,443

CLASS 340

52 R 4,719,445
71 4,719,444
310 A 4,719,446
347 AD 4,719,447
4,719,448
347 DD 4,719,450
4,719,451
347 P 4,719,449
384 E 4,719,452
568 4,719,453
574 4,719,454
709 4,719,455
728 4,719,456
784 4,719,457
825.31 4,719,460
825.5 4,719,458
825.57 4,719,461
825.800 4,719,459

CLASS 342

20 4,719,462
43 4,719,463
149 4,719,464
151 4,719,465
159 4,719,466
179 4,719,467
201 4,719,468
434 4,719,469

CLASS 343

700 MS 4,719,470
792 4,719,471

CLASS 346

76 PH 4,719,473
108 4,719,474
140 R 4,719,472
4,719,475
4,719,476
4,719,477
4,719,478
4,719,479
4,719,480
159 4,719,481

CLASS 350

91 4,719,482
96.20 4,718,744
96.21 4,718,745
4,718,746
96.23 4,718,747
96.30 4,718,748
99 4,718,743
163 4,718,749
255 4,718,750
336 4,718,751
385 4,718,752
503 4,718,753
574 4,718,754
584 4,718,755
600 Re.32,576
616 4,718,756

CLASS 354

76 4,718,757
173.11 4,718,758
310 4,719,483
320 4,719,484
400 4,719,485
408 4,719,486
481 4,719,487

CLASS 355

1 4,719,488
3 FU 4,719,489
6 4,719,490
14 R 4,719,491
52 4,719,492
67 4,719,493
77 4,719,494
100 4,719,495

CLASS 356

152 4,718,759
237 4,718,760
318 4,718,761
319 4,718,762
326 4,718,763
328 4,718,764
346 4,718,765
350 4,718,766
381 4,718,767
402 4,718,768

CLASS 357

4 4,719,496
17 4,719,497
30 4,719,498
4,719,499
38 4,719,500
59 4,719,501
72 4,719,502

CLASS 358

12 4,719,503
13 4,719,504
19 4,719,505
80 4,719,506
92 4,719,507
98 4,719,508
112 4,719,509
147 4,719,510
213.18 4,719,512
213.19 4,719,511
254 4,719,513
261 4,719,514
268 4,719,515
296 4,719,517
310 4,719,519
330 4,719,518
780 4,719,516

CLASS 360

20 4,719,520
32 4,719,521
38.1 4,719,522
51 4,719,523
73 4,719,524
77 4,719,525
97 4,719,526
121 4,719,527
130.24 4,719,528
132 4,719,529

CLASS 361

66 4,719,530
86 4,719,531
189 4,719,532
230 4,719,533
232 4,719,534
4,719,535
238 4,719,536
273 4,719,537
283 4,719,538
307 4,719,539
377 4,719,540
407 4,719,541
417 4,719,542

CLASS 362

80 4,719,543
104 4,719,544
240 4,719,545
260 4,719,546
299 4,719,547
309 4,719,548
398 4,719,549

CLASS 363

37 4,719,550
41 4,719,551
44 4,719,552
49 4,719,553
51 4,719,554
56 4,719,555
4,719,556
79 4,719,557
98 4,719,558
4,719,559
150 4,719,560

CLASS 364

148 4,719,561
200 4,719,562
4,719,563
4,719,564
4,719,565
4,719,566
4,719,567
4,719,568
4,719,569
4,719,570
300 4,719,571
431.05 4,719,572
431.07 4,719,573
468 4,719,574
469 4,719,575
470 4,719,576
474 4,719,577
4,719,578
4,719,579
483 4,719,580
485 4,719,581
498 4,719,582
506 4,719,583
516 4,719,584
518 4,719,585
552 4,719,586
4,719,587
748 4,719,589
754 4,719,588
768 4,719,590
807 4,719,591
900 4,719,592
4,719,593

CLASS 365

113 4,719,594
189 4,719,595
4,719,596
4,719,597
201 4,719,598
208 4,719,599
210 4,719,600
230 4,719,601
4,719,602
4,719,603

CLASS 366

69 4,718,769
71 4,718,770
97 4,718,771
348 4,718,772

CLASS 367

93 4,719,604
98 4,719,605
135 4,719,606
189 4,719,607
113 4,719,608
220 4,719,609
276 4,718,773

CLASS 369

32 4,719,610
47 4,719,611
54 4,719,612
109 4,719,613
110 4,719,614
284 4,719,615

CLASS 370

11 4,719,616
58 4,719,617
62 4,719,618
70 4,719,619
85 4,719,620
4,719,621
4,719,622
100 4,719,623
4,719,624

CLASS 371

11 4,719,625
16 4,719,626
38 4,719,627
50 4,719,628
68 4,719,629

CLASS 372

18 4,719,630
34 4,719,631
46 4,719,633
4,719,634
50 4,719,632
4,719,635
4,719,636
59 4,719,637
62 4,719,638
66 4,719,639
97 4,719,640
109 4,719,641

CLASS 374

7 4,718,774
104 4,718,775
170 4,718,776
181 4,718,777

CLASS 375

30 4,719,642
115 4,719,643

CLASS 378

[illegible] 4,719,644
144 4,719,645
179 4,719,646

CLASS 379

[illegible] 4,719,647
155 4,719,648

CLASS 383

100 4,718,778
121 4,718,738

CLASS 384

206 4,718,779
4,718,780
495 4,718,781

CLASS 400

23 4,718,782
4,718,783
68 4,718,784
120 4,718,785
320 4,718,786

CLASS 403

175 4,718,787
211 4,718,788
233 4,718,789

CLASS 404

[illegible] 4,718,790

CLASS 405

262 4,718,791
4,718,792
303 4,718,793

CLASS 406

30 4,718,795
34 4,718,796

CLASS 408

241 R 4,718,797

CLASS 409

97 4,718,798
234 4,718,799

CLASS 410

61 4,718,800

CLASS 411

378 4,718,801
421 4,718,802
476 4,718,803
478 4,718,804

CLASS 414

22 4,718,805
24.5 4,718,806
36 4,718,807
37 4,718,808
129 4,718,809
286 4,718,810
[illegible] 4,718,811
540 4,718,812
[illegible] 4,718,813
[illegible] 4,718,814
729 4,718,815
739 4,718,816
744 R 4,718,817

CLASS 415

9 4,718,818
149 R 4,718,819
174 4,718,820

CLASS 416

[illegible] 4,718,821
119 4,718,822
162 4,718,823

CLASS 417

[illegible] 4,718,824
16 4,718,833
54 4,718,834
171 4,718,835
205 4,718,836
218 4,718,825
234 4,718,826
244 4,718,827
313 4,718,828
319 Re.32,577
372 4,718,829
4,718,830
4,718,831
417 4,718,832

CLASS 418

154 4,718,837

CLASS 419

1 4,719,073
5 4,719,074
4,719,075
[illegible] 4,719,076
23 4,719,077
53 4,719,078

CLASS 420

[illegible] 4,719,079
443 4,719,080
463 4,719,081

CLASS 422

13 4,719,082
[illegible] 4,719,083
16 4,719,084
[illegible] 4,719,085
100 4,719,086
102 4,719,087
[illegible] 4,719,088
131 4,719,089
179 B1 3,966,419
310 4,719,090

CLASS 423

[illegible] 4,719,091
235 4,719,092
239 4,719,094
335 4,719,093
346 4,719,095
504 4,719,096

CLASS 424

[illegible] 4,719,097
[illegible] 4,719,098
47 4,719,099
[illegible] 4,719,100
65 4,719,101
[illegible] 4,719,102
4,719,103
70 4,719,104
76.21 4,719,105
80 4,719,106
85 4,719,107
94.2 4,719,108
117 4,719,109
[illegible] 4,719,110
195.1 4,719,111
456 4,719,112

CLASS 425

[illegible] 4,718,838
111 4,718,839
145 4,718,840
[illegible] 4,718,841
4,718,842
371 4,718,843
522 4,718,844
589 4,718,845

CLASS 426

35 4,719,113
[illegible] 4,719,114
302 4,719,115
315 4,719,116
502 4,719,117
[illegible] 4,719,118

CLASS 427

1 4,719,119
[illegible] 4,719,120
[illegible] 4,719,121
53.1 4,719,122
165 4,719,126
4,719,127
345 4,719,128
[illegible] 4,719,129
[illegible] 4,719,130
[illegible] 4,719,131
[illegible] 4,719,132
[illegible] 4,719,133

CLASS 428

4,719,134
35 4,719,135
58 4,719,136
67 4,719,137
72 4,719,138
114 4,719,139
138 4,719,140
[illegible] 4,719,141
145 4,719,142
212 4,719,143
257 4,719,144
327 4,719,145
331 4,719,146
336 4,719,147
4,719,148
397 4,719,150
428 4,719,151
432 4,719,152
473 4,719,149
515 4,719,153
694 4,719,154
700 4,719,155

CLASS 429

14 4,719,156
34 4,719,157
50 4,719,158
159 4,719,159

CLASS 430

2 4,719,160
5 4,719,161
49 4,719,162
58 4,719,163
114 4,719,164
115 4,719,165
166 4,719,166
192 4,719,167
203 4,719,168
258 4,719,169
270 4,719,170
271 4,719,171
309 4,719,172
398 4,719,173
409 4,719,174
440 4,719,175

CLASS 431

76 4,718,846

CLASS 432

241 4,718,847

CLASS 433

5 4,718,848
39 4,718,849
72 4,718,850
122 4,718,851
148 4,718,852

CLASS 435

6 4,719,176
91 4,719,177
135 4,719,178
172.1 4,719,179
320 4,719,180

CLASS 436

66 4,719,181
501 4,719,182

CLASS 437

19 4,719,183
24 4,719,184
31 4,719,185
101 4,719,123
126 4,719,124
231 4,719,125

CLASS 438

35 4,718,853
63 4,718,854
70 4,718,855
147 4,718,856
292 4,718,857
296 4,718,858
329 4,718,859
447 4,718,860
460 4,718,861
482 4,718,862
496 4,718,863
578 4,718,864
606 4,718,865
607 4,718,866
609 4,718,867
627 4,718,742
840 4,718,868

CLASS 440

1 4,718,869
4,718,872
47 4,718,870
71 4,718,871

CLASS 441

5 Re.32,578
70 4,718,873

CLASS 443

36 4,718,874
231 4,718,875
295 4,718,876
313 4,718,877

CLASS 450

58 4,718,878

CLASS 455

1 4,719,649

CLASS [illegible]

185 4,718,879

CLASS 474

201 4,718,880
242 4,718,881

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CLASS 492
164 4,718,882
328 4,718,883
419 4,718,884

CLASS 494
20 4,718,885
58 4,718,886
4,718,887
85 4,718,888

CLASS 501
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4,718,900
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4,719,204
4,719,205
4,719,336
4,719,399
4,719,406
4,719,532
4,719,577
56 : 4,718,374

DESIGN PATENTS

[redacted] : 293,679
05 : 293,647
293,699
[redacted] : 293,623
293,624
293,636
293,660
293,667
293,696
293,717
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12 : 293,638
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42 : 293,635

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48 : 293,671
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49 : 293,698
[redacted] : 293,715
53 : 293,666
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293,725

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U.S. DEPARTMENT OF COMMERCE
C. William Verity, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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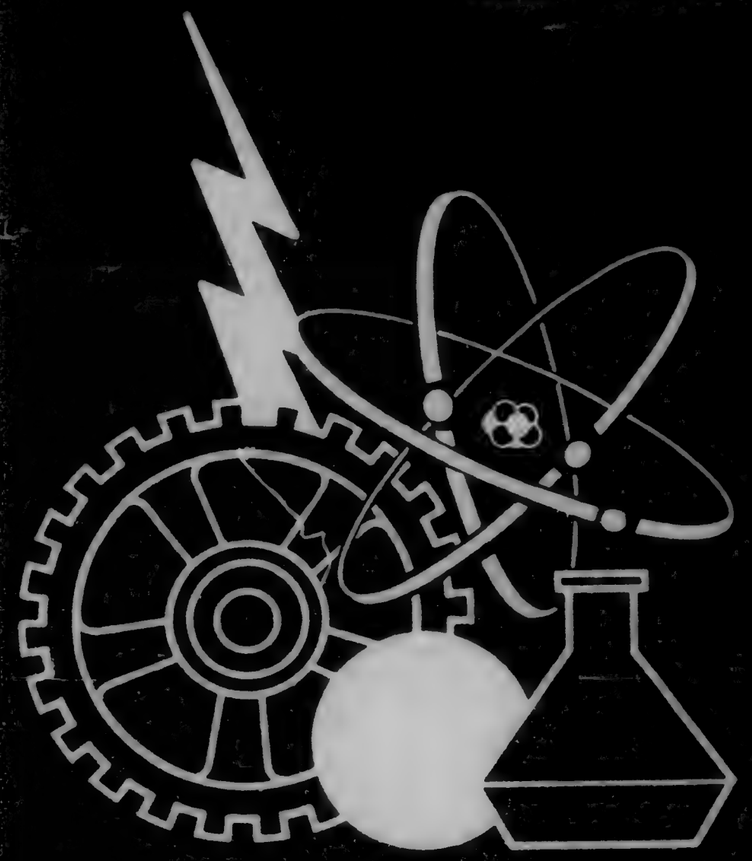
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to

PATENTS

January 19, 1988



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 30 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected uner PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 31 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 15, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,493,115 through 4,494,244
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 1, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,412,360	06/273,863	11/1/83
4,412,364	06/242,254	11/1/83
4,412,366	06/238,557	11/1/83
4,412,374	06/265,979	11/1/83
4,412,380	06/298,647	11/1/83
4,412,386	06/289,939	11/1/83
4,412,391	06/427,458	11/1/83
4,412,398	06/244,660	11/1/83
4,412,408	06/244,653	11/1/83
4,412,410	06/258,766	11/1/83
4,412,417	06/263,886	11/1/83
4,412,423	06/388,766	11/1/83
4,412,426	06/276,648	11/1/83
4,412,427	06/326,094	11/1/83
4,412,430	06/384,370	11/1/83
4,412,433	06/300,035	11/1/83
4,412,441	06/419,126	11/1/83
4,412,444	06/335,348	11/1/83
4,412,447	06/286,177	11/1/83
4,412,462	06/330,296	11/1/83
4,412,466	06/295,195	11/1/83
4,412,468	06/280,694	11/1/83
4,412,477	06/282,026	11/1/83
4,412,480	06/298,413	11/1/83
4,412,487	06/221,305	11/1/83
4,412,493	06/317,961	11/1/83
4,412,495	06/261,603	11/1/83
4,412,499	06/258,680	11/1/83
4,412,503	06/402,472	11/1/83
4,412,516	06/220,184	11/1/83
4,412,518	06/322,806	11/1/83
4,412,521	06/282,226	11/1/83
4,412,526	06/225,034	11/1/83
4,412,537	06/287,309	11/1/83
4,412,547	06/258,588	11/1/83
4,412,550	06/261,573	11/1/83
4,412,554	06/288,107	11/1/83
4,412,558	06/296,198	11/1/83
4,412,568	06/295,644	11/1/83
4,412,572	06/294,318	11/1/83
4,412,579	06/376,019	11/1/83
4,412,589	06/427,363	11/1/83
4,412,595	06/253,076	11/1/83
4,412,597	06/301,274	11/1/83
4,412,601	06/255,211	11/1/83
4,412,602	06/302,954	11/1/83
4,412,603	06/334,706	11/1/83
4,412,604	06/337,423	11/1/83
4,412,615	06/253,260	11/1/83
4,412,625	06/348,678	11/1/83
4,412,628	06/255,141	11/1/83
4,412,634	06/319,947	11/1/83
4,412,636	06/407,779	11/1/83
4,412,637	06/309,462	11/1/83
4,412,644	06/284,779	11/1/83
4,412,646	06/372,577	11/1/83
4,412,649	06/365,475	11/1/83
4,412,660	06/250,110	11/1/83
4,412,662	06/407,250	11/1/83
4,412,681	06/350,725	11/1/83
4,412,684	06/252,131	11/1/83
4,412,688	06/284,496	11/1/83
4,412,689	06/259,033	11/1/83
4,412,692	06/234,767	11/1/83
4,412,704	06/260,804	11/1/83
4,412,705	06/323,408	11/1/83
4,412,706	06/227,642	11/1/83
4,412,724	06/248,869	11/1/83

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Patent Number	Serial Number	Issue Date
4,412,727	06/257,007	11/1/83
4,412,753	06/299,084	11/1/83
4,412,763	06/226,734	11/1/83
4,412,765	06/224,031	11/1/83
4,412,769	06/248,481	11/1/83
4,412,771	06/288,439	11/1/83
4,412,790	06/310,749	11/1/83
4,412,807	06/343,148	11/1/83
4,412,821	06/401,651	11/1/83
4,412,841	06/278,056	11/1/83
4,412,865	06/216,214	11/1/83
4,412,869	06/219,572	11/1/83
4,412,874	06/322,821	11/1/83
4,412,890	06/340,005	11/1/83
4,412,892	06/282,909	11/1/83
4,412,901	06/379,902	11/1/83
4,412,911	06/351,967	11/1/83
4,412,932	06/337,822	11/1/83
4,412,942	06/373,158	11/1/83
4,412,949	06/279,542	11/1/83
4,412,950	06/361,187	11/1/83
4,412,958	06/404,075	11/1/83
4,412,987	06/305,345	11/1/83
4,412,993	06/229,255	11/1/83
4,412,998	06/325,290	11/1/83
4,413,000	06/281,553	11/1/83
4,413,013	06/330,740	11/1/83
4,413,014	06/238,544	11/1/83
4,413,034	06/353,956	11/1/83
4,413,035	06/324,641	11/1/83
4,413,044	06/322,412	11/1/83
4,413,046	06/365,050	11/1/83
4,413,050	06/261,462	11/1/83
4,413,055	06/306,143	11/1/83
4,413,056	06/312,667	11/1/83
4,413,057	06/240,290	11/1/83
4,413,059	06/344,498	11/1/83
4,413,071	06/273,861	11/1/83
4,413,116	06/366,584	11/1/83
4,413,124	06/418,936	11/1/83
4,413,125	06/279,371	11/1/83
4,413,134	06/339,581	11/1/83
4,413,139	06/375,767	11/1/83
4,413,142	06/358,326	11/1/83
4,413,151	06/397,997	11/1/83
4,413,164	06/370,721	11/1/83
4,413,165	06/242,910	11/1/83
4,413,171	06/328,643	11/1/83
4,413,175	06/227,506	11/1/83
4,413,190	06/269,267	11/1/83
4,413,192	06/263,101	11/1/83
4,413,205	06/266,574	11/1/83
4,413,211	06/333,637	11/1/83
4,413,213	06/317,940	11/1/83
4,413,233	06/279,721	11/1/83
4,413,234	06/306,282	11/1/83
4,413,253	06/236,001	11/1/83
4,413,260	06/297,990	11/1/83
4,413,262	06/327,359	11/1/83
4,413,279	06/330,935	11/1/83
4,413,303	06/276,539	11/1/83
4,413,304	06/380,476	11/1/83
4,413,307	06/281,583	11/1/83
4,413,311	06/298,303	11/1/83
4,413,322	06/217,417	11/1/83
4,413,325	06/246,949	11/1/83
4,413,332	06/277,357	11/1/83
4,413,351	06/248,631	11/1/83
4,413,354	06/231,081	11/1/83
4,413,355	06/234,010	11/1/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,668,984, Re. S.N. 124,315, Filed Nov. 23, 1987, Cl. 358/107, OPTICAL PATTERN GENERATION TECHNIQUE, Jerome Peter Rosenfeld, Owner of Record: *RCA Corp., Princeton, N.J.*, Attorney or Agent: Clement A. Berard, Jr., et al., Ex. Gp.: 262

4,698,268, Re. S.N. 124,569, Filed Nov. 24, 1987, Cl. 428/484, HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM, Seiji Ueyama, Owner of Record: *General Company, Ltd., Osaka, Japan*, Attorney or Agent: Harold C. Wegner, et al., Ex. Gp.: 154

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,536,386, Reexam. No. 90/001,397, Requested: Dec. 18, 1987, Cl. 424/10, METHOD OF CONTROLLING EMESIS CAUSED BY CIPLATIN IN CANCER CHEMOTHERAPY, Robert E. Keenan, Owner of Record: *A. H. Roberts Co., Inc., Richmond, Va.*, Attorney or Agent: Donald E. Gillespie, Ex. Gp.: 120, Requester: James V. Costigan, New York, N.Y.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 20, 1987 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with *E through J*. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with *E through J* and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557–1728.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

Dec. 1, 1987.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 19, 1988

D. 289,989	4,657,790	4,677,844	4,687,782
4,484,710	4,657,841	4,678,053	4,688,304
4,486,717	4,658,006	4,678,264	4,688,572
4,502,126	4,658,195	4,679,660	4,688,628
4,503,898	4,658,363	4,680,581	4,688,872
4,558,201	4,659,581	4,680,614	4,689,052
4,558,430	4,660,472	4,681,228	4,689,139
4,564,580	4,663,297	4,681,232	4,689,328
4,567,503	4,663,378	4,681,509	4,689,475
4,583,873	4,663,924	4,681,822	4,689,487
4,592,032	4,664,134	4,682,862	4,689,597
4,594,692	4,665,308	4,682,896	4,689,795
4,614,968	4,665,746	4,683,095	4,689,941
4,621,162	4,666,488	4,683,786	4,689,955
4,628,110	4,666,503	4,683,977	4,690,144
4,628,928	4,667,951	4,684,150	4,690,640
4,631,416	4,669,711	4,684,247	4,690,859
4,631,921	4,670,302	4,684,946	4,690,992
4,637,514	4,670,601	4,685,053	4,691,498
4,638,476	4,670,721	4,685,154	4,691,777
4,640,785	4,670,877	4,685,155	4,691,779
4,645,283	4,671,745	4,685,678	4,692,650
4,645,527	4,671,832	4,685,774	4,693,037
4,646,075	4,673,670	4,685,980	4,693,206
4,647,213	4,673,698	4,686,061	4,693,310
4,648,702	4,674,355	4,686,222	4,693,317
4,649,063	4,674,367	4,686,400	4,693,451
4,649,336	4,674,426	4,686,790	4,693,834
4,650,048	4,674,544	4,686,857	4,694,877
4,650,839	4,674,909	4,686,882	4,695,447
4,652,505	4,675,054	4,687,126	4,696,958
4,653,488	4,675,290	4,687,622	4,697,024
4,654,623	4,675,992	4,687,689	4,700,148

SPECIAL BOXES FOR MAIL

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Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
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	Detroit Public Library	(313) 833-1450
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 5, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-12-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during December 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,543,308 to 3,551,900, inclusive
Plant Patents ..... Numbers 3,008 to 3,010 inclusive

REEXAMINATIONS

JANUARY 19, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,092,529 (810th)

DETECTING HEAD FOR USE IN AN APPARATUS FOR READING OPTICALLY AN INFORMATION RECORDED ON A RECORD CARRIER AS A TRACK OR TRACES

Takayuki Aihara, Hachioji; Kiyoshi Hori, Hino, and Toshiaki Morokuma, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Reexamination Request No. 90/001,195, Mar. 20, 1987.
Reexamination Certificate for Patent No. 4,092,529, issued May 30, 1978, Ser. No. 730,688, Oct. 7, 1976.
Claims priority, application Japan, Oct. 8, 1975, 50-120765; Oct. 31, 1975, 50-130527; Oct. 31, 1975, 50-130528
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 4, and 6 are cancelled.

Claims 1, 3, 5, 7 and 8 are determined to be patentable as amended.

Claims 9–11, dependent on an amended claim, is determined to be patentable.

New claims 12–30 are added and determined to be patentable.

1. A detecting head for use in an apparatus for reading optically information recored on a record carrier as a track or tracks comprising an optical system including a projection lens having an optical axis for projecting a light spot on the surface of the record carrier and means for detecting the relative position between the light spot and the track to be read, said optical system further comprising means for supporting the projection lens movably *at least* in a *first* direction perpendicular to the optical axis of the projection lens and perpendicular to the track direction *and in a second direction parallel to the optical axis of said projection lens* and means for driving the projection lens in said [direction] *first and second directions* in which it is movable comprising [a coil] *first and second coils* secured to said projection lens supporting means *for moving the projection lens in said first and second directions, respectively,* and a magnet *means* having pole pieces arranged across the [coil] *first and second coils,* and means connecting the position detecting means and said [coil] *first and second coils* of the driving means such that [a signal] *signals* supplied from said position detecting means [is] *are* supplied to said [coil] *first and second coils* of the driving means.

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REISSUES

JANUARY 19, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

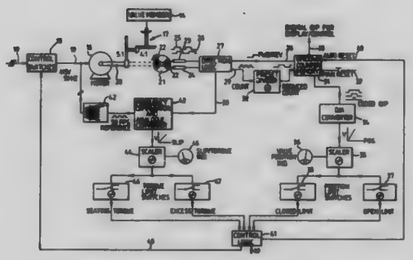
Re. 32,579
MOTOR OPERATING PARAMETER SENSING APPARATUS

Raymond G. A. Harvey, and David S. Evans, both of Newbury, England, assignors to Colin F. Norton, Andover, England

Original No. 4,491,775, dated Jan. 1, 1985, Ser. No. 315,052, Oct. 26, 1981. Application for reissue Feb. 12, 1986, Ser. No. 825,613

Int. Cl.[4] H02K *17/34*

U.S. Cl. 318—434 10 Claims



8. A motor-operated fluid valve, comprising:

(a) a valve housing (11) including fluid inlet (12) and outlet (13) openings communicating with a chamber;

(b) a valve member (14) mounted in said chamber for movement between open and closed positions relative to said housing to control the flow of fluid between said inlet and outlet openings;

(c) means including a motor (16) for driving said valve member between said open and closed positions;

(d) means supplying driving power to said motor; and

(e) means for controlling the torque exerted by said motor, including

(1) means (21–23, 30) for producing a cyclic signal representative of the actual speed of said motor;

(2) means (42,43) for modifying said speed signal to provide a torque signal indicative of the torque exerted by said motor;

(3) torque limiting means (46, 47) for comparing said torque signal with a preset valve thereof to provide torque output signal indicative of whether the motor torque exceeds a given value;

(4) means (41, 18) for controlling said driving power supply means as a function of said torque output signal so as to prevent the motor torque from exceeding said given value;

(5) position-signal generating means (31, 32, 34, 35) responsive to said cyclic signal to provide a positive signal representative of the position of said valve member relative to said housing; and

(6) position comparing means (37, 38) for comparing said position signal with at least a preset value thereof to provide a position output signal indicative of said valve member reaching a given position relative to said housing.

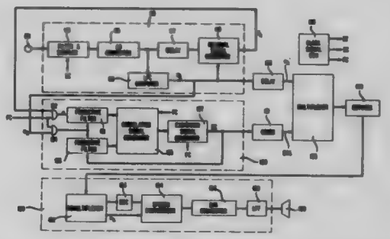
Re. 32,580
DIGITAL SPEECH CODER

Bishnu S. Atal, New Providence, and Joel R. Remde, Elizabeth, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,472,832, dated Sep. 18, 1984, Ser. No. 326,371, Dec. 1, 1981. Application for reissue Sep. 18, 1986, Ser. No. 909,319

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—40 43 Claims



1. A method for processing a sequential pattern comprising the steps of: partitioning said sequential pattern into successive time intervals; generating a set of signals representative of the sequential pattern of each time interval responsive to said time interval sequential pattern; generating a signal corresponding to the differences between said interval sequential pattern and the interval representative signal set responsive to said interval sequential pattern and said interval representative signals; forming a first signal corresponding to the interval pattern responsive to said interval pattern representative signals and said interval differences representative signal; generating a second interval corresponding signal responsive to said interval pattern representative signals; generating a signal corresponding to the differences between said first and second interval corresponding signals; producing a third signal responsive to said interval differences corresponding signal for altering said second signal to reduce the interval differences corresponding signal; and utilizing said third signal to construct a replica of said interval sequential pattern.

Re. 32,581
CERTAIN SUBSTITUTED PHENYL ESTERS OF NICOTINIC ACID, COMPOSITIONS AND METHODS OF USING SAME FOR TREATMENT OF HYPERLIPIDEMIA

Arthur Scherm, Bad Homburg; Dennee Peteri, Hattersheim, and Klaus Hummel, Frankfurt, all of Fed. Rep. of Germany, assignors to Merz + Co. GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Original No. 4,321,268, dated Mar. 23, 1982, Ser. No. 222,679, Jan. 5, 1981. Continuation-in-part of Ser. No. 119,576, Feb. 7, 1980, abandoned. Application for reissue Jul. 24, 1984, Ser. No. 634,472

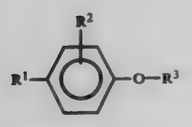
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904757; Feb. 8, 1979, 3009099

Int. Cl.[4] C07D *213/55;* A61K *31/455*

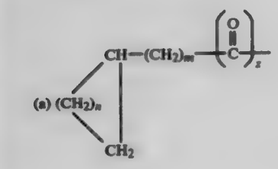
U.S. Cl. 514—356 12 Claims

[1. Compounds having the general formula:

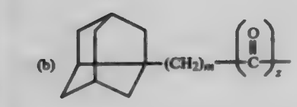
-continued



Wherein R^1 =



where n = 0–12
m = 0–1
z = 0–1



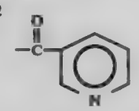
where m = 0–1

and z = 0–1

(c) Cumyl
(d) p-Chlorobenzoyl
(e) Hydrogen, but R^1 can only equal hydrogen when R^2 equals Cycloalkyl or Cycloalkylene $(-CH_2-)_n$

and R^2 =
(a) $(-CH_2-)_n$ where n = 0 or 4
(b) Halogen
(c) C_1–C_6—Alkyl or C_3–C_6—cycloalkyl
(d) Methoxy
(e) Ethoxy
(f) Trifluoromethyl
(g) Nitro
(h) hydrogen,

and R^3 =



and pharmaceutically-acceptable acid addition salts thereof.]

[10. A compound of claim 1 which is o-cyclohexylphenyl nicotinate hydrochloride.]

PLANT PATENTS

GRANTED JANUARY 19, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,083

ROSE PLANT JACTRED

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Feb. 3, 1986, Ser. No. 825,362

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its continuous production of large red flowers, its upright and vigorously growing bush, its 7 leaflet leaves and its bright yellow anthers with red centers.

6,084

CHRYSANTHEMUM PLANT NAMED ULTRALIGHT

Peter S. Hesse, Bradenton, Fla., assignor to Ball PanAm Plant Company, Parrish, Fla.

Filed Dec. 19, 1985, Ser. No. 813,772

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Ultralight, as described and illustrated, and particularly characterized by its daisy capitulum type and flat capitulum form, dark purple ray floret color, nine week flowering response, upright growth habit, and its excellent color retention at high temperatures.

6,085

CHRYSANTHEMUM NAMED "RENDEZ-VOUS"

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Netherlands Antilles

Filed Sep. 12, 1985, Ser. No. 775,406

Claims priority, application Netherlands, Sep. 14, 1984, CHR 935

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinctive variety of Chrysanthemum named Rendez-Vous, as described and illustrated in the foregoing specification and accompanying drawings.

6,086

PHILODENDRON PLANT NAMED IMPERIAL GREEN

Paul DeCoster, Brusselsesteenweg 94, 9230 Melle, Belgium

Filed Dec. 27, 1985, Ser. No. 813,926

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of philodendron plant named Imperial Green, as illustrated and described, and particularly characterized by the combined features of rosette plant form; dark, relatively large foliage; ease of propagation by tissue culture; compact growth habit, both in 4" and larger pots; close, symmetrical internodes, and fast growth habit.

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PATENTS

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ERRATA

For CLASS	See PATENT NO.
052-223	4,719,658
280-047	4,720,048
439-108	4,720,155
439-260	4,720,156
439-851	4,720,157
437-069	4,720,323
512-015	4,720,354
437-234	4,720,394
437-241	4,720,395
437-173	4,720,620

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GRANTED JANUARY 19, 1988

GENERAL AND MECHANICAL

4,719,650
PACIFIER BIB
Mary E. Milloy, 2107 Pierce St., Apt. 5, San Francisco, Calif. 94115
Filed Nov. 25, 1986, Ser. No. 934,719
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R 7 Claims



1. A pacifier bib formed from a single and unitary flat panel of soft and flexible material having a wishbone shape comprising

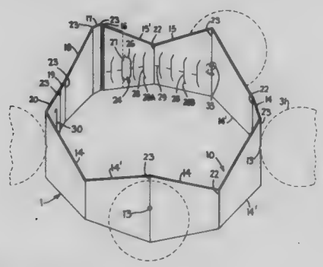
collar means for encirclement about a child's neck,

holder means, including a flap extending directly downwardly from a lower end of said collar means, for releasably attaching a pacifier to said bib,

first fastening means comprising hook and loop fasteners secured on opposite sides of the distal ends of said collar means for releasably attaching the distal ends of said collar means together, and

second fastening means on a distal end of said flap, comprising hook and loop fasteners secured in longitudinally spaced relationship on the same side of said flap to define a loop when said latter fasteners are attached together, for releasably attaching said pacifier to said flap.

4,719,651
FOLDING PARTY HAT
Edward G. Tereshinski, Kalamazoo, Mich., assignor to Kalamazoo Banner Works, Inc., Kalamazoo, Mich.
Filed Sep. 26, 1986, Ser. No. 912,749
Int. Cl.[4] A42B *1/22, 1/20, 1/24*
U.S. Cl. 2—197 6 Claims

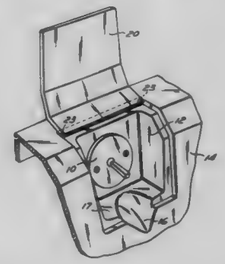


1. A folding party hat, comprising:

an elongated strip of finite length having first and second longitudinal ends and first and second panels thereat, said elongated strip comprising a plurality of foldedly connected panels, series connected to each other at folds extending transversely to a longitudinal axis of said strip and to said first and second panels, said elongated strip being adapted for alternate configuration with said panels unfolded as a hat band and with said panels folded for compact storage, each panel intermediate said first and second panels having folded ends and facing sides disposed between said ends;

first and second fastening means located adjacent said first and second ends, respectively, for facilitating a detachable connecting of said first and second ends together to effect the hat band configuration and third fastening means on a preselected panel adjacent said second end for detachable engagement with said first fastening means on a preselected panel for holding said strip in a folded configuration, said second fastening means comprising a plurality of complimentary slots on at least one panel at said second end, said third fastening means comprising a slot, and said first fastening means comprising a tab on said first end for detachable engagement with at least one of said plurality of complimentary slots and said slot defining said third fastening means, said plurality of complimentary slots being spaced apart for facilitating a size adjustable engagement between said first and second ends of said strip.

4,719,652
RECESSED CAVITY AND COVER FOR BATHTUBS AND THE LIKE
Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604
Continuation of Ser. No. 767,499, Aug. 20, 1985, abandoned, which is a continuation of Ser. No. 572,703, Jan. 20, 1984, abandoned. This application Oct. 20, 1986, Ser. No. 921,366
Int. Cl.[4] A47K *3/00*
U.S. Cl. 4—559 10 Claims



1. A bathtub, including top and interior side and end walls defining continuous free-form contoured surfaces thereof, comprising:

(a) a recess formed in the bathtub end and top wall surfaces, which recess includes a bottom wall, a back wall, and opposed side walls, and opens into one end of the bathtub interior and the top portion thereof, the bathtub end and top wall surfaces including portions defining an opening therein substantially coextensive with the recess opening;

(b) a drain channel formed in the recess bottom wall and bathtub end wall surfaces and opening into the interior of the bathtub;

(c) a recess cover pivotally mounted in the top wall of the bathtub proximate the top of the back wall of the recess, adapted to be pivotable relative to the recess, between an opened position thereof extending upwardly and outwardly away from the interior of the bathtub, and a closed

position thereof, overlying and covering the recess while not covering the drain channel, so as to be flush with, and continue the free-form contour of, the bathtub top and interior end wall surfaces adjacent the recess; and

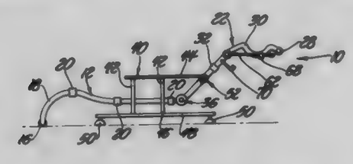
(d) means for pivotally mounting the recess cover in the top wall of the bathtub proximate the top of the back wall of the recess so as to enable the cover to be pivoted between positions opening and closing the recess.

4,719,653

ADJUSTABLE BODY SUPPORT DEVICE

Randy A. Bishop, and Victoria A. Bishop, both of 1878 Stanley, Birmingham, Mich. 48009

Filed Jan. 2, 1986, Ser. No. 815,806
Int. Cl.[4] A47C *1/34*
U.S. Cl. 4—572 **15 Claims**



1. An adjustable body support device comprising seating means for supporting the lower torso of the body, back means for supporting the upper torso of the body, and an arm rest means non-rotatably mounted and permanently positioned to said seating means for supporting the arms of the body and said arm rest means being selectively engageable and disengageable with said back means to hold the latter in a predetermined position relative to said seating means.

4,719,654

WALL CONNECTION PIECE FOR A HAND-HELD SHOWER

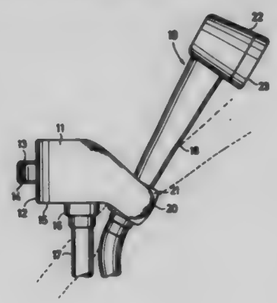
Gerhard Blessing, Villingen, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

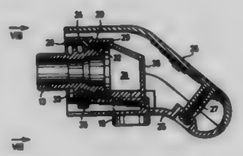
Filed Feb. 11, 1986, Ser. No. 828,638
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506129
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—597 **9 Claims**

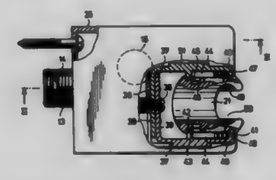
1. A wall connecting piece, comprising:

a casing which is connectable to a wall connection adaptor for a water main and has a connection for a shower hose leading to a hand-held showing with a grip;

a mounting support for the hand-held shower, the mounting support having a retaining head mounted in the casing and which acts on the grip of the hand-held shower and is pivotable about an axis passing through the casing, the grip being fixable in the retaining head and the retaining head being insertable in the casing, the mounting support for the retaining head having an approximately U-shaped carrier with two approximately parallel arms, between which is inserted the retaining head, the U-shaped carrier having two approximately L-shaped mounting parts, each L-shaped mounting part having two connected legs whereof in each case one leg forms an arm of the carrier and a second leg is superimposed with a corresponding







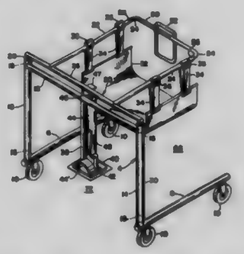
second leg of the other L-shaped mounting part to form a connecting web between the arms of the U-shaped carrier.

4,719,655

INVALID TRANSFER DEVICE

S. Brooks Dean, 2021 Washington Blvd., Huntington, W. Va. 25701

Continuation-in-part of Ser. No. 820,240, Jan. 21, 1986, abandoned. This application Sep. 2, 1986, Ser. No. 902,590
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—81 R **6 Claims**



1. An invalid lift and transfer device comprising, a rigid chassis frame formed of a pair of parallel horizontal bars lying in a plane providing a space therebetween, a pair of tubular posts rigidly connected to and extending vertically upward from corresponding ends of said horizontal bars, and a first

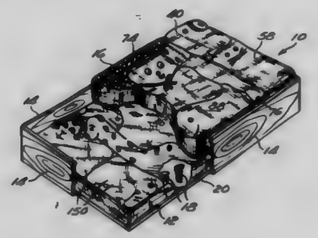
cross bar rigidly connected to and extending between upper end portions of said vertical tubular posts, said first cross bar providing the sole connection between said vertical tubular posts there being no connection between said horizontal bars in the plane of said horizontal bars, said space between said horizontal bars thereby being unobstructed to permit the feet and legs of a patient to project forwardly of said corresponding ends of said bars, a rigid invalid lifting frame movably supported on said chassis frame comprising a pair of parallel horizontal arms providing a space therebetween, a second cross bar rigidly connected to and extending between corresponding ends of said horizontal arms, and a pair of vertical posts extending downwardly from opposite end portions of said second cross bar, the vertical posts of said invalid lifting frame telescopically engaging in the vertical tubular posts of said chassis frame, jack means engaging between said frames for raising and lowering said invalid lifting frame with respect to the chassis frame, and a sling supported from the arms of the invalid lifting frame, said jack means comprising a body member and an extensible plunger member, a column extending downwardly from said first cross bar substantially centrally thereof, a platform on the lower end of said column, one of said jack members being supported on said platform and the other of said jack members engaging said second cross bar intermediate the ends thereof.

4,719,656

BED AND MATTRESS FORMED BY ANIMAL SHAPED NESTING PLAY CUSHIONS

Wayne P. Godinet, 1717 Kraft St., Oceanside, Calif. 92054

Filed Jul. 12, 1982, Ser. No. 397,492
Int. Cl.[4] A63H *33/04*; A47C *31/02*
U.S. Cl. 5—401 **6 Claims**



1. A bed comprising:

(a) a horizontal supporting body and vertical side frames lapping the sides of said body and extending thereabove and forming a rectangle thereabout and a generally rectangular mattress resting on and generally completely covering said supporting surface and generally completely filling the space between said side frames,

(b) said mattress being formed by a multiplicity of at least six separate, divided, individually removable, juxtaposed, pillows having their sides generally abutted together to form said mattress in a substantially continuous body, at least about half of the sides of said pillows forming outlines curving in plan view and generally interfitting on curved lines of abutment so at to generally maintain contact between the curved outlines,

(c) each pillow in plan view forming a meaningful symbol by its outline, the majority of said symbols being animals and the pillows having covers representatively colored and decorated to represent the symbols related thereto, and

(d) the upper surface of said horizontal supporting body having markings outlining the arrangement of the outlines of said pillows so as to guide the user in restoring the arrangement of said pillows in designed dispositions.

2. A bed comprising:

(a) a horizontal supporting body and vertical side frames lapping the sides of said body and extending thereabove and forming a rectangle thereabout and aa generally rectangular mattress resting on and generally completely covering said supporting surface and generally completely filling the space between said side frames,

(b) said mattress being formed by a multiplicity of at least four separate, divided, individually removable, juxtaposed pillows having their sides generally abutted together to form said mattress in a substantially continuous body,

(c) each pillow in plan view forming a meaningful symbol by its outline, the majority of said symbols being animals and the pillows having covers decorated to represent the symbols related thereto, at least about half of the sides of said pillows forming outlines bending in plan view, to form animal irregular outlines, and generally interfitting on bent lines of abutment so as to generally maintain contact between bent outlines and

(d) the upper surface of said horizontal supporting body having markings outlining the arrangement of the outlines of said pillows so as to guide the user in restoring the arrangement of said pillows in designed dispositions.

3. A bed comprising:

(a) a horizontal supporting body and vertical side frames lapping the sides of said body and extending thereabove and formng a rectangle thereabout and a generally rectangular mattress resting on and generally completely covering said supporting surface and generally completely filling the space between said side frames,

(b) said mattress being formed by a multiplicity of at least six separate, divided, individually removable, juxtaposed pillows having their sides generally abutted together to form said mattress in a substantially continuous body, and

(c) each pillow in plan view forming a meaningful symbol by its outline, the majority of said symbols being animals and the pillows having covers colored and decorated to represent the symbols related thereto, at least about half of the sides of said pillows forming outlines curving in plan view, to form animal irregular outlines, and generally interfitting on curved lines of abutment so as to generally maintain contact between the curved outlines.

5. A bed comprising:

(a) a horizontal supporting body and vertical side frames lapping the sides of said body and extending thereabove and forming a rectangle thereabout and a generally rectangular mattress resting on and generally completely covering said supporting surface and generally completely filling the space between said side frames,

(b) said mattress being formed by a multiplicity of at least four separate, divided, individually removable, juxtaposed pillows having their sides generally abutted together to form said mattress in a substantially continuous body,

(c) each pillow in plan view forming a meaningful symbol by its outline, the majority of said symbols being animals and the pillows having covers decorated to represent the symbols related thereto, at least about half of the sides of said pillows forming outlines bending in plan view, to form animal irregular outlines, and generally interfitting on bent lines of abutment so as to generally maintain contact between bent outlines.

4,719,657

METHOD OF FORMING IRIS VARIEGATION PATTERNS ON CONTACT LENSES

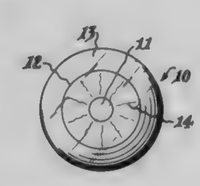
Rajan Bawa, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Mar. 27, 1986, Ser. No. 844,652
Int. Cl.[4] D06P *5/12, 5/00*
U.S. Cl. 8—453 **6 Claims**

1. A method of forming a dyed pattern in the iris area of a hydrated hydrogel contact lens which comprises:

forming a viscous paste which comprises an aqueous liquid, a thickening agent and a vat dye in its reduced state,

applying the paste in the form of a pattern to the surface of a soft, resilient, impervious rubber or plastic pad,
pressing the pad into contact with a portion of an annular area surrounding the pupilar zone in the iris area of the lens to transfer the paste in a pattern to said annular area,
treating the lens with an aqueous solution of a different reduced vat dye,



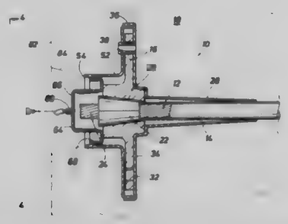
treating the lens with a vat dye developing solution to form on the lens a dyed pattern in the iris area and a contrasting background tint in areas not covered by the print paste, and
thereafter washing the lens to remove any remaining paste and developer.

4,719,658

HERMETICALLY SEALED ANCHOR CONSTRUCTION FOR USE IN POST TENSIONING TENDONS

Kris P. Kriofske, Dallas, Tex., assignor to Special Personal and Financial Planning and Referral Services, Inc., Dallas, Tex.

Filed Oct. 15, 1986, Ser. No. 919,258
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 L **13 Claims**



1. A protective apparatus for use with an anchor plate on a tendon wherein the tendon and anchor plate are installed on a cast or molded structure, the apparatus comprising encapsulation means surrounding the anchor plate and the end of said tendon exposed to atmosphere and having an interior space adapted to receive hermetic sealing viscous material protecting the anchor plate and tendon, said encapsulation means comprises upper and lower members, said members having cooperative peripheral lips for joining together in a loose fit, the fit being sufficient to enable grease to be injected thereinto and to flow between the lips to assure complete filling with the hermetic sealing material.

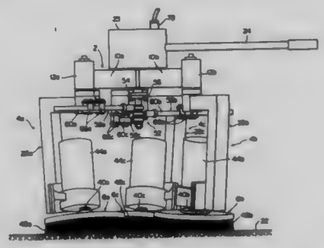
4,719,659

ROTARY TRAVELLING SURFACE TREATMENT DEVICE

Fukashi Urakami, 5-21-204 Konandai 4-chome, Konan-ku, Yokohama, Japan

Filed Dec. 19, 1986, Ser. No. 943,459
Claims priority, application Japan, Dec. 28, 1985, 60-299204
Int. Cl.[4] A47L *11/16*
U.S. Cl. 15—49 R **10 Claims**

1. A rotary travelling device comprising
a main supporting member rotatable around a first axis extending substantially perpendicularly to a travelling surface,
a subsidiary supporting member mounted on the main supporting member for free rotation around a second axis extending substantially parallel to the first axis,
a rotary disc mounted on the subsidiary supporting member for free rotation around a third axis extending inclinedly



to the second axis, the under surface of the rotary disc being adapted to come into inclined contact with the travelling surface,
a driving means for rotating the rotary disc around the third axis, and
means for rotating the subsidiary supporting member around the second axis according to the rotation of the main supporting member around the first axis.

4,719,660

ICE SCRAPER

Ross E. Hopkins, Emporia, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Nov. 17, 1986, Ser. No. 931,605
Int. Cl.[4] A47L *1/16*; B60S *1/04*
U.S. Cl. 15—105 **9 Claims**



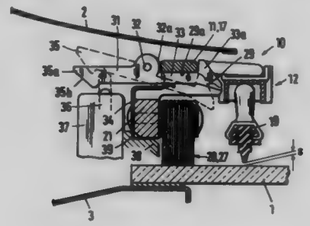
1. A hand-held scraper for removing ice from a surface comprising
a handle portion having a gripping end and a blade end; and
a substantially J-shaped blade mounted to the blade and of said handle portion, said blade being of a unitary construction and having first and second outwardly flared scraping arms, said first arm being longer than said second arm, ad one of said arms having a smooth beveled edge and the other said arm having a plurality of protruding ridges, wherein each ridge has a beveled edge; said first arm increasing in width from a base portion of the blade to a scraping portion of the blade while said second arm decreases in width from the base to the scraping edge of the blade.

4,719,661

CLEANING DEVICE FOR MOTOR VEHICLE WINDOW PANES

Dieter Hasselmann, Remseck, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,106
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447055
Int. Cl.[4] B60S *1/28, 1/38, 1/04, 1/46*
U.S. Cl. 15—250.41 **34 Claims**



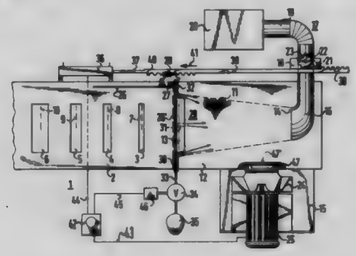
1. A vehicular window cleaning apparatus, comprising:
a windshield wiper assembly including a wiper arm-and-blade and drive means for driving said wiper arm-and-blade;
an additional part for intensifying the cleaning effect of said wiper blade;
a coupling for coupling said additional part to said assembly for movement with said wiper arm-and-blade; and
an adjusting element for operating said coupling to selectively couple said additional part to said assembly and uncouple said additional part therefrom.

4,719,662

DUST-REMOVAL APPARATUS FOR TEXTILE MACHINES AND MACHINE ROOMS

Dieter Horak, Moenchen-Gladbach; Hans-Heinz Schäfer, Schwalmtal, and Wilhelm Schmitz, Moenchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,700
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540688; Aug. 30, 1986, 3629559
Int. Cl.[4] A47C *9/20*
U.S. Cl. 15—301 **15 Claims**



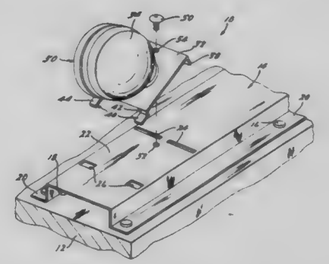
1. Dust-removal apparatus for textile machines and machine rooms, comprising a chamber containing dust-laden air, a clean-air chamber, a tube disposed between and separating said chamber containing dust-laden air from said clean-air chamber, at least part of said tube being a filter element, a suction device connected to said clean-air chamber, another switchable suction device in the form of a filter cleaning device connected to said tube, said tube having an inlet end, and means for selectively closing said inlet end of said tube.

4,719,663

DETACHABLE CASTER WHEEL ASSEMBLY HAVING A FLANGE AND BOLT MECHANISM

Frank J. Ternisi, Elgin, Ill., assignor to Marvel Metal Products Company, Chicago, Ill.

Filed Aug. 29, 1986, Ser. No. 901,834
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—30 **1 Claim**



1. An assembly for detachably mounting a caster wheel to the underside of a structure, said assembly comprising:
an elongated, channel-shaped mounting bracket fixedly secured to the underside of the structure, said mounting bracket including a first pair of linearly aligned mounting slots extending across said bracket and having a first surface therebetween and a second pair of linearly aligned mounting slots extending across said bracket, said first and second pairs of mounting slots formed in transverse parallel alignment, a first throughbore formed in said bracket adjacent the first surface;
an integral caster plate having a first pair of integral flange members formed perpendicular to said caster plate along a first edge of said plate and having a second surface therebetween and a second pair of integral L-shaped flange members formed along a second opposite edge of said plate, said first flange members cooperating with said first mounting slots and said second flange members cooperating with said second mounting slots to detachably secured said caster plate in adjacent flush relation to said mounting bracket, said L-shaped flange members including an outwardly extending portion disposed parallel to said caster plate which underlies and abuts said mounting bracket upon insertion into said second mounting slots upon assembly, a second throughbore formed in said caster plate adjacent said second surface, said first and second throughbores being aligned with each other after assembly;
a caster wheel pivotably and rotatably mounted to said caster plate; and
means for fixedly securing said caster plate to said mounting bracket, said means including at least one mounting bolt which extends through said aligned throughbores.

4,719,664

SWIVABLE CASTER

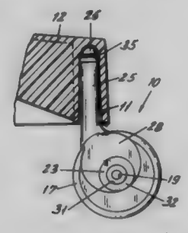
Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Nov. 17, 1986, Ser. No. 931,714
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—47 **18 Claims**

1. A caster assembly including:
a. first means defining a vertically extending socket open at

its bottom end and having a downwardly facing annular shoulder at a location substantially above its bottom end;

b. second means removably mounted to said first means and including an elongated stem, wheel means mounted on said stem at its lower end for rotation about a horizontal axis, a peripheral groove in said stem near its upper end, a split ring entered into said grove and having a peripheral portion projecting outside of said groove;



c. said stem being entered into said socket through said bottom end with said peripheral portion having its upper surface engaged with said shoulder to limit upward movement of said second means relative to said first means to a position wherein said wheel means is outside of said socket in the vicinity of said bottom end;

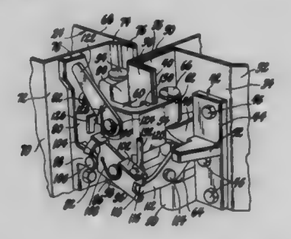
d. said stem having its longitudinal axis generally vertical and being swivable about said longitudinal axis with said split ring providing a bearing for swiveling of said stem.

4,719,665

DOUBLE PIVOT HINGE

Gregory E. Bell, Roseville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1986, Ser. No. 940,739
Int. Cl.⁴ E05D *11/06, 11/10;* **E05F** *3/20*
U.S. Cl. 16—232 **3 Claims**



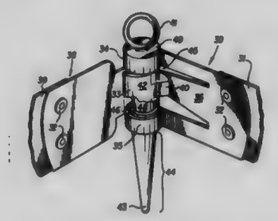
1. A double pivot hinge for swingably mounting a closure on a vehicle for movement of the closure between closed, intermediate open, and full open positions comprising, in combination, a hinge arm, first means pivotally connecting the hinge arm to the vehicle for pivotal movement relative thereto about a first pivotal axis, second means pivotally connecting the hinge arm to the closure for pivotal movement of the hinge arm relative thereto about a second pivotal axis, first latch means movable between (1) a latched position wherein the first latch means latches the hinge arm to the closure for pivotal movement of the hinge arm and closure as a unit about the first pivotal axis relative to the vehicle between closed and intermediate open positions, and (2) an unlatched position wherein the first latch means unlatches the closure and hinge arm for movement of the closure relative to the hinge arm about the second pivotal axis, second latch means movable between (1) a latched position wherein the second latch means latches the hinge arm to the vehicle for pivotal movement of the closure relative to the hinge arm between intermediate open position and full open position about the second pivotal axis, and (2) an unlatched position wherein the second latch means permits movement of the hinge arm relative to the vehicle about the first pivotal axis, and means interconnecting the first and second latch means for moving one latch means to unlatched position upon movement of the other latch means to latched position to permit pivotal movement of the closure about only one pivotal axis.

4,719,666

SELF-LOCKING, SELF-ALIGNING STEPPED PIN AND SPRING HINGE

Victor Rios, 57-26 255th St., Little Neck, N.Y. 11362, and Henry W. Wolf, 43 Boulevard, Malba, N.Y. 11357

Division of Ser. No. 410,412, Aug. 23, 1982, Pat. No. 4,524,486. This application Jun. 24, 1985, Ser. No. 748,324
Int. Cl.⁴ E05D *5/12*
U.S. Cl. 16—259 **18 Claims**



1. A substantially rigid, self-aligning, self-locking apparatus comprising:

(a) a spring hinge pin which comprises,

(1) a leading section having a truncated region,

(2) a stepped midsection juxtapositioned at said truncated region,

(3) and a stopping element connected to said stepped midsection and having a radial dimension greater than that of said stepped midsection;

(b) additionally comprising a hinge having,

(1) a first encountering portion, having a curled portion through which said pin is adapted to be inserted, and

(2) a second encountering portion having a tang and a first and second curled portion through which said pin is adapted to be inserted, said curled portions disposed on either side of said tang.

(c) said tang positioned,

(1) to directly and continuously contact during assembly and in final assembly an outer surface of said curled portion of said first encountering portion when said pin is inserted through said second encountering portion of said first encountering portion and said curled portion, and

(2) to urge said curled portion of said first encountering portion and said second encountering portion into contact with said stepped midsection of said pin;

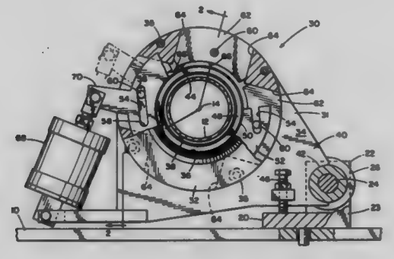
(d) said curled portions being offset from one another such that said curled portion of said first encountering portion and said first and second curled portions of said second encountering portion each comprise a distinct longitudinal axis which are spaced from and substantially parallel to each other and are separate from all other longitudinal axes when said leading section of said pin enters during the assembly and is located in after the assembly said second curled portion of said second encountering section.

4,719,667

CLAMP MEANS FOR A STUFFING MACHINE

Algimantas P. Urbutis, Palos Heights, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Nov. 12, 1986, Ser. No. 929,455
Int. Cl.⁴ A22C *11/00*
U.S. Cl. 17—41 **10 Claims**



1. A stuffing machine including a bed, a stuffing horn supported above the bed and having a forward discharge and a rearward inlet, and a clamp means on said stuffing machine for releasably attaching to an end of a sleeve which is slidably mountable on the stuffing horn, said clamp means comprising:

(a) a frame including front and rear plates joined in a face-to-face spaced apart relationship so as to form a space therebetween, said plates being disposed transverse to the longitudinal axis of the stuffing horn with each plate having a circular passageway radially aligned to accomodate the stuffing horn, and said front plate passageway having a diameter sufficient to admit a said sleeve end into said space between said plates;

(b) a plurality of pressing elements disposed in said space between said plates and circumferentially positioned about a said sleeve end, said pressing elements each being guided for sliding movement relative to said plates to and from a first position spaced radially outward from a said sleeve end and a second position pressed inwardly against a said sleeve end;

(c) a driven number in said space between said plates, said driven member being journaled to one of said plates for rotary motion about the longitudinal axis of said stuffing horn through a defined arc length;

(d) drive means carried by said frame and connected to said driven member for alternately rotating said driven member clockwise and counterclockwise through said arc length; and

(e) linking means between said driven member and each of said pressing elements for slidably moving said pressing elements between said first and second positions responsive to the clockwise and counterclockwise rotation of said driven member.

4,719,668

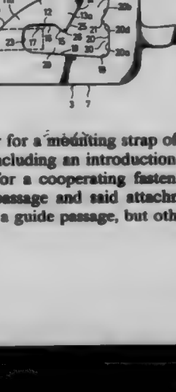
ROPE CINCHING DEVICE

Roland R. Cavanagh, 13716 Skyline Boulevard, Woodside, Calif. 94062

Filed Sep. 15, 1986, Ser. No. 907,476
Int. Cl.⁴ F16G *11/14*
U.S. Cl. 24—68 F **4 Claims**

1. In a cinching device for tensioning and securing a line, said device including a body having a first line securement means frictionally engaging and securing said body to said line at a first position along said line, said body further having a surface formed for and supporting a portion of said line proximate said first position for movement of said portion over said surface during cinching, and said body having a second line securement means securing said line at a second position proximate said portion and along said line on a side of said portion opposite said first portion, wherein the improvement in said cinching device comprises:

said body further being formed as an aperture-free body with channel means extending from all of said first line securement means, said surface, and said second line securement means to a side of said body for passage of a section of said line from said side of said body through said channel means and into operative engagement with each of said first line securement means, said surface, and said second line securement means;



said first line securement means and said second line securement means each being formed for and securing said line solely by frictional engagement with said body;

said first line securement means securing said line to said body during tensioning of said line by movement over said surface; and

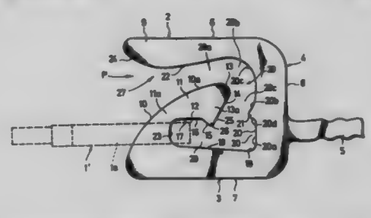
said first line securement means, said surface, and said second line securement means defining a single path for said line which constrains the held portion of said line to a plane.

4,719,669

FASTENING MEMBER FOR A TIRE CHAIN

Anton Müller, Aalen-Unterkochen; Hubert König, Aalen, and Ludwig Wolfbeis, Aalen-Hofherrnweiler, all of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,050
Claims priority, application Fed. Rep. of Germany, May 2, 1985, #3512865[U]
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Int. Cl.⁴ A44B *21/00*
U.S. Cl. 24—68 TT **10 Claims**



1. A fastening member for a mounting strap of a tire chain, said fastening member including an introduction passage and an attachment passage for a cooperating fastening member, with said introduction passage and said attachment passage being interconnected by a guide passage, but otherwise being

separated from one another by a hook arm portion that is provided with a securing element that narrows said attachment passage; the improvement comprised therein that:

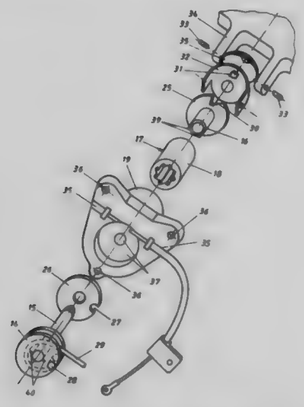
said guide passage, at the level of said hook arm portion, extends at an angle of greater than 90° relative to the longitudinal axis of said attachment passage.

4,719,670

SKI BOOT

Hilgarth Kurt, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Nov. 5, 1986, Ser. No. 927,072
Claims priority, application Austria, Nov. 14, 1985, 3322/85
Int. Cl.⁴ A43C *11/00*; A44B *21/00*; A43B *5/00*
U.S. Cl. 24—71.2 8 Claims



1. A tensioning device for a cable wire or band wire for utilisation in a ski boot having a casing and a leg portion, more especially a ski boot which is put on by entering the boot from the rear, and wherein the leg portion comprises a sleeve, which forms the front portion thereof, and a cover, which forms the rear portion thereof, as well as a means for securing the leg portions together in the position of use, a pressure distribution plate being disposed inside the shell, preferably between the casing and an inner boot portion, and said pressure distribution plate extends at least over the instep region, preferably to the front part of the foot, and laterally surrounds the foot at least partially;

the tensioning device including at least one cable reel mounted in a bearing bush by means of a bearing bolt so as to be rotatable and axially displaceable;

wherein the bearing bush forms the rotary member of a freewheel bearing which has a rigid bearing sleeve surrounding the bearing bush and connected to the housing of the tensioning device with wedge locking means operative between the bearing bush and the sleeve for permitting unlimited rotation of the bush in the sleeve in a cable reel-tensioning direction and locking the sleeve against rotation in the bush in a cable reel-relaxing direction;

wherein one end of the bearing bush is connected to the cable reel via an engageable and disengageable coupling means; and

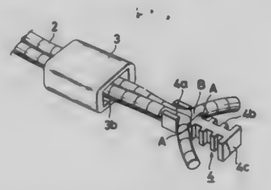
wherein the other end of the bearing bush is connected to a tensioning disc provided with a rotary knob, a tensioning lever or the like, the bearing bolt extending through the tensioning disc and being connected to a resilient member which is supported on the tensioning disc, the resilient member biasing the engageable and disengageable coupling means into an engaged condition for tensioning the cable reel the coupling means being disengageable by the axial displacement of the bearing bolt in a direction opposite the force of the resilient member.

4,719,671

STRAP CONNECTOR

Hitomi Ito, Kanagawa, and Toshitsugu Furuya, Hyogo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 784,839, Oct. 4, 1985. This application May 7, 1987, Ser. No. 47,610
Claims priority, application Japan, Nov. 8, 1984, 59-169346[U]
Int. Cl.⁴ F16G *11/00*
U.S. Cl. 24—115 R 6 Claims



1. A strap connector assembly for a camera comprising:

an elongated strap member having a thickness dimension;

a connector body having a hollow interior with a pair of interior walls on opposite sides thereof and with openings at opposite ends thereof;

a core member adapted to be placed within said hollow interior of said connector body through one of said openings to grasp said strap member in clamped engagement therein, said core member being adapted to be removed from said interior of said connector body through said one opening to release said clamped engagement;

said core member being integrally formed to include a pair of opposed walls forming a gap therebetween with two parts of said strap member being held in juxtaposed position within said gap between said walls and a base part having one end spaced away from said opposed walls and extending therefrom to an end face thereof located on a side of said base part opposite said one end;

said strap member being held when in said clamped engagement with said two juxtaposed parts extending from one side of said gap through the other of said openings in said connector body and from an opposite side of said gap so as to be bent through two essentially 90° turns so as to extend to opposite sides of said base part to between said base part and said interior walls, respectively, of said connector body;

said one end of said base part being spaced away from said opposed walls defining said gap a distance at least equal to said thickness of said strap member and with a width at least equal to the width of said gap so as to engage said two parts of said strap member and divert said two parts through said two 90° turns and to opposite sides of said base part.

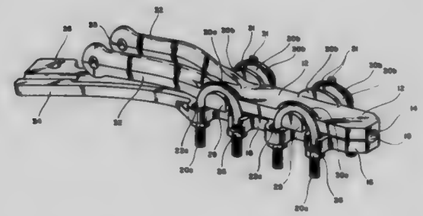
4,719,672

CLAMP BODY FOR CABLE CONDUCTOR

Kenneth P. Apperson, Pinson, and James D. Glass, Birmingham, both of Ala., assignors to Square D Company, Palatine, Ill.

Filed May 9, 1986, Ser. No. 861,761
Int. Cl.⁴ F16G *11/06*
U.S. Cl. 24—135 R 3 Claims

1. An apparatus for clamping a conductor comprising an upper section with two opposing elongated sides and lower section with two opposing elongated sides, said upper and lower sections having means for receiving and maintaining a cable therein, said upper section having on a first elongated side at least one U-bolt with corresponding nuts secured thereto and a means for securing at least one U-bolt thereto such that the U-bolt is captively held to the upper section adjacent the first elongated side; and said second elongated side of said upper section having at least one U-bolt with corresponding nuts releasably secured thereto and having means for releasably maintaining at least one U-bolt adjacent the second elongated side; said means for releasably maintaining at least one U-bolt adjacent the second elongated side of the upper section comprising a groove formed in the upper section and adjacent the second elongated side, said groove having a pair of opposing walls defining the ends thereof, where one of said walls is an outer wall with respect to the second elongated side of the upper section and said outer wall has a height and width substantially reduced from that of the other wall such that the U-bolt placed in said groove will be maintained there when torqued into the clamp, but will be able to clear the outer wall when loosened to permit the upper section to be lifted off of the lower section to expose the means for receiving a cable therein, said lower section having on a first elongated side, corresponding to the first elongated side of the upper section, means for securing said U-bolt thereto; said lower section having on said second elongated side, corresponding to the second elongated side of the upper section, means for releasably retaining a leg of said U-bolt said means



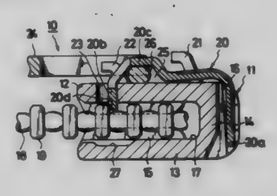
for releasably retaining a leg of said U-bolt comprising a slot formed in the lower section and adjacent the second elongated side, said slot receiving a leg of the U-bolt such that the slot will provide mean against which the U-bolt and a nut threaded thereon can be torqued against the upper and lower sections of the clamp and will allow the leg of the U-bolt to pivot away from the clamp when said nut is loosened and when the U-bolt is lifted off of the outer wall of the groove on the upper clamp section, and means for allowing said U-bolt to clear the cable receiving area of the clamp when the upper clamp section is removed from the lower clamp section said means for allowing the U-bolt to clear the cable receiving area of the clamp comprising an opening in the second elongated side of the lower section, said opening cooperating with the slot to receive the other leg of the U-bolt and to provide means against which the U-bolt is torqued against the clamp; said opening having a beveled section therein adjacent an outer side of the opening with respect to the second elongated side, said beveled section allowing the U-bolt, when removed from the groove adjacent the second elongated side of the upper section, to tilt away from cable receiving area of the clamp such that the U-bolts, when assembled therein, cooperate to allow the upper section to be removed from the lower section to expose the cable receiving area, without disassembling the U-bolts from the clamp or the upper section from the lower section.

4,719,673

LOCKABLE SLIDER FOR SLIDE FASTENERS

Yasutoshi Kubo, Macon, Ga., assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,225
Claims priority, application Japan, Feb. 17, 1986, 61-21725[U]; May 23, 1986, 61-78739[U]
Int. Cl.⁴ A44B *19/30*
U.S. Cl. 24—421 4 Claims



1. An automatic lock slider for a slide fastener having a slide fastener chain provided with coupling elements comprising:

(a) a slider body including upper and lower wings spaced parallel to each other and joined together at their front ends to define a guide channel therebetween for a regular track of the slide fastener chain;

(b) a pull tab pivotally mounted on the slider body;

(c) a locking member supported on the slider body and including a locking prong movable through an aperture into and out of the guide channel;

(d) said lower wing having a cavity disposed in its inner surface contiguous to said guide channel in confronting relation to said prong to allow said coupling element to sink therein, said cavity having an upgrade cam surface extending toward the front ends of said wings such that when an external separating force is applied to the fastener chain with said locking prong disposed outside the guide channel, the coupling element disposed underneath said locking prong is moved past the locking prong through said cavity and then guided up along said upgrade cam surface back onto the regular track in the guide channel; and

(e) said locking prong having a cam surface downwardly canted at an angle consistent with an angle at which said coupling elements tilt under stresses barely reaching the critical point at which said coupling elements become displaced or separated, said locking prong having an effective cam surface commencing at a position above the upper end surface of said coupling element.

4,719,674

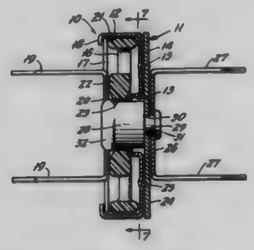
SNAP-TYPE FASTENER

Chan Y. Kit, c/o Kit Hart Metal Fty Kwai Tak Industrial Centre, 15-33 Kwai Tak Street, Kwai Chung, New Territories, Hong Kong

Filed Sep. 5, 1986, Ser. No. 904,192
Claims priority, application United Kingdom, Sep. 5, 1985, 852204
Int. Cl.⁴ A41F *1/00*
U.S. Cl. 24—589 11 Claims

1. A snap-type fastener comprising a male part and a female part, said female part being provided with a resilient member having an outer rim and resilient inwardly directed prongs with the inner end portions thereof defining a variable opening, the outer end portions of said prongs having reduced thickness as compared to said inner end portions, said prongs each extending from said outer rim in a direction substantially tangential to said opening, and said male part having a projection provided with an enlarged head portion, and said variable opening normally being smaller than said head portion so that said prongs retain said male part when its head portion has

been forced through said opening, whereby in use said projection and head portion can be forced through the opening by



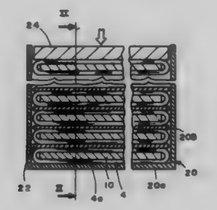
engaging and forcing said resilient prongs to enlarge said opening to pass said head portion.

4,719,675

PRODUCTION OF CAPACITORS OF THE STACKED TYPE

Franco Savoia, Bologna, Italy, assignor to Arcotronics Italia S.p.A., Bologna, Italy

Filed Feb. 11, 1986, Ser. No. 828,128
Int. Cl.[4] H01G *4/26*
U.S. Cl. 29—25.42 **3 Claims**



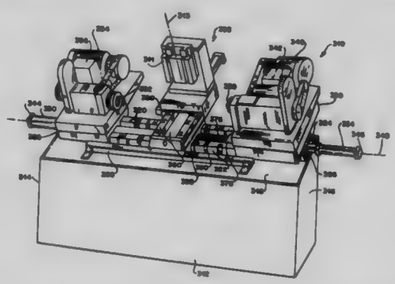
1. A process for producing capacitors of the stacked type, characterized in that the process comprises, in the order stated hereunder, the following steps: the simultaneous winding of two superposed films (1, 2), each metallized on one side (1*a*, 2*a*) and with the metallized side (1*a*, 2*a*) of one film (1, 2) in contact with the non-metallized side of the other film (2, 1), around a stick-shaped support (10) until a reel (4) made up of a predetermined number of turns is formed, the reel (4) comprising two elongated substantially rectilinear, parallel side portions (4*a*) at either side of the support (10) connected by curved portions (4*b*) either end of the support (10); the formation inside a frame (20), open at the front and rear, of a stack (23) constituted by a number of superposed reels (4), wound onto the corresponding supports (10), and by separation diaphragms (22), each interposed between two consecutive reels (4) with a flat side portion of each reel (4) in contact with the adjacent diaphragm (22) and spacing the support from the diaphragm so that edge faces (6*a*) of the reels (4) are exposed; the compression, at a predetermined pressure, of the said stack (23); the metallization, by spraying, of both the front and rear exposed faces of the said stack; the removal, through brushing, of layers of metallization deposited on the coated faces of the separation diaphragms (22) and of the supports (10); the extraction of the stack (23) from the frame (20) and the separation of the reels (4) from the diaphragms (22); the separation of each reel (4) from the corresponding support (10) and, either during or after separation of the reels (4) from the support (10), the transverse shearing of the reels (4) to remove the curved portion (4*b*) to provide at least two capacitive rods (6) extending rectilinearly, the gauge of each of which is identical to that of the reel (4); and the transverse shearing of each rod (6) in order to produce a plurality of individual capacitors (9), each of a predetermined capacitance.

4,719,676

FLEXIBLE MACHINING SYSTEM

Reno D. Sansone, Watchung, N.J., assignor to Wadell Equipment Company, Inc., Edison, N.J.

Filed Sep. 10, 1984, Ser. No. 648,897
Int. Cl.[4] B23B *3/30*
U.S. Cl. 29—27 A **1 Claim**



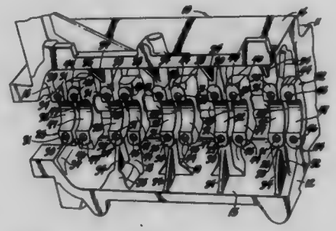
1. A flexible machining system, comprising first adjustable receiving means for interchangeably and rotatably receiving workpieces or tools, whereby a tool received in said first receiving means can be removed therefrom and replaced with a workpiece or vice versa, first rotating means for rotating said first receiving means, first mounting means for mounting said first receiving means such that said first receiving means is movable bidirectionally along a first axis, second adjustable receiving means for interchangeably and rotatably receiving workpieces or tools, whereby a tool received in said second receiving means can be removed thereform and replaced with a workpiece or vice versa, second rotating means for rotating said second receiving means, second mounting means for mounting said second receiving means such that said second receiving means is movable bidirectionally along said first axis and such that said second receiving means is arranged coaxially relative to said first receiving means, third receiving means for releaseably receiving a workpiece or a tool, third mounting means for mounting said third receiving means such that said third receiving means is movable bidirectionally along said first axis between said first and second receiving means and such that said third receiving means is movable bidirectionally along a second axis which is arranged perpendicular to said first axis, said third mounting means including attaching means for removably attaching a jig milling slide to said third mounting means such that said jig milling slide functions as said third receiving means, whereby said jig milling slide is conjointly movable with said third mounting means along said first and second axes, and such that said jig milling slide is also movable bidirectionally along a third axis arranged normal to a plane containing said first and second axes, supporting means for supporting said first, second and third mounting means such that said first, second and third mounting means are movable bidirectionally and independently of each other along said supporting means, said supporting means including a single way system common to said first, second and third mounting means such that each of said first, second and third mounting means is supported by said way system, first moving means for bidirectionally moving said first mounting means along said way system between a first position in which said first mounting means is remote from said third mounting means and a second position in which said first mounting means is adjacent one side of said third mounting means, second movigng means for bidirectionally moving said second mounting means along said way system between a third position in which said second mounting means is remote from said third mounting means and a fourth position in which said second mounting means is adjacent an opposite side of said third mounting means, whereby when said first mounting means is in said second position and said second mounting means is in said fourth position, the first and second receiving means are close enough to each other such that workpieces can be transferred from said first receiving means to said second receiving means or vice versa, and third moving means for bidirectionally moving said third mounting means along said way system between said first and second mounting means.

4,719,677

CRANKCASE MANUFACTURING METHOD

Philip D. Arnold, Pleasant Ridge, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 831,423, Feb. 20, 1986, Pat. No. 4,690,112.
This application May 26, 1987, Ser. No. 54,283
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R **3 Claims**



1. A method of manufacturing a crankcase assembly, said method including the steps of

forming an integral crankcase having a plurality of longitudinally spaced laterally extending journal receiving portions and longitudinally displaced bearing caps connected with at least one of said journal receiving portions by severable connecting portions, said journal receiving portions and bearing caps including unfinished bearing recesses substantially longitudinally coaxially aligned,

machining said crankcase including the journal receiving portions and bearing caps to provide attaching holes, finished joint face surfaces and machined bearing recesses,

separating the bearing caps from the crankcase by severing the connecting portions, and

securing the severed bearing caps to associated journal receiving portions with suitable attaching means.

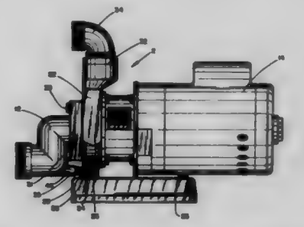
4,719,678

METHOD FOR DRAINING A HYDROTHERAPY PUMP

Donald Lindberg, North Hollywood, Calif., assignor to Albert R. Weaver, Symar, Calif.

Continuation of Ser. No. 588,287, Apr. 10, 1984, abandoned, which is a division of Ser. No. 509,383, Jun. 30, 1583, Pat. No. 4,465,428, which is a continuation of Ser. No. 182,123, Aug. 28, 1980, abandoned. This application Jun. 3, 1986, Ser. No. 869,882
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 R **2 Claims**

1. A method of providing substantially complete drainage for an impeller chamber of a hydrotherapy pump having a unitary integral exterior casing, said chamber containing a pump impeller and being defined by walls and having a pump suction inlet and a pump exhaust communicating with the chamber, comprising boring a drain opening in a chamber wall in a bottom portion of the chamber, and sealingly attaching to said opening and to said pump suction two ports of a pipe



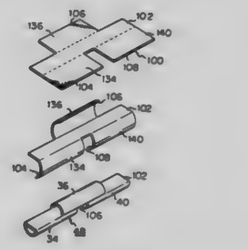
fitting having at least three ports, said pipe fitting having a mounting flange for attachment directly to the pump casing.

4,719,679

METHOD OF MANUFACTURING TUBES FOR USE IN A MUFFLER FOR INTERNAL COMBUSTION ENGINES

Masao Fukuda, Omiya, Japan, assignor to Sankei Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 746,260, Jun. 19, 1985, Pat. No. 4,637,491.
This application Jun. 12, 1986, Ser. No. 873,491
Claims priority, application Japan, Jun. 21, 1984, 59-127766
Int. Cl.[4] B21D *53/00*; F01N *1/08*
U.S. Cl. 29—157 R **8 Claims**



1. A method of manufacturing an integral combination tube for use in a muffler comprising the steps of:

preparing a flat sheet of metal,

shaping said sheet so as to include a main portion having sides and first and second faces,

further shaping said sheet to provide a first subsection extending from one side of said main portion and a second subsection extending from an opposite side of said main portion,

bending said first subsection over said first face of said main portion to form a tube, and

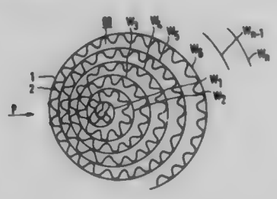
bending said second subsection over said second face of said main portion to form a tube.

4,719,680

METHOD FOR MANUFACTURING A WOUND METALLIC EXHAUST GAS CATALYST CARRIER BODY HAVING A GEOMETRICALLY COMPLEX CROSS-SECTIONAL SHAPE

Theodor Cyron, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 891,116
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1985, 3527111
Int. Cl.[4] B21D 53/00
U.S. Cl. 29—157 R 5 Claims



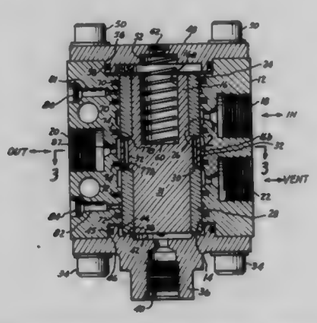
1. Method of producing a metallic exhaust gas catalyst carrier body, which comprises winding alternating layers of smooth and corrugated sheet metal strips to form a blank and inserting the blank into a jacket tube, each winding of the blank being formed of a respective smooth and corrugated sheet-metal strip each having an individually predeterminable length; determining the length of each winding in accordance with the length necessary for filling a predetermined jacket tube cross section, fixing each winding beforehand to at least one side of the blank, so as to produce a blank which is tightly wound on the one side and wound with varying looseness in the remaining region thereof; inserting the blank into the jacket tube in such a manner that the tightly wound side is located in a region of the jacket tube cross section in which a largest possible inscribed circle of the jacket tube cross section engages the jacket tube.

4,719,681

METHOD OF MAKING A FLUID FLOW CONTROLLING SLIDE MEMBER FOR A VALVE BODY

Meyer Piet, City of Industry, Calif., assignor to Futurecraft Corporation, City of Industry, Calif.

Division of Ser. No. 752,553, Jul. 8, 1985, Pat. No. 4,664,151.
This application Jan. 27, 1987, Ser. No. 6,766
Int. Cl.[4] B21D 53/00
U.S. Cl. 29—157.1 R 3 Claims



1. A method of making a fluid flow controlling slide member adapted for slidable movement within a valve body of the character having a cylindrical bore adapted to closely receive the slide member and including fluid inlet and outlet ports in communication with the bore, said method comprising the steps of:

(a) forming a first part in a manner to have a first cylindrical portion and an enlarged diameter second cylindrical portion defining a radially extending shoulder therebetween;

(b) forming a cylindrically shaped hollow sleeve having an inner diameter slightly larger than the outer diamter of said first cylindrical portion, an outer diameter equal to the outer diameter of said second cylindrical portion and an annular shaped edge; and

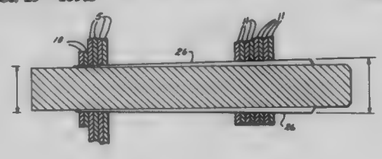
(c) affixing said sleeve to said first cylindrical portion of said first part with said annular shaped edge disposed in close proximity with said radially extending shoulder to define a circumferentially fluid carrying groove therebetween.

4,719,682

METHOD OF FORMING A LAMINATED WHEEL ASSEMBLY

John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Division of Ser. No. 694,106, Jan. 23, 1985, Pat. No. 4,630,498, which is a continuation-in-part of Ser. No. 403,465, Jul. 30, 1982, Pat. No. 4,522,080. This application Sep. 22, 1986, Ser. No. 911,098
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] B21K 1/30
U.S. Cl. 29—159.2 6 Claims



1. A method of forming a wheel assembly, comprising the steps of:

stamping a plurality of plates of desired configuration each provided with an opening formed therethrough;

forming teeth along the periphery of each plate;

stamping apertures in said plates in the shape of a cam to provide a plurality of cam members;

assembling the plates into a laminated stack so that adjacent plates are in abutting relation to one another with their openings in register and so that the teeth of adjacent plates are in registry to provide a laminated gear;

stamping an opening in each cam member;

assembling the cam members into a laminated stack so that adjacent cam members are in abutting relation to one another with their openings in registry to form an integral cam surface;

positioning said laminated stack of cam members in spaced relation to said laminated gear;

providing a shaft having a plurality of axially extending, axially tapered, radially projecting teeth disposed circumferentially about substantially the entire outer surface of said shaft; and

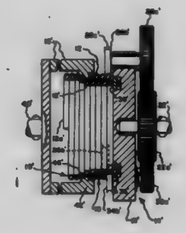
forcing said shaft through said openings so that the teeth of said shaft cut into said plates to secure said plates against both axial and circumferential movement relative to said shaft and so that said stack of cam members is forced onto said shaft at substantially the same time as said gear.

4,719,683

PRELOADED SPRING, METHOD AND APPARATUS FOR FORMING SAME

Otmar M. Ulbing, Fairport, N.Y., assignor to Windwinder Corporation, Tipp City, Ohio

Filed Dec. 30, 1985, Ser. No. 814,234
Int. Cl.[4] B21F 35/00
U.S. Cl. 29—173 21 Claims



1. A method of forming a preloaded, close-wound tension spring of one hand from a compression spring of the opposite hand comprising the steps of radially compressing said compression spring and then winding the compressed compression spring outwardly upon itself.

4. An apparatus for forming a preloaded, close-wound tension spring of one hand from a compression spring of the opposite hand comprising: axial guide means; driven surface means for frictionally engaging a radially inner surface of coils of said compression spring as said coils are presented thereto for feeding said compression spring in a direction axially thereof towards said axial guide means; and guide surface means for radially expanding said coils passing from engagement with said driven surface means, said axial guide means limiting movement of said coils axially of said compression spring beyond said guide surface means in said direction and cooperating with said guide surface means to reverse wind coils of said compression spring outwardly upon themselves to form said tension spring.

4,719,684

APPARATUS FOR INSERTING SEALS INTO INTERNAL GROOVES OF VALVE BORES

Harry P. Mutter, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1986, Ser. No. 913,448
Int. Cl.[4] B23P 19/02
U.S. Cl. 29—235 8 Claims



1. An apparatus for inserting seals into a body, the body having a bore which extends through the body and defines an opening in the body at each end of the bore, and at least one annular groove situated within the bore between said ends and in said body for receiving a seal, said annular groove defining parallel spaced apart edges, the apparatus comprising:

a cylindrical plug having a seal supporting surface at one end and an outside diameter which is substantially equal to the inside diameter of said bore and such that the cylindrical plug can be inserted through one end of said body into said bore to a position where said seal supporting surface is located adjacent to on edge of an annular groove;

a seal insertion tube having a front surface, an inside diameter defining a seal passage and an outside diameter substantially equal to the inside diameter of said bore and such that the seal insertion tube can be inserted through the other end of said body into said bore to a position where said front surface is located adjacent to the other edge of said annular groove; and

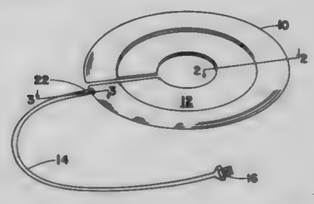
means for urging a seal through the inside diameter of said seal insertion tube against said seal supporting surface of said cylindrical plug and thereafter for urging the seal into said annular groove.

4,719,685

JACK DEVICE FOR WASHING MACHINES

Jeff H. Anderson, 527 N. Azusa Ave., Suite 188, Covina, Calif. 91722

Filed Aug. 4, 1986, Ser. No. 892,365
Int. Cl.[4] B25B 27/14
U.S. Cl. 29—252 2 Claims



1. A jack device adapted to quickly and easily break an agitator in an automatic washing machine loose from a shaft to which it has become stuck by scale deposits, said device comprising: a bladder of toroidal form and split-ring configuration when deflated, the deflated bladder being of a size to fit substantially entirely underneath said agitator in said washing machine around said shaft, said bladder having a radially outwardly disposed portion of its wall approximately double the thickness of the remaining portion thereof, said thicker portion extending inwardly from the periphery approximately one third of the diameter of said bladder, to prevent outward ballooning of the bladder from the space underneath said agitator when the bladder is inflated, whereby inflation of the bladder, so positioned causes it to expand upwardly into contact with the bottom of the agitator to thereby free the agitator from its attachment to said shaft; a flexible tube and means attaching it to said bladder in a way to permit inflation of said bladder therethrough by hydraulic or pneumatic pressure.

4,719,686

METHOD FOR REPAIRING A PISTON AND SHAFT ASSEMBLY

Donald R. Fagin, LaGrange Park; Howard E. Toon, Lombard, both of Ill., and Clebora W. Sigley, Orange Park, Fla., assignors to Co-Ordinated Railway Services, Inc., Downers Grove, Ill.

Filed May 28, 1986, Ser. No. 867,761
Int. Cl.[4] B23P 6/00
U.S. Cl. 29—402.08 8 Claims

1. A method of repairing a damaged piston and shaft combination for an end-of-car cushioning device wherein the device includes a piston and a shaft connected to the piston, the method comprising the steps of:

removing the shaft from the piston;

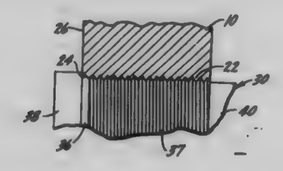
finding the true center of the piston;

cutting a bore through the true center of the piston;

cutting threads in the bore;

cutting an angled chamfer in one end of the bore;

providing a new shaft having a central length of a diameter less than the diameter of the bore, a threaded portion at a predetermined position on the shaft, the threads having an outside diameter greater than the diameter of the bore and being adapted to mate with the threads of the bore to provide a positive abutment against axial piston motion along the shaft in one axial direction, and an angled chamfer of increased diameter at one end of the threaded portion, the chamfer being adapted to mate with the chamfer of the bore to provide a positive abutment against axial piston motion along the shaft in the other axial direction;



connecting the new shaft to the old piston by sliding the piston over the central length of the shaft and then rotating the piston and shaft relative to each other so that the threaded portion of the new shaft engages the threads of the bore and so that the chamfers abut.

4,719,687

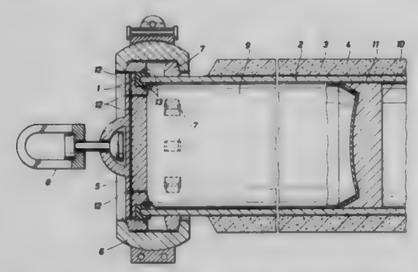
METHOD FOR SEALING, PRESSURE-TESTING, AND TRANSPORTING A MULTI-PIPE SEGMENT

Walter C. Nanny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 644,144, Aug. 24, 1984, abandoned, which is a division of Ser. No. 64,448, Aug. 7, 1979, abandoned, which is a continuation of Ser. No. 848,980, Nov. 7, 1977, abandoned, which is a division of Ser. No. 754,142, Dec. 27, 1976, abandoned. This application Sep. 12, 1986, Ser. No. 906,639

Int. Cl.⁴ B23Q *17/00*; B21D *53/00*

U.S. Cl. 29—407 **1 Claim**



1. A method for sealing, pressure testing and transporting a multi-pipe segment for connection to a previously installed pipeline, comprising:

engaging and protecting the end periphery of at least one pipe of the multi-pipe segment with an elastomer ring seal retained in a closure cap;

closing the end of the pipe with the ring seal retained in the closure cap and pressing the seal against the pipe end;

attaching an outer pipe periphery edge-tapered slip-on ring, parallel and proximate to the end periphery of the pipe;

gripping the outer pipe periphery edge-tapered slip-on ring and the ring seal retaining closure cap with an inside-tapered hinged closure means, thereby causing the ring to press the seal as the device ends are drawn together;

displacing undesired gases or fluids from the pipe;

injecting test media fluids into the pipe;

subjecting the interior of the pipe to high pressure to test for the presence of leaks to verify the internal pressure-retaining capability of the pipe;

depressuring and removing the mechanical end seal;

injecting a transport material into the pipe;

porting the mechanical end seal to permit energizing or de-energizing a separate and secondary internal pipe sealing device, disposed within the pipe; and

forming a sealed multi-pipe segment and transporting the sealed segment by means of a swivel-type pull eye, drawing the end pipe of the multi-pipe segment into proximate alignment and orientation with a previously installed pipeline.

4,719,688

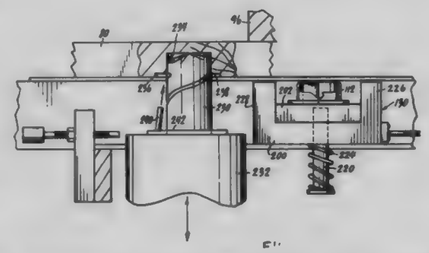
MANUFACTURING A PLAQUE WITH AN INSERT THEREIN

Charles McCrea, P.O. Box 149, Bohemia, N.Y. 11716

Continuation-in-part of Ser. No. 817,042, Jan. 8, 1986, Pat. No. 4,655,428. This application Nov. 18, 1986, Ser. No. 932,041

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—445 **23 Claims**



1. Apparatus for automatically placing an insert in a body comprising support means for supporting said body at a processing station, drill means reciprocal towards and away from said body at said processing station for drilling a hole in said body, and slide means reciprocal between positions respectively intervening between the drill means and the body at the processing station and removed therefrom, said slide means being adapted to support said insert and being adapted to be at least in part displaced by said drill means to move the insert into said hole whereby on sequential movements said drill means drills a hole in said body and then moves the insert into the hole.

4,719,689

METHOD OF MAKING A RUST PREVENTIVE HEMMED JOINT BETWEEN TWO METAL PANELS

Shozo Yamamoto, Fujisawa; Tsuneo Sakauchi; Tadashi Ashida, both of Yokohama; Koichi Handa, Miura, and Masao Nakajima, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Dec. 3, 1986, Ser. No. 937,481

Claims priority, application Japan, Dec. 4, 1985, 60-273748

Int. Cl.⁴ B23P *25/00*

U.S. Cl. 29—458 **2 Claims**

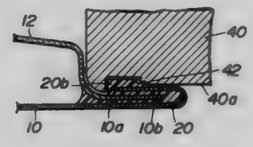
1. A method of making a rust preventive peripheral joint between first and second metal panels, comprising the steps of:

applying a predetermined quantity of a rust preventive sealant to a marginal part of the first panel generally along a free edge of the first panel;

placing a marginal part of the second panel in a predetermined position with respect to said marginal part of the first panel; and

hemming said marginal part of the first panel along said free edge so as to hem in said marginal part of the second panel by using a press die member which is formed with a groove in a surface used to hem the first panel such that said groove extends along said edge of the first panel at the end of the hemming operation,

said predetermined quantity of said sealant being in excess of a quantity just sufficient for completely filling in gaps in the joint made by the hemming operation so that the excess portion of said sealant is pressed out of the joint by the end of the hemming operation and is confined within a space defined by said groove and is shaped in conformance with the shape of said groove so as to closely cover said edge of the hemmed first panel.



4,719,690

TOOL-CHANGING DEVICE FOR A MACHINE TOOL

Otto Eckle, Loechgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter-und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

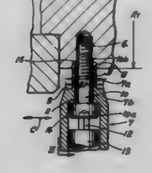
Filed Jun. 18, 1986, Ser. No. 875,859

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 8519793[U]

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **7 Claims**



1. In a tool-changing device for a machine tool with a tool holder receiver, and more particularly a spindle, provided on the machine tool, with a plurality of tool holders which can be inserted interchangeably in the tool holder receiver, each of the tool holders having a cylindrical part and a screw-threaded bore extending radially into the latter and with a changing head mounted on the free end of a changing arm for movement radially with respect to the axis of the cylindrical part or of the spindle, the said changing head being provided, at the outer end thereof which faces towards the tool holder, with a centering recess arranged to engage the cylindrical part of the latter during tool changing and being further provided in the center of the centering recess with a connecting bolt extending in the radial direction of movement of the changing head and capable of being motor driven in either of two opposite directions of rotation at will, the said connecting bolt being capable of restricted axial sliding movement in the changing head and having on its free end part an external screw thread which is engageable in the screw-threaded bore, the improvement comprising wherein said changing head has at the end thereof which faces towards the tool holder concerned at any time, a substantially segmental part and a first centering recess in the latter formed by a first part-cylindrical (arcuate) centering surface the radius of which corresponds approximately to the radius of the cylindrical part of a first tool holder, wherein portions of a second part-cylindrical (arcuate) centering surface are provided, one on each side of the segmental part, on a part of the changing head which is widened out axially of the latter, the said second centering surface being concentric with the first centering surface and having a relatively large radius corresponding approximately to the relatively large radius of a cylindrical part of a second tool holder which has, in the vicinity of its radial screw-threaded bore a recess for the segmental part.

4,719,691

TOOL CHANGE MECHANISM FOR PUNCH PRESSES AND THE LIKE

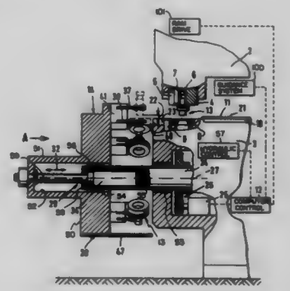
Hans Klingel, Mogltngen, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,563

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1984, 3440224

Int. Cl.⁴ B23Q *3/155*

U.S. Cl. 29—568 **28 Claims**



1. In combination with a punch press or like apparatus having a frame providing a horizontal support surface for an associated workpiece, and a reciprocable ram assembly with a tool mounting receptacle spaced above said support surace, a tool storage and transfer mechanism comprising:

a. A magazine having its principal dimensions extending in a vertical plane parallel to the axis of reciprocation of said ram assembly and rotatable about a horizontal axis perependicular thereto, said magazine having a major portion with a periphery circumscribing an arc of a first radial distance from said horizontal axis and a minor portion having a periphery of a second radial distance from said horizontal axis reduced from that of said first radial distance, the peripheries of said major and minor portions being generally continuous and defining a closed geometric figure, said magazine having at least five tool carrying elements at spaced points about said periphery of said major portion and each adapted to seat releasably a tool adapted to seat in the tool mounting receptacle, and tools seated in substantially all of said tool carrying elements, said magazine comprising the sole component of said punch press for storing tooling for movement into said tool mounting receptacle;

b. means mounting said magazine for rotation about said horizontal axis which is spaced a distance below the plane of said support surface, said distance being of a dimension to locate said tool carrying elements in horizontal alignment with said tool mounting receptacle when said magazine is rotated to locate them in uppermost position, said

magazine minor portion reduced radial distance being of a dimension relative to said horizontal axis so that its periphery does not extend above the plane of said horizontal support surface when rotated into the uppermost position;

c. means for transferring tooling between the uppermost tool carrying element of said magazine and the tool mounting receptacle of said punch press; and

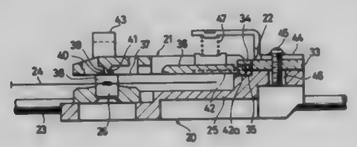
d. means for rotating said magazine to orient a selected tool mounting receptacle in said uppermost position for tooling transfer by said transferring means and for thereafter rotating said magazine to orient said reduced peripheral portion in said uppermost position so that said plane of said work support surface is spaced above said magazine to permit free motion of a workpiece thereover.

4,719,692

METHOD OF MANUFACTURING A MAGNETIC HEAD ASSEMBLY

Satoshi Sakai, Furukawa, and Yuichi Hishi, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 10, 1985, Ser. No. 807,369
Claims priority, application Japan, Dec. 10, 1984, 59-260382
Int. Cl.⁴ G11B *5/42*
U.S. Cl. 29—603 **4 Claims**



1. A method of manufacturing a magnetic head assembly comprising:

fixing a lower magnetic head to a carriage;

mounting an upper magnetic head rotatably by a gimbal spring on an arm having a rear end remote from said upper head which is so positioned as to face said lower head;

connecting said rear end of said arm to said carriage so that said arm may be rotatable only in a direction which allows said upper head to face said lower head;

maintaining between said upper and lower heads a clearance having a width which is equal to the thickness of a magnetic disk; and

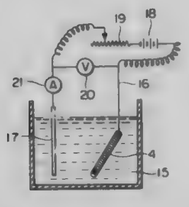
fixing said upper head to said arm.

4,719,693

RESISTANCE ELEMENT FOR WOUND-TYPE VARIABLE RESISTORS AND METHOD OF MAKING SAME

Kentaro Nagano, Yokohama, and Taichiro Kotani, Hatano, both of Japan, assignors to Tokyo Cosmos Electric Co., Ltd., Japan

Filed Dec. 5, 1985, Ser. No. 805,433
Claims priority, application Japan, May 10, 1985, 60-97956
Int. Cl.⁴ H01C *17/04*
U.S. Cl. 29—618 **3 Claims**



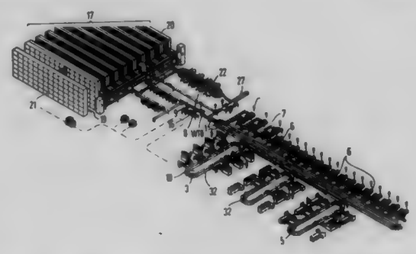
1. A method of making a resistance element for wound-type variable resistors having a metallic resistance wire and a core, the method comprising the steps of: preparing a resistance material by winding a metallic resistance wire, formed of either nickel and chromium or nickel and copper on the core; subjecting said resistance wire to electrolyte etching treatment employing an electrolyte solution containing at least any one type of sulfuric acid, ammonium persulfate, oxalic acid, nitric acid, copper nitrate and phosphoric acid; and, after subjecting said resistance wire to electrolyte etching treatment, immersing said resistance wire in a solution that dissolves copper.

4,719,694

INSTALLATION FOR AUTOMATIC ASSEMBLY AND TESTING OF ELECTRONIC CARD MODULES

Wolfgang Herberich, Koenigsbrunn; Walter Degle, Bobingen; Heiner Bohnsen, Bocholt, and Olaf-Ragnar Bolzmann, Augsburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 13, 1986, Ser. No. 930,645
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540316
Int. Cl.⁴ B23P *21/00*; B23Q *15/00*
U.S. Cl. 29—703 **3 Claims**



1. In a production facility for automatic assembly and testing of different types of electronic card modules manufactured from elements including circuitboards and electrical components, using automatic program-controlled equipping, soldering and testing units cooperatively arranged with a conveyor system, in which a plurality of processing stations are combined to form cells, and in which the control of the elements occurs via a master computer in cooperation with cell computers in the cells and with identifiers which are applied to the elements, the improvement wherein:

the conveyor system comprises first, second and third parts, said first part for conveying printed circuitboards and electrical components;

the processing stations are arranged along said first part of said conveyor system;

switches are arranged along said first part of said conveyor system at the processing stations and are controlled by the master computer to direct the elements to and from the processing stations;

a first route head is located upstream of and in communication with said first part of said conveyor system for applying the circuitboards to a respective first workpiece carrier bearing a destination address and applying destination addresses to the electrical components;

individual driverless conveyors communicating said processing stations, via said switches, with said first part of said conveyor system;

means are provided at each processing station for reading the destination addresses and applying the next destination address;

buffers are provided at the respective processing stations for temporarily storing incoming elements;

a soldering station is spaced from said first conveyor part, the second part of the conveyor system extending through said soldering station;

a second route head is provided for transferring the partially-equipped card modules from the workpiece carrier on the first conveyor part onto a second workpiece carrier on the second conveyor part for soldering in response to the last-applied destination address;

a final assembly and test station is spaced from said soldering station; and

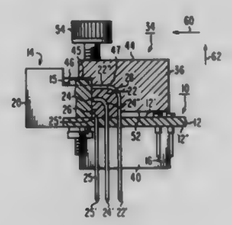
the third part of the conveyor system comprises an endless belt located between and transporting the card modules from the soldering station to the final assembly and test station.

4,719,695

PRINTED CIRCUIT BOARD SUPPORT FIXTURE FOR CONNECTOR WIRE WRAP PINS

William P. Sturner, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 6, 1986, Ser. No. 893,824
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—760 **6 Claims**



1. A fixture for supporting exposed L-shaped pin portions extending from a connector body into and through a printed circuit board first surface in an array, each of said L-shaped pin portions including a first straight pin portion which is substantially orthogonal to said first surface and a second straight portion which is substantially parallel to said first surface, said pin portions tending to bend and distort in response to wire wrapping force on the pins extending through the printed circuit board, said fixture comprising:

at least one first elongated contact support member adapted to be closely releasably inserted into an elongated space defined by the L-shaped pin portions, the adjacent connector body and the printed circuit board first surface, said support member being cylindrical with a cross-section including plural mutually orthogonal flat surfaces for abutting said adjacent connector body and said first surface, said cross-section further including mutually orthogonal further flat surfaces for abutting said first and second straight pin portions; and

a second contact support member releasably secured to said board and adapted to support said arrayed L-shaped pin portions at a region external to, and in nested relation with, said elongated space, said second contact support member including a portion axially aligned with said first straight pin portions.

4,719,696

PACKAGE FOR AN EXPANDABLE REMOTE INTERFACE UNIT

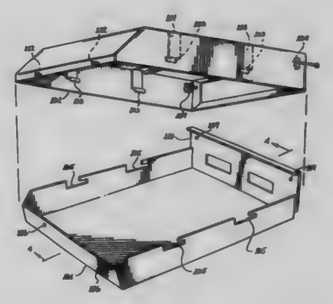
Bryan G. Castner, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Division of Ser. No. 662,959, Oct. 19, 1984, Pat. No. 4,672,510.
This application Apr. 1, 1986, Ser. No. 846,831
Int. Cl.⁴ H05K *3/36*
U.S. Cl. 29—830 **5 Claims**

1. The method of packaging an expandable remote interface unit comprising the steps of:

coupling a unit circuit board to a base portion of a remote interface unit housing;

providing said unit circuit board with a plurality of stations for coupling expansion module circuit boards;



coupling at least one expansion module circuit board to said unit circuit board by removably engaging an electrical connector on said unit circuit board with an electrical connector on said expansion module circuit board; and

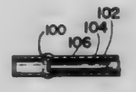
attaching a top portion of said housing to said base portion.

4,719,697

METHOD OF PREPARING COAXIAL CABLE FOR TERMINATION

Benjamin Schwartzman, Hagerstown, Md.; Russell A. Clearwater, Waynesboro, and Robert Volinskie, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 762,463, Aug. 5, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 873,827
Int. Cl.⁴ H01R *43/04*
U.S. Cl. 29—867 **18 Claims**



1. A method of preparing coaxial cable proximate the end thereof for termination to a coaxial electrical contact, said cable being of the type comprising a signal conductor, inner insulation surrounding said signal conductor, a braided metal shield surrounding said inner insulation, and an outer insulative jacket surrounding said shield, said method comprising the steps of:

cutting through said outer insulative jacket and said shield circumferentially at a first distance from said end with blade means,

withdrawing said blade means,

cutting said outer insulative jacket circumferentially at a second distance from said end with said blade means, said second distance being greater than said first distance,

removing the outer insulative jacket from said second distance to said end and said shield from said first distance to said end as a unit.

4,719,698

ELECTRIC SHAVER WITH A DRIVE CONTROL

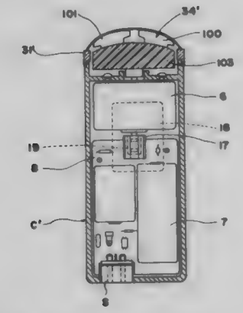
Kazunori Ninomiya; Katsuki Shitama, both of Nougata, and Masashi Aoi, Fukuoka, all of Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Jul. 2, 1986, Ser. No. 881,335

Claims priority, application Japan, Jul. 2, 1985, 60-100682[U]; Jul. 20, 1985, 60-111729[U]; Jul. 20, 1985, 60-111730[U]; Oct. 17, 1985, 60-159417[U]

Int. Cl.[4] B26B *19/14*

U.S. Cl. 30—43.6 7 Claims



5. An electric shaver which comprises:

a shaver housing comprising a generally rectangular box-like casing and a head casing removably mounted on one end of the box-like casing;

a finely perforated stationary shear foil replaceably mounted on the head casing;

a reciprocable blade assembly positioned inside the head casing and outside the box-like casing and cooperable with the stationary shear foil to cut bristles entering the head casing through the perforations in the stationary shear foil;

an electric drive motor accommodated within the box-like casing and having a drive shaft;

means for connecting the drive shaft with the blade assembly to permit the blade assembly to undergo oscillation relative to the stationary shear foil;

a photoelectric detector comprising a light emitting element and a photoelectric cell for providing an electric output signal indicative of a parameter descriptive of the speed of rotation of the motor, said photoelectric detector being positioned as to permit rays of light emitted from the light emitting element and travelling towards the photoelectric cell to be intercepted in a frequency generally equal to the frequency of oscillation of the blade assembly; and

a printed circuit board incorporating a control circuit for controlling the motor in dependence on the output signal and accommodated within the box-like casing.

4,719,699

REFERENCE ANTENNAS FOR EMISSION DETECTION

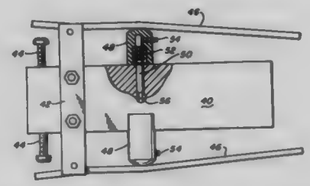
Glen Dash, Holden Green 307A, Cambridge, Mass. 02138, and Isidor Straus, 8 Longfellow Rd., Wayland, Mass. 01778

Filed Nov. 4, 1985, Ser. No. 794,780

Int. Cl.[4] B26F *13/00*

U.S. Cl. 30—90.1 2 Claims

1. In the construction of a balun, a device for severing the center conductor of a coaxial cable without disturbing the center conductor so as to permit removal of a portion of the center conductor, said cutting device comprising a body, said body having means for receiving the coaxial conductor, a pair of cutter blades and means for supporting the cutter blades so that the cutter blades are disposed for operation toward and away from each other and in a direction at right angles to the passage that accommodates the coaxial conductor, and means for mutually operating the cutter blades so as to pierce the coaxial conductor and sever the center conductor thereof, wherein the means for supporting the cutter blades each comprise a blade holder and handle means on opposite sides of the



body adapted to be compressed towards each other for operating the blade holders to in turn operate the associated cutter blades, wherein each blade holder has a recess for accommodating a biasing spring for normally biasing the blades away from each other.

4,719,700

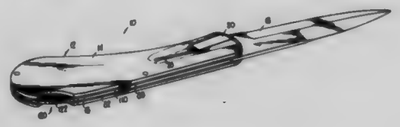
KNIFE OPENING MECHANISM

William J. Taylor, Jr., 828 Sycamore Dr., Decatur, Ga. 30030

Filed Jun. 26, 1986, Ser. No. 878,791

Int. Cl.[4] B26B *3/06*

U.S. Cl. 30—158 7 Claims



1. A folding knife comprising:

a casing;

a blade pivotably mounted to said casing and having a closed position and an open position with respect thereto;

a wheel operatively associated with said blade such that rotating said wheel pivots said blade with respect to said casing;

an actuator slidably mounted to said casing for actuation by a user; and

a non-extensible linkage attached to said actuator and wrapped around a portion of the circumference of said wheel such that when a user exerts a force against said actuator to slide said actuator with respect to said casing, said user-exerted force is transmitted to said non-extensible linkage wrapped around a portion of said wheel, whereby said user-exerted force is converted into a rotational force by said wheel to rotate said blade from said closed position to said open position.

4,719,701

DUAL BLADE SAW ATTACHMENT

David S. Williams, Rte. 1, Box 227, Oak Hill, W. Va. 25901

Filed Oct. 14, 1986, Ser. No. 918,023

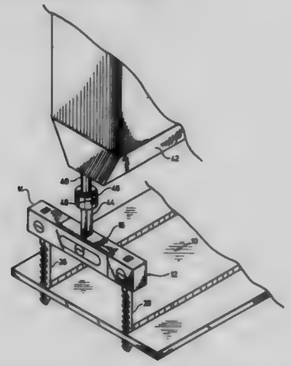
Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—304 6 Claims

1. A dual blade saw attachment for facilitating a concurrent use of a pair of spaced apart, paralleledly aligned saw blades, said attachment comprising:

a. a blade holder means for holding first and second saw blades in parallel alignment, said blade holder means comprising first and second members fixedly securable together;

b. an adjustment means for facilitating a spaced apart adjustment of said first and second saw blades, said adjustment means including a first serrated surface on said first member and a second serrated surface on said second member, said first and second serrated surfaces being engageable at various positions to effect said spaced apart adjustment of said first and second saw blades;



c. a first securing means for securing said blade holder means to a power saw, said first securing means being operable to effect a fixed securement of said first and second members together; and,

d. a second securing means for securing said first and second saw blades to said blade holder means.

4,719,702

UTENSIL HAND GUARD

Paul J. Hoffman, P.O. Box 2501, Appleton, Wis. 54913

Filed Aug. 6, 1986, Ser. No. 893,812

Int. Cl.[4] A47J *43/28*

U.S. Cl. 30—326 5 Claims



1. A device for hand feeding infants and small children comprising in combination an utensil and a removable elastomeric hand guard which is fitted around the utensil handle near the food carrying portion of said utensil, said guard having a broad surface facing but sloping away from said food portion and simulating an object on said slope, said guard having a base portion which extends along said handle for such a length as to be directly under said slope for at least a third of the length of said sloping surface, said base portion having means to provide free standing stability to said guard, said guard because of its elastomeric properties having a handle opening being capable of varying in size to meet the change of size of said handle as said guard is moved along the length of said handle, said hand guard being capable of amusing small children when removed from said utensil.

4,719,703

MULTICOORDINATE MEASURING MACHINE

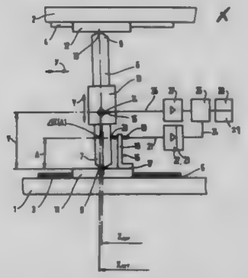
Günther Ross, Oberndorf, and Volker Schwarz, Zimmern, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,881

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512935

Int. Cl.[4] G01B *7/03*

U.S. Cl. 33—1 M 6 Claims



1. A multicoordinate measuring machine comprising two guiding systems each extending in a first coordinate direction and being spaced from each other in a second coordinate direction, a first carriage movably mounted on one of said guiding systems for movement in the first coordinate direction, a second carriage movably mounted to the other of said guiding systems for movement in said first coordinate direction, a cross arm having opposite ends extending between said guiding systems, one end being connected at a first pivot point to said first carriage and the other end being connected at a second pivot point to said second carriage, said cross arm extending at least approximately in said second coordinate direction, a measuring head having at least one measuring probe mounted on said cross arm at a location intermediate said ends of said cross arm, electrical means electrically connected to said measuring head for generating a signal corresponding to an actual position of said measuring probe in said first coordinate direction, a beam, connected to said first carriage and extending in said second coordinate direction at right angles to said first coordinate direction, a scanning head having a further measuring probe engaged with said cross arm at a contact point separated from said first pivot point by a selected distance, said scanning head being mounted on said beam, said further measuring probe being connected to said electrical means for generating a signal corresponding to a position of said cross arm at said selected distance from said first pivot point and in said first coordinate direction.

4,719,704

UNITIZED VEHICLE MEASURING GAUGE AND GAUGING SYSTEM

John W. Hogg, 165 Camden Crescent, London, Ontario, Canada N5X 2J6

Filed Sep. 29, 1986, Ser. No. 912,550

Int. Cl.[4] G01B *5/25*

U.S. Cl. 33—288 7 Claims

1. A vehicle body-and-frame measurement gauge for use in realigning the structure of a damaged vehicle having reference points comprising:

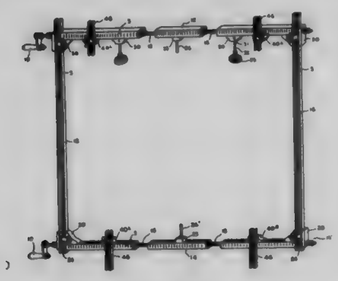
(a) two vertical members, each identically scaled with indicia along one surface thereof;

(b) a pair of cross bars with opposite ends each having its longitudinal length scaled and carrying;

(i) means at either end for attachment to one of each of the vertical members whereby to arrange the vertical mem-

bers and the cross bar into a generally U-shaped configuration;

(ii) a pair of adjustable block means carried by the cross bar adapted to be adjustably positioned therealong; and,



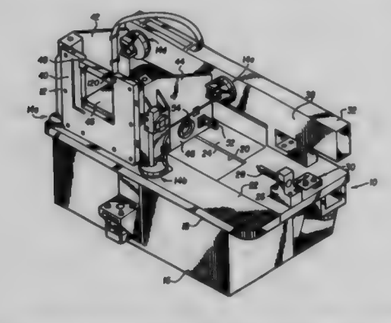
(iii) means for adjusting the adjustable block means, simultaneously, an equal dimension toward or away from each other, and as well, from the respective near ends of the cross bar.

4,719,705

RETICLE TRANSPORTER

Joseph L. Laganza, East Norwalk, and Orest Engelbrecht, Ridgefield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 24, 1986, Ser. No. 877,817
Int. Cl.[4] B23Q *1/04*; B25B *11/00*; F16C *32/06*
U.S. Cl. 33—568 10 Claims



1. Apparatus for precisely and rapidly transporting a reticle past an optical slit which comprises:

a base member having thereon a first planar bearing surface and a second planar bearing surface, said first and second bearing surfaces lying in intersecting planes whereby they are angularly disposed relative to each other;

a reticle stage linearly movable along the line of intersection of said planes;

three triangularly disposed gas bearings mounted on said reticle stage for supporting it on each of said first and second bearing surfaces, each of said gas bearings having planar supporting surface movable along one of said first and second bearing surfaces, said supporting surface defining a vacuum chamber and a plurality of preasure chambers adjacent its respective bearing surface;

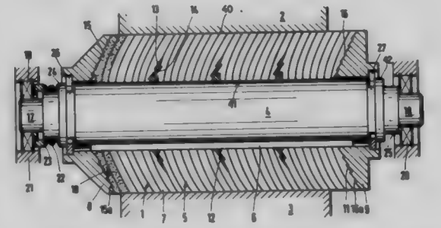
means for simultaneouly connecting said vacuum chamber to a vacuum source and said pressure chamber to a pressurized gas source whereby pressurized gas permits essentially friction-free movement of said reticle stage along said bearing surfaces while vacuum prevents movement of said reticle stage away from said bearing surfaces; and means for propelling said reticle stage along said bearing surfaces.

4,719,706

APPARATUS FOR CHANGING THE MOISTURE CONTENT OF RUNNING WEBS OF TEXTILE MATERIAL OR THE LIKE

Wolfgang Tschirner, Tönisvorst, Fed. Rep. of Germany, assignor to Kleinewefers Textilmaschinen GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,881
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515265
Int. Cl.[4] F26B *13/26*
U.S. Cl. 34—71 29 Claims



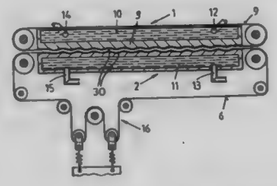
1. Apparatus for changing the moisture content of a running web of filamentary, fibrous or like material, comprising a first roll having an elongated core and a shell surrounding said core, said shell having a cylindrical external surface and comprising a stack of washer-like concentric discs of absorbent material, said roll further having two end walls flanking said shell and maintaining said discs in compressed condition, one of said end walls having a convex frustroconical surface abutting the respective end of said stack and the other of said end walls having a concave frustoconical surface abutting the respective end of said stack, each of said discs having a frustoconical shape and tapering toward said core in a direction toward said other end wall; and a second roll defining with said first roll a nip through which the running web passes.

4,719,707

CONVEYING APPARATUS FOR A FLAT ARTICLE, PARTICULARLY A CARDBOARD BLANK, PAPER SHEETS OR SIGNATURES OR THE LIKE

Hartmut Klapp, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,962
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521842
Int. Cl.[4] F26B *13/06*
U.S. Cl. 34—94 11 Claims



1. In a conveying apparatus for a flat article having a plastic coating, particularly a cardboard blank, paper sheet or the like,

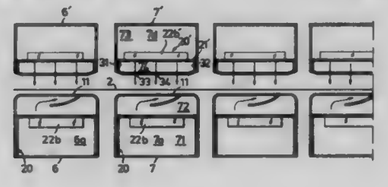
comprising two driven endless belts running over guides positioned opposite each other between which said flat article is clamped during transport through said conveying apparatus, said guides extending substantially the full length of a path of said belts between rollers at which said belts are deflected from said path, the improvement wherein each of said guides has a base surface facing said endless belts which is formed on a fixed bed with a wavelike longitudinal cross section with a plurality of wave troughs and crests and a plurality of lateral supporting members attached to said beds, wherein said wave crests of one of said guides are staggered with respect to said wave crests of the other of said guides and opposite said wave troughs of said other of said guides and said endless belts are either elastic in the transport direction or a belt storage unit engages each of said endless belts, at least one heating device acting on an edge of said article alongside said guides to melt said coating.

4,719,708

ARRANGEMENT IN MATERIAL DRYING SYSTEMS

Sven I. Karlsson; John B. Rudolfsson, both of Växjö ; Rolf K. Pettersson, Eneryda, and Nicola Nenow, Växjö, all of Sweden, assignors to Fläkt AB, Nacka, Sweden

Filed Dec. 31, 1985, Ser. No. 815,221
Claims priority, application Sweden, Jan. 16, 1985, 8500197
Int. Cl.[4] F26B *13/20*
U.S. Cl. 34—155 31 Claims



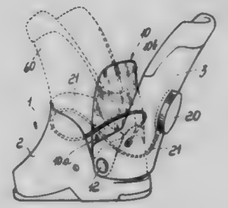
1. An arrangement in material drying sections of the kind in which the material, in the form of a web, is arranged for movement through the drying section while being supported by a plurality of air streams which impinge on an undersurface of the web and extend parallel, or substantially parallel with a plane of said web, each of said air streams being directed through a plurality of nozzle-like exit orifices formed in a blow box and providing the air streams with an exiting velocity and direction so as to hold the web material in a suspended position, said blow box having an end portion which receives a flow of supply air, the end portion provided with means for reducing and/or eliminating and/or over-compensating a velocity vector influence of the flow of supply air on the air streams as the air streams exit the nozzle-like orifices, the blow box having an interior divided into two chambers, a first chamber for receiving substantially all of the incoming air flow and a second chamber for receiving a portion of the air flow, said portion of the air flow having a velocity vector less than the velocity vector of the incoming air flow entering the first chamber, the nozzle-like exit orifices being positioned downstream from said second chamber, said means for reducing and/or eliminating and/or over-compensating the velocity vector influence being a plate or disc provided with a number of slots and being of an elongated configuration with a length shorter than half the longitudinal extension of the blow box and preferably shorter than one quarter of said longitudinal extension.

4,719,709

REAR ENTRANCE SKI BOOT

Franco Vaccari, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Continuation of Ser. No. 840,339, Mar. 17, 1986, abandoned.
This application Mar. 16, 1987, Ser. No. 26,247
Claims priority, application Italy, Mar. 22, 1985, 20014 A/85
Int. Cl.[4] A43B *5/04*; A43C *11/00*
U.S. Cl. 36—117 10 Claims



1. In a rear entrance ski boot defining a location for the wearer's foot and including a shell with a sole thereon with a longitudinal extension of the sole and with a plane of lay of the shell, a front quarter member and a rear quarter member hinged to said shell at a hinge point thereof, closure means for tightening said front and said rear quarter members towards each other, said rear quarter member having a bottom edge and a concave shape facing inwards to the ski boot and defining an inner space therein,

a rear inner quarter member arranged between said front quarter member and said rear quarter member and hinged to said shell at said hinge point and having a lower edge which is more distant from said sole than the distance of said bottom edge from said sole,

said rear inner quarter member having a shape suitable for wrapping at least partially the lateral and rear areas at ankle region of a wearer's foot and being at least partly arranged within said inner space defined by said rear quarter member and wherein

said closure means are in the form of cable means encircling at least partially said rear inner quarter member to press it towards the location of the user's foot when said cable means are tightened.

4,719,710

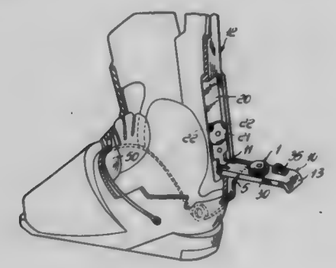
OPERATING DEVICE FOR FOOT LOCKING ELEMENTS, PARTICULARLY FOR SKI BOOTS

Alessandro Pozzobon, Paderno Di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Aug. 18, 1986, Ser. No. 897,564
Claims priority, application Italy, Sep. 4, 1985, 22096/85[U]
Int. Cl.[4] A43B *5/00*; A43C *11/00*
U.S. Cl. 36—119 7 Claims

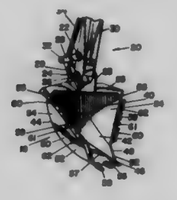
1. Operating device for foot locking elements, particularly for ski boots, comprising an operating knob actuating a reel for winding thereon a cable acting on at least one foot locking element, a lever pivoted on the ski boot and rotatably support-

ing on a side thereof said knob, said lever being positionable in an opening position in which said knob is accessible from the



outside and in a closing position in which said knob is enclosed between said lever and said ski boot.

4,719,711
EXCAVATION BUCKET
Karl G. Sieber, 0627 Beverly La., Dublin, Calif. 94568, and Kurt G. Sieber, 720 Terrace View Dr., Greensburg, Pa. 15601
Filed Jun. 3, 1985, Ser. No. 740,811
Int. Cl.[4] E02F *3/40*
U.S. Cl. 37—118 R 9 Claims



1. An excavating bucket for digging an excavation comprising a trench for laying pipe therein,

said bucket comprising:

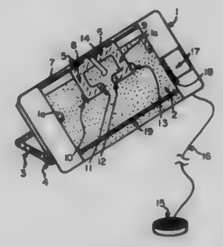
means for providing an excavation, said excavation having a bottom with a substantially flat portion and with two sides having portion substantially perpendicular to said bottom leading to two flared edges, said two sides being spaced from each other by a distance slightly greater than the diameter of the pipe to be laid therein,

said means for providing an excavation comprising:

a first, flat bottom with two sides substantially perpendicular to said flat bottom, portion means for forming a substantially rectangular lower part in said excavation having a depth sufficient to accommodate the pipe therein and for forming the lower excavation part to be of a size such that there is little or no distortion of the pipe to be laid therein; and

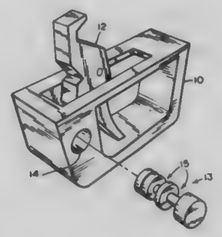
a second, outwardly flared V-shaped, portion means contiguous to said first portion means for forming said two flared edges.

4,719,712
AUTOMATICALLY CONTROLLED APPARATUS FOR TURNING PAGES
Jean-Claude A. Morcos, Vert Saint Denis, and Francoise Chaudiere, Paris, both of France, assignors to Societe Anonyme Haudiosoft, Vert Saint Denis Cedex, France
PCT No. PCT/FR84/00218, § 371 Date Jul. 24, 1985, § 102(e) Date Jul. 24, 1985, PCT Pub. No. WO85/01479, PCT Pub. Date Apr. 11, 1985
PCT Filed Oct. 3, 1984, Ser. No. 744,556
Claims priority, application France, Oct. 4, 1983, 83 15757
Int. Cl.[4] G09F *11/02*
U.S. Cl. 40—475 11 Claims



1. A page turning device comprising a support for a document the pages of which are to be turned, a reciprocable assembly mounted on the support for translatory back and forth movement in respective page-turning directions, the assembly including a substantially U-shaped pusher with opposite substantially symmetrical limbs, and a page lifting mechanism positioned on the assembly between the limbs, the device further including drive means for moving the assembly back and forth between respective outer positions in which the lifting mechanism can be used to elevate a page to be turned and so that movement of the assembly from one of the outer positions towards the other outer position causes a respective one of the limbs to be inserted under the elevated page and turn the page over.

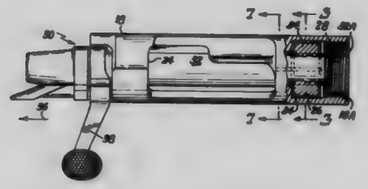
4,719,713
TRIGGER SAFETY STATUS SIGNALING DEVICE
Richard A. Hagie, 1494 Bucknell Way, Marietta, Ga. 30067
Filed Feb. 2, 1987, Ser. No. 9,742
Int. Cl.[4] F41C *17/02*
U.S. Cl. 42—1.01 5 Claims



1. A trigger safety status signal device for a firearm of the type having a trigger guard to which a trigger is mounted for movement between cocked and fire positions and to which a safety is mounted for reciprocal movement along a path of travel that extends through opposite sides of the trigger guard between safety-on and safety-off positions, and with the device comprising a bifurcated housing comprised of a pair of housing members each formed with an opening through which the

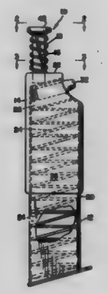
safety may extend; fastening means for attaching said housing members to said trigger guard so as to straddle said guard with said housing member openings aligned with the safety path of travel whereby the path of travel may extend into said housing through said openings; a battery and an electrically operable signal means mounted in said housing, and electric switch means for coupling and decoupling said signal means with said battery in response to movements of the safety within said housing along the path of travel.

4,719,714
LOCKING LUG INSERT FOR A FIREARM RECEIVER
Louis Palmisano, 627 E. 24th St., Paterson, N.J. 07505
Filed Jun. 19, 1986, Ser. No. 875,999
Int. Cl.[4] F41C *7/00*
U.S. Cl. 42—16 22 Claims



1. A locking lug insert for a locking lug recess of a firearm receiver comprising an insert body havng an outer diameter dimensioned to be received in the locking lug recess so as to rotate therein without undergoing substantial translational movement, the body defining a non-threaded, smooth surfaced central aperture extending substantially the length of the body, and at least one locking lug cut-out extending substantially the length of the body and opening into the central aperture to accept a locking lug of a bolt associated with the receiver such that, as the bolt is rotated between its locked and unlocked positions, the insert body rotates within the locking lug recess without undergoing substantial translational movement.

4,719,715
MAGAZINE CHARGER
William J. Howard, P.O. Box 573, Wilson, N.C. 27893
Filed Apr. 17, 1987, Ser. No. 39,294
Int. Cl.[4] F42B *39/06*; F41C *27/00*
U.S. Cl. 42—87 13 Claims



1. A magazine charger for charging cartridges to a magazine adapted to house first and second parallel rows of cartridges; said magazine charger comprising;

A. a body comprising:

(1) an open end constituting means for receiving a magazine to be charged with cartridges; wherein the magazine has a magazine spring; and

(2) a closed end opposite the open end; and

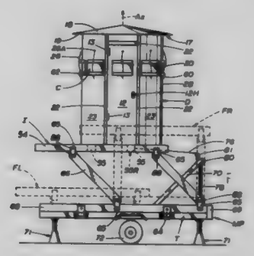
(3) a plunger-receiving passage in the closed end; said plunger-receiving passage having outwardly flared sidewalls; and

B. a plunger axially, slidably carried in the plunger-receiving passage of the closed end of the body of the charger and adapted to move cartridges against the magazine spring; and

C. a plunger spring which biases the plunger away from the open end of the charger;

whereby the plunger is operable to sequentially depress the uppermost cartridge, thereby alternately feeding the cartridges to the first and second parallel rows of cartridges in the magazine.

4,719,716
ROUND DEER STAND
Tom H. Chrisley, Jr., Rte. 2, Box 220, Groesbeck, Tex. 76642
Filed Dec. 29, 1986, Ser. No. 946,983
Int. Cl.[4] A01M *31/02*
U.S. Cl. 43—1 16 Claims



1. A round hunting blind for concealing the presence of at least one hunter stalking game of the type having an enclosure having a peripheral wall forming essentially an upright cylinder; a roof attached to the upper end of the upright cylinder and extending over the edges of said wall; exterior framing supporting the peripheral wall; a floor member attached to the lower end of the upright cylinder; an entrance door formed in the wall; at least two window openings formed in the peripheral wall at a desired height suitable for the hunter; the invention comprising:

an outer window having one edge mounted to the exterior surface of the peripheral wall and having essentially the same curvature of the peripheral wall and dimensions of the window opening; said window fitting into the window opening formed in the peripheral wall; said outer window opening toward to outside of the peripheral wall; and,

an essentially transparent inner window mounted to the interior of the peripheral wall; said inner window essentially covers the window opening; and, said inner window opens toward the interior of the peripheral wall;

wherein the outer window may be opened independently of the inner window, and which inner window protects the hunter from the weather outside of the blind, while providing a clear view outside of the blind for the hunter.

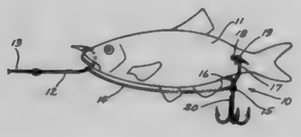
4,719,717
TRAILER HOOK FISHING APPARATUS
John A. Koestner, Rural Rte. 3 Box 120, Webster City, Iowa 50595
Filed Oct. 21, 1986, Ser. No. 921,267
Int. Cl.[4] A01K *83/06*
U.S. Cl. 43—44.2 4 Claims

1. Fishing apparatus comprising:

a wire yoke having a bottom and two upstanding side portions;

a straight bendable wire shank member connected at one end thereof to the top end of one of said upstanding side portions and extending at least mostly horizontal in use;

downwardly extending means connected to the top of the other of said two upstanding side portions for selectively



holding the other end of said shank member from bending upwardly when disposed within said downwardly extending means but permitting said shank member to bend downwardly and outwardly to become disengaged from said downwardly extending means; and

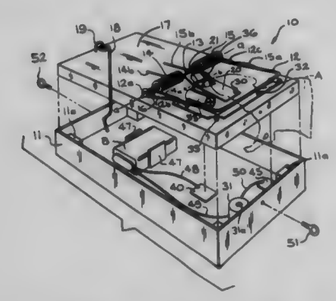
means in the middle of the bottom of said wire yoke for centrally attaching a fish hook to said yoke.

4,719,718

ELECTRICALLY OPERATED ANIMAL TRAP

Robert T. Kou, 83 W. Sherwood, Williamston, Mich. 48895

Filed May 21, 1987, Ser. No. 52,279
Int. Cl.[4] A01M *23/30*
U.S. Cl. 43—81 22 Claims



1. In an animal trap apparatus including a base having one side supporting a rotatable trapping means loaded by a spring means and pivotable about a pivot axis between cocked and uncocked positions, a holding means for holding the trapping means in the cocked position and a trip means which engages the holding means until the trip means is dislodged from the holding means for the trapping means to thereby move the trapping means to the uncocked position so that the animal is trapped on the one side of the base by the trapping means the improvement which comprises:

(a) a housing having a bottom and at least one wall surrounding the bottom defining an opening such that the base fits as a cover in closely spaced relationship in the opening to define a chamber;

(b) electrical coil means powered by an electrical circuit mounted in the chamber wherein there is a central hole inside the coil means;

(c) a movable plunger means positioned in the hole in the coil means and attached to the trip means wherein the plunger means can be activated by the coil means to dislodge the trip means from the holding means and release the trapping means; and

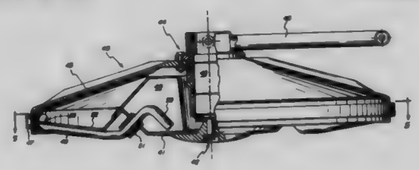
(d) electrical switch means mounted on the base which is engaged by the animal to activate the coil means and plunger means.

4,719,719

APPLICATOR DISKS

Alec M. Stevens, Graham Road, Tolga, Australia (OSD 4582)

PCT No. PCT/AU85/00039, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/03845, PCT Pub. Date Sep. 12, 1985
PCT Filed Mar. 5, 1985, Ser. No. 801,156
Claims priority, application Australia, Mar. 5, 1984, PG3909
Int. Cl.[4] A01M *21/00*
U.S. Cl. 47—1.5 12 Claims



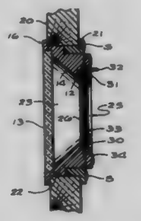
1. An applicator for applying liquids selectively to plants growing about a cultivated crop comprising at least one applicator wick, said applicator including means holding a supply of liquid, a rotating support means being provided to support said wick, said wick having a radially extending segment and an inner end, said radially extending segment extending across a surface of said support means, the said inner end of said wick extending into said supply of liquid, said applicator further including a housing means, said rotating support means being housed in said housing means, said housing means shielding all but said surface which supports said at least one applicator wick.

4,719,720

DOOR WICKET OR VIEWING PORT WITH POLARIZING LENS

John W. Olsen, 2854 Piedmont, La Crescenta, Calif. 91214

Filed Jul. 3, 1986, Ser. No. 881,916
Int. Cl.[4] E06B *7/28*
U.S. Cl. 49—171 4 Claims



1. A polarizing assembly for use in an optically transparent window for converting said optically transparent window to selectively light passing and light blocking window comprising:

a first linear polarized element of size corresponding generally to the size of the portion of the optically transparent window which is desired to remain optically transparent under the control of the user;

a second linear polarized element;

means superimposing said second linear polarized element on said first linear polarized element;

planar means secured to said window and coextensive in size with the portions of said window to be continuously nontransparent for blocking transmission of light through any areas of said optically transparent window outside of the parameter of said second linear polarized element; and

means for rotating said second linear polarized element to selectively pass and block light transmission through the portion of said second linear polarized element;

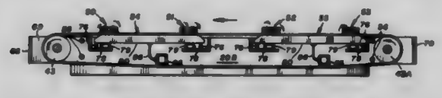
wherein said window comprises a multi-paned stained glass window and said planar light transmission blocking means corresponds in size to one of the panes which is relatively transparent.

4,719,721

CONVEYOR BED ASSEMBLY AND VACUUM PLATEN

Lee E. Stamp, Brooklyn Park, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed Dec. 18, 1986, Ser. No. 943,168
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—138 2 Claims



1. In a wide belt sanding machine having main frame means, an abrasive working station comprising a power-driven endless wide sanding belt mounted upon said main frame, a workpiece conveyor operatively mounted on said main frame and having an endless wide workpiece carrying belt with a generally horizontally disposed upper flight positioned to convey individual workpieces into said working station where the workpiece surfaces make contact with the surface of the endless sanding belt, and improved force-applying means disposed along the undersurface of said conveyor upper flight for urging said workpieces against the surface of said sanding belt while in said working station; the improvement comprising:

(a) said force-applying means comprising a plurality of elongated hollow platens of rectangular parallelepipedon configuration and disposed in side-by-side relationship with the axes thereof being generally parallel to the axis of the upper flight of said conveyor belt and with the interior of said hollow platens defining an enclosed chamber;

(b) air bladder means disposed between said frame means and the opposed ends of said elongated platens for resiliently urging said elongated platens against the undersurface of said conveyor belt;

(c) means coupling the opposed ends of each of said elongated platens to said main frame and for accommodating pivoting and rocking movement of each of said elongated platen members about both longitudinal and transverse axes;

(d) the upper surface of each of said platen members having a plurality of bores formed generally along the axis thereof, at generally uniformly spaced first intervals therealong, and in communication with said platen chamber; and

(e) means coupling said platen chamber to a source of vacuum.

4,719,722

KNIFE SHARPENER AND HOLDER

Robert M. Washburn, Mahtomedi, Minn., assignor to Advertising Unlimited, Inc., Sleepy Eye, Minn.

Filed Apr. 8, 1982, Ser. No. 366,691
Int. Cl.[4] B23F *21/03*
U.S. Cl. 51—205 R 14 Claims

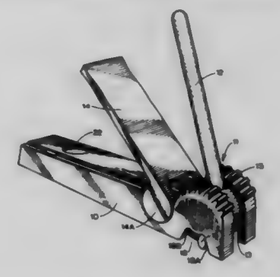
1. A knife sharpener and holder, comprising:

(a) an elongated base member having an elongated recess;

(b) a single elongated knife sharpener rod;

(c) means for pivotally engaging said base member with said rod;

(d) means for holding the rod in two different angular knife sharpening positions when swung upwardly from the base member, said rod holding means being releasable to permit the rod to be pivotally swung into the base member recess for storage.

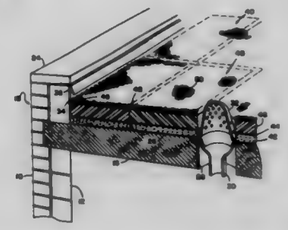


4,719,723

THERMALLY EFFICIENT, PROTECTED MEMBRANE ROOFING SYSTEM

John D. Van Wagoner, 8554 Georgetown Pike, McLean, Va. 22101

Filed Oct. 3, 1985, Ser. No. 783,525
Int. Cl.[4] E04B *5/00, 7/00*; B32B *5/32*
U.S. Cl. 52—15 6 Claims



1. A thermally efficient, protected membrane roofing system for insulating the interior of a building from ambient thermal cycling and for insuring water impermeable integrity of the building, said roofing system comprising:

a water impermeable membrane overlaying a roof deck or the like;

an array of factory assembled roofing panels positioned in a juxtaposed position across the roof deck and operably and overlaying said water impermeable membrane, said panels each including at least,

a vapor barrier course, and

an insulation course overlaying the vapor barrier course, said insulation course serving to protect and isolate the water impermeable membrane from external thermal cycling and said vapor barrier course serving to protect the insulation course from outwardly driven water vapor from the building or the surface of the water impermeable membrane;

a waterproof, but vapor permeable, tape bonded to the exterior surface of adjacent roofing, insulation panels to isolate the seam from penetration of surface water while concomitantly permitting the escape of water vapor from beneath the panels to the atmosphere through the peripheral seams of said roofing insulation panels, said waterproof tape including

a plurality of conical extensions aligned along the edges of said tape for physical penetration into the outer surface of adjacent roofing panels; and

a protective and retaining course overlaying the outer sur-

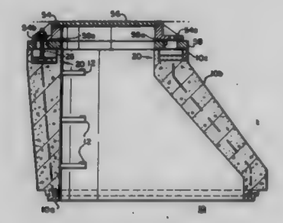
face of the roofing panels to isolate the panels from ultra-violet degradation and retaining the panels in position upon the roofing deck.

4,719,724

PRECAST CONCRETE MANHOLE ADJUSTABLE BOLT SLOT ASSEMBLY FOR SECURING CAST IRON FRAME AND COVER

Jack Ditcher, Langhorne, Pa., assignor to A-LOK Products, Inc., Tullytown, Pa.

Continuation of Ser. No. 632,392, Jul. 19, 1984, Pat. No. 4,618,464. This application May 21, 1986, Ser. No. 865,539
Int. Cl.⁴ E02D *29/14*
U.S. Cl. 52—20 **11 Claims**



1. A combination manhole assembly and thin, light-weight insert for use as an adjustable fastener slot and to be embedded in cast concrete manhole top sections for mounting and securing a cover frame thereto by means of a threaded member, said combination comprising:

a manhole assembly including at least a base section and a top section supported thereon;

a manhole cover frame mounted upon the top surface of said top section for supporting an annular-shaped manhole cover;

said cover having a plurality bolt openings about its circumference;

a plurality of inserts being embedded at spaced intervals about the top of said top section, each of said inserts having a longitudinal axis radially aligned about said top section and comprising:

an elongated insert member formed of a T-shaped plastic shell fully enclosing a hollow interior of a substantially T-shaped cross-section defining a wide base portion and a narrow upper portion;

the free end of the narrow upper portion extending to the top surface of said top section;

the exterior periphery of said insert generally conforming to said cross-sectional configuration;

substantially the entire top surface of said insert including an elongated substantially rectangular-shaped integral web formed simultaneously with the remainder of said insert through one of the processes of molding, casting and extruding and being of a thickness substantially less than the remaining portion of the insert member and sufficiently thin to prevent the cast material from entering into the hollow interior of the insert and to facilitate the piercing, cutting away and removal of said web to form an elongated rectangular-shaped slot for insertion of a threaded member having an enlarged head portion an integral threaded portion;

said enlarged base portion slideably receiving said head portion and the narrower upper portion of the insert communicating with said base portion and extending to said web for receiving said threaded portion;

the threaded portion of each threaded member extending upwardly from said top section and through an associated opening in said cover lid frame for threaded engagement with a tapped member;

the interior region of said insert being an elongated hollow region of substantially uniform T-shaped cross-section to permit the threaded member to be slideably positioned along the length thereof;

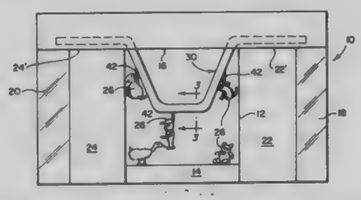
the length of said inserts being sufficient to accomodate manhole cover frames of varying diameters and of a length of the order several inches.

4,719,725

MOBILE DISPLAY APPARATUS FOR STORES

Gordon M. Weiner, Richmond, Va., assignor to Prince Frederick C & A, Inc., Richmond, Va.

Filed Sep. 16, 1986, Ser. No. 910,237
Int. Cl.⁴ E04H *3/04*; B65G *17/32*
U.S. Cl. 52—31 **2 Claims**



1. In combination with a store which comprises a sales floor area, at least one doorway for providing entry into said store and having an upper boundary, a transparent wall adjacent a public walk whereby passers-by on the public walk may view articles through said wall, a conveyor, said conveyor comprising a linear flexible chain-like element of small cross-section in comparison to its length and capable of traversing arcs about axes which are angularly related to each other, means for driving said linear flexible element, support means carried by said linear flexible element for supporting articles in spaced apart relationship along the length thereof, means in the sales floor area for supporting at least a part of said flexible element at a relatively high level at or adjacent the upper boundary of said doorway, and support means for guiding said flexible element from said upper level to a lower level, said flexible element at said lower level being adjacent said transparent wall, said lower level of said flexible element being substantially below said upper level;

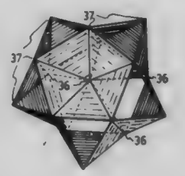
whereby articles carried by said support means are caused to move in serial array by said conveyor at said relatively higher level in said sales floor area, and to move in serial array at a lower level adjacent said transparent wall.

4,719,726

CONTINUOUS SPHERICAL TRUSS CONSTRUCTION

Helmut Bergman, 116 Newport Ave., Scarborough, Ontario M1L 1J5, Canada

Filed Apr. 14, 1986, Ser. No. 851,934
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—81 **7 Claims**



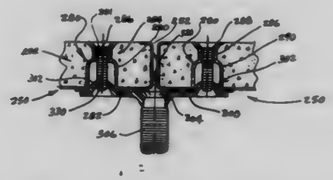
1. A truss structure comprising at least one octahedral rosette formed from five octahedrons each having a face joined to a face of an adjacent octahedron, the octahedrons being disposed in a ring around a node at which an apex of each of the octahedrons is joined, the octahedral rosette defining a pentagonal recess in its outer side, and associated with each octahedral rosette, a tetrahedral rosette formed from five tetrahedrons each having a face joined to a face of an adjacent tetrahedron, the tetrahedrons being disposed in a pentagonally shaped cluster with an edge of each joined face being joined to a corresponding edge of each other joined face and with opposite ends of the joined edges forming an inner and an outer apex, the tetrahedral rosette being joined to the octahedral rosette with which it is associated and fitting in the pentagonal recess in close packing fashion therein.

4,719,727

ACCESS FLOOR PANEL

Gordon J. Cooper, Alto, and Todd N. Rose, Kentwood, both of Mich., assignors to C-Tec, Inc., Grand Rapids, Mich.

Filed Oct. 4, 1985, Ser. No. 784,859
Int. Cl.⁴ E04B *5/00*
U.S. Cl. 52—126.6 **9 Claims**



1. An access floor system, comprising:

a plurality of floor panels, each panel including a generally rectangular metal pan having a bottom and integral sidewalls, a plurality of corner inserts, each insert including a pad portion contacting an outer surface of said bottom and a core portion extending through said bottom, said core portion defining a bore opening through said pad portion and a concrete mixture within said pan and encapsulating said core portions of said inserts;

a plurality of supports, each support including a pedestal and a pedestal plate, said plate being joined to said pedestal and defining a plurality of semispherical portions, each semispherical portion being dimensioned to extend into one of said core portion bores; and

a plurality of fasteners, each fastener interconnecting one of said inserts and said plates so that said panels are locked to said supports with said pad portions between said outer surface of said bottom and said supports, and wherein the core portion of each of said inserts defines a reduced diameter portion, said fasteners each engaging one of said reduced diameter portions and one of said semispherical portions of said plates.

4,719,728

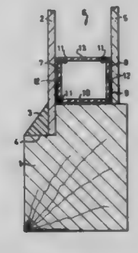
PROFILE SPACING ELEMENT FOR FORMING A WINDOW COMPRISING MORE THAN ONE GLASS IN A WINDOW FRAME

Lars Eriksson, Storgatan 40, S-361 00 Emmaboda, and Frank Andersson, Korsvägen 8, S-361 04 Eriksmåla, both of Sweden

PCT No. PCT/SE85/00304, § 371 Date Apr. 4, 1986, § 102(e) Date Apr. 4, 1986, PCT Pub. No. WO86/01248, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 7, 1985, Ser. No. 852,946
Claims priority, application Sweden, Aug. 10, 1984, 8404057
Int. Cl.⁴ E06B *7/12*
U.S. Cl. 52—172 **5 Claims**

1. A spacing element for spacing first and second window panes and for defining a closed sealed space between the panes, the closed space having at least one corner region, said spacing element comprising:

an elongate, hollow body having at least one corner section for traversing the at least one corner region of the closed space, the hollow body having a first side wall adjacent said first window pane, a second side wall adjacent said second window pane and a bottom wall adjacent a window frame for said first and second window panes, the hollow body further including first and second longitudinally extending deformation notches extending, respectively, along said first and second side walls, said side walls being deformed away from the window panes at said corner section, said hollow body and said longituinal deformations being effective to enable said body to bend sharply at said at least one corner section without causing said body to bulge transversely to its longitudinal direction at its said corner section; and



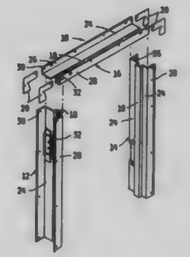
a resilient and continuous covering formed of elastic material, said covering extending longitudinally along said hollow body to form a diffusion tight seal between said hollow body, on the one hand, and said first and second window panes and said window frame, on the other hand, said covering extending along said first and second walls and along said bottom wall.

4,719,729

REUSABLE METAL WALL FRAME

Roger N. Wynar, 19 Parkside Ave., Hamburg, N.Y. 14075

Filed Aug. 27, 1986, Ser. No. 900,764
Int. Cl.⁴ E06B *1/04*
U.S. Cl. 52—211 **3 Claims**



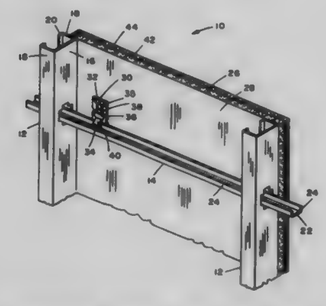
1. Inconspicuously attached, separable assemblies, especially useful for door and window frames in normal wall and partition construction, said frames comprised of:

(a) substantially U channel shaped, elongate jamb runners, each including a wall traversing web portion, a pair of wall surface contacting flange portions extending essentially perpendicular from opposite sides web portion, said flange portions including outwardly directed terminal edges;

(b) a plurality of dual purpose, jamb runner/casing cover fasteners, each including an enlarged washer head portion, spaced from said flange portions by a reduced diameter, flange abutting, shoulder portion, and a further reduced diameter, subsurface engaging, shank portion; and

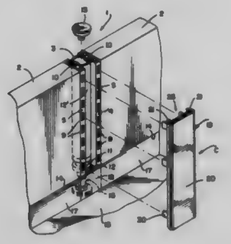
(c) substantially C channel shaped, elongate, resilient casing cover runners, each including a web portion intermediate a first, protuberant leg portion, engaging said washer head portion of said jamb runner/casing cover fastener and a second protruberant leg portion engaging said outwardly directed terminal edge of said jamb runner flange portion.

4,719,730
ACOUSTICAL TACK BOARD
Daniel A. Winkowski, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.
Filed Dec. 19, 1986, Ser. No. 943,904
Int. Cl.[4] E04B *1/82*
U.S. Cl. 52—238.1 20 Claims



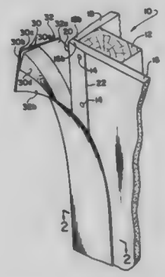
1. A laminated acoustical tack board panel comprising a gypsum board base board, a rigid, porous mineral fiber board core board, and a thin, porous, wall face surface laminate, adhesively affixed to said core board front surface and to the edges of said core board and said base board by an adhesive disposed on said wall face surface laminate, so disposed as to not substantially lessen the porosity thereof, said wall face surface laminate on said core board edges and said base board edges forming the sole edge framing element of said panel.

4,719,731
POST COVER FOR PARTITION SYSTEMS
Gary P. Ravotti, Poland, and Bill J. Shamblin, Hubbard, both of Ohio, assignors to GF Furniture Systems, Inc., Youngstown, Ohio
Filed Dec. 22, 1986, Ser. No. 944,529
Int. Cl.[4] E04B *2/74*
U.S. Cl. 52—239 7 Claims



1. In a partition assembly having at least two adjacent panels each having a side edge attached to an intermediate support post, slotted edge channels carried by each panel side edge juxtaposed said support port and spaced apart from one another to define a normally exposed gap spanning said spaced apart edge channels, the improvement comprising; an elongated post cover removably attachable to said assembly to mask said support post and gap between said panel side edges, said cover including a cover plate having a rear wall and a front wall laterally extending at least the distance between said two spaced apart edge channels, a fastener assembly carried by said cover plate including a medial mounting base overlying said rear wall and having a pair of deflectable resilient arms extending rearwardly and laterally from said cover plate, inwardly inclined side walls projecting rearwardly from said cover front wall, inner surfaces on said side walls defining with said rear wall an interior cavity, at least one tab laterally projecting from each side of said fastener assembly mounting base and respectively engageable with said cover plate side walls to captively retain said fastener assembly within said interior cavity juxtaposed said rear wall while allowing selective longitudinal displacement of said fastener assembly within said cavity of said elongated post cover, whereby said fastener assembly is slidably displaceable within said cavity along the axial extent of said elongated cover to align said arms with a selected pair of respective slots in said two edge channels, and said arms respectively insertable into said selected pair of said slots in said edge channels of said two adjacent panels and thereupon deflected as said post cover is urged toward said edge channels to retain said post cover in a position overlying said post and masking said gap as said arms resiliently engage said slots.

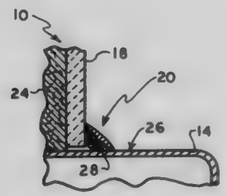
4,719,732
DRYWALL ATTACHMENT STRIPS
Andre Bernard, 5 Kitchel Rd., Mt. Kisco, N.Y. 10549
Filed Jul. 24, 1987, Ser. No. 77,505
Int. Cl.[4] E04F *13/06, 19/02*
U.S. Cl. 52—287 4 Claims



1. For attachment in drywall construction to a pair of edge-abutting plasterboards forming a corner, the improvement for rounding off said corner comprising an extrusion, cut to the vertical size of said corner, having in cross section an L-shape to thereby present from their connection a pair of outwardly diverging arms, said extrusion being of plastic construction material having resiliency for permitting limited flexing in the position of said arms, and having a specified melting temperature, and a heat-shrinkable plastic tape disposed in covering relation along one side of said extrusion and of a size in its width to present, when said extrusion is centered thereon, opposite side portions extending beyond said extrusion, said tape and extrusion having an operative position in which said arms of said extrusion are disposed in straddling relation over said plasterboard corner and said tape is in said covering relation thereover with said opposite side portions in contact with said plasterboard beyond said extrusion, whereupon in response to the application of heat against said tape, at a temperature below said specified melting temperature of said extrusion and above said shrinking temperature of said tape, said tape undergoes shrinkage and fuses itself in attached relation to said plasterboard, said shrinkage resulting simultaneously in the removal of any wrinkles therefrom and in the urging of said resilient arms of said extrusion through flexing movement

which conforms the shape provided by said arms to the corner shape of said plasterboards.

4,719,733
METHOD AND APPARATUS FOR FINISHING A CORNER JOINT
Bolesław Seles, 5153 S. Meade, Chicago, Ill. 60638
Continuation of Ser. No. 818,043, Jan. 13, 1986, abandoned. This application Oct. 14, 1986, Ser. No. 918,159
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—288 8 Claims



1. A finished joint at an inside corner formed between two generally planar surface members which are in substantial perpendicular relationship relative to one another, comprising in combination

an elongate one-piece molding member having a surface strip portion having a face side, a back side, and a rib projecting into said inside corner from said back side,

the distal end portion of said rib having first and second mutually parallel elongate edges,

said face side of said molding member having third and fourth elongate edges extending parallel to said first and second edges,

said first elongate edge and said third elongate edge defining a first plane,

said second elongate edge and said fourth elongate edge defining a second plane,

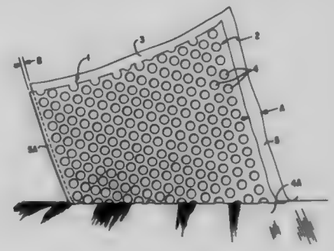
said first and second planes being mutually perpendicular, said molding member being positioned in said corner with said third and fourth edges respectively abutting said surface members and at least one of said first and second edges abutting one of said surface members,

said surface members, said rib and said back side of said strip portion defining first and second cavities, and

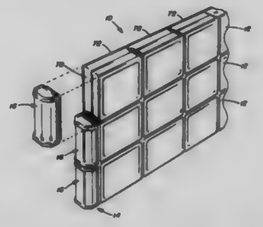
said cavities being substantially filled with a bonding agent.

4,719,734
WATERPROOF MEMBRANE
Leonard G. Fell, and William L. K. Fell, both of 15/98 Old Pittwater Road, Brookvale New South Wales 2100, Australia
PCT No. PCT/AU85/00115, § 371 Date Aug. 13, 1986, § 102(e) Date Aug. 13, 1986, PCT Pub. No. WO86/04106, PCT Pub. Date Jul. 17, 1986
PCT Filed May 31, 1985, Ser. No. 910,150
Claims priority, application Australia, Dec. 28, 1984, PG8724
Int. Cl.[4] E04D *5/10, 5/12*
U.S. Cl. 52—302 8 Claims

1. A self-adhering waterproofing membrane having affixed to the adhesive face thereof at least one vent sheet, adapted upon installation of the membrane over a substrate, to release any vapor pressure which would otherwise cause blistering wherein said vent sheet has a plurality of apertures arranged over the area thereof, the vent sheet being sufficiently thin and the apertures being so arranged that a sufficient portion of said adhesive face engages the substrate through said apertures to enable the membrane to adhere thereto, the remaining portion of said adhesivie face between said apertures being prevented from bonding to said substrate by the vent sheet so that ventilation of said vapor pressure is thereby provided in all directions to the edges of the membrane.



4,719,735
TRANSLUCENT END CAP
Harry A. Fleming, Jr., Smethport, and Robert L. Wehman, Port Allegany, both of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.
Filed Mar. 27, 1987, Ser. No. 31,509
Int. Cl.[4] E04C *1/42*
U.S. Cl. 52—306 17 Claims



1. A translucent end cap for use with a translucent glass block comprising,

a pair of top and bottom surfaces spaced from each other,

said top and bottom surfaces being substantially parallel and generally having the same preselected shape,

a side surface extending between said top and bottom surfaces, said side surface perpendicular and joined to said top and said bottom surfaces,

said side surface having a contour generally conforming to said top and said bottom surfaces preselected shape, and

a raised rear surface portion extending from said side surface to form a protrusion, a portion of said protrusion arranged to abut a portion of an abutting side surface of a translucent glass block.

4,719,736
REMOVABLE WINDOW ASSEMBLY
Jack R. Abo, Clawson; Roger J. Dingman, Rochester; Larry R. Gee, Utica, and Leon R. Szlachta, St. Clair Shores, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 648,280, Sep. 6, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,102
Int. Cl.[4] D60J *1/00*; E06B *3/54, 7/00*
U.S. Cl. 52—397 1 Claim

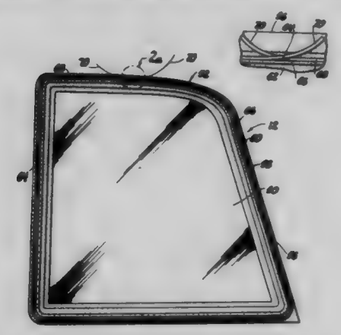
1. An improved window assembly of the type adapted to be adhesively installed to a flange defining a window opening in a vehicle or the like, said window assembly having a molded

frame with an outer surface facing the outside of the vehicle, said frame further having a bonding portion adapted to be spaced from the flange and bonded thereto by a curable adhesive bead, said improvement providing means for allowing the installed window assembly to be easily removed without significant damage with access only from the interior of the vehicle, and to be reinstalled after removal, comprising;

a cutting wire,

a wire retention groove defined in the frame and extending completely around the bonding portion between said bonding portion and the outer surface of the frame, said groove being sized so that said cutting wire is tightly held in said groove and thereby retained to said molded frame as a unitary structure prior to said window assembly being adhesively installed, said groove also serving to locate said wire spaced from said flange by less than said bonding portion after the window assembly is installed,

an adhesive dam integral with the frame and extending completely around the wire retention groove between



said wire retention groove and the bonding portion, said adhesive dam being adapted to engage the window opening flange when the window assembly is installed to prevent the adhesive bead from moving past the wire retention groove toward the outer surface of the frame, said dam also being sufficiently resilient to flex without damage as the cutting wire is pulled beneath it, and

flexible mechanical fasteners adapted to snap past said flange and temporarily retain said window assembly to said flange until said adhesive bead cures,

whereby the installed window assembly may be removed by pulling the terminal ends of the cutting wired from the vehicle interior, thereby pulling said cutting wire from the wire retention groove between the flexing adhesive dam and the flange to flex said flexible fasteners away from said flange and to completely cut through the adhesive bead without significant damage to the frame and flexible fasteners, said window assembly thereupon being reinstallable by applying a new bead of adhesive and reusing said flexible fasteners.

4,719,737

INTERLOCKING CONSTRUCTION BLOCK

Pieter Daniel Swart, Verwoerdburg, South Africa, assignor to Sylsands Securities (Proprietary) Limited, Pretoria West, South Africa

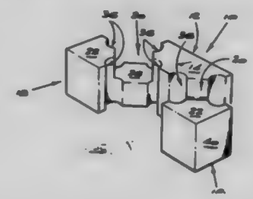
Filed Feb. 19, 1987, Ser. No. 16,625

Claims priority, application South Africa, Feb. 26, 1986, 86/1435

Int. Cl.⁴ E04B *5/04*

U.S. Cl. 52—605 **10 Claims**

1. An interlocking construction block including a first part having a first surface lying in a first plane and a second surface lying in a second plane spaced apart from and parallel to the first plane, two second parts which are spaced away from the first part and from each other and which each have first and second surfaces lying in the first and second planes respectively, and two third parts each located between the first part and one of the second parts, and one of the second parts, each third part having a first surface lying in a third plane which is



parallel to, but between the first and second planes and a second surface which lies in the second plane, the parts being integral with one another to define a block which has generally a right angled V-shape when the block is viewed in a direction normal to the first, second and third planes.

4,719,738

BLOCK

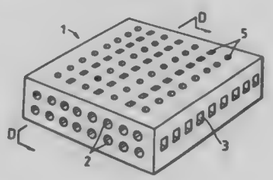
Chang Y. Lee, 285-3, Yugkok-dong Buchon, Kyungki-do, Rep. of Korea

Filed Jun. 17, 1983, Ser. No. 505,396

Claims priority, application Rep. of Korea, Nov. 22, 1982, 9297

Int. Cl.⁴ E04C *2/04*

U.S. Cl. 52—607 **9 Claims**



1. A tile block comprising a body having a hexahedral right parallelepiped shape, said block having a first plurality of holes distributed uniformly along a first side of said body and horizontally extending in parallel from said first side of the body to an opposite second side of the body, a second plurality of holes distributed uniformly along a third side of said body which is perpendicular to said first and second sides, said second plurality of holes horizontally extending in parallel from said third side of the body to an opposite fourth side of the body, the first plurality of holes being extended in a direction transverse to the second plurality of holes and respective ones of the first plurality of holes intersecting and communicating with the second plurality of holes, each of said first and second holes having a predetermined transverse dimension and said body having a first surface bounded by and transverse to all of the aforementioned sides, and a plurality of recesses having a predetermined depth in said first surface of the body, the depth of said recesses being comparable to the transverse dimensions of said first and second holes, wherein said body includes a third plurality of holes vertically extending from said first surface to an opposite surface of the body, and said third plurality of holes being generally perpendicular to and intermediate said first and second plurality of holes.

4,719,739

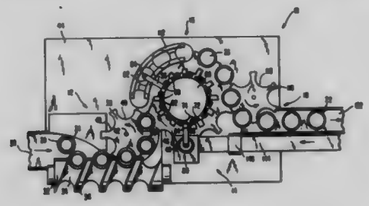
CONTINUOUS MOTION IN-LINE SEALER

Istvan Foldesi, Laval, Canada, assignor to Montreal Milling Cutter Company, Inc., Quebec, Canada

Filed Sep. 16, 1986, Ser. No. 907,938

Int. Cl.⁴ B65B *7/28*

U.S. Cl. 53—306 **20 Claims**



1. A continuous motion, in-line sealer assembly useable to apply a flexible foil sealing disk to the mouth of a container, said sealer assembly comprising:

an infeed means for continuously supplying containers to be sealed;

a continuously rotatable sealer star wheel having a plurality of sealer star wheel pockets, each said sealer star wheel pocket being sized to receive a container from said infeed means;

a reciprocable vacuum head positioned above each said sealer star wheel pocket;

means to vertically reciprocate each said vacuum head;

means to rotate each said vacuum head in coordination with a cooperating one of said sealer star wheel pockets;

supply means for supplying said flexible foil sealing disks to a supply point;

dwell means for causing each said vacuum head to dwell mometarily at said supply point;

means for activating an adhesive layer of said sealing disk when said disk has been brought into contact with a container to be sealed; and

outfeed means for transferring sealed containers away from said sealer assembly.

4,719,740

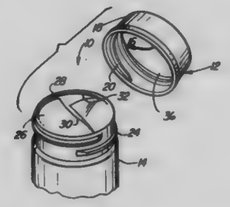
TAMPER INDICATING HERMETIC SEAL

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 22, 1986, Ser. No. 922,126

Int. Cl.⁴ B65B *61/02, 51/22*; B67B *3/20*

U.S. Cl. 53—421 **16 Claims**



1. A method for assembling a closure with a sealable liner and applying it to a container to produce a hermetically sealed, easily opened, tamper-indicating package comprising the steps of:

moving a continuous web of a laminated liner comprising a layer of metal foil adhesively bonded to a tough thermoplastic film and a sealing layer;

cutting a linear disk from said web to fit into said closure for sealing to said container;

inserting said liner disk into said closure;

melting through said thermoplastic film to said metal foil layer to form a frangible opening line;

applying said closure to said container; and

bonding said liner to said container with said sealing layer, hermetically sealing said container.

4,719,741

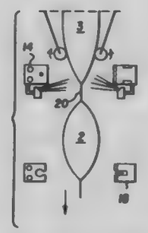
CROSS SEAL COOLING FOR VERTICAL FORM FILL SEAL APPARATUS

James R. Mabry, Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Dec. 8, 1986, Ser. No. 938,939

Int. Cl.⁴ B65B *9/08, 51/30*

U.S. Cl. 53—451 **4 Claims**



1. An apparatus for intermittently feeding a tubular film material, filling it with a substance to be packaged, and subdividing it into individual packages, comprising:

(a) a pair of pinch rolls positioned opposite each other in the upper region of the apparatus, and movable perpendicularly toward and away from said tubular film,

(b) a pair of heat-sealing means positioned opposite each other, spaced from and beneath said pinch rolls and movable perpendicularly toward and away from said tubular film;

(c) a pair of cutting means positioned opposite each other, spaced from and beneath said heat-sealing means, and movable perpendicularly toward and away from said tubular film;

(d) a pair of nozzles connected to, and spaced beneath, respective heat sealing means, and positioned to direct a cooling medium in an arcuate pattern onto the tubular film material;

(e) means for delivering the cooling medium to the nozzles as a heat seal formed by the heat-sealing means passes downward toward the cooling-cutting means; and

(f) means for activating the delivering means.

4,719,742

MOWING MACHINE

Rino Ermacora, Ottersthal, and Anton Werner, Saverne, both of France, assignors to Kuhn S.A., Saverne, France

Continuation of Ser. No. 716,174, Mar. 26, 1985, abandoned. This application Mar. 4, 1987, Ser. No. 21,757

Claims priority, application France, Apr. 12, 1984, 84 05955

Int. Cl.⁴ A01D *34/66, 43/10*

U.S. Cl. 56—16.4 **40 Claims**

1. A mowing machine comprising

a body,

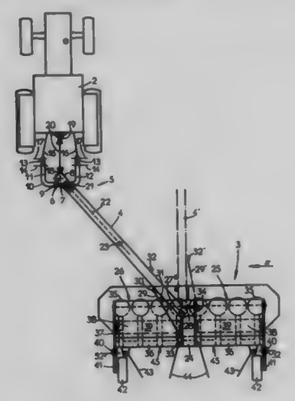
two cutting groups on said body, said cutting groups each comprising a frame and cutting means supported by said frame,

an intermediate structure on said body, said first cutting group extending on one side of said intermediate structure, and said second cutting group extending on the other side of said intermediate structure, said frames of said first

and said second cutting groups being rigidly and removably secured to said intermediate structure,

a beam for connecting said mowing machine to a tractor, said beam being connected to said intermediate structure, so as to be pivotable about an upwardly directed axis,

positioning means operable to determine the position of said beam with respect to said body,



supporting wheels on said body for supporting said body on the ground at least during working of said mowing machine, said supporting wheels extending at the rear of said body and being movable in respect to said body,

maneuvering means operable to modify and to determine the position of said supporting wheels with respect to said body, and

driving means for driving said cutting means of said first and said second cutting groups.

4,719,743

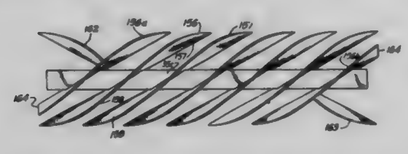
NONHAZARDOUS MOWER

William S. Bokus, 6111 Geremander Ave., Rialto, Calif. 92376

Continuation-in-part of Ser. No. 321,596, Nov. 16, 1981, Pat. No. 4,563,867, which is a continuation-in-part of Ser. No. 237,379, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 54,132, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 816,291, Jul. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 661,157, Feb. 25, 1976, abandoned. This application Dec. 30, 1985, Ser. No. 814,732

Int. Cl.[4] A01O *34/42*

U.S. Cl. 56—294 4 Claims



1. A mower having a frame mounted on ground wheels, a transverse cutting bar mounted on the frame at a selected cutting height above ground level and a rotary cutter assembly cooperative with the transverse cutting bar for mowing purposes;

said rotary cutter assembly having a plurality of peripheral cutting edges of generally circular profile configuration, as seen along the axis of the rotary cutter assembly, spaced along the transverse cutting bar;

said peripheral cutting edges being the edges of a plurality of separate disks, each of said disks being of elongated configuration and having a longitudinal transitional midsection between integral, longitudinally flanking, nonplanar end sections whereby its cutting edge configuration is of generally S-shaped side profile, said midsection being longitudinally disposed at an angle within the range of from about 25° to about 41° with the axis of rotation of said rotary cutter assembly to wobble, and thereby cause the peripheral cutting edges to reciprocate, along the cutting bar in response to rotation about said axis;

the spacing of said disks being such that the ranges of reciprocation of their peripheral cutting edges along said cutting bar overlap;

whereby said peripheral cutting edges shift along the bar in response to rotation of the rotary cutter assembly in such a way as to make the cutting operation nonhazardous by pushing away from the cutting zone any part of the operator's body that may inadvertently intrude thereinto.

4,719,744

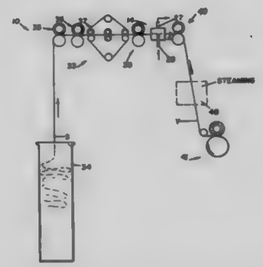
VACUUM SPINNING METHOD

Elbert F. Morrison, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 386,078, Jun. 7, 1982, Pat. No. 4,507,913. This application Dec. 11, 1984, Ser. No. 680,510

Int. Cl.[4] D02G *3/36, 3/34;* D01H *1/12, 5/28*

U.S. Cl. 57—5 23 Claims



1. A method of spinning yarn comprising the steps of:

(a) nipping a sliver or roving so that some of the fibers within the sliver or roving have loose ends;

(b) transporting the nipped sliver or roving in a linear direction A at a substantially constant linear speed;

(c) feeding a core filament into the sliver or roving, after nipping, so that the core filament passes with the nipped sliver or roving in the direction A; and

(d) while transporting the sliver or roving, and core filament, in direction A, rotating loose ends of fibers around the fiber mass, and the core filament, the ends being held substantially linearly stationary during rotation, to produce the desired yarn, with core filament.

4,719,745

TEXTURIZING MACHINE FOR FALSE-TWIST CRIMPING OF SYNTHETIC YARNS

Gunter Konig, Uhingen-Baiereck, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 8,742

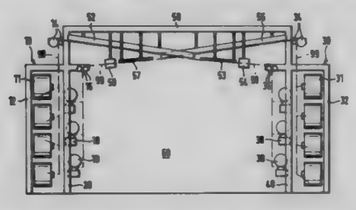
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603058; Dec. 3, 1986, 3641212

Int. Cl.[4] D02G *1/02, 1/20*

U.S. Cl. 57—291 27 Claims

1. A texturizing machine for false-twist crimping of synthetic yarns having a plurality of work stations at each of which yarn is drawn by feed rolls from supply bobbins and guided successively through a heating device, a cooling device

and a texturizing unit to a group of superjacent bobbin winding units, with the bobbin winding unit groups being arranged in longitudinal succession along the length of the machine, said machine comprising a pair of opposed spaced longitudinally extending support frames defining an operator service passageway therebetween, said heating devices, cooling devices and texturizing units being disposed adjacent said passageway with said yarn being guided over said passageway, said bobbin



winding units being mounted on said opposed frames on both sides of said passageway with said groups of bobbin winding units being mounted in longitudinal sequence with successive bobbin winding unit groups being alternately mounted on opposite frames and with the yarns of successive bobbin winding unit groups being guided in opposite directions over said passageway and successively through said heating devices, cooling devices and texturizing units.

4,719,746

GAS TURBINE WITH A PRESSURE WAVE MACHINE AS THE HIGH PRESSURE COMPRESSOR PART

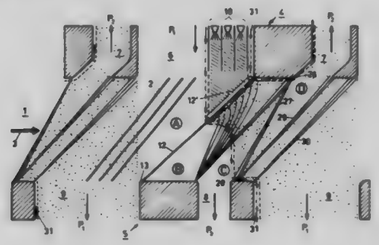
Jakob Keller, Dottikon, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 21, 1986, Ser. No. 887,204

Claims priority, application Switzerland, Jul. 31, 1985, 3319/85

Int. Cl.[4] F02C *3/02;* F02G *1/00*

U.S. Cl. 60—39.17 3 Claims



1. In a gas turbine installation with a pressure wave machine as a high pressure compressor, which pressure wave machine is connected downstream of a low pressure compressor,

the gas turbine installation having a gas turbine, which is coupled to the low pressure compressor, and which has a high pressure part, a medium pressure part and a low pressure part,

the installation also having a controllable combustion chamber, whose burner is supplied with high pressure air delivered by the pressure wave machine and with a fuel, and wherein driving gases produced in the combustion chamber are supplied through a driving gas duct to the high pressure part of the turbine and pass through the three parts mentioned,

the pressure wave machine including a cell rotor with rotor cells, a rotor casing surrounding the periphery of the cell rotor, a first casing having a low pressure air port connected to the low pressure compressor, and a second casing with a high pressure air port connected to the combustion chamber via a high pressure air duct, which casings close the ends of the rotor casing mentioned,

said cell rotor with rotor cells including means for generating a compression wave in the rotor cells during operation of the pressure wave machine, the compression wave starting from a closing edge of a low pressure gas port in the rotor casing; the improvement comprising;

fuel nozzle means in a rear region of the low pressure air port of the first casing as seen in the rotor rotational direction for discharging fuel onto the compression wave prior to ignition of the fuel so as to cause self-ignition of the fuel upon impact with the compression wave, the compression wave being in the rotor cells then located in the region of the fuel nozzle means;

one medium pressure gas port in the first casing after the low pressure air port as seen in the direction of rotation of the rotor, which medium pressure gas port is connected, via a medium pressure duct to an inlet space of the medium pressure part of the gas turbine; and

one low pressure gas port after the high pressure air port as seen in the direction of rotation of the rotor in the casing containing the high pressure air port, which low pressure gas port is connected via a low pressure gas duct to an inlet space of the low pressure part of the gas turbine.

4,719,747

APPARATUS FOR OPTIMIZING THE BLADE AND SEALING SLOTS OF A COMPRESSOR OF A GAS TURBINE

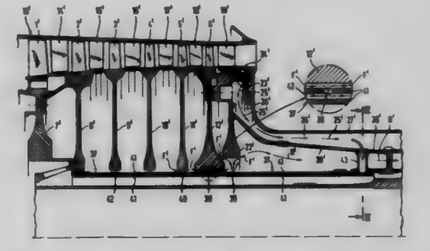
Franz Willkop, Munich; Gerhard Zachring, Woerthsee; Joachim Popp, Dachau, and Robert Ruetsch, Karlsfeld, all of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,049

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428892

Int. Cl.[4] F02C *6/18;* F02G *3/00*

U.S. Cl. 60—39.07 16 Claims



1. Apparatus for optimizing blade and sealing gaps of a multistage compressor of a gas turbine, said apparatus comprising a rotor having an axis of rotation and including a plurality of axially spaced discs and rotor blades on said discs, each disc including a root portion of greatest mass remote from its assorted blade, a stator casing surrounding, said rotor blades and forming clearance gaps therewith, said blades and stator casing forming a path for flow of air in a main stream in which the air is compressed in stages by said blades and discharged from the last stage of the compressor, main compressor sealing means at the last of the discs forming sealing gaps through which leakage air flows from the main stream, means for conveying said leakage air for discharge from the compressor towards the axis of rotation of said rotor, means for diverting a portion of said leakage air from said conveying means, as a secondary stream, in a direction opposite the main stream of air flow in the compressor towards the last rotor disc and at least the next adjacent rotor disc, means for dividing said secondary stream into a plurality of further streams respectively directed directly against said root portions of greatest mass of the last and next

to last discs, and means for collecting the air after it has undergone flow on said root portions of greatest mass for discharge from the compressor, said plurality of further streams from said secondary stream causing heating of the root portions of greatest mass whereat the temperature is substantially equalized with the temperature at the periphery of said discs including said root portions of greatest mass.

4,719,748

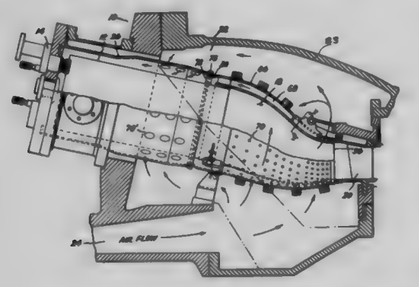
IMPINGEMENT COOLED TRANSITION DUCT

Lewis B. Davis, Jr., Schenectady; Walter W. Goodwin, Londonville, and Charles E. Steber, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 734,018, May 14, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,580

Int. Cl.[4] F02C *3/00*

U.S. Cl. 60—39.37 **11 Claims**



1. An impingement cooling apparatus for cooling a surface of a transition duct disposed between a combustor and a turbine stage of a gas turbine engine, said transition duct being disposed in a compressed air plenum, comprising:

an impingement sleeve surrounding said transition duct and spaced a distance therefrom to form a flow volume therebetween:

a plurality of apertures in said impingement sleeve;

each of said plurality of apertures having an area:

adjacent ones of said plurality of apertures being separated by a spacing:

a closed end at a turbine end of said flow volume;

an exit at a combustor end of said flow volume;

a flow sleeve within the compressed air-plention surrounding said combustor;

a flared entry portion at an end of said flow sleeve overlapping said exit and forming an aerodynamic converging shape therebetween;

a flow of air through said aerodynamic converging shape flowing toward said combustor being effective to reduce a pressure at said exit below a preasure in said compressed air plenum whereby a pressure drop across said impingement sleeve produces an impingement jet of air from each of said plurality of apertures directed toward said transition duct: and

at least one of said distance, said area and said spacing being non-uniform over said impingement sleeve to control a cooling in said surface.

4,719,749

VALVE FOR A FLUID FLOW ENGINE

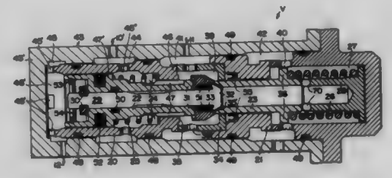
Christian Grosse, Fuerstenfeldbruck, and Georg Zotz, Haimhausen, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,524

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521193

Int. Cl.[4] F02C *7/232*

U.S. Cl. 60—39.094 **19 Claims**



1. A control valve device, especially for gas turbine engines, comprising a first control piston (22) and a second control piston (23), valve housing means for holding said first and second control pistons in an axially slidable manner, first and second compression spring means operatively arranged in said valve housing means for cooperation with said first and second control pistons, a fuel supply chamber (39) in said valve housing means, said first control piston being arranged for controlling entry of fuel into said fuel supply chamber, said second control piston having a hollow duct for guiding unused fuel to at least one discharge port (40) in said valve housing means, a fuel supply line connecting said fuel supply chamber (39) to nozzles of an engine, said first and second control pistons having end surfaces facing each other and forming a shut-off device in said fuel supply chamber (39) for shutting off unused fuel, said first control piston having a plurality of radially outwardly located fuel supply slots (47) in its outer wall, a flow control bushing (46) in said valve housing arranged for cooperation with said fuel supply slots (47) for increasingly opening a fuel inlet path into said fuel supply chamber (39) when said first and second control pistons are displaced against said first and second compression springs, a fuel inlet chamber (24) arranged in said valve housing means for cooperation with said fuel supply slots (47), whereby said fuel supply slots (47) are always in communication with said fuel inlet chamber (24), a valve closure member (33) arranged in said fuel supply chamber (39) for cooperating with said end surfaces in forming said unused fuel shut-off device and for cooperation with said flow control bushing for closing said fuel inlet path through said slots (47) into said fuel supply chamber (39), said flow control bushing (46), said fuel supply slots (47) and said shut-off device being so arranged relative to each other that fuel supply into said fuel supply chamber (39) through said slots (47) is closed-off while said shut-off device for unused fuel is fully open in a first end position of said first and second control pistons (22, 23), and so that in a first piston displacement phase said first control piston (22) is displaced against said first compression spring (25) for closing said shut-off device, a fuel outlet (37) for unused fuel being arranged for cooperation with said hollow duct in said second control piston, and further being so arranged that it is progressively closed if both control pistons move against said first and second compression springs for passing fuel through said slots (47) into said fuel supply chamber (39), and means for applying a control pressure acting separately of fuel supply pressure in said inlet chamber (24) on a control surface of said first control piston (22).

4,719,750

INSTALLATION FOR THE CONTROL OF THE FUEL SUPPLY TO THE AFTERBURNER OF A BYPASS GAS TURBINE JET PROPULSION UNIT

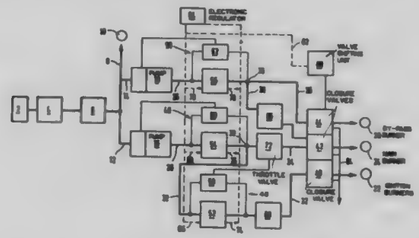
Juergen Lesmin, Lochham, Fed. Rep. of Germany, assignor to MTU Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,419

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3542908

Int. Cl.[4] F02C *3/10, 3/11*

U.S. Cl. 60—226.1 **18 Claims**



1. An installation for controlling the fuel supply to an afterburner of a bypass gas turbine jet propulsion unit, comprising a fuel pump arrangement, fuel line means operatively connecting said fuel pump arrangement with burner means including ignition burner means and main burner means of the inner flow as well as burner means of the by-pass flow, the fuel line means to the burner means of the inner flow splitting off into a fuel line means to the main burner means and into a fuel line means to the ignition burner means, and controllable fuel-metering means arranged in the fuel line means to the main burner means of the inner flow, to the ignition burner means and to the burner means of the bypass flow, said pump arrangement including a first fuel pump means for feeding fuel to the fuel line means leading to the burner means of the inner flow and a second fuel pump means for feeding fuel to the fuel line means leading to the burner means of the bypass flow, the feed quantities of said first and second pump means being regulatable independently of one another, throttle valve means in the fuel line means to the main burner means of the inner flow which is controllable by the fuel-metering means in the fuel line means to the ignition burner means, and pre-fill line means operatively connecting the fuel line means to the burner means of the bypass flow with the fuel line means to the main burner means of the inner flow, said pre-fill line means including pre-fill shifting valve means for the selective connection of the prefill line means with the fuel line means to the burner means of the bypass flow.

4,719,751

DIESEL PARTICULATE OXIDIZER REGENERATION SYSTEM

Satoru Kume, Otsu; Michiyasu Yoshida, Kyoto; Tateo Kume, Kyoto; Hiroki Oshima, Kyoto; Mitsuhiro Kawagoe, Kyoto, and Kazuo Koga, Otokuni, all of Japan, assignors to Mitsubishi Jidosha Kogyo K.K., Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,848

Claims priority, application Japan, Mar. 31, 1984, 59-64144; Mar. 31, 1984, 59-64145; Apr. 9, 1984, 59-70521; Apr. 24, 1984, 59-82434; Apr. 26, 1984, 59-84295; Aug. 13, 1984, 59-170285; Oct. 3, 1984, 59-150001; Oct. 12, 1984, 59-213969; Oct. 12, 1984, 59-213972; Nov. 8, 1984, 59-235394; Nov. 9, 1984, 59-236345

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—285 **25 Claims**

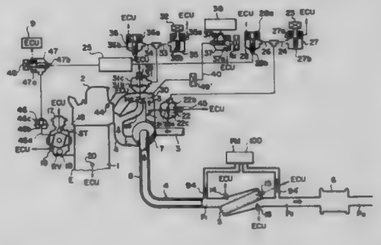
1. In a diesel engine having a fuel injection pump and fuel control means for controlling the injection volume or injection timing of said fuel injection pump, a diesel particulate oxidizer regeneration system including:

a diesel particulate oxidizer disposed in an exhaust system of the diesel engine and having a trap carrier for collecting unburnt fine particles contained in exhaust gas, said trap carrier supporting an oxidation catalyst;

a regeneration means for burning the unburnt fine particles collected in said diesel particulate oxidizer;

a regeneration timing control means for detecting the quantity of the unburnt fine particles deposited in said diesel particulate oxidizer and providing a signal to said regeneration means for operating the latter when the detected value is above a predetermined value; and

a regeneration end control means for detecting that the quantity of the unburnt fine particles collected and deposited in the diesel particulate oxidizer has become less than



the predetermined value after combustion, and producing a signal for stopping the operation of said regeneration means,

characterized by said regeneration timing control means being provided with a pressure detection means for detecting pressure loss of the diesel particulate oxidizer,

said pressure detecting means including an exhaust pressure detecting pipe for conducting the pressure of the exhaust system of the diesel engine to a pressure sensor, and filter means disposed in said exhaust pressure detecting pipe,

said filter means having a casing in which are disposed a filter for collecting particles in the exhaust gas, a water trapping wire mesh disposed closer to the exhaust passage than said filter and an exhaust pulsation reducing volume.

4,719,752

EXHAUST PIPE SYSTEM

Andrew W. Hall, Uddingston, Great Britain, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1986, Ser. No. 909,000

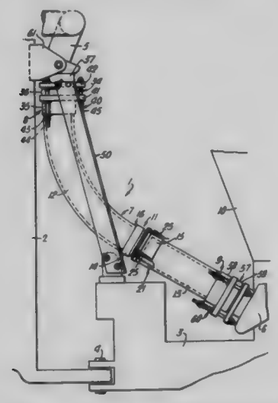
Claims priority, application United Kingdom, Sep. 20, 1985, 8523308

Int. Cl.[4] F01N *7/00*; F16L *35/00*

U.S. Cl. 60—322 **6 Claims**

1. An exhaust pipe system for an articulated motor vehicle comprising at least a first part and a second part, the first and second parts being pivotable relative to one another, the exhaust pipe system comprising a first rigid portion securable to the first part of the vehicle; a second rigid portion securable to the second part of the vehicle; and an intermediate flexible portion connected at its ends to the rigid portions, the flexible portion comprising a coupling comprising two parts which are releasably secured together by fastening means to provide a substantially gas-tight seal between the two parts of the coupling, the fastening means being such that, when the two parts of the coupling are subjected to a force, relative to one another, above a predetermined level, the fastening means is released allowing the two parts of the coupling to separate from one another without damaging any of the exhaust pipe system, each part of the coupling comprising a flange member, one of the flange members having a circumferentially extending spigot locatable in a corresponding recess in the other flange member when the two parts of the coupling are secured together, the mated spigot and recess forming a substantially

gas-tight seal between the two parts of the coupling, and one of the flange members having at least two protruding pins which



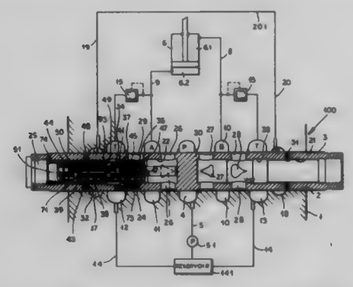
are locatable in corresponding holes in the other flange member when the two parts of the coupling are secured together.

4,719,753

SLIDE VALVE FOR LOAD SENSING CONTROL IN A HYDRAULIC SYSTEM

Walter Kropp, Sulzbach/Main, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 832,122
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506294
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—445 13 Claims



1. A control valve for use in a hydraulic system, said system including

a variable-speed pump, said pump having at least one control element;

a reservoir for storage of a hydraulic pressure medium;

a return conduit which leads to said reservoir;

a pump control piston connected to said control element and displaceable in a respective pump control cylinder;

means for generating a control pressure which can displace said pump control piston so that the position of said pump control piston is determined by said control pressure;

a conveying conduit connected to said pump for feeding the pressure medium to a plurality of demand locations;

control elements connected to said conveying conduit;

at least one branch line to bring the respective fluid to a respective demand location from said conveying conduit;

at least one self-movable valve arranged in said branch line for connecting a respective demand location with said conveying conduit;

a common control pressure conduit at said control pressure;

for each branch line at least one adjustable parallel control throttle having an adjustment element and at least one spring, whereby the respective adjustment element of each parallel control throttle can be impacted at one side by the pressure prevailing in the respective branch line and on the other side by a respective control pressure of said at least one spring, and whereby the control pressure is of equal magnitude at any parallel control throttle of a respective demand point; and

a control pressure branch conduit for connecting said one side of the control element of the parallel control throttle to said common control pressure control conduit; and in which

each conveying pressure branch line leading to a demand point formed with a controllable indicator throttle in said valve, and in the flow direction this indicator throttle the control pressure branch line is connected, and

whereby on at least one side of the respective piston there is provided a longitudinal bore in the piston in which is mounted an auxiliary piston which can be moved in reference to the force of said spring, and the auxiliary piston together with a part of the piston of said valve performing the parallel control throttle functions, the improvement which comprises:

a reversing piston chamber in said auxiliary piston,

a reversing piston for each reversing piston chamber which can be shifted by having said pressure medium impacting at a forward end thereof, and which has a central rod portion of reduced diameter with respect to which said reversing piston chamber can form an annular groove,

a transverse bore formed in said auxiliary piston for communicating said reversing piston chamber at said annular groove occupied by said central rod portion of reduced diameter of said reversing piston and said common control pressure conduit,

a transverse bore formed in said auxiliary piston for bringing pressure medium to the rearward end of said auxiliary piston, and

a rearward transverse bore formed in said auxiliary piston for bringing pressure medium to the forward end of said auxiliary piston whereby under predetermined control conditions the space forwardly of said reversing piston can be connected to a respective conduit leading to a demand point, and whereby the space of said reversing piston chamber at the rearward end of said reversing piston can be communicated with said annular groove which surrounds said central rod portion of reduced diameter of said reversing piston.

4,719,754

WAVE-ACTIVATED POWER GENERATING APPARATUS

Koichi Nishikawa, 58, Komatsu-cho, Toyohashi-shi, Aichi-ken, Japan

Filed Nov. 29, 1985, Ser. No. 802,977
Claims priority, application Japan, Nov. 30, 1984, 59-251935
Int. Cl.[4] F03B 13/12
U.S. Cl. 60—501 11 Claims

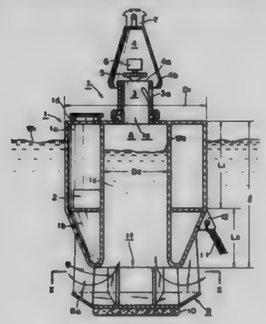
1. A wave-activated power generating apparatus, comprising:

a main body floatable in the water surface, said main body including a central working passage defined therein as extending vertically straight through said main body, having a bottom open end opened into the water when said main body floats in the water surface and a top open end located above said water surface;

at least one air turbine rotatably mounted on said main body so as to be driven to rotate by a forced air flow moving through said top open end of said central working passage due to an up and down motion of a water column in the central working passage;

at least one generator mounted on said main body and operatively coupled to said at least one air turbine so as to be driven by said at least one air turbine to generate electricity; and

a flat guide plate which is larger in size than the cross section of said central guide passage and fixedly attached to the



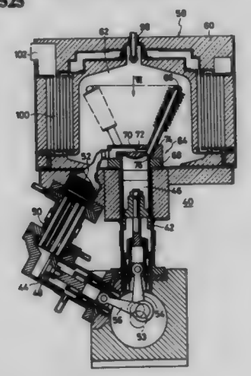
bottom of said main body as opposed to and spaced apart from said bottom open end of said central working passage through a plurality of supporting struts extending between the bottom of said main body and said guide plate, whereby a lateral passage defined between two adjacent ones of said plurality of supporting struts is in fluid communication with the bottom open end of said central working passage.

4,719,755

STIRLING ENGINE

Shigemi Nagatomo, Tokyo; Minoru Komori, Ebina; Tsutomu Sakuma, Yokohama; Noboru Kagawa, Tokyo; Takashi Komukai, Kawaguchi; Toshinori Iwasaki, Kawasaki, and Akira Kudo, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 9, 1985, Ser. No. 764,117
Claims priority, application Japan, Aug. 11, 1984, 59-167282
Int. Cl.[4] F02G 1/04
U.S. Cl. 60—525 9 Claims



1. A Stirling engine comprising

(A) a first cylinder and a second cylinder with a first piston and a second piston, respectively, that have a fixed phase difference between them, wherein (i) the first cylinder and the second cylinder are connected through a heater, a regenerator and a cooler, (ii) a fixed amount of working fluid is sealed in the first cylinder and the second cylinder, and (iii) the engine is driven by heating or cooling the working fluid by the heater or the cooler;

(B) a plurality of heat exchange pipes attached to the cylinder head of said first cylinder for communication between a manifold section and said first cylinder;

(C) said manifold section, being formed by said cylinder head of said first cylinder for communicating with the regenerator and comprising a central region, situated on the longitudinal axis of the first cylinder, to which working fluid from said heat exchange pipes converges before flowing into said regenerator; and

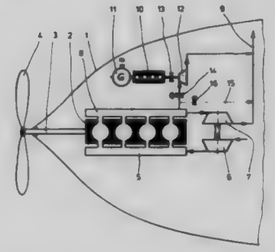
(D) a burner for heating said heat exchange pipes, wherein at least one heat exchange pipe is configured differently from the other pipes of said plurality but provides a duct resistance that is substantially equal to the duct resistance presented by each of said other pipes.

4,719,756

SUPERCHARGED MARINE DIESEL ENGINE

Adrian Streuli, Schinznach-Bad, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 11, 1986, Ser. No. 850,561
Claims priority, application Switzerland, Apr. 25, 1985, 1764/85
Int. Cl.[4] F02C 5/00
U.S. Cl. 60—597 2 Claims



1. A marine power system comprising a main engine having an exhaust duct with parallel branches, an exhaust gas turbocharger in one of said branches and a separate power turbine in another of said branches, an auxiliary diesel engine, a synchronous generator, and a common shaft connected between said auxiliary diesel engine and said synchronous generator and to said power turbine for driving said generator for supplying electrical power for a shipboard grid.

4,719,757

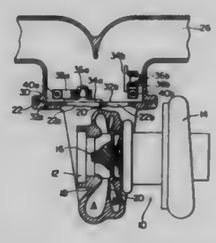
VARIABLE-VOLUME TURBOCHARGER

Norio Nakazawa; Yoshimasa Matsuo; Tetsuo Takemoto, and Susumu Kohketsu, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

PCT No. PCT/JP85/00129, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985
PCT Filed Mar. 15, 1985, Ser. No. 801,698
Claims priority, application Japan, Mar. 15, 1984, 59-37187[U]; Mar. 15, 1984, 59-37192[U]; Jul. 31, 1984, 59-117813[U]; Jul. 31, 1984, 58-117815[U]; Jul. 31, 1984, 59-117816[U]; Jul. 31, 1984, 59-161158; Nov. 15, 1984, 59-173540[U]; Mar. 13, 1985, 60-48194; Mar. 13, 1985, 60-54624[U]
Int. Cl.[4] F02B 37/12
U.S. Cl. 60—602 12 Claims

1. A variable-volume turbocharger device comprising a turbine housing having at least first and second exhaust gas passages divided by a partition wall provided in the housing.

said first exhaust gas passage having a large flow characteristic and said second exhaust gas passage having a small flow characteristic, a first valve means operable to open and shut said first exhaust gas passage, and a second valve means operative to open and shut said second exhaust gas passage independently



from said first valve means, each of said valve means having a valve member which cooperates with a valve seat to open and shut the corresponding exhaust gas passage, said valve members being arranged so as to open toward the upstream side of the flowing direction of exhaust gas with respect to said valve seats.

4,719,758

DEVICE FOR CHANGING THE DIRECTION OF AN AIRFLOW ENTERING THROUGH THE INTAKE OF A COMPRESSOR OF AN EXHAUST GAS TURBO-CHARGER

Siegfried Sumser, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,630
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529281
Int. Cl.⁴ F02B 37/12
U.S. Cl. 60—611 7 Claims

1. An exhaust gas turbo-charger arrangement comprising:
compressor intake means for guiding air to an exhaust gas driven compressor,
induction duct means opening to the compressor intake means,
bypass duct means bypassing the induction duct means and opening to an annular space disposed upstream of the compressor intake means in surrounding relationship to the induction duct means,
outlet openings leading from the annular space to the compressor intake means,
sleeve means for changing the flow cross-sectional area of the outlet openings to the compressor intake means, said sleeve means having nozzle-shaped openings and being arranged to be rotatable in the annular space,
a shut-off valve located in the induction duct means upstream of the compressor intake means and downstream of the connection of the bypass duct means, and
shut-off valve control means for controlling the opening of the shut-off valve as a function of engine load conditions.

4,719,759

METHOD OF AND MEANS FOR DISPOSING OF WASTE SALTS AND BRINES

Dan Zaslavsky, Rehovot, Israel, assignor to Solmat Systems, Ltd., Yavne, Israel

Continuation of Ser. No. 510,893, Jul. 5, 1983, abandoned. This application Dec. 16, 1986, Ser. No. 943,830
Int. Cl.⁴ F03G 7/02
U.S. Cl. 60—641.8 31 Claims



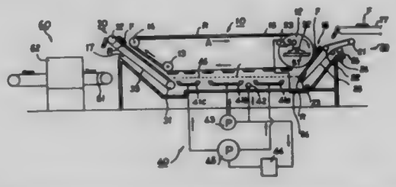
1. A method for disposing of waste brine comprising the steps of:
a. building a salt water solar pond having a halocline overlying a heat storage layer; and
b. introducing the waste brine into the solar pond.

4,719,760

METHOD OF AND APPARATUS FOR FREEZING FOOD

Usui Takayuki, Kanazawa, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00436, § 371 Date May 14, 1986, § 102(e) Date May 14, 1986, PCT Pub. No. WO86/01081, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 1, 1985, Ser. No. 852,850
Claims priority, application Japan, Aug. 3, 1984, 59-163651; Aug. 3, 1984, 59-163652
Int. Cl.⁴ F25D 13/04
U.S. Cl. 62—65 11 Claims



1. A method of freezing food comprising the steps of wrapping the food in a film which is non-permeable to water, immersing the wrapped food in flowing brine of sequentially different temperatures in order to freeze the wrapped food rapidly, reducing the difference in temperature between the outer peripheral portion and the core portion of said food, and thereafter completely freezing the food, the temperature of said brine being −35° to −40° C., −20° to −25° C., and −35° to −40° C. in the order of immersion.

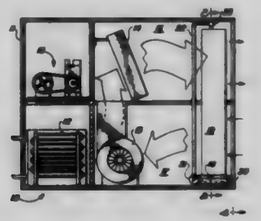
4,719,761

COOLING SYSTEM

Charles J. Cromer, 460 Indian Creek Dr., Cocoa Beach, Fla. 32931

Filed May 30, 1986, Ser. No. 868,581
Int. Cl.⁴ F25D 17/06
U.S. Cl. 62—94 2 Claims

1. A moisture removal method comprising the steps of:
evaporating moisture into the dry feed air of the cooling coils of an air conditioning system;
passing the moisture laden air through the cooling coils of the air conditioning system for increased removal of the moisture from the air passing therethrough;
removing moisture from the air exiting the cooling coils; and



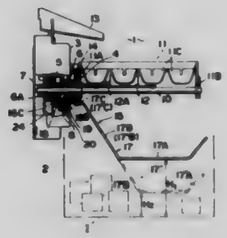
evaporating moisture removed from the air exiting the cooling coils back into the dry feed air of the cooling coils of the air conditioning system, whereby increased moisture removal is obtained by the air conditioning system.

4,719,762

STORED ICE DETECTING DEVICE IN ICE MAKING APPARATUS

Kenichi Ouabe, Kano, Japan, assignor to Toshiba Heating Appliances Co., Ltd., Japan

Filed Nov. 13, 1986, Ser. No. 931,858
Claims priority, application Japan, Nov. 21, 1985, 60-179509[U]; Aug. 13, 1986, 61-124800[U]
Int. Cl.⁴ F25C 1/10
U.S. Cl. 62—137 2 Claims



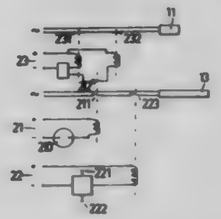
1. A stored ice detecting device for detecting ice stored in an ice bank, in an ice making apparatus having an ice making apparatus body for freezing ice making water into ice and supplying the ice to the ice bank, said stored ice detecting device comprising:
an arm lift member attached rotatably to a base frame, a stored ice detecting arm adapted to come into abuttment with the ice stored in said ice bank to detect whether ice is present or not therein, and a joint member for connecting said arm lift member and said stored ice detecting arm integrally replaceably and transmitting movements of the arm lift member to the detecting arm, said arm lift member having a pair of parallel long side portions, one long side portion being attached rotatably to the base frame and the other long side portion being adapted to move in response to movements of a cam portion interlocked with a rotational reversing motion of said ice making tray.

4,719,763

DEVICE FOR CHANGING THE TEMPERATURE OF A ROOM

Hellmut Tietze, 6 Roslagsgatan, S-113 55 Stockholm, Sweden

PCT No. PCT/SE86/00168, § 371 Date Nov. 13, 1986, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO86/05572, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 13, 1986, Ser. No. 940,760
Claims priority, application Sweden, Mar. 14, 1985, 8501269
Int. Cl.⁴ F25D 17/04
U.S. Cl. 62—186 3 Claims



1. A device for changing the temperature in a room, comprising
a refrigerant circuit including refrigerant compressor means, condenser means for receiving compressed refrigerant from the compressor means, and an evaporator for receiving condensed refrigerant from the condenser means;
a cooling circuit including cold accumulator for containing cooling liquid, a heat exchanger for receiving cooling liquid from the cold accumulator and a pump for circulating cooling liquid through the cooling circuit;
said evaporator being received in the cold accumulator to generate and accumulate cold in the cooling liquid by absorbing heat from the cooling liquid; and
fan means arranged to circulate air in the room through said heat exchanger for cooling the air, the improvement comprising:
control means arranged to start operation of the fan means and the cooling circuit in response to a person entering the room and to stop operation of the fan means and the cooling circuit in response to a person leaving the room;
timer means arranged to stop operation of the operating refrigerating circuit when a predetermined amount of cold has been generated and accumulated in the cooling liquid and when, upon starting operation of the fan means and the cooling circuit, a predetermined minor amount of cold has been generated and accumulated in the cooling liquid.

4,719,764

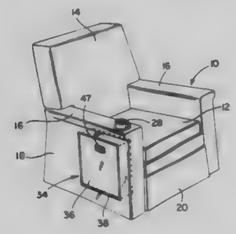
CHAIR WITH REFRIGERATOR AND ARMREST BEVERAGE COOLER

Myrna C. Cook, Austin, Tex., assignor to R & R Chair, Inc., Austin, Tex.

Filed Aug. 18, 1986, Ser. No. 897,506
Int. Cl.⁴ F25D 23/00
U.S. Cl. 62—261 9 Claims

1. In combination with a chair having an armrest with an upwardly facing surface alongside and outwardly of a seat, a beverage receptacle cooler and holder, said cooler and holder including a receptacle defined by a bottom and peripheral wall extending downwardly from the upwardly facing surface of the armrest for removably receiving a beverage receptacle, and an evaporative coil means associated with the cooler and

holder receptacle in heat exchange relation thereto for cooling the cooler and holder receptacle and a beverage receptacle



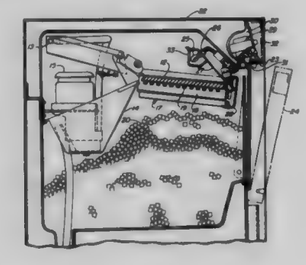
therein, said evaporative coil means forming a portion of a refrigeration system mounted on said chair.

4,719,765

ICE STORAGE RECEPTACLE LIGHT FOR ICE MAKER

Charles R. Hooper, Knight Township, Vanderburgh County, Ind., and Lawrence W. Michal, Arden Hills, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 19, 1986, Ser. No. 909,172
Int. Cl.[4] F25D *27/00*
U.S. Cl. 62—264 14 Claims



9. In a refrigeration apparatus having a cabinet defining an access opening, a bin in said cabinet for storage of ice bodies therein, and closure means for providing selective access to said bin through said opening for removal of a desired quantity of ice bodies therefrom, improved illuminating means for illuminating the ice bodies in the bin for observation thereof through said opening, said illuminating means comprising:

ice forming means for forming an ice slab;

a lamp;

means for mounting the lamp in said cabinet spaced above said bin;

grid means for receiving the ice slab from said ice forming means, said grid means being spaced below said lamp and above said bin, said grid means defining means for diffusing light shining from said lamp onto the ice bodies in said bin, said grid means comprising heating wire means; and

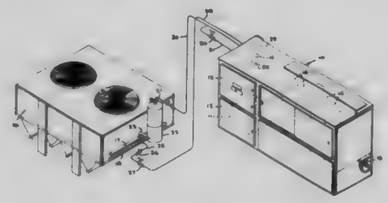
means for energizing said heating wire means for cutting an ice slab received thereon into a plurality of ice bodies and permit the ice bodies to fall from the grid into said bin, said lamp providing sufficient light for diffusively illuminating the ice bodies in said bin through said grid means and an ice slab on said grid means.

4,719,766

DEFROST GAS CONDITIONER FOR AIR COOLED REVERSE CYCLE DEFROST REFRIGERATION SYSTEM

William F. Morris, Jr., P.O. Box 1046, Raleigh, N.C. 27602-1046

Filed Aug. 30, 1985, Ser. No. 771,359
Int. Cl.[4] F25B *47/00*
U.S. Cl. 62—278 1 Claim



1. In a reverse cycle defrost refrigeration system having a compressor, an air cooled condenser and avaporator means having surfaces for forming ice thereon during a freezing cycle and arranged to discharge the ice therefrom during a defrost cycle, conduit means for conducting gaseous refrigerant from the compressor to the condenser to be condensed to liquid refrigerant in the condenser and conduit means for conducting the liquid refrigerant to the evaporator means during the freezing cycle, defrost cycle means including a defrost conduit means having defroat solenoid valve connected to the condenser hot gas supply form the compressor and a discharge conduit connected thereto and to the evaporator means to supply hot gaseous refrigerant to the evaporator means during the defrost cycle, the defrost conduit means being connected to the condenser for releasing flash gas from the condenser to the evaporator at the time the defrost solenoid valve opens; the improvemnet comprising means for conditioning warm defrost gaseous refrigerant which passes back through the discharge conduit to the defrost solenoid valve and the evaporator means at the beginning of the defrost cycle from carrying slugs of liquid refrigerant that may be in the condenser into the discharge conduit and evaporator means and compressor including a liquid separator surge tank and an inlet conduit connected to the top of the surge tank above the level of the discharge conduit connection to the condenser connected to said discharge conduit and a surge tank outlet conduit exiting tangentially from said surge tank near the bottom thereof and connected to said discharge conduit connection to said condenser to pass hot gas refrigerant from the compressor to the evaporator means and convey flash gas from the condenser through said discharge conduit to the evaporator means and to separate and accumulate in said surge tank any slugs of liquid refrigerant or oil that may be entrained with the flash gas.

4,719,767

ABSORPTION REFRIGERATION AND HEAT PUMP SYSTEM

Edward A. Reid, Jr., Westerville; F. Bert Cook; Edward M. Winter, both of Columbus, all of Ohio; Richard H. Merrick, Newburgh, Ind.; Edgar M. Purvis, Jr., Troy, and Stephen P. Cremean, Gahanna, both of Ohio, assignors to Columbia Gas System Service Corp., Wilmington, Del.

Continuation-in-part of Ser. No. 683,187, Nov. 13, 1984, Pat. No. 4,646,541. This application Dec. 22, 1986, Ser. No. 944,985
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—476 25 Claims

1. An absorption refrigeration and/or heating system in connection with a primary source of heat, a cooling or heating load, and a heat sink or secondary source, and an external source of mechanical energy to selectively provide heat to or remove heat from the load comprising:

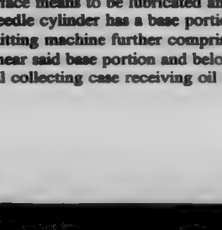
(a) a multiple effect generator means to apply the primary source of heat to an absorption solution pair comprising a highly volatile refrigerant, and an absorbent, and to desorb refrigerant from the pair;

(b) first and second heat exchanger means, one of which is in heat exchange relationship with the heat sink or secondary source, and the other of which is in heat exchange relationship with the load,

(c) valve means to selectively switch and reverse the functions of the first and second heat exchangers, from condenser to evaporator, in the cooling or heating mode and vice versa;

(d) an absorber means selectively connectable to the first or second heat exchanger when the heat exchanger is functioning as the evaporator;

(e) a pump means connected between the absorber means and the generator means to transfer solution flow to the generator means at higher pressure;



(f) the generator means comprising a plurality of coiled tubes with the coils juxtaposed one to the next in a generally annular composite form with a generator means surrounding the source of heat;

(g) the pump means having connection means to mechanically convert pressure energy in the refrigerant and/or solution pair to mechanical energy, and means to add the converted mechanical energy to the mechanical energy externally supplied to the system; and

(h) means to defrost the system by a procedure of switching the refrigerant from the second heat exchanger to the first heat exchanger, interrupting or minimizing contact between the secondary heat source and the first heat exchanger, and interrupting contact between the load and the second heat exchanger, and reversing the defrosting procedure when the system is defrosted.

4,719,768

CIRCULAR KNITTING MACHINE, IN PARTICULAR FOR HOSE KNITTING, WITH CONTINUOUS CYCLE LUBRICATION

Francesco Lonati, Brescia, Italy, assignor to LONATI S.p.A., Brescia, Italy

Filed Dec. 5, 1985, Ser. No. 805,004
Claims priority, application Italy, Dec. 10, 1984, 23970 A/84
Int. Cl.[4] D04B *35/28*
U.S. Cl. 66—8 6 Claims

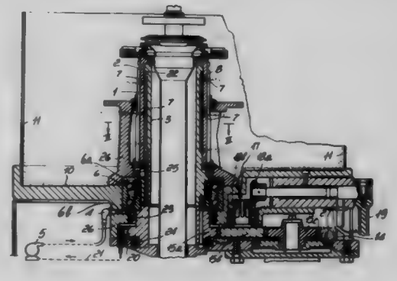
1. In a circular knitting machine with continuous cycle lubification with a feed pump having a feed conduit and a delivery conduit for lubricating oil, and having a cylinder holder and a needle cylinder surrounding the cylinder holder and having surface means to be lubricated located at least on an outside peripheral portion of said needle cylinder,

means defining a space beteen said needle cylinder and said cylinder holder and in communication with said

delivery conduit and duct means for connecting said space with said surface means to be lubricated and

wherein said needle cylinder has a base portion and

wherein the knitting machine further comprises a collector pan located near said base portion and below said collector pan an oil collecting case receiving oil from said collector pan and in communication with said feed conduit of said feed pump and a gear train for transmission of rotary



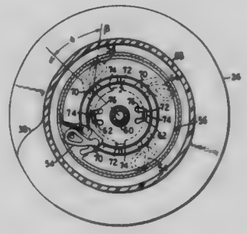
motion to said needle cylinder, said gear train being located in said oil collecting case.

4,719,769

ONE WAY CLUTCH FOR DUAL ACTION AGITATOR

John W. Pieknecier, St. Joseph, and Dale E. Mueller, Benton Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 7, 1986, Ser. No. 848,935
Int. Cl.[4] D06F *17/08*
U.S. Cl. 68—133 17 Claims



1. A dog clutch for use in a washing machine agitator having a first agitator portion driven in oscillatory movement and a second agitator portion rotatably mounted on the first agitator portion with a radially inwardly projecting annular mounting ring, and having an interior annular friction surface, comprising:

a cam mounted adjacent the annular friction surface for movement with the first agitator portion,

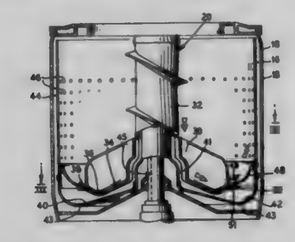
said cam having a plurality of spaced dog engaging portions each including a retaining rib and a stop spaced from said retaining rib; and

a plurality of dogs resting on said mounting ring, each having a pivot member held within one of said dog engaging portions, said plurality of dogs being frictionally pivotally driven by said mounting ring into and out of engagement with the annular friction surface to drive the second agitator portion incrementally in a first direction at each oscillation of the first agitator portion.

4,719,770
CLOTHES ROLLOVER AGITATION SYSTEM FOR AUTOMATIC WASHER

Robert A. Brenner, St. Joseph Township, Berrien County; William L. Kennedy, Coloma Township, Berrien County, and Anthony Mason, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 18, 1986, Ser. No. 897,302
Int. Cl.[4] D06F *17/10*
U.S. Cl. 68—134 14 Claims



1. A clothes rollover agitation system for an automatic washer having a vertical axis agitator with a plurality of radially extending vanes adjacent a lower end of said agitator extending outwardly from a central agitator post mounted centrally within a cylindrical wash basket having a bottom wall and a substantially vertical side wall, comprising:

a skirt portion formed on said agitator below said vanes having an inner portion extending radially outwardly and downwardly away from said post and an outer portion extending radially outwardly and upwardly to a distal perimeter terminating a distance from said wash basket side wall; and

a ring member secured to the interior of said wash basket between said distal perimeter of said agitator skirt and said basket side wall, said ring member having a cross-sectional profile shaped to continue the upward and outward shape of said outer portion of said agitator skirt;

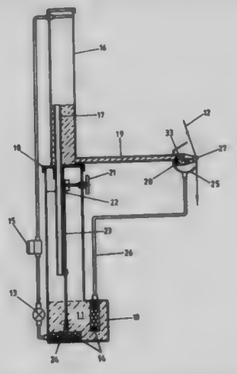
whereby, the shape of said agitator skirt will assist in increasing the rollover rate of clothes within said wash basket, and said ring member will provide a smooth transition path between said agitator skirt and said basket side wall.

4,719,771
APPARATUS FOR APPLYING LIQUIDS TO YARNS

Denys W. Brough, and Christopher J. Lawrence, both of Macclesfield, England, assignors to Rieter Scragg Limited, Cheshire, England

Filed Feb. 26, 1986, Ser. No. 833,121
Claims priority, application United Kingdom, Mar. 8, 1985, 8506070
Int. Cl.[4] D06B *1/08*
U.S. Cl. 68—200 20 Claims

1. Apparatus for applying liquid to a yarn, comprising a hollow body, a manifold for said liquid in said body, liquid supply means in fluid flow connection with said manifold and operable to supply liquid thereto at a constant predetermined pressure, a yarn guide, a path for a yarn in said yarn guide for said yarn to pass in contact therewith, an elongate tube having a length substantially greater than the diameter thereof, extending from said manifold to said yarn guide, a bore of a first diameter in said elongate tube, and a bore having a minimum diameter greater than said first diameter in said yarn guide connecting said tube bore with said yarn path and providing a liquid flow path from said manifold solely to said yarn path, in which the rate of flow of liquid is determined by the rate of

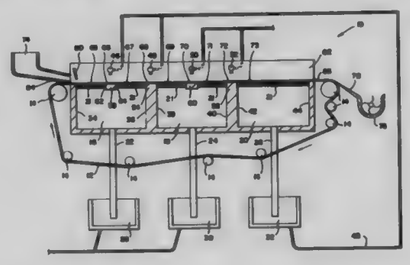


flow of liquid along said tube under said predetermined pressure.

4,719,772
APPARATUS FOR REMOVING INK PARTICLES FROM PAPER PRODUCTS

Remberto P. Bustamante, Miami, Fla., assignor to Michael Scheck, Miami, Fla., a part interest

Division of Ser. No. 703,950, Feb. 21, 1985, Pat. No. 4,680,088.
This application Feb. 24, 1987, Ser. No. 18,844
Int. Cl.[4] D21C *9/06*; D06B *1/02*
U.S. Cl. 68—205 R 5 Claims



1. An apparatus for removing ink particles from an inked paper product comprising:

means for conveying the paper product along a path, said conveying means being constructed of a semi-permeable material that passes the ink particles while retaining the paper product;

means proximate to a first side of the conveying means for establishing a pressure differential across the conveying means and across a first segment of said path to draw the ink particles from the paper product through said conveying means;

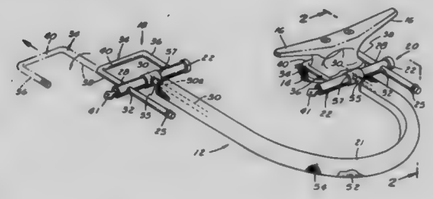
means on a second side of the conveying means for directing a liquid toward the conveying means and onto the paper product to break the paper product into a slurry as the paper product is advanced along a second substantial segment of said path; and

means on the first side of the conveying means directly opposite the liquid directing means for substantially preventing the establishment of a pressure differential across and flow through the conveying means and across the second substantial segment of the path.

4,719,773
SECUREMENT APPARATUS

Scott Alberts, 307 N. Lima St., Burbank, Calif. 91504

Filed May 1, 1987, Ser. No. 44,821
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—18 9 Claims



1. A locking device for lockably joining two spaced apart objects, comprising:

(a) first and second securement means, each said securement means including:

(i) a barrel portion having a longitudinally extending bore and at least first, second and third spaced apart transverse bores in communication with said longitudinally extending bore;

(ii) a generally U-shaped shackle receivable about at least a portion of the spaced apart objects, said shackle having first and second legs movable respectively within said first and second transverse bores of said barrel portion between first and second positions; and

(iii) locking means for locking said first and second legs of said shackle in a first position; and

(b) connector means for interconnecting said first and second securement means, comprising:

(i) an elongated connector member having first and second ends, said first end being receivable within said third transverse bore of said first securement means and second end being receivable within said third transverse bore of said second securement means;

(ii) first means receivable within said longitudinally extending bore of said first securement means, said first means being connected to said first end of said connector member and being so constructed and arranged as to prevent removal thereof from said longitudinally extending bore of said first securement means; and

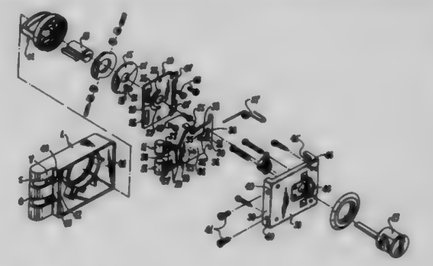
(iii) second means receivable within said longitudinally extending bore of said second securement means, said second means being connected to said second end of said connector member and being so constructed and arranged as to prevent removal thereof from said longitudinally extending bore of said second securement means.

4,719,774
DEADBOLT ASSEMBLY

Donald J. Newman, Somnerville, and John A. Christie, Heathmont, both of Australia, assignors to Ogden Industries Pty. Ltd., Huntingdale, Australia

Filed Dec. 16, 1986, Ser. No. 943,362
Claims priority, application Australia, Dec. 18, 1985, PH3930
Int. Cl.[4] E05B *63/12*
U.S. Cl. 70—131 21 Claims

1. A deadbolt assembly including, a housing, a deadbolt mounted on said housing for linear movement relative thereto between operative and inoperative positions, an actuator mounted on said housing, a drive plate rotatably mounted on said housing and being connected to said actuator so as to rotate in response to operation of said actuator, a drive pin fixed to said drive plate so as to move therewith and being located radially outwards from the axis of said plate rotation, the assembly being one wherein said pin travels through an arc during movement of said deadbolt between said positions thereof, and the extremities of said arcuate travel are located on a straight line which is substantially parallel to the path of said linear movement, and means on said deadbolt cooperating

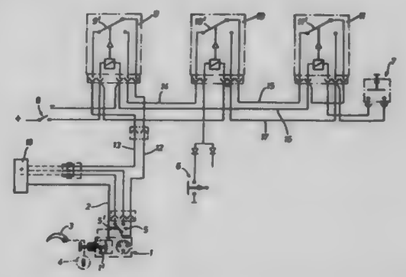


with said pin so that said pin is adapted to push against said deadbolt and thereby cause said linear movement thereof as said plate is rotated.

4,719,775
CENTRAL LOCKING SYSTEM FOR AUTOMOTIVE VEHICLES

Fritz Press, Wildberg; Rudi Knelb, Sindelfingen; Guenther Weikert, Weil der Stadt, and Klaus J. Heinsbrodt, Trenchtlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,209
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523432
Int. Cl.[4] E05B *53/00*
U.S. Cl. 70—264 2 Claims



1. A central locking system for a motor vehicle with a multiple position operation for door locks that are actuable for either hydraulic or pneumatic regulating elements, said door locks locking a driver door, a front passenger door, and rear doors, said system comprising:

electric switching means for outputting a switching signal for a central power-actuated control of all said door locks into locking and unlocking positions;

lock cylinders actuable by a key at least at said driver door and said front passenger door, said lock cylinders being operably connected with said regulating element and said switching means to control said locking and unlocking of said door locks upon key actuation of one of said lock cylinders;

ingnition switch means, connected to said switching means, which in a closing position, causes said switching means to output a signal for locking all said door locks and in an open position permits unlocking of said door locks;

touch contact locking switch means in a passenger compartment and connected to said switching means for overrid-

ing said ignition switch means to unlock all said door locks when said touch contact locking switch means is closed, and returning control of said door locks to said ignition switch means when said touch contact locking switch means is opened;

door contact switch means which is closed when one of said doors is open, said doors being operable by actuation of an inside door actuating handle, said door contact switch means being connected to said switching means such that when one of said doors is open and said ignition switch means is in a closing position, said door contact switch means is closed and overrides control of said switching means by said ignition switch means so as to open all said door locks, and when said doors are closed, said door contact switch means is open such that control of said switching means is returned to said ignition switch means and said door locks are locked; and

change-over switch means connected to said switching means for causing said switching means to output unlocking signals when said ignition switch means is in an open position and at least one of said driver door and said front passenger door is opened via said inside door actuating handle.

4,719,776

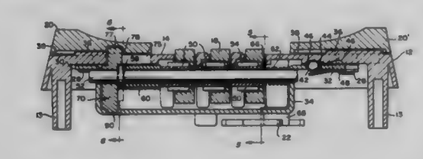
COMBINATION LOCK WITH COMBINATION-CHANGING FEATURE

Richard Molnar, Elmwood, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Continuation of Ser. No. 585,368, Mar. 2, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 894,745

Int. Cl.⁴ E05B *37/02, 37/00, 65/52;* **A45C** *13/10*

U.S. Cl. 70—312 **7 Claims**



1. In a combination lock comprising a casing having a combination lock mechanism therein for controlling the locking and unlocking of a member cooperable with but separate from said lock, and actuator means including finger-engageable button means mounted exteriorly of said casing and supported for movement in a predetermined direction between a locked position at which said member is locked and an unlocked position at which said member is unlocked, said lock mechanism including a plurality of combination dials with peripheral portions thereof exposed through respective slots in a faceplate wall of the casing, said button means being supported for movement along said faceplate wall at an end thereof beyond said peripheral portions of said dials, locking means controlled by said dials for preventing movement of said button means from said locked position to said unlocked position until said dials are set at a predetermined unlocking combination, and a shift member supported for movement with said button means to said unlocked position and also for shifting movement relative to said button means while said button means is at said unlocked position, said lock mechanism including means responsive to shifting movement of said shift member to permit said dials to select a different unlocking combination, the improvement in that said shifting movement of said shift member is transverse to said predetermined direction of movement of said button means and in that said button means has opening means accessible from the exterior of said casing adjacent to said wall of the casing for providing access to a surface of said shift member to cause shifting movement of said shift member, and wherein said opening means comprises a pair of spaced, separate openings accessible only at opposite sides of the exterior of said button means, respectively, through respective exterior surfaces of said lock that are substantially perpendicular to said faceplate wall and said shift member is supported for said shifting movement between a first position at which a portion of said shift member is disposed to be engaged through one of said openings and a second position at which another portion of said shift member protrudes through the other of said openings.

7. In a combination lock comprising a casing having a combination lock mechanism therein for controlling the locking and unlocking of a member cooperable with but separate from said lock, and actuator means including finger-engageable button means mounted exteriorly of said casing and supported for movement in a predetermined direction between a locked position at which said member is locked and an unlocked position at which said member is unlocked, said lock mechanism including a plurality of combination dials with peripheral portions thereof exposed through respective slots in a faceplate wall of the casing, locking means controlled by said dials for preventing movement of said button means from said locked position to said unlocked position until said dials are set at a predetermined unlocking combination, and a shift member supported for movement with said button means to said unlocked position and also for shifting movement relative to said button means while said button means is at said unlocked position, said lock mechanism including means responsive to said shifting movement of said shift member to permit said dials to select a different unlocking combination, the improvement in that said shifting movement of said shift member is transverse to said predetermined direction of movement of said button means, in that said shift member has camming means for moving a portion of said locking means relative to said dials in response to said transverse shifting movement of said shift member, so that said dials may select said different unlocking combination, and in that said lock has opening means adjacent to said faceplate wall through an exterior surface of said lock that is substantially perpendicular to said faceplate wall for providing access to a surface of said shift member against which a force can be exerted to cause said transverse shifting movement of said shift member wherein said opening means comprises a pair of spaced, separate openings accessible only at opposite sides of the exterior of said lock, respectively, through exterior surfaces of the lock that are substantially perpendicular to said faceplate wall, and wherein said shift member is supported for reciprocative shifting movement along a path between said openings.

4,719,777

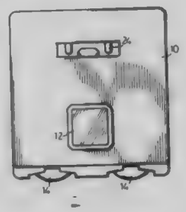
COMBINATION LOCK FOR BRIEFCASES

Blake Hwang, No. 40, Chao An Street, Taipei, Taiwan

Filed Mar. 30, 1987, Ser. No. 32,175

Int. Cl.⁴ E05B *37/02*

U.S. Cl. 70—312 **1 Claim**



1. A combination lock for a briefcase, comprising a case body, a push button, a plurality of combination dials, a plurality of driven wheels, a sliding sheet, a positioning sheet, a sliding block, a structural body, a back cover and a plurality of springs; when the dials are on-combination, the push button can be pushed in a direction for opening the lock and can be pushed in an opposite direction for changing combination; the combination lock is characterized in that each combination dial is a composite body consisting of a rotation wheel and a toothed wheel, wherein the diameter of the toothed wheel is not larger than that of the rotation wheel, and the dial being provided on its bottom surface with a plurality of dents; each of the driven wheels being in the form of a disc on one side of which is provided a hub disc, and on the other side of which is provided a wheel disc, wherein both of the hub disc and wheel disc are provided with a recess at the same location; each driven wheel being drivable by one of the dials when in mesh with that dial; a plurality of axles provided on the structural body, each dial being mounted on one of the axles; a plurality of raised points provided around each axle on the surface of the structural body for engagedly cooperating with the dents on the bottom surface of each dial; a spring mounted on each axle for forcing each dial to abut against the structural body; the sliding sheet being provided at its two opposite sides with two inserting tabs respectively; the push button can be pushed downwards when each inserting tab is in alignment with the corresponding recess of the hub disc; each wheel disc of the driven wheel being mounted in a corresponding circular aperture in the structural body; when each recess of the wheel disc is in alignment with the corresponding projection provided on the circumference of the circular aperture, the push button can be pushed in the opposite direction so that each driven wheel is disengaged from the corresponding dial to achieve a combination-changeable state.

4,719,778

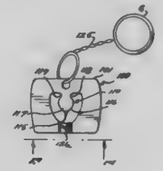
KEY RING SEPARATOR

Hildegarde J. Murphy, and Milo E. Murphy, both of 2299 Ximeno Ave., Long Beach, Calif. 90815

Filed Feb. 24, 1986, Ser. No. 832,646

Int. Cl.⁴ B25B *33/00*

U.S. Cl. 70—456 R **1 Claim**



1. A planar sheet structure for separating the collapsed coils of a key ring, comprising:

a generally triangular structure projection including an apex defined by the intersection of two arcuate concave sides each extending from said apex to a corresponding one of two opposing recesses separated by a base connection of a key ring carried object, each said recess being conformed to receive a coil of said key ring; and

a peripheral edge strip surrounding said structural projection, said edge strip including a passageway being defined by two opposed outwardly bent edge members separated by a dimension greater than the sectional dimension of said key ring.

4,719,779

HEAT SHIELD ARRANGEMENTS

William R. Laws, Worcester Park, and Geoffrey R. Reed, Tadworth, both of England, assignors to Encomech Engineering Services Limited, Great Britain

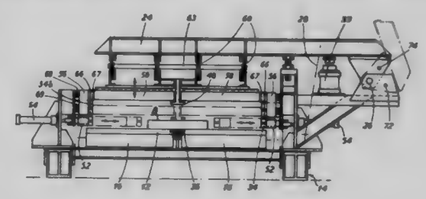
Filed Feb. 4, 1986, Ser. No. 825,888

Claims priority, application United Kingdom, Mar. 26, 1985, 8507858

Int. Cl.⁴ B21B *43/00, 45/02*

U.S. Cl. 72—14 **16 Claims**

1. A heat shield arrangement for a hot-rolling mill having a hot material path along its length, said arrangement comprising at least one carrier frame extending transversely across the material path, at least one series of upper heat insulating panels suspended from said at least one carrier frame and located above the hot material path, positioning means acting on said at least one frame for raising and lowering said panels jointly with said frame to adjust the distance of said panels above said hot material path between an operative clearance position



close to said material path and a higher raised position substantially vertically above said clearance position, and means sensing the arrival of hot material along said path and for operating said positioning means such that the panels are lowered to a said operative position closer to the material from a said higher position in response to said sensing means sensing the presence of the material under the panels.

4,719,780

TOOL POINT AND ITS WORKING METHOD AND TOOL FOR MAKING AND FLANGING A HOLE

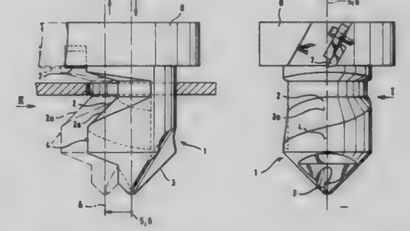
Pekka Ristimäki, Laihia, Finland, assignor to G.A. Seriachius Corp., Laihia, Finland

Filed Jul. 2, 1986, Ser. No. 881,082

Claims priority, application Finland, Oct. 4, 1985, 853850

Int. Cl.⁴ B21D *19/00*

U.S. Cl. 72—71 **9 Claims**



1. A tool point for making and flanging a hole, said tool point (1) comprising a hole-cutting bit member (3) and thereabove a flanging portion for producing a flange in a hole formed by said hole-cutting bit member, characterized in that said flanging portion comprises a surface (2) designed on the tool point and extending thereon in a radial direction, said surface being located inside the diametral rim of said hole-cutting bit member (3) as it rotates around its axis.

4,719,781

DEVICE FOR STRAIGHTENING METAL WIRES BY MEANS OF A PLURALITY OF ROLLERS

Jean Cloup, Château Beaugey-Carignan, 33360 Latresne, France

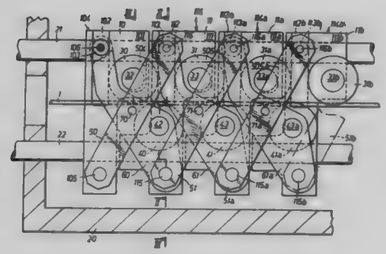
Filed Aug. 7, 1986, Ser. No. 894,019

Int. Cl.⁴ B21D *3/02;* **B21F** *1/02*

U.S. Cl. 72—164 **10 Claims**

1. In a device for straightening metal wires by means of a plurality of straightening rollers located in the same plane alternately on either side of the path of the wire contained in

said plane and acting alternately to bend said wire in one direction then in the opposite direction during its passage between the rollers, said device comprising a fixed frame, an odd number, at least equal to five, of straightening rollers distributed in first and second series disposed on either side of the path of the wire, the first series comprising at least three reference straightening rollers whose axes lie in substantially the same fixed plane with respect to the frame and generally parallel to the path of the wire, the second series including one roller less than the first series, the rollers of said second series also having their axes located in substantially the same plane being generally parallel or slightly inclined with respect to the plane of the axes of the reference rollers, and being located on a side of said wire opposite said reference rollers, each of the rollers of the second series being disposed in an intermediate position between two reference rollers, said device also including plural carriages each bearing a reference roller via a pin, one of the carriages being fixed with respect to the frame and the other carriages being mobile and guided parallel to the path of the wire, each of the carriages bearing the reference rollers extending downwardly beyond the path of the wire over a sufficient length and carrying a lower pivot pin a lower portion thereof located on the opposite wire side, an upper portion of



each carriage on the side of the first series of reference rollers being formed with a groove generally perpendicular to the path of the wire and substantially aligned with the pivot pin located at the lower portion of the associated carriage and extending towards the pin, the pin of the reference roller borne by the carriage being located adjacent the groove, and wherein two adjacent carriages are connected by an assembly of two levers articulated on each other in their median part by a pivot pin to form a scissor type assembly, said assembly of two levers including a first lever having one end articulated on the lower pivot pin of a first of said adjacent carriages and an opposite end pivoting on a journal borne by a slide block movably mounted in the groove in the carriage adjacent the first carriage, and a second lever which is articulated at one end thereof on the lower pivot pin of said carriage adjacent the first carriage and by the other end on the pin of a slide block movably mounted in the groove of the first carriage, and the second lever carries, in a portion thereof located between its articulation on the lower end of said adjacent carriage and the pivot pin of the two levers, a roller of the second series whereby a displacement of the mobile carriages results in a simultaneous displacement of the levers and a substantially proportional resulting displacement of the reference rollers relative to the rollers of the second series.

4,719,782

ROLLING MILLS

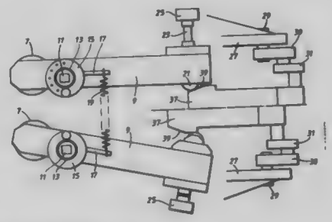
Dennis Stubbs, Sheffield, England, assignor to Hille Engineering Limited, Yorkshire, England

Filed Apr. 30, 1986, Ser. No. 857,253

Claims priority, application United Kingdom, Apr. 30, 1985, 8510927

Int. Cl.⁴ B21H *1/22*

U.S. Cl. 72—199 **3 Claims**



1. A rolling mill comprising:

a housing structure;

a first pair of elongate mill rolls positioned one above the other with their longitudinal axes horizontal and parallel, said rolls being rotatably supported in the housing structure;

means for rotating said rolls to engage opposite faces of a workpiece passed therebetween;

a second pair of elongate mill rolls positioned side-by-side with their longitudinal axes vertical and parallel to engage opposite edges of a workpiece;

a pair of support arms each having a first end and an opposite end, said second pair of rolls being rotatably supported at said first ends of the support arms;

each support arm being pivotal about a position between its first and opposite ends on respective pivots on said housing structure;

an adjustable eccentric member positioned between each support arm and its pivot;

a cam member displaceable between the arms to engage the arms at a location opposite of the pivots from the second pair of mill rolls to cause said arms to pivot about the respective pivots to move the rolls of the second pair toward and away from each other; and

means for displacing the cam member relative to the arms.

4,719,783

PORTABLE PIPE BENDING MACHINE

Martin C. Corry, Rydal, Pa., assignor to Joan G. Frost, Rydal, Pa.

Filed May 8, 1986, Ser. No. 860,986

Int. Cl.⁴ B21D *7/02*

U.S. Cl. 72—217 **5 Claims**

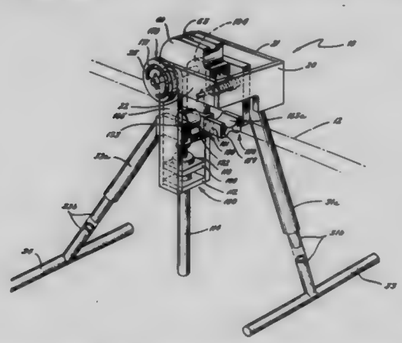
1. A portable pipe-bending machine comprising:

stabilizing means to provide a secure platform from which to exert leverage against a section of pipe; and

bending means fixedly adjustable inside said stabilizing means to force the section of pipe into a predetermined curve and including rotatable pressure means for simultaneously forcing the section of pipe into a groove in a stationary bending mandrel and being rotatable around said predetermined curve and guide means located adjacent said mandrel to restrain the curved surface of the pipe as said pressure means is moved;

wherein said stabilizing means includes a mounting bracket and a plurality of telescopingly adjustable legs, at least one of which is pivotally movable to and securable in a desired position;

wherein said bending means includes a curvature guide to predetermine the degree of curve to be put into the section of pipe; and



wherein said bending means includes a resiliently pivotable pipe guide tray.

4,719,784

ROLL BENDING APPARATUS FOR ROLLING MILL

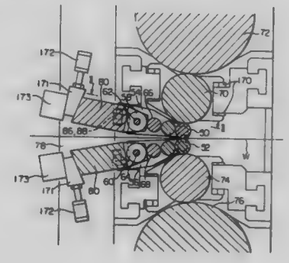
Koichi Matsumoto; Masahiro Hayashi, and Toshiyuki Kajiwara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

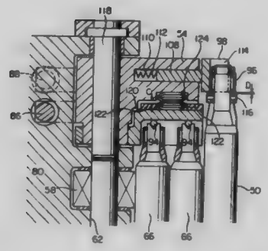
Filed Apr. 3, 1986, Ser. No. 847,489

Claims priority, application Japan, Apr. 3, 1985, 60-70643

Int. Cl.⁴ B21B *29/00, 31/08, 31/32*

U.S. Cl. 72—242 **13 Claims**





1. A roll bending apparatus for a multi-stage rolling mill, comprising:

a mill frame;

upper and lower parallel axis work rolls rotatably mounted on said frame for rolling sheet material therebetween;

upper andlower vertical support rolls mounted on said frame for rotation about respective axes parallel to said work roll axes for vertically supporting said work rolls;

horizontal support rolls mounted horizontally adjacent at least one of said work rolls for rotation about respective axes parallel to said work roll axes for supporting the respective work roll in one horizontal direction;

a pair of horizontal support arm members respectively mounting opposite axial ends of said support rolls and said one work roll;

pivot means for mounting said support arm members for rocking motion in respective substantially vertical planes about a common fulcrum axis spaced from and parallel to the axis of said one work roll;

each of said support arm members having a work roll support end ortion provided with bearing means for mounting said one work roll on said support arm member for limited horizontal lost motion and vertically fixed coupling; and

bending force generating menas for applying a substantially vertical roll bending force to the ends of said support arm members opposite from said work roll support end portions and on the opposite side of said fulcrum axis from said work rolls, for rotating eachof said support arm members about said fulcrum axis to exert a vertical roll bending force on the opposite ends of sid one work roll.

13. A roll bending apparatus for a multi-stage rolling mull, comprising:

a mill frame;

upper and lower parallel axis work rolls rotatably mounted on said frame for rolling sheet material therebetween;

upper and lower vertical support rolls mounted on said frame for rotation about respective axes parallel to said work roll axes for vertically supporting said work rolls;

horizontal support rolls mounted horizontally adjacent at least one of said work rolls about respective axes parallel to said work roll axes for supporting the respective work roll in one horizontal direction;

a pair of horizontal support arm members respectively mounting opposite axial ends of said support rolls and said one work roll;

each of said support arm members having a work roll support end portion provided with means for mounting said one work roll on said support arm member;

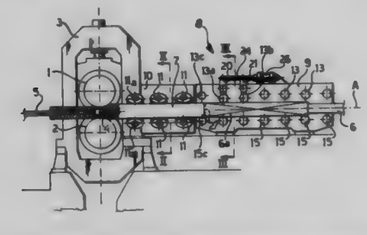
each of said support arm members includes a support roll support member portion mounted on its respective support arm member for relative horizontal movement in the axial direction, each support roll support member mounting a respective end of said horizontal supports rolls and having a support roll thrust bearing therebetween, spring means resiliently between each support roll support member portion and its support arm member for resiliently axially biasing said support roll support member axially toward the adjacent horizontal support rolls to provide a support rolls thrust gap of posible relative axial movement beteen said support rolls and said support arm member; work roll thrust bearing means for the opposite end of each of said one work roll providing a thrust axial work roll gap of relative movement between said one work roll and said support arm members; said thrust work roll gap being substantially less than said support rolls thrust gap; said support roll thrust bearing means having a thrust capacity substantially less than said work roll thrust bearing means, and said spring means having a biasing axial force substantially less than said support roll thrust bearing force capacity, so that axial thrust on said one work roll, as it increases, will first overcome the bias of said support roll spring means without damaging said support roll thrust bearing means until said thrust axial work roll gap is closed and thereafter be counteracted by said work rol thrust bearing.

4,719,785

METHOD AND APPARATUS FOR GUIDING A BILLET INTO A PRESSURE-PIERCING ROLLING MILL

Emanuele Gencia, Milan, Italy, assignor to Ilmo Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Jun. 18, 1986, Ser. No. 875,563
Claims priority, application Italy, Jun. 28, 1985, 21331 A/85
Int. Cl.[4] B21B *39/16*
U.S. Cl. 72—250 5 Claims



1. A method for guiding a billet into a pressure-piercing mill which includes two round-grooved rolls defining a rolling axis, a boring bit on the delivery end of the pressure-piercing mill, a pusher to force a billet along said rolling axis through the nip of said rolls and against the boring bit, and an infeed guide, said method compriaing the steps of securing the billet to said pusher in axial alignment relationahip, guiding the pusher along the rolling axis and releasing the pusher from the billet when its end reaches the nip of said rolls.

4,719,786

REINFORCED PLASTIC RETAINER RINGS FOR SHEET METAL FORMING AND METHOD OF MAKING

William A. Martell, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 19, 1986, Ser. No. 864,317
Int. Cl.[4] B21D *11/02;* B29C *33/40*
U.S. Cl. 72—296 5 Claims



1. A plastic retainer ring, used to secure a workpiece in a sheet metal stretch forming process, said ring having a body portion with an opening therein for receiving a forming die, said body being formed of a polymeric material and including a rim portion defining said opening, said rim portion being subject to large substantially radially inward stresses during said stretch forming process, said rim comprising a plurality of spaced part, generally radially aligned reinforcing members having a projected finger portion extended into and embedded within said rim portion and an elongated portion extended from said finger portion into said body portion of the retainer ring, a working surface containing a beaded, curved section for securing said sheet metal workpiece, whereby said large substantially radially inward stresses acting on said rim portion during said stretch forming process are alleviated by the stress distribution from said rim portion to said body portion through the reinforcing members.

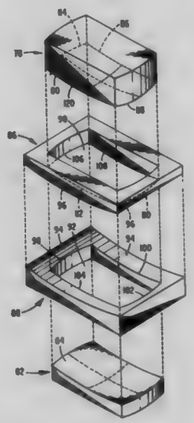
5. A method of casting a reinforced plastic retainer ring for use in securing a workpiece in sheet metal stretch forming process including the steps of providing a pattern of a die having an exterior surface defining the interior surface of said retainer ring; orienting said pattern in a pattern box the interior surface of which defines the exterior surfaces of said retainer ring; applying a release coating to the surfaces of the pattern and the box; assembling and placing a plurality of spaced apart, generally radially aligned reinforcing members into said pattern box along the periphery of said pattern, said reinforcing members having projected finger portions equipped with apertures which are positioned adjacent to the pattern; connecting said reinforcing members through said apertures with a flexible wire member; pouring a polymeric casting compound into said pattern box and demolding said retainger ring after fully cured.

4,719,787

APPARATUS FOR FORMING A SHADOW MASK

Frank R. Ragland, Jr., Manheim Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1986, Ser. No. 901,569
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—347 6 Claims



1. In an apparatus for forming a shadow mask from a mask blank including a punch having a convex surface, a pad having a complementary concave surface, and upper and lower dies having openings therein for receiving said punch and said pad, respectively, each die having a complementary nonplanar surface with an inner edge adjacent said opening for clamping said mask blank, the improvement comprising:

each die surface having a surface contour that substantially matches the extended surface contour of said mask blank when said mask blank lies unclamped against the inner edge of said lower die surface, so that wrinkling does not occur when said mask blank is clamped between said upper and lower dies.

4,719,788

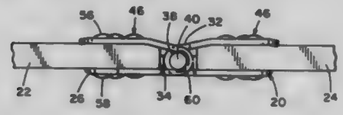
BELT FASTENER WITH ENLARGED LOOP FOR HINGE PIN

Edward C. Musil, Lyons, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Division of Ser. No. 616,287, Jun. 1, 1984, Pat. No. 4,625,369.
This application Sep. 16, 1986, Ser. No. 908,223
Int. Cl.[4] B21D *53/46*
U.S. Cl. 72—379 1 Claim

1. A method of making a hinge belt fastener having upper and lower plates joined by a pair of arcuate straps with an inwardly projecting abutment finger on one of the plates for limiting belt insertion at a predetermined reachback distance from free ends of said upper and lower plates, said method comprising the steps of: punching a flat sheet of steel to form a pair of plates joined by flat strips and having a flat finger in the plane of said plates,

coining the flat finger with a punch to substantially reduce the thickness of the flat finger on a first side thereof opposite a second side on said finger,



bending the flat finger inwardly to be substantially normal to its attached plate with the second side facing the free ends of the plates and to be at said predetermined reachback distance from the free ends of .he plates, and

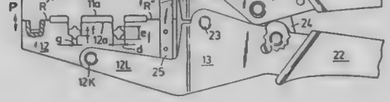
bending the flat strips into arcuate shape to form the arcuate straps and to provide an upper plate which is disposed above the lower plate and is substantially parallel thereto with the arcuate straps having inwardly facing sides facing the first side of said finger to define a space which admits a larger size of hinge pin.

4,719,789

CRIMPING TOOL

Ulrich Wiebe, Dörentrup, and Manfred Wilmes, Detmold, both of Fed. Rep. of Germany, assignors to C.A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,191
Claims priority, application Sweden, May 21, 1986, 8602301
Int. Cl.[4] B21D *7/06, 53/36*
U.S. Cl. 72—410 13 Claims



1. In a tool for crimping terminals onto ends of electrical conductors comprising a pair of rigid die carriers movable from an open position in which the die carriers are spaced one from another into a closed position defined by an end stop means and in which the die carriers are adjacent one another; an inner edge on each said die carrier facing an inner edge of the other die carrier; mounting means for mounting said die carriers one opposite the other; driving means for driving said die carriers in their said movement; at least one crimping die element at each said inner edge, defining with the crimping die element in the other die carrier a pair of co-operating dies;

an improvement for rendering said tool suitable to form a crimp having a cross-sectional shape of generally a star with four tips, said improvement comprising:

each said die element comprising an indentation extending in the direction of said movement and in alignment, in said closed position, with the indentation in the other die element, and terminated by a dead end;

said pair of co-operating dies comprising at least two lateral cut-in portions extending transversely to the direction of said movement at opposite ends of an associated indentation, and at least two terminal means at the ends of opposite lateral cut-in portions;

the ends of all lateral cut-in portions being equally spaced from said associated indentation;

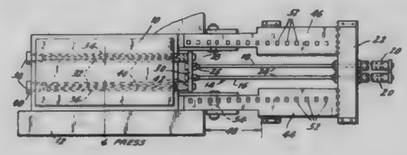
said pair of co-operating dies defining thus in said closed position a crimping space surrounded continuously by a counter-pressure surface and having the shape of a star with four tips, two opposite tips being defined by the two indentations, and the other two opposite tips being defined by said lateral cut-in portions.

4,719,790

TABLE SHIFT APPARATUS FOR LARGE HYDRAULIC PRESSES

Adam Zandel, Forest Hills, N.Y., assignor to Press Technology Corporation, White Plains, N.Y.

Continuation of Ser. No. 820,111, Jan. 21, 1986, abandoned. This application Mar. 31, 1987, Ser. No. 33,905
Int. Cl.[4] B30B *15/06;* B21J *13/08*
U.S. Cl. 72—448 10 Claims



1. A shifting apparatus for slidingly moving a very heavy forging press component of a forging press back and forth along a given travel path which extends between first and second ends of said path, said apparatus comprising:

said heavy forging press component;

first cylinder/ram means connected at one end thereof to a stationary member of said forging press and at the other end thereof to said heavy press component, said first cylinder/ram means having a ram means and means for operating said ram means solely in tension to pull said heavy press component from said first end to said second end along said path; and

second cylinder/ram means connected at one end thereof to another stationary member of said forging press and at the other end thereof to said heavy press component, said second cylinder/ram means having a respective ram means and a respective operating means arranged with respect to said heavy press component and said first cylinder/ram means for operating said ram means of said second cylinder/ram means solely in tension to pull said heavy press component from said second end to said first end along said path, each said ram means of said first and second cylinder/ram means being constructed such that said ram means is sufficiently sturdy to enable said ram means to operate in tension to pull said press component and is inadequate to permit said ram means to be operated in compression to push said press component whereby said ram means operate mutually exclusively of one another and each of said ram means has a reduced size and capacity configuration.

4,719,791

INDIVIDUAL FILTER BAG MONITORING SYSTEM FOR BAGHOUSES

Gary Greiner, Troutville, and Dale A. Furlong, Vinton, both of Va., assignors to ETS, Inc., Va.

Filed Dec. 5, 1986, Ser. No. 938,516
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—38 12 Claims

1. An apparatus for taking filter bag pressure measurements which comprises:

(a) a chamber formed from a tubular sidewall having an upper open end and a bottom end, said bottom end being sealed with an orifice plate having an orifice for the pas-

sage of a gas stream therethrough upwards toward the open end;

(b) an upstream pressure sensor tap comprising a tube having an opening no higher than the bottom of the orifice plate, said opening being located between the orifice and the sidewall whereby the tap opening is substantially out of the flow stream;



(c) a downstream pressure sensor tap comprising a tube having an opening inside the chamber, said tap being bent in the configuration of a loop with the open end pointing downward, said open end being located at an elevated point between the orifice and the sidewall whereby the opening is above the orifice plate and substantially outside of the flow path.

4,719,792

METHOD AND A DEVICE FOR TESTING THE TIGHTNESS OF AN ENGINE

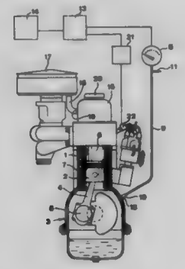
Ingemar Eriksson, Zinkvägen 10, 860 20 Njurunda, Sweden

Continuation of Ser. No. 702,474, Feb. 19, 1985. This application Apr. 7, 1986, Ser. No. 849,196

Claims priority, application Sweden, Feb. 21, 1984, 8400929

Int. Cl.[4] G01M *3/00*

U.S. Cl. 73—47 8 Claims



1. A device for testing the fit of the parts of a combustion engine having a plurality of cylinders, a piston slidably movable in each cylinder and a crankcase with crank means drivably connected to the pistons, said device comprising:

a measuring apparatus connected to the crankcase of the engine wherein said measuring apparatus fluidly communicates with the crankcase in order to measure the leakage of gaseous fluids circumventing the piston into the crankcase;

a fluid outlet disposed between the crankcase and said measuring apparatus;

means for detecting combustion in a particular engine cylinder; and

means for distinguishing said particular cylinder from the remaining engine cylinders.

4,719,793

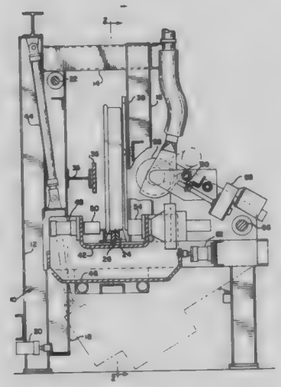
HARDNESS TESTING APPARATUS

Jaime F. Pozo, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 8, 1986, Ser. No. 938,791

Int. Cl.[4] G01N *3/48*

U.S. Cl. 73—81 5 Claims



1. A hardness testing device comprising

a main frame adapted to receive a metal wheel to be tested,

adjustable bracing means to secure the metal wheel in the main frame,

grinding means adapted to pass across a section of the metal wheel to grind said section,

hardness means adapted to be brought into alignment with the ground section of the metal wheel to test the hardness of the metal wheel,

a single pivot axis mounted on said main frame,

a secondary frame to which said grinding means and said hardness testing means are mounted,

and a clamping cylinder mounted to said secondary frame such that when said hardness testing means is in alignment with the ground section of the metal wheel, said clampng cylinder when extended contacts said wheel on a side opposite from said hardness testing means to provide lateral support to said wheel,

wherein said secondary frame with said grinding means, said hardness testing means and said clamping cylinder are mounted to rotate about said single pivot axis, and said grinding means and said hardness testing means are mounted at a preselected angle to each other.

4,719,794

SYSTEM AND METHOD OF ENGINE CALIBRATION

Victor Ruiz, Canton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1986, Ser. No. 858,019

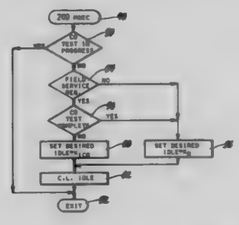
Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 1 Claim

1. The method of calibrating an air-fuel delivery system supplying a mixture of air and fuel to an internal combustion engine comprising:

establishing an initial open loop calibration of the air-fuel delivery system including the steps of (A) operating the engine at idle, (B) determining the peak engine idle speed as a function of the air/fuel ratio of the mixture supplied to the engine, (C) adjusting the air/fuel ratio of the mixture supplied to the engine until a desired engine operating condition is established and (D) storing the values of the air/fuel ratio and the decrease in the engine idle speed from the determined peak engine idle speed when the engine operating condition is established at the desired condition and

periodically recalibrating the air-fuel delivery system including the steps of (A) operating the engine at idle, (B) determining the peak engine idle speed as a function of the air/fuel ratio of the mixture supplied to the engine, (C)



adjusting the air/fuel ratio of the mixture supplied to the engine until the engine idle speed decreases from the peak engine idle speed by the stored decrease in the engine idle speed and (D) updating the stored value of the air/fuel ratio to the value at which the engine idle speed has decreased from the peak engine idle speed by the stored decrease, the stored value of the air/fuel ratio comprising a calibration value for the air-fuel delivery system to establish the desired engine operating condition.

4,719,795

THROTTLE VALVE OPENING SENSOR

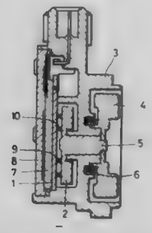
Kenji Eitoku, and Kenji Hayashi, both of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Nov. 7, 1986, Ser. No. 927,877

Claims priority, application Japan, Nov. 8, 1985, 60-172600[U]

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118.1 2 Claims



1. In a throttle valve opening sensor including a substrate provided with an opening detecting portion for detecting openings of a throttle valve and a specific opening detecting portion for detecting a specific opening of said throttle valve, said specific opening detecting portion comprising a collector and a conductor, a rotor adapted to be rotated in association with rotation of said throttle valve, and first and second contacts mounted on said rotor and adapted to slide on said opening detecting portion and said specific opening detecting portion, thereby detecting the openings and the specific opening of said throttle valve; the improvement comprising forming said collector and said conductor of said specific opening detecting portion from a metal conductor formed of an alloy containing Ag in an amount less than 73% and Pd or other metals in an amount equal to or greater than 27%, said alloy being restrained from migration of Ag, and arranging a resin member on said substrate in connection with said collector and said conductor, said resin member being made substantially flush with said collector and said conductor, wherein said second contact is slid on said resin member.

4,719,796

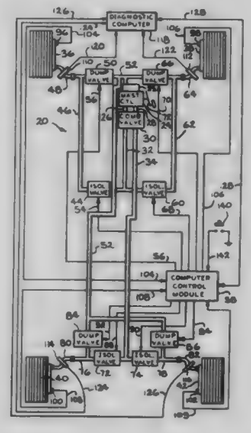
METHOD AND APPARATUS FOR TESTING A VEHICLE ANTI-SKID BRAKE SYSTEM

Richard L. Zeaker, Grosse Pointe Woods, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.

Filed Jan. 27, 1987, Ser. No. 7,022

Int. Cl.[4] G01L *5/28*

U.S. Cl. 73—121 10 Claims



1. A method of testing a vehicle anti-skid braking system wherein the braking system includes at least one valve means located in a brake fluid line for controlling the application of fluid pressure to a selected wheel brake, said method comprising the steps of:

(a) sensing the fluid pressure in a portion of the brake line located between the valve means and the selected wheel brake;

(b) supplying pressurized brake fluid to the selected wheel brake through the valve means;

(c) operating the valve means in a predetermined sequence; and

(d) simultaneously with step (c), monitoring the pressure sensed in step (a) to determine whether the anti-skid braking system is operable.

4,719,797

SPINNING ASSEMBLY FOR EXPLOSIVE MUNITIONS

Chris A. Weickert, Ralston, and Thomas A. Storrie, Medicine Hat, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Jul. 16, 1986, Ser. No. 886,006

Claims priority, application Canada, Aug. 14, 1985, 488729

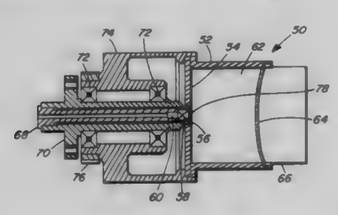
Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—167 5 Claims

1. An assembly for spinning an explosive device about an axis, comprising:

a stationary axle;

a hub mounted for rotation on the axle and having means for securing the explosive device to the hub;



detonator mounting means for mounting a detonator and an explosive booster on the axle adjacent but spaced from the explosive device; and

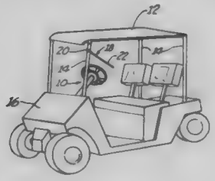
drive means for rotating the hub on the axle.

4,719,798

WIND DIRECTION FINDER FOR A GOLF CART

Henry E. Orkin, 1138 W. Cypress Dr., Pompano Beach, Fla. 33060

Filed Jul. 18, 1986, Ser. No. 886,879
Int. Cl.[4] G01W *1/02*; A63B *57/00*
U.S. Cl. 73—189 **12 Claims**



1. In combination:

a golf cart having a canopy held up by a plurality of canopy posts attached to the body of said cart such that wind is free to blow between said canopy and said body; and

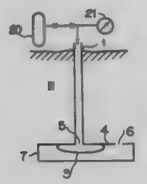
a wind direction finder having a ribbon affixed to means adhesively affixed to one of said canopy posts.

4,719,799

HEAD FOR A BUBBLE TUBE

Douglas B. Wicks; Dennis W. Johnson; William S. C. Brooks, and Terry J. Nelson, all of Saskatoon, Canada, assignors to Sci-Tec Instruments Inc., Saskatoon, Canada

Filed Jun. 30, 1986, Ser. No. 880,545
Claims priority, application Canada, Jan. 31, 1986, 500905
Int. Cl.[4] G01F *23/00*; G01L *7/00*; G01N *9/28*
U.S. Cl. 73—302 **16 Claims**



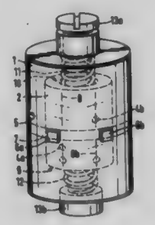
13. A pressure sensor comprising a tube, means for applying gas pressure to the tube, means for measuring gas pressure within the tube, and a plate fixed and sealed to the end of the tube having a flat lower surface for horizontal disposition within a liquid, the plate having an orifice communicating with the interior of the tube, whereby said plate can be horizontally disposed at a predetermined depth within a liquid, a bubble can be formed at the end of the tube supported by the plate, and the gas pressure can be measured.

4,719,800

ACCELEROMETER

Bernd Moser, Hamm/Sieg, Fed. Rep. of Germany, assignor to BOGE GmbH, Eitorf, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,447
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518383
Int. Cl.[4] G01P *15/08*; G01H *1/00*
U.S. Cl. 73—517 R **18 Claims**



1. A digital signal accelerometer for measuring acceleration, said accelerometer comprising:

a housing with an inertial mass disposed to move within said housing under acceleration of said housing;

a source of light disposed within and moving with said mass;

means for suspending said mass for movement within said housing and for permitting said mass to move back and forth within said housing during use when acceleration is being measured;

means for conducting light from said light source from an interior portion to an exterior portion of said mass; and

said housing having photoelectric sensing means disposed to selectively receive light from said light source through said light conducting means and generate at least one digital signal as said mass moves back and forth within said housing; and

wherein said light conducting means comprises a plurality of holes disposed in said mass and said photoelectric means comprises a plurality of photoelectric elements, each of said plurality of photoelectric elements having a number of said holes for impining light thereto, each of said photoelectric elements being aligned to receive light from its corresponding holes.

4,719,801

ULTRASONIC METHOD AND APPARATUS FOR DETECTING LEAKS

Dwight A. Blaser, Fraser; Kestutis P. Nemanis, Redford Township, Wayne County; James J. Zik, Rochester, and Edward C. Hess, Farmington Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1986, Ser. No. 908,621
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—592 **6 Claims**

1. An apparatus for inspecting an automotive vehicle body for leaks comprising;

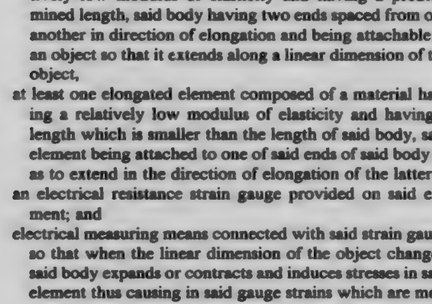
a first transducer comprising an ultrasonic emitter,

means for driving the emitter to sweep the emitted energy through a frequency range having a center frequency above about 65 kHz,

a second transducer comprising an ultrasonic receiver responsive to the emitted energy,

robot means for scanning one of the transducers along a predetermined path outside the body to define a moving inspection zone,

the other transducer inside the body so that the ultrasonic energy is received by the receiver at a low level if no leak is present in the inspection zone and if the inspection zone



is moved to a leak location an increase in received energy is detected, and

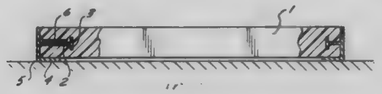
a computer coupled to the robot and to the receiver programmed to respond to the detection of a leak and identify the location of the leak.

4,719,802

DEVICE FOR AND METHOD OF DETERMINING CHANGES IN LINEAR DIMENSION OF OBJECTS

Ari Adini, 104-20 Queens Blvd. #22J, Forest Hills, N.Y. 11375

Filed Jun. 12, 1987, Ser. No. 61,090
Int. Cl.[4] G01B *7/16*
U.S. Cl. 73—763 **14 Claims**



1. A device for determining changes in a linear dimension of an object, comprising

an elongated body composed of a material having a relatively low modulus of elasticity and having a predtermined length, said body having two ends spaced from one another in direction of elongation and being attachable to an object so that it extends along a linear dimension of the object,

at least one elongated element composed of a material having a relatively low modulus of elasticity and having a length which is smaller than the length of said body, said element being attached to one of said ends of said body so as to extend in the direction of elongation of the latter;

an electrical resistance strain gauge provided on said element; and

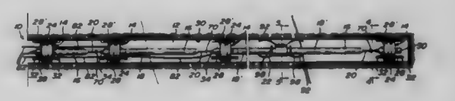
electrical measuring means connected with said strain gauge so that when the linear dimension of the object changes, said body expands or contracts and induces stresses in said element thus causing in said gauge strains which are measured by said measuring means and are indicative of the changes in the linear dimension of the object.

4,719,803

BOREHOLE EXTENSOMETER FOR MONITORING RELATIVE MASS DISPLACEMENTS

Jean-Francois Capelle, St-Lambert; Raoul Leroux, Boucherville, and Gérard Therose, Brossard, all of Canada, assignors to Roctest Ltee/Ltd., St. Lambert, Canada

Filed Apr. 20, 1987, Ser. No. 40,104
Int. Cl.[4] G01N *33/24*
U.S. Cl. 73—784 **14 Claims**



1. A device positionable in a borehole for monitoring relative mass displacements axially along the borehole between at least two spaced-apart anchor points, said device comprising:

at least two retrievable anchor members arranged in spaced-apart opposite relationship to define said at least two anchor points, said anchor members each having radially displaceable borehole wall contacting means and including mechanical means for radially outwardly displacing said borehole wall contacting means to engage the borehole wall and thereby fix the anchor member in said borehole against the wall thereof; and

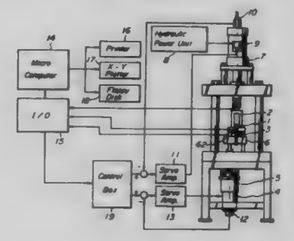
linear displacement sensing means arranged between said anchor members, said displacement sensing means being connected to one of said anchor members and including an elongated axially movable sensor element, said sensor element being normally biased in a direction toward the other anchor member for contact engagement therewith, whereby relative mass displacements are transmitted to said sensor element and are measured by said displacement sensing means as a variation in distance between said anchor members within said borehole.

4,719,804

APPARATUS FOR TESTING PERFORMANCE OF CLAMP SCREW IN ELASTIC AND PLASTIC REGIONS

Kazuo Maruyama, Machida, Japan, assignor to Tokyo Institute of Technology, Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,274
Claims priority, application Japan, Aug. 19, 1985, 60-181577
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—794 **12 Claims**



12. A bolt displacement and twist detector comprising a stationary frame, twist detecting means fixed to the stationary frame and abutted to the tip end of a bolt for detecting a twist angle of the bolt, a movable frame rotated with respect to the stationary frame in accordance with axial displacement of the head of the bolt, the displacement detecting means for detecting elongation of the bolt in accordance with rotation of said movable frame.

4,719,805

DRY FLOW SENSOR WITH AUTOMATIC SPEED COMPENSATION AND TOTALIZER CIRCUIT

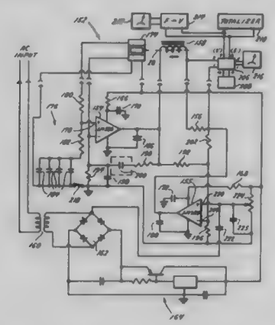
Joseph A. Volk, Chesterfield; Joseph A. Volt, Jr., Florissant, both of Mo., and Chusak Tanguwan, Los Altos, Calif., assignors to Beta Raven Inc., Earth City, Mo.

Continuation-in-part of Ser. No. 560,187, Dec. 12, 1983, Pat. No. 4,538,471, which is a continuation-in-part of Ser. No. 479,252, Mar. 28, 1983, Pat. No. 4,543,835. This application May 16, 1985, Ser. No. 734,620

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ G01F *1/86, 1/30*

U.S. Cl. 73—861.03 **33 Claims**



1. A dry flow sensor having means to measure the rate of flow of granular material through a chute, said dry flow sensor comprising a surface against which the flowing material impresses a force, means to measure the force applied to the surface by the material and produce a first signal, means to measure the speed of the material prior to its leaving the surface and produce a second signal, and means to combine said first and second signals to produce a third signal indicative of the flow rate of material through the chute, said first and second signals comprising amplitude sensitive signals and said third signal comprising a frequency sensitive signal.

4,719,806

FLUID FLOW RATE MONITOR PROBE

Joseph G. Craigen, Whitley Bay, and Bryan F. Dixon, Newcastle-upon Tyne, both of England, assignors to British Gas Corporation, London, England

Filed Feb. 21, 1986, Ser. No. 831,501

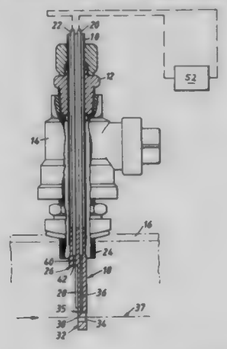
Claims priority, application United Kingdom, Feb. 27, 1985, 8505092

Int. Cl.⁴ G01F *1/20*

U.S. Cl. 73—861.42 **6 Claims**

1. Apparatus for monitoring the flow rate of fluid flowing in a conduit, comprising first means for producing a static fluid pressure differential dependent on said flow rate and second means responsive to said pressure differential, said first means defining first and second pressure sensing ports opening into said conduit and including means for connecting said ports to said second means, said first means further comprising an elongate probe withdrawably mounted in said conduit in penetrating relationship thereto, said probe imposing an insignificant reduction in the open internal cross-sectional area of said conduit, said probe defining within said conduit a sharp edge across which fluid flows and downstream thereof a wall past which flows fluid which has crossed said edge, said first pressure sensing port opening at said wall close to said edge, said edge being effective to cause flow-separation of fluid from said wall to produce at said first port a first fluid pressure less than the static pressure of fluid in said conduit, said second port being positioned for sensing a second fluid pressure at least equal to said static pressure, said pressure differential being the difference between said second and first pressures and having a minimum value which is twice the dynamic pressure of the fluid and which is independent of said reduction in area imposed by said probe,

wherein said probe comprises a tip portion having first and



second external surfaces which extend lengthwise of said tip portion and of said probe and which respectively face in the upstream and downstream direction of said fluid in said conduit, said wall extending transversely to both said first and second external surfaces and said wall intersecting said first external surface to form said sharp edge.

4,719,807

TURBINE WHEEL METER

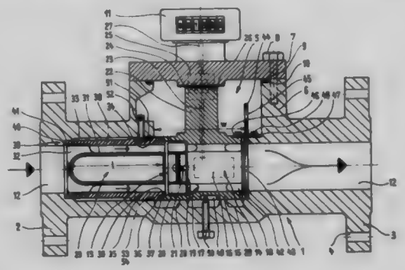
Jovan Jovicic, Karlsruhe, Fed. Rep. of Germany, assignor to Johann Baptist Rombach GmbH & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,549

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521410

Int. Cl.⁴ G01F *15/18*

U.S. Cl. 73—861.92 **9 Claims**



1. Turbine wheel meter for measuring a volume of a flowing medium, the turbine wheel meter including a meter housing having a lateral opening, a duct extending through said housing, said duct having a discontinuity in an area of the lateral opening; a tubular measuring means inserted in the discontinuity through the lateral opening and comprising an impeller and a reversing gear means; a flow regulator means on an inlet side of the duct upstream of the measuring means including a flow displacement member seated in a cylindrical sleeve and provided with guide ribs; a housing lid means for sealing the lateral opening and mounting a counting mechanism on an outside thereof; a length of the cylindrical sleeve is less than an inside diameter of the discontinuity of the duct; the cylindrical sleeve of the flow regulator and the measuring insert means includes plug-in and centering means having mutually opposed end faces; the duct includes a cylindrical, flaring portion emanating from the discontinuity, with a first shoulder forming radial bearing surface of which extending in a direction of the discontinuity, and the cylindrical sleeve seated in the flaring portion abuts, with a counter shoulder, the first shoulder; and a circular-ring-shaped clamping means disposed between the measuring means and an edge of the discontinuity of the duct on a discharge side of the turbine wheel meter.

4,719,808

TEMPERATURE-COMPENSATED ULTRASONIC MEASUREMENT OF WALL THICKNESS

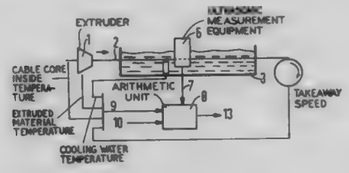
Joachim Baumann, Garching, and Peter Graf, Riemerling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 8, 1986, Ser. No. 849,403

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515216

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—622 **5 Claims**



1. A temperature compensated apparatus for non-destructive, non-contacting ultrasonic measurement of wall thickness of an extruded plastic tubular shape which comprises:

an extruder forming said plastic tubular shape,

an ultrasonic transducer providing means for generating a first signal dependent on the thickness of said shape while said shape is at a non-uniform condition of temperature,

a liquid cooling means directly downstream from said extruder,

means for generating a second signal depending on at least one process parameter, and

an arithmetic means processing the first and second signals to generate an error signal which compensates for the influence of temperature.

4,719,809

APPARATUS AND TEST METHOD FOR DETERMINING FLOW OR NO FLOW CONDITIONS OF BULK SOLIDS

Jerry R. Johanson, and Kerry D. Johanson, both of San Luis Obispo, Calif., assignors to JR Johanson, Inc., San Luis Obispo, Calif.

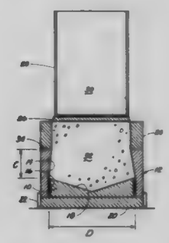
Continuation-in-part of Ser. No. 815,226, Dec. 31, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 922,009

Int. Cl.⁴ G01N *11/00*

U.S. Cl. 73—866 **18 Claims**

8. Apparatus for use in determining the flow properties of a sample of a particulate matter comprising:

a hollow test cell including a sleeve-like portion having an inside surface conforming to a frustrated conical section and further including a plug spanning the larger-diameter end of the frustrated conical section, fitting loosely therein for unopposed movement a limited distance into the space within the conical section and having a concave conical surface coaxial with the axis of the conical section and facing toward the frustrated conical section.



4,719,810

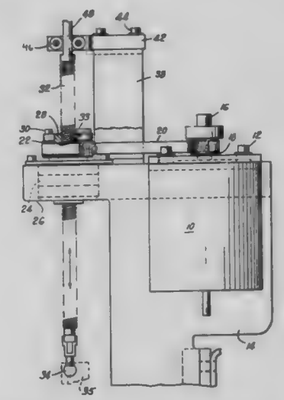
DRIVE MECHANISM FOR ELECTRICAL COMPONENT PLACEMENT HEAD

Paul L. St. Cyr, Middleton, and Vitaly Bandura, Danvers, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed May 15, 1986, Ser. No. 863,747

Int. Cl.⁴ F16H *25/24*

U.S. Cl. 74—89.15 **2 Claims**



1. A component placement machine having a placement head for placing electronic components onto or into printed circuit boards comprising:

lead screw means;

the bottom of said lead screw means being adapted to attach to the placement head of the machine;

means for vertically displacing said lead screw means including;

frame means;

a bearing assembly supported by said frame means and having a pulley and a lead nut;

said bearing assembly having a hole therein through which said lead screw means extends;

servo motor means;

timing belt means interconnecting said servo motor means and said pulley for rotatively driving said lead nut, and

said frame means including means for preventing the rotation of said lead screw means whereby rotation of said lead unit nut will result in the vertical displacement of said lead screw means.

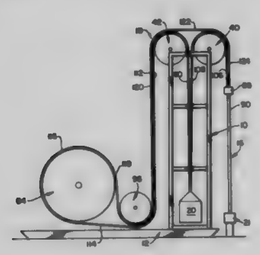
VOL 1086 ISS 3 JA 19 1988 UMI

4,719,811

WELL PUMPING UNIT WITH COUNTERWEIGHT

Jerry M. Lang, Lindale, and Gordon R. Lively, Longview, both of Tex., assignors to Rota-Flex Corporation, Longview, Tex.

Filed Feb. 25, 1985, Ser. No. 704,924
Int. Cl.[4] F04B 47/02; F16H 19/06
U.S. Cl. 74—89.22 18 Claims



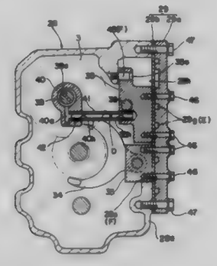
1. A well pumping unit comprising:
a derrick;
a polish rod assembly;
drive means for operating said well pumping unit;
a counterweight;
first and second sheave assemblies, said sheave assemblies being rotatably connected to said derrick near the top of said derrick in a spaced relationship; and
cable means for connecting said drive means, said polish rod assembly and said counterweight;
said cable means engaging said sheaves,
said counterweight being suspended by said cable means between said sheave assemblies,
wherein said cable means forms a closed loop extending from said polish rod assembly to said first sheave assembly, to said counterweight, to said second sheave assembly, to said drive mechanism, to said second sheave assembly, to said first sheave assembly and back to said polish rod assembly.

4,719,812

TRANSMISSION CASING INCLUDING A HYDRAULIC CLUTCH

Setoshi Machida, Sennan; Shigekazu Hasegawa; Tetsu Fukui, both of Sakai, and Yoshimi Oota, Osaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 16, 1986, Ser. No. 852,684
Claims priority, application Japan, Aug. 29, 1985, 60-190527; Aug. 30, 1985, 60-192336; Aug. 30, 1985, 60-192337; Aug. 30, 1985, 60-133321
Int. Cl.[4] F16H 5/40
U.S. Cl. 74—335 11 Claims



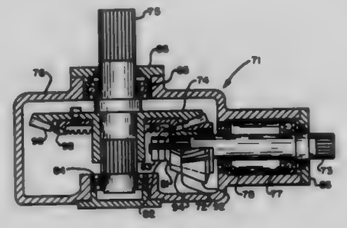
1. A transmission casing including a hydraulic clutch for a working vehicle in which said transmission case includes a lateral opening, a cover attachable to said transmission casing for closing said lateral opening, said hydraulic clutch being disposed on a transmission shaft within said transmission casing, a hydraulic control means mounted on an inner face of said cover attached to said transmission case, said hydraulic control means acting to control oil flow to said hydraulic clutch, said hydraulic control means being connectable to oil passage means connected to said hydraulic clutch when the cover is attached to said transmission case, said hydraulic oil passage means includes a first oil passage operatively connected to the hydraulic clutch, a second oil passage defined in a stationary member disposed adjacent said transmission shaft and communicating with said first oil passage and a third oil passage defined in an oil pipe adapted to extend between said stationary member and said hydraulic control means to hydraulically connect said second oil passage to said hydraulic control means.

4,719,813

GEAR ASSEMBLY

Lazar Chalik, 10 Edgebrook Dr., West Hartford, Conn. 06117

Division of Ser. No. 546,726, Oct. 28, 1983, Pat. No. 4,612,816.
This application May 28, 1986, Ser. No. 868,143
Int. Cl.[4] F16H 55/20, 1/14
U.S. Cl. 74—409 5 Claims



1. A gear assembly for transmission between two shafts having intersecting axes, one a drive shaft and the other a driven shaft, comprising:

a. two meshing bevel gears, one mounted to said drive shaft and one to said driven shaft, each of said gears having coaxially disposed first and second toothed portions having the same pitch cone, the first and second toothed portions of each of said gears affixedly attached to each other forming together an integral toothed member, the teeth of the first toothed portion of each gear being cut at a first inclination angle and the teeth of the second toothed portion thereof being cut at a second inclination angle different from the first inclination angle, the first toothed portions of said gears having interengaging teeth and the second toothed portions of said gears having interengaging teeth thereby establishing a mating relationship between said gears whereby a driving relationship is established between said shafts, one of said gears being axially displaceable along its axis said first inclination angle B1 and said second inclination angle B2 being preselected such that:

$$\tan \beta 2 = \frac{K\frac{W_1}{W_2} + C\sqrt{\left(K\frac{W_1}{W_2}\right)^2 + (1 - C^2)}}{(1 - C^2)}$$

Where:

$C = (\tan\phi) \cdot (\tan\gamma)$

and

$K = \tan \beta 1 + (C/\cos \beta 1)$,

W_1 and W_2 being the peripheral loads applied to the first toothed portion and to the second toothed portion respectively, ϕ being the normal tooth pressure angle, and γ being the pitch angle of the floating gear; and

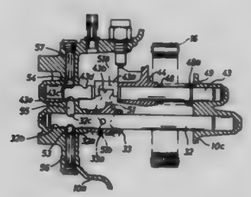
b. preloading means engaging said displaceable gear for applying an axially directed load to said displaceable gear to urge said displaceable gear against said other gear while allowing said displaceable gear to float during operation.

4,719,814

SHIFT MECHANISM IN POWER TRANSFER DEVICE

Shuichiro Ida; Toshio Yoshinaka, and Shuji Nagano, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 23, 1986, Ser. No. 866,381
Claims priority, application Japan, May 24, 1985, 60-78229[U]
Int. Cl.[4] G05G 5/10; B60K 23/08
U.S. Cl. 74—477 3 Claims



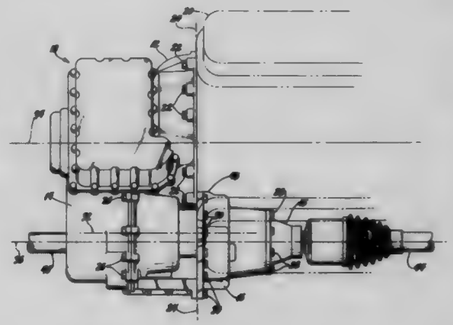
1. A shift mechanism in a power transfer device adapted for use in combination with a power transmission, comprising:
a first shift rod axially slidably mounted within a housing of said transfer device to selectively establish a high speed drive power train or a low speed drive power train in reponse to axial movement thereof;
a second shift rod arranged in parallel with said first shift rod and axially slidably mounted within the housing to selectively establish a two-wheel drive power train or a four-wheel drive power train in response to axial movement thereof;
an interlock mechanism arranged to selectively retain said shift rods in their shifted positions;
an operation rod extending through the peripheral wall of the housing and rotatably supported therethrough, said operation rod having an outer end operatively connected to a manually operated transfer lever and an inner end located in an interior of the housing; and
a swing lever pivoted to the inner end of said operation rod at a position displaced a predetermined distance from the axis of said operation rod, said swing lever having a first end protion engaged with said first shift rod and a second end portion engaged with said second shift rod;
wherein an axial movement distance between two shift positions of said first shift rod is substantially the same as an axial movement distance between two shift positions of said second shift rod, and wherein a distance between a pivot axis of said swing lever and said second end portion of the same in engagement with said second shift rod is larger than the distance between the pivot axis of said swing lever and said first end portion of the same in engagement with said first shift rod, whereby a shift distance of said manually operated transfer lever for effecting movement of said second shift rod between its two shift positions is less than a shift distance of said manually operated transfer lever for effecting movement of said first shift rod between its two shift positions.

4,719,815

TRANSVERSELY MOUNTED TRANSMISSION ARRANGEMENT

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 30, 1986, Ser. No. 880,392
Int. Cl.[4] F16H 57/02, 37/08
U.S. Cl. 74—606 R 3 Claims



1. A transverse drive transmission secured to an engine for transverse installation in a vehicle comprising: a substantially hemispherical torque converter housing portion for housing a torque converter and having a flat mounting surface means for mating with an engine mounting surface, and a torque converter centerline coincident with an engine centerline; a gear housing portion secured to said torque converter housing portion and radially displaced from said engine centerline and having a gear shaft centerline substantially parallel with said engine centerline; and a differential housing portion having an output shaft centerline radially displaced from the gear shaft centerline and including a cylindrical portion housing a differential gear, said cylindrical portion having an end face secured to said gear housing portion and having an outer cylindrical surface extending radially toward said engine centerline with a portion of said cylindrical surface being axially adjacent a portion of said flat mounting surface and being radially closer to the engine centerline than said adjacent portion of said flat mounting surface.

3. A transverse engine mounted transmission comprising: a transmission housing including an input housing means for housing a transmission input member and having a substantially circular outer periphery, an input member centerline coincident with an engine centerline, and a flat mounting face securable to an engine mounting face, said input housing means being enclosed in a circular cylindrical envelope defined by an extension of said circular outer periphery along said input centerline, a gear housing having a gear centerline parallel to and radially offset from said input centerline, said gear housing being secured to said input housing means on the input housing means side of said flat mounting face and a differential housing having a differential centerline substantially parallel to and radially offset from both said gear centerline and said input centerline and being secured to said gear housing on the engine side of said flat mounting face adjacent the engine, the outer surface of said differential housing being defined by a substantially circular surface and being enclosed in a cylindrical envelope defined by an extension of said circular surface along said differential centerline, a portion of which is disposed within the circular cylindrical envelope defined by the extension of said circular outer periphery of the input housing means.

4,719,816

DEVICE FOR POSITIONING AN ACTUATOR

Bengt E. Carlnäs, Gävle, Sweden, assignor to Rotell AB, Gavle, Sweden

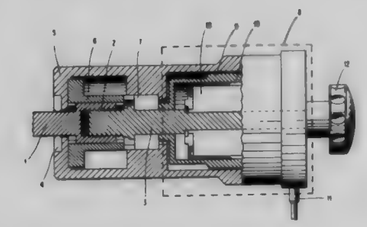
PCT No. PCT/SE83/00438, § 371 Date Aug. 14, 1984, § 102(e) Date Aug. 14, 1984, PCT Pub. No. WO84/02405, PCT Pub. Date Jun. 21, 1984

Continuation of Ser. No. 641,952, Aug. 14, 1984, abandoned. This PCT application Dec. 8, 1983, Ser. No. 9,015

Claims priority, application Sweden, Dec. 14, 1982, 8207138

Int. Cl.[4] F16H *35/18, 1/22*

U.S. Cl. 74—625 **4 Claims**



1. Apparatus comprising:

a linearly reciprocable actuator,

a rotatable part operably connected to said actuator to produce linear movement of said actuator in response to rotation of said rotatable part,

fine drive means comprising a stepping motor and being operably connectable to said rotatable part for rotating said rotatable part with precision movement, said fine drive means being disconnectable from said rotatable part to permit the latter to be rotatable independently of said fine drive means, said stepping motor including a drive gear and a driven gear having different numbers of teeth, said driven gear comprising a portion of said rotatable part, and

coarse drive means connected to said rotatable part independently of said fine drive means for rotating said rotatable part in a coarser manner than said fine drive means when said fine drive means is disconnected from said rotary part.

4,719,817

LOCKING DIFFERENTIAL WITH VARIABLE FRICTION TORQUE

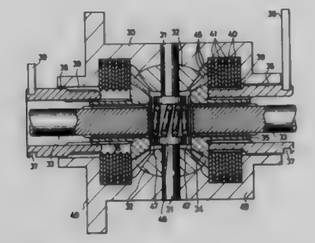
Hitoshi Azuma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 25, 1986, Ser. No. 934,865

Claims priority, application Japan, Dec. 7, 1985, 60-185699[U]

Int. Cl.[4] F16H *1/44*

U.S. Cl. 74—710.5 **15 Claims**



1. A locking differential comprising:

a differential case, said differential case locating first and second axle shafts;

first and second side gears housed in said case to slide along said first and second axle shafts respectively;

a plurality of thrust washers and guide rings arranged in alternate relation in said case on each said axle shaft to slide along said axle shafts;

a plurality of clutch plates arranged in said guide rings and interposed between said thrust washers on each said axle shaft;

a resilient member urging said side gears to press said thrust washers and said clutch plates against inner surfaces of said case while said clutch plates are held in pressure contact with said thrust washers;

first and second sleeves arranged outwardly of said first and second side gears respectively and having external splines for slidable movement along said axle shafts;

each said clutch plate having on its inner periphery splines for selective engagement with said external splines of one of said sleeves; and

means for moving each said sleeve along the axis of its respective side gear for selectively progressively engaging said splines of said sleeve with said splines of such clutch plates.

4,719,818

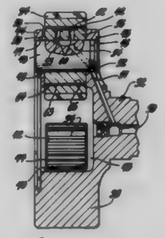
TURBOCHARGER PLANETARY DRIVE

Charles H. McCreary, Oak Park, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1986, Ser. No. 901,406

Int. Cl.[4] F16H *3/44*

U.S. Cl. 74—750 R **7 Claims**



1. A turbocharger planetary drive train having an engine driven planet carrier rotatable at a high speed, a ring gear fixed during a drive mode, a sun gear drivably connected with a turbocharger compressor and a plurality of planet gears rotatably carried by the planet carrier and engaging the sun and ring gears for driving the compressor at an elevated speed greater than that of the planet carrier,

wherein the planet carrier includes axially spaced end walls extending radially outward from a rotational axis of the carrier with means in said walls receiving a plurality of removable axles in angularly spaced locations between said walls, said planet gears being rotatably supported on the axles by bearings, and the improvement wherein,

the planet gears are made light by having large internal bores of at least 50 percent larger diameter than the diameters of their respective supporting axles,

the bearings form said large internal bores and comprise sleeves fixed to the planet gears, said sleeves having internal bearing surface unbroken by grooves or openings, and

separate removable large hubs are fixedly mounted on the axles within and engaging the bearings for rotation of the planet gears and bearings on the axle carried hubs,

whereby the specific loading and wear on the planet gear bearings is minimized by the relatively low centrifugal forces of the light planet gears on their bearings and the high load carrying area of the large bearings.

4,719,819

POWER TRANSMISSION SYSTEM FOR A VEHICLE

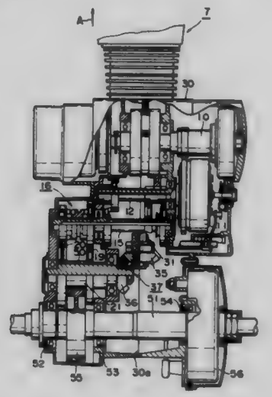
Shinobu Tsutsumikoshi, and Yasuo Nagaike, both of Hamamatsu, Japan, assignors to Suzuki Motor Company Limited, Shizuoka, Japan

Filed Jul. 23, 1985, Ser. No. 758,117

Claims priority, application Japan, Feb. 18, 1985, 60-30053

Int. Cl.[4] F16H *3/02, 3/08*

U.S. Cl. 74—745 **2 Claims**



1. A power transmission system of a saddle type vehicle for driving on irregular ground, said vehicle defining a longitudinal direction, having a body, having two balloon-tired front wheels and two balloon-tired rear wheels on said body, and an engine having a crankcase and having a crank shaft, a counter shaft, a drive shaft and a secondary drive shaft all in parallel with each other almost in the center of said body of said vehicle and a transmission disposed at right angles to said longitudinal direction of said body of said vehicle, which comprises an output shaft of a secondary transmission for driving said front and rear wheels through said secondary drive shaft, said output shaft being approximately centrally disposed adjacent a bottom surface of said crankcase of said engine and along said longitudinal direction of said body of said vehicle, said output shaft of said secondary transmission is connected operatively to said secondary drive shaft disposed in said crank casing by way of a bevel gear transmission means,

said crank casing is of a vertical-split type that is split centrally into right and left counterparts, and

said output shaft is mounted rotatably adjacent surfaces defining a joint generally centrally of said crank casing and between said right and left counterparts.

4,719,820

METHOD FOR DIRECTING A DOWN-SHIFT OPERATION FOR A VEHICLE WITH A MANUAL TRANSMISSION

Yoshitaka Hibino, Utsunomiya, and Hiroshi Kogure, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,287

Claims priority, application Japan, Sep. 28, 1984, 59-203280

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—866 **3 Claims**

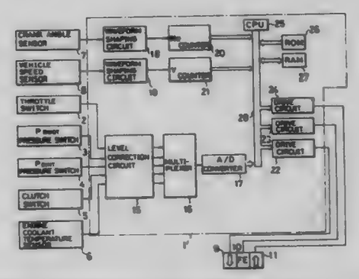
3. A method for directing a timing of down-shift operation for a vehicle having an internal combustion engine and a manual transmission, comprising steps of:

detecting an opening angle of a throttle valve of said internal combustion engine;

detecting an acceleration and a deceleration of a vehicle;

generating a direction of the down-shift operation when the acceleration of the vehicle is above a predetermined first reference value while the vehicle is running with the throttle valve substantially fully closed and when the deceleration of the vehicle is above a predetermined second reference value while the vehicle is running with the throttle valve substantially fully opened; and

wherein said direction of the down-shift operation is generated when the deceleration of the vehicle is above the



second predetermined value while the vehicle is running with the throttle valve substantially fully opened and a pressure within an intake pipe of said internal combustion engine downstream from said throttle valve is above a predetermined valve indicative of a high load condition of the engine.

4,719,821

CREEP PREVENTIVE ARRANGEMENT IN AUTOMATIC TRANSMISSION

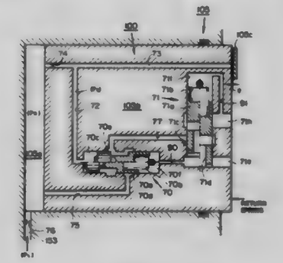
Youichi Yagi, and Yoshiro Morimoto, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1984, Ser. No. 683,453

Claims priority, application Japan, Dec. 20, 1983, 58-238738; Oct. 8, 1984, 59-209911

Int. Cl.[4] B60K *41/22, 41/28;* **F16D** *47/02, 43/284*

U.S. Cl. 74—869 **31 Claims**



1. A creep preventive arrangement for an automatic transmission having a torque converter including an output rotatable at a torque converter output revolution speed, comprising;

a friction engagement element having a member rotatable with the output of the torque converter and a fluid chamber, said member being movable responsive to fluid pressure in said fluid chamber from a released position to a firmly engaged position through a predetermined creep preventive position as the fluid pressure in said fluid chamber increases;

a start-up pressure regulating means in fluid communication with said fluid chamber for discharging fluid from said fluid chamber to cause a drop in the fluid pressure in said fluid chamber responsive to said member having moved to said predetermined creep preventive position so as to prevent further increase in the fluid pressure in said fluid chamber; and

means in communication with said start-up pressure regulating means and responsive to the torque converter output revolution speed for prohibiting said start-up pressure regulating means from discharging fluid from said fluid

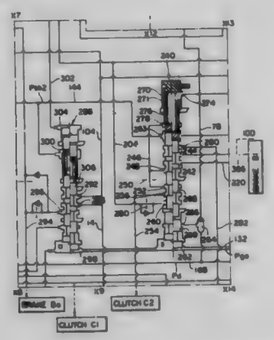
chamber when the torque converter output revolution speed exceeds a predetermined value thereby to permit further increase in the fluid pressure in said fluid chamber to urge said member to move beyond said predetermined creep preventive position to said firmly engaged position.

4,719,822

HYDRAULIC PRESSURE CONTROL APPARATUS FOR USE IN AN AUTOMATED TRANSMISSION

Kunio Moriawa, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 25, 1985, Ser. No. 715,820
Claims priority, application Japan, Apr. 4, 1984, 59-65819; Jul. 9, 1984, 59-140613; Jul. 9, 1984, 59-140614; Jul. 18, 1984, 59-147677
Int. Cl.⁴ B60K 41/10
U.S. Cl. 74—869 2 Claims



1. A hydraulic pressure control apparatus for use in an automatic transmission, comprising:

a regulator valve (18) for generating a line pressure which increases from a first basic value by an amount proportional to throttle opening;

a governor valve (174) for generating a governor pressure which is related to and increases with vehicle speed;

a throttle valve (140) for generating a throttle pressure which is related to and increases with throttle opening;

a manual valve (46) for controlling supply of the line pressure, said manual valve including a 2-range control port (54) for delivering the line pressure when said manual valve is shifted to 2-range;

a modulator valve (60) which generates from the line pressure delivered from said 2-range control port thereto a modulator pressure which increases from a second basic pressure lower than said first basic pressure by an amount proportional to throttle opening;

a first shift valve (200) comprising a first spool which is shiftable between first and second shift positions thereof for changing over the transmission between a first speed stage and a second speed stage which is a next higher speed stage relative to said first speed stage, respectively, a first input port to be supplied with the line pressure, and a first output port for delivering the line pressure supplied to said first input port when said first spool is shifted to said second shift position thereof; and

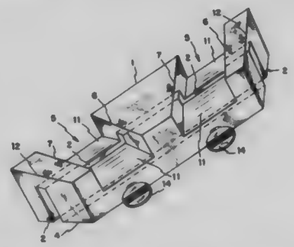
a second shift valve (240) comprising a second spool which is shiftable between first and second shift positions thereof for changing over the transmission between said second speed stage and a third speed stage which is an next higher speed stage relative to said second speed stage, a pressure member (271) engageable with said second spool to drive said second spool in a first direction toward said first shift position thereof, a spring (270) which biases said press member in said first direction toward engagement with said second spool so far that said second spool is driven to said first shift position thereof via said press member, a second input port connected with said first output port of said first shift valve, a second output port (248) for delivering the line pressure when said second spool is shifted in said second shift position thereof, a first control port (278) connected with said second output port to receive the line pressure delivered therefrom and to apply the line pressure to said press member so as to drive said press member in a second direction opposite to said first direction, and a second control port (274) supplied with said modulator pressure when delivered so as to apply said modulator pressure to said press member so as to drive said press member in said first direction.

4,719,823

CHAIN SAW SHARPENING GUIDE

Jack D. Pyle, 19-K Evergreen Dr., Hertford, N.C. 27944

Filed Jan. 6, 1986, Ser. No. 816,227
Int. Cl.⁴ B23D 63/10, 63/16
U.S. Cl. 76—36 3 Claims



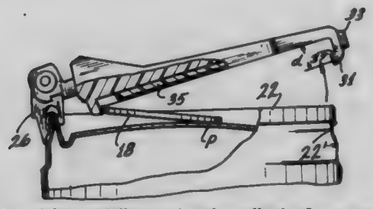
1. A multiple use saw chain sharpening guide for sharpening both right and left-hand cutter blades incorporated on a saw chain mounted on a chain saw bar to either 30 degrees, 35 degrees, or 40 degrees, and with a combined 10 degree upward pitch if desired, consisting of a light-weight hand operated, elongated and inverted U-shaped one piece member, said sharpening guide includes a vertical, longitudinal, continuous channel through said member for placing the sharpening guide on the saw chain and saw bar enabling the sharpening guide to move along the saw chain and saw bar while filing cutter blades, said vertical, longitudinal, continuous channel being deep enough and wide enough to permit the free movement of the saw chain with cutter blades, said sharpening guide includes two horizontal transverse channels oppositely situated on the upper part of said sharpening guide that are wide enough to permit the use of a round file, or round file holder with file, and deep enough to accommodate a saw chain with cutter blades extending above the bottom level allowing adequate clearance for the transverse reciprocating movement of a round file, or round file holder with file, said horizontal transverse channels each having 30 degree and 35 degree opposing vertical filing angle alignment surfaces and 10 degree upward pitch alignment surfaces, said sharpening guide includes two 40 degree vertical filing angle surfaces oppositely situated on the guide end faces, said sharpening guide's vertical filing angle alignment surfaces for 30 degrees, 35 degrees, and 40 degrees, are all formed by surfaces of the channels or guide end faces, said sharpening guide's vertical filing angle alignment surfaces are all appropriately numbered on the top part of th sharpening guide next to the proper filing angle, said sharpening guide's vertical filing angle alignment surfaces all include a vertical 90 degree, a horizontal 0 degree, and a slanted 10 degree upward pitch filing angle alignment line, said sharpening guide includes a saw chain sharpening guide alignment and locking means consisting of three hand operated flat headed adjustable bolts which hold the sharpening guide squarely and firmly in place on the saw chain and saw bar, said sharpening guide alignment and said locking bolts, with threaded bolt holes are located with two horizontal bolts and threaded bolt holes adequately spaced on a horizontal plane parallel with the longitudinal axis and perpendicular to the vertical, longitudinal, continuous channel on the short side of the sharpening guide, and one horizontal bolt and threaded bolt hole located slightly off center and perpendicular to the vertical, longitudinal, continuous channel on the opposite side of the sharpening guide, said threaded bolts when tightened, contact the saw bar below the level of the saw chain and saw bar track; a separate spacer is included for use with the sharpening guide to eliminate saw chain side movement or saw chain wobble when filing cutter blades to 30 degrees, or 35 degrees, said spacer is irregular in shape with a flat vertical surface for inserting in the space between the saw chain cutter blade and the inside wall of the vertical, longitudinal, continuous channel, said spacer includes a flat 10 degree angled surface which rests on the slanted 10 degree upward pitch filing guide alignment surface in the horizontal transverse channels, said spacer also includes a horizontal flat surfaced tab for inserting and removing the spacer.

4,719,824

PULL TAB OPENER

Robert Chagoya, 1833 17th St., #2, Santa Monica, Calif. 90404

Filed Apr. 28, 1986, Ser. No. 856,176
Int. Cl.⁴ B67B 7/44
U.S. Cl. 81—3.09 9 Claims



1. A tool for partially opening the pull tab of a pop top can comprising means for mounting the tool onto the rim or edge of the can on the side opposite the opening, a lever arm, means for flexibly connecting the arm to the mounting means so that the arm can be generally rotated about the edge of the can downwardly and over the pull tab, said lever being long enough for easy movement by hand and longer than the distance from the container edge to the outer end of the pull tab to provide meachanical advantage, means forming a recess and lip within the lower side of the arm so that the lip extends just slightly beyond the outer edge of the pull tab so that the user, in pushing down on the arm, pushed the tab downward toward the can which allows the lip to fall below the pull tab after which raising of the arm by the user lifts the lip and tab upwardly in counter-rotating motions and beyond the yield point of the tab before the lip disengages it, thereby leaving the tab sprung open for being easily pried open with the fingers.

4,719,825

METERING NEEDLE ASSEMBLY

Peter G. LaHaye, #3 Eucalyptus Ct., Woodside, Calif. 92062; Richard D. Phipps, 38450 Berkeley Common, Fremont, Calif. 94536, and Robert L. Lathrop, 1667 Glenrock Ct., San Jose, Calif. 95124

Filed Mar. 24, 1986, Ser. No. 843,051
Int. Cl.⁴ B43K 5/06
U.S. Cl. 81—9.22 11 Claims



1. A tattooing device, comprising:
a needle having a passageway therein;
means for holding a liquid in communication with the passageway, said holding means includes a plunger having a first end and a second end;
means for dispensing a selected portion of the liquid, said dispensing means includes:
a plunger pin having a first end attached to a stationary nut member for engagement with a threaded rod, a second end of said pin being in engagement with said second end of said pin being in engagement with said second end of said plunger, wherein rotational movement of the threaded rod is converted to linear displacement of said plunger along the longitudinal axis;
a clutch member connected to the threaded rod to rotate the threaded rod about a longitudinal axis upon activation of the clutch member;
a cam member operatively fixed to the clutch member to permit activation of the clutch member; and
a spring means adjacent the cam member to provide rotational movement to the cam member.

4,719,826

LIGHT BULB EXTRACTOR

Roger D. DuBois, 12516 Genesee Ave., Apple Valley, Minn. 55124

Filed Jun. 2, 1986, Ser. No. 869,582
Int. Cl.⁴ B25B 13/50
U.S. Cl. 81—53.12 1 Claim



1. A light bulb extractor comprising:
(a) a generally U-shaped gripper having two opposing arms with each opposed arm of said gripper formed into a predetermined shape to fit the end of a light bulb;
(b) said U-shaped gripper formed of steel and after forming annealed to spring characteristics;
(c) wherein said arms of said gripper are each coated on their extremities with a material having a high coefficient of friction;
(d) locking means for securing said gripper arms at any desired span as a means of adjusting the gripping force of said arms, said locking means consisting of a flexible link attached between said gripping arms and a ball chain attached to the center of said flexible link, with said chain threaded through a hole near the center of said gripper of an adequate size to admit the balls of said chain, with said

hole having an integral slot on one side, said slot being of a smaller width than the balls of said chain and a larger width than the connecting links between said balls to permit securing said chain within said slot at a number of positions; and

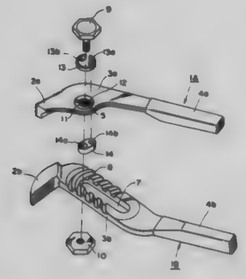
(e) a means for attaching a first extension to said gripper, and said first extension having means for attaching a second extension thereto.

4,719,827

TONGUE-AND-GROOVE PLIERS

Tsutomu Igarashi, Sanjo, Japan, assignor to Igarashi Plier Co., Ltd., Mitsuke, Japan

Filed Apr. 22, 1986, Ser. No. 854,758
Claims priority, application Japan, Nov. 2, 1985, 60-169460[U]
Int. Cl.⁴ B25B 7/06
U.S. Cl. 81—417 **1 Claim**



1. In tongue-and-groove pliers comprising a pair of plier members each having a jaw portion, a joint portion and a handle portion, one of the pair of plier members having a bolt hole bored in the joint portion thereof for passing a pivotal bolt therethrough and also having an arcuate protuberance formed on the inner surface of the joint portion thereof so as to be concentric relative to the bolt hole, the other one of the pair of plier members having an oblong slot bored in the joint portion thereof for admitting the pivotal bolt so as to be movable therein and also having a plurality of adjustable channels formed in the inner surface of the joint portion thereof about the oblong slot in an arcuate shape as being engageable with the arcuate protuberance of the one plier member, and a nut for holding therewith the pivotal bolt having been passed through the bolt hole and admitted in the oblong slot in its place, the leading end of the pivotal bolt projecting from the nut being calked, the improvement comprising:

a spring member formed in a ring shape with a gap and provided on one end thereof with a long downward projection and on the other end thereof with a short downward projection, the joint portion of the one plier member having an annular groove formed in the outer surface thereof about the bolt hole for accommodating therein said spring member and also having a through hole formed by piercing through part of the bottom of the annular groove so as to have a length larger than a distance between said long downward projection and said short downward projection of said spring member, said long downward projection of said spring member accommodated within said annular groove being projected downwardly from said through hole, said short downward projection of said spring member accommodated within said annular groove being stopped by an edge of said through hole without being projected downwardly from said through hole, and

a pressure transmitting member having an insertion hole for inserting the pivotal bolt thereinto and an engaging hole for engaging therein said long downward projection of said spring member which projects downwardly from said through hole, and being loosely fitted movably in the oblong slot of the other plier member,

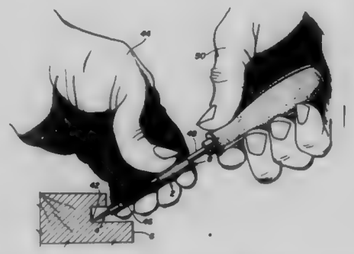
whereby said spring member serves as a pressure source for opening the jaw portions of the pair of plier members and said pressure transmitting member serves to transmit the pressure of said spring member to the other plier member, and cooperation of said spring member and said pressure transmitting member causes the jaw portions to be opened automatically.

4,719,828

SCREW STARTER DEVICES

John A. Corsetti, 833 SW. Bayshore Blvd., Port St. Lucie, Fla. 33453

Filed Jan. 5, 1987, Ser. No. 323
Int. Cl.⁴ B25B 23/08, 23/10
U.S. Cl. 81—451 **8 Claims**



1. A screw starter device for temporarily holding a screw while starting it into a substrate which comprises:

a truncated conical flexible tubular member defined by a proximal end portion, a distal end portion and a central body portion integral with said end portions, said member tapering downwardly from said proximal end portion to said distal end portion,

a first arcuate concentric opening large enough to admit the head of a screw to be started into a substrate with the aid of a device in said side of said tubular member defined by a first proximal transverse edge, a first distal transverse edge and a first pair of longitudinal edges,

a second arcuate concentric opening smaller in size than said first opening in said side of said tubular member distal of said first opening defined by a second proximal transverse edge, a second distal transverse edge and a second pair of longitudinal edges,

a first longitudinal slot large enough in width to admit the shank of a screw to be started into a substrate with the aid of said device through the side of said member extending from and through said first distal transverse edge to and through said second proximal transverse edge, and

a second longitudinal slot smaller in width than said first slot through the side of said member extending from and through said second distal transverse edge to and through the distal end of said member.

4,719,829

METHOD AND APPARATUS FOR FORMING MATCHING TAPERED SURFACES ON INTERFITTING MALE AND FEMALE PARTS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Feb. 16, 1982, Ser. No. 348,980
Int. Cl.⁴ B23B 5/36, 3/36
U.S. Cl. 82—15 **6 Claims**

1. An apparatus for forming matching tapered surfaces on male and female parts to be interfitted one within the other along complementary tapered surfaces thereof comprising

a lathe having a bed with guide rails parallel to the centerline of the lathe,

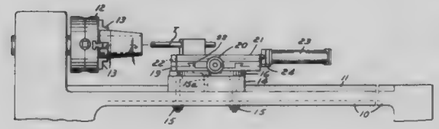
a head stock with a rotatable driven chuck having its axis along the centerline of the bed,

a tool carriage mounted on the guide rails comprising a fixed member,

means for clamping said fixed member to said guide rails,

a rotatable member rotatably mounted on said fixed member about a vertical axis intersecting the horizontal axis of the lathe,

means for locking said rotatable member in a predetermined angular position said fixed member,



a first cross slide on said rotatable member,

means for translating said first cross slide and holding said cross slide in position with respect to said rotatable member,

a second cross slide on said first cross slide movable along an axis forming an angle with the direction of movement of said first cross slide,

a cutting tool on said second cross slide,

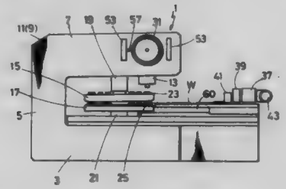
and means on said cross slide for moving said second cross slide with respect to said first cross slide such that the tool is moved at an angle to the centerline of the lathe.

4,719,830

APPARATUS FOR CONTROLLING HEAT DEFORMATION OF A TURRET PUNCH

Kijyu Kawada, Atsugi, and Nobuyuki Ikeda, Hatano, both of Japan, assignors to Amada Company, Limited, Japan

Continuation of Ser. No. 754,146, Jul. 10, 1985, abandoned, which is a continuation of Ser. No. 565,139, Dec. 28, 1983, abandoned, which is a continuation of Ser. No. 264,851, May 18, 1981, abandoned. This application Nov. 20, 1986, Ser. No. 933,324
Claims priority, application Japan, May 19, 1980, 55-065264
Int. Cl.⁴ B26D 7/10, 5/08
U.S. Cl. 83—170 **2 Claims**



1. Apparatus for controlling heat deformation of a turret punch comprising:

a C-shaped frame having a base and a beam cantilevered on said base and positioned above said base to define a throat section between said beam and said base, and having a rotational axis;

an upper shaft mounted on said beam and having a rotational axis;

a lower shaft mounted on said base and having a rotational axis coaxial with the rotational axis of the upper shaft;

a pair of opposed upper and lower turrets rotatably mounted on said upper shaft and lower shaft, respectively, said turrets having mounted thereon coacting tools adapted to be rotated into alignment;

a ram mounted on said beam for vertical movement along an axis which is parallel with and spaced a predetermined distance from the rotational axes of the upper and lower shafts;

ram drive means mounted on said beam for vertically moving said ram into contact with said coacting tools for punching operation;

means for rotating said upper and lower shafts to rotate said upper and lower turrets so as to align said coacting tools with said ram for punching operation;

said ram drive means constituting a heat source disposed asymmetrically on said beam which causes thermal deformation of said beam and misalignment of said upper and lower shafts at right angles to the rotational axes of the upper and lower shafts, whereby said tools on the upper and lower turrets become misaligned from said ram;

temperature detection means provided at symmetrical portions on said beam is proximity to said ram drive means for detecting the temperature of said beam at said symmetrical portions thereof;

circuit controlling means connected to said temperature detection means for determining the temperature of each of said symmetrical portions of the beam and for comparing the determined temperatures to one another to further determine which of the temperatures is the greater; and

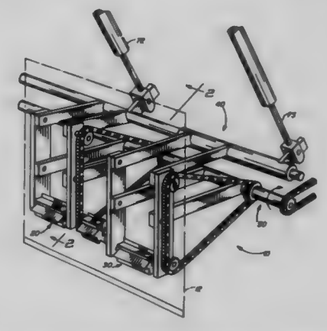
temperature controlling means provided at the symmetrical portions of the beam for changing the temperature of one of the symmetrical portions of the beam to bring said portions to substantially the same temperature whereby the heat deformation of said turret punch frame is controlled.

4,719,831

BACON SLICING APPARATUS

James P. Smithers, Scottsdale, Ariz., assignor to Conagra, Inc., Omaha, Nebr.

Continuation of Ser. No. 456,659, Jan. 10, 1983, abandoned. This application Jan. 20, 1987, Ser. No. 4,956
Int. Cl.⁴ B26D 7/06
U.S. Cl. 83—355 **17 Claims**



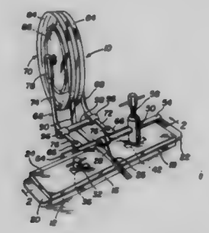
1. In an apparatus for controllably delivering a slab of bacon to a slicing blade, the improvement comprising:

a support shaft mounted to the apparatus;

a drive shaft mounted to the apparatus parallel to the support shaft;

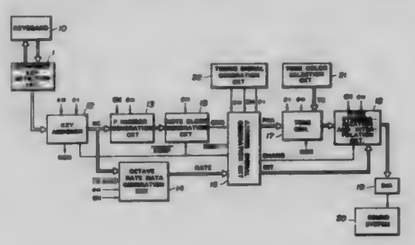
a first pair of arms mounted so as to pivot about the support shaft in unison;
a second pair of arms mounted so as to pivot about the drive shaft in unison;
a pair of legs, each leg pivotally mounted to a first arm of the first pair of arm at a first pivot point and pivotally mounted to a second arm of the second pair of arm at a second pivot point, wherein each leg comprises a lower portion extending below the first and second pivot point;
a feed roller having an axis of rotation parallel to the support shaft and being rotatably mounted to the lower end of each leg;
a drive sprocket affixed to the drive shaft;
a drive loop cooperating with the drive sprocket to drive the feed roller;
whereby said feed roller is adapted to move vertically while minimizing variations in spacing between the blade and the feed roller.

4,719,832
COPPER FOIL CUTTER
Blazej Svihra, 463 Jefferson Ave., Rahway, N.J. 07065
Filed Jun. 9, 1986, Ser. No. 872,021
Int. Cl.[4] B26D *7/01*; B65H *9/04*
U.S. Cl. 83—407 **11 Claims**



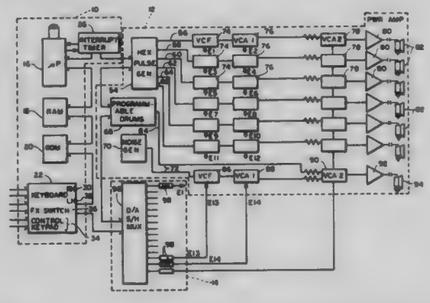
1. Apparatus for longitudinally cutting a length of strip material such as copper foil to a desired width comprising a base member having an upper cutting surface, a blade guide plate for positioning on the upper surface of the base member, the blade guide plate including an elongate blade slit formed therethrough, guide means defining an elongate pull-through guideway for the strip material between the base member and guide plate parallel to and below the slit and adjustable as to width and location transversely of the slit, hold down means for releasably clamping together the base member, the guide means, and the blade guide plate, and blade holder means for supporting a cutting blade is a position extending into the guideway through the slit to longitudinally cut the material as it is pulled lengthwise through the guideway, said guide means comprising a pair of mutually adjustable guide plates having adjacent edges movable laterally and independently to respective positions defining the guideway therebetween of a width conforming to the width of the material and a location related to the slit dependent on the desired width to which the material is to be cut, said mutually adjustable guide plates having respective outer portions projecting from between the base member and the blade guide plate for adjustably moving the adjustable guide plates upon release of the hold down means.

4,719,833
TONE SIGNAL GENERATION DEVICE WITH INTERPOLATION OF SAMPLE POINTS
Mitsumi Katoh, and Tokuji Hayakawa, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Apr. 10, 1986, Ser. No. 850,287
Int. Cl.[4] G10H *7/00*
U.S. Cl. 84—1.01 **13 Claims**



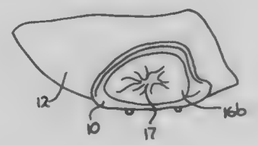
1. A tone signal generation device comprising:
phase information generation means for generating phase information representing progressive portions of a tone signal to be generated and corresponding to a tone pitch of said tone signal;
waveshape generation means for generating a tone waveshape in the form of amplitude sampled values in response to said phase information; and
interpolation means for interpolating at least two of said amplitude sampled values and for outputting an interpolated result as a new sampled value constituting a part of said tone signal, said interpolation means including means for increasing the fineness of the interpolation as said tone pitch becomes lower.

4,719,834
ENHANCED CHARACTERISTICS MUSICAL INSTRUMENT
Robert J. Hall, 20756 Tribune St., Chatsworth, Calif. 91311; George R. Hall, 13613 Huston St., Sherman Oaks, Calif. 91423, and Jack C. Cookerly, 26916 Barbacoa Pl., Saugus, Calif. 91350
Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981. This application Jun. 15, 1984, Ser. No. 621,325
Int. Cl.[4] G10F *1/00*; G10H *1/00, 3/03*
U.S. Cl. 84—1.03 **56 Claims**



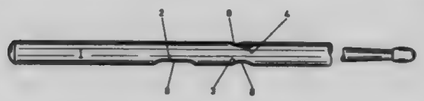
1. In a method for providing musical accompaniment having a plurality of musical components in response to playing of a processor-controlled musical instrument, the improvement comprising the steps, accomplished by the instrument itself, of:
providing a plurality of processes corresponding to different musical components of the accompaniment, each component comprising a plurality of sequential musical events related to one another according to a tempo at which the accompaniment is to be sounded;
executing a portion of a first of said processes to perform at least on said musical events;
suspending the first process for a musically appropriate period of time substantially equal to the time before the next musical event of said process;
executing a portion of at least one other process, while the first process remains suspended, to perform at least one other musical event;
suspending said at least one other process for another musically appropriate period of time;
continuing said first process to perform at least said next musical event of said process; and
alternating suspending and continuing said processes to execute them one portion at a time, such that the executions of said processes overlap to produce a coherent musical accompaniment.

4,719,835
VIOLIN CHINREST INSERT
Americole R. Biasini, Bellingham, Wash., and Paul C. Anastasio, Nashville, Tenn., assignors to RICO Products, Sun Valley, Calif.
Filed Oct. 23, 1986, Ser. No. 922,737
Int. Cl.[4] G10D *3/18*
U.S. Cl. 84—279 **16 Claims**



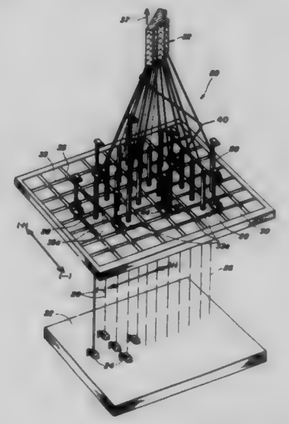
1. An insert for an instrument chinrest comprising:
a volume of malleable material for obtaining an imprint of a chin of a performer of the instrument, said material being hardened after the chin imprint is made therein; and
attachment means for attaching said material to said instrument chinrest.

4,719,836
DRUMSTICKS FOR USE WITH PERCUSSION INSTRUMENTS
Harry Baumgart, Am Rübrbrunnen 8, D-6521 Dorn-Dürkheim, Fed. Rep. of Germany
Filed Nov. 5, 1986, Ser. No. 927,740
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **9 Claims**



1. A set of drumsticks comprising a first drumstick for the left hand and a second drumstick for the right hand of the user, each of said drumsticks having an elongated body including a substantially cylindrical portion having a peripheral surface provided with recesses to facilitate engagement of the drumstick by the respective hand in a predetermined position to beat a drum or a like instrument, the peripheral surface of said first drumstick having a first recess for a portion of the palm in the region of the short flexor of the thumb, a second recess for the ring finger and a third recess for the middle finger, the peripheral surface of said second drumstick having a first recess for the thumb and a second recess for the index finger, and further comprising a cushion provided in at least one of said recesses.

4,719,837
COMPLEX SHAPED BRAIDED STRUCTURES
Ronald F. McConnell, West Chester, Pa., and Peter Popper, Wilmington, Del., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.
Filed Apr. 17, 1986, Ser. No. 853,742
Int. Cl.[4] D04C *1/06, 3/00*
U.S. Cl. 87—1 **12 Claims**

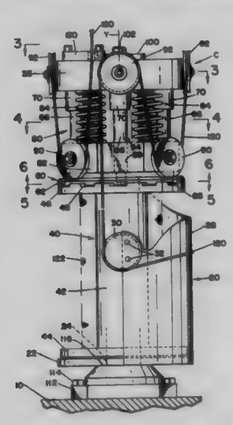


1. In a method for forming a braided structure that includes a multi-layer array of axial yarns extending longitudinally in the structure and braiding yarns by moving the braiding yarns towards and away from the outer periphery of the structure alternately in opposite directions in diagonal paths through the array in an interlacing pattern and interconnecting with other braiding yarns, the improvement comprising moving each of said braiding yarns in a first step in an interlacing pattern in said paths completely through the array to the outer periphery of the structure to reversal points before moving any of said braiding yarns in a second step in said paths in another diagonal direction from a reversal point.
2. In a braided structure including a multi-layer array of axial yarns extending longitudinally in the structure and braiding yarns which alternatively extend towards and away from the outer periphery of the structure in opposite directions in paths through the array in an interlacing pattern and interconnect with other braiding yarns, the improvement comprising a repeating two-step interlacing pattern wherein each of said braiding yarns extend in diagonal paths completely through the array to the outer periphery of the structure to a reversal point in one step of the pattern before any of said braiding yarns extend in a path in another diagonal direction from said reversal point to another reversal point in another step of the pattern.

4,719,838
STRAND CARRIER FOR A BRAIDING MACHINE
Simon A. DeYoung, 5132 Mayview Rd., Lyndhurst, Ohio 44124
Filed Mar. 2, 1987, Ser. No. 20,663
Int. Cl.[4] D04C *3/18*
U.S. Cl. 87—57 **15 Claims**

1. In a strand carrier for carrying and releasing a strand under tension in a braiding machine, said braiding machine having a plurality of shuttles moving around an elongated

workpiece to be braided in a plane perpendicular to the axis of said workpiece, said carrier including a base, a bobbin rotatable with respect to said base, and bobbin having said strand wound thereon and extending therefrom to said workpiece, a clutch operatively associated with said bobbin to controllably permit rotation thereof with unwinding of said strand therefrom, a tension controlling mechanism operatively associated with said strand between said bobbin and said workpiece to maintain a generally constant tension in said strand between said carrier and said workpiece, said tension controlling mechanism con-



trollably enabling said clutch to permit rotation of said bobbin in response to changes in strand tension, the improvement which comprises: said base, bobbin, clutch and tension controlling mechanism all being substantially symmetrical about a common axis extending perpendicular to said plane, said base being freely rotatably supported on a shuttle for rotation about said axis whereby said carrier is rotatable as a whole with respect to said shuttle about said axis; and, said rotation of said carrier being in response to said tension in said strand between said carrier and said workpiece.

4,719,839
ROTARY STORAGE MAGAZINE
Paul W. Smothers; James M. Coryell, and Frederick I. Maish, all of Orlando, Fla., assignors to Werkzeugmaschinenfabrik, Zurich, Switzerland
Filed Feb. 14, 1985, Ser. No. 701,610
Int. Cl.[4] F41F *9/08*; B65G *1/04, 25/04*
U.S. Cl. 89—1.802 **45 Claims**

1. In an ordnance apparatus having a generally horizontal deck, a munitions storage bay below the deck, and a weapon on the deck, a rotary storage magazine generally aligned with the longitudinal centerline of the ordnance apparatus and operably disposed in said munitions storage bay, said rotary storage magazine usable such that munitions may be stored and thereafter quickly delivered on an as-needed basis to an intermediate position for the reloading of the weapon, said rotary storage magazine comprising multi-armed rotary support devices disposed in a fore-and-aft relationship immediately below deck level in said munitions storage bay, said rotary support devices being located a spaced distance apart, which distance is less than the length of the munitions to be stored, said rotary support devices each having the same number of support arms, such that a like number of munitions disposed in a generally parallel array may reside between corresponding support arms of the fore and aft rotary support devices, said rotary support devices being rotatable together, and having a common axis of rotation disposed in substantial parallelism with the longitudinal centerline of the apparatus, means in said munitions storage bay for driving said rotary support devices in one rotative direction during the loading of munitions into the storage magazine, and for driving said rotary support devices in the opposite direction during the delivery of the munitions for reloading of the weapon, and a munition transporter contained between said rotary support devices and spaced laterally from said axis of rotation of said rotary support devices, said munition transporter being in the form of an elevator movable between an upper position and a lower position, such that it can selectively move munitions down to said multi-armed rotary support devices during the loading of the storage magazine, and up away from said multi-armed rotary storage devices during the delivery of munitions of the loading of the weapon, said elevator, when in its lowered position, being located between circumferentially adjacent munition storage locations.

40. In a vehicle or structure having a generally horizontal deck, a munitions storage bay below the deck, and a weapon on the deck, a rotary storage magazine usable so that munitions may be stored and thereafter quickly delivered on an as needed basis to an intermediate position for the reloading of a deck weapon, said rotary storage magazine comprising fore and aft multi-armed rotary support devices disposed below deck level in a munitions storage bay, said rotary support devices being located a spaced distance apart, which distance is less than the length of the munitions to be stored, said rotary support devices each having the same number of support arms, such that a like number of munitions disposed in a generally parallel array may reside between corresponding support arms of the fore and aft rotary support devices, said rotary support devices being rotatable together, and having a common axis of rotation disposed in substantial parallelism with the longitudinal centerline of the vehicle or structure, means in said munitions storage bay for driving said support devices in one rotative direction during the loading of munitions into the storage magazine, and for driving said rotary support devices in the opposite direction during the delivery of the munitions for reloading of the weapon, and a munition transporter usable for moving munitions to said multi-armed rotary support devices during the loading of the storage magazine, and away from said multi-armed rotary support devices during the delivery of munitions for the unloading of the weapon, said rotary support devices being mounted directly below an unbroken section of deck, and alongside an elongate lateral opening in the side of the vehicle or structure, and a munition transporter in the form of a below deck lateral conveyor serving to move munitions one at a time through said lateral opening during the loading of the storage magazine, and to redeliver munitions one at a time through said lateral opening during the phase in which the weapon is to be reloaded, the moving of munitions by said lateral conveyor being in a lateral direction spaced vertically from said axis of rotation of said rotary support devices between a munition storage location in said storage magazine and a location immediately outside said lateral opening, said lateral conveyor further serving to move munitions in a vertical direction between said outside location and a location at deck level.

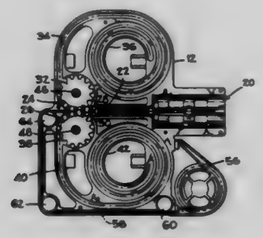
4,719,840
STIFF-BACKED RAMMING CHAIN
Bradley D. Goodell, Anoka, and Ronald A. Larson, Minneapolis, both of Minn., assignors to FMC Corporation, Chicago, Ill.
Filed Jun. 7, 1985, Ser. No. 742,244
Int. Cl.[4] F41F *9/06*
U.S. Cl. 89—47 **4 Claims**

1. In a rammer assembly having a frame with a rammer head extendable from a retracted position in said frame and a pair of driven sprockets rotatably mounted on said frame, an improved rammer chain assembly comprising:

a pair of chains attached to said rammer head with each of said pair of chains engaging one of said pair of sprockets;

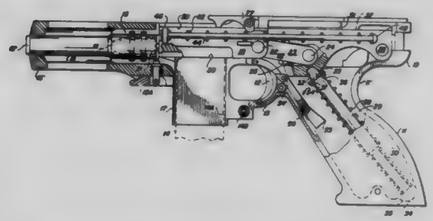
each of said chains having a plurality of links pinned together at the forward and rearward ends thereof;

each of the links having a vertical tab at both the forward and rearward ends thereof; each of said tabs contacting the tab on the adjacent link of the same chain and contacting the corresponding tab on the link of the other chain to



render the chain assembly rigid when the sprockets drive the chain together to extend the rammer head.

4,719,841
TRIGGER RELEASE MECHANISMS FOR FULL AND SEMI AUTOMATIC OPEN BOLT WEAPONS
Walter E. Perrine, 12356 Addison St., N. Hollywood, Calif. 91607
Filed Aug. 18, 1986, Ser. No. 897,634
Int. Cl.[4] F41D *3/02*
U.S. Cl. 89—189 **7 Claims**



1. A hesitation blowback bolt action weapon comprising:

a frame,

a handle on said frame,

a trigger mounted on said frame adjacent said handle,

a hollow barrel having a firing chamber,

a bolt movable in said frame axially to and from the firing chamber of said barrel,

a toggle interconnected between the bolt and the frame,

said toggle comprising a pair of pivotally connected links,

the free end of one of said links being pivotally connected to said frame and the free end of the other of said links being pivotally connected to said bolt,

the end of said one of said links at said pivotal connection comprising a bifurcated configuration,

said toggle being movable to an under-center locked position slightly below a line between the pivotal connection of the toggle on the frame and on the bolt,

said pivotal interconnection of said links of the toggle swinging said toggle downwardly within the handle of the weapon upon firing of the weapon,

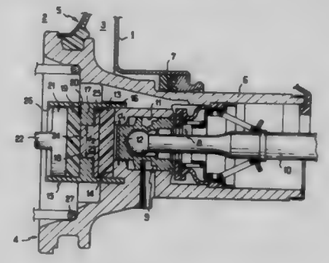
said one of said links of said toggle directing recoil forces to lower rear end of said handle of the weapon,

a sear pivotally mounted within said handle and within the path of movement of said toggle into said handle,

said sear engaging said one of said links of said toggle adjacent the point of their pivotal connection within said bifurcated configuration upon movement of said toggle into said handle to lock said toggle in its collapsed position until released by finger pressure applied to said trigger which pressure causes said sear to rotate out of engagement with said toggle, and

a spring mounted within said handle between said handle and said sear for biasing said sear in counterclockwise direction to its movement by said trigger for aiding in locking said toggle in collapsed position.

4,719,842
BRAKE BOOSTER WITH A DOUBLE PRESSURE DISK
Jean-Pierre Gautier, Aulnay-sous-Bois, France, assignor to Bendix France S.A., Paris, France
Filed Jan. 6, 1987, Ser. No. 803
Claims priority, application France, Jan. 8, 1986, 86 00165
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A **7 Claims**



1. A brake booster comprising: a booster piston coupled to an output rod and containing distribution valve means actuated by a valve plunger connected to an input rod of the booster, and a pressure disk which is confined peripherally and arranged between a rear end of the output rod, and a front end of the valve plunger and a peripheral annular central shoulder of the booster piston, characterized in that the booster comprises a second pressure disk which is confined peripherally and co-operates with the rear end of the output rod, and a stepped middle member arranged between the two pressure disks and co-operating with the disk.

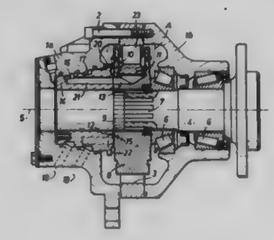
4,719,843
HYDRAULIC MECHANISM, ENGINE OR PUMP, PROVIDED WITH ROLLERS MOUNTED ON THE PISTONS AND WITH MEMBERS FOR HOLDING SAID ROLLERS IN POSITION
Alain W. Nöel, Verberie, France, assignor to Societe Anonyme: Poclain hydraulics, Verberie, France
Filed May 7, 1986, Ser. No. 860,491
Claims priority, application France, May 15, 1985, 85 07426
Int. Cl.[4] F01B *13/06*
U.S. Cl. 92—58 **16 Claims**

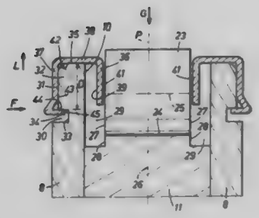
1. In a hydraulic mechanism of the type that includes a fixed cam with an undulating inner peripheral surface, a rotating cylinder block located within the cam and formed with radially oriented cylinders, pistons slidably fitted into each of said cylinders, and cylindrical rollers with flat end faces located between the pistons and the undulating cam surface to enable reciprocating motion of the pistons within their respective cylinders with the rollers riding the undulating cam surface as the cylinder block rotates, each roller being free to be partially received with the corresponding cylinder, an assembly for limiting lateral motion of the rollers along their respective axes and turning motion of the roller axes about their corresponding cylinder axes, comprising:

a pair of recesses in each of the pistons, with a roller bearing surface formed between the pair of recesses, the roller bearing surface having a generally cylindrical form to receive one of said rollers therein;

a plurality of pairs of stop elements, disposed with one ele-

ment of each pair adjacent an end of each roller to limit motion of the roller along its axial direction with respect to the corresponding adjacent portions of cylinder wall, each stop element being formed to have a curved generally cylindrical portion sized to match the cylinder wall and a flat roller-contacting surface adjacent a corresponding flat roller end surface; and





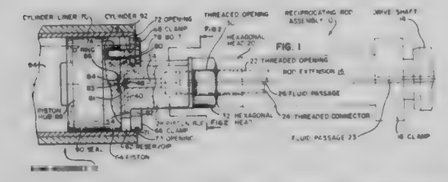
means for individually holding each stop element at the end of the corresponding cylinder closest to the cam undulating surface, such that each stop piece can slidingly contact a corresponding roller end surface to transmit a corrective force thereto from said cylinder wall to limit motion of said roller in the direction of its own axis, each stop element being also individually held with respect to the corresponding cylinder such that the stop element cannot move around the corresponding cylinder axis.

4,719,844

SHAFT ALIGNMENT SYSTEM FOR PUMPS

Larry M. Dugan, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Nov. 15, 1984, Ser. No. 671,637
Int. Cl.⁴ F04B *15/00, 39/14;* F15B *21/04;* F16D *1/06*
U.S. Cl. 92—80 **7 Claims**



4. A pump assembly for pumping an abrasive material such as mud during a drilling operation and comprising:

a cylinder means having a cylindrical pumping chamber defined by a cylindrical inner surface;

a piston means having a sealing ring mounted thereon and being engageable with said cylindrical inner surface for reciprocable movement in said cylinder means;

piston rod means operably connected to said piston means for causing reciprocable movement of said piston means;

said piston rod means terminating in a flanged portion adjacent to said piston means;

clamping means circumjacent said piston rod means and located so that said flange portion is between said clamping means and said piston means;

fastening means for causing relative movement of said clamping means toward said piston means so as to clamp said flange portion between said clamping means and said piston means so as to prevent relative movement between said flanged portion and said piston means;

said clamping means having an outer periphery; mounting means in said outer periphery;

an annular member mounted in said mounting means and in contact with said outer periphery and said cylindrical inner surface;

fluid inlet passage means in said piston rod means for supplying cooling and flushing fluid to said cylindrical inner surface during reciprocable movement of said piston means;

an annular fluid chamber means formed by said flanged portion of said piston rod means, said piston, said clamping means, said annular member and said cylindrical inner surface of said cylinder means for holding a ring of cooling and flushing fluid therebetween during reciprocable movement with the outer peripheral surface of the ring of cooling and flushing fluid in contact with said cylindrical inner surface of said cylinder means; and

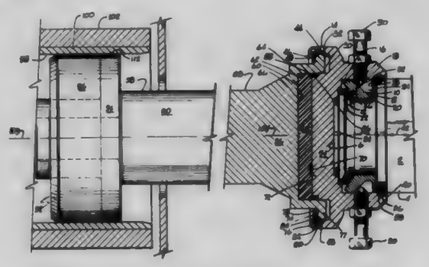
flow restricting outlet passage means comprising radially opposite gaps between said clamping means opening into said annular fluid chamber means for enabling restricted flow of cooling and flushing fluid from said annular fluid chamber means at a rate sufficient to maintain a volume of cooling and flushing fluid in said annular fluid chamber means sufficient to establish fluid contact with said cylindrical inner surface of said cylinder means.

4,719,845

JOINT SYSTEM

Larry M. Dugan, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 5, 1985, Ser. No. 804,628
Int. Cl.⁴ F16J *1/10;* F01B *11/02;* F16B *7/10*
U.S. Cl. 92—84 **8 Claims**



1. Apparatus for increasing the working life of an oil well mud pump having a ceramic cylinder liner wherein the force applied to drive the piston operating in the ceramic cylinder lining is relatively high and which piston is reciprocated at relatively high rates with each stroke moving through a substantial distance comprising:

a pump means for use as an oil well mud pump;

said pump means having a cylinder;

a ceramic cylinder liner secured to said cylinder;

a piston mounted for reciprocation in said ceramic cylinder liner at relatively high rates with each stroke moving through a substantial distance;

a piston rod having one end thereof fixedly connected to said piston;

said piston rod having a longitudinal axis and an other end;

a cavity having a generally cylindrical inner surface and a generally planar bottom surface formed in the other end of said piston rod;

a solid, deformable, non-compressible material having a generally cylindrical outer surface and generally planar end surfaces, which are continuous in all directions, located in said cavity;

said solid, deformable, non-compressible material having a diameter slightly less than but substantially equal to the diameter of said inner surface of said cavity;

reciprocating driving means for applying forces to said piston rod so as to reciprocate said piston rod and therefore said piston in said ceramic cylinder liner;

said driving means having a longitudinal axis;

coupling means for connecting said driving means to said other end of said piston rod so that reciprocal movement of said driving means causes reciprocal movement of said piston rod;

said coupling means having a plug having a generally cylindrical outer surface having a diameter slightly less than but substantially equal to said diameter of said inner surface of said cavity and having a generally planar end surface located in said cavity and adapted to contact one of said generally planar end surfaces of said solid, deformable, non-compressible material to deform said solid, deformable, non-compressible material until it reaches its non-compressible state so that said driving force from said driving means is distributed evenly across said generally planar bottom surface of said cavity of said piston rod, including those instances wherein said longitudinal axes of said piston rod and said driving means are not in alignment so as to move said piston rod in one direction;

an annular recess formed in said outer surface of said plug and said end surface of said plug;

retaining means in said annular recess for preventing extrusion of said solid, deformable, non-compressible material out of said cavity when a relatively high force is applied thereto by said driving means; and

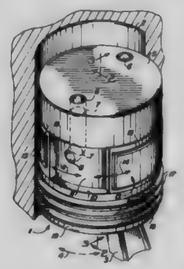
movement permitting means for permitting limited relative movement between said plug and said solid, deformable, non-compressible material so as to allow for the formation of a separation therebetween.

4,719,846

METHOD AND CIRCUMFERENTIAL SLIDER APPARATUS POR BALANCING LATERAL FORCE BETWEEN PISTON AND CYLINDER WALL

Steven W. Langstroth, 500 S. Carmichael, No. 332D, Sierra Vista, Ariz. 85635

Filed Jan. 5, 1987, Ser. No. 411
Int. Cl.⁴ F01B *31/00;* F16J *1/10*
U.S. Cl. 92—127 **15 Claims**



1. An apparatus for reducing friction between a piston and a cylinder, comprising means for balancing varying horizontal components of force applied by a connecting rod to the piston, the balancing means including in combination:

(a) first and second openings in the piston providing communication of compressive gas above the piston in the cylinder to first and second opposed side wall areas of the piston;

(b) movable first and second circumferential means, each symmetrically disposed on a side wall of the piston relative to ends of a wrist pin connecting the connecting rod to the piston and mechanically coupled to the connecting rod, for varying the first and second side wall areas in relation to the orientation of the connecting rod relative to the piston; and

(c) means for mechanically coupling the connecting rod to the first and second circumferential means to

i. move the first and second circumferential means toward the first side wall area thereby reduce the first side wall area approximately proportionally to a horizontal force component applied toward the first side wall areas onto the piston by the connecting rod and thereby increase the second side wall area approximately proportionately to that horizontal force component,

ii. move the first and second circumferential means toward the second side wall area and thereby also reduce the amount of the second side wall area approximately proportionally to a horizontal force component applied toward the second side wall area onto the piston by the connecting rod and thereby also increase the amount of the first area approximately proportionally to that horizontal force component,

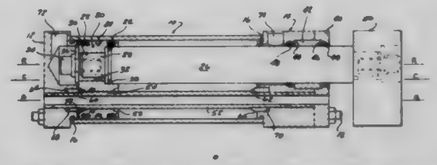
during rotation of a crankshaft connected to a lower end of the connecting rod.

4,719,847

FLUID PRESSURE OPERATED MOTOR WITH POSITIVE LOCATING DEVICE

Leland F. Blatt, P.O. Box 220, Fraser, Mich. 48026

Filed Jan. 20, 1987, Ser. No. 4,619
Int. Cl.⁴ F16J *15/18*
U.S. Cl. 92—168 **2 Claims**



1. In a hydraulic motor including a hollow cylinder closed at its opposite ends by end cap means, a piston slidably and sealingly received within said cylinder, and a piston rod fixedly secured at one end to said piston and projecting axially of said cylinder through one of said end cap means in sliding sealed relationship therewith;

the improvement comprising means defining a bore extending axially through said piston in parallel offset relationship to the axis of said cylinder and terminating at each end in an outwardly flared frusto-conical counterbore, an elongate guide rod fixedly mounted at its opposite ends in said end cap means and extending through said bore in sliding sealed relationship therewith in parallel offset relationship to the axis of said cylinder, and a pair of coaxial frusto-conical locator members respectively complementary to said counterbores fixedly mounted on said guide rod adjacent the respective opposite ends thereof complementary to and engageable in said counterbores to establish the location of said piston axially, radially and rotatively relative to said cylinder at said opposite end limits of movement.

4,719,848

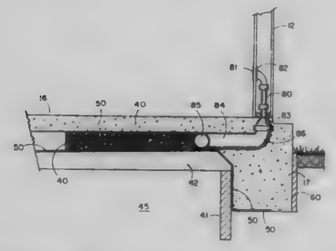
AIR CIRCULATION SYSTEM AND AIR FLOW ELEMENTS THEREFOR

Hervin J. Bergeron, Jr., Rte. 2, Box 224, Opelousas, La. 70570

Division of Ser. No. 530,211, Sep. 8, 1983, Pat. No. 4,538,507, which is a division of Ser. No. 230,375, Feb. 2, 1981, Pat. No. 4,440,343, which is a continuation-in-part of Ser. No. 54,659, Jul. 3, 1979, Pat. No. 4,505,325, and Ser. No. 135,073, Mar. 28, 1980, abandoned. This application Aug. 30, 1985, Ser. No. 771,430

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 98—31 **14 Claims**



1. An aggregate bag air circulation element comprising:

(a) a bag envelope having a top surface, a bottom surface and side surfaces, said bag envelope having openings over at least a portion of its side surfaces, said openings allowing airflow through said bag envelope;

(b) particulate expanded clay aggregate contained within said bag envelope; and

(c) indexing means on said bag envelope for indicating the height of said bag envelope from above when said aggregate filled bag envelope rests on a supportive plane-like surface, said indexing means comprising a sheet affixed to said top surface, said sheet being sized so as to be less than the width of the empty bag envelope and about equal to the width of the bag envelope when completely filled with the aggregate whereby the width of the bag envelope extending beyond the periphery of the sheet enables the height of said bag envelope to be ascertained from above when said aggregate filled bag envelope rests on a supportive plane-like surface.

4,719,849

FOOD PRODUCT COOKER

Jonathan C. Cope; Michael E. Grady, and Donald G. Warnock, all of Madera, Calif., assignors to Valley Grain Products, Inc., Madera, Calif.

Filed Nov. 7, 1986, Ser. No. 927,959

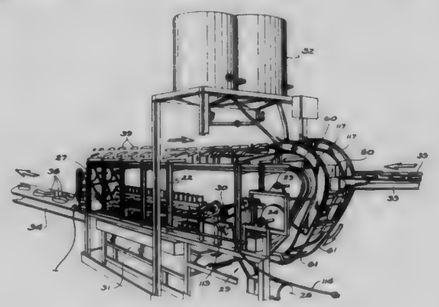
Int. Cl.⁴ A47J *37/12*

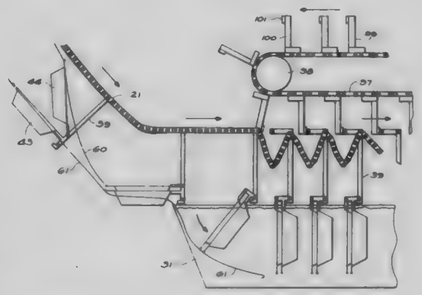
U.S. Cl. 99—404 **33 Claims**

1. In a food product cooker having a main frame, a cooking oil pan, a plurality of product carriages, and a main drive endless chain for moving said carriages about said main frame to and from said pan, with each of said carriages including a food product holder having upper and lower sections for holding a food product therebetween,

the improvement wherein each of said carriages includes a support arm having first and second ends, with said drive chain attached at said first end and with said holder attached at said second end,

said holder including means for pivoting said holder sections relative to each other between open and closed conditions and means for pivoting said holder between first and





second positions relative to said support arm when said holder sections are in said closed condition.

4,719,850

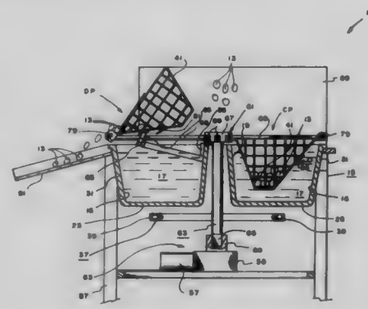
AUTOMATIC COOKING APPARATUS

Jerry G. Sowell, Rt. 1, Oakfield, Tenn. 38362

Filed Dec. 12, 1986, Ser. No. 940,913

Int. Cl.⁴ A47J *37/12*

U.S. Cl. 99—404 **8 Claims**



1. An automatic cooking apparatus comprising, in combination:

a vat having an interior for containing a cooking medium;

heater means associated with said vat for heating said cooking medium within said vat;

a plurality of food holding members for holding food products to be cooked, each of said food holding members being movable between a cooking position located at least partially within said interior of said vat and a discharge position located at least partially out of said interior of said vat;

drive means for rotating said food holding members within said vat, said drive means including hub means coupled to said food holding members, including a motor, said hub means including an elongated hub shaft having a first end operatively coupled to said motor for being rotated thereby and having a second end, and including a plurality of spoke members attached to said second end of said hub shaft and extending radially therefrom, each of said food holding members being movably attached to one end of at least one of said spoke members;

cam means for causing said food holding members to move between said cooking and discharge positions.

4,719,851

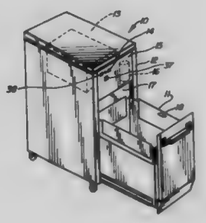
METHOD AND APPARATUS FOR INDICATING NEED FOR REPLACEMENT OF TRASH-TREATING MATERIAL SUPPLY

Paul B. Chesnut, Armstrong Township, Vanderburg County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 24, 1986, Ser. No. 945,898

Int. Cl.⁴ B30B *15/08*

U.S. Cl. 100—45 **14 Claims**



1. A method of indicating the need for replenishing a supply of trash-treating material sequentially delivered into a trash compactor trash receiver, comprising the steps of:

causing a timer to advance seriatim a preselected amount as a result of each compacting operation of a compacting ram of the trash compactor; and

causing an indication of the need to replenish said supply as the result of a preselected cumulative advance of said timer.

4,719,852

AIRCRAFT TRASH COMPACTOR

James L. Durbin, Valencia, and Robert M. Clemens, Newhall, both of Calif., assignors to A.K.G.S., Las Vegas, Nev., a part interest

Filed Jul. 24, 1986, Ser. No. 889,685

Int. Cl.⁴ B30B *15/30*

U.S. Cl. 100—229 A **10 Claims**

1. A trash compactor comprising:

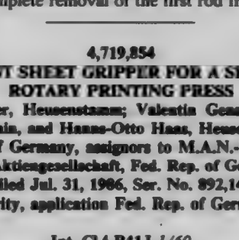
a. a housing provided with an internal chamber having front and rear chamber sections which are adapted to receive trash containers;

b. means to deposit trash in a trash containers disposed within the front chamber section;

c. a reciprocating compacting platen which is extendable downwardly into the trash container disposed with the front chamber section to compact trash therein;

d. a moveable support wall transversely disposed in an interior chamber between the front and rear chamber sections;

e. means to fix the transverse position of the movable support wall between the front and rear chamber sections to facilitate the support of the rear panel of a trash container disposed within the front chamber section; and



f. means to move the movable support wall from its fixed transverse position to an out-of-the-way position so that a trash container in the front chamber section may moved into the rear chamber section.

4,719,853

CODING BOX WITH SELECTIVELY ADJUSTABLE PRINTING WHEELS

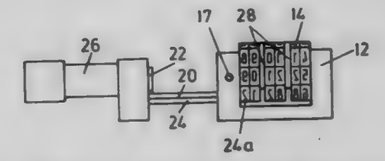
John G. Bowers, Leicester, England, assignor to R. E. Bowers & Freeman Limited, Leicester, England

Filed Dec. 8, 1986, Ser. No. 938,972

Claims priority, application United Kingdom, Dec. 16, 1985, 8530934

Int. Cl.⁴ B41J *1/60*

U.S. Cl. 101—110 **4 Claims**



1. A coding box suitable for a hot foil printing machine which comprises a frame, a plurality of print wheels rotatable about a shaft with respect to the frame, each print wheel having a plurality of outward-facing peripheral flats bearing indicia, each wheel having a through-hole parallel to the shaft and corresponding to each flat, a rod passable through the holes for setting the wheels in desired orientations with respect to the frame, means for locking the rod in a set position, and a second rod fast with respect, and parallel, to the first rod and having an enlarged distal end for engagement with a hole in the frame to prevent complete removal of the first rod from the frame.

4,719,854

RESILIENT SHEET GRIPPER FOR A SHEET-FED ROTARY PRINTING PRESS

Manfred Ruger, Heusenstamm; Valentin Geaubelmer, Muhlheim am Main, and Hanno-Otto Haas, Heusenstamm, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,149

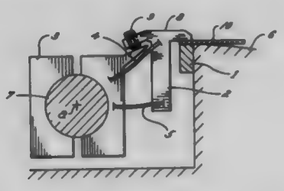
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529612

Int. Cl.⁴ B41J *1/60*

U.S. Cl. 101—409 **5 Claims**

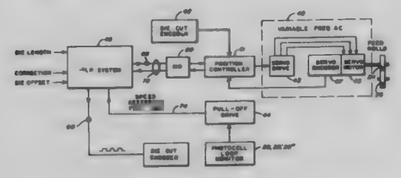
1. A resilient sheet gripper for a sheet-fed rotary printing press having a pivotable clamping member secured to a gripper shaft mounted with its axis stationary in the recess of a press cylinder, the gripper having a finger adjustably disposed and resiliently biased in relation to the clamping member, comprising, in combination, a plurality of prestressed spring strips

connecting the gripper finger to the clamping member, and a plurality of articulation points along each spring strip disposed



on a line passing substantially through the stationary axis of the gripper shaft.

4,719,855
COMPUTER CONTROLLED WEB FEED METHOD, APPARATUS AND SYSTEM FOR WEB TREATMENT APPARATUS SUCH AS ROTARY DIE CUTTER
David C. Cannon, and Stephen P. Lyles, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.
Filed Aug. 1, 1986, Ser. No. 891,799
Int. Cl.[4] B41F *13/54*
U.S. Cl. 101—426 17 Claims



12. Method for operating web treatment apparatus, such as a high speed rotary die cutter, capable of accommodating dies of differing lengths on a die cylinder of fixed circumference and having feed roll means and a stored program position controller and servo drive means therefor for feeding a web to be treated to said die cylinder for treatment thereby and for pulling such web back therefrom when such die is of a length less than the full circumference of said die cylinder and during non-engagement by said die, comprising:

generating an output signal from position encoder means associated with such die cylinder as said die cylinder rotates;

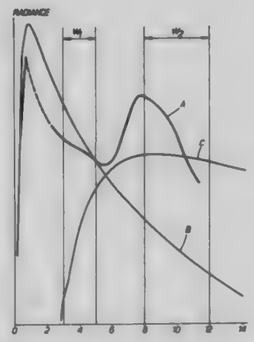
inputting by an operator the die length, die offset and the desired amount of pullback or correction of web travel so as to synchronize the web travel with the die engagement;

calculating velocity profile functions in a microprocessor with a program based upon the inputted die length, die offset and desired pullback, and

downloading such velocity profile functions to said stored program position controller controlling servo drive means;

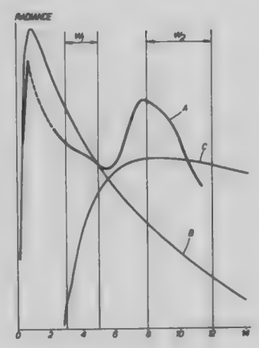
whereby said position controller may be programmed to decelerate and reverse the movement of such web and then again reverse and accelerate such web again towards the web treatment apparatus to again be engaged thereby with no wastage of web material between passes while enabling generation of optimal velocity profiles for each selected die length and pullback length.

4,719,856
PYROTECHNIC DEVICE
Nigel F. Joslin, Southampton, England, assignor to Paine-Wessex Limited, Salisbury, England
Filed Mar. 29, 1982, Ser. No. 376,385
Claims priority, application United Kingdom, Apr. 1, 1981, 8110182; Nov. 6, 1981, 8133516
Int. Cl.[4] F42G *4/00*
U.S. Cl. 102—335 11 Claims



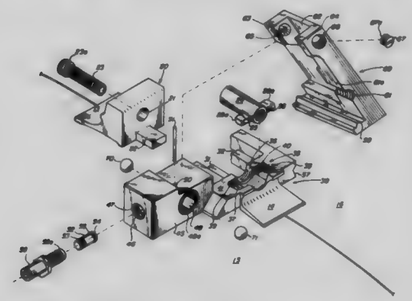
1. A pyrotechnic device for use in screening a heat-emitting source from a heat-seeking or heat-detecting device, the pyrotechnic device containing a pyrotechnic composition which comprises a combustible particulate substance, a combustible propellant for, upon ignition, heating the particulate substance and expelling the particulate substance from the device to form a screen of hot particles having a substantial degree of radiation in the 3–14 micron wavelength band, by combustion, and means for inhibiting oxidation of the particulate substance within the device.

4,719,857
PYROTECHNIC DEVICE
David J. Spring, Slough, England, assignor to Paine-Wessex Limited, Salisbury, England
Filed Mar. 29, 1982, Ser. No. 376,386
Claims priority, application United Kingdom, Apr. 1, 1981, 8110182; Nov. 6, 1981, 8133516
Int. Cl.[4] F42B *4/00*
U.S. Cl. 102—335 6 Claims



1. A pyrotechnic device for use in screening a heat-emitting source from a heat-seeking or heat-detecting device, the pyrotechnic device containing a pyrotechnic composition which consists essentially of a combustible particulate substance, and a combustible propellant for, upon ignition, heating the particular substance and expelling the particulate substance from the device to form a screen of hot particles having a substantial degree of radiation in the 3–14 micron wavelength band, wherein the particulate substance is selected from the group which consists of silicon, silicon alloys and silicon compounds.

4,719,858
EXPLOSIVE BAND SEPARATION DEVICE
Edward H. Stiles, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 22, 1986, Ser. No. 911,274
Int. Cl.[4] F42B *15/10*
U.S. Cl. 102—378 10 Claims



1. An apparatus for releasing a pretensioned band holding successive stages of a missile together comprising:

means secured to one end of the pretensioned band for provided at least one lug member having an inclined surface;

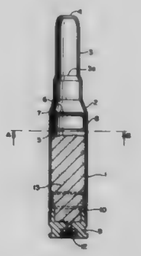
means secured to the other end of the pretensioned band for retaining the lug member in a retaining recess having an inclined wall configured to accommodate the inclined surface of the lug, the inclined surface and the inclined wall mechanically cooperating to produce a resultant force on and displacement of the lug from the retaining means;

means having a pair of cone-shaped cavities and carried on the providing means and the retaining means for holding the lug in the retaining recess, the holding means prevents displacement of the lug from the retaining recess;

means coupled to the cavities of the holding means for releasably securing the holding means on the providing means and the retaining means by the divergent displacement thereof;

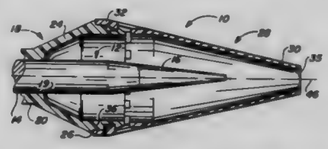
means disposed in the retaining means for initiating a convergent displacement of the releasably securing means to release the holding means that enables the resultant force to push the holding means away and the consequent displacement of the lug and release of the pretensioned band.

4,719,859
TRAINING CARTRIDGE
Kurt Ballreich, Nuremberg; Ernst Jensen, Fürth, and Helmut Neubert, Nuremberg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany
Continuation of Ser. No. 726,395, Apr. 23, 1985, abandoned, which is a continuation of Ser. No. 542,442, Oct. 17, 1983, abandoned. This application Oct. 23, 1985, Ser. No. 790,402
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238270
Int. Cl.[4] F42B *5/22*
U.S. Cl. 102—444 7 Claims



1. A training cartridge comprising a metallic cartridge case having a case shoulder and a hollow dummy projectile integrally formed at one end and an open propellant charge powder chamber integrally formed at the other end, said hollow dummy projectile having at least one gas exhaust opening formed therein which is free of externally projecting, sharp-edged rims; a rupturable cup-shaped closure element tightly fitted into the cartridge case for sealing off the propellant charge powder chamber at forward end of the chamber, said closure element having means for defining predetermined intentional breaking zones which rupture during firing; and a bottom closure member which is tightly fitted into the cartridge case and which seals off the propellant charge powder chamber at the rear end of the chamber; said cartridge case being free of deformation in the vicinity of the hollow dummy projectile when a cartridge is fired.

4,719,860
ARMOR-PENETRATING AMMUNITION ASSEMBLY WITH MOLDED PROTECTIVE CAP
Paul D. Ruffle, Edina; Randall L. Schiestl, Brooklyn Park, and Robert L. Bonde, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 28, 1987, Ser. No. 7,852
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—521 9 Claims



1. An armor-penetrating projectile assembly 10 for an automatic cannon having a rifled barrel comprising:

a cylindrical penetrator 12 having a pointed leading end 16;

a discarding sabot 18 for positioning said penetrator 12 in a bore of a barrel of an automatic cannon, said sabot 18 having a cylindrical portion 19 defining a bore for receiving said penetrator 12, a flared intermediate portion 24, and a circular front end 26;

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a one piece protective cap **28** molded from a thermoplastic material, said cap having an open ended conical leading portion **30**, a cylindrical rear portion **32** forming an integral centering band having an outer diameter which is greater than the outer diameter of the circular front end **26** of the sabot **18**, a substantially conical inner surface **35**, and a plurality of stress concentrating grooves **34** formed in the inner surface **35** of the cap **28** and extending longitudinally through both the cylindrical rear portion **32** and conical portions **30** of the cap **28** for assisting in cap breakup when said assembly **10** is fired from a cannon; and

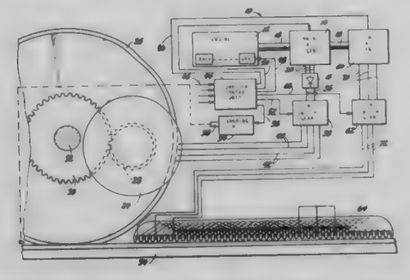
fastening means including cooperating elements **52** on the forward portion **24** of said sabot **18** and **54** on the rear portion of said protective cap **28**, said cooperating elements **52**, **54** securing said cap **28** to said sabot **18** until the sabot **18** exits from the barrel of a cannon from which it is fired, said fastening means including an extension **36** forward of the circular front end **26** of the sabot **18**, said extension **36** having a sloping forward portion **48**, a groove **37** rearward of said sloping forward portion **48**, the sloping portion **48** and groove **37** defining a lip **52**; a plurality of windows **40** formed in said conical leading portion **30** of the protective cap **28**; and ramped projections **38** proximate the cylindrical rear portion **32** of the cap **28** and formed on the inner surface **35** of the cap **28** rearwardly of each window **40**; the lip **52** of the forward portion **48** of the sabot **18** projecting into the windows **40** of the protective cap **28**, and the ramped projections **38** of the cap **28** being received in the groove **37** of the sabot **18** to secure the cap **28** to the sabot **18**.

4,719,861

ENERGY MANAGEMENT METHOD FOR A LOCOMOTIVE INCLUDING SINGLE-SIDED LINEAR INDUCTION MOTORS

Jack W. Savage, Centerville, Ohio; Thomas J. Savage, Darien, Ill., and Mark A. Navarre, Huntington Woods, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1986, Ser. No. 922,249
Int. Cl.[4] B61C *7/04, 15/04, 15/10*
U.S. Cl. 104—165 **13 Claims**



1. For a railway locomotive including a source of electrical energy, a primary traction mechanism for converting electrical energy to tractive effort including a locomotive wheel supported on a ferrous rail and an electrically powered traction motor connected to rotatably drive such wheel, and a supplemental energy conversion mechanism for increasing the effective adhesion between the locomotive wheel and the rail including at least one electrically activated single-sided linear induction motor (SLIM) suspended from the locomotive in close proximity to the rail, a method of operating the supplemental energy conversion mechanism comprising the steps of:

detecting the existence of a suboptimal operating condition for which the energy conversion capability of the primary conversion mechanism is limited due to less than optimal adhesion between the locomotive wheel the rail; and

determining an actual adhesion level and maximum gain in energy conversion capability that could be obtained by the primary energy conversion mechanism with increased adhesion; and

activating the SLIM in relation to such determined adhesion level and maximum gain for increasing the effective adhesion between the locomotive wheel and the rail when the existence of the suboptimal operating condition is detected, such that the SLIM is activated only to the extent that the consequent increase in effective adhesion increases the energy conversion capability of the primary energy conversion mechanism.

11. For a railway locomotive having an engine source of mechanical energy governed by an operator manipulated power control setting, a primary energy conversion mechanism including a locomotive wheel supported on a ferrous rail, an electric traction motor connected to rotatably drive such wheel, and a primary engine driven electrical generator for producing electrical energy to operate such traction motor, and a supplemental energy conversion mechanism including at least one electrically activated single-sided linear induction motor (SLIM) suspended from the locomotive in close proximity to the rail, and a supplemental engine driven electrical generator for producing electrical energy for activating such induction motor for increasing the effective adhesion between the locomotive wheel and rail, a method of operating the supplemental energy conversion mechanism comprising the steps of:

detecting the existence of an operating condition for which the energy conversion capability of the primary conversion mechanism is limited due to less than optimal adhesion between the locomotive wheel and the rail; and

comparing a measure of the electrical power output of the primary generator with a maximum power reference corresponding to the maximum power output the engine is capable of developing at the power control setting, thereby to develop a signal indicative of the reserve power potential of the engine;

developing a power requirement signal in accordance with the combination of (1) the engine power required to fully energize the SLIM, and (2) the engine power required to increase the energization of the traction motor with the improved adhesion brought about by energization of the SLIM; and

developing a control signal for the supplemental engine driven generator in accordance with a ratio of the reserve power potential signal to the power requirement signal, such that when the SLIM is energized in accordance with the control signal, the combined additional power requirements of the SLIM and traction motor do not exceed the reserve power potential of the engine.

4,719,862

BLADE SHANK ASSEMBLY USED IN A FERTILIZER APPLICATOR ASSEMBLY

Delmar D. Edmisson, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymon, Okla.

Continuation-in-part of Ser. No. 699,169, Feb. 7, 1985, Pat. No. 4,628,839. This application Jul. 3, 1986, Ser. No. 881,734
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—7 **2 Claims**

1. A fertilizer applicator knife assembly comprising:

a curved blade shank plate having a concave leading edge of substantially uniform thickness up and down its length and a convex trailing edge, an upper end and a lower end, and further having a pair of parallel side surfaces extending between the concave leading edge and the concave trailing edge;

a generally L-shaped protective hard metal wear insert secured to the concave leading edge of the blade shank plate, said L-shaped protective wear insert including:

an elongated, shank portion extending downwardly along the concave leading edge of the shank plate and being of increasing transverse thickness from its upper end to its lower end, said shank portion having a leading edge and having a pair of side surfaces converging to said leading edge, and having a rear side extending between said side surfaces, said rear side of the shank portion of the insert having a width which is greater than the width of the leading edge of said shank plate throughout the entire distance of contact of said wear metal insert with said leading edge of said shank portion whereby space adjacent the parallel side surfaces of said shank is defined by the overhang of the rear side surface of said elongated, shank portion of said hard metal wear insert for the accumulation and retention in said defined space of a protective layer of caked soil;

an enlarged, pointed head portion at the forward lower end of said shank portion, and constituting that portion of said



insert having the greatest transverse width, said head portion having a width which is at least twice the narrowest transverse dimension of the shank portion of said insert; and

an elongated bottom sole extending rearwardly from the head portion along the lower side of the shank plate and decreasing in transverse thickness from a location adjacent said head portion toward the rear end thereof, said bottom sole having a transverse thickness greater than the transverse thickness of said shank plate as measured between said parallel side surfaces and therefore providing an overhang which defines the protective soil layer retaining-space commonly defined by the cooperation of the overhanging bottom and the overhanging rear side of the shank portion of the wear insert.

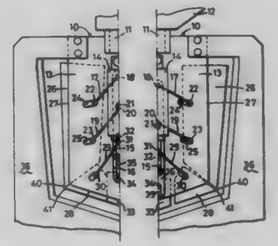
4,719,863

SMALL CLOTH VISE FOR A SEWING MACHINE

Flavio Bisson, Cava Manara Pv, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Apr. 27, 1987, Ser. No. 42,840
Claims priority, application Italy, May 14, 1986, 32306/86[U]
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **4 Claims**

1. A small cloth vise in a sewing machine arranged for the automatic application of small pockets applied on blue-jeans or on other similar garments by two fixing seams where at least on one side said seams are not parallel, comprising a central element, a cylinder fixed to said element, a small plate which transmits motion driven by said cylinder, a first blade placed under said central element for displacement in proximity to the seams operatively connected to said small plate, and first and second levers having ends connected to said blade corresponding to the side where said seams are not parallel, said first lever effecting a displacement larger than that of said second lever



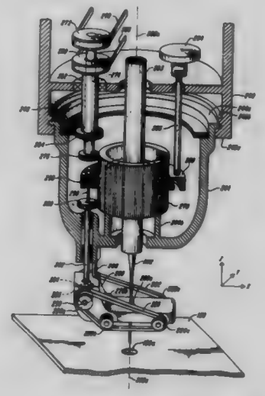
for causing said blade to rotate and thus to translate in sequence.

4,719,864

LIMP MATERIAL SEAM JOINING APPARATUS WITH ROTATABLE LIMP MATERIAL FEED ASSEMBLY

David S. Barrett, Needham, and William B. Costain, West Newbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 11, 1987, Ser. No. 48,373
Int. Cl.[4] D05B *21/00, 27/14*
U.S. Cl. 112—121.12 **5 Claims**



1. A sewing machine system for joining portion of a multiple layer limp fabric workpiece, comprising:

A. a substantially planar workpiece support surface,

B. an elongated needle,

C. a sewing head assembly including selectively operable needle drive means for driving said needle along a needle axis offset from said support surface, whereby a tip of said needle passes in a reciprocating motion through an aperture in said support surface,

D. a selectively operable feeder assembly including feed means for transporting a region of said limp fabric workpiece on said support surface and adjacent to said needle axis in the direction of a feed axis, said feed axis having a fixed orientation with respect to said feeder assembly,

E. a coupling assembly including means for rotatably coupling said feeder assembly to said sewing head assembly whereby said feeder assembly is selectively rotatable about said needle axis, and

F. a controller including:

i. a feed controller means for selectively controlling said feeder assembly to be operative,

ii. an orientation controller means for selectively controlling the angular orientation of said feeder whereby said feed axis may be adjustably offset at any angle within a predetermined range R, where R is greater than zero degrees measured with respect to a reference axis on said support surface,

wherein said feeder assembly includes:

i. a feeder frame member,

ii. an endless belt assembly including at least one endless belt disposed about an associated set of rotatable support members affixed to said feeder frame member, each of said belts having a portion of its outer surface lying substantially in a reference plane, said reference plane being substantially parallel to and above said planar workpiece support surface in the region adjacent to said aperture, said portions of said outer surfaces of said belts being adapted for motion along respective belt axes, said belt axes lying in said reference plane and being mutually parallel and disposed on opposite sides of said needle axis,

iii. selectively operable drive motor and associated linkage responsive to said feed controller means, said drive motor and associated linkage including means for driving each of said belts about its associated set of support members.

4,719,865

SEWING MACHINE WITH THREAD TAKE-UP MECHANISM

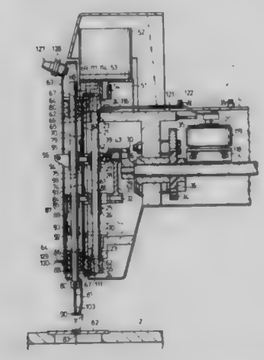
Masaaki Yokoe, Nagoya; Yoshikazu Kurono, Aichi; Koji Hayashi, and Miho Hashimoto, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 14, 1986, Ser. No. 931,462

Claims priority, application Japan, Nov. 20, 1985, 60-261658

Int. Cl.[4] D05B *69/00, 47/00, 1/12*

U.S. Cl. 112—221 **7 Claims**



1. A sewing machine with thread take-up mechanism, said sewing machine comprising:

a frame;

a needle bar movably supported on said frame in the vertical direction and having a sewing needle at the lower end thereof;

means for driving said needle bar;

a take-up member movably supported on and fitted around said needle bar and having a hole for a needle thread; and

means for driving said take-up member with a timing different from that of the vertical movement of said needle bar.

4,719,866

SEWING MACHINE WITH CONTROL DEVICE FOR THE NEEDLE DRIVING MOTOR

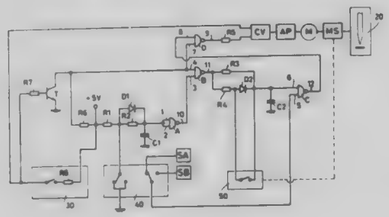
Flavio Bisson, Cava Manara, and Giacomo Cattaneo, Pavia, both of Italy, assignors to Necchi Societa per Azioni, Pavia, Italy

Filed Dec. 1, 1986, Ser. No. 936,390

Claims priority, application Italy, Dec. 18, 1985, 42916 A/85

Int. Cl.[4] D05B *69/22*

U.S. Cl. 112—275 **5 Claims**



1. Sewing machine comprising a motor for reciprocating a sewing needle between a first and a second extreme position, a motor speed regulator for obtaining a zero speed and a maximum speed, a switch operated by means adapted to mechanically disengage the sewing needle from the motor, a position selector having at least two positions for controlling the motor in order to stop the needle at least in the first or in the second extreme position, the machine comprising at least first and second sensor means, operatively connected to the position selector, supplying a control electric signal respectively when the needle is in the first extreme position and in the second extreme position, first means being provided of the logic gate type with a first and second input and an output, which commutate from a first and a second logic condition and vice versa, said first logic condition in which at said output an electrical signal is present which controls the starting of the motor and a second logic condition in which at said output an electric signal is present which controls the stopping of the motor, the first input of said logic gate means being operatively connected to said regulator in such a way that when said regulator is in its motor starting position, said first logic gate means is in its first logic condition and when said regulator is in its motor stop position, said first logic gate means commutates from one to the other of its two logic conditions according to the logic level present at its second input, second means being moreover provided of the logic gate type having a first and a second input and an output, the output of said second means being connected to the second input of said first means, said second means commutating from a first to a second logic condition and vice versa, the commutation of said second means from one to the other of its two logic conditions causing the commutation of said first means from one to the other of its two logic conditions when said regulator is in the motor stop position, first capacitor means being moreover provided connected to the first input of said logic gate second means and operatively connected to the regulator and to the switch, said first capacitor means being electrically charged when the regulator is in its motor starting position and being electrically discharged when the switch is in the position corresponding to the disengagement of the needle from the motor, said first capacitor means, when it is charged keeping said second logic gate means in condition of non-commutation, one or the other of said first and second sensor means, depending on the position of the selector, being connected to the second input of said second logic gate means in such a way as to supply to it said electric control signal, said electric control signal, when this regulator is in its motor stop position, causing the commutation of said second logic means from one logic condition to the other in such a way as to cause the commutation of said first logic means in the logic condition corresponding to the stopping of the motor.

4,719,867

LOWER WHEEL FABRIC FEEDING DEVICE IN A COLUMN SEWING MACHINE

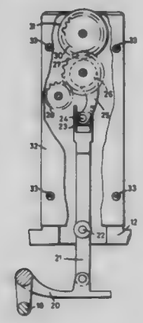
Flavio Bisson, Cava Manara PV, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Dec. 1, 1986, Ser. No. 936,253

Claims priority, application Italy, Jan. 22, 1986, 42902 A/86

Int. Cl.[4] D05B *27/14*

U.S. Cl. 112—318 **3 Claims**



1. A lower wheel fabric feeding device for a column sewing machine containing an oscillatable feeding shaft comprising a first lever attached to said feeding shaft, a second lever at one end pivotally connected to said first lever and having a forked section at the other end, said second lever being pivotally connected to said column intermediate the ends of said second lever, a connecting rod having an end slidable within said forked section of said second lever, a first free release wheel, the other end of said connecting rod being fixed to said first free release wheel, a first gear rotated by said first free release wheel, second and third gears coupled to said first gear and a feed wheel rotated by said third gear and means mounted to said second gear to transmit intermittently the oscillations of said feeding shaft and prevent reverse rotation of said first gear.

4,719,868

SEWING MACHINE

Haruo Iwabuchi, and Yutaka Asaba, both of Tama, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Feb. 25, 1986, Ser. No. 833,334

Claims priority, application Japan, Feb. 28, 1985, 60-39505; Feb. 28, 1985, 60-39506

Int. Cl.[4] D05B *3/04*

U.S. Cl. 112—461 **11 Claims**

1. A sewing machine, said machine comprising:

a cam setting a feed pitch formed thereon;

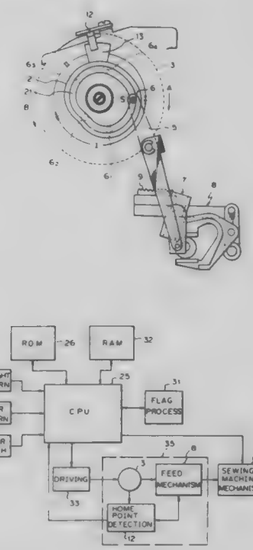
a linkage means engaging the cam and linked with a feed dog to vary the quantity of work piece feeding in accordance with a feed pitch; and

a motor actuating the cam to rotate into a feed pitch position;

wherein said machine further comprises:

said cam having a plurality of regions and said feed pitch formed in each of said regions and at least one detecting position of home point of said motor set in a predetermined position;

means for discriminating and indicating a rotating direction of said cam toward the detecting position of said home point according to respective regions; and



a single home point detector to be used in detecting the home point in said detecting position.

4,719,869

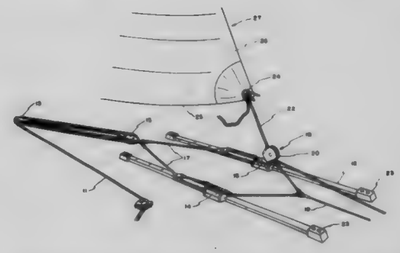
SAILBOAT TRAVELER CAR ASSEMBLY WITH REMOVABLE BLOCK

Peter O. Harken, Pewaukee, Wis.; Robert A. Whitehouse, Newport, R.I., and Kenneth E. Lange, West Allis, Wis., assignors to Vanguard, Inc., Pewaukee, Wis.

Filed Nov. 6, 1986, Ser. No. 927,518

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—102 **21 Claims**



1. In conjuction with a sailboat having a deck, a foresail and a sheet for trimming the foresail, and a foresail lead block through which the sheet is passed, a lead car system comprising a plurality of spaced adjacent tracks secured to the deck of the boat, a traveler car slidably mounted on each of the tracks, a lead block mounted on one of said cars and comprising an upper rotatable sheave for receiving said sheet and a base for attachment to said traveler car, said base having a depending portion which interfits and mates with portions of each of said traveler cars in a complementary fashion to enable securement of said block to any of said cars, and means for releasably

locking said base to said cars to enable transfer of said block to any of said cars, and means for releasably locking said base to said cars to enable transfer of said block from one car to another.

4,719,870

QUICK-RELEASE SKI TOW BRACKET

Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed Feb. 12, 1987, Ser. No. 14,223
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—218 **7 Claims**



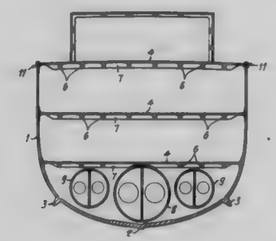
1. Means for securing a rope having a loop at one end to a boat for water skiing comprising: a sheave-like circular anchor member having a recessed peripheral groove for seating the rope loop; and fastener means for securing the same to a support; a cover having a central recess for receiving said anchor member therein; means mounting said cover to said anchor member; said mounting means including a central post depending from said cover supporting said cover for both rotation and axial movement with respect to said anchor member; said cover having a peripheral flange surrounding said anchor member and having a free edge spaced from said anchor member substantially less than the thickness of the rope to be used with it, said cover being axially moveable between a retracted position substantially enclosing said groove and a release position permitting the loop of a rope to enter said groove; means resiliently urging said cover into retracted position; said flange having a circumferentially extending opening of a circumferential width and axial height to permit both sides of the loop of a rope seated in the groove of said anchor member to pass therethrough without interference with said cover when the cover is in retracted position.

4,719,871

SHIP WITH MONOCOQUE HULL MADE OF PLASTIC-BASED COMPOSITE MATERIAL

Gianfranco Fantacci, Bolzano, and Gianfranco De Casa, Massa, both of Italy, assignors to Intermarine S.p.A., Sarzana, Italy

Filed Mar. 14, 1986, Ser. No. 839,670
Claims priority, application Italy, Mar. 15, 1985, 12454 A/85
Int. Cl.[4] B32B *3/26*
U.S. Cl. 114—357 **3 Claims**



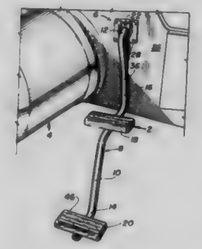
1. A ship having decks (4), a stringer area, a monocoque hull (1), and a keel (2) and rolling chocks (3), wherein
(a) the thickness of said monocoque hull increases substantially uninterruptedly from said stringer area to said keel;
(b) at least some of said decks are supported by transverse structural bulkheads (5) via longitudinal carrying beams (6) arranged under respective said decks and made integral therewith;
(c) said keel (2) and said rolling chocks (3) are both integral with said monocoque hull (1); and
(d) said monocoque hull, said decks, said transverse structural bulkheads, said longitudinal carrying beams, said keel and said rolling chocks are all made of the same composite material with a reinforced plastics base.

4,719,872

BOAT LADDERS

Robert G. Ritten, Ft. Pierce, Fla., assignor to Step-On Inc., Ft. Pierce, Fla.

Filed Oct. 10, 1986, Ser. No. 917,801
Int. Cl.[4] B63B *27/14*
U.S. Cl. 114—362 **5 Claims**



1. A ladder for use with inflatable boats or other runabout type watercraft comprising:
a single mounting bracket and a moveable boarding step unit,
said step unit comprising:
a single elongated support bar including:
an upper end, a lower end and an elongated central portion integrally joining said upper end to said lower end,
a plurality of steps fixed, vertically spaced apart to said support bar and
a latch plate having a U-shaped peripheral edge fixed transversely to said upper end of said support bar;
said mounting bracket comprising:
a flat back to engage the transom or other support surface of said watercraft,
a face web fixed to said back,
an opening between said back and said web sized to slideably receive and capture said latch plate and
a U-shaped slot in said face web to admit said upper end of said support bar,
said central portion of said support bar has a section contoured so that when said latch plate is positioned in said bracket, said steps depend below said watercraft and are firmly held away from it by a part of said central portion of said bar bearing against said support surface of said watercraft.

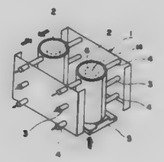
4,719,873

FILM FORMING APPARATUS

Yasutomo Fujiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 770,154
Claims priority, application Japan, Sep. 7, 1984, 59-186492
Int. Cl.[4] C23C *16/50*
U.S. Cl. 118—723 **9 Claims**

1. A film-forming apparatus utilizing electrical discharge to accomplish film formation comprising a reaction chamber, an electrically conductive cassette in said reaction chamber in which a substrate for film formation is contained, wherein said substrate is insulated and spaced from said cassette, a cover electrode provided in said reaction chamber movable from a first position separate from the cassette to a second predetermined film forming position in contact with and electrically connected to the cassette whereby electrical discharge is caused in said cassette, a gas supply pipe fixed to said cover electrode for injecting gas into said cassette and means connected to said apparatus for exhausting the reaction chamber to create a vacuum.

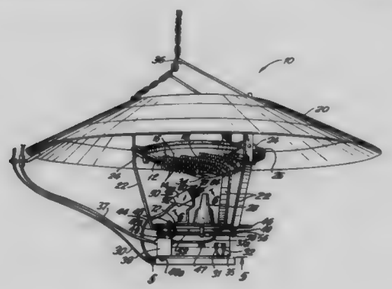


4,719,874

POULTRY BROODER

Paul E. Maurice, 14 Fontaine St., Ludlow, Mass. 01056

Continuation-in-part of Ser. No. 666,115, Oct. 29, 1984, Pat. No. 4,614,166. This application May 7, 1986, Ser. No. 860,529
Int. Cl.[4] A01K *31/20*
U.S. Cl. 119—32 **28 Claims**



1. A poultry brooder comprising:
a canopy roof;
an inverted frusto-conical ceramic heat radiating element suspended beneath said canopy roof;
gas burner means beneath the center of said ceramic radiant element; and
direct spark ignition means disposed adjacent said gas burner means in the radiant path of said ceramic radiant element for igniting said gas burner, said direct spark ignition means including an electronic control unit, an electronic gas solenoid valve controlled by said electronic control unit and connected to the fuel source for said gas burner means, and a spark unit having a spark gap disposed over said gas burner means.

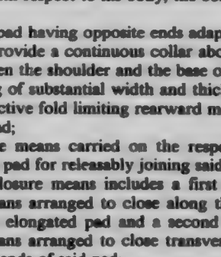
4,719,875

HOG FEEDER WITH FLEXIBLE AGITATOR

Carl W. Van Gilst, Goshen, Ind., assignor to Agri-Plastics, Inc., Goshen, Ind.

Filed Jun. 30, 1986, Ser. No. 880,069
Int. Cl.[4] A01K *5/00, 5/02*
U.S. Cl. 119—53.5 **28 Claims**

1. A device (10) for dispensing feed, which device comprises:
a hopper (14) having a lower portion (18), and having a discharge opening (28) in said lower portion;
a shaft (32), being disposed in said hopper;
actuator means (66), being operatively connected to said shaft, for imparting angular rotation to said shaft that is in a first direction; and
agitator means, comprising a flexible agitator (70) that is disposed in said hopper, that is operatively attached to said shaft, and that extends outwardly from said shaft for a first radial distance (74), for agitating feed in said hopper



that is proximal to said flexible agitator in response to said angular rotation of said shaft in said first direction, for elastically bending said flexible agitator in a first direction, and for reducing said first radial distance to a second radial distance (96, 106, or 110) in response to a first predetermined resistance of said feed to said angular rotation of said shaft in said first direction; whereby
said elastic bending and said reduction of said first radial distance to said second radial distance automatically limits the torque that is required to agitate said feed.

4,719,876

RESTRAINT COLLAR

Frank T. Wilken, 24308 Shrewsbury Cir., Canoga Park, Calif. 91307

Filed Jun. 5, 1986, Ser. No. 870,913
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—106 **1 Claim**



1. An animal restraint collar limiting the movement of the animal's head with respect to his body, the combination comprising:
an elongated pad having opposite ends adapted to be overlapped to provide a continuous collar about the animal's neck between the shoulder and the base of the neck;
said pad being of substantial width and thickness to gather into a restrictive fold limiting rearward movement of the animal's head;
double closure means carried on the respective opposite ends of said pad for releasably joining said ends together;
said double closure means includes a first hook and pile fastener means arranged to close along the longitudinal axis of said elongated pad and a second hook and pile fastener means arranged to close transversely about the overlapped ends of said pad;
said pad is composed of a soft, pliable cushion material covered with a fabric and said pad width is at least three times the dimensional thickness of said pad;
said double closure means being carried on said fabric stitched into said cushion material;

said longitudinal fastener means includes a hook strip carried on one of said pad ends midway between opposite edges thereof and a pile strip carried on the other pad end midway between the opposite edges thereof whereby said hook strip and said pile strip are in alignment when said opposite ends are overlapped;

said transverse fastener means includes at least two sets of hook strips arranged on said opposite edges of said one pad end extending normally to said longitudinal strips and at least two sets of pile strips arranged in parallel spaced apart relationship secured to said other pad end and said sets of hook strips adapted to extend over said overlapped pad edges to releasably engage with said pile strips; and

said transverse fastener means hook strips carried on the outer or external surface of said one pad end while said transverse fastener means pile strips are carried on the inner or internal surface of said other pad end whereby said hook strips fold over said overlapped pad ends from the external side to join with said pile strips on the inner side of said overlapped pad ends.

4,719,877

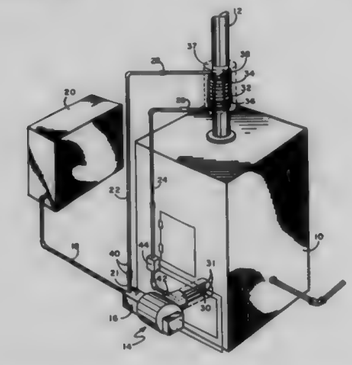
FUEL PREHEATER

Richard A. Delage, 82 May St., Biddeford, Me. 04005

Filed Nov. 21, 1986, Ser. No. 933,174

Int. Cl.[4] F22B *5/00*

U.S. Cl. 122—14 **7 Claims**



1. In combination with an oil burner having a nozzle for atomizing fuel fed to it under high pressure for burning in a boiler of the type having a supply line for carrying a heated medium therefrom and a pump for feeding the fuel from a reservoir at the desired high pressure to said nozzle, means for preheating said fuel comprising

a coil member wrapped around said line in heat transfer engagement therewith,

a fuel supply line extending from the outlet of said pump to one end of said coil member to direct pressurized fuel from the outlet of said pump through said coil member to be heated by heat transfer from said supply line;

a fuel feed line connecting the other end of said coil member to said nozzle for feeding pressurized preheated fuel thereto, and

thermal grease packed around said coil member to help conduct the heat from said heated medium in said supply line to said coil to preheat the fuel in said coil before it is burned.

4,719,878

INSTALLATION FOR HEATING LIQUIDS AT DIFFERENT TEMPERATURE LEVELS

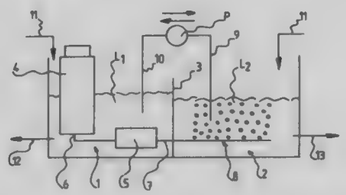
Georges Austruy, Villetaneuse; Francois Cagnon, Paris; Denis Di Paola, Argenteuil, and André Vinchon, Paris, all of France, assignors to Gaz de France, France

Filed Jul. 9, 1986, Ser. No. 883,739

Claims priority, application France, Jul. 17, 1985, 85 10974

Int. Cl.[4] F22B *1/02*

U.S. Cl. 122—31 R **5 Claims**



1. A heating installation comprising a first vat (1) containing a first liquid (L1), a second vat (2) containing a second liquid (L2), partition wall means (3) for separating the first liquid from the second liquid, an exchanger (5) immersed in the first liquid of said first vat (1), a burner (4) connected to said exchanger (5) for heating the first liquid through said exchanger and diffusing means (8) connected to said exchanger and immersed into the second liquid of said second vat (2) for independently heating the second liquid (L2) at a temperature different from and lower than that of the first liquid (L1) in said first vat.

4,719,879

INTAKE MANIFOLD

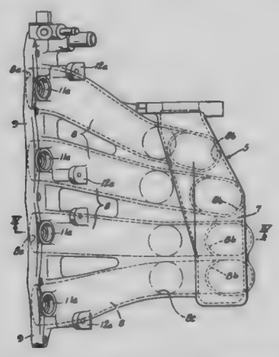
Seiji Kato, Saitama, and Masayuki Kumada, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,032

Claims priority, application Japan, Oct. 23, 1984, 59-221213; Oct. 23, 1984, 59-159162[U]

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 M **19 Claims**



1. An intake manifold employed for a multicylinder in-line engine having an oval intake port for each cylinder with each oval intake port having a major axis extending longitudinally in relation to a row of cylinders, comprising a distribution chamber adapted for mounted disposition on said engine with its longitudinal axis generally parallel to the major axes of said intake ports, one intake pipe for each cylinder communicating with said distribution chamber and extending laterally therefrom, a forward end portion on each intake pipe for connecting to said oval intake port of each said cylinder having a substantially oval shape with the major axes of said forward end portions being mutually aligned in a direction substantially parallel to said row of cylinders, and a rear end portion on each said intake pipe connected to the distribution chamber having a substantially oval shape with the minor axes of said rear end portions being mutually aligned in a direction substantially parallel to said row of cylinders.

4,719,880

TWO STROKE CYCLE INTERNAL COMBUSTION ENGINES

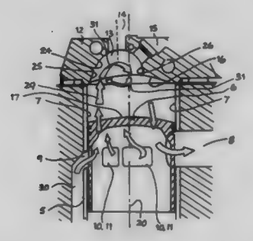
Christopher K. Schlunke, Kingsley, and Robert M. Davis, Mount Lawley, both of Australia, assignors to Orbital Engine Company Pty. Ltd., Balcatta, Australia

Filed May 23, 1986, Ser. No. 866,427

Claims priority, application Australia, May 24, 1985, PH0732

Int. Cl.[4] F02B *75/02*

U.S. Cl. 123—65 WA **25 Claims**



1. A two stroke cycle internal combustion engine having a cylinder, a cylinder head at one end of the cylinder, a piston mounted for reciprocation in the cylinder, and an inlet port and an exhaust port in the wall of the cylinder at substantially diametrically opposite locations in the cylinder, said ports being opened and closed in timed relation by the reciprocating piston, a cavity in the cylinder head extending in a generally diametral direction from adjacent the cylinder wall at a location directly above the inlet port, wherein the cylinder head and cylinder wall juncture form a transition zone for substantially smooth air flow from the inlet port to said cavity, an injector nozzle opening in an upper portion of the cavity from which fuel may be injected into the cylinder, the cavity having substantially parallel straight side edges in the direction of extension spaced apart a distance of about 0.35 to 0.65 of the diameter of the cylinder, and the longitudinal length of the cavity in said direction of extension being about 0.55 to 0.77 of the diameter of the cylinder.

4,719,881

OIL METERING DEVICE FOR SUPPLYING OIL TO A FUEL TANK

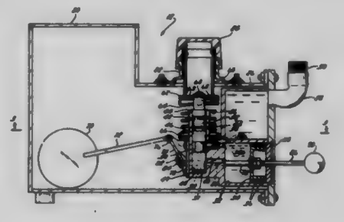
Theodore J. Holtermann, Milwaukee, and William F. Ziehm, Wauwatosa, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 31, 1984, Ser. No. 687,870

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 AD **22 Claims**

1. A fuel tank including a first container means adapted to contain a fuel mixture and including an inlet opening adapted to receive fuel, a second container means adapted to contain a second liquid, and means for selectively delivering a measured quantity of the second liquid from said second container means to said first container means when fuel is added to said first container means, the volume of the second liquid being delivered to said first container means being proportional to the volume of fuel added to said first container means, said means for selectively delivering a measured quantity of said second liquid including means defining a metering chamber and means for alternatively providing fluid communication between said



metering chamber and said first container means and between said metering chamber and said second container means.

4,719,882

ELECTROMAGNETIC-POSITIONING SYSTEM FOR GAS EXCHANGE VALVES

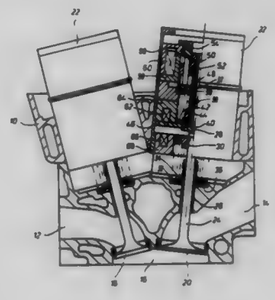
Peter Kreuter, Josef-Ponten Str. 38, Aachen 5100, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 850,938

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513105

Int. Cl.[4] F01L *9/04;* **H01F** *7/16*

U.S. Cl. 123—90.11 **20 Claims**



1. An improved actuator assembly for an electromagnetically-actuated positioning mechanism of spring-loaded valve-type reciprocating actuators in displacement machines, comprising in operative combination:

(a) means comprising an assembly for reciprocatingly actuating a valve member, said valve member being movable between a first, closed operating position to a second, open operating position;

(b) said reciprocating actuator assembly including a guide assembly comprising an anchor guide member and a single electromagnetically attractable anchor plate member secured adjacent one end thereof, said actuator assembly being disposed to permit said valve member movement;

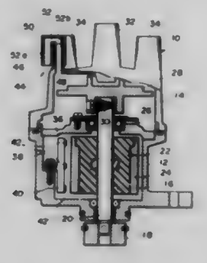
(c) at least one actuating solenoid disposed to selectively attract said actuator anchor plate into a position permitting said valve to move to said closed operating position;

(d) means for guiding said anchor guide member in reciprocating association therewith, said anchor guide member guiding the travel of said anchor plate into said position permitting said valve member operating position movement, and said guide means being reciprocable relative to said actuating solenoid;

(e) said guide assembly being separate from said valve member;

(f) said valve member comprising a valve stem free of an anchor plate; and said anchor guide member and said valve stem are disposed mutually coaxial;
(g) means for contacting one end of said valve stem disposed adjacent an end of said anchor guide member;
(h) said anchor guide member contact means is disposed spaced apart from said end of said valve stem when said valve is in said first, closed position;
(i) said anchor guide member contact means contacting said valve stem end upon selective actuation of said actuator anchor plate to move said valve into said second, open operating position;
(j) said space providing tolerance for valve stem heat expansion and valve travel adjustment; and
(k) an adjusting solenoid disposed in association with said guide means to cause said guide means to reciprocate relative to said actuating solenoid.

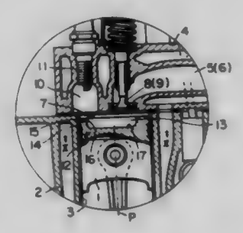
4,719,853
DISTRIBUTOR
Toshio Yokoyama, and Iwao Shimase, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1987, Ser. No. 39,008
Claims priority, application Japan, Apr. 15, 1986, 61-86785
Int. Cl.[4] F02P 7/02; H01R 39/00
U.S. Cl. 123—146.5 A 4 Claims



1. A distributor in which is accomodated is a magnetic rotating member which rotates in synchronization with the rotation of the crankshaft of an internal combustion engine, the improvement comprises:
said distributor is provided with an air vent portion having a magnetic trap means.

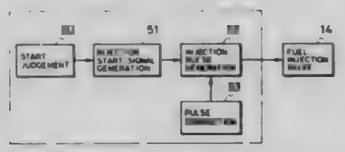
4,719,884
COMBUSTION CHAMBER WITH A DOMED AUXILIARY CHAMBER FOR A SPARK-IGNITION ENGINE
Yoshio Shinno, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Feb. 3, 1986, Ser. No. 825,581
Int. Cl.[4] F02B 19/12, 19/18
U.S. Cl. 123—269 11 Claims

1. A combustion chamber having a domed auxiliary chamber for a spark-ignition engine, comprising:
(a) a cylinder (7);
(b) a main combustion chamber (13) within the cylinder (7);
(c) a cylinder head (4) above the cylinder (7);
(d) a domed auxiliary chamber (10) having a circumference and being formed in a hollow portion of the cylinder head, a part of the circumference extending over the main combustion chamber (13);
(e) a spark plug (11) in the domed auxiliary chamber (10);
(f) a piston having a piston head (12) thereon positioned in the cylinder (7); and
(g) said piston head being provided with a connecting channel (15) in an annular bank around the main combustion chamber (13) and being positioned opposite the auxiliary chamber (10), the channel (15) having a bottom (16)



stepped higher than a bottom (17) of the main combustion chamber (13).

4,719,885
ELECTRONIC CONTROL FUEL INJECTION DEVICE
Masami Nagano, and Takeshi Atago, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan
Filed Feb. 2, 1987, Ser. No. 9,921
Claims priority, application Japan, Jan. 31, 1986, 61-17952
Int. Cl.[4] F02N 17/00; F02D 41/06
U.S. Cl. 123—179 L 8 Claims

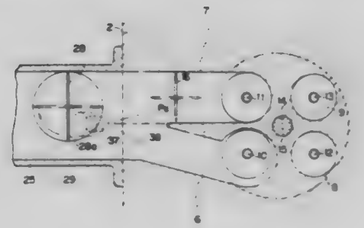


1. An electronic control fuel injection device comprising
(a) a fuel injection valve (14) disposed in an intake system and driven electrically,
(b) start judgement means (50) for judging the cranking state of an internal combustion engine (8),
(c) fuel injection start signal generation means (51) for generating an injection start signal determining the injection start timing of said fuel injection valve (14) when said start judgement means (50) judges the cranking state; and
(d) injection pulse generation means (52) for generating a injection pulse for opening said fuel injection valve (14) between preceding and succeeding injection start signals generated from said injection start signal generation means (51),
characterized in that further comprising pulse correction means (53) for controlling said injection pulse generation means (52) in such a manner that the number of said injection pulses is increased with a lower temperature of said internal combustion engine (8).

4,719,894
INTERNAL COMBUSTION ENGINE SIAMESE PORT TYPE INTAKE SYSTEM CONSTRUCTION WITH DEFLECTION VALVE ADDITIONAL TO INTAKE CONTROL VALVE
Takeshi Kotani, and Soichi Matsushita, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Nov. 4, 1986, Ser. No. 927,045
Claims priority, application Japan, Nov. 8, 1985, 60-250422
Int. Cl.[4] F02B 15/00
U.S. Cl. 123—308 6 Claims

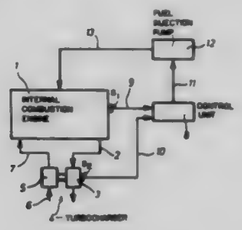
1. An intake system construction for an internal combustion engine formed with a combustion chamber, comprising:

a generally straight first intake port opening to said combustion chamber;
a generally helical second intake port also opening to said combustion chamber;
a common intake passage leading to upstram end of said first and said second intake port;



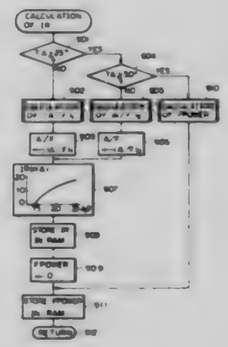
a control valve fitted in said first intake port so as selectively to throttle said first intake port; and
a deflection valve fitted in said common intake passage so as selectively to constrict a part of a cross sectional opening of said common intake passage and to deflect intake flow therethrough towards said second intake port and away from said first intake port.

4,719,887
CONTROL ARRANGEMENT FOR A FUEL INJECTION SYSTEM
Friedrich Schmid, and Karl Maderthaner, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Continuation of Ser. No. 386,070, Jun. 7, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 728,028
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122333
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—383 6 Claims



1. A control arrangement for a fuel-injected supercharged internal combustion engine, the control arrangement comprising a fuel injection pump means, a control means for adjusting an output of fuel injection pump means, and means for sensing instantaneous operating parameters of the engine and a supercharging means and for supplying output signals of the sensed parameters to the control means whereby the fuel injection pump means is controlled in dependence upon the instantaneous sensed parameters and quantity of combustion air supplied by the supercharging means, and wherein the sensed parameters are an instantaneous rotational speed of the engine and an instantaneous rotational speed of the supercharging means.

4,719,888
METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE
Nobuyuki Kobayashi; Takashi Hattori, and Toshimitsu Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 7, 1985, Ser. No. 731,524
Claims priority, application Japan, May 7, 1984, 59-89240
Int. Cl.[4] F02B 3/00
U.S. Cl. 123—440 4 Claims



1. A method for controlling the air-fuel ratio in an internal combustion engine having a throttle valve therein, comprising the steps of:
detecting an intake air pressure of said engine;
detecting an opening of said throttle valve;
controlling the air-fuel ratio of said engine so that said air-fuel ratio is close to a power fuel increment air-fuel ratio by which a torque output of said engine is at a maximum when the opening of said throttle valve is larger than a first predetermined value;
calculating a first target air-fuel ratio which changes continuously in accordance with the detected intake air pressure and which is leaner than said power fuel increment air-fuel ratio, when the opening of said throttle valve is between said first predetermined value and a second predetermined value smaller than first predetermined value;
loading a second target air-fuel ratio independent of the detected intake air pressure, when the opening of said throttle valve is between said first and second predetermined values, said second target air-fuel ratio being such that performance of said engine is not degraded even when the controlled air-fuel ratio is changed rapidly from said second target air-fuel ratio to said power fuel increment air-fuel ratio, thereby rapidly changing the output torque of said engine, said second target air-fuel ratio being leaner than said power-fuel increment air-fuel ratio;
controlling a feedback of the air-fuel ratio of said engine so that the air-fuel ratio approaches a richer air-fuel ratio between said first and second target air-fuel ratios, when the opening of said throttle valve is betweeen said first and second predetermined values; and
controlling the feedback of said air-fuel ratio of said engine so that said air-fuel ratio approaches said first target air-fuel ratio, when the opening of said throttle valve is smaller than said second predetermined value.

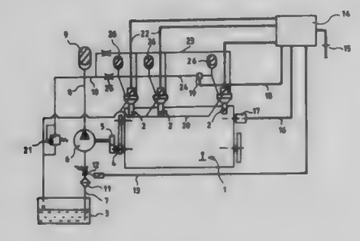
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4,719,889

FUEL INJECTION INSTALLATION FOR AN INTERNAL COMBUSTION ENGINE

Gernot Amann, Hohenems, Austria, and Christian Mathis, Arbon, Switzerland, assignors to Dereco Dieselmotoren Forschungsund Entwicklungs-AG, Arbon, Switzerland and IVECO Fiat S.p.A., Turin, Italy

Filed Jan. 20, 1987, Ser. No. 4,706
Claims priority, application Switzerland, Jan. 22, 1986, 237/86
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 12 Claims



1. A fuel injection installation for an internal combustion engine having engine cylinders, especially a diesel engine, comprising:

at least one electrically operated fuel injector provided for each engine cylinder;

a continuously delivering fuel pump operatively associated with the fuel injectors;

a common pressure reservoir connected upstream of the fuel injectors and subject to the action of the continuously delivering fuel pump as a function of engine speed and load;

each fuel injector being provided with an annular chamber, a throttle and a channel;

said common pressure reservoir being continuously connected by means of the annular chamber and the throttle to the channel in each fuel injector;

a solenoid valve provided for each fuel injector and operable for each fuel injection process;

each fuel injector comprising means defining a fuel injection opening for feeding fuel to the associated engine cylinder;

each fuel injector further comprising a nozzle needle cooperating with said fuel injection opening for closing said fuel injection opening;

a pressure chamber provided for each fuel injector at a location directly upstream of the fuel injection opening;

a fuel return pipe operatively associated with each of said fuel injectors;

said solenoid valve of each fuel injector when operated connecting said channel of the related fuel injector to said fuel return pipe and thereby relieving the nozzle needle closing the fuel injection opening and releasing the discharge of fuel from said pressure chamber located directly upstream of the fuel injection opening;

means providing a further pressure chamber for each fuel injector and located in the region thereof;

each fuel injector further containing channel means having a length matched to a predetermined ignition delay time; and

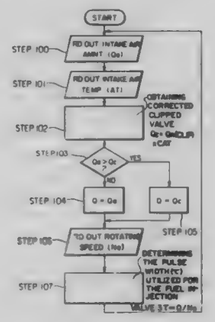
said pressure chamber located directly upstream of the fuel injection opening of each fuel injector being connected by said channel means to said further pressure chamber associated with such fuel injector and by means of said further pressure chamber to the common pressure reservoir.

4,719,890

FUEL CONTROL APPARATUS FOR ENGINE

Seiji Wataya; Setsuhiro Shimomura, and Yukinobu Nishimura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1986, Ser. No. 897,253
Claims priority, application Japan, Aug. 20, 1985, 60-182702
Int. Cl.[4] F02D *41/18*
U.S. Cl. 123—488 6 Claims



1. A fuel control apparatus for an engine comprising:

an air flow sensor for detecting and producing an output representing intake air amount flowing through an intake passage of the engine,

an operating state sensor for detecting and producing an output representing an operating state of the engine,

a controller means for calculating and producing an output signal representing optimum value of fuel supply amount in accordance with the outputs of said sensors,

fuel injecting means controlled by the output signal of the controller for injecting fuel to the intake passage of the engine,

a temperature sensor for detecting the temperature of the intake air and

wherein said controller means, in the operating range of the engine where the output of said air flow sensor does not exhibit the true value of the intake air amount due to reverse-flow of the intake air of the engine, sets at least one upper limit value of the intake air amount in response to the operating state of the engine, and wherein the upper limit value is corrected according to the temperature of the intake air detected by said temperature sensor.

4,719,891

ELECTRONIC CONTROLLER FOR INTERNAL COMBUSTION ENGINES

Wolfgang Porth, Frankfurt am Main; Wolfgang Weißler; Eckhart Kern, both of Hofheim; Thomas Hannewald, Griesheim, and Reiner Weingärtner, Hofheim, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1986, Ser. No. 926,454
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3539012
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—494 11 Claims

1. In a system having an electronic controller for an internal combustion engine, particularly injection engines, in which the controller is functionally connected to a plurality of sensors and at least one actuator, the improvement comprising:

an assembly including the controller; and wherein the assembly further comprises:

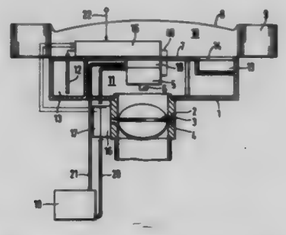
a throttle-valve mechanism, an air-mass sensor, a throttle-valve position sensor and an injection valve;

a length of pipe;

a housing connected to an intake port of the internal combustion engine by said length of pipe; and wherein

said throttle-valve mechanism is provided in said length of pipe; and

an air filter assembly which has a circular air filter and is located on an outer wall of the housing; and wherein



a flow channel connects an inner space of the filter assembly, formed by the circular air filter, to the inside of the housing, said air-mass sensor being located within said flow channel; and wherein

the electronic controller is located on the outer wall of the housing and extends into the inside of the air-filter assembly.

4,719,892

CAVITY CLOSURE WITH ISOLATOR SEAL AND METHOD

Jose M. Lopez-Crevillen, Westland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1986, Ser. No. 878,725
Int. Cl.[4] F02B *77/11*
U.S. Cl. 123—198 E 8 Claims



1. A vibration resistant cover for closing an opening extending longitudinally through a cavity defining wall of a housing subject to noise including vibration, said wall having an outer face and an inwardly facing peripheral surface about the opening adjacent said face, said cover comprising

a rigid outer rim having a flange operatively engageable with the wall outer face and adapted to be secured thereto, said rim also having an inwardly extending support portion including a lip extending longitudinally from adjacent the flange to an inturned portion with a continuous inner edge,

a rigid central panel extending laterally within the rim support portion and having an outer portion with a continuous outer edge parallel with, of similar configuration to and longitudinally offset from the inner edge of the rim support portion, and

a bead of resilient vibration absorbent elastomer secured to said rim support portion and to said panel outer portion and sealing a peripheral gap between said offset inner and outer edges, said bead including a compressible edge extending laterally outward from the longitudinal lip and which upon installation sealingly engages the peripheral surface of said wall around the opening to thereby seal against leakage between the cover and the opening,

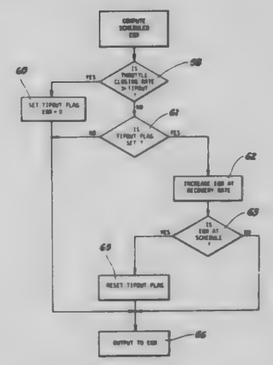
said bead further acting to seal and to provide resilient damping between the central panel and the outer rim so as to close the opening and limit the transmission of housing vibrations to the central panel, thereby minimizing the generation of noise by the panel.

4,719,893

INTERNAL COMBUSTION ENGINE WITH THROTTLE TIPOUT DILUTION REDUCTION

Kenneth J. Buslepp, Utica; Kenneth J. Ciupinski, Sterling Heights, and James H. Currie, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1987, Ser. No. 24,289
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 3 Claims



1. An internal combustion engine comprising fuel charge supply apparatus including a throttle effective to control the mass airflow to a combustion chamber, fuel supply apparatus effective to form a combustible fuel charge therein and dilution control apparatus effective to control the admittance of exhaust gasses to the fuel charge to thereby control the dilution thereof according to a predetermined schedule, the engine being of the type which responds to a throttle tipout condition with a sudden, unscheduled increase in dilution, the engine further combprising:

first means effective to detect a throttle tipout condition comprising a rate of throttle closing exceeding a predetermined reference rate and decrease the dilution from the scheduled value to its minimum value during the existence of the throttle tipout condition; and

second means to detect the end of the throttle tipout condition and return the dilution to its scheduled value at a controlled rate.

4,719,894

EXHAUST GAS REFLUX APPARATUS

Akira Onada, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 30, 1985, Ser. No. 782,254
Claims priority, application Japan, Oct. 2, 1984, 59-206792
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 7 Claims

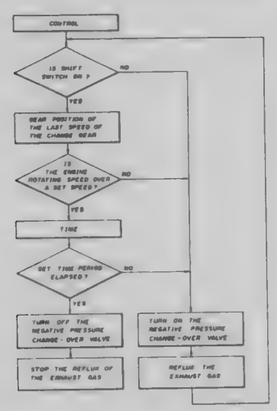
1. An exhaust gas reflux apparatus comprising:

EGR regulating valve means for controlling a reflux amount of an exhaust gas which is refluxed into an intake system of an internal combustion engine; having at least two operating states;

sensing means for sensing the operating state of said engine;

first control means responsive to said sensing means for detecting the start of a predetermined one of said operating states of the engine, in which the temperature of the exhaust gas becomes high;

timer means responsive to detection by said first control means of the start of said predetermined operating state for measuring a time delay, said time delay beginning immediately after and only in response to said detection of the start of said predetermined operating state and expiring a predetermined time interval thereafter; and



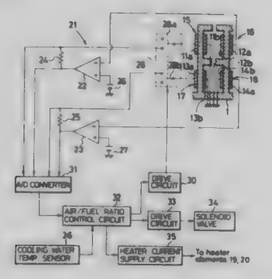
second control means responsive to said timer means for controlling said EGR regulating valve means to stop the reflux of said exhaust gas immediately after expiration of said predetermined time interval.

4,719,895

METHOD FOR CONTROLLING AN OXYGEN CONCENTRATION SENSOR

Toshiyuki Mieno; Toyohei Nakajima; Yasushi Okada, and Nobuyuki Oono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 946,402
Claims priority, application Japan, Dec. 26, 1985, 60-294407
Int. Cl.[4] F02M *23/00*
U.S. Cl. 123—589 **1 Claim**



1. A method for controlling an oxygen concentration sensor mounted on an internal combustion engine having an exhaust gas passage, which sensor includes: a pair of oxygen ion conductive solid electrolyte members with electrodes and disposed in said exhaust gas passage; one of said oxygen io conductive solid electrolyte members being operative as an oxygen pump element, and the other of said oxygen ion conductive solid electrolyte members being operative as a sensor cell element for measuring an oxygen concentration ratio; a pump current source for supplying a pump current to be supplied across said electrodes of said oxygen pump element; and a heater element arranged to heat said oxygen ion conductive solid electrolyte members when a heater current is supplied thereto, said method comprising:

a detection step for detecting a temperature of the engine immediately before a start of a supply of said heater current; and

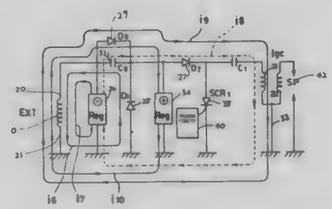
a control step for controlling a supply of said pump current so that the supply of said pump current is started when an elapse of more than a time period determined correspondingly to said temperature of the engine from a time of the supply of said heater current, is detected.

4,719,896

CAPACITIVE DISCHARGE IGNITION DEVICE

Hitoshi Nakayama; Nobuo Miura, both of Wako; Yoshio Morita, Hidaka, and Masami Kawabe, Yono, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jan. 13, 1987, Ser. No. 2,969
Claims priority, application Japan, Feb. 14, 1986, 61-29962
Int. Cl.[4] F02P *3/09*
U.S. Cl. 123—599 **3 Claims**



1. A capacitive discharge ignition device wherein alternating electric power generated by a generator coil is discharged to an ignition coil by a switching element after charging the alternating electric power in a first capacitor to provide an electric spark for igniting an engine characterized in that the device comprises

first bypass means for charging a second capacitor during one half cycle of the alternate electric power and for bringing said generator coil to a short circuit or substantially short circuit condition after charging, and for charging said first capacitor from said second capacitor, and

second bypass means for charging said first capacitor from said generator coil during the other half cycle of the alternating electric power and for bringing said generator coil to the short circuit or substantially short circuit condition.

4,719,897

COCKING MECHANISM FOR CROSSBOW

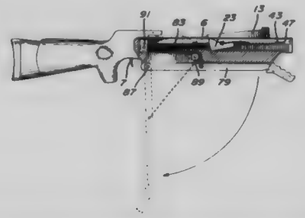
Jacques Gaudreau, 7265 Lacordaire #38, Montreal, Quebec, Canada H1S2A5

Filed Apr. 24, 1986, Ser. No. 855,386
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—25 **11 Claims**

1. A cocking mechanism for a crossbow, said crossbow including an elongated frame formed at one end with a stock containing a triggering mechanism including a trigger and a latch member and a barrel member at the other end, said barrel having a front part and a rear part, said barrel member including a slide to mount an arrow, and a bow and string combination disposed on said barrel at the front part thereof and associated with said slide, said cocking mechanism comprising

a sliding channel formed in said barrel, said sliding channel being rectangular and having a forward end and a rearward end, said rearward end extending to said triggering mechanism in open communication therewith,

a string engaging member slidably disposed in said channel, said string engaging member comprises a U-shaped device having a flat bottom and upstanding side walls, each upstanding side wall formed with a hook near the upper end thereof facing said rearward end of said channel, said hook being engageable with said string, said rectangular channel having a depression formed therein at said forward end thereof so that when said U-shaped device is at the forward end of said rectangular channel it sits therein at a lower level than when it slides in said channel toward said triggeringmechanism, thereby preventing said U-shaped device including said hooks from obstructing said arrow upon release thereof,



said slide is disposed in said channel, said U-shaped device is adapted to travel between the bottom of said channel and said slide, said slide comprising a pair of flanges at the forward end of said channel, said flanges terminating in upwardly inclined steps, an inclined ramp formed in said channel to connect said depression to the bottom of said channel so that when pulling said U-shaped device toward said triggering mechanism, said U-shaped device will rise by riding on said ramp and said hooks will rest against said flanges until reaching said upwardly inclined steps when they engage said string,

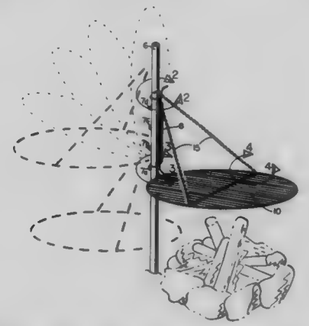
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4,719,898

INSTANT OUTDOOR COOK GRILL

Robert E. Stanislawski, 639 Clarks La., Winona, Minn. 55987

Filed Nov. 22, 1985, Ser. No. 806,175
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 R **7 Claims**



1. A portable, horizontally and vertically adjustable, and foldable grill comprising:

a. a vertical post, including a plurality of spaced shelf protrusions in line and permanently fixed along a longitudinal line of said post; and

b. a grill surface having a perimeter rim wire and,

c. a first and a second flexible suspension member; and

d. a hanger support for hinge joining said grill surface and said first and second flexible suspension members engaged to said vertical post, and all said elements together composing a unit-assembled-apparatus with a non-seizing positioning means for suspending said grill surface horizontal in a vast multitude of rigid positions high, low, and sideways for suspending food for cooking over and away from a heat source and said unit-assembled-mechanism having a self-folding means for folding fully assembled into a flat package for clean compact storage. transport, and shipping and providing instant set-up between uses, said hanger support comprising:

first and second rigid bearing ring members held sufficiently far apart and exteriorly joined in line on their common bearing ring axis by permanent fixed attachment at four points of joining adjacent to the ends of two sufficiently long rigid stringer members, said first and second rigid bearing ring members being adapted for simultaneous complete pivotal engagement over said vertical post and individual thrust engagement on top of any one of said shelf protrusions, and each said rigid bearing ring member having sufficient opening in its' minor arc of said joining with said stringers to allow clear passage of said shelf protrusions through said openings, and the portion of first and second said stringer members intermediate first and second said bearing ring members formed sufficiently radially distant from said common bearing ring axis for said stringer members to radially clear the ends of said shelf protrusions during pivotal travel of said hanger support engaged about said vertical post, each said stringer member terminating in a loop at one first end common to first said bearing ring member, first and second said loop of first and second said stringer members comprising together a hinge means for hinge joining over the perimeter rim wire of said grill, the second end of first and second said stringer members each extending upward beyond said points of joining at said second rigid bearing ring thereat providing first and second tabs for attachment of top ends of said first and second flexible suspension members to said first and second tab members and the bottom ends of said first and second flexible suspension members permanently assembled to opposing ends of a diametrical rib of said grill surface to suspend said grill surface substantially horizontal to said vertical post, whereby said hinge means in conjunction with the flexible nature of said suspension members provide said self-folding means for said grill in said unit-assembled-apparatus to fold flat against said vertical post for compact storage without disassembly.

4,719,899

DEPOT FOR GRANULAR CARBONACEOUS FUEL AND METHOD EMPLOYING THE SAME TO PROVIDE HIGH EFFICIENCY FIRES FOR CHARBROILING AND THE LIKE

William H. Burkhart, Los Altos, Calif., assignor to Bar-B-Quik Corp., Los Altos, Calif.

Filed Sep. 3, 1986, Ser. No. 904,003
Int. Cl.[4] F23H *13/02*
U.S. Cl. 126—163 R **44 Claims**

33. A method of providing a high temperature fire of loose granular carbonaceous fuel comprising,

providing refractory basket means for holding the granular carbonaceous fuel to be burned,

providing a plurality of open-ended porous refractory flues through said basket means, which flues have pores small enough to prevent the granular fuel and ashes thereof from entering the flues yet allow diffusion of air from the flue to the fuel and allow exit of the gaseous products of combustion into said flues,

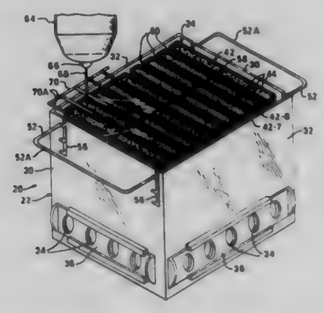
providing said flues with a hydraulic diameter that is no larger than necessary to supply the amount of air needed for rapid, high-temperature combustion of the fuel and with a flue surface area that is substantially greater than the flue cross sectional area.

36. A depot for granular carbonaceous fuel comprising,

refractory basket means for holding loose granular carbonaceous fuel,

an array of open ended flues extending through said basket means for entrance of air at one end and exit of flue gases from the other end,

said flues having porous walls through which air may diffuse from the flue into the carbonaceous fuel contained in the basket means, and through which gaseous products of combustion of said fuel may simultaneously diffuse from the burning fuel into the flues,



said porous flue walls having pores small enough to contain the fuel and ash granules and prevent their movement into the flues,

said flues having a predetermined hydraulic diameter such that during burning of the fuel a minimum of radiant energy is emitted from the ends of the flues yet sufficient air enters the flue to support high temperature combustion of the fuel.

4,719,900

GRATE FOR USE IN INDUSTRIAL FURNACES

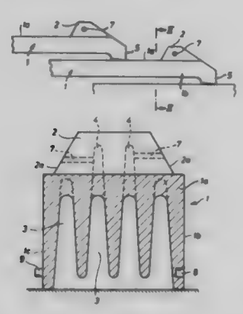
Walter J. Martin, Leopoldstrasse 248, D-8000 München 40, Fed. Rep. of Germany

Filed Jun. 11, 1986, Ser. No. 873,011

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521266

Int. Cl.⁴ F23H *11/00*

U.S. Cl. 126—163 R **19 Claims**



1. In a grate, particularly for use in industrial furnaces, a grate bar comprising a top wall having a front end and a rear end; a front wall extending substantially transversely of and downwardly from the front end of said top wall; and a pair of sidewalls flanking said top wall and extending downwardly therefrom, said walls defining at least one air admitting passage and said top wall having at least one hollow upward extension adjacent said front end and defining a portion of said passage, said extension having at least two lateral openings constituting outlets which connect said portion of said passage with the surrounding atmosphere.

4,719,901

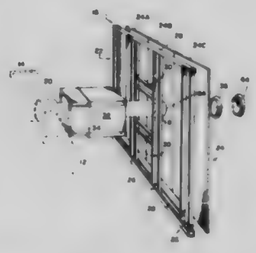
FLUE PIPE INSTALLATION THROUGH FLAMMABLE WALLS

Stephen D. McLaughlin, R.F.D. 1, Box 101, Lincolnville, Me. 04849

Filed Jan. 23, 1987, Ser. No. 6,499

Int. Cl.⁴ F23J *13/00*

U.S. Cl. 126—314 **7 Claims**



1. In combination with a flammable wall in a building a non-flammable pass-through unit mounted in a framed opening in said wall as a substitute wall section for the purpose of allowing the safe installation of a heating appliance, such as a wood or coal stove, in registry with a flue opening in an existing chimney located behind the wall comprising

a metal frame composed of vertical metal studs and horizontal channel members,

said metal frame adapted to fit an opening framed in a new flammable wall or cut and framed in an existing flammable wall as a substitute for a corresponding wood framed section of an existing wall of a building,

said metal frame defining a square opening which, when the frame is installed, is centered on the axis of the chimney flue opening,

a tunnel lined with non-flammable, heat resistant matting fitted into said opening and butting against said chimney and centered on said axis, and

non-flammable sheathing covering the face of said frame,

said sheathing defining an opening centered on said axis for receiving a thimble and a stove pipe and adapted, when installed, to have its surface flush and merging with the surface of the flammable wall.

4,719,902

LIGHT TRANSMISSIVE INSULATION APPARATUS

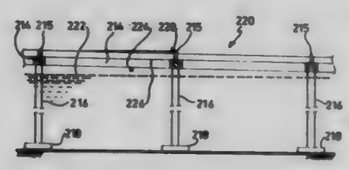
Shimon Klier, Simtat Magal 4, Savyon, and Ofer Novik, Rehovot, both of Israel, assignors to Shimon Klier, Savyon, Israel

Continuation-in-part of Ser. No. 800,915, Nov. 25, 1985, which is a continuation of Ser. No. 541,119, Oct. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 363,451, Mar. 30, 1982, Pat. No. 4,480,632. This application Mar. 17, 1986, Ser. No. 839,967

Int. Cl.⁴ F24J *2/42*

U.S. Cl. 126—415 **2 Claims**

1. A solar pond comprising a body of liquid material sought to be heated, a layer of solar spectrum radiation transmissive insulation arranged to lie over said body of liquid material in a non-contact spaced relationship therewith so as to form an air gap therebetween, wherein said layer of solar spectrum radiation transmissive insulation comprises an array of cells generally transmissive to solar spectrum radiation and generally opaque to thermal radiation, the array being surrounded by a generally sealed enclosure comprising planar glass panels defining top, bottom and side surfaces and being joined by sealing means, said enclosure including venting apparatus for permitting communication between the interior and exterior of the enclosure, each of said cells in said array having a uniform non-rectangular planar cross section and an aspect ratio which is selected from a range between 5 and 50 to minimize free convection therethrough, the insulation apparatus being configured such that only a single layer of cells is disposed between the liquid material sought to be heated and the sun, said non-contact spaced relationship being provided by a fixed support secured to the bottom of said solar pond for mounting said solar radiation transmissive insulation thereon, said air gap minimizing scale buildup on said enclosure bottom surface and providing insulation against heat loss from the pond.



4,719,903

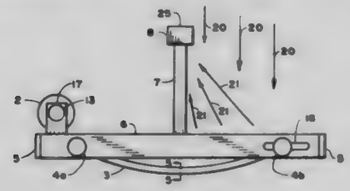
VARIABLE APERTURE, VARIABLE FLUX DENSITY, AEROSPACE SOLAR COLLECTOR

Roger A. Powell, 1589 Vernon Rd., Norristown, Pa. 19401

Filed Nov. 21, 1985, Ser. No. 800,219

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—438 **13 Claims**



1. A solar collector for use in space, having a longitudinal axis, comprising:

a. a plurality of curved rib members transverse to said longitudinal axis,

b. a plurality of elongated members, having axes parallel to said longitudinal axis, and being attached to the ends of said curved rib members, whereby acting to separate said curved rib members,

c. a sheet of thin reflective material attached to and disposed between said curved rib members, said sheet of thin reflective material assuming a substantially cylindrical shape as dictated by said curved rib members, said sheet of thin reflective material reflecting and concentrating direct incident solar energy from its concave side to a line of focus, said line of focus having a flux density,

d. an elongated receiver, comprised of a first element that converts concentrated radiant energy into electrical energy and a second element located transversely of said first element for converting concentrated radiant energy into thermal energy, having an axis parallel to said longitudinal axis, receiving concentrated radiant energy reflected from the concave side of said sheet of thin reflective material, and located substantially at said line of focus of said sheet of thin reflective material,

e. means for structurally interconnecting said elongated receiver and said plurality of curved rib members,

f. means for relocating said line of focus to a plurality of transverse locations on said elongate receiver such that incoming energy to each of said first and second elements can be proportioned to match load requirements.

4,719,904

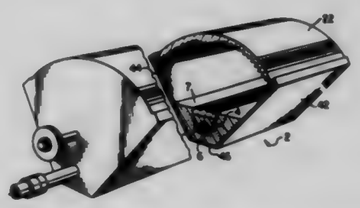
SOLAR THERMAL RECEIVER

Mark J. O'Neill, Richardson, Tex., assignor to Entech, Inc., DFW Airport, Tex.

Division of Ser. No. 701,308, Feb. 13, 1985, Pat. No. 4,672,949. This application Jul. 22, 1986, Ser. No. 887,931

Int. Cl.⁴ F24J *2/08*

U.S. Cl. 126—440 **8 Claims**



1. A radiant energy collector including a housing for supporting means for focusing along a focal axis of the collector incoming radiation onto a thermal energy receiver, the housing supporting the means for focusing in a position to receive the incoming radiation and also supporting along the focal axis the thermal energy receiver, the thermal energy receiver comprising:

support means mounted within said housing generally along the focal axis of the collector;

a conduit positioned in the support means in a position extending along the longitudinal axis;

an energy absorber in thermal contact with said conduit and positioned between said means for focusing and said conduit, said energy absorber have a black surface exposed to the means for focusing;

a dielectric layer of a thermally insulating material transperent to incoming radiation and in thermal contact with the black surface of the energy absorber and positioned between the means for focusing and said energy absorber to receive the focused radiation and transmit such radiation to said absorber, said layer having a thickness between said means for focusing and said energy absorber greater than several wavelengths of the incoming radiation to minimize thermal losses from the absorber.

4,719,905

APPARATUS AND METHOD FOR MAINTAINING VERTEBRAE IN A DESIRED RELATIONSHIP

Arthur D. Steffee, Moreland Hills, Ohio, assignor to AcroMed Corporation, Cleveland, Ohio

Continuation of Ser. No. 793,901, Nov. 1, 1985, Pat. No. 4,648,388. This application Dec. 1, 1986, Ser. No. 936,314

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—69 **13 Claims**

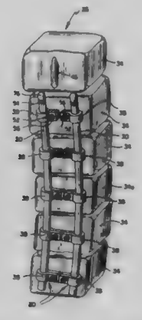
1. An apparatus for maintaining vertebrae in a desired relationship, said apparatus comprising:

a rod, said rod being deformable to a configuration which is a function of a desired curvature of a spine, said rod having a sufficient length and rigidity to maintain the vertebrae in the desired relationship;

clamp means for gripping a portion of said rod, said clamp means having a clamp portion which includes inner surfaces which circumscribe said rod, said clamp means also having a base portion projecting outwardly from one side of said clamp portion, said base portion includes surface

means defining an opening which is offset to one side of said rod; and

fastener means for securing said clamp means to a vertebra and for pressing said inner surfaces of said clamp means against an outer side surface of said rod to hold said rod against axial and rotational movement relative to said



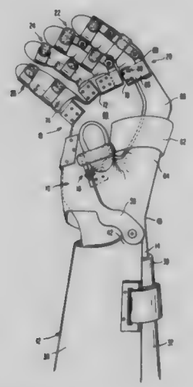
clamp means, said fastener means including an externally threaded member extending through the opening in said base portion and having a central axis extending transversely to a central axis of said rod, said externally threaded member including threads for engaging a vertebra disposed on a first side of said clamp means.

4,719,906

UNIVERSAL ARTICULATED SPLINT

Rose DeProspero, Rte. 2, Box 79, Ireland, W. Va. 26376

Filed May 7, 1987, Ser. No. 46,756
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 A **10 Claims**



1. A hand splint comprising:

a palmar hand support for receiving and supporting the hand of a patient;

a plurality of finger supports for receiving and supporting the individual fingers of a patient, each said finger support including;

(a) a proximal piece including a connector tab for rigid connection to said palmar hand support and a first longitudinally extending finger guide, said proximal piece being shaped to receive the proximal phalange of a patient's finger;

(b) a middle piece including a second longitudinal finger guide and a first depending phalangeal support band shaped to receive and support the middle phalange of a patient's finger; and

(c) a distal piece including a third longitudinal finger guide and a second depending phalangeal support band shaped to receive and support the distal phalange of a patient's finger;

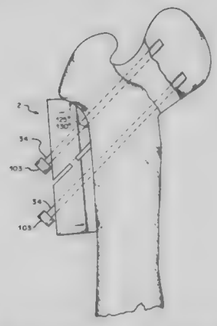
(d) wherein said proximal piece is joined to said middle piece by a first adjustable, locking, articulating joint and wherein said middle piece is joined to said distal piece by a second adjustable, locking articulating joint, each said joint including adjustment means for locking the joint in a selectable fixed position and for releasing the joint to permit selection of a different fixed position as required by the needs of the patient; and securing means for holding the patient's hand and fingers in place in said hand splint.

4,719,907

ORTHOPEDIC PIN PLACEMENT GUIDE

Victor F. Banko, Dover, N.J., and Robert E. Zickel, Hastings on the Hudson, N.Y., assignors to Orthospec, Inc., Spring Valley, N.Y.

Filed Mar. 18, 1987, Ser. No. 27,301
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VD **20 Claims**



1. Guide device for the placement of a pin in the orthopedic treatment of bone fractures, said device comprising a body having a first opening for guiding therethrough a pin for placement in the orthopedic treatment of a bone fracture, said body having a frangible portion for separating said body from about said pin, whereby said body is removable while said pin remains in place within said bone.

4,719,908

METHOD AND APPARATUS FOR IMPLANTING A PROSTHETIC DEVICE

Robert G. Averill, Ringwood, and Christopher G. Sidebotham, Bergenfield, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Aug. 15, 1986, Ser. No. 897,139
Int. Cl.[4] A61E *5/04*
U.S. Cl. 128—92 VW **31 Claims**

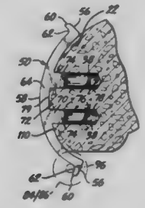
1. Apparatus for preparing a seating surface of prescribed area and contour on the bone of a joint at which a prosthetic device is to be implanted, the bone having been provided with at least a partially prepared site for locating and seating a component part of the prosthetic joint at the seating surface, said apparatus comprising:

a contouring guide having opposite ends and an upper locator surface extending longitudinally along the contouring guide between the opposite ends;

the upper locator surface having a profile contour essentially matching the contour of the prescribed area of the seating surface;

holding means integral with the contouring guide for holding the contouring guide on the bone at the site with the upper locator surface placed at a predetermined location relative to the bone above the bone and along the bone; and

a cutter having a cutting surface and a bearing surface adjacent to the cutting surface, the bearing surface being located relative to the cutting surface and the upper locator surface of the contouring guide such that upon engage-



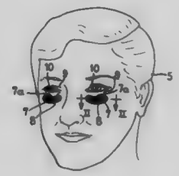
ment of the bearing surface with the upper locator surface the cutting surface will enter the bone up to a limited depth of cut determined by the predetermined location of the upper locator surface above the bone and upon longitudinal translation of the bearing surface along the contouring guide, the cutting surface will cut the bone along a limited length of cut determined by the length of the upper locator surface along the bone to prepare the seating surface of prescribed area and contour.

4,719,909

UNDER-EYE LIGHT ABSORBING DEVICE AND METHOD

Ronald L. Micchia, and Sandra K. Micchia, both of 8558 Harvest Home Dr., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 852,107, Apr. 14, 1986, abandoned. This application Oct. 14, 1986, Ser. No. 917,968
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **16 Claims**



11. A method of absorbing incident light from the skin area on the zygomatic arch of a user along the lower side of the orbit, comprising:

applying a black pliable porous patch to said skin area to substantially cover said skin area of the zygomatic arch and substantially reduce reflections of light from the area of the zygomatic arch toward the eyes; and

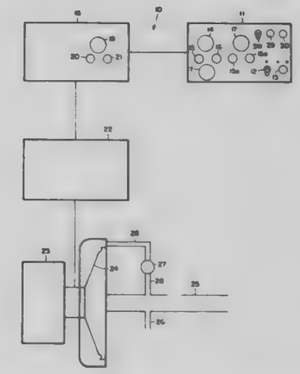
adhesively attaching said patch to said skin area by a pressure sensitive adhesive to removably retain said patch over said skin area of the zygomatic arch and reduce the chance of inadvertent removal of said patch from said skin area.

4,719,910

OSCILLATING VENTILATOR AND METHOD

Robert L. Jensen, 8603 Botts La., San Antonio, Tex. 78217

Continuation-in-part of Ser. No. 728,146, Apr. 29, 1985, abandoned, Continuation of Ser. No. 519,387, Aug. 1, 1983, abandoned, Continuation-in-part of Ser. No. 485,900, Apr. 18, 1983, abandoned, Continuation-in-part of Ser. No. 358,648, Mar. 16, 1982, abandoned. This application Sep. 13, 1985, Ser. No. 776,014
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.21 **12 Claims**



1. A high frequency oscillating ventilator comprising:

a source of gas;

a housing including a magnet and having a diaphragmatically sealed piston mounted therein;

means conducting the flow of gas from said gas source to the space within said housing on the first side of said piston;

a coil mounted to the first side of said piston within said housing;

means in said housing for directing the flow of gas delivered by said gas source to the first side of said piston around said coil and through said housing to the atmosphere, thereby cooling said coil;

means connecting said gas source, the space on the second side of said piston, and the airway of a patient; and

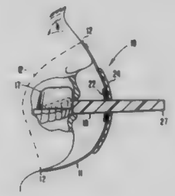
means for delivering current to said coil operable to reverse the polarity of the current in said coil, thereby causing said coil to move back and forth within said housing relative to said magnet to alternately produce a positive and negative pressure wave in the flow of gas in said connecting means.

4,719,911

AIR FILTER MASK WITH MOUTH RETENTION MEANS

George L. Carrico, 6195 Gregory Dr., Indianapolis, Ind. 46241

Filed Oct. 20, 1986, Ser. No. 920,732
Int. Cl.[4] A62B *18/08*
U.S. Cl. 128—206.29 **10 Claims**



1. An air filter mask to be worn by a person, comprising:

a cup-shaped air permeable filter element having a perimetri-

cal edge adapted and configured to fit against the face of the person circumjacent the nose and mouth such that substantially all of the air breathed by the person passes through the filter element; and

retention means adapted to be received in the mouth of the person for retaining said filter element in position against the face while permitting lower jaw movement sufficient for talking, said retention means including:

a mouthpiece adapted and configured to be received and gripped between the upper lip and the upper teeth and gums of the person,

a shaft attached to the mouthpiece and configured to extend outwardly from the mouth between the lips of the person, and

means for attaching said filter element to the shaft such that the perimetrical edge of said filter element fits against the face of the person circumjacent the nose and mouth when said mouthpiece is received and gripped between the upper lip and the upper teeth and gums of the person, said means for attaching being adjustable to provide for user adjustment of the distance between the mouthpiece and the filter element, and including an aperture defined by said filter element and sized to receive the shaft therethrough, and a pair of annular retainers disposed about the shaft in slidable frictional engagement therewith, one on each side of the filter element for engaging the filter element therebetween and retaining the filter element in a selected position with respect to the shaft.

4,719,912

APPARATUS FOR CONTROLLING THE PHOTOCOAGULATION OF BIOLOGICAL TISSUE

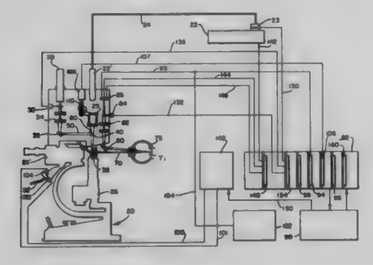
Wolfram S. Weinberg, Rockingham, Tex., assignor to Promed Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 649,541, Sep. 11, 1984, abandoned. This application May 26, 1987, Ser. No. 57,692

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, P3306981; PCT Intl. Appl., Feb. 27, 1984, PCT/US84/00295

Int. Cl.⁴ A61B *17/36*

U.S. Cl. 128—303.1 **20 Claims**



1. Apparatus for performing photocoagulation of biological tissue comprising: an intensive light source for initiating coagulation; first optical means for focusing the intensive light source on an area to be irradiated; second optical means for projecting an image of the irradiated area; luminance measuring means, said second optical means projecting the image of the irradiated area onto said luminance measuring means, said measuring means being adapted to detect the luminance of at least two sub-regions of a region of the tissue; processing means adapted to generate control signals indicative of the change in luminance in each sub-region; control means supplied with the control signal for controlling the parameters of irradiation; a sighting device for shifting the beam of the intensive light source across the tissue; said control means controlling the intensity of the beam of the intensive light source and the position of the beam established by the sighting device.

4,719,913

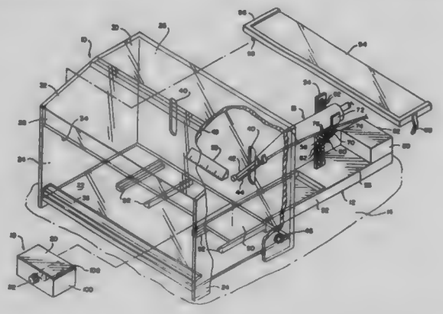
SURGICAL APPARATUS FOR CONTOURING IMPLANTS

Gerald E. Merwin, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Division of Ser. No. 737,535, May 24, 1985, Pat. No. 4,656,995. This application Jan. 15, 1987, Ser. No. 3,507

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—303 R **6 Claims**



1. Surgical apparatus for use in contouring medical implants and the like comprising a stand for holding a surgical drill tool, the stand comprising a base having means for releasably connecting the base to a work surface in a surgical theater; a fixed support member extending upwardly from the base; a first bracket slidably disposed on the fixed support member; first means for fixing the first bracket in a preselected location on the fixed support member; a second bracket pivotally connected to the first bracket, the second bracket carrying clamp means for supporting the surgical drill tool; second means for fixing the second bracket in a preselected orientation with respect to the first bracket so as to hold the surgical drill tool in a predetermined location with respect to the work surface; and means carried by the stand for immobilizing the stand with respect to the work surface.

4,719,914

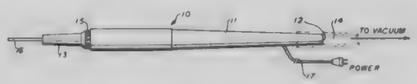
ELECTROSURGICAL INSTRUMENT

Gerald W. Johnson, 17070 Red Oak, Ste. 301, Houston, Tex. 77090

Filed Dec. 24, 1986, Ser. No. 946,485

Int. Cl.⁴ A61B *17/39;* **A61M** *1/00*

U.S. Cl. 128—303.1 **12 Claims**



1. An electrosurgical instrument comprising:

a hollow tubular member having an opening at one end adapted for connection by hollow tubing to a source of vacuum, and a side opening adjacent to said one end,

the opposite end of said tubular member including a tapered hollow nose portion,

an electrocauterizing blade secured in and having one end extending outward from the end of said nose portion and the other end positioned inside said tubular member,

electric heating means for said electrocauterizing blade including an electric lead extending through said tubular member and through said side opening for connection to a power source,

said nose portion having a plurality of openings adjacent to the tapered surface thereof adapted to withdraw smoke from a surgical area being cut and cauterized by means of a vacuum connected to said tubular member open end, and

means for selectively controlling the application of vacuum through said nose portion openings comprising means supported on said tubular member for selectively covering and uncovering said nose portion openings.

4,719,915

SCALPEL

Michael Porat, 52 Hamitnadev St., Tel Aviv, and Amir Porat, 22 Rachvat Eilan St., Givat Shaul, Ramat Eilan, both of Israel

Filed May 2, 1986, Ser. No. 858,744

Claims priority, application Israel, May 5, 1985, 75096

Int. Cl.⁴ A61B *17/32*

U.S. Cl. 128—305 **9 Claims**



1. A surgical instrument including a handle, a surgical blade mounted on said handle with a portion of the blade projecting from said handle, a blade shield extending from said handle, said blade shield underlying said blade and extending peripherally beyond the projecting portion of said blade, and frangible means integrally joining said shield with said handle for a selective manual breaking of said shield from said handle for an exposure of the projecting portion of said blade, said blade shield including sleeve means receivable over the projecting portion of said blade after detachment of the shield from the handle for a selective retention of the shield on said blade with said shield projecting peripherally beyond the projecting portion of said blade, said sleeve means including means for frictionally engaging and retaining said blade therein, said blade, prior to detachment of the shield from the handle, being external of said sleeve means, said shield being generally planar with first and second opposed generally parallel surfaces, said first surface being generally planar and immediately underlying said blade prior to detachment of said shield from said handle, said sleeve means being on said second surface remote from said blade prior to detachment of said shield whereby detachment and repositioning of said shield is required prior to reception of said blade in sleeve means.

4,719,916

INTRAINTESTINAL BYPASS TUBE

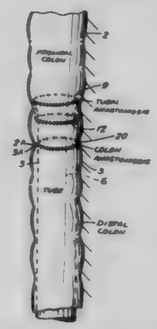
Biagio Ravo, Nassau Hospital, 259 First St., Mineola, L.I., N.Y. 11501

Continuation of Ser. No. 538,347, Oct. 3, 1983, abandoned. This application Sep. 19, 1986, Ser. No. 910,252

Int. Cl.⁴ A61B *17/11*

U.S. Cl. 128—334 R **20 Claims**

1. A bypass graft suitable for attachment in the lumen of a resectioned intestine or duct upstream of the anastomosis thereof, the bypass graft consisting essentially of (1) a tube having opposite ends and formed along its entire length of a thin, water-impervious wall material having sufficient flexibility to conform to the natural movements of said intestine or duct surrounding it, and (2) freely collapsible reinforcing means extending circumferentially around at least one of said ends rendering said at least one end stronger than said thin wall material but still sufficiently flexible to conform to said natural movements, with said graft being freely collapsible and freely bendable throughout its entire length.



4,719,917

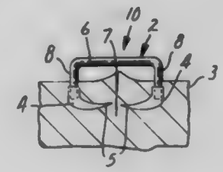
SURGICAL STAPLE

Thomas H. Barrows, Cottage Grove, and Harold E. Froehlich, St. Anthony, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 17, 1987, Ser. No. 14,867

Int. Cl.⁴ A61B *17/04*

U.S. Cl. 128—334 R **16 Claims**



1. A surgical staple for use in closing an opening in mammalian tissue, said staple, when open, comprising a central portion of strong, ductile, non-absorbable material, and lower leg portions at opposite ends of the central portion, said lower leg portions comprising bioabsorbable material and flanking said central portion, said lower leg portions having points at their ends and being joined by coupling means to said central portion, such staple when closed is bent in the central portion to form a crown portion and upper leg portions which with said lower leg portions form generally into a closed shape with said lower leg portions in a position approximating one another so that each of said lower leg portions of the staple can extend through the tissue on one side of the closed opening so as to hold said tissue firmly in closed position.

12. A method of surgically stapling mammalian tissue comprising the steps of:

(a) implanting at least one staple which when open comprises a central portion of strong, ductile, non-absorbable material, and lower leg portions at opposite ends of the central portion, said lower leg portions comprising bioabsorbable material and flanking said central potion, said lower leg portions having points at their ends and being joined by coupling means to said central portion, which staple when closed is bent in the central portion to form a crown portion and upper leg portions which with said lower leg portions form generally into a closed shape with said lower leg portions in a position approximating one another so that each of said lower leg portions of the

staple can extend through the tissue on one side of the closed opening so as to hold said tissue firmly in closed position, and

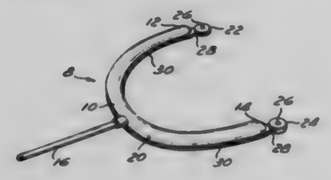
(b) removing said central portion of said staple when sufficient tissue healing has occurred and said bioabsorbable lower legs have loosened sufficiently to allow removal of said central portion.

4,719,918

SUBPERIOSTEAL TISSUE EXPANDER

Donald J. Bonasso, Olympia Fields, Ill., and Robert C. Paulson, Goleta, Calif., assignors to Cox-Uphoff Corporation, Carpinteria, Calif.

Filed May 8, 1986, Ser. No. 861,059
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—344 16 Claims



1. A subperiosteal tissue expander, comprising:

an elongated inflatable tube having a first end and a second end, said tube being longitudinally curved into a "C" shape and being sized to fit subperiosteally along at least half the entire length of the alveolar ridge of a human, wherein periosteal tissues surrounding said alveolar ridge have not been previously expanded over the course of several days;

means for filling said tube with a fluid; and

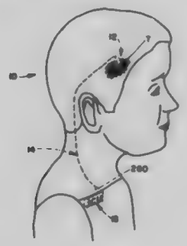
means for sealing said fluid inside said tube.

4,719,919

IMPLANTABLE HYPERTHERMIA DEVICE AND SYSTEM

Jose A. Marchosky, Creve Coeur; Robert B. Alek, Ellisville; Christopher Morea, Creve Coeur, and Raymond E. Rutledge, Ballwin, all of Mo., assignors to Ramon Associates, a partnership, Creve Coeur, Mo.

Continuation of Ser. No. 459,708, Jan. 21, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,697
Int. Cl.[4] A61F 7/12
U.S. Cl. 128—401 10 Claims



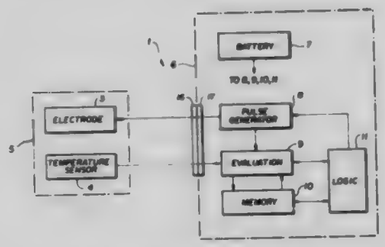
1. A hyperthermia system for treating a cancerous brain tumor, comprising a system entirely implantable beneath the skin of the person being treated, said implantable system including a probe having opposite ends including a first end for extending into the brain tumor to be treated and a second end extendable therefrom to adjacent the surface of the skin, an electric heater element and a heat sensitive member mounted in the probe adjacent to the first end, and means for thermally insulating said heat sensitive member from said heater element, means operatively connected to the probe to select a predetermined temperature condition to be produced in the tumor, an electronic control unit under control of the means operable to select, and means operatively connecting the electronic control unit to the heater element and to the heat sensitive member, said electronic control unit including an energy source for the implantable system and means under control of the electronic control unit to apply energy from the energy source to the heater element to generate the selected predetermined temperature condition in the brain tumor to be treated adjacent to the probe, and closed-loop control means in the electronic control unit responsive to the condition of the heat sensitive member for controlling the application of energy to the heater element according to the difference between the selected predetermined and actual temperature conditions in the brain tumor being treated, the implant table system also including a programmable circuit including a memory circuit, and transmission and receiving means, said means operable to select, said electronic control unit and said programmable circuit being implantable in a remote location in the person's body, and an external control system having transmission and receiving means therein for coupling to the transmission and receiving means of the implantable system through the skin, said external control system including programmable means operable for programming the memory in the implantable system to establish the temperature conditions to be produced in the brain tumor being treated.

4,719,920

EXERCISE-RESPONSIVE RATE-ADAPTIVE CARDIAC PACEMAKER

Eckhard Alt, Munich, Fed. Rep. of Germany, and Richard V. Calfee, Houston, Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Oct. 10, 1986, Ser. No. 917,358
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1985, 3541598
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PG 18 Claims



1. A rate-responsive cardiac pacemaker, comprising

means for sensing the central venous blood temperature of the patient,

means responsive to the sensed blood temperature for detecting the onset of exercise by the patient by recognition of the characteristic drop in blood temperature associated therewith, and

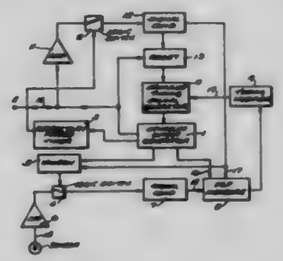
adjusting means responsive to detection of the onset of exercise for thereupon stepping up the stimulation rate of the pacemaker.

4,719,921

CARDIAC PACEMAKER ADAPTIVE TO PHYSIOLOGICAL REQUIREMENTS

Raul Chirife, Pirovano 137, 1640 Martinez Buenos Aires, Argentina

Filed Aug. 28, 1985, Ser. No. 770,205
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PG 5 Claims



1. A demand cardiac pacemaker including an adjustable rate artificial stimulus pulse generator having output means for being coupled to a patient's heart to deliver artificial stimulus pulses to said heart, means for detecting the start of ventricular ejection during each heart cycle,

means for sensing during each heart cycle an intrinsic heart stimulus signal or an artificial stimulus pulse whichever is first to occur during each heart cycle, said sensed signal or pulse coinciding with the start of the preejection period during said cycle,

means for measuring in each heart cycle the length of the PEP constituting the time between occurrence of the intrinsic stimulus signal or stimulus pulse that is sensed by said sensing means and occurrence of ventricular ejection, the length of said PEP being a function of the physiological demand of the patient,

means for producing a signal that is a function of the length of said PEP, and

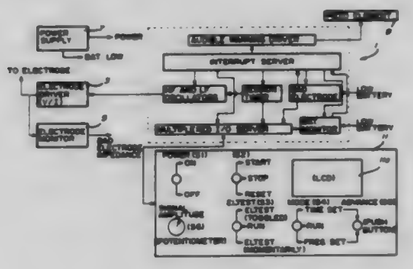
means responding to said last named signal by adjusting the rate of said stimulus pulse generator.

4,719,922

STIMULATOR APPARATUS

Aute L. Padjen, Beaconsfield; Bruce MacDougall, and Hans Schulze, both of Montreal, all of Canada, assignors to 147638 Canada Inc., Montreal, Canada

Filed Mar. 3, 1986, Ser. No. 835,285
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—421 7 Claims



1. A stimulator apparatus for applying a low frequency pulse train, modulating a high frequency pulse train to produce a modulated pulse train, to a patient, comprising:

electrode means for placement on said patient in the area of stimulation;

programmable microprocessor means for generating said modulated high frequency pulse train;

electrode driver means comprising means for providing an adjustable constant current to said electrode means, said means for providing an adjustable constant current comprising a constant current source having an input terminal and an output terminal, means for driving said constant current source having at least one input terminal and an output terminal and means for adjusting the amplitude of said constant current source having an input terminal and an output terminal, said modulated pulse train being fed to the input terminal of said means for adjusting the amplitude, the output terminal of said means for adjusting the amplitude being fed to said at least one input terminal of said means for driving said constant current source, the output terminal of said means for driving said constant current source being fed to the input terminal of said constant current source, and the output terminal of said constant current source being fed to said electrode means;

electrode monitor means having input and output means, the input means of said electrode monitor means being connected to the output means of said electrode driver means, the output means of said electrode monitor means being connected to an input terminal of said microprocessor means to detect poor electrode connections; and

a display console enclosing said programmable microprocessor means, said electrode driver means and said electrode monitor means, and including a display arrangement and a switch group;

and wherein said means for driving said constant current source comprises a first operational amplifier having a second input terminal comprising an inverting input terminal, said at least one input terminal comprising a non-inverting input terminal;

said constant current source comprising a transistor, said input terminal of said transistor comprising a base electrode, said output terminal of said transistor comprising a collector electrode and further including an emitter electrode;

the output terminal of said first operational amplifier being connected to the base electrode of said transistor;

the collector electrode of said transistor being connected to said electrode means;

the emitter electrode of said transistor being connected to the inverting terminal of said first operational amplifier;

and wherein said electrode monitor means comprises a second operational amplifier having an inverting input terminal, a non-inverting input terminal and an output terminal, a third operational amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal, and a 2 to 1 multiplexer;

said electrode means being connected to the inverting input terminal of said second operational amplifier;

the inverting terminal of said third operational amplifier being connected to an output of said microprocessor means to receive said modulated pulse train;

the output terminals of said second and third operational amplifiers being connected to said 2 to 1 multiplexer.

4,719,923

NON-INVASIVE BLOOD FLOW MEASUREMENTS UTILIZING AUTOREGRESSIVE ANALYSIS WITH AVERAGED REFLECTION COEFFICIENTS

Walter T. Hartwell, St. Charles, and Gustavus H. Zimmerman, III, Westmont, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

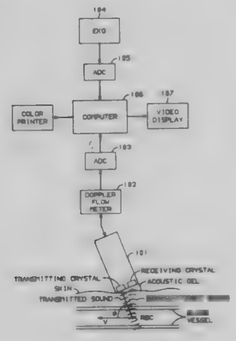
Filed May 6, 1985, Ser. No. 730,487
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—663 17 Claims

1. An autoregressive analysis system for obtaining the aver-

age power spectrum of a plurality of signal groups each comprising a plurality of information signals, comprising:

means for determining the start and end of each of said signal groups;

means responsive to said information signals of each of said groups as determined by said determining means for calculating reflection coefficients for each of said signal groups;



means responsive to said information signals and said reflection coefficients for each of said signal groups for generating a residual energy level for each of said signal groups;

means for averaging said reflection coefficients of said signal groups and said residual energy levels of said signal groups; and

means responsive to said averaged reflection coefficients and said averaged residual energy level for generating the average power spectrum.

4,719,924

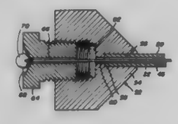
SMALL DIAMETER STEERABLE GUIDEWIRE WITH ADJUSTABLE TIP

James F. Crittenden, Hollis, N.H., and Bryan J. White, Lowell, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 9, 1986, Ser. No. 905,622

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—772 **15 Claims**



1. A steerable small diameter guidewire comprising:

an elongate solid wall tubular main wire having a proximal end and a distal end;

an elongate helical coil spring having proximal and distal ends and being connected at its proximal end to the distal end of the main wire and extending distally of the main wire;

a distal core wire having proximal and distal ends and being connected to and extending distally from the distal end of the main wire, the core wire extending through the lumen of the spring and having a distal tip which terminates short of the distal end of the spring;

the distal end of the distal core wire being secured to the spring at a location intermediate the ends of the spring thereby to define a distal spring segment extending from the distal end of the core wire to the distal end of the spring, the distal segment being more flexible than the more proximal portions of the guidewire;

means defining a pull wire opening adjacent to the distal end of the main wire proximally of the proximal end of the distal core wire;

a pull wire having a proximal end and a distal end, the distal end of the pull wire being secured to the distal end of the spring, the pull wire extending proximally between the core wire and the spring and through the opening into the lumen of the main wire, the pull wire extending proximally through the lumen of the main wire to the proximal end of the main wire;

whereby the proximal end of the pull wire may be pulled to apply tension to the pull wire thereby to draw at least a portion of the distal segment of the spring into a curved configuration.

4,719,925

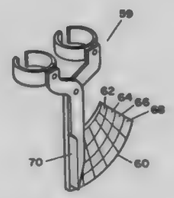
CERVICAL-DILATION METER

Natan Parsons, 71 Babcock St., Brookline, Mass. 02146

Division of Ser. No. 801,640, Nov. 25, 1985, Pat. No. 4,682,609. This application Apr. 21, 1987, Ser. No. 40,876

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—775 **3 Claims**



1. A dilation-meter kit comprising:

A. a dilation meter including a pair of rings, adapted to fit simultaneously on the bases of adjacent fingers of a user, and measurement means connected to the rings, the measurement means including a scale having spaced scale indicia thereon, including a predetermined calibrating scale indicium, the measurement means also including an indicator movably positioned with respect to the scale for indicating different scale indicia when the rings are separated by different amounts, the scale indicium indicated by the indicator representing the lateral extension, when the indicator indicates that indicium, of the tips of fingers whose bases are enclosed by the rings;

B. a calibrator including a stationary member and a slide member slidably mounted with respect to the stationary member and having a pointing indicium thereon, the calibrator further including a calibration scale adjacent the pointing indicium and having size indicia spaced therealong so that the pointing indicium points to different size indicia when the slide is in different positions, the stationary member and slide member providing complementary edges that together define an aperture whose width varies with slide position, which aperture is adapted for reception therein of two adjacent fingers of a user and for sliding of the slide as the fingers extend laterally against the edges so that lateral extension in the calibration aperture of fingers with the rings on their bases so as to cause the meter indicator to indicate the predetermined calibrating scale indicium causes the calibrator pointing indicium to point to a size indicium associated with the sizes of those fingers; and

C. a calibrating table associating dilation entries with combinations of the scale indicia and size indicia associated with different finger sizes, the entry for each combination of a given size indicium and a given scale indicium representing the lateral extension of fingers whose sizes are those associated with the given size indicium when the rings are positioned on the bases of those fingers and the indicator indicates the given scale indicium.

4,719,926

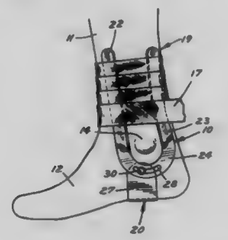
HINGED FOOT AND ANKLE BRACE

Ronald E. Nelson, 405 Sunset La., Cambridge, Minn. 55008

Filed Feb. 28, 1986, Ser. No. 834,595

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 H **4 Claims**



1. An ankle brace device comprising:

a generally U-shaped leg member for engagement of a leg, having first and second elongate arms positionable in vertically straddling relationship to the malleolus of the leg, and an arcuate shoulder connecting the lower ends of the arms and spaced beneath the malleolus when the arms are positioned in straddling relationship to the malleolus, said shoulder having a first hinge means comprised as an arcuate slot disclribed about a center approximately coincidental with the horizontal axis of rotation of the hinge;

means for fixing the leg member to a leg comprised as an elongate leg wrap for circumferentially wrapping around the leg and the first and second arms of the leg member to hold the leg member stationary with respect to the leg;

an L-shaped anchor member having a base engagable with a bottom portion of the foot, and a side wall perpendicular to the base and positionable abutting the side of the foot, said side wall carrying a second hinge means comprised as a pivot pin engaged in the slot of the shoulder of the leg member to ride in the slot upon pivotal movement of the foot following the leg engaged by the leg member.

4,719,927

METHOD AND APPARATUS FOR SEGREGATING ROD-SHAPED ARTICLES FROM CONVEYORS IN FILTER TIPPING AND LIKE MACHINES

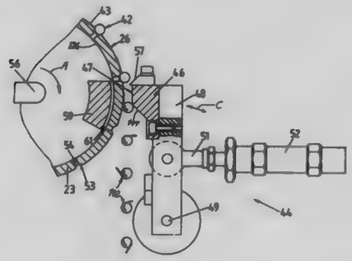
Karl-Heinz Barbe, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 25, 1986, Ser. No. 833,531

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508242

Int. Cl.[4] A24C *5/47*

U.S. Cl. 131—94 **23 Claims**



1. A method of separating articles of the tobacco processing industry from a surface on which the articles are supported at a series of neighboring locations while the surface advances in a predetermined direction along a predetermined path, comprising the steps of rolling the articles along said surface away from the respective locations and toward the neighboring locations, each article comprising at least one rod-shaped component and an adhesive-coated sheet-like component, said rolling step including at least partially uniting the components of the articles so that the thus united components leave said surface as a unit wherein the sheet-like component is at least partially rolled around the respective rod-like component in the course of said rolling step; thereafter effecting a movement of articles away from said surface before the articles reach the neighboring locations, the movement of articles away from said surface being effected in a predetermined portion of said path; interrupting said rolling step so that the components of each article advance beyond the predetermined portion of said path; and draping the the sheet-like components around the respective rod-like components downstream of said predetermined portion, as considered in said direction.

4,719,928

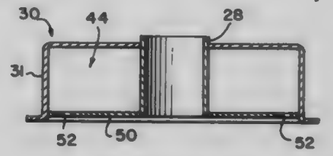
METHOD AND APPARATUS FOR DETERMINING STEM CONTENT OF BALED TOBACCO

James M. Mitchell, Jr., Lewisville; Hoyt S. Beard, Winston-Salem, and Jerry R. Joyce, Kernersville, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 15, 1985, Ser. No. 723,431

Int. Cl.[4] A24B *5/06*

U.S. Cl. 131—312 **7 Claims**



1. An apparatus for determining the stem content of a mass of leaf comprising:

(a) size reduction and classifying means for separating the stem portion from the lamina portion of the leaf and segregating same;

(b) means for receiving and introducing said mass of leaf into said size reduction and classifying means;

(c) dryer means associated with said size reduction and classifying means for drying said mass of leaf to a proper moisture;

(d) scale means for receiving the stem and lamina portions from the size reduction and classifying means and determining the weight of said segregated stem and lamina portions; and

(e) means for selectively transporting the stem and lamina portions to said scale means.

4,719,929

NON-TOBACCO SMOKING MATERIALS

Robert G. Breckwoldt, Goshen, N.Y., assignor to Tripar Incorporated, Stamford, Conn.

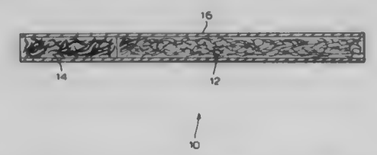
Filed Oct. 2, 1986, Ser. No. 914,830

Int. Cl.[4] A24B *15/10, 15/28*; A24D *1/18*

U.S. Cl. 131—359 **8 Claims**

1. A composition of matter, which comprises; a homogeneous blend of a smokably acceptable, cellulose carrier and a

smoke flavor enhancing proportion of distiller's dried grain and solubles; said composition being free of a compound se-



lected from the group consisting of tobacco or tobacco extracts.

4,719,930
HAIR TREATMENT AND PROCESS FOR HAIR TREATMENT

Paul Gross, Darmstadt, and Walter Keller, Ober-Ramstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP84/00336, § 371 Date Jun. 20, 1985, § 102(e) Date Jun. 20, 1985, PCT Pub. No. WO85/02113, PCT Pub. Date May 23, 1985
PCT Filed Oct. 26, 1984, Ser. No. 749,535
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3340350
Int. Cl.[4] A45D *7/00*; A61K *7/06, 7/08*
U.S. Cl. 132—7 **10 Claims**

1. A synergistic composition for treating hair for improving hair combability, luster and touch, which consists essentially of:

(A) 1.0 to 40% by weight of cetyl alcohol lactic acid ester;

(B) 0.5 to 30% by weight of a monoquaternary ammonium compound selected from the group consisting of distearyl dimethyl ammonium choride, lauryl pyridinium chloride, tetradecyl trimethyl ammonium bromide, tris-(oligooxyethyl)-octadecyl ammonium phosphate, methyltris(C_8 to C_{10} alkyl) ammonium chloride, and cetyl trimethyl ammonium chloride;

(C) 30 to 98.5% by weight of ethanol, isopropanol, or mixtures thereof; and

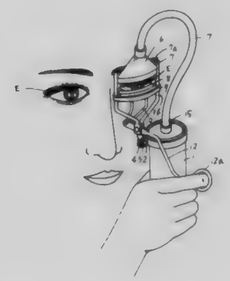
(D) 0 to 15% by weight water.

4,719,931
EYELASH CURLER

Kisaburo Suzuki, No. 23-5, 4-chome, Shibamata, Katsushika-ku, Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 934,655
Int. Cl.[4] A45D *2/42*
U.S. Cl. 132—32 C **9 Claims**

1. An eyelash curler including a gripping body; a bifurcate supporting member secured on the gripping body by means of a fitting member; an operation handle pivotally held at its intermediate portion between the tine of the bifurcate supporting member and having an outer end trigger-like hoop portion; a pair of follower rods each lower end of which is pivotally held on the inner end of the operation handle; a holder slidable up and down along the vertical parallel rod portions of the supporting member by means of the followers rods whose upper ends are secured thereto in spaced relation with each other; a lower nipping member mounted on the holder, and an upper nipping member both ends of which are secured to the upper portion of the supporting member; the holder, the lower nipping member and the upper nipping member all being moderately curved outward substantially in conformity with the curvature of the eyelids as that the upper and lower nipping members may be mated with each other when the latter is pushed up by pulling down the trigger-like hoop portion,



thereby allowing the eyelash to be curled; characterized in that the gripping body contains a high-low adjustable electric heater and blower device at least one flexible tube is provided for supplying hot air from the blower device to at least one of the lower and the upper nipping member and distribution means is provided for uniformly distributing the hot air over the respective nipping member.

4,719,932
AUTOMATIC VEHICLE WASHING SYSTEM

Forrest R. Burton, Green Bay, Wis., assignor to PDQ Manufacturing Inc., Green Bay, Wis.

Filed May 21, 1985, Ser. No. 736,462
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—57 R **16 Claims**

1. An apparatus for applying fluids on a vehicle comprising:

(a) a support column;

(b) a carriage slidably mounted on said support column;

(c) drive means attached to said carriage to provide a driving force to move said carriage up and down on said support column;

(d) a boom assembly cantileverly supported on said carriage by a hinge connection allowing the boom to pivot about the support column in a substantially horizontal plane;

(e) a magnet assembly interconnected between said boom and said support column which prevents the boom from pivoting about said support column under normal operating conditions unless the boom is struck by a vehicle;

(f) a plurality of fluid dispensing nozzles mounted on said boom assembly;

(g) a plurality of pairs of photoelectric units, each pair comprising an emitter element and a detector element, mounted on said boom assembly such that

(i) one element of each pair is mounted at opposite ends of the boom asembly and

(ii) a straight line between the elements of each pair forms an angle with the generally horizontal plane containing the direction of relative movement between the vehicle and the apparatus; and

(h) control means for activating said drive means including:

(i) means for raising said boom assembly when the path between a first one of said pairs of photoelectric units is obscured,

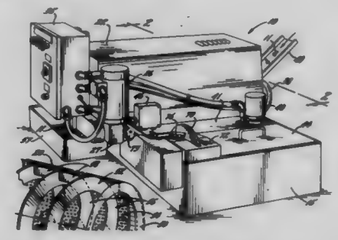
(ii) means for lowering said boom assembly when none of the paths between said pairs of photoelectric units are obscured and

(iii) means for holding said boom in its existing position when the path between said first pair of photoelectric units is not obscured but the path between one or more of the other of said pairs of photoelectric units is obscured.

4,719,933
MACHINE FOR WASHING PARTICULATE WORKPIECES

Warren M. Jackson, Rockford, Ill., assignor to Warren M. Jackson, Inc., Rockford, Ill.

Filed Dec. 8, 1986, Ser. No. 939,080
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—65 **13 Claims**



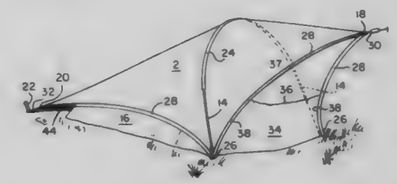
1. Apparatus for cleaning contaminants from particulate workpieces, said apparatus comprising an elongated drum supported to rotate about a generally horizontal axis coinciding with the axis of the drum, means for rotating said drum about said axis, said drum having a workpiece entrance end and a workpiece discharge end, means for delivering particulate workpieces into said drum adjacent the entrance end thereof, an annular helical conveyor secured to the inner wall of said drum and extending around and along said wall from the entrance end of the drum toward the discharge end thereof to advance said workpieces axially within said drum in response to rotation of said drum about said axis, means in said drum for spraying said workpieces with a cleaning solution as the workpieces are advanced within the drum, an end ring joined to said drum at the entrance end thereof and extending substantially perpendicular to the axis of said drum, said ring extending inwardly from the inner wall of said drum, said conveyor comprising a continuous helical flight having an initial turn starting adjacent said end ring and gradually proceeding axially away from said end ring, and means for preventing parts from becoming trapped in the space between said end ring and the initial turn of said conveyor flight, said last-mentioned means comprising a shield spanning the inner edge portions of part of said end ring and said initial turn and covering the space therebetween, said shield starting at the start of said initial turn and gradually increasing in width upon proceeding around said drum through less than one revolution to a terminal end, and a baffle spanning said end ring and said initial turn and extending generally radially between the terminal end of said shield and the inner wall of said drum to close off said space whereby said shield and said baffle prevent workpieces delivered into said drum from entering said space.

7. Apparatus for cleaning lubricant from particulate workpieces, said apparatus comprising a tank defining a reservoir for cleaning solution, an elongated perforated drum supported above said reservoir to rotate about a generally horizontal axis coinciding with the axis of the drum, means for rotating said drum about said axis, said drum having a workpiece entrance end and a workpiece discharge end, means for delivering particulate workpieces into said drum adjacent the entrance end thereof, conveyor means secured to the inner wall of said drum and operable to advance said workpieces axially within said drum in response to rotation of the drum about said axis, means in said drum for spraying said workpieces with cleaning solution to remove lubricant therefrom as the workpieces are advanced within the drum, the cleaning solution and the removal lubricant draining out of the perforated drum and into said tank, a disc rotatable about a horizontal axis in said tank with the lower portion of the disc submerged in the cleaning solution in the tank and with the upper portion of the disc located above the level of the cleaning solution in the tank, said disc being made of a material capable of attracting lubricant contained in said cleaning solution, means for rotating said disc, and means for scraping lubricant from the upper portion of said disc as the disc is rotated and for discharging such lubricant from said tank.

4,719,934
STABLE LIGHTWEIGHT SHELTER STRUCTURE

David Mydans, 462 Greenwich St., New York, N.Y. 10013

Filed Mar. 17, 1986, Ser. No. 840,031
Int. Cl.[4] E04H *15/16, 15/40, 15/32*
U.S. Cl. 135—90 **15 Claims**



1. A structural panel including elastic wall means having a substantially triangular configuration including a base and an apex; further including a flexible rod member extending between said base and said apex, secured by a securing means to said wall means between said base and said apex, wherein the longitudinal extent of said base and said elastic wall means adjacent said base is increased by the application of a linear force to said base in a direction parallel to the longitudinal extent of said base, thereby decreasing the distance between said base and said apex so that said wall means applies a compressive force to said rod member causing said rod member to bow in a direction orthongonal to the direction of said compressive force, said securing means deflecting said elastic wall means corresponding to said rod member bow and further including means for maintaining said linear force.

4,719,935
PORTABLE MULTI-PURPOSE TENT ASSEMBLY

Stephen R. Gustafson, 149 Kachina Trail, Flagstaff, Ariz. 86001

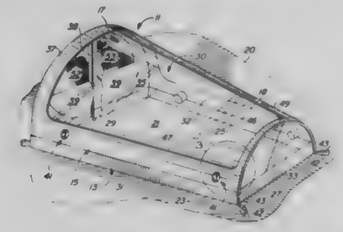
Filed Feb. 14, 1986, Ser. No. 829,183
Int. Cl.[4] E04H *15/36, 15/30*
U.S. Cl. 135—102 **6 Claims**

1. A multi-purpose, portable, tent-like structure comprising:

a generally box-like lower tent section including a generally rectangular bottom adapted to be operatively disposed substantially horizontally on a ground surface, a pair of generally rectangular, substantially upright, longitudinal side panels, a generally rectangular, substantially upright lower head-end panel adapted to serve as the head of said tent-like structure, and a generally rectangular, substantially upright, lower foot-end panel adapted to serve as the foot of said tent-like structure, said bottom having an outer peripheral edge portion, said generally box-like lower tent section comprising a generally rectangular

box-like configuration with a substantially horizontal bottom and substantially vertical side panels and end panels extending upwardly from the outer peripheral edge portions of said bottom, each of said panels having the top edge portion;

an upper tent section at least one of integral with and fixedly attached to the upper edge of said lower tent section, said upper tent section including a pair of upper longitudinal side panels having a bottom edge of at least one integral with and fixedly attached to the corresponding top edge of a corresponding lower longitudinal side panel, and a top edge, said pair of upper longitudinal side panels being oriented substantially vertically upward from said lower longitudinal side panels and being curved a predetermined distance inwardly toward one another, a generally semi-circular foot-end panel having its diameter at least one of integral with and fixedly secured to the top edge of said lower foot end panel and the semi-circular curved portion extending substantially vertically upward therefrom and substantially coplanar therewith, a generally semi-circular head end portion having its diameter at least one of integral with and fixedly attached to the top edge of said lower head end portion and the semi-conductor curved portion extending substantially vertically upright therefrom and substantially coplanar therewith, the radius of the semi-circular curved portion of said head end panel being greater than the radius of the semi-circular portion of the foot end portion, each of said upper panels having a top edge portion, a generally inwardly facing framing



means having an outside edge portion at least one of integral with and fixedly attached to the top edge portions of said upper panels and an interior edge extending a predetermined distance inwardly therefrom for forming a roof opening extending substantially the entire longitudinal length of said tent-like structure from said head end portion to said foot end portion;

at least first and second fastening means, each of said fastening means including first and second fastening portions adapted to be removably secured and unsecured from one another, each of said first fastening portions being operatively secured to the inwardly facing edge portions of said framing means for forming said roof opening;

first roof insert means;

second roof insert means;

third roof insert means;

each of said first, second, and third roof insert means being different and distinct from one another, each being dimensioned for fitting within and substantially closing said framed roof opening and each including an outer peripheral edge portion to which said second fastening portion of each of said fastening means is attached thereto such that each of said insert means can be selectively mounted in and removed from said roof opening by attaching a corresponding first fastening portion which is attached to the interior edge portion of said framing means to a corresponding second fastening portion secured about the outer peripheral edge portion of said insert;

said roof opening being exposed to the atmosphere when none of said insert means are operatively secured therein for admitting air and providing a substantial view therethrough;

said roof opening being closed by at least one of said first, second and third insert means for forming a multi-function tent-like assembly;

said first insert means including a generally flexible sheet of tent material formed as a truncated portion of a conical section that is adapted for keeping out the light, keeping out insects, and keeping out inclement weather;

a second roof insert means including a generally flexible sheet of transparent plastic material formed as a truncated portion of a conical section and adapted for heating the interior of the tent-like structure by solar energy, even in cold weather, provide the sun is shining; enabling the interior of the tent to be used as a sun-tanning closure; providing the occupant of the tent interior with a wide angle view therefrom; and preventing the admission of insects and the effects of inclement weather;

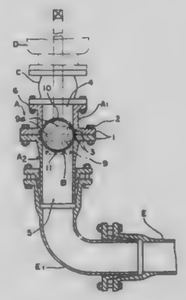
said third roof insert means including a generally flexible sheet of mesh-like screen material formed as a truncated portion of a conical section and adapted to provide protection from the outside elements, and permit fresh air to enter the tent, and permit a relatively good view from the interior thereof.

4,719,936

METHOD OF HOT TAPPING TYPE BRANCHING AND SPLIT JOINT USED THEREIN

Toshihiro Tsubakimoto, Minoo; Koziro Heri, Takarazuka, and Toshio Shibabuti, Hashimoto, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Feb. 28, 1983, Ser. No. 470,501
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—15 **4 Claims**



1. A method of hot tapping type branching wherein a branch pipeline (E) is connected to a main pipeline (B) establishing communication therebetween through a perforation (13) formed in the main pipeline (B) and across a joint (A) mounted on the main pipeline (B), the main pipeline (B) and the branch pipeline (E) having an identical or like diameter, and the joint (A) including an outlet opening (5) for communication with said pipeline (B) and a drill receiving opening (4) disposed opposite said outlet opening (5) across said main pipeline (B), the joint (A) comprising a pair of split joint members (A1, A2) having opposite flanges (1) which are tightened together to securely mount the joint members on said main pipeline in fluid-tight condition, said method comprising the steps of;

mounting said joint (A) on said main pipeline (B), connecting said branch pipeline (E) to said outlet opening (5) of the joint (A) and carrying out a fluidtightness test thereon;

attaching a drill (D) having a hole saw (9) to a portion of said joint (A) defining said drill receiving opening (4) and forming a first perforation (12) in a peripheral wall (10) of said main pipeline (B) opposed to said drill receiving opening (4) and immediately thereafter a second perforation (13) in a peripheral wall (11), thereof opposed to said outlet opening (5) by using said hole saw (9) through said drill receiving opening (4), thereby to establish communication between said main pipeline (B) and said branch pipeline (E) through said second perforation, and thereby to thread a female screw (14) in the perforation (12); and

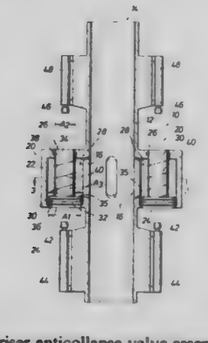
removing said drill (D) and attaching a stopper plug fitting device (F) in place of said drill to thereby fit a stopper plug (15) into mesh with the female screw (14) so as to close said perforation (12) whereby the split joint (A) is prevented from inadvertently turning around the main pipeline (B) when the stopper plug (15) abuts the inside of the split joint A.

4,719,937

MARINE RISER ANTI-COLLAPSE VALVE

Joseph R. Roche, Humble, and Gabriel G. Alexander, Houston, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Nov. 29, 1985, Ser. No. 802,997
Int. Cl.[4] F16K *17/12*
U.S. Cl. 137—114 **14 Claims**



3. A marine riser anticollapse valve assembly comprising,

a body adapted for connection in series with a riser string at a position below sea level, said body having a bore through it and having an opening in its wall,

a valve structure disposed exterior to said body wall about said body wall opening and including a cylinder having a first cylinder aperture and a second cylinder aperture, said cylinder having an opening in its wall in fluid communication with said body wall opening,

a piston of weight W_p disposed within said cylinder and having a first piston head having a lateral first cross sectional area A_1 and means for slidable sealing within said first cylinder aperture and a second piston head having a lateral second cross-sectional area A_2 and means for slidable sealing within said second cylinder aperture, said first and second cross-section areas being subject to sea water head pressure P_h, said piston including an internal shoulder of a third lateral cross sectional area A_3, said internal shoulder being subject to drilling fluid pressure P_b of said riser via said body wall opening and said cylinder wall opening,

whereby said valve structure remains closed so long as the sum of the weight of the piston and the product of drilling fluid pressure and said third lateral cross-sectional area is greater than the product of sea water head pressure and the difference between the lateral first and second cross section areas of said piston heads, or

$$P_b(A_3) > P_h(A_1 - A_2) - W_p,$$

and said valve structure automatically opens when the drilling fluid pressure drops to a level such that

$$P_b(A_3) < P_h(A_1 - A_2) - W_p,$$

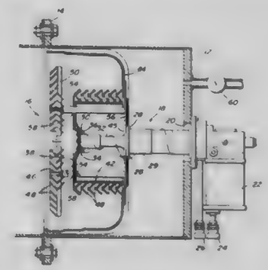
and further including remotely actuatable hydraulic rod means disposed longitudinally aligned with said first piston head and when actuated for engagement with said first piston head for moving said piston longitudinally beyond said first cylinder aperture thereby opening said bore of said body to sea water via said body wall opening and said opening in said cylinder wall.

4,719,938

SELF-CLEANING VALVE AND CRYOPUMP UTILIZING THE SAME

Robert C. Pandorf, Newton Highlands, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Jan. 22, 1985, Ser. No. 693,121
Int. Cl.[4] F16K *15/00*; B08B *9/00*; B01D *5/00*
U.S. Cl. 137—244 **12 Claims**



1. A cryopump having a pressure relief valve, the valve comprising:

a valve cylinder having at least one inlet port in communication with a cryopump chamber and at least one exhaust port;

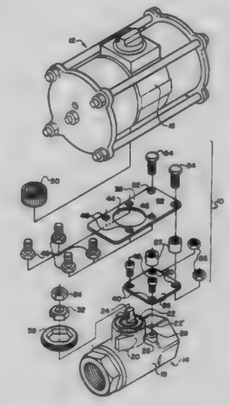
a valve member within the cylinder having a seal ring for pressing against the inner surface of the cylinder to close the end port from the exhaust port, the valve member further comprising a wiper ring having a tapered outer periphery for preceding the seal ring along the inner surface of the valve cylinder as the valve member is moved to the closed position to wipe debris from the inner surface of the valve cylinder.

4,719,939

APPARATUS FOR COUPLING A VALVE AND ROTARY ACTUATOR

Henry R. Killian, Monroe, N.C., assignor to Conbraco Industries, Inc., Matthews, N.C.

Filed Jun. 10, 1987, Ser. No. 60,662
Int. Cl.[4] F16K *43/00, 31/124*
U.S. Cl. 137—315 **6 Claims**



6. Apparatus for coupling a ball valve of the type having a

valve body which rotatably supports a valve ball for reciprocal opening and closing rotation and gland means which rotatably supports a valve stem in operative connection to said valve ball for actuating movement thereof, said gland means including a drive portion having a regular polygonal annular drive surface, and a rotary actuator of the type having an actuator body rotatably supporting an output shaft for reciprocal driving rotation, said coupling apparatus comprising drive means for establishing positive coaxial drive connection of said valve stem and said output shaft for controlling opening and closing movement of said valve ball, said drive means including nut means affixed coaxially about said valve stem and mating drive socket means affixed to said output shaft for coaxially receiving said nut means in annular driving engagement therewith, and bracket means for substantially rigidly connecting said valve body and said actuator body, said bracket means including plate means bolted respectively to each of said valve body and said actuator body and an annular alignment bushing defining an axial opening of a regular polygonal shape closely conforming annularly to said drive surface of said gland means, said alignment bushing being supported by said plate means in annular fitted engagement about said drive surface of said gland means for applying to said gland means reactive loads generated by valve actuation forces of said rotary actuator, whereby essentially only torsional actuation forces are applied to said valve stem.

4,719,940

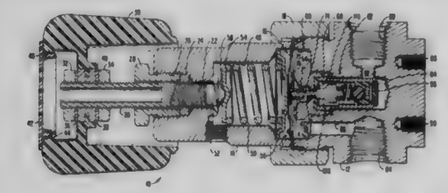
ADJUSTABLE TIED-DIAPHRAGM GAS PRESSURE REGULATOR

Michael E. Beavers, Gainesville, Tex., assignor to Victor Equipment Company, Denton, Tex.

Continuation-in-part of Ser. No. 897,417, Aug. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 878,569, Jun. 25, 1986, abandoned. This application Sep. 5, 1986, Ser. No. 904,346

Int. Cl.[4] F16K *31/38*

U.S. Cl. 137—505.39 **19 Claims**



1. A pressure regulator for regulating the flow of fluid from a high pressure source to a low pressure application comprising:

a. a body,

b. a high pressure valve chamber in said body,

c. an inlet opening in said body for communicating said high pressure valve chamber with a source of high pressure fluid,

d. a low pressure chamber in said body having an open end,

e. a flexible diaphragm closing off said open end, said diaphragm having a side away from said low pressure chamber being exposed to the ambient surrounds,

f. a cap on said body defining an ambient air chamber therein, said diaphragm being positioned between said cap and said body so that said air chamber is adjacent to said away from said low pressure chamber,

g. spring means in said cap for adjusting the position of said diaphragm.

h. valve means in said body intermediate said high and low pressure chambers for controlling flow of fluid from said high to said low pressure chambers,

i. attachment means for operatively attaching said valve means to said diaphragm, wherein said attachment means is affixed to the side opposite to said one side of said diaphragm and wherein said diaphragm is free of any openings and of unitary, one-piece construction, and

j. said diaphragm being a generally flat, disc-shaped member having an annular skirt depending therefrom, said body adjacent said opening defining a cylindrical shape having a diameter substantially less than that of the internal diameter defined within said skirt whereby said diaphragm may move across said open end without interfering with said cylindrical shape whereby misalignment of said valve means with respect to said diaphragm may be automatically adjusted for.

4,719,941

THROTTLE VALVE

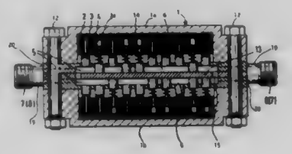
Bernd Moser, Hamm, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

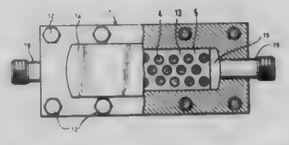
Continuation of Ser. No. 772,306, Sep. 4, 1986, abandoned. This application Dec. 12, 1986, Ser. No. 941,522

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432466

Int. Cl.[4] F15D *1/14*; F16K *31/06*

U.S. Cl. 137—599 **9 Claims**





1. A throttle valve for selectively varying the flow therethrough, said throttle valve comprising:

(a) a housing;

(b) a chamber formed within said housing, said chamber being substantially parallelepiped in shape and having a substantially greater length than width when viewed in plan;

(c) first and second tubular members disposed at opposing extremities of said chamber, said tubular members being substantially parallel to said length of said chamber and being in fluid communication with said chamber;

(d) a substantially planar plate disposed within said chamber so as to divide said chamber into first and second subchambers;

(e) said plate being provided with throughgoing passages of substantially constant cross sectional area which establish fluid communication between said first and second subchambers;

(f) a first multiplicity of bistable electromagnetically actuated armature translatably mounted in said housing adjacent sasid first subchamber, each of said first armatures being reciprocably translatable along a path substantially transverse to said substantially planar plate between a first position wherein each of said first armatures projects into said first subchamber and directly abuts said plate and a second position wherein each of said first armatures is retracted into said housing and does not project into said first subchamber;

(g) a second multiplicity of bistable electromagnetically actuated armatures translatably mounted in said housing adjacent said second subchamber, each of said second armatures being reciprocably translatable along a path substantially transverse to said substantially planar plate between a first position wherein each of said second armatures projects into said second subchamber and directly abuts said plate and a second position wherein each of said second armatures is retracted into said housing and does not project into said first subchamber; and

(h) electromagnetic actuation means for electromagnetically translating selected combinations of said first and second multiplicities of armatures between said first and second positions to thereby selectively alter the rate of fluid flow through said chamber and between said first and second tubular members over a wide ranges;

whereby selected members of said multiplicity of first armatures and selected members of said multiplicity of second armatures may simultaneously be translated into their first positions directly abutting said plate while still permitting fluid flow between said first and second tubular members through said chamber.

4,719,942

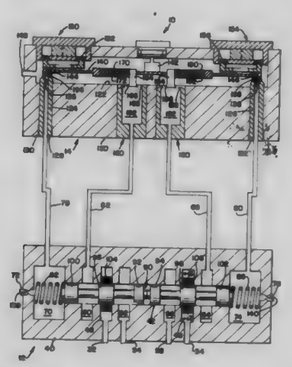
HYDRAULIC VALVE ASSEMBLY

Paul F. Hayner, Exeter, N.H., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 18, 1987, Ser. No. 50,522

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—625.61 **12 Claims**



1. In a hydraulic valve assembly comprising a directional valve and a pilot valve controlling the directional valve, wherein the directional valve has a pair of inlet connections adapted to receive hydraulic fluid from a source, a pair of outlet connections adapted to return hydraulic fluid to a reservoir, a pair od load connections, and a pair of pilot connections adapted to receive hydraulic fluid from the pilot valve, differential pressures in the pilot connections controlling the directional valve so as to allow hydraulic fluid to flow from one of the inlet connections, through the directional valve, and into one of the load connections and to return from the other of the load connections, through the directional valve, and into one of the outlet connections, an improvement wherein the pilot valve comprises a body having a chamber, the chamber having an outlet connection adapted to return hydraulic fluid to a reservoir, a pair of nozzles separated from each other and mounted within the chamber, each nozzle being connected to one of the pilot connections of the directional valve, a rocker arm mounted within the chamber for pivotal rotation about a pivot point approximating a midpoint of the rocker arm, the rocker arm being provided with a pair of flapper means separated from each other and spaced equally from the midpoint of the rocker arm, each flapper means being juxtaposed to one of the nozzles so as to restrict the flow of hydraulic fluid from said one of the nozzles, each flapper means allowing hydraulic fluid to flow less freely through said one of the nozzles when the rocker arm is pivoted so as to move such flapper means further toward said one of the nozzles, each flapper means allowing hydraulic fluid to flow more freely through said one of the nozzles when the rocker arm is pivoted oppositely, motor means arranged to impart a torque to the rocker arm so as to move a selected one of the flapper means further toward the juxtaposed one of the nozzles and to move the other one of the flapper means further away from the other one of the nozzles, whereby differential pressures can be thus produced in the pilot connections of the directional valve, the pilot valve further comprising a pair of transducers, each transducer having a cavity connected to one of the return connections of the differential valve, each transducer having a plug fitted loosely into the cavity, disposed so as to sense the pressure of hydraulic fluid flowing from said one of the return connections into the cavity of such transducer, and coupled to the rocker arm so as to impart a torque to the rocker arm, effectively at a point spaced from the midpoint of the rocker arm, in response to the pressure sensed by the plug of such transducer and in opposition to the torque imparted by the motor means.

4,719,943

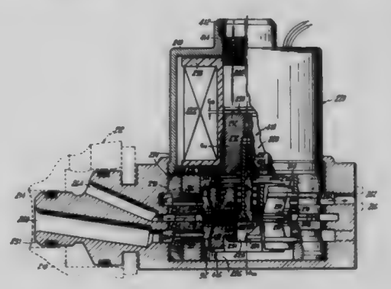
CONTROL VALVE ASSEMBLY

Asi Perach, Farmington Hills, Mich., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 740,692, Jun. 3, 1985, Pat. No. 4,624,285, which is a continuation-in-part of Ser. No. 523,909, Aug. 16, 1983, Pat. No. 4,538,645. This application Nov. 25, 1986, Ser. No. 834,758

Int. Cl.[4] F16K *31/06*

U.S. Cl. 137—625.65 **14 Claims**



1. A control valve assembly of the type adapted to be operated at a high frequency with a variable duty cycle, the valve having an axis Am, which comprises:

a housing having a cavity which extends axially within the housing, the housing further having

a first seat disposed in the cavity,

a second seat disposed in the cavity and spaced axially from the first seat leaving a control chamber therebetween,

a first port which adapts the valve assembly to be in fluid communication with a fluid at a first pressure, and which is in fluid communication through the first seat with the control chamber,

a second port which adapts the valve assembly to be in fluid communication with a region having a fluid at a second pressure which is not equal to the first pressure, and which is in fluid communication through the second seat with the control chamber,

a third port which is in fluid communication with the control chamber;

an armature having a first end and a second end, the armature extending axially about the axis Am, and being movable in a first direction to a first position and movable in a second direction to a second position, the armature having

a first section extending from the first end which is adapted to engage a shaft, the first section including
a poppet disposed in the control chamber which is adapted to engage the first seat at the first position of the armature and to engage the second seat at the second position of the armature, and
means integrally joined to the poppet for adapting the first section to engage a diaphragm,
a second section extending from the second end, the second section including
a plunger disposed in the cavity which is spaced axially from the poppet and which is spaced radially from the housing leaving a clearance gap Gr therebetween, and having an end spaced axially from the housing leaving an axial gap Ga therebetween,
a shaft which is integrally joined to the plunger and which extends axially from the plunger to the first section through one of said seats to axially engage the first section to join the poppet to the plunger and which is slidable with respect to the second section;
means engaging the first section for urging the poppet in one of said directions to engage one of said seats;
a coil extending circumferentially about at least a portion of the plunger for urging the poppet in the other of said directions to engage the other of said seats; and,
means for radially positioning the armature from the housing as the armature moves between the first seat and the second seat under operative conditions and for resisting movement of the armature in the radial direction which includes an annular diaphragm having an outer portion attached to the housing and having an inner portion which is engaged by the means for adapting the first section to engage a diaphragm to attach the inner portion of the diaphragm to the first section of the armature at a location between the poppet and said first end of the armature, the diaphragm extending circumferentially about the axis Am between the armature and the housing to bound a flow path for fluid extending through the contral chamber and to block the fluid from contacting said first end of the armature and the diaphragm extending axially to adapt the diaphragm to exert a centering force on the armature in response to the static pressure of the fluid as the poppet moves between the seats;
wherein forces exerted on the first section of the armature are transmitted to the poppet to positively drive the poppet at high frequencies from the first seat to the second seat and from the second seat to the first seat to establish an average pressure in the control chamber which is a function of the time spent at each seat and between the seats, and wherein the inertia of the first section of the armature and the means for radially positioning the armature act to resist movement of the poppet in the radial direction in response to fluid forces acting on the poppet as the poppet moves between the seats.

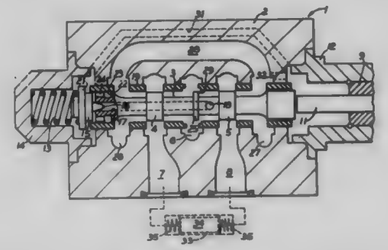
4,719,944

PILOT VALVES FOR TWO-STAGE HYDRAULIC DEVICES

Kenneth G. Cleasby, Cobham, England, assignor to Vickers Systems Limited, Havant, England

Filed Sep. 3, 1986, Ser. No. 903,401
Claims priority, application United Kingdom, Oct. 26, 1985, 8526443
Int. Cl.⁴ F15B *13/043*
U.S. Cl. 137—625.65 **13 Claims**

1. A pilot valve for a two-stage hydraulic device, the pilot valve comprising a housing, an inlet port and two service ports provided in said housing, a spool slidably mounted in said housing, first and second metering means provided on said spool, said spool being movable in opposite directions from a normal null position in order to deliver, under the control of said first or second metering means, fluid under pressure from said inlet port through one of said two service ports to the second stage of the device to actuate the latter in one of said opposite directions from a normal null position, and an electrically-actuated spool control device, associated with one end of said spool, said pilot valve spool being movable beyond its normal operating range to an offset, zero flow position in the event of a failure of said control device, wherein the improvement comprises said pilot valve spool having third metering means, and said pilot valve further comprising resilient means disposed at one end of said pilot valve spool and operable, in the event of said failure, to move said spool to a predetermined position, stop means for said resilient means operable to prevent further movement of said spool by said resilient means beyond said predetermined position, and means for allowing pressure fluid to react on said pilot valve spool so that when said resilient means engage said stop means, this reaction results in further movement of said spool to move said spool fully to the offset zero flow position in which both said service ports are connected to tank, said third metering means inhibiting flow of fluid under pressure from said inlet port through the service port which would otherwise be subjected to such flow in such offset position of said pilot spool.

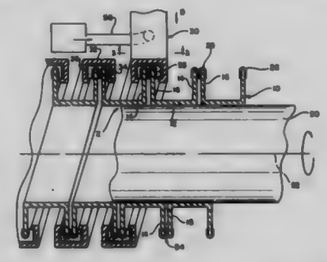


4,719,945

HOSE WITH COMPOSITE JOINTS

Toby D. Richards, Morris Plains, and Anthony I. Antonio, Jr., Bridgewater, both of N.J., assignors to Fabricated Plastics, Inc., Morristown, N.J.

Filed Dec. 5, 1986, Ser. No. 938,551
Int. Cl.⁴ F16L *11/11*
U.S. Cl. 138—154 **12 Claims**



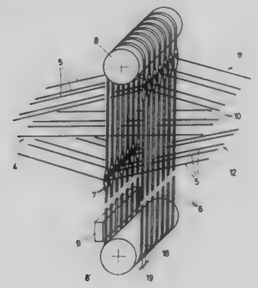
1. A hose comprising:
(a) one or more helically wound elongated members defining a plurality of turns, each of said members have connecting portions extending lengthwise along the member, said connecting portions being juxtaposed with one another at junctions of adjacent turns, at least said connecting portions of said members being formed from one or more polymeric structural materials;
(b) one or more polymeric buffer materials fused with and at least partially covering the structural material of at least one of said connecting portions each said buffer material being more readily fusible than the structural material covered by the buffer material; and
(c) a polymeric bonding material having a melting point lower than that of said structural materials disposed between said justaposed connecting portions and bonded to said connecting portions so that said bonding material interconnects said juxtaposed connecting portions, whereby said buffer material is interposed between said bonding material and the structural material of at least one of said connecting portions wherein each said buffer material is disposed in a layer overlying and substantially conforming in shape to the connecting portion covered by the buffer material.

4,719,946

METHOD OF PRODUCING A TUBULAR WOVEN FABRIC AND A CIRCULAR LOOM FOR CARRYING OUT THE METHOD

Johann Buchinger, Vöcklabruck; Bruno Mistlberger, Gschwandt; Rudolf Wolf, Lenzing; Johann Schönberger, Zipf; Thomas Langer, Gmunden; Johann Bloo, Seewalchen; Kurt Vilsecker, and Bruno Haider, both of Gmunden, all of Austria, assignors to Lenzing Aktiengesellschaft, Austria

Continuation of Ser. No. 832,845, Feb. 24, 1986, abandoned. This application May 11, 1987, Ser. No. 48,461
Claims priority, application Austria, Oct. 10, 1985, 2936/85
Int. Cl.⁴ D03D *37/00*
U.S. Cl. 139—13 R **8 Claims**



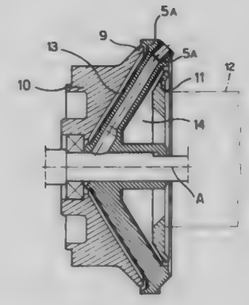
2. A method of producing a tubular woven fabric of variable weave patterns, said method being performed by using a circular loom including shedding means comprising thread guiding organs consisting of a plurality of thread eyes carried by a plurality of flexible bands, said flexible bands corresponding in number with the number of warp threads and capable of carrying said corresponding warp threads and being spaced side by side across the width of the warp to form therebetween free spaces, said method including the steps of:
guiding selected ones of said warp threads through their corresponding thread eyes and operating said thread guiding organs to raise and lower said warp threads so as to form sheds;
guiding others of said warp threads through the free spaces of said thread guiding organs adjacent their corresponding thread eyes, said others of said warp threads comprising loose warp threads, said loose warp threads crossing an opened shed approximately centrally thereof;
moving at least two shuttles through said sheds;
utilizing deflection guide means mounted on at least one of said shuttles to lift said loose warp threads; and
utilizing additional guide means mounted on at least an additional one of said shuttles to thereafter lower said loose warp threads.

4,719,947

ROTOR FOR WEFT FEEDING DEVICE FOR WEAVING LOOMS

Bruno Maina, Valdengo, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

Filed Oct. 9, 1984, Ser. No. 658,804
Claims priority, application Italy, Oct. 7, 1983, 23186/83[U]
Int. Cl.⁴ D03D *47/36*; B65H *51/20*
U.S. Cl. 139—452 **3 Claims**



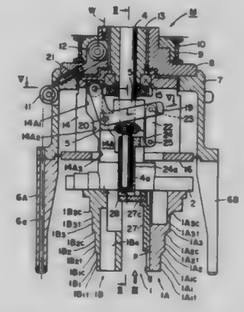
1. A rotor for a weaving loom weft feeding device, comprising a framework comprising a hub, a plurality of spaced-apart spokes extending outwardly from the hub and interconnected at their outer ends by a circular rim, and two thin covers which enclose the spaces between the spokes and are fixed securely to the framework one on each side of the plurality of spokes, said rim defining annular recesses on opposite sides thereof, one of said recesses being adapted to receive in nested relation a portion of a casing of a motor for driving the rotor and the other of said recesses being adapted to receive in nested relation a portion of a winding drum of a weft feeding device to which the rotor is secured.

4,719,948

METHOD OF AND APPARATUS FOR WINDING COILS

Takayuki Tsugawa, Kaisei, Japan, assignor to Odawara Engineering Company Limited, Kaisei, Japan

Filed Jun. 10, 1986, Ser. No. 872,678
Claims priority, application Japan, Jun. 14, 1985, 60-128098
Int. Cl.⁴ B21F *3/00*
U.S. Cl. 140—92.1 **8 Claims**



1. A method of winding coils for an electric motor in which a coil former having a plurality of winding steps with increasingly larger size moves downward step by step, a wire fed from a winding flyer rotated around the coil former is wound on each step of the coil former and coils formed on each step of

the coil former are inserted into a coil-inserting tool having a plurality of blades in a circle and disposed below the coil former, said method comprising the steps of:

(a) moving downward the coil former in order to set a lower winding step of the coil former at a winding position;

(b) winding a predetermined number of turns on the lower winding step of the coil former while rotating the winding flyer around the coil former, some turns being dropped into the coil-inserting tool;

(c) moving downward the coil former in order to set an upper winding step of the coil former on which a winding operation is to be carried out at a winding position with at least one step located lower than the upper winding step, inserted into the coil-inserting tool, simultaneously moving downward a guide member having guide steps each corresponding to each step of the coil former at a higher speed than the coil former and by a larger distance than the same thereby to locate a step of the guide member in a position where the guide step is projected downward from the border between the upper winding step and a step adjoining downwardly of the upper winding step when a winding operation is transferred from the lower winding step of the coil former to the upper step thereof;

(d) winding a predetermined number of turns on the upper winding step of the coil former while rotating the winding flyer around the coil former, some turns being dropped into the coil-inserting tool;

(e) repeating the motions of the coil former, the guide member and the flyer in the same manner as the above two steps (c), (d) in response to the number of winding steps of the coil former; and

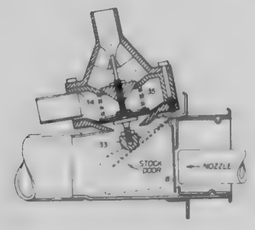
(f) inserting all turns on each step of the coil former into the coil-inserting tool by moving down stripper means disposed so as to be moved vertically in the coil former.

4,719,949

AUTOMOTIVE NOZZLE-ACTUATED REFUELING EMISSION SYSTEM SHUTOFF VALVE

William G. Mears, Kennett Square, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,426
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—301 **6 Claims**



1. A fluid flow device for use in connection with a motor vehicle having a fuel-containing line connecting a fuel tank to a portion of the engine fuel combustion system comprising:

(a) a first hollow tubular segment adapted to be inserted in a conduit connected to said fuel tank through which conduit liquid fuel ordinarily is introduced into said fuel tank;

(b) a first valve seat positioned and dimensioned within said tubular segment sufficiently near one end of segment so as to permit passage therethrough of a fueling nozzle;

(c) a flapper pivotably mounted within said tubular segment to seat against said valve seat and seal said seat in the absence of a fueling nozzle being inserted in said valve seat

(d) a second tubular segment attached to, and communicating with said first hollow tubular segment.

(e) a second valve seat positioned in said second tubular segment;

(f) a second valve and valve stem having an upstream side and a downstream side positioned coaxially within said second tubular segment and sealing against said second valve seat and engaging said flapper of (c) so that when the flapper is opened said valve stem is displaced longitudinally;

(g) means for urging said second valve and valve stem of (f) into a closed position;

(h) means providing a flexible seal between the flapper valve in an open position and said second valve when both are in an open position;

(i) a third tubular segment attached near one end to said second tubular segment and communicating with the upstream side of said second valve when said valve is closed and with the downstream and upstream sides when said valve is open, the other end of said third tubular segment communicating with the upper portion of said tank; and

(j) a fourth tubular segment attached near one end to said second tubular segment and communicating with the downstream side of said second valve when said second valve is closed and with the downstream and upstream sides when said valve is open.

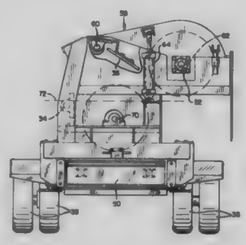
5. A fuel vapor recovery system comprising a liquid fuel tank connected to a vapor adsorption canister by a conduit having the valve device of claim 1 positioned in the conduit at a location intermediate the liquid fuel tank and the vapor adsorption canister.

4,719,950

TREE SIZE ADAPTABLE DEBARKING/DELIMBING APPARATUS

Arnold N. Peterson, Eugene, and Larry A. Sprague, Dexter, both of Oreg., assignors to Peterson Pacific Corporation, Pleasant Hill, Oreg.

Filed Jul. 13, 1987, Ser. No. 72,560
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—208 J **5 Claims**



1. A debarking/delimbing apparatus comprising;

a housing having an inlet and outlet for logs and defining therebetween a feed line, a lower flailing drum mounted in the housing for axial rotation crossway to the feed line, said lower drum mounted below the feed line, flails mounted to the drum and defining a path during rotative movement of the drum that projects above the feed line and against logs progressing along the feed line, said flails having a length sufficient to reach upwardly to the mid-point of logs progressing along the feed line,

an arm structure pivotally mounted to the housing and having a pivotable arm end projected over the defined feed line, an upper flailing drum rotatably mounted at the arm end about an axis of rotation crossway to the feed line, upper and lower limiting means limiting the pivotable movement of the arm structure to limit the upper and lower movement of the upper drum, and flails mounted to the drum and defining a path during rotative movement that projects down toward the feed line and against logs progressing along the feed line, the flails having a length sufficient to reach the mid-point of smaller logs with the arm structure in the lowered position, and to the mid-point of larger logs in the raised position, and

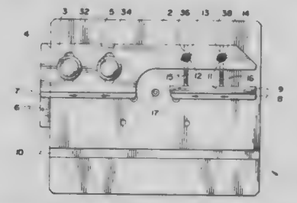
a movable gate connected to the arm structure whereby force applied to the gate discriminately raises the arm structure to accommodate different sizes of logs.

4,719,951

COMBINATION DRILL PRESS, ROUTER AND SHAPER TABLE, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Joseph W. Woltanski, 28164 Hendrie, Mt. Clemens, Mich. 48045

Filed Feb. 10, 1986, Ser. No. 827,429
Int. Cl.[4] B27B *31/00*; **B27C** *1/12*
U.S. Cl. 144—253 J **13 Claims**



1. An apparatus for guiding a wood workpiece or the like when being routered or cut on a drill press or like machine, comprising, in combination:

a substantially flat member;

first means for guiding the workpiece operably attached in a predetermined manner to said flat member;

second means for attaching said flat member to said drill press or other like machine;

said second means including fasteners which pass through slots in said flat member;

a slidable miter gauge residing in a slot in the top surface of said flat member;

a plurality of posts;

a plurality of apertures in said flat member;

said plurality of posts residing in said plurality of apertures for receiving attachments including rollers by which said workpiece is guided;

said first means including a primary fence and a secondary fence;

said primary fence spanning substantially the length of said flat member; and

said primary fence comprising:

a slidable first face on the side of said primary fence nearest the workpiece.

4,719,952

SURFBOARD HORIZONTAL CONTROL SURFACE PROTECTION METHOD AND APPARATUS

John D. Geronimo, 406 S. Lucia, Redondo Beach, Calif. 90277

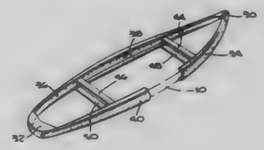
Filed Nov. 24, 1986, Ser. No. 933,935
Int. Cl.[4] A63C *15/05*
U.S. Cl. 150—52 R **5 Claims**

1. A reusable, one-piece, low bulk, temporary, shock absorbing cover for completely protecting the forward tip, rear base, and the entire longitudinal extent of the horizontal control edge surfaces of a conventional surfboard or the like from scratches, abrasions, fractures or impact damage during transit or storage without contacting or affecting the waxed upper surface of the surfboard, said one-piece cover comprising:

a first resilient, shock absorbing pocket means for protectively encasing the forward tip of said surfboard;

a second resilient, shock absorbing pocket means for protectively encasing the rear base of said surfboard; and

a pair of substantially identical, generally planar, resilient, shock absorbing members for protectively covering the entire longitudinal extent of the horizontal, control edge surfaces of said surfboard, each of said members provided with a broadened midsection and integrally attached to



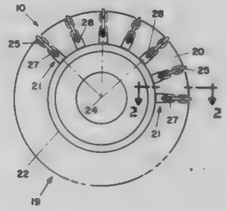
and longitudinally extending between said first and second pocket means, said shock absorbing members being spaced apart from one another in substantially parallel, opposed relationship.

4,719,953

ANTI-SLIP DEVICE

Raymond H. Norheim, Jr., 14 Monterra Dr., Port Angeles, Wash. 98362

Filed May 1, 1986, Ser. No. 858,197
Int. Cl.[4] B60C *27/00*
U.S. Cl. 152—216 **13 Claims**



1. A vehicular skid prevention device, which comprises in combination:

a plurality of linkages for mounting on automotive tires including opposite end loops having flexible elements secured on the loops adjacent to an outer end,

relatively small arcuate frames each comprising an extension from a side portion terminating in a folded, closed end loop, the extension further being formed inwardly at its connection to the frame rim so as to subtend an acute angle with the rim,

binders for covering said frames each binder having an opening in a fold for passage of said extension therethrough for a pivotal connection with one of said opposite end loops of the linkages,

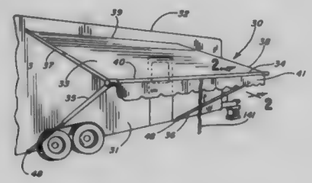
means for fastening the binder covered frames on the tire sidewalls with an adhesive in spaced position for a conjoint union with said linkages, and

means for connecting said linkages with the fastened binder covered frames and to join said linkages end loops and said extension in a united lock.

4,719,954
AWNING ASSEMBLY WITH TELESCOPING SUPPORT ARMS

Richard D. Curtis; Gayle G. Juracek, and Jerry T. Scherer, all of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Sep. 2, 1986, Ser. No. 903,642
Int. Cl.[4] E04F 10/06
U.S. Cl. 160—67 24 Claims



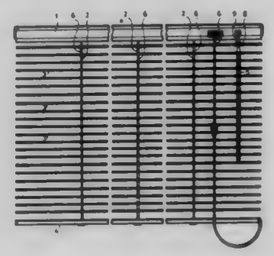
1. An awning assembly comprising:
an awning having an inner end and an outer end, the inner end adapted to be attached to a support structure,
a roller having a pair of ends and means for attaching the outer end of the awning to the roller whereby the awning can be wound and unwound on the roller,
a first telescoping support arm assembly having an upper end for rotatably supporting one end of the roller and a lower end adapted to be pivotally attached to the support structure and a second telescoping support arm assembly having an upper end for rotatably supporting the other end of the roller and a lower end adapted to be pivotally attached to the support structure, each of the telescoping support arm assemblies including an inner arm and an outer arm telescopingly engaged with the inner arm, actuating means connected to the telescoping support arm and the roller for extending the telescoping support arm when the roller unwinds the awning and for retracting the telescoping support arm when the roller winds up the awning,
a first rafter arm assembly having an outer end for supporting one end of the roller and an inner end adapted to be attached to the support structure and a second rafter arm assembly having an outer end for supporting the other end of the roller and an inner end adapted to be attached to the support structure.

4,719,955
BLIND

Koui Tachikawa; Yuuichi Miura, both of Tokyo; Masaharu Kawashima, and Satoru Ogawa, both of Naruto, all of Japan, assignors to Tachikawa Corporation, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,580
Claims priority, application Japan, Jun. 28, 1985, 60-99672[U]; Jun. 28, 1985, 60-99673[U]; Aug. 30, 1985, 60-133603[U]; Sep. 24, 1985, 60-145384[U]; Oct. 16, 1985, 60-158170[U]; Nov. 15, 1985, 60-176432[U]; Nov. 21, 1985, 60-179498[U]; Dec. 3, 1985, 60-186470[U]
Int. Cl.[4] E06B 9/30
U.S. Cl. 160—168 R 8 Claims

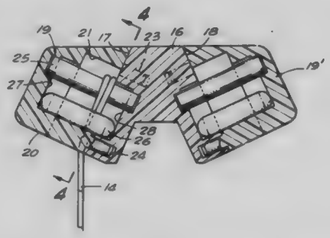
1. A blind, comprising:
(a) a head box;
(b) an operating rod extending outwardly from one side of said head box;
(c) an angle control shaft in said head box which is driven to rotate by said operating rod;
(d) a multiplicity of slats controlled for angle by rotations of said angle control shaft;
(e) a slat angle controller having a gear mechanism provided between said operating rod and angle control shaft, said gear mechanism comprising a first gear shaft provided with a first gear and extending diagonally insection of said head box, a second gear shaft provided with a second gear, said second shaft being coupled to said angle control shaft and extending longitudinally of said head box, the diagonal extension of said first gear shaft permitting the first gear provided thereupon to be disposed non-interferingly between said second gear and a corner of said head box with said first and second gears meshing so as to couple the gear shafts.



4,719,956
ADJUSTABLE WINDOW COVERING CORD LOCK

Louis G. Valle, Huntington Beach, Calif., assignor to Beatrice Companies, Denver, Colo.

Continuation of Ser. No. 714,876, Mar. 22, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,464
Int. Cl.[4] E06B 9/38
U.S. Cl. 160—178 C 2 Claims



1. In a window blind having a headrail housing with a base and a cap-like member fitted onto the base foring an enclosure, a locking device for a height adjusting cord including a first pin with its ends fixedly mounted in the respective headrail base and cap-like member and located within the enclosure, a second pin having its ends portions slidingly confined in slots formed in the headrail base and cap-like member to move along a gravity path within the enclosure in a plane including said second pin from a first position spaced from said first pin a distance less than the cord thickness to a second position spaced from said first pin a distance substantially greater than the cord thickness, the improvement comprising:
the second pin is constructed of a material that has spaced apart relatively soft portions separated by relatively hard portions, said relatively soft portions having outwardly facing surfaces removed to form pits and being abradable by the adjusting cord to provide said second pin with a continuously pitted peripheral surface.

4,719,957
PARTITIONING APPARATUS

John Strehlieks, 3850 Wind Drift Dr., Apt. 2C, Indianapolis, Ind. 46254

Filed Apr. 24, 1986, Ser. No. 855,320
Int. Cl.[4] A47H 1/00
U.S. Cl. 160—332 5 Claims

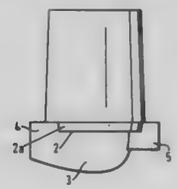


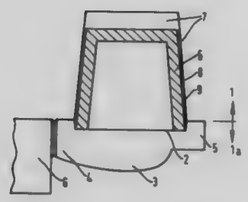
1. Partitioning apparatus comprising:
a first member mountable across an opening in a building;
a first row of bead hanger strands carried by said first member;
a second row of bead hanger strands carried by said first member parallel to said first row of bead hanger strands;
strand shifting means associated with said first member and said strands to proximately shift the strands; and
a plurality of beads having apertures receiving said hanger strands through them, said beads hanging on said strands and operable, when the strands are shifted, to move from a full screening position to a partial screening position; and
wherein the shifting means include:
first and second parallel hanger bars, the strands being suspended from said hanger bars;
pivot arms mounted to said first member and connected to said hanger bars and pivotable to shift the positions of said hanger bars between a position at which said strands are in the full screening position and a position at which said strands are in the partial screening position.

4,719,958
METHOD, APPARATUS AND FEEDER SLEEVES FOR THE PRODUCTION OF CASTING MOULDS

Helmut Schopp, Borken, and Michael Friedrichs, Wesel, both of Fed. Rep. of Germany, assignors to Foseco International Ltd., Birmingham, England

Filed Dec. 18, 1986, Ser. No. 943,042
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600847
Int. Cl.[4] B22C 9/08, 7/00
U.S. Cl. 164—29 20 Claims





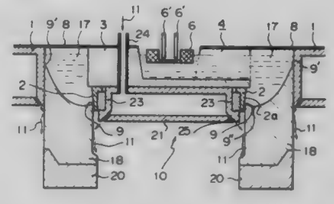
1. A method for the production of a metal casting mould comprising a cope mould and a drag mould and having, incorporated therein, a feeder sleeve whose outer lateral surface tapers from the bottom end of the feeder sleeve to the top end, the method comprising
(1) providing a two part feeder pattern consisting of a lower part and an upper part, the lower part having means for locating and centering the feeder sleeve in the mould, and the upper part having a lateral surface having substantially the same taper as the taper of the feeder sleeve and dimensions greater than the corresponding dimensions of the outer lateral surface of the feeder sleeve
(2) fixing the lower part of the feeder pattern to a drag mould pattern plate and the upper part of the feeder pattern to a cope mould pattern plate
(3) compacting particulate moulding material around the two parts of the feeder pattern and removing the two parts of the feeder pattern so as to produce a drag mould and a cope mould
(4) locating the feeder sleeve in the mould and
(5) closing the cope and drag moulds in such a manner that the central vertical axis of a cavity produced in the cope mould by the upper part of the pattern is in line with the central vertical axis of the feeder sleeve, and there is a gap between the wall of the cavity in the cope mould and the outer lateral surface of the feeder sleeve.

18. A two part feeder pattern for producing a feeder cavity in casting mould, said pattern comprising a lower part adapted to be secured to a drag pattern plate and an upper part adapted to be secured to cope pattern plate, said upper part having an outer surface which tapers along substantially its entire length, wherein said lower pattern part includes means for forming in said feeder cavity, surfaces for seating and centering a feeder sleeve.

4,719,959
APPARATUS FOR CONTINUOUSLY PRODUCING HOLLOW METALLIC INGOT

Susumu Nawata, Shimizu; Katsuzo Ichikawa, Fujinomiya; Eiichi Sugisaka, Shimizu, and Masaharu Sugiyama, Numazu, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 693,163, Jan. 22, 1985, abandoned. This application Apr. 29, 1987, Ser. No. 45,771
Claims priority, application Japan, Jun. 12, 1984, 59-258310
Int. Cl.[4] B22D 11/04
U.S. Cl. 164—421 8 Claims



1. An apparatus for continuously producing an elongated hollow metallic ingot having a cross-section in the form of a circle or other closed loop form, said apparatus comprising:
(a) an annular water-cooled metallic mold having an open upper end and an open lower end with the cross-section of the inner periphery thereof being so shaped as to correspond to that of the outer periphery of the hollow metallic ingot;
(b) a core member located within the inner space of said mold with the cross-section of the outer periphery thereof being so shaped as to correspond to that of the inner periphery of the hollow metallic ingot, thereby forming together with said mold a casting passage therebetween which is adapted to pass therethrough molten metal supplied thereinto from said open upper end for continuously causing solidification of the molten metal between the open upper end and the

open lower end of said casting passage so as to produce the hollow metallic ingot; and

(c) a movable supporting base member adapted to be initially so located as to close said open lower end of said casting passage for supporting the molten metal supplied in said casting passage thereon and then to be gradually lowered away from said open lower end so as to pull out the solidified metal supported thereon as the solidification of the molten metal continuously proceeds, while the molten metal is continuously supplied into said casting passage so as to compensate for the amount of metal solidified and pulled out from said casting passage, thereby permitting said hollow metallic ingot to be continuously produced, the solidification point of the molten metal within said casting passage being maintained substantially within the range between said open upper and lower ends of said casting passage;

(d) said core member comprising:

(i) a heat-insulating member:

(A) made of a heat insulating material;

(B) having a molten metal receiving vessel integrally formed therein;

(C) being formed with at least one molten metal conducting passage communicating said molten metal receiving vessel with said casting passage for supplying the molten metal from said vessel into said casting passage; and

(D) having a planar bottom surface;

(ii) a casting member:

(A) made of graphite or a carbonic material;

(B) having a planar top surface secured to the planar bottom surface of said heat-insulating member;

(C) comprising a thin-walled hollow portion extending along the direction in which the solidified metal is pulled out;

(D) the outer peripheral surface of which is tapered downwardly and inwardly and which extends by an appropriate range within which the solidification commencing point is located at an appropriate position so as to form a casting face of said core member; and

(E) the top edge of the outer peripheral surface of which joins the planar top surface of said casting member and is spaced inwardly of the lower edge of the planar bottom surface of said heat-insulating member, whereby an inwardly extending, downwardly facing planar ledge is formed at the interface of said heat-insulating member and said casting member and above the solidification commencing point;

(iii) a molten metal supplying device including a molten metal level controller located in said molten metal receiving vessel, said molten metal level controller comprising a float and at least one dip tube arranged to maintain the level of the molten metal in said molten metal receiving vessel constant;

(e) said heat-insulating member having an outer peripheral edge portion extending outwardly a short distance beyond the outer peripheral edge portion of said casting member so as to project into said casting passage.

4,719,960

APPARATUS FOR CONNECTING A DUMMY STRIP TO THE LEADING END OF A CASTING IN THE START-UP OF CONTINUOUS CASTING OF STRIP METAL

Horst Grothe, Kaarst; Peter Boese, Moers; Manfred Kolakowski, Erkrath, and Hermann Lax, Düsseldorf, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG., Dusseldorf and Thyssen Aktiengesellschaft, Duisburg, both of, Fed. Rep. of Germany

Filed Feb. 2, 1987, Ser. No. 9,809

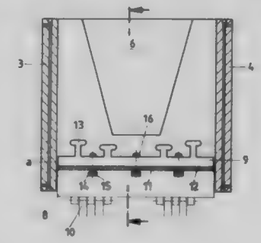
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603190

Int. Cl.⁴ B22D *11/08*

U.S. Cl. 164—426 **10 Claims**

1. Combined apparatus for the start-up of teeming for continuously casting strip metal comprising a mold shaped for continuously casting metal strip, said mold having a distal zone in which a proximal end of a dummy strip lies during start-up said distal zone of said mold having respectively opposed narrow and broad side walls lying in substantially parallel relation, said apparatus further comprising:

means for connecting the leading end of a cast strip to said dummy strip comprising a heat sink element having a proximal edge lying in a plane generally normal to the longitudinal axis of said dummy strip and having the approximate cross-sectional shape of, but smaller than the strip being cast and means for connecting said heat sink element to the proximal end of said dummy strip, said heat sink element also having axially extending sides and ends defining a narrow gap between the heat sink and the parallel walls of said mold



when said dummy strip is in said zone during start-up, so as to extract heat from molten metal poured into said gap, in two directions,

means operatively associated with said heat sink element for positively interlocking with said cast strip, and

means operatively associated with said heat sink element located substantially downstream of the proximal edge of said heat sink element dimensioned to fit snugly within the distal zone of said mold and against the parallel walls thereof, for holding said heat sink element accurately centered within the distal zone of said mold when said dummy strip is lodged therein during start-up and to make the dimension across the narrow gap substantially uniform during start-up.

4,719,961

VERTICAL OR BOW-TYPE CONTINUOUS CASTING MACHINE FOR STEEL

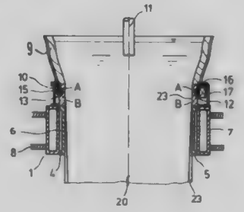
Jochen Vogels, Ratingen; Hans Streubel, Erkrath, and Hans O. Thörner, Meerbusch, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 4, 1986, Ser. No. 892,984

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528649

Int. Cl.⁴ B22D *11/10, 11/04*

U.S. Cl. 164—439 **2 Claims**



1. Apparatus for the continuous casting of steel comprising: an elongated continuous casting mold of heat conductive metal having an open inlet end, an open outlet end, and

walls forming a substantially parallel sided mold cavity therebetween;

means for cooling said mold;

refractory feeding means having an inlet end and an outlet end for introducing molten metal to the inlet end of said mold, said feeding means having walls forming a substantially parallel sided feeding cavity between its inlet and outlet ends with the planes of the walls of the feeding cavity conforming dimensionally and positionally to the walls of the mold cavity to form a feeding cavity between the walls of the feeding means having a cross section which is substantially the same as that of the mold cavity, said feeding means aligned and in abutment with the inlet end of the mold;

a charging funnel having an a flared inlet end and a constricted outlet end, said outlet end for supplying molten metal to said feeding means and being coterminous therewith;

a casting pipe for pouring molten metal into said charging funnel;

said feeding means comprising an upstream section in abutment with the constricted outlet end of said carging funnel, and a downstream section in abutment with the inlet end of said casting mold;

means associated with the upstream section of said feeding means for maintaining metal in contact therewith and upstream thereof above liquidus temperature; and

means associated with the downstream section of said feeding means for cooling said downstream section sufficiently to start the strand shell development of said metal in said downstream section while at the same time preventing the rapid conduction of heat from said upstream section into the cooling means for said mold.

4,719,962

METHOD FOR SELECTIVELY FORMING AT LEAST ONE COATING STRIP CONSISTING OF A METAL OR ALLOY ON A SUBSTRATE CONSISTING OF ANOTHER METAL

Georges Haour, Geneva; Dag F. Richter, Carouge; Peter Boswell, Acacias/Geneva, and Willy Wagnieres, Grand-Lancy, all of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

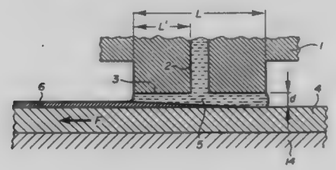
PCT No. PCT/CH86/00026, § 371 Date Nov. 3, 1986, § 102(e) Date Nov. 3, 1986, PCT Pub. No. WO86/05213, PCT Pub. Date Sep. 12, 1986

PCT Filed Feb. 25, 1986, Ser. No. 933,748

Claims priority, application Switzerland, Mar. 4, 1985, 963/85

Int. Cl.⁴ B22D *11/00*

U.S. Cl. 164—461 **7 Claims**



1. A method of forming an alloy or metal coating on a metal substrate comprising the steps of:

(a) heating said substrate to a temperature of from 0.60 to 0.95 of the melting point of the alloy or metal material to be used for coating;

(b) melting said alloy or metal material at a temperature of from one to two times the melting point thereof;

(c) depositing said molten alloy or metal on said substrate via a nozzle at a pressure of from 50 to 500 mm H_2O;

said substrate moving relative to said nozzle at from 1 to 15 m/min, at a distance of from 50 to 500 mm from the nozzle outlet, where said nozzle outlet measures from 0.3 to 1.0 mm in the direction of movement of the substrate, and where a surface defining the outlet of the nozzle extends from about 0.5 to 5 mm in the direction of substrate movement; thereby

(d) forming a coating of said alloy or metal material having a thickness of from 4 μm to 50 μm;

such that an intermetallic layer formed at the coating/substrate interface has a thickness of between 0.5 and 4 μm, but which thickness does not exceed 40% of the total thickness of said coating, the balance of the coating consisting of the initial alloy or metal of between 97 and 99.5% purity.

4,719,963

PROCESS FOR THE PRODUCTION OF A METAL STRAND, MORE PARTICULARLY IN THE FORM OF A STRIP OR SECTION, BY CASTING AND APPARATUS FOR THE PERFORMANCE OF THE PROCESS

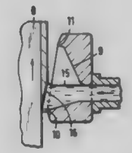
Horst Schenk, Dortmund, and Peter Dziura, Iserlohn, both of Fed. Rep. of Germany, assignors to Sundwiger Eisenhutte Maschinenfabrik Grah & Co., Hemer-Sundwig, Fed. Rep. of Germany

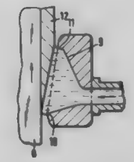
Filed Jun. 12, 1986, Ser. No. 873,557

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521778; Jan. 29, 1986, 3602594

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—461 **21 Claims**





1. In a process for the production of metal strands, including providing a moving cooling surface of a cooling member and applying molten metal from a first slotted die onto the cooling surface as it moves past the die with a narrow gap therebetween, the improvement comprising: starting the step of applying by forming a wedge-shaped solidification front within the region of the die by adjusting at least one of the speed of the cooling surface and the width of the gap to prevent uncontrolled flow of the molten metal comprising disposing the die at an initial gap width which is narrower than that of said narrow gap and thereafter gradually increasing the gap width while keeping the solidification front within the region of the die.

11. In a process for the production of metal strands, including providing a moving cooling surface of a cooling member and applying molten metal from a first slotted die onto the cooling surface as it moves past the die with a narrow gap therebetween, the improvement comprising: starting the step of applying by forming a wedge-shaped solidification front within the region of the die by adjusting at least one of the speed of the cooling surface and the width of the gap to prevent uncontrolled flow of the molten metal, wherein the cooling surface moves upwardly, forming a wedge-shaped gap between the die and the cooling surface and wherein the step of adjusting comprises initially setting the speed of the moving cooling surface to maintain the level of the molten metal at an

VOL 1086 ISS 3 JA 19 1988 UMI

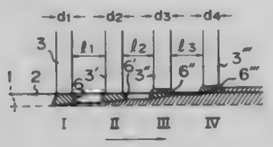
initial low level and adjusting the speed to gradually increase the level to a higher normal operating level.

4,719,964

METHOD FOR PRODUCING A METAL WIRE

Takashi Sato; Tsutomu Ozawa, and Toshio Yamada, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,266
Claims priority, application Japan, Dec. 2, 1983, 58-227888
Int. Cl.⁴ B22D *11/00*
U.S. Cl. 164—463 **6 Claims**



1. A method for producing a metal wire having a round or virtually round cross section, comprising the steps of:
preparing a rotary chill block or wheel having a surface provided with a groove extending in a predetermined direction;
preparing at least one container having at least two nozzles, with each nozzle having an orifice diameter of from 0.2 to 0.8 mm and arranged at a distance such that a distance between adjacent metal streams is from 0.3 to 3 mm;
disposing said at least one container above said movable rotary chill block or wheel and aligning the nozzles in registry with such groove in a line parallel to said predetermined direction wherein at least some of said nozzles have orifice diameters of different dimensions with the dimensions of said orifice diameters decreasing in size along said predetermined direction;
moving said rotary chill block or wheel in said predetermined direction;
holding molten metal in said at least one container;
ejecting the molten metal through the nozzles as the melt streams, thereby forming a flat wire in the groove by the melt stream ejected from the most upstream nozzle;
successively superimposing said melt stream from each downstream nozzle on flat metal which is ejected from the most upstream nozzle and is positioned in the groove, while this metal is unsolidified, thereby increasing a cross section of the wire; and
cooling the successively superimposed metal in the groove to form a completely solid wire having a round or an essentially round cross section.

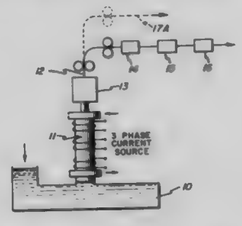
4,719,965

CONTINUOUS METAL CASTING METHOD

Hugh R. Lowry, Fairfield, Conn., and Robert T. Frost, Berwyn, Pa., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 165,421, Jul. 2, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,830
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.⁴ B22D *27/02*
U.S. Cl. 164—467 **18 Claims**

1. The method of producing a metal product of long length which comprises the steps of forming an elongated upwardly traveling alternating electromagnetic field within the interior of a surrounding casting vessel, introducing the liquid metal into the lower portion of the casting vessel and the field, establishing the value of the electromagnetic field acting on the liquid metal column to reduce the hydrostatic head of the column and to maintain a predetermined dimensional relationship between the outer surface of the liquid metal column and the interior surrounding surfaces of said casting vessel, maintaining the value of the electromagnetic field so that the cross-sectional dimension of the liquid metal column is sufficiently large to preclude formation of a substantial gap between the outer surface of the column and the interior surrounding surfaces of the casting vessel thereby effecting maximum obtainable heat transfer between the liquid metal column and the casting vessel while simultaneously reducing gravitational, frictional and adhesive forces to a minimum, moving the liquid metal column upwardly through the casting vessel, solidifying the metal while moving upwardly through said vessel and said field, and removing solidified metal product from the upper portion of said vessel.

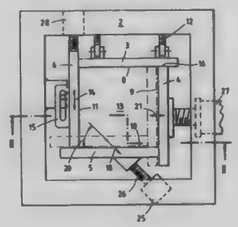


4,719,966

METHOD OF AND ARRANGEMENT FOR ADJUSTING A CONTINUOUS CASTING MOLD

Adalbert Röhrig, Thalwil, Switzerland, assignor to Concast Standard AG, Zürich, Switzerland

Filed Apr. 10, 1987, Ser. No. 37,220
Claims priority, application Switzerland, Apr. 15, 1986, 494/86
Int. Cl.⁴ B22D *11/04*
U.S. Cl. 164—491 **16 Claims**



1. A method of changing the dimensions of a generally square or rectangular continuous casting mold cavity defined by four cooled mold surfaces, comprising the step of shifting at least two of said surfaces transverse to the casting direction, the shifting step for at least one of said two surfaces being performed in such a manner that said one surface moves along a direction making an acute angle with said one surface.

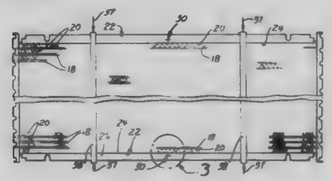
5. A continuous casting mold, comprising a mold frame; four mold walls mounted on said frame and each having a cooled mold surface and an end face, each of said end faces abutting the mold surface of a neighboring wall so that said surfaces cooperate to define a generally square or rectangular mold cavity; and means for shifting at least two of said walls transverse to the casting direction, said shifting means including at least one shifting mechanism arranged to move one of said two walls along a direction making an acute angle with the respective mold surface.

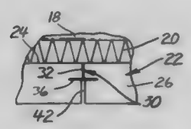
4,719,967

HEAT EXCHANGER CORE WITH SHEARABLE REINFORCEMENTS

Louis Scarselletta, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 22, 1987, Ser. No. 65,010
Int. Cl.⁴ B21D *53/02;* **B23P** *15/26*
U.S. Cl. 165—76 **4 Claims**





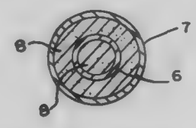
1. A heat exchanger core comprising a pair of headers, a row of interleaved tubes and air centers extending between said headers and arranged so that there is an outboard located air center at both ends of said row, a pair of reinforcements sandwiching said row and extending along side the respective outboard air centers and between said headers, said reinforcements having a cross section with a base contacting the associated outboard air center and at least one leg extending outwardly therefrom, and perforation configured means in said reinforcements defining shear zones in their leg for maintaining rigidity in said reinforcements for fixturing and brazing of the core and being shearable thereafter to fully fracture said reinforcements.

4,719,968

HEAT EXCHANGER

Phillip C. Speros, 10293 Prouty Rd., Painesville, Ohio 44077

Continuation-in-part of Ser. No. 607,416, May 7, 1984, abandoned, which is a division of Ser. No. 438,767, Nov. 11, 1982, Pat. No. 4,459,976, which is a continuation-in-part of Ser. No. 225,254, Jan. 15, 1981, abandoned. This application Jul. 16, 1985, Ser. No. 755,619
Int. Cl.⁴ F28F *21/00*
U.S. Cl. 165—154 **15 Claims**



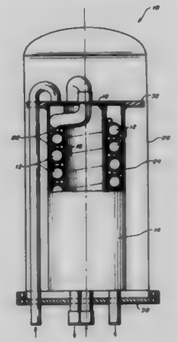
1. In a heat exchanger, the combination of a heat transfer pack consisting of compressed discrete particles of radiation energy-absorbing solid matter having a mean diameter of no more than about 750 microns and having a thermal diffusivity constant of at least 0.5 cm^2/sec at 20° C., said particles being immobilized relatively to each other by a pack pressure sufficient to maintain said particles in physical and thermally-conductive contact with each other during operating conditions, said particles providing a plurality of interstitial fluid passageways through said pack, and an enclosure for retaining said particles in heat transfer contact with a fluid directed through said pack.

4,719,969

VIBRATION AND SHOCK RESISTANT HEAT EXCHANGER

William G. Patton, Severna Park; Victor H. Dilling, Chester, and Geoffrey F. Green, Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1985, Ser. No. 739,349
Int. Cl.⁴ F28F *1/24;* **F28D** *7/02*
U.S. Cl. 165—160 **8 Claims**



1. A vibration and shock resistant finned tube counter-flow heat exchanger comprising:
a cylindrical heat exchanger shell, having an inner shell wall and an outer shell wall;
a finned tube, helically wound about the inner wall of said cylindrical heat exchanger shell;
a support member, helically wound about, and affixed to, the inner wall of said cylindrical heat exchanger shell and having the same pitch as said finned tube windings, wherein said support member rigidly supports said finned tube, maintains a space between the adjacent finned tube windings, and directs the counter flow across the surface area of the finned tube fins; and,
a compliant spacer element, helically wound about the finned tube windings, the windings of the compliant spacer element having the same pitch as the finned tube windings and lying within the groove formed between the adjacent windings of the finned tube and the outer wall of the heat exchanger shell, wherein said compliant spacer element maintains a space between the adjacent windings of the finned tube and directs the counter-flow across the surface area of the finned tube fins in co-operation with the support member.

4,719,970

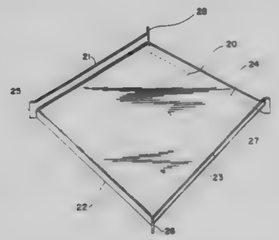
PLATE EXCHANGERS AND NOVEL TYPE OF PLATE FOR OBTAINING SUCH EXCHANGERS

Lucien Fayolle, Le Vieux, France, assignor to Vicarb, France

Continuation of Ser. No. 719,468, Apr. 3, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 938,338
Claims priority, application France, Apr. 19, 1984, 8406442
Int. Cl.⁴ F28F *3/08*
U.S. Cl. 165—166 **18 Claims**

1. A heat exchanger including independent fluid circuits, said heat exchanger comprising:
modular elements in the form of blocks maintained juxtaposed inside an enclosure, said enclosure comprising lateral walls and a plurality of blocks which define a plurality of independent lateral fluid chambers, each block defining

superposed channels, adjacent ones of said superposed channels opening out alternately into one of said plurality of lateral fluid chambers, said channels extending over the whole width of the block, each of said plurality of blocks comprising a plurality of substantially identical elemental plates, each of said elemental plates including a plurality



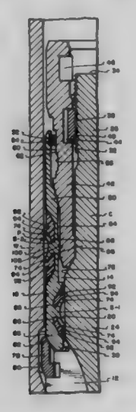
of horizontal edges turned back through 90° alternately in opposite directions, adjacent horizontal edges forming an angle therebetween, a vertical edge being formed in each said angle enabling said blocks to be fixed to the lateral walls, said plates being associated with one another by butt-welding ends of the horizontal edges of the vertical edges.

4,719,971

METAL-TO-METAL/ELASTOMERIC PACK-OFF ASSEMBLY FOR SUBSEA WELLHEAD SYSTEMS

Henry S. Owens, Santa Barbara, Calif., assignor to Vetco Gray Inc., Houston, Tex.

Filed Aug. 18, 1986, Ser. No. 897,482
Int. Cl.⁴ F21B *33/04*
U.S. Cl. 166—191 **17 Claims**



14. A seal assembly for sealing two cylindrical walls spaced from one another comprising;

a first metal-to-metal sealing means positioned in said space between said inner and outer walls and engaging one of said walls in an interference fit sealing relationship,

a second metal-to-metal sealing means positioned in said space between said inner and outer walls and initially spaced from one of said walls, and

means for wedging the said second metal-to-metal sealing means radially into sealing engagement with the other of said walls by moving said wedging means between said inner wall and said second metal-to-metal seal.

4,719,972

TREATMENT OF STEAM FEEDWATER WITH CO_2 TO REDUCE OIL WELL RESERVOIR GRAVEL AND SAND DISSOLUTION DURING STEAM INJECTION

Liming Hsueh, Buena Park, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 29, 1985, Ser. No. 728,063
Int. Cl.⁴ E21B *43/24, 47/00*
U.S. Cl. 166—252 **7 Claims**

1. A process of inhibiting the dissolution of the gravel pack and/or silicate containing hydrocarbon-bearing formation subjected to steam enhanced oil recovery stimulation comprising:

creating steam, said steam comprises a vapor phase and a residual liquid phase;

monitoring the pH of said residual liquid phase;

injecting a sufficient amount of CO_2gas into the residual liquid phase of the steam to reduce the pH of the residual liquid phase to from about pH 5 to about pH 9, and

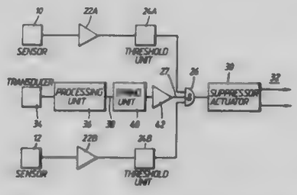
injecting said steam into said formation, wherein the reduced pH of the steam inhibits the dissolution of the gravel pack and/or silicate containing hydrocarbon-bearing formation.

4,719,973

FIRE AND EXPLOSION DETECTION AND SUPPRESSION

Nicholas S. Allen, Windsor, and Peter E. Moore, Reading, both of England, assignors to Graviner Limited, Berkshire, England

Filed Nov. 25, 1986, Ser. No. 934,669
Claims priority, application United Kingdom, Dec. 20, 1985, 8531486
Int. Cl.⁴ A62C *37/04*
U.S. Cl. 169—61 **10 Claims**



1. A fire and explosion detection system for detecting fire or explosion within an area to be protected, comprising

radiation detection means operative to produce an alarm signal in response to the detection of electromagnetic radiation from a source within the said area and thereby indicative of a fire or explosion in the said area,

non-radiation-responsive transducer means operative to detect the existence within the said area of a predetermined non-radiation parameter and thereby indicating that the source of electromagnetic radiation to which the radiation detection means is responsive is one in response to which no alarm signal is required, and

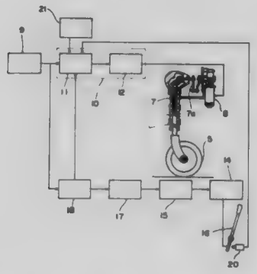
inhibit means responsive to the non-radiation-responsive transducer means for blocking such alarm signal.

4,719,974

WALKING OPERATOR TYPE CULTIVATOR WITH AUTOMATIC CONTROL STOPPER

Naotaka Kasai, Miki, and Nobuhide Yanagawa, Osaka, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Oct. 23, 1985, Ser. No. 790,555
Claims priority, application Japan, Nov. 14, 1984, 59-240274; Feb. 4, 1985, 60-14530; Mar. 4, 1985, 60-42285; Mar. 4, 1985, 60-42286
Int. Cl.⁴ A01B *63/111;* B62D *51/04*
U.S. Cl. 172—2 **10 Claims**



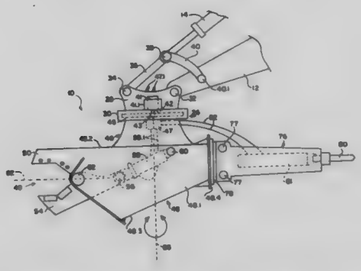
1. In a walking-operator type cultivator comprising an engine, drive wheels adapted to receive power of the engine through a propelling system clutch, a rotary plow adapted to receive the power of the engine through a plowing clutch, a ground engaging member for setting a plowing depth, a position adjusting mechanism for raising and lowering the ground engaging member, sensor means for detecting fore and aft inclinations of the cultivator, automatic position control means for automatically controlling the position adjusting mechanism in response to signals received from the sensor means, the improvement comprising control stopper means connected to the automatic position control means for automatically inhibiting operation of the automatic position control means in response to said signals for avoiding movement of said ground engaging member to a position during non-plowing operations that interferes with movement of the cultivator.

4,719,975

ROTATING HAMMER-SHEAR

Kenneth R. LaBounty, Rt. 1, Box 164B, Two Harbors, Minn. 55616

Filed Feb. 28, 1986, Ser. No. 834,808
Int. Cl.⁴ E21C *37/00*
U.S. Cl. 173—46 **10 Claims**



1. A rotating hammer shear for demolishing structures of material such as concrete and for releasable attachment to a boom structure and hydraulic system of a hydraulic excavator, comprising:

(a) a frame,

(b) a power operated heavy duty shear secured to one end of the frame and extending therefrom,

(c) a power operated hammer secured to an end of the frame opposite the shear and extending therefrom away from the shear,

(d) rotational mounting means secured to the frame for rotating the frame through an arc of 360 about an axis transverse to the extension of the shear and hammer from the frame, and

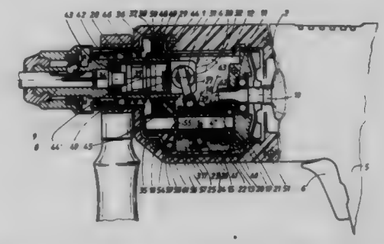
(e) securing means for providing pivotal attachment of the rotational mounting means to the boom structure and hydraulic system of the excavator.

4,719,976

HAMMER DRILL

Manfred Bleicher, Leinfelden-Echterdingen; Ulrich Bohne, Kohlberg, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 825,095
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506695
Int. Cl.⁴ B25D *11/10*
U.S. Cl. 173—109 **21 Claims**



1. A hammer drill having a housing and, within the housing, means for guiding work tool, a driving motor coupled by a gear train and a motion converting wobble disc means to a percussive mechanism acting via a resilient buffer on an axially reciprocating striking member whose energy is transferred to a work tool inserted in said guiding means, comprising a clutch arranged in said gear train to transmit torque from said driving motor to said wobble disc means when brought in engaged condition in response to a contact pressure of the work tool against a workpiece, the clutch including an axially movable clutch part arranged for joint rotation with the wobble disc means and an axially fixed clutch part driven by said gear train and being backed up by said housing, said means for guiding a work tool being supported for axial movement relative to said housing; and said axially movable clutch part being brought into engagement with said axially fixed clutch part by the action of said percussive mechanism transmitting back forces via said wobble disc means when the work tool is pressed against a workpiece.

4,719,977

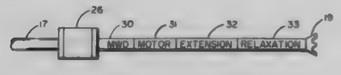
METHOD OF DRILLING DEVIATED WELLBORES

Thomas B. Dellinger, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,738
Int. Cl.⁴ E21B *7/08*
U.S. Cl. 175—61 **11 Claims**

1. A method of drilling a deviated wellbore into the earth by a rotary drilling technique wherein a drill string is used to advance a drill bit through the earth and a drilling fluid is circulated down the drill string and returned from the wellbore in the annulus formed about the drill string, comprising:

(a) drilling a vertical first portion of said wellbore into the earth from a surface location to a kick-off point at about the lower end of said first portion by rotating and advancing a drill string and drill bit into the earth,
(b) initiating a deviated second portion of said wellbore at said kick-off point,
(c) withdrawing said drill string and drill bit from said vertical first portion of said wellbore,
(d) running into said vertical first portion of said wellbore a drill tool for drilling said deviated second portion of said wellbore, said specialized drill tool being comprised of a drill string, a drill bit, a motor for rotating said drill bit, and an extension sub having both contracted and extended positions for providing weight to said drill bit during movement from said contracted to said extended position,
(e) positioning said drill tool such that said drill bit is a predetermined distance above the wellbore bottom,



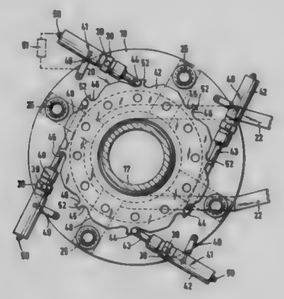
(f) imparting both rotation and a rapid dynamic movement downward to said drill tool such that said drill bit impacts the wellbore bottom and places said extension sub in a contracted position,
(g) removing excessive weight on said drill bit that would otherwise be detrimental to the drilling of said deviated wellbore prior to said drilling by a relaxation movement of said drilling tool,
(h) producing a drilling stroke of said drill bit into the earth below the wellbore bottom by simultaneously maintaining said drill string stationary, rotating said drill bit under the control of said drill motor, and advancing said drill bit under the weight provided by said extension sub in moving from said contracted position to said extended position,
(i) raising said drill tool at the end of said first drilling stroke to again position said drill bit a predetermined distance above the wellbore bottom, and
(j) repeating steps (f) through (h) so as to provide additional drilling strokes for the drilling of said deviated wellbore.

4,719,978

EARTH DRILLING DEVICE

Günter Klemm, Drolshagen, Fed. Rep. of Germany, assignor to Ing. Günter Klemm Spezialunternehmen für Bohrtechnik, Fed. Rep. of Germany

Filed Dec. 2, 1986, Ser. No. 936,752
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544086
Int. Cl.[4] E21B *3/02, 7/22*
U.S. Cl. 175—113 **10 Claims**



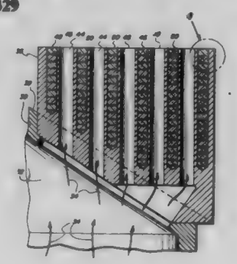
1. An earth drilling device for rotating a pipe (17) into the ground comprising a rotary disk (20) having clamping means (28, 35) for engaging the pipe, a reciprocatingly driven first driving cylinder (40) for rotating said clamping means (28, 35), a stationary table (19) supporting said rotary disk (20), said rotary disk (20) having a plurality of peripherally distributed engaging members (45) capable of being advanced by said first driving cylinder (40), means for selectively operating said first driving cylinder (40) to advance said engaging members (45) in a first direction of rotation during a working stroke and moving away from said engaging members during a return stroke, swivel means (49, 53) for swiveling the first driving cylinder (40) toward the axis of the rotary disk (20) to effect selective engagement thereof with said engaging members (45), said rotary disk (20) having an inclined face (27), said clamping means (28, 35) including a plurality of clamping jaws (28) which are pressed axially against said inclined face (27) by a pressure member (35), and tension means (34) for urging said clamping means (28) and rotary disk (20) into clamping engagement through said inclined face (27).

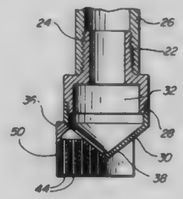
4,719,979

EXPENDABLE DIAMOND DRAG BIT

Kenneth W. Jones, Kingwood, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 24, 1986, Ser. No. 843,049
Int. Cl.[4] E21B *10/46, 10/60*
U.S. Cl. 175—329 **16 Claims**





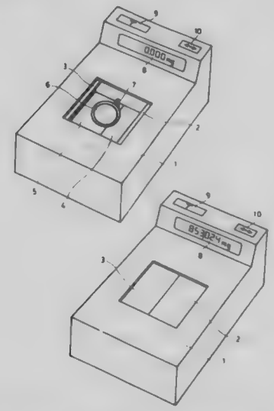
1. A drill bit for drilling in subterranean formations comprising:
a pin end formed at a first end of said drill bit adapted for being removably attached to a drill string;
a drill bit body attached to the pin end of said drill bit, the body forms an interior cavity which is in fluid communication with the drill string for receiving drilling fluid in the interior cavity; and
two or more drilling blades attached to the drill bit body at a second cutting end of said drill bit, each drilling blade forms a leading edge configured for contacting the formation when the drill bit is used for drilling, the drilling blade forms a plurality of channels penetrating through the body of the blade and comprising means for conducting drilling fluid from the interior cavity of the drill bit body to the leading edge of the blade where each of the channels forms a fluid discharge port whereby, as the blade erodes during drilling, the drilling fluid continues to be ejected from the several discharge ports formed in the eroding leading edge of the blade, the drilling blade having a plurality of elongated rods comprising hard diamond drilling material, the rods being affixed to the blade in cavities formed in the blade and being exposed for drilling the formation in the leading edge of the blade with their respective longitudinal axes substantially perpendicular to the direction of erosion of the blade, whereby, as the blade and the rods of hard diamond drilling material erode during drilling, the rods continue to be exposed in the eroding leading edge of the blade, said drilling blades having approximately the same number of discharge ports as elongated rods comprising hard diamond material and wherein at least one fluid discharge port is located immediately adjacent to the exposed end of each diamond rod.

4,719,980

ANALYTICAL BALANCE WITH SCALE ON TOP AND WITH WEIGHING CHAMBER LOCK

Erich Knothe, Eddigehausen; Franz-Josef Melcher, Hardegsen; Klaus Dardat, Dransfeld, and Günther Maaz, Uslar, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Dec. 24, 1986, Ser. No. 946,016
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601408
Int. Cl.[4] G01G *21/28*
U.S. Cl. 177—180 **6 Claims**



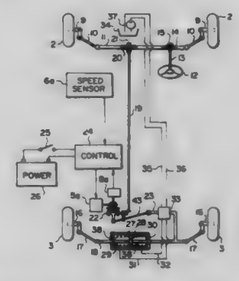
1. Analytical balance with scale on top with a scale carrier which is directly operatively connected to a measured value receiver, with a balance scale disk which rests in a removable manner on the scale carrier, with a weighing chamber which surrounds the balance scale disk, the scale carrier and the measured value receiver, with a weighing chamber lock which constitutes the communication between the weighing chamber and the environment and which consists of two closing elements located in series in the form of a lock and with a transport device which can move the balance scale between a weighing position of the scale carrier and a loading position outside of the weighing chamber, characterized in that the two closing elements 4, 5 and 2, 3 or 2', 3,' of the weighing chamber lock are located above one another, that the lower closing element consists of at least one level, horizontal plate (4,5) which can be shifted in the plate plane, that the upper closing element consists of at least one level plate (2,3) which can be shifted in a plane and that the transport device (7,12) for the balance scale moves the latter essentially vertically.

4,719,981

FOUR-WHEEL STEERING SYSTEM

Akihiko Miyoshi, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Sep. 12, 1985, Ser. No. 775,330
Claims priority, application Japan, Sep. 17, 1984, 59-195411
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 **9 Claims**



1. A four-wheel steering system for a vehicle comprising a steering wheel, a front wheel turning mechanism for turning front wheels in response to the operation of the steering wheel, a rear wheel turning mechanism which turns rear wheels in response to the operation of the steering wheel, an electric actuator for changing the position of a movable member, the position of which determines a rear wheel turning angle ratio, said rear wheel turning angle ratio being a ratio of the turning angle of the rear wheels to the turning angle of the front wheels for a given turning angle of the steering wheel, and a vehicle speed sensor and a target rear wheel turning angle ratio setting means for setting a target rear wheel turning angle ratio according to a speed detected by said vehicle speed sensor, the electric actuator being controlled to obtain and target rear wheel turning angle ratio wherein the improvement comprises a preset vehicle speed detecting means for providing a detection signal when at least one preset vehicle speed is detected, a first control means for receiving a signal from said target rear wheel turning angle ratio setting means and outputting a driving signal to said electric actuator to thereby control said actuator when the vehicle speed is not at set preset vehicle speed, a rear wheel turning angle ratio detecting means for detecting the actual rear wheel turning angle ratio, and a second control means for receiving signals from the preset vehicle speed detecting means and the rear wheel turning angle ratio detecting means and, when the vehicle speed is at said preset vehicle speed providing a driving signal to said electric actuator to change the position of the movable member so that the actual rear wheel turning angle ratio coincides with the target rear wheel turning angle ratio at said preset vehicle speed.

4,719,982

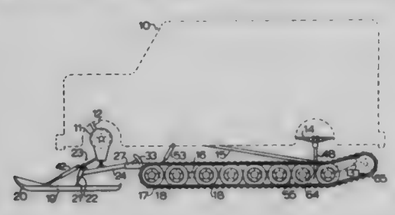
APPARATUS FOR CONVERTING A ROAD VEHICLE INTO A SNOWMOBILE

Allen L. Shaver, General Delivery, Stonewall, Manitoba, Canada R0C 2Z0

Filed Nov. 7, 1986, Ser. No. 927,713
Int. Cl.[4] B62B *19/00*
U.S. Cl. 180—183 **11 Claims**

1. Apparatus for converting into a snowmobile a road vehicle of the type including a vehicle body, a pair of front ground wheel attachment hubs, a pair of rear ground wheel attachment hubs, front suspension spring means for mounting said front wheel hubs on said vehicle body for a suspension movement, rear suspension spring means for mounting said rear wheel hubs on said vehicle body for a suspension movement, and a drive shaft for communicating drive from a vehicle engine to said rear wheel hubs, said apparatus comprising a substantially rectangular subframe, two series of track engag-

ing idler wheels arranged along respective sides of said subframe, an endless ground engaging track extending around each series of track engaging wheels, means for attachment of said frame to said rear suspension spring means, a pair of ground engaging steering members, strut means mounting each of said steering members on said subframe, said strut means extending forwardly from a front edge of said subframe and being pivotal about a substantially horizontal axis relative to said subframe, means for attaching each of said strut means to



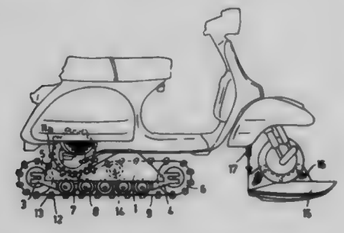
respective one of said front hubs such that said front suspension spring means applies spring force to said strut means in pivotal movement thereof, and limit means coupled between said subframe and said strut means for limiting the pivotal movement of the strut means relative to said subframe wherein said limit means comprises an extension portion of said strut extending beyond said pivot axis and a pair of stop members arranged on opposed sides of said extension portion for limiting movement of said extension portion about said pivot axis.

4,719,983

DEVICE AND ATTENDANT EQUIPMENT FOR CONVERTING A MOTOR-SCOOTER INTO A VEHICLE SUITABLE FOR OPERATING ON SNOWY GROUND

Riccardo Brazzone, Viale Des Geneys 29A/4, 16148 Genova, Italy

Filed Dec. 8, 1986, Ser. No. 938,802
Int. Cl.[4] B62M *27/02*
U.S. Cl. 180—184 4 Claims



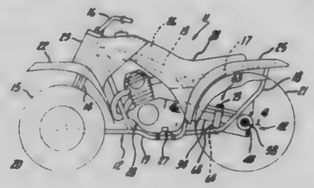
1. A device and attendant equipment for converting a motor scooter having a rear wheel and a front wheel into a vehicle suitable for operating in any direction and without altered center of gravity substantially comprising a rear crawler-mounting trolley with its drive reversing/reducing gearing mounted in lieu of the rear wheel and a steering skid mounted in lieu of the front wheel, said trolley comprising a cradle-like frame connectible to the normal fixing means of the existing engine and shock absorber of the scooter, said frame including two transverse spacer bars supporting a front fork and a rear fork, for mounting two idle wheels capable of movably guiding said crawler track while permitting limited lateral tiltability thereof and for swingably supporting a longitudinal bar mounting a plurality of pairs of smaller supporting wheels, said crawler track having a flat belt of rubberized fabric or the like and having affixed thereto a plurality of equally-spaced cross members or shoes made of metal angle bars, and provided with a central row of rectangular openings formed with a suitable pitch therebetween in the spaces between consecutive shoes to permit meshing engagement, on the outer side of said track, of a driving toothed wheel mounted on a suitable drum hub containing a crown-and-pinion reversing/reducing gearing to be mounted in lieu of the drum hub carrying the rear wheel of the vehicle.

4,719,984

DRIVE AND BRAKING SYSTEM FOR VEHICLE

Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Continuation of Ser. No. 699,203, Feb. 5, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 933,321
Claims priority, application Japan, Feb. 6, 1984, 59-18416
Int. Cl.[4] B62M *17/00*; B60K *17/24*
U.S. Cl. 180—226 8 Claims



1. A wheeled vehicle drive and braking arrangement, said wheeled vehicle having a generally open frame, at least one dirigible front wheel supported at a forward end of said frame, a saddle type seat carried by said frame to the rear of said front wheel and adapted to carry a rider seated thereon in straddle fashion, a pair of spaced apart rear wheels to the rear of said seat, axle means journaled by said frame and carrying said rear wheels, final drive means for driving said axle means and therby driving said wheels, said final drive means including an outer housing carried by said frame, an engine spaced from said final drive means and positioned beneath and forwardly of said seat, said engine having an outer housing carried by said frame and spaced from said final drive means for driving said wheels, a drive shaft extending longitudinally of said vehicle between said engine and said final drive means through an open portion of said frame, a brake disk fixed for rotation with said drive shaft beneath said seat, an exposed brake housing fixed against rotation directly to at least one of said engine and said final drive means outer housings but spaced outwardly thereof and enclosing said brake disk, brake pad means and actuator means carried by said brake housing and cooperating with said brake pad means for actuating said brake pad means to brake said brake disk, said brake pad means and said brake sidk constituting the sole brake acting upon said rear wheels.

4,719,985

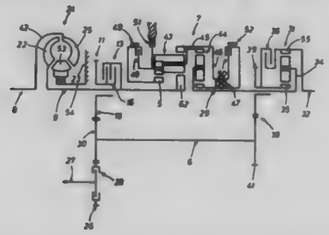
DRIVE ARRANGEMENT FOR A MOTOR VEHICLE WITH FOUR-WHEEL DRIVE

Wolfgang Zaiser, Steinheim, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,217
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542416
Int. Cl.[4] B60K *17/354*; F16H *1/44*
U.S. Cl. 180—245 20 Claims

1. A drive arrangement for a motor vehicle having a four-wheel drive establishable by connecting one wheel axle with another drivable wheel axle, and wherein said one wheel axle is driven by an input shaft drivable by a driving engine via an auxiliary drive shaft and a gear shift transmission, the auxiliary drive shaft and gear shift transmission being arranged parallel to an axis of the input shaft, the auxiliary drive shaft and the

input shaft being brought into direct driving connection with one another by means of an auxiliary transmission, at least one of these two auxiliary drive shafts and input shafts, being brought into driving connection with the auxiliary transmis-



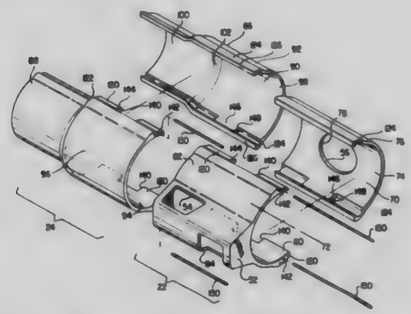
sion by engagement of a clutch means and the clutch means being engaged only when torque transmission in the gear shift transmission is interrupted and an interaxle differential means that is connected between the two wheel axles is brought into an unblocked condition.

4,719,986

STEERING COLUMN SHIELD

Winsford H. Richardson, Jr., 2511 Wedgles, #823, Dallas, Tex. 75211

Filed Mar. 20, 1987, Ser. No. 28,217
Int. Cl.[4] B60R *25/02*
U.S. Cl. 180—287 7 Claims



1. Apparatus for preventing the unauthorized use of a vehicle having an ignition lock and at least one control lever mounted in a steering column, comprising:

a main column unit including first and second main column unit half shells;

the first main column unit half shell having semi-cylindrical inner and outer surfaces extending substantially along the length thereof and walls defining an opening for the ignition lock of the vehicle;

the second main column unit half shell having partial semi-cylindrical inner and outer surfaces and a lever pocket extending from the outer surface thereof, the lever pocket including walls defining at least one opening for the control lever of the vehicle;

main column unit interlocking joint means disposed on side edges of the first and second main column unit half shells for fixing the main column unit about the steering column in the vicinity of the ignition lock and control lever;

main column unit locking means acting in cooperation with the main column unit interlocking joint means for preventing the removal of the main column unit once it is fixed about the steering column;

a column base unit including first and second column base unit half shells;

the first and second column base unit half shells each having inner and outer semi-cylindrical surfaces extending substantially along the length thereof;

base column unit interlocking joint means disposed on side edges of the first and second base column unit half shells for fixing the base column unit about the steering column in an abutting relationship to the main column unit; and

base column unit locking means acting in cooperation with the base column unit interlocking joint means to prevent the removal of the base column unit once it is fixed about the steering column.

4,719,987

BI-PLANAR PONTOON PARAVANE SEISMIC SOURCE SYSTEM

Robert K. George, Jr., Lewisville; Lorton E. Trout, Richardson, and Ernest R. Harrison, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 622,307, Jun. 19, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 29,377
Int. Cl.[4] G01V *1/38*
U.S. Cl. 181—114 11 Claims



1. A seismic source system for towing by a marine vessel equipped with a lifting mechanism, comprising:

(a) a seismic source array, selectively attachable to the lifting mechanism; and

(b) a bi-planar pontoon paravane for housing and supporting the seismic source array, the paravane comprising:

(i) a buoyant bridge having two long sides;

(ii) housing means including the bridge for housing the seismic source assembly when the lifting mechanism is attached and activated to lift the seismic source array; and

(iii) means responsive to a first predetermined condition of said lifting mechanism for suspending the seismic source array a desired distance beneath the paravane and responsive to a second predetermined condition of said lifting mechanism for moving said seismic source array into said housing means.

4,719,988

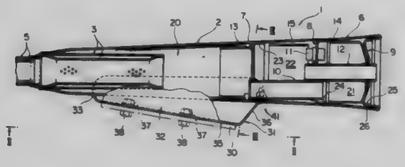
MUFFLER

Sosuke Kinouchi, Kakogawa; Syuzo Shigemoto, Hyogo, and Wataru Kanazawa, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 27, 1986, Ser. No. 879,306
Claims priority, application Japan, Jul. 8, 1985, 60-150822
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—273 8 Claims

1. A muffler for an internal combustion engine comprising a cylinder having fluid flow inlet and outlet means, a main sound arresting chamber within said cylinder and a bracket fixedly secured to an outer surface of said cylinder and having a peripheral wall provided with mounting means, the improvement comprising means for partitioning the main sound arresting

chamber into an upstream main sound arresting chamber portion and a downstream main sound arresting chamber portion, said bracket being sealingly secured at a peripheral portion thereof to a wall portion of said cylinder coinciding with the upstream main sound arresting chamber portion to define an



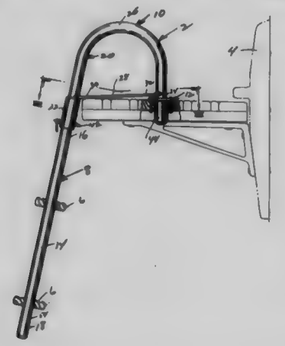
auxiliary sound arresting chamber therebetween, and means for fluid communication between said auxiliary sound arresting chamber and the upstream portion of said main sound arresting chamber provided in said wall portion of said cylinder coinciding with the upstream main sound arresting chamber portion.

4,719,989

BOAT BOARDING LADDERS HAVING A STOWAGE FEATURE

Robert G. Ritten, Ft. Pierce, Fla., assignor to Step-On Inc., Ft. Pierce, Fla.

Filed Jun. 26, 1987, Ser. No. 66,527
Int. Cl.[4] B63B *29/20*; E06C *7/48, 1/36*
U.S. Cl. 182—93 **8 Claims**



1. An improved boat boarding ladder that may be mounted on a boat in a boarding position wherein at least one step thereof extends into the water surrounding said boat and mounted in another stowage position wherein it is clear of such water which comprises:

a step section, a support section and mount means,

said step section comprising a pair of tubular spaced apart siderails having upper ends and lower ends and a plurality of steps fixed between said siderails,

said upper ends of said siderails extending above the uppermost of said steps and said lower ends extending below the lowermoat of said steps,

said support section comprising a pair of U-shaped tubular members each defined by a first free end, a second free end and an integral arcuate portion joining said free ends together,

each said U-shaped member including a bar that is fixed at one of its ends to said arcuate portion near said first free end and at its other end to said second free end,

said first free end of said U-shaped member having an inside perimeter that is approximately equal to the outside perimeter of said tubular siderails whereby said upper ends of said siderails may be fitted into said first free ends of said U-shaped members,

a first pair of opposed holes in each of said first free ends and a second pair of opposed holes in each of said upper ends of said side rails to mate with said first pair permitting a removable pin to be inserted through said first and second pairs to hold said step section depending from said support section, and

said mount means including a pair of mount units each having a tubular portion and a plate portion fixed to said tubular portion normal thereto,

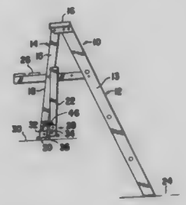
said tubular portion of each of said mount units having an inside perimeter that is approximately equal to the outside perimeter of said second free ends of said U-shaped members whereby said second free ends may be fitted into said mount unit tubular portions.

4,719,990

STEP LADDER FOR STAIRS

Branko Markovic, 758 East 38th Avenue, Vancouver, British Columbia, Canada V5W 1J1

Filed Aug. 27, 1986, Ser. No. 900,980
Int. Cl.[4] E06C *1/28*
U.S. Cl. 182—163 **8 Claims**



1. A step ladder apparatus which is convertible for resting on a flat surface or adjacent first and second surfaces wherein the second surface is raised above the first surface, the step ladder apparatus comprising:

(a) rear support means for providing a climbing structure;

(b) front support means including a pair of spaced-apart front support legs for retaining the rear support means in a substantially erect position, said front support means being hingedly connected to the rear support means, each of the legs including an upper portion with a bottom end and a lower portion with a top end;

(c) hinge means for hingedly connecting the upper and lower portions together, the hinge means including a top member having a first recess to receive the upper portion and a bottom member having a second recess to receive the lower portion, each of the members having opposite first and second sides, the members being hingedly connected together on the first said sides of the members so as to permit the members to hinge between an unfolded position where the recesses are aligned and a folded position where the recesses are not aligned; and

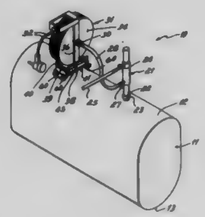
(d) wherein the upper and lower portions and their respective members are relatively positioned so that each of the upper portions projects beyond the top member to expose the bottom end of each said upper portion and each of the bottom members projects beyond the top of the lower portions to provide a pocket to receive the bottom end of the respective upper portion when the step ladder apparatus is in the unfolded position, whereby the bottom ends can rest on the first surface when the step ladder apparatus is resting adjacent the first and second surfaces.

4,719,991

LUBRICANT DISTRIBUTION SYSTEM WITH HOSE MOUNT

Philip H. Diehn, Asheville, N.C., and Timothy P. Dunigan, Jr., Lansdale, Pa., assignors to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Oct. 14, 1986, Ser. No. 917,857
Int. Cl.[4] F01M *11/00*
U.S. Cl. 184—6.28 **12 Claims**



1. A lubricant distribution system comprising:

a conventional oil storage tank having a curved upper surface,

a pump for withdrawing lubricant from said tank,

a retractable hose reel having a hose connected to the outlet of said pump and having a base for rotatably supporting said reel,

a saddle bracket for mounting said reel base on said curved upper surface of said tank, and

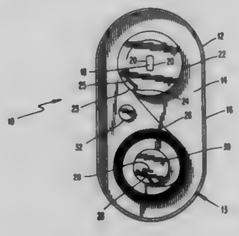
said saddle bracket having a horizontal platform secured to said hose reel base and attached centrally thereof to said upper surface of said tank, and having a plurality of feet attached to each of the opposite ends of said platform and extending toward and standing upon said upper surface.

4,719,992

B-MOTOR WITH FLOATING LOCKING PLUG

Michael P. Elward, Wilkes Barre, and Donald R. Lodwick, Clarks Summit, both of Pa., assignors to Sandvik Steel Co., Clarks Summit, Pa.

Filed Jan. 8, 1987, Ser. No. 1,368
Int. Cl.[4] F03G *1/02*
U.S. Cl. 185—43 **20 Claims**



1. A spring motor, comprising:

a frame for mounting the spring motor;

a spring having a first end and a second end;

means for receiving the spring and having the first end of the spring connected thereto, said means being rotatably mounted to said frame;

free-floating means for receiving the spring and having the second end of the spring attached thereto, said spring being coiled around the free-floating means when the spring is in an unstressed state, the free-floating means being unattached to said frame; and

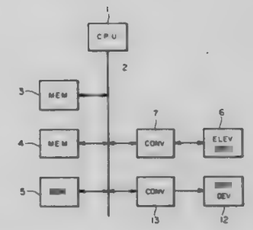
fixed means mounted to said frame for preventing overwinding of the spring motor, said fixed means being mounted to said frame a predetermined distance from said means for receiving the first end of the spring.

4,719,993

CONTROL APPARATUS FOR ELEVATOR

Hideyo Ujihara, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,250
Claims priority, application Japan, Mar. 6, 1986, 61-48964
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—101 **3 Claims**



1. In an elevator which is installed in a building and which is controlled by control means constructed of an electronic computer that has a memory storing information for control; a control apparatus for an elevator comprising:

(a) first storage means to store control information items which are peculiar to the building and which might be revised, at a plurality of separate addresses, so that when any of the control information items is revised, the stored content at the address corresponding to the information item is revised and stored, whereupon the stored contents of said first storage means including the revised information item are used for the elevator control,

(b) second control means to store the control information items at a plurality of separate addresses corresponding to the addresses of said first storage means, these information items being left unrevised, so that the original control information items before being revised are normally stored in said second storage means, and

(c) display means to display the contents of said first and second storage means at the respectively corresponding addresses.

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FLOOR RE-LEVELING APPARATUS FOR ELEVATOR

Ryuichi Kajiyama, Hoji Heights, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

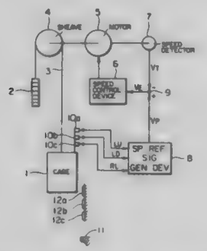
Filed Nov. 25, 1985, Ser. No. 801,312
Claims priority, application Japan, Nov. 27, 1984, 59-250062
Int. Cl.[4] B66B *1/40*
U.S. Cl. 187—113 **3 Claims**

1. A floor re-leveling apparatus for automatically repositioning an elevator cage to position the cage floor at the same level as the hall floor when the elevator cage has arrived at a position where the cage floor level deviates from the hall floor level,

said apparatus comprising:

(a) position detecting means to detect the position of the cage to determine whether the cage floor level is within one of three sections of a landing zone in which the cage can be releveled and to produce output signals representative of the level of the cage floor in any one of the three sections, the three sections including a normal floor arrival section containing the building floor level and another section immediately above and another section immediately below the normal floor arrival section;

(b) re-leveling speed reference signalgenerating device receiving the output signals of said position detection means and generating a re-leveling speed reference signal reponsive to an output signal indicating the cage floor is within one of the other sections, which speed reference signal increases at first and terminates responsive to an output signal indicating that the cage floor lies within the normal floor arrival section; and



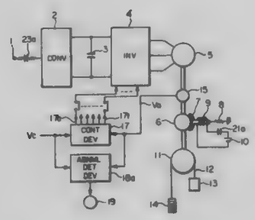
(c) a control device supplied with the speed reference signal from said generating device including means for comparing the speed reference signal with a signal representing actual cage speed and driving the cage responsive to the difference therebetween to reposition the cage and the cage floor into the normal floor arrival section.

4,719,995

CONTROL APPARATUS FOR A.C. ELEVATOR

Hiroyuki Ikejima, Inazawa City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 6, 1987, Ser. No. 46,390
Claims priority, application Japan, May 8, 1986, 61-105557
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—119 **8 Claims**



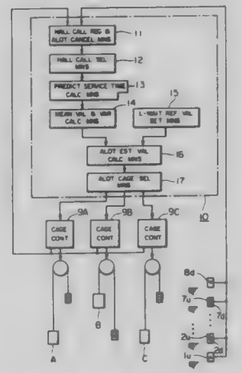
1. A control apparatus for an A.C. elevator having a variable voltage and variable frequency inverter for driving an induction motor couple to a cage of the elevator, a control device for controlling the inverter in accordance with a deviation between a speed signal detected from the induction motor and a speed command signal having a preset value, and an abnormality detection device for interrupting feed of the A.C. power to said induction motor upon detecting that a slip frequency command corresponding to the deviation is greater than a predetermined set value and continues exceeding the predetermined set value in excess of a predetermined period of time.

4,719,996

GROUP SUPERVISION APPARATUS FOR ELEVATOR

Shintaro Tsuji, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 3, 1985, Ser. No. 804,180
Claims priority, application Japan, Dec. 5, 1984, 59-256920
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—127 **5 Claims**



1. In an elevator wherein hall buttons are disposed for hall call registration in halls for a plurality of floors served by a plurality of cages, a group supervision apparatus comprising means to tentatively allot the registered hall calls to respective cages and calculate, based on the tentative cage allotments, predicted service times required for the allotted cage to serve passengers, the predicted service times including riding times, service completion times, and waiting times of passengers, mean value and variance calculation means to calculate a mean value and a variance of the predicted service times for each of the tentative cage allotments, means to set a reference time value on the basis of the predicted service times, means to find a square value of a difference between the reference time value and the mean value of the predicted service times and calculate a ratio of the variance relative to the square value corresponding to each of the tentative cage allotments and further to convert the calculated ratio in accordance with a predetermined assignment estimation function which is monotonically increasing so as to calculate an assignment estimation value for each of the cage allotments, and selection means to assign a cage to serve the passengers on the basis of the assignment estimation values which minimize rate of occurrence of long waiting times.

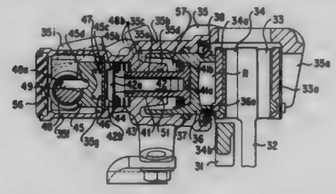
4,719,997

DISC BRAKE WITH PARKING BRAKE MECHANISM

Matsuhisa Tsuruta, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

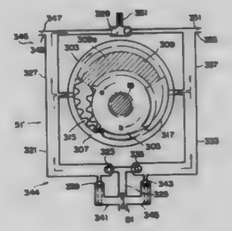
Continuation of Ser. No. 689,303, Jan. 7, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 30,285
Claims priority, application Japan, Mar. 28, 1984, 59-60038
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—71.9 **11 Claims**

1. A disc brake with a parking brake mechanism, comprising:
- a caliper having a cylinder defined therein;
- a cup-shaped piston axially slidably fitted in said cylinder with a piston seal interposed therebetween;
- a pad pressable in response to movement of the piston pushed by the parking brake mechanism or a fluid supplied under pressure into a chamber defined by said cylinder and said piston;
- a bottomed tubular adjusting nut being slidably fitted in a bore defined in a bottom wall of said cylinder coaxially with said piston with a seal ring interposed between said nut and said bore and having a closed end positioned in said chamber;
- an adjusting bolt axially movably threaded in said adjusting nut and having a head projecting out of said cylinder;
- a first spring located outside said chamber and interposed between said head of said adjusting bolt and said bottom wall of said cylinder for normally urging said adjusting bolt in a direction out of said cylinder;
- a thrust bearing located outside said chamber and interposed between said head and said first spring for ensuring smooth rotation of said adjusting bolt;
- a pusher located outside said chamber and disposed in coaxial relation to said adjusting bolt and axially movable supported by a support portion of said caliper, said pusher having at one end a slot extending substantially perpendicularly to an axis of said adjusting bolt, said pusher serving as a clutch for selective engagement with said head of the adjusting bolt;
- a second spring located outside said chamber for normally urging said pusher in a direction out of said cylinder;



- a plate located outside said chamber and having an intemediate portion extending through said slot in said pusher and interposed between said pusher and said head of the adjusting bolt so as to be relatively movable in an axial direction of said cylinder and having opposite ends supported by said support portion of said caliper for preventing said plate from moving toward said adjusting bolt and for allowing said plate to move away from said adjusting bolt and for preventing said pusher from being turned when said pusher serving as a clutch is engaged, said plate serving as a second thrust bearing selectively engageable with a central top surface of said head of said adjusting bolt of said intermediate portion thereof;
- a cam shaft positioned outside said chamber, rotatably supported by the caliper and having a cam slot opening toward an opposite end of said pusher, said cam having a parking lever secured thereto; and
- a toggle interposed between said cam slot and said opposite end of said pusher for axially moving said pusher in response to angular displacement of said cam slot.

to provide a variable discharge pressure proportional to the rotational speed difference between the first and second rotational shafts; a clutch mechanism for coupling the first and second rotational shafts with each other with a variable coupling force corresponding to the magnitude of the discharge pressure fed from the oil pump so as to distribute the driving force from the one rotational shaft directly connected to the



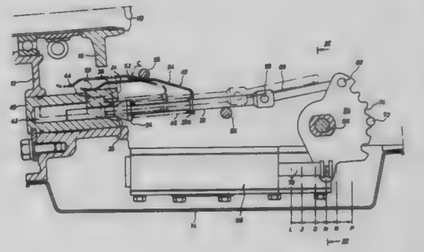
transmission to the other rotational shaft; a hydraulic circuit for feeding hydraulic fluid to the oil pump and for supplying the discharge pressure from the oil pump to the clutch mechanism; and oil pressure control means provided in the hydraulic circuit for modulating the magnitude of the discharge pressure of the hydraulic fluid flowing through the hydraulic circuit in accordance with the relative rotational direction of the first and second rotational shafts.

4,719,999

PARKING DEVICE FOR AUTOMATIC TRANSMISSION

Masahiro Ohkubo, Kadoma, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Oct. 6, 1986, Ser. No. 915,369
Claims priority, application Japan, Oct. 30, 1985, 60-243541
Int. Cl.[4] B60K *41/26*; B60T *1/00*
U.S. Cl. 192—4 A **6 Claims**



1. A parking device for an automatic transmission comprising:
- (a) an automatic transmission having a housing and disposed at a rear stage of a torque converter, and having a parking gear to lock the transmission at the time of parking;
- (b) a locking arm;
- (c) a push rod to move the locking arm;
- (d) a leaf spring mounted on the push rod so as to urge the locking arm apart from said parking gear when a driving range is selected other than a parking range, and moving the locking arm to lock the parking gear when the parking range is selected; and
- (e) a pin mounted on said housing at a position where a spring force of said leaf spring functions so as to disengage said locking arm from said parking gear when the driving mode is selected to a range other than parking range, and the leaf spring is formed in such a shape that the leaf

4,719,998

POWER TRANSMISSION SYSTEM FOR VEHICLE

Takeo Hiramatsu, Nagaokakyo; Bonnosuke Takamiya, Joyo, and Yoshimasa Nagayoshi, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,698
Claims priority, application Japan, May 29, 1984, 59-109221; Oct. 24, 1984, 59-223582; Oct. 24, 1984, 59-223583
Int. Cl.[4] F16D *25/02*; B60K *41/02, 17/34*
U.S. Cl. 192—0.033 **24 Claims**

1. A power transmission system for a vehicle having an engine, a first rotational shaft which transmits a driving force to the vehicle front wheels, and a second rotational shaft which transmits a driving force to the vehicle rear wheels, the power transmission system comprising: a transmission directly connected to one of the first and second rotational shafts but not directly to the other for transmitting the driving force produced by the engine to the one rotational shaft; an oil pump cooperatively driven by the first and second rotational shafts

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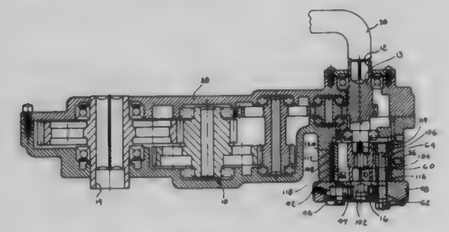
spring does not contact the pin as the driving mode is shifted to the parking range.

4,720,000

TORQUE WRENCH WITH CLUTCHES

Robert F. Snyder, Hamden, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Jul. 15, 1986, Ser. No. 885,969
Int. Cl.⁴ F16D *67/02, 13/74;* **B25B** *17/02*
U.S. Cl. 192—7 **11 Claims**



1. In a torque wrench having:
a casing;
torque transmission means in said casing;
input means connected to said transmission means for delivering an input force to said transmission means in response to movement of said input means in a first direction;
output means connected to said transmission means for imposing a torque load on an element to be torqued;
one way clutch means coupled to said input means to prevent reaction forces in said wrench from acting on said input means to cause undesired movement of said input means in a direction opposite to said first direction; and
slip brake means connected to said one way clutch means and in series with said one way clutch means, said slip brake means being responsive to a predetermined load on said input means in a direction opposite to said first direction to relax the reaction forces in said wrench;
said improvement comprising:
first sleeve means having an outer surface and an inner surface, said outer surface of said first sleeve means being grounded to said casing;
lubricant retaining means at said inner surface of said first sleeve means;
split ring means positioned within said first sleeve means;
second sleeve means around and connected to said split ring means, said second sleeve means being continuous so as to retain lubricant within said lubricant retaining means, said second sleeve means having an outer surface, said outer surface of said second sleeve means abutting said inner surface of said first sleeve means; and
said first sleeve means, said second sleeve means and said split ring means being parts of said slip brake means.

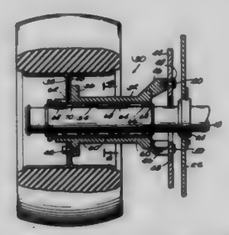
4,720,001

FREE WHEELING HUB AND BRAKE FOR RACING KARTS

Michael E. Jensen, Rte. 1, Box 199H Sandy Dr., Shawano, Wis. 54166

Filed Aug. 20, 1986, Ser. No. 898,347
Int. Cl.⁴ F16D *67/02, 15/00, 41/00*
U.S. Cl. 192—13 R **8 Claims**

1. A hub assembly for use in a self propelled kart, the kart including a frame, a plurality of wheels for supporting the frame for movement along the ground, the plurality of wheels including a pair of drive wheels, an engine supported by the frame, an axle supported by the frame and including opposite ends, means for drivingly connecting the engine to the axle such that the axle is driven by the engine, the hub assembly comprising:
a one-piece hub adapted to be mounted on one of said opposite ends of said axle and for supporting one of said wheels on said one of said opposite ends of said axle, said hub including opposite ends, one end of the hub including means for supporting one of the drive wheels, said means for supporting one of the drive wheels including a flange surrounding one end of the hub, and the other of the ends of the hub including means for supporting a brake disk, and said hub including a central cylindrical bore, and
at least one roller bearing clutch means housed in said central cylindrical bore, said roller bearing clutch housing an end of said axle, and said roller bearing clutch means



including means for providing a driving connection between said axle and said hub such that said axle can drive said hub in a first direction of rotation and means for supporting said hub for free rotation around said axle in said first direction of rotation when said wheel rotates in said first direction of rotation at a speed greater than the speed of rotation of said axle, said roller bearing clutch including a housing adapted to be housed in said central cylindrical bore of said hub for rotation with said central cylindrical bore of said hub, a bearing cage contained in said housing, a plurality of roller bearings supported by said bearing cage, said roller bearings being adapted to support said axle for rotation with respect to said hub, and a plurality of clutch members supported by said bearing cage and spaced circumferentially around said axle.

4,720,002

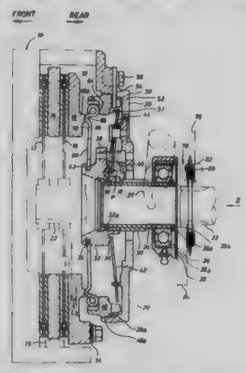
CLUTCH HAVING AN ADJUSTABLE DIAPHRAGM SPRING ENGAGING LEVER

Seiichi Kitano, Shijounawate; Yasunobu Fukatani, Hiraksta; Masaaki Asada, Ibaragi, and Kazuhiko Yoseda, Katano, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 26, 1986, Ser. No. 900,655
Claims priority, application Japan, Sep. 2, 1985, 60-194158
Int. Cl.⁴ F16D *13/48, 13/75*
U.S. Cl. 192—70.25 **5 Claims**

1. A clutch carrying out a releasing operation so as to pull a release bearing apart from a flywheel by means of a releasing lever connected to a clutch pedal, characterized by that a clutch disc is spline fitted onto an input shaft of a transmission, a sleeve is provided on an outer periphery of the input shaft, a release bearing is fastened to a transmission side end of this sleeve, a load transmitting retainer is spline fitted onto a flywheel side end of the sleeve, a clutch cover connected to the flywheel and covering a pressure plate for pressing the clutch disc is provided, an approximately disc-like diaphragm spring is disposed between this clutch cover and said retainer, an outer peripheral part of the diaphragm spring is held through wire rings to the clutch cover, an inner peripheral part of the diaphragm spring is in pressing contact with said transmission side end of the retainer, a lever an inner peripheral side fulcrum of which is held by the retainer an outer peripheral side fulcrum of which is pressed on the clutch cover so as to be interrelated therewith and an intermediate fulcrum of which is

pressed on the pressure plate, is provided between the retainer and the pressure plate, and a load of the diaphragm spring on



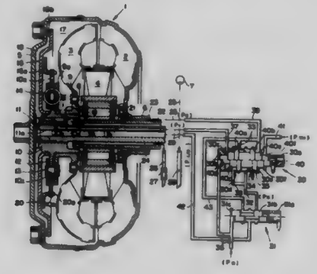
the retainer is transmitted in an magnifying manner at a lever ratio of distances between the fulcrums.

4,720,003

LOCK-UP TORQUE CONVERTER HAVING CLUTCH SLIP CONTROL DEVICE

Takashi Murasugi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 5, 1986, Ser. No. 836,412
Claims priority, application Japan, Mar. 11, 1985, 60-48044
Int. Cl.⁴ F16D *47/02;* **B60K** *41/02*
U.S. Cl. 192—0.076 **2 Claims**



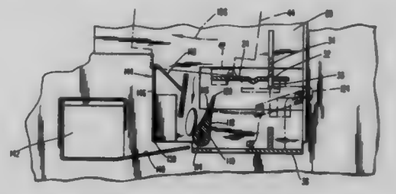
1. A lock-up torque converter comprising:
input and output elements rotatable relative to each other;
clutch means disposed between said input and output elements and responsive to first fluid pressure for direct driving connection therebetween;
valve means for controlling said first fluid pressure in response to second fluid pressure representative of relative rotation between said input and output elements and third and fourth fluid pressures representative of at least one kind of clutch slip control factors, in which said input element is a pump impeller secured to a converter cover adapted to be driven by a power source and said output element is a turbine runner cooperating with said pump impeller to form a toroidal fluid circuit and said second fluid pressure is representative of torque transmitted by said turbine runner; and
a lock-up control chamber in which said first fluid pressure prevails, defined between said converter cover and said clutch means, a converter chamber defined between said clutch means and said turbine runner, first passage means for delivering said second fluid pressure to said valve means, variable opening restriction means variable in opening in response to torque transmitted by said turbine runner for draining fluid in said converter chamber into said first passage means increasingly as the torque transmitted by said turbine runner increases, said first passage means having a branch passage provided with a fixed opening restriction for draining fluid in said first passage means, second passage means for drawing thereinto said first fluid pressure from said lock-up control chamber, third passage means for delivering fluid pressure in said converter chamber to said valve means, second valve means responsive to said fourth fluid pressure for providing communication between said second passage means and said third passage means when said fourth fluid pressure is lower than a predetermined value, said first mentioned valve means having a drain port, and fourth passage means extending between said first mentioned valve means and said second valve means and communicable at the opposed ends thereof with said drain port of said first mentioned valve means and said second passage mean, respectively, said second valve means providing communication between said second passage means and said fourth passage means when said fourth fluid pressure is higher than said predetermined value, said first mentioned valve means selectively providing and obstructing communication between said fourth passage means and said drain port based upon said second, third and fourth fluid pressures.

4,720,004

COIN-OPERATED DISPLAY RACK HAVING ROTATABLE COIN-RECEIVING MECHANISM WHICH ACTIVATES A MOVABLE COIN DIVERTER

Ronald C. Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed Jan. 8, 1986, Ser. No. 817,089
Int. Cl.⁴ G07F *5/02*
U.S. Cl. 194—202 **19 Claims**



1. A coin-operated display rack, comprising:
a housing for containing articles to be displayed,
a door on said housing, said door including a latch receivable within said housing,
coin-operated means in said housing for releasably locking said latch and comprising:
securing means securing said latch in said housing,
means defining a coin-return path,
a coin receiving mechanism defining slot means for receiving coinage, said coin-receiving mechanism being movable relative to said latch between a first position in which an outlet of said slot means is disposed in a position enabling said latch to be released upon the depositing of a preselected coinage, and a second position wherein said outlet overlies said coin return path to enable deposited coins to fall through said slot means and onto said coin return path, and
coin return actuator means operably connected to said coin-receiving mechanism for displacing the latter from said first position to said second position,
coin retaining means in said housing, said means which defines a coin-return path including a diverter situated below said latch such that coins from said coin-receiving mechanism fall upon said diverter, said diverter being movable between a coin-return position wherein said

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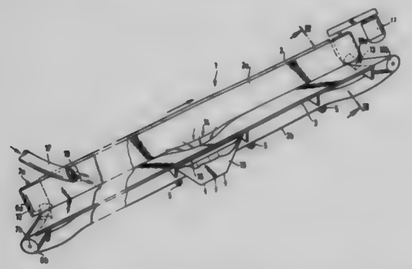
diverter diverts coins to said coin return path and a coin-retention position wherein said diverter diverts coins to said coin-retaining means, diverter displacement means provided for maintaining said diverter in said coin return position in response to said latch being fully inserted into said housing, and for moving said diverter to said coin-retention position in response to said latch being moved out of said housing.

4,720,005

MATERIAL CONVEYOR AND DISTRIBUTION SYSTEM

Isaac Berezinsky, Haifa, Israel, assignor to Moledeth Know-How Export Company (1978) Ltd., Haifa, Israel

Filed Feb. 24, 1986, Ser. No. 832,242
Claims priority, application Israel, Mar. 5, 1985, 74503
Int. Cl.[4] B65G 47/46
U.S. Cl. 198—370 12 Claims



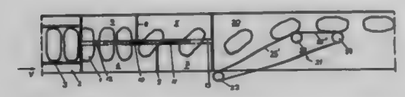
1. A materials conveyor and distribution system comprising a pair of juxtaposed component belts forming a composite conveyor belt having a conveyor stretch and a return stretch, each of said component belts having a conveying top surface and non-conveying side surfaces which extend transversely to said conveying top surface along the longitudinal edges thereof, adjacent side surfaces of said component belts being disposed in an abutting relationship and each of said component belts being angled upwardly from the horizontal, at least in the conveyor stretch, support means for supporting the component belts in a curved disposition with their adjacent side surfaces in said relationship whilst allowing for the free movement of the belts with respect to said support means, into and out of the conveyor stretch, one or more discharge locations along said conveyor stretch wherein the adjacent surfaces of said component belts can move apart so as to form a discharge gap, and drive means for driving said composite conveyor belt into and out of said conveyor stretch.

4,720,006

APPARATUS FOR SEPARATING AND CONVEYING ELONGATE ARTICLES

Harald Leaherr, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Sep. 24, 1986, Ser. No. 911,501
Claims priority, application Switzerland, Oct. 9, 1985, 4354/85
Int. Cl.[4] B65G 47/24
U.S. Cl. 198—415 9 Claims



1. In an apparatus for separating and conveying elongate items having a generally flat bottom; the apparatus including first and second conveyor belts arranged in a side-by-side, parallel orientation and being driven codirectionally in a conveying direction at identical first speeds; said first and second conveyor belts being arranged for simultaneously supporting each item in a transverse orientation relative to said conveying direction; third and fourth conveyor belts arranged in a side-by-side, parallel orientation in longitudinal alignment with respective said first and second conveyor belts downstream thereof as viewed in said conveying direction; said third and fourth conveyor belts being driven codirectionally in said conveying direction at identical second speeds greater than said first speeds; a first item transfer location defined between a downstream end of said first conveyor belt and an upstream end of said third conveyor belt; a second item transfer location defined between a downstream end of said second conveyor belt and an upstream end of said fourth conveyor belt; said first and second item transfer locations being spaced from one another parallel to said conveying direction whereby each item being turned to assume an oblique orientation relative to said conveying direction and a longitudinal clearance oriented parallel to said conveying direction being defined between the first and second conveyor belts and between the third and fourth conveyor belts; the improvement comprising

(a) suction means including a suction opening aligned with said longitudinal clearance and extending in said conveying direction at least between said first and second item transfer locations for pressing the items by a suction air stream against at least some of said first, second, third and fourth conveyor belts;

(b) a conveyor arranged in a longitudinal alignment with said third and fourth conveyo belts downstream thereof for receiving the items from said third and fourth conveyor belts; said conveyor being driven in a direction identical to said conveying direction; and

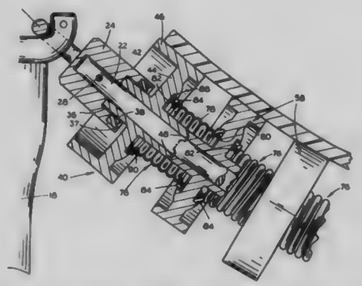
(c) item turning means situated above said conveyor for rotating each item, during advance thereof on said conveyor, into a longitudinal orientation which is at least approximately parallel to said conveying direction.

4,720,007

SUSPENDED IDLER ROLLER FOR SUPPORTING A TROUGHING BELT

Robert C. Milek, 6560 Stones Throw Dr., Omaha, Nebr. 68152

Continuation-in-part of Ser. No. 756,078, Jul. 17, 1985. This application Dec. 11, 1986, Ser. No. 940,660
Int. Cl.[4] B65G 15/08
U.S. Cl. 198—827 5 Claims



1. An idler assembly for supporting a conveyor belt, comprising,

an elongated support rod curved along substantially its entire length and having opposite ends,

means for supporting the ends of said support rod,

an end idler wheel rotatably mounted on said support rod adjacent each of the opposite ends thereof, each of said end idler wheels comprising an elongated central hub portion rotatably mounted on said rod and having inner and outer ends, a web means extending radially outwardly from said central hub, and an outer peripheral rim surface extending around the outer end of said web means,

a plurality of intermediate idler wheels rotatably mounted on said rod between said end idler wheels,

each of said intermediate idler wheels comprising a central hub portion which is rotatably mounted on said support rod, a web means extending radially outwardly from said hub portion, and an outer peripheral rim portion extending around the outer end of said web means,

said end idler wheels and intermediate idler wheels being operatively interconnected whereby said end idler wheels and said intermediate idler wheels rotate in unison as the conveyor belt moves thereover,

said inner ends of the hub portions of said end idler wheels and the ends of said hub portions of said intermediate idler wheels having gear teeth provided thereon which mesh with the gear teeth on the next adjacent hub portion,

a flexible bellows sealably secured to and extending between the web means of each adjacent pair of idler wheels which sealably encloses the hub portions of said intermediate idler wheels and said end idler wheels for excluding contaminants from the interiors thereof,

said flexible bellows comprising a generally cylindrical resilient material having radial convolutions therein,

and means sealing the outer ends of said hub portions of said end idler wheels for preventing contaminants from entering the interiors of said hub portions,

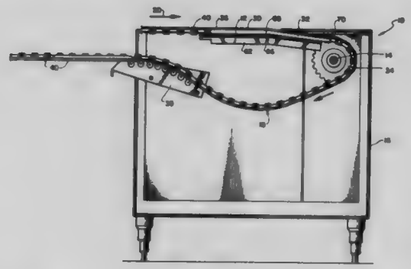
said sealing means including a resilient, generally circular snap ring having a flange portion extending radially outwardly therefrom and an arcuate shoulder portion extending radially inwardly to define a generally circular opening, each of said idler wheels having an annular recess therein adapted to receive said snap ring flange portion, and said snap ring shoulder portions adapted to retain the end convolution of said bellows compressively against said web.

4,720,008

CONVEYOR ASSEMBLY

Jared E. Ufland, Thousand Oaks, Calif., assignor to National Conveyor Corporation, North Hollywood, Calif.

Filed Aug. 17, 1984, Ser. No. 642,067
Int. Cl.[4] B65G 17/00
U.S. Cl. 198—841 9 Claims



1. A conveyor assembly for articulated link conveyor, comprising:

a stationary frame;

an elongated guide ramp securely supported by said frame for guiding conveyor links of a slat type on an upper flight track of the conveyor assembly, said guide ramp having a generally horizontal leading section and a downwardly inclined trailing section, said guide ramp comprising:

(a) an opposed pair of outer plates, each outer plate having a first horizontal side and a second side bent at substantially 90° wherein each second side is securely attached to a respective sidewall of said frame;

(b) an opposed pair of central plates, each central plate having a first and a second side, said first side adjustably attached to the first side of an associated outer plate; and

(c) an opposed pair of wear strips, each wear strip attached to the second side of the associated central plate whereby a clearance provided between said wear strips provides a guide path for said conveyor links;

a sprocket mounted on said frame for driving the conveyor links, said sprocket having teeth such that the uppermost position of said teeth are at a location substantially lower than the horizontal surface of said leading section;

a drive mechanism providing drive means for said sprocket; and

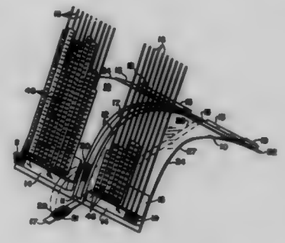
protective and supporting means operably associatable with said guide ramp for preventing items being transported on the conveyor links from falling into said drive mechanism and for protecting the operator's hands and fingers.

4,720,009

WIRE IDENTIFICATION SLEEVE CONTAINER

Herbert Tomes, Jr., Rte. 3, Box 1160, Callahan, Fla. 32011

Filed Aug. 21, 1986, Ser. No. 898,629
Int. Cl.[4] B65D 73/02
U.S. Cl. 206—328 14 Claims



1. A portable booklike container for wire identification sleeves comprising two covers each of which is joined to a spine along a fold line each cover having a top edge perpendicular to said fold line, a bottom edge, perpendicular to said fold line, a side edge parallel to said fold line, an inside surface, and an outside surface, a support bar attached to said inside surface parallel to and adjacent to said bottom edge, a plurality of parallel elongated thin spindles each nonremovably affixed to said support bar and extending parallel to said fold line to a free end adjacent said top edge, and means for fastening said covers together when folded upon each other with said outside surfaces exposed.

4,720,010

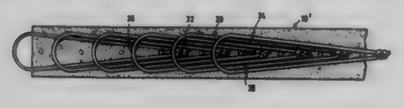
STOCK ASSEMBLY FOR STORING AND SUCCESSIVELY SUPPLYING CLOSED LOOP MEMBERS FOR SUSPENDING SAUSAGES

Hans J. Bertram, 26, Strassheimer Weg, Rosbach, v.d.H. 6365, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,010
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1981, 3147386
Int. Cl.[4] B65D 85/00
U.S. Cl. 206—345 6 Claims

1. A stock assembly adapted to store a mass of individual, individually closed loop members for suspending sausages and to successively supply loop members to an automatic sausage-sealing machine, each loop member comprising a pieces of yarn arranged to form an elongated loop and having the ends thereof knotted together at one end of said elongated loop, said

stock assembly including an elongate strip member of resilient material adapted to wound onto a drum, said loop members being arranged in serial overlapping relationship in the direction of elongation of the loops members in a scale-like pattern and being detachably affixed to said strip member along said strip member at longitudinally spaced positions one after the other with a spacing substantially smaller than the length of each loop member such that the elongated loop of each one of the loop members overlaps the knotted end of at least one



adjacent loop member at one end thereof and the knotted end of said one loop member is overlapped by the elongate loop of at least one other adjacent loop member at the other end thereof, each said loop member being affixed to said strip member at the sides of the elongated loop of that loop member and the end of each loop member opposite the knotted end thereof being arranged so as to freely protrude into a position for engagement with the sausage sealing machine when the loop members are supplied to the sausage-sealing machine, said strip and said loop members being wound to form a reel.

4,720,011
PACKAGE HAVING TEARSTRIP OPENER
Ernest V. Canamero, Durand, Ill., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 30, 1986, Ser. No. 913,347
Int. Cl.[4] B65D *65/46, 27/38, 65/34, 75/68*
U.S. Cl. 206—455 46 Claims

1. An enclosed package having two surfaces sealed together on at least one end and having a tearstrip. the improvement wherein between the sealed surfaces is present a hot melt adhesive-covered tearstrip sealed in an area along the entire length of the outer edge of the tearstrip, the inner edge of substantially the entire length of the tearstrip remaining unsealed, whereupon forcibly removing the tearstrip, the entire length of a surface of the package separates in a line along the unsealed edge of the tearstrip in the direction of the removing force, the tearstrip simultaneously delaminating from the other surface without substantially tearing said other surface thus leaving two substantially nonragged package edges that do not impede the extraction of the package contents.

4,720,012
JEWELRY HOLDER
Laurette Dufour, P.O. Box 2306, Lewiston, Me. 04240
Filed Nov. 10, 1986, Ser. No. 928,787
Int. Cl.[4] B65D *5/50, 85/30*
U.S. Cl. 206—472 9 Claims

1. A portable, book-like device for holding and displaying jewelry of the type having attachment means such as posts and rear clips, pins and the like, and for holding and displaying jewelry of the type having an ear lobe catch element of a standard earring, comprising:

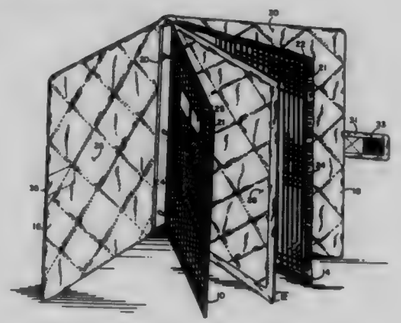
a first page of mesh material having a plurality of apertures defined therein through which apertures the attachment means such as the posts of pierced earrings can be passed and from the rear the rear clips of such pierced earrings can be inserted on said earring posts to hold said jewelry to said mesh page, said apertures each having a size smaller than the rear clips, said apertures each having a maximum dimension;

a second mesh page similar in structure to said first mesh page, at least one of the pages having at least one slit formed therein and being adapted to receive therethrough attachment means of a piece of jewelry such as the ear lobe catch element of a standard earring in order to have said jewelry's attachment means passed through said slit to hold said jewelry piece to said selected mesh page, said slit having a maximum dimension larger than the maximum dimension of each of said apertures;

a separator element disposed between said first and second mesh pages, said separator element being of substantially the same size as said first and second mesh pages and said separator element having cushioning on each side thereof; and

binding means having front and rear cover members with cushioning on the inside of each respectively, said binding means further including means to hingeably retain said first and second mesh pages and said separator element therebetween between said front and rear cover.

4. A portable, book-like assembly for holding and displaying jewelry including pierced earrings having attachment mechanisms for attachment of the jewelry to a portion of the human body, the attachment mechanisms including post and clip mechanisms, comprising:



a first page of mesh material having a plurality of apertures defined therein, a post of a piece of the jewelry being receivable through at least one of the apertures with a clip being received on the distal end of the inserted post to hold the piece of jewelry to the mesh page;

a second mesh page capable of holding jewelry in a manner similar to that of the first page;

a separator element disposed between said first and second mesh pages, said separator element being of substantially the same size as said first and second mesh pages and said separator element having cushioning on each side thereof; and,

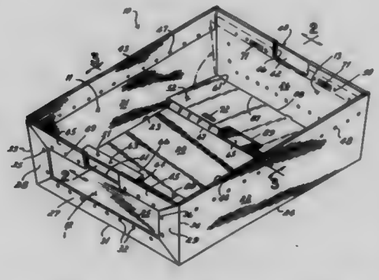
front and rear cover members mounting the first and second mesh pages and the separator element between said front and rear cover members, the front and rear cover members being of substantially the same size as the first and second mesh pages and the separator element to allow the assembly to be placed in a stable display position on a surface with the cover members, the mesh pages and the separator element contributing to the stability of the assembly, thereby allowing facility in viewing of jewelry mounted on the mesh pages.

4,720,013
NESTABLE AND STACKABLE TRAY
Glenn R. Nichols, Wyoming; Michael F. Stejskal, and Robert M. Zink, both of Holland, all of Mich., assignors to Bradford Company, Holland, Mich.
Filed Aug. 28, 1986, Ser. No. 901,021
Int. Cl.[4] B65D *21/06*
U.S. Cl. 206—506 12 Claims

1. A nestable, stackable tray comprising:
a rectangular base,

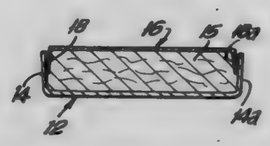
four walls, one secured to and upstanding from each of the edges of said base and tapered outwardly therefrom, and

a pair of stacking supports each pivotally secured at the bottom of one of an opposite pair of said walls, and movable between (a) a lowered position against said base for



presenting an upwardly facing, load bearing surface for supporting a like tray from said load bearing surface and engaged with said load bearing surface and nested within said tray and (b) a raised position against said one of said walls for supporting another like tray stacked thereon.

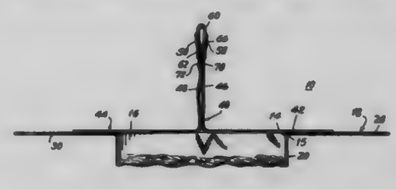
4,720,014
COMPACT PACKAGE FOR SPREADABLE PRODUCTS
Sanford Redmond, 1385 York Ave., New York, N.Y. 10021
Filed Apr. 30, 1985, Ser. No. 729,050
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—525 17 Claims



1. A package for storing, shipping and handling an individual service portion of a spreadable, tacky product and for supporting said spreadable, tacky product for use after opening said package, comprising: a relatively stiff, channel-shaped base member having a substantially flat bottom and opposed substantially vertically upwardly extending said walls; a spreadable, tacky product support on the bottom of said base member and by at least a portion of each of said channel side walls; and a relatively thin cover member covering at least the top of said spreadable, tacky product; each of said base channel said walls and cover member adhering to said product to thereby form a unitized package structure without the use of an adhesive material other than the packaged product.

4,720,015
MOISTURE-PROOF, LINERLESS CARTON WITH RECLOSABLE TOP MEMBRANE
Arne H. Brauner, Plymouth, Minn., assignor to International Paper Company, Purchase, N.Y.
Filed Apr. 30, 1986, Ser. No. 857,658
Int. Cl.[4] B65D *51/22*
U.S. Cl. 206—621 6 Claims

1. A carton having an interior surface which comprises: an open ended body portion formed by an upright boundary wall, and a top end peripheral edge which defines the carton opening; a cover for closing the top end of the carton; and a membrane liner attached and sealed to the carton opening, said liner including first and second attachment sections which are secured to the interior carton surface, and first and second upright sections which respectively extend outwardly from the first and second attachment sections and terminate at aligned edges, said upright sections being integral parts of the respective attachment sections, said upright sections being secured



together at the terminal edges by a removable connecting strip, said terminal edges, when the strip is removed, defining a membrane opening which communicates with the carton opening, said upright sections also including an integral means for resealing said membrane liner, said resealing means including interlocking tab and groove elements attached to the first and second upright sections.

4,720,016
CLOSET STORAGE SYSTEM
Harold Kay, 20 Point of Woods Dr., North Brunswick, N.J. 08902
Filed Mar. 10, 1986, Ser. No. 838,155
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—96 21 Claims



1. A closet storage system comprising:
a bracket;
an extension member; and
a connection means for slidably engaging said bracket with said extension member, said bracket and said extension member being shaped so that said extension member is partially slidable within said bracket, said connection means being adapted to be secured to any one of said bracket, said extension member, and both of said bracket and said extension member together.

4,720,017
SPECIMEN KITS AND STOPPER THEREFOR
Cornelius N. Pestos, Boring, Oreg., assignor to Medical Media Laboratory, Inc., Boring, Oreg.
Filed Jul. 27, 1982, Ser. No. 402,370
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—227 16 Claims

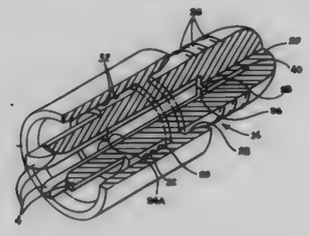
1. A specimen kit for providing non-contaminating storage for a specimen, including a container having an opening and having a rim surrounding said opening, a shaft having absorbent material at one end thereof for collecting said specimen thereon, said specimen being inserted in said opening on said shaft, a stopper for said container, said stopper for maintaining

said container sterile internally prior to insertion of said specimen therein, the improvement comprising:

(a) said stopper having:

(1) a first end and a second end, said first end being inserted in said opening before use;

(2) an annular ring joined to said stopper at a junction between said first end and said second end, said annular ring extending axially from said junction toward said first end and said second end;



(3) gripping means associated with said second end;

(b) said stopper being withdrawn from said opening and inverted prior to insertion of said specimen therein;

(c) said shaft being breakable at a preselected point following insertion in said opening; and

(d) said gripping means engaging said breakable shaft when said second end is pressed upon said rim.

4,720,018

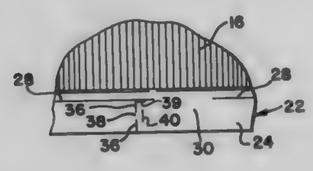
SCORING ARRANGEMENT FOR A TAMPER-INDICATING PLASTIC CLOSURE

John Schetzsle, and Michael E. Corcoran, both of Crawfordsville, Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Continuation-in-part of Ser. No. 824,428, Jan. 31, 1986, Pat. No. 4,666,053. This application Sep. 16, 1986, Ser. No. 907,970

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 4 Claims



1. A tamper-indicating closure, comprising:

a plastic cap having a top wall portion and a depending annular skirt portion; and

an annular pilfer band depending from said skirt portion and being partially detachably connected thereto, and distinguished therefrom by circumferential, horizontal score means having spaced apart ends between which is provided a connector portion for integrally joining said pilfer band with said annular skirt portion, said pilfer band including a fracturable portion provided by vertical score means positioned beneath said horizontal score means, said pilfer band further including means for substantially preventing propagation of said vertical score means,

said propagation preventing means comprising further score means formed in said pilfer band in substantially intersecting relationship with said vertical score means in closely spaced relationship below said circumferential horizontal score means to substantially prevent propagation of said vertical score means.

4,720,019

CONTAINER CLOSURE WITH SEAL

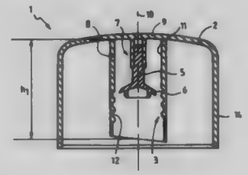
Reinold Geiger, Neuilly, France, assignor to A.M.S. S.A., Saint-Ouen l'Aumone, France

Filed Aug. 19, 1986, Ser. No. 897,877

Claims priority, application France, Aug. 20, 1985, 85 12526

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—343 18 Claims



1. A stopper for a container comprising:

means for detachably joining the stopper to a container,

a seal for engaging a container,

means for joining the seal to the stopper comprising a projection extending upwardly from the central portion of the seal and having an upper part thereof and a lower part joining the upper part to the seal,

said joining means further comprising a socket extending downwardly from and within the stopper,

said upper part of said projection being in said socket,

means for securing said projection in said socket, said means resisting relative rotational and longitudinal movement of said projection relative to said socket,

said stopper comprising an end piece at its upper end and said seal being spaced from said end piece by said lower part of said projection when said stopper is on a container and said seal is seated on the lip of a container,

said stopper being free of parts located radially outwardly of the seal which would inhibit radial displacement of the seal when urged against the lip of a container and free of parts engaging the upper surface of said seal outwardly of said projection.

4,720,020

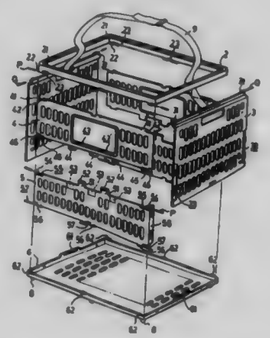
FOLDING CRATE

Kuo K. Su, No. 23, Lane 54, Sec. 2, An Ho Rd., Tainan City, Taiwan

Filed May 4, 1987, Ser. No. 46,246

Int. Cl.[4] B65D *7/24*

U.S. Cl. 220—6 3 Claims



1. A folding crate comprising:

(a) a rectangular upper frame having two recesses at an inner face of its transverse ends, and a plurality of first tubular lappings at a lower face of said upper frame's longitudinal sides with a third notch formed adjacent to each of said first tubular lappings;

(b) two end walls, each of said end walls having two second tubular lappings at an upper face thereof, a hanging means at a central part of said upper face, and a shallow recess at an outer lower part of the two edges;

(c) two upper side webs, each having a plurality of third tubular lappings at an upper face thereof with a first notch formed adjacent to each of said third tubular lappings, two rectangular slits at a lower portion thereof, three rectangular prongs extending downwardly from a lower face thereof, and a fourth tubular lapping at two end parts of said lower face with a fifth notch formed adjacent to said fourth tubular lappings;

(d) two lower side webs, each having two hooking tabs with outwardly extending head portions extending upwardly from an upper face thereof, three rectangular retainers formed on said upper face, a fifth tubular lapping at both end parts of said upper face with a fourth notch formed adjacent to said fifth tubular lappings, a plurality of sixth tubular lappings at a lower face thereof with a seventh notch formed adjacent to each of said sixth tubular lappings, and a bracket extending laterally from the both ends thereof;

(e) a base panel having a bracket extending from a central upper face of both transverse ends thereof, and a plurality of seventh tubular lappings extending from an upper face of two longitudinal sides thereof; and

(f) said first tubular lappings being retained in the corresponding first notches, said third tubular lappings being retained in the corresponding third notches, said fourth tubular lappings being retained in the corresponding fourth notches, said fifth tubular lappings being retained in the corresponding fifth notches, and said seventh tubular lappings being retained in the corresponding seventh notches, thereby causing said first tubular lappings to be juxtaposed with said third tubular lappings, said fourth tubular lappings to be juxtaposed with said fifth tubular lappings and said sixth tubular lappings to be juxtaposed with said seventh tubular lappings, each pair of juxtaposed lappings being engaged together by a pin member;

said second tubular lappings being retained in the corresponding recesses of upper frame with a resilient pin member to fix them together; and

said rectangular prongs of the upper side webs being retained in the corresponding rectangular retainers of said lower side webs, and outwardly extending head portions of said hooking tabs being retained in said rectangular slits of said upper side webs.

4,720,021

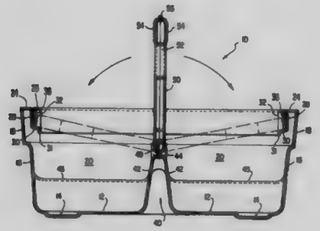
UTILITY TRAY HAVING FOLDABLE HANDLE

James E. Byrns, 1027 2nd Ave., S., Clinton, Iowa 52732

Filed Nov. 22, 1985, Ser. No. 800,783

Int. Cl.[4] B65D *25/28*

U.S. Cl. 220—94 R 11 Claims



1. A portable and generally rectangular utility tray formed from a resilient thermoplastic material, the tray having bottom and side walls and having an open top, an integral, longitudinally and upwardly extending raised central rib reunning from one end wall to the opposite end wall, to thereby divide the tray interior, the upwardly extending rib being substantially V shaped in inverted transverse cross-section and being formed from the bottom wall of the tray and forming an integral portion of the bottom wall, the upper portion of the upwardly extending rib carrying a hinged handle, the lower portion of the handle being hingedly mounted on the top edge of the upwardly extending central rib, the handle being mounted for swinging movemen? from a first angular position wherein the upper end of the handle engages and is releasably retained by a portion of one sidewall of the tray to a second angular position wherein the upper end of handle engages and is retained by a portion of the sidewall of the tray which is opposite to said first mentioned tray sidewall, said handle carrying means to releasably maintain it in an upright position, said means being defined by at least one pintle integral with a lower portion of the handle and by a corresponding and aligned depression on the upper portion of the centrally running rib, the pintle fitting into the depression when the handle is in its upright position, the resiliency of the plastic material permitting the handle to be swung away from its upright position.

4,720,022

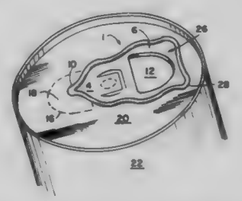
BEVERAGE CAN OPENING AND SEALING TAB

Rodney A. Gomes, 1760 Hookupu St., Pearl City, Hi. 96782

Filed Apr. 18, 1986, Ser. No. 853,398

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—269 18 Claims



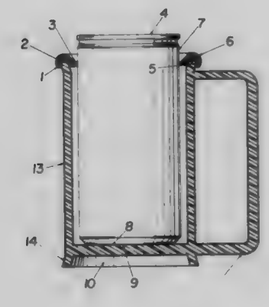
1. An easy opening beverage can resealable, recoverable tab comprising,

a one piece body having a can opening portion and a can sealing recoverable portion, and

attachment means for rotatably connecting the one piece body to a beverage can lid adjacent an openable portion of the lid, the attachment means providing both a vertical and horizontal rotational axis for the one piece body, whereby rotational movement of the one piece body about the horizontal rotational axis causes the can opening portion to move downwardly and impinge upon the openable portion of the can lid, thereby exerting opening force to create an opening, and whereby after forming an opening, rotational movement about the vertical rotational axis of the body by about 180 degrees causes the can sealing recoverable portion to be juxtaposed over the opening, to keep out foreign matter, and whereby the opening can be resealed by fitting and pushing downward the can sealing recoverable portion tightly into the opening, wherein the sealing recoverable portion of the one piece body has a countersunk bevelled portion having an outer side wall corresponding in shape to a peripheral edge of the can opening, the countersunk bevelled portion being insertable into the can opening and being held in the opening by an interference fit, wherein the can opening portion comprises an upwardly inclined pointed end of the one piece body.

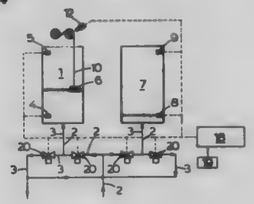
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,023
COMBINATION INSULATED MUG AND BEVERAGE CAN HOLDER
Michael J. Jeff, 3821 SE. 13th Ter., Gainesville, Fla. 32601
Filed Sep. 29, 1982, Ser. No. 428,354
Int. Cl.[4] B65D *25/18, 81/38*
U.S. Cl. 220—412 4 Claims



1. A combination of an insulated mug and a beverage container retainer ring comprising a generally cylindrical tubular mug body having a support base end and an opposite open top portion at respective ends of the mug body defined by outwardly flared rims at each end of the tubular body, an internally transversely extending wall adjacent one end of the tubular body that completely closes off the base end of the tubular body, the inside diameter of the body being sufficiently large to permit the insertion of a generally cylindrical beverage container therein, said mug body formed from a rigid insulated material, an annular beverage container retainer ring made of a flexible rubber-like material, said retainer ring having an inner tapered flexible generally radially inwardly extending circular lip, said ring also having an annular axially extending groove near its outer edge that defines an axially extending outer lip, said ring defining groove extends in a direction that is generally perpendicular to the radially inwardly extending lip, said annular ring groove further having a cross-sectional configuration that is generally similar in size and shape to the cross section of the flared rims of the mug at each end, said flared mug rims being angled outwardly from the axis of the tubular body so that the portion of the rim adjacent the tubular body is of a smaller diameter than the end portions of both mug rims, the largest diameter of the annular groove of the ring being slightly smaller than the large diameter of the mug rims that the retainer ring is fastened to, said outer lip of the ring having a rounded lower inside edge that functions to ease the assembly of the ring on the mug rims so that when the flexible ring is pressed on the mug rim at either end of the tubular body the outer lip of the ring is capable of being slipped over the flared rim adjacent thereto and resisting removal therefrom, the insulated mug being usable as a drinking vessel with the retainer ring being secured to the base rim for storing the retainer ring and for convenient access thereof, and said insulated mug being usable as a beverage container insulator and beverage container holder and retainer with the retainer ring being secured to the rim at the top portion of the mug and aiding in retaining a beverage container insertable into the mug by surrounding and engaging a wall portion of the beverage container.

4,720,024
MEASURING DEVICE FOR AN APPARATUS FOR MEASURING AND DELIVERING PREDETERMINED QUANTITIES OF LIQUID, FOR EXAMPLE QUANTITIES OF WATER
Sebastiaan C. E. Jongerius, Renswoude, Netherlands, assignor to Jongerius Hanco B.V., Netherlands
Continuation-in-part of Ser. No. 684,459, Dec. 21, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,752
Int. Cl.[4] B67D *5/30*
U.S. Cl. 222—14 14 Claims

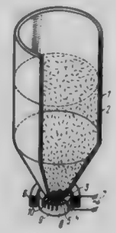


1. A measuring devie for measuring and delivering any predetermined quantity of liquid as a continuous flow, said measuring device comprising:
a first single measuring vessel of a volume less than said predetermined quantity;
a liquid supply pipe connected to said first single measuring vessel;
a second single vessel for discharging said predetermined quantity of liquid as a continuous stream through a discharge valve and arranged at a lower level than said first single measuring vessel, said second single vessel receiving liquid solely from said single measuring vessel and having a capacity less than said first predetermined amount;
a connecting pipe connecting said single measuring vessel to said second single vessel;
measuring means, mounted within said first single measuring vessel, for measuring a fixed quantity of liquid in said first single measuring vessel and for measuring any residual quantity of liquid equal to the difference between said predetermined amount and some multiple of said fixed amount;
a first valve, accomodated in said supply pipe, said first valve opening and closing responsive to said measuring means; and
a second valve, accomodated in said connecting pipe and operating responsive to said measuring means, said second valve opening when the liquid level in said first single measuring vessel reaches an upper level, as detected by said measuring means, and closing when the liquid level has fallen to a lower level, as detected by said measuring means; and the discharge valve of the second single vessel is set in such a way that the second single vessel cannot become empty before liquid is supplied again to the second single vessel from the first single measuring vessel.

4,720,025
FEEDER OF LOOSE MATERIALS
Ruben A. Tatevosian, and Mikhail Y. Titov, both of Moscow, U.S.S.R., assignors to Proizvodstvennoe Geologicheskoe Obiedineale Tsentralnykh Raionov "Tsentrgeologiya", Moscow, U.S.S.R.
Filed Jan. 22, 1986, Ser. No. 821,463
Int. Cl.[4] G01F *11/14*
U.S. Cl. 222—247 14 Claims

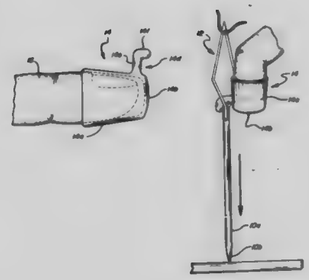
1. A feeder of loose material comprising:
a hopper;
a chamber arranged in a lower portion of said hopper;
recesses provided on opposite sides of said chamber;

control means of said chamber to permit the discharge of the loose materials thought the hopper;
a latticed partition which comprises said control means;
kinematically disconnected magnetic bodies arranged on said latticed partition;
said latticed partition including horizontal pins provided on respective ends of parallel vertically arranged plates se-



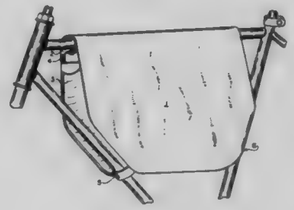
cured in said recesses of said chamber by means of said horizontal pins for oscillating said plates relative to said chamber; and
a source of alternating magnetic field covering said chamber with magnetic lines of force for oscillating said plates relative to said recesses and for moving said magnetic bodies to contact said plates causing said plates to oscillate.

4,720,026
SEWING ASSEMBLY
Arnold I. Feserman, 5179 Corners Dr., West Bloomfield, Mich. 48033
Filed Aug. 22, 1986, Ser. No. 899,466
Int. Cl.[4] D05B *85/00*
U.S. Cl. 223—102 6 Claims



1. A sewing assembly comprising:
a first assembly member comprising a sewing needle including an elongated main body portion having a point at its front end and seat means defining a concave rearwardly opening seating surface at a location along said main body portions spaced rearwardly from said front end thereof; and
a second assembly member defining a driver member including a main body portion sized to fit over the finger of a user, and a rod portion secured to and projecting outwardly from said main body portion and sized to engage said seat means and operative when pressed forwardly against said seating surface to exert an axial driving force on said needle main body portion to facilitate movement of said pointed end of said needle main body portion through a resistant fabric.

4,720,027
BICYCLE CROSS-BAR BAG
William D. Board, 731-G St. Space #A-10, Chula Vista, Calif. 92010
Filed Aug. 22, 1985, Ser. No. 768,353
Int. Cl.[4] B62J *11/00*
U.S. Cl. 224—35 1 Claim



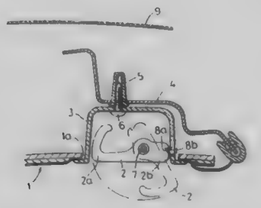
1. A bag for use in combination with a bicycle frame, comprising:
a front bag wall having perimeter edges and an inside face and an outside face,
a back bag wall having perimeter edges and an inside face and an outside face,
an elongated narrow band positioned between the perimeter edges of the front bag wall and the back bag wall and joining the front bag wall and the back bag wall together along side and bottom portions of the perimeter edges, forming an open-topped bag structure,
said front bag wall and said back bag wall each having a flap formed unitarily with each front bag wall and said back bag wall and extending upwardly from said open-topped bag structure,
said front bag wall attached flap having two mating hook and loop fastener material strips affixed to said front bag wall inside face in a vertically spaced relationship such that said front bag wall flap can be folded along a line parallel to the top of said open-topped bag structure to encircle a bicycle cross-bar, such that the two mating hook and loop fastener strips may join together to attach said front bag wall to a bicycle cross-bar,
said front bag wall flap further having a hook and loop fastener material strip along the outside face of said front bag wall flap,
said back wall flap having a hook and loop fastener material strip along the inside face of said back bag wall flap, whereby, the hook and loop fastener material on the side face of said back bag wall flap may be attached to the hook and loop fastener material on the outside face of said front wall flap to form a cover for the open-topped bag structure while the open-topped bag structure is mounted on a bicycle cross bar.

4,720,028

DEVICE FOR HANGING A GARMENT IN A VEHICLE

Hiroshi Takemura, Saitama, and Naoaki Tsuchiya, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1986, Ser. No. 853,771
Claims priority, application Japan, Apr. 19, 1985, 60-58587[U]
Int. Cl.⁴ B60R 7/08
U.S. Cl. 224—42.45 A 6 Claims



1. A device for hanging a garment in a vehicle, compprising, a hook housing embedded in a vehicle wall, a hook supported by said housing movable between a retracted position in which the hook stays within said housing and a hanging position in which the hook projects from the housing into an interior space of the vehicle, said housing being provided with a shaft on which said hook is rotatably supported, said hook having a [illegible], and said housing having an arcuate slot along which said pin is movable to allow said hook to rotate, and said housing being provided with a lever having having a generally arcuate cam groove in which said pin extending through said slot is engageable to hold said hook in said retracted position thereof.

4,720,029

FOLDING CHAIR/BACKPACK

John E. Varanakis, 762 E. 8125 South, Sandy, Utah 84070

Filed Aug. 8, 1986, Ser. No. 894,906
Int. Cl.⁴ A45F 4/02
U.S. Cl. 224—155 10 Claims



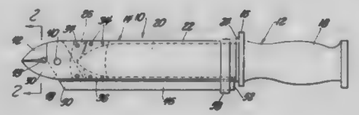
1. A folding chair/backpack frame structure including first and second frame members and seat frame means, said first frame member being disposed in upstanding position, having front and rear sides and defining a backrest and a reat leg assembly, said second frame member being generally horizontal and defining opposite side armrests and a front leg assembly, said first frame member including first elongated and generally parallel upright opposite side members, a first lower transverse member extending between and interconnecting the lower end portions of said first side members and an upper transverse member extending between and interconnecting the uppre end portions of said first side members, said second frame member including second elongated, generally parallel, front-to-rear extending and rearwardly and upwardly inclined arm rest defining opposite side members, said second side members each including integral relatively angulated front and rear end portions defining a rearwardly and downwardly opening included angle of less than 180°, a second lower transverse member extending between and connecting the front end portions of said front-to-rear extending second side members, said second side members being spaced apart to receive said first side members therebetween, pivot means pivotally anchoring the rear ends of said second opposite side members to the outer sides of the corresponding first side members centrally intermediate said first frame member upper and lower transverse members for oscillation of said second opposite side members relative to said first frame member about aligned horizontal transverse axes, said seat frame means being horizontally disposed and including a pair of elongated opposite side front-to-rear extending side marginal members and a seat panel extending therebetween and supported therefrom, means anchoring forward portions of said side marginal members spaced rearward of the forward ends thereof between said front end portions of said second opposite side members centrally intermediate the upper and lower extremities of said front end portions and above said second lower transverse member, anchor means anchoring the rear ends of said side marginal members relative to the rear ends of said rear end portions of said second side members and with said rear ends of said side marginal members spaced below said rear end portions of said second side members and abutted against the forward facing sides of the lower end portions of said first opposite side members at locations thereon spaced above said first transverse member, and backrest panel means extending between and supported from said first opposite side members, said second frame member and seat frame means being upwardly swingable, as a unit, and about said axes relative to said first frame member toward a position with said second opposite side members substantially paralleling and closely embracing the remote sides of said first opposite side members therebetween, shoulder strap means extending between and anchored to said first lower and upper transverse members for shoulder mounting of said structure from a person with the rear side of said first frame member opposing the back of the upper torso portion of said person.

4,720,030

MULTIPURPOSE BAYONET SYSTEM

Paul A. Petrovich, 11269 Judd Rd., Fowlerville, Mich. 48836

Filed Jan. 30, 1987, Ser. No. 8,998
Int. Cl.⁴ B26B 29/02
U.S. Cl. 224—232 5 Claims



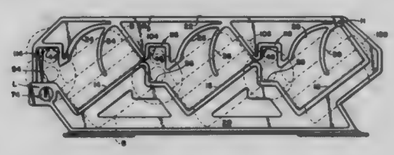
1. A scabbard suitable for storing a bayonet which can also perform other tasks, the scabbard including: a first scabbard member formed as a hollow elonged body with a longitudinally extending cavity forming a opening at one end of the scabbard member the cavity being adapted to receive and enclose a blade portion of the bayonet securely within the cavity but allowing rapid removal; a fixed metal cutting jaw rigidly attached to one end of the elongated body opposite the opening of the cavity and extending outward from the end of the body, the fixed metal cutting jaw being formed with a cutting edge extending longitudinally along the center line of the body; a pivot pin mounted on one side of the fixed jaw extending transversely from the face of the fixed jaw; a movable jaw attached to the pivot pin, the movable jaw having a second cutting edge which is complimentary to the cutting edge of the fixed jaw so that the movable jaw can be rotated from an open position to a closed cutting position with the cutting jaws engaged; a handle extending from the movable jaw, the handle having a free end which is located near the open end of the scabbard and extending coaxially along one side of the scabbard; an intermediate portion which connects the other end of the handle to the rotatable jaw, the intermediate portion being offset to one side of the fixed jaw and extending diagonally across the same side of the fixed jaw as the pivot pin, the intermediate portion being journeled to the pivot pin; and a clamping means attached to the free end of the body to hold the handle close to the scabbard's edge when the jaws are closed for storage.

4,720,031

SKI RACK

Jeff E. Zimmerman, Sacramento, Calif., assignor to Sherpa, Inc., Sacramento, Calif.

Filed May 12, 1986, Ser. No. 862,076
Int. Cl.⁴ B60R 9/04
U.S. Cl. 224—323 1 Claim



1. A ski rack member for receiving confronted pairs of skis with poles on the top of an automobile comprising in combination:

lower ski rack member for spanning immediately over the surface of said automobile;

three side-by-side ski pair receiving slots defined in said lower member for receiving confronted skis with protruding bindings, said slots canted with respect to the surface of said car to an angle, said ski pairs receiving slots disposed in immediately side-by-side relation to permit bindings from said skis to protrude upwardly and downwardly;

three rectilinear pole receiving slots defined in said lower ski rack member interstitially spaced between said ski receiving slots, each slot configured for trapping a ski pole therein;

each rectilinear slot having two side edges and an upwardly exposed bottom edge for receiving and capturing ski poles;

an upper ski rack member confronting said lower ski rack member, said upper ski rack member defining three side-by-side complementary ski pair receiving slots with respect to the ski pair receiving slots of said lower member;

three rectilinear pole receiving slots defined in said upper ski rack member, interstitially spaced between said ski receiving slots and complementary to said rectilinear pole receiving slots in said lower ski rack member whereby ski poles in said upper and lower member are trapped in pairs in said upper and lower slots between said members;

each rectilinear slot having two side edges and a downwardly exposed upper edge for preventing removal of ski poles when said upper and lower ski rack members are confronted;

leaf springs for spring biasing skis in said slots to one boundary of said slots attached to one of said members to prevent movement of said skis within said slots; and,

a hinge joining said upper and lower members at one end of said members and a lock joining said upper and lower members at the other end of said members whereby said upper and lower members are movable towards and away from each other to capture poles and skis therebetween;

said lock including one of said members defining a tongue with a bolt receiving aperture;

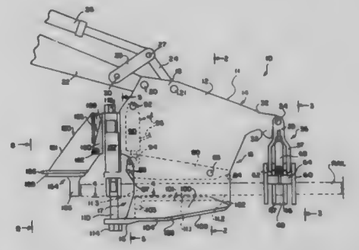
the other of said members a tongue receiving aperture a bolt mounted to the other of said member for reciprocal movement into and out said tongue receiving aperture into said bolt receiving aperture.

4,720,032

PORTABLE RAIL BREAKER

Kenneth R. LaBounty, Rte. 1, Box 164B, Two Harbors, Minn. 55616

Filed Aug. 12, 1986, Ser. No. 895,861
Int. Cl.⁴ B23P 17/02; B26F 3/00
U.S. Cl. 225—96.5 17 Claims



1. A machine for breaking railway rails into smaller sections and for releaseable attachment to the boom structure and hydraulic system of a hydraulic excavator comprising:

(a) a rigid frame housing having means for tiltably securing the frame to the boom structure and hydraulic system of the excavator, and the frame housing having an elongate rail guiding passage with an inlet end and an outlet end, the passage normally extending horizontally and being tiltable with the housing to inclined orientation, and the frame housing having a grapple support portion adjacent the inlet end of the passage,

(b) a rigid guide support affixed to the frame housing and extending along the passage and the inlet and outlet ends thereof, the guide support including a rail-engaging anvil adjacent the outlet end of the passage,

(c) a power operated rail-grasping grapple swingably suspended from the grapple support portion in spaced rotation with the inlet end of the passage for guiding the end of a rail into the inlet end of the passage,

(d) a power operated rail notching means on the frame housing and opposite the anvil for producing a notch in the rail, and

(e) a breaking assembly on the frame housing adjacent to the outlet end of the passage, the breaking assembly including a power operated breaking head movable transversely of the passage and against the rail and cooperating with the anvil to break the rail at the notch.

4,720,033

MOTOR-OPERATED FASTENER DRIVING MACHINE WITH MOVABLE ANVIL

Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island, N.Y.

Continuation-in-part of Ser. No. 859,545, May 5, 1986, abandoned. This application Sep. 3, 1986, Ser. No. 903,170
Int. Cl.⁴ B25C 1/06; B27F 7/36, 7/19, 7/21
U.S. Cl. 227—131 10 Claims

1. In a motor-driven fastener machine having a base, an anvil on the base, a fastener driving mechanism mounted for movement relative to the base, the improving comprising

drive-control means also mounted on the base about pivot means for movement with respect to the base to cause the fastener driving mechanism to drive the fastener against the anvil;

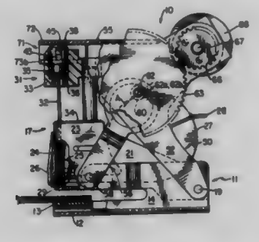
rotary drive means mounted on the drive-control means

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such rotary drive means including eccentric means carrying shaft means;

follower arm means mounted between (1) the base about a second pivot means spaced from the first pivot means, and (2) the rotary drive means such arm means including eyelet means for surrounding and engaging the eccentric [illegible]

transmission means (66,63) connected to the rotary drive



means (68) for causing the drive-control means (50) carrying such shaft means (62) to move through a cycle of movement including a reciprocating path (A); and

fastener mechanism means (55) on the drive-control means (50) slidably engageable with the fastener driving mechanism (17, 43) which engagement means (55) causes at times the fastener mechanism (17, 43) to be driven downwardly and at other times causes the drive-control means to move the fastener mechanism upwardly.

4,720,034

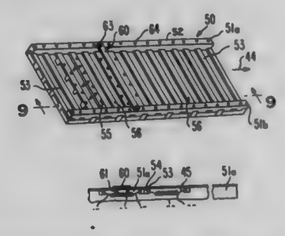
APPARATUS AND METHOD OF SOLDER COATING INTEGRATED CIRCUIT LEADS

Jong S. Lee, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 794,038, Oct. 31, 1985, Pat. No. 4,657,172. This application Nov. 10, 1986, Ser. No. 928,951

Int. Cl.[4] B05C *13/00*

U.S. Cl. 228—37 **4 Claims**



1. A pallet for mounting a series of integrated circuit packages and for passing said mounted series of integrated circuit packages through a wave of molten solder, said pallet comprising:

elongate support members;

spaced support bars attached traversely to said elongate support members;

means for mounting a series of integrated circuit packages linearly in an elongate frame;

means for mounting a series of said elongate frames parallel to and between said spaced support bars; and

a series of package support bars extending transversely of said elongate support members for supporting ones of said series of integrated circuit packages contained in each of said series of elongate frames.

4,720,035

METHOD OF REFLOW BONDING ELECTRONIC PARTS ON PRINTED CIRCUIT BOARD AND APPARATUS USED THEREFOR

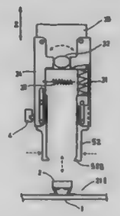
Yoshio Isogai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 16, 1987, Ser. No. 3,845

Claims priority, application Japan, Jan. 17, 1986, 61-008411

Int. Cl.[4] B23K *1/02, 3/04, 35/14*

U.S. Cl. 228—102 **15 Claims**



1. A method of reflow bonding an electronic part on a printed circuit board, said method comprising the steps of:

(a) providing a plurality of bonding tips in pairs, each said bonding tip being provided with a heating means for a horizontal tip portion thereof, and a cross section of said horizontal tip portion having a protrusion on bottom surface thereof facing leads of said electronic part;

(b) providing a first driving means for said bonding tips, said driving means comprising a pusher rod and a spring, wherein said pusher rod is moved vertically to predetermined positions sequentially and said spring has a function of pressing said bonding tips downward to the printed circuit board when downward movement of said pusher rod exceeds a specified value of a contact position of said bonding tips;

(c) providing a second driving means for opening and closing a gap between said bonding tips in pairs facing with each other;

(d) providing a sensor fitted with said bonding tips for detecting said contact position of the bonding tips;

(e) operating the first driving means downward until said sensor detects that the bonding tips make said contact with a specified object on the printed circuit board;

(f) operating the first driving mechanism upward by a specified distance;

(g) operating the second driving means for closing the gap between said bonding tips, and operating the first driving means for lowering said pusher rod until said bonding tips are pressing part leads with a specified pressurizing force; and

(h) reflow bonding by heating said bonding tips.

10. A reflow bonding apparatus for an electronic part on a printed circuit board comprising:

(a) a plurality of bonding tips in pairs, each said bonding tip being provided with a heating means for a horizontal tip portion thereof, and a cross section of said horizontal tip portion having a protrusion on bottom surface thereof facing leads of said electronic part;

(b) a first driving means for said bonding tips, said driving means comprising a pusher rod and a spring, wherein said pusher rod is moved vertically to predetermined positions sequentially and said spring has a function of pressing said bonding tips downward to the printed circuit board when downward movement of said pusher rod exceeds a specified value of a contact position of said bonding tips;

(c) a second driving means for opening and closing a gap between said bonding tips in pairs facing with each other; and

(d) a sensor fitted with said bonding tips for detecting said contact position of the bonding tips.

4,720,036

METHOD AND APPARATUS FOR A SURFACE-IMPROVING TREATMENT OF BODY OF AN ALLOY HAVING A READILY OXIDIZABLE SURFACE-IMPAIRING COMPONENT

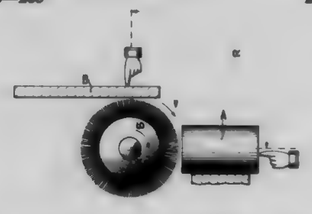
Rudolf Lisoa, Herzogenrath; Hans Dienstknecht, Langerwehe, and Egon Sigismund, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschranker Haftung, Julich, Fed. Rep. of Germany

Continuation of Ser. No. 720,525, Apr. 5, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,135

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412742

Int. Cl.[4] B23K *1/20*

U.S. Cl. 228—205 **2 Claims**



1. Process of bonding surfaces of bodies of an alloy metal including a readily oxidizable alloy component which impairs the surface bonding properties of said alloy, by fluxless brazing with a brazing filler metal, comprising the steps of:

pressing a body of bond-promoting metal and, simultaneously, a surface of a said alloy metal body to be bonded, against bristles of a rotating brush of a metal harder than said bond promoting metal, said brush rotating in a direction for scouring said bond promoting metal body, for picking up fine particles of said bond promoting metal on said bristles of said brush and simultaneously scouring or abrading said alloy metal body surface to eliminate any non-metallic skin layer portions and transferring particles of said bond promoting metal in finely divided form onto said scoured substrate surface not more than five milliseconds after pick-up of said filler metal particles from said filler metal body, for at least one minute, until a layer of said bond promoting metal having a thickness in the range from 10^{-3} to 10^{-1} mm is formed on said alloy metal body surface to be bonded;

fitting together said coated surface of said alloy metal body with a surface of a metal to be bonded therewith by fluxless brazing in relative position in which said bodies are to be bonded together and with brazing filler metal in the fitting-together boundary and then heating them, while in contact with said brazing filler metal under fluxless brazing conditions, to a brazing temperature in a furnace, and cooling said bodies while said surfaces thereof are in contact with each other.

4,720,037

SANITARY JACKET FOR ICE CREAM CONES

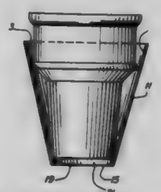
Theodore Alpert, Chicago, Ill., assignor to North American Paper Company, Berkeley, Ill.

Continuation of Ser. No. 841,202, Mar. 19, 1986, abandoned. This application Mar. 19, 1987, Ser. No. 28,002

Int. Cl.[4] B65D *3/06*

U.S. Cl. 229—1.5 H **2 Claims**

1. In combination with an ice cream cone, covering a substantial portion of an outer surface of the ice cream cone, and providing a sanitary barrier between a user's fingers and the ice cream cone, the improvement comprising a tapered, cylindrical sanitary jacket disposed around said ice cream cone, said ice cream cone having an upper projection engaging said jacket at an upper portion of said jacket and a lower portion engaging said jacket at a lower portion of said jacket, said ice cream cone and said jacket defining a chamber between said upper projection and said lower portion of said ice cream cone, said jacket including an upper, distal segment projecting freely



above said upper projection of said cone and being collapsible to allow the user to firmly grip said cone.

4,720,038

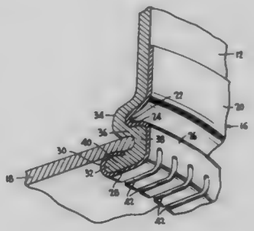
CORNER STRUCTURE

John K. Shepard, Bolingbrook, Ill., assignor to Continental Forest Industries, Inc., Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,059

Int. Cl.[4] B65D *3/30*

U.S. Cl. 229—5.7 **9 Claims**



1. In a drum of the type including a tubular body, an end wall and a corner reinforcement in the form of a metal chime, said chime having a corner portion including an annular end flange and a cylindrical upstanding flange; the improvement residing in upstanding ribs extending transversely across said annular end flange towards the interior of said drum, said ribs extending beyond said annular flange into said cylindrical flange with each of said ribs being generally of an L-shape.

4,720,039

PAPERBOARD CONTAINER

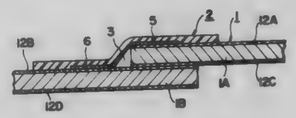
Yoichi Nishiguchi, Tokyo, Japan, assignor to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,627

Claims priority, application Japan, Mar. 18, 1986, 61-59857

Int. Cl.[4] B65D *5/42*

U.S. Cl. 229—48 T **11 Claims**



1. A paperboard container which has polyethylene coatings on front and back surfaces of a paperboard blank, and in which a contact area of polyethylene coatings of overlying end parts is heat sealed,

comprising, over the entire length of a container inside, a sealing tape which consists of a polyethylene base and a

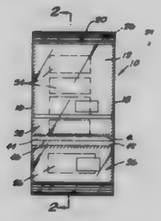
non-heat sealing layer, said polyethylene base being wider than said non-heat sealing layer and being heat-sealed to said polyethylene coatings inside of said container except the part consisting of said non-heat sealing layer, said non-heat sealing layer existing between said polyethylene base and said polyethylene coatings.

4,720,040

SECURITY DEPOSIT BAG

Richard M. Gurewitz, 5914 Woodland View Dr., Woodland Hills, Calif. 91367

Filed Dec. 19, 1986, Ser. No. 943,425
Int. Cl.[4] B65D *33/14*
U.S. Cl. 232—1 D 10 Claims



1. A security deposit bag for negotiable instruments to store and transport said negotiable instruments and to by visual inspection determine whether said bag has been tampered with, said bag comprising:

a pair of superimposed plastic sheets having ends sealed along opposed marginal edges and along a bridge area extending therebetween forming a pair of in line negotiable instrument pockets therein each adapted to receive a single form of negotiable instrument, and end extension flaps opposite said bridge area extending from the respective ends of one of said plastic sheets:

sealing means on said end extension flaps to secure said end extension flaps with the other of said plastic sheet to permanently close said negotiable instrument pockets, whereby an attempt to open said sealed end will result in a tearing of said bag; and separation means on said bridge area to be used to separate said in line pockets one from the other for appropriate servicing by a financial institution.

4,720,041

TELESCOPING COIN BOX FOR A COIN-OPERATED MACHINE

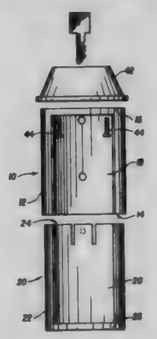
Ronald D. Swenson, Roanoke, Va., and James N. Seaborn, Kitchner, Canada, assignors to Medeco Security Locks, Inc., Salem, Va.

Filed Oct. 16, 1986, Ser. No. 919,692
Int. Cl.[4] G07B *15/00*
U.S. Cl. 232—16 4 Claims

1. A telescoping coin vault box for a coin-operated machine, comprising:

(a) a first box portion including a first generally cylindrical wall portion having an open end and a closed end, the cylindrical wall portion having an open slot extending from approximate said closed end to the open end of the cylindrical wall portion;

(b) a second box portion including a second generally cylindrical wall portion having an open end and a closed end, the second cylindrical wall portion having an open slot extending from aproximate the closed end of the second cylindrical wall portion to the open end of the second cylindrical wall portion, the open end of the first box portion telescopically receiving the open end of the second box portion with the slots of the first and second box portions in alignment to form a telescoping coin vault box defined by the cylindrical wall portions and the closed ends of the first and second box portions with the respective slots in alignment for admitting coins into the coin vault box, the first and second box portions being telescopically slidable relative to each other between an extended position wherein said closed ends are a first distance apart with the coin box being capable of holding a first volume of coins, and a contracted position wherein said closed ends are a lesser distance apart with the coin box being capable of holding a smaller volume of coins;



(c) means cooperating between the first and second box portions for selectively locking together the respective cylindrical wall portions of the first and second box portions in said extended position; and

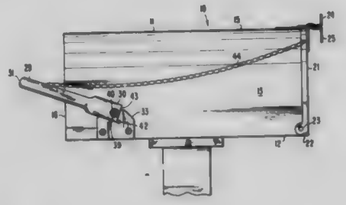
(d) one of said closed ends including means for connecting that closed end with a lock means for selectively locking the coin box within a coin vault of a coin-operated machine.

4,720,042

MAILBOX WITH DOOR ACTUATED SIGNAL FLAG

Wilbur F. Tapy, 3013 Olive Branch Rd., Greenwood, Ind. 46142

Filed Apr. 3, 1987, Ser. No. 33,781
Int. Cl.[4] A47G *29/12*
U.S. Cl. 232—35 6 Claims



1. A mailbox, comprising:

a hollow box open at one end;

a door sized and configured for closing the open end of said hollow box;

hinge means for hingedly attaching the lower edge of said door to the lower edge of the open end of said hollow box;

an elongate signal arm;

pivot means for pivotally attaching the lower end of said signal arm to one side of the hollow box to permit frictionless pivotal movement of said signal arm in a plane parallel to the one side of the hollow box;

a pivot stop pin attached to the one side of the hollow box so as to engage and stop said signal arm at a first orientation in which said signal arm is reclined away from the open end of the hollow box, and to engage and stop said signal arm at a second orientation in which said signal arm is oriented upwardly and disposed in an over-center condition with respect to said pivot means; and

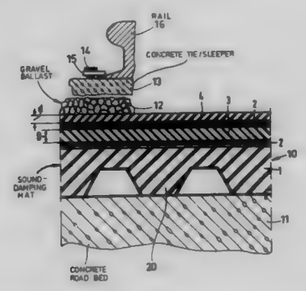
a chain connected at one end to said signal arm at a location away from said pivot means and connected at the other end to said door at a location away from the hinged connection, the connection locations and length of said chain being such that said signal arm can be reclined in the first orientation when said door is closed, and such that said signal arm is drawn from the first orientation to the second orientation as said door is opened, the length of said chain further being sufficient to permit said door to be rotated about its hinge from the closed position to a fully opened position in which the door hangs vertically below the hinge means.

4,720,043

RESILIENT BALLAST UNDERLAYMENT MAT INCLUDING NONWOVEN FIBER FLEECE LAYERS

Hermann Ortwein, Köln, Fed. Rep. of Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Köln, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,513
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506505
Int. Cl.[4] E01B *1/00*; B32B *17/02*
U.S. Cl. 238—2 5 Claims



1. In a road bed for railway rails, a sound-damping support assembly for the rails which consists of the combination of a ballast underlayment mat and a stone ballast on top of said mat, wherein said mat consists essentially of a body of elastomeric material formed at a bottom side thereof with prominent and projecting parts of said elastomeric material and at an upper side thereof with at least one layer consisting of a fiber fleece of nonwoven fiber limiting penetration of the stone ballast into the elastomeric material, a plurality of spaced apart layers of said fiber fleece of nonwoven fiber being provided at said upper side of said mat and said layers of fiber fleece being separated from one another by an intermediate resilient layer.

4,720,044

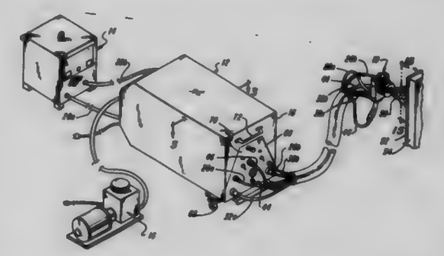
ELECTRIC ARC SPRAY METALIZING APPARATUS

Robert J. Stemwedel, Jr., Eagle, Colo., assignor to Eagle Arc Metalizing Company, Eagle, Colo.

Filed Dec. 13, 1985, Ser. No. 808,826
Int. Cl.[4] B05B *1/24, 1/28*; B64D *13/00*; A47B *77/08*
U.S. Cl. 239—84 5 Claims

5. In an electric arc spray metalizing apparatus for applying a metalizing coating to a substrate, and which includes a spray gun having means for consuming a pair of wires in an electric arc and transporting molten metal particles from the wires in a spray stream to the substrate, a pair of hollow cables connected at one end to the spray gun and through which the wires are supplied to the spray gun, a wire feed drive mechanism connected to the other end of the cables and including a supply of wire and means for pushing one wire through each cable to the spray gun, and an improvement in combination therewith comprising:

a housing having an interior within which the wire feed drive mechanism is located, the housing separating the other end of the cables and the supply of wires and the pushing means from the ambient environment, and



means for supplying pressurized gas to the interior of the housing to inhibit the entrance of airborne particles into the interior of the housing at open spaces in the housing,

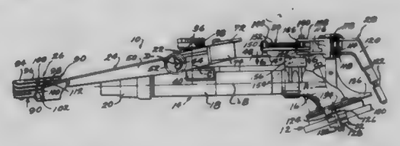
said wire feed drive means comprising a pair of drive contact means contacting each wire in a tandem relationship and operative to individually impart driving force to push the wire into the cable.

4,720,045

LARGE VOLUME SPRINKLER HEAD WITH PART-CIRCLE STEP BY STEP MOVEMENTS IN BOTH DIRECTIONS

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Division of Ser. No. 726,382, Apr. 23, 1985, Pat. No. 4,669,663.
This application Sep. 30, 1986, Ser. No. 913,247
Int. Cl.[4] B05B *3/06, 3/14*
U.S. Cl. 239—230 5 Claims



1. A sprinkler head capable of generally uniform operation under varying local source pressure conditions in a part circle mode wherein reversing directions of movement at the ends of the part circle pattern is accomplished without establishing excessive reversing loads so as to render the sprinkler head acceptable for use as an end gun in a pivot move irrigation system comprising

a sprinkler body having an inlet and an outlet,

means for mounting said sprinkler body for controlled rotational movement about a generally vertical axis with said inlet in communication with a conduit arranged to communicate a source of water under pressure therewith,

said outlet being disposed to direct water under pressure communicated with said inlet in a stream flowing therefrom in a direction upwardly and outwardly in generally symmetrical relation to a plane passing through the axis of rotation,

an impulse arm,

means pivotally mounting said impulse arm with respect to said sprinkler body (1) for pivotal movement about an axis disposed within said plane between a selected first or

second operating position and (2) for operative oscillating movement about an axis extending transverse to said plane,

said impulse arm having a drive spoon including first and second reactant elements angularly related with respect to one another in diverging relation with respect to one another in the direction the stream flows from said outlet,

said first and second reactant elements being operable when said impulse arm is in said first and second operating positions respectively to effect rotational movement of said sprinkler body in clockwise and counterclockwise directions respectively,

said impulse arm being normally biased toward an oscillatory limited position wherein an operable one of said reactant elements leaves the stream and moves away from the latter in one direction and a return stroke wherein said operable one of said reactant elements moves in the opposite direction toward said stream and enters the latter, and

means operable (1) when said impulse arm is in said first operating position and said sprinkler body has been rotated clockwise into a first rotational limiting position for changing the selected position of said impulse arm from said first operating position to said second operating position and (2) when said impulse arm is in said second operating position and said sprinkler body has been rotated counterclockwise into a second rotational limiting position for changing the selected position of said impulse arm from said second operating position to said first operating position,

said first reactant element including first arm oscillating surface means fixed with respect to said arm to provide a reactant area engaged by the stream which increases as the extent of entry of said first reactant element within said stream approaches said maximum extent so that the product of the energy level of the stream and the reactant area of said first arm oscillating surface means engaged thereby establishes an impulse force having a component tangential to the oscillating axis of said arm for effecting the impulse stroke thereof which is maintained generally constant by varying the extent of entry of said first reactant element within said stream in response to variation in the pressure of the source of water under pressure and hence by increasing or decreasing the reactant area of said first arm oscillating surface means in response to a decrease or increase in the energy level of the stream engaged thereby,

said first reactant element also including first sprinkler body rotating surface means fixed with respect to said arm to provide a reactant area engaged by the stream which increases as the extent of entry of said first reactant element within said stream approaches said maximum extent so that the product of the energy level of the stream and the reactant area of said first body rotating surface means engaged thereby establishes an impulse force having a component tangential to the rotational axis of said body for effecting an incremental rotational movement thereof in a clockwise direction which is maintained generally constant by varying the extent of entry of said first reactant element within said stream in response to variation in the pressure of the source of water under pressure and hence by increasing or decreasing the reactant area of said first body rotating surface means in response to a decrease or increase in the energy level of the stream engaged therby,

said second reactant element including second arm oscillating surface means fixed with respect to said arm to provide a reactant area engaged by the stream which increases as the extent of entry of said second reactant element within said stream approaches said maximum extent so that the product of the energy level of the stream and the reactant area of said second arm oscillating surface means engaged thereby establishes an impulse force having a component tangential to the oscillating axis of said arm for effecting the impulse stroke thereof which is maintained generally constant by varying the extent of entry of said second reactant element within said stream in response to variation in the pressure of the source of water under pressure and hence by increasing or decreasing the reactant area of said second arm oscillating surface means in response to a decrease or increase in the energy level of the stream engaged thereby, and

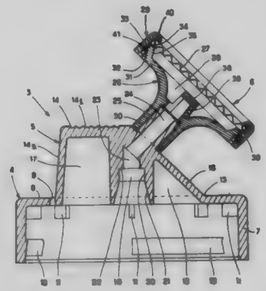
said second reactant element also including second sprinkler body rotating surface means fixed with respect to said arm to provide a reactant area engaged by the stream which increases as the extent of entry of said second reactant element within said stream approaches said maximum extent so that the product of the energy level of the stream and the reactant area of said second body rotating surface means engaged thereby establishes an impulse force having a component tangential to the rotational axis of said body for effecting an incremental rotational movement thereof in a counterclockwise direction which is maintained generally constant by varying the extent of entry of said reactant element within said stream in response to variation in the pressure of the source of water under pressure and hence by increasing or decreasing the reactant area of said second body rotating surface means in response to a decrease or increase in the energy level of the stream engaged thereby.

4,720,046

PRESSURIZED CONTAINER FOR DISCHARGING, IN A CONTROLLED FASHION, AN IMPROVED QUALITY MOUSSE

Bruno P. Morane, Neuilly, France, assignor to 'L'Oreal', Paris, France

Filed Dec. 31, 1985, Ser. No. 815,034
Claims priority, application France, Dec. 24, 1985, 85 19133
Int. Cl.[4] B05B *1/14*
U.S. Cl. 239—343 **9 Claims**



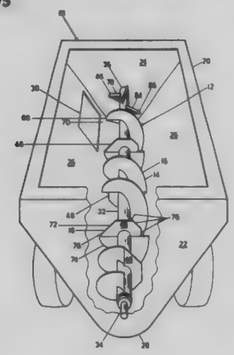
1. A pressurised container for packaging of a foaming product and its controlled distribution in the form of an improved quality mousse, said container comprising a container body; an outlet orifice of said body; a distribution valve placed on the outlet orifice; a discharge channel associated with said valve; push button means cooperating with the said valve effective to produce discharge of the said product through said discharge channel; a mousse accumulation chamber having an interior into which the discharge channel opens; a deflector located at said interior of said chamber, in the vicinity of the orifice by which said channel opens into the said chamber, said deflector having a surface disposed to obstruct the entering flow of the mousse, and an end wall constituted by a grill mounted on said chamber substantially opposite and facing the said orifice, said accumulation chamber being defined by a cylindrical sleeve serving as a base with said sleeve engaging and surrounding said discharge channel, said sleeve having an upper end which flares outwardly to an extremity to define a flared portion of the chamber and terminating in an annular flat wall portion lying in a plane, said deflector having an outer surface which lies substantially in said plane and an upstream wall in the flared portion of the chamber.

4,720,047

AUGER FOR CONVEYING MATERIALS SUCH AS MANURE

William S. Knight, and William M. Saunders, both of Brodhead, Wis., assignors to Knight Manufacturing Corporation, Brodhead, Wis.

Filed Dec. 12, 1986, Ser. No. 940,780
Int. Cl.[4] A01C *15/00*
U.S. Cl. 239—675 **25 Claims**



1. An improved auger adapted for use in moving liquid of semi-solid materials through a container comprising:

(a) a shaft having a back end and a front end and an axis of rotation; and

(b) a continuous blade mounted to and extending radially outwardly from the shaft, the blade including plural helical portions and at least one plate portion substantially perpendicular to the axis of rotation of the shaft and extending between the helical portions of the blade to make the blade substantially continuous on the shaft, and whereby rotation of the auger causes the helical portions of the blade to accelerate material in contact therewith in a direction toward the front end of the shaft and causes the plate portions to slow the movement of the material so that boiling action of material at the front end of the shaft is inhibited, and furthermore causes the plate portions to each create turbulence within the material as the material moves against the plate portions to inhibit bridging of material over the auger.

4,720,048

CART FOR TRANSPORTING CIRCUIT COMPONENTS

Ralf P. Maroney, Orange, and Gregory A. Fishkind, Milford, both of Conn., assignors to Plug-In Storage Systems, Inc., Milford, Conn.

Filed Dec. 26, 1985, Ser. No. 813,576
Int. Cl.[4] B62B *3/10*
U.S. Cl. 280—47.34 **19 Claims**

1. A cart for transporting electronic circuit components from one location to another comprising:

a frame formed from a first electrically conductive material including

spaced portions providing a substantially horizontal support,

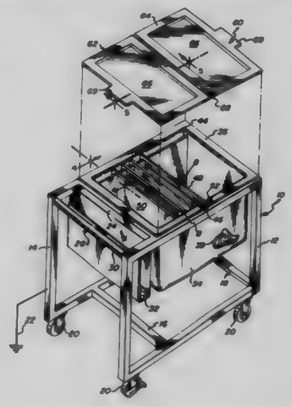
a bin having an outer and inner surface adapted to house said electronic circuit components,

said bin including

a flange adapted to be seated on said horizontal support of said frame,

at least the outer surface of said bin and flange being formed from a second electrically conductive material,

said flange being in contact with said frame for conducting electric charge from said bin into said frame,



wheel means on said frame for facilitating movement of said frame from one location to another, and

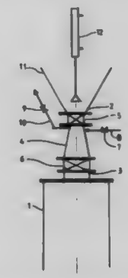
means connected to said frame for electrically grounding the same.

4,720,049

FEEDER DEVICE FOR PRESSURE CHAMBER GRINDER

Jouko Niemi, Pirkkala, Finland, assignor to Oy Finnpulva AB, Finland

PCT No. PCT/FI85/00082, § 371 Date Jun. 5, 1986, § 102(e) Date Jun. 5, 1986, PCT Pub. No. WO86/02287, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 11, 1985, Ser. No. 876,868
Claims priority, application Finland, Oct. 12, 1984, 844028
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—39 **7 Claims**



1. A pressure chamber grinder equipment comprising a pressure chamber grinder equalizing tank, a substantially vertical, control feeder chamber enlarging downwardly and having an inlet opening at its upper end and an exhaust opening at its bottom end, said exhaust opening communicating with said equalizing tank, a valve member in the inlet opening and the exhaust opening, each having the same diameters as the corresponding openings and each valve member being provided with an elastic closing member defining an annular muscle for closing and opening the openings, a gas feed pipe passing into the top portion of the feeder chamber, a feed valve for the generation of a pressure impact and a top end of said feed

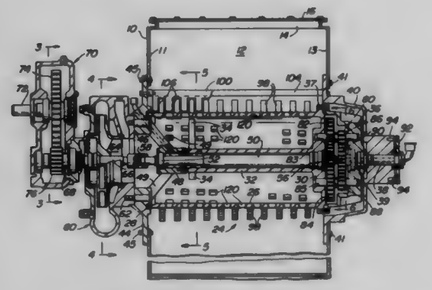
chamber, a gas removing pipe, a gas discharge valve for lowering the pressure prevailing in said feed chamber, the volume of said equalizing tank being at least four times as large as the volume of said feeder chamber.

4,720,050

COMMINUTOR-PUMP ASSEMBLY

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Jun. 18, 1962, Ser. No. 389,676
Int. Cl.[4] B02C *23/36*
U.S. Cl. 241—46.06 **14 Claims**



1. A comminutor-pump assembly comprising:
- a housing defining a comminution chamber and having an inlet for a solids containing liquid,
- a comminutor drum including a hollow cylinder having a cylindrical wall defining exterior and interior surfaces,
- an interior chamber enclosed by said interior surface of said cylindrical wall,
- means-mounting said cylinder to extend within said comminution chamber with its longitudinal axis extending horizontally and for rotation about its longitudinal axis,
- one end of said cylinder being open,
- means closing the end of said cylinder opposite said one end,
- a plurality of cutting teeth on the exterior surface of said cylindrical wall,
- a plurality of blades extending within said comminution chamber on the exterior of said cylinder for cooperating with said cutting teeth so as to comminute solids within said chamber,
- a plurality of openings in said cylindrical wall of said cylinder through which comminuted solids of a predetermined size may pass into said interior chamber of said cylinder,
- a pump mounted on said housing adjacent to the open end of said cylinder, said pump having a suction through which liquid is drawn into the pump, the suction of said pump being in flow communication with said interior chamber of said cylinder, and
- drive means for causing rotation of siad pump and rotation of said cylinder to cause said solids and the liquid to be drawn into the comminution chamber through said inlet, the comminution of solids by said teeth, and the passage of comminuted solids through said openings into said interior chamber of said cylinder from which they flow to the suction of the pump and are discharged therefrom.

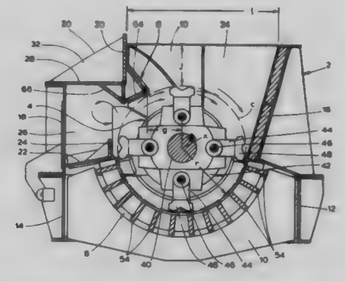
4,720,051

HAMMER-TYPE SHREDDER WITH AIR DEFLECTOR

Donald F. Graveman, St. Charles, and Sven B. Strom, St. Louis, both of Mo., assignors to American Pulverizer Company, St. Louis, Mo.

Filed Dec. 16, 1985, Ser. No. 809,485
Int. Cl.[4] B02C *13/282*
U.S. Cl. 241—186.3 **22 Claims**

1. A machine for shredding material, said machine comprising: a housing having an upwardly presented inlet into which the material to be shredded is introduced, the housing also having spaced apart end walls, a breaker plate, and an upright wall which surround the inlet; a rotor mounted in the housing with its axis of rotation passing through the end walls and being generally parallel to the breaker plate and upright wall, with the breaker plate being to one side of the axis and the upright wall to the other side of the axis, the rotor having hammers, the tips of which describe a hammer circle as the rotor revolves, the direction of rotation being such that the hammers move upwardly toward that region of the inlet that is located along the upright wall and thence, after coming over the top of the hammer circle, move toward the breaker plate, the diameter of the hammer circle being no larger than the length of the inlet measured from the upright wall to the



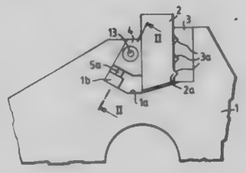
breaker plate; an arcuate grate located in the housing generally below and generally concentric to the hammer circle, with one end of the grate being at and aligned with the lower end of the breaker plate, the grate having openings through which shredded refuse will pass; and a deflector mounted on the housing to direct windage generated by the revolving hammers generally laterally through the inlet instead of upwardly out of the inlet, the deflector including a first deflector plate which projects over that portion of the hammer circle that leads up to the top of the hammer circle and further projects laterally beyond the upright all, but is nevertheless offset in its entirey to that side of the axis of rotation on which the upright wall is located, the spacing between the first deflector plate and the hammer circle where the first deflector plate is closest to the hammer circle being no greater than about $\frac{1}{4}$ inches.

4,720,052

DEVICE FOR THE FASTENING OF HAMMERS IN REBOUND-MILL ROTORS

Stefan Hasenfuss, and Bernd Kirchhoff, both of Eanigerloh, Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 867,649
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521582
Int. Cl.[4] B02C *13/26*
U.S. Cl. 241—192 **3 Claims**



1. In a device for fastening hammers in axially extending

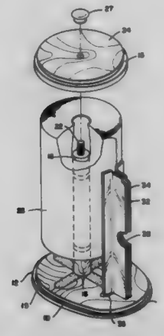
cutouts in a rebound-mill rotor having a form-locking attachment between each hammer and one side of the corresponding cutout and aa force attachment on the other side by means of at least one wedge-shaped clamping ledge which is acted on in the clamping direction by a plurality of pressure elements each of which has a clamping piston acted on by a pressure medium and which are connected to each other by a commpressure conduit which can be closed by a valve, the improvement wherein
- said clamping pistons are arranged in the clamping ledge and are connected by the pressure conduit, the latter opening in at least one end surface of the clamping ledge and being filled with a flowable, plastic compressible pressure medium,
- a closure screw being screwable into a mouth of the pressure conduit, and
- a setting piston being formed on said closure screw acting on said pressure medium for obtaining an excess pressure.

4,720,053

HOLDER FOR A ROLL OF PAPER TOWELS

Robert F. Vance, P.O. Box 1174, Tulsa, Okla. 74101

Filed Sep. 23, 1986, Ser. No. 910,555
Int. Cl.[4] B65H *19/00, 35/00*
U.S. Cl. 242—55.54 **5 Claims**



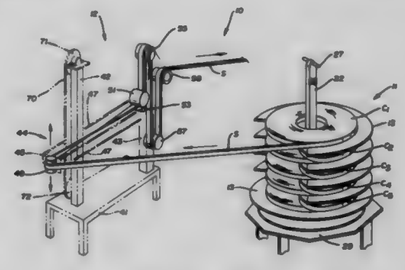
1. A free standing portable holder for supporting conventional rolls of paper towelling which may be rolled on a hollow core center and means for facilitating gradual tearing off a sheet of paper towel from said roll by manually gripping a perpendicularly disposed edge of said paper towelling comprising, a pedestal base adapted to rest upon a horizontal surface, said pedestal base including upper and lower surfaces, separate parallel adjacent closely spaced sheet guide means extending upwardly from said upper surface of said base, each of said upstanding sheet guide means have oppositely disposed horizontally aligned arcuate cut-away portions to facilitate grasping of said paper towelling which is guided between said sheet guide means, said upper, pedestal surface including an arcuate slotted depression adapted to receive bottom extremities of said upstanding adjacent closely spaced parallel disposed sheet guide means, a pole secured to the upper surface of said base, said pole having a length greater than said hollow core extending upwardly from said base and having a diameter adapted to fit within the hollow core of said roll of paper towelling for supporting the latter with its axis normal to the upper surface of said base; a threaded bolt having a diameter less than said pole secured to the top of said pole along a linear axis, a cap which is free of any axially extending edge surface, said cap having an axial aperture greater than said bolt for positioning said cap on said threaded bolt and for seating on said upstanding pole, a knob having a diameter greater than said axial aperture in said cap which is screwed onto said threaded bolt to hold said cap in place, said cap including a lower surface zone provided with an arcuate undercut depression which is arranged to receive the upper extremities of said upstanding sheet guide means, said arcuate undercut depression in said cap and said upper surface of said base being spaced from said pole so that said guide means stands outwardly of an unused roll of towelling when placed in said holder, said free standing portable holder further includes paper towel roll impeding friction creating means spacedly arranged on the circumference of said upwardly extending pole and on the upper and lower surfaces of said base, said impeding means on the upper surface of said base having an outer zone deliminated by the circumference of an unused roll of towelling placed on said pole.

4,720,054

SYSTEM FOR SUPPLYING STRIP TO A PROCESSING LINE

Walter J. Hood, Shaker Heights; Anthony C. Costello, Strongsville, and Eugene L. Conaway, Twinsburg, all of Ohio, assignors to Kent Corporation, Cleveland, Ohio

Filed Dec. 5, 1985, Ser. No. 805,311
Int. Cl.[4] B65H *16/00, 77/00*
U.S. Cl. 242—58 **43 Claims**



1. A system for supplying strip material according to the demand of a processing line comprising a strip uncoiler assembly and a strip take-out assembly; said uncoiler assembly including a plurality of adjacently positioned coils of strip material, each said coil lying in a plane and having its trailing end of strip material connected to the leading end of the strip material on the serially adjacent coil; said uncoiler assembly also including means to rotate said coils; said take-out assembly including means to receive strip material from said coils, means to index said means to receive strip material to align the same in said plane with the individual coil satisfying the demand of the processing line, and means responsive to the demand of the processing line to control said means to rotate said coils.

4,720,055

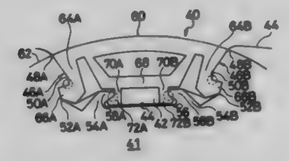
TAPE CLAMP MECHANISM FOR REEL HUB OF TAPE CASSETTE

Takateru Satoh, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Nov. 6, 1985, Ser. No. 795,639
Claims priority, application Japan, Nov. 7, 1984, 59-169085[U]
Int. Cl.[4] B65H *75/28*
U.S. Cl. 242—74.1 **14 Claims**

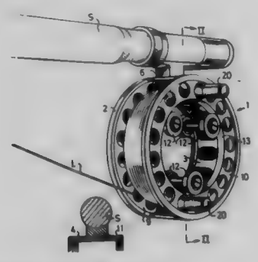
1. A tape clamp mechanism for a reel hub of a tape cassette, said reel hub having a circumferential curved surface, said tape clamp mechanism comprising
- a clamp block for clamping a tape to the reel hub, said clamp block having a main block having spaced opposite ends, an outer curved surface corresponding to the outer circumferential curved surface of the reel hub and an inner surface;

a first pair of prongs projecting from the inner surface at both ends of said clamp block;
a bridge member provided on the inner surface of said main block; and
a second pair of prongs projecting from said bridge member;
said reel hub having a recess for receiving said clamp block and said recess having cavity means for interacting with said first and second pairs of prongs of said clamp block,



wherein said clamp block is settable in said recess of said reel hub by a snap mounting or friction fit method;
wherein said cavity means comprise
a first pair of cavities for receiving said first pair of prongs,
a second pair of cavities for receiving said second pair of prongs;
and said hub comprises
a pair of projections, each projection situated between respective ones of said first and second pairs of cavities.

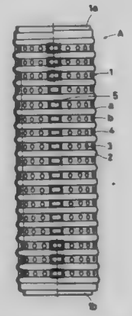
4,720,056
FLY-FISHING REEL AND PROCESS FOR CHANGING LINES
Kurt Danielsson, Lyrvägen 15, S-77700 Smedjebacken, Sweden
Filed Mar. 5, 1986, Ser. No. 836,526
Claims priority, application Sweden, Mar. 8, 1985, 8501158
Int. Cl.⁴ A01K *89/02*
U.S. Cl. 242—84.5 R **6 Claims**



1. A fly-fishing reel comprising:
a line spool including a tubular body with outwardly and radially projecting edge flanges and inclined edge portions on the inner peripheral surface thereof;
a housing accommodating said spool and having means for attaching said reel to a fly rod, said housing including a ring plate from which a plurality of support shafts, displaced the same radial distance from the center of the ring plate, extend in a perpendicular direction from said ring plate;
pairs of carrier rollers displaced axially and rotatably journalled on each of said shafts, said rollers having the shape of truncated cones with an inclination corresponding to the inclination of said inclined edge portions of said spool and coacting with said edge portions to rotatable support said spool; and
means for regulating the contact pressure between said rollers and said inclined edge portions on said spool to a predetermined value, said means being the only means for regulating the rotational drag of said reel.

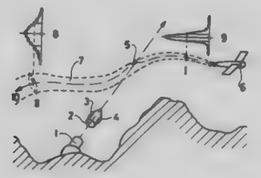
6. Process for the exchange of a fly-casting line mounted on a rod and on a fly-fishing reel, said reel provided with an auxiliary shaft removably attached to the housing of said reel, comprising the following steps:
attaching an empty exchange spool to the auxiliary shaft mounted on the housing of the fly-fishing reel, and affixing the fly line to be replaced to the exchange spool;
winding off the fly line from the fly-fishing reel by rotating the exchange spool while winding the line completely onto the exchange spool, and then cutting off the backing line at the point of attachment to the fly line;
replacing the exchange spool from the auxiliary shaft by an additional exchange spool onto which is wound a new fly line of the type desired;
tying the new fly line to the backing line and winding off and new fly line completely from the additional exchange spool by rotating the fly-fishing reel so as to wind the new fly line onto the fly-fishing reel; and
removing the emptied additional exchange spool and the auxiliary shaft from the fly-fishing reel.

4,720,057
PRESS BOBBIN FOR YARN TREATMENT
Nobutaka Ono, Ashiya, and Yasuhisa Seko, Toyonaka, both of Japan, assignors to Osaka Bobbin Kabushiki Kaisha, Osaka, Japan
Filed May 15, 1987, Ser. No. 50,797
Claims priority, application Japan, Dec. 15, 1986, 61-193575[U]
Int. Cl.⁴ B65H *75/20*
U.S. Cl. 242—118.11 **3 Claims**



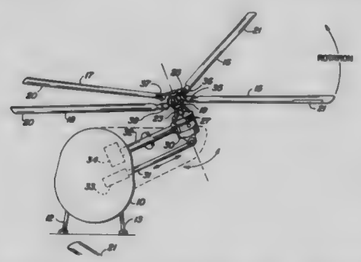
1. In a press bobbin for yarn treatment formed of a cylindrical body of a synthetic plastic which is defined, on a cylindrical wall thereof, with a plurality of holes for liquid flow, an improvement in which said cylindrical wall is fabricated by blow molding of the synthetic plastic and comprises a plurality of relatively thin-gage zones and a plurality of relatively thick-gage zones both of which extend circumferentially and are alternatively arranged in the axial direction of the bobbin, said cylindrical wall defines, along the axial direction, an indentation configuration wherein said relatively thin-gage zones and said thick-gage zones correspond to projecting portions and recessed portions, respectively, said thick-gage zones are defined with a plurality of holes for passage of liquid, said thin-gage zones are, when pressed axially, capable of bending in a U-form to protrude outwardly, whereby the bobbin is axially compressible.

4,720,058
METHOD FOR TRACKING A MOTOR-OPERATED FLYING OBJECT
Walter Jaeger, Cureglia, Switzerland, assignor to GX-Holding AG, Basel, Switzerland
PCT No. PCT/CH83/00097, § 371 Date Apr. 17, 1984, § 102(e) Date Apr. 17, 1984, PCT Pub. No. WO84/00806, PCT Pub. Date Mar. 1, 1984
Continuation-in-part of Ser. No. 601,366, Apr. 17, 1984, abandoned. This PCT application Aug. 12, 1983, Ser. No. 867,612
Claims priority, application Switzerland, Aug. 20, 1982, 4974/82; Sep. 2, 1982, 5221/82
Int. Cl.⁴ F41G *7/22*
U.S. Cl. 244—3.15 **13 Claims**



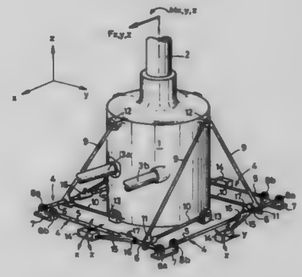
1. A method of tracking a motor driven flying object by means of a steerable tracker body in which the tracker body is introduced into a trail of a flying object and at least one part of the tracker body is steered in accordance with combustion products generated by a motor of the flying object as a predetermined trail criterion so as to fly along said trail; said combustion products being remotely sensed by at least one lidar sensor incorporated in said tracker body, said lidar being sensitive to combustion generated molecule complexes and combustion generated aerosoles as trail criterion and being connected with a computer generating steering signals in consequency of signals from said lidar sensor.

4,720,059
HIGH SPEED HELICOPTER
Hoyt A. Stearns, Jr., 4131 E. Cannon Dr., Phoenix, Ariz. 85028
Filed Dec. 31, 1986, Ser. No. 948,022
Int. Cl.⁴ B64C *27/06*
U.S. Cl. 244—17.11 **15 Claims**



1. In a single-rotor helicopter having fuselage, at least three rotor blades each having a hube end and a tip end, an offset flapping hub with an axis of rotation and to which the hub ends of the rotor blades are attached, and means for rotating the rotor blades to cause the rotor blades to advance on one side of the fuselage and to retreat on the other, an improvement including in combination;
a mast attached to said fuselage for mounting said hub above and offset past the retreating blade side of said fuselage;
means for cyclically individually controlling the pitch of each of said rotor blades as a function of the angular position of said blades with respect to said fuselage; and
means for tilting said hub with respect to said mast independently of said means for individually controlling the pitch of each of said rotor blades, said tilting means including first control means for tilting said hub from side to side relative to the longitudinal axis of said fuselage and second control means for tilting said hub front to back in a line parallel with the longitudinal axis of said fuselage.

4,720,060
ANTI-RESONANT SUSPENSION DEVICE HAVING SIX DEGREES OF FREEDOM FOR A HELICOPTER
Victor Y. Yasa, Marseille, France, assignor to Aerospatiale Societe Nationale Industrielle, France
Filed Jun. 27, 1986, Ser. No. 879,217
Claims priority, application France, Jul. 3, 1985, 85 10157
Int. Cl.⁴ B64C *27/04*
U.S. Cl. 244—17.27 **7 Claims**

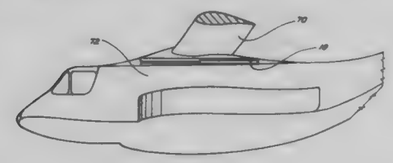


1. An anti-resonant suspension device of a lift rotor speed reducer assembly for a fuselage of a helicopter, comprising: pivot members at four locations equally spaced about the rotor speed reducer assembly; a triangular member having an apex pivotally connected to each one of said pivot members, each said triangular member having a base portion with a first base pivot and a second base pivot, each of said second base pivots connected to a base portion of the rotor speed reducer assembly; a first suspension arm suspended between a first bearing and a second bearing; a second suspension arm suspended between said second bearing and a third bearing; a third suspension arm suspended between said third bearing and a fourth bearing; a fourth suspension arm suspended between said first bearing and said fourth bearing, each of said first, second, third and fourth bearings having a base portion connected to the fuselage, each of said suspension arms having an isotropic flexible portion and a rigid portion; a support lever including a beating weight connected to each rigid portion of each suspension arm, each first base pivot of each of said triangular members being connected to a suspension arm.

4,720,061
AIRCRAFT ROTATING WING SEAL AND METHOD THEREFOR
Stephen F. Abdenour, Akron, and Stephen M. Polatas, Parma, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Jul. 28, 1986, Ser. No. 890,056
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.⁴ B64C *3/56*
U.S. Cl. 244—46 **12 Claims**

1. In an aircraft having a turntable mounted wing configured for rotation in a particular direction about a rotational axis from an inflight position wherein a longitudinal axis of the wing is substantially perpendicular to a longitudinal axis of a

fuselage of the aircraft, to a stowage position where the longitudinal axis of the wing substantially parallels the longitudinal axis of the fuselage, and wherein a gap thereby exists between the wing and the fuselage while the wing is in an inflight position, the gap requiring sealing, a method of sealing the gap comprising the steps of: (a) providing a seal element; (b) positioning the seal element to fill and seal the gap; (c) configuring the seal element to include a pair of sections; (d) affixing one of the sections to the fuselage, and affixing the remaning section to the wing; (e) identifying a point of inflection along the seal; (f) configuring each seal element to having a thickness in a direction generally parallel to the rotational axis; (g) configuring a portion of the fuselage attached section forward of the point of inflection in a direction of motion from the inflight to stowage positions to have a thickness generally parallel to the rotational axis reduced by at least 1% from a corresponding thickness of the portion of the fuselage attached section rearward of the inflection point; (h) providing the corresponding wing attached section to have corresponding forward and rearward portions configured in thickness to mate to the forward and rearward portion of fuselage attached section to yield a seal having a desired thickness in a direction generally parallel to the rotational axis while the wing is in the inflight position.

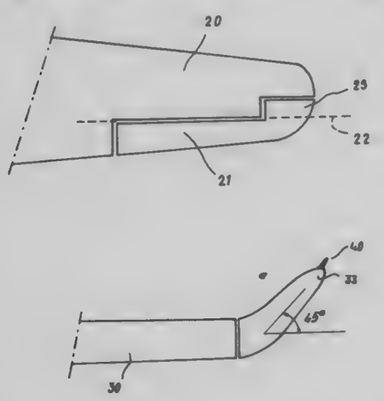


4,720,063

AILERON FOR AN AIRPLANE WING

Bernod J. J. Warrink, Rijsenhout, and Ed Obert, Nieuw-Vennep, both of Netherlands, assignors to Fokker B. V., Schiphol, Netherlands

Filed Mar. 21, 1986, Ser. No. 842,532
Claims priority, application Netherlands, Mar. 29, 1985, 8500950
Int. Cl.[4] B64C 9/30
U.S. Cl. 244—90 R **5 Claims**



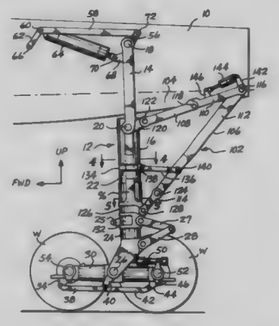
1. Aileron for an airplane wing controlled by a reversible control system, said aileron comprising a first section extending in general behind the pivot axis of the aileron parallel to the longitudinal axis of the wing and a second section extending in front of the pivot axis of the wing for aerodynamically balancing the aileron, said second section coinciding with the wing tip, wherein to improve the transveral stability of the airplane during drifting flight the second section is directed upwards and outwards in relation to the chord plane of the wing at an angle between 20° and 70° with said chord plane.

4,720,063

MAIN LANDING GEAR WITH VARIABLE LENGTH DRAG BRACE

Milton E. James, Vashon, and John A. Stepien, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 782,220
Int. Cl.[4] B64C 25/10
U.S. Cl. 244—102 R **11 Claims**



1. In an aircraft:

frame means defining a landing gear stowage compartment, a first mounting station in an upper central portion of the stowage compartment, and a second mounting station in said stowage compartment which is spaced both horizontally and vertically downwardly from the first mounting station; and

a landing gear that is retractable into and extendable out from said stowage compartment, comprising:

a folding wheel strut comprising an upper portion having upper and lower ends and a lower portion having upper and lower ends;

wheel means at the lower end of the lower portion of the wheel strut;

means mounting the upper end of the upper portion of the wheel strut to said frame means at the first mounting station, for pivotal movement about a fixed first horizontal axis;

means connecting the lower end of the upper portion of the wheel strut to the upper end of the lower portion of the wheel strut, for pivotal movement about a second horizontal axis that is parallel to said first horizontal axis;

an extend/retract actuator means connected between the upper portion of the wheel strut and a third mounting station on said frame means spaced from the first mounting station in a direction horizontally opposite the second mounting station, for pivoting the upper portion of the wheel strut in position about said first axis, between an in use position in which the upper portion of the wheel strut extends substantially vertically downwardly from the first mounting station and a retracted position in which the upper portion of the wheel strut is within the stowage compartment; and

a folding drag brace truss means interconnected between the lower portion of the wheel strut and the second mounting station, said folding drag brace truss means being movable in response to pivotal movement of the upper portion of the wheel strut, between an in use position in which said folding truss means extends in a bracing position between the second mounting station and the wheel strut, to brace and fully stabilize the landing gear, and a folded position in which the folding truss means is located within the stowage compartment, generally between the first and second mounting stations, said folding truss means functioning in response to pivotal movement of the upper portion of the wheel strut to move the lower portion of the wheel strut between an in use position in which it is substantially vertically aligned with the upper portion of the wheel strut, and both of said wheel strut portions extend substantially vertically downwardly from the first mounting station, and a retracted position within the stowage compartment in which the upper portion of the wheel strut extends from the first mounting station generally towards the second mounting station and the lower portion of the wheel strut is folded generally up against the upper portion of the wheel strut.

4,720,064

EJECTION SEAT RESTRAINT/PARACHUTE HARNESS

Gerald F. Herndon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 782,131, Sep. 30, 1985, abandoned. This application Apr. 7, 1987, Ser. No. 35,200
Int. Cl.[4] B64D 25/06
U.S. Cl. 244—122 AG **26 Claims**

1. An ejection seat restraint/parachute harness, comprising:

continuous strap means for providing a continuous load path beginning at a side front torso location and running diagonally up and across the back, down the front, across and under the buttocks, up the front, and diagonally down and across the back to an opposite side front torso location;

chest strap means for preventing a wearer's shoulders from slipping out of the harness;

thigh strap and lap belt means, extending diagonally upwardly and laterally outwardly across the front of torso location and directly laterally across the front of the lower torso below the chest of the wearer, for preventing the pelvis of the wearer from rotating and slipping out of position; said thigh strap and lap belt means being fixedly attached to said continuous strap means at each of said side front torso locations when the harness is in use; and

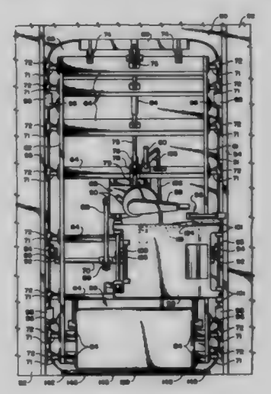
means for anchoring opposite sides of the thigh strap and lap belt means to an ejection seat, said means for anchoring engaging the thigh strap and lap belt means at said side front torso locations.

4,720,065

TRANSLATABLE OUTWARD OPENING PLUG-TYPE AIRCRAFT DOOR AND ACTUATING MECHANISMS THEREFOR

Tomio Hamatani, King County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 24, 1985, Ser. No. 694,426
Int. Cl.[4] B64C 1/14
U.S. Cl. 244—129.5 **18 Claims**



1. An outward opening plug-type aircraft door of the type adapted to be mounted in an ingress/egress cutout opening formed in the aircraft fuselage and bounded by generally vertical fore and aft fuselage frame members, said door comprising, in combination:

(a) means defining a generally L-shaped hinge element having a relatively short hinge arm and a relatively long hinge arm;

(b) means for securing said relatively short hinge arm to one of the generally vertical fore and aft frame members bounding the ingress/egress cutout opening in the aircraft fuselage with freedom for rotation about a first generally vertical hinge axis;

(c) an outwardly opening plug-type aircraft door dimensioned to be received in and to close the ingress/egress cutout opening in the aircraft fuselage, said door being mounted in cantilever fashion on the free extremity of said relatively long hinge arm for rotation about a second generally vertical hinge axis and with freedom for limited up and down vertical movement relative to said hinge element and the ingress/egress cutout opening in the aircraft fuselage;

(d) means defining a programming mechanism interconnecting said aircraft door, said hinge element and said one of the fore and aft fuselage frame members for controlling the rotational attitude of said aircraft door as the latter is shifted between fully closed and fully opened positions and for maintaining said aircraft door in a plane essentially parallel to the plane containing the ingress/egress cutout opening at all door positions, said programming mechanism defining means comprising:

(i) a first 4-bar linkage assembly defined by (1) said relatively short hinge arm; (2) bell crank defining means pivotally secured intermediate its opposite ends to said L-shaped hinge element at the juncture of said relatively short and said relatively long hinge arms; and (3), a first control link pivotally secured at one end thereof to one end of said bell crank defining means and pivotally secured at the opposite end thereof to said one of the generally vertical fore and aft frame members for rotation about a third generally vertical hinge axis par-

allel to and spaced from said first generally vertical hinge axis; and,

(ii) a second 4-bar linkage assembly defined by (1) said relatively long hinge arm; (2) said bell crank defining means; and (3), a second control link pivotally secured at one end thereof to the other end of said bell crank defining means and pivotally secured at the opposite end thereof to said door for rotation about a fourth generally vertical hinge axis parallel to and spaced from said second generally vertical hinge axis;

with said first and second 4-bar assemblies being interconnected to one another by said bell crank defining means and being arranged such that when said aircraft door is in the fully opened position the components defining said first 4-bar linkage assembly lie in an essentially vertical plane immediately adjacent said one of the generally vertical fore and aft frame members bounding the ingress/egress cutout opening in the aircraft fuselage, the components defining said second 4-bar linkage assembly lie wholly outside the aircraft fuselage and either fore or aft of the ingress/egress cutout opening, and the ingress/egress cutout opening is essentially devoid of any obstructions when said aircraft door is in the fully open position;

(e) cooperable latch means mounted on the fore and aft vertical edges of said aircraft door and on the fore and aft generally vertical fuselage frame members bounding the ingress/egress cutout opening for selectively latching said aircraft door in a seated, fully closed and latched condition; and,

(f) manually operable actuating means mounted on said aircraft door for lifting said aircraft door within the fuselage ingress/egress cutout opening a distance on the order of approximately two inches from a seated, fully latched and closed position to a raised unlatched and closed position and for lowering said aircraft door within the fuselage ingress/egress cutout opening a distance on the order of approximately two inches from a raised, unlatched and closed position to a seated, fully latched and closed position; whereby said aircraft door may be shifted between a seated, fully latched and closed position and a raised, unlatched and closed position by manual actuation of said actuating means; and, whereby said aircraft door, when in a raised, unlatched and closed position, can be manually shifted out of the ingress/egress cutout opening to a fully open position wherein said door is located outboard of the aircraft fuselage with the door's inner surface and the fuselage outer surface in facing relation with said door being maintained in a plane essentially parallel to the plane containing the ingress/egress cutout opening at all door positions intermediate a fully closed and fully opened position and with the ingress/egress cutout opening being substantially devoid of laterally projecting hinge and/or actuating components when said door is fully opened.

4,720,066

FLAP/SPOILER COMBINATION

Juergen Renken, Freyersen, and Wilhelm Martens, Delmenhorst, both of Fed. Rep. of Germany, assignors to MBB GmbH, Bremen, Fed. Rep. of Germany

Filed Aug. 26, 1986, Ser. No. 900,507

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530864; Jun. 26, 1986, 3621401

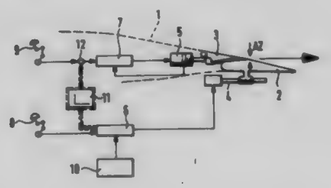
Int. Cl.⁴ B64C *9/12*

U.S. Cl. 244—213 **4 Claims**

1. In a flap arrangement for an aircraft wing having along its trailing edge a high lift flap and a spoiler associated therewith and arranged upstream therefrom, there being a first actuator with first controller connected for operating the high lift flap, there being a second actuator with second controller connected for operating the spoiler, the improvement comprising,

means (i) for providing a signal being indicative of the disposition of the high lift flap in relation to said spoiler; and

means (ii) connected to the means (i) and to the second controller of the spoiler for operating the second controller and actuator such that a gap between the spoiler and the high lift flap does not form, so as to obtain follow up



positioning of the spoiler in relation to movement and actuation of the high lift flap.

4,720,067

METHOD FOR INCREASING THE NUMBER OF SIGNALS WHICH MAY BE TRANSMITTED FROM A GROUND STATION TO A RAIL VEHICLE

Walter Jaeger, Bel Bosco, CH-6951 Cureglia, Switzerland

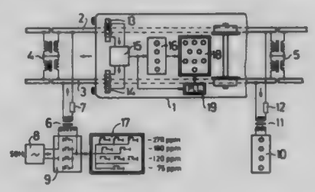
PCT No. PCT/CH84/00038, § 371 Date Nov. 9, 1984, § 102(e) Date Nov. 9, 1984, PCT Pub. No. WO84/03672, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 12, 1984, Ser. No. 680,260

Claims priority, application Switzerland, Mar. 14, 1983, 1381/83; Mar. 14, 1983, 1380/83

Int. Cl.⁴ B61L *3/20*

U.S. Cl. 246—34 B **8 Claims**



1. A method for transmitting signals to first and second kinds of rail vehicles, and in which there is a base section equipped with a coder, the base section being connected to a section of track on which said first and second kinds of vehicles may run, each of the first knd of vehicle having a decoder that operates by pulse frequency demodulation only and is equally reponsive to signals of a pulse frequency modulated carrier of a predetermined pulse frequency in which the pulse duration is of any value within a given range of percentage of the period of the frequency of the signals, characterized by:

(a) transmitting a plurality of different signals from said base section to said section of track by an alternating current carrier that is both frequency modulated and pulse width modulated, with the frequency of modulation of all of said different signals being the same as that to which the decoder of said first kind of rail vehicle is responsive and with the pulse width modulation being such that each signal has a pulse width which is one of a preselected number of different predetermined percentages of pulse width to the period of the frequency of the pulse, and in which each of said different predetermined percentages of pulse width to pulse period of the frequency of the pulse is within said given range of percentage the period of the pulse frequency to which said decoder of said first rail vehicle is responsive, and

(b) equipping each of said second kind of rail vehicle with a decoder that operates on said signals by pulse frequency demodulation and is responsive to signals of the pulse

frequency of said transmitted signals and that also operates on said signals by pulse width demodulation and is separately responsive to each of the preselected number of differently pulse width modulated signals that are transmitted.

4,720,068

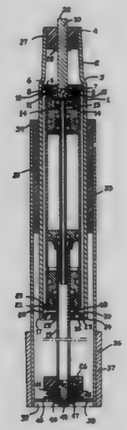
SEAT SUPPORT COLUMN

Lino E. Tornero, 629 Joyner St., Greensboro, N.C. 27403

Filed Aug. 29, 1986, Ser. No. 901,837

Int. Cl.⁴ F16M *11/00*

U.S. Cl. 248—161 **5 Claims**



1. Apparatus for adjustably and rotatably mounting the seat of a chair or stool to a base comprising:

(a) a support cylinder, a height adjusting gas spring, and a generally tubular casing secured to the underside of said seat;

(b) said support cylinder including an annular mounting plate adjacent the lower end thereof and a generally open top;

(c) said height adjusting gas spring including a gas cartridge having a diameter less than the diameter of said support cylinder with a piston rod protruding from one end thereof, a cartridge pin adjacent the other end of said gas cartridge, said gas cartridge being vertically reciprocal along said piston rod responsive to depression of said cartridge pin;

(d) the free end of said piston rod being attached to said annular mounting plate in such a manner as to be rotatable thereon, but radially and axially fixed with respect thereto, whereby said height adjusting cartridge is substantially disposed within the support cylinder in parallel spaced relation to the cylindrical wall thereof;

(e) the longitudinal axes of said support cylinder, said piston rod, and said gas cartridge being colinear with respect to each other and remain substantially vertically erect at all times;

(f) said tubular casing having an upper section and a generally cylindrical lower section, the lower section having a diameter greater than the diameter of said gas cartridge and less than the diameter of said support cylinder, a collar means for substantially enclosing the upper end of said lower section, the lower end of said casing being generally open, and said cartridge providing substantially the entire support for said casing;

(g) an activating pin extending through the upper end of said casing and said activating pin engages said cartridge pin through an opening in an upper wall of said cartridge; said activating pin being radially or laterally movable with respect to said cartridge pin for selective activation thereof;

(h) the longitudinal axis of said casing being tiltable or laterally shiftable with respect to the longitudinal axes of said support cylinder, piston rod, and height adjusting cartridge responsive to non-axial or side loads on said seat member, whereby the damaging or objectionable effects of such side loads are minimized.

4,720,069

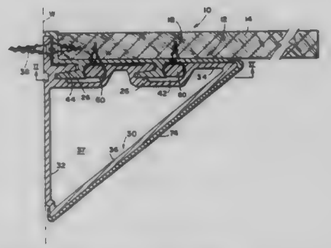
LOCK PIN CANTILEVER SHELF

Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Filed Aug. 21, 1986, Ser. No. 898,419

Int. Cl.⁴ A47G *29/02*

U.S. Cl. 248—250 **14 Claims**



1. A shelf bracket assembly comprising:

a wall bracket; said wall bracket having a vertical wall engaging surface and a horizontally extending support portion;

a first coupler at said support portion including a female or a male member;

a shelf bracket; said shelf bracket having a horizontally extending shelf support portion having at the bottom thereof a male or a female member for respectively interengaging with said female or male member on said wall bracket;

said first and second couplers being complementary to each other to interfit with each other in a sliding interfit when said shelf bracket is moved downwardly and rearwardly relative to said wall bracket;

said first and second couplers, when interfitted, defining a receiving space therebetween; and

interlock means in said space between said first and second couplers to prevent removal of said shelf bracket and any shelf thereon from said wall bracket.

4,720,070

HEIGHT ADJUSTER OPERATION MECHANISM FOR AN AUTOMOTIVE SEAT

Takaichi Nishino, Akishima, Japan, assignor to Tachi-S Co., L.T.D., Japan

Filed Nov. 4, 1986, Ser. No. 927,353

Int. Cl.⁴ F16M *11/12*

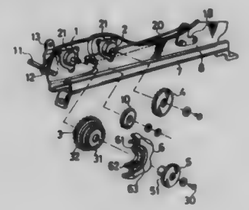
U.S. Cl. 248—394 **8 Claims**

1. A height adjuster operation mechanism for use in an automotive seat, comprising:

a front rotary shaft rotatably mounted to right and left upper rails of a seat adjuster so as to extend across said right and left upper rails for providing a driving rotary force to working parts of a front height adjuster to raise and lower the front portion of a seat cushion frame;

a rear rotary shaft rotatably mounted in the rear of said front rotary shaft to said right and left upper rails of said seat adjuster so as to extend across said right and left upper rails for providing a driving rotary force to working parts

of a rear height adjuster to raise and lower the rear portion of said seat cushion frame;
a driving rotary member rotatably fitted on said front rotary shaft;
cooperative rotary means located between said front and rear rotary shafts and connected with both said driving rotary member and said rear rotary shaft;
a socket fixed to said front rotary shaft;
an operation knob axially movably mounted on said front rotary shaft between said driving rotary member and said socket;



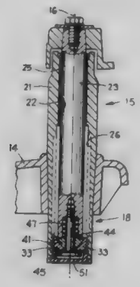
said socket being provided on the side thereof facing said operation knob with an engagement portion which is engageable with said operation know; and,
said driving rotary member being provided on the side thereof facing said operation knob with an engagement portion engageable with said operation knob,
whereby, when said operation knob is moved axially to be brought into engagement with either said driving rotary member or said socket, then the rotational force of said operation knob can be transmitted to said driving rotary member or said socket to rotate said rear rotary shaft or said front rotary shaft respectively so as to adjust the height of a seat cushion of said automotive seat.

4,720,071

SPLIT NUT MECHANICAL HEIGHT ADJUSTING MECHANISM FOR CHAIR

Patrick C. Nelson, and Donald L. Cool, both of Holland, Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Dec. 19, 1986, Ser. No. 943,969
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—406.2 **10 Claims**



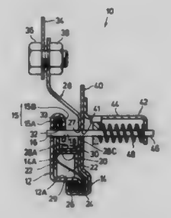
1. In a chair having a seat means, a base having thereon an upwardly projecting support tube defining a central opening which projects vertically downwardly therethrough, a vertically elongated spindle having the upper end portion thereof nonrotatably interconnected to said seat means, said spindle projecting downwardly so that the lower portion thereof is rotatably positioned and confined within said central opening, said spindle being rotatable about its longitudinal axis relative to said support tube, and a load-released height-adjusting mechanism coacting between said spindle and said support tube for (1) rotatably supporting the seat means when occupied for rotation about the axis of the spindle and (2) permitting the height of said seat means when unoccupied to be vertically adjusted responsive to rotation of the unoccupied seat means relative to the base, said height-adjusting means including a nut threadably engaged with the support tube, releasable clutch means for nonrotatably connecting said nut to said spindle when said seat means is unoccupied, and said spindle being normally maintained in an uppermost position wherein said clutch means is engaged when the seat means is unoccupied, the improvement comprising:
said nut being axially split into at least two sectors which are independently movable radially relative to said longitudinal axis, said nut being maintained in continuous threaded engagement with said support tube, wedge means continuously coacting with said nut sectors for wedgingly urging the nut sectors in opposed radial directions which maintain the nut in threaded engagement with the support tube, spring means normally biasing said wedge means axially toward said nut for causing the nut sectors to be continuously urged in radially opposed directions for maintaining the nut in continuous threaded engagement with the support tube, said spindle having an abutment surface thereon which is normally maintained in axially spaced relationship from said wedge means when said spindle is in its uppermost position due to an unoccupied chair seat means, said abutment surface being disposed in abutting engagement with said wedge means when the spindle is moved downwardly due to an occupied chair seat means so that the load on the spindle urges the wedge means downwardly for causing a corresponding opposed radial urging of the nut sectors to effect a tight wedging threaded engagement of the nut sectors to the support tube so as to prevent rotation between the nut sectors and the support tube.

4,720,072

BELT ANCHOR INCORPORATING SEAT TRACK STRUCTURE

Tateo Kitano; Masakazu Hashimoto, and Yuji Nishiyama, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 15, 1986, Ser. No. 863,423
Claims priority, application Japan, May 17, 1986, 60-73115[U]
Int. Cl.[4] F16M *13/00*; B60R *21/10*
U.S. Cl. 248—429 **19 Claims**



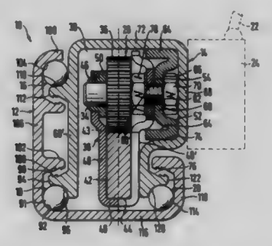
1. A belt anchor incorporating a seat track structure for use in a seatbelt system of a vehicle comprising:
(a) a seat track having a lower rail rigidly secured to the vehicle and an upper rail movable along said lower rail in the longitudinal direction of the vehicle;
(b) a belt anchor secured to said upper rail and adapted to be movable together with said upper rail;
(c) a lower arm for rigidly securing said upper rail to a seat of the vehicle;
(d) seat retaining means having a lock pin extending through said seat track and said belt anchor, and biasing means for biasing said lock pin in said extending direction, and adapted for retaining said seat at a given position in the longitudinal direction of the vehicle and for transmitting the load acting on said belt anchor to said lower arm; and
(e) overlapping portions defined by a portion of said upper rail and a portion of said lower rail, said portion of upper rail extending so as to overlap said portion of said lower rail, said overlapping portions being adapted for transmitting the load acting on said belt anchor to said lower rail,
whereby the load which acts on said belt anchor when an emergency situation of the vehicle occurs is transmitted to said lower rail through said seat retaining means and the overlapping portions of said upper and lower rails and relinbly supported by said lower rail.

4,720,073

SEAT LONGITUDINAL ADJUSTING MECHANISM

Bernd Maas, Pfarrweisach/OT Römmelsdorf; Emil Dinkel, Coburg, and Hans Rampel, Ahorn/OT Schorkendorf, all of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG., Coburg, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,401
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427467
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—430 **31 Claims**



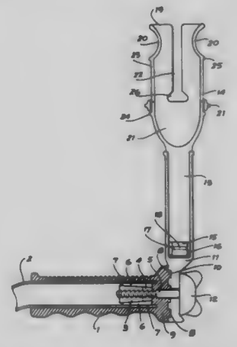
1. A seat longitudinal adjusting mechanism, especially for a motor vehicle seat, comprising two rail means longitudinally displaceably supported at one another and profiled correspondingly to form therebetween a hollow space, the two rail means being adapted to be connected with a corresponding seat part, a toothed rack means operatively connected with one of the two rails, said toothed rack means extending within the hollow space in the rail longitudinal direction and being substantially completely covered by the rail means transversely to the longitudinal rail direction, a pinion within the hollow space engaging in the toothed rack means, said pinion being supported in pinion bearing means, adjusting gear means located on a side of the other rail means facing away from the hollow space and detatchably connected through a hole in said other rail means with said pinion for driving said pinion, and preassembly rail means adapted to be inserted into the hollow space of the rail means from one of the rail ends, said preassembly rail means including fastening means for fastening the pinion bearing means at the preassembly rail means prior to insertion of the preassembly rail means, the length of the preassembly rail means corresponding at least to the distance of the pinion bearing means from the one end of the other rail means.

4,720,074

UMBRELLA SUPPORT BRACKET

Ronald C. Gard, 2 Woodward Place, and Raymond P. St. Ledger, 5 Warrabina Avenue, both of St. Ives, New South Wales, Australia 2075

Filed Apr. 9, 1986, Ser. No. 849,743
Claims priority, application Australia, Apr. 9, 1985, PH00048
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—514 **6 Claims**



1. A cupped receptacle adapted to releasably captivate and secure an umbrella handle of the type terminating in a bulb, said receptacle comprising a base portion extending into two or more upstanding arcuate petals defining the sides of the cupped receptacle and capable of resilient radial deflection, each petal having a main body and being forked towards its upper extremity at an included angle of between 10 and 30 degrees such that the main body of the petal diverges radially outwardly with respect to the internal leg of the fork; locking means slidable from a first position adjacent the lower extremity of the petals whereat the locking means does not prevent outward radial deflection of the petals, to a locked position about the upper extremities of the petals whereat the locking means prevents radially outward deflection of the petals and maintains the internal legs of the forks in a position such that an umbrella may be supported with its bulb captive within the base of the receptacle; and means adjacent the base of the receptacle to secure same to a stable object.

4,720,075

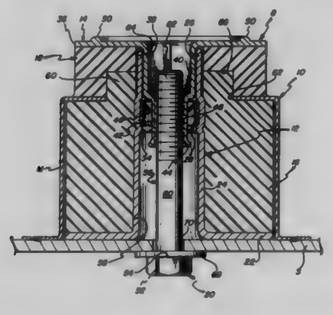
SHOCK ISOLATING MOUNT

Francis C. Peterson, Woodbury; Lorenzo Perosino, Waterbury, and Robert Despins, Madison, all of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

Filed Jul. 28, 1986, Ser. No. 890,905
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—635 **9 Claims**

1. An assembly for securing a mounting part of a structure onto a support, comprising:
a rigid spacer member having a spacer flange and a spacer tube integral with the spacer flange and projecting from said spacer flange to extend through apertures in mating bodies and said mounting part disposed between said bodies;
a rigid thimble member having a thimble flange and a thimble tube integral with the thimble flange and projecting from said thimble flange, said thimble tube being receivable inside and displaceable axially relative to said spacer tube, said thimble member and said spacer member having mutually engaging means for limiting rotation of either of them relative to the other;
an elongate fastening device having a shank to extend through said spacer tube, a head portion disposed outside said spacer member and a support disposed between said

spacer flange and said head portion, and an end portion, said end portion and said thimble tube having cooperating means operable by manipulation of said fastening device to draw said thimble tube into said spacer tube and



thereby draw said spacer and thimble flanges together and against said bodies, securely clamping said bodies and said mounting part between said flanges, and to secure said assembly and said mounting part to said support.

4,720,076

DISPENSE TAP

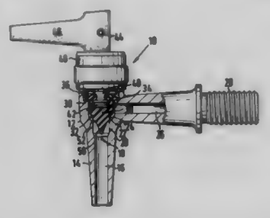
Roger J. Hyde, Kettering, England, assignor to Alumasc Limited, Kettering, England

Filed Nov. 14, 1985, Ser. No. 797,984

Claims priority, application United Kingdom, Nov. 30, 1984, 8430324

Int. Cl.⁴ F16K *47/00, 7/00*

U.S. Cl. 251—122 **4 Claims**



1. A tap, for a carbon dioxide gas pressure dispense system for beer, comprising:
- a tap body;
- a nozzle, forming part of said tap body, to convey dispensed beer to a receptacle therefor;
- a counterbore in said tap body and communicating with said nozzle;
- a valve seat within said tap body and about said counterbore;
- a reciprocating valve housed in said tap body to control flow of beer through said tap;
- said reciprocating valve having a valve member movable by a valve operating mechanism towards and away from said valve seat to close and open said tap;
- said reciprocating valve being configured to minimize pressure drop and turbulence in the flow of beer through said tap when said valve member is in the open position;
- said valve member having an extension that projects through said valve seat into said counterbore;
- said extension having a radially outwardly directed flange that is always disposed within said counterbore defining a range of movement of said valve member proximate the closed position thereof;
- said flange cooperating with said counterbore to define a narrow annulus to substantially restrict beer flow and create a turbulence-inducing pressure drop so as to facilitate an automatic positioning of the valve operating mechanism by an operator to a turbulence and pressure drop-inducing position within said range and hence a generally automatic production of foam in the tap prior to said flange leaving said counterbore in an opening direction or after said flange enters the counterbore in a closing direction and without requiring manuel adjustment of the parts of the reciprocating valve and the operating mechanism relative to each other.

4,720,077

FUEL INJECTION VALVE

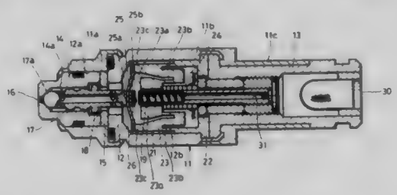
Mikio Minoura, and Shoji Ito, both of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Dec. 22, 1986, Ser. No. 942,685

Claims priority, application Japan, Dec. 28, 1985, 60-297919

Int. Cl.⁴ F16K *31/02*

U.S. Cl. 251—129.06 **5 Claims**



1. A fuel injection valve comprising:
- A. a cylindrical casing comprising a front portion, a central portion and a rear portion;
- B. a valve housing fixedly engaged in said front portion of said cylindrical casing;
- C. a valve body reciprocatably received in said valve housing for opening and closing an injection nozzle;
- D. a piezoelectric actuator inserted in said central portion of said casing for driving said valve body, said piezoelectric actuator comprising
- a stacked piezoelectric ceramics expandable upon application of an electric field thereto;
- a lever member having a base portion fixed to said central portion of said casing, an inner portion contacting with an end of said stacked piezoelectric ceramics and receiving an expansion force from said stacked piezoelectric ceramics, a fulcrum portion fixed to said base portion, and at least two outer portions adapted to be outwardly displaced when said inner portion receives said expansion force from said stacked piezoelectric ceramics; and
- a flexing member formed of an elastic material and connected at its both ends to said outer portions of said lever member under the condition where a central portion of said flexing member is flexed frontwardly, said central portion of said flexing member being connected to a rear end of said valve body; and
- E. a return spring inserted in said central portion of said casing for normally biasing said valve body in a valve closing direction.

4,720,078

SOLENOID VALVE

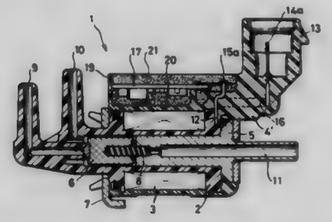
Masaru Nakamura, Takahama; Hideo Haseda, Toyota; Shigeki Nishie, Kariya, and Takao Noncyama, Toyota, all of Japan, assignors to Aisan Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Dec. 2, 1985, Ser. No. 803,738

Claims priority, application Japan, Dec. 1, 1984, 59-254542

Int. Cl.⁴ F16K *31/06*, H01F *5/04*

U.S. Cl. 251—129.15 **5 Claims**



1. A solenoid valve comprising:
- a bobbin of non-magnetic synthetic resin having a central bore;
- fluid passageway means communicating with said central bore;
- a coil wound upon said bobbin for generating a magnetic field when activated and having an outer peripheral portion;
- a stationary core disposed in said central bore of said bobbin;
- a movable core situated in said central bore of said bobbin and spaced away from said stationary core via a spring, said movable core moving in response to the magnetic field generated by said coil to open or close said fluid passageway means;
- a magnetic yoke arranged on an outer peripheral portion of said coil and secured to said bobbin;
- a cover surrounding said outer peripheral portion of said coil, said cover including a socket;
- a control circuit module for selectively activating said coil, said control circuit module being integrally imbedded in said cover; and
- first, second, and third terminals each having a portion securely imbedded in said cover and electrically connected to said control circuit module, each of said first and third terminals being further connected to said coil and each of said first and second terminals having connector means for connecting to one polarity of a power supply, said connector means of said first and second terminals respectively including first and second connecting electrodes positioned in said socket.

4,720,079

DIAPHRAGM AND FABRICATION METHOD THEREOF

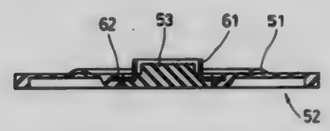
Naomichi Iizuka; Motoyuki Suzuki, and Toshiyuki Hosohara, all of Toyota, Japan, assignors to Fuji Polymer Industries Co., Ltd., Nagoya, Japan

Filed Nov. 5, 1984, Ser. No. 668,315

Claims priority, application Japan, May 9, 1984, 59-91002

Int. Cl.⁴ F16K *31/126*

U.S. Cl. 251—331 **1 Claim**



1. A diaphragm for a gas flow control device having an intake side and an outlet side in an emission gas recirculation system of a vehicle comprising:
- a deformable member for separating the intake side of the flow control device from the outlet side, said deformable member being made of a fluorosilicone rubber curable by a peroxide;
- a valve member made of a fluorocarbon rubber curable by the same peroxide by which the fluorosilicone rubber of the deformable member is curable so as to permit simultaneous curing of said deformable member and said valve member, said valve member being integrally bonded to said deformable member as a result of a simultaneous curing; and
- a rigid plate at least part of which is embedded in the valve member and in a part of the deformable member in such a way that the valve member and deformable member are isolated from each other by said at least part of the plate, and wherein said plate includes an upright inner peripheral edge which protrudes above the valve member.

4,720,080

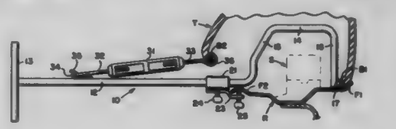
TOOL FOR SPREADING TIRE SIDEWALLS

Mason C. Winfield, Orchard Park, N.Y., assignor to Astronics Corporation, Orchard Park, N.Y.

Filed Feb. 12, 1987, Ser. No. 14,235

Int. Cl.⁴ B60C *25/14*

U.S. Cl. 254—50.1 **11 Claims**



1. A tool for spreading the sidewalls of a tire having an inboard tire bead thereof mounted on and surrounding a tire rim, and having an outboard tire bead thereof disengaged from said rim, comprising
- a first member,
- clamping means adjustably mounted on said first member intermediate the ends thereof for releasably securing said first member on said rim with one end of said first member extending in one direction from said clamping means and between said tire and rim and into engagement with said inboard bead releasably to retain said inboard bead against a first flange formed on one side of said rim, and with the opposite end of said first member extending in the opposite direction from said clamping means and externally of said tire and beyond the opposite side of said rim, and
- spreader means mounted on said first member adjacent said opposite end thereof and operable independently of said clamping means to engage and withdraw the outboard tire bead of said tire away from said rim while said inboard bead is retained against said first flange.

4,720,081

SCREW DRIVE SIX LINK SIDE LIFT VEHICLE JACK ASSEMBLY

Gregory F. Exner, Woodhaven, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1987, Ser. No. 43,971

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 254—126 **5 Claims**

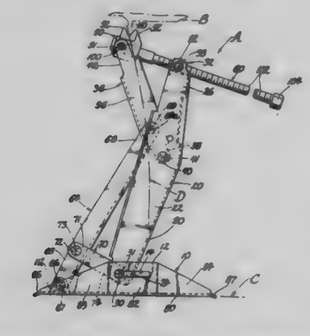
1. A jack assembly which is adapted to engage an underside portion of side body structure of an automotive vehicle for the purpose of raising and lowering the same relative to its adjacent ground surface comprising:
- a base for engaging the ground surface and which has a pair of spaced upwardly extending sides,
- each of said sides having a horizontally extending slot therethrough,

a main support link means having one end pivotally connected to said sides of the base via a first pivot means extending through said slots for movement about a generally horizontal axis,

said main support link means at its other end being pivotally connected to a screw nut means for movement about a generally horizontal axis,

a lift arm having one end pivotally connected to said main support link means via a second pivot means for movement about a generally horizontal axis and its other end pivotally connected to a bearing means for movement about a generally horizontal axis, said bearing means including lifting head means for engaging an underside portion of the side body structure of the vehicle,

a screw means having one end rotatably supported by said bearing means and which is threadably engaged with said screw nut means, said screw means causing said scew nut means to be moved toward and away from said bearing means and said lift arm and main support link means to be pivoted toward and from each other to raise and lower the same when rotated in opposite directions,



a positioning link having one end pivotally connected to said base by a third pivot means for movement about a generally horizontal axis and its other end pivotally connected to said lift arm by a fourth pivot means for movement about a generally horizontal axis,

follower link means having one end pivotally connected to said positioning link by a fifth pivot means for movement about a generally horizontal axis and its other end pivotally connected to said first pivot means,

the length of the positioning link and following link means and the location of their respective pivotal connections with the lift arm and positioning link being such that the lifting head means of said bearing means on the lift arm follows an arc which is the natural arc of the side body portion of the vehicle when the screw means is rotated to raise and lower the vehicle while simultaneously the follower link means causes the first pivot means to slide in the slots in the base and horizontally move the main support link means so that its pivotal connection with said base is always located directly beneath the underside portion of the side body structure being moved when the screw means is rotated to raise and lower the lift arm and main support link means.

4,720,082

GUIDE ROD DRIVE METHOD AND STRUCTURE USING SLIDABLE DRIVE SCREW NUT SET FOR GENERATING DRIVE FEEDING DEPENDENT ON THE SPEED CHANGE OF THE LOAD

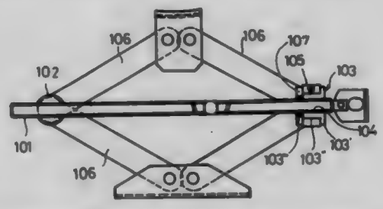
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan, Taiwan

Filed Jan. 8, 1986, Ser. No. 817,246

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 254—126 **6 Claims**

1. In a loading-lifting device, the combination of a drive rod including a forward portion being threaded in a first direction, a rearward portion being threaded in a second, opposite direction, and an intermediate, unthreaded portion therebetween, drive means for rotatably moving the drive rod in first and second opposite directions, a driven member for supporting the load thereon, the driven member being driven in first and second opposite directions in response to the rotational movement of the drive rod for thereby lifting the load on the driven member, said driven member being connected to the respective forward and rearward portions of the drive rod by a pivotable linkage means, the linkage means including a drive sleeve threadably carried on the rearward portion of the drive rod, the drive sleeve having an outer periphery, the linkage means further including a linkage block in which at least partly disposed therein, the driven load supported by the member exerting a force on the linkage block through the linkage means, a positive screw nut structure on the forward portion of the drive rod between the drive rod and the linkage means, an adjustable pressure means carried by the linkage block and contacting the periphery of the drive sleeve for applying a pressure thereon, wherein when the pressure on the drive sleeve exceeds the force on the linkage block, the drive sleeve is maintained in a substantially stationary position relative to the rotary movement of the drive rod, and further wherein when the force on the linkage block exceeds the pressure on the drive sleeve, the drive sleeve rotates substantially in unison with the drive rod.



4,720,083

VALVE CLOSURE GATE ASSEMBLY FOR FOUNDRY LADLES

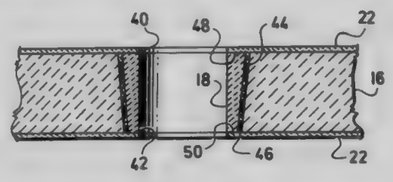
Karel Zverina; Petr Kroupa; Josef Szabó , all of Prague; Veslav Maroszczyk, Trinec; Valter Böhm, Cesky Tesin, and Antonín Ciesiar, Trinec, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 17, 1984, Ser. No. 601,303

Claims priority, application Czechoslovakia, Jul. 15, 1983, PV 5355-83

Int. Cl.⁴ B22D *37/00*

U.S. Cl. 266—275 **2 Claims**



1. In a valve closure gate asembly for a foundry ladle including two mutually slidable heat-resistant gates having respective openings therein and a surface-protecting layer of an oxide refractory material on portions thereof exposable to a melt, said coating being applied by plasma spraying, the improvement comprising a pair of flow-through ring members disposed in respective ones of said openings, said flow-through ring members being made of a material based on oxide refractory ceramics as a self-supporting refractory body having on its inner radial surface a porosity assuming less than 10 percent of the volume and on its outer radial surface a porosity assuming 15 to 25 percent of the volume, said surface-protecting layer covering respective upper surfaces and respective lower surfaces of said flow-through ring members, between said flow-through ring members and said openings a dilatation layer on the outer radial surface of at least one of said flow-through ring members is situated, and said dilatation layer is made of a refractory material with the porosity assuming 12 to 25 percent of the volume.

4,720,084

HYDRAULIC ENGINE MOUNT

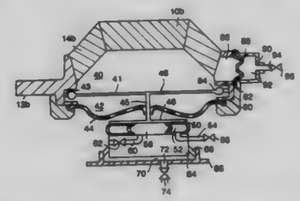
Heinz Hollerweger, Ingolstadt; Johannes van den Boom, Kösching, and Geert Kuipers, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi AG., Ingolstadt, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 741,872

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421137

Int. Cl.⁴ B60G *15/04;* **F16M** *5/00, 13/00;* **F16F** *9/46*

U.S. Cl. 267—217 **10 Claims**



1. An apparatus for selectively absorbing movements of variable frequency and amplitude between an automotive engine and the frame of a vehicle, comprising:

core means for connecting to one of said engine and said frame;

base means for connecting to the other of said frame and said engine;

means for providing an elastic connection between said core means and said base means;

means including said core means, said base means and said connection means for forming at least one resiliently deformable and substantially sealed chamber adapted to be filled with a substantially incompressible fluid;

diaphragm means for dividing said at least one chamber into at least two sections and mounted for movement in response to relative movement at a first range of frequency and amplitude between said core means and said base means, one of said sections being provided intermediate said core means and one surface of said diaphragm means;

means for limiting said movement of said diaphragm means at relative movement at a second range of frequency and amplitude in excess of said first range between said core means and said base means;

throttle means for providing a limited exchange of fluid between said at least two sections in response to relative movement within substantially said first range;

means for providing an absorptive mass moving substantially out of phase with said relative movement at frequencies and amplitudes substantially within said first range;

means comprising a selectively inflatable and expandable first fluid chamber positioned intermediate said absorptive mass means and another surface of said diaphragm means for selectively connecting said absorptive mass means with one of said elastic connection means and said other surface of said diaphragm means.

4,720,085

VEHICLE SUSPENSION APPARATUS

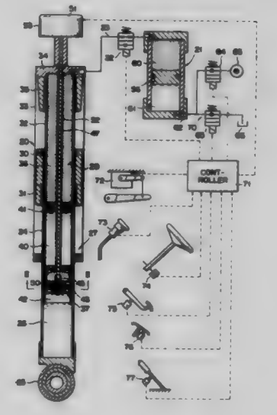
Takeyoshi Shiabori, Yokosuka; Takeo Fukamura, and Yoshio Kimura, both of Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 651,433, Sep. 17, 1984, abandoned. This application Sep. 4, 1986, Ser. No. 904,782

Claims priority, application Japan, Sep. 26, 1983, 58-176401; Feb. 28, 1984, 59-36725; Mar. 31, 1984, 59-64481; Mar. 31, 1984, 59-64482; Jun. 30, 1984, 59-136308; Aug. 9, 1984, 59-166945

Int. Cl.⁴ B60G *17/00, 11/26;* **F16F** *5/00, 9/46*

U.S. Cl. 267—64.16 **6 Claims**



1. A vehicle suspension apparatus comprising a contraction-/expansion body including a cylinder and a hollow rod telescopically coupled to the cylinder in a substantially coaxial relation so as to reciprocate therewith and having therein an internal space of variable volume, the internal space being separated into a gas chamber filled with a gas and an oil chamber filled with a working oil;

A restriction member submerged in said working oil and arranged in the oil chamber to be substantially perpendicular to an axis of the contraction/expansion body and having an orifice to allow passage therethrough of the working oil;

an auxiliary container having a gas chamber containing gas therein and an oil chamber containing oil therein;

a channel for coupling through a valve the gas chamber of the internal space of the rod and the gas chamber of the auxiliary container;

a hydraulic pump means for increasing/decreasing the quantity of oil contained in the auxiliary container and commensurately decreasing/increasing the quantity of gas contained in the gas chamber of said auxilary container; and

means operable in response to travel conditions encountered during movement of the vehicle for controlling, during actual vehicle use, an area of the orifice arranged in said restriction member in order to vary damping; for controlling the operation of the valve to set the amount of gas passing therethrough in order to control springiness, and to control said hydraulic pump means by increasing/decreasing the amount of oil contained in the oil chamber of said auxiliary container to set height of the body by varying the volume of the gas chamber in said rod with a commensurate variation of the volume in the gas chamber of said auxilary container.

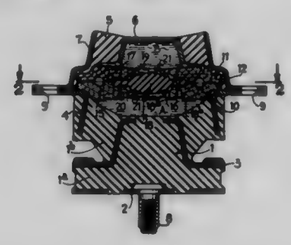
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,086

ELASTICALLY YIELDABLE UNIT IN PARTICULAR FOR THE SUSPENSION OF AN ENGINE OF A VEHICLE

Robert Le Salver, Chanteloup les Vignes, and Dominique Poupard, Charille, both of France, assignors to Automobiles Peugeot and Automobiles Citroen, both of Paris, France

Continuation of Ser. No. 403,526, Jul. 30, 1982, abandoned, which is a continuation of Ser. No. 197,609, Oct. 16, 1980, abandoned. This application Apr. 9, 1984, Ser. No. 597,571
Claims priority, application France, Oct. 22, 1979, 79 26137
Int. Cl.[4] F16F *9/10*
U.S. Cl. 267—140.1 32 Claims



1. In an elastically yieldable unit comprising two chambers filled with a liquid and defined at least partly by elastically yieldable walls, a rigid wall separating the two chambers and defining a cavity, orifice means putting the two chambers in communication with the cavity and two spaced-apart seats; the improvement comprising in combination means for damping vibrations of a given frequency and given amplitude and comprising an unbroken solid movable wall having a mean plane and a peripheral marginal portion and sealingly combined with the rigid wall by said peripheral marginal portion and movable between the two spaced-apart seats in a direction perpendicular to said mean plane for application against either of said seats, and means for damping vibrations of a frequency lower than said given frequency and of an amplitude larger than said given amplitude and comprising conduit means of great length and a closed section which is small relative to said length and defined within and by the rigid wall and puts the two chambers in permanent communication with each other under conditions which are unrelated to the manner in which said movable wall is applied against said seats, said conduit means having a length sufficiently greater than its diameter so that fluid resonance occurs therein to dampen high amplitude vibrations.

4,720,087

INERTIA TYPE FLUID MOUNT USING ELECTRORHEOLOGICAL AND OTHER FLUID

Theodore G. Duclos, Raleigh; Douglas A. Hodgson, and J. David Carlson, both of Cary, all of N.C., assignors to Lord Corporation, Erie, Pa.

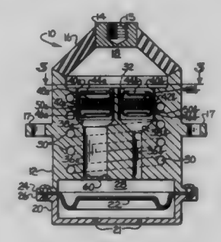
Filed Sep. 5, 1986, Ser. No. 904,627
Int. Cl.[4] F16F *6/00*
U.S. Cl. 267—140.1 20 Claims

1. A vibration attenuating fluid mount or the like of the type adapted to generate inertia forces effecting abrupt changes in mount dynamic stiffness at certain excitation frequencies, comprising:

housing means defining first, second and third variable volume fluid chambers, and further defining first and second passageways, said first and third chambers being contiguous, said first passageway extending between and communicating with said first and second chambers, said second passageway having one end contiguous with said first chamber and having another end contiguous with said third chamber;

a first hydraulic fluid of an electrorheological type within said third chamber, a second hydraulic fluid of a nonelectrorheological type within said first and second chambers and at least said first passageway;

electric field producing means for when energized producing a high voltage electric field within said third chamber;



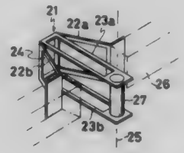
said third chamber being effective when said field producing means is de-energized to transmit pressure pulses between said first chamber and said second passageway, and said third chamber being substantially ineffective to transmit said pulses when said field producing means is energized.

4,720,088

OPTICAL SYSTEM SUPPORTING DEVICE

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,199
Claims priority, application Japan, May 18, 1983, 58-85896; May 18, 1983, 58-85897
Int. Cl.[4] F16F *1/18;* A47G *1/24;* F16M *1/00;* G02B *7/02*
U.S. Cl. 267—158 10 Claims



1. An optical system supporting device for supporting an optical system, comprising:

(a) a pair of first leaf springs which are in parallel with the optical axis of the optical system, but non-parallel to each other, each one end of which is fixed to a main body, and each other end of which is movable relative to the main body along a direction normal to the optical axis, the distance between said pair of first leaf springs being largest at the ends thereof fixed to the main body and smallest at the other ends thereof, said distance being gradually tapered from the ends fixed to the main body toward the other ends;

(b) a pair of second leaf springs which are perpendicular to the optical axis of the optical system and are mutually in parallel, to each one end of which the optical system is fixed;

(c) an intermediate supporting member for supporting the other end of each of said first and second leaf springs, said pair of second leaf springs extending from said intermediate supporting member toward said main body; and

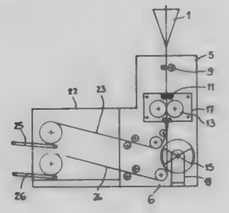
(d) each of said first and second leaf springs having a cut-out portion at a portion excluding its both ends.

4,720,089

DUAL FOLDING FORMER PRINTED PRODUCT FOLDING APPARATUS

Johannes Richter, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,076
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526059
Int. Cl.[4] B41L *43/10*
U.S. Cl. 270—43 12 Claims



1. Dual folding former and folded product delivery apparatus,

for folding and transporting two supplied webs (3, 4), supplied to a respective one of two formers (1, 2) and delivery of folded, cut products, comprising

a base (6);

a central support structure (7) defining a housing, located on said base;

one, each, folding assembly including

one of said folding formers (1, 2);

at least one transport roller unit (9, 10, 11, 12);

a cutting cylinder unit (13, 14); and

a distribution apparatus unit (15, 16),

each of said units being rotatably journalled at one side on said housing support structure, extending, symmetrically, with respect to a center line (21) passing through said housing support structure;

a common drive means (8) coupled to said units (9, 10, 11, 12; 13, 14; 15, 16) retained in the housing structure (7);

bearing plates (17, 18, 19, 20), at least one of said units being journalled at a second side thereof on said bearing plates;

and at least two receiving means (25, 26) receiving folded, cut products from each of said distribution apparatus units,

whereby two supplied webs (3, 4) will be folded, cut into two cut products and the two cut products distributed by two distribution apparatus units to two respective delivery means, each, and thereby to four separate receiving means.

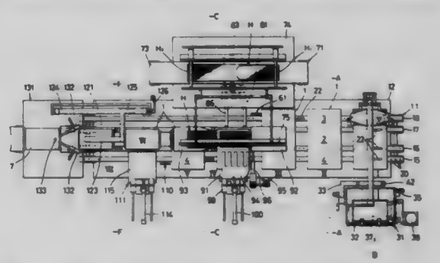
4,720,090

PROCESS AND AN APPARATUS FOR FOLDING AND PACKING HOSE

Yoshihiro Ganno, and Toyomi Kuniki, both of Yamatotakada, Japan, assignors to Takatori Machinery Mfg. Co., Ltd. and Takatori Hitech Co., Ltd., both of Yamatotakada, Japan

Filed Oct. 2, 1986, Ser. No. 915,277
Claims priority, application Japan, May 16, 1986, 61-113100
Int. Cl.[4] B42C *1/00*
U.S. Cl. 270—45 2 Claims

1. A process for folding and packing hose, which comprises a dressing paper-folding sub-process, wherein a sheet of dressing paper consisting of three parts, to form front cover part, to form back cover part and to form inner flap part, capable of being folded in three on two crease lines previously provided, is fed, in the developed condition, on to a conveyor belt with suction power by which said dressing paper is held and intermittently forwarded, a first dressing paper-bending up sub-process, wherein said inner flap part of said dressing paper is bent up by a given angle to the horizontal plane in the middle of the travel thereof on said conveyor belt, a hose-feeding sub-process, wherein a pair of hose are fed on to said back cover part of said dressing paper so that the longitudinal direction of said hose is in line with the moving direction of said conveyor, a first dressing paper-folding sub-process, wherein said bent-up inner flap part is laid flat on said fed hose, a hose-folding sub-process, wherein both hose ends extending out of said inner flap part are folded on said inner flap part of said dressing paper one after another so that they are overlapped



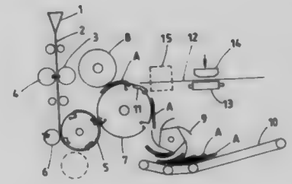
with each other, a second dressing paper-bending up sub-process, wherein said front cover part of said dressing paper is bent up by a given angle to the horizontal plane in the middle of travel thereof on said conveyor belt, a second dressing paper-folding sub-process, wherein said bent-up front cover part is laid flat on said folded hose so that said hose are wrapped up in said triple-folded dressing paper, and a packing sub-process, wherein said dressing paper wrapped with said hose is put in an envelope awaiting ahead and said envelope is subsequently taken out of said moving conveyor.

4,720,091

PRINTED COPY FOLDING AND ASSEMBLY APPARATUS

Ingo Kobler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,712
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527712
Int. Cl.[4] B65H *5/30*
U.S. Cl. 270—57 12 Claims



1. Printed copy folding and assembly apparatus comprising

a first transverse folding means (5, 7) to form a transverse fold in a copy (A) being applied thereto;

a second folding means (13, 14) to form a further fold in the copy supplied thereto;

transport means (12) transporting the first folded copy from the first folding means to said second folding means; and

a collection and assembly means (15; 16, 16', 16"; 17–40) for separating the copy into copy of a first type (A1) and copy of a second type (A2), and assembling the copy of the first type (A1) with the copy of the second type (A2) prior to the formation of the second fold in said second folding means

(13, 14), interposed between said first and second folding means,

said collection and assembly means (15) including,

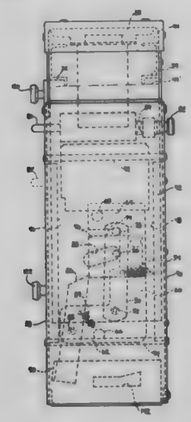
means for selectively transporting the copy of the first type or the copy of the second type in a first path which is essentially straight through the collection and assembly means or, selectively, in a second path (X-Y) which defines a detour, and returns the copy transported via the second detour path over the copy transported via the first, essentially straight path with the edges of said copies of both types in alignment, and switching means (16', 40) in the path of the copies of both types being supplied to the selective transport means and determining which type of the copy is to be transported through which one of the selected paths, and guiding said copy in the selected path.

4,720,092

LOCKED BILL STACKER

David C. Juleff, Kalamazoo, Mich., assignor to Rowe International Inc., Whippany, N.J.

Filed Jan. 9, 1986, Ser. No. 817,528
Int. Cl.[4] B65H 31/00
U.S. Cl. 271—207 5 Claims



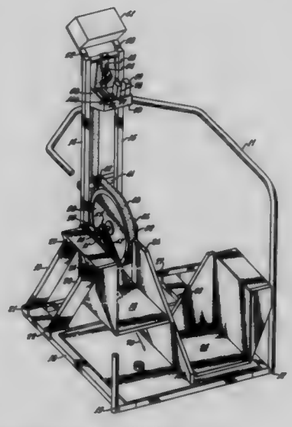
5. A bill stacker having an inlet for receiving bills from a bill acceptor or the like with which said stacker is associated including in combination, a box for receiving a stack of bills fed to said stacker through said inlet, a closure member, means mounting said closure member on said box for movement between a first position at which it closes said inlet and a second position at which said inlet is open, means for mounting said stacker in operative relationship with said bill acceptor, manually releasable latching means operable upon movement of said closure member from said first position to said second position for concomitantly latching said closure member in said second position and locking said stacker in operative relationship with said acceptor, means responsive to movement of said closure member from said second position to said first position upon release of said latching means for locking said closure member against return movement to said second position, second releasable means for initially presenting movement of said closure member from said first position to said second position, and means responsive to mounting of said stacker on said acceptor for releasing said second releasable means.

4,720,093

STRESS TEST EXERCISE DEVICE

Bruce E. Del Mar, Laguna Beach, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Continuation-in-part of Ser. No. 621,844, Jun. 18, 1984, abandoned. This application Nov. 15, 1984, Ser. No. 671,628
Int. Cl.[4] A63B 1/00
U.S. Cl. 272—70 20 Claims



1. A stress testing device comprising:

a base frame;

a first pedal platform;

first suspension means attached to said base frame and said first pedal platform for mounting said first pedal platform so as to permit said first pedal platform to translate at an inclined angle with respect to said base frame;

a second pedal platform;

second suspension means attached to said base frame and said second pedal platform for mounting said second pedal platform so as to permit said second pedal platform to translate at an inclined angle with respect to said base frame;

a flywheel journeled to rotate with respect to said base frame;

linkage means for connecting said first and second pedal platforms together so as to produce a reciprocal translational motion between said first and second pedal platforms;

energy transfer means coupled to said linkage means and said flywheel for converting the reciprocal translation motion of said first and second pedal platforms into a unidirectional rotary motion of said flywheel;

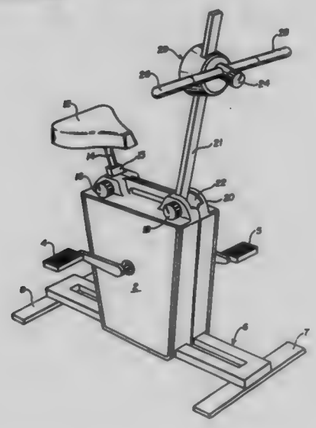
wherein said linkage means comprises a first chain having one end attached to said first pedal platform and having the other end attached to said second pedal platform, and a second chain having one end attached to said first pedal platform and having the other end attached to said second pedal platform and wherein said energy transfer means comprises a first ratchet sprocket journaled to rotate in a plane parallel to the plane of rotation of said flywheel and a second ratchet sprocket journaled to rotate in a plane parallel to the plane of rotation of said flywheel and wherein said first ratchet sprocket is positioned to engage said first chain and wherein said second ratchet sprocket is positioned to engage said second chain and coupling means for summing the output motion of said first and second ratchet sprockets whereby said motion will be coupled to said flywheel so as to cause said flywheel to be driven in the same direction when a force is applied to either pedal platform.

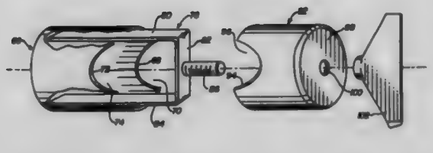
4,720,094

EXERCISE APPARATUS WITH LOCKING MEANS

James E. Deuchalis, 244 Sunset Dr., Pittsburgh, Pa. 15235

Division of Ser. No. 736,142, May 20, 1985. This application Feb. 26, 1987, Ser. No. 19,080
Int. Cl.[4] A63B 23/04; B62K 21/22
U.S. Cl. 272—73 6 Claims





5. Exercise apparatus comprising a body support portion, a locking means for securing an adjustment member operatively associated with said portion,

a locking element for positioning within a tubular member of said locking means,

knob means threadedly connected to the locking element for applying compressive locking action to the locking element in securing said adjustment member in a desired position,

said locking element having a pair of tubular elements each having a pair of recesses which cooperates with the recesses of the other to establish clamping locking action on the adjustment member when compressive relative closing movement is applied to the two tubular elements, and

a threaded stud means secured to one of said tubular elements and operatively associated with the other and being threadedly engaged with said knob means.

4,720,095

SPORTS TRAINING AND PRACTICE DEVICE

Gregory E. Sowards, Box 682, Carthage, Mo. 64836

Continuation-in-part of Ser. No. 661,951, Oct. 10, 1984, abandoned. This application Jun. 19, 1985, Ser. No. 746,347
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] A63B 69/00
U.S. Cl. 272—77 6 Claims

1. A soccer training and practice device comprising:

an anchor member, said anchor member having means for securing said member to a foundation and including a helical coil to facilitate its being twisted into and out of the foundation;

a ball-like target adapted for being kicked from various directions with a typical soccer dribbling motion; and

means for resiliently mounting the target to substantially the top of the anchor, said resilient mounting means supporting said target in a generally upright orientation substantially adjacent the foundation so that it can be kicked by a person standing on the foundation with a typical soccer dribbling motion, the resilient mounting means restoring the target to its original upright orientation and position after the target is displaced.

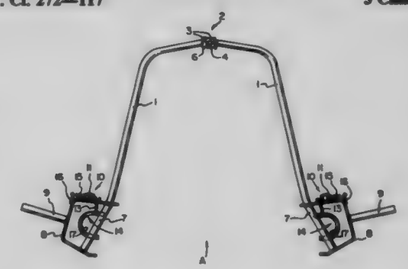


4,720,096

CHEST EXERCISE DEVICE

John B. Rogers, RR #1, Hunts Point, Queens County, Nova Scotia, Canada B0T 1G0

Filed Feb. 18, 1986, Ser. No. 829,826
Claims priority, application Canada, May 2, 1985, 480662
Int. Cl.[4] A63B 13/00, 21/32
U.S. Cl. 272—117 5 Claims



1. A portable exercise device which is supported and stabilized by the use of said device during the use thereof, comprising:

a symmetrically disposed left lever and a right lever interconnected with one another, each having a free end for gripping by the hand, the free end of each being deflectable relative to the other so as to permit a user gripping the free ends to bring the free ends together and push then apart, the levers being interconnected at their ends remote from their free ends;

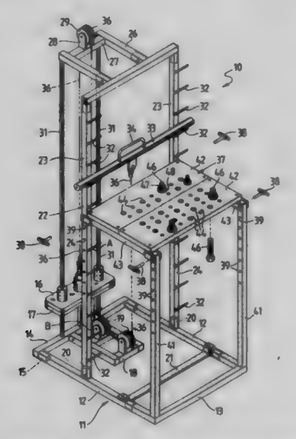
means associated with each free end to receive a selected weight;

biasing means for applying a force between the levers against which a user may exert a countervailing muscular force; and

an assembly attached to each lever for stabilizing the exercise device by contacting the wrist or forearm of the user using the device.

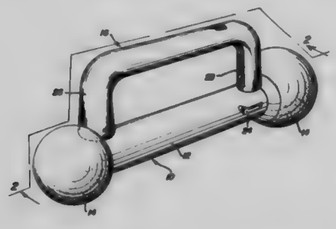
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,097
SIMULATED WORK ENVIRONMENT ABILITY TESTER
Claude F. Peacock, 2433 Dalton Dr., Pelham, Ala. 35124
Filed Sep. 2, 1986, Ser. No. 902,795
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 12 Claims



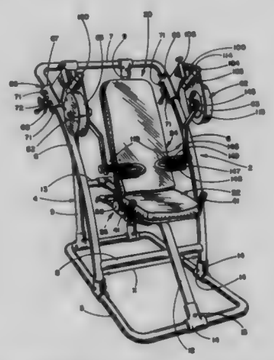
1. Apparatus for measuring the vocational capabilities of a person comprising in combination:
(a) graduated means for indicating the isotonic lifting capabilities of said person throughout a normal range of motion; and
(b) skill means for indicating the aptitudinal abilities of said person in terms of manual dexterity including a platform detachably affixed to said graduated means at any one of a plurality of predetermined heights to simulate a work station and a plurality of work simulation pieces detachably affixed to said platform.

4,720,098
EXERCISER WITH BEVERAGE RESERVOIR
Hy S. Gordon, Plantation, Fla., assignor to Hydrocizer Industries, Inc., Fla.
Filed Jul. 23, 1986, Ser. No. 888,138
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 17 Claims



1. An exercising device in the form of a dumbbell having a hollow cylindrical central section suited for holding in the hand, and first weighted ball-shaped ends on the cylindrical section, wherein at least one of said ends is in the form of a screw-on cap for the cylindrical section for providing access thereto so that the cylindrical section may be used as a reservoir for containing a drinking liquid, the first weighted ball-shaped ends being weighted, such that the device can be used for exercising, independent of any drinking liquid contained in the device.

4,720,099
EXERCISE MACHINE
Robert B. Carlson, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.
Continuation of Ser. No. 675,366, Nov. 27, 1984, abandoned.
This application Jun. 29, 1987, Ser. No. 68,707
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 19 Claims

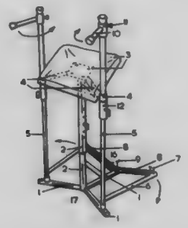


1. An exercise machine for use with a user carried on a support means located above the ground, which comprises a frame which extends vertically upwardly between a lower end located at or below the level of the support means and an upper end located substantially above the support means, resistance means carried on the frame for exercising both sides of the body, wherein the resistance means includes two working axes each having means for coupling an exercise attachment thereto, wherein the working axes are transversely spaced apart sufficiently far so that opposed body members of a user located between the working axes can simultaneously contact the attachments coupled thereto to be capable of simultaneously exercising muscle groups on each side of the body, wherein each of the working axes is vertically movable on the frame between a lower position generally aligned with the plane of the support means an an upper position substantially above the plane of the support means and closer to the upper end of the frame to be capable of aligning the working axes with some of the major musculo-skeletal joints of the upper and lower portions of a user's body, and wherein each of the working axes is pivotal relative to the frame to be capable of exercising muscles of body members which are affected when the body members pivot in different planes.

8. An exercise machine which comprises a frame that includes two spaced side frame members between which a user may be located, wherein the side frame members extend vertically upwardly in an arcuate curve from front to back relative to the user, a resistance unit movably carried on each side frame member, wherein each resistance unit includes a rotatable shaft the rotation of which is opposed by a force, and wherein the resistance units are vertically movable sufficiently far along the arcuate curve of the side frame members for repositioning the shafts relative to the user for exercising muscle groups on both the upper and lower body of the user.

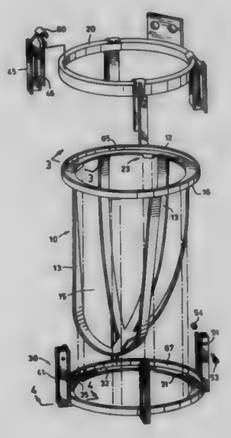
15. An exercise machine for exercising both upper and lower body muscle groups, which comprises:
(a) a frame including left and right side frame members which are transversely spaced apart in a side-to-side direction and which extend vertically upwardly between a lower end and an upper end located substantially above the ground, wherein the side frame members are further inclined relative to the vertical to span a particular longitudinal distance in a front-to-back direction as they extend upwardly:
(b) a generally horizontal support means carried on the frame between the left and right side frame members at a vertical position between the upper and lower ends thereof, wherein the support means is longitudinally adjustable on the frame to adjust the position of the support means in the front-to-back direction relative to the side frame members; and
(c) a resistance unit carried on each side frame member for exercising the adjacent side of the user's body, wherein each resistance unit includes a working axis the rotation of which is opposed by a force, and wherein each working axis is vertically movable on its respective side frame member between a lower position generally aligned with the plane of the support means and an upper position substantially above the plane of the support means and closer to the upper end of the side frame member, whereby the working axes are capable of being aligned with some of the major musculo-skeletal joints of the upper and lower portions of the user's body depending on their respective positions on the side frame members relative to the user's position on the support means.

4,720,100
APPARATUS FOR EXERCISING THE ARM MUSCLES
Robert V. Du Buy, Amsterdam, Netherlands, assignor to Mandky Products B.V., Cuijk, Netherlands
Filed Dec. 17, 1985, Ser. No. 810,871
Claims priority, application Netherlands, Dec. 18, 1984, 8403831
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 13 Claims



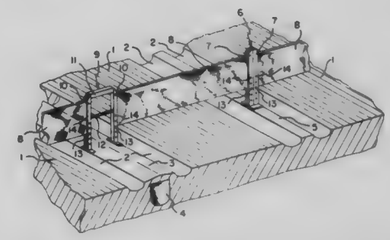
1. An apparatus for exercising the arm muscles of the human body, characterized in that the apparatus comprises a base with an inclined working surface positioned above said base, said inclined working surface being mounted on said base by means of a plurality of sleeves mounted on said working surface and a plurality of shafts, said shafts being rotatably mounted in said sleeves and said sleeves being vertically movable so that the height of said working surface is adjustable with respect to said base, pivot means on said base mounting said shafts on said base so as to be rotatable about their longitudinal axis, resistance means on said apparatus for providing resistance against rotation, hand grips transversely attached to the ends of said shafts opposite their pivot ends for manually imparting rotational movement to said shafts against the resistance provided by said resistance means.

4,720,101
BASKETBALL RETURN DEVICE
Louis Farkas, Jr., Windsor, Canada, assignor to 670161 Ontario Inc., Oldcastle, Canada
Filed May 26, 1987, Ser. No. 54,239
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1.5 A 6 Claims



1. A basketball return device attachable to a basketball hoop, comprising:
a chute member for receiving a basketball and guiding it in a selected return direction outwardly away from the hoop, the member having a ring from which depend at least three ribs forming a guideway for a basketball, the guideway being formed to discharge the basketball well above the floor so that the ball may bounce along the return direction; and
an annular track member for suspending the chute member beneath the hoop having a track with a surface upon which the ring of the chute member may slide to orient the guideway in any return direction about the full 360° circumference of the hoop, the track member having at least three arms extending upwardly from the track, each arm having means for adjusting its longitudinal extension, and each arm having means for attaching it to the hoop.

4,720,102
BOWLING ALLEY LANE GUARD
Donald J. Gibson, London, Canada, assignor to 638460 Ontario Ltd., London, Canada
Filed Apr. 25, 1986, Ser. No. 855,671
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—54 D 3 Claims



1. The combination of a bowling alley lane and a lane guard

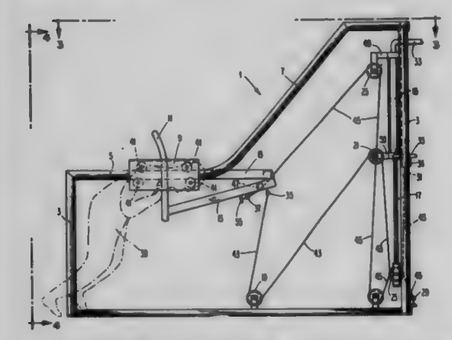
therefor, comprising a barrier member in the form of a transparent, vertically oriented panel, and means for mounting said barrier member above the lane and along the lane from the foul line to extend horizontally across the lane at a height slightly greater than the diameter of a bowling ball to be used on the lane whereby to require a bowler to roll the ball smoothly onto the lane in order for the ball to pass under the barrier member.

4,720,103

TRAINING DEVICE FOR FOOTBALL PLAYERS

William D. Palladino, Jr., Coventryville Rd., P.O. Box 234, Pottstown, Pa. 19464

Filed Jan. 13, 1986, Ser. No. 817,898
Int. Cl.[4] A63B 67/00
U.S. Cl. 273—55 R 12 Claims



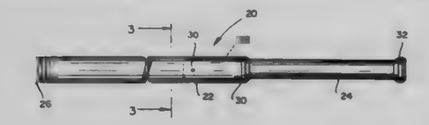
1. A device for training football players in the art of blocking, the device comprising:
(a) a frame, the frame including a track, the track having a horizontal portion and an upwardly sloping portion,
(b) a carriage having a set of rollers, the rollers being adapted to fit around the track, wherein the carriage is attached to the track by the rollers, and wherein the carriage is adapted to move along the track,
(c) a piston and a cylinder, said piston being positioned in and reciprocally movable within said cylinder, the cylinder having means for connection to a source of pressurized fluid, wherein the movement of the piston within said cylinder will be retarded, and
(d) tackle means connecting the piston to the carriage, the connection between the piston and the carriage being such that the piston is urged towards one end of the cylinder when the carriage is moved upwardly along the track.

4,720,104

STICKBALL BAT CONSTRUCTION

Martin DiSieno, 28-12 Astoria Blvd., Long Island City, Queens, N.Y. 11102

Filed Sep. 8, 1986, Ser. No. 904,954
Int. Cl.[4] A63B 59/06
U.S. Cl. 273—67 R 15 Claims



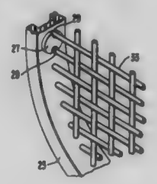
1. A stickball bat construction including a length of tubular metal being open at oppsite ends for defining a uniform barrel section, cylindrical handle means insertable within a first of said ends of said barrel section for providing a shock absorbing hand grip distinct from the barrel section, edge protection means insertable in a second of said open ends of said barrel section for preventing edge damage to the barrel section, the respective components being adapted for providing a weight distribution for positioning the center of gravity about a point located longitudinally between approximately the midpoint of the bat and a proximal end of the handle means whereby the stickball bat may be rapidly accelerated during a swinging motion for hitting a ball.

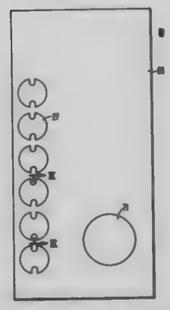
4,720,105

WEIGHT AND BALANCE ADJUSTING ASSEMBLY FOR RACQUETS

Harry Ferrari; Raymond P. Harrington, and Harry W. Ingram, all of Pittsburgh, Pa., assignors to Ferrari Importing Company, Inc., Royal Oak, Mich.

Filed Sep. 3, 1985, Ser. No. 771,782
Int. Cl.[4] A63B 49/04
U.S. Cl. 273—73 C 3 Claims





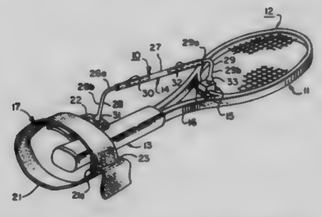
3. For use in adjusting the weight and balance of a racquet having a frame and a butt-cap, and having strings threaded through said frame, a package including a card having secured to the surface thereof a plurality of weight-and-balance adjusting assemblies, each said assembly including a weight, said weight having a high-bonding adhesive secured thereto and said weight being secured to said card such that one side of the adhesive contacts the weight while the other side of the adhesive contacts the card, said assemblies having different contours, each contour having a form and being dimensioned so that said eac adjusting assembly of a given contour fits into and is accomodated by a selected area of the surface of said racquet which area corresponds to said accomodated assembly, assemblies of different contours being accomodated by different corresponding areas of said racquet, certain of said weight-and-balance adjusting assemblies having contours shaped to be adhered to the surface area of said frame of said racquet which is bounded by adjacent string sections threaded through said frame, the said package being characterized by that each of said certain weight-and-balance adjusting assemblies has slots in its rim for clearing said adjacent string sections.

4,720,106

VIBRATION DAMPENING DEVICE FOR ATTACHMENT TO A RACKET

Lane A. Bickham, Box 802, Tomball, Tex. 77375

Filed Apr. 16, 1986, Ser. No. 854,550
Int. Cl.[4] A63B 49/00
U.S. Cl. 273—73 R 11 Claims



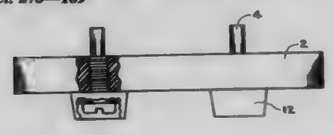
1. An attachment for a racquet having handle, neck and head sections comprising a first rigid anchoring means for attaching said attachment to a portion of said head section, a second anchoring means
for attaching said attachment to the wrist of a user when the user grips the handle of the racquet, and a rigid, elongated member having end portions universally connected to said first and second anchoring means through ball and joint connections, each of the ball portions of said connections being rigidly secured either to said rigid, elongated member or to one of said anchoring means and each of the socket portions of said connections being rigidly secured to the other of said rigid, elongated member or said anchoring means whereby upon the attachment being worn by a user and a ball being struck by the strings of the racquet, the vibratory forces generated by the strings of the racquet at least partially will be transmitted to the wrist of the user through and be dampened by said rigid, elongated member.

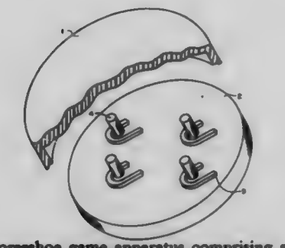
4,720,107

MINI-SHAKE, TWIST, AND SLIDE HORSESHOE GAME

Duane Peters, and Ty C. Peters, both of 2237 Terrace Dr., New Brighton, Minn. 55112

Filed Jan. 21, 1986, Ser. No. 820,659
Int. Cl.[4] A63B 67/14, 59/02, 65/00; A63F 7/06
U.S. Cl. 273—109 8 Claims





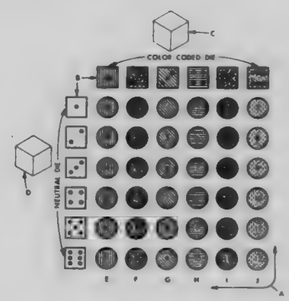
1. A horseshoe game apparatus comprising a substantially flat base, said base having spaced apart substantially parallel top and bottom surfaces and a plurality of threaded holes extending therethrough; said holes being substantially perpendicular with said top and bottom surfaces; a plurality of feet attached to said base, the number of said feet corresponding to the number of said holes in said base, each of said feet having a central bore extending therethrough; a plurality of stakes, each of said stakes having a head portion and a stem portion, said head portion being larger in diameter than said stem portion; thread means on said stem portion, said thread means extending from said head portion and along said stem portion a distance substantially equal to but not greater than the distance between said top and bottom surfaces of said base, each of said stem portions extending through a corresponding bore in said feet and a said hole in said base such that said thread means on said stem engage said threads in a said hole of said base thereby attaching said feet to said bottom surface; said stem portion further having a length greater than the distance between said top and bottom surfaces such that the ends thereof, remote from said head portion, will extend above said top surface; a plurality of U-shaped game pieces adatped to slide on said top surface, the distance between the legs of said game pieces being greater than the diameter of the extending ends of said stems; a transportation cover, said cover being attached to said base such that said U-shaped game pieces and extending ends of said stems are enclosed by said cover and base.

4,720,108

VISUAL SYSTEM DIFFERENTIATING IDENTICAL SUMS OF TWO NUMBERED DICE

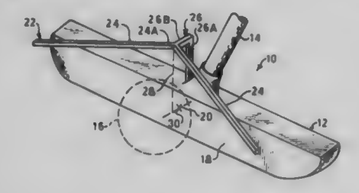
Robert E. Gramera, 1027 Raleigh St., Denver, Colo. 80204

Continuation-in-part of Ser. No. 650,666, Sep. 14, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 804,919
Int. Cl.[4] A63F 9/04
U.S. Cl. 273—146 2 Claims



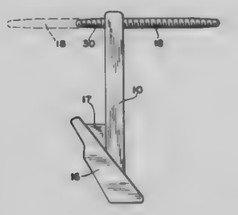
1. A pair of multi-sided dice, comprising one neutral die having thereon a plurality of flat faces of equal area, all of said faces provided with the same background indicia, each face additionally carrying means representing a numeral, said represented numerals being different, said represented numerals further being consecutive in ascending order, commencing with the represented numeral one; and one coded die having thereon the same number of flat faces as said neutral die, each face of said coded die carrying means representing a different numeral, the numerals represented on said coded die faces being the same, as those on said neutral die faces, and each face on said coded die carrying additional indicia, different from that on each other face and different from said background indicia on said neutral die; whereby the result of a throw of the pair of dice can be read by a combination of said additional indicia on the upper face of said coded die and the sum of the represented numerals appearing on the upper face of each die.

4,720,109
GOLF CLUB WITH STROKE GUIDING DEVICE
Karl D. Kryter, Bodega Bay, Calif., assignor to Acousis Company, Bodega Bay, Calif.
Filed Oct. 27, 1986, Ser. No. 923,182
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—164 21 Claims



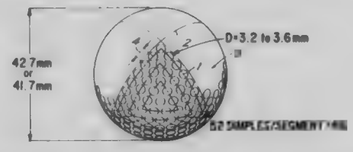
1. In combination with a golf club having an upwardly extending shaft and a head at the lower end of the shaft which head includes a bottom surface and a substantially flat ball-striking surface having a sweet-spot, guide means comprising
a first pair of relatively unobtrusive, thin, visible line segments which together form at least portions of opposite arms of a V-shape,
means for attaching said guide means to the golf club with at least portions of each line segment extending forwardly of the plane of the ball-striking surface and at a height above the bottom surface of the club head that is greater than the diameter of a golf ball to allow striking of the golf ball by the striking surface, said line segments being located at opposite sides of a vertical plane that is normal to the ball-striking surface and extending through the sweet-spot, the spacing between said visible line segments increasing going to the forward free ends thereof, at least a portion of a golf ball at the sweet-spot of the ball-striking surface being visible between the said visible line segments as viewed from above.

4,720,110
GOLF CLUB AND SIGHTING ATTACHMENT THEREFOR
John M. Hurst, 30 St. James Rd., Shrewsbury, Mass. 01545
Filed Sep. 18, 1986, Ser. No. 908,735
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 D 13 Claims



1. Golfing aid in combination with a golf club having a head with front and rear faces and an upwardly visible center marking on the head, said aid comprising a removable attachment for either face of the head of the golf club, a direction indicating pin extending from the attachment to point to the target of a golf ball to be impelled by the club, the pin being in significantly spaced relation to and above the golf club head and the center marking thereon, and being adapted to align the golfer's eye vertically with the marking when the marking and the pin appear to be aligned to the golfer, so that the golfer is aided in determining the line of flight of the ball and simultaneously is in correct stance with the eye vertically over the marking on the club,
the pin being adjustable to partially reveal the center marking in selected position of the pin.

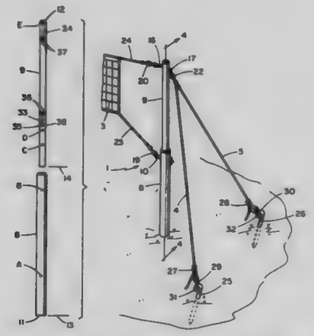
4,720,111
GOLF BALL
Kaname Yamada, Kakogawa, Japan, assignor to Sumitomo Rubber Industries Ltd., Hyogo, Japan
Filed Jul. 10, 1984, Ser. No. 629,386
Claims priority, application Japan, Nov. 21, 1983, 58-220277
Int. Cl.[4] A63B *37/14*
U.S. Cl. 273—232 3 Claims



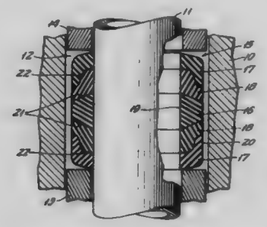
1. A golf ball having a spherical surface containing therein eight triangular areas divided by phantom lines and extended over the spherical surface, each of the triangular areas comprising three sides of equal spherical length,
the golf ball being provided on the spherical surface to form 52 dimples in each of the triangular areas without adjacent dimples overlapping each other and to form totally 416 dimples,
said 52 dimples being so arranged that a first spherically shaped triangle formed inside and along the triangular area defined by the phantom lines comprises three sides of equal spherical length and includes 9 dimples formed on each of the side lines to provide totally 24 dimples, a second spherically shaped triangle formed inside and along the first triangle comprises three sides of equal spherical length and includes 7 dimples formed on each of the side lines to provide totally 18 dimples, and a third spherically shaped triangle formed inside and along the second triangle includes 4 dimples formed on each of the side lines to provide totally 9 dimples and further includes 1 dimple inside thereof,
said golf ball having a diameter of the dimples being 3.2 to 3.6 mm and of a dimple depth such that the total volume of the dimples is in the range of 222 to 476 mm^3.

4,720,112
ADJUSTABLE STANDARD FOR NET GAMES
Keith A. Stettner, and Stephen Hamilton, both of 125 E. Washington Blvd., Lombard, Ill. 60148
Filed Sep. 10, 1986, Ser. No. 905,401
Int. Cl.[4] A63B *61/02*
U.S. Cl. 273—411 8 Claims

1. A net supporting standard for net games, comprising a pair of elongated thinwall cylindrical plastic tubes diametrically sized so that one tube telescopes adjustably within the bore of the second or base tube; a first set of holes passing through the wall of the one tube and with the holes being spaced along the longitudinal axis of the tube; a second set of holes passing through the wall of the second tube and with the holes being spaced along the longitudinal axis of the second tube; both sets of holes being selectively located on their tubes so that the alignment of various combinations of paired holes one from each tube telescopes the two tubes to a proper length for supporting a game net at an appropriate height; means engaging the selected combination of paired holes to lock the telescoped tubes to a fixed length; means for attaching a net to the standard, means for attaching a guy to the one tube; and in which the two sets of holes are selectively located through the walls of two tubes so that different combinations of paired holes will adjustably telescope the standard from a closed position to a men's volleyball, or women's volleyball, or badminton, net height; and in which the second tube has selectively spaced holes A and B, and the one tube has selectively spaced holes C and D, and in which locked paired holes A and D, A and C, B and D, and B and C, establish a closed position or net heights for badminton, women's volleyball, and men's volleyball, respectively; and in which the one tube has a third hole located near the tube end removed from the second tube and through which hole a double attaching loop passes to which a supported net attaches to one loop and a guy attaches to the other loop; and in which the means engaging the selected pair of holes is a pin; and elongated line means located on the outer surface of the one tube for aligning the holes of both tubes for pin insertion through a set of paired holes.

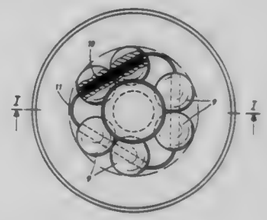


4,720,113
MULTILAYER, MULTIHARDNESS SEAL
Daniel L. Hertz, Jr., Red Bank, N.J., assignor to Seals Eastern Inc., Red Bank, N.J.
Filed Nov. 14, 1985, Ser. No. 797,901
Int. Cl.[4] F16J *15/10*
U.S. Cl. 277—165 12 Claims



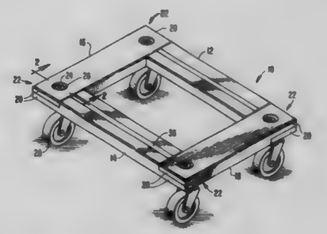
1. An annular multilayer seal comprising a series of at least five layers of elastomeric material, the innermost layer being the softest, each of the two outermost layers being harder than the innermost layer, and each layer between the innermost layer and each outermost layer being harder than the innermost layer and softer than its respective outermost layer.

4,720,114
ROLLER MANDRELL CHUCK
Jürgen Braitmaier, and Bodo Hammeley, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Nov. 22, 1985, Ser. No. 800,802
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442585
Int. Cl.[4] B23B *31/40*
U.S. Cl. 279—2 R 20 Claims



1. A ball-type chucking mandrel comprising:
contact body means defining a predetermined guide surface means,
chucking ball means disposed for guiding movement on said guide surface means,
and a mandrel means exhibiting a predetermined contact surface engaging against the ball means to forcibly move the ball means to a position of gripping a chucking area of a workpiece,
wherein said chucking ball means include chucking balls which are rigidly connected to one another in pairs to prevent roll off of the chucking balls in the circumferential direction,
a plurality of these pairs being distributed at the contact surface of the mandrel means when in an in use operative position.

4,720,115
PLASTIC DOLLY
Houston Rehrig, 505 S. Orange Grove, Apt. 11, Pasadena, Calif. 91105
Filed May 2, 1986, Ser. No. 858,671
Int. Cl.[4] B62B *3/02*; A47B *9/00*
U.S. Cl. 280—79.1 R 6 Claims



1. A plastic dolly, said dolly comprising:
a pair of longitudinal side members and a pair of transverse end members coupled to form a frame, said side members being formed in a honeycomb/cellular configuration;
each of said side members and said end members having end portions, said end portions interfitting to form a lap joint coupling said side members and said end members at each corner of the frame;
a caster fastening hole formed in each of said end members

for receiving a caster fastening bolt which securely fastens each of said lap joints together and carries a dolly caster wheel; and

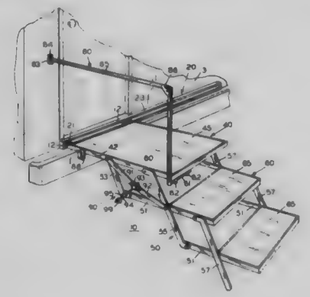
reinforcement means coupled to at least one of said side members for reinforcing said side member, wherein said reinforcement means is disposed in a long groove, said long groove being formed longitudinally in one of said side members, and extending substantially along the length of said side member, and in a short groove formed in each of said corresponding end portions of said end members and extending radially outwardly from said caster fastening hole to align with the said long groove, wherein the ends of said reinforcement means fit within said short grooves so as to couple said reinforcement means between the lap joint of one said end member, along said long groove, to the corresponding lap joint of the other of said end members.

4,720,116

STORABLE STAIRWAY AND PLATFORM APPARATUS FOR RECREATIONAL VEHICLES

Michael G. Williams, Box 756, Sun Valley, Id. 83353, and Jim R. Williams, 5705 E. Mountain Ave., Orange, Calif. 92667

Filed Nov. 24, 1986, Ser. No. 934,260
Int. Cl.[4] B60R *3/02*
U.S. Cl. 280—166 **9 Claims**



1. Storable stairway and platform apparatus for recreational vehicles comprising:

horizontally extending mounting means affixed to the vehicle;

platform means laterally movable on said mounting means and pivotally engagable therewith for vertical movement relative thereto;

stairway means pivotally connected to the sides of said platform means to engage the ground for supporting said apparatus, said stairway means including at least one step joined to said platform means by a pair of opposing scissor linkages for folding each of said steps into compact parallel abutment with one another and with said platform means; and

leveling means connected to at least one of said opposing scissor linkages for retracting or extending said linkage for leveling of the apparatus relative to ground.

4,720,117

HAND-PEDALLING ATTACHMENT FOR WHEEL-CHAIRS

Carl M. Hay, 627 S.E. 53rd Ave., Portland, Oreg. 97215

Filed Apr. 14, 1986, Ser. No. 851,722
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—250 **8 Claims**

7. A handpowered pedalling apparatus for attachment to a wheelchair to form a composite vehicle, wherein:

I. said pedalling apparatus has a steering column having a driving wheel in contact with a rolling surface; and

II. said wheelchair has side frames having first and second attachment points thereon, and castering wheels on said side frames contacting said rolling surface when said wheelchair is used separately;

The Improvement Comprising:

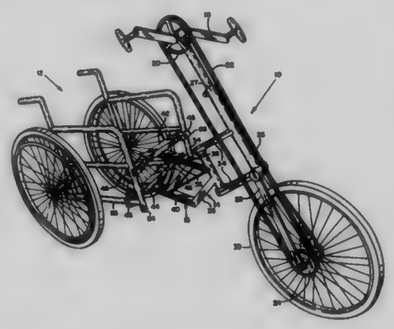
a. said apparatus has:

1. an attachment frame including said steering column, and further including first and second attachment means thereon for securing said apparatus to said wheelchair, said attachment frame having:

A. a hollow tube having a shaped opening in an end thereof, said shaped opening being of a regular configuration about an axis;

B. said attachment means having an extension rotatably attached at a point thereof:

I. said extension shaped to fit insertably into said shaped opening in any of a multiplicity of positions; and



II. said point of said attachment means of said extension being eccentrically located with respect to said axis;

C. means for fixedly securing said extension in any of said multiplicity of positions with respect to said opening, whereby to obtain said incremental adjustment of said position of said attachment means with respect to said attachment frame, in any of said multiplicity of positions;

2. lifter means on said attachment frame, including:

A. a lifter lever rotatably attached to said attachment frame;

B. a lifter post rotatably attached to said attachment frame; and

C. a connecting link rotatably connecting said lifter lever to said lifter post;

b. whereby to lift said castering wheels from said rolling surface when said pedalling attachment is secured to said wheelchair.

4,720,118

ANTI-JACKKNIFING APPARATUS FOR A SEMITRAILER RIG

Rainer M. Schultz, Lagerlöfstr. 19, 2000 Hamburg 65, and Denis B. Browne, Fuhlsbüttlerstr. 611, 2000 Hamburg, both of Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,697
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606120
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—432 **15 Claims**

1. An anti-jackknifing apparatus for a semitrailer rig including a trailer hitched to a tractor via a king pin and a wedge on said trailer and a fifth wheel on said tractor, said wedge being

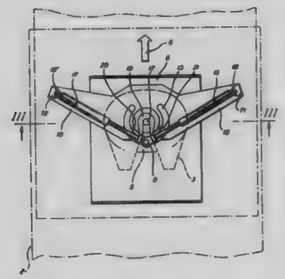
disposed behind said king pin, said king pin and said wedge being inserted into said fifth wheel, said apparatus comprising:

a coupling plate attached to said trailer, said coupling plate being provided with an arcuate guide slot extending along a portion of a circle having a center;

a guide pin attached to said wedge, said pin traversing said slot, said pin extending substantially perpendicularly with respect to said plate;

a pivot pin connected to said king pin and coaxial therewith, said pivot pin being disposed at said center of said slot;

means for attenuating rotary motion between said tractor and said trailer, said means for attenuating including two double-action hydraulic cylinders having respective piston rods, said piston rods having outer ends connected to said guide pin;



means for generating signals upon attainment of predetermined angles between said trailer and said tractor, said means for generating including a pair of limit switches attached to said coupling plate at points spaced from one another along said slot, said limit switches being operable by said guide pin during motion of said guide pin along said slot; and

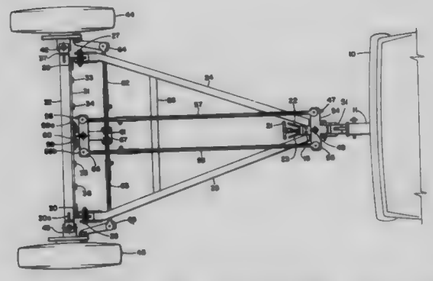
control means operatively connected to said means for attenuating and said limit switches for controlling pressurization of said cylinders to attenuate rotary motion between said tracter and said trailer as a function of both speed of travel of said semitrailer rig and brake pressure and for limiting a jackknifing angle between said trailer and said tractor in response to signals from said limit switches.

4,720,119

STEERING SYSTEM FOR A FOUR-WHEELED TRAILER

Russell H. Ritter, 2707 Forest Grove, Wyoming, Mich. 49509

Filed Oct. 16, 1986, Ser. No. 919,384
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—443 **6 Claims**



1. In combination with a towing vehicle having a hitch member including a coupling ball, a four-wheeled trailer having a frame and a transverse front axle beam with wheel-carrying members, each having a steering arm and pivotally mounted at the opposite ends of said beam for steering articulation, and also having tongue means extending in front of said beam and connected to said frame, said tongue means having coupling means adapted to engage said ball, wherein the improvement comprises:

a vertically-extending abutment fixed with respect to said hitch member and spaced from said ball;

a first crank member pivotally mounted on said tongue means for articulation on a vertical axis adjacent said coupling means, said crank member having a member engageable with said abutment, and also having at least one control arm extending laterally;

a second crank member pivotally mounted on structure normally fixed with respect to said frame for articulation on a vertical axis adjacent said axle beam, said tongue means being fixed with respect to said axle beam against relative movement about a vertical axis, and pivotally moveable with respect to said axle beam on a horizontal axis adjacent said second crank member axis, said second crank member having at least one laterally-extending follower arm, and at least one actuating arm extending in a front-rear direction;

first link means connecting said control arm and said follower arm; and

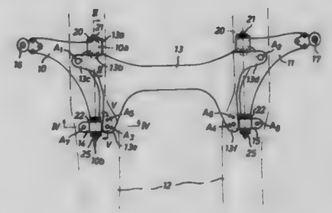
second link means, connecting said actuating arm and said steering arms.

4,720,120

WHEEL SUSPENSION FOR MOTOR VEHICLE

Hiroyaki Shimatani; Yasuhiro Morita, and Hideki Komamizu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 13, 1987, Ser. No. 25,623
Claims priority, application Japan, Mar. 13, 1986, 61-36738[U]; Jan. 10, 1987, 62-2063[U]
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—671 **3 Claims**

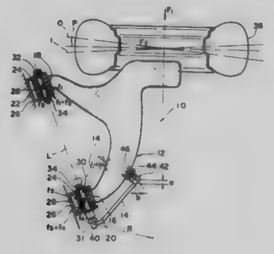


1. In a wheel suspension for a motor vehicle comprising a subframe arranged transversely to the longitudinal direction of the vehicle and having a pair of laterally spaced front end portions to be fastened to the vehicle chassis and a pair of laterally spaced rear end portions to be fastened to the vehicle chassis, and a pair of suspension arms each base portion of which has a front end articulated to the respective front end portions of said subframe and a rear end to be articulated to the respective rear end portions of said subframe,

the improvement wherein a pair of brackets each are fastened at their base portions to the rear end portions of said subframe to support each rear end base portion of said suspension arms articulated thereto, and wherein said brackets each are further fastened at their base portions to the vehicle chassis through the rear end portions of said subframe and at their end portions to the vehicle chassis.

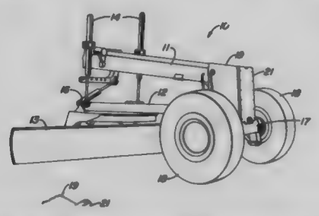
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,121
REAR SUSPENSION FOR VEHICLE
Kenichi Kikuchi, Toyota; Yoshikazu Kawai, Susono; Makoto Satoe, Susono, and Hakumi Ishii, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jan. 28, 1986, Ser. No. 823,277
Claims priority, application Japan, Jan. 28, 1985, 60-12637
Int. Cl.[4] B60G *3/02*
U.S. Cl. 280—701 **2 Claims**



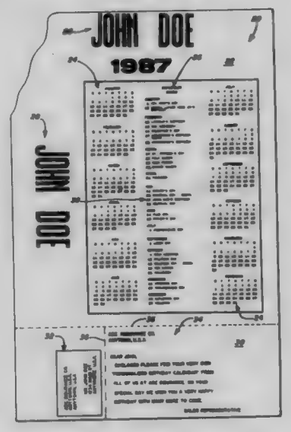
1. A rear suspension for a vehicle comprising:
a trailing arm for supporting a wheel having inner and outer connections spaced from each other widthwise of a car body and connected to the car body by a shaft extending through each of bushings disposed in the respective connections, wherein said shaft in the inner connection comprises a bolt; and
a link having a first end connected to said car body through a first joint having the rotary center thereof disposed on a swinging axis of the trailing arm and a second end connected to said trailing arm through a second joint, said first and second joints having rigidities larger than that of said bushing disposed in the inner connection, and said first joint being a ball joint and mounted on one of a head of the bolt, an end of the bolt and a nut being screwed onto the bolt.

4,720,122
TRACTOR FRONT-END WEIGHT OPTION
Dennis A. Brimeyer, and Terrence H. Maneman, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 821,386, Jan. 21, 1986, abandoned. This application Jun. 9, 1987, Ser. No. 59,929
Int. Cl.[4] B62D *37/04, 63/04*
U.S. Cl. 280—759 **7 Claims**



1. In a tractor having a front end adapted to have an optional piece of equipment connected thereto, a front-end weight option improvement comprising:
an optional piece of equipment having a rear surface and plurality of first openings formed therein;
mounting means secured to the front end of the tractor having a predetermined outline in elevation, and having an exposed front surface adapted for mating engagement with said rear surface of said optional piece of equipment, and having further second openings formed therein about top and side edges thereof and alignable with said first openings;
weight means mountable between said mounting means and said optional piece, said weight means having third openings formed therein about top and side edges thereof and alignable with said first and second openings, and further wherein said weight means comprises at least one plate, each said plate having front and rear surfaces identical to the front and rear surfaces of said mounting means and said optional piece, respectively whereby said at least one plate can be sandwiched between said mounting means and said optional piece without the requirement of additional equipment; and
fastening means insertable from the front of and through all said aligned openings in said mounting means, each said plate and said optional piece.

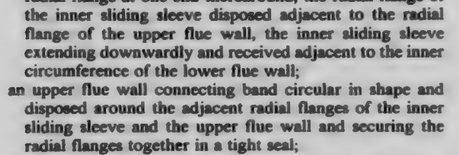
4,720,123
CUSTOMIZED CALENDAR
Robert G. Chelius, Palatine, Ill., assignor to Colorforms Image Center, Inc., Glenview, Ill.
Filed Sep. 29, 1986, Ser. No. 913,062
Int. Cl.[4] B42D *15/00, 15/02;* **G08D** *3/00*
U.S. Cl. 283—2 **8 Claims**



1. A customized calendar comprising at least one planar sheet having a plurality of surface sections formed by the printing of information thereon, and including important date information indicia printed thereon in one section, name information indicia relating to a specific person printed thereon in at least a second section, birthdate information indicia printed thereon in a third section, and monthly calendar information indicia printed thereon in at least a fourth section.

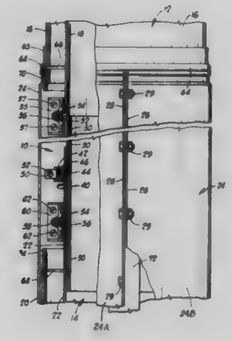
4,720,124
TELESCOPING JOINT
William M. Taylor, Houston, and Thomas R. Schmitz, Katy, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.
Filed Aug. 2, 1985, Ser. No. 761,692
Int. Cl.[4] F16L *27/06*
U.S. Cl. 285—18 **6 Claims**

1. A reusable subsea telescoping joint adapted to be installed in a subsea line and to be adjustable in length comprising
an inner tubular member having an external serrated cylindrical locking surface intermediate the ends of said inner tubular member,
an outer tubular member surrounding a portion of said inner tubular member and having an integral internal serrated cylindrical locking surface intermediate the ends of said outer tubular member,
means for sealing between said tubular members to provide a pressure chamber on at least one side of said locking surfaces,
at least one port extending through said outer tubular member communicating with said chamber,



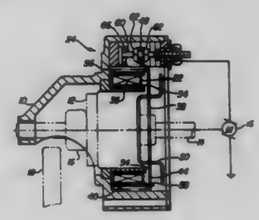
the diameter of said locking surfaces having a slight interference fit whereby relative movement of said surfaces is inhibited until fluid pressure is supplied to said port to separate said locking surfaces allowing relative movement of said surfaces to lengthen or shorten said joint.

4,720,125
EXPANSION AND LENGTH ADJUSTMENT JOINT
John D. Ream, and William J. Bialock, both of Wichita, Kans., assignors to Metal-Fab, Inc., Wichita, Kans.
Filed Dec. 22, 1986, Ser. No. 945,080
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—47 **6 Claims**



1. An expansion and length adjustment joint for a metal chimney having an upper and lower chimney section, each of the chimney sections including an outer casing wall and an inner flue wall, the flue walls of the chimney sections having flanges at the ends thereof which extend radially outwardly, the expansion and length adjustment joint comprising:
an inner sliding sleeve cylindrical in shape and having a radial flange at one end therearound, the radial flange of the inner sliding sleeve disposed adjacent to the radial flange of the upper flue wall, the inner sliding sleeve extending downwardly and received adjacent to the inner circumference of the lower flue wall;
an upper flue wall connecting band circular in shape and disposed around the adjacent radial flanges of the inner sliding sleeve and the upper flue wall and securing the radial flanges together in a tight seal;
a gasket retaining collar having an outwardly extending radial flange at one end therearound, the radial flange of the gasket retaining collar disposed adjacent the radial flange of the lower flue wall, the gasket retaining collar further including a groove therearound;
a gasket adapted for receipt in the groove of the gasket retaining collar;
a lower flue wall connecting band circular in shape and disposed around the adjacently disposed radial flange of the gasket retaining collar and the radial flange of the lower flue wall and securing the radial flanges together in a tight seal; and
gasket compression means attached to the gasket retaining collar for compressing the gasket therein against the outer circumference of the inner sliding sleeve.

4,720,126
INTEGRATED POWER RELAY FOR ELECTRIC STARTER MOTOR
Anthony G. Mike, Big Flats, N.Y., assignor to Facet Enterprises, Inc., Elmira, N.Y.
Filed Sep. 18, 1986, Ser. No. 908,739
Int. Cl.[4] F02N *11/00, 11/06, 17/00*
U.S. Cl. 290—38 R **18 Claims**

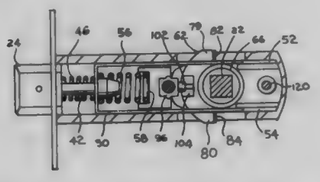


1. A power relay integrated in the electrical starter of an internal combustion engine, the electrical starter being of the type having a starter housing, a starter drive mechanism disposed in said starter housing, a pinion gear engageable with a toothed gear of an internal combustion engine, and an electrical starter motor having a rotary output connected to said starter drive mechanism, said starter drive mechanism having an annular electromagnetic coil operative to be energized from an external source of electrical power through a starter switch, and a unidirectional clutch having an armature plate disposed adjacent to said electromagnetic coil and concentric therewith, said armature plate being clamped against said electromagnetic coil to engage aid unidirectional clutch and couple the rotary output of said electrical starter motor to said pinion gear when said pinion gear is fully engaged with said engine's toothed gear, said power relay comprising:
a relay chamber provided in said starter housing radially offset from said electromagnetic coil;
an electrical switch disposed in said relay chamber, said electrical switch having a power input terminal for receiving electrical power from an external source and a power output terminal connected to said starter motor;
an axially displaceable annular relay armature disposed in said starter housing between said electromagnetic coil and said armature plate of said drive mechanism, said relay armature being connected to said electrical switch and operative to actuate said electrical switch to a closed position to provide electrical power to said starter motor in response to the energizing of said electromagnetic coil; and
resilient means for producing a force biasing said relay armature away from said electromagnetic coil and actuating said electrical switch to an open position.

4,720,127
DOOR LATCH
Martin P. Doolan, Duncanville, Tex., assignor to Sunwest International Trading Co., Inc., Duncanville, Tex.
Filed May 15, 1987, Ser. No. 48,049
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—169.22 **10 Claims**

1. A door latch having an elongated stationary case, a latch

bolt mounted to reciprocate longitudinally in said case between outwardly extended and inwardly retracted positions,
- an operator rotatable about an axis extending transversely through said case,
- a driver operable to move said latch bolt longitudinally in response to rotation of said operator,
- said operator comprising a first cam and a second cam, each having top and bottom portions engaging said driver to enable said driver by rotation of said operator in either a clockwise or counterclockwise direction,
- a push button key moveably mounted through a sidewall of said case and moveable in direction into and out of said case without engaging said second cam,
- said first cam having a portion for receiving at least a part of said push button key for locking said first cam against rotation when said key is in said receiving portion,



- said second cam having a camming means formed in a surface of said second cam adjacent said side wall of said case,
- said push button key including a pin mounted transversely of the movement of said key and extending beyond an end of said second cam for engagement with said camming means, whereby rotation of said second cam will move said push button key out of said receiving portion of said first cam to enable rotation of said first cam, and
- a spindle for rotating said cams comprised of first and second segments in end butting relation and rotatable with respect to each other, said spindle passing through said cams and said case with said first segment in engagement with said first cam and said second segment in engagement with said second cam.

4,720,128

MAGNETIC EMERGENCY EXIT DOOR LOCK WITH TIME DELAY

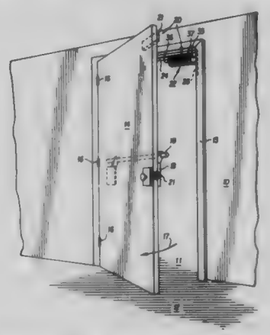
Emanuel L. Logan, Jr., Columbia, Md.; Bruce G. Beigel, Seven Valleys, and Michael A. Kelly, Felton, both of Pa., assignors to Reliable Security Systems, Inc., Cockeysville, Md.

Continuation of Ser. No. 700,867, Feb. 14, 1985, Pat. No. 4,652,028. This application Oct. 29, 1986, Ser. No. 924,475

Int. Cl.⁴ E05C *17/56*

U.S. Cl. 292—251.5 **16 Claims**

1. An exit door security system, said system comprising, in combination:
- (a) an exit door frame;
- (b) an exit door connected to said frame;
- (c) an electromagnet connected to said frame;
- (d) a magnetically attractable armature secured to said door adapted to be attracted to and held by said electromagnet;
- (e) an alarm;
- (f) a timer:
- (g) a power source;
- (h) an electric circuit electrically interconnecting said alarm, electromagnet, timer and power source; and,
- (i) switch means connected in said circuit projecting beyond a portion of the door frame for engaging said door, said switch means being closed when said door is fully closed



to allow activation of said electromagnet to prevent full opening of said door.

4,720,129

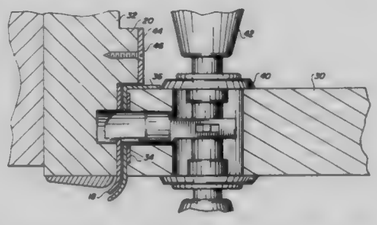
IMPROVED TWO PIECE SECURITY PLATE FOR A DOOR

Donald J. Bouchard, 3920 S. Third Ave., Phoenix, Ariz. 85041

Continuation-in-part of Ser. No. 684,571, Dec. 21, 1984, Pat. No. 4,629,231. This application Aug. 25, 1986, Ser. No. 899,644

Int. Cl.⁴ E05C *21/02*

U.S. Cl. 292—346 **4 Claims**



1. An improved swingable door two piece security plate assembly set, the improved two piece security plate assembly set preventing the use of a credit card or the like from being used to retract a latch on a door, when the door is in a closed position, from a cooperating standard striker plate which is installed on a mating jamb, the mating door jamb being equipped with a door stop, the latch being a portion of a latch set, the two piece security assembly set comprising in combination:
- a swingable door having a hinge set mounted on an edge thereof and having the latch set mounted on an opposite edge thereof;
- plate means for covering at least a portion of said door stop in a vicinity adjacent the striker, said plate means being fastened to said door stop; and
- a double ended security plate mounted on said opposite edge of said door over the latch, said double ended security plate further comprising:
  - a main body having hole means therethrough for clearing the latch;
  - a first end forming an "L" shape cross section with said main body, said "L" shape having a first leg thereof oriented approximately perpendicular to said main body, a second leg of said "L" shape being the main body, said first leg of said "L" shape being interposed between said door and said door stop when said door is in a closed position, said first and said second legs being connected at a corner of the door where said edge of the door and said face of the door meet; and
  - a second end having a curved shape, said curved shape having a curve to correspond to a shape of the striker plate, said curved shape being adjacent to the striker plate when said door is in a closed position.

4,720,130

INDUSTRIAL ROBOT HAND WITH POSITION SENSOR

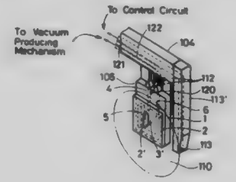
Yukinori Andou, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 713,831, Mar. 20, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 4,844

Claims priority, application Japan, Mar. 21, 1984, 59-41039[U]

Int. Cl.⁴ B25J *15/06, 19/02*

U.S. Cl. 294—64.1 **8 Claims**



1. A robot for transporting a semiconductor wafer comprising:
- robot hand means for engaging and retaining a semiconductor wafer,
- said robot hand means including first support means for supporting the retained semiconductor wafer and second support means for supporting said first support means,
- position sensing means located on said second support means for detecting the presence and exact position of the semiconductor wafer on said robot hand means,
- said position sensing means including first sensor means and second sensor means,
- said first sensor means including first and second sensors spaced apart and positioned so as to not be covered by the semiconductor wafer in its correct position,
- said first and second sensors each having a center,
- said second sensor means including a third sensor equidistant from said first and second sensors and spaced from a line drawn between said centers of said first and second sensors and positioned so as to be covered by the semiconductor wafer in its correct position, and
- said first sensor means and said second sensor means together indicating if the semiconductor wafer is present and in a correct position.

4,720,131

ASHTRAY, ESPECIALLY FOR MOTOR VEHICLES

Franz-Josef Grote, Schmallenberg, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

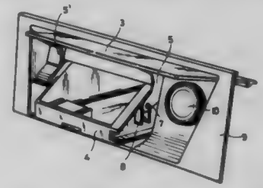
Filed Dec. 17, 1986, Ser. No. 942,682

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602197

Int. Cl.⁴ B60N *3/08*

U.S. Cl. 296—37.9 **4 Claims**

1. An ashtray, especially for motor vehicles, including an ashtray housing, an ash receptacle adapted to be supported by the housing and moved relative thereto from a storage position into the direction of the occupant compartment, and including a closure member which is adapted to close off the ash receptacle from the occupant compartment, with the closure member and the ash receptacle being operatively interconnected to enable automatic displacement of the ash receptacle, and the ash receptacle being biased by the force of a spring into its forwardly projecting position, the improvement being that said ash receptacle 4 is slidably guided at its two side walls by said housing via a guide and track means in a drawer-like fashion for generally horizontal movement through an opening in said housing between a storage position and a forward position, the closure member 3 is mounted in the ashtray housing 9 for pivoting movement about a horizontal pivot axis 6 between a generally vertical closed position in which it closes off said opening and said ash receptacle and a generally horizontal open position in which it is disposed above said ash receptacle, said pivot axis 6 of the closure member 3 being positioned, when the closure member 3 is in the closed position, below the upper edge of the closure member 3 and being spaced rearwardly of



the closure member 3, said closure member being provided with two lateral portions 5 which extend perpendicular to the plane of said closure member 3 and which are in overlapping relationship with the side walls of the ash receptacle 4, and the closure member being adapted to engage through transverse pins 7, 7' carried by said portions into respective guide tracks 8, 8' arranged in the side walls of the ash receptacle and which extend transversely of the direction of ash receptacle movement, said pins 7, 7' engaging the guide tracks 8, 8' being positioned, when the closure member 3 is in the closed position, at a location which is beneath the pivot axis 6 and the ashtray housing 9 having a catch means 18 thereon which is engageable with a cam 17 on the ashtray receptacle 4 to limit the extent of the forward movement of the ash receptacle.

4,720,132

ELECTRICALLY CONDUCTIVE STIFFENING WIRE FOR A SUN VISOR FOR VEHICLES

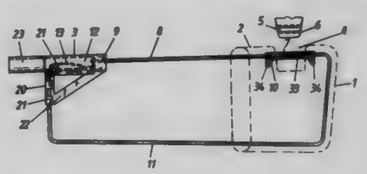
Charles Ebert, Luxeuil, France; Hermann Krebl, Baden-Baden; Lothar Viertel, Berus, both of Fed. Rep. of Germany; Bernard Hilbert, Cappel, France, and Rüdiger Walter, Ladenburg, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jan. 15, 1987, Ser. No. 4,329

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601762

Int. Cl.⁴ B60J *3/02*

U.S. Cl. 296—97 K **12 Claims**



1. A sun visor, comprising:
- a sun visor body, a stiffening wire including a first wire section and a separate second wire section which extend in the sun visor body and stiffen the visor body, the first and second wire sections being formed of an electrically conductive material and being electrically separate;

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first means for providing an electrical connection between the first wire section and an electrical source; the first means including a mounting housing disposed in the body, the mounting housing being effective to connect the sun visor body to a sun visor support shaft, means in the mounting housing for receiving the first wire section plugged into the mounting housing and an electrically conductive part in the mounting housing for contacting the first wire section and for connecting the first wire section to an electrical source; and

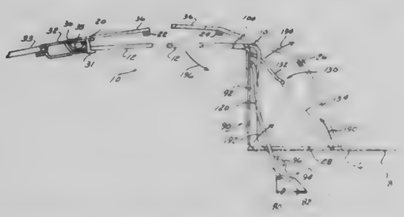
second means for providing an electrical connection between the second wire section and the electric source, and the first and second wire sections being at opposite electric poles.

4,720,133

CONVERTIBLE TOP STRUCTURE

Michael P. Alexander, Grosse Ile, and William A. Sims, Lincoln Park, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Feb. 10, 1986, Ser. No. 828,014
Int. Cl.[4] B60J *7/12*
U.S. Cl. 296—117 **3 Claims**



3. A convertible top structure movable between raised and lowered positions on a vehicle having a pivotal tonneau mounted rearward of the vehicle passenger compartment and a header bounding the upper edge of a windshield, the convertible top structure comprising:

first and second spaced side rails, each associated with one side of the vehicle, each of the first and second side rails being formed of a rigid, single piece member;

first, second, third, fourth and fifth spaced crossbows extending transversely across the vehicle;

a flexible top covering and attached to the first, second, third, fourth and fifth crossbows and the first and second side rails;

means for mounting the convertible top structure to the vehicle;

means mounted on the fourth crossbow for releasably receiving one of the first and second links when the convertible top structure is in its raised position and the first and second links are disposed in their over-center lock position;

means for latching the first crossbow to the windshield header of the vehicle;

means for assisting the raising and lowering of the convertible top structure, the assisting means comprising fluid cylinder means, mounted between the rear rails and the mounting means, for urging the rear rail upwards when the convertible top structure is moved to its raised position and cushioning the descent of the rear rail when the convertible top structure is lowered to its folded position; and

means for pivotally attaching the front end of the first and second side rails to the first and second crossbow to permit lateral outward movement of the first and second side rails as the convertible top structure is moved to its lowered position comprising;

a transverse slot formed in the end of each first and second side rail;

fastening means extending through the first crossbow and slidingly movable within the slots in the first and second side rails;

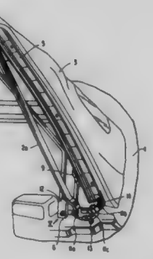
a pivot pin pivotally connected at a first end to the first crossbow and fixedly connected at a second end to the end of the second crossbow for allowing pivotal movement between ends of the second crossbow and the first and second side rails as the convertible top structure is moved between the raised and lowered positions.

4,720,134

CONVERTIBLE TOP FOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

Peter R. Seifert, Weil der Stadt 5, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellshaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,630
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523433
Int. Cl.[4] B60J *7/12*
U.S. Cl. 296—118 **12 Claims**



1. A convertible top for vehicles of the type having flexible cover means and a frame means for supporting the cover means, the frame means comprising,

two column means for stretching the cover means when in a closed convertible top position, said column means being spaced from one another in a transverse direction of a vehicle and being mounted for pivotal movement about a transverse vehicle axis with the column means having a maximum distance from one another with a closed convertible top substantially at the height of upper edges of side walls of an associated vehicle body,

column adjusting means for automatically adjusting a maximum width of the convertible top at the column means so that said width is reduced in the course of the convertible top folding-in operation in dependence on a pivot angle of the column means,

said column means being each formed by a roof column constituting a main support and by a fabric-retaining bow-shaped member, the roof columns extending offset toward the vehicle inside and the bow-shaped member being arranged on the outside of a respective roof column, the bow-shaped member being pivotally connected to a corresponding roof column in the upper area thereof, and

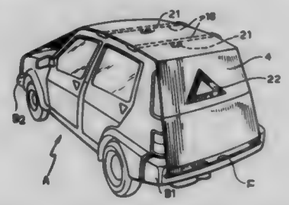
said column adjusting means including further adjusting means for controlling the movement of the bow-shaped member so that it is pivotal from an outwardly deflected stretching position in which it predetermines a lateral inclination of the cover means with a closed top, into a pivoted-in folding position in which it extends at least approximately parallel to the roof column.

4,720,135

PROTECTIVE DEVICE FOR A MOTOR VEHICLE

Fernando Farina, Via Parucco 51, Pianezza (Torino), Italy

Filed Nov. 10, 1986, Ser. No. 928,484
Claims priority, application Italy, Nov. 11, 1985, 54025/85[U]
Int. Cl.[4] B60J *11/00*
U.S. Cl. 296—136 **4 Claims**



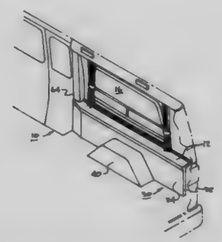
1. A protective device for a motor vehicle of the type comprising a flexible cover for covering the bodywork of a motor vehicle, characterised in that the flexible cover comprises a protective sheet (4) having one end (17) anchored to a winding roller (2) adapted for permanent fixing to the vehicle (A) in the region of one of its bumpers (B_1, B_2), parallel thereto, and the other end having means (6) for anchoring it to the region of the other bumper (B_2, B_1) of the vehicle A to retain it in its condition of use and further including rods (18) which can be used as poles for supporting the sheet (4) in the form of a canopy as an extension of the vehicle (A) to which the winding roller (2) is attached in use and wherein the rods (18) have rests (21) for their location on the roof of the vehicle (A) to maintain the corresponding portion of the sheet (A) spaced from the roof in its condition in which it covers the vehicle (A).

4,720,136

CURTAIN-HANGING MEANS FOR RECREATIONAL VEHICLES

Bob J. Higgins, Elkhart, Ind., assignor to Trans-Aire International, Inc., Elkhart, Ind.

Filed Jul. 22, 1986, Ser. No. 889,111
Int. Cl.[4] B60J *1/16*
U.S. Cl. 296—138 **7 Claims**



1. In a recreational vehicle having a flat, elongate rail fastened to an interior side wall thereof and along and adjacent to the bottom of a window of the recreational vehicle and curtain-hanging means for hanging curtains in front of the window;

the improvement which comprises:

a track member for curtain-holding glides which member extends along said rail adjacent the bottom of the window; and

a support member having a upper vertical portion which extends upwardly from said rail to said track member, a horizontal portion which rests on said rail member, and a lower vertical portion which extends downwardly between said rail and the wall of said recreational vehicle to which said rail member is fastened;

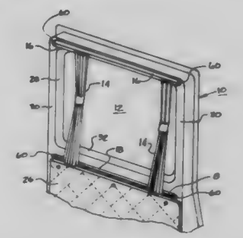
said lower vertical portion of said support member being fastened to said rail member whereby the fastening means therefor is concealed.

4,720,137

CURTAIN-HANGING MEANS FOR RECREATIONAL VEHICLES

Bob J. Higgins, Elkhart, Ind., assignor to Trans-Aire International, Inc., Elkhart, Ind.

Filed Jul. 22, 1986, Ser. No. 889,110
Int. Cl.[4] B60J *1/16*
U.S. Cl. 296—138 **1 Claim**



1. In a curtain-hanging means for hanging curtains in front of a window in a recreational vehicle,

the improvement in said curtain-hanging means which comprises:

a two-piece elongate track having complementarily-extruded base and cover portions; and

means for mounting said base portion on a wall of the recreational vehicle adjacent said window;

said base portion having a first longintudinal channel therein wide enough and deep enough to accommodate said mounting means and lateral wings and said cover portion having undercut longitudinal grooves adapted to receive said wings;

said cover portion comprising a longitudinal, glide-holding channel having inturned lips in which a curtain glide having a complementary T-shaped base is adapted to slide to and fro;

said base portion having wall contacting means consisting of a pair of longitudinally-extending, spaced-apart, parallel feet adapted to abut the wall of the recreational vehicle on which the curtain-hanging means is mounted and to form a second longitudinal channel opposed to and separated from said first longitudinal channel by a web having parallel opposed faces which forms the bottoms of said channels.

4,720,138

SLIDING ROOF FOR AUTOMOBILES

Albert Schlapp, Dreieich; Horst Böhm, Frankfurt am Main, and Rainer Grimm, Wetzlar, all of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 905,002
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535126
Int. Cl.[4] B60J *7/053, 7/195*
U.S. Cl. 296—222 **8 Claims**

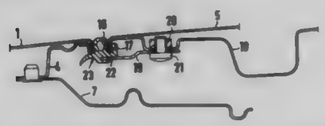
1. In a sliding roof for an automobile having a rigid sliding lid for closing a fixed roof opening, a sliding roof frame, guide rails mounted laterally on said roof frame, front and rear sliding elements mounted on said guide rails for guiding said sliding lid, a rear edge of said sliding lid which can be lowered by pivoting with respect to said front sliding elements to slide beneath said fixed roof to the rear of the roof opening and a

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mounting frame onto which said sliding roof frame is releasably attached at the front and sides thereof, that improvement consisting of

a peripheral downwardly oriented edge flange on said rigid lid;

an intermediate sealing profile strip on said downwardly oriented edge flange for sealing a gap between the lid and the fixed roof opening;



said intermediate profile strip having a substantially vertical seat for pushing onto the downwardly oriented edge flange of said rigid lid, a sealing lip which engages an underneath edge of the fixed roof opening, and a substantially horizontal slot in said intermediate sealing profile strip; and

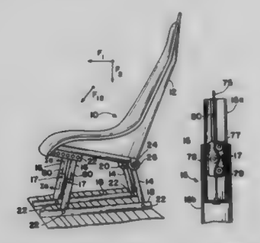
a holding frame which projects into said horizontal slot.

4,720,139

VARIABLE RESPONSE LOAD LIMITING DEVICE

Dwight D. McSmith, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 6, 1981, Ser. No. 309,291
Int. Cl.⁴ B60R *21/00*
U.S. Cl. 297—216 **7 Claims**



1. A spool assembly adapted for use as a load limiting member in a structure to control the level of applied loads, comprising:

a tubular shaft for absorbing rotational energy;

said tubular shaft having an interior cavity of sufficiently large diameter and walls thereof sufficiently thin to cause it to deform plastically at a prescribed load;

said tubular shaft having integrally formed flanged connecting ends, each said flanged end being circular and having a plurality of through holes arranged concentrically with said spool assembly, one of said flanged ends being connected rigidly to a structure and the other said flanged end being connected to pivotal structure causing rotation thereof under the influence of applied loads so as to cause said tubular shaft to twist when subjected to a transverse force; and

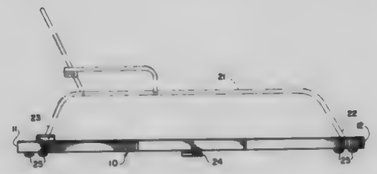
said tubular shaft and said flanged connection ends being of unitary construction and having dimensions dictated by the desired load response, thereby causing all of said shaft to be utilized in dissipating energy.

4,720,140

ROTATING PLATFORM FOR SUNBATHERS

Nicholas D. Change, III, 91592 Marilla St., Chatsworth, Calif. 91311

Filed Apr. 28, 1987, Ser. No. 43,531
Int. Cl.⁴ A47C *7/62*
U.S. Cl. 297—217 **4 Claims**



1. A revolving apparatus for sunbathers occupying a chair of recliner comprising:

a chair or recliner having support rungs;

an elongated platform having opposite end portions integrally joined together by a midsection of reduced width;

a central pivot means disposed on the underside of said platform midsection;

roller means carried on the underside of platform end portions arranged on an arcuate axis coaxially disposed with respect to said pivot means; and

means provided on the upper surface of said platform for releasably retaining said chair or recliner when occupied on said platform;

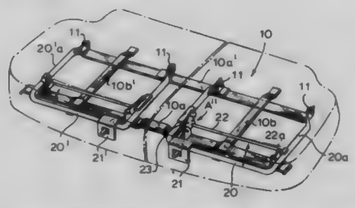
said central pivot means is of a greater height than the height of said roller means to permit flexing of said platform opposite end portions about said pivot to engage said roller means with the ground.

4,720,141

SEAT FOR VEHICLES

Takao Sakamoto, Akishimashi, and Tadayoshi Komatsu, Okazakishi, both of Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 693,263, Jan. 22, 1985. This application Sep. 24, 1986, Ser. No. 911,127
Int. Cl.⁴ A47C *3/00*
U.S. Cl. 297—284 **2 Claims**



1. In a seat construction supporting at least two passenger seats which includes a seat frame having a front support member and a rear support member each having a length sufficient to be coextensive with said at least two passenger seats arranged in side-to-side relationship, and at least two transverse frame members extending between said front and rear support members each said transverse frame member supporting one of said passenger seats,

an independent thigh support frame for each of said passenger seats, said thigh support frame pivotably connected to said rear support member and extended forward to said front support member and arranged in substantially overlaying relationship therewith, each said thigh support frame formed to receive a cushion member by substantially coextensive support of the perimeter of said cushion, and each said thigh support frame comprising rotation

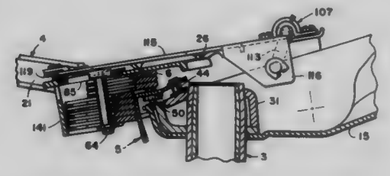
locking means between said frame and said front support member for fixing said frame at various levels of upward pivotal adjustment whereby upward and downward adjustment of said thigh support frame results in a corresponding adjustment of said cushion, while maintaining coplanar thigh support for a passenger seated thereon.

4,720,142

VARIABLE BACK STOP

Russell T. Holdredge; Glenn A. Knoblock, both of Kentwood, and Charles P. Roossien, Wyoming, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 10, 1986, Ser. No. 850,508
Int. Cl.⁴ A47C *1/024*
U.S. Cl. 297—300 **36 Claims**



1. In a chair of the type having a stationary support and a back which tilts with respect to said support, the improvement of a variable back stop comprising:

a stop surface disposed on one of said chair support and said chair back;

a plurality of stop members positioned on top of one another in a stack, and operably connected with the other of said chair support and said chair back; said stop surface and said stop members being mutually positioned such that rearward tilting of said chair back generally converges said stop surface and said stop members along a path of motion, and forward tilting of said chair back generally diverges said stop surface and said stop members; said stop members having an engaged position wherein at least a portion of one of said stop members is positioned in said path of motion to abut said stop surface upon rearward tilting of said chair back, and a disengaged position wherein said stop members are positioned outside of said path of motion to avoid abutting said stop surface upon rearward tilting of said chair back;

means for interconnecting said stop members and selectively shifting groups of adjacently disposed stop members between the engaged and disengaged positions to limit rearward tilting of said chair back at a plurality of different positions.

4,720,143

EASY ENTRY ASSIST MECHANISM FOR VEHICLE PIVOTAL SEAT

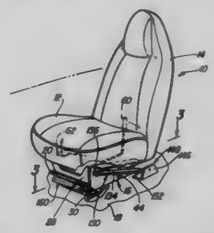
Martin T. Schwartz, Glenview, Ill.; Mariano T. Cadiz, Ann Arbor, Mich.; Eric G. Clark, Utica, Mich.; Neville G. D'Souza, Troy, Mich.; Walter D. Talley, III, Mt. Clemens, Mich., and Matthew E. Dukatz, Bloomfield Hills, Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 5, 1987, Ser. No. 58,412
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 297—326 **4 Claims**

1. In a vehicle a seat structure including a seat back connected to a seat cushion, a seat riser mounted on the underside of the cushion, said seat riser pivotally mounted on a vehicle floor for rotation from a first seat structure upright position, wherein said riser is releasably latched to the floor by a latch mechanism operable to be released by a first seat latch release handle, said seat riser adapted to be rotated upon operation of said first release handle to a second seat structure forwardly tilted stop position wherein said riser is inclined to the floor, the improvement comprising:

a gas spring assisted latch assembly operative upon release of said latch mechanism for pivoting said seat structure from said upright position to said forwardly tilted position allowing easy access to the vehicle area rearwardly of said seat structure;

said gas spring actuator being extensible and retractable and constantly biased to an extended position, said gas spring actuator having its one end pivotally connected to said seat riser and its other end pivotally connected by bracket means to said vehicle floor;



a second side latch release handle adopted to release said latch mechanism, said second handle projecting outboard from said seat riser, whereby upon either said first or second release handle being operated resulting in release of said latching mechanism;

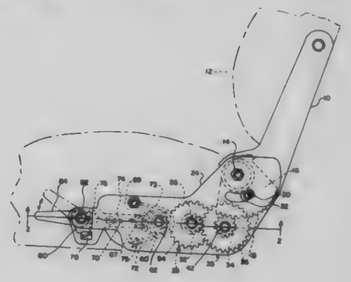
said gas spring actuator operative, upon release of said latch mechanism, to expand rotating said seat structure to said stop position and maintaining said seat structure in said stop position without passenger assistance until said seat structure is manually returned to said upright latched position by retracting said gas spring actuator under pressure and re-engaging said latch mechanism.

4,720,144

MANUAL SEAT RECLINER

Max O. Hecsch, Ypsilanti, Mich., assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 681,957, Dec. 14, 1984, Pat. No. 4,573,738. This application Oct. 15, 1985, Ser. No. 787,267
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 297—362 **1 Claim**



1. A seat recliner comprising:

a seat back support;

a sector gear having teeth, said sector gear connected to said seat back support;

a base frame;

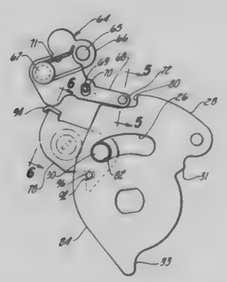
pivot means at which said seat back support is pivotably joined to said base frame;
a first gear set having a first toothed wheel meshed with said teeth on said sector gear and a second toothed wheel;
a second gear set having a first tooth wheel meshed with said second tooth wheel of said first gear set and a second toothed wheel; a clutch spool having a toothed wheel meshed with said second tooth wheel of said second gear set;
spring coil means including two oppositely wound coil springs in tandem around said clutch spool such that when tensioned, said spring coils prevent said clutch spool from rotating in opposite directions and locks said seat back support in a selected position; and
clutch release means contacting said spring coil means in a manner such that upon a selected movement of said clutch release means, the tension of said spring coil means is reduced to permit rotation of said clutch spool, thereby enabling movement of said seat back support, said clutch release means including a release lever mounted to said base frame and an elongated release plate mounted to said base frame for lateral slidable movement in response to movement of said release lever, said release plate having an end section positioned between one tang end of each of said two coil springs whereby said end section when moved laterally in a direction away from the clutch spool separates the tang ends of said coil springs.

4,720,145

MOTOR VEHICLE SEAT HINGE

Robert L. Bell, Oxford, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Continuation of Ser. No. 394,742, Mar. 29, 1984, abandoned. This application Feb. 18, 1987, Ser. No. 18,785
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 **12 Claims**



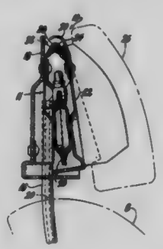
8. a hinge mechanism for controlling rotation of a motor vehicle seat back with respect to the seat bottom, comprising:
a lower hinge structure supporting said seat bottom and defining an arcuate slot,
an upper hinge structure supporting said seat back,
first pivot means rotatably attaching said lower hinge structure to said upper hinge structure, thereby permitting said upper hinge structure to be rotated from a first substantially vertical position to an angularly displaced second forward position,
a stop pin affixed to said upper hinge structure and positioned within said lower hinge structure arcuate slot thereby limiting the extent of rotation of said upper hinge structure with respect to said lower hinge structure,
inertia sensitive latch means pivotably attached to said upper hinge structure by second pivot means,
an engaging pin installed within bores formed in said latch means,
a stop surface formed on said lower hinge structure, said stop surface interfering with said engaging pin in the event of deceleration of said motor vehicle above a predetermined level thereby preventing movement of said upper hinge structure from said first to said second position, and
a cam plate rotatably attached to said upper hinge structure by said stop pin, said lower hinge structure having cam surfaces which cooperate with cam surfaces of said cam plate such that said cam plate is biased against said latch means thereby maintaining said engaging pin in close proximity with said stop surface when said upper hinge structure is in said first position and said cam plate becoming disengaged from said latch means by gravity thereby relieving said bias when said upper hinge structure is displaced from said first position.

4,720,146

VEHICLE SEAT HEADREST APPARATUS AND METHOD

Gerald W. Mawbey, Rochester, and Robert L. Shinaberry, Jr., Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1986, Ser. No. 901,639
Int. Cl.[4] B60R *22/28*; A47C *1/10*
U.S. Cl. 297—409 **12 Claims**



1. A vehicle seat headrest, said headrest in combination comprising:
a frame connected to said vehicle seat;
a cushion support for providing a surface of contact for a vehicle seat occupant, said cushion support being pivotally connected with said frame adjacent an upper end of said cushion support; and
a first selectively inflatable pneumatic bladder captured between said cushion support and said frame whereby inflation of said pneumatic bladder causes said cushion support to be angularly displaced with respect to said frame.

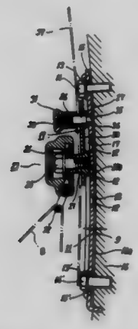
4,720,147

ADJUSTABLE VEHICLE SEAT BELT ANCHOR

Juichiro Takada, 3-12-1 Shinmachi Setagayaku, Tokyo, Japan 105

Filed Jun. 5, 1986, Ser. No. 870,790
Claims priority, application Japan, Jun. 7, 1985, 60-124700; Jul. 29, 1985, 60-115209[U]; Jul. 29, 1985, 60-115210[U]
Int. Cl.[4] B60R *22/24*
U.S. Cl. 297—472 **4 Claims**

1. An adjustable vehicle seat belt anchor comprising:
an elongated rail member having a multiplicity of longitudinally spaced-apart pin-receiving holes;
a slide member slidably received for movement longitudinally along the rail member;
a belt-supporting member attached to the slide member;
a retaining pin mounted on the slide member such that it is movable into and out of any selected one of the pin-receiving holes in a direction orthogonal to the direction in which the slide member moves along the rail member and having a portion received in the pin-receiving hole, said portion having a tip and having a groove which is spaced apart from the tip to thereby form a pin flange at the tip thereof;
a spring biasing the retaining pin in a direction to urge the retaining pin into one of the pin-receiving holes in the rail member; and



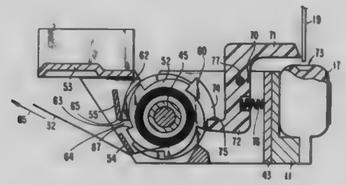
a deformable member received in the groove of the retaining pin, the deformable member having a stiffness such that it is not deformed until an abnormal load is applied to the belt but upon such an abnormal load deforms such that the pin flange engages an outer edge of the pin-receiving hole.

4,720,148

BELT RETRACTOR WITH TONGUE/BUCKLE CONTROLLED LOCKING CAM

James R. Anthony; Allan R. Lortz, both of Carmel; David D. Merrick, Indianapolis, and Michael A. Wiseman, Whiteland, all of Ind., assignors to Indiana Mills & Mfg. Co., Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 769,061, Aug. 26, 1985. This application Dec. 1, 1986, Ser. No. 937,039
Int. Cl.[4] B60R *21/10*
U.S. Cl. 297—474 **17 Claims**



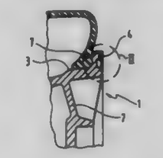
1. A child seat with harness for installation in an automobile comprising:
a child seat configured to receive a child and mountable upon an automobile seat;
harness means including a belt and being mounted to said child seat and extendable over the child to secure the child within said child seat;
an interlocking seat belt buckle and tongue mounted to said child seat and said harness means; and,
automatic retractor means mounted to said child seat and including a spring biased spool rotatably mounted thereto wrappingly receiving said belt and normally urging said belt to a retracted condition whereat said belt is wrapped on said spool but yieldably to allow withdrawal of said belt; and wherein:
said retractor means includes a pair of spaced apart walls mounted to said child seat with said spool rotatably mounted thereto, a ratchet shaped end plate fixedly secured to said spool and rotatable therewith, a spring engaged with said spool urging said spool with said belt to said retracted condition, a cam plate movably mounted adjacent one of said walls, a spring biased bar movably mounted to said walls and having a locking position engageable with said ratchet shaped end plate and a removed position allowing said spool to rotate with said cam plate and normally positioned to contact said bar and hold said bar in said removed position but releasable to move with said spool as said belt is withdrawn and allow said bar to move to said locking position, and an elongated pivot member movably mounted to said seat with one end positioned adjacent said buckle and an opposite end positioned adjacent said cam plate normally holding said cam plate in position to hold said bar in said removed position but movable to release said cam plate to move allowing said bar to move to said locking position when said tongue is contacted against said one end and inserted into said buckle.

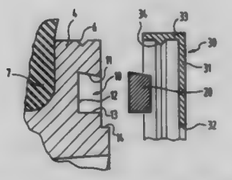
4,720,149

MOUNTING MEANS FOR MOUNTING BALANCE WEIGHTS ON A MOTOR VEHICLE WHEEL

Werner P. Thissen, and Karl H. Schillings, both of Goch, Fed. Rep. of Germany, assignors to International Technical Research S.A.H., Luxembourg

Filed Sep. 12, 1985, Ser. No. 775,215
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 8426961[U]
Int. Cl.[4] B60B *7/02*, *13/00*
U.S. Cl. 301—5 B **10 Claims**





1. A concealed balancing system for a motor vehicle wheel comprising a light-weight wheel rim including a flat rim flange extending substantially radially, the rim flange including first and second flat flange surfaces and a continuous axial recess forming an annular-outwardly opening groove in the first flange surface; balance weights adapted for being completely baused and secured within the groove; and an annular cover including fastening means cooperatively arranged with the cover for releaseably clamping the annular cover to the rim flange, the annular cover having an angular cross-sectional profile including a relatively wide, radially extending first leg comprising a flat ring portion covering the groove and adjacent portions of the flat rim flange and a relatively narrow, axially extending second leg provided on the periphery of the first leg, the fastening means comprising a continuous projection formed integrally with the inside of said second leg and being adapted to engage in an annular recess on a side of the rim flange and the flat ring portion having a side which is even with the second flange surface whereby the cover is integrated into the wheel rim design to provide a nearly unnoticeable balancing system.

4,720,150

BRAKE-PRESSURE CONTROL SYSTEM

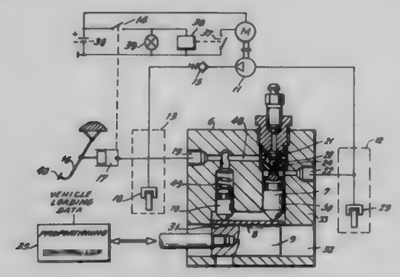
Wilhelm Heubner, Itzgrund, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 890,006

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527019

Int. Cl.⁴ B60T *13/00, 8/18*

U.S. Cl. 303—6 C **13 Claims**



1. A brake-pressure control system for vehicles having front and rear wheels, said system including:

hydraulic braking front and rear circuits for stopping the respective front and rear wheels;

a proportioning controller means operatively connected to said rear circuit operable to supply reduced braking pressure to said rear circuit compared to unreduced braking pressure in said front circuit as a function of loading referred to the front of said vehicle;

braking means for pressurizing said circuits to stop said wheels;

a pump means which when actuated pumps brake fluid from said rear circuit to said front circuit; and

switch means for actuating said pump means when pressure delivered by said braking means exceeds a predetermined level;

said pump means being operable to deliver fluid at a rate to obtain substantially the same rear circuit pressure characteristic of braking pressure in said rear circuit compared with said unreduced braking pressure, whether said pressure delivered by said braking means is increasing or decreasing.

4,720,151

SLIP-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf; Wolfram Seibert, Pfungstadt, and Norbert Ocvirk, Offenbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 888,998

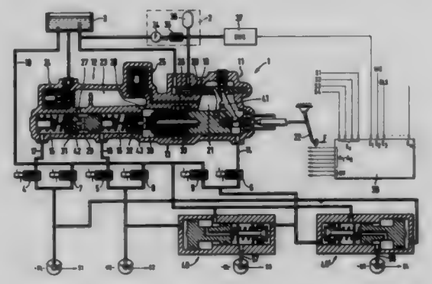
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1985, 3529744

Int. Cl.⁴ B60T *8/32, 13/00, 15/46*

U.S. Cl. 303—6 A **3 Claims**

1. A slip controlled brake system for automotive vehicles of the type including an auxiliary hydraulic pressure medium source connected to a booster chamber of a master cylinder wherein said master cylinder includes a brake pedal operated pressure control valve interposed between said booster chamber and said auxiliary pressure medium source, electric valve means electrically connected to and controlled by an electronic controller of said system for controlling flow of said pressure medium from said booster chamber to a prechamber of said master cylinder, said prechamber hydraulically connected to a pair of working chambers in said master cylinder, said each of said working chambers connected to a static brake circuit leading to a respective one of two front brakes of said vehicle, said booster chamber hydraulically connected to a dynamic brake circuit leading to each of two rear brakes of said vehicle, comprising a normally open solenoid valve operated by said electronic controller in each statis brake circuit between each working chamber and each front brake and in the dynamic brake circuit between said booster chamber and each rear brake,

a pair of hydraulic valves each having a first inlet connected to one of said static brake circuits between said solenoid valve and said front brake, a second inlet of each of said hydraulic valves connected to said dynamic brake circuit between said solenoid valve and said rear brake and each hydraulic valve having a first outlet connected to a reser-



voir of said brake systems, each said hydraulic valve including a second outlet connected to a rear brake of said vehicle diagonally opposite the front brake of said vehicle which is connected to connect to the first inlet of said respective hydraulic valve, each hydraulic valve including means responsive to pressure at said first inlet providing for hydraulic connection between said second inlet and said second outlet when said pressure is above a predetermined value, said means responsive to pressure at said first inlet further providing for simultaneous interruption of said connection between said second inlet and said second outlet and connection of said first outlet to said second outlet when said pressure is below said predetermined value.

4,720,152

ANTI-SKID DEVICE FOR MOTOR VEHICLES

Yoshiharu Adachi, Gamagori; Takumi Nishimura, Chiryu; Tadao Saito, Nagoya; Nobuyasu Nakanishi, and Noboru Noguchi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 3, 1986, Ser. No. 881,700

Claims priority, application Japan, Jul. 5, 1985, 60-148586

Int. Cl.⁴ B60T *8/40, 8/34, 8/42*

U.S. Cl. 303—113 **5 Claims**

1. An anti-skid device for motor vehicles, comprising:

a hydraulic circuit connecting a brake master cylinder with a wheel brake cylinder;

a first valve disposed in said hydraulic circuit and dividing said hydraulic circuit into a brake master cylinder side hydraulic circuit and a wheel brake cylinder side hydraulic circuit, said first valve being movable between a first position wherein said master cylinder side hydraulic circuit and said wheel brake cylinder side hydraulic circuit have substantially the same pressure, and a second position wherein said wheel brake cylinder side hydraulic circuit has substantially less pressure than does said master cylinder side hydraulic circuit;

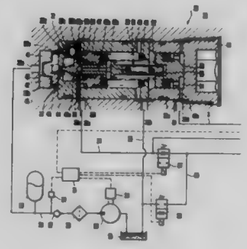
an electric motor;

a pump for generating working fluid pressure, wherein said pump is connected to an output of said motor such that said pump is driven by said motor;

an accumulator communicating with an output of said pump for accumulating working fluid pressure generated by said pump;

a pressure reducing piston movable between an inactive position in engagement with said first valve for maintaining said first valve in said first position, and an active position out of engagement with said first valve whereby said first valve can assume said second position and the capacity of said wheel brake cylinder side hydraulic circuit is increased, said pressure reducing piston including means for assuming said inactive position in response to the application of the working fluid pressure to said pressure reducing piston;

a second valve comprising means for supplying said working fluid pressure to said pressure reducing piston when a motor vehicle wheel associated with said wheel brake cylinder side hydraulic circuit is rotating in a normal condition, said second valve also comprising means for releasing said working fluid pressure from said pressure reducing piston when locking of the wheel is imminent, whereby said pressure reducing piston can move to said active postion so that said first valve can move to said second position in which said wheel brake cylinder side



hydraulic circuit has substantially less pressure than does said master cylinder side hydraulic circuit;

a first floating piston having opposing sides respectively in communication with said master cylinder side hydraulic circuit and said wheel brake cylinder side hydraulic circuit;

a first spring biasing said first floating piston in opposition to hydraulic pressure from said brake master cylinder side hydraulic circuit, whereby said first floating piston is slidable by a predetermined degree in response to the hydraulic pressure of said brake master cylinder side hydraulic circuit acting against the hydraulic pressure of said wheel brake cylinder side hydraulic circuit and said first spring;

a second floating piston having opposing sides respectively communicating with said brake master cylinder side hydraulic circuit and said wheel brake cylinder side hydraulic circuit; and

a second spring biasing said second floating piston in opposition to said hydraulic pressure of said brake master cylinder side hydraulic circuit, whereby said second floating piston is slidable by a predetermined degree in response to said hydraulic pressure of said brake master cylinder side hydraulic circuit acting against said hydraulic pressure of said wheel brake cylinder side hydraulic circuit and said second spring.

4,720,153

STORAGE RACK FOR MAGNETIC TAPE CARTRIDGES

David O. Hatcher, Williamsville, N.Y., assignor to Mead-Hatcher, Inc., Buffalo, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,741

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 312—13 **23 Claims**



1. A storage rack for magnetic tape cartridges comprising:

shelf means including at least two shelves for supporting a plurality of tape cartridges in an upstanding, side-by-side relationship, each of said shelves including means defining a platform for tape cartridges for operatively positioned thereupon and means defining a back for the shelf, said platform including means defining a cartridge-supporting plane adapted to be overlain by an edge of a cartridge operatively positioned upon the platform and said platform extending forwardly of the corresponding back and terminating in a substantially linear forward edge, and

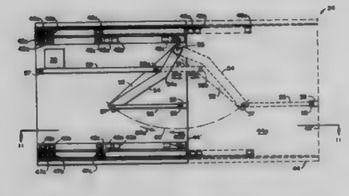
means for supporting said shelves in a superposed relationship so that one shelf is positioned generally above the other shelf, the forward edge of each shelf is arranged substantially horizontally and each shelf platform is oriented so that the edge of a tape cartridge operatively overlying the platform is canted rearwardly and downwardly from the corresponding forward edge so that the overlying cartridge edge defines an acute angle with the horizontal, said acute angle being within the range of about ten to twenty degrees so that the aforesaid canting of the overlying cartridge edge enhances the retention of the cartridge by the underlying platform, the forward edge of each shelf arranged so as to be overhung by the overlying edge of a cartridge stored thereupon and the platform-defining means of one shelf being spaced above the platform-defining means of said other shelf a distance which is substantially no greater than the vertical height of a cartridge when positioned upon said other shelf and measured from the corresponding forward edge plus an amount providing finger clearance between the underside of the platform-defining means of said one shelf and the upper edge of a cartridge when positioned upon said other shelf so that the index finger of one hand can be placed atop a cartridge stored upon said other shelf at a location on the cartridge adjacent the upper, forward corner thereof and the cartridge pivoted forwardly with the index finger relative to said other shelf as the overlying cartridge edge moves in rolling contact about the corresponding forward edge from a stored condition upon the other shelf to a forwardly-tilted condition in relationship to adjacent cartridges so that the opposite sides of the cartridge can be grasped between the thumb and remaining fingers of the one hand for purposes of withdrawing the cartridge from said other shelf, the depth of each platform as measured between its forward edge and the corresponding back and generally in its cartridge-supporting plane being in the range of about 0.75 to 0.90 times the length of the overlying cartridge edge so that the amount of the overlying cartridge edge overhanging the platform forward edge is large enough to facilitate the aforesaid forward pivoting of the cartridge yet small enough so that the remainder of the cartridge edge which directly overlies the platform is large enough to enhance the stability of the cartridge when stored upon the platform.

4,720,154

AUTOMATIC TELLER MACHINE HAVING MOTORIZED DRAWER

Stephen R. Seiter, 1785 Thames St., Clearwater, Fla. 33515

Filed Nov. 19, 1986, Ser. No. 932,263
Int. Cl.[4] A47B *88/00*; G07G *5/00*
U.S. Cl. 312—319 17 Claims



1. An expandable structure having utility as an automatic teller machine of the island kiosk type, comprising:
- a fixed position structure having a generally rectangular planform;
- said structure including a motorized movable drawer having a retracted position and an extended position;
- a support means for said motorized drawer;
- said support means including a plurality of nested, telescoping members that progressively extend out of said structure when said drawer is moved into an extended position;
- a linear actuator means for effecting extension and retraction of said drawer;
- leverage means for amplifying the effect of said linear actuator means;
- said telescoping members including a base member, an intermediate member and a top member;
- said leverage means including a lever arm member having a fixed position, pivotally mounted proximal end, a pushrod member having a first end pivotally secured to a distal end of said lever arm member, and said pushrod member having a second end pivotally secured to said top member;
- said linear actuator means pivotally secured to said lever arm member at a point between the fixed position, pivotally mounted proximal end of said lever arm member and the distal end of said lever arm member;
- whereby a fulcrum means is established at the point of pivotal connection between said actuator means and said lever arm member;
- whereby the linear actuator means operates at a slow speed but effects a relatively high speed extension or retraction of said drawer as a result of said amplifying means; and
- whereby the linear actuator means travels a relatively short distance yet effects travel by said drawer over a greater distance.

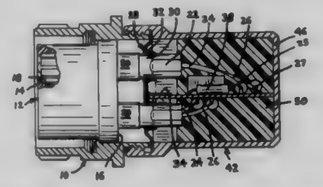
4,720,155

DATABUS COUPLER ELECTRICAL CONNECTOR

Alan L. Schildkraut, Sidney, and Alan L. Davis, Unadilla, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Apr. 4, 1986, Ser. No. 848,110
Int. Cl.[4] H01R *13/658*
U.S. Cl. 439—108 9 Claims

1. A databus coupler comprising an electrically conductive enclosure which has an opening leading to a closed chamber, a dielectric insert having a rear face disposed in said opening and including an array of axial passages each extending through the insert, an electronic component completely enclosed by said chamber and including a plurality of circuit paths each for transmitting a communication signal, a matable terminal mounted in each said passage each terminal including an electrically conductive outer conductor encircling a pair of electrically conductive inner conductors, each said conductor having a rearward end portion extending rearwardly of said rear face and into said chamber, conducting means for electrically connecting the rearward end portion of one respective inner conductor with one respective circuit path, and grounding means engaging the rearward end portion of the outer conductors for electrically sealing the chamber and grounding the coupler to prevent electromagnetic frequency interference from entering



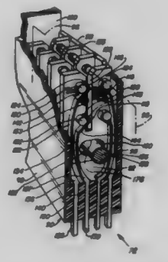
or leaving the chamber, the grounding means completing a common electrical circuit path between the outer conductors of all said terminals, said enclosure, and the electronic component whereby to protect the inner conductors from electromagnetic frequency interference.

4,720,156

MANUALLY OPERATED ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Howard L. Beers, Cape Coral, Fla., assignor to Tritec, Inc., Naperville, Ill.

Division of Ser. No. 639,831, Aug. 13, 1984, Pat. No. 4,611,870.
This application Sep. 8, 1986, Ser. No. 904,944
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—260 22 Claims



1. A manually operated connector for connecting a plurality of spaced printed terminals located on a printed circuit board with a plurality of corresponding output leads carried by said connector in order to connect the terminals with other parts of the electrical system with which the printed circuit board is used, said plurality of printed terminals being arranged in a predetermined pattern comprising at least two rows of terminals located on one side of said printed circuit board, said rows being oriented adjacent and parallel to a first edge of said circuit board, which connector comprises:
- (a) a plurality of output leads equal in number to said plurality of printed terminals;
- (b) a plurality of contacts equal in number to said plurality of printed terminals and arranged in at least two rows forming a pattern that is the mirror image of said predetermined pattern of printed terminals located on one side of said printed circuit board, each of said contacts having:
- (i) a free end associated with a predetermined one of said printed terminals and electrically connected with a predetermined one of said output leads,
- (ii) an open position, and

- (iii) a closed position for contact with its associated printed terminal;
- (c) a narrow hollow body formed of rigid, insulative material for housing said contacts and for carrying said output leads fixedly attached to said connector body and extending outward therefrom, said body having a median plane and two main walls parallel to said plane which are connected by two narrow walls, said walls together defining the interior of said connector body and defining an opening for receiving said printed circuit board,
- (d) means for guiding said circuit board, when the board is inserted by the user of the connector in said board-receiving opening, through a predetermined path into an operative position within the interior of said body in which position said board is disposed generally parallel to said main walls, and in which each of said printed terminals of said at least two rows is in a position to make contact only with its associated contact in the electrical connector,
- (e) resiliently deformable support means for each of said plurality of contacts, each of said support means:
- (i) normally supporting its respective contact in the contact's open position, and
- (ii) being insulated, together with its associated contact, from the other contacts and the latter's associated support means;
- (f) actuator means for each of said resiliently deformable support means, each of said actuator means being positioned to deform the support means with which it is associated to urge its respective contact, in a direction generally normal to said median plane, into its said closed position;
- (g) means for operating all said actuator means, said operating means having an open, inoperative position and a closed operative position;
- (h) manually controlled means other than said printed circuit board for urging said last mentioned means to operate said actuator means, said urging means having an open, inoperative position and a closed, operative position; and
- (i) locking means for preventing said operation of the actuator means until after said printed circuit board with its at least two rows of terminals oriented adjacent and parallel to a first edge of said circuit board has been inserted in said board-receiving opening and, while said contacts are held by their respective support means in their normal open positions, said board has been moved along said predetermined path to its said operative position in which each of said printed terminals of said at least two rows along one side of the board is in position to make contact only with its associated contact of the electrical connector,

whereby all contact between said contacts and said printed terminals is avoided unless the printed circit board has been inserted within the connector and has been moved into its said operative position.

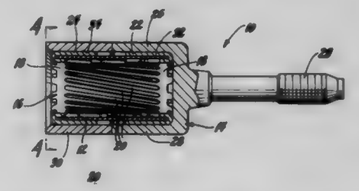
4,720,157

ELECTRICAL CONNECTOR HAVING RESILIENT CONTACT MEANS

Charles R. Nestor, Niles, and Robert G. Plyler, Vienna, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1986, Ser. No. 925,812
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—851 11 Claims

1. An electrical connector having resilient contact means comprising:
- a sleeve member of conducting material having a longitudinal axis,
- a support member coaxially disposed with respect to the sleeve member, and
- resilient contact means in the form of a stamped sheet metal cylinder,
- said stamped sheet metal cylinder comprising a pair of longitudinally spaced bands which are connected to each other by a plurality of resilient longitudinal contact strips, and said stamped sheet metal cylinder being secured to the sleeve member so that the resilient longitudinal contact strips



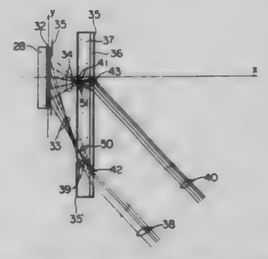
extend obliquely to the longitudinal axis of the sleeve member whereby the resilient longitudinal contact strips provide resilient contact means which engage a mating contact when the mating contact and the sleeve member are disposed in a nested relationship.

4,720,158

METHOD OF AND APPARATUS FOR MAKING A HOLOGRAM

Tetsuro Kuwayama, Yokohama, and Yasuo Nakamura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,592
Claims priority, application Japan, Dec. 7, 1983, 58-229835; Dec. 7, 1983, 58-229836
Int. Cl.[4] G03H *1/22*
U.S. Cl. 350—3.69 3 Claims



1. A method of making a hologram comprising the steps of:
- forming a first hologram for producing an object light beam and a second hologram for producing a reference light beam on the same plane of a plane substrate; and
- illuminating said first and second holograms formed on said same plane of the plane substrate and forming a third hologram by the light beams from said two holograms.

4,720,159

SPHERICAL SCANNING SYSTEM WITH IMPROVED MEANS OF WIDE, ADJUSTABLE SCANNING AREA

Yuan Shu-Hua, 140 E. Ave. 44th, #5, Los Angeles, Calif. 90031

Filed May 15, 1985, Ser. No. 734,592
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.9 2 Claims

1. A spherical scanning system comprising:
- a. a condenser designed to combine reflected and refracted beams from parallel laser beams emanated from laser sources in order to increase the intensity of laser light;
- b. a ring-like divergent lens having inside and outside concave surfaces; and
- c. a rotating mirror positioned in optical alignment with said condenser, and inside and in coaxial relationship with said divergent lens, said rotating mirror being affixed in an

inclined position at a lower end of a threaded drive screw which can be threadably moved up and down in a determined range to reflect the combined reflected and refracted beams toward said inside concave surface.

4,720,160

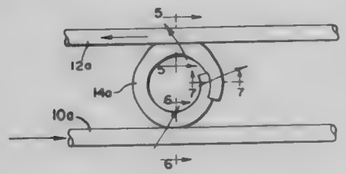
OPTICAL RESONANT CAVITY FILTERS

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 331,052, Dec. 16, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,543

Int. Cl.⁴ G02B *6/26;* **H01S** *3/30;* **H04B** *9/00;* **G02F** *1/00*

U.S. Cl. 350—96.15 **40 Claims**



1. A filter system for coupling an input optical waveguide to an output optical waveguide, said system comprising a resonant waveguide cavity formed with a dispersive couple providing a wavelength dependent filter whereby the effective length of said cavity determines a plurality of resonant wavelengths and said dispersive couple is more selective of one of said rosonant wavelengths.

4,720,161

OPTICAL FIBER COUPLER-DISTRIBUTER, AND METHOD OF MANUFACTURE

Francois-Louis Malavieille, Paris, France, assignor to Alliance Technique Industrielle, Evry, France

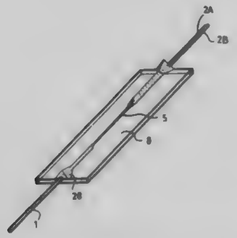
Filed Jan. 25, 1985, Ser. No. 694,751

Claims priority, application France, Jan. 31, 1984, 84 01492

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.15 **16 Claims**





1. An optical fiber coupler-distributer of the type comprising: firstly a first pair of optical fibers each having a polished and chamfered side at one end, said ends being positioned adjacent to each other in such a manner as to define a common end face of substantially the same cross section as that of a single fiber; and secondly another fiber, or another pair of fibers similarly disposed to define a second common end face, disposed in end-to-end optical co-operation with the said first pair by means suitable for fixing the fibers in said disposition, the coupler-distributer further including the improvement whereby the means for fixing the fibers in said disposition comprise a rigid plate together with retaining means for keeping the fibers pressed against the rigid plate.

4,720,162

DEVICE FOR SWITCHING FROM ONE LIGHT SOURCE TO ANOTHER

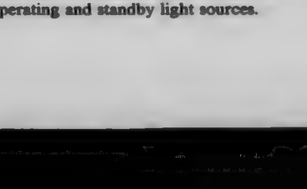
Kiyofumi Mochizuki; Hirokazu Wakabayashi; Yoshihori Namihira, and Hidekazu Tokiwa, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 710,958, Mar. 14, 1985, abandoned, which is a continuation of Ser. No. 373,562, Apr. 30, 1982, abandoned. This application Apr. 11, 1986, Ser. No. 850,453

Claims priority, application Japan, May 11, 1981, 56-069419

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **8 Claims**



1. A light switching device for switching from one light source to another, comprising first and second light sources for emitting linear polarized light waves; first and second polarization maintaining single mode fibers each having an input end disposed adjacent a respective one of said light sources so that light beams output from said light sources enter into said fibers respectively, said fibers being so disposed relative to said light sources that the polarization axis of each of said fibers is substantially parallel to the polarization axis of the light waves incident on said fiber from its associated light source; a main track optical fiber for propagating said light beams output from both of said light sources; and a polarizing beam splitter disposed between the output ends of said first and second polarization maintaining single mode fibers and the input end of said main track optical fiber; said first and second polarization maintaining single mode fibers being operative to transmitting said light beams with the planes of polarization of said light beams being respectively maintained and with horizontal polarized light waves P and vertical polarized light waves S crossed perpendicularly to each other being emitted from the output ends of said optical fibers; said polarizing beam splitter having four planes the planes of incidence of which differ from the planes of emission thereof in dependence on the planes of polarization of the light beams that are output from said optical fibers; said polarization maintaining single mode fibers being so oriented to the respective planes of said polarizing beam splitter that some of the horizontal polarized light waves P and vertical polarized light waves S output from said optical fibers emerge simultaneously from the same plane of said polarizing beam splitter as emission light, one of said light sources being normally used as an ON operating light source and the other of said light sources being normally used as an OFF standby light source; and means responsive to the magnitude of said emission light from said same plane for controlling the ON-OFF states of said operating and standby light sources.

4,720,163

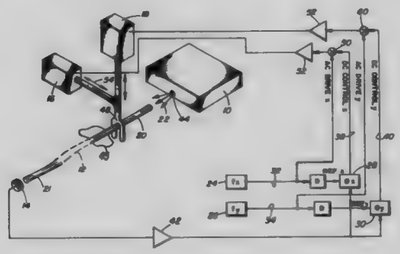
LASER-FIBER POSITIONER

John C. Goodwin, and Tibor F. Devenyi, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1985, Ser. No. 752,983

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **6 Claims**



1. Apparatus for positioning a light output device relative to a light input device to obtain maximum light coupling therebetween;

the apparatus comprising means for vibrating one of the devices;

a photodetector connected to the input device for detecting light received by the input device and;

means for generating an electrical signal in response to the detected light;

the apparatus characterized by: a phase sensitive detector for detecting amplitude of an oscillatory component of the electrical signal and for detecting the phase difference between said oscillatory component and the vibration applied to said one device, the oscillatory component resulting from vibrating said one of the devices; and

means responsive to the amplitude and phase of the oscillatory component, for applying a force to translationally move one of the devices in a direction so as to reduce said amplitude to a minimum.

4,720,164

PRESSURE-TIGHT OPTICAL CABLE

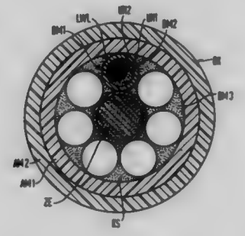
Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 751,968

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424804

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **8 Claims**



1. In a pressure-tight optical cable having a cable core with a plurality of light waveguides, a sealing compound disposed in the region of said cable core and a pressure-tight outside sheath surrounding said cable core, the improvement comprising different sealing compounds being provided such that a softer sealing compound is disposed in the immediate proximity of the light waveguides and at least one harder sealing compound being disposed at a greater distance therefrom within the sheath, said softer sealing compound filling a smaller cross section of said cable core than does said harder sealing compound, said harder sealing compound having a modulus of elasticity greater than a modulus of elasticity of said softer sealing compound by an amount at least roughly proportional to respective circumferences of the appertaining sealed cross sections, said harder sealing compound having a viscosity greater than a viscosity of said softer sealing compound by an amount at least roughtly proportional to respective circumferences of the appertaining sealed cross sections, and said different sealing compounds being disposed within different hose-like claddings.

4,720,165

OPTICAL FIBER SHEET AND METHOD AND APPARATUS FOR FABRICATION THEREOF

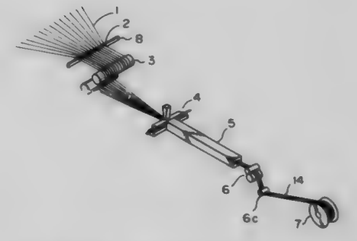
Shuichiro Tokuda; Noriyuki Furukawa, both of Nagoya; Ikuo Kinoshita, Kasugai; Hideo Nakamoto, and Fumito Aonai, both of Nagoya, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,884

Claims priority, application Japan, Feb. 25, 1985, 60-035593; May 23, 1985, 60-109278

Int. Cl.⁴ G02B *6/04*

U.S. Cl. 350—96.24 **7 Claims**



1. A method for the fabrication of an optical fiber sheet, which comprises the steps of:

holding a number of optical fibers arranged on one plane spaced from one another by a tool having a clearance slightly larger than the size of the fibers,

constringing the held portions of the fibers in a lateral direction to bring them close to one another so that the fibers are contacted with one another while remaining in one plane,

applying an adhesive to the held portions of the fibers, and solidifying the adhesive to fix the fibers.

4,720,166

CLADDING MATERIALS FOR OPTICAL FIBERS

Akira Ohmori, Ibaraki; Nobuyuki Tomikashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 720,455, Apr. 4, 1985, abandoned, which is a continuation of Ser. No. 617,474, Jun. 5, 1984, abandoned. This application Jul. 30, 1986, Ser. No. 890,458

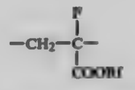
Claims priority, application Japan, Jun. 10, 1983, 58-104550

Int. Cl.⁴ G02B *6/18*

U.S. Cl. 350—96.34 **2 Claims**

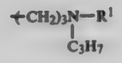
1. In an optical fiber comprising a cladding and a core, an improvement wherein the cladding comprises a polymer comprising:

(1) 10 to 100 mole % of a structural unit represented by the formula

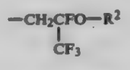


(a)

wherein Rf is a chlorofluorobutyl group, fluoro-lower alkyl group, fluorometnylbenzyl group, fluoromethylcyclohexyl group,



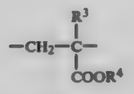
(wherein R^1 is a fluoroheptyl group) or



(wherein R^2 is fluoropropyl group), and

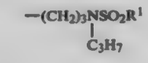
(2) up to 90 mole % of at least one structural unit selected from the group consisting of;

(i)



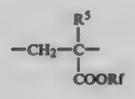
(b)

wherein R^3 is hydrogen, fluorine or methyl group and R^4 is methyl group, phenyl group, cyclohexyl group, trimethylcyclohexyl group or



(wherein R^1 is as defined above) and

(ii)



(c)

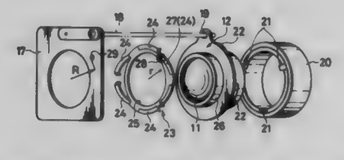
wherein R^5 is hydrogen or methyl group and Rf is as defined above.

4,720,167

LENS BARREL WITH LENS SHUTTER

Zenichi Okura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 801,993
Claims priority, application Japan, Nov. 30, 1984, 59-253536
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—252 7 Claims



1. In a lens barrel including a lens shutter in which a front lens group frame is supported in front of a shutter housing such that said front lens group frame is linearly movable along an optical axis, and wherein a rear lens group frame is fixed in the rear of said shutter housing, the improvement comprising;

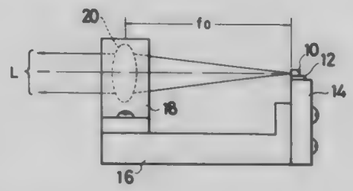
first spring means for urging said front lens group frame towards said shutter housing, and second spring means for urging said front lens group frame in a radial direction, said first and second spring means being provided between a stationary member integral with said shutter housing, and said front lens group frame.

4,720,168

LASER BEAM COLLIMATING APPARATUS

Yutaka Kaneko, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 8, 1986, Ser. No. 817,029
Claims priority, application Japan, Jan. 10, 1985, 60-2476
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—253 8 Claims



5. Apparatus comprising:

a laser light source whose wavelength varies with temperature by R nm/°C.;

a collimator lens which receives laser light from the source and outputs a collimated light beam when spaced from the source by a selected distance along an axis, said collimator lens having a dispersion n nm^{-1}; and

a support which supports the source and the lens spaced from each other and has a thermal expansion coefficient a $°C.^{-1}$ in the direction of said axis;

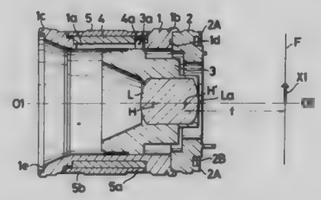
wherein the parameter a is substantially equal to the product of the parameters n and R.

4,720,169

LENS FOR MACRO-PHOTOGRAPHY

Tohru Kawai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed May 30, 1985, Ser. No. 739,380
Claims priority, application Japan, Jun. 7, 1984, 59-083605[U]
Int. Cl.[4] G02B 7/02, 7/04
U.S. Cl. 350—255 8 Claims



1. A lens for macro-photography, mounted on a camera body, comprising:

a lens barrel body including a photo-taking lens and means for shifting said lens, said shifting means including a shifting construction which enables said lens to move along an optical axis thereof;

a connection tube arranged to be interposed between said lens barrel body and said camera body; and

first and second coupling means arranged at both ends of the optical axis of said lens barrel body,

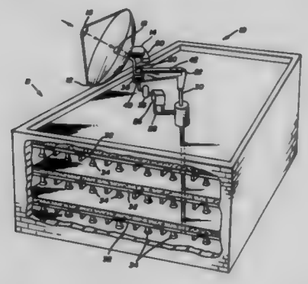
wherein a position of a rear principle point of said photo-taking lens, when said lens is shifted to a nearest distance position by said shifting means with said lens barrel body being connected to said connection tube by said first coupling means, coincides with a position of a rear principle point of said photo-taking lens, when said lens is maintained at said nearest distance position by said shifting means and said lens barrel body is connected to said connection tube by said second coupling means.

4,720,170

DAYLAMP SYSTEM

Martin P. Leary, Jr., 1885 Nautilus St., LaJolla, Calif. 92037

Filed Apr. 30, 1985, Ser. No. 729,173
Int. Cl.[4] G02B 17/00
U.S. Cl. 350—264 12 Claims



1. A daylighting system for providing illumination to the interior of a building using solar energy as a source of light comprising:

a solar energy collector means mounted on the buildings' roof by means of Coude' and Gregorian types of Cassegrainian optical systems

a means of moving said collector means to an attitude tracking the sun's position in the sky during daylight hours

a heat separation means for removing heat from the concentrated beam of sunlight and for applying said heat to other uses; and

light guide means for channeling and distributing concentrated light beams throughout places of use in the building.

4,720,171

LIQUID CRYSTAL OPTICAL SWITCHING DEVICE HAVING REDUCED CROSSTALK

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, A Division of ITT Corporation, Nutley, N.J.

Filed Nov. 5, 1985, Ser. No. 795,155
Int. Cl.[4] G02F 1/133; G02B 6/42
U.S. Cl. 350—331 R 24 Claims

1. A liquid crystal optical switching device; said device comprises:

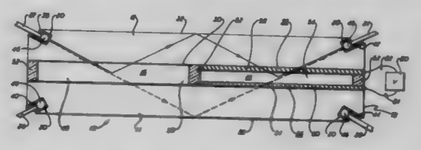
a first transparent member having inner and outer opposing optically flat surfaces;

a second transparent member having inner and outer opposing optically flat surfaces;

means, extending into said first and second members for receiving a plurality of optical fibers;

means, disposed between an electrodeless first section of said inner surfaces of said first and second transparent members, for splitting a light beam impinging thereon into components said first section including liquid crystal material therebetween; and

means, disposed between a second section of said inner surfaces of said first and second transparent members, for



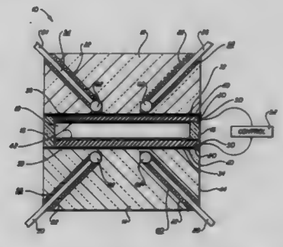
selectively directing said components of a light beam impinging thereon between a first port and a second port, said second section including liquid crystal material therebetween.

4,720,172

LIQUID CRYSTAL OPTICAL SWITCHING DEVICE

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, A Division of ITT Corporation, Nutley, N.J.

Filed Nov. 5, 1985, Ser. No. 795,156
Int. Cl.[4] G02F 1/13; G02B 6/42
U.S. Cl. 350—334 29 Claims



1. A liquid crystal optical switching device which comprises:

a first transparent member, said first transparent member having a liquid crystal material overlying one surface thereof;

means, extending into said first transparent member, for receiving a plurality of optical fibers; and

means for switching at least a portion of a light beam impinging on said liquid crystal material from one of said optical fibers to another optical fiber.

4,720,173

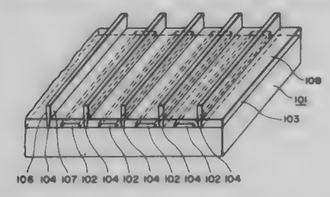
DISPLAY HAVING AN ORIENTATION TREATMENT BETWEEN 0° AND 15° TO THE SPACER WALL

Shinjiro Okada, Kawasaki; Junichiro Kanbe, and Kazuharu Katagiri, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,271
Claims priority, application Japan, Mar. 9, 1984, 59-44882
Int. Cl.[4] G02F 1/137
U.S. Cl. 350—341 21 Claims

1. An optical modulating device comprising a pair of base plates comprising a first base plate and a second base plate disposed in parallel with each other, and a chiral smectic liquid crystal sandwiched between the pair of base plates; a plurality of spacer members being arranged in the form of stripes on the face of said first base plate contacting the liquid crystal, a monoaxial orientation treatment being applied to the face of the second base plate contacting the liquid crystal in a direction forming an angle θ with the extension direction of the plurality of spacer members on the first base plate, wherein

0°≦θ<15%, said chiral smectic liquid crystal being disposed in a layer thin enough to unwind the spiral structure of the



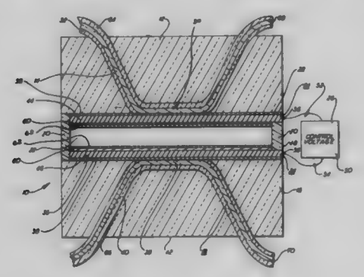
chiral smectic liquid crystal and forming monodomain formed through a cholesteric phase during a temperature decreasing stage.

4,720,174

LIQUID CRYSTAL OPTICAL SWITCHING DEVICE WITH INTEGRALLY ATTACHED OPTICAL FIBERS

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, A Division of ITT Corporation, Nutley, N.J.

Filed Nov. 5, 1985, Ser. No. 795,152
Int. Cl.⁴ G02F 1/13; G02B 6/42
U.S. Cl. 350—347 V 13 Claims



1. A liquid crystal device comprises:

a first optical fiber having a portion of the core thereof exposed;

a second optical fiber having a portion of the core thereof exposed, said exposed core of said first optical fiber being proximate said portion of said exposed core of said second optical fiber; and

means for varying the coupling coefficient between said exposed cores, said means including a liquid crystal material between said exposed cores.

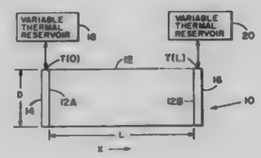
4,720,175

COMPOSITE LOGIC GATE ELEMENT AND MULTIPLEXXER FOR OPTICAL COMPUTING AND OPTICAL COMMUNICATION

Joseph W. Haus, Schenectady, N.Y.; Charles M. Bowden, and Chi C. Sung, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 2, 1985, Ser. No. 803,360
Int. Cl.⁴ G02F 1/17
U.S. Cl. 350—353 7 Claims

1. An optical device comprising: a nonlinear optical material and first and second dielectric materials, said optical material being sandwiched between said dielectric materials and having uniform surface contact therebetween for providing optical logic gate operation; said nonlinear optical material being a platelet of material having first and second primary surfaces in direct thermal contact with respective of said first and second dielectric materials for providing a temperature bias across said primary surfaces; and thermal means coupled to said first and



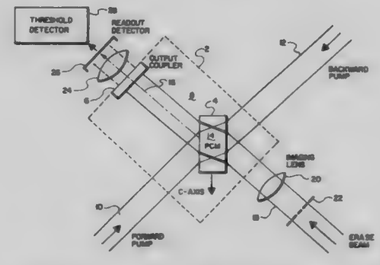
second dielectric materials for controllably biasing the temperature of said materials.

4,720,176

ERASE BEAM APPARATUS AND METHOD FOR SPATIAL INTENSITY THRESHOLD DETECTION

Marvin B. Klein, Malibu; Gilmore J. Dunning, Newbury Park, and George C. Valley, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 20, 1986, Ser. No. 865,212
Int. Cl.⁴ G02B 5/23; G02F 1/01
U.S. Cl. 350—353 18 Claims



1. An optical intensity threshold detector for an optical input erase beam having a spatial intensity pattern, comprising:

a phase conjugate resonator (PCR) comprised of a phase conjugate mirror (PCM), a mirror means optically opposed to the PCM and an oscillation cavity between the PCM and mirror means, the PCR having a greater than unity gain,

the PCM being adapted to receive the erase beam and having a conjugating medium whose local reflectivity decreases with increasing erase beam local intensity, the PCR producing a high intensity spatial optical output at locations corresponding to the locations of the erase beam having an optical intensity below a threshold level, and a low intensity output at locations corresponding to the locations of the erase beam having an optical intensity above said threshold level, and

an optical detector means for sensing the PCR output.

4,720,177

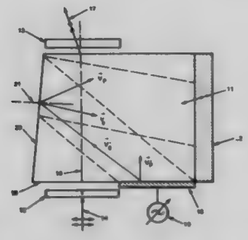
TUNABLE ACOUSTO-OPTIC FILTER UTILIZING INTERNAL MODE CONVERSION

I-Cheng Chang, 649 Nauhua Ct., Sunnyvale, Calif. 94087

Filed Sep. 28, 1984, Ser. No. 655,910
Int. Cl.⁴ G02F 1/11
U.S. Cl. 350—372 4 Claims

1. Apparatus for diffracting light from a first polarization to a second polarization, said apparatus comprising an acoustically anisotropic, optically birefringent crystal, means for passing a light beam through said crystal along a selected axis oriented at a non-zero angle with the optic axis of said crystal;

means for exciting a first acoustic wave in said crystal and varying the frequencies of said first acoustic wave; means for directing said first acoustic wave to propagate along a selected direction in said crystal to be incident on an internal reflection surface of said crystal to excite a second acoustic wave such



that the acoustic group velocity of the said second acoustic wave is noncollinear with the incident light beam in the said crystal and such that the tangents to the locus of the wave vectors for the incident light and diffracted light are substantially parallel; the orientation of said internal reflection surface being determined by the relation,

$$\tan\alpha = \frac{V_a'\sin(\theta_a' - \theta_a)}{V_a - V_a'\cos(\theta_a' - \theta_a)}$$

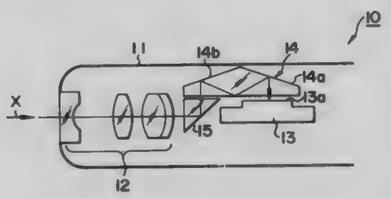
wherein "α" is the angle between the normals of said internal reflection surface and said first acoustic wave, V_a' and V_a are the phase velocities of said first and second acoustic wave, respectively, and θ_a' and θ_a are the polar angles of said first and second acoustic waves, respectively.

4,720,178

OPTICAL SYSTEM FOR ENDOSCOPE

Kimihiko Nishioka; Tsutomu Yamamoto; Susumu Takahashi, and Akira Yokota, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Aug. 13, 1985, Ser. No. 765,355
Claims priority, application Japan, Aug. 15, 1984, 59-169380
Int. Cl.⁴ A61B 1/04; G02B 5/04, 5/22, 5/30
U.S. Cl. 350—401 12 Claims



1. An optical system adapted to be disposed within a housing that is located at a distal end of an endoscope and has a central axis situated longitudinally of such endoscope, said optical system including:

an objective lens assembly for receiving light from an external object, a longitudinally extending image sensor disposed at said central axis, and prism means disposed for guiding light from said objective lens assembly downstream along an optical path toward a plane of incidence at a pickup surface of said image sensor;

with said central axis positioned horizontally and said pickup surface being horizontal and facing upward, said pickup surface facing a bottom surface of said prism means through which light exits from said prism means;

said prism means including at least two reflection surfaces: a first of said reflection surfaces directing a light beam received from the objective lens assembly along said optical path to a second of said reflection surfaces that reflects said light in a straight line through an exit surface of said prism means to impinge upon said pickup surface;

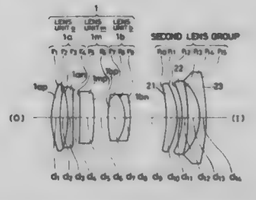
said optical path deviating substantially from the longitudinal axis of the endoscope.

4,720,179

ZOOM LENS SYSTEM FOR USE WITH A COMPACT CAMERA

Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Nov. 28, 1986, Ser. No. 935,982
Claims priority, application Japan, Nov. 28, 1985, 60-268473
Int. Cl.⁴ G02B 15/14
U.S. Cl. 350—423 13 Claims



1. A zoom lens system comprising, in order from the object side, a first lens group having a positive focal length and a second lens group having a negative focal length and which achieves zooming between a wide angle position and a narrow angle position by changing the distance between the first and second lens groups, said first lens group having a positive focal length and being composed of a lens unit (a) having a negative focal length that is positioned on the object side of said first lens group and which comprises at least one positive lens element and at least one negative lens element, a lens unit (b) having a positive focal length that is positioned on the image side of said first lens group and which comprises at least one negative lens element and at least one positive lens element, and a lens unit (m) that is positioned between the lens units a and b and which comprises at least one positive lens element having its convex surface directed toward the image side, said lens system satisfying the following conditions:

(1) $1.35 < f_t/f_1 < 1.7$;
(2) $1.69 < N_{1an}$;
(3) $34 < \nu_{1an}$;
(4) $-2.0 < f_t/f_{1bn} < -0.7$;
(5) $9 < \nu_{1bp} - \nu_{1bn}$;
(6) $0.23 < f_{Bt}/f_t < 0.5$; and
(7) $0.3 < f_t/f_{1m} < 1.0$

where

f_t: the focal length of the overall system at the wide angle position;

f_1: the focal length of the first lens group;

N_{1an}: the refractive index at d-line of the negative lens element in the lens unit a;

ν_{1an}: the Abbe number of the negative lens element in the lens unit a;

f_{1bn}: the focal length of the negative lens element in the lens unit b;

ν_{1bp}: the Abbe number of the positive lens element in the lens unit b;

ν_{1bn}: the Abbe number of the negative lens element in the lens unit b;

f_{Bt}: the back focus at the wide angle position; and

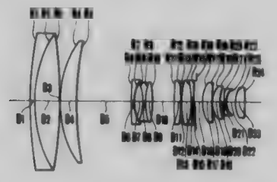
f_{1m}: the focal length of the lens unit m.

4,720,180

HIGH MAGNIFICATION RANGE ZOOM LENS

Toshiaki Asano, Kanagawa; Sadatoshi Takahashi, Tokyo, and Sadahiko Tsuji, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Mar. 15, 1983, Ser. No. 475,532
Claims priority, application Japan, Mar. 19, 1982, 57-45235
Int. Cl.⁴ G02B *15/14, 9/64*
U.S. Cl. 350—427 **5 Claims**



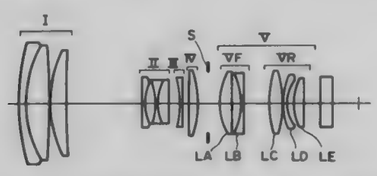
1. A high magnification range zoom lens comprising:
three lens groups and another lens group behind the three lens groups;
said three lens groups and said another lens group being, from front to rear,
a first lens group having a positive refractive power,
a second lens group having negative refractive power,
a third lens group having a positive refractive power, said third lens group having a negative image magnification and being arranged so that the light flux coming out of the third lens group converges, and
said another lens group having a positive refractive power,
wherein said zooming is performed by holding said third lens group stationary and moving said first and second lens groups and said another lens group, and
when in the telephoto position, said first lens group lies closer to the object end, and said second lens group lies closer to the image end than in the wide angle position.

4,720,181

LARGE APERATURE RATIO ZOOM LENS SYSTEM

Kazuyoshi Hata, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1985, Ser. No. 786,657
Claims priority, application Japan, Oct. 12, 1985, 59-214787
Int. Cl.⁴ G02B *15/16, 9/64*
U.S. Cl. 350—427 **4 Claims**



1. A large aperture ratio zoom lens system, comprising from the object side to the image side;
a first lens unit of a positive refractive power fixed in the zooming operation;
a second lens unit of a negative refractive power;
a third lens uhit of a negative refractive power;
a fourth lens unit of a positive refractive power;
an aperture diaphragm; and
a fifth lens unit of positive refractive power, including a front lens unit consisting of a positive first lens component whose object side surface has stronger refractive power than its image side surface has and a negative second lens component whose object side surface has stronger refractive power than its image side surface has, and a rear lens unit consisting of a biconvex third lens component, a negative meniscus fourth lens component whose image side surface has stronger refractive power than its object side surface has, and a positive fifth lens component whose object side surface has stronger refractive power than its image side surface has;
wherein the second lens unit and the third lens unit are shiftable along the optical axis in the zooming operation; and wherein the lens system fulfills the following conditions:

$$0.6 < |\phi_{BP}|F_V < 1.4 \qquad \phi_{BP} = \frac{N_{B-1}}{r_{BP}} < 0$$

$$1.2 < |\phi_{BP}|/\phi_{CF} < 2.5 \qquad \phi_{CF} = \frac{1 - N_C}{r_{CF}} < 0$$

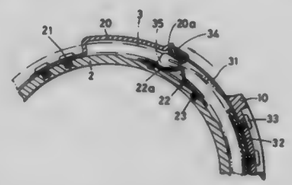
wherein,
F_V: the focal length of the fifth lens unit,
N_B: the refractive index of the second lens component,
Nc: the refractive index of the third lens component,
r_{BP}: the radius of curvature of the object side surface of the second lens component,
r_{CF}: the radius of curvature of the image side surface of the third lens component,
ϕ_{BP}: the refractive power of the object side surface of the second lens component, and
ϕ_{CF}: the refractive power of the image side surface of the third lens component.

4,720,182

ZOOM LENS CAPABLE OF EFFECTING A MACRO OPERATION

Hitoshi Imanari, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,266
Claims priority, application Japan, Nov. 8, 1984, 59-235487; Nov. 8, 1984, 59-235488
Int. Cl.⁴ G02B *7/10, 15/00*
U.S. Cl. 350—430 **11 Claims**



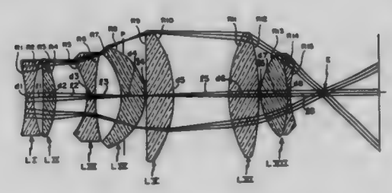
1. A zoom lens assembly comprising:
an optical system forming an optic axis and having a lens group moved along said optic axis for zooming and for focusing on an object to be photographed more proximate than an object lying at a normal object distance;
a barrel member coupled to said lens group and rotatable about said optic axis to thereby move said lens group;
an operating member moved along said optic axis for a zooming operation and rotated about said optic axis for a focusing operation, said operating member having a close-up operation area in which said operating member is rotated during focusing on said object to be photographed more proximate than the object lying at said normal object distance;
means for rotating said barrel member in response to said zooming operation of said operating member; and
a connecting device provided between said barrel member and said operating member, said connecting device having an engaging slot and a coupling member that is fitted into said engaging slot in response to the rotation of said operating member into said close-up operation area to couple said barrel member to said operating member for rotation therewith, said coupling member being disengaged from said engaging slot in response to the rotation of said operating member away from said close-up operation area.

4,720,183

EXTREME WIDE ANGLE EYEPIECE WITH MINIMAL ABERRATIONS

Donald C. Dilworth, Medford, Mass., assignor to Optical Systems Design, Inc., East Booth Bay, Me.

Filed Feb. 27, 1986, Ser. No. 833,963
Int. Cl.⁴ G02B *25/00*
U.S. Cl. 350—410 **2 Claims**



1. A wide-angle eyepiece comprising seven lenses, I, II, III, IV, V, VI, and VII, and a field stop P located between lenses IV and V, wherein lens I is a bi-concave lens, lens II is a meniscus lens with the strongest curve adjacent lens III, lens III is a bi-concave lens, lens IV is a meniscus lens with the strongest curve adjacent lens V, lens V is a lens with a convex surface adjacent lens VI and a surface adjacent lens IV within the range of slightly positive to slightly negative, lens VI is a bi-convex lens, and lens VII is a doublet comprising a bi-convex lens and a bi-concave lens with the bi-convex lens adjacent lens VI, said lenses having parameters substantially as set forth in the following table wherein lens curvatures, lens thicknesses, and lens separation distances are given in millimeters, n is the index of refraction of a lens element, and v is the Abbe number of a lens element:

Lens	Radii	Axial Thickness "d"	Lens Separation "l"	n	v
LI	R1 = −56.3118	d1 = 3.39373		1.53996	59.71
	R2 = +46.2614		l1 = 4.1225		
LII	R3 = −221.1200	d2 = 5.86885		1.84666	23.83
	R4 = −33.9786		l2 = [illegible]		
LIII	R5 = −23.38768	d3 = 3.57986		1.62004	36.37
	R6 = +83.8454		l3 = 11.6589		
LIV	R7 = −26.7386	d4 = 10.75047		1.62041	60.32
	R8 = −23.4904		l4 = 0.41		
LV	R9 = −4353.465	d5 = 12.4375		1.62041	60.32
	R10 = −50.5861		l5 = 24.826		
LVI	R11 = +57.4022	d6 = 14.0534		1.62041	60.32
	R12 = −104.509		l6 = 0.41		
	R13 = +25.6419				

-continued

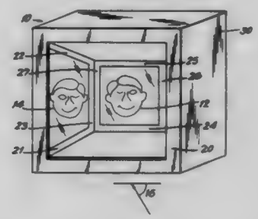
Lens	Radii	Axial Thickness "d"	Lens Separation "l"	n	v
LVII	R14 = −59.6482	d7 = 12.152		1.63854	55.42
	R15 = +46.1346	d8 = 1.294		1.80518	25.43
			l7 = 16.367		

4,720,184

REVERSING AND NON-REVERSING MIRROR DEVICE

William Watson, 174 W. 76 St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 581,526, Feb. 21, 1984, Pat. No. 4,580,880. This application Mar. 27, 1986, Ser. No. 843,800
Int. Cl.⁴ G02B *5/08, 7/18*
U.S. Cl. 350—617 **8 Claims**



1. A mirror device for viewing a subject, said device providing a non-reversed reflected image of said subject and at least one reversed reflected image of said subject, said device comprising:
first and second mirrors disposed with respect to each other to provide said reflected images; and
a three dimensional substantially hollow housing containing said mirrors, a first end of said housing partially opened forming a frame around the perimeter of said first end; said frame having an inside portion of substantial width throughout the entire continuous perimeter of said frame;
whereby when said subject is placed proximate to said first end, reflected each of said images appear to be on separate surfaces within said housing surrounded by a perceived border caused by the reflection of said frame.

4,720,185

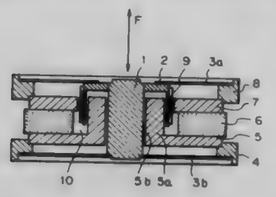
DRIVE AND SUPPORT STRUCTURE OF AN OBJECTIVE LENS

Toshihiko Kurihara, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,220
Claims priority, application Japan, Jul. 13, 1984, 59-105830[U]
Int. Cl.⁴ G02B *7/04*
U.S. Cl. 350—255 **3 Claims**

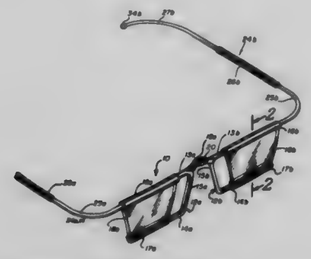
1. A drive and a support structure of an objective lens comprising:
an objective lens for applying a light beam on a recording surface of a recording medium;
a support mechanism for supporting said objective lens so that an optical axis of said objective lens is perpendicular to said recording surface, while permitting a displacement of said objective lens along a direction of said optical axis; and
a drive means for driving said objective lens in said direction of said optical axis, including a focusing coil on which said

objective lens is mounted so that a central axis of said coil is substantially parallel with said optical axis, and a magnetic circuit including magnets and a yoke having a surface generally perpendicular to magnetic surfaces of said



magnets and arranged to surround and face an outer side of said coil and producing magnetic fluxes crossing said coil, with an inner space of said coil being reserved as a vacant space to accomodate the objective lens and the light beam which passes therethrough.

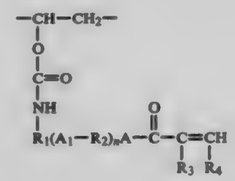
4,720,186
FOLDING EYEGLASSES
Roger Douillard, 66 Columbus Ave., Valhalla, N.Y. 10595
Filed Nov. 27, 1985, Ser. No. 802,387
Int. Cl.[4] G02C *5/08, 5/16, 1/00*
U.S. Cl. 351—63 **7 Claims**



1. A pair of folding eyeglasses comprising:
a first and a second frame member each having a separate hollow sleeve along the upper portion and the lower portion thereof and a lens mounted between said sleeves, said frame further including a pair of adjustable nose pads each having upper and lower projecting members slidable within the corresponding hollow sleeves, a downwardly extending portion therebetween and an outwardly extending bridge portion and means on said portion coupling the pads together,
a first and a second flexible temple bar extending outwardly from a corresponding frame member, said
temple bars having resilient means at an intermediate point and terminating in a downwardly extending ear piece portion.

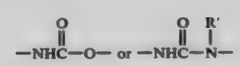
4,720,187
POLYVINYL ALCOHOL DERIVATIVES CONTAINING PENDANT (METH)ACRYLOYL UNITS BOUND THROUGH URETHANE GROUPS AND CROSSLINKED HYDROGEL CONTACT LENSES MADE THEREFROM
Merrill Goldenberg, Teaneck, N.J., and Karl F. Mueller, New York, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 812,651, Dec. 23, 1985, Pat. No. 4,670,506. This application Jan. 8, 1987, Ser. No. 1,310
Int. Cl.[4] G03B *21/46*
U.S. Cl. 351—160 R **10 Claims**

1. A hydrated contact lens prepared by crosslinking a polymer in the presence of an organic solvent and a free radical initiator, in a contact lens mold, and equilibrating the resultant swollen crosslinked polymeric material in an aqueous medium to recover said hydrated contact lens, wherein said polymer is an organic aprotic solvent soluble polymer which is a derivative of a polyvinyl alcohol having a weight average molecular weight of at least about 2,000, containing an effective amount between about 0.5 to about 20 percent, based on the number of hydroxyl groups on said polyvinyl alcohol, of units of the formula



(I)

wherein
R_1 and R_2 are independently straight or branched chain alkylene of 2 to 8 carbon atoms, arylene of 6 to 12 carbon atoms, a saturated cycloaliphatic divalent group of 6 to 10 carbon atoms, aralkylene of 7 to 14 carbon atoms, or aralkarylene of 13 to 16 carbon atoms;
n is 0 or 1;
A_1 is



where R′ is hydrogen or lower alkyl;
A is —O—, —NH— or

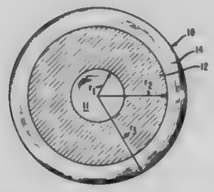


where R″ is hydrogen or lower alkyl;
R_3 is hydrogen or methyl; and
R_4 is hydrogen, methyl or —$COOR_5$ where R_5 is hydrogen or lower alkyl with the proviso that when R_3 is methyl then R_4 is hydrogen.

4,720,188
PROCESS FOR MANUFACTURING COLORED CONTACT LENSES AND LENSES MADE BY THE PROCESS
Julius Z. Knapp, Somerset, N.J., assignor to Schering Corporation, Kenilworth, N.J.
Continuation of Ser. No. 778,947, Sep. 23, 1985, Pat. No. 4,704,017, which is a continuation-in-part of Ser. No. 600,860, Apr. 16, 1984, Pat. No. 4,582,402, and Ser. No. 628,868, Jul. 9, 1984, abandoned. This application Jan. 25, 1987, Ser. No. 66,367
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.[4] G02C *7/04*; D06P *5/00*
U.S. Cl. 351—177 **20 Claims**

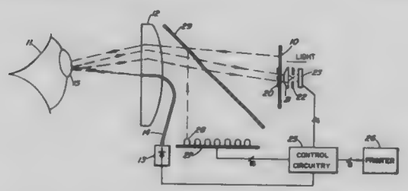
1. In a process for manufacturing a colored contact lens comprising providing a transparent contact lens, applying a colorant to the surface of such contact lens and rendering the colorant resistant to removal by ocular fluids, where the contact lens has a central pupil section and an iris section surrounding such pupil section, the improvement comprising applying the colorant in an intermittant pattern, the elements of the pattern being undiscernable to the ordinary viewer, over the entire iris section in a manner such that at least about ten

percent of the iris section is covered and such that a sufficient amount of the iris within the interstices of the pattern is left



uncovered to permit visualization of the structure of the iris of the lens wearer's eye.

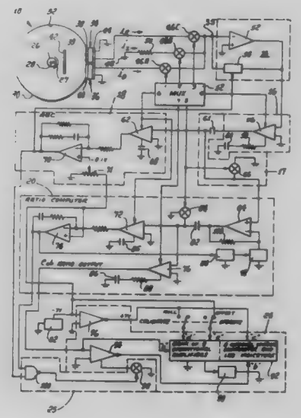
4,720,189
EYE-POSITION SENSOR
Jan Heynen, Ottawa, and David A. Kahn, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jan. 7, 1986, Ser. No. 816,787
Int. Cl.[4] A61B *3/14*
U.S. Cl. 351—210 **7 Claims**



1. In an eye-position sensor which provides a signal representative of the X and Y coordinates of light reflected from the cornea of an eye;
said eye-position sensor comprising:
a substantially point source of light for illuminating the eyel and
a light sensor including:
a quadrantal array of contiguous photo detectors each of which generates a signal which is proportional to the illuminated area thereof;
a lens for collimating the light from the point source of light reflected from the cornea of the eye, onto the quadrantal array of contiguous photo detectors;
said light sensor characterized by:
a spatial filter for providing a substantially rectangular pattern of light from said source which is specularly reflected from the eye onto the array so that each corner of the rectangular pattern lies in a different quadrant of the array;
the filter being disposed so that movement of the eye changes the position of the pattern illuminating the array.

4,720,190
LAMP ANALYZER
Jack E. Peterson, Chino, Calif., assignor to Dupree, Inc., Chino, Calif.
Filed Dec. 5, 1985, Ser. No. 804,882
Int. Cl.[4] G01J *5/30, 5/60*
U.S. Cl. 356—45 **11 Claims**

1. In a system for analyzing the color temperature of an incandescent lamp which provides radiation in the visible spectrum and having blue and red components, the combination of:
an input section for generating electrical analogs of the blue and red components of lamp radiation, in the form of first and second currents, respectively,
said input section including a first photosensor unit and a second photosensor unit for receiving lamp radiation and providing said first and second currents, respectively, a zero ground reference, and a first resistor connected to said zero ground reference for providing a third current as a reference current;
a multiplex system for multiplexing said first, second and third currents in time sequence;
a current-to-voltage converter for producing first, second and third voltages substantially proportional to said first, second and third currents, respectively, with said third voltage being a constant reference voltage,
said current-to-voltage converter including a first amplifier having said multiplexed currents as an input;
a ratio computer having said first, second and third voltages as inputs, for computing the ratio of said first and second voltages,
said ratio computer including sample-and-hold means controlled by said multiplex system for sampling said first and second voltages in sequence with said third voltage providing a reference; and



a display means for displaying color temperature as a function of said ratio, and including a meter and translating circuitry connecting said ratio computer output to said meter for translating said ratio computer output to the color temperature of the lamp;
said translating circuitry including:
a plurality of operational amplifiers, each having gain and offset adjustments;
a window comparator with a corresponding plurality of segments for selecting an operational amplifier for connection to said meter, each of said window comparator segments having a trip point;
first means for connecting the ratio computer output as an input to each of said operational amplifiers in parallel; and
second means for connecting the ratio computer output and a reference voltage to said window comparator in controlling relation for selecting an operational amplifier output for connection to said meter.

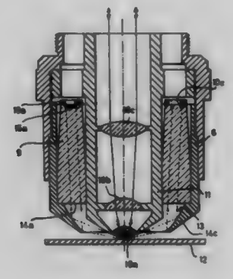
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,191

METHOD AND APPARATUS FOR LIGHT SPAN MICROSCOPIC DARK-FIELD DISPLAY OF OBJECTS

Augustin Siegel, Oberkochen, and Peter Seidel, Steinheim, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,763
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540916
Int. Cl.[4] G01N 21/47
U.S. Cl. 356—237 11 Claims



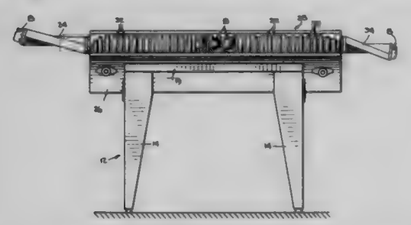
1. A method for light scan microscopic dark-field display of objects which comprises providing a light scan microscope having an optical system including a member chosen from the group consisting of an objective and a condenser, said microscope having an illuminating optical system which has an aperture, arranging a plurality of at least three detectors in a circle around said member and outside said aperture of said illuminating optical system, and subjecting output signals from said detectors to a logical "and" operation in such manner that a dark-field image display (y) takes place only when all detectors simultaneously give an output signal of comparable size.

4,720,192

GLASS BOTTLE INSPECTION UNIT

Beverly G. Willison, Akron, Ohio, assignor to FECO Engineered Systems, Inc., Cleveland, Ohio

Filed Apr. 16, 1985, Ser. No. 723,806
Int. Cl.[4] G01N 21/00
U.S. Cl. 356—240 5 Claims



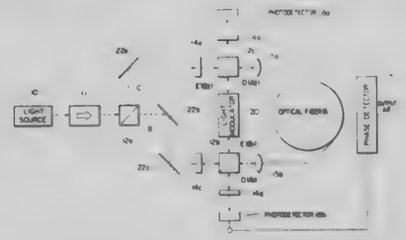
1. A glass bottle inspection unit comprising a conveyor for receiving and moving bottles through an inspection station, the conveyor having spaced carrier means defining an endless path, a plurality of generally cylindrical members supported for rotation at opposite ends by the spaced carrier members, the cylindrical members being spaced from each other and defining bottle receiving grooves therebetween, means for delivering bottles to the conveyor grooves for carriage through the inspection station, means for rotating the bottles as they move through the inspection station, and means for receiving bottles from the unit after being inspected.

4,720,193

OPTICAL FIBER GYROSCOPE

Hiromasa Miura, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Japan

Filed May 6, 1985, Ser. No. 730,565
Claims priority, application Japan, May 21, 1984, 59-100664
Int. Cl.[4] G01B 9/02; G01C 19/64
U.S. Cl. 356—350 3 Claims



1. An optical fiber gyroscope comprising first means for splitting an incident beam of light emitted from a coherent light source into first and second light components, second means for splitting said first light component into third and fourth light components, third means for splitting said second light component into fifth and sixth light components, optical fiber loop means disposed in a coil fashion, first and second photodetecting means for converting a light signal into a corresponding electric signal, fourth means for directing said third and fifth light components to pass through said optical fiber loop means in opposite directions, light modulating means comprising two optical frequency modulators operatively connected in series for finely adjusting the frequency of said fourth and said sixth light components passing therethrough in opposite directions, and phase detecting circuit means connected to both of said photodetecting means, wherein said third and fourth light components are directed by said third means so as to be received by said first photodetecting means in which said received light components interfere with each other, said fifth and sixth light components are directed by said second means so as to be received by said second photodetecting means in which said received light components interfere with each other, and wherein said phase detecting circuit means are operable to detect a phase difference from the outputs of said first and second photodetecting means, whereby the angular velocity of a rotary optical system is determined.

4,720,194

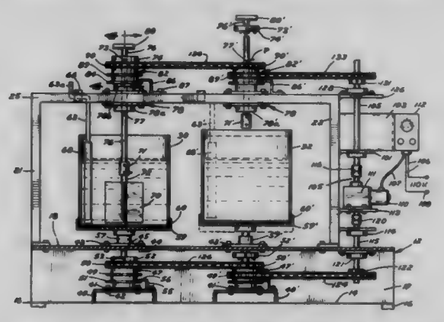
LIQUID MIXING APPARATUS

Donald R. Friedland, 8300 Dupont Ave. No., Minneapolis, Minn. 55444

Filed Jan. 16, 1987, Ser. No. 4,026
Int. Cl.[4] B01F 9/12
U.S. Cl. 366—221 8 Claims

1. An apparatus mixing liquid material, having in combination
- a supporting frame having a bottom wall and an upper cross member,
- a first bearing plate mounted onto said bottom wall,
- a support underlying said frame,
- a second bearing plate carried by said support underlying said first bearing plate,
- a first sprocket gear mounted onto said second bearing plate,
- a first shaft having said sprocket gear journaled thereon, extending therethrough and being journaled in said first and second bearing plates,
- a first clutch secured to said shaft in releasable driving engagement with said gear,
- a plate member,
- a mixing container carried by said plate member,

- means secured to said shaft supporting said plate member,
- a third bearing plate carried by said cross member vertically aligned with said first and second bearing plates,
- a second shaft extending vertically journaled in said third bearing plate,
- a second sprocket gear journaled onto said second shaft,



- a second clutch secured to said second shaft in releasable engagement with said second sprocket gear,
- a mixing blade releasably carried by said second shaft extending into said container,

driving means adjacent said frame, and

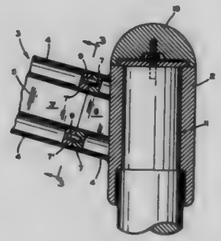
means in connection with said driving means driving said first and second sprocket gears at relative rates of speed.

4,720,195

AGITATOR

Klaus W. Röder, Bad Nauheim; Konrad Probst, Schopfheim, and Hans Schupper, Zell, all of Fed. Rep. of Germany, assignors to UHDE GmbH, Postfach and Ekato Rühr-und Mischtechnik GmbH, Dortmund, both of, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,943
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519647
Int. Cl.[4] B01F 7/16
U.S. Cl. 366—342 1 Claim



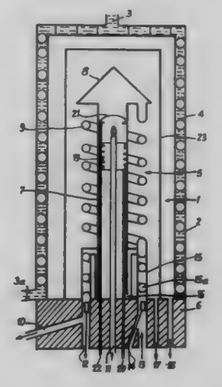
1. A agitator for use in a mixing vessel having a drive shaft and an opening through which the agitator can be inserted and removed, comprising:
- a hub adapted to be connected to the drive shaft in the mixing vessel;
- at least one radially extending arm having a smooth outer surface, said arm including a stub protion and a main portion, the stub and main portions of said one arm each including first and second spaced apart generally parallel longitudinally extending tubes;
- means located totally within the first and second tubes of the stub portion and the main portion of said one arm for releasably connecting the stub portion of said one arm to the main portion of said one arm;
- a first pair of spaced apart webs connecting the first and second spaced apart tubes of the stub portion of the said one arm, and a second pair of spaced apart webs connecting the first and second spaced apart tubes of the main portion of said one arm said webs completely enclosing said tubes and extending the entire length of said tubes thus creating a hollow space inside said one arm; and
- weld means joining said first and second webs of the respective stub portion and the main portion of said arm in abutting relation to form a completely smooth uninterrupted outer surface of said one arm.

4,720,196

METHOD AND APPARATUS FOR MEASURING THE HEATING POWER OF COMBUSTIBLE GASES

Lucien Mondell, Mortaas, and Francois Robert, Treapocy Prolongée, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Jun. 18, 1986, Ser. No. 875,600
Claims priority, application France, Jun. 18, 1985, 85 09238
Int. Cl.[4] G01N 25/40
U.S. Cl. 374—37 12 Claims



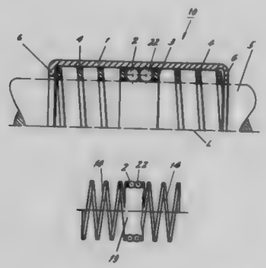
1. A method for continuously measuring the calorific value of a combustible gas utilizing a calorimeter having an annular internal cell containing a reference gas and an annular external cell containing said combustible gas, both of said cells surrounding a central chimney, comprising the steps of:
- supplying, to a burner located in said housing, a combustible gas and combustion air, and burning said combustible gas in said burner;
- monitoring the pressure differential in said annular internal and external cells by a pressure sensor means, and maintaining said pressure differential substantially constant;
- maintaining the ratio of the temperature of the burnt gas exiting said burner to the temperature of said combustion gas being supplied to said burner at a value substantially close to 1 by regulating the amount of heat added to said calorimeter; and,
- maintaining said combustion air being supplied to said burner at its water saturation limit by passing said combustion air through a humidifier.

VOL 1086 ISS 3 JA 19 1988 UMI

4,720,197
BALL SLEEVE FOR GUIDING AXIALLY DISPLACEABLE PARTS

Gunter Schurting, Gochsheim, and Bernhard Broser, Bergrheinfeld, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 928,848
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539860
Int. Cl.[4] F16C *29/04, 33/46;* F16F *1/06*
U.S. Cl. 384—49 13 Claims



1. A device for guiding axially displaceable elements, said device including:
- a sleeve, a rod extending through said sleeve, a plurality of roller bearing elements interposed between said rod and said sleeve, a closed annular constituting cage means positioning said bearing elements in an array surrounding said rod, and coil springs extending from opposite axial sides of said annulus;
- said coil springs being disposed within said sleeve at opposite ends thereof and surrounding said rod;
- said coil springs being formed integrally with said cage means.

4,720,198
HINGE BEARING INCLUDING A TAPERED PIN AND BUSHING

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Jul. 28, 1986, Ser. No. 890,028
Int. Cl.[4] E05D *11/00*
U.S. Cl. 384—246 6 Claims

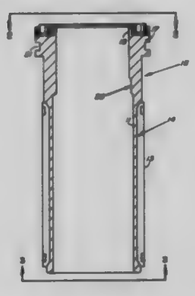


1. A bearing comprising a one-piece housing having a one-piece wall defining an opening of circular cross-section, said opening having a tapered portion and having a substantially cylindrical portion, an elongated spindle of circular cross-section having first and second ends, said housing being made of a material which is softer than the material of said spindle, said spindle having a first end portion formed with a first taper which diminishes in diameter upon progressing toward the first end of the spindle, said taper being shaped to seat against said tapered portion of said opening, a second taper formed on said spindle and diminishing in diameter upon progressing toward the second end of the spindle, a bushing telescoped into said cylindrical portion of said opening and telescoped over said spindle, the inner periphery of said bushing being formed with a taper shaped to seat against said second taper, and means captivating said bushing axially in a substantially fixed position in said opening whereby said bushing holds said spindle axially in a substantially fixed position in said opening by virtue of engagement of the taper of said bushing with the second taper of said spindle.

4,720,199
BEARING STRUCTURE FOR DOWNHOLE MOTORS

Bela Geczy; James N. McPherson, and Robert G. Toth, all of Orange, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Sep. 3, 1986, Ser. No. 903,229
Int. Cl.[4] F16C *17/10;* E21B *4/02*
U.S. Cl. 384—282 2 Claims



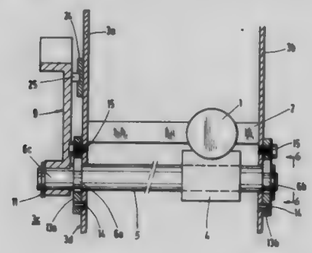
1. A bearing structure for mounting to a drive shaft comprising:
- a generally cylindrical unitary bearing sleeve having an annular surface at one end thereof said annular surface being positioned concentrically about the axis of said cylindrical unitary bearing sleeve;
- a radial bearing surface attached to said sleeve, said radial bearing surface comprising a blend of macro-crystalline tungsten carbide powder and cemented tungsten carbide cobalt chips in a copper base infiltrant;
- a generally planar retainer ring having a number of through holes therein;
- a plurality of polycrystalline diamond faced thrust bearing inserts, one mounted in each of said through holes; and
- brazing material rigidly bonding said ring and said inserts to said annular surface, concentric with said axis, and rigidly bonding said inserts to said ring.

4,720,200
ADJUSTING THE DISTANCE OF A PRINT HEAD FROM A PLATEN

Guenter Gomoll, Nersingen/Leibi; Wolfgang Hauslaib, Langenau, and Gustav Frank, Neu-Ulm/Pfuhl, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,980
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3608001
Int. Cl.[4] B41J *11/20*
U.S. Cl. 400—59 5 Claims

1. Device for adjusting the spacing between a print head mounted on a carriage riding on a rail means, and a print platen along which the print head travels, there being a printer frame in which the platen is mounted, the frame having two side walls structures comprising:
- the rail means including a round bar traversing the carriage and causing the carriage to move towards and away from the platen as the shaft moves in a direction transversely to its extension, the bar being held in slots in the side wall structure permitting this movement;
- first and second eccentric cam means on opposite ends of the bar having similarly oriented eccentricities;
- two adjustably positioned plate means on the side wall structure each having a reference surface;
- spring means for urging the first and second eccentric cam means respectively against the reference surfaces of the plate means;

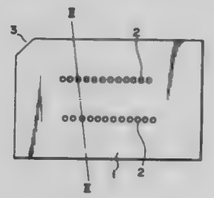


- a third eccentric cam means on the bar having an eccentricity that is particularly oriented to the first and second eccenter cam means; and
- a latching handle means on the third eccentric cam means such that the angular disposition of the handle means is a precise indication of the position of the first and second cam means and, thereby, of the spacing of the bar from the plate.

4,720,201
PRINTER GUIDE MEMBER

Kiyoshi Nakamura; Syozi Okada, both of Yokohama, and Toshio Kamiyama, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1985, Ser. No. 777,738
Claims priority, application Japan, Sep. 27, 1984, 59-202716
Int. Cl.[4] B41J *3/12;* C04B *35/58*
U.S. Cl. 400—124 11 Claims

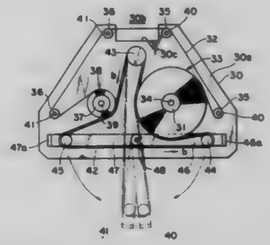


1. A printer guide member comprising:
- a ceramic sintered body having a plurality of guide holes therein, each said guide hold having an inner surface on which is formed a layer of whiskers, said sintered body consisting essentially of:
- (a) not less than 60% by weight of Si_3N_4;
- (b) not more than 10% by weight of Al_2O_3; and
- (c) at least one component, as an additive, selected from the group consisting of:
  - (i) not more than 10% by weight of a rare earth element oxide,
  - (ii) not more than 10% by weight of AlN, and
  - (iii) not more than 10% by weight of at least one oxide selected from the group consisting of TiO_2, MgO and ZrO_2.

4,720,202
PRINT RIBBON REPLACEABLE CASSETTE

Masanori Kawakami, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,216
Claims priority, application Japan, Oct. 12, 1984, 59-213774
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 8 Claims



1. A print ribbon cassette comprising:
- a supply roll of print ribbon detachably and rotatably supported in said cassette;
- a take-up roll detachably and rotatably supported in said cassette for taking up the print ribbon unwound from said supply roll;
- guide means for guiding the print ribbon unwound from said supply roll to said take-up roll through a printing section where the print ribbon extends exterior of said cassette;
- a driving roller provided in said cassette such that said driving roller may be coupled to a driving source of a printer when said cassette is mounted on said printer;
- a pair of support arms which are pivotally supported in said cassette and each of which carries thereon a rotatable belt roller; and
- an endless belt extending around said driving and belt rollers such that said endless belt advances as said driving roller is driven to rotate, wherein said support arms are manually movable between a first position, at which said belt rollers are separated from each other and are substantially at opposite sides of said supply and take-up rolls with respect to said driving roller and said endless belt is in driving engagement with said supply and take-up rolls and a second position, at which said endless belt is effectively disengaged from said supply and take up rolls and said belt rollers are located closer together than when at said first position and said endless belt extends generally straight from said driving roller to said belt rollers between said supply and take-up rolls.

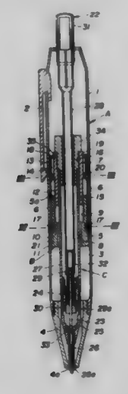
4,720,203
PUSH-BUTTON TYPE MECHANICAL PENCIL

Shoji Shimada, Tokyo, Japan, assignor to Iwasaki Kinzoku Kogyo Co., Ltd., Japan

Filed May 6, 1986, Ser. No. 860,132
Claims priority, application Japan, May 16, 1985, 60-104871
Int. Cl.[4] B43K *21/22*
U.S. Cl. 401—94 1 Claim

1. A push button type mechanical pencil comprising a barrel consisting of upper and lower barrel members which are engaged with each other at a substantially vertically-intermediate portion of said barrel; a unit structure of a rotatable construction which combines said upper and lower barrel members with each other, and which consists of a connecting cylinder provided at the lower portion thereof, having a female screw in the inner surface of a central bore therein and fitted closely in said upper barrel member, a guide cylinder rotatably attached around the upper portion of said connecting cylinder and engaged tightly with the inner surface of said lower barrel member to thereby set said upper and lower barrel members

relatively rotatable with respect to each other, and a movable cylinder which has in and on its outer circumferential surface slits and a male screw engaged with said female screw in said connecting cylinder, and which is thereby set axially movable owing at least in part to the screw pair in said movable cylinder and said connecting cylinder; guide members consisting of said slits in the outer circumferential surface of said movable cylinder and guide projections on a part of the inner circumferential surface of said guide cylinder which is fitted around said movable cylinder, which slits and projections are engaged with each other unitarily to guide the displacement of said movable cylinder straight in the axial direciton thereof; and a lead-extruding structure which is held in said barrel, and which



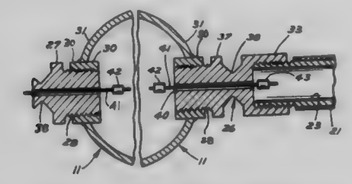
consists of an extrusion unit capable of extruding the lead in a stepped manner by a very small length at a time by the operations of a chuch provided at a lower portion of a push-down tube and a tightening ring fitted around said chuck, a push-button member projecting from the rear end of said barrel, a protective pipe provided at the lower end of said lead-extruding structure so as to extend toward an end bore in a metal tip, and an outer tube provided on the outer side of said push-down tube and fixed to said movable cylinder so that said lead-extruding structure can be operated in accordance with the movement of said movable cylinder, said protective pipe in said lead-extruding structure being projected by an arbitrary length from the free end of metal tip by turning either of said two barrel members.

4,720,204

BANNER ARM BREAK-AWAY DEVICE

Dale L. Johnson, Glencoe, Minn., assignor to Sterner Lighting Systems Incorporated, Winsted, Minn.

Filed Oct. 23, 1986, Ser. No. 922,206
Int. Cl.⁴ F16D *1/00*
U.S. Cl. 403—24 **10 Claims**



5. A banner support assembly comprising a pole for supporting a banner, first and second banner support arms spaced apart in direction along the longitudinal axis of said pole, each of said support arms having means for mounting the arm to extend laterally from said pole comprising:

a coupling member for each of said arms having first and second portions; said first portion being rigidly mounted to said pole, said second portion being mounted to said respective support arm; and

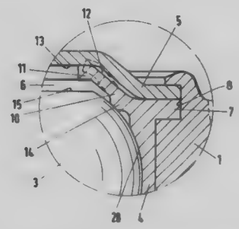
a rigid frangible portion mounting said respective first and second portions together and being selected in strength to fracture under loads on a banner supported on said support arm prior to failure of the supporting pole.

4,720,205

BALL JOINT

Elichi Ito, Meerbusch, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 8,867
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602917
Int. Cl.⁴ F16C *11/06*
U.S. Cl. 403—140 **8 Claims**



1. A ball jount comprising:

a housing having a cover;

a ball stud having a ball portion disposed in the housing; and

a bearing disposed between the housing and the ball portion and having an end portion and spring arms;

the spring arms being disposed in a radial array, engaging the ball portion at one end and then extending spaced therefrom in a direction away from the ball portion;

each of the spring arms having one end thereof connected to the end portion of the bearing and the other end thereof extending toward the longitudinal central axis of the ball stud, said other end being spaced from the ball portion and engaging the cover to thereby exert a force against the ball portion;

the housing cover having a cup-like projection extending outwardly from the ball jount, the other ends of the spring arms engaging a cylindrical inner surface of said cup-like projection.

4,720,206

TOOL HANDLE FASTENING CLIP

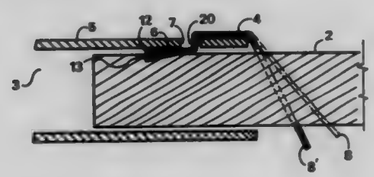
Paul C. Aquilina, Kitchener, Canada, assignor to Melnor Manufacturing Ltd., Brantford, Canada

Filed Jun. 5, 1986, Ser. No. 870,902
Claims priority, application Canada, May 30, 1986, 510529
Int. Cl.⁴ B25G *3/02*; F16D *1/00*
U.S. Cl. 403—361 **11 Claims**

1. In combination, a tool, a handle, and a clip for securing the shaft of said handle in a shaft-receiving opening in said tool, said clip comprising:

a central portion for positioning on the structural portion of the tool which surrounds said shaft-receiving opening;

a tab portion integral with said central portion, configured for projecting through a radially-directed slot in said structural portion of the tool which surrounds said shaft-receiving opening; one of said central portion and said tab portion being configured for positioning on the interior of said structural portion of the tool which surrounds said shaft-receiving opening, and the other on the exterior, whereby by virtue of said tab portion passing through said radially-directed slot, and by virtue of the interior one of said central portion and said tab portion being jammed within said shaft-receiving opening when the handle shaft is inserted, said slip is secured against axial movement in said tool; and



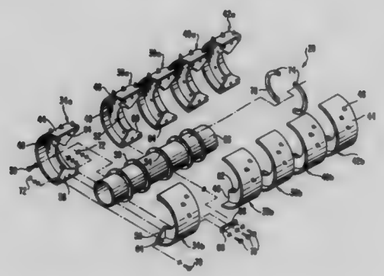
shaft-engaging means integral with said central portion, extending therefrom towards the shaft-receiving opening so as to present to a handle shaft installed in said shaft-receiving opening at least one edge angled and biased towards said handle shaft generally in the direction of insertion of said handle shaft for engaging said handle shaft to thereby resist withdrawal of said handle shaft.

4,720,207

SEGMENTED ROTOR

C. Ranjan Saiani, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 29, 1986, Ser. No. 901,876
Int. Cl.⁴ E01C *23/12, 19/26*
U.S. Cl. 404—90 **22 Claims**



1. In a road or soil working machine having a rotor of predetermined width and cutting teeth mounted on the rotor for cutting a strip of corresponding width in a surface, the improvement comprising:

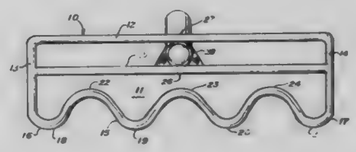
the rotor including a shaft, a plurality of segments each having a circular shape and defining together a width equal to said predetermined width, and a plurality of said cutting teeth mounted on each of said segments, said segments including a plurality of subsegments each defining a sector of said circular shape, said rotor further including first means for removably attaching each said subsegment to said shaft, second means for removably attaching each said subsegment to the other subsegment of the same segment, whereby any number of segments can be added to and removed from said shaft without disconnecting said shaft from said road working machine, in order to define a rotor having a width different from said predetermined width, and third means for removably attaching each said rotor segment to adjacent rotor segments.

4,720,208

AGGREGATE LEVELING RAKE

Anthony M. Spigarelli, 18425 Lakeview Point Dr., Wyoming, Minn. 55092

Filed Jun. 26, 1986, Ser. No. 879,047
Int. Cl.⁴ E01C *19/20*
U.S. Cl. 404—97 **8 Claims**



1. An aggregate leveling rake comprising in combination;

a flat, rigid, planar frame comprised of a continuous peripheral member having top and side portions, means for distributing and leveling a layer of aggregate comprising a rounded configuration on the bottom adjacent the lower sides and an intermediate member disposed generally parallel to the top and extending intermediate the sides; and

a handle-receiving socket connected to the center portions of said top and intermediate members and extending perpendicularly thereto and angularly upwardly with respect to the plane of said frame.

4,720,209

DRYWELL STRUCTURE

Donald R. Isaac, 4530 W. Buffalo St., Chandler, Ariz. 85226

Filed Sep. 30, 1986, Ser. No. 913,266
Int. Cl.⁴ E02B *11/00*
U.S. Cl. 405—36 **19 Claims**



1. An improved drywell structure of the type having a liner means below a ground surface and having an open top in liquid receiving communication with the ground surface, said liner means defining a chamber for receiving drain water from the ground surface and directing it into a depending drain pipe means which leaches the water into subterranean soil, said improvement comprising:

a drain water filtration and intake means in the chamber defined by the liner means and in liquid communication

with the depending drain pipe means for filtration of silt and other foreign materials from the drain water prior to its being directed into the depending drain pipe means, said drain water filtration and intake means including.

(a) a perforated intake pipe in the chamber defined by the liner means of the drywell structure, said intake pipe having one end which is in liquid communication with the depending drain pipe means and having a closed opposite end, and

(b) a filtration fabric mounted on the periphery of said intake pipe so as to cover at least the perforations thereof.

4,720,210

APPARATUS FOR GENERATING WAVES

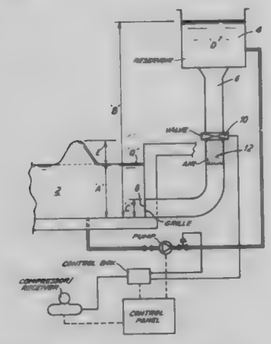
William F. Stonor, 68 Elmfield Road, Gosforth, Newcastle upon Tyne, NE3 4XA; Neil F. Taylor, The Grange, 7 North Road, Ponteland, Newcastle upon Tyne, NE20 9UH; David J. Whittingham, 15 Rookery Close, Mottram Rise, Stalybridge, Cheshire, and Alan R. Hough, 3 Mark Wood, Delph, Oldham, Lancashire, all of England

Filed Feb. 11, 1987, Ser. No. 13,531

Claims priority, application United Kingdom, Feb. 17, 1986, 8603895

Int. Cl.[4] A47K *3/10*

U.S. Cl. 405—79 **6 Claims**



1. Apparatus for generating waves in a swimming pool having a quiescent water level therein, the apparatus comprising a reservoir independent of and separate from the pool, a volume of water within the reservoir, at least one inlet communicating into the lower regions of the swimming pool and adapted to be supplied with water from said volume within the reservoir, at least one flow path for each inlet, through which water from the reservoir is fed to the associated inlet, a flow control valve in each flow path, and, defined within each flow path downstream of the associated control valve, a volume of air for entrainment with the water flowing to the swimming pool such that, on entry of the water into the swimming pool, a wave having a turbulent, air-containing wake is formed.

4,720,211

APPARATUS FOR REPLACING MAINS

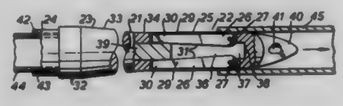
Roy Streatfield, Bilsborrow, Nr. Preston, and Francis D. Wilson, Blackburn, both of England, assignors to British Gas Corporation, England

Continuation of Ser. No. 842,767, Mar. 21, 1986, which is a continuation of Ser. No. 478,361, Mar. 24, 1983, abandoned, which is a division of Ser. No. 326,138, Nov. 30, 1987, abandoned. This application Aug. 4, 1986, Ser. No. 892,322

Claims priority, application United Kingdom, Dec. 2, 1980, 8038655

Int. Cl.[4] F16L *55/18, 1/00*

U.S. Cl. 405—154 **36 Claims**



1. Apparatus for fracturing and expanding buried fracturable pipe of a crackable fracturable material and positioning a replacement pipe with its centerline substantially coincident with said buried fracturable pipe, comprising:

(a) an elongated pipe fracturing and displacement apparatus having a generally frusto-conical pipe fracturing and expanding portion having a small extremity not greater than the internal diameter of said buried fracturable pipe and a large extremity at least as great as the external dimension of said replacement pipe, said pipe fracturing and expanding portion compriaing fracturing means for applying an intense local pressure against the buried pipe, upon being moved through said buried fracturable pipe, to reduce said buried fracturable pipe to a multitude of pipe fragments of irregular form, and the said large extremity of said fracturing and expanding portion comprising a means for forcing said pipe fragments radially outwardly, generally about the said centerline, into the soil within which said fracturable pipe is buried, said fracturing means being operable to cause at least some outward movement of the fragments under the action of said intense local pressure which causes the fracturing of the pipe into irregular fragments;

(b) means for moving said pipe fracturing and displacement apparatus through said buried fracturable pipe; and

(c) connector means mounted on said apparatus at the trailing portion of said pipe fracturing and expanding portion, said connector means adapted for connection to the leading end of said replacement pipe whereby said replacement pipe is moved linearly into the passage occupied by said buried fracturable pipe upon the fracturing and expansion thereof.

4,720,212

METHOD AND APPLIANCE FOR LAYING A SHEET OF MATERIAL IN THE GROUND

Bastiaan G. Steenbergen, Essen, Belgium, and Arie A. Hofman, Reukum, Netherlands, assignors to Digging Trading Company N.V., Klaaswaal, Netherlands

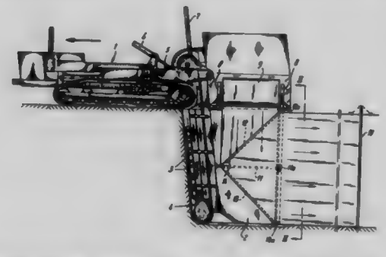
Filed Feb. 13, 1986, Ser. No. 828,998

Claims priority, application Netherlands, Feb. 14, 1985, 8500421

Int. Cl.[4] E02F *5/10*; **F16L** *1/02*; **E02B** *11/00*; **E02D** *31/02*

U.S. Cl. 405—176 **4 Claims**

1. Method for laying a sheet of material in the ground, wherein a trench is dug in the ground and the sheet is passed into the trench while being unwound from a stock roll, the sheet of material being fed, with its longitudinal dimension in a downward direction, into the trench from the stock roll located above ground level, and deflection means for turning the longitudinal dimension of the sheet, within the trench, to extend longitudinally in said trench; the method comprising the steps of introducing the sheet of material into the trench folded



on itself along its length, unfolding said sheet into an approximately vertical plane, and extending said sheet along the trench.

4,720,213

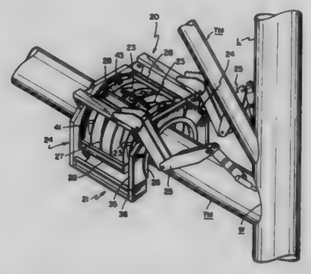
APPARATUS FOR INSPECTING, CLEANING AND/OR PERFORMING OTHER TASKS IN CONNECTION WITH A WELDED JOINT

Michael L. Gernhardt, Houston, and Edward W. Hughes, Jr., Katy, both of Tex., assignors to Oceaneering International, Inc., Houston, Tex.

Filed Mar. 16, 1987, Ser. No. 26,282

Int. Cl.[4] B63C *11/52*

U.S. Cl. 405—190 **6 Claims**



1. Apparatus for use in inspecting, cleaning and/or performing other tasks in connection with a welded joint between intersecting tubular members of an offshore platform which are located a substantial depth beneath the water surface, comprising a support body including a main portion having a throat in one side thereof so that it may be moved onto one of the tubular members whose peripheral end edge is welded to the other member, and means connected to the main portion for movement between outer positions to the side of the throat to permit the body to be moved onto or removed from the one member, and inner position tightly engaged with the one member for clamping the body thereabout, a carrier mounted on the support body for rotation thereabout and having a throat in one side thereof which, when the carrier is in a first rotative position, is generally aligned with the body throat to permit the carrier to be moved with the body onto or removed from the one tubular member, said carrier having means thereon for inspecting and/or cleaning the joint as the carrier is rotated into other positions about the body, and means responsive to the supply of power from a remote source for moving the clamping means between inner and outer positions, rotating the carrier about the body, and activating the means for inspecting, cleaning and/or performing other tasks in connection with the joint, said means for rotating the carrier comprising pins mounted on the carrier in circumferentially spaced relation to form a partial ring of teeth extending concentrically of the axis of rotation of the carrier generally from one side to the other of the throat in the carrier, pinion gears mounted on the main body portion with their teeth arranged to successively move into and out of the open spaces between the pins in order to rotate the carrier upon rotation of the pinion gears, and means on the body for so rotating the pinion gears.

4,720,214

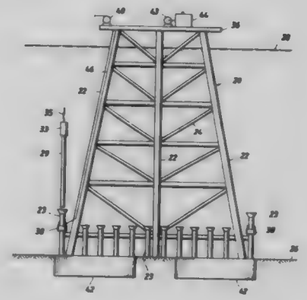
MUDMAT DESIGN

Lee K. Branted, Kingwood, Tex., and Edward S. Piter, Tulsa, Okla., assignors to Shell Offshore Inc., Houston, Tex.

Filed May 21, 1986, Ser. No. 865,329

Int. Cl.[4] E02B *17/02*; **E02D** *5/74*

U.S. Cl. 405—227 **18 Claims**



1. An apparatus for positioning and levelling an offshore platform jacket on the ocean floor and restraining it against lateral and vertical movement, said jacket comprising;

a plurality of substantially vertical legs having cross-bracing members, said legs being arranged in a closed pattern and adapted to extend downwardly to the ocean floor when positioned thereon;

a plurality of substantially vertical tubular sleeves fixedly secured to the bottom of said jacket at spaced intervals around the periphery thereof, said sleeves adapted to receive anchoring piles driven through said sleeves for securing said jacket to the ocean floor;

a plurality of holding and anchoring means for securing said piles to said sleeves affixed to and carried at the lower end of said jacket, at least one of said anchoring means being mounted adjacent each corner of said platform; and

mudmat footing means affixed to the bottom of the jacket and having a downwardly extending peripheral wall forming at least one chamber therein, said wall being adapted to penetrate the ocean floor.

4,720,215

RIVET DELIVERY SYSTEM

Pat S. Arena, Jensen Beach, Fla., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 666,882, Oct. 31, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 23,993

Int. Cl.[4] B65G *53/58*

U.S. Cl. 406—105 **3 Claims**

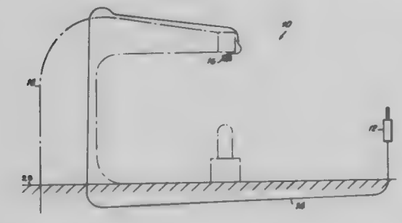
1. An apparatus for feeding rivets comprising:

a hopper for delivery of rivets to a riveting machine;

a conduit for delivery of rivets to said hopper, said conduit having means to position said rivets for delivery to said hopper;

a rivet delivery means connected to said hopper, said rivet delivery means having a housing having a partition dividing an upper chamber from a lower chamber therewithin, a cylindrical tube passing through said housing, said tube having one end connected to said conduit and the other

end extending above said housing and being closed save for a slot to receive rivets, at least one relief bore leading from the interior of the tube to the lower chamber, at least one angled bore leading from the upper chamber to the interior of the tube above said relief bore, inlet means connect to said upper chamber and outlet means connected to said lower chamber;



a reciprocating sleeve operatively arranged on said cylindrical tube to be movable over the slot of said tube after inserting a rivet therethrough to close said slot;

a first flow control means for delivering air under pressure to said inlet means for said upper chamber; and

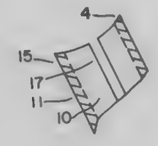
a second flow control means for controlling exhaust of air from said lower chamber.

4,720,216

CYLINDRICAL CUTTING TOOL

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Jan. 18, 1985, Ser. No. 692,426
Int. Cl.[4] B23B *39/00*
U.S. Cl. 407—113 2 Claims



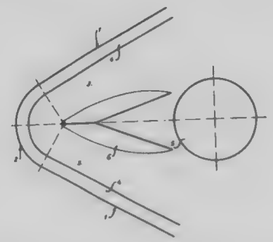
1. A device for machining materials said device including a tool bit comprising a circular cylindrical rod having an external cylindrical surface, a first end with an internal first surface, a circular cutting edge formed at the intersection of said external surface and said internal first surface, a second end with a second surface, a hole extending longitudinally from said second surface to said first surface and means for supplying lubricating fluid to said cutting edge, said means including an elongated stem located in said hole, said stem having first and second stem ends connected by a bore, said first stem end having a round side and cap located within a recess formed by the internal surface formed by the internal surface of said rod, an opening in said round side adjacent said cap, said opening communicating with said bore, and said second stem end protruding from said hole at the second surface of said rod, whereby lubricating fluid may be supplied to said bore at said first stem end to lubricate material being machined at said cutting edge.

4,720,217

CUTTER BIT FOR MACHINING BY CHIP REMOVAL

Christian Bonjour, Nyon, and Charles Hauser, Genolier, both of Switzerland, assignors to Stellram S.A., Nyon, Switzerland

Filed May 4, 1982, Ser. No. 374,738
Claims priority, application Switzerland, May 19, 1981, 3247/81
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—114 5 Claims



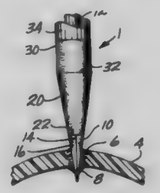
1. In a cutter bit for machining by chip removal comprising at least one cutting edge, a nose and a chip-breaker formed by a throat disposed along the cutting edge; the improvement in which the chip-breaking throat is bounded toward the interior of the bit by a heel, the height of this heel relative to the bottom of the throat declining from the nose in a direction toward the center of the bit, the heel being pyramidal and being defined on two sides by first surfaces that rise from the throat and that intersect each other along a first line lying in a plane that bisects the nose and that rises in a direction from the nose toward the center of the bit, the heel being defined by a third surface that intersects each of said first surfaces along second lines that meet but diverge from said first line in a direction away from the nose, said second lines being inclined downwardly relative to said cutting edge in a direction away from the nose.

4,720,218

COMBINATION DRILLING AND DRESSING BIT

Rene F. DeFries, and Arthur D. Riley, both of Winnipeg, Canada, assignors to The Boeing Company, Seattle, Wash.

Filed May 1, 1987, Ser. No. 45,613
Int. Cl.[4] B23B *51/00*
U.S. Cl. 408—145 9 Claims



1. A bit for producing and dressing holes, comprising:

a pointed tapered drill portion including sharp cutting edge means for producing a hole, said drill portion having a first maximum diameter;

a grinder portion including generally frustoconical abrasive outer surface portions extending generally axially inwardly from the drill portion for enlarging the hole, said grinder portion having a second maximum diameter larger than said first maximum diameter; and

a reamer portion including essentially cylindrical abrasive outer surface portions that are axially inward continuations of said surface portions of the grinder portion for finishing the hole.

4,720,219

REBORING TOOL

Steven J. Masonek, 7475 Cana Hwy., Chico, Calif. 95926, and Frederick N. Rabo, 2120 Oro-Chico Hwy., Durham, Calif. 95938

Filed Apr. 9, 1987, Ser. No. 36,334
Int. Cl.[4] B23B *51/08*
U.S. Cl. 408—201 8 Claims



1. A reboring tool for removal of cut off or broken portions of plastic pipe and the glue that adheres the plastic pipe to the internal surface of plasic pipe fittings and plastic coupler joints, comprising:

an arbor;

said arbor a single shank member sectioned into two portions,

there being a drill chuck receiving end portion and a tool securing end portion;

said drill chuck receiving end portion constituting substantially one half the length of said shank is smooth surfaced to a diameter for transversing a retainer nut;

said tool securing end portion threaded to receive said retainer nut, said threads terminating at a screw nut head;

an internal guide disc;

said internal guide disc being cylindrically sized to the internal diameter of the portion of pipe to be removed, there being a centrally aligned aperture for passage of said arbor therethrough;

a cutting head;

said cutting head having multiple protrusions radially aligned at the circumference of a support disc with said protrusions angled and sharpened to produce plastic chips when rotated in contact with plastic pipe and said disc apertured centrally to accommodate said arbor;

a retainer nut;

said retainer nut sized to pass freely along said smooth portion end of said arbor shank and threaded cooperatively with said threaded portion of said arbor shank;

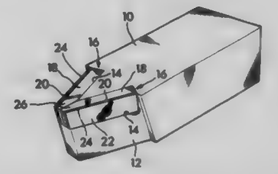
said reboring tool constituting the assemblage of said internal guide disc positioned through said aperture on said threaded portion of said arbor shank adjacent said shank screw head and juxtaposed with said cutting head similarly attached and having said internal guide disc and said cutting head secured by said retainer nut tightened on said arbor shank threaded portion bearing against said cutting head.

4,720,220

TOOL FOR MACHINING TOOTH FLANKS AND METHOD OF FINISHING TOOTH FLANKS

Peter Bloch; Rudolf Fischer, both of Mutschellen, and Roman Schwaighofer, Geroldswil, all of Switzerland, assignors to Maag Gear Wheel & Machine Co. Ltd., Zurich, Switzerland

Continuation of Ser. No. 459,358, Jan. 19, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,399
Claims priority, application Switzerland, Feb. 2, 1982, 615/82
Int. Cl.[4] B23F *21/00*
U.S. Cl. 409—33 15 Claims



1. A tool for the material-removal machining of tooth flanks of a hardened workpiece having pre-formed teeth, said tool comprising:

at least one cutting blade holder;

at least one cutting blade mounted at said at least one cutting blade holder;

said cutting blade comprising a base member and a sintered-on cover layer formed of an an extremely hard polycrystalline cutting material;

said cutting blade forming a cutting surface and a clearance surface;

said cover layer containing a surface and one relatively narrow end face; and

each said cutting blade being arranged at said cutting blade holder with respect to a predetermined direction of an intended cutting movement such that said surface of said cover layer forms said clearance surface and said one relatively narrow end face of said cover layer is located in said cutting surface to form a relatively minor portion thereof.

4,720,221

MACHINE TOOL WITH AN ANGLE SPINDLE ATTACHMENT

Kengo Yoshioka, and Yoshihiko Nishida, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 12, 1986, Ser. No. 929,273
Claims priority, application Japan, Nov. 12, 1985, 60-253346
Int. Cl.[4] B23B *31/26;* B23Q *3/155*
U.S. Cl. 409—233 7 Claims

1. A machine tool, comprising:

a machine frame;

a spindle head movable on said machine frame and rotatably carrying a tool spindle;

an angle spindle attachment detachably mounted on said spindle head and carrying an attachment spindle rotatable by said tool spindle, the axis of said attachment spindle being inclinded at an acute angle relative to the axis of said tool spindle;

transmission means provided in said angle spindle attachment for transmitting the rotation of said tool spindle to said attachment spindle;

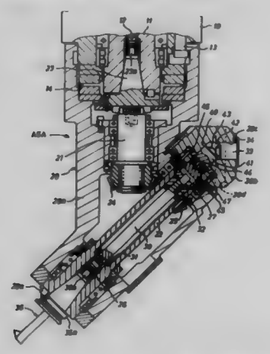
arresting means provided in said attachment spindle for arresting a tool holder received in a front end portion of said attachment spindle;

a draw bar mechanism provided in said attachment spindle and having a draw bar for drawing said arresting means axially of said attachment spindle by the action of spring means;

a push rod carried in said angle spindle attachment as a

portion near the rear end of said attachment spindle for axial movement in a direction prependicular to the axis of said tool spindle;

a thrust direction converting mechanism provided between the rear end of said attachment spindle and said push rod in said angle spindle attachment for converting the axial movement of said push rod into axial movement of said draw bar against said spring means; and



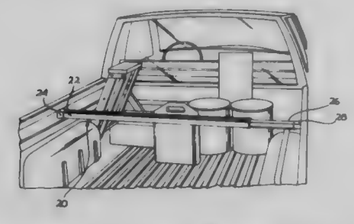
an unclamping device mounted on said machine frame and including an actuation rod axially movable in a direction perpendicular to the axis of said tool spindle, said actuation rod is engageable with said push rod of said angle spindle attachment mounted on said spindle head for axially moving said push rod to move through said thrust direction converting mechanism said draw bar against said spring means.

4,720,222

RESTRAINING BAR FOR PICKUP TRUCKS

Neil F. Nagy, 1310 Park Western Dr., #159, San Pedro, Calif. 90731, and William Palleva, 19014 S. Laurelbrook Pl., Cerritos, Calif. 90701

Filed Aug. 8, 1986, Ser. No. 894,935
Int. Cl.[4] B60P 7/14
U.S. Cl. 410—151 **14 Claims**



1. A restraining bar assembly comprising:

a first elongate bar having a first end for abutting a first surface, and a second end, said first bar having a longitudinal slot therein;

a second elongate bar having a first end for abutting a second surface, and a second end for sliding within said second end of said first bar;

a spring assembly means for biasing said first end of said first bar towards said first surface and said first end of said second bar towards said second surface, said spring assembly means comprising:

a lever means having a first end slidably mounted in said longitudinal slot of said first bar and rotatable between an unlocked position in which said first end of said lever means is freely slidable in said longitudinal slot and a locked position in which said first end of said lever means is held in a fixed position within said longitudinal slot;

a first spring means having a first end coupled to said second end of said second bar and a second end coupled to said lever means, said first string means movable by said lever means from a free position in which said first and second ends of said first spring means have a first relative separation to a spring loaded position in which said first and second ends of said first spring means have a second relative separation, such that rotating said lever means from said unlocked to said locked position moves said first spring means from said free position to said spring loaded position;

whereby as said lever mean is rotated to said locked position said first end of said first bar is biased by said first spring means towards said first surface and said first end of said second bar is biased by said first spring means towards said second surface

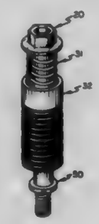
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4,720,223

CONTROLLED PRELOAD, SELF-RETRACTING CAPTIVE FASTENER ASSEMBLY

Paul D. Neights, and Jay M. Stafford, both of Torrance, Calif., assignors to Rexnord Inc., Brookfield, Wis.

Filed May 7, 1985, Ser. No. 731,810
Int. Cl.[4] F16B 43/00
U.S. Cl. 411—11 **5 Claims**



1. A self-retracting, controlled preload, captive fastener assembly adapted for installation in a first structure and securement with a second structure, said fastener assembly comprising:

a fastener having a predetermined length, an uppermost end, a lowermost end, a head at said uppermost end and a threaded portion proximate said lowermost end;

means, intermediate said fastener ends and captivated along said fastener length, for applying a predetermined preload when said fastener installed in a first structure is secured to a second structure;

means, isolated from said means for applying a predetermined preload, for biasing said fastener in a first direction relative to the second structure in which said fastener is installed, said means for biasing said fastener being captivated on said fastener length proximate said fastener uppermost end; and

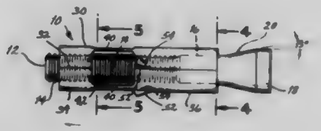
stop means, on said shank portion, for positioning said fastener, said means for applying a predetermined preload, and said means for biasing said fastener relative to a second structure for applying a controlled preload to the second structure.

4,720,224

SLEEVE ANCHOR

William H. Peterken, Higganum, Conn., assignor to United Industries Corporation, St. Louis, Mo.

Filed May 29, 1986, Ser. No. 868,411
Int. Cl.[4] F16B 13/06
U.S. Cl. 411—36 **5 Claims**



1. A sleeve anchor for use in a pre-drilled hole in concrete, brick, masonry and the like substrate materials, comprising a bolt threaded at one end for receiving a pressure member and including a shank providing at the other end a head of diameter greater than the shank, the head including a wedge-forming shoulder adjoining the shank, a sleeve disposed concentrically upon the bolt including an inner portion of petal-form configuration including three petals having distal ends presented for contacting the shoulder, the petals extending along the shank in closely-spaced side-by-side but separate relationship, the distal ends of the petals each defining in section a vee-shaped lobal prominence extending outwardly of the shank whereby the distal ends of the petals together form in section a figure of closed trilobular configuration, the sleeve being shiftable longitudinally upon the shank for setting in response to pressure upon the sleeve provided by the pressure member for causing the petal distal ends to ride up the shoulder for pressure engagement of substrate material interiorly of the hole for anchoring the sleeve anchor within the hole, the sleeve including pre-load structure for causing selective foreshortening of the sleeve to provide pre-loading of the sleeve anchor following setting in response to further pressure upon the sleeve provided by the pressure member, the pre-load structure comprising a collar of the sleeve disposed at its outer end and a plurality of rectilinear longitudinally extending pillars interconnecting the petals to the collar, the pillars being of narrow arcuate extent and between them windows of the sleeve of arcuate extent greater than the pillars, the collar including a collar-defining portion and each of the petals including a proximal end connected by a respective pillar to the collar-defining portion, each of the petals forming an ear disposed along a leading side edge of the petal for providing gripping antirotational engagement of interior surfaces of the hole, the pillars being torsionally deformed upon said further pressure for causing said foreshortening of the sleeve.

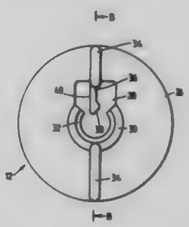
4,720,225

THREADED FASTENING SYSTEMS

David A. Burt, Berkshire, England, assignor to ITW Limited, Basingstoke, Great Britain

Filed Nov. 17, 1986, Ser. No. 931,716
Claims priority, application United Kingdom, Nov. 28, 1985, 8529274
Int. Cl.[4] F16B 39/32
U.S. Cl. 441—329 **2 Claims**

1. A threaded fastening system comprising a bolt of plastics material including a helically-extending rib forming a thread of more than one pitch in length, a plurality of substantially rigid webs being located between portions of the helically-extending rib on the bolt to form first discontinuities, and further comprising a nut of plastics material including a helically-extending rib forming a thread with a resiliently deflectable tongue being located beyond one end of the helically-extending rib on the nut to form a second discontinuity, the arrangement being such that threaded advance of the bolt relatively to the nut causes deflection and resilient return of the second discontinuity as it



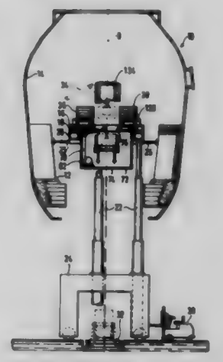
passes each of the first discontinuities, thereby providing a tangible indication of the extent of said threaded advance.

4,720,226

AUTOMATED APPARATUS FOR LINING THE INNER WALL OF A VESSEL WITH BRICKS

Edouard Legille, Luxembourg; Emile Lonardi, L-Bascharage, and Victor Kremer, Luxembourg, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Dec. 3, 1986, Ser. No. 937,587
Claims priority, application Luxembourg, Dec. 3, 1985, 86189
Int. Cl.[4] E04G 21/16
U.S. Cl. 414—10 **20 Claims**



1. Apparatus for lining the inner wall of a vessel with bricks comprising:

a work platform vertically movable within the vessel and capable of rotating about the vertical axis of the vessel, said work platform including two brick-pallet storage areas and automatic means for manipulating and laying bricks;

pallet-holder housing means including at least two superimposed compartments for respectively receiving a full pallet and an empty pallet;

basket means for carrying said housing means;

lifting means for raising or lowering said basket means, together with said pallet-holder housing means, to the level of said work platform and for releasing said pallet-holder housing means from said basket means; and

means for placing an empty pallet in said housing means and removing a full pallet therefrom.

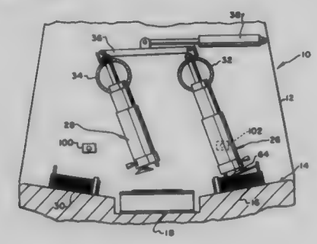
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,227

METHODS OF AND APPARATUS FOR STACKING BATTERY PLATES AND THE LIKE

William J. Eberle, 2812 Riverlake Ct., Irving, Tex. 75060

Continuation-in-part of Ser. No. 598,361, Apr. 9, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 834,624
Int. Cl.[4] B65H 39/04
U.S. Cl. 414—32 15 Claims



1. Apparatus for capturing topmost elements from supplies of battery elements and transferring the captured topmost elements to depository zones comprising:

a plurality of vacuum pick-up means, each said means comprising a flexible cup-shaped member having a central opening,

each said pick-up means having stationary sensing means remote from its said cup-shaped member for sensing variations in vacuum pressure applied to said cup-shaped member,

means independent of time responsive to said sensing means for individually moving each said pick-up means toward and away from the topmost elements of the supplies of elements,

switch means responsive to maximum movement of said cup-shaped members each with a captured element away from the supply of elements,

means responsive to said switch means for moving said cupshaped members with captured elements simultaneously toward a zone for depositing the elements held by said pick-up means only when all said cup-shaped members have attained said maximum movement with captured elements.

4,720,228

AUTOMATIC PARTS HANDLING APPARATUS

Hajio Horiguchi; Masahide Okabe, and Tsutomu Shigeta, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,465
Claims priority, application Japan, May 20, 1985, 60-105935
Int. Cl.[4] B65G 60/00
U.S. Cl. 414—32 3 Claims

1. An automatic parts handling apparatus for feeding parts to and receiving parts from an apparatus for successively assembling and processing the parts, said automatic parts handling apparatus comprising:

a plurality of pallets, each said pallet having an area for supporting parts, and said pallets being capable of being stacked;

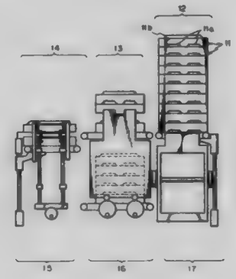
a delivery apparatus for receiving and delivering a stack of said pallets.

a separator apparatus for receiving said stack of pallets from said delivery apparatus, said separator apparatus including means for sequentially separating one at a time from said stack of pallets the lowermost said pallet and sequentially conveying the thus separated pallets;

a positioning apparatus for sequentially receiving one at a time said separated pallets from said separator apparatus and for positioning said thus received pallet at a location whereat parts are fed thereto or removed therefrom;

an accumulating lifter apparatus for removing from said positioning apparatus one at a time the thus processed pallets having parts fed thereto or removed therefrom and for accumulating in a stack an arbitrary number of said processed pallets;

a storage apparatus for receiving from said accumulating lifter apparatus and temporarily storing said stack of processed pallets;



a discharge lifter apparatus for receiving said stack of processed pallets from said storage apparatus and for returning said stack of processed pallets to said delivery apparatus; and

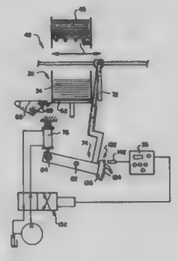
said delivery apparatus, said separator apparatus and said positioning apparatus being positioned in-line at a location above an in-line arrangement of said accumulating lifter apparatus, said storage apparatus, and said discharge lifter apparatus, such that said pallets are transferred downwardly from said positioning apparatus to said accumulating lifter apparatus and are transferred upwardly from said discharge lifter apparatus to said delivery apparatus.

4,720,229

STACK PUSHER

Horst Steinhart, Westminster, Calif., assignor to Rima Enterprises, Incorporated, Huntington Beach, Calif.

Filed Nov. 5, 1986, Ser. No. 927,059
Int. Cl.[4] B65H 31/30
U.S. Cl. 414—46 15 Claims



14. An apparatus for use with a signature stacker, said apparatus comprising:

a pusher bar supported for reciprocating movement along a length of travel and for engaging a stack of signatures in the stacker;

means for moving said pusher bar to push the stack of signatures from the stacker; and

means for selecting the length of travel of the pusher bar to provide for different lengths of travel for different size signatures, said selecting means including a controller for controlling said moving means in accordance with a selected signature size and means for actuating said moving means in response to a signal from said controller to cause said moving means to move said pusher bar a selected length of travel.

4,720,230

TRIPLE COMBINATION FLEXIBLE DISKETTE PICKER

Ronald R. Johnson, Shorewood, and Dennis L. Johnson, Plymouth, both of Minn., assignors to Information Exchange Systems, Inc., Shorewood, Minn.

Filed May 9, 1986, Ser. No. 861,582
Int. Cl.[4] B65G 59/06
U.S. Cl. 414—131 3 Claims



1. A picker assembly for ejecting data storage diskettes, one at a time, from the bottom of a hopper containing a stack of such diskettes, where all of the diskettes in a given size hopper are of one of a plurality of differing length, width and thickness dimensions, comprising:

(a) a stationary dead plate;

(b) means for selectively positioning one of a plurality of different sized hoppers containing storage diskettes of corresponding size upon said stationary dead plate at one of a plurality of predetermined locations thereon;

(c) gate means affixed to said dead plate at a forward edge thereof, said gate means having an aperture pattern defining a plurality of apertures therein for allowing exit of diskettes of differing width and height dimensions therethrough, one at a time;

(d) picker plate means having a forward edge surface and a plurality of stepped vertical pick surfaces formed thereon a predetermined distance rearward from said forward edge surface, each of said predetermined distances corresponding to a size dimension of different ones of said diskettes, said pick surfaces being separated from each other by an inclined plane surface;

(e) means for reciprocally moving said picker plate means in a forward and rearward direction toward and away from said gate means, respectively, atop said stationary dead plate and beneath said hopper, only one of said vertical pick surfaces engaging the rearward edge of a bottom one of said diskettes in said hopper to advance said bottom diskette through said aperture in said gate means, the particular vertical pick surface engaging the diskette depending upon the size of the diskette contained in the hopper, the engagement of said rearward edge of the bottom one of said diskettes effecting placement of the bottom one of said diskettes on an inclined plane surface thereby aiming the leading edge of said bottom one of said diskettes toward the portion of said aperture pattern through which said diskettes in said one hopper are capable of passing.

4,720,231

TRANSFER DEVICE

David J. Pienta, Temperance, Mich., assignor to Automatic Handling, Inc., Erie, Mich.

Filed Oct. 28, 1985, Ser. No. 792,019
Int. Cl.[4] B65H 19/30
U.S. Cl. 414—560 24 Claims

1. A transfer device for moving objects that are supported on shafts from a receiving station to a transfer station, said shafts being disposed in adjacent substantially parallel relationship, said device comprising:

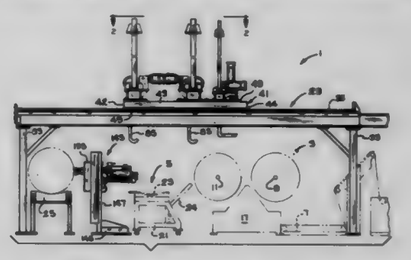
track means extending from said receiving station to said transfer station;

a movable carriage positioned on said track means, said carriage being positioned for movement along said track means;

a drive means mounted on said carriage, said drive means engaging said track means for advancing said carriage along said track from said receiving station to said transfer station;

a plurality of moveable lifting means positioned on said carriage, said lifting means being disposed for engaging said shafts so that said shafts and the objects supported thereon can be transferred from said receiving station to said transfer station, each lifting means being movable independently of the other lifting means to engage said shafts so that said shafts and said objects supported thereon can be independently engaged and lifted from said receiving station by said lifting means; and

gripper means located adjacent said transfer station, said gripper means being disposed to grip said shafts that support said objects and to remove said shafts from said objects.

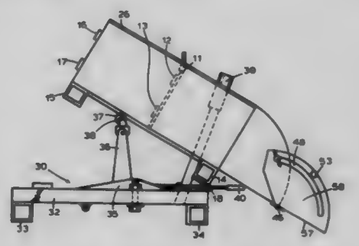


4,720,232

PARTS HANDLER

Robert E. Williams, Rte. 3, Hodgenville, Ky. 42748

Filed Jan. 13, 1986, Ser. No. 818,334
Int. Cl.[4] B65G 65/00
U.S. Cl. 414—607 1 Claim



1. A parts handler for handling small parts for operation with a forklift comprising a container having a flat bottom, two longer sides and two shorter sides attached to the flat bottom and to each other; one of those shorter sides having a discharge chute for the selective discharge of small parts which is secured to an opening in that shorter side, the bottom of said discharge chute being flush with the flat bottom of the container and the sides of said discharge chute inset from the longer sides of the container and extending outward from that side wall of the container, a door trough with adjustable side walls secured to the sides of the discharge chute by a slotted arc in the side walls of the door trough, and a bolt and wingnut assembly; and attached to the container is a frame compris-

ing parallel slotted beams into which the tines of a forklift will fit, crossbeams attached to the slotted beams at or near the opposite ends of the slotted beams and an hydraulic jack with a rotatable caster at the end of the arm of the hydraulic jack, the caster rotating within a channel secured to the bottom of the container and located in such a fashion that when the arm of the hydraulic jack rises, the end of the container opposite the discharge chute will also rise.

4,720,133

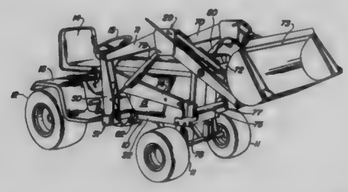
TRACTOR FRAME FOR TRACTOR-MOUNTED IMPLEMENT

Paul A. Meyer, Mayville, and Michael Bodis, Oconomowoc, both of Wis., assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 675,787, Nov. 28, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,847

Int. Cl.[4] E02F 3/627

U.S. Cl. 414—686 **7 Claims**



5. In a tractor-implement combination in which the tractor has a tractor frame supported on front and rear transversely spaced wheels and having left and right side plate means extending substantially the entire length of the frame, the improvement comprising:

said plate means defining a horizontal bottom extending substantially the entire length of the frame;

a horizontal transverse structural tube fixed to and extending through the side plate means at respective locations above said bottom and having opposite transversely spaced open ends located outwardly of the plate means, said structural tube being located longitudinally between the front and rear wheels;

a transverse implement beam extending through the tube and having opposite end portions projecting transversely outwardly of said spaced open end

said tube having a notch therein and said beam and said tube having alignable openings therein and characterized by a nut and bolt assembly that extends through the openings and has one end located in the notch and seated against the beam and the other end seated against the outside of the tube whereby, as the nut is retracted on the bolt, the assembly will draw an outer surface of the beam into tight contact with an inner surface of the tube; and

implement supports detachably mounted on said end portions and connected to an implement for carrying the implement on the tractor.

4,720,234

BACKHOE

Cecil J. Stralow, 14672 Brookstone Dr., Poway, Calif. 92064

Filed Jul. 21, 1986, Ser. No. 887,811

Int. Cl.[4] E02F 3/32, 3/627

U.S. Cl. 414—686 **16 Claims**

16. In machinery, the combination of

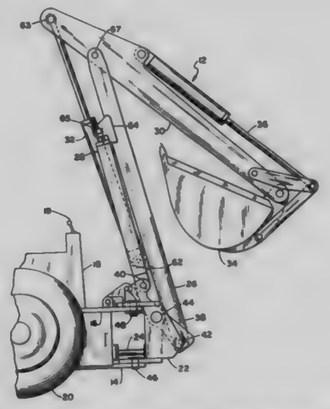
a boom having a free end,

an earth working mechanism hinged at the free end of said boom,

a cradle formed to provide upper and lower points and a tilting point therebetween,

support means adapted to provide a pivotal mounting for said cradle so that it can tilt about said tilting point,

said boom being hinged to said cradle at said lower pivot point, and



actuating means between said boom and the upper pivot point of said cradle to swing said boom in elevation and depression.

4,720,235

TURBINE ENGINE WITH INDUCED PRE-SWIRL AT THE COMPRESSOR INLET

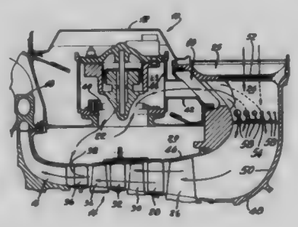
Roger Lachance, Longueuil, and Vasil Ozarapoglu, St. Lambert, both of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Continuation-in-part of Ser. No. 726,688, Apr. 24, 1985, abandoned. This application Jun. 3, 1986, Ser. No. 870,085

Claims priority, application European Pat. Off., Apr. 23, 1986, 86105589

Int. Cl.[4] F01D 1/12

U.S. Cl. 415—53 R **11 Claims**



1. An apparatus for providing an induced pre-swirl at the entry of a compressor of a gas turbine engine, the engine including a shroud and hub walls defining an airflow path to the compressor entry, a plurality of hollow members extending across the airflow path between the shroud and hub of the engine and upstream of the compressor entry, the members communicating with an air inlet in the shroud for communicating with a source of a pressurized gas flow, each member having a leading edge and a trailing edge relative to the airflow path and at least a row formed of a plurality of discrete openings each defining an individual nozzle to form a jet and said plurality of discrete openeings defining an axis extending from the shroud to the hub, and the area of the discrete openings gradually decreases from the shroud and the hub, with the row of openings being spaced a short distance from the trailing edge of the member, each opening having a location, size and angle which is a factor in the formation of the individual jets

forming a jet flap and thus the angle of pre-swirl flow in a corresponding radial sector at the compressor, said location and size of each discrete opening being determined by the required $m_j V_j/m_o V_o$ in a sector of the airflow path at the member to provide a predetermined pre-swirl angle α in a corresponding radial sector of the airflow path at the compressor inlet where m_j is the mass flow rate of the jet of bleed air from said opening, V_j is the velocity of the jet, m_o is the mass airflow rate upstream of the member in said section, V_o is the velocity of said airflow, and α is the pre-swirl angle at the compressor inlet in said radial sector.

4,720,236

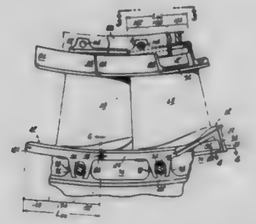
COOLABLE STATOR ASSEMBLY FOR A GAS TURBINE ENGINE

Leonard W. Stevens, East Hampton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1984, Ser. No. 684,821

Int. Cl.[4] F02C 3/00

U.S. Cl. 415—136 **5 Claims**



1. A stator assembly for a rotary machine having an annular flow path for working medium gases, an inner support inwardly of the flow path and an outer support outwardly of the flow path, which comprises:

an array of stator vanes extending between the inner support and the outer support, at least one of which has

a downstream inner flange which is adapted to be attached to the inner support to restrain the vane against axial, radial and circumferential movement;

a downstream outer flange spaced radially from the downstream inner flange which abuttingly engages the outer support in the axial direction and slidably engages the outer support in the radial direction;

an upstream outer flange spaced axially from the downstream outer and inner flanges which slidably engages the outer support in the radial direction and which is adapted to abuttingly engage the outer support in the circumferential direction;

means for restraining each vane against axial, radial and circumferential movement which includes

a means for attaching the downstream inner flange to the inner support to restrain the vane against axial, radial and circumferential movement, and

a means for restraining the vane against circumferential movement which engages the upstream outer flange and the outer support.

4,720,237

UNISON RING ACTUATOR ASSEMBLY

Harvey I. Weiner, South Windsor, and Alexander Kurti, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 24, 1986, Ser. No. 832,553

Int. Cl.[4] F01D 17/16

U.S. Cl. 415—150 **8 Claims**

1. An actuator for selectively imparting a tangential displacement to first and second unison rings each disposed closely about respective first and second cylindrical portions of an axial compressor housing or the like, comprising:

frame member having a first plate with a first end, a second end, and a central portion therebetween,

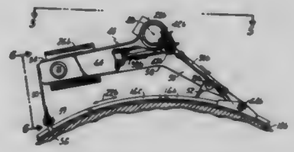
the first end being secured at a first point to the housing against radial, axial, or tangential movement therebetween,

the second end being secured to the compressor housing at a second point circumferentially displaced about the housing from the first point against radial and axial movement with respect to the compressor housing,

the central portion forming a bridge between the first and second ends, and

a bearing, disposed in the central portion;

a crankshaft, supported by the bearing and rotatable about an axis parallel to the longitudinal axis of the compressor cylindrical portions, the crankshaft and bearing being radially outwardly displaced from the unison rings;



a drive arm, secured to the crankshaft and extending radially outwardly therefrom;

a linear drive component, pivotably secured to the frame and coopertively engaged with the drive arm for imparting a selected rotational displacement to the crankshaft;

a first crank arm, secured to the crankshaft and rotatable therewith in the plane of the first unison ring;

a second crank arm, secured to the crankshaft and rotatable therewith in the plane of the second unison ring;

a first pushrod, disposed between the first crank arm and the first unison ring for imparting tangential displacement to the first unison ring in response to the rotational displacement of the crankshaft and first crank arm; and

a second pushrod, disposed between the second crank arm and the second unison ring for imparting tangential displacement to the second unison ring in response to the rotational displacement of the crankshaft and second crank arm.

4,720,238

METHOD OF INTERFACING MECHANICAL AND CONCRETE COMPONENTS OF A PUMP COMPRISING A CONCRETE VOLUTE, AND CORRESPONDING PUMP

Jean-Pierre Daux, Mandres les Roses, France, assignor to Bergeron, Societe Anonyme, Paris, France

Filed Jan. 14, 1987, Ser. No. 3,294

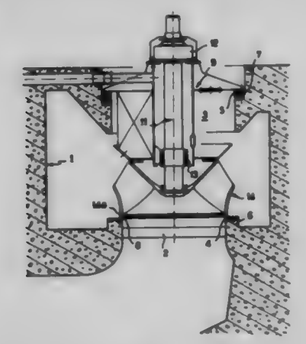
Claims priority, application France, Jan. 20, 1986, 86 00685

Int. Cl.[4] F03B 11/02; F04D 29/08

U.S. Cl. 415—170 A **6 Claims**

1. Method of interfacing mechanical and concrete components of a pump comprising a concrete volute having an axial suction orifice in its lower part and a well in its upper part substantially coaxial with said suction orifice, coaxial upper and lower metal rings, which are fixed in respective recesses provided in the concrete of said well and of said suction orifice, a sealing ring removably attached to said lower ring, a metal cover having an edge removably attached to said upper ring, a vertical shaft supported axially and rotatably mounted on said cover, and a rotor attached to a lower end of said shaft and having a part facing said sealing ring with a small clearance between them, in which method said upper and lower rings are

placed simultaneously in the respective recess, each ring is encapsulated with a hardeneble resin which is shaped by means of a single mold having upper and lower molding surfaces coaxial with and spaced from each other at an axial distance corresponding to the vertical distance between said edge of



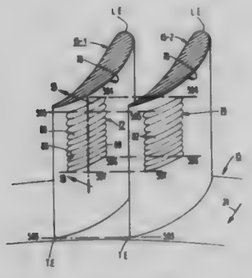
said cover and said sealing ring so as to form, once said resin has set, upper and lower annular blocks or resin reinforced by said metal rings and having molded surfaces corresponding to said molding surfaces of said mold and respectively serving to support said cover and said sealing ring.

4,720,239

STATOR BLADES OF TURBOMACHINES

Jerzy A. Owczarek, 2345 Overlook Dr., Bethlehem, Pa. 18017

Continuation of Ser. No. 436,004, Oct. 22, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 658,080
Int. Cl.[4] F04D 21/00
U.S. Cl. 415—181 9 Claims



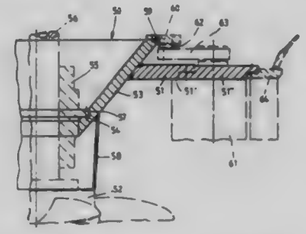
1. In combination in a turbomachine, a casing, at least one row of spaced stator blades, with stator flow passages therebetween, mounted therein and extending inwardly therefrom, a rotor positioned in said casing for rotation about an axis and having mounted thereon at least one row of spaced rotor blades, with rotor flow passages therebetween, at least one of said rows of stator blades having blade surfaces facing downstream toward one row of said rotor blades, at least some of said downstream facing surfaces having discontinuity groove means positioned adjacent one another and disposed on at least 5% of said blade surfaces and extending substantially at 0° to the main flow direction to points inward from the trailing edges of said stator blades for dispersing pressure waves reflecting from said one row of said rotor blades.

4,720,240

COVER FOR TURBINES AND PUMPS

Helmut Brenowski, and Christian Dahlke, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Division of Ser. No. 820,691, Jan. 16, 1986. This application Sep. 18, 1986, Ser. No. 908,794
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501883
Int. Cl.[4] F01D 25/24
U.S. Cl. 415—219 C 6 Claims



1. In a machine of the type of a propeller-type rturbine, Kaplan-type turbine, or similarly-shaped pump, or the like, the machine comprising

a rotatable shaft; a rotatable runner on the shaft, such that rotation of the shaft and the runner applies an axial force on the shaft; bearings on the shaft for supporting the shaft for rotation; and an outer covering around the shaft and the runner;

the improvment comprising a cover for said machine, the cover comprising

(a) a flat ring which is supported at an exterior edge thereof on the outer covering;

(b) a first axially extending shell which is conically shaped, and is connected to an interior edge of the flat ring at an exterior region of the first shell intermediate the axial length of the first shell, the first shell concentrically surrounding the shaft and tapering narrower toward the runner; and

(c) a second shell also conically shaped for directing radially inward water flow axially toward said runner and defining a lesser conical angle than the first conical shell, and extending from an exterior region of the first conical shell and toward the runner;

one said bearing being mounted between the first shell and the shaft, said bearing between the first shell and the shaft being a radial bearing located generally toward the runner side of the first shell.

4,720,241

CEILING FAN

Michael A. Markwardt, Fort Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.

Continuation of Ser. No. 791,750, Oct. 28, 1985, Pat. No. 4,621,977. This application Oct. 16, 1986, Ser. No. 919,758
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] F04D 29/32, 29/64
U.S. Cl. 416—5 2 Claims

1. A ceiling fan comprising:

downwardly projecting rod means;

a housing top plate having a raised, centrally located, bearing-receiving hub disposed therein and defining a recessed portion of the top plate having a central opening therethrough for receiving said rod means therethrough;

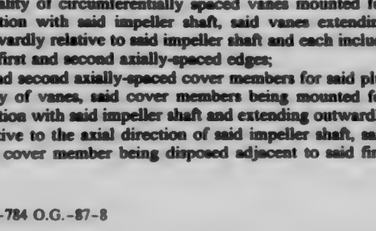
a first bearing disposed in said bearing-receiving hub in the central portion of said top plate, and surrounding said central opening and said vertically extending rod means, said first bearing rotatably mounting said top plate on said rod means for rotation of said top plate around the longi-tudinal axis of said rod means;

a housing bottom plate having a depressed, bearing-receiving hub centrally disposed therein and defining a cavity for the receipt of a bearing, said depressed bearing-receiving hub having an opening in the center thereof for receiving said rod means;

an enlarged diameter central portion included in said rod means and disposed between said housing top plate and said housing bottom plate, and having an upper end forming a shoulder contacting said first bearing;

a second bearing disposed in said bearing-receiving hub of said bottom plate, and rotatably mounting said bottom plate on said rod means for rotation about the longitudinal axis of said rod means, said second bearing contacting said enlarged diameter central portion in said rod means;

an iron armature secured to said housing top plate and detachably secured to said housing bottom plate whereby said bottom plate can be adjustably radially positioned



relative to the longi-tudinal axis of said rod means, and relative to said top plate and iron armature and then secured to said arma-ture during the assembly of said fan;

an annular housing side band disposed between said top plate and said bottom plate by snap insertion therebetween and radially outwardly from said iron armature to facilitate the snap insertion of said annular housing side band between said housing top plate and said bottom plate after said top plate and bottom plate have been secured to said iron armature;

a stator plate assembly secured to said enlarged diameter central portion of said rod means at a location between said top plate and said bottom plate, said stator plate assembly including copper wire windings disposed opposite, and in alignment with, said iron armature for impelling said armature and said housing top plate, said housing bottom plate and the annular housing side band in rotation about said stator plate assembly; and

blades detachably secured to said bottom plate at a location spaced inwardly from the location where said bottom plate is detachably secured to said iron armature.

4,720,242

CENTRIFUGAL PUMP IMPELLER

Primo Loviatto, Vicenza, Italy, assignor to Lowara, S.p.A., Italy

Filed Mar. 23, 1987, Ser. No. 28,976
Int. Cl.[4] F04D 29/22, 29/66
U.S. Cl. 416—186 A 23 Claims

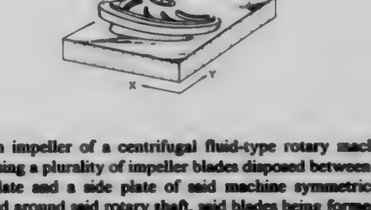
1. An impeller for a centrifugal pump comprising:

a rotatable impeller shaft;

a plurality of circumferentially spaced vanes mounted for rotation with said impeller shaft, said vanes extending outwardly relative to said impeller shaft and each including first and second axially-spaced edges;

first and second axially-spaced cover members for said plurality of vanes, said cover members being mounted for rotation with said impeller shaft and extending outwardly relative to the axial direction of said impeller shaft, said first cover member being disposed adjacent to said first edges of said vanes and said second cover member being disposed adjacent to said second edges of said vanes so as to provide an impeller chamber between said first and second cover members which is divided into subchambers by said vanes;

one of said first and second cover members having a centrally disposed inlet opening therethrough for admitting fluid into said impeller chamber to then be conducted outwardly upon rotation of said impeller shaft; and



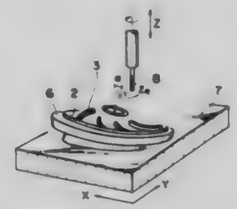
said first cover member being so constructed and mounted relative to said vanes that a portion thereof is free to flex axially away from respective portions of said first edges of said vanes in response to fluid pressure pulsations within said impeller chamber to temporarily increase the distance between said portion of said first cover and said respective portions of said first edges of said vanes.

4,720,243

IMPELLER OF CENTRIFUGAL FLUID-TYPE ROTARY MACHINE

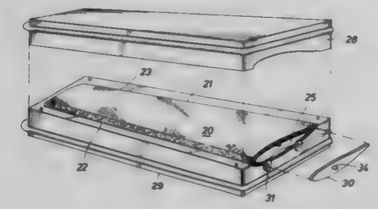
Kazuo Katayama; Susumu Izuki, and Ken Fujita, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 839,368, Mar. 13, 1986. This application Sep. 22, 1986, Ser. No. 909,639
Int. Cl.[4] F04D 29/22
U.S. Cl. 416—186 1 Claim



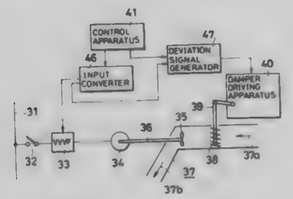
1. An impeller of a centrifugal fluid-type rotary machine comprising a plurality of impeller blades disposed between the main plate and a side plate of said machine symmetrically arranged around said rotary shaft, said blades being formed in a curved shape and having a convex front surface and a concave back surface, said front curved surface and said back curved surface of said blades being formed by parallel generatrices inclined with respect to said rotary shaft, said blade having edged surfaces with a leading edge at the suction side which is more deflected from said rotary shaft at the outer ends than at their inner ends.

4,720,244
FAN BLADE FOR AN AXIAL FLOW FAN AND METHOD OF FORMING SAME
George E. Kluppel, Richmond, and Robert C. Monroe, Houston, both of Tex., assignors to Hudson Products Corporation, Houston, Tex.
Filed May 21, 1987, Ser. No. 53,074
Int. Cl.[4] F01D 5/14
U.S. Cl. 416—224 14 Claims



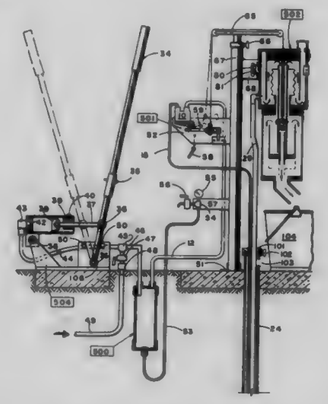
1. For use as part of an axial flow fan, a blade comprising a hollow, one-piece molded body having leading and trailing edges and including a core of reinforced, thermosetting resin having relatively low abrasive resistance, and a large concentration of silica particles molded into the body along only its leading edge.

4,720,245
FLOW RATE CONTROL SYSTEM IN FLUID SUPPLY AND DRAIN APPARATUS
Nobuharu Takata, Hyogo, and Sachio Nakashima, Nagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Oct. 24, 1986, Ser. No. 923,090
Claims priority, application Japan, Oct. 25, 1985, 60-239057; Jan. 8, 1986, 61-641; Jan. 9, 1986, 61-2814
Int. Cl.[4] F04B 49/00
U.S. Cl. 417—28 4 Claims



1. A flow rate control system in fluid supply and drain apparatus comprising;
a motor to be driven by a variable frequency power supply whose output frequency changes on the basis of a command request of load, said variable frequency power supply providing an output,
a fluid flowing means which is rotatably driven by said motor and provided in the flow path of fluid,
a flow rate control means which mechanically controls flow rate of fluid which is a load of said fluid flowing means,
a deviation detector which detects deviation between a preset value of flow rate of said fluid and actually measured flow rate of fluid and provides an output,
an integrator which proportionally integrates the output of said deviation detector and provides an output,
a first control means which inputs the output of said integrator to said variable frequency power supply,
a setting signal generator which designates necessary control of flowing fluid to a predetermined value while said motor is being controlled to the specified operating condition by the output of said variable frequency power supply,
an adder which adds the output of said setting signal generator and the output of said deviation detector and provides an output, and
a second control means which inputs the output of said adder to said flow rate control means.

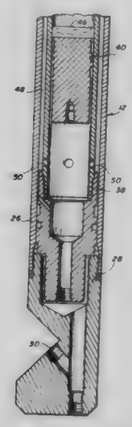
4,720,246
SIPHON-CONTROLLED PNEUMATIC DISPLACEMENT PUMP
Paul H. Morton, 180 Berkeley St., Satellite Beach, Fla. 32937
Filed Jul. 28, 1986, Ser. No. 889,874
Int. Cl.[4] F04G 1/06
U.S. Cl. 417—53 24 Claims



1. A method for pumping fluid, including the steps of:
displacing fluid in a blow chamber by forcing compressed air into said blow chamber;
collecting fluid forced from said blow chamber in a first chamber;
siphoning said fluid from said first chamber when the collected fluid reaches a predetermined volume;
collecting said fluid siphoned from said first chamber in a bucket means;
terminating the application of compressed air to said blow chamber when a predetermined quantity of fluid has been collected in said bucket means;
opening a venting means whereby said blow chamber is vented to ambient atmosphere when said predetermined quantity of fluid has been collected;
filling said blow chamber with fluid from a surrounding source;
initiating a timing interval by siphoning said collected fluid; and
terminating said timing interval when a predetermined quantity of said collected fluid has been siphoned.

4,720,247
OIL WELL PUMP
Albert L. Strickland, and William O'Dell, both of Spring, Tex., assignors to Landell International Company, Inc., Houston, Tex.
Filed Nov. 14, 1986, Ser. No. 930,272
Int. Cl.[4] F04B 17/00
U.S. Cl. 417—392 2 Claims

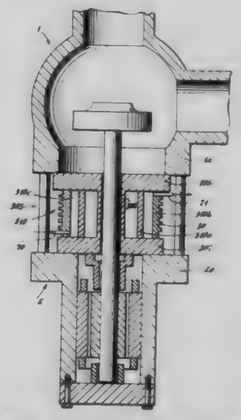
1. A oil well, fluid pressure operated, reciprocating piston pump comprising:
a pump cylinder having intake and discharge valves at its upper end and means affording connection to a source of high pressure working fluid at its lower end;
a hollow piston of lesser diameter than and slidably mounted in said cylinder, closed at opposite ends with heads in sliding sealing engagement with said cylinder;
stationary means in said cylinder surrounding and slidably sealingly engaging said piston between said heads;
a free piston in slidable sealing engagement with the interior of said hollow piston;
a pressurized compressible fluid in said hollow piston between the upper end of said free piston and the upper end of said hollow piston;
ports at the lower end of said hollow piston communicating the interior thereof below said free piston with the annular space between the lower portion of said cylinder and hollow piston;



an incompressible fluid filling the space between the lower end of said free piston and the lower end of said hollow piston and the annular space between said hollow piston and cylinder below said stationary means whereby;
the pressure of said compressible fluid biases said free piston toward the lower end of said hollow cylinder forcing said incompressible fluid through said ports to bias said hollow piston toward the bottom of said cylinder permitting well fluid to fill the upper end of said cylinder through said intake valve, and when high pressure working fluid is admitted to the lower end of said cylinder, said hollow piston is forced upwardly to pump well fluid through said discharge valve while forcing said incompressible fluid into the lower portion of said hollow piston to force said free piston upwardly and raise the pressure of said compressible fluid.

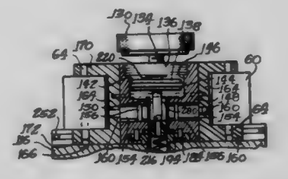
4,720,248
THERMAL BARRIER FOR SUBMERSIBLE PUMP AND MOTOR ASSEMBLIES
Robert Dernedde, Frankenthal; Hans-Joachim Franke, Grünstadt; Peter Havekost, Bobenheim-Roxheim, and Christian Klepp, Frankenthal, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany
Continuation of Ser. No. 258,806, Apr. 29, 1981, abandoned.
This application Apr. 27, 1984, Ser. No. 604,407
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016481
Int. Cl.[4] F04B 17/00, 35/00, 39/02, 39/06
U.S. Cl. 417—373 26 Claims

1. A glandless circulating pump and motor assembly comprising: (a) a pump having a casing; (b) a motor having a housing which is spaced from said casing; (c) a pump shaft connected with said pump and said motor; and (d) a thermal barrier interposed between said casing and said housing, said barrier including a first section through which said shaft passes with clearance, and said first section having first and second portions which form respective seals with said casing and said housing, and a third portion which connects and is sealed to said first and second portions, said barrier further including a



removably installed second section comprising a plurality of separable components, said second section being interposed between said first and second portions and at least partly surrounding said third portion, said second section being removable from between said first and second portions and being designed to impede heat transfer and transmit stresses between said casing and said housing.

4,720,249
PERISTALTIC PUMP WITH ENHANCED TUBE LOADING FEATURES
Helmut Krebs, 4849 N. Kenneth Ave., Chicago, Ill. 60630, and Jerrold Widran, 60 Estate Dr., Glencoe, Ill. 60022
Filed May 21, 1986, Ser. No. 865,896
Int. Cl.[4] F04B 43/12
U.S. Cl. 417—477 11 Claims



1. A peristaltic type tubing pump for driving and for controlling the flow of fluid through fluid-conducting tubing positioned in a channel in said pump, said pump comprising:
housing means for supporting operational components of said pump,
wall means in said housing including means defining an arcuate channel for receiving tubing therewithin and including a circumscribing bounding wall portion for contiguous abutment with a lineal section of compressible tubing confined in said channel during operation of said pump,
rotor means and means for rotatably supporting said rotor means within said housing means for rotation about a fixed axis of said rotor means concentric with and displaced radially inwardly of said arcuate channel,

means for coupling said rotor means to motor means for rotatably driving said rotor means,

roller means for sequentially engaging and bearing upon resiliently-compressible tubing positioned in said pump, and means securing said roller means at a radially outwardly directed circumferential zone of said rotor means for bearing against the resiliently-compressible tubing confined in said arcuate channel during rotation of said rotor means;

roller positioning means for selectively shifting said roller means between a first position in which said roller means are urged outwardly of a rotational fixed axis of said rotor means stressingly to bear upon and compress resiliently-responsive tubing confined in said arcuate channel of said pump to compel roller-means-propelled travel of fluid through said tubing during rotation of said rotor means, and a second position in which said roller means are retracted radially inwardly of and away from said wall means of said arcuate channel to facilitate loading entry of tubing into and unloading withdrawal of tubing from said arcuate channel of said pump,

said roller positioning means comprising hydraulic control means including cylinder means and fluid-actuated piston means,

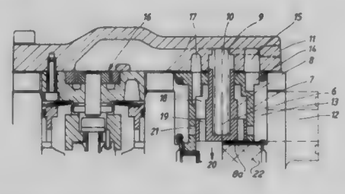
means coupling said roller means to said piston means, and means for controllably selectively varying fluid volume in said cylinder means for controlling advance of and allowing retraction of said piston means and of said roller means coupled thereto for effecting selective radial positioning of said roller means within said housing means of said pump.

4,720,250

REGULATOR FOR COOLING OR HEAT PUMP SYSTEMS

Rune Glanvall, Norrköping, Sweden, assignor to STAL Refrigeration AB, Norrköping, Sweden

Filed Nov. 26, 1986, Ser. No. 935,218
Claims priority, application Sweden, Nov. 26, 1985, 8505574
Int. Cl.[4] F01C *21/04;* F04B *39/02*
U.S. Cl. 418—84 2 Claims



1. A regulator device for controlling the oil pressure and oil flow to the high pressure side of a compressor from an oil store within a cooling or heat pump system, said regulator device comprising a regulating valve and an oil pump, said regulating valve including

a cylinder which defines a first annular space therearound and which has an open end and by-pass openings therein near said open end, the open end of said cylinder being in communication to an outlet channel communicating with the high pressure side of said compressor,

an inlet connection for supplying oil from said oil store to said annular space,

an abutment element which covers a portion of the open end of said cylinder,

a hollow piston which is movably positioned within said cylinder, said piston defining a second annular space between it and said cylinder and having a head portion which is abutable against said abutment element, said head portion, when positioned against said abutment element, closing said by-pass openings, and said head portion including axial holes therethrough which communicate said second annular space with said open end of said cylinder,

a spring means biasing said piston towards said abutment element,

connecting channels which extend from said first annular space to oil pump and from said oil pump to said second annular space, and

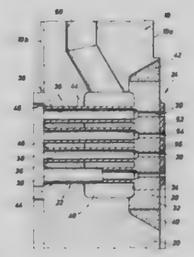
a pressure channel for supplying a pressure fluid to the interior of said piston, the force of said pressure fluid and said spring on said piston opposing the force on said piston from the oil in said outlet channel, thereby determining the position of said piston in said cylinder and thus whether or not oil can flow through said by-pass openings directly to said outlet channel or to said outlet channel exclusively via said connecting channels and said oil pump.

4,720,251

EXTRUSION DIE PLATE CONSTRUCTION

John B. Mallay, and A. J. Johnson, both of Houston, Tex., assignors to Muesco Mallay Houston Inc., Houston, Tex.

Continuation of Ser. No. 644,202, Aug. 24, 1984, abandoned.
This application Oct. 30, 1986, Ser. No. 924,116
Int. Cl.[4] B02C *18/06*
U.S. Cl. 425—67 18 Claims



1. An extrusion die for a pelletizing apparatus comprising:

a die body;

a die insert carried by said die body and being rigidly secured thereto, said die insert including

a die plate having a die plate face and a die plate back surface, said die plate having at least one first port extending therethrough, and

at least one extrusion port formation projecting from said die plate back surface, said port formation defining at least one second port, said first port being in register with said second port, said die plate and said extrusion port formation comprising a monolithic structure; and

a cavity defining a heat exchange chamber for circulation of a heating medium therein and being formed at least partially by said die body, at least a portion of said port formation being received in said cavity such that said port formation and said cavity form a heat exchanger of the shell and tube type whereby said heating medium is in direct heat exchange relationship with said portion of said port formation received in said cavity.

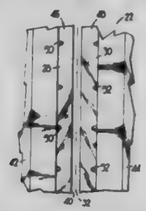
4,720,252

SLOTTED MELT-BLOWN DIE HEAD

David W. Appel, Wittenberg, Wis.; Adrian D. Droste, and Jark C. Lau, both of Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 9, 1986, Ser. No. 905,228
Int. Cl.[4] B28B *5/00*
U.S. Cl. 425—80.1 6 Claims

1. In an elongated die head for extruding melted thermoplastic material to form fibers, wherein the die head has an elongated centrally located die tip, which die tip extends along the length of the die head, has a hollow interior cavity for receiving melted thermoplastic material, and has external surfaces defining a generally triangular cross-section and extending toward an apex, which apex defines a line extending the length of the die head, and wherein the die head also has air plates mounted on both sides of the die tip which air plates along with the exterior surfaces of the die tip define fluid delivery channels on both sides of the die tip which fluid delivery channels



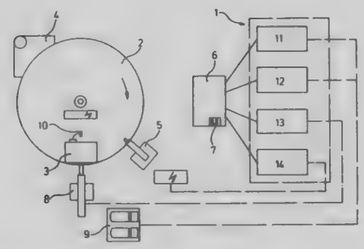
extend parallel to the apex and deliver a fluid stream adjacent the die tip, the improvement comprising a passage having sides which are generally planar and parallel to each other and which extend parallel to the line of the apex and wherein the passage also has ends which with the sides define a continuous slot opening extending along the apex and wherein the passage communicates with the hollow interior cavity for delivering melted thermoplastic material through the slot opening into the fluid stream.

4,720,253

PROGRAM-CONTROLLED APPARATUS FOR THE PRODUCTION OF MOLDINGS FROM MULTICOMPONENT PLASTIC, IN PARTICULAR POLYURETHANE

Gerhard Koentges, Osnabrueck, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH, Strasslach, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,763
Int. Cl.[4] B29C *31/06*
U.S. Cl. 425—145 1 Claim



1. Apparatus for the production of moldings from multicomponent plastic, in particular polyurethane, said apparatus comprising

a conveyor which mounts a plurality of interchangeable molds to be filled,

a mixing unit for filling the molds,

a mold release unit, and

a program control unit for controlling said conveyor, said mixing unit and said mold release unit,

said apparatus also comprising

a plug provided on and individual to each mold and connecting the associated mold with said program control unit, said plug having contacts which set up a code characteristic of the associated mold, and

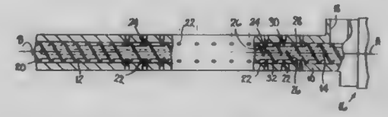
a decoder associated with said control unit, said decoder being responsive to said code for controlling said control unit to perform the program corresponding to said code.

4,720,254

SCREW EXTRUDERS

Kenneth Wood, Nordea, England, assignor to Farrel Corporation, Ansonia, Conn.

Filed Jul. 2, 1986, Ser. No. 881,131
Claims priority, application United Kingdom, Jul. 16, 1985, 8517864
Int. Cl.[4] B29C *47/38*
U.S. Cl. 425—208 2 Claims



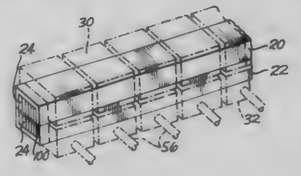
1. A screw extruder comprising a barrel having a chamber extending therethrough, a screw mounted for rotation in the chamber and comprising at least one helical flight defining a channel or channels between helical faces of a screw flight, at least one set of projections projecting from the barrel towards the axis of rotation of the screw into an annular zone of the chamber and interrupting the flight or flights of the screw, the flights at either side of the annular zone being disposed angularly relative to one another, the construction and arrangement being such that the end portions of adjacent flights at either side of the, or each, annular zone overlap one another when considered in a direction parallel with the screw axis, said flights terminating in end faces lying in planes substantially at right angles to the axis and the flights being displaced angularly relative to one another so that, considered in a direction longitudinally of the screw parallel with its axis, said end faces of adjacent flights do not face one another and are disposed at least partially opposite a helical face of a screw flight at the opposite side of the annular zone.

4,720,255

APPARATUS FOR PLANAR FORMING OF ZERO DEGREE COMPOSITE TAPE

Robert F. Mittelstadt, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 626,414, Jun. 28, 1984, abandoned.
This application Jul. 7, 1986, Ser. No. 882,445
Int. Cl.[4] B31F *1/00;* B29D *7/00;* A01J *21/00;* A21C *3/00*
U.S. Cl. 425—394 19 Claims



1. Apparatus for forming fiber reinforced composite material tape in the general plane of the tape, comprising:

restraint means for exerting pressure on the tape in a thicknesswise direction perpendicular to said plane to confine the tape to an elongated space during forming of the tape in the general plane of the tape, to confine the tape to said general plane and thereby prevent buckling and wrinkling of the tape; said restraint means including portions that define the thickness of said space and that are flexible in a

widthwise direction perpendicular to said thicknesswise direction; and

bending means for exerting a force on said portions in said widthwise direction, to bend said portions and said space and any tape confined therein in said widthwise direction, to form said space and said tape confined therein into a predetermined planform configuration without changing the width and thickness of the space and the width and thickness of the tape.

4,720,256

HOT ISOSTATIC PRESS APPARATUS

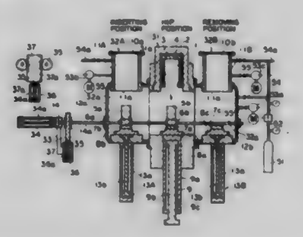
Akira Asari, Obaaka; Tamehara Masuda; Masanori Kurita, both of Kobe, and Tsuneya Ueno, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 3, 1985, Ser. No. 751,593

Claims priority, application Japan, Jul. 10, 1984, 59-143809; Sep. 19, 1984, 59-197492; Sep. 19, 1984, 59-197493; Nov. 12, 1984, 59-171400[U]; Nov. 13, 1984, 59-239090; Nov. 13, 1984, 59-239089

Int. Cl.⁴ B30B *9/28*

U.S. Cl. 425—405 H **24 Claims**



1. A continuous hot isostatic pressing apparatus comprising:

a hot isostatic press and a high pressure vessel having an open end, both being disposed at a main station of said apparatus;

at least one movable support member for supporting at least one work object to be pressed;

a main cover means for sealing said open end of said high pressure vessel and a main member attached to said main cover means for selectively receiving said at least one support member;

main station moving means disposed at said main station for selectively moving said main cover means into and out of sealing engagement with said open end of said high pressure vessel;

at least a first operating chamber having an open end and being disposed at a first auxiliary station of said apparatus;

first auxiliary cover means for sealing said open end of said first operating chamber and a first auxiliary member attached to said first auxiliary cover means for selectively receiving said at least one support member;

first auxiliary moving means disposed at said first auxiliary station for selectively moving said first auxiliary cover means into and out of sealing engagement with said open end of said first operating chamber;

a sealed tank, said open ends of said high pressure vessel and said first operating chamber being disposed therein, said sealed tank isolating said open ends of said high pressure vessel and said first operating chamber from an environment of said apparatus and communicating said open ends of said high pressure vessel and said first operating chamber in a common atmosphere when said main cover means and said first auxiliary cover means are removed therefrom; and

a transfer device comprising a movable transfer member mounted on said sealed tank and means for moving said transfer member, said transfer device comprising means for engaging and disengaging said at least one support member and for moving said at least one support member between a position in which said support member rests on said first auxiliary member of said first auxiliary cover means and a position in which said support member rests on said main member of said main cover means.

4,720,257

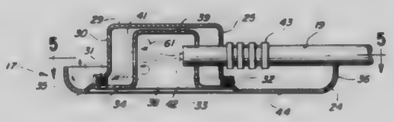
BURNER FOR CAMPSTOVE

Hugh Beckham, and Richard Curtis, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 21, 1986, Ser. No. 887,442

Int. Cl.⁴ F23D *11/44*

U.S. Cl. 431—211 **15 Claims**



1. A burner box assembly for a campstove burner comprising a generally cylindrical inner wall, a generally cylindrical outer wall surrounding the inner wall and providing an annular mixing chamber between the inner and outer wall, the cylindrical inner wall having an opening therein facing the cylindrical outer wall, a fuel tube within the inner wall for directing fuel toward the opening in the inner wall whereby said fuel mixes with air from within the inner wall and the fuel and air flow through the opening in the inner wall and a portion of the fuel and air is deflected by the outer wall and returned through the opening in the inner wall, and means for allowing fuel and air to flow from the annular mixing chamber.

4,720,258

TEMPERATURE CONTROL MEANS FOR EVAPORATORS

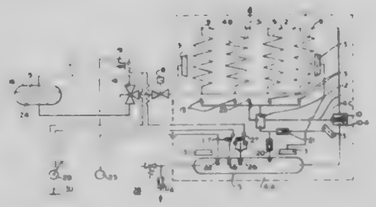
Hildegard Berger, Wanneweg 14, 6973 Boxberg, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,678

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1985, 3531299; Jun. 23, 1986, 3620956

Int. Cl.⁴ F23D *11/44*

U.S. Cl. 431—242 **11 Claims**



1. An apparatus for attaining, keeping constant and limiting a predetermined operating temperature of an evaporator (1) accommodated in a heating chamber (2) open to the atmosphere, characterized in that heating elements (3) are positioned in predetermined relation in the heating chamber (2), said heating chamber (2) also being provided with a control tube, coils of pipe (9) for heat transmission and temperature sensor means (10), said last-named elements adapted to provide different temperature zone (4-A, 4-B, 4-C) whereby an ambient temperature is attained (reached and maintained) in the control tube (5) of over 40° C., another temperature is attained in proximity to the coils of pipe (9) of approximately 60° C., and still another temperature is attained in proximity to the temperature sensor (10) of over 65° C.

4,720,259

HAND TORCH

Jerry J. Day, 134 Forge Road S.E., Calgary, Alberta, Canada T2H 0S8

Filed May 11, 1987, Ser. No. 48,283

Int. Cl.⁴ F23Q *7/12*

U.S. Cl. 431—255 **7 Claims**



1. A portable hand torch for attachment to a gaseous fuel source comprising elongated barrel means; handle means on one end of said barrel means; inlet passage means in said handle means for feeding gaseous fuel from a fuel tank to said barrel means; coupler means in said handle means for connecting a fuel tank to said inlet passage means; elongated burner tube means on the other end of said barrel means for receiving gaseous fuel from the fuel tank; burner nozzle means on an outer free end of said burner tube means for burning gaseous fuel; retention gas line means in said barrel means for carrying gaseous fuel from the inlet passage means to said burner nozzle means; venturi passage means in said barrel means for carrying gaseous fuel from said inlet passage means to the inlet end of said burner tube means; restricted orifice means in said venturi passage means for limiting the quantity of gaseous fuel entering the venturi passage means from said inlet passage means; inlet opening means in said venturi passage means for introducing air into said venturi passage means for mixing with gaseous fuel entering said venturi passage means through said restricted orifice means; spark producing means in said venturi passage means for igniting the mixture of air and gaseous fuel in said venturi passage means, whereby, when gaseous fuel is fed into said inlet passage means under pressure, the gaseous fuel flows through the retention gas line means and said venturi passage means, and once ignition has been achieved in said venturi passage means flame passes through said burner tube means to ignite gaseous fuel from said retention gas line means, and thereafter burning is limited to the area of the burner nozzle means.

4,720,260

BURNING WICK FOR OIL BURNING APPARATUS

Isaharo Yamaguchi, Niigata, Japan, assignor to Kitate Sangyo Co., Ltd., Niigata, Japan

Filed Sep. 17, 1986, Ser. No. 908,505

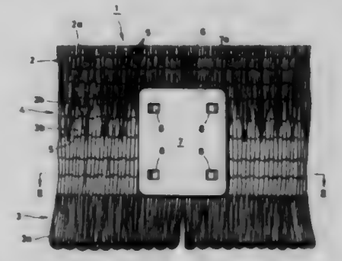
Claims priority, application Japan, Sep. 17, 1985, 60-203537

Int. Cl.⁴ F23D *3/18*

U.S. Cl. 431—325 **13 Claims**

1. A tubular burning wick for oil burning apparatus, comprising: a band of wick cloth having opposite cut ends, an upper burner part and a lower oil suction part, said opposite ends being abutted to form said band into a tube and define an abutment seam extending axially of said tube; and a binder element superposed on said abutment seam, said binder element comprising a body superposed on the exterior surface of said tube and extending circumferentially of said tube on both sides of said abutment seam, and first and second opposite peripheral portions extending axially of said tube, each said peripheral portion having a plurality of claws extending radially inwardly of said tube, said claws passing through said tube and being bent relative to said body into contact with the interior surface of said tube; all said claws being identical, said claws of said first peripheral portion having ends extending toward said second peripheral portion and said claws of said second peripheral portion having ends extending toward said first peripheral portion.

9. Method of producing a tubular burning wick for oil burning apparatus, comprising the steps of: providing a band of wick cloth having opposite cut ends, an upper burner part and a lower oil suction part; forming said band into a tube by abutting said opposite ends to form an abutment seam extending axially of said tube; superposing a binder element on said abutment seam exteriorly of said tube, said binder element



having first and second peripheral portions extending axially on both sides of said seam and claws formed from said peripheral portions, said claws extending substantially radially inwardly of said tube; forcing said claws radially inwardly through said tube, whereby at least a portion of each said claw is disposed interiorly of said tube; and bending at least said interiorly disposed portion of each said claw on said first peripheral portion toward said second peripheral portion and each said claw on said second peripheral portion toward said first peripheral portion, all said claws being identical and bent against the interior surface of said tube; thereby to secure said abutment seam with said binder element.

4,720,261

EXPLOSION RELIEF PANEL

Alan J. Fishwick; Robert K. Jackson, and Anthony J. Wilson, all of Bolton, England, assignors to Metal Box Public Limited Company, Berkshire, England

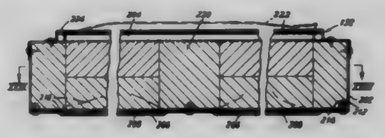
Division of Ser. No. 732,829, filed as PCT GB84/00288, Aug. 26, 1984, Pat. No. 4,654,003.

This application Dec. 9, 1986, Ser. No. 939,782

Claims priority, application United Kingdom, Aug. 20, 1983, 8322484

Int. Cl.⁴ F27D *21/00*; B65D *25/00*

U.S. Cl. 432—36 **5 Claims**



1. An explosion relief panel, for closing an aperture in a wall of an enclosed housing and having an outer side for facing outwardly of said wall and an inner side for facing into said housing, said explosion relief panel comprising a light, box-like casing (202) open at its outer side (204) and its inner side (206); an explosion panel (210) of thin flexible sheet material within the casing and covering the open inner side of the casing; explosion panel securing means (212) releasably clamping the edge only of the explosion panel inside the casing, so that at least the greater part of the said edge is releasable under pressure applied to the explosion relief panel in excess of about 1.01 atmospheres; a mattress (220), of light, energy-absorbing material for absorbing a portion of said energy, overlying the explo-

sion panel (210); and an outer cover (222) of thin flexible sheet material overlying the open outer side of the casing; and outer cover securing means (224) retaining the outer cover captive with the casing by only its edge so that the outer cover is releasable outwardly under said overpressure.

4,720,263

APPARATUS FOR THE HEAT TREATMENT OF FINE MATERIAL

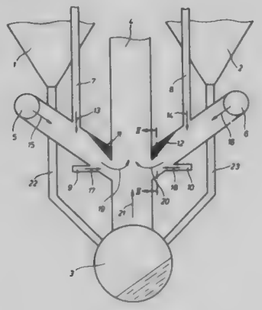
Manfred Dürr, Oelde; Karl Krützner, Beckum; Heinz-Werner Thiemeyer; Jurgen Wurr, both of Ennigerloh; Peter Tiggesbäumker, and Wolfgang Rother, both of Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

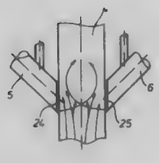
Continuation of Ser. No. 771,616, Sep. 3, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 1,247

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436687

Int. Cl.[4] F27B *7/02*

U.S. Cl. 432—106 **13 Claims**





1. In apparatus for the heat treatment of fine material having:
(a) a kiln;
(b) a preheater;
(c) a calciner having a longitudinal axis joining the kiln and the preheater and forming a combustion zone for the precalcination of the preheated fine materials;
(d) air pipe means communicating with the calciner for supplying tertiary air thereto; and
(e) material supply pipe means communicating with said air pipe means at a point upstream from said calciner for mixing said material and tertiary air;
the improvement comprising:
(f) means restricting the internal cross sectional area of said air pipe means at its juncture with said calciner for accelerating the speed at which mixed material and tertiary air are delivered into said calciner, thereby increasing turbulence within said calciner said restricting means comprising a wedge which increasingly reduces the cross sectional area of the pipe means in the direction of flow of the tertiary air, the narrowest cross sectional area being located at the juncture of the air pipe and the calciner.

12. In apparatus for the heat treatment of fine material having:
(a) a kiln;
(b) a preheater;
(c) a calciner having a longitudinal axis joining the kiln and the preheater and forming a combustion zone of the precalciantion of the preheated fine materials;
(d) air pipe means communicating with the calciner for supplying teritary air thereto; and
(e) material supply pipe means communicating with said air pipe means at a point upstream from said calciner for mixing said material and tertiary air;
the improvement comprising:
(f) means restricting the internal cross sectional area of said air pipe means its juncture with said calciner for accelerating the speed at which mixed material and tertiary air are delivered into said calciner, thereby increasing turbulence within said calciner, said restricting means comprising an adjustable slide.

4,720,263

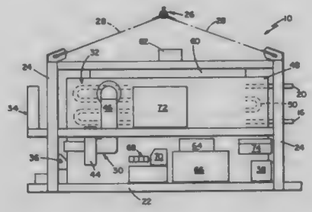
TRANSPORTABLE SYSTEM FOR PROVIDING HEAT TO FLOWING MATERIALS

Robert S. Green, 12270 Jim Platt Rd., Citronell, Ala. 36522

Filed Jun. 4, 1986, Ser. No. 870,503

Int. Cl.[4] F24H *1/00*

U.S. Cl. 432—222 **7 Claims**



1. An apparatus for connection in-line to a pipeline of a producing pretroleum product well and the like for heating the petroleum product flowing in the pipeline for in-process removal of built-up parafin and the like from the inner surface of the pipeline, said apparatus comprising:
a combustion section and heat transfer section,
said combustion section comprising an air heater means, blower means for causing a predetermined volume of air to flow through said heater means to be heated and into the heat transfer section, and conduit means for recirculation of air from said heat transfer section to said combustion section,
said heat transfer section comprising a heater shell, and, disposed therewithin, a heat transfer tubing coil adapted to be connected in a pipeline of a producing petroleum product well, upstream of built-up material to be removed, for receiving the flow of petroleumm product in said pipeline from said well, product in said pipeline being caused to flow through said coil, and means for causing the heated air from said combustion section to flow across the coil in said heater shell for transfer of heat from said air through said coil to the product flowing therewithin, said tubing coil further comprising fin means disposed about the exterior of said tubing and extending outwardly therefrom for relatively greater surface area about the exterior of said tubing coil, said fin means and said tubing coil being formed of material having greater thermal conductivity than the petroleum product film coefficient within said pipeline and said fins means and said tubing coil being joined in a manner whereby heat is transferred uniformly about said fin means and tubing coil, and the rate of heat transfer from said coil to said petroluem product is greater than the rate of heat transfer from the heated air into said fin means,
whereby the temperature of the product in said coil is raised to a predetermined temperature to liquify material built up on the inner surface of said pipeline to flow with said petroleum product.

4,720,264

DUAL TORQUE LIMITING AND WINDING TOOL

Harry J. Lazarus, 36 Knox Ln., Englishtown, N.J. 07724

Filed Mar. 12, 1987, Ser. No. 25,003

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—39 **20 Claims**



1. A torque limiting and winding tool for winding a coil of one of a plastic and a metal retainerless matrix, comprising: a rotatable handle having a handle bore therein; a barrel mounted in said handle bore; torque limiting means mounted to said barrel for engagement with said handle to establish a co-rotational engagement between said barrel and said handle up to an adjustable torque limit beyond which said handle is disengaged from said barrel and rotates independently of said barrel; adjustable compression means for applying an adjustable force against said torque limiting means to adjust the torque limit at which said handle becomes disengaged from said barrel; a flexible sleeve connected to said barrel for co-rotation with said barrel, said flexible sleeve extending out of said barrel; a winding head fixed to said flexible sleeve for rotation with said sleeve and for engaging a coil of a retainerless dental matrix to wind the coil; a palm grip connected to said handle for relative rotation between said palm grip and said handle whereby said palm grip is held in the hand of a user while the fingers of the hand can be used to rotate said handle; a bendable, nonrotatable shaft made of flexible and resilient material, extending through said handle bore and through said barrel, said shaft having a bent end extending into said flexible sleeve for maintaining a bent shape for said flexible sleeve, said shaft being anchored to said grip for nonrotation of said shaft with nonrotation of said grip, said handle, barrel, flexible sleeve and winding head being rotatable together while said shaft is nonrotatable for avoiding a propellering movement of said bent flexible shaft, said shaft being operatively engaged with said adjustable compression means for applying reciprocal compression to said torque limiting means by virtue of the resiliency of said shaft; said shaft being operatively engaged with said adjustable compression means so as to permit rotation of said barrel, said torque limiting means and said adjustable compression means around said shaft, said shaft receiving a bow under the influence of said adjustable compression means.

4,720,265

CURVED DIE POSITIONER

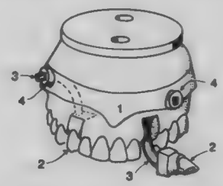
Richard Jacobi, 229 Wimbledon Rd., Midwest City, Okla. 73130

Filed Sep. 26, 1986, Ser. No. 911,760

Int. Cl.[4] A61C *19/00*

U.S. Cl. 433—74 **5 Claims**

1. A curved metal dowel pin for removably joining a dental die to a dental cast, said dowel having a notched or knurled head at one end for embedding in said die, and a smooth shank extending from said head and being uniformly curved substantially throughout its length for sliding into a similarly shaped



channel in said dental cast, said shank terminating in a tip which is smaller in diameter than the entrance of the channel.

4,720,266

DENTAL TREATMENT DEVICE

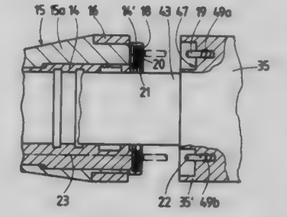
Henri Lecourt; Bernard Lacour, both of Besancon; Jean-Claude Boisot, Rouland, and Jean-Paul Jacoulet, Besancon, all of France, assignors to Micro-Mega S.A., Besancon, France

Filed Mar. 26, 1986, Ser. No. 844,079

Claims priority, application France, Mar. 27, 1985, 85 05016; Mar. 27, 1985, 85 05017; May 6, 1985, 85 07161

Int. Cl.[4] A61C *1/08*

U.S. Cl. 433—126 **2 Claims**



1. A dental treatment instrument comprising, a handpiece having a head for mounting a dental tool thereon and having means for illuminating a work area of the dental tool when in use and a micromotor removably mounted on the handpiece, means for establishing an electrical connection between the handpiece and the micromotor comprising a ring module removably mounted on an end of the handpiece and having concentric annular electrical contacts, mounting means for removably mounting the ring module on said handpiece, and the micromotor having housed on an end thereof, and into which end said ring module fits, two resiliently mounted piston-like, electrically conductive contacts for each engaging a respective one of said annular electrical contacts on said ring module mounted on said handpiece for establishing said electrical connection when the handpiece and micromotor are assembled.

4,720,267

CONNECTOR WITH INTERNAL ELECTRICAL CONNECTIONS TO BE MADE OPTIONALLY

Siegfried A. De Jong, Fahrenheitstraat 380, The Hague, Netherlands

Filed May 28, 1986, Ser. No. 868,320

Claims priority, application Netherlands, May 29, 1985, 8501533

Int. Cl.[4] H01R *13/66*

U.S. Cl. 439—76 **19 Claims**

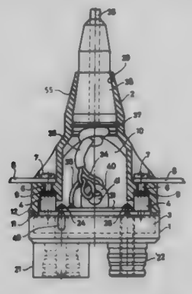
1. A connector for connecting a string of geophones to a main cable or to a main cable through another connector, comprising a casing, a fixing piece having an inside side and an outside side, and a removable printed wiring card having

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conductor tracks, the casing and the fixing piece forming an enclosure within which the printed wiring card is removably located, the connector having at least two groups of electrically conducting connecting elements extending outside said casing through the fixing piece and fixed to the fixing piece, wherein:

(a) for a first group, each electrically conducting connecting element comprises a pin on the outside side of said fixing piece, and for a second group, each electrically conducting connecting element comprises a sleeve on said outside side;

(b) the electrically conducting connecting elements of each group on said outside side of said fixing piece are disposed at a distance from each other and parallel to each other



and exposed to the environment in a respective coupling section for the respective group so that an electrically conducting connection can be obtained with a corresponding group of matching electrically conducting connecting elements of another unit;

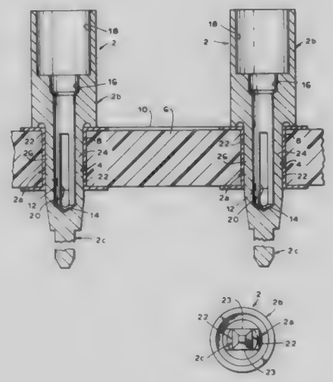
(c) respective conductors of a cable extending into the casing from the outside are connected to respective conductor tracks;

(d) the groups of electricaly conducting connecting elements are fixed at a distance from each other to the fixing piece in a manner such that all the pins and sleeves extend parallel to each other on the outside of the fixing piece; and

(e) the electrically conducting connecting elements on the inside side of the fixing piece are connected to the conductor tracks provided on the printed wiring card.

4,720,268
COMPLIANT CONDUCTIVE PIN
Moses Weiss, Brooklyn, N.Y., assignor to Industrial Electronic Hardware, New York, N.Y.
Filed Mar. 23, 1987, Ser. No. 29,212
Int. Cl.[4] H01R *13/41, 13/428*
U.S. Cl. 439—82 **9 Claims**

1. A conductive pin adapted to be inserted into a hole having a conductive inner surface, said pin comprising a body portion extending along an axis, one lateral dimension of said body portion being closely the same as the corresponding dimension of the hole, a second lateral dimension of said body portion substantially at right angles to said one dimension being less than said one dimension, said body portion having an axial bore and also having an opening completely laterally therethrough in the general direction of said second dimension and communicating with said bore, said opening extending axially along said body portion along a substantial proportion of that part of said body portion adapted to be received in said hole and having closed axial ends, said opening producing controlled resiliency in said body portion when received in said hole,



thereby to maximize the electrical connection between said pin and said conductive hole surface.

4,720,269
MODULAR TELEPHONE JACK WITH ELASTOMERIC CONTACT MEMBER
Steve W. Haskins, Juliet, and John R. McFarland, Gallatin, both of Tenn., assignors to Northern Telecom Limited, Montreal, Canada
Filed Mar. 10, 1987, Ser. No. 24,024
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—90 **12 Claims**



1. A modular telephone jack having a hollow housing, said housing having a profiled entrance aperture at a front surface, and side, end and bottom walls, an elastomeric contact member mounted in said housing at the junction of said end and bottom walls, said contact member having a plurality of spaced parallel electrically conductive contact portions on a surface thereof extending into said housing, the contact portions spaced and positioned to align with the contact members of a plug.

4,720,270
ELECTRIC CONNECTOR WITH A CONTACT ELEMENT OF SHAPE-MEMORY MATERIAL
Gérard Guenin, Meyzieu; Guy Herubel, Marly le Roi; Raymond Bargain, Sartrouville, and Michel De Mendez, Montlhery, all of France, assignors to Souriau & Cie, France
Filed Mar. 13, 1986, Ser. No. 839,150
Claims priority, application France, Mar. 19, 1985, 85 04040
Int. Cl.[4] H01R *13/20*
U.S. Cl. 439—161 **14 Claims**



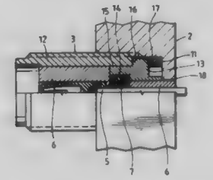
1. An electric connector comprising:

at least one conductive male part or female part intended to be inserted into a respective female part or male part for ensuring or breaking electric conduction between them;

one at least of said male or female parts is of conductive, homogeneous shape-memory material, at least at an active contact end;

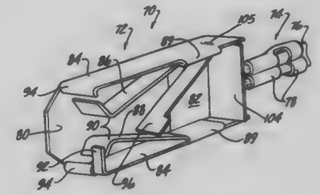
said male or female part being shaped in a manner to be able to be tightly adapted to said respective female part or male part in the first shape-memory state and to be able to ensure the zero insertion force disengagement of said respective female part or male part in a second shape-memory state, passage from the first shape-memory state to the second shape-memory state being effected solely by the modification of the temperature of the connector through a reversible shape-memory effect over a plurality of connection-disconnection cycles.

4,720,271
HERMETIC COAXIAL CONNECTOR
Pierre Grange, Charavines, France, assignor to Radiall Industrie, Rosny-Sous-Bois, France
Filed Dec. 1, 1986, Ser. No. 936,225
Claims priority, application France, Nov. 29, 1985, 85 17665
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—271 **3 Claims**



1. A hermetic coaxial connector of the type intended to be attached to a panel to ensure hermetic coaxial traverse of a bore having a top and a bottom in said panel, comprising a central conductive contact housed with interposition of an insulator in a housing, forming an external conductor, provided with a means of attachment to said panel, a sealing joint between said external conductor and said panel and an insulating glass bead sealed to said central conductive contact and to an annular ring housed at least partly in a recess of said housing, characterized by the fact that said ring presents a staggered configuration containing an axial annular span connected via said insulated glass bead to said central conductive contact, an axial span in contact with a corresponding span of said housing, a first radial span supported against a corresponding span of said housing and a second radial span in contact with said sealing joint interposed between said ring and said panel.

4,720,272
SNAP-IN TERMINAL WITH WIRE GUIDE
Renie P. Durand, Fraser, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Continuation of Ser. No. 751,756, Jul. 3, 1985, abandoned. This application Oct. 28, 1986, Ser. No. 922,780
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—375 **3 Claims**



1. A snap-in lamp terminal for use in a socket housing for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on sides of the wedge base, a pair of troughs extending transverse to the wedge base, the wedge base further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extending side wings of the wedge base, the snap-in terminal comprising:

a lamp receiving portion and a conduit receiving portion;

the conduit receiving portion including wire retention means;

the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;

cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;

the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;

the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;

a wire guide means cantilevered from at least one terminal side projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires, by urging the skewed filament wires from a position near the vent tube of the bulb to a position onto the side wings of the wedge base, the interaction of the wire guide means and vent tube resulting in deformation of the wire guide means.

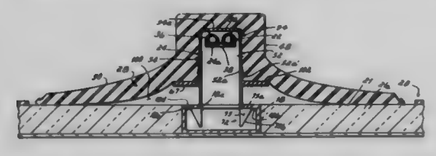
4,720,273
CONNECTOR ASSEMBLY FOR ANODE SOCKET OF CATHODE RAY TUBE
Thomas V. Thole, 5543 Jessup Rd., Cincinnati, Ohio 45239
Filed May 6, 1986, Ser. No. 860,244
Int. Cl.[4] H01R *11/22*
U.S. Cl. 439—592 **36 Claims**

1. An anode connector assembly connectable between (a) an electrically conductive anode socket having an annular ring with an inwardly-directed circular lip mounted to the exterior wall of an evacuated glass tube, and (b) the end of an insulated high voltage wire having an electrically conductive core surrounded by an insulative sheath, said assembly comprising:

a stamped band of electrically conductive spring sheet material formed into a generally U-shaped anode clip having a

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central base, a connecting element, and oppositely disposed elongated arms, said arms each including
(a) a first section at the free end thereof, and
(b) a second section located between and integral with a side of said base and said first section,
said first sections of said arms each having means for mechanically and electrically connecting said arms to said anode socket at opposite points of said lip of said annular ring,
an electrically insulative resilient cup having
(a) a skirt section defining a large open cavity designed to surround said first clip arm sections,
(b) a central body section having a small cavity with internal walls connecting to said open cavity designed to snugly embrace said clip base and said second arm sections when said anode clip is inserted therein, said small cavity having a longitudinal axis parallel to the direction of the length of said arms,
(c) a barrel having a bore therein connected at its inner end to said small cavity proximate the connecting ele-



ment of an anode clip fully inserted into said small cavity, said bore further having an outer end, and a longitudinal axis which is approximately perpendicular to the longitudinal axis of said small cavity, and
a conductive terminal having an inner section electrically connectable to said conductive core, said terminal having an outer section terminating at a leading edge, said terminal outer section being slidably electrically and mechanically interconnectable with said anode clip connecting element when said outer terminal section in inserted into the outer end of said barrel bore toward and into engagement with said anode clip connecting element, said terminal when engaged with said anode clip connecting element being electrically and mechanically interconnected to said anode clip only via mechanical and electrical connective engagement with said anode clip connecting element, said conductive core and said insulative sheath being free of direct mechanical engagement by said anode clip arms, anode clip connecting element and/or central base when said terminal outer section is mechanically interconnected with said anode clip connecting element.

4,720,274

ELECTRICAL CONNECTOR ASSEMBLY

Timothy N. Tackett, Warren, and Frederick H. Rider, Youngstown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1986, Ser. No. 825,483
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—668 **2 Claims**

1. An electrical connector assembly including an electrical terminal and adapted to receive a component and to make electrical contact with a surface of said component on one side only of said electrical terminal, said connector assembly comprising in combination,
a connector body adapted to receive said component and direct said component surface along a defined path, said connector body also having a wall, said electrical terminal being joined to said connector body, said terminal further having a substantially flat base portion, a first flexible leg extending outwardly from said base portion at a predetermined angle, an elongated, substantially flat contact portion extending from said first leg spaced from and substantially parallel to said base portion and including an integral lead-in flange forming an angle with said contact portion and extending along the length of said contact portion so as to stiffen said contact portion, and a second flexible leg of substantially the same length as said first leg extending from said contact portion inwardly toward said base portion and terminating at a free end engaging said base portion and forming an angle with said base portion substantially equal to said predetermined angle, said first and second legs therefor being substantially symmetrical relative to said base and contact portion, said terminal being joined to said connector body with said base portion against said connector body wall and with said terminal contact portion oriented generally normal to the path of said component contact surface and located such that, as



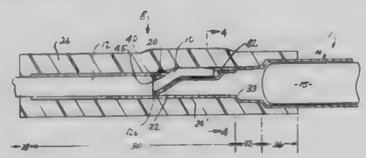
said component is received in said connector body, said component surface first engages said contact portion lead-in flange and then engages said contact portion, thereby moving said contact portion toward said base portion as said first and second legs flex and force said base portion against said connector body wall, said lead-in flange, by stiffening said contact portion, cooperating with said symmetrical first and second flexible legs to allow said contact portion to move toward said base portion substantially without bending and substantially parallel to said base portion, thereby making electrical contact with said component surface without applying forces to said terminal that would tend to move it along said connector body wall and out of position.

4,720,275

QUICK TERMINATION APPARATUS AND METHOD FOR ELECTRICAL CONNECTOR

Mark A. Swart, Upland, and Charles J. Johnston, West Covina, both of Calif., assignors to Everett/Charles Contact Products, Inc., Pomona, Calif.

Filed Apr. 14, 1986, Ser. No. 851,334
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—725 **27 Claims**



1. Electrical connector and flexible wire assembly with quick termination, the assembly comprising:
a flexible electrically conductive wire having a bare end;
an electrical connector comprising an electrically conductive tube, the tube comprising an internal passage, separate axial end opening and transverse side opening to the passage and a ramp extending toward the side opening from in the passage;

the bare end of the wire extending into the passage through the end opening, along the ramp, out of the side opening and along an external side of the tube; and
a non-conductive sleeve extending around and gripping the combination of the bare wire and the tube to thereby retain the bare wire and tube in mechanical and electrical contact with each other.

4,720,276

CLAMP TYPE CONTACT AND METHOD OF MANUFACTURE THEREOF

Toru Takahashi, Yokohama, Japan, assignor to Yamaichi Electric MFG. Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1986, Ser. No. 841,458
Claims priority, application Japan, Mar. 25, 1985, 60-61525
Int. Cl.[4] H01R *11/22*
U.S. Cl. 439—861 **10 Claims**



1. A clamp type contact comprising:
a thin upper end at which first and second elongate contact pieces are defined each of which extend from a common base end at an end of said thin upper end to respective free ends thereof,
said second elongate contact piece having a base portion extending from said base end at a predetermined angle thereto and a bent portion extending from said base portion to said respective free end thereof,
the respective free end of the second elongate contact member facing the respective free end of the first elongate contact member, and
the free end of said first elongate contact piece comprising an expanded portion having a surface area that is increased and a thickness that is reduced with respect to the portion of the first elongate contact piece from which the free end thereof extends.

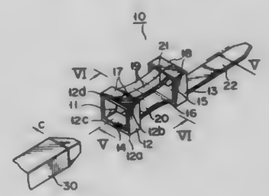
4,720,277

RECEPTACLE

Haruo Sakamoto, Tokyo, Japan, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1986, Ser. No. 930,477
Claims priority, application Japan, Nov. 30, 1985, 60-185466[U]
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—842 **1 Claim**

1. A receptacle comprising:
first and second rectangular frames each having a rectangular opening, so that a plug pin can be detachably inserted into the first frame through the rectangular opening;
a pair of leaf spring pieces connecting the first frame to the second frame and arranged opposite each other between respective pairs of opposite sides of the rectangular first and second frames; and
an external connection pin formed at one of the two opposite sides of the second frame such that it extends away from the first frame,
in which said pair of leaf spring pieces are inwardly curved toward each other so that they can elastically retain said plug when the latter is inserted into said receptacle



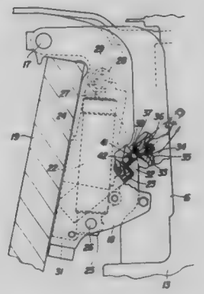
through said first frame, the opposite surfaces of said pair of leaf spring pieces being chamfered at their side edges.

4,720,278

TRIMMING DEVICE FOR MARINE PROPULSION UNIT

Michihiro Taguchi, and Yoshihiro Nagata, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

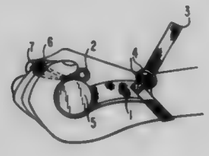
Filed Jan. 7, 1987, Ser. No. 1,016
Claims priority, application Japan, Jan. 17, 1986, 61-7728
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—61 **16 Claims**



16. In a trim arrangement for a marine outboard drive member for pivotal movement through a plurality of trim adjusted positions relative to a transom member of an associated watercraft and beyond said trim adjusted positions to a tilted up position, a trim motor fixed relative to one of the members and having a reciprocating thrust member adapted to bear against another of said members for effecting pivotal movement of said outboard member relative to said transom member upon reciprocation of said thrust member through the range of only said trim adjusted positions, and means for moving said outboard drive member beyond said trim adjusted positions to said tilted up position, the improvement comprising anti-friction means interposed between said thrust member and said another member for reducing friction upon reciprocation of said thrust member, said anti-friction means comprising a pivotally supported bearing element and a removable housing for supporting said bearing element and detachably affixed to the another member, said bearing elements being held in engagement only by the weight and thrust of said outboard drive member and being freely moveable away from contact with each other when said outboard drive member is moved to said tilted up position.

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4,720,279
HOOK WATER SPORTS HAND GRIP
Charles L. Fritschen, and Elizabeth A. Fritschen, both of 17062 - 66th Pl., NE., Bothell, Wash. 98011
Continuation-in-part of Ser. No. 752,798, Jul. 8, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 14,658
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—69 20 Claims



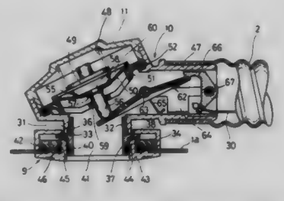
1. A water sport hand grip for grasping a generally cylindrical object which exerts a pulling force on a user, comprising:
an elongated palm strap for extending longitudinally of a user's hand on the palm side of the user's hand, the strap having a finger end and a wrist end;
a protuberant rib secured to the palm strap adjacent the finger end and extending transversely of the palm strap;
at least one finger loop, each loop comprising a narrow strip of material which is secured at each end to the palm strap adjacent the protuberant rib for slidably and adjustably securing the palm strap to at least one of the user's fingers, each strip being of such a size and shape that when the grip is in use, each loop surrounds only a small area of each finger received by the loop so that other portions of the finger are open to the air; and
wrist attachment means extending outwardly from the wrist end of the palm strap for securing the palm strap to a user's wrist.

4,720,280
WAVE SKI
Ernest Hufnagl, 1/640 Bunneroog Road, Matraville, and Christopher J. Fields, 39 Brisbane Street, Chifley, both of Sydney, Australia 2036
Filed Jun. 4, 1986, Ser. No. 873,166
Claims priority, application Australia, Jul. 31, 1985, PF1737
Int. Cl.[4] A63C *15/05*
U.S. Cl. 441—74 19 Claims



9. A wave ski comprising:
a hull,
a seat adapted to move longitudinally along said hull,
said hull defining a slot extending longitudinally therealong, and
a fin operatively associated with said seat through said slot such that a user of the wave ski can simultaneously adjust the longitudinal positions of said fin and said seat relative to said hull.

4,720,281
DIVING BUOYANCY COMPENSATOR
Mitsuhiro Matsuoka, Tokyo, Japan, assignor to Tabata Co., Ltd., Tokyo, Japan
Filed Dec. 23, 1986, Ser. No. 945,507
Claims priority, application Japan, Dec. 31, 1985, 60-297355
Int. Cl.[4] B63C *9/12*
U.S. Cl. 441—92 3 Claims

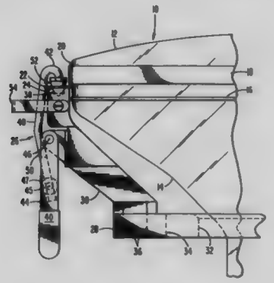


1. A diving buoyancy compensator including a compensator itself, a first inflation hose having first and second ends and a tendency to contract being capable of expansion and contraction and having one end connected through a coupling to an air inlet port formed in said compensator itself, a power inflator carried on the other end of said first inflation hose, a second inflation hose having first and second ends having one end connected to said inflator and the other end adapted to be connected to an air tank, and a safety valve device adapted to be automatically opened when said compensator has been filled with an excessive quantity of air and also adapted to be opened through manual operation by a diver, in case of emergency, so as to relieve the quantity of air filling said compensator, wherein said inflator includes a mouthpiece, a button to operate a valve adapted to open and close an air passage within said inflator extending between said first inflation hose and said second inflation hose, and another button to operate a valve adapted to open and close an air passage within said inflator extending between said first inflation hose and said mouthpiece, characterized by that
said safety valve device is incorporated into a mount member coupled to said coupling to which the one end of said first inflation hose is connected, an operating mechanism for said safety valve device is juxtaposed with said mount member, a pull cord for actuation of said operating mechanism is connected at one end to a portion of said operating mechanism and extends through said first inflation hose into said inflator to be connected thereto, said first inflation hose is expanded against its tendency to contract and thereby said pull cord is pulled so as to open said safety valve device through said operating mechanism.

4,720,282
METHOD AND APPARATUS FOR SECURING A CATHODE-RAY TUBE DURING PROCESSING
Thomas L. Chase, and Kenneth A. Long, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.
Division of Ser. No. 889,625, Jul. 18, 1986, Pat. No. 4,695,045.
This application Jan. 12, 1987, Ser. No. 2,319
Int. Cl.[4] H01J *9/20*
U.S. Cl. 445—52 6 Claims

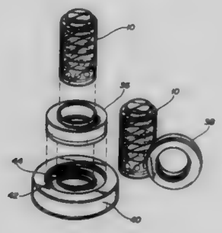
1. A method of holding a cathode-ray tube in a fixed position during processing utilizing mounting lugs attached to said tube, each of said lugs having an end projecting away from said tube and containing an aperture, comprising:
supporting the ends of said mounting lugs, respectively, on legs connected to a platform, each of said legs having a recess therein aligned with the aperture in said respective end, and

clamping each lug to said respective leg by pivoting clamping means, attached to each of said legs, until an end



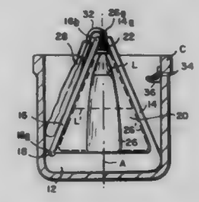
portion of each of said clamping means projects through said aperture into the respective recess.

4,720,283
BABY'S MARBLE RUNWAY TOY
D. Michael Williams, New York, N.Y., and Lawrence B. Grubb, Moakton, Md., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Aug. 7, 1985, Ser. No. 763,266
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—69 7 Claims



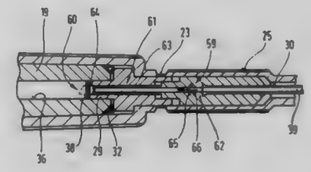
1. A baby's toy comprising
(i) a hollow cylindrical body having a top portion, a bottom portion and a central axis in its longitudinal direction;
(ii) a substantially spiral passage around said central longitudinal axis and located within said cylindrical body;
(iii) at least one spherical body disposed within aid cylindrical body and adapted to move along said spiral passage;
said spiral passage comprising a plurality of substantially semicircular flat plates having arc portions, each arc portion being fixed to the inner wall of said cylindrical body, the semicircular plates having their planes inclined at an angle to the cross-section of said cylindrical body to thereby form said spiral passage, said cylindrical body comprising a first semi-cylindrical half and a second semi-cylindrical half, each of said halves having a top portion, a side portion and a bottom portion, the bottom portion of said first half comprising a bottom guide disk, the second of said halves comprising a reinforcing plate which is spaced from the bottom portion of said second half, said bottom guide disk being adapted to be inserted between said reinforcing plate and said bottom portion of said second half whereby said halves may be accurately positioned with respect to each other prior to their being connected together.

4,720,284
METHOD AND MEANS FOR SEPARATION OF BLOOD COMPONENTS
Read S. McCarty, Hingham, Mass., assignor to Neotech, Inc., Rockland, Mass.
Filed Oct. 3, 1986, Ser. No. 894,788
Int. Cl.[4] B01D *21/26*; B04B *1/00*
U.S. Cl. 494—37 19 Claims



1. The method of separating different density fluid components comprising the steps of
A. placing a sample of said fluid in a first flexible container having side walls and a bottom; and
B. spinning said container and its contents at a high speed while controlling the shape of said container so that its side walls spread apart and the container bottom flattens whereby the container and its contents have a relatively small aspect ratio so that different density components of said fluid travel minimum distances while separating in said container to achieve a density distribution in said container, with the densest components of said fluid distal to the spin axis being distributed over a relatively large area surface constituted by the container bottom.

4,720,285
INJECTION SYRINGE
Ewald Pickhard, Redtenbachergasse 15, A-1160 Vienna, Austria
PCT No. PCT/AT85/00048, § 371 Date Jul. 21, 1986, § 102(e) Date Jul. 21, 1986, PCT Pub. No. WO86/03126, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 20, 1985, Ser. No. 893,297
Claims priority, application Austria, Nov. 21, 1984, 3698/84
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 3 Claims



1. An injection syringe comprising
(a) a syringe body adapted to receive an injectin fluid;
(b) a frusto-conically tapered attachment member integral with the syringe body,
(1) the syringe body and the attachment member defining an annular groove therebetween, and
(2) the attachment member defining an outlet opening for the injection fluid in communication with the syringe body;
(c) a membrane closing the outlet opening;
(d) a syringe needle arranged coaxially with the outlet opening;
(e) a tubular needle element arranged coaxially with the outlet opening and in communication with the syringe needle, the tubular needle element having an end facing

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the membrane and the membrane being interposed between the tubular needle element end and the outlet opening;

(f) a two-part protective cap for the syringe needle,

(1) one part of the cap constituting a securing device for the cap and including inwardly projecting claw means resiliently engaging the annular groove,

(2) a second part of the cap constituting a needle protection cap, and

(3) a weakened score line frangibly connecting the parts of the protective cap; and

(g) a two-part device for breaking the membrane whereby the outlet opening communicates with the tubular needle element, the two-part membrane breaking device extending in the interior of the protective cap from the attachment member past the score line to the needle protection cap and essentially consisting of

(1) a needle carrier part joined to the protective cap and defining an axial bore having an open end facing the membrane;

(2) a support member part joined to the tubular needle element, the support member holding the syringe needle and the support member with the tubular needle element being displaceably guided in the needle carrier part relative to the membrane in a direction of the longitudinal extension of the syringe needle for piercing the membrane, and

(3) the tubular needle element being sealingly and slidably guided in the needle carrier.

4,720,286

MULTIFOCUS INTRAOCULAR LENS

Kelvin E. Bailey, 1100 Greentree Ct., Lexington, Ky. 40502, and Daniel B. Pope, 203 69th St., NW., Bradenton, Fla. 33529

Filed Jul. 20, 1984, Ser. No. 632,863
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 9 Claims



1. A multifocus intraocular lens comprising:

a body of transparent material suitable for permanent placement in the eye;

a hollow lenticule in said body, said lenticule being positioned for encompassing the light path between the pupil of the eye and the retina;

a pair of fluid reservoirs in said body, one above and one below said lenticule and in fluid communication therewith;

channel means interconnecting said reservoirs, said channel means bypassing said light path and said lenticule, said channel means, lenticule, and reservoirs forming a closed system within said body; and

transparent fluid means filling said closed system for changing the index of refraction of said lens upon predetermined changes in the inclination of said light path with respect to the horizontal, wherein said fluid means comprises at least two immiscible liquids with different refractive indices.

4,720,287

LOW TEMPERATURE THERMAL-CHEMICAL PRETREATMENT PROCESS FOR PEAT DEWATERING

John D. Sheppard, Montreal, and David G. Cooper, Dollard-des Ormeaux, both of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Filed Jul. 13, 1986, Ser. No. 891,316
Claims priority, application Canada, Aug. 29, 1985, 489711
Int. Cl.[4] C10L 9/02; C10F 7/06
U.S. Cl. 44—33 17 Claims

1. A process for dewatering peat comprising:

(a) heating and subjecting peat to a surface active agent, selected from the group consisting of a chitosan salt of a mineral acid, dodecyltrimethylammonium bromide, and biologically produced surface active agents being produced by an organism selected from the group consisting of *Xanthomonas campestris, Bacillus subtilis, Rhizopus arrhizus* and *Aureobasidium pullulans,* to render peat more amenable to mechanical dewatering; and

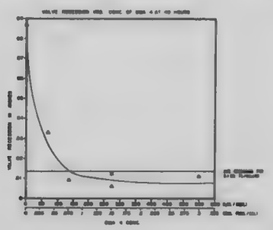
(b) Mechanically dewatering the product of step (a) to yield a peat product with lowered moisture content.

4,720,288

GASOLINE FUEL COMPOSITION

Michael C. Croudace, Huntington Beach, and Ward W. Howland, Anaheim, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 27, 1986, Ser. No. 844,867
Int. Cl.[4] C10L 1/22
U.S. Cl. 44—72 215 Claims



1. A fuel composition comprising (1) an olefin-containing gasoline which causes an excessive wear rate of exhaust valve seats when combusted in an internal combustion engine containing non-hardened exhaust valve seats and (2) a sufficient amount of an amine salt of an acid of phosphorus dissolved in said gasoline to provide a dissolved concentration of phosphorus in the gasoline of at least about 0.06 gram per gallon.

4,720,289

PROCESS FOR GASIFYING SOLID CARBONACEOUS MATERIALS

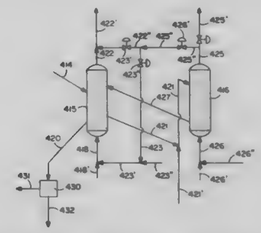
Stephen N. Vaugh, Webster, and Robert Lang, Baytown, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 5, 1985, Ser. No. 751,927
Int. Cl.[4] C10J 3/54
U.S. Cl. 48—197 R 8 Claims

1. A process for gasifying a solid carbonaceous material comprising:

(a) initially gasifying from about 40 to about 80 wt % of said solid carbonaceous material in the presence of a carbon alkali metal gasification catalyst at an elevated temperature and a pressure above about 100 psig in the presence of steam; and

(b) gasifying at least a portion of the partially gasified solid carbonaceous material resulting from step (a) at an elevated temperature and pressure in the presence of hydrogen and in an environment substantially free of carbon



dioxide and steam such that from about 60 to about 20 wt % of said solid carbonceous material is gasified.

4,720,290

REDUCTION OF LIQUID ATOMIZER DROPLET SIZE

Duane C. McCoy, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Nov. 8, 1985, Ser. No. 796,370
Int. Cl.[4] B03C 3/01; B01D 51/00
U.S. Cl. 55—10 4 Claims

1. An improved process for the removal of particulate matter from flue gases, comprising contacting said particulate laden flue gases with a humidifying liquid and subjecting said humidified particulate-laden flue gases to particle separation to produce substantially particulate-free flue gases, the improvement comprising

(1) venting a first portion of said particulate-free flue gases, while

(2) dissolving a second portion of said particulate-free flue gases in said humidifying liquid in amounts sufficient to substantially saturate said humidifying liquid at a pressure of at least 50 pounds per square inch with soluble flue gas components and venting non-soluble flue gas components,

(3) passing said gas-saturated humidifying liquid through a two-fluid atomizing nozzle, where a second gaseous fluid impinges upon said gas saturated humidifying liquid immediately prior or immediately subsequent to ejection from the nozzle in a particulate-laden flue gas humidifying chamber wherein said contacting is effected, said saturated gas thereby expanding to more finely divide the expelled humidifying liquid droplets, more completely contacting the particulate matter in the particulate-laden gases with humidifying liquid.

4,720,291

AERO-HYDRAULIC POLLUTION CONTROL SYSTEM

Ilya Z. London, 72 Vogel St., Boston, Mass. 02132

Filed Nov. 12, 1986, Ser. No. 929,917
Int. Cl.[4] B01D 47/02
U.S. Cl. 55—227 15 Claims

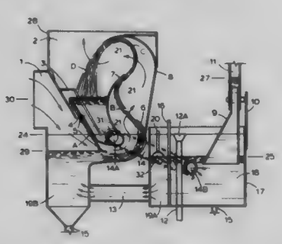
1. A system for gas and water pollution control, and sludge handling, based exclusively on the aerohydrodynamic principles and without any moving parts, filled up to desired static level with a liquid, which becomes a cleaning and flame suppression media as a result of said liquid recirculation constituted by said gas flow, comprising:

a liquid pollutant extractor, open to the atmosphere and easily accessible for manual sludge removal and service in operating and unoperating time,

a gas pollutant extractor, interconnected by polluted and clarified liquid circulating passages with said liquid pollutant extractor, preventing entrapped pollutants from reentering said gas pollutant extractor,

said circulating passages, hydraulically connecting high and low operating liquid levels of said gas pollutant extractor

through said liquid pollutant extractor, delivering a trapped pollutant into said liquid pollutant extractor for extracting it from said circulating liquid,



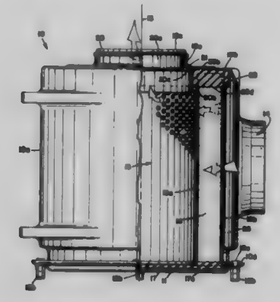
means for implementing said system to the dual purpose as an air pollution control and as an element of a technological process, where pollutant soluble in a liquid creates a new product.

4,720,292

CYLINDRICAL AIR FILTER WITH LIGHTWEIGHT HOUSING AND RADIALLY DIRECTED SEAL

Donald F. Engel, Prior Lake, and Steven S. Gieseke, Richfield, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jul. 14, 1986, Ser. No. 884,992
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—337 **10 Claims**



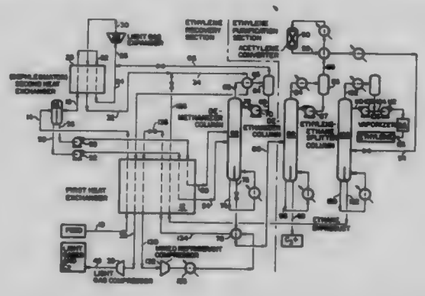
1. An air filter, comprising:
(a) a lightweight housing having a longitudinal axis, a first generally closed end having an axial outlet opening, a generally open second end closeable by a removeable cover, and a peripheral air inlet opening;
(b) a generally cylindrical filter element comprising an inner liner, a filter and an outer liner, carried within said housing coaxial therewith, having a first end engageable with said closed end of said housing and having a second, closed end engageable with said cover;
(c) said closed end of said housing comprising a cylindrical outlet member in said outlet opening having a short inner portion extending axially inwardly into said housing and said filter element, said inner portion having a first outside diameter; and
(d) said first end of said filter element comprising a ring-like end cap having a relatively soft, rubber-like consistency, said end cap having a generally cylindircal radially inwardly facing surface of a diameter smaller than said first diameter and constructed and arranged to fit over said inner portion of said outlet member and to be compressed between said inner portion and said inner liner to sealingly engage said inner portion of said outlet member whereby air flowing from said air inlet into said housing is forced to flow through said filter element to said outlet opening.

4,720,293

PROCESS FOR THE RECOVERY AND PURIFICATION OF ETHYLENE

Howard C. Rowles, Center Valley; Kimberly S. Grassi, Schnecksville, and Dennis P. Bernhard, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 28, 1987, Ser. No. 43,582
Int. Cl.[4] F25J *1/02*
U.S. Cl. 62—24 **17 Claims**



1. In a process for the recovery and purification of ethylene from an ethylene containing feed stream, wherein the ethylene containing feed stream is cooled in two heat exchange stages to condense out the bulk of C_2^+ material present in the feed stream; the condensed C_2^+ material is fed to a demethanizer column to remove any remaining light gases, producing a light gas stream as an overhead of the demethanizer column and a demethanized C_2^+ stream is then fed to an ethylene-ethane separation process which produces at least an ethylene product stream and an ethane byproduct stream, the improvement comprising the utilization of three integrated refrigeration cycles wherein low level refrigeration for the second heat exchange stage is provided by work expansion, in one or more stages, of at least a portion of an uncondensed light gas stream removed from the cold end of the second heat exchange stage or an uncondensed light gas stream removed from the cold end of the second heat exchange stage and at least a portion of the light gas stream from the overhead of the demethanizer column; intermediate level refrigeration for the demethanizer column condenser and for the cold end of the first heat exchange byproduct stream from the ethylene-ethane separation process with at least a portion of the light gas stream from the cold end of the second heat exchange stage or at least a portion of the light gas stream from the overhead of the demethanizer column, or both; and high level refrigeration for the warm end of the first heat exchange stage is provided by a mixed refrigerant system.

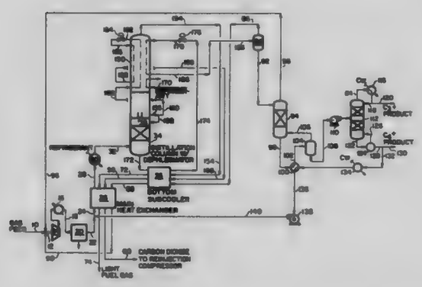
4,720,294

DEPHLEGMATOR PROCESS FOR CARBON DIOXIDE-HYDROCARBON DISTILLATION

Gene A. Lucadamo, Macungie, and Howard C. Rowles, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 5, 1986, Ser. No. 893,506
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—31 **8 Claims**

1. In a process for the separation of a carbonaceous off-gas stream containing a quantity of acid gases, such as carbon dioxide, hydrogen sulfide and carbonyl sulfide, wherein said off-gas stream is compressed, cooled and separated in a low temperature distillation column into a fuel gas stream which is recovered from the top portion of said distillation column, a liquefied acid gas sidestream and a bottoms liquids stream, the improvement comprising
(a) incorporating a dephlegmator as the top portion of said distillation column;
(b) passing at least a portion of said liquefied acid gas sidestream to the dephlegmator for indirect heat exchange



with distillation column fluids thereby providing refrigeration for said dephlegmator; and
(c) subcooling at least a porton of the bottoms liquids stream and passing said subcooled bottoms liquids stream to the dephlegmator for indirect heat exchange with distillation column fluids thereby providing refrigeration for said dephlegmator.

4,720,295

CONTROLLED PROCESS FOR MAKING A CHEMICALLY HOMOGENEOUS MELT FOR PRODUCING MINERAL WOOL INSULATION

Boris Bronshtein, 6702 N. Newgard, Chicago, Ill. 60626

Filed Oct. 20, 1986, Ser. No. 921,156
Int. Cl.[4] C03B *5/16*; C03C *13/06*
U.S. Cl. 65—2 **6 Claims**

1. A controlled method for making a chemically homogeneous melt for producing light-colored mineral wool which comprises:
(a) physically homogenizing a mixture of the following formula:

Ingredient	% By Weight
Mineral Wool Production Waste (≦¼")	20–50
Cement Kiln Dust	15–25
Clay	12–20
Blast Furnace Slag (≦¼")	10–40
Dolomite (≦¼")	0–10
Portland Cement	3–5
Ground Portion of said wool production waste (<150 microns)	5–10

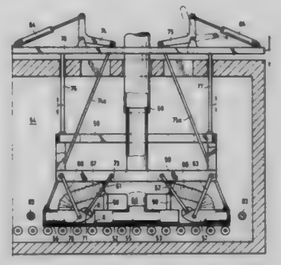
(b) briquetting said mixture into agglomerate pieces of predetermined size and shape to a density of 125 to 160 lbs./ft^3;
(c) melting said agglomerate in a cupola furnace;
(d) discharging the molten agglomerate into a receiver;
(e) passing hot combustion gases into said melt to chemically homogenize the melt and heat the melt to a predetermined temperature; and
(f) converting said melt into fibers.

4,720,296

METHOD AND APPARATUS FOR BENDING A GLASS PANE

Karl-Rudolf Bartunel; Alf Kriesenger, both of Stolberg, and Werner Gatzweiler, Heinsberg, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Aug. 1, 1986, Ser. No. 894,626
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527858
Int. Cl.[4] C03B *23/023*
U.S. Cl. 65—290 **5 Claims**



1. Apparatus for bending a glass pane to a desired form comprising:
a rigid first part having a substantially flat first contact surface;
a rigid sweepable part mounted for relative motion with respect to said first part around an articulated axis and between a first position spaced from said first part and a second position closer to said first part than said first position, said sweepable part having a second contact surface, a portion of said second contact surface that is disposed adjacent said first part being arched according to a desired final curve of the glass pane;
means for holding a glass pane against said first and second contact surfaces;
moving means for moving said sweepable part with respect to said first part;
guiding means establishing constant dislocation of said articulated axis with respect to the glass pane along a predetermined curved path during said motion of said sweepable part, said curved path having a shape corresponding to the desired bend of the glass pane, said guiding means guiding said arched portion of said second contact surface of said sweepable part in rolling motion on the surface of the pane without relative sliding movement on the surface of the pane during said movement of said sweepable part, wherein the glass pane is bent substantially without relative sliding motion between said pane and said first and second parts.

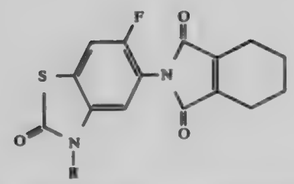
4,720,297

BENZOTHIAZOLONES, AND THEIR PRODUCTION AND USE AS HERBICIDES

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Ryo Sato, and Koichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 25, 1986, Ser. No. 911,360
Claims priority, application Japan, Sep. 27, 1985, 60-216043; Dec. 5, 1985, 60-274113; Dec. 5, 1985, 60-274114; Dec. 5, 1985, 60-274115; Jan. 6, 1986, 61-001171
Int. Cl.[4] A01N *43/78*; C07D *277/68*
U.S. Cl. 71—90 **10 Claims**

1. A compound of the formula:



wherein R is a hydrogen atom, a C_1–C_5 alkyl group, a C_3–C_4 alkenyl group, a C_3–C_4 alkynyl group, a halo(C_1–C_4)alkyl group, a halo(C_3–C_4)alkenyl group, a halo(C_3–C_4)alkynyl group, a C_1–C_2 alkoxy(C_1–C_2)alkyl group, a C_1–C_2 alkoxy(C_1–C_2)alkoxy(C_1–C_2)alkyl group, a cinnamyl group, a cyano(C_1–C_3)alkyl group, a carboxy(C_1–C_3)alkyl group, a C_1–C_5 alkoxycarbonyl(C_1–C_3)alkyl group, a halo(C_1–C_5)alkoxycarbonyl(C_1–C_3)alkyl group, a C_1–C_2 alkoxy(C_1–C_2)alkoxycarbonyl(C_1–C_3)alkyl group, a C_1–C_5 alkoxycarbonyl(C_1–C_2)alkoxycarbonyl(C_1–C_3)alkyl group,, a cyclo(C_3–C_6)alkoxycarbonyl(C_1–C_3)alkyl group, a C_1–C_5 alkylaminocarbonyl(C_1–C_3)alkyl group or a di(C_1–C_5)alkylaminocarbonyl(C_1–C_3)alkyl group.

9. A method for controlling the growth of undesired weeds, which comprises applying a herbicidally effective amount of the compound according to claim 1 and an inert carrier or diluent to the area where the undesired weeds grow or will grow.

4,720,298

PHENYL-SUBSTITUTED SULFONAMIDES

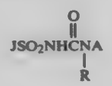
Robert J. Pasteris, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 641,579, Aug. 16, 1984, Pat. No. 4,582,527, which is a division of Ser. No. 406,191, Aug. 11, 1982, Pat. No. 4,492,596. This application Jan. 17, 1986, Ser. No. 819,670

Int. Cl.[4] C07D *407/12, 409/12;* A01N *43/66, 43/70*

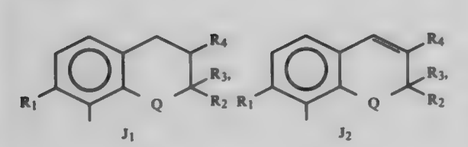
U.S. Cl. 71—91 40 Claims

1. A compound selected from

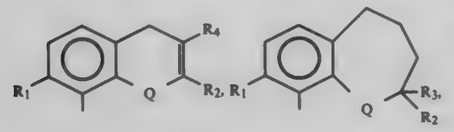


wherein

J is

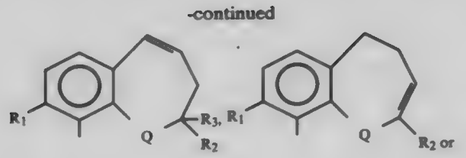


J_1 J_2

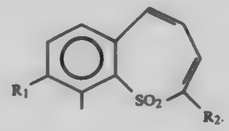


J_3 J_4

-continued



J_5 J_6



J_7

Q is O, S or SO_2;

R is H or CH_3;

R_1 is H, CH_3, OCH_3, Cl, Br, CO_2R_5, SO_2R_6, OSO_2R_7 or $SO_2NR_8R_9$;

R_4 is H or CH_3;

R_2 and R_3 are independently H or C_1–C_3 alkyl;

R_5 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_6 is C_1–C_3 alkyl;

R_7 is C_1–C_3 alkyl or CF_3;

R_8 and R_9 are independently C_1–C_2 alkyl;

A is

X is CH_3 or OCH_3;

Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$ or $N(CH_3)_2$;

Z is N; and

their agriculturally suitable salts provided that

(1) the total number of carbon atoms in R_2 and R_3 are less than or equal to 3;

(2) in Formula J_2, when R_2 and R_3 is other than H, then R_4 is H;

(3) in Formula J_3 when R_2 is other than H, then R_4 is H;

(4) when Q is S, then R_1 is not $SO_2NR_8R_9$;

(5) in Formula J_3 and J_6, Q may not be O; and

(6) in Formula J_7, R_1 is not CH_3.

31. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,720,299

METHOD FOR THE DIRECT REDUCTION OF PARTICULATE IRON-OXIDE-CONTAINING MATERIAL

Konstantin Milionis, Graz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Austria

Filed Apr. 29, 1986, Ser. No. 857,238

Claims priority, application Austria, May 13, 1985, 1441/85

Int. Cl.[4] C21B *13/02*

U.S. Cl. 75—34 10 Claims

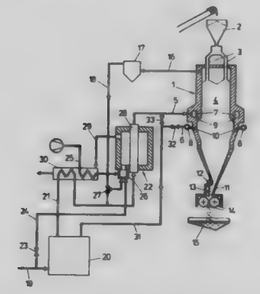
1. A method for the direct reduction of particulate iron-oxide-containing material in a shaft furnace including an upper section, a reducing zone and a lower section arranged below said reducing zone, which method comprises:

charging said particulate iron-oxide-containing material into said shaft furnace;

supplying reformed gas from a reformer as reducing gas to said reducing zone of said shaft furnace so as to obtain directly reduced ferrous particles and top gas;

discharging said directly reduced ferrous particles from said shaft furnace;

extracting said top gas from said upper section of said shaft furnace;



separating natural gas containing low hydrocarbons of methane and ethane, and higher hydrocarbons of propane, butane, and hydrocarbons from pentane to octane into a first fraction enriched with said low hydrocarbons and a second fraction enriched with said higher hydrocarbons, before introducing said fractions into said shaft furnace and said reformer;

conducting said first fraction through said reformer to form said reformed gas; and

injecting said second fraction into said shaft furnace.

4,720,300

PROCESS FOR PRODUCING NIOBIUM METAL OF AN ULTRAHIGH PURITY

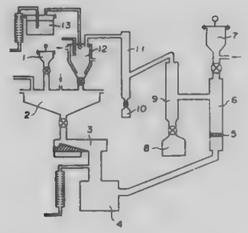
Keiichiro Nishizawa, Sagamihara; Hajime Sudo, Machida, and Masayuki Kudo, Yokohama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Jun. 3, 1986, Ser. No. 869,879

Claims priority, application Japan, Jun. 3, 1985, 60-118774

Int. Cl.[4] C22B *9/05*

U.S. Cl. 75—84.5 8 Claims



1. A process for producing niobium metal of ultrahigh purity, which comprises:

(a) iodizing niobium metal or niobium chloride containing at least tantalum as an impurity, in the presence of an iodizing agent at a temperature of at least 300° C., thereby preparing an iodized product containing a higher niobium iodide;

(b) thermally reducing said iodized product in an inert gas atmosphere at a temperature of from 200°–600° C., or a hydrogen gas atmosphere at a temperature from 100°–300° C., thereby converting at least a portion of said higher niobium iodide to a lower niobium iodide; and

(c) thermally decomposing the higher and lower niobium iodides at a temperature of at least 700° C., thereby forming said niobium metal.

4,720,301

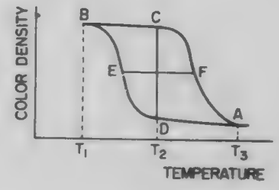
REVERSIBLE HEAT SENSITIVE RECORDING COMPOSITION

Tsutomu Kito, Gifu; Norikazu Nakazuji, Aichi; Takashi Katsuka, Aichi; Hiroshi Inagaki, Aichi, and Yutaka Shibakashi, Aichi, all of Japan, assignors to Pilot Ink Co., Ltd., Japan

Filed Dec. 11, 1985, Ser. No. 807,908

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 2 Claims



1. A reversible heat-sensitive recording composition comprising:

(A) an electron-donating chromatic organic compound selected from the group consisting of diaryl phthalides, indolyl phthalides, polyaryl carbinols, leuco auramines, acyl auramines, aryl auramines, Rhodamine B lactams, indolines, spiropyrans, and fluorans;

(B) a compound selected from the group consisting of phenolic compounds having 6 to 49 carbon atoms, metal salts of the phenolic compounds, aromatic carboxylic acids having 7 to 12 carbon atoms, aliphatic carboxylic acids having 2 to 5 carbon atoms, metal salts of carboxylic acids having 2 to 22 carbon atoms, acidic phosphoric esters having 1 to 44 carbon atoms, metal salts of the acidic phosphoric esters and triazole compounds having 2 to 24 carbon atoms; and

(C) an ester compound,

said components (A), (B), and (C) being present in a weight ratio in the range of 1:0.1 to 50:1 to 800 and being in the form of homogenous fused mixture, wherein said component (C) is selected from the following compounds having ΔT value [melting point (°C.)−clouding point (°C.)] in the range of from 5° C. to less than 50° C.: an alkyl ester, aryl ester and cycloalkyl ester of aromatic carboxylic acid having substituent(s) or not in the aromatic ring, a branched alkyl ester, aryl ester, arylalkyl ester and cycloalkyl ester of aliphatic carboxylic acid, an alkyl ester of alicylic carboxylic acid, a diester of dicarboxylic acid and a glyceride.

4,720,302

BONDING OF CERAMIC AGGREGATES USING GELLED ALUMINUM CHLORIDE

Thomas D. Hutchinson, 3513 Rosetta La., Anniston, Ala. 36201

Filed Aug. 5, 1985, Ser. No. 762,271

Int. Cl.[4] C04B *9/02, 14/00;* B01J *13/00*

U.S. Cl. 106—121 2 Claims

1. The process of forming a shaped aggregate by mixing a delayed action gelating agent, a solution containing aluminum and chlorine ions in the weight ratio 1:6 to 1:2 with a minimum total concentration of 4.2 percent in the solvent, and ceramic

materials, in any order or conjointly, to form a shaped aggregate.

4,720,303

THICKENING AGENTS AND THE MANUFACTURE AND USE THEREOF

Anthony C. Soldatos, New York, N.Y., assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 768,946, Aug. 23, 1985, abandoned. This application Nov. 6, 1986, Ser. No. 928,668

Claims priority, application United Kingdom, Aug. 29, 1984, 8421827

Int. Cl.[4] C09K 7/00; C08L 1/08

U.S. Cl. 106—181 12 Claims

5. A composition essentially consisting of a latex dispersed in an aqueous alkaline-medium and a thickening agent composition essentially consisting of a cellulose ether and a solid organic said selected from the group consisting of citric acid, tartaric acid, oxalic acid, malonic acid, and succinic acid and

said thickening agent composition being present in an amount sufficient to enhance the viscosity of said alkaline medium without lump formation,

said organic acid being a solid in the thickening agent composition but said organic acid dissolving in the medium to be thickened.

4,720,304

PIGMENT FORMULATIONS

Wolfgang Ruff, Stuttgart; Egon Liedek, Esslingen; Gerhard Berger, Stuttgart, and Hans W. Sonnebora, Schwaebisch-Gmuend, all of Fed. Rep. of Germany, assignors to BASF Farben+Fasern Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,494

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434379

Int. Cl.[4] C08K 5/18

U.S. Cl. 106—288 Q 17 Claims

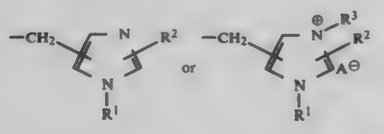
1. A pigment, formlation containing

(a) one or more azo pigments (α) based on coupling products of diazotized aromatic monoamines with acetoacetarylides, 1-phenylpyrazolones, 3-hydroxy-2-naphthoic acid, its arylides and/or β-naphthol, or (β) based on coupling products of tetrazotized 4,4'-diaminodiphenyl, dichloro-, dichlorodibromo- and/or tetrachloro-4,4'-diaminodiphenyl with acetoacetarylides and/or 1-phenylpyrazolones, or (γ) mixtures of (α) and (β), and

(b) one or more dyes of the general formula

$$Q-(X)_n$$

where Q is an n-valent radical of a monoazo dye, a disazo dye or a quinophthalone, and may or may not carry a sulfo group, n is 1, 2, 3 or 4 and X is a group of the formula



where R^1 and R^2 independently of one another are each hydrogen or C_1–C_4-alkyl, R^3 is C_1–C_4-alkyl or hydroxy-C_2–C_4-alkyl and $A^{\ominus}$ is one equivalent of an anion, and, where n is >1, the radicals X may be identical or different.

4,720,305

MIXTURES OF PIGMENTS

Abul Iqbal, Ettingen; Johannes Pfenninger, Marly; Alain C. Rochat, Fribourg, and Fridolin Bibler, Marly, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,933

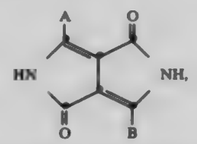
Claims priority, application Switzerland, Nov. 7, 1984, 5335/84

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] C08K 5/16

U.S. Cl. 106—288 Q 15 Claims

1. A mixture of pigments containing at least two different pigments of formula (I)

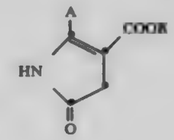


(I)

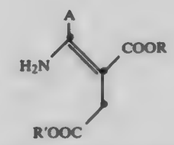
with the difference lying in the meanings of the radicals A and B, in which formula (I) A and B are the same or different alkyl, aralkyl, cycloalkyl, carbocyclic or heterocyclic aromatic radicals, which mixture of pigments is obtainable by

(a) reacting in a molar ratio 1 mole of a disuccinate with 1.75 to 1.998 moles of a nitrile of the formula ACN and 0.002 to 0.25 mole of a nitrile of the formula BCN or of a mixture of several nitriles of the formula BCN, the radicals B of which are different from A, or

(b) reacting in a molar ratio 1 mole of a lactam of formula (II) or of an enamine of formula (III)



(II)



(III)

in which formulae each of R and R' independently of the other is alkyl or aryl, with 0.75 to 0.998 mole of a nitrile of the formula ACN and 0.25 to 0.002 mole of a nitrile of the formula BCN or of a mixture of several nitriles of the formula BCN, the radicals B of which are different from A, in an organic solvent, in the presence of a strong base and at elevated temperature, and subsequently hydrolysing the resultant reaction product.

4,720,306

CLEANING METHOD

Hermann Emmert, Erlangen; Herbert Heba, Klettgau; Detlev Coerlin, and Klaus Kuhnke, both of Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,131

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513676; Sep. 23, 1985, 3533886

Int. Cl.[4] C23G 1/02; B08B 9/04, 9/00, 30/00

U.S. Cl. 134—3 5 Claims

1. Method for cleaning vessels, in particular steam generators, to remove therefrom incrustations or solid deposits containing copper compounds together with hard-to-dissolve metal-containing substances other than copper, which comprises: passing an aqueous solution containing ammonia and ethylenediamine into a vessel in contact with deposits therein to chemically dissolve copper compounds contained in the deposits by the formation of copper complexes, whereby first ammonium complexes and then soluble ethylenediamine chelates of the copper compounds are formed, mechanically removing loose deposits and liquid from the vessel after the chemical treatment of dissolving the copper compounds, chemically treating the residual deposits to effect at least partial dissolution and softening of the residual deposits, and flushing-out loosened deposits as well as remaining chemicals in the vessel after the chemical treatment of the residual deposits.

4,720,307

METHOD FOR PRODUCING HIGH STRENGTH STEEL EXCELLENT IN PROPERTIES AFTER WARM WORKING

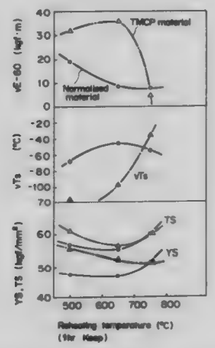
Kazuaki Matsumoto; Seishi Tsuyama; Hisatoshi Tagawa, and Yoshitaka Yamasaki, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,288

Claims priority, application Japan, May 17, 1985, 60-103843; Feb. 25, 1986, 61-38217

Int. Cl.[4] C21D 7/14

U.S. Cl. 148—12 R 14 Claims



1. A method for producing high tension steel having excellent properties after warm working comprising, subjecting a steel consisting essentially of C: 0.03 to 0.20%, Si: not more than 0.6%, Mn: 0.5 to 2.0%, sol.Al: 0.005 to 0.08%, Nb: 0 to 0.1%, V: 0 to 0.15%, Ti: 0 to 0.15%, Cu: 0 to 1.0%, Cr: 0 to 1.0%, Ni: 0 to 3.5%, Mo: 0 to 1.0%, B: 0 to 0.003% and the balance essentially Fe, to a controlled hot rolling of at least 30% of accumulated reduction at temperatures of not more than 900° C., reheating said steel up to temperatures between 400° C. and 750°, and then carrying out a warm working at temperatures between 250° C. and 700° C. with cooling between said reheating and said warm working being no more rapid than air cooling.

4,720,308

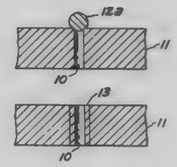
METHOD FOR PRODUCING HIGH-ASPECT RATIO HOLLOW DIFFUSED REGIONS IN A SEMICONDUCTOR BODY AND DIODE PRODUCED THEREBY

Thomas R. Anthony, Schenectady; Douglas E. Houston, Liverpool, and James A. Loughran, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 567,708, Jan. 3, 1984, Pat. No. 4,595,428. This application Mar. 24, 1986, Ser. No. 843,346

Int. Cl.[4] H01L 29/06

U.S. Cl. 148—33.0 4 Claims



1. In a semiconducting device wherein a body of semiconducting material has at least one bore extending completely therethrough, said bore having a diameter of less than about 1.5 mils and an average length-to-diameter ratio of at least about 6:1, the improvement wherein said bore is defined by a region in the shape of a hollow cylinder, said region of said semiconducting material being in the recrystallized state and having therein throughout said region a substantially constant uniform concentration level of metal atoms in a direction perpendicular to the bore length, wherein a P-N junction providing the interface between the recrystallized region and the material of the semiconductor body contiguous with said region has a width of less than about 1 micron,

said metal being selected from the group consisting of aluminum, indium, gallium, antimony, gold, silver and tin.

4,720,309

SATURATABLE ABSORBANT WITH VERY SHORT SWITCHING TIMES

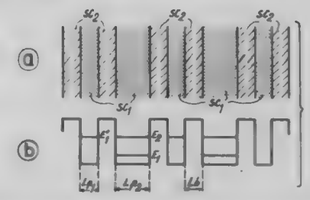
Benoit Deveaud, hh res Duroux, 22300 Lannion; André Chomette, Kerflet Camlez, 22450 La Roche-Derrien, and André Regreny, 17 rue A Camus, 22700 Perros Guirec, all of France

Filed Jul. 9, 1986, Ser. No. 883,818

Claims priority, application France, Jul. 23, 1985, 85 11234

Int. Cl.[4] H01L 33/00, 31/06; H01S 3/18

U.S. Cl. 148—33.1 7 Claims



1. An absorbant with saturatable absorption and low switching times, comprising a superlattice formed by a stack of films of a first semiconductor material having a first forbidden band gap and a second semiconductor material having a second forbidden band gap which is wider than the first, a potential well being produced in each film corresponding to the first semiconductor and a potential barrier in each film corresponding to the second semiconductor, a plurality of films corresponding to the first semiconductor having a large thickness and the remaining films corresponding to the first semiconductor having a small thickness, the large thickness being between

9 and 25 nm and the small thickness between 5 and 9 nm, at least one film with a large thickness alternating with at least one film with a small thickness, said saturatable absorption of radiation occurring in the films of the first semiconductor having said small thickness and a rapid restoration of the absorption occurring in the films of the first semiconductor having said large thickness.

4,720,310

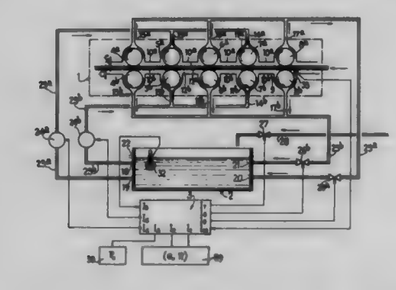
PROCESS FOR EFFECTING THE CONTROLLED COOLING OF METAL SHEETS

Stéphane Vlassey, Voisin le Bretonneux, and Jack Sebbah, Trith Saint Leger, both of France, assignors to Union Siderurgique du Nord et de l'est de la France (USINOR), Puteaux, France

Continuation of Ser. No. 648,602, Sep. 7, 1984, abandoned, which is a continuation of Ser. No. 445,221, Nov. 29, 1982, abandoned. This application Mar. 13, 1986, Ser. No. 839,828

Int. Cl.[4] C21D *11/00*

U.S. Cl. 148—128 **8 Claims**



1. A process for cooling a metal sheet having a particular thickness e in accordance with a desired cooling rate R of said sheet for imparting to said sheet a selected crystalline structure, the process used in a cooling system which includes a closed case in which cooling liquid is placed in contact with the sheet, a tank containing said liquid, pump means for circulating said liquid between said case and said tank, and a control unit, the process comprising the steps of:

supplying a cooling liquid to an upper surface and to a lower surface of the sheet in a substantially horizontal position within said case by means of elongated narrow and continuous outlet means extending continuously in a given direction alongside each of said surfaces of the sheet throughout the extent of the sheet in said given direction so that said liquid is made to flow and spread across said surfaces in the lengthwise direction of the sheet in a continuous evenly-distributed sheet of liquid parallel to said surfaces, thereby preventing the spraying of said liquid at angles to said surfaces which would disturb said flowing of said sheet of liquid across said surfaces,

supplying said liquid to said case at a critical speed V_C in such manner that the pressure of said liquid within said case is higher than atmospheric pressure and so that said liquid fills said case;

providing, to the control unit, data representative of

i. the thickness e of the particular metal sheet to be cooled;

ii. the desired cooling rate R of said sheet corresponding to the desired structures of the metal;

iii. the temperature of the cooling liquid in said tank; calculating, in said control unit, the theoretical value of the thermal flux exchanged between said sheet and the cooling liquid based on said data representative of said thickness e and said desired cooling rate R in accordance with the relation

$$\phi = A_1(e, R)$$

wherein ϕ is the thermal flux calculated to be a function (A_1) of e and R;

calculating, in said control unit, the theoretical value of the velocity of the cooling liquid required for cooling the sheet under the desired cooling rate R and thickness e based on the calculated theoretical value of said thermal flux and the actual temperature θ of the cooling liquid in the tank in accordance with the relation

$$V = A_2(\phi, \theta)$$

wherein V is the velocity of the cooling liquid calculated to be a function of ϕ and θ;

variably controlling said pump means in accordance with the calculated value of said velocity of the cooling liquid and so that $V > V_C$;

calculating the theoretical temperature value of the cooling liquid based on the calculated value of the thermal flux; and

regulating the actual temperature of the cooling liquid in the tank based on the calculated theoretical temperature value.

4,720,311

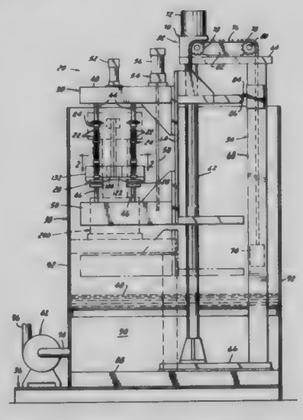
CAMSHAFT LOBE HARDENING METHOD AND APPARATUS

Roger L. Hutton, 3141 Pinewood Ct., Milford, Mich. 48042, and John P. Williams, Jr., 10475 Moon Lake Ct., Pinckney, Mich. 48169

Filed Mar. 24, 1986, Ser. No. 843,060

Int. Cl.[4] C21D *1/10*

U.S. Cl. 148—150 **27 Claims**



1. A method of finishing and hardening a lobe of a camshaft which lobe is of a metal which can be hardened by heating and quenching, the method comprising: providing the contour and finish of the cam surface on the lobe before it is hardened, disposing the lobe so that it is encircled by and spaced from an induction coil, disposing a spray head adjacent the lobe, applying to the coil for not more than five seconds an alternating current with a power of at least 30 killowatts per square inch of the cam surface of the lobe to rapidly heat the peripheral portion of the lobe to a temperature of at least about 1500° F. on the cam surface, and after the current has been applied to the coil, supplying an aqueous liquid to the spray head to quench the heated lobe to thereby harden the periphery of the lobe to a depth not greater than about 0.18 of an inch without any significant distortion or warpage of the cam surface of the lobe.

4,720,312

PROCESS FOR PRODUCING SURFACE REMELTED CHILLED LAYER CAMSHAFT

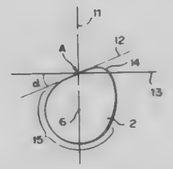
Toshiharu Fukuizumi, and Hideo Nonoyama, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 8, 1986, Ser. No. 894,828

Claims priority, application Japan, Aug. 8, 1985, 60-173113

Int. Cl.[4] C21D *9/30*

U.S. Cl. 148—152 **5 Claims**



1. A process for producing a camshaft with cams subjected to a remelting chilling treatment comprising steps of melting a sliding cam surface of each of said cams by irradiating with a high density energy, and forming a continuous chill layer by self-cooling, wherein at places where a molten metal pool formed during the melting may be caused to sag by the force of gravity, the melting action is interrupted to solidify the molten metal pool and is resumed so as to overlap a former formed chili layer portion and a following chill layer portion, wherein said former formed chill layer portion includes a portion immediately contiguous said places where the melting action is interrupted.

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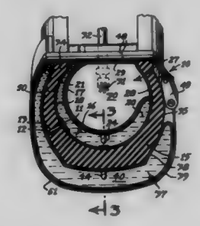
HYDRAULIC TIRE REPAIR METHOD

Robert F. Wegehaupt, Murfreesboro, Tenn., assignor to Perfect Equipment Corp., Murfreesboro, Tenn.

Filed May 2, 1985, Ser. No. 729,673

Int. Cl.[4] B60C *21/02, 25/16;* B29C *35/04*

U.S. Cl. 156—97 **7 Claims**



1. A method for vulcanizing a repair patch on an injured area in the surface of a tire comprising the steps of:

(a) applying a repair patch of unvulcanized rubber upon the injured area in the surface of a tire to be repaired,

(b) placing a fluid pressure bag, containing a heat-conductive hydraulic fluid having a predetermined boiling point, flush against said rubber repair patch and the surrounding surface of a tire to be repaired,

(c) heating said hydraulic fluid to an operating vulcanizing temperature less than said boiling point,

(d) placing a mandrel within the tire to be repaired and in general radial alignment with the repair watch,

(e) applying pressure to said mandrel, and

(f) transferring said pressure to, and against, the opposite side of the fluid pressure bag from the tire surface to increase the pressure of the heated hydraulic fluid against the repair patch and vulcanize the unvulcanized rubber repair patch.

4,720,314

PROCESS FOR PRODUCING SELF-CRIMPING POLYESTER YARN

William B. Black, Pensacola, Fla., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 780,464, Sep. 26, 1985, Pat. No. 4,661,404, which is a continuation-in-part of Ser. No. 583,801, Mar. 2, 1984, abandoned, which is a continuation of Ser. No. 373,755, Apr. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,482, May 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 157,130, Jun. 6, 1980, abandoned. This application Dec. 15, 1986, Ser. No. 941,888

Int. Cl.[4] D01D *5/20*

U.S. Cl. 156—167 **23 Claims**



1. A process for forming a yarn, comprising melt spinning a plurality of polyester filaments having shrinkage peaks and valleys out of phase from filament to filament, wherein one or more of said plurality of filaments is generated by the steps comprising:

a. extruding from at least one group of at least two substantially parallel spinneret capillaries at least first and second molten streams of polyester polymer of fiber-forming molecular weight, said first stream being extruded at a greater velocity than said second stream and being spaced laterally from said second stream a finite distance selected such that said first and second streams periodically unite below said spinneret to form a combined stream having thick and thin regions;

b. coalescing and attenuating each combined stream and then quenching and solidifying each said combined stream into an individual filament having shrinkage peaks and valleys;

c. withdrawing each said filament from said combined stream at a spinning speed of at least about 1500 meters per minute, said spinning speed and the velocities and lateral spacing upon extrusion of said first and second streams being selected such that said shrinkage peaks and valleys along said filament are substantially regular and periodically spaced; and,

d. gathering together said filaments into a yarn bundle.

4,720,315

METHOD FOR PREPARING A SELECTIVELY DECORATED RESIN FILM

Joseph Greenman, Plainfield, N.J., assignor to Transfer Print Foils, Inc., East Brunswick, N.J.

Continuation of Ser. No. 576,603, Feb. 3, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,780

Int. Cl.[4] B44C *1/16;* B32B *31/00;* B05D *1/32*

U.S. Cl. 156—233 **14 Claims**

1. A method for the preparation of a directly decorated resin film having a selective decoration consisting essentially of:

A. providing and feeding a printable resin base film to serve as the base of said decorated resin film;

B. applying a primer coat over an entire broad surface of said base film;

C. applying over a portion of said primer coat a masking

coat abhesive thereto, said masking coat applied in a predetermined pattern defining the outer border of said selective decoration;

D. applying a metal coat over the entire surface of the coated base film of Step C to completely cover said primer coat and said masking coat and to make direct interfacial contact therewith,

E. bonding the coated base film of Step D to a mask-removing resin film bearing a pressure-sensitive adhesive coat, with said adhesive coat positioned for contact with said metal coat; and



F. separating the coated base film of Step E from said mask removing film;

whereby the masking coat and the portions of the metal coat disposed thereover are removed from said base film and adhesively bound to said mask removing film, and

whereby said directly decorated resin film consists essentially of said base film bearing said selective decoration comprising said primer coat disposed against said base film and said metal coat disposed against said primer coat.

4,720,316

METHOD FOR MAKING FLAT GASKETS

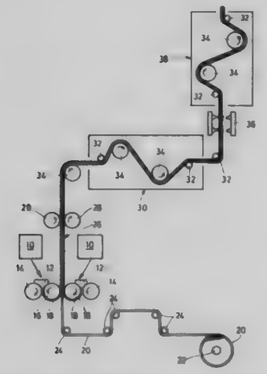
Eugen Ruoff, Urach, Fed. Rep. of Germany, assignor to Elring Dichtungswerke GmbH, Fed. Rep. of Germany

Filed Jul. 1, 1986, Ser. No. 880,709

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617721

Int. Cl.[4] B32B *31/14*

U.S. Cl. 156—242 **12 Claims**



1. A method for making flat gaskets comprising the steps of:

(a) admixing a soft gasket forming composite material including a binder, filler and a catalyst so that the catalyst is distributed substantially homogeneously in said composite material to form a homogeneous admixture, said catalyst exhibiting a substantially inert behavior toward the binder;

(b) applying said admixture onto a flat support to form a flat sealing layer; and

(c) impregnating the sealing layer with at least one polysiloxane which may be crosslinked by means of said catalyst.

4,720,317

METHOD FOR DICING A SEMICONDUCTOR WAFER

Hideo Kuroda, Hannancho, and Masao Taniguchi, Seanan, both of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Feb. 14, 1986, Ser. No. 829,814

Claims priority, application Japan, Feb. 14, 1985, 60-28030; Feb. 14, 1985, 60-28031; Sep. 4, 1985, 60-196540; Sep. 4, 1985, 60-196541; Sep. 4, 1985, 60-196542; Sep. 4, 1985, 60-196543; Sep. 4, 1985, 60-196544; Sep. 4, 1985, 60-196545

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—250 **13 Claims**

1. A method for dicing a semiconductor wafer to form dice which comprises:

(a) placing and fixing the wafer on a dicing film which comprises a base film permeable to ultraviolet light and a layer of a pressure sensitive adhesive formed on one side of the base film to fix thereon the wafer, the adhesive comprising:

(i) at least one elastic polymer selected from the group consisting of a polymer comprising acrylic acid ester copolymers, and a saturated copolyester comprising a dibasic carboxylic acid and a dihydroxy alcohol;

(ii) and ultraviolet light polymerizable acrylic acid ester having not less than two acryloyl or methacryloyl groups in the molecule and having a molecular weight of not more than about 1000, in amounts of about 15–200 parts by weight in relation to 100 parts by weight of the elastic polymer;

(iii) a tacifier in amounts of about 10–200 parts by weight in relation to 100 parts by weight of the elastic polymer;

(iv) anhydrous silica powder in amounts of about 1–30 parts by weight in relation to 100 parts by weight of the elastic polymer; and

(v) a photopolymerization initiator in a sufficient amount to induce the photopolymerization of the ultraviolet light polymerizable acrylic acid ester;

(b) dicing the wafer;

(c) applying the ultraviolet light to the other side of the dicing film to substantially reduce the adhesive force of the dicing film; and

(d) removing the resultant dice from the dicing film.

4,720,318

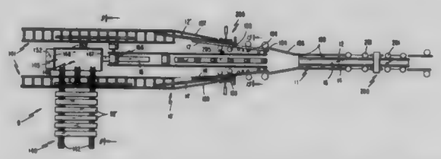
METHOD AND APPARATUS FOR MAKING WOODEN I-BEAMS

Jerry L. Lines, Wilmington, N.C., assignor to Gang-Nail Systems, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 764,180, Aug. 9, 1985. This application Mar. 24, 1986, Ser. No. 843,228

Int. Cl.[4] B27D *1/10*; B32B *31/18*

U.S. Cl. 156—258 **57 Claims**



1. A production line method of making a unitary wooden I-beam from a pair of elongated wooden cord members and planar wooden web members, comprising the steps of:

(a) forming said chord members by cutting a rectangular elongated piece of lumber substantially along its longitudinal axis into said chords and substantially simultaneously cutting longitudinal grooves into said chords;

(b) shaping opposite edges of said web members to provide beveled edges;

(c) grouping and conveying said web members;

(d) driving a pair of chords respectively along opposite sides

of the web members to define a chords and web line with the longitudinal grooves of said chords facing said web members and providing glue in said longitudinal grooves and on said beveled edges;

(e) directing said pair of chords towards said web members so that opposite edges of said web members are respectively inserted into the longitudinal grooves of said pair of chords in the chords and web line to form an interconnecting glued joint therebetween and thereby said wooden I-beam;

(f) driving said wooden I-beam at a predetermined continuous speed; and

(g) cutting said continuous wooden I-beam into a desired length.

4,720,319

METHOD FOR APPLYING RETENTION MEANS ONTO CASTING PATTERNS OF DENTAL PROSTHETIC METAL CONSTRUCTIONS

Oswald Gasser, Seefeld, Fed. Rep. of Germany, assignor to ESPE Fabrik pharmazeutischer Praparate GmbH, Fed. Rep. of Germany

Filed Apr. 17, 1986, Ser. No. 853,033

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514283

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—273.5 **14 Claims**

1. A method for applying removable retention means onto casting patterns of dental prosthetic metal constructions comprising:

(a) coating a wax casting pattern with a fluid adhesive composition comprising at least one photopolymerizable compound the polymerization of which is inhibited by oxygen, and at least one photopolymerization initiator;

(b) irradiating said casting pattern;

(c) applying removable retention means onto the irradiated surface of said casting pattern; and

(d) irradiating said casting pattern.

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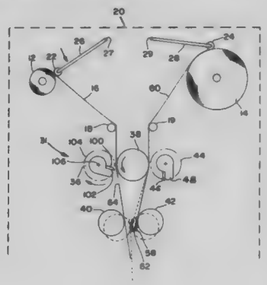
APPARATUS FOR SPLICING A TRAILING END OF A WEB FROM A DEPLETED COIL TO THE LEADING END OF A FRESH COIL

Paul M. Niemi, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 3, 1986, Ser. No. 835,691

Int. Cl.[4] B65H *19/20, 69/06*

U.S. Cl. 156—504 **3 Claims**



1. An apparatus for splicing a trailing end of a first web to an adherent leading edge of a second web and a trailing end of the second web to an adherent leading edge of a third web, comprising:

a rotatable first cutting cylinder including a first cutting means,

a rotatable second cutting cylinder including a second cutting means,

a rotatable anvil roll disposed between said first and said second cutting cylinders,

said first cutting cylinder being rotatable between an extended position wherein said first cutting means is spaced apart from said anvil roll and a closed position wherein said first cutting means is rotated toward said anvil roll to rotationally engage a first web running therebetween and said first cutting means cuts the first web,

said second cutting cylinder being rotatable between an extended position wherein said second cutting means is spaced apart from said anvil roll and a closed position wherein said second cutting means is rotated toward said anvil roll, and

a pair of nip rollers downstream, relative to web movement, of said cutting cylinders and said anvil roll, said nip rollers being movable between an open position wherein said nip rollers are spaced apart and a closed position wherein said nip rollers rotationally engage and adhere the cut trailing end of the first web to an adherent leading edge of a second web.

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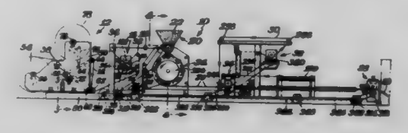
METHOD AND APPARATUS FOR MANUFACTURING PACKAGING PADS

Gary T. Smith, Lemon Cove, Calif., assignor to Keyes Fibre Company, Waterville, Me.

Filed Jun. 26, 1985, Ser. No. 748,961

Int. Cl.[4] B29J *5/00*

U.S. Cl. 156—549 **10 Claims**



1. Apparatus for manufacturing packaging pads having bottom and top sheets laminated together along transverse and side peripheral surface portions and a pocket of filler material disposed between central surface portions of the sheets, the apparatus comprising bottom sheet feeding means constructed and arranged to continuously feed an endless bottom sheet along a predetermined travel path, first gluing means constructed and arranged to continuously apply liquid adhesive to the entire upper surface of the bottom sheet, filler metering means constructed and arranged to supply a continuous stream of filler material at a predetermined rate, filler depositing means constructed and arranged to continuously receive and separate the continuous stream of filler material into individual pocket amounts and to serially apply such amounts to spaced apart central surface portions on the adhesive coated surface of the bottom sheet whereby each individual pocket amount of filler material is surrounded by adhesive coated transverse and side peripheral surface portions of the bottom sheet, top sheet feeding means constructed and arranged to continuously feed an endless top sheet, second gluing means constructed and arranged to continuously apply liquid adhesive to the entire lower surface of the top sheet, laminating means constructed and arranged to join the adhesive coated transverse and side peripheral surface portions of the bottom sheet with the adhesive coated top sheet to thereby form a continuous laminate with spaced apart pocket amounts of filler material therebetween, and severing means constructed and arranged to transversely cut the continuous laminate midway between adjacent pockets of filler material to thereby form individual packaging pads, and wherein the filler depositing means includes a drum having a substantially cylindrical outer surface and rotatably mounted about a transverse axis, discharge means on the filler metering means directing the continuous stream of filler mate-

rial onto the outer surface of the drum, equally spaced apart radially shifting spacer bars at the outer surface of the drum transversely extending across the drum surface for dividing the filler material into individual pocket amounts, pressing means guiding and urging the adhesive coated surface of the bottom sheet into engagement with the pockets of filler material located between the spacer bars, and bar operator means connected to retract the spacer bars to below the drum surface as the adhesive coated surface of the bottom sheet is urged into engagement with the individual pockets of filler material on the drum surface.

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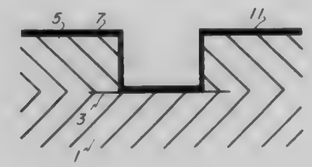
PLASMA ETCHING OF BLIND VIAS IN PRINTED WIRING BOARD DIELECTRIC

Paula K. Tiffin, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1987, Ser. No. 37,761

Int. Cl.[4] B44C *1/22*; C03C *15/00*; C23F *1/02*; B29C *37/00*

U.S. Cl. 156—643 **20 Claims**



1. A method of forming blind vias in an organic printed wiring board, comprising the steps of:

(a) providing a printed wiring board of organic material having a buried electrically conductive pattern in said organic material and an electrically conductive layer on the surface of said board;

(b) removing predetermined portions of said electrically conductive layer to expose said organic material thereunder and define at least one via location thereat;

(c) providing a plasma etching chamber having at least one pair of spaced parallel electrodes;

(d) positioning said board between said electrodes, electrically connecting said board to one of said electrodes and having said surface facing and parallel to the said electrodes;

(e) filling said chamber with a mixture of an oxidizing gas and a fluorocarbon gas;

(f) etching said organic material from said exposed organic material at said surface to said buried pattern to expose said buried pattern by applying an RF signal across said electrodes; and

(g) forming an electrically conductive layer on the exposed surfaces of said organic material contacting said exposed buried pattern and said conductive layer.

4,720,323

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Masaki Sato, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 805,628, Dec. 6, 1985. This application Feb. 26, 1987, Ser. No. 19,517

Claims priority, application Japan, Dec. 7, 1984, 59-258515

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 437—69 **8 Claims**

1. A method of manufacturing a semiconductor device having floating and control gates which further includes source and drain regions, a channel region, and a composite insulating layer provided between said floating and control gates, said method comptising the steps of:

selecting first and second regions on a semiconductor substrate of a first conductivity type, said source and drain regions being formed in said first and second regions;

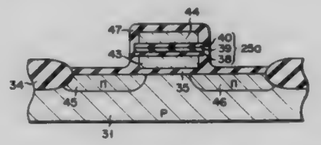
forming a field insulating layer surrounding an active region including said first and second regions;

forming a first SiO_2 (silicon dioxide) layer covering said active region;

forming a first polysilicon layer covering said first SiO_2 layer and said field insulating layer;

patterning said first polysilicon layer so as to have a width corresponding to the width of said floating gate, said width being the length in the channel-width direction;

forming a multilayered insulating layer on said first polysilicon layer from which said composite insulating layer is formed;



forming a second polysilicon layer on said multilayered insulating layer;

forming a resist pattern on said second polysilicon layer, said resist pattern having a length corresponding to that of said composite insulating layer, said length being the length in the channel-length direction;

effecting an etching, using said resist pattern as a mask, for forming said control gate, said composite insulating layer and said floating gate, so as to have an equal length;

shortening the lengths of said control and floating gates; and

doping an impurity of second conductivity type into said first and second regions for forming said source and drain regions.

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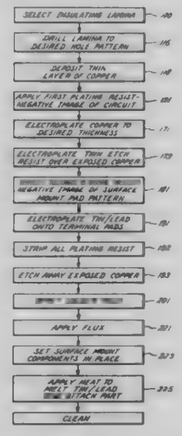
PROCESS FOR MANUFACTURING PRINTED CIRCUIT BOARDS

John S. Hayward, 6119 Jessamine, Houston, Tex. 77081

Filed Oct. 3, 1985, Ser. No. 783,481

Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—645 **31 Claims**



1. A process for the manufacture of printed circuit boards from insulating lamina having a thin layer of conductive material using art work masters, for a circuit, using surface mount components adapted for use with pads, comprising:

A. Applying a first resist negative image of the circuit to the thin layer of conductive material;

B. Depositing a thin, solder compatible etch resist to portions of the thin layer of conductive material;

C. Applying a second plating resist negative image of the surface mount pads at the locations of the surface mount pads to at least the desired height of the surface mount pads;

D. Electroplating solder material onto the places for the surface mount pad, to form the surface mount pads; and

E. Stripping all exposed plating resist.

4,720,325

METHOD FOR THE MANUFACTURE OF A MATERIAL IN THE FORM OF SHEETS OR A WEB PROVIDED WITH A WATERMARKLIKE PATTERN

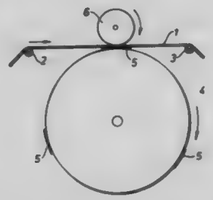
Hans Rausing, Wadhurst, England, and Ingvar Nilsson, Åkarp, Sweden, assignors to Svecia Antiqua SA, Fribourg, Switzerland

Filed Jan. 22, 1986, Ser. No. 821,341

Claims priority, application United Kingdom, Jan. 24, 1985, 8501756; Aug. 29, 1985, 8521504

Int. Cl.[4] D21H *5/00*

U.S. Cl. 162—110 **4 Claims**



1. A method of manufacturing a material web having a predetermined watermarklike pattern, said method comprising the steps of imprinting a relieflike matrix corresponding to said pattern against one side of said web, and removing material from raised regions on the opposite side of said web overlying said matrix, whereby said pattern having mutually adjoining positions of different thickness and degree of light transmittance are formed in said material web, said removing step includes placing the web between said relieflike matrix conforming with said predetermined pattern and a rotating grinding roller, whereby material is removed along the regions as the regions are pressed against said roller by said matrix.

4,720,326

PROCESS FOR WORKING-UP AQUEOUS AMINE SOLUTIONS

Heiko Beckhaus, Brunsbüttel; Harro Witt, Kuden; Dieter Becher, Dormagen; Hermann Dallmeyer, Leverkusen, and Uwe J. Zarnack, Brunsbüttel, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,759

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607665

Int. Cl.[4] B01D *3/00*

U.S. Cl. 203—14 **9 Claims**

1. A distillation process for separating amine from an aqueous amine solution containing an aromatic diamine and an organic by-product which is volatile in steam comprising

(a) feeding the aqueous amine solution to a distillation column,

(b) distilling the aqueous amine solution,

(c) condensing the vapors that were generated during distillation (b),

(d) removing the condensed vapors obtained in step (c),

(e) passing the condensed vapors removed in (d) into a separating device in which an organic and an aqueous phase are formed,

(f) removing the organic by-product volatile in steam as the organic phase,

(g) returning the aqueous phase remaining after separation in (f) to the head of the distillation column as reflux, and

(h) removing the water from the distillation column in a sidestream thereby leaving aromatic diamine freed of water and volatile by-products as the residue.

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DISTILLATIVE SEPARATION OF LIQUID MIXTURES OF SUBSTANCES

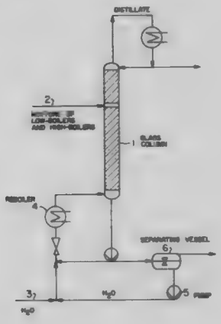
Werner Aquila, Mannheim; Axel Nissen, Leimen; Gerd Kaibel, Lampertheim; Michael Horner, Neustadt, and Walter Rebafka, Hirschberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,485

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138423

Int. Cl.[4] B01D *3/38*

U.S. Cl. 203—96 **2 Claims**



1. In a process for the separation of methanol and trimethylamine from mixtures containing methanol, trimethylamine and hydrogenation products of citral by distilling off the methanol and the trimethylamine the improvement comprising carrying out the distillation in the presence of water almost completely maintained in the bottoms or refluxed thereto, the concentration of the water being kept between about 10 and 40 weight percent of the distillation bottoms.

4,720,328

METHOD FOR REMOVING IMPURITIES FROM CAPROLACTAM

Tom F. Corbin; Jack A. Dellinger, and Kenneth B. Wagener, all of Asheville, N.C., assignors to Akzona Incorporated, New York, N.Y.

Continuation of Ser. No. 277,522, Jun. 26, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 529,063

Int. Cl.[4] C07D *201/16*; B01D *3/10, 3/34*

U.S. Cl. 203—37 **6 Claims**

1. A method for removing impurities from ϵ-caprolactam containing less than about 0.2% (wt.) of water which comprises the sequential steps of:

(a) treating said impure caprolactam with phosphorus pentoxide so that said impurities react with said phosphorus pentoxide to form species which are substantially nonvolatile with respect to caprolactam; and

(b) distilling the so treated impure caprolactam to recover substantially pure caprolactam as overhead, with said reacted impurities remaining as bottoms.

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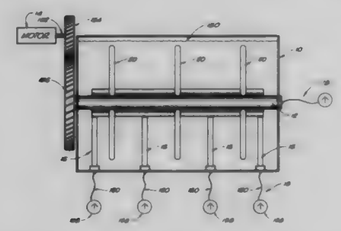
APPARATUS AND METHOD FOR THE ELECTROLYTIC PLATING OF LAYERS ONTO COMPUTER MEMORY HARD DISCS

Michael A. Sirbola, League City, Tex., assignor to Microsurface Technology Corp., Houston, Tex.

Continuation-in-part of Ser. No. 651,493, Sep. 17, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,081

Int. Cl.⁴ C25D *7/00, 17/00*

U.S. Cl. 204—23 **21 Claims**



1. An apparatus for the electrolytic plating of a computer memory disc comprising:

plating container means for receipt of a liquid plating bath;

spindle means fitted to said plating container means, said spindle means having a receiving area for fixing to the inner diameter of a computer memory disc;

prime mover means connected to said spindle means for applying rotational energy to said spindle means, said spindle means rotatable within said plating container means;

stationary anode means fixed and nontranslatable relative to said plating container means, said stationary anode means positioned so as to be distal from and on opposite sides of said receiving area on said spindle means, said stationary anode means comprising:

an anode member having an upper curved edge which corresponds in shape to the outer diameter of said spindle means, and having a lower curved edge, said anode member having a shape corresponding to a pie-cut of a disc; and

a busbar member in electrical contact with said lower curved edge of said anode member; and

electrical transmission means connected to said spindle means and to said stationary anode means, said electrical transmission means including a contact surface, said contact surface suitable for generally continuous electrical contact with the entire inner diameter of a computer memory disc, said electrical transmission means for passing a current between said contact surface and said stationary anode means.

17. A method of electrolytically plating a plurality of computer memory discs comprising the steps of:

fastening a plurality of computer memory discs to a plurality of receiving sections of a spindle, said computer memory discs being fastened such that said computer memory discs extend radially from said spindle, said computer memory discs fastened such that the inner diameter of said computer memory discs generally continuously contact said spindle;

submerging said plurality of computer memory discs entirely into an electrolytic plating bath;

rotating said spindle and said computer memory discs in said plating bath; and

transmitting an electrical current through said spindle to said discs, said electrical current passing from each of said discs to stationary anodes located on opposite sides of each of said discs in said bath, said discs being rotated while said current is being transmitted.

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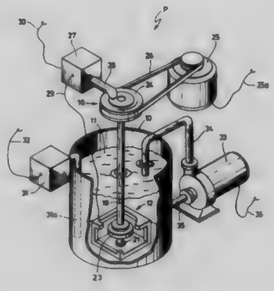
DEVICE AND METHOD FOR ELECTROPLATING A WORKPIECE HAVING AXIAL SYMMETRY

Mani Shabrang, Midland, and Daniel A. Gokey, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 6, 1987, Ser. No. 70,268

Int. Cl.⁴ C25D *7/04, 17/00, 17/12, 21/02*

U.S. Cl. 204—25 **7 Claims**



7. A method for electroplating a workpiece that has axial symmetry, which comprises the steps of:

fastening a workpiece holder on an elongate metal rod, near one end of the rod, with a metal pin;

fitting the workpiece onto the holder, such that an inside surface of the workpiece is in contact with the metal pin, to provide a cathode structure;

filling a plating tank with a given amount of an electrolyte solution that contains metal ions;

placing an anode structure in the plating tank such that it is submerged in the electrolyte solution, the anode structure has an anode chamber defined by first and second anode plates that are spaced apart and in parallel relation, and a third anode plate that is spaced from and perpendicular to the first and second plates;

lowering the metal rod of the cathode structure into the plating tank to position the workpiece inside the anode chamber so that about half of the outside surface of the workpiece lies in that part of the chamber located between the first and second anode plates, and the remainder of the outer surface of the workpiece lies in that part of the chamber that is not located between the first and second anode plates;

rotating the metal rod to cause the workpiece to revolve inside the anode chamber;

passing a direct current through an electrical power unit into the metal rod and workpiece, and into the anode structure to thereby cause a metal coating to be deposited on the outer surface of the workpiece.

4,720,331

METHOD AND APPARATUS FOR ELECTROLYZING WATER

Roger E. Billings, 3420 Pink Hill Cir., Blue Springs, Mo. 64015

Filed Mar. 27, 1986, Ser. No. 844,694

Int. Cl.⁴ C25B *1/02*

U.S. Cl. 204—129 **41 Claims**

1. An electrode structure for electrolysis apparatus comprising:

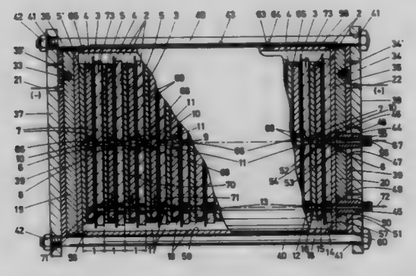
substantially open porous anode and cathode plates which are disposed on either side of and in contact with a solid electrolyte membrane, said anode and cathode plates being composed of an electrically conductive material capable of being permeated by a liquid, such as water;

a first flow passage comprising concentrically aligned bores, extending substantially through the center of said cathode plate, anode plate and membrane, with the bore in said cathode plate being fitted with an annular sealing gasket;

a second flow passage comprising also concentrically aligned bores but extending eccentrically through the cathode plate, the anode plate and the membrane, with the bore in said anode plate being fitted with an annular sealing gasket;

sealing means at the outside perimeter of the cathode plate;

means for securing the cathode plate, membrane and anode plate in firm side-by-aide series engagement;



means for applying to said first flow passage a liquid flowing into and substantially radially through said porous anode plate so as to cool the anode plate and wetting the membrane, so that the products produced at the interface of the membrane and anode plate diffuse through the porous anode plate and are carried radially away with the liquid passing through the anode plate to the outside perimeter of the anode plate, and products produced at the interface of the membrane and the cathode plate diffuse through the porous cathode plate to said second flow passage; and

means for applying a D.C. current to the cathode and anode plates.

4,720,332

NICKEL STRIP FORMULATION

Barry W. Coffey, Rte. 10, Box 683, Lenoir, N.C.

Filed Apr. 21, 1986, Ser. No. 854,309

Int. Cl.⁴ C25F *5/00*

U.S. Cl. 204—146 **44 Claims**

1. A nickel stripping composition suitable for use in an aqueous electroless stripping bath, said nickel stripping composition consisting essentially of:

(1) a zwitterion,

(2) an oxidizing agent in the form of a soluble organic nitro compound,

(3) a pH-adjusting compound selected from the group consisting of a soluble salt that forms an alkaline solution when dissolved in water, sodium hydroxide and potassium hydroxide, to adjust the stripping solution to an operating pH range of 7 to 11, and

(4) a compound that forms the sulfide ion in solution to act as a catalyst in the chemical stripping process.

4,720,333

ELECTROLYSIS TANK SUPERSTRUCTURE WITH INTERMEDIATE GANTRY, FOR THE PRODUCTION OF ALUMINIUM

Christian Duval; Bernard Langon; Michel Leroy, and Alain Noizet, all of Saint-Jean-de-Maurienne, France, assignors to Aluminium Pechiney, Paris, France

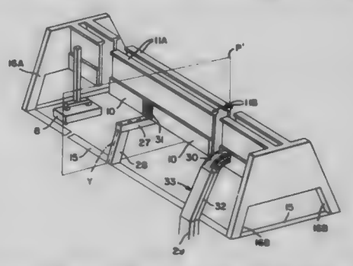
Filed May 29, 1986, Ser. No. 868,145

Claims priority, application France, May 30, 1985, 85 08578

Int. Cl.⁴ C25C *3/10, 7/06;* **C25B** *15/02*

U.S. Cl. 204—241 **25 Claims**

1. In a superstructure for a tank for the production of aluminium using the Hall-Héroult process by the electrolysis of alumina in molten cryolite, the tank being formed by a rigid metal heat-insulated casing of elongate parallelepipedic shape, the two ends of the tank comprising heads, and a superstructure formed by at least one rigid beam disposed along the long length of the casing at least supporting an anodic frame structure and the current input members coming from a preceding tank in a series of tanks and the anodes of the tank, and the beam at least resting at its two ends on supports disposed at the



two head ends of the tank, the improvement comprising said superstructure having said at least one rigid beam (11) supported on at least one intermediate gantry provided with a horizontal support surface on which said at least one beam rests, and legs, said horizontal support surface being located entirely below said at least one rigid beam without said at least one intermediate gantry passing through said at least one rigid beam.

4,720,334

DIAPHRAGM FOR ELECTROLYTIC CELL

Donald W. DuBois, Akron, and William W. Carlin, Norton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 4, 1986, Ser. No. 926,495

Int. Cl.⁴ C25B *13/00*

U.S. Cl. 204—296 **41 Claims**

1. A liquid permeable, diaphragm for an electrolytic cell, said diaphragm comprised of from about 65 to 99 percent by weight fibrillated polyfluorocarbon and from 1 to about 35 percent by weight perfluorinated ion exchange material, basis total weight of polyfluorocarbon and ion exchange material, said diaphragm prepared by depositing polyfluorocarbon fibrils and perfluorinated ion exchange material from a slurry onto a foraminous cathode whereby to form an entangled mat and heating the deposited mat at temperatures below the sintering or decomposition temperatures of both the polyfluorocarbon fibrils and the perfluorinated ion exchange material for a sufficient time to secure the mat upon the cathode.

4,720,335

WIDE RANGE AIR FUEL RATIO SENSOR

Meguma Fukushima; Kazunari Konatsu; Yasuhiro Shidahara, and Katihiro Yokomizo, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Continuation of Ser. No. 727,538, Apr. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 553,254, Nov. 18, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 898,821

Claims priority, application Japan, Dec. 1, 1982, 57-210998

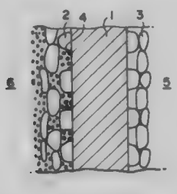
Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—424 **4 Claims**

1. A wide-range air-fuel ratio potentiometric sensor for detecting the air-fuel ratio in intake gas introduced into an engine by way of the oxygen and HC concentration in engine exhaust, prepared by providing, drying, and firing an electrode material formed of at least one of Ag and Au on a solid electrolyte body to thereby respectively form porous electrodes on the opposite sides of the solid electrolyte body where one of said porous electrodes is in contact with the engine exhaust and both porous electrodes on opposite sides of the solid electrolyte body are electrically isolated from any external source of

electrical potential, an electromotive force being generated between the porous electrodes, and the electromotive force being a function of the partial pressures of O_2 and CO at a three phase point at which the solid electrolyte, the exhaust side porous electrode, and the exhaust adjoin each other,

and impregnating, drying, and firing a metal oxide, for oxidizing said HC to CO, in the pores of the exhaust side porous electrode to provide sufficient metal oxide for oxidizing HC to CO near said three-phase point at which the solid electrolyte, the exhaust side porous electrode,



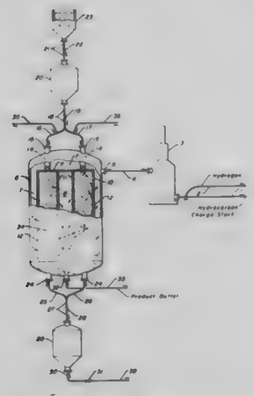
and the exhaust adjoin each other where the amount of said metal oxide present in said exhaust side porous electrode is such that a substantial gradient in said electromotive force exists for a range of values of the air-fuel ratio extending from about the stoichiometric value of 14.7 to values substantially geeater than the stoichiometric value and where the amount of said Au or Ag in said first porous electrode with respect to said metal oxide is such that the gradient of said electromotive force is substantially linear for values of the air-fuel ratio substantially less than said stoichiometric value.

4,720,336

CATALYTIC REACTOR SYSTEM

Bipin V. Vora, Elk Grove Village, and Norman H. Scott, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 10, 1986, Ser. No. 905,600
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—46 **11 Claims**



1. A continuous process for hydrocarbon conversion wherein a hydrocarbon charge stock is catalytically converted at hydrocarbon conversion conditions including a first inlet temperature and a first mass flow rate into a hydrocarbon product stream in a high space velocity moving bed radial flow reactor containing catalyst wherein at least a portion of said catalyst is pinned and thereby immobilized during high space velocity conversion which process comprises:

(a) reducing said first inlet temperature of said reactor to a second inlet temperature thereby lowering the rate of said hydrocarbon conversion;

(b) reducing said first mass flow rate of said hydrocarbon charge stock to a second mass flow rate which is sufficient to unpin said catalyst from said reactor thereby ensuring uniform gravitational catalyst flow through said reactor;

(c) introducing a quantity of fresh catalyst into an upper portion of said reactor while simultaneously removing a similar quantity of spent catalyst from a lower portion of said reactor;

(d) increasing said second mass flow rate to essentially said first mass flow rate of said hydrocarbon charge stock; and

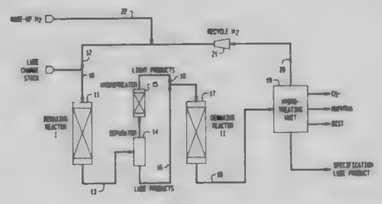
(e) increasing said second inlet temperature to essentially said first inlet temperature of said reactor to restore said hydrocarbon conversion.

4,720,337

HYDRODEWAXING METHOD WITH INTERSTAGE SEPARATION OF LIGHT PRODUCTS

Kenneth R. Graziani, Woodbury; James R. Katzer, Moorestown, and Chwan P. Kyan, Manuta, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 685,564, Dec. 24, 1984, Pat. No. 4,648,957, and a continuation-in-part of Ser. No. 816,092, Jan. 3, 1986, Pat. No. 4,695,364. This application Mar. 9, 1987, Ser. No. 23,183
Int. Cl.[4] C10G *65/10, 65/12*
U.S. Cl. 208—58 **25 Claims**



1. A process for dewaxing a hydrocarbon feedstock by (i) catalytically dewaxing the feedstock in at least two sequential catalytic dewaxing steps in which olefins are produced during the dewaxing, (ii) separating the effluent from the first of the two catalytic dewaxing steps to produce a lower boiling fraction including olefins and a higher boiling fraction, (iii) passing the higher boiling fraction to the second of the two catalytic dewaxing steps, (iv) hydrotreating the lower boiling fraction to saturate the olefins and (v) passing the hydrotreated lower boiling fraction to the second catalytic dewaxing step.

4,720,338

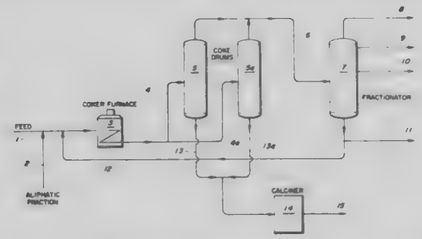
PREMIUM COKING PROCESS

Bruce A. Newman, Ponca City; John K. Shigley, Stillwater, and Ta-Wei Fu, Ponca City, all of Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 3, 1986, Ser. No. 926,039
Int. Cl.[4] C10G *9/14*
U.S. Cl. 208—131 **6 Claims**

1. In a delayed premium coking process in which an aromatic mineral oil feedstock having an f_a of at least about 40 and selected from the group consisting of decant oil, gas oil, thermal tar and extracted coal tar pitch is combined with conventional recycle and coked at premium coking conditions, the improvement comprising adding to said feedstock and natural recycle during about the latter half of the fill cycle an aliphatic petroleum residual oil fraction having an f_a below about 25 and a Richfield pentane insolubles content of less than 15 weight

percent whereby the coke formed during the latter part of the fill cycle will have a CTE value more near that of the coke



formed during the initial part of the fill cycle than would be the case if the aliphatic material were not added.

4,720,339

FLOTATION BENEFICIATION PROCESS FOR NON-SULFIDE MINERALS

D. R. Nagaraj, Stamford; Alan S. Rothenberg, Norwalk, and Alexander S. Lambert, Bethel, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 15, 1985, Ser. No. 711,924
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—167 **16 Claims**

1. A method for froth flotation of non-sulfide value minerals with selective depression of associated siliceous gangue minerals and materials, said method comprising:

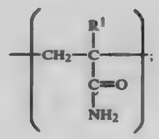
(a) providing an aqueous pulp slurry of finely-divided, liberation-sized non-sulfide particles;

(b) adjusting the pH of said pulp slurry to a value of between about 5 and 11;

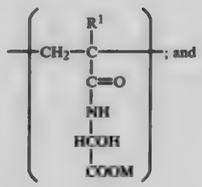
(c) conditioning said pulp slurry with an effective amount of an anionic collector;

(d) further conditioning said pulp slurry with an effective amount of a depressant selective for siliceous gangue minerals and materials, said depressant comprising a polymer derived from:

(i) x units of the formula:

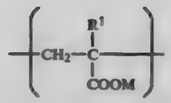


(ii) y units of the formula:



and

(iii) z units of the formula:



wherein R^1 is hydrogen or C_1–C_4 alkyl; M is hydrogen, an alkali metal cation or ammonium ion; x represents the residual mol percent fraction; y is a mol percent fraction ranging from about 1% to about 50%; z is a mol percent fraction ranging from about 0% to about 45%, and the average molecular weight of the polymer is between about 500 and about 1,000,000; and

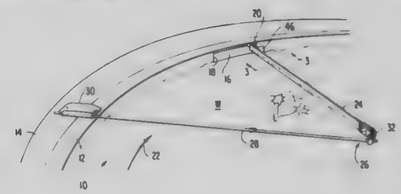
(e) collecting the non-sulfide value minerals by froth flotation procedures.

4,720,340

FOLDABLE WEIGHT POSITIONABLE POOL SKIMMER DEBRIS DEFLECTOR

James E. O'Brien, Rd. #3, Box 283, Muncy, Pa. 17756

Filed Jul. 9, 1986, Ser. No. 883,672
Int. Cl.[4] E04H *3/20*
U.S. Cl. 210—169 **4 Claims**



1. A pool skimmer debris deflector for diverting surface debris from a swimming pool filled with water, said swimming pool including a vertical side wall with an overflow skimmer water return port therein opening to the pool, and the water circulating in one direction along the pool sidewall, said skimmer debris deflector comprising: an elongated, vertically upright floatable skimmer blade having an inboard end insertable into said overflow water return port and an outboard end extendable away from the pool sidewall, a elongated rigid rod-like suspension wand having first and second ends, means forming a folding pivot connection between said rigid rod-like suspension wand and the outboard end of said vertically upright floatable skimmer blade, and a weighted bag longitudinally adjustably coupled to the second end of said rod-like suspension wand for adjustably fixing the second end of the wand on the pool edge, a stop fixedly mounted to and projecting outwardly from the downstream side of the blade and outwardly of the inboard end of the blade for contact with the pool sidewall to facilitate, along with the tension exerted on the blade through said rigid, rod-like suspension wand and the circulation of the water, the maintenance of the inboard end of the blade within said overflow water return port, whereby; the weighted bag maintains the second end of the wand on the pool edge irrespective of rise or fall of the floatable blade, and wherein said folded pivoted connection between the rod-like suspension wand and said vertical upright blade permits angular adjustment of said blade relative to said vertical sidewall and said overflow skimmer water return port, while the penetration of outboard end of said vertically upright blade into the water may be selectively adjusted into the water by selective placement of the weighted bag on the pool side, the blade permits the floatable blade to rise and fall with the water level, the wand maintains tension on the blade and the inboard end of

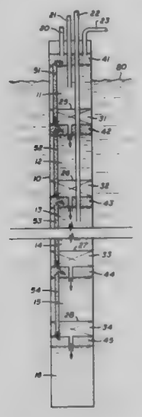
the floating blade within the overflow water return port while, during nonuse, the wand and blade may be folded for storing.

4,720,341

WATER TREATING IN A VERTICAL SERIES COALESCING FLUME

Kenneth E. Arnold, 3031 Shadowdale, Houston, Tex. 77043

Filed May 20, 1985, Ser. No. 735,686
Int. Cl.[4] B01D *17/028*
U.S. Cl. 210—262 38 Claims



1. An apparatus for removing oil from a mixture of oil and water, comprising:
a plurality of compartments disposed in a vertical series;
inlet means for introducing such mixture into said compartments;
flow means for flowing fluid between adjacent said compartments;
coalescing means disposed in said flow means for coalescing oil droplets present in such mixture flowing therethrough at a flow rate and having a first distribution of droplet sizes, said coalescing means including a closed channel having a flow bore and a flow length sufficient to induce turbulence in such mixture at such flow rate for such time as necessary to coalesce such oil droplets to result in a second distribution of droplet sizes evidencing a greater percentage of larger droplet sizes than evidenced by such first distribution;
removal means for removing oil from said apparatus;
transport means in each said compartment for collecting oil from an upper region of said compartment and transporting such oil to said removal means; and
outlet means for discharging fluid from the lowermost said compartment.

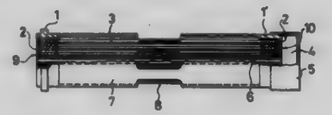
4,720,342

HOLLOW-FIBER FILTER MODULE WITH FILTRATE CONDUIT

Tohru Takemura, Hiroshima; Haruhiko Yoshida, Yamaguchi; Hiroshi Takahashi, Hiroshima; Yoshikazu Fujinaga, Toyohashi, and Masashi Okamoto, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,240
Claims priority, application Japan, May 21, 1984, 59-100572; Oct. 29, 1984, 59-225982
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.79 5 Claims

1. A hollow-fiber filter module assembly comprising a plurality of hollow-fiber filter modules connected in series, each said hollow-fiber filter module comprising:
a bundle of parallel hollow fibers having two open ends;
means for forming a filtrate collection chamber at one of said open ends; and
filtrate conduit means for conducting filtrate from said one of said open ends to the other of said open ends;
wherein said assembly includes fastening means at ends of each said bundle for fixing adjacent ones of said bundles to one another,
wherein said fibers are rectilinear and said filtrate conduit means comprises a conduit which extends parallel to said fibers,



wherein said conduit of each said filter module connects said collection chamber of said filter module with said other of said open ends thereof, and
wherein said means for forming a filtrate collection chamber of each said filter module comprises a partitioning member adapted for connection relative to said other end of an adjacent hollow-fiber bundle not having said filtration collection chamber.

4,720,343

MACROPOROUS ASYMMETRICAL HYDROPHILIC MEMBRANE MADE OF A SYNTHETIC POLYMER

Axel Walch, Frankfurt am Main; Juergen Wildhardt, Huenstetten, and Dieter Beissel, Weisbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,764
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149976
Int. Cl.[4] B01D *13/04*
U.S. Cl. 210—500.28 6 Claims

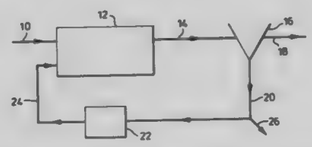
1. An asymmetrical macroporous membrane, comprising: a polymeric mixture comprised of from about 5–70% by weight of polyvinylpyrrolidone having a molecular weight ≧100,000 Dalton and from about 95 to 30% by weight of a polymer selected from polysulfone, polyether sulfone, or an aromatic or araliphatic polyamide, the percentages by weight being relative to the total weight of the polymeric mixture, and the membrane having a water absorbency of at least about 11% by weight of water, relative to its total weight, at 100% relative humidity and 25° C.

4,720,344

NITRIFICATION PROCESS IN WASTE WATER TREATMENT

Jerzy J. Ganczarczyk, 83 Edenbridge Dr., Islington, Ontario, Canada M9A 3G5, and Sabaratnam Suthersan, Box 82, 321 Bloor St. West, Toronto, Ontario, Canada M5S 1S5

Continuation of Ser. No. 724,649, Apr. 18, 1985, abandoned.
This application Feb. 17, 1987, Ser. No. 16,476
Int. Cl.[4] C02F *3/34*
U.S. Cl. 210—612 9 Claims



1. A microbiological process for treating ammonia-containing waste water to reduce the ammonia concentration thereof, which comprises:
feeding said waste water to aerobic treatment zone which contains an active microorganism system containing microorganisms of the genus Nitrosomonas in an active growth condition and microorganisms of the genus Nitrobacter in an inhibited condition;
subjecting waste water in said aerobic treatment zone to the microbiological action of Nitrosomonas organisms and for a time which is less than that required for rehabilitation of said Nitrobacter to fully active condition therein;
transferring said microorganism system to an inhibition zone;
treating the microorganism system by a treatment selected from pH adjustment, free ammonia concentration adjustment and addition of inhibition-causing chemicals in the inhibition zone to inhibit the growth of Nitrobacter on said waste water substrate whilst leaving the activity of Nitrosomonas therein substantially unaffected;
and returning the microorganism system so treated to the aerobic zone to mix with waste water therein.

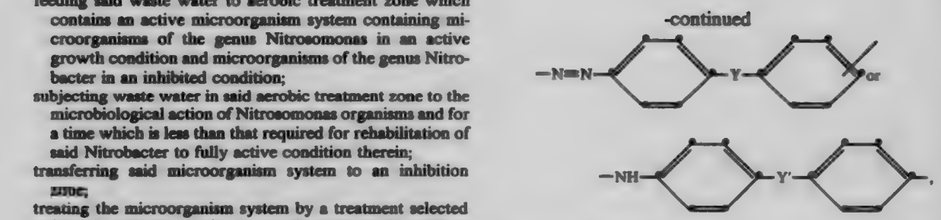
4,720,345

SEMIPERMEABLE MEMBRANES OF MODIFIED STYRENE-BASED POLYMERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

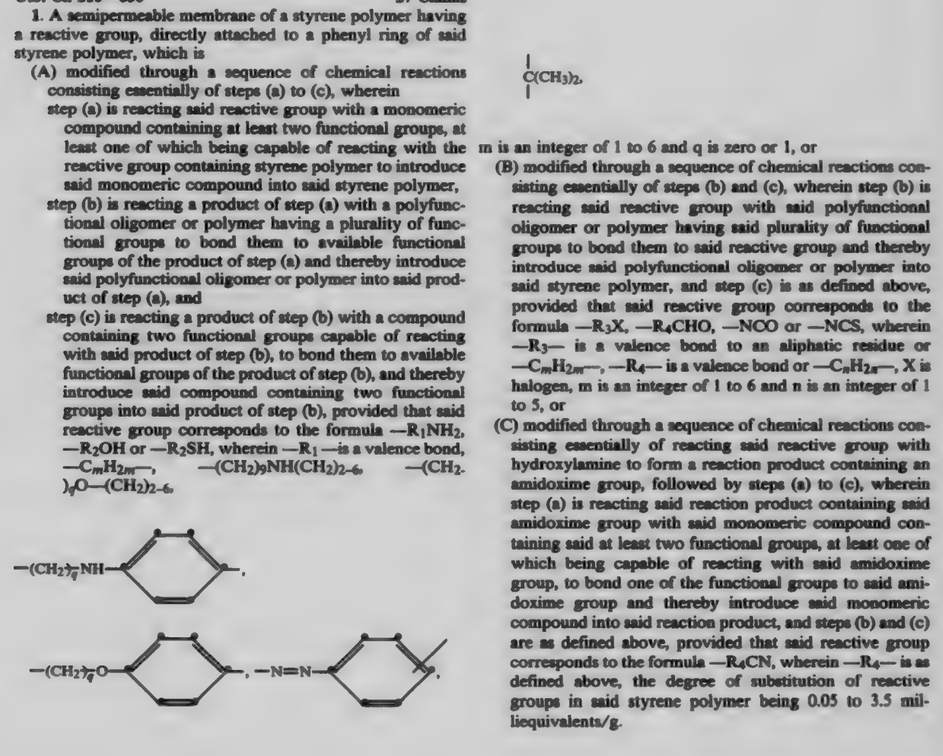
Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 451,370, Dec. 20, 1982, abandoned.
This application Mar. 17, 1986, Ser. No. 841,057
Claims priority, application Switzerland, Dec. 21, 1981, 8174/81
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—650 27 Claims

1. A semipermeable membrane of a styrene polymer having a reactive group, directly attached to a phenyl ring of said styrene polymer, which is
(A) modified through a sequence of chemical reactions consisting essentially of steps (a) to (c), wherein
step (a) is reacting said reactive group with a monomeric compound containing at least two functional groups, at least one of which being capable of reacting with the reactive group containing styrene polymer to introduce said monomeric compound into said styrene polymer,
step (b) is reacting a product of step (a) with a polyfunctional oligomer or polymer having a plurality of functional groups to bond them to available functional groups of the product of step (a) and thereby introduce said polyfunctional oligomer or polymer into said product of step (a), and
step (c) is reacting a product of step (b) with a compound containing two functional groups capable of reacting with said product of step (b), to bond them to available functional groups of the product of step (b), and thereby introduce said compound containing two functional groups into said product of step (b), provided that said reactive group corresponds to the formula $-R_1NH_2$, $-R_2OH$ or $-R_2SH$, wherein $-R_1-$ is a valence bond, $-C_mH_{2m}-$, $-(CH_2)_9NH(CH_2)_{2-6}$, $-(CH_2)_qO-(CH_2)_{2-6}$,



-continued



$-R_2-$ is a valence bond, $-C_mH_{2m}-$,

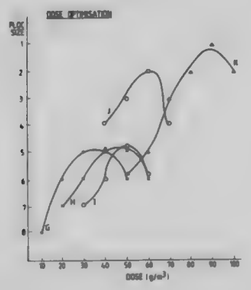
Y is a valence bond, —O— or —NH—, Y' is —O—, —S—, $-SO_2$ or

4,720,346

FLOCCULATION PROCESSES

Peter Flesher; David Farrar, and John R. Field, all of West Yorkshire, England, assignors to Allied Colloids Ltd., England

Filed Apr. 23, 1986, Ser. No. 855,509
Claims priority, application United Kingdom, Apr. 25, 1985, 8510496; Oct. 29, 1985, 8526624
Int. Cl.[4] C02F 1/56
U.S. Cl. 210—734 24 Claims



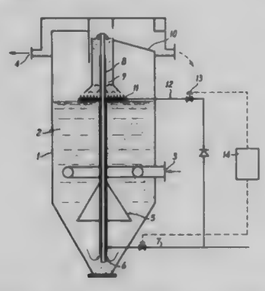
1. A process for flocculating an aqueous suspension of suspended solids comprising, adding to the suspension a flocculating amount of a synthetic polymeric flocculant material to form thereby an aqueous medium containing flocculated suspended solids and in which the said polymeric flocculant material at the time of addition to the suspension has a specific viscosity (measured by a capilliary flow viscometer at 34° C. on a 0.5% solution in deionised water) above 10 and comprises polymeric particles that have a dry size of below 10 μm, the polymeric material is added in a floc stabilising amount, and the flocculant solids are subjected to shear in the presence of the aqueous medium substantially without increasing the amount of suspended solids in the aqueous medium to reduce the size and increase the shear stability of said flocculated suspended solids.

4,720,347

METHOD AND APPARATUS FOR THE FILTRATION OF A SUSPENSION BY A GRANULAR FILTRATING LAYER

Francois Berne, Suresnes, France, assignor to Degremont, Hauts de Seine, France

Filed Oct. 3, 1985, Ser. No. 783,637
Claims priority, application France, Oct. 29, 1984, 84 16491
Int. Cl.[4] B01D 23/10, 23/24
U.S. Cl. 210—792 11 Claims



1. In a method of filtering a liquid to be treated by passing said liquid upwardly through a bed of granular filtering material, during which said filtering material removes particles from said liquid and becomes soiled thereby, and the thus filtered liquid is collected above said bed, the improvement comprising cleaning the thus soiled filtering material without interrupting said filtering operation by:

providing a tube extending from a lower portion of said bed of granular filtering material to a position above the upper surface of said bed;

injecting compressed gas into said tube, thereby driving said soiled filtering material upwardly through said tube and therein performing a first washing of said filtering material by means of said compressed gas, and then discharging said filtering material from the upper end of said tube, such that said filtering material falls downwardly toward said upper surface of said bed; and

directing pressurized gas upwardly from above said bed toward said filtering material falling downwardly from said upper end of said tube, thereby fluidizing said falling filtering material and performing a second washing of said filtering material by means of said pressurized gas and filtered liquid above said bed, after which the thus twice washed filtering material settles onto said upper surface of said bed.

4,720,348

WATERFLOODING EMPLOYING THICKENED SURFACTANT SOLUTIONS

Joseph G. Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 107,250, Dec. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 859,626, Dec. 12, 1977, Pat. No. 4,181,178. This application Feb. 1, 1982, Ser. No. 344,569
The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.
Int. Cl.[4] E21B 43/22
U.S. Cl. 252—8.554 4 Claims

1. In a method for the recovery of oil from a subterranean oil reservoir having a temperature of at least 90° F. and penetrated by spaced injection and production systems wherein an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising:

employing as at least a portion of the fluid introduced into said injection system a thickened aqueous liquid having a salinity within the range of 5–18 weight percent and containing a mixture of at least two water-soluble sulfonated polyethoxylated aliphatic alcohols of different HLB values and whereby said mixture increases the viscosity of said aqueous liquid to a value greater than the viscosity of said aqueous liquid containing an equal amount of either of said sulfonated polyethoxylated aliphatic alcohols alone, said mixture having an average HLB within the range of 10.0–14 and said sulfonated polyethoxylated aliphatic alcohols being characterized by the formula:

$$R(OC_2H_4)_nOC_3H_6SO_3^-M^+ \quad (I)$$

wherein R is an aliphatic hydrocarbon group having an average of from 16 to 20 carbon atoms,

n is at least 2, and

M is an alkali metal, ammonium, or substituted ammonium ion.

4,720,349

SLIDING MEMBER OF GRAPHITE-METAL BORIDES

Kazuo Kobayashi, Tosu; Kenji Miyazaki, Dazaifu; Tsuyoshi Hagio; Ichitaro Ogawa, both of Tosu; Hisayoshi Yoshida, Ogori; Kazutsugu Kashima, Tosu; Takashi Tada; Yoshichiro Hayashi, both of Fujisawa, and Wataru Abe, Hiratsuka, all of Japan, assignors to The Agency of Industrial Science and Technology and Oiles Industry Co. Ltd., both of Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,849
Claims priority, application Japan, Nov. 7, 1984, 59-233276
Int. Cl.[4] F16C 33/16
U.S. Cl. 252—12 5 Claims

1. High temperature-resistant and abrasion-resistant sliding members of graphite-metal boride, showing a friction coefficient of 0.01 to 0.09 and a specific amount of abrasion of 1.0 to 4.0×10^{-8} mm²/kg determined under the conditions of a load of 20 kg/cm² and a sliding velocity of 5 m/min at a temperature of 300° C., a bending strength of 230 to 900 kg.f/cm² and a Shore hardness of 28 to 45, produced by sintering a uniform mixture of

(a) 70 to 93% by weight of powdery amorphous carbon,

(b) 5 to 20% by weight of at least one boride of a metal selected from metals belonging to IVa-group, Va-group and VIa-group of the periodic table, and

(c) 2 to 10% by weight of powdery natural graphite, powdery Kish graphite or a mixture thereof.

4,720,350

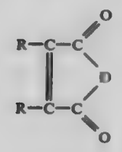
OXIDATION AND CORROSION INHIBITING ADDITIVES FOR RAILWAY DIESEL CRANKCASE LUBRICANTS

Benjamin H. Zoleski, Beacon; Rodney L. Sung, Fishkill, and Ronald L. O'Rourke, Hyde Park, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

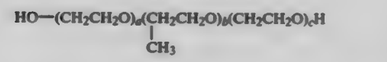
Filed Apr. 14, 1986, Ser. No. 851,617
Int. Cl.[4] C10M 129/00
U.S. Cl. 252—51.5 A 11 Claims

1. A railway diesel crankcase lubricant composition comprising a major portion of a diesel lubricating oil and a minor amount of, as an oxidation and corrosion inhibiting agent, a condensate product prepared by the process comprising:

(i) reacing a dibasic acid anhydride of the formula



where R is H, CH_3— or C_2H_5—, with a polyol of the formula



where a+c has a value of about 2 to about 80 and b has a value of about 5 to about 70; thereby forming an ester of maleic acid;

(ii) reacting said ester of maleic acid with an N-alkyl alkylene diamine, thereby forming the condensate product; and

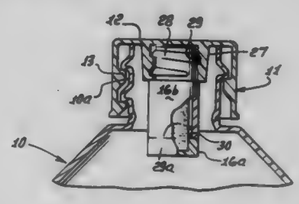
(iii) recovering said condensate product.

4,720,351

MULTI FUNCTIONAL LAUNDRY PRODUCT AND EMPLOYMENT OF SAME DURING FABRIC LAUNDERING

Brian P. Flynn, Lakewood; Deborah S. Wisotzky, Torrance, and George D. Evans, Tustin, all of Calif., assignors to Purex Corporation, Phoenix, Ariz.

Division of Ser. No. 689,293, Jan. 7, 1985, Pat. No. 4,636,328, which is a division of Ser. No. 597,127, Apr. 5, 1984, Pat. No. 4,563,186. This application Jan. 9, 1986, Ser. No. 872,264
Int. Cl.[4] B65D 51/28, 79/00, 81/32; G11D 17/04
U.S. Cl. 252—90 22 Claims



1. In combination,

(a) a first openable container containing a detergent composition for use in home laundering fabrics,

(b) a dispensing container containing a fabric prespotter composition, and forming a fitment,

(c) the fitment carried by the first container to be readily detachable at least in part for dispensing the prespotter composition onto fabric as at the time of fabric laundering, the composition being in solid or semi-solid stick form,

(d) and including manipulable means associated with the dispensing container for effecting progressive dispensing of the prespotter composition,

(e) the first container being a bottle having a neck and a removable cap, the cap having a top wall and a depending skirt interfitting the neck, the fitment being operatively attached to the underside of the cap top wall, the cap top wall having a sleeve depending therefrom within the bottle neck, the fitment having threaded interconnection with said sleeve, and wherein the fitment includes a sub-container containing the prespotter composition, and a removable sub-container cap, the sub-container having said threaded interconnection with said sleeve.

4,720,352

PROCESS FOR THE PREPARATION OF VANADIUM-CONTAINING MIXED METAL SOAP SOLUTIONS

Joseph Petronella, Old Bridge Township, Middlesex County, and Samuel J. Bellettiere, South Brunswick, both of N.J., assignors to Nuodex Inc., Piscataway, N.J.

Filed Nov. 1, 1985, Ser. No. 793,870
Int. Cl.[4] B01J 13/00; C10M 113/08, 155/00
U.S. Cl. 252—308 19 Claims

1. A process for the preparation of a solution in an organic solvent of a complexed mixed soap of vanadium and at least one other metal which comprises comingling (a) at least one inorganic vanadium compound selected from the group consisting of vanadium oxides, vanadium chlorides, vanadium oxychlorides, vanadium sulfates, ammonium vanadates, alkali metal vanadates, and vanadic acids, (b) at least one comminuted metal selected from the group consisting of aluminum, strontium, copper, zinc, iron, cadmium, zirconium, bismuth, lead, manganese, antimony, tin, cobalt, and nickel, (c) at least one organic monocarboxylic acid selected from the group consisting of straight chain or branched chain saturated or unsaturated monocarboxylic acids having from 1 to 18 carbon atoms, naphthenic acids, and tall oil fatty acids, and mixtures thereof, in an amount to provide a stoichiometric excess of

from about 0.1% to about 50% of said monocarboxylic acid over the total equivalents of said inorganic vanadium compound and said comminuted metal, (d) water, and (e) a water-immiscible inert organic solvent to form a reaction mass, and heating and agitating said reaction mass in the presence of oxygen until reaction is essentially complete.

4,720,353

STABLE PHARMACEUTICAL W/O EMULSION COMPOSITION

Stephen R. Bell, Harwinton, Conn., assignor to Richardson-Vicks Inc., Wilton, Conn.

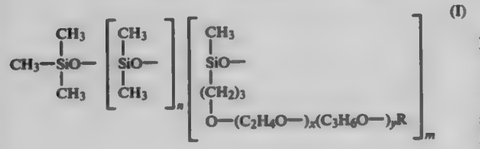
Filed Apr. 14, 1987, Ser. No. 38,216
Int. Cl.[4] B01J *13/00*
U.S. Cl. 252—309 **8 Claims**

1. A stable water-in-oil emulsion composition comprising:

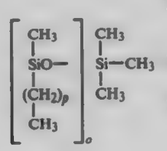
a. a dispersed water phase comprising water optionally containing a pharmaceutically acceptable electrolyte dissolved therein;

b. a pharmaceutically acceptable continuous oil phase comprising mineral oil and a volatile silicone fluid selected from the group consisting of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane and mixtures thereof dissolved therein;

c. an organopolysiloxane of the average formula:



(I)



wherein

R is hydrogen or C_{1-4} alkyl;

n is a number between 10 and 200;

m is a number between 1 and 25;

o is a number between 1 and 100, provided that all o>m;

p is a number between 7 and 17;

and the molar weight of $(C_2H_4O—)_x(C_3H_6O—)_yR$ is between 250 and 2000, in which x and y are such that the weight ratio of oxyethylene ($C_2H_4O—$) groups to oxypropylene ($C_3H_6O—$) groups is between 100:0 to 20:80.

d. PPG-20 Methyl Glucose Ether Distearate; and

e. an effective therapeutic amount of a topically active drug.

4,720,354

AROMA COMPOSITION

Yoshinori Asakawa, Tokushima, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Nov. 15, 1985, Ser. No. 798,393
Claims priority, application Japan, Nov. 20, 1984, 59-246764
Int. Cl.[4] A01K *7/46*
U.S. Cl. 252—522 R **1 Claim**

1. A process for imparting an aromatic fragrance to a substrate material, which comrpises adding an olfactorily sensible amount of 1,5,8,8-tetramethylbicyclo[8.1.0]undec-5-en-2-one to the substrate material.

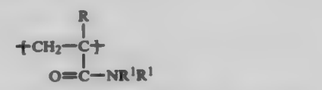
4,720,355

ORGANIC NONLINEAR OPTICAL SUBSTRATES

Ronald N. DeMartino, Wayne, N.J., assignor to Hoechst Celanese Corporation, Bridgewater, N.J.

Division of Ser. No. 771,864, Sep. 3, 1985. This application Mar. 4, 1986, Ser. No. 836,132
Int. Cl.[4] G03C *1/03;* **G02B** *5/20;* **G02F** *1/01*
U.S. Cl. 252—582 **15 Claims**

1. A nonlinear optical medium in the form of a homogeneous single phase solid substrate comprising (1) a host thermoplastic polymer which contains a recurring monomeric unit corresponding to the formula:



where R is a substituent selected from hydrogen, methyl and ethyl groups, and R^1 is an alkyl substituent containing between about 1–4 carbon atoms; and (2) a guest organic compound which has a charge asymmetric electronic structure and exhibits nonlinear optical response, and is present in a quantity of at least about 25 weight percent based on the total substrate weight.

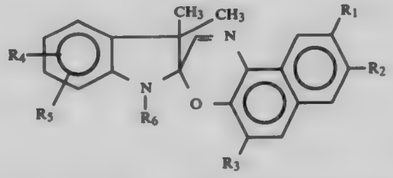
4,720,356

PHOTOCHROMIC COMPOSITION RESISTANT TO FATIGUE

Nori Y. C. Chu, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 843,792, Mar. 18, 1986, abandoned, which is a continuation of Ser. No. 696,452, Jan. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 497,263, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 360,455, Mar. 22, 1982, Pat. No. 4,440,672. This application Jun. 4, 1987, Ser. No. 58,629
Int. Cl.[4] G02B *5/23;* **C08K** *5/35*
U.S. Cl. 252—586 **19 Claims**

1. A photochromic composition comprising at least one photochromic compound having the structural formula



wherein one of R_1, R_2 and R_3 is selected from the group consisting of hydrogen, halogen, lower alkoxy, and lower alkyl and the others are hydrogen; R_4 and R_5 are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, and trifluoromethyl; and R_6 is lower alkyl; and a hindered amine light stabilizer.

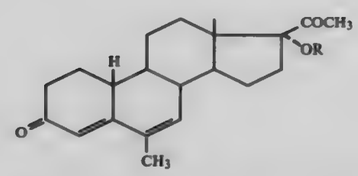
4,720,357

NEW PROCESS FOR MANUFACTURING DERIVATIVES OF 17 ALPHA-HYDROXY 19-NOR PROGESTERONE AND NOVEL INTERMEDIATES FOR USE THEREIN

Claude Tchernatinsky, Beausoleil, France, assignor to Laboratoire Theramex, Monaco

Filed Aug. 19, 1985, Ser. No. 766,481
Int. Cl.[4] C07J *1/00*
U.S. Cl. 260—397.3 **12 Claims**

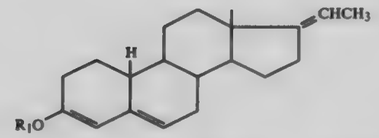
1. A process for manufacturing 6-methyl, 19-nor-pregna-4, 6-diene, 3,20-diones of the formula (I):



(I)

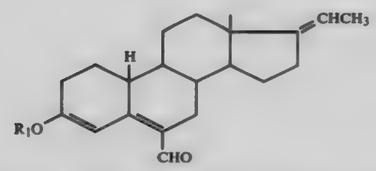
wherein R is hydrogen or the acyl residue of a saturated or unsaturated organic carboxylic acid having from 1 to 18 carbon atoms in a saturated hydrocarbon chain or from 2 to 18 carbon atoms in an unsaturated hydrocarbon chain which may include from 1 to 5 double bonds in a straight or branched chain, which comprises the steps of:

reacting a 3-alcoxy, 19-nor-pregna-3, 5, 17 (20)-triene of the formula (II):



(II)

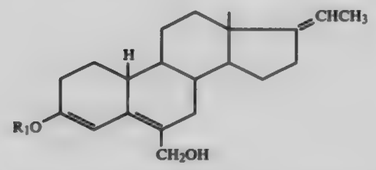
wherein R_1 is a lower alkyl radical or a cyclo-lower alkyl radical, in the form of an E or Z isomer, with a formylating agent under the conditions of Vilsmeier's reaction to produce a 6-formylated derivative of the formula (III):



(III)

wherein R_1 has the same meaning as previously given;

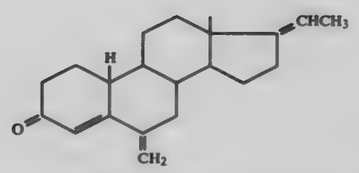
reducing said 6-formylated derivative by means of a reducing agent to produce a 6-hydroxymethylated derivative of the formula (IV):



(IV)

in the form of an E or Z isomer, wherein R_1 has the same meaning as previously given;

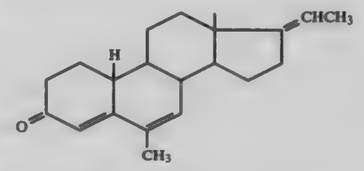
contacting said 6-hydroxymethylated derivative with a dehydrating mineral or organic acid to form a 3-keto, 6-methylenic derivative of the formula (V):



(V)

in the form of an E or Z isomer;

isomerizing said 3-keto, 6-methylenic derivative by means of an isomerizing catalytic agent in an inert medium to produce a 3-keto, 4, 6, 17-pregna-triene of the formula (VI):



(VI)

in the form of an E or Z isomer; and

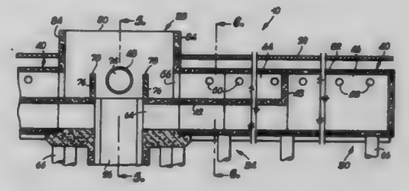
converting said 3-keto, 4, 6, 17-pregna-triene into 6-methyl, 17-alpha-hydroxy, 19-nor-pregna-4, 6-diene, 3,20-dione, that is, the specific compound of formula (I) wherein R is hydrogen, by means of a bis-hydroxylating agent in an inert solvent and in the presence of a catalyst based on osmium tetroxide; and optionally reacting said 17-alphahydroxy, 6-methyl, 19-nor-pregna-4, 6-diene, 3,20-dione with an acylating agent to produce the remaining compounds of formula (I) wherein R is other than hydrogen.

4,720,358

ZONED HOT WATER DISTRIBUTION SYSTEM FOR COUNTERFLOW TOWERS

Kenton A. Cropp, Edgerton, Kans., assignor to The Marley Cooling Tower Company, Mission, Kans.

Filed Feb. 2, 1987, Ser. No. 10,188
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—111 **8 Claims**



1. In combination with a counterflow cooling tower having upright wall means defining an air passageway and a fill assembly extending across said passageway, a hot water distribution system comprising:

riser means for receiving hot water at a variable flow rate;

elongated conduit means connected to said riser means for receiving hot water from the latter;

a plurality of distribution pipes connected at space locations along the length of said conduit means for conveying hot water to an outer distribution zone located over a first, peripheral region of said fill assembly and adjacent said wall means of said tower, and for conveying hot water to an inner distribution zone located over a second, inner

region of said fill assembly end within a central region of said passageway;

a first plurality of nozzle means connected to said distribution pipes for delivering hot water directed to said outer distribution zone to said first region of said fill assembly;

a second plurality of nozzle means connected to said distribution pipes for delivering hot water directed to said inner distribution zone to said second region of said fill assembly; and

means for directing hot water only to said first plurality of nozzle means and thereby to said outer distribution zone whenever the flow rate of hot water passing through said riser means is any one of a number of values below a certain, preselected value, and for directing hot water to both said first plurality of nozzles and to said second plurality of nozzles and thereby to both said inner and said outer distribution zone whenever the flow rate of hot water passing through said riser means is any one of a number of values above said certain, pre-selected value,

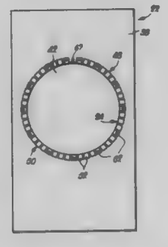
said directing means including structure for continuously equalizing the pressure of hot water encountered by each of said first plurality of nozzle means with the pressure of hot water encountered by each of said second plurality of nozzle means when the flow rate of water passing through said riser means is any one of a number of values which each exceed said certain, pre-selected value.

4,720,359

WRAPPED FAN CYLINDER FOR WATER COOLING TOWER

Robert S. Glanz, Shawnee, and Joyce D. Holmberg, Overland Park, both of Kans., assignors to The Marley Cooling Tower Company, Mission, Kans.

Filed Oct. 23, 1986, Ser. No. 922,163
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—24 **9 Claims**



1. A fan cylinder assembly comprising:

a support having a generally circular opening;

an initially flat sheet having a major region with a certain thickness and an edge region with a plurality of spaced tabs bent to extend in a direction substantially perpendicular to said major region,

said major region of said sheet being comprised of a resilient material having a yield strength and a significant memory which can be overcome when said major region is deflected laterally to impose stress greater than said yield strength to the majority of said material comprising said major region,

said major region of said sheet being formed to a cylindrical configuration,

at least eighty percent of said material comprising said major region in directions along the thickness of said sheet being subjected to stress less than the yield strength of said material when said major region is formed to said cylindrical configuration to enable the memory of said at least eighty percent of said resilient material to bias said major region to an exact cylindrical configuration; and

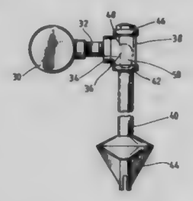
means for affixing certain of the tabs to said support at precise, predetermined positions spaced around said opening to cause said major region of said sheet to bear against said circular opening and to thereafter retain said major region of said sheet in said exact, cylindrical configuration.

4,720,360

DIFFUSED AERATION SYSTEM

Milton R. Melber, Salado, Tex., assignor to Enviroquip, Inc., Austin, Tex.

Filed Feb. 10, 1986, Ser. No. 827,752
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—76 **9 Claims**



1. An orifice device, adapted for use in an aeration system which includes at least one tee-joint, said tee-joint having first and second ports disposed at opposite ends of a vertically disposed run of the tee-joint and a third port disposed intermediate said first and second ports, said third port having a longitudinal axis disposed essentially perpendicular to the run of the tee-joint, said orifice device comprising:

an upper cylindrical member and a lower cylindrical member, each adapted to be received by one of said first and second ports;

said upper cylindrical member having an upper end and a lower end, fluid guidance structure and a longitudinal wall defining an entry port to said fluid guidance structure, said entry port being adapted to be in fluid communication with said third port of said tee-joint and said fluid guidance structure being configured to direct the flow of fluid entering said upper cylindrical member from said entry port to said lower cylindrical member, said fluid guidance structure essentially defining a curving surface substantially in the shape of a 90 degree arc about the intersection of the centerline of said upper cylindrical member and an axis adapted to be substantially coincident with said longitudinal axis of said third port of said tee-joint;

said upper end of said upper cylindrical member further comprising a plug adapted to seal said one of said first and second ports of said run of the tee-joint, said upper end being provided with structure adapted to wrench said upper cylindrical member into, and out of, said tee-joint, said upper end further including means for indicating the orientation of said entry port; and

said lower cylindrical member having an upper end and a lower end, said upper end being fluidly engageable with said lower end of said upper cylindrical member, said lower end of said lower cylindrical member having a flow restriction, and said lower cylindrical member having a channel to direct fluid entering said lower cylindrical member from said upper cylindrical member to said flow restriction, wherein said channel tapers as it approaches said flow restriction.

3. Apparatus for use in aerating a body of liquid, comprising:

a fluid manifold positioned substantially horizontally over the surface of said liquid;

a plurality of conduits spaced along said manifold and extending substantially laterally over said liquid to conduct fluid from said manifold;

a separate tee-joint, having a side port and an end port at each end of the run of the tee-joint, positioned opposite each said conduit such that said run of the tee-joint is

substantially vertically disposed and substantially perpendicular to the centerline of its respective conduit, said side port of each said tee-joint being connected to its respective conduit;

a separate fluid injection pipe connected at one end to the lower end port of each said tee-joint and extending downwardly into said liquid from said lower end port;

a separate fluid diffuser head attached to the lower end of each said fluid injection pipe;

a separate orifice device positioned in said run of each said tee-joint, said device comprising an upper cylindrical member and a lower cylindrical member, said upper cylindrical member having an upper end, a lower end, and a longitudinal side-wall having an entry port, said upper cylindrical member having fluid guidance structure configured to direct the flow of fluid entering said upper cylindrical member from said side port of said tee-joint through said entry port of said longitudinal side-wall of said upper member, to said lower cylindrical member, said fluid guidance structure essentially defining a curving surface substantially in the shape of a 90 degree arc about the intersection of the centerline of said upper cylindrical member and the centerline of said side port of said tee-joint;

said upper end of said upper cylindrical member further comprising a plug adapted to seal the upper end port of said run of the tee-joint, said upper end being provided with structure adapted to wrench said upper cylindrical member into, and out of, said tee-joint, said upper end further including means for indicating the orientation of said entry port relative to said side port of said tee-joint when said orifice device is positioned within said tee-joint; and

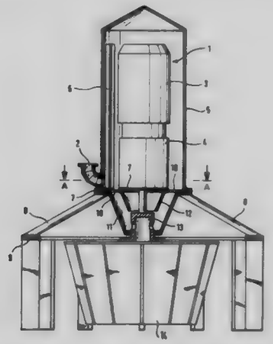
said lower cylindrical member having an upper end and a lower end, said upper end being fluidly engageable with said lower end of said upper cylindrical member, said lower end of said lower cylindrical member having a flow restriction having a center, said center being located substantially along the centerline of said run of the tee-joint, said lower cylindrical member having a channel to direct fluid entering said lower cylindrical member from said upper cylindrical member to said flow restriction, wherein said channel tapers as it approaches said flow restriction.

4,720,361

IMMERSIBLE AERATOR AND/OR MIXER APPARATUS

Arvo E. Andersson, Outokumpu, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Feb. 19, 1986, Ser. No. 830,967
Claims priority, application Finland, Feb. 20, 1985, 850690
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—87 **19 Claims**



1. An immersible apparatus for agitating liquid, comprising a casing having a lower wall, inlet means for supplying gas under pressure to the casing, a mechanical drive unit disposed within the casing and having an output shaft that extends through an aperture in said lower wall, a mixer connected to the output shaft of the drive unit on the opposite side of the lower wall from the drive unit, and a tubular structure secured to the lower wall of the casing and surrounding said aperture and extending to said opposite side of the lower wall, the casing having at least one hole for allowing gas supplied to the casing by way of the inlet means to leave the casing, and the tubular structure and the lower wall together defining a gas trap which, when the apparatus is disposed in liquid with the output shaft extending vertically downwards from the drive unit, prevents liquid from reaching the aperture in said lower wall.

4,720,362

TRANSPARENT ALUMINUM OXYNITRIDE AND METHOD OF MANUFACTUBE

Richard L. Gentilman, Acton; Edward A. Maguire, Ashland, and Leonard E. Dolhert, Malden, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 570,419, Jan. 13, 1984, which is a division of Ser. No. 297,896, Aug. 31, 1981. This application Mar. 20, 1985, Ser. No. 714,223
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.2 **20 Claims**

1. A method of manufacturing a dense aluminum oxynitride body comprising the steps of:

forming a single phase aluminum oxynitride powder;

pressing said powder into a green body of predetermined shape; and

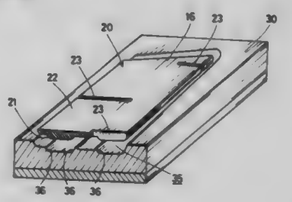
sintering said green aluminum oxynitride body in a nitrogen atmosphere.

4,720,363

METHOD OF MANUFACTURING PLASTIC MOLDING

Tohru Mayumi, and Isamu Eto, both of Anjyo, Japan, assignors to Inoue MTP Kabushiki Kaisha, Aichi, Japan

Filed Sep. 3, 1985, Ser. No. 762,887
Claims priority, application Japan, Jan. 22, 1985, 60-10668
Int. Cl.[4] B29C *35/12, 67/22, 33/10*; B29B *11/14*
U.S. Cl. 264—26 **9 Claims**



1. A method of manufacturing a foamed plastic molding having a predetermined shape and formed from a foamable plastic raw material blank or preform containing a foaming agent comprising placing a foamable thermoplastic resin blank or preform having preformed gas discharge openings provided therein, the gas discharge openings extending through the thickness of the blank or preform, into the mold cavity a molding die assembly defining a molding cavity having the predetermined shape of the foamed plastic molding; the heating said black or preform by the application of high frequency voltage to soften and foam said blanks or preform and, wherein air originally trapped in the mold cavity and gas issued during the foaming is discharged from the mold cavity through said gas discharge openings preformed in the blank or preform which extend through the thickness of the raw material from the lower side thereof that is adjacent to the lower surface of the molding cavity to the opposite upper side of the foamable plastic raw material blank or preform.

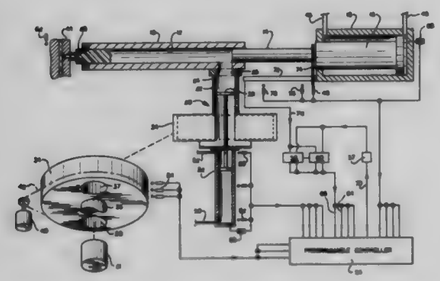
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,364

METHOD FOR INJECTION MOLDING FIBER-REINFORCED THERMOSET PLASTIC ARTICLES

Abe J. Kauffman, Millersburg; Robert S. Black, Southwest Massillon, and Arthur J. Stanley, Ashtabula, all of Ohio, assignors to Trans Plastics, Inc., Conneaut, Ohio, a part interest

Filed Apr. 15, 1985, Ser. No. 723,071
Int. Cl.[4] B29C 45/18, 45/76
U.S. Cl. 264—40.5 5 Claims



1. A process for injection molding a fiber-reinforcing molding material to form thermoset plastic articles comprising the steps of:

providing a mixture of short lengths of reinforcing fibers with a thermosetting resin in a predetermined fiber-to-resin ratio;

introducing said mixture into a stuffer cylinder for conveying the mixture to an intersecting injection molding cylinder, said injection molding cylinder including an injection plunger with a tip which traverses the intersection between said stuffer and injection molding cylinders within said injection cylinder;

providing a mold including a mold cavity having a predetermined volumetric capacity in fluid communication with said molding cylinder for injection of said mixture;

the volume of said mixture exceeding the volumetric capacity of said mold cavity by at least a factor of two;

supplying said mixture from said stuffer cylinder to said injection cylinder;

moving said injection plunger across said intersection to compress the mixture at a relatively high pressure and to a substantially compressed condition to substantially completely drive out any entrapped gases by allowing said gases to escape around the tip of the plunger and to establish a first volume in said molding cylinder;

injecting a portion of the mixture into said mold cavity by decreasing the first volume of the molding cylinder to a second volume less than said first volume to begin a first molding cycle, the volume of said portion of the mixture corresponding to the volumetric capacity of the mold cavity;

increasing the volume of said second volume by decreasing the pressure on said mixture;

curing the resin in said mold cavity and removing a molded article from said cavity at the end of the molding cycle; and

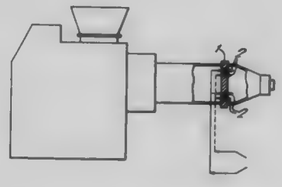
repeating the steps of the molding cycle to provide a plurality of molding cycles during which said injection plunger tip traverses said intersection a single time during the first molding cycle only to minimize shearing and balling of said fibers.

4,720,365

MANUFACTURE OF DETERGENT BARS

Erich Schönig, Mannheim, and Hans Brückel, Hockenheim, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 102,066, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 608,607, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 433,171, Jan. 14, 1974, abandoned, which is a continuation of Ser. No. 230,371, Feb. 29, 1972, abandoned. This application May 6, 1986, Ser. No. 861,611
Claims priority, application United Kingdom, Jul. 1, 1971, 30783/71; Jul. 1, 1971, 57385/71
Int. Cl.[4] B29C 47/04
U.S. Cl. 264—75 7 Claims



1. A process for preparing multicolored detergent bars comprising:

(i) passing a detergent mass through a soap plodder;

(ii) passing said mass through a perforated plate positioned after the worm compressor of said plodder to form a plurality of continuous rods;

(iii) introducing in the interstices between the continuous rods in at least one position downstream of the perforated plate a liquid phase comprising a solution or dispersion of an additive having a different appearance than the detergent mass;

(iv) compressing the continuous rods inwardly to form a continuous mass having striations of the liquid phase therein, and

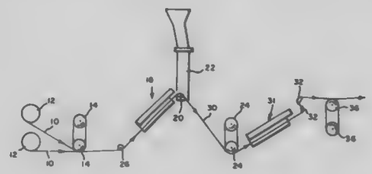
(v) extruding the mass whereby a bar is formed having stripes distributed over the whole cross-section of said bar.

4,720,366

METHOD FOR PRODUCING FIBER REINFORCED THERMOPLASTIC MATERIAL

Edwin K. Binnersley, and William H. Krueger, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 618,112, Jun. 7, 1984, Pat. No. 4,640,861. This application May 16, 1986, Ser. No. 863,904
Int. Cl.[4] B32B 5/02
U.S. Cl. 264—172 5 Claims



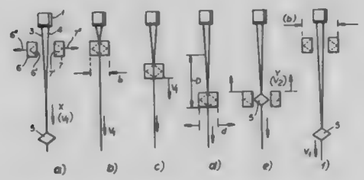
1. A method of making a fiber reinforced thermoplastic material comprising: advancing a tensioned array of fiber bundles comprised of continuous filaments in sliding contact with an arcuate surface of a heated extruder head; moving a molten thermoplastic polymer having a relative viscosity of at least 50 in a flow under pressure from one side to the other through the tensioned array of filaments from a slot in the arcuate surface of the extruder head, said slot being tranverse to said one side of the filament array said filaments having a melting point that exceeds the temperature of said molten thermoplastic polymer; expelling air from the other side of said filament array by means of said flow; and forming polymeric protrusions on said other side of said filament array.

4,720,367

METHOD OF AN APPARATUS FOR DEEP DRAWING OF THERMOPLASTIC FOIL

Bernd Schenk, Eibenweg 7, D-7517 Waldbronn, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,284
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513399
Int. Cl.[4] B29C 51/20, 51/10
U.S. Cl. 264—545 8 Claims



1. A method of operating a deep-drawing machine for the production of hollow articles from a thermoplastic foil, comprising the steps of:

(a) extruding a pair of webs of said thermoplastic foil and displacing said webs in juxtaposition at a foil-feed speed;

(b) downstream of the extruding of said thermoplastic foil, engaging each of said webs with a respective mold half formed with a cavity adapted to shape the respective web into a respective container half by vacuum drawing, and vacuum drawing the respective web into the respective cavity to form the respective container half;

(c) pressing, at a relatively upstream location of said mold halves, said mold halves together to fuse said webs together around the respective cavities and thereby bond said container halves together and form a respective hollow article therefrom;

(d) displacing said mold halves with said webs while said mold halves are pressed together from said relatively upstream location at said foil-feed speed over a distance selected in accordance with the rate of cooling of said article to a relatively downstream location;

(e) stressing means comprising at least one force-storage element by the movement of said mold halves over said distance;

(f) spreading said mold halves apart to release said article from said mold at said relatively downstream location;

(g) with force generated at least in part by said stressing of said force-storage element, displacing said mold halves back to said relatively upstream location at a velocity greater than said speed of said foil; and

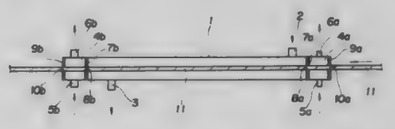
(h) repeating steps (b) through (g) sequentially.

4,720,368

METHOD FOR FORMING A ROD-LIKE MOLDING

Takayoshi Nakasone; Tetuo Sibagaki, both of Gifu, and Kenji Kozuka, Ichinomiya, all of Japan, assignors to Ube-Nitto Kasei Co., Ltd., Tokyo, Japan

Division of Ser. No. 624,517, Jun. 25, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,941
Claims priority, application Japan, Jun. 28, 1983, 58-115268; Jan. 23, 1984, 59-8432
Int. Cl.[4] B29C 35/06
U.S. Cl. 264—562 4 Claims



1. In a method of forming a fiber reinforced synthetic resin rod-like molding obtained by forming a core portion having at least in the outer portion thereof a reinforcing fiber bundle impregnated with non-hardened thermosetting resin, coating said core portion with a molten thermoplastic resin, cooling and solidifying said thermoplastic resin to form a semimolding with said thermosetting resin remaining non-hardened, and thereafter hardening said thermosetting resin, the improvement wherein said hardening comprises the steps of:

introducing said semimolding into a hardening tub;

supplying a thermal medium at a temperature in the vicinity of the molting point of said thermoplastic resin into said hardening tub, thereby softening said thermoplastic resin and hardening said thermosetting resin of said core portion;

maintaining said thermal medium at an elevated pressure and thereby pressing together at outer surface portion of said core portion and an inner surface portion of said thermoplastic resin layer while in respective semifluid states to achieve firm and integral adhesion therebetween due to an anchor effect; and

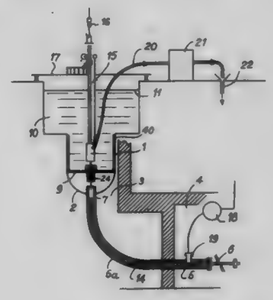
thereafter again cooling and solidifying said thermoplastic resin.

4,720,369

DEVICE FOR CLEANING THE GUIDE TUBES OF THE MEANS OF MEASURING NEUTRON FLUXES IN A PRESSURIZED-WATER NUCLEAR REACTOR

Gerard Cadaureille, St. Laurent de Mure; Patrick Cresson, Lyons, and Claude Vecchionacci, Chalon-sur-Saone, all of France, assignors to Framatome, Courbevoie, France

Filed Nov. 6, 1985, Ser. No. 795,596
Claims priority, application France, Nov. 13, 1984, 84 17311
Int. Cl.[4] G21C 17/08, 19/00
U.S. Cl. 376—248 4 Claims



1. Device for cleaning the guide tubes (5) of the means for

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measuring neutron flux in a pressurized-water nuclear reactor at shutdown, said reactor comprising a vessel (1) containing internal equipment (9, 40) supporting and retaining fuel assemblies of a core or lower internal equipment arranged above a convex vessel bottom (2) and comprising, in particular, a horizontal core support plate (9), a reactor pool (10) communicating with the inner volume of said vessel (1), the assembly as a whole being filled with water, a fueling machine movable above said pool (10) in a horizontal plane and comprising, in particular, a platform (17) and a winch (16) for handling in the vertical direction, capable of coming into vertical alignment with all the points on said convex bottom (2), a containment containing said pool and said vessel (1) within a vessel well (3), and an instrumentation room (4) arranged laterally in relation to said vessel well (3) and into which enters one of the ends of said guide tubes (5), each connecting said instrumentation room (4) along a path incorporating a bend (5a) to the inner volume of said vessel (1), into which said guide tube (5) opens via a vertical sleeve (7) passing through said vessel bottom (2) in alignment with a guide column (24), the central guide duct of which opens onto the upper face of said core support plate (9) at the level of a passage corresponding to a position of entry of the flux-measuring means into an assembly, said cleaning device comprising means (18, 19) for injecting demineralized water into each of said guide tubes (5) located in said instrumentation room (4) and means (15, 20, 21, 22) of recovering the water laden with radioactive particles at the outlet of said vertical sleeve (7), comprising a flexible tube (20) connected to a filtration station (21) located above said fuel pool, wherein, in order to install said recovery means and recover the radioactive particles without extracting said internal equipment (9, 40) from said reactor vessel (1), from which only said upper internal equipment and said core assemblies have been extracted, said recovery means comprise

(a) a hollow structural beam (26) suspended vertically via its upper part from said handling winch (16) by means of a suspension element (27, 57), on which said beam (26) is mounted so as to be rotatable about its vertical axis (Z-Z');

(b) a fastening plate (28) mounted on the lower end of said beam (26) rotatable about the vertical axis (Z-Z') of said beam (26) and having positioning means (47, 49) interacting with positioning means (48, 51) corresponding to an assembly provided on said core support plate (9) and means (30) of locking said beam (26) in fixed angular positions on said plate (28);

(c) a first housing (29) mounted so as to be movable in said beam (26) in its axial direction and carrying a hollow needle (35) with a point offset axially (93) at its lower end, said needle being provided with deformable gaskets (96) on its outer surface;

(d) a three-way valve (88) having a body (90), one channel of which valve communicates with the inner space of said needle (35), a second channel (97*b*) of which communicates with said flexible tube (20), and a third channel (97*c*) of which is an extension of said first channel (97*a*);

(e) a second housing (80) carrying a light source (81), a fibroscope (83) and a television camera (82) and movable in said first housing (29) above said three-way valve, for introducing said fibroscope (83) and displacing it in said hollow needle (35) by means of said three-way valve (88);

(f) two winches (31*a*, 31*b*) controlling the axial displacement of said housings (29, 80), each associated with a housing and fastened to said platform (17) of said fueling machine by means of a support (32), in which said beam (26) is mounted so as to be rotatable about its vertical axis (Z-Z'); and

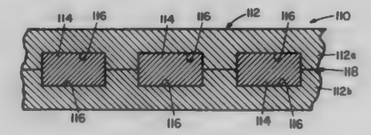
(g) display and control means located on said platform (17) of said fueling machine for the controlled introduction of said needle (35) into the bore of said sleeve (7).

4,720,370

NUCLEAR REACTOR FUEL STRUCTURE CONTAINING URANIUM ALLOY WIRES EMBEDDED IN A METALLIC MATRIX PLATE

Armando Travelli, Hinsdale, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 25, 1985, Ser. No. 791,235
Int. Cl.⁴ G21C *3/36*
U.S. Cl. 376—422 **12 Claims**



1. A nuclear fuel-containing plate structure for a nuclear reactor,

such structure comprising a pair of malleable metallic non-fissionable matrix plates having confronting surfaces which are pressure bonded together and fully united to form a bonded interface,

and a plurality of elongated malleable wire-like fissionable fuel members separately confined and fully enclosed between said matrix plates along said interface to afford a high fuel density as well as structural integrity and effective retention of fission products,

said plates having separate recesses formed in said confronting surfaces for closely receiving said wire-like fissionable fuel members,

said wire-like fissionable fuel members being made of a malleable uranium alloy capable of being formed into elongated wire-like members and capable of withstanding pressure bonding,

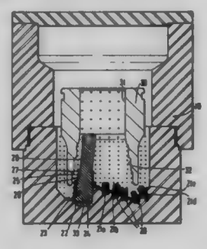
said wire-like fissionable fuel members being completely separated and isolated by fully united portions of said interface.

4,720,371

ROTARY DRILL BITS

David Shirley, Cheltenham, England, assignor to NL Petroleum Products Limited, Gloucestershire, England

Filed Apr. 21, 1986, Ser. No. 854,178
Claims priority, application United Kingdom, Apr. 25, 1985, 8510454
Int. Cl.⁴ B22F *7/06, 3/26*
U.S. Cl. 419—10 **15 Claims**



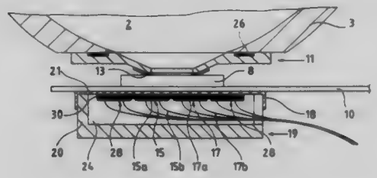
1. A method of manufacturing by a powder metallurgy process a rotary drill bit including a bit body having an external surface on which are mounted a plurality of cutting elements, and a passage for supplying drilling fluid to the surface of the bit, the method including the steps of forming a rigid hollow mould for moulding at least a portion of the bit body, packing at least part of the mould with powdered matrix-forming material, and infiltrating the material with a metal alloy in a furnace to form a matrix, the method further including the step, before packing the mould with the powdered matrix-forming material, of positioning on the interior surface of the mould at least one former which projects into the interior of the mould space at the desired location for a socket within the bit body, the former being formed from material having a coefficient of thermal expansion not less than that of the matrix.

4,720,372

DEVICE FOR THE EVALUATION OF A FLAT TEST CARRIER FOR THE ANALYTICAL DETERMINATION OF COMPONENTS OF BODY FLUIDS

Werner Fey, Pfungstadt; Manfred Paull, Schwetzingen; Uwe Ruppender, and Manfred Seidenstricker, both of Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,017
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321783
Int. Cl.⁴ G01N *21/00, 21/13*
U.S. Cl. 422—67 **8 Claims**



1. The combination of a test carrier having a test field and a device for the evaluation of said test carrier for the analytical determination of components of body fluids, comprising:

a test carrier having a test field; and

a device for the evaluation of said test carrier for the analytical determination of components of body bluids comprising;

a tempering device and a regulating unit, the tempering device including at least one heating and measurement unit, said at least one heating and measurement unit having a heating surface which can be homogeneously heated with at least one resistance heating element and which can be pressed flatly against the test carrier in the region of the test fieldutilized for the evaluation;

at least one resistance heating element having at least one first part arranged in close proximity to the heating surface;

said at least one first part having at least one portion thereof which serves as temperature measurement section, arranged in close proximity to the heating surface and comprising a material with a temperature-dependent electrical resistance to form at least one combined heating and temperature measuring element; and

said at least one heating and measurement unit including a flat substrate and said at least one resistance heating element including resistance strips carried on a first surface of the substrate, the substrate comprising said heating surface, said heating surface being at least substantially as large as the test field of the test carrier used for the evaluation, the resistance strips being so dimensioned and distributed that there is obtained a uniform distribution of the electrical power density on said first substrate surface, at least a part of the resistance strips forming said at least one combined heating and temperature measuring element;

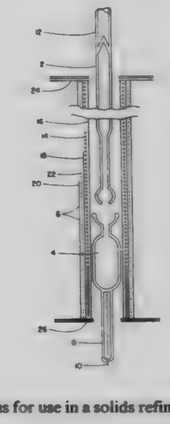
said at least one combined heating and temperature measuring element being associated with said regulating unit so that the electrical resistance of the temperature measurement section is used for the regulation of the temperature of the heating and measurement unit by means of the regulating unit.

4,720,373

SOLIDS REFINING APPARATUS

Lawrence R. Holland, Huntsville, Ala., assignor to Research Corporation, Tucson, Ariz.

Division of Ser. No. 630,503, Jul. 13, 1984, Pat. No. 4,584,054. This application Jan. 16, 1986, Ser. No. 819,781
Int. Cl.⁴ B01D *9/00*
U.S. Cl. 422—245 **2 Claims**



1. A VLS apparatus for use in a solids refining process which comprises:

(a) an evaporator having enclosed sides, an enclosed lower end and an open upper end provided with a ball joint,

(b) a process tube having enclosed sides, an enclosed upper end and a open lower end provided with a ball joint, the ball joint of said evaporator mating with the ball joint of said process tube to provide communication between the interior of portions of said evaporator and said process tube,

(c) heating means effective to evaporate material located in the interior of the lower end of the evaporator,

(d) cooling means effective to condense and solidify vaporous material located in the interior of the upper end of the process tube,

(e) positioning means effective to position said heating means relative to the longitudinal axis of the evaporator, and

(f) vacuum means effective to evacuate the interior portions of the evaporator and the process tube and to maintain a sub-atmospheric pressure outside of the mated evaporator and process tube which is lower than the pressure in the interior of the mated evaporator and process tube.

4,720,374

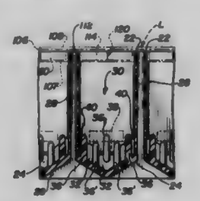
CONTAINER HAVING A SONICATION COMPARTMENT

Narayanaswamy Ramachandran, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 22, 1985, Ser. No. 757,576
Int. Cl.⁴ G01N *1/10*
U.S. Cl. 422—310 **2 Claims**

1. A container having a hydration compartment adapted to receive therein a hydrating liquid and a material to be dissolved or dispersed thereinto, the compartment having sidewalls and endwalls and a floor from which an array of finger-like members project vertically upwardly into the compartment, the fingers being spaced from the sidewalls and endwalls with the tips of predetermined ones of the finger-like members being above the tips of others of the members within the com-

partment, the members being arranged with respect to each other to define a material receiving recess and being relatively spaced apart to define recirculating gaps therebetween such that, in use, the material to be dissolved by the application of



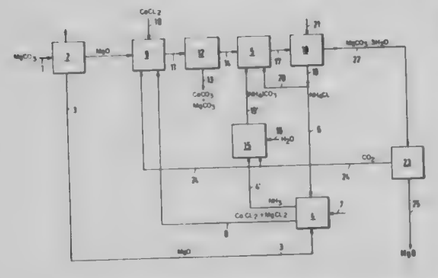
ultrasonic energy from a source introduced into the compartment is confined within a relatively high energy zone defined by the recess and hydrating fluid is recirculated through and out of the relatively high energy zone through the gaps between the finger-like members.

4,720,375

PROCESS FOR PRODUCING MAGNESIUM OXIDE

William S. Ainscow, Winterthur, and Balkrishna B. Gadgil, Ratersehen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 26, 1985, Ser. No. 801,741
Claims priority, application European Pat. Off., Nov. 27, 1984, 84114353.0
Int. Cl.[4] C01F 11/04
U.S. Cl. 423—175 5 Claims



1. A process of producing magnesium oxide comprising the steps of

obtaining an ore containing magnesium and being capable of producing magnesium oxide upon calcination;

calcining the ore to obtain magnesium oxide;

leaching the magnesium oxide with ammonium chloride solution in a recovery stage to obtain ammonia, calcium chloride from calcium impurities in the calcined ore and a magnesium chloride solution;

combining the calcium chloride and magnesium chloride solution from the recovery stage in a first precipitation stage with carbon dioxide, magnesium oxide and added calcium chloride to precipitate calcium carbonate while forming a magnesium chloride solution;

precipitating magnesium carbonate trihydrate from the magnesium chloride solution in a second precipitation stage while forming ammonium chloride for delivery to the recovery stage; and

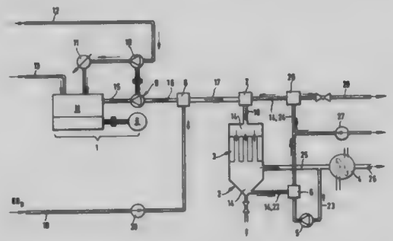
filtering, washing, drying and calcining the magnesium carbonate trihydrate to magnesium oxide.

4,720,376

PROCESS FOR THE REMOVAL OF NITROGEN OXIDES AND SOOT FROM EXHAUST GASES OF MACHINES AND COMBUSTION INSTALLATIONS BURNING HEAVY FUEL OIL

Karl H. Lang, Hattingen; Claus Flockenhaus; Erich Hackler, both of Essen; Blagoje Levkov, Wiesbaden; Daniel Grimm, Schlangenbad-Bärstadt; Hartmut Kainer, Wiesbaden; Hermann Stein, Bad Durkheim, and Hans-Eugen Bühler, Königstein, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen and Didier-Werke AG, Wiesbaden, both of, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,306
Claims priority, application Fed. Rep. of Germany, May 7, 1985, 3516359
Int. Cl.[4] B01J 37/00
U.S. Cl. 423—239 7 Claims



1. A process for the removal of nitrogen oxides from exhaust gases and soot from a free-passage catalyst of machines and combustion apparatus of the type burning heavy fuel oil by passing the exhaust gases through said free-passage catalyst at high temperatures with the addition of ammonia into the exhaust gas stream upstream of said free-passage catalyst, the improvement comprising the steps of:

selectively admixing an abrasive material into said exhaust gas prior to passing said exhaust gas into said free-passage catalyst, whereby said abrasive material, through frictional contact with the soot adhering to the free-passage catalyst, removes at least a portion of the soot therefrom,

selectively withdrawing at least a portion of said abrasive material after passage through said free-passage catalyst for recycle with said exhaust gas prior to the passage of said exhaust gas into said free-passage catalyst, and

introducing an ignition agent into the recycled exhaust gas to combust soot remaining therein.

4,720,377

METHOD FOR PRODUCING NITROUS OXIDE BY REACTING AMMONIA WITH A MOLTEN NITRATE SALT OF AN ALKALINE EARTH METAL

B. Timothy Pennington, Sulphur, La., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 884,470, Jul. 11, 1986, abandoned. This application Jun. 3, 1987, Ser. No. 57,846
Int. Cl.[4] C01B 21/22
U.S. Cl. 423—400 18 Claims

8. A continuous method for producing nitrous oxide by the steps of:

(a) reacting ammonia with at least one molten nitrate salt of an alkaline earth metal at reaction conditions to produce said nitrous oxide, thereby converting at least a portion of said molten nitrate salt to molten nitrite salt,

(b) reconverting said molten nitrite salt to molten nitrate salt by reacting said molten nitrite salt with an oxidizing agent, and

(c) repeating steps (a) and (b) in a continuous manner.

4,720,378

COATED COLORED INTAGLIATED ARTICLES

Sidney F. Forse, Macclesfield, and Raymond C. Rowe, Congleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 347,480, Jul. 21, 1986, abandoned. This application Jul. 22, 1986, Ser. No. 885,756
Claims priority, application United Kingdom, Mar. 9, 1981, 8107275; Sep. 9, 1981, 8127301
Int. Cl.[4] A61K 9/20
U.S. Cl. 424—6 7 Claims

1. A pharmaceutical tablet having at least one highlighted intagliation, said article comprising a coloured base having an intagliated part and a non-intagliated part, said base bearing over the whole of its surface at least one film coating which includes at least one film-coating agent and at least one optically anisotropic substance having a minimum refractive index of less than 1.57 and minimum and maximum refractive indices which differ by at least 0.04, the refractive index of the film-coating agent being essentially the same as the minimum refractive index of the optically anisotropic substance, and the amount of optically anisotropic substance in the film coating being such that the film appears transparent over the non-intagliated parts of the article and opaque over the intagliated parts, whereby the intagliations are highlighted in white or a colour which contrasts with the base colour of the article.

4,720,379

USE OF DIMERCAPTOPROPANESULFONIC ACID AND DIMERCAPTO-PROPANESUCCINIC ACID FOR THE PREPARATION OF PHARMACEUTICAL COMPOSITIONS AND A METHOD OF TREATMENT

Eduard Heyl, and Wolfgang Parr, both of Berlin, Fed. Rep. of Germany, assignors to Hey Chem. Pharm. Fabrik GmbH & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 395,008, Jun. 30, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,227
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111770
Int. Cl.[4] A61K 45/00, 31/19, 31/095
U.S. Cl. 424—10 4 Claims

1. A method of treating poisoning effected by alkylating agents of the lost type in warm-blooded animals comprising administering to said warm-blooded animals an amount of at least one compound selected from the group consisting of 2,3-dimercaptopropane-1-sulfonic acid, 2,3-dimercapto-succinic acid and their non-toxic, pharmaceutically acceptable salts sufficient to treat poisoning by alkylating agents.

4,720,380

HYDROGEN-PHOSPHIDE RELEASING COMPOSITIONS AND PROCESSES FOR THEIR PRODUCTION AND USE

Wolfgang Friemel, Heppenheim, and Reiner Ehret, Weinheim, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg Chemische Fabrik Delitia Naschf., Laudenbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 436,769, Oct. 26, 1982, Pat. No. 4,503,032, which is a continuation of Ser. No. 215,586, Dec. 11, 1980, abandoned. This application Mar. 4, 1985, Ser. No. 720,900
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950999
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.[4] A01N 59/16, 59/26, 25/18
U.S. Cl. 424—40 19 Claims

1. A method of reducing the risk of auto-ignition of particulate aluminum phosphide by contact with liquid water while generating phosphine therefrom by hydrolysis thereof with H_2O, which comprises conducting the hydrolysis while the aluminum phosphide is in contact with (a) a source of ammonia or ammonium ions which is decomposable to yield NH_3 under conditions under which the aluminum phosphide is hydrolyzed or which is capable of dissociating in the presence of H_2O to yield ammonium ions, in an amount effective to inhibit auto-ignition of the aluminum phosphide in the presence of humidity; and (b) zinc or a zinc compound which is compatible with the aluminum phosphide, in an amount effective to reduce the temperature rise associated with the hydrolysis of the aluminum phosphide with liquid water while in contact with the source of ammonia or ammonium ions, thereby further reducing the likelihood of auto-ignition of the aluminum phosphide upon contact with liquid water.

4,720,381

ACID STABLE MONOSORBITOL ACETAL GELS

Thomas J. Schamper, Ramsey, N.J.; Martin M. Peri, Brooklyn, and James D. Warren, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 657,463, Oct. 3, 1984, abandoned, which is a continuation of Ser. No. 373,589, Apr. 30, 1982, abandoned. This application Mar. 7, 1986, Ser. No. 837,856
Int. Cl.[4] A61K 7/34, 7/38
U.S. Cl. 424—66 7 Claims

1. A solid, transparent, gelled antiperspirant composition consisting essentially of:

(a) about 1 to 10 percent by weight of dibenzyl monosorbitol acetal as a gelling agent;

(b) 37 to 94 percent by weight of a solvent non-reactive with said dibenzyl monosorbitol acetal which is selected from the group consisting of C_3 to C_6 aliphatic secondary alcohol, C_4 to C_6 aliphatic dihydric alcohol and mixtures thereof;

(c) 0 to 25 percent by weight of an emollient;

(d) about 5 to 25 percent by weight of an antiperspirant-active metal salt; and

(e) about 0 to 3 percent by weight of a C_{12} to C_{20} fatty acid.

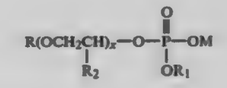
4,720,382

INHIBITING THE CORROSION OF HAIR CONDITIONING COMPOSITIONS

Constance E. Erdman, and W. Stephen Tait, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 804,409, Dec. 4, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 909,612
Int. Cl.[4] A61K 7/06
U.S. Cl. 424—70 16 Claims

1. A method of inhibiting the corrosion to metal of a corrosive chloride or methosulfate ion-containing hair conditioning composition without adversely affecting the hair conditioning properties thereof which comprises adding to the chloride or methosulfate ion-containing hair conditioning composition an effective metal corrosion inhibiting amount of a compound of the formula



wherein

R represents C_1–C_{20} alkyl;

R_1 represents C_1–C_{20} alkyl;

R_2 represents —H or —CH_3;

M represents hydrogen, an alkali metal ion or an equivalent of an alkaline earth metal ion or zinc ion; and

X represents 1–15.

4,720,383

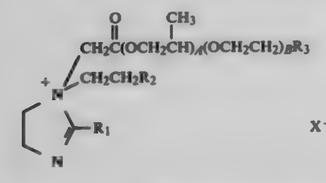
SOFTENING AND CONDITIONING FIBERS WITH IMIDAZOLINIUM COMPOUNDS

John E. Drach, Cheltenham; Robert D. Evans, Warminster, both of Pa.; Joseph J. Fanelli, Alpharetta, and Anthony J. O'Lenick, Jr., Lilburn, both of Ga., assignors to Quaker Chemical Corporation, Pa.

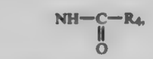
Filed May 16, 1986, Ser. No. 864,085
Int. Cl.[4] A61K *7/075*; C07D *233/18*
U.S. Cl. 424—70 8 Claims

1. A compound of the formula:

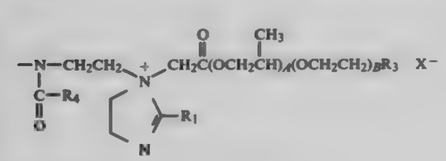
Formula I



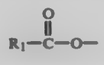
wherein R_1 is an n-alkyl, branched alkyl, alkenyl, branched alkenyl alkadienyl or branched alkadienyl group containing 8 to 21 carbon atoms; R_2 is a radical selected from the group consisting of (a) —OH, (b) amide radicals each of which has the structure



(c) a substituted imidazolinium group which has the structure:



R_3 is a radical which has the structure



or OR_5; R_4 is an alkyl or alkenyl group containing 1 to 15 carbons atoms; R_5 is R_1 or monononyl phenyl or dinonylphenyl; A is an integer of from 0 to 20 and B is an integer of from 0 to 20 and A+B>0; x is either chlorine or bromine.

3. A method for softening and conditioning fibers, hair or skin comprising applying to said fibers, hair or skin an effective amount of an aqueous composition comprising a compound of claim 1, or mixtures of said compounds.

4,720,384

MANUFACTURE OF HOLLOW FINE TUBULAR DRUG DELIVERY SYSTEMS

Robert C. Di Luccio, Wilmington, Del.; Ray B. Duggins, Chadds Ford, and Eli Shefter, Media, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 730,064, May 3, 1985, Pat. No. 4,673,565. This application Aug. 21, 1986, Ser. No. 898,653
Int. Cl.[4] A61K *31/74*; B29C *47/04, 63/18*
U.S. Cl. 424—78 21 Claims

1. A process for preparing a hollow tube drug delivery system comprising:

a. extruding a polymer solution or suspension through an annular orifice to provide a tubular membrane having a hollow core;

b. simultaneously extruding a drug suspended in a polymer solution into the hollow core of the tubular membrane to provide a drug encapsulated tubular membrane system;

c. passing the system into a non-solvent for the polymers having a density different from that of the system, to coagulate the polymers under conditions to minimize orientation in the tube polymer and to create pores in the tube polymer wall;

d. removing residual solvent from the system; and

e. collecting a drug encapsulated, porous polymeric hollow tube.

4,720,385

PROTEIN COMPOSITIONS SUBSTANTIALLY FREE FROM INFECTIOUS AGENTS

Kenneth J. Lembach, Danville, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 480,056, Mar. 29, 1983, Pat. No. 4,534,972. This application May 20, 1985, Ser. No. 736,197
Int. Cl.[4] A61K *39/12, 39/02, 39/40, 39/42, 37/00, 39/00*
U.S. Cl. 424—86 24 Claims

1. A method for rendering a composition, which contains a therapeutically or immunologically active protein, selected from the group consisting of blood plasma proteins, virus vaccines, bacterial vaccines, and non-infectious antigens dissolved in an aqueous medium, substantially free from infectious agents selected from viable viruses and bacteria without substantial loss of therapeutic or immunologic activity, which comprises

(a) mixing an aqueous solution of the protein composition with an effective amount of a complex formed from mixing an angularly-fused, polynuclear heterocyclic arene having two nitrogen atoms in a "cis-ortho" relationship and a transition metal ion capable of complexing with said arene and a reducing agent, selected from ascorbic acid, ascorbate group present as an ester or as the anion component of an alkali metal or alkaline earth metal salt of ascorbic acid, a mixture of ascorbic acid or ascorbate with a thiol, NADPH, NADH, and a mixture of NADPH or NADH with at least one of a thiol, ascorbic acid and ascorbate in an effective amount, said amounts being effective to inactivate substantially all of the infectious agents contained in said composition and which does not result in substantial loss of thereapeutic or immunologic activity, and

(b) holding the mixture for a time and at a temperature sufficient to render said infectious agents substantially non-infective in the protein composition without substantial loss of therapeutic or immunologic activity therein.

4,720,386

VACCINE AND METHOD FOR IMMUNOTHERAPY OF NEOPLASTIC DISEASE

Duncan L. McCollester, Beech La., Tarrytown, N.Y. 10591

Continuation of Ser. No. 127,041, Mar. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 744,601, Nov. 24, 1976, abandoned. This application Sep. 30, 1981, Ser. No. 307,191
Int. Cl.[4] A61K *39/00, 31/74*
U.S. Cl. 424—88 12 Claims

1. A vaccine for the immunotherapy of neoplastic disease, said vaccine being produced by:

(a) obtaining an amount of cancerous tissue from the patient to be treated and suspending said tissue in an aqueous solution of between about 100 and 150 millimolar sodium chloride and between about 5 and 15 millimolar sodium EDTA,

(b) disaggregating the tissue into its component cells;

(c) suspending the cells in water;

(d) subjecting the suspended cells to hydrodynamic turbulence sufficient to disrupt the cells and detach therefrom the cell components possessing cancer-specific antigens; and

(e) contacting and admixing the cell components obtained in step (d) with a source of manganous ion to form the vaccine.

4,720,387

SUSTAINED-RELEASE PREPARATION OF PINACIDIL

Teruo Sakamoto; Sadao Kawai, both of Osaka; Kiszaburo Noda, Hyogo; Toyohiko Takeda, Hyogo, and Toshihiro Ogura, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jun. 5, 1984, Ser. No. 617,567
Claims priority, application Japan, Jun. 22, 1983, 58-113027
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—472 13 Claims

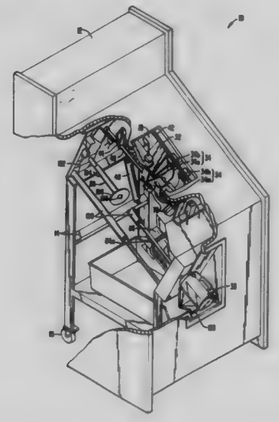
1. A sustained-release preparation of pinacidil which consists essentially of two different components: one is a rapid-release component dissolving rapidly in the stomach and the other is an enteric coated slow-release component containing hydrophilic additives at 40 to 90 wt% and hydrophobic additives at 30 to 2 wt% based on the slow-release component, wherein the ratio of pinacidil in the respective components is in a range of 4:6 to 1:9 by weight.

4,720,388

METHOD FOR PEELING FRESH FRUITS

Frank D. Pierce, Pacific Grove; Bradford E. Knickerbocker, Piedmont, and Don H. Lenker, Salinas, all of Calif., assignors to Castle & Cooke, Inc., San Francisco, Calif.

Filed Jan. 22, 1986, Ser. No. 821,267
Int. Cl.[4] G01N *7/22*; A23P *1/00*; B26D *5/00*
U.S. Cl. 426—231 3 Claims



1. A method for peeling a fresh fruit having a generally soft interior portion surrounded by a generally hard external surface by means of a peeling apparatus, said peeling apparatus including (a) knife means for removing the hard external surface from said fruit, leaving substantially the soft interior portion, (b) a housing enclosing said knife means, said housing having two openings, one for receiving the fruit, and one for discharging said soft interior portion after said fruit has been peeled, (c) a door connected to the housing in such manner that when the door is in an open position, the opening for receiving the fruit is substantially unobstructed and when the door is in a closed position, it closes the opening for receiving the fruit, (d) a receptacle for receiving said soft interior portion of the fruit discharged from the discharging opening of the housing after peeling, (e) means in said housing for causing relative movement between said fruit and said knife means, said relative movement being such that the external surface is removed from the fruit by said knife means, and (f) sensing and activating means for sensing whether said door is substantially in the closed position, for sensing whether said receptacle is in said receiving position, and for automatically activating said movement causing means to remove the external surface after sensing both that the door is substantially in the closed position and that the receptacle is in the receiving position, said method comprising:

depositing the fruit through the receiving opening of the housing;

closing the door and placing the receptacle in the receiving position, thereby causing the sensing and activating means to activate the relative movement causing means to cause relative movement between the fruit and said knife means to remove the external surface from the fruit; and discharging the interior portion of the fruit into the receptacle.

4,720,389

FOAM-STABILIZED MALT BEVERAGE

Kenneth Clare, Vista, and Margaret A. Lawson, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 22, 1986, Ser. No. 855,044
Int. Cl.[4] C12C *5/02*
U.S. Cl. 426—329 15 Claims

1. A process for improving the foam properties of a fermented malt beverage comprising adding to said beverage xanthan gum in combination with konjak gum or a galactomannan in a combined amount of about 5–400 ppm by weight of said beverage.

4,720,390

PREPARATION OF GELLED FOOD PRODUCTS

Robert Bächler, Corsier-sur-Vevey, Switzerland; Pierre-Yves Fosseux, Saint-Lo, France, and Rolf Jost, La Tour-de-Peilz, Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 5, 1986, Ser. No. 836,312
Claims priority, application Switzerland, Mar. 19, 1985, 1209/85
Int. Cl.[4] A23C *21/04, 21/06*
U.S. Cl. 426—573 24 Claims

1. A process for preparing gelled food products comprising:

(a) combining and homogenizing an aqueous medium containing gellable whey proteins with a lipidic medium such that an emulsion is formed which contains 4% to 12% by weight/volume of the gellable whey proteins and from 2.5% to 40% by volume of the lipidic medium and which contains a homogeneous series of lipidic globules having diameters of from 140 to 6000 nanometers and a mean diameter of less than 1000 nanometers;

(b) heat-treating the emulsion at a pH of from 3.5 to 8 at from 80° C. to 250° C. for from 5 to 90 minutes.

4,720,391

CRUSTACEAN FORMING PROCESS

Frank S. Kawana, Pasadena, Calif., assignor to JAC Creative Foods, Inc., Los Angeles, Calif.

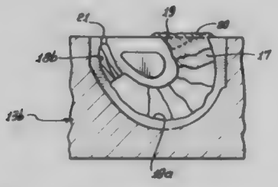
Filed Jan. 14, 1986, Ser. No. 818,774
Int. Cl.[4] A22C *25/00, 29/02*
U.S. Cl. 426—250 5 Claims

1. In the process of forming a fish product having shrimp shape the steps that include:

(a) comminuting fish meat to form fish paste, and also providing pieces of shredded gelled fish paste, and combining said paste and pieces to form a mix,

(b) providing a heated mold having sections which are closable to form a cavity which is vented to the exterior via a vent, and which are openable to provide access to said cavity,

(c) injecting said mix into said cavity, to fill same, said injecting effecting production of a mix bulge overlapping the exterior side of the vent,
(d) further heating said mold to at least partially cook the mix in the cavity, to expand a portion of the mix at said vent and to the exterior of the vent outside the mold, thereby to form an uneven surface terminus of said portion, in alignment with said vent, and to set the mix,



whereby a formed product is produced, said expansion from the vent displacing the bulge away from the vent to simulate the uneven neck terminus of a shrimp after pull-off removal of the shrimp head,
(e) and opening said mold and recovering the formed product,
(f) and including brushing mold exterior surfaces adjacent the vent prior to said injecting step to free said exterior surfaces of cooked fish paste.

4,720,392

PROCESS FOR CONTROLLING MONOMERIC EMISSIONS

Mark Livesay, 1866 Friendship Dr., Suite F, El Cajon, Calif. 92020

Filed Dec. 4, 1985, Ser. No. 804,662
Int. Cl.[4] B05D 3/06; B04D 5/00
U.S. Cl. 427—54.1 12 Claims

1. A process for forming a coating on an uncured article which emits an olefinic monomeric vapor on curing and controlling the emission of said vapor into the atmosphere from said uncured article prior to curing which comprises the steps of treating said uncured article with a top coating composition comprising at least one polymerizable olefinic compound and a polymerization catalyst, at least partially curing said top coating prior to initiating curing of said uncured article so as to form a barrier film on said uncured article, copolymerizing said olefinic monomeric vapor from said uncured article with said olefinic compound of said top coating composition and curing said uncured article whereby olefinic monomeric vapor is prevented from entering the atmosphere by said top coating.

4,720,393

METHOD OF MANUFACTURING A LAYER WITH ELECTRICAL CONDUCTIVITY

Robert Bjorklund, Linköping, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Oct. 8, 1986, Ser. No. 917,065
Claims priority, application Sweden, Oct. 10, 1985, 8504692
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—58 13 Claims

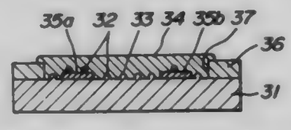
1. A method of manufacturing a layer with electrical conductivity comprising the steps of
(1) providing a liquid product by mixing (a) water, (b) a water-soluble polymer, (c) a pyrrole compound selected from the group consisting of pyrrole and N-methylpyrrole and mixtures thereof, and (d) a substance which is capable of taking up electrons from the pyrrole compound during polymerization of the pyrrole compound,
(2) allowing the pyrrole compound in the liquid product from step (1) to polymerize, thereby providing an aqueous solution containing water-soluble polymer with polymerized pyrrole compound anchored thereto,
(3) applying the aqueous solution from step (2) onto a base to form a layer on the base, and
(4) allowing the water in the layer formed in step (3) to evaporate.

4,720,394

GAS SENSOR WITH CERAMICS SUBSTRATE AND METHOD FOR PRODUCING THE SAME

Takao Kojima, Nagoya; Akira Nakano, Inuyama; Toshitaka Matsuura, Komaki, and Akio Takami, Konan, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Division of Ser. No. 664,872, Oct. 25, 1984. This application Jan. 30, 1986, Ser. No. 880,613
Claims priority, application Japan, Oct. 28, 1983, 58-203222; Mar. 28, 1984, 59-60040; Sep. 4, 1984, 59-183818
Int. Cl.[4] G01N 27/12
U.S. Cl. 437—234 3 Claims



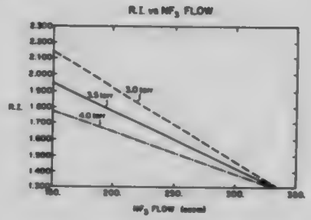
1. A method for producing a gas sensor comprising the steps of: preparing a green sheet formed of electrically insulating ceramics particles and organic binder, printing a thick film electrode pattern of a predetermined shape on a surface of said green sheet, loosely depositing in dry form particles of granulated ceramics on said surface of the green sheet in the vicinity of said electrode pattern, said granulated ceramics particles having a mean diameter of at least 5 μm and a maximum diameter of not larger than 500 μm, sintering the green sheet with the electrode pattern printed thereon and the granulated ceramics particles loosely deposited thereon, printing a gas-sensitive thick film of paste on said surface of the sintered green sheet so as to be firmly bonded thereto through said ceramics particles, said paste mainly consisting of gas-sensitive metal oxide, and firing the thus printed gas-sensitive thick film.

4,720,395

LOW TEMPERATURE SILICON NITRIDE CVD PROCESS

Derrick W. Foster, Fremont, Calif., assignor to Anicon, Inc., San Jose, Calif.

Filed Aug. 25, 1986, Ser. No. 899,923
Int. Cl.[4] B05D 5/12; C23C 16/34
U.S. Cl. 437—241 19 Claims



1. A thermal CVD process for forming silicon nitride-type films comprising the steps of:
(a) introducing NF_3 and Si_2H_6 as reactant gases into a CVD reaction zone containing a substrate on which a silicon nitride-type film is to be formed;

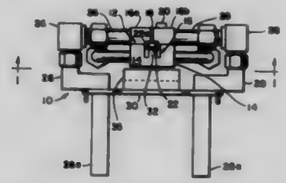
(b) maintaining the temperature of said zone and said substrate within the range of from 250° C. to about 400° C.;
(c) maintaining the pressure in said zone in the range of about 0.1 to about 10 Torr; and
(d) passing said gases into contact with said substrate for a period of time sufficient to form a silicon nitride-type film thereon having a refractive index in the range of from about 1.4 to about 3.0;
wherein the gases react to form the films without plasma activation or irradiation.

4,720,396

SOLDER FINISHING INTEGRATED CIRCUIT PACKAGE LEADS

Richard C. Wood, Portland, Me., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Jan. 25, 1986, Ser. No. 878,307
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—96 25 Claims



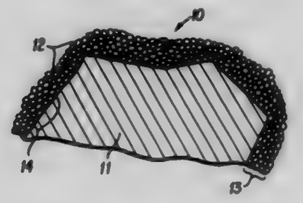
1. A method for solder finishing the leads of an integrated circuit package having two parallel rows of leads along the sides of the package comprising:
establishing two vertical columns of falling molten solder and spacing the columns apart a distance substantially the width of the package:
passing the package between the vertical columns of falling molten solder and immersing the two parallel rows of leads along the sides of the package in the respective columns of molten solder, washing the leads with molten solder and depositing a finishing layer of solder over the surfaces of the leads;
directing hot gas over the leads of the package as the package passes from the columns thereby eliminating accumulation of excess solder and bridging of solder between the leads.

4,720,397

RAPID DISSOLVING POLYMER COMPOSITIONS AND USES THEREFOR

Dion P. O'Mara, Vienna, Va.; Albert F. Hadermann, Ijamsville, Md., and Jerry C. Trippe, Fairfax Station, Va., assignors to General Technology Applications, Inc., Manassas, Va.

Filed Dec. 12, 1985, Ser. No. 807,547
Int. Cl.[4] B05D 5/00
U.S. Cl. 427—180 18 Claims



1. A process for preparing a rapid dissolving polymer composition, said polymer characterized by reactivity of newly cleaved polymer surfaces which, if allowed to react with oxygen or water vapor would hinder dissolution of the polymer in a solvent, said process comprising:
comminuting a soluble polymer at a temperature below its glass transition temperature to form clean-surfaced particles thereof while maintaining the polymer in an inert and non-reactive atmosphere, said atmosphere consisting essentially of nitrogen, argon and mixtures thereof;
commingling a solid particulate coating agent with said polymer particles while maintaining the polymer particles at a temperature below the glass transition temperature of said polymer and in said inert and non-reactive atmosphere, said coating agent being non-reactive toward said polymer and having a median particle diameter less than one-tenth the median diameter of said polymer particles;
admixing said polymer particles and said coating agent particles while raising the temperature of said mixture to and above the glass transition temperature of said polymer and while maintaining said mixture in said inert gaseous atmosphere whereby there is obtained a particulate composition having a polymer particle core surrounded by a multi-layered shell of particulate coating agent; the interstices around said core and within said shell filled with said inert gas.

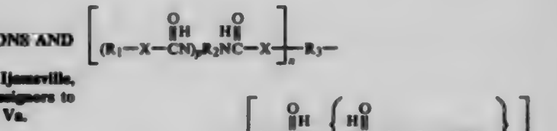
4,720,398

PROCESS FOR THE IMPROVEMENT OF THE ADHESION TO RUBBER OR A THERMOPLASTIC ELASTOMER OF SYNTHETIC YARNS, CORDS OR FABRICS MADE THEREFROM

Hendricus A. A. van Aalten, Westervoort; Freerk R. van Calker, Lathum, and Willem E. Wenning, Zevenaar, all of Netherlands, assignors to Akzo nv, Arnhem, Netherlands

Filed Mar. 14, 1985, Ser. No. 711,803
Claims priority, application Netherlands, Mar. 19, 1984, 8400870
Int. Cl.[4] B05D 5/10, 3/02
U.S. Cl. 427—208.2 15 Claims

1. A process for the improvement of the adhesion to rubber or a thermoplastic elastomer of synthetic yarns, cords or fabrics by applying to said synthetic yarns, cords or fabrics an adhesive consisting of an aqueous solution or dispersion of a polyurethane with ionic groups, capped isocyanate groups and groups with a Zerewitinoff-active H atom, followed by drying the product thus treated, characterized in that the polyurethane corresponds to the following structure:



wherein X has the meaning of an O or S atom or of an O-, S-, N- or P-containing group with a Zerewitinoff-active H atom or to which prior to reaction with an isocyanate group a Zerewitinoff-active H atom had been attached,
R_1 represents the remainder of a capping agent,
R_2 represents an at least divalent organic group which remains after removal of isocyanate groups from a polyisocyanate,
R_3 represents an at least divalent organic group which remains after removal of —XH groups from an organic compound having a molecular weight of 62 to 2000,
R_4 represents an ionic group or a potentially ionic group which remains after removal of —XH group(s),
m is a number ≧1 and ≦4,
n is a number ≧1 and ≦4,
p is a number ≧1 and ≦3,

q is a number ≧1 and ≦3, and
r is a number ≧0 and ≦3.

4,720,399

PROCESS FOR MANUFACTURE OF PARTICULATE BUILT NONIONIC SYNTHETIC ORGANIC DETERGENT COMPOSITION COMPRISING POLYACETAL CARBOXYLATE AND CARBONATE AND BICARBONATE BUILDERS

Riad A. Taha, Spotswood, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,461
Int. Cl.⁴ B05D 7/00; C11D 17/00
U.S. Cl. 427—221 **10 Claims**

1. A process for manufacturing a substantially phosphate-free particulate built nonionic synthetic organic detergent composition, which composition comprises a detersive proportion, 5 to 35%, by weight, of a nonionic synthetic organic detergent which is a condensation product of ethylene oxide and a higher fatty alcohol, and a building proportion, 30 to 95%, by weight, in combination, of polyacetal carboxylate, sodium carbonate and sodium bicarbonate builders for the nonionic detergent, wherein the polyacetal carboxylate builder is of a calculated weight average molecular weight in the range of 3,500 to 10,000, the ratio of the weight of polyacetal carboxylate to the combined weights of the sodium carbonate and sodium bicarbonate builders is within the range of 1:5 to 2:1, and the weight ratio of sodium carbonate to sodium bicarbonate is within the range of 1:3 to 3:1, with the balance of the composition, if any, being filler(s) and/or other builder(s) and/or adjuvant(s) and/or moisture, which process comprises the steps of spray drying an aqueous crutcher mix of sodium carbonate and sodium bicarbonate, mixing the resulting spray dried beads with the nonionic detergent in liquid form at elevated temperature, whereby the detergent is absorbed into the spray dried carbonate-bicarbonate beads, and mixing such beads containing the nonionic detergent with the polyacetal carboxylate builder, whereby said builder is held to such beads and a free flowing particulate detergent composition results.

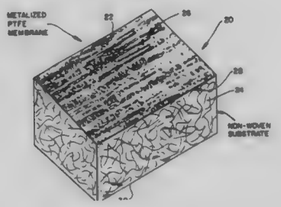
5. A process for manufacturing a substantially phosphate-free particulate built nonionic synthetic organic detergent composition, which composition comprises a detersive proportion, 5 to 35%, by weight, of a nonionic synthetic organic detergent which is a condensation product of ethylene oxide and a higher fatty alcohol, and a building proportion, 30 to 95%, by weight, in combination, of polyacetal carboxylate, sodium carbonate and sodium bicarbonate builders for the nonionic detergent, wherein the polyacetal carboxylate builder is of a calculated weight average molecular weight in the range of 3,500 to 10,000, the ratio of the weight of polyacetal carboxylate to the combined weights of the sodium carbonate and sodium bicarbonate builders is within the range of 1:5 to 2:1, and the weight ratio of sodium carbonate to sodium bicarbonate is within the range of 1:3 to 3:1, with the balance of the composition, if any, being filler(s) and/or other builder(s) and/or adjuvant(s) and/or moisture, which process comprises the steps of dissolving and/or dispersing the polyacetal carboxylate builder in nonionic detergent in liquid form at elevated temperature, spray drying an aqueous crutcher mix of the sodium carbonate and sodium bicarbonate, and applying to the resulting spray dried beads the polyacetal carboxylate builder-nonionic detergent solution or dispersion, with mixing, whereby such solution or dispersion is sorbed by the carbonate-bicarbonate beads, producing a free flowing particulate detergent composition.

4,720,400

MICROPOROUS METAL-PLATED POLYTETRAFLUOROETHYLENE ARTICLES AND METHOD OF MANUFACTURE

James L. Mannino, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 476,839, Mar. 18, 1983, Pat. No. 4,557,957.
This application Aug. 28, 1985, Ser. No. 769,774
Int. Cl.⁴ C23C 18/30
U.S. Cl. 427—243 **12 Claims**



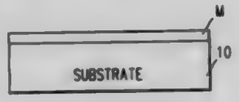
1. A process for coating a microporous polytetrafluoroethylene substrate with a conductive metal, the substrate having a microstructure of nodes interconnected with fibrils, and the conductive metal coating being continuous and substantially encapsulating at least some of the nodes and fibrils, the coated substrate being conductive along at least one surface and through at least a portion of the substrate volume beneath the one surface, the coated substrate retaining at least some of its porosity, the metal-coated substrate volume portion being hydrophilic and the non metal-coated substrate volume being hydrophobic, the process comprising the steps of:
(1) cleaning the substrate;
(2) saturating the substrate with an aqueous surfactant solution;
(3) activating the surfaces of said substrate to be plated using a palladium/tin activator solution wherein the activating step includes as a final activating substep displacing the tin portion of said activator solution with an accelerator solution;
(4) displacinng at least a portion of the accelerator using an aqueous medium; and
(5) plating the substrate using an electroless plating solution.

4,720,401

ENHANCED ADHESION BETWEEN METALS AND POLYMERS

Paul S. C. Ho, Chappaqua, N.Y.; Peter O. Hahn, Burghausen, Fed. Rep. of Germany; Harry Lefakis, Shrub Oak, and Gary W. Rubloff, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 690,567, Jan. 11, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,564
Int. Cl.⁴ C23C 16/06
U.S. Cl. 427—250 **17 Claims**



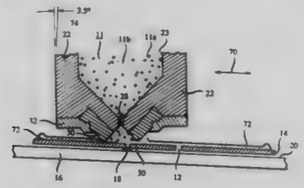
1. A method for producing a metal-organic substrate composite with increased adhesion between the metal and the organic substrate, where the metal has only weak intrinsic bonding to the organic substrate, including the steps of:
heating the organic substrate to a temperature approximately 0.6–0.8 of its curing temperature T_c, and depositing said metal onto said organic substrate while said substrate is heated to a substrate temperature within the range of about (0.6–0.8) T_c until at least a few atomic layers of continuous metal are formed on said substrate, said deposition occurring at a rate such that the diffusion of depositing metal atoms into said organic substrate is equal to or greater than the arrival rate of said metal atoms at the surface of said organic substrate, said metal being one which has only weak chemical bonding to the atomic constituents of said organic substrate.

4,720,402

METHOD FOR DISPENSING VISCOUS MATERIAL

Thaddeus Wojcik, Hopewell, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jan. 30, 1987, Ser. No. 4,200
Int. Cl.⁴ B05D 5/12
U.S. Cl. 427—282 **6 Claims**



1. A method for fabricating an article comprising the steps of:
expelling a viscous material from a dispenser into a void between a pair of flexible members extending from said dispenser for contact with a foraminous member overlying a substrate;
imparting a relative motion between said dispenser and said foraminous member so that said viscous material expelled from said dispenser is urged by at least one of said pair of flexible members through openings in said foraminous member and onto said substrate; and
completing the fabrication of said article, Characterized in That said step of imparting a relative motion includes the step of:
raising a leading one of said pair of flexible members a predetermined distance from said foraminous member while simultaneously keeping the viscous material expelled from said dispenser substantially confined between said flexible members.

4,720,403

ANTICORROSIVE COATING COMPOSITIONS

Kenneth E. Jaeseof, Des Plaines; Ronald J. Lewarchik, Arlington Hts., and John Smyrniotis, Chicago, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 7, 1986, Ser. No. 894,293
Int. Cl.⁴ C08K 3/10
U.S. Cl. 427—327 **25 Claims**

1. A pigmented, corrosion and abrasion resistant, thermosetting organic solvent solution coating composition comprising: (a) from about 50 percent to about 85 percent of total resin solids of a resinous polyepoxide; (b) from about 10 percent to about 20 percent of total resin solids of an aminoplast, phenoplast or blocked isocyanate crosslinking agent for said polyepoxide; (c) from about 5 percent to about 30 percent of total resin solids of an epoxy-phosphate, said epoxy-phosphate being provided by reacting a resinous polyepoxide with at least 0.05 mole of orthophosphoric acid per equivalent of oxirane in said polyepoxide; and (d) a chromium-containing pigment providing resistance to corrosion.

4,720,404

AQUEOUS ALKALINE BATH FOR THE CHEMICAL DEPOSITION OF COPPER, NICKEL, COBALT AND THEIR ALLOYS

Josif Caljkovic, Gessler Str. 3, 1000 Berlin 33, Fed. Rep. of Germany

Continuation of Ser. No. 693,803, Jan. 23, 1985, abandoned. This application Aug. 7, 1986, Ser. No. 896,741
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3404270
Int. Cl.⁴ C23C 18/40
U.S. Cl. 427—98 **11 Claims**

1. In an aqueous alkaline bath for adhesive chemical deposition of copper containing a copper compound, reducing agent, wetting agent, pH-regulating substance, stabilizer, inhibitor and complex former, the improvement for deposition of copper with greater purity onto printed circuits, wherein said complex former comprises
(a) sorbitol or glycerin, in mixture with
(b) biuret, in a molar ratio of metal to complex former from 1:0.8 up to 1:6.

10. Method for adhesive chemical deposition of copper onto printed circuits, comprising placing a printed circuit into the bath according to claim 1, said bath is utilized at a temperature from 5° C. to the boiling point thereof.

4,720,405

METHOD OF PROVIDING A SUBSTRATE WITH A FLEXIBLE MULTILAYER COATING

Dennis W. Carson, Lower Burrell; Robert J. Schmitt; Carl A. Seneker, both of Pittsburgh, all of Pa.; Thomas A. Van Kuren, and David R. Wallace, both of Dublin, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 808,762, Dec. 13, 1985, Pat. No. 4,680,346. This application Dec. 24, 1986, Ser. No. 946,254
Int. Cl.⁴ B05D 3/02; B32B 27/38
U.S. Cl. 427—410 **27 Claims**

1. A method of providing a substrate with a multilayer coating comprising:
a. applying a flexible primer coating composition to a substrate, said primer coating composition comprising an organic polyol, a polyepoxide, a blocked polyisocyanate curing agent, and a phenolic resin and having an elongation of at least 10 percent when cured;
b. applying a pigmented coating composition to the coated substrate of step (a), said pigmented coating composition comprising a fluorocarbon polymer;
c. applying a clear coating composition to the coated substrate of step (b), said clear coating composition comprising a fluorocarbon polymer; and
d. at least partially curing the coated substrate of step (c);
said multilayer coating having an elongation of at least 10 percent cured.

4,720,406

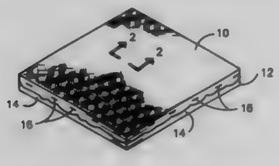
ARTIST'S CANVAS AND PRODUCTION PROCESS THEREFOR

Harry E. Dixon, 9034 Cascade St., Beulah, Colo. 81023

Filed Apr. 7, 1987, Ser. No. 35,588
Int. Cl.⁴ A47G 1/12
U.S. Cl. 428—14 **33 Claims**

1. An artist's canvas forming a surface adapted to be painted,

comprising a sheet of flexible, substrate material and a surface coating of refined animal glue adhered to said sheet of sub-



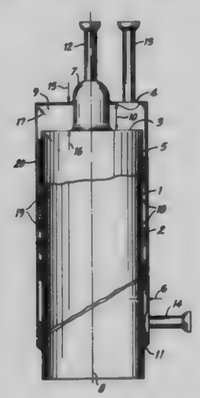
strate material and operative to form a translucent glaze thereon to define the surface to be painted.

4,720,407

DOUBLE-WALLED QUARTZ-GLASS TUBE FOR SEMICONDUCTOR-TECHNOLOGY PROCESSES

Karl-Albert Schülke, Grosskrotzenburg, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 18, 1986, Ser. No. 932,070
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544812
Int. Cl.[4] F16L *9/14;* B01D *9/00*
U.S. Cl. 428—36 10 Claims



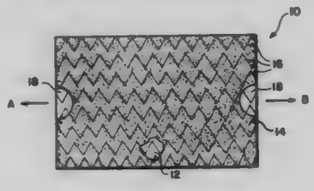
1. In a double-walled quartz-glass tube for semiconductor-technology processes, having an inner tube surrounded by a coaxially positioned outer tube with an annular space between the inner and outer tubes and with the ends of the inner and outer tubes that face in the same direction each having a closure, a processing-gas supply connection mounted on the inner-tube closure and extending through the outer-tube closure and wherein the outer tube is connected at the other end against the outside of the inner tube and has connections for supplying and removing a scrubbing gas, the impovement wherein the inner tube has a diameter of at least 150 mm, wherein at least one of the closures is essentially flat, wherein the axis of the processing-gas supply connection is in alignment with the axis of the inner tube and at least the section of the processing-gas supply connection that extends between the two closures has an inside diameter that is 20 to 70% as long as the inside diameter of the inner tube, and wherein the outer tube is fused gas-tightly to both the processing-gas supply connection and the outside of the inner tube.

4,720,408

DESTRUCTIBLE CARBON PAPER

Peter Sing, 43 Donnybrook Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 906,897, Sep. 15, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 31,376
Int. Cl.[4] B65D *65/28;* B41L *1/16*
U.S. Cl. 428—43 9 Claims



1. Destructible carbon paper duplicating sheet to be used for making authorized copies and thereafter to be rendered uncopyable by being pulled apart manually without soiling the hands of the puller, which comprise:

a tissue paper base sheet;

a plurality of filament strands embedded in and distributed throughout said paper base sheet, said filament strands being arranged in a repetitive pattern of alternating angular relationship to the edges of said paper sheet;

duplicating ink transfer layer substantially coating one surface of said paper sheet; and

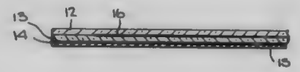
oppositely disposed means for gripping the destructible carbon paper sheet with the thumb and fingers of both hands, said gripping means being devoid of said ink transfer layer so that hands are unsoiled when the carbon paper sheet is pulled apart to be rendered unusable.

4,720,409

FILM-LAMINATE TYPE AIR FRESHENER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 932,610, Nov. 20, 1986, Pat. No. 4,696,844. This application Feb. 18, 1987, Ser. No. 16,109
Int. Cl.[4] B32B *3/14;* B44C *1/28*
U.S. Cl. 428—46 7 Claims



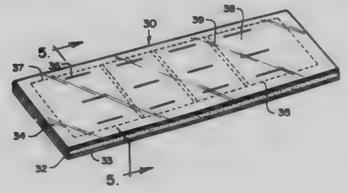
1. An air freshener adherable to a wall tile or other substrate comprising a transparent laminate constituted by a transparent plastic face film inpregnated with a volatile fragrance that is slowly released therefrom, the fragrance being in a concentration resulting in a relatively prolonged emission and a transparent backing film laminated to said face film in a manner which does not impair the transparency of the laminate, the front surface of the backing film having an artwork imprinted thereon which is effectively sandwiched between the face film and the backing film and thereby protectively sealed, and a low-tack, pressure-sensitive, clear adhesive layer on the rear surface of the backing film whereby the laminate may be adhered onto a smooth substrate and later pulled therefrom when the fragrance is exhausted, the surface of the substrate being visible through the laminate.

4,720,410

HEAT-ACTIVATED BLOTTER

Burton R. Lundquist, Scottsdale, and Randal J. Monforton, Phoenix, both of Ariz., assignors to Conagra, Inc., Omaha, Nebr.

Filed Dec. 5, 1986, Ser. No. 938,583
Int. Cl.[4] B32B *3/10, 27/12;* B65D *81/34*
U.S. Cl. 428—136 13 Claims



1. A blotter for use below a meat product during storage and during cooking which blotter is adapted to absorb liquids released from the meat product during cooking, and adapted to substantially avoid absorbing liquids from the meat product during storage, which blotter comprises:

absorbent means comprised of a material which will absorb liquids released from the meat product;

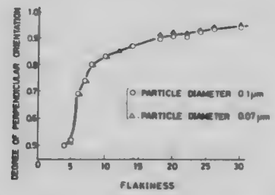
a heat shrinkable film adjacent the top surface of the absorbent means, which film is partially attached to the absorbent means so as to leave at least one area which is not attached to the absorbent means, the film further comprising at least one opening feature in the film in the at least one area which is not attached to the absorbent means, whereby when the blotter is subject to heat during cooking, the film around the at least one opening feature shrinks to thereby automatically create an opening through which liquids released from the meat product can pass into the absorbent means.

4,720,411

MAGNETIC RECORDING MEDIUM

Toru Shimozawa; Shigeyo Miyamori, and Masaharu Nishimatsu, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,570
Claims priority, application Japan, Apr. 5, 1985, 60-72186; Apr. 22, 1985, 60-86052; Apr. 30, 1985, 60-93056; Apr. 30, 1985, 60-93057; Apr. 30, 1985, 60-93058; Jun. 8, 1985, 60-124820
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—141 4 Claims



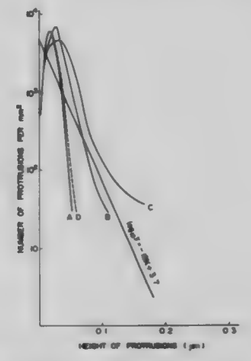
1. A magnetic recording medium comprising a substrate having opposed major surfaces and at least one magnetic layer formed on at least one of the major surfaces, said magnetic comprising a radiation cured binder and a plate magnetic material having an average particle diameter of up to 0.1 μm and a flakiness of at least 6.

4,720,412

POLYESTER BASE FILM FOR MAGNETIC RECORDING MEDIA

Hideo Katoh, Kanagawa, and Hiroshi Tomita, Saganihara, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 851,146
Claims priority, application Japan, Apr. 17, 1985, 60-80274
Int. Cl.[4] G11B *5/70;* B32B *3/30, 27/00*
U.S. Cl. 428—141 12 Claims



1. A biaxially stretched, single-layer polyester base film containing inert solid fine particles dispersed therein and having may fine protrusions on its surface, said film having the following properties:

(a) in a distribution curve representing the relation between the number of protrusions (y/mm^2) and the height of protrusions (x in μm) on the surface of said film which are measured in a region having at least 20 protrusions/mm^2, that part of the distribution curve at which the protrusion height (x) is larger than its peak value of the distribution curve crosses the line of $\log_{10} y = -18x + 3.7$,

(b) when the number of protrusions (y) on the film surface is at least 20/mm^2, no protrusion exists which has a height (x) of at least 0.13 μm,

(c) said film has a surface roughness (Ra) of not more than 0.012 μm,

(d) said film has a Young's modulus in the longitudinal direction of at least 650 kg/mm^2, and

(e) when heat-treated at 70° C. for 1 hour under no load, said film has a heat shrinkage in the longitudinal direction of not more than 0.1%.

4,720,413

MAGNETIC RECORDING MEDIUM HAVING A BACK COAT LAYER

Akira Horiguchi; Isao Sasaki, and Hirokazu Moritsuni, all of Mito, Japan, assignors to Victor Company of Japan, Ltd., Japan

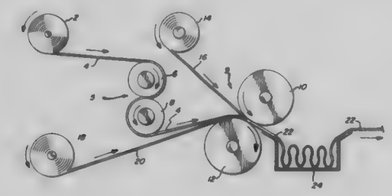
Filed Jul. 21, 1986, Ser. No. 892,382
Claims priority, application Japan, Jul. 22, 1985, 60-160262; Jul. 22, 1985, 60-160263; Jul. 29, 1985, 60-165839
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—141 5 Claims

1. In a magnetic recording medium which comprises a non-magnetic support, a magnetic recording layer formed on one side of the support, and a back coat layer formed on the other side of the support, the improvement in that said back coat layer is made of a dispersion, in a resin binder, of non-magnetic particles which have a Mohs hardness of from 2.5 to 10 and which have adsorbed thereon carbon black having an average particle size not larger than 100 millimicrometers and a specific surface area of not less than 30 m^2/g.

4,720,414
FIRE-RESISTANT MATERIAL
Roque F. Burga, 12542 Eckleson St., Cerritos, Calif. 90701
Filed Jun. 25, 1986, Ser. No. 878,429
Int. Cl.[4] D06N 7/04; B32B 9/00
U.S. Cl. 428—141 12 Claims

1. A fire resistant material comprising a rigid sheet impregnated with a binder composition comprising, by volume:
two to three parts alkali metal silicate solution having a density in the range of 40° to 41° Be'; and
one part sugar in aqueous solution, said sugar solution having a density of approximately 10° to 15° Be';
said impregnated rigid sheet being coated with a coating composition comprising:
one volume non-metallic powder selected from the group consisting of brick dust, kaolin, talc, pyrophyllite, mica, calcium carbonate, calcium sulfate, and volcanic rock powder;
one volume silica;
two volumes of fine mesh saw dust; and
two and one half volumes of said binder composition.

4,720,415
COMPOSITE ELASTOMERIC MATERIAL AND PROCESS FOR MAKING THE SAME
Michael J. Vander Wielen, and Jack D. Taylor, both of Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jul. 30, 1985, Ser. No. 760,437
Int. Cl.[4] D06N 7/04
U.S. Cl. 428—152 44 Claims



1. A method of producing a composite elastic material comprising the steps of:
elongating a nonwoven fibrous elastic web having a basis weight of from about 5 to about 300 grams per square meter;
joining the elongated nonwoven fibrous elastic web at spaced-apart locations to at least one gatherable web;
relaxing the elongated nonwoven fibrous elastic web whereby the gatherable web is gathered between said spaced-apart locations.

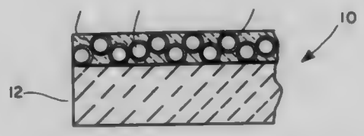
4,720,416
PRESSURE SENSITIVE LABEL STOCK MATERIAL POSSESSING A WRINKLE-RESISTANT LUSTROUS, OPAQUE LAMINATE FILM FACING
Gary L. Duncan, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Mar. 9, 1987, Ser. No. 23,511
Int. Cl.[4] A61F 3/02; B32B 3/26
U.S. Cl. 428—195 14 Claims

1. A pressure sensitive label stock material possessing a wirnkle-resistant lustrous, opaque biaxially oriented polymer film laminate facing layer for application to a collapsible wall type container, the facing layer comprising:
(a) a thermoplastic core layer having an upper and lower surface and a strata of voids located within said substrate layer, there being positioned within at least a substantial number of said voids at least one void-initiating particle which is phase distinct and incompatible with the surrounding thermoplastic material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void;
(b) a void-free thermoplastic skin layer affixed to the upper surface and, optionally, to the lower surface of core layer (a), and;
(c) discrete areas of pressure sensitive adhesive directly or indirectly applied to the exposed surface of core layer (a) or, where an optional skin layer (b) has been applied to the lower surface of core layer (a), to the exposed surface of optional skin layer (b), the adhesive-free areas of the exposed surface of core layer (a), or, where present, the adhesive-free areas of the exposed surface of optional skin layer (b), exhibiting little or no tendency to adhere to the material of the collapsible wall type container to which the facing layer is applied.

4,720,417
FRAGRANCE-RELEASING PULL-APART SHEET
Norman P. Sweeny, North Oaks, Minn.; Jack W. Charbonneau, Somerset, Wis., and Orville F. Wienke, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 680,490, Dec. 11, 1984, abandoned. This application Oct. 31, 1986, Ser. No. 924,115
Int. Cl.[4] A61L 9/04; B01J 13/00; D01F 1/02; D04H 1/04
U.S. Cl. 428—201 27 Claims

1. A device for exposing a liquid, said device comprising
(1) at least two surfaces of coated paper bound by an adhesive composition layer,
(2) said adhesive composition layer containing microcapsules with said liquid within the shell of the microcapsules, and
(3) said microcapsules having an average diameter between 4 and 80 micrometers,
the cohesive strength of the adhesive composition layer being less than the strength of the bond between said adhesive composition and a coated face of said sheets, the tensile rupture strength of said microcapsules being such that the cohesive failure of the adhesive results in breakage of the microcapsules, and the tensile rupture strength between said two surfaces being at least 4.0 g/cm and less than 90 g/cm at 20° C. and 50% relative humidity and greater than 4.0 g/cm after storage at 120° C. and less than 1% relative humidity for seventy-two hours.

4,720,418
PRE-REACTED RESISTOR PAINT, AND RESISTORS MADE THEREFROM
Charles C. Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.
Filed Jul. 1, 1985, Ser. No. 750,029
Int. Cl.[4] B05D 5/12
U.S. Cl. 428—209 13 Claims



1. A first base metal, printable thick film resistive composition, which comprises:
a tin oxide powder coated with a resinate solution having 10% to 15% Cobalt therein, the resinate coated tin oxide powder prefired in air to burn out depolymerizable organics therefrom, then reduced in a reducing atmosphere to form a Cobalt pre-reacted tin oxide powder therefrom;
a borosilicate glass frit powder coated with a resinate solution having 6% to 12% selected from at least one of Tantalum and Manganese to form a resinate coated glass frit; and
the Cobalt pre-reacted tin oxide powder and the resinate coated glass frit are well mixed with a screening agent to form the first base metal resistor composition having a sheet resistivity in a range from 5,000 to 20,000 ohms per square when screened upon a substrate and fired in an inert atmosphere to form a base metal resistor therefrom.

4,720,419
SUBSTRATES FOR ELECTRONIC DEVICES
James A. Cairns, Wantage, and James H. Stephen, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England
Continuation of Ser. No. 512,744, Jul. 11, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 820,898
Claims priority, application United Kingdom, Jul. 14, 1982, 8220418
Int. Cl.[4] B32B 15/04, 15/18, 15/20
U.S. Cl. 428—209 12 Claims

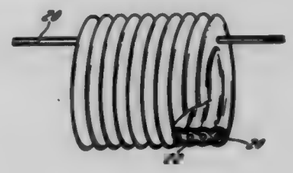
1. An electronic device including a substrate having electronic circuit elements deposited thereon, the substrate comprising a lamina made of an aluminum bearing ferritic steel coated with an applied adherent layer of a material having a high dielectric strength, a low dielectric constant, and a coefficient of thermal expansion approximately equal to that of the steel lamina, and being of surface smoothness, thickness and purity suitable for adheringly receiving, and compatible with, the electronic circuit elements deposited thereon.

4,720,420
SEALABLE, TRANSPARENT POLYOLEFINIC MULTILAYER FILM
Günther Crass, Taunusstein; Lothar Bothe, Mainz-Gonsenheim, and Siegfried Janocha, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Nov. 26, 1985, Ser. No. 801,808
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 34441581
Int. Cl.[4] B32B 7/02, 27/08; C09J 7/02
U.S. Cl. 428—216 18 Claims

1. A sealable, transparent polyolefinic multilayer film, comprising:
a polypropylene base layer;
a sealable surface layer disposed on one surface of said base layer and comprising an ethylene-propylene-butene-1 terpolymer and a propylene-butene-1 copolymer, corresponding to a content of from about 0.1% to about 7% by weight of ethylene, from about 53% to about 89.9% by weight of propylene and from about 10 to about 40% by weight of butene-1, based on the total weight of the olefin resin composition; and
a non-sealable surface layer disposed on the other surface of said base layer and comprising from about 96.5% to about 99.6% by weight of a propylene homopolymer, from about 0.3% to about 2.5% by weight of a slip agent, and from about 0.1% to about 1.0% by weight of an antiblocking agent.

2. A packaging film produced from the multilayer film of claim 1, wherein said surface layers have a thickness of less than about 3 μm.

4,720,421
POISON RESISTANT COMBUSTIBLE GAS SENSOR
Gul Khilnani, Fremont, Calif., assignor to Rexnord Inc., Brookfield, Wis.
Division of Ser. No. 564,982, Dec. 23, 1983, Pat. No. 4,560,585. This application Dec. 20, 1985, Ser. No. 811,616
Int. Cl.[4] G01N 27/16
U.S. Cl. 428—222 2 Claims



1. A poison resistant active element for a combustible gas sensor having a helically wound filament of electrically conductive material coated with a refractory material comprising;
a first layer of a combination ceramic material and catalytically active material disposed on the refractory coated filament;
a plurality of alternating intermediate layers of porous non-catalytic ceramic material and catalytically active material; and
a further final layer of porous ceramic material disposed on the final alternating intermediate layer, said final layer of porous ceramic material having a higher porosity than intermediate said layers of porous non-catalytic ceramic material, wherein said further final layer of porous ceramic material is obtained by applying a liquid mixture comprising aluminum chloride, and heating.

4,720,422
MATERIAL FOR COLLECTING RADIONUCLIDES AND HEAVY METALS
Hideo Higuchi, and Nobuhiro Nonaka, both of Chiba, Japan, assignors to Japan Chemical Analysis Center, Chiba, Japan
Filed Apr. 3, 1985, Ser. No. 719,433
Claims priority, application Japan, Jun. 6, 1984, 59-115827; Jun. 15, 1984, 59-122979
Int. Cl.[4] B01D 39/04, 39/16; D06M 11/00
U.S. Cl. 428—252 15 Claims

1. A material for collecting radionuclides and heavy metals which comprises an acrylic fiber element having fixedly supported thereon at least one ferrocyanide compound of the formula $K_2M^{II}[Fe(CN)_6]$ wherein M^{II} is a divalent metal selected from the group consisting of Co, Zn, Zr and Ni.

3. The material in accordance with claim 1, wherein M^{II} is Zn.

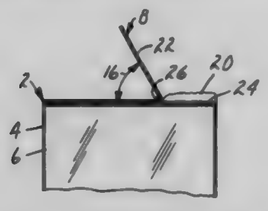
4. The material in accordance with claim 1, wherein M^{II} is Zr.

4,720,423
PACKAGE OPENING SYSTEM
Andrew D. Fraser, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 25, 1986, Ser. No. 899,807
Int. Cl.[4] B32B 5/16, 29/04
U.S. Cl. 428—313.5 18 Claims

1. An article comprising an interior article, an overwrap, and a tear strip for opening said overwrap, said tear strip having two layers of material selected from the group consisting of polymeric film and paper secured by an adhesive layer associated with said tear strip, said two layers being in the form of
(1) a tab to engage said tear strip or
(2) the tear strip itself, the adhesive layer of said two layers of material containing frangible microcapsules having

average diameters between 3 and 180 microns containing fragrance therein.

18. An article comprising an interior article, an overwrap,



and a tear strip for opening said overwrap having said tear strip secured by an adhesive layer to said interior article, the adhesive layer containing frangible microcapsules having average diameters of 3 to 180 microns containing fragrance therein.

4,720,424

ELECTRONIC COMPONENT ENCAPSULATED WITH A COMPOSITION COMPRISING A POLYMER WHICH IS CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE AND SUBSTANTIALLY INCAPABLE OF FURTHER CHAIN GROWTH UPON HEATING

Nancy C. Eickman, Mountainside; Charles E. McChesney, Monmouth Junction; Gary E. Williams, Short Hills, and Hyun-Nam Yoon, Summit, all of N.J., assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Division of Ser. No. 619,608, Jun. 18, 1984, Pat. No. 4,632,798, which is a continuation-in-part of Ser. No. 517,870, Jul. 27, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 872,007

Int. Cl.⁴ B32B *5/16, 27/06, 27/34, 27/36*

U.S. Cl. 428—323 **28 Claims**

1. An article which comprises an electronic component imperviously encapsulated within a molding composition of matter comprising (a) a thermoplastic melt processable polymer selected from the group consisting of wholly aromatic polyesters, aromatic-aliphatic polyesters, wholly aromatic poly(ester-amides), aromatic-aliphatic poly(ester-amides), aromatic polyazomethines, aromatic polyester-carbonates, and mixtures of the foregoing which is capable of forming an anisotropic melt phase, has a weight average molecular weight of approximately 4,000 to 25,000, and which is substantially incapable of further chain growth upon heating, and (b) approximately 40 to 80 percent by weight based upon the total weight of said molding composition of matter of a particulate inorganic material substantially uniformly dispersed in component (a) which is capable of decreasing the volumetric coefficient of thermal expansion and increasing the thermal conductivity of component (a).

4,720,425

MULTI-LAYER LAMINATED STRUCTURE

Masafumi Hattori, and Takayuki Inoue, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,774

Claims priority, application Japan, Dec. 18, 1985, 60-285152

Int. Cl.⁴ B32B *27/36;* **B65D** *35/08*

U.S. Cl. 428—340 **9 Claims**

1. A multi-layer laminated structure comprising a polycarbonate or thermoplastic polyester layer having adjacently adhered thereto a layer comprised of a modified olefin polymer having a stiffness modulus of from 100 to 2,000 kg/cm² and a degree of crystallinity of not more than 33%, in which an unsaturated carboxylic acid or the derivative thereof is grafted to at least a part of a polymer consisting of a hydrocarbon, said unsaturated carboxylic acid or the derivative thereof being present in an amount of from 0.01 to 5% by weight based on the modified olefin polymer.

4,720,426

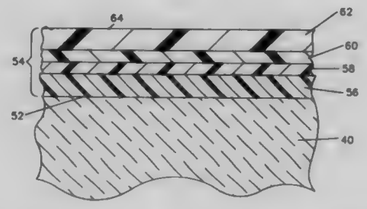
REFLECTIVE COATING FOR SOLID-STATE SCINTILLATOR BAR

August O. Englert, Waukesha; Robert J. Lyons, Milwaukee, and Charles F. Marks, New Berlin, all of Wis., assignors to General Electric Company

Filed Jun. 30, 1986, Ser. No. 880,190

Int. Cl.⁴ B32B *15/00*

U.S. Cl. 428—344 **11 Claims**



1. A reflective coating for a scintillation bar comprising:

an adherent layer for adhesion to a surface of said scintillation bar;

said adherent layer including a substantially transparent adhesive material containing means for diffusely scattering a predetermined portion of light passing therethrough; and

means outside said adherent layer for specularly reflecting light passing through said adherent layer back into said adherent layer.

4,720,427

ORIENTED MULTI-LAYER HEAT SEALABLE FILM

Melvil B. Clanson, Raymond, N.H., and John R. Wagner, Jr., Rochester, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 838,203, Mar. 7, 1986, abandoned, and Ser. No. 791,961, Oct. 28, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 918,963

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—349 **15 Claims**

1. A laminar thermoplastic film comprising a substrate comprising a polyolefin layer having on at least one surface thereof a layer comprising a linear very low density copolymer of ethylene and a C_4-C_8 alpha olefin. or a blend of (1) said copolymer and (2) a polyolefin wherein the density of said copolymer is from about 0.890 to less than 0.900 g/cc.

4,720,428

CLADDING MATERIALS FOR OPTICAL FIBERS

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

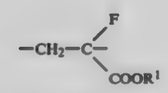
Filed May 20, 1985, Ser. No. 735,648

Claims priority, application Japan, May 28, 1984, 59-107971

Int. Cl.⁴ D02G *3/00;* **G02B** *6/00*

U.S. Cl. 428—373 **2 Claims**

1. In an optical fiber comprising a cladding and a polymeric core having high transparency, the improvement wherein said cladding comprises a polymer having a structural unit represented by the formula



(a)

wherein R^1 represents chain hydrocarbon group having 1 to 5 carbon atoms or cyclic hydrocarbon group having 3 to 6 carbon atoms and optionally substituted with lower alkyl group having 1 to 6 carbon atoms.

4,720,429

FOAM CUPS WITH ENHANCED COFFEE RETENTION

Fred M. Sonnenberg, Merion, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 11,654, Feb. 5, 1987. This application May 15, 1987, Ser. No. 50,107

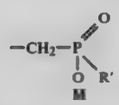
Int. Cl.⁴ C08J *9/22;* **B05D** *7/00*

U.S. Cl. 428—407 **4 Claims**

1. A moldable composition comprising expandable vinyl aromatic polymer particles having a thin film coating of a fluorosurfactant having the general formula

$$R—CH_2—X,$$

wherein R represents a perfluoroalkyl group having from 6 to 16 carbon atoms; wherein X represents $—CH_2SCH_2CH_2CO_2Li$, $—CH_2SO_3H$, $—CH_2SO_3NH_4$, $—CH_2O(CH_2CH_2O)_xH$, $—CH_2O(CH_2CH_2O)_yH$, $—CH_2SCH_2CH_2N^+(CH_3)_3CH_3SO_4^-$, $—CH(OCOCH_3)CH_2N^+(CH_3)_2CH_2CO_2^-$, and



and wherein x represents an integer from 8 to 14, y represents an integer from 4 to 7, R' represents $—OCH_2CH_2R$ or —OM, and M represents —H, $—NH_4$, or $—NH_2(CH_2CH_2OH)_2$, the amount of fluorosurfactant being present in an amount sufficient to enhance the coffee retentiveness of cups molded from the moldable composition as compared to the coffee retentiveness in the absence of the fluorosurfactant.

4,720,430

GLASS HAVING CONTROLLABLE INFRARED TRANSMISSION

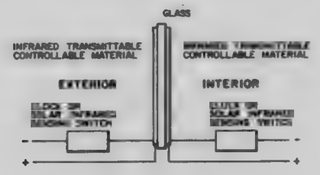
Harry A. Beale, 1307 Windham Dr., Columbus, Ohio 43220

Division of Ser. No. 793,358, Oct. 31, 1985. This application Nov. 4, 1986, Ser. No. 899,583

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.⁴ B32B *9/04, 13/04, 17/06, 15/00*

U.S. Cl. 428—432 **1 Claim**



1. A glass sheet provided at least on one side with a coating containing V_2O_3 as its principal ingredient, said V_2O_3 containing a sufficient amount of at least one alloying element so that the transformation temperature of said V_2O_3 is elevated so that said coating will reflect infrared energy when the ambient temperature is above approximately 45° F.-60° F. and will transmit infrared energy when said ambient temperature is below approximately 45° F.-60° F., and wherein said glass sheet is provided on its other side with a coating containing tungsten oxide as its principal ingredient, which coating may be activated to reflect or transmit infrared energy by causing an electric current to be transmitted therethrough.

4,720,431

SILICONE ENCAPSULATED DEVICES

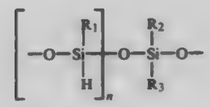
Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed May 21, 1986, Ser. No. 872,294

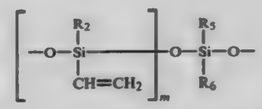
Int. Cl.⁴ B32B *9/04*

U.S. Cl. 428—447 **8 Claims**

1. An article of manufacture comprising an electronic device having an essentially bubble-free, cured, cast silicone resin potting compound encapsulating said device, wherein said potting compound is formed by heat-curing a two-part mixture comprising relatively high viscosity polysiloxane, at least one part of which contains a platinum catalyst in an amount sufficient to catalyze a cross-linking reaction upon mixing said two parts with the application of heat, and at least one part of which further contains 5 to 15 weight percent of a low viscosity polysiloxane having a similar reactive group as the high viscosity polysiloxane in said part, said low viscosity polysiloxane having a viscosity at 25° C. of from 2 to 100 centipoise, and wherein the high viscosity polysiloxane of one part consists essentially of a polysiloxane having reactive



groups wherein n is an integer such that the viscosity at 25° C. is from 750 to 1250 centipoise and wherein the high viscosity polysiloxane of the other part consists essentially of a polysiloxane having reactive



groups where m is an integer such that the viscosity at 25° C. is from 2500 to 3500 centipoise and wherein R_1-R_6 are selected from the group consisting of low molecular weight alkyl groups and aryl groups.

4,720,432

ELECTROLUMINESCENT DEVICE WITH ORGANIC LUMINESCENT MEDIUM

Steven A. VanSlyke; Ching W. Tang, and Luther C. Roberts, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,528

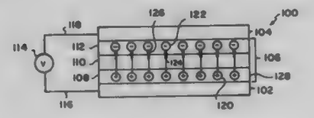
Int. Cl.⁴ B32B *15/04;* **H01J** *1/62;* **H01L** *29/12;* **C09K** *11/06*

U.S. Cl. 428—457 **20 Claims**

1. An electroluminescent device comprising in sequence, an anode, an organic hole injecting and transporting zone, an organic electron injecting and transporting zone, and a cathode, characterized in that

said organic hole injecting and transporting zone is comprised of
a layer in contact with said anode containing a hole injecting porphyrinic compound and
a layer containing a hole transporting aromatic tertiary amine interposed between said hole injecting layer and said electron injecting and transporting zone.

20. An electroluminescent device comprising in sequence
an opaque anode,
a hole injecting layer comprised of a phthalocyanine,
a first hole transporting layer comprised of a tetraphenyldiamine,



a second hole transporting layer comprised of a triphenylamine,
an electron injecting and transporting layer comprised of a chelated oxinoid compound, and
a light transmissive cathode comprised of a layer consisting essentially of a plurality of metals other than alkali metals,
at least one of said metals having work function greater than 4 eV and being chosen from the group consisting of magnesium, a rare earth metal, or indium, and
at least one other of said metals being chosen from the group consisting of aluminum, copper, silver, gold, tin, lead, bismuth, tellurium, indium, and antimony.

4,720,433

RUBBER ARTICLES CONSISTING OF DIFFERENT RUBBER LAYERS, THE PRODUCTION AND USE THEREOF

Heinrich Königshofen, Bergisch-Gladbach, and Zsolt Szentivanyi, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,214
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514697
Int. Cl.⁴ B32B *25/12, 27/08*
U.S. Cl. 428—495 **3 Claims**

1. Rubber articles fabricated from at least two layers of at least two different elastomers joined tightly together wherein one elastomer layer is acrylonitrile-butadiene rubber, styrene-butadiene rubber, chloroprene rubber, butadiene rubber, or natural rubber and the other elastomer is a hydrogenated acrylonitrile-butadiene rubber with a degree of hydrogenation of from 85 to 99.7% by weight and having an acrylonitrile content of from 16 to 49% by weight.

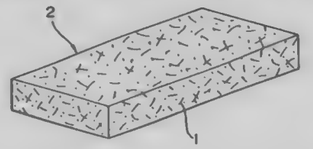
4,720,434

COMPOSITE MATERIAL INCLUDING SILICON CARBIDE AND/OR SILICON NITRIDE SHORT FIBERS AS REINFORCING MATERIAL AND ALUMINUM ALLOY WITH COPPER AND RELATIVELY SMALL AMOUNT OF SILICON AS MATRIX METAL

Masahiro Kubo; Tadashi Dohnomoto; Atsuo Tanaka, all of Toyota, and Hidetoshi Hirai, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 28, 1986, Ser. No. 901,196
Claims priority, application Japan, Sep. 2, 1985, 60-193416
Int. Cl.⁴ B22F *3/26*
U.S. Cl. 428—567 **6 Claims**

1. A composite material, comprising short fibers, the material of each one of which is selected from the class made up of silicon carbide and silicon nitride, embedded in a matrix of metal, said metal being an alloy consisting essentially of between approximately 2% to approximately 6% of copper,



between approximately 0.5% to approximately 3% of silicon, and remainder substantially aluminum.

4,720,435

NUCLEAR GRADE STEEL ARTICLES

Paul Crook, Kokomo, Ind., and Richard D. Zordan, Raleigh, N.C., assignors to Haynes International, Inc., Kokomo, Ind.

Division of Ser. No. 672,963, Nov. 11, 1984, Pat. No. 4,643,767.
This application Jun. 18, 1986, Ser. No. 875,847
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.⁴ B32B *15/18*
U.S. Cl. 428—677 **5 Claims**

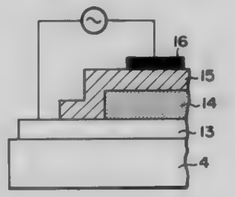
1. An article of manufacture for use as a component in nuclear installations coated with a stainless steel consisting essentially of, in weight percent, 15 to less than 25 chromium, 5 to 15 nickel, 2.7 to 5.5 silicon, 1 to 3 carbon, niobium plus vanadium 5 to 15, up to 0.15 nitrogen, up to 1.5 cobalt and the balance iron plus impurities wherein niobium is at least 3.77.

4,720,436

ELECTROLUMINESCENCE DEVICES AND METHOD OF FABRICATING THE SAME

Seiichi Ohseto; Yoshiyuki Kageyama, both of Numazu, and Kenji Kameyama, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 5, 1986, Ser. No. 903,765
Claims priority, application Japan, Sep. 11, 1985, 60-199533; Sep. 26, 1985, 60-210930; Mar. 27, 1986, 61-067156
Int. Cl.⁴ H05B *33/00, 33/10, 33/14*
U.S. Cl. 428—690 **4 Claims**



1. A thin film electroluminescent device including an electroluminescent emitting layer which comprises a luminescent host material consisting of SrSe or CaSe, and a lanthanoid rare-earth element as activator.

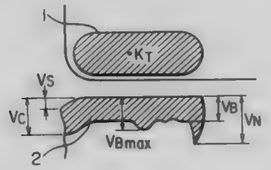
3. A thin film electroluminescent device comprising:
a substrate,
a transparent electrode layer formed on said substrate,
an electroluminescent emitting layer comprising a luminescent host material consisting of SrSe or CaSe, and a lanthanoid rare-earth element as activator, formed on said transparent electrode layer,
an insulating layer formed on said electroluminescent emitting layer, and
an electrode formed on said insulating layer.

4,720,437

SURFACE-COATED CEMENTED CARBIDE ARTICLE OR PART

Masuo Chudo; Toshio Nomura, and Toshihiro Iida, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 21, 1986, Ser. No. 842,805
Claims priority, application Japan, Mar. 27, 1985, 60-62800
Int. Cl.⁴ B32B *7/02, 15/18, 17/06*
U.S. Cl. 428—698 **3 Claims**



1. A surface-coated cemented carbide having a hard coating layer on the surface thereof, in which the hard coating layer comprises:
an inner layer of TiC having a thickness of 0.5 to 2.5μ,
a penultimate layer of TiC having a thickness of 0.5 to 2.5μ,
an intermediate layer, provided between said inner layer and penultimate layer, consisting of a composite layer with a TiN layer having a thickness of 0.5 to 2.5μ sandwiched between TiCN layers each having a thickness of 0.1 to 2.5μ, and
an outer layer of Al_2O_3 with a thickness of 0.5 to 5μ provided on said penultimate layer.

4,720,438

MOLDED CLAY ARTICLE COATED WITH PEARL PIGMENT

Takaji Watanabe, Saitama, and Katsuhisa Nitta, Fukushima, both of Japan, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 873,911
Claims priority, application Japan, Jun. 13, 1985, 60-127259
Int. Cl.⁴ B32B *9/00*
U.S. Cl. 428—697 **17 Claims**

1. A process for producing a molded clay article having pearly luster, comprising coating a molded clay article with a mixture of (1) a glaze adjusted to have the sum of the R_2O groups in the Seger formula in the range of 0 to 0.55 mol and (2) a pearlescent pigment comprising mica powder particles having a coating of transparent metal oxide wherein the pearl pigment is present in an amount up to about 33 wt% of the glaze composition; and firing the coated clay article at a temperature not exceeding 900° C.

11. A molded clay article having pearly luster, made by the process of claim 1.

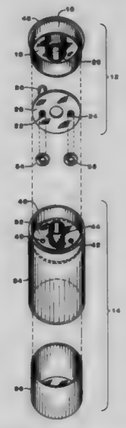
4,720,439

DEFERRED ACTION BATTERY ACTIVATED BY ROTATION

Wayne R. Hruden, San Luis Obispo, Calif., assignor to Ultimate Survivor of America, Inc., San Luis Obispo, Calif.

Filed Apr. 19, 1984, Ser. No. 601,865
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.⁴ H01M *6/36*
U.S. Cl. 429—114 **26 Claims**

1. A deferred action battery characterized in that activation is initiated by rotating a first part of the battery (the rotor) with respect to a second part of the battery (the stator) and further characterized in that the outside dimensions of the battery are the same before and after activation, said deferred action battery comprising in combination:
a rotor including portions defining a rotor chamber within said rotor and including portions defining a rotor port that leads into the rotor chamber;
a stator including portions defining a stator chamber within said stator and including portions defining a stator port that leads into the stator chamber; and,



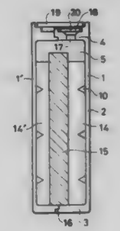
means for securing said rotor to said stator for only rotation with respect to said stator;
said rotor port and said stator port being so located that said rotor chamber and said stator chamber communicate through said rotor port and said stator port at some, but not all, rotational positions of said rotor.

4,720,440

MONOBLOCK SEALED LEAD-ACID STORAGE BATTERY

Kunio Yonezu; Masaharu Tsubota, and Teruhiro Hatanaka, all of Kyoto, Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Aug. 25, 1986, Ser. No. 899,581
Claims priority, application Japan, Oct. 2, 1985, 60-220888; Oct. 2, 1985, 60-220889; Oct. 17, 1985, 60-232906
Int. Cl.⁴ H01M *10/14*
U.S. Cl. 429—57 **9 Claims**



1. A monoblock sealed lead-acid storage battery using a non-fluid electrolyte, comprising:
a plurality of porous separators;
a bisected battery container composed of two separate halves joined together with said separators disposed side by side between said two halves; and

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a cover covering portions of a joined surface of said two halves;
wherein each of said halves comprises;
a container wall integrated with at least one partition wall to define at least two cell recess, corresponding cell recesses of said two halves being opposed to each other,
said container wall and at least one partition wall being commonly injected molded,
at least two conductive metal grids mold bonded to the inner surface of the injected molded container wall,
two of said grids in combination of said two halves being integrated with two respective terminals passing through said cover, and
in at least one of said halves, at least one connecting conductor connecting two respective grids and adjacent cell recesses which are not integrated with said terminals, each said conductor passing through the partition walls separating said adjacent cell recesses, and
positive and negative active materials alternatively filled into said cell recesses, a cell recess of a first one of said halves which is filled with said positive active material being opposed to a corresponding cell recess of a second one of said halves filled with said negative active material with one of said separators disposed therebetween.

4,720,441

METHOD OF PREPARING A HOLOGRAM

John A. Clark, Altrincham; Alan Adshead, New Mills, and David W. Butcher, Goostrey, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jun. 24, 1986, Ser. No. 877,835

Claims priority, application United Kingdom, Jun. 25, 1985, 8516054

Int. Cl.⁴ G03H *1/04, 1/18;* **G03C** *5/44*

U.S. Cl. 430—1 **12 Claims**

1. A method of preparing a hologram which comprises subjecting holographic material to a holographic exposure, the holographic material comprising a silver halide emulsion of which at least 80% by weight of the halide is bromide, developing the exposed material in a silver halide developing solution to yield developed silver, converting the residual silver bromide, in the main part at least, to silver iodide by use of an aqueous iodide solution, removing the developed silver but leaving the silver iodide either by use of a bleach/fix bath under controlled conditions or by rehalogenating the developed silver to silver bromide or chloride using a brominating or chlorinating silver bleach solution and simultaneously or subsequently fixing out the thus formed silver bromide or chloride using a fixing agent under such conditions that silver iodide is not dissolved from the material.

4,720,442

PHOTOMASK BLANK AND PHOTOMASK

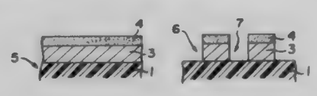
Norihiko Shinkai, Kanagawa; Takeshi Haranoh, Yokohama; Junetsu Kanazawa, Yokohama, and Takashi Hatano, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 27, 1986, Ser. No. 866,926

Claims priority, application Japan, May 28, 1985, 60-113124

Int. Cl.⁴ G03F *9/00;* **B32B** *17/06*

U.S. Cl. 430—5 **12 Claims**



1. A photomask blank comprising a transparent substrate and at least two layers including a masking layer and an antireflection layer, formed thereon, wherein said masking layer is a chromium masking layer containing from more than 25% to not more than 50% by atomic ratio of nitrogen, and said antireflection layer is a chromium oxide antireflection layer containing from more than 25% to not more than 40% by atomic ratio of nitrogen.

4,720,443

MEMBER HAVING LIGHT RECEIVING LAYER WITH NONPARALLEL INTERFACES

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuzuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,821

Claims priority, application Japan, Apr. 5, 1984, 59-68725; Apr. 13, 1984, 59-75386; Apr. 13, 1984, 59-75387; Apr. 16, 1984, 59-76818; Apr. 18, 1984, 59-77284; Apr. 18, 1984, 59-78081; Apr. 19, 1984, 59-79007; Apr. 20, 1984, 59-79894; Apr. 23, 1984, 59-81488; Oct. 16, 1984, 59-215175; Oct. 17, 1984, 59-216353; Oct. 18, 1984, 59-217262; Oct. 19, 1984, 59-218526; Oct. 20, 1984, 59-219389; Oct. 22, 1984, 59-220376

Int. Cl.⁴ G03G *5/085*

U.S. Cl. 430—57 **73 Claims**

1. A light-receiving member comprising a substrate for light-receiving member and a light-receiving layer of a multilayer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms, a second layer comprising an amorphous material containing silicon atoms and exhibiting a photoconductivity, and a surface layer comprising an amorphous material containing silicon atoms and carbon atoms provided on the substrate successively from the substrate side, said light-receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction.

4,720,444

LAYERED AMORPHOUS SILICON ALLOY PHOTOCONDUCTIVE ELECTROSTATOGRAPHIC IMAGING MEMBERS WITH P, N MULTIJUNCTIONS

Inan Chen, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1986, Ser. No. 891,017

Int. Cl.⁴ G03G *5/14, 5/082*

U.S. Cl. 430—58 **43 Claims**



1. An imaging member comprised of a supporting substrate, a p, n multijunction photogenerating layer comprised of from about 8 to about 100 alternating layers of components selected from the group consisting of hydrogenated amorphous silicon, hydrogenated amorphous germanium, alloys of hydrogenated amorphous silicon and hydrogenated amorphous germanium; and a charge transporting layer.

4,720,445

COPOLYMERS FROM MALEIMIDE AND ALIPHATIC VINYL ETHERS AND ESTERS USED IN POSITIVE PHOTORESIST

Karime Brahim, Hamilton Square, and Michael J. McFarland, Middlesex, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 18, 1986, Ser. No. 829,874

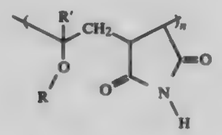
Int. Cl.⁴ G03C *1/60, 1/495*

U.S. Cl. 430—192 **10 Claims**

1. A positive photoresist composition comprising a mixture of:

(a) 1 to 35 dry weight percent of an alkali-insoluble photoactive compound, capable of being transferred into an alkali-soluble species upon exposure to actinic radiation, in an amount sufficient to render the mixture alkali-insoluble prior to exposure; and

(b) 65–99 dry weight percent of a film forming copolymer of maleimide and a vinyl ether or vinyl ester having the structure



where R is an alkyl substitutent of from 1 to 20 carbon atoms, R^1 is independently H,C_1 to C_{10} alkyl, phenyl, benzyl, or C_1 to C_{10} aralkyl

and wherein said copolymer has a sufficient number of imide N—H groups to render the mixture soluble in aqueous alkali after exposure; and

(c) a solvent capable of dissolving both the polymer and the photoactive compound.

4,720,446

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaharu Toriuchi, and Osamu Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1986, Ser. No. 858,775

Claims priority, application Japan, May 2, 1985, 60-95241

Int. Cl.⁴ G03C *5/54, 1/40*

U.S. Cl. 430—213 **20 Claims**

1. A color photographic light-sensitive material having on a support silver halide emulsion layers associated with a yellow dye-providing compound, a magenta dye-providing compound, and a cyan-dye providing compound, and having thereon on the same support or having on a different support an image-receiving layer, said image-receiving layer comprising (1) a first image-receiving layer containing at least one kind of a cyclic quaternary ammonium mordant (I) having a quaternary ammonium salt moiety of a saturated cyclic amine or pyridine as a recurring unit for preferentially mordanting a cyan dye released or formed from said cyan dye-providing compound as a result of development and (2) a second image-receiving layer containing at least one kind of a quaternary ammonium mordant (II) having a quaternary ammonium salt moiety of an acyclic amine as a recurring unit for selectively mordanting a magenta dye and a yellow dye released or formed from said magenta dye-providing compound and said yellow dye-providing compound, respectively, as a result of development.

4,720,447

SILVER SALT DIFFUSION TRANSFER REVERSAL PROCESS

René M. De Keyzer, Borsem; Leon L. Vermeulen, Hereuthout, and Robert J. Poliet, Vremde, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

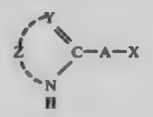
Filed Oct. 9, 1986, Ser. No. 917,107

Claims priority, application European Pat. Off., Oct. 10, 1985, 85201654

Int. Cl.⁴ G03C *5/54*

U.S. Cl. 430—244 **9 Claims**

1. Method of making a DTR-image comprising image-wise exposing a photosensitive element comprising a photographic silver halide emulsion layer, developing the exposed emulsion layer with the aid of an alkaline processing solution in the presence of a silver halide solvent and causing silver complexes to diffuse from the emulsion layer into a non-light-sensitive image-receiving layer in the presence of development nuclei thereby to form a silver transfer image in that layer, said transfer image formation occurring in the presence of at least one heterocyclic azole compound, which influences the density and tone of said transfer image, wherein said heterocyclic azole is contained in said non-light-sensitive image-receiving layer or a non-light-sensitive hydrophilic colloid layer in water-permeable relationship therewith and/or in said alkaline processing solution and is a unidentate, bidentate, or polydentate heterocyclic azole reagent for silver that does not carry a mercapto group or the tautomeric thione thereof and corresponds to the following general formula I:


(I)

wherein:

Y represents the ring member =N— or =HC—;

Z represents the atoms completing a heterocycle, which heterocycle may carry a fused on aromatic ring system;

A represents a chemical bond or the group $-(L^1)_n-Alk-(L^2)_m-$ wherein

n is 0 or 1,

L^1 is —S—,

Alk represents an alkylene group, an alkylene group interrupted by at least one hetero atom or a group containing a hetero atom, an arylene group, or an alkenylene group,

m is 0 or 1,

L^2 is —S—, —Se—, or $-N(R^2)-$, wherein R^2 is hydrogen or a C_1–C_4alkyl group;

X represents a C_1–C_{18}alkyl group, a C_1–C_{18}alkenyl group, an aryl group, or a heterocycle, which heterocycle may carry a fused on aromatic ring system; and

wherein at least one water-solubilizing group, more particularly a —COOM or $-SO_3M$ group with M is hydrogen, ammonium, a metal atom, or an organic amine, can be linked directly or indirectly to the molecule of said heterocyclic azole.

4,720,448

METHOD OF MANUFACTURING PHOTORELIEF PRINTING PLATE USING A LIQUID PHOTOPOLYMER

Carlton R. Mousseau, Sylvania, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

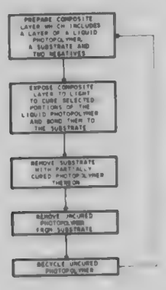
Filed Sep. 4, 1984, Ser. No. 646,881

Int. Cl.⁴ G03C *7/02*

U.S. Cl. 430—306 **4 Claims**

1. The method of manufacturing a photorelief printing plate comprising the steps of: preparing a composite layer comprising a layer of a liquid photopolymer, a first printing negative on one side of the liquid photopolymer, a second printing negative on the other side of the liquid photopolymer, said

second printing negative being substantially identical to said first printing negative and being in registration therewith, a transparent substrate between said liquid photopolymer and one of said printing negatives and in surface to surface contact with said liquid photopolymer and said one of said printing plates, said transparent substrate being bondable to said liquid



photopolymer upon the curing of said liquid photopolymer; curing selected portions of said liquid photopolymer by exposing said composite layer to light sources external to said first and second printing negatives to permit light to pass through said negatives; removing said printing negatives from said composite layer; and removing the uncured portions of said liquid photopolymer.

4,720,449

THERMAL IMAGING METHOD

Alan L. Borror, Andover, and Ernest W. Ellis, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 740,889, Jun. 3, 1985, abandoned. This application May 14, 1986, Ser. No. 861,377

Int. Cl.⁴ G03C *1/72*

U.S. Cl. 430—338 **16 Claims**

1. A heat-sensitive element comprising a support carrying at least one imaging layer of a substantially colorless di- or triarylmethane imaging compound possessing within its di- or triarylmethane structure an aryl group substituted in the ortho position to the meso carbon atom with a moiety ring-closed on the meso carbon atom to form a 5- or 6-membered ring, said moiety possessing a nitrogen atom bonded directly to said meso carbon atom and said nitrogen atom being bound to a group with a masked acyl substituent that undergoes fragmentation upon heating to liberate the acyl group for effecting intramolecular acylation of said nitrogen atom to form a new group in the ortho position that cannot bond to the meso carbon atom whereby said di- or triarylmethane compound is rendered colored.

4,720,450

THERMAL IMAGING METHOD

Ernest W. Ellis, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 740,885, Jun. 3, 1985, abandoned. This application May 15, 1986, Ser. No. 863,454

Int. Cl.⁴ G03C *1/72*

U.S. Cl. 430—339 **16 Claims**

1. A heat-sensitive element comprising a support carrying at least one imaging layer of a colored di- or triarylmethane imaging compound possessing in its di- or triarylmethane structure an aryl group substituted in the ortho-position to the meso carbon atom with a thermally unstable urea moiety, said urea moiety undergoing a unimolecular fragmentation reaction upon heating to provide a new group in said ortho position that bonds to said meso carbon atom to form a ring having 5 or 6 members whereby said di- or triarylmethane compound becomes ring-closed and rendered colorless.

4,720,451

SILVER HALIDE COLOR REVERSAL LIGHT-SENSITIVE MATERIAL

Sadanobu Shuto, and Naoyasu Deguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

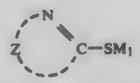
Filed Sep. 18, 1985, Ser. No. 777,143

Claims priority, application Japan, Sep. 18, 1984, 59-195408

Int. Cl.⁴ G03C *7/30, 7/26, 5/50*

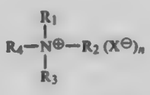
U.S. Cl. 430—379 **17 Claims**

1. In a method for developing a silver halide color reversal light-sensitive material after imagewise exposing which comprises at least a first black-and white development and a subsequent color development, wherein during the first development silver halide in the silver color reversal light-sensitive material is subjected to solution physical development, the improvement wherein the solution physical development is controlled by the presence of at least one compound represented by the later presented general formulae (I) to (IV), said silver halide color reversal light-sensitive material comprising a support having thereon at least one red-sensitive emulsion layer, at least one green-sensitive emulsion layer and at least one blue-sensitive emulsion layer, at least one layer of said light-sensitive material comprising (1) an emulsion containing tabular silver halide grains having a diameter/thickness ratio of at least about 4 and (2) at least one compound represented by the following general formulae (I) to (IV), said tabular silver halide grains being present in amount of at least about 50% of the total projected area of silver halide grains present in the same layer:



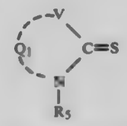
(I)

wherein M_1 represents a hydrogen atom, a cation or a group cleavable in alkaline conditions, and Z represents an atomic group necessary to form a 5-membered or 6-membered heterocycle, a substituted 5-membered or 6-membered heterocycle or a condensed ring containing a 5-membered or 6-membered heterocycle;



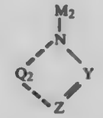
(II)

wherein R_1, R_2, R_3 and R_4, which may be the same or different, each represents an alkyl group, an aryl group or an aralkyl group (and the total number of carbon atoms in R_1 to R_4 is 20), provided that R_1, R_2 and R_3 may combine to form a heterocycle containing a quaternary nitrogen atom or R_1 and R_2 may combine to form a group containing a double bond bonded to the nitrogen atom and then form together R_3 a nitrogen-containing ring, $X^{\ominus}$ represents an anion, and n is 1 or is 0 when the compound forms an inner salt;



(III)

wherein R_5 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group, V represents O, S, Se or NR_6 wherein R_6 represents an alkyl group, an aralkyl group, an alkenyl group, an aryl group or a heterocyclic group, which may be the same or different from R_5, and Q_1 represents an atomic group necessary to form a 5-membered or 6-membered heterocycle or a condensed ring containing a 5-membered or 6-membered heterocycle; and



(IV)

wherein Y and Z, which may be the same or different, each represents a methine group, a substituted methine group or a nitrogen atom, Q_2 represents an atomic group necessary to form a 5-membered or 6-membered heterocycle or a condensed ring containing a 5-membered or 6-membered heterocycle, and M_2 represents a hydrogen atom or a cation selected from an alkali metal cation and an ammonium ion.

4,720,452

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hideki Takiguchi; Toshifumi Iijima; Toshihiko Yagi, and Yoshihiro Haga, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 679,597, Dec. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 519,552, Aug. 2, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,702

Claims priority, application Japan, Aug. 10, 1982, 57-139561

Int. Cl.⁴ G03C *1/02*

U.S. Cl. 430—567 **10 Claims**

1. A light-sensitive silver halide photographic material having silver halide emulsion layers on a support, wherein at least one layer of said silver halide emulsion layers contains surface latent image-forming mono-dispersed silver halide grains, and 50% or more of the silver halide grains contained in said at least one silver halide emulsion layer are core-shell silver halide grains containing cores comprising a silver halide containing silver iodide and shells comprising primarily silver bromide covering said cores and are the surface latent image-forming mono-dispersed silver halide grains of tetradecahedral regular crystals whose external surfaces have crystal faces (100) and (111), the area ratio of said (100) face and said (111) face represented by:

$$K = \frac{\text{Area of (100) face}}{\text{Area of (111) face}}$$

and satisfying the following formula:

$$\frac{100}{13} \leqq K \leqq \frac{100}{0.2}$$

wherein K is the ratio between the intensities of respective diffraction lines attributable to the (200) face at 30.9° of the diffraction angle which corresponds to the (100) face and the (222) face at 55° of the diffraction angle which corresponds to the (111) face measured in X-ray diffraction analysis as set forth in the following formula

$$K = \frac{\text{Diffraction line intensity due to (200) face}}{\text{Diffraction line intensity due to (222) face}}.$$

4,720,453

DETECTING ENVIRONMENTAL POLLUTANTS WITH PROTOPLASTS IN ALGINATE MATRIX

Heide Schnabl, Ottobrunn; Ulrich Zimmermann, Würzburg, and Gottfried Küppers, Heinsberg, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 633,872

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3327691

Int. Cl.⁴ G01N *33/18*

U.S. Cl. 435—4 **11 Claims**

1. Method of detecting environmental pollutants by determining noxious effect of a fluid environment on plant cell protoplasts comprising the steps of:

enhancing the sensitivity of protoplasts of plant origin to pollution and prolonging the senescence period of said protoplasts in a fibrous matrix of mesh sufficiently large to allow gas or waster to pass through said matrix and to have access to protoplasts immobilized therein, by:

suspending said protoplasts in an isotonic solution of a soluble alginable; and

bringing the alginate solution, in which said protoplasts are suspended, into contact with a solution containing ions of at least one metal selected from the group consisting of calcium and lanthanum to produce an alginate matrix holding said protoplasts therein;

exposing protoplasts immobilized in said matrix to contact with a fluid medium containing at least one material having a noxious effect on living plant matter; and

measuring intensity of at least one biochemical-physiological process of the exposed protoplasts subject to change by the noxious effects of pollutants, and comparing the process intensity measurement with a corresponding process intensity in the absence of pollution.

7. Indicator material for detecting pollutants comprising protoplasts of plant origin enmeshed in a fibrous lanthanum alginate matrix of small enough mesh to immobilize said protoplasts and of great enough mesh to allow passage of gas and water through said matrix, said indicator being ready for use by virtue of having been kept in contact with a nutrient solution from the time of making until the time of using.

4,720,454

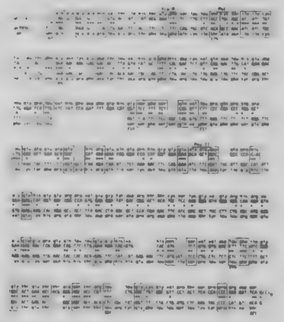
GENETIC PROBE USED IN THE DETECTION OF ADRENAL HYPERPLASIA

Perrin C. White, 3001 Henry Hudson Pkwy., Bronx, N.Y. 10463; Bo Dupont, Braxmar Dr. S., Winfield Glen, Harrison, N.Y. 10528, and Maria I. New, 435 E. 70th St., New York, N.Y. 10021

Filed Apr. 18, 1984, Ser. No. 601,650

Int. Cl.⁴ C12Q *1/68*; C12N *15/00*

U.S. Cl. 435—6 **3 Claims**



1. cDNA probe pC21a (ATCC 39663) capable of binding to

genomic human DNA diagnostic for congenital C21 hydroxylase deficiency adrenal hyperplasia in humans.

4,720,455

PROGESTERONE ASSAY METHOD FOR MAMMALS AND MONOCLONAL ANTIBODY THEREFOR

Uma M. Babu, Voorhees, N.J.; Abdus S. Mia, Fairless Hills, and Gregory D. Pascari, Gardenville, both of Pa., assignors to Pitman-Moore, Inc., Terre Haute, Ind.

Filed Sep. 6, 1985, Ser. No. 773,398
Int. Cl.[4] G01N *33/53*; C12N *15/00*
U.S. Cl. 435—7 25 Claims

1. A method of assaying progesterone in a bodily fluid derived from a female mammal which comprises the steps of:
(I) immersing into a vessel holding a competitive solution comprising
(a) a solution containing a known concentration of progesterone bound to an enzyme, and
(b) a known volume of said bodily fluid containing an unknown concentration of progesterone to be assayed,
a solid support carrying on the surface thereof and bound thereto, a monoclonal antibody to progesterone that is produced by the hybridoma continuous cell line designated by ATCC Accession Number HB 8886;
(II) removing said solid support from the competitive solution;
(III) immersing said solid support in a vessel holding an enzyme assay solution which comprises a chromogen or a substrate-chromogen combination which develops a color or shade upon exposure to said enzyme, said color or shade being proportional to the amount of enzyme; and
(IV) comparing the degree of coloration or shade in said enzyme assay solution to a standard.

19. The hybridoma continuous cell line designated by ATCC Accession Number HB 8886.

20. The monoclonal antibody produced by the hybridoma continuous cell line designated by ATCC Accession Number HB 8886.

23. A test kit for the assay of the concentration of progesterone in a bodily fluid of a female mammal, which comprises:
a solution containing a known concentration of progesterone bound to an enzyme;
a washing solution;
a solution of a chromogen which changes color or shade by the action of the enzyme;
a volume of said bodily fluid containing a known concentration of progesterone;
pipettes for the transfer of said solutions; and
a solid support carrying on the surface thereof a monoclonal antibody to progesterone that is produced by the hybridoma continuous cell line designated by ATCC Accession Number HB 8886.

4,720,456

TREHALOSE LIPID TETRAESTERS

Fritz Wagner, Stockheim; Egbert Ristau, Wolfsburg; Zu-yi Li; Siegmund Lang, both of Brunswick; Walther Schulz, Staufenberg; Hans-Jurgen Hofmann, Vechta; Kai-Udo Sewe, Barnstorf, and Walter Lindorfer, Kassel, all of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

Continuation of Ser. No. 609,120, May 11, 1984, abandoned.
This application Aug. 20, 1986, Ser. No. 898,838
Int. Cl.[4] C12P *19/44*; C12N *1/28*; C07G *11/00*
U.S. Cl. 435—74 6 Claims

1. A process for increasing the yield of trehalose lipids comprising the steps of cultivating a trehalose lipid-producing microorganism capable of utilizing n-alkanes aerobically in a sterilized aqueous culture suspension with a nutrient medium containing hydrocarbons at a temperature range of from 15° C. to 50° C., under limited growth conditions by maintaining the pH between 3 and 8 by addition of a nitrogen-free alkaline compound, stirring 10 to 20 g/l portions of an organic solvent selected from the group consisting of kerosene and a mixture of about 89 vol. % of C_{14} and about 9 vol. % of C_{15} n-paraffins into the culture suspension over the period of time during which logarithmic growth takes place at intervals of 14 to 59 hours which will not arrest the growth of said microorganism, lowering the temperature at the end of the logarithmic growth period and isolating the resulting mixture of trehalose lipids from the culture suspension.

4,720,457

SELECTIVE PRODUCTION OF ETHYL ACETATE AND ACETALDEHYDE BY MICROORGANISMS

David W. Armstrong; Stanley M. Martin, both of Ottawa, and Hiroshi Yamazaki, Nepean, all of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Continuation of Ser. No. 684,109, Dec. 20, 1984, abandoned.
This application Jun. 9, 1986, Ser. No. 873,826
Int. Cl.[4] C12P *7/62, 7/24*
U.S. Cl. 435—135 10 Claims

1. A method of producing acetaldehyde comprising:
(a) inoculating an ethanol containing aqueous medium with ethanol-acclimatized cells of an organism selected from *Candida utilis* ATCC 9950, *Hansenula anomala* ATCC 2102 and strains of said organisms possessing similar oxidation characteristics; and
(b) fermenting said medium resulting from step (a) at a pH between 2 and 8 with the provisos that ethanol concentration is maintained above 35 g/L and up to approximately 65 g/L and conditions are maintained substantially free of dissolved iron and at temperatures from about 21° C. up to that known to support viability of the organism to yield acetaldehyde.

9. A method of switching between the production of acetaldehyde and the production of ethyl acetate in the same fermentation comprising:
(a) inoculating an ethanol containing aqueous medium with at least one organism selected from *Candida utilis* ATCC 9950, *Hansenula anomala* ATCC 2102 and strains of said organisms possessing similar oxidation characteristics;
(b) fermenting said medium under conditions substantially free of dissolved iron at a pH of about 7, and at temperatures from about 21° C. up to that known to support viability of the organism, and
(c) switching from acetaldehyde production to ethyl acetate production by reducing the concentration of ethanol to below about 35 g/L or from ethyl acetate production to acetaldehyde production by raising the concentration of ethanol to above about 35 g/L.

4,720,458

HEAT SENSITIVE BACTERIAL ALKALINE PHOSPHATASE

Cornelius W. Sullivan, 5629 Marialinda St., Torrance, Calif. 90503; Hiroaki Shizuya, 1632 Indiana Ave., South Pasadena, Calif. 91030, and Hiromi Kobori, 1-8, Toyotama, Kita, Nerima-ku, Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,435
Int. Cl.[4] C12N *9/16*; C12Q *1/42, 1/68*
U.S. Cl. 435—196 2 Claims

1. The process for producing alkaline phosphatase having the characteristic of being inactivated by heating to a temperature of at least 50° C. for at least 10 minutes comprising the steps of:
isolating the microorganism HK-47 (ATCC 39469);
cultivating said microorganism in an aqueous solution containing assimilable quantities of carbon, nitrogen and oxygen; and
purifying the enzyme alkaline phosphatase from said culture of microorganisms.

4,720,459

MYELOMAS FOR PRODUCING HUMAN/HUMAN HYBRIDOMAS

Jeffrey L. Winkelhake, Emeryville, Calif., assignor to Medical College of Wisconsin Research Foundation, Inc., Milwaukee, Wis.

Filed Feb. 14, 1985, Ser. No. 701,921
Int. Cl.[4] C12N *5/00, 15/00*; C12R *1/91*
U.S. Cl. 435—240.2 3 Claims

1. A human myeloma having the identifying characteristics of the myeloma deposited with ATCC designation CRL 8644.

4,720,460

PROCESS FOR PRESERVING ACID PRODUCING BACTERIA AND COMPOSITIONS PRODUCED THEREBY

Jeffrey T. Barach, Elkhart, and Bassie J. Kamara, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 4, 1985, Ser. No. 719,895
Int. Cl.[4] C12N *1/04, 1/20*; A01N *63/00*; A23C *9/12*
U.S. Cl. 435—260 9 Claims

1. A method of preserving acid-producing bacteria which comprises suspending the acid-producing bacteria in a stablizing amount of an aqueous buffered solution containing a buffering agent and polyethylene glycol as a cell stabilizing carrier in the amount of 0.1–10% weight/volume, said solution being free of a specific fermentable substrate for the bacteria, thereby providing a suspension of bacteria having enhanced viability.

4,720,461

SUCCINATE-SENSITIVE, NODULATION-ENHANCING RHIZOBIUM MUTANTS FOR USE WITH LEGUMES

James E. Urban, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed Sep. 8, 1986, Ser. No. 905,280
Int. Cl.[4] C12N *1/20*
U.S. Cl. 435—253 8 Claims

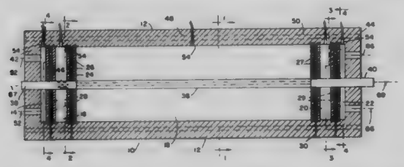
1. A viable culture of a succinate-sensitive, nodulation-enhancing strain of Rhizobium, comprising a mutant of a Rhizobium species exhibiting normal growth in a minimal growth medium containing succinate as the only carbon source at a succinate concentration below the minimum concentration permitting normal growth of the wild-type species of the mutant, said mutant strain inducing an average formation of at least two times as many nodules on a legume host plant for the species as the wild-type species.

4,720,462

CULTURE SYSTEM FOR THE CULTURE OF SOLID TISSUE MASSES AND METHOD OF USING THE SAME

Robert Rosenson, 6408 Irwin Ct #1, Oakland, Calif. 94609

Filed Nov. 5, 1985, Ser. No. 794,968
Int. Cl.[4] C12M *3/04*
U.S. Cl. 435—285 18 Claims



1. A culture apparatus for tissue culture growth, comprising:
a straight culture tube;
a plurality of gas-permeable and cell-impermeable essentially rigid hydrophobic tubes within said culture tube extending parallel to a central longitudinal axis of said culture tube and arranged in a radially symmetric pattern;
a plurality of essentially rigid hydrophilic, cell-impermeable tubes within said culture tube extending parallel to said horizontal axis and arranged in a radially symmetric pattern;
said culture tube being longitudinally divided into five distinct chambers as follows:
a culture chamber within said culture tube;
a liquid supply chamber within said culture tube;
a gas supply chamber within said culture tube;
a liquid return chamber within said culture tube, said liquid return chamber and said liquid supply chamber being positioned so that said culture chamber is positioned therebetween;
a gas return chamber within said culture tube, said gas return chamber and said gas supply chamber being positioned so that said culture chamber is positioned therebetween;
a plurality of radially extending seals within said culture tube, said seals defining passages therein for said hydrophilic and hydrophobic tubes, each of said seals separating one of said chambers from an adjoining chamber;
each of said hydrophobic tubes extending from the gas supply chamber, through said culture chamber, to the gas return chamber;
each of said hydrophilic tubes extending from the liquid supply chamber, through said culture chamber, to the liquid return chamber;
a conduit for conveying a tissue culture filtrate away from said culture tube, said conduit being positioned outside said culture tube;
a central tube within and cocentric with said culture tube and extending from one end of said culture tube to said conduit;
said central tube having a first solid-walled portion extending from an end of said culture tube closest said liquid supply chamber to said liquid supply chamber, said first solid-walled portion including means defining radially arranged holes in said solid wall for diffusing liquid within said central tube into said liquid supply chamber; a macroporous section extending from one end of said culture chamber to the other, a plug sealing the interior of said central tube between said holes and an end of said liquid supply chamber closest said culture chamber, and a second solid-walled portion extending between said culture chamber and said conduit.

4,720,463

AUTOMATED MICROBIOLOGICAL TESTING APPARATUS

Glenn L. Farber, Port Jefferson; Maria C. Navarro, North Massapequa; Manfred K. Hegemann, Nyack; Samuel G. Cohen, Pleasantville, and Cameron O. Cox, Mossey, all of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 1, 1985, Ser. No. 707,339
Int. Cl.[4] C12M *1/34*; G01N *21/75*
U.S. Cl. 435—291 21 Claims

1. An automated microbiological testing apparatus comprising an incubation chamber for incubating a plurality of microbiological test trays such as susceptibility trays and identification trays, said trays each having a plurality of wells, an inspection station at which the test trays may be inspected to determine the results of the microbiological tests, means for moving any predetermined test tray as desired from the incubation chamber to the inspection station, said moving means including a track running from the incubation chamber at least to the inspection station along which the test trays are moveable, a plurality of carriers for carrying one or more trays each, said

carriers being moveable along said track from the incubation chamber to the inspection station, and means for processing the

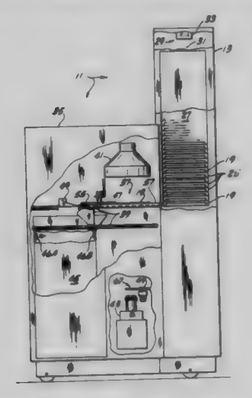


image of the test tray at the inspection station to determine test results.

4,720,464

ELECTROLYTES FOR KARL FISCHER COULOMETRIC TITRATION

Sinichi Kuwata, Machida; Hiromasa Katoh, Hachiouji, and Mitsumasa Ono, Ebina, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,589

Claims priority, application Japan, Dec. 28, 1983, 58-248005; May 7, 1984, 59-90432

Int. Cl.⁴ G01N *33/18*

U.S. Cl. 436—42 **7 Claims**

1. An electrolyte for Karl Fischer Coulometric titration which contains effective amounts of

A. iodine or an iodine compound

B. SO_2

C. a halogenated hydrocarbon or an aromatic hydrocarbon, and

D. an amine component

wherein said amine component is taken from Class 1 or Class 2 wherein Class 1 consists of:

(i) a first amine of Formula I,

(ii) a second amine of Formula II, wherein the molar ratio of said first amine to said second amine is in the range of 0.3 to 10, and

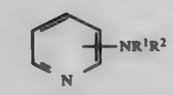
(iii) 30 to 70 weight % of a monohydric alcohol, or 5 to 50 weight % of a polyhydric alcohol or an ether compound thereof of Formula III

wherein Class 2 consists of:

(i) said first amine or said second amine and

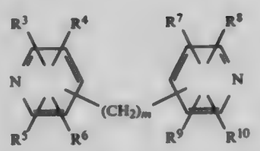
(ii) 5 to 50 weight % of said polyhydric alcohol or said ether compound thereof,

wherein the weight percentages are based on said electrolyte, wherein the molar ratio of total amines to sulfur dioxide in the electrolyte is from 0.3:1 to 6:1, and wherein Formula I is:



(I)

wherein R^1 and R^2 each represents a hydrogen atom, an alkyl group, a pyridyl group or a pyrrolidinyl group; Formula II is:



(II)

wherein R^3 to R^{10} each represents a hydrogen atom or an alkyl group, and m is an integer of 1 to 5; and Formula III is:

$$R^{11}O-(CH_2)_n-OR^{12} \quad \text{(III)}$$

wherein R^{11} and R^{12} each represents a hydrogen atom or an alkyl group, an n is 2 or 3.

4,720,465

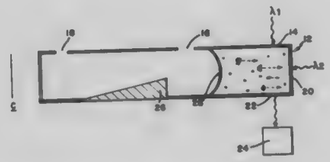
CENTRIFUGAL KINETIC AGGLUTINATION ASSAY

Mona D. Jensen, Hampstead, N.H.; Kwok K. Yeung, Malvern, Pa.; Pih-Kuei C. Huang, Lexington, Mass.; Brian B. Lentrichia, Mahway, N.J., and Robert J. Dummel, White Plains, N.Y., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed May 14, 1985, Ser. No. 733,688

Int. Cl.⁴ G01N *33/557, 33/543, 33/551, 33/546*

U.S. Cl. 436—523 **8 Claims**



1. A method for the determination of a target binding pair member in a sample which comprises:

(a) admixing the sample with a reagent containing stably suspended particles, the particles being coated with a member selected from the group consisting of binding pair members complementary to the target binding pair member and binding pair members competitive with the target binding pair member, the mixture further containing complementary binding pair member when the coated member is competitive;

(b) subjecting the mixture during reaction between binding pair members to a centrifugal force sufficient to differentially change the concentration of particles in the mixture at a locus relative to the total concentration of particles in the mixture, the rate of such change being a function of the degree of agglutination of the particles;

(c) measuring the light transmission or scattering at the locus at a plurality of points of time during reaction and application of centrifugal force; and

(d) comparing the change in light measurement over time at the locus for the mixture containing sample with changes in light measurement over time at the locus for mixtures containing standard samples of known concentration of the target pair member.

4,720,466

Patent Not Issued For This Number

4,720,467

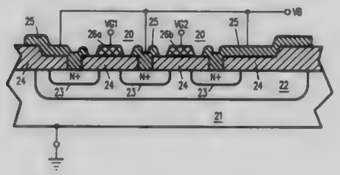
METHOD OF FORMING A CAPACITOR-TRANSISTOR INTEGRATED CIRCUIT

Raymond A. Muggli, San Jose, and Terence P. McCaffrey, Cupertino, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1986, Ser. No. 913,832

Int. Cl.⁴ H01L *21/38, 29/94*

U.S. Cl. 437—52 **7 Claims**



1. In an integrated circuit, the method of forming a capacitor structure at the same time as structure for transistors, each having a source, drain and gate, said method comprising the steps of:

providing a substrate;

forming a well of a first conductivity type in the substrate;

forming a high concentration impurity region of a second conductivity type in the well to form a first capacitor plate at the same time that impurity regions for the source and drain of the transistors are formed;

forming an oxide layer having access holes over the first-mentioned impurity region to form the capacitor dielectric at the same time that an oxide layer for the gates of the transistors is formed;

forming a layer of high conductivity material over the first-mentioned oxide layer to form a second capacitor plate; and

forming a layer of metalization over the first-mentioned oxide layer which is connected to the high concentration impurity region via the access holes to provide electrical connection to the first capacitor plate.

4,720,468

PROCESS FOR THE PRODUCTION OF A MONOLITHIC INTEGRATED OPTICAL DEVICE INCORPORATING A SEMICONDUCTOR LASER AND DEVICE OBTAINED BY THIS PROCESS

Louis Menigaux, 85 Avenue des Tilleuls, 91440 Bures-sur-Yvette; Alain Carenco, 4 Rue Paul-Henry Thilloy, 92340 Bourg-la-Reine, and Pierre Sansonetti, 61 Chemin de la Vallée aux Wryn, 92290 Chatenay Malabry, all of France

PCT No. PCT/FR85/00067, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/04491, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 29, 1985, Ser. No. 800,601

Claims priority, application France, Mar. 30, 1984, 84 05053

Int. Cl.⁴ H01L *21/306*

U.S. Cl. 437—129 **4 Claims**

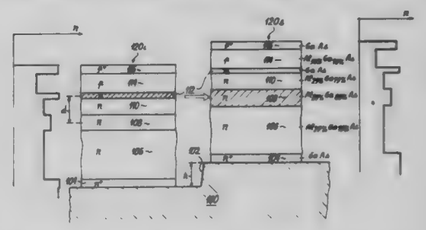
1. A process for the production of a planar monolithic integrated optical device incorporating at least one semiconductor laser and an optical waveguide by stacking semiconductor layers by epitaxy on a substrate, wherein it comprises the following operations:

the substrate is given a profile having at least one step of height (h) between two different height levels, namely a lower level and an upper level;

on said substrate is deposited by a single vapour phase epitaxy operation and in a successive manner a first confinement layer, a guidance layer made from a material transparent for the radiation emitted by the laser, a second confinement layer, an active layer, a third confinement layer and a contact layer, to form a lower stack on said lower level and an upper stack on said upper level;

the transparent material is chosen in such a way that its refractive index is higher than the indices of the confinement layers surrounding it;

thickness values are given to the transparent guidance layer, the second confinement layer and the active layer such that the distance (d) separating the median planes of the active layer and the transparent guidance layer is equal to



the height (h) of the substrate step, thereby the active layer of the lower stack is located at the same level as the transparent guidance layer of the upper stack, the lower stack constituting a laser emitting radiation in the plane of the active layer, said radiation penetrating into and being guided by the transparent guidance layer of the upper stack serving as an optical guide;

etching said third confinement layer and said contact layer of the upper stack, thereby leading to a planar upper face.

4,720,469

METHOD FOR DIFFUSING ALUMINUM

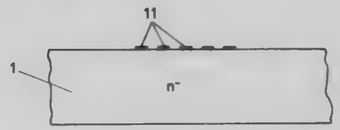
Helmut Keser, Birr, and Jan Voboril, Nussbaumen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

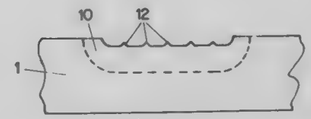
Filed Apr. 11, 1986, Ser. No. 850,541

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520699; European Pat. Off., Oct. 12, 1985, 85112967.6

Int. Cl.⁴ H01L *21/385*

U.S. Cl. 437—143 **19 Claims**





1. A method for producing a semiconductor device with at least one deep, laterally limited p^+-type doped zone comprising the following steps:

(a) bombarding a major face of a silicon wafer with rare gas ions, thereby enhancing the adhesion of a subsequently deposited aluminum layer on said major face,

(b) depositing an aluminum layer on said major face by cathode sputtering in a non-corroding gas plasma,

(c) structuring said aluminum layer according to a predeter-

minable pattern for the purpose of generating at least one deep, laterally limited p^+-type doped zone, and

(d) heating silicon wafer coated with said aluminum layer in an oxygen containing atmosphere to a diffusion temperature for a time sufficient to diffuse aluminum from the aluminum layer into the silicon wafer to produce said p^+-type doped zone.

4,720,470

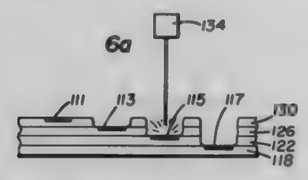
METHOD OF MAKING ELECTRICAL CIRCUITRY

Morgan Johnson, Woodside, Calif., assignor to Laserpath Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 561,917, Dec. 15, 1983, abandoned. This application Apr. 3, 1986, Ser. No. 847,935

Int. Cl.⁴ H01L *21/22*

U.S. Cl. 437—173 **28 Claims**



1. A method of making an electrical circuit on at least a portion of an integrated circuit chip where the portion has no prededicated functions, said method including the steps of:

providing an integrated circuit chip having:

a first layer having layer a plurality of first electrical pathways, each of said first electrical pathways having a plurality of first repeating patterns, each of said first repeating patterns including a plurality of mutually aligned first traces;

wherein the first traces in one of said first electrical pathways are aligned with the first traces in another of said first electrical pathways such that all of said first traces are capable of being cut along a first cut path;

said first layer further having a plurality of first electrical connecting pathways that interconnect said first repeating patterns of said first electrical pathways so as to form a first grid;

a second layer located adjacent said first layer, said second layer having a plurality of second electrical pathways, each of said second electrical pathways having a plurality of second repeating patterns, each of said second repeating patterns including a plurality of mutually aligned second traces;

wherein the second traces in one of said second electrical pathways are aligned with the second traces in another of said second electrical pathways such that all of said traces are capable of being cut along a second cut path;

said second layer further having a plurality of second electrical connecting pathways that interconnect said second repeating patterns of said second electrical pathways so as to form a second grid;

said first cut path being aligned with said second cut path and said first traces being unaligned with second traces such that any of said first traces and any of said second traces can be cut along said first and second cut paths without cutting any other of said first and second traces; and

communicationg means for communicating between the first and second layers; and

using a directable energy beam to sever selectively at least one of;

a plurality of said first traces on said first layer at a point proximate to or on said first cut path, and

a plurality of said second traces at a point proximate to or on said second cut path,

to form a complete individual route along the uncut electrical pathways and electrical connecting pathways of said first and second layers and said communicating means.

4,720,471

ALUMINA PORCELAIN COMPOSITIONS

Minato Ando; Masaaki Ito, and Fumio Mizuno, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

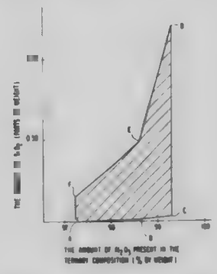
Filed Jan. 31, 1986, Ser. No. 824,472

Claims priority, application Japan, Jan. 31, 1985, 60-17564

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.⁴ C04B *35/10, 35/46*

U.S. Cl. 501—136 **1 Claim**



1. A sintered alumina porcelain composition consisting of a ternary composition consisting of from 97.2 to 99.3% by weight of Al_2O_3 and the remainder consisting of CaO and TiO_2 present in a CaO/TiO_2 weight ratio of from 0.55/1 to 0.77/1 and SiO_2, wherein based on 100 parts by weight of the ternary Al_2O_3—CaO—TiO_2 composition, SiO_2 is present in an amount within the range defined by the area defined by the straight lines connecting points A-B-C-D-E-F-A in the composition diagram set forth in the attached drawing showing the relationship between the SiO_2 content and the Al_2O_3 content, provided that point A is excluded from the range of the SiO_2 content, with said points having the following location:

	SiO_2 (parts by weight)	Al_2O_3 (% by weight)
Point A	0	97.2
Point B	0.01	99.6
Point C	0.03	99.3
Point D	1.20	99.3
Point E	0.48	98.6
Point F	0.14	97.2

4,720,472

HYDROCRACKING CATALYST FOR MIDDLE DISTILLATES

Stephen L. Parrott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 8, 1985, Ser. No. 763,592

Int. Cl.⁴ B01J *27/19, 31/00, 27/051, 21/08*

U.S. Cl. 502—211 **9 Claims**

1. A catalyst composition comprising nickel, molybdenum, and phosphorus impregnated on a support consisting of silica/-titania on alumina wherein the molar ratio of silica to titania ranges from about 10:1 to about 0.05:1, said nickel is present in the composition in an amount ranging from about 0.1 to about 5 weight percent based on the weight of said catalyst composition, and said molybdenum is present in the composition in an amount ranging from about 1 to about 15 weight percent based on the weight of said catalyst composition.

4,720,473

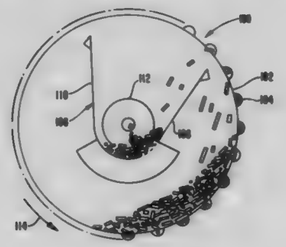
PRODUCTION OF IMPROVED CATALYST-TYPE PARTICLES USING LENGTH AND DENSITY GRADING

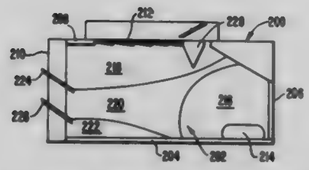
J. Gary Welch, and Robert E. Ellingham, both of Baltimore, Md., assignors to CRI International, Inc., Baltimore, Md.

Division of Ser. No. 837,690, Mar. 10, 1986. This application Aug. 7, 1986, Ser. No. 894,025

Int. Cl.⁴ B01J *38/72*; C10G *45/08*; B03B *4/00*; B07B *13/075*

U.S. Cl. 502—21 **11 Claims**





1. A process for treating a spent hydrotreating catalyst supported on a refractory metal oxide support comprising shaped, generally cylindrical, regular geometric particles having substantially the same diameter, varying length and an L/D greater than one, said spent catalyst particles having carbonaceous and metallic deposits resulting from a hydrocarbon feedstock;

passing said spent catalyst particles to a stripping zone in which volatilizable hydrocarbons are stripped from said withdrawn spent particles to render said catalyst particles free-flowing;

passing said free-flowing catalyst particles to a length grading zone comprising a rotating cylindrical drum having inwardly opening indentations in a cylindrical wall thereof, said indentions having a transverse diameter L_1 in the range of 0.8 to about 24 millimeters;

rotating said drum about a longitudinal axis thereof at a speed sufficient to entrap in the indentations and convey catalyst particles having a length below L_1 and an L/D greater than one upwardly to a height permitting the catalyst particles to fall into a fixed upwardly opening trough, while retaining catalyst particles having a length above L_1 and an L/D greater than one in a bottom portion of said drum; conveying the catalyst particles in the trough out a first outlet;

whereby said catalyst particles with a length less than L_1 are separated from the desired catalyst particles which have a length greater than L_1; said particles having a length greater than L_1 comprising lightly contaminated particles and more heavily contaminated catalyst particles; and

passing said catalyst particles from said bottom portion of said drum to a density grading zone in which lightly metals contaminated catalyst particles become suspended in a gas above more heavily metals contaminated catalyst particles, said more heavily contaminated catalyst particles being caused to move upwardly along an inclined, vibrating surface and are thereafter collected at a first density grading zone outlet, said lightly contaminated catalyst particles contacting a lower portion of said vibrating surface and are collected at a second density grading zone outlet; and

passing said lightly contaminated catalyst particles to a regeneration zone in which carbonaceous deposits are removed from said lightly contaminated catalyst particles by oxidation in the presence of an oxygen-containing gas to produce regenerated catalyst particles which are lightly contaminated with metals.

4,720,474

OLEFIN OXIDATION CATALYST SYSTEM

Janis Vasilevskis, Los Gatos; Jacques C. De Deken, Palo Alto; Robert J. Saxton, Mountain View; Paul R. Wentreek, Redwood City; Jere D. Fellmann, Livermore, and Lyubov S. Kipnis, Sunnyvale, all of Calif., assignors to Catalytica Associates, Mountain View, Calif.

Filed Sep. 24, 1985, Ser. No. 779,501

Int. Cl.⁴ B01J *31/02*

U.S. Cl. 502—165 **55 Claims**

1. A catalyst system useful for olefin oxidation to a carbonyl product which comprises:

(a) at least one polyoxoanion component which is a member selected from the group consisting of compounds which have the general formula:

$$[X_xM_aM'_bM''_cO_z]^{-m}$$

wherein

X is a member selected from the group consisting of B, Si, Ge, P, As, Se, Te, I, Co, Mn and Cu;

M, M′ and M″ are members independently selected from the group consisting of W, Mo, V, Nb, Ta and Re;

x is zero for isopolyoxoanions and mixed isopolyoxoanions;

x is an integer greater than zero for heteropolyoxoanions;

a, z and m are integers greater than zero;

b, c are integers; and

$a+b+c \geq 2$;

(b) at least one palladium component; and

(c) at least one nitrile ligand.

4,720,475

SILICA-PARTICLES CONTAINING ALUMINA, PROCESS FOR PREPARING SAME AND THE USE THEREOF

Octavian Anton, Brussels; Dirk Van Wouwe, Tisselt; Georges Poncelet, Beauvechain; Pierre Jacobs, Gooik, and Johan Martens, Brussels, all of Belgium, assignors to Redco N.V., Kapelle-op-den Bos, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 920,663

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538377

Int. Cl.⁴ B01J *21/12*

U.S. Cl. 502—250 **7 Claims**

6. A process for preparing substantially spherical silica particles obtained by the acidic hydrolysis of substantially spherical synthetic crystalline calcium silicates having a size of from 20 to 120 microns, characterized in that the calcium silicates are hydrolyzed in the pH range of from 0.6 to 5 using an acid which does not form a sparingly soluble calcium salt, a reactive aluminum compound is added to the reaction mixture, the reaction is allowed to proceed and the insoluble silica particles are collected.

4,720,476

CATALYST FOR DECREASING THE CONTENT OF NITROGEN OXIDES IN FLUE GASES

Michael Schneider, Ottobrunn-Riemerling; Hans J. Wernicke, Geretsried; Karl Kochloefl, Bruckmühl/Heufeld, and Gerd Maletz, Landshut, all of Fed. Rep. of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 11, 1986, Ser. No. 895,405

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3529060; Sep. 10, 1985, 3532226

Int. Cl.[4] B01J *20/12, 21/16*

U.S. Cl. 502—81 **14 Claims**

1. A catalyst for decreasing the content of nitrogen oxides in flue gases comprising at least one metal selected from the group consisting of titanium, zirconium, vanadium, tunsten, molybdenum and cerium in the form of one or more of their oxides and a clay mineral silicate with a three-layer structure comprising acid-activated, but not yet X-ray amorphous pyrophyllite whose crystalline layer structure is partly retained, and acid activation increasing the BET surface area at least 15% in terms of the BET surface area of the three-layer silicate before acid activation, and the atomic ratio of the silicon in the acid-activated three-layer silicate to the metal in the oxide being between 0.2 and 50.

7. A catalyst according to claim 1, wherein the metal oxides are individually present in the following ranges of concentration:

TiO_2: 10–80% by weight,

WO_3 and/or MoO_3: 1–25% by weight,

V_2O_5: 0.1–25% by weight, and

CeO_2: 1–25% by weight,

with the acid-activated three-layer silicate accounting for the rest of the active constituents.

8. A catalyst according to claim 1, wherein when present in a ternary combination, the metal oxides are present in one of the following percentages by weight:

(a) $(TiO_2+WO_3+$and/or $MoO_3+V_2O_5)=10–80$

(b) $(TiO_2+CeO_2+V_2O_5)=10–80$

(c) $(TiO_2+ZrO_2+V_2O_5)=10–80$

(d) (WO_3 and/or $MoO_3+CeO_2+V_2O_5)=10–25$

(e) (WO_3 and/or $MoO_3+ZrO_2+V_2O_5)=10–25$

with the acid-activated three-layer silicate accounting for the rest of the active constituents.

4,720,477

METHOD FOR CONVERTING COAL TO UPGRADED LIQUID PRODUCT

William P. Hettinger, Jr., Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 786,186, Oct. 10, 1985, abandoned, which is a continuation of Ser. No. 507,865, Jun. 27, 1983, abandoned. This application Jul. 23, 1986, Ser. No. 890,784

Int. Cl.[4] B01J *11/40, 23/00, 21/08*

U.S. Cl. 502—255 **17 Claims**

1. A method for preparing colloidal size particles of hydrogenation catalyst suitable for use in a coal liquefaction process involving a solvent which comprises:

(a) preparing by agitated mixing a cellusolve dispersion containing a colloidal support material selected from the group consisting of silica colloid, alumina colloid and alumina-coated silica colloid particle material,

(b) preparing an aqueous solution of two or more hydrogenation metal compounds

(c) slowly adding drops of said cellusolve dispersion comprising said selected colloidal support material to said aqueous solution of said hydrogenation metal compounds at a temperature and with agitation sufficient to avoid irreversible coagulation of colloids to form a dispersible colloid, and

(d) dispersing said dispersible colloid in a liquid which is miscible with said solvent used in said coal liquefaction process.

4,720,478

CATALYST FOR THE ORTHOMETHYLATION OF PHENOLS

Heinz-Werner Voges, Dorsten, and Arno S. Schmidt, Münster, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Division of Ser. No. 767,014, Aug. 19, 1985, Pat. No. 4,644,086. This application Aug. 29, 1986, Ser. No. 901,902

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430222

Int. Cl.[4] B01J *23/10, 23/78, 23/84, 23/88*

U.S. Cl. 502—303 **16 Claims**

1. A catalyst suitable for orthomethylation, consisting essentially of

(a) iron oxide,

(b) molybdenum oxide and/or tungsten oxide and

(c) at least one oxidre of the elements magnesium, calcium, barium, lanthanum, cerium or manganese,

said oxids being in a metal-atomic ratio of about

(a):(b):(c) of 100:0.2–10:0.2–10

wherein said catalyst is prepared by coprecipitation of the metal oxides or hydroxides from an aqueous solution of metallic salts to which a base has been added, drying resultant coprecipitate and calcining the resultant dried coprecipitate.

4,720,479

CARBONLESS PAPER SHEET MATERIALS

Amy J. K. Craig, Chicago, Ill.; Mark A. Burns, Lowell, Ind., and Mary J. Monjes, Bolingbrook, Ill., assignors to Daubert Coated Products, Inc., Chicago, Ill.

Filed Jun. 1, 1987, Ser. No. 56,394

Int. Cl.[4] B41M *5/16*

U.S. Cl. 503—200 **17 Claims**



1. A sheet material for use in the production of multi-part pressure sensitive adhesive labels, tags, tickets, and the like, consisting essentially of a base sheet of self-contained carbonless paper having an imageable side; and a continuous film of a silicone release agent on said imageable side of the self-contained carbonless paper.

4,720,480

SHEET FOR HEAT TRANSFERENCE

Yoshikazu Ito; Masanori Akada; Masaki Kutsukake, all of Tokyo; Mineo Yamauchi, Ichikawa; Masanori Saito, Tokyo; Atsushi Takano, Tokyo; Hideichiro Takeda, Tokyo, and Hitoshi Arita, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Feb. 26, 1986, Ser. No. 833,039

Claims priority, application Japan, Feb. 28, 1985, 60-39934; Feb. 28, 1985, 60-39935; Apr. 15, 1985, 60-79857

Int. Cl.[4] B41M *5/26*

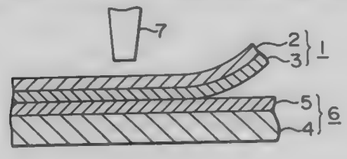
U.S. Cl. 503—227 **13 Claims**

1. A sheet to be heat transfer printed which is to be used in combination with a heat transfer sheet, comprising a receptive sheet having:

a base sheet;

a receptive layer for receiving a dye transferred from the heat transfer sheet upon being heated, said receptive layer comprising a resin; and

an intermediate layer provided between said base sheet and said receptive layer, said intermediate layer comprising a



resin having a 100% modulus of 100 kg/cm^2 or lower as defined under JIS-K-6301.

4,720,481

CYCLOHEXENYL PYRIDINE DERIVATIVES, ORGANOLEPTIC USES OF SAME AND PROCESSES FOR PREPARING SAME

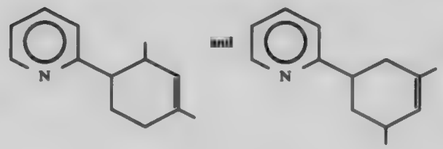
Richard M. Boden, Ocean, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 22, 1987, Ser. No. 53,349

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—10 **12 Claims**

1. A mixture of compounds having the structures:



4,720,482

PHARMACEUTICAL COMPOSITIONS CONTAINING ONE OR MORE LYMPHOCYTE GROWTH FACTORS

Harvey I. Cantor, Wellesley, and Gary Nabel, Newton, both of Mass., assignors to Dana Farber Cancer Institute, Boston, Mass.

Division of Ser. No. 433,510, Oct. 22, 1982, Pat. No. 4,613,459. This application Jun. 5, 1986, Ser. No. 870,835

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—2 **4 Claims**

1. A pharmaceutical composition, comprising a mammalian cell growth factor and a pharmaceutically acceptable carrier, said growth factor comprising (a) a protein having a molecular weight of approximately 14 kilodaltons and being functional to stimulate growth of both B and T lymphocytes, (b) a protein having a molecular weight of approximately 50 kilodaltons and being functional to stimulate growth of B lymphocytes, or (c) a growth factor having a molecular weight of approximately 45 kilodaltons and being functional to stimulate growth of mast cells.

4,720,483

OLIGOPEPTIDES AND INTERMEDIATES AND PROCESSES FOR THEIR MANUFACTURE

Hendrik S. Jansz, Zeist; Cornelis J. M. Lips, The Hague; Paul H. Steenbergh, Bunnik, all of Netherlands; Hans Rink, Riehen, and Peter Sieber, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 15, 1986, Ser. No. 819,168

Claims priority, application Switzerland, Jan. 16, 1985, 188/85

Int. Cl.[4] A61K *37/24;* **C07K** *7/10*

U.S. Cl. 514—11 **9 Claims**

1. A peptide fragment of human calcifonin gene related peptide of at least 37 amino acids up to 90 amino acids containing at least the 37 amino acid sequence of the formula

—Ala—Cys—Asn—Thr—Ala—Thr—Cys—Val—Thr—His—

—Arg—Leu—Ala—Gly—Leu—Leu—Ser—Arg—Ser—Gly—

—Gly—Met—Val—Lys—Ser—Asn—Phe—Val—Pro—Thr—

—Asn—Val—Gly—Ser—Lys—Ala—Phe—

the Cys resides within said 37 amino acid sequence being free or forming an intra- or inter-molecular disulfide bridge, said peptide being a fragment of human calcitonin gene related peptide; the carboxy terminus of said fragment being a free carboxy group or amidated by NH_2; the amino terminus of said fragment being a free amino group or acetylated; or a pharmaceutically acceptable salt thereof.

4,720,484

PEPTIDE COMPOUNDS HAVING A NITROGENOUS POLYCYCLIC STRUCTURE

Michel Vincent, Bagneux; Georges Remond, Versailles, and Claude Cudennec, La Celle St Cloud, all of France, assignors to ADIR S.A.R.L., Neuilly-sur-Seine, France

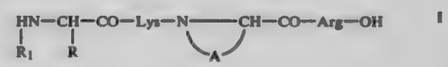
Continuation-in-part of Ser. No. 816,812, Jan. 6, 1986, abandoned. This application Nov. 20, 1986, Ser. No. 933,093

Claims priority, application France, Jan. 7, 1985, 85 00140

Int. Cl.[4] A61K *37/02;* **C07K** *5/10*

U.S. Cl. 514—18 **12 Claims**

1. A Compound of the general formula I



I

in which

R represents:

hydrogen atom,

straight-chain or branched alkyl radical containing from 1 to 5 carbon atoms, optionally substituted by a hydroxy, amino, mercapto, methylthio, methylsulphoxide, carboxy or guanidino group, or

benzyl or indol-3-ylmethyl radical optionally substituted by a hydroxy group,

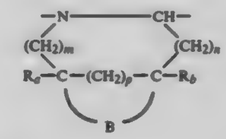
R_1 represents a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms,

Lys and Arg represent, respectively, the lysyl and arginyl residues linked through the peptide bonds.



represents

bicyclic structure of the formula:



wherein

m represents 1 or 0,

n and p each represents 0, 1 or 2,

R_a and R_b each represents a hydrogen atom or may together form a direct bond when p=0,

B represents an alkylene chain $(CH_2)q$ in which q repre-

sents 2, 3 or 4, or an unsaturated structure (—CH=CH—)$_2$ when p=0 and R_a and R_b together form a bond,

with the proviso that the sum of m, n, p and q is an integer of from 3 to 6, or,

1, 2, 3, 4-tetrahydro-β-carboline the enantiomers, epimers and diastereoisomers thereof, as well as the pharmaceutically acceptable acid or base addition salts thereof.

4,720,485

TRIPEPTIDES FOR CONTROL OF INTESTINAL MOTILITY

Irving Goodman, and Robert B. Hiatt, both of New York, N.Y., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 577,450, Feb. 6, 1984, Pat. No. 4,552,764, which is a continuation of Ser. No. 488,631, Apr. 26, 1983, abandoned, which is a continuation of Ser. No. 307,638, Oct. 1, 1981, abandoned, which is a continuation of Ser. No. 175,325, Aug. 4, 1981, abandoned, which is a continuation of Ser. No. 1,473, Jan. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 935,578, Aug. 31, 1979, abandoned, which is a continuation of Ser. No. 881,819, Feb. 27, 1978, abandoned, which is a continuation of Ser. No. 787,141, Apr. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 627,777, Nov. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,806, Nov. 14, 1974, abandoned. This application Sep. 24, 1985, Ser. No. 779,745

Int. Cl.^{4} C07K *5/08*

U.S. Cl. 514—18 **3 Claims**

1. Coherin A_2 which is a thermally stable peptide characterized as having an amino acid sequence glycine-serine-tyrosine soluble in water, slightly soluble in absolute ethanol, and insoluble in acetone, having a λ maximum of 273 nm at pH 3.5 and a corresponding minimum at 247 nm in the ultraviolet region of the spectrum and having the ability to control intestinal motility, and the pharmaceutically acceptable salts thereof.

4,720,486

METHOD OF INHIBITING VERTEBRATE COLLAGENASE ACTIVITY USING PEPTIDE HYDROXAMIC ACID DERIVATIVES

Curtis A. Spilburg, Chesterfield, and William M. Moore, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 789,271, Oct. 18, 1985, Pat. No. 4,687,841. This application Jan. 7, 1987, Ser. No. 1,265

Int. Cl.^{4} A61K *37/02*; C08F *283/00*

U.S. Cl. 514—18 **4 Claims**

1. A method of inhibiting vertebrate collagenase activity comprising treating a vertebrate collagenase-containing substrate with a collagenase inhibitory effective amount of a peptide hydroxamic acid derivative having the following structural formula:

R—Pro—Leu—Gly—NHOH

wherein R=H or N-protecting group or agarose.

4,720,487

BORNANE DERIVATIVES, THEIR PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Paris, France

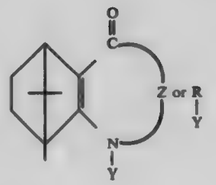
Filed Apr. 1, 1985, Ser. No. 718,065

Claims priority, application United Kingdom, Apr. 24, 1984, 8410484

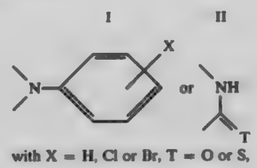
Int. Cl.^{4} A61K *31/70*

U.S. Cl. 514—43 **2 Claims**

1. Bornane derivatives of the formula:



wherein Z stands for:



with X = H, Cl or Br, T = O or S,

and y stands for an arabinose, xylose or ribose moiety, the acetylated form of the same, with either a pyranose or furanose configuration and bound to the R moiety of either the α or the β anomer.

2. A therapeutic composition comprising an effective amount, said effective amount being selected from the group consisting of an antivirally effective amount, an antibacterially effective amount, and a cardiovascularly effective amount, of a compound according to claim 1 in a pharmaceutically acceptable carrier.

4,720,488

2-PHENYLIMINO-1,3-THIAZOLIDIN-3-ORGANOPHOSPHORUS COMPOUNDS HAVING PESTICIDAL ACTIVITY

Yoshio Hayase, Kameyama; Mitsuhiro Ichinari, Suzuka; Kazuo Kamei, Edogawa; Junji Taguchi, Ichikawa; Katsuaki Oba, Kouka, and Toshio Takahashi, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

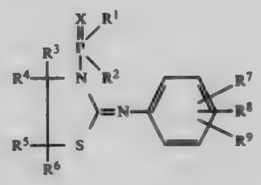
Filed Dec. 8, 1986, Ser. No. 939,104

Claims priority, application Japan, Dec. 7, 1985, 60-275297

Int. Cl.^{4} A01N *57/24*; C07F *9/65*

U.S. Cl. 514—92 **2 Claims**

1. A compound of the formula:



(I)

wherein R^1 and R^2 each represent C_1–C_5 alkoxy or C_1–C_5 alkylthio, R^3, R^4, R^5 and R^6 each represent hydrogen or C_1–C_5 alkyl, R^7, R^8 and R^9 each represent hydrogen, C_1–C_5 alkyl or halogen, and X represents oxygen or sulfur.

4,720,489

HAIR GROWTH MODIFICATION WITH ORNITHINE DECARBOXYLASE INHIBITORS

Douglas Shander, 5 Meadowgrass Ct., Gaithersburg, Md. 20878

Filed Oct. 15, 1984, Ser. No. 661,019

Int. Cl.^{4} A61K *31/56, 31/13, 31/195*

U.S. Cl. 514—171 **9 Claims**

1. The process of reducing the rate and altering the character of human hair growth which comprises the step of applying to the skin a composition containing an ornithine decarboxylase inhibitor.

8. A topical composition for reducing the rate and altering the character of human hair growth comprising from about 0.01 to about 20% by weight of an ornithine decarboxylase inhibitor in combination with from about 0.01 to 10% by weight of an anti-androgen selected from the group consisting of 5-alpha-reductase inhibitors and cytoplasmic androgen receptor-binding agents.

4,720,490

FLUORALKYLATEDCARBAPENEM DERIVATIVES

Ching P. Mak, and Hans Fliri, both of Vienna, Austria, assignors to Sandoz Ltd., Tokyo, Japan

Continuation of Ser. No. 517,513, Jul. 26, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 793,011

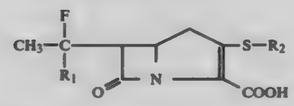
Claims priority, application Switzerland, Jul. 26, 1982, 4539/82; Sep. 24, 1982, 5654/82; Dec. 31, 1982, 7648/82

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.^{4} C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 **6 Claims**

1. A compound of the formula

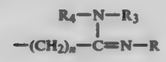


(I)

wherein

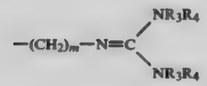
R_1 is hydrogen or methyl, and

R_2 is a substituent of the formula



(II)

or



(IIa)

wherein

R_4, R_5 and R_6 are the same or different and are hydrogen or lower alkyl or R_4 and R_5 are joined to form a ring in II and IIa, which rings are unsubstituted or mono- or poly-substituted by alkyl, hydroxy, carboxy or di-(lower)-alkylamino,

m is 2 or 3, and

n is 1, 2 or 3

or a salt thereof or a zwitterion thereof, with the proviso that when R_1 is hydrogen and the group containing it has R-configuration, R_2 is not acetylaminoethyl.

4,720,491

FLUORALKYLATEDCARBAPENEM DERIVATIVES

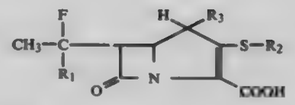
Ching P. Mak, and Hans Fliri, both of Vienna, Austria, assignors to Sandoz Ltd., Tokyo, Japan

Continuation of Ser. No. 657,220, Oct. 3, 1984, abandoned. This application Oct. 30, 1985, Ser. No. 793,017

Int. Cl.^{4} C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 **6 Claims**

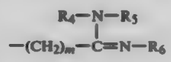
1. A compound of the formula



wherein

R_1 is hydrogen or methyl,

R_2 is a substituent of the formula



or —$(CH_2)_n$—R_7,

R_3 is methyl,

R_4, R_5 and R_6 are hydrogen or methyl, and

R_7 is —NH_2,

m is 1, 2 or 3, and

n is 0, 1, 2 or 3,

or a salt thereof or a zwitterion thereof.

4,720,492

QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINE SULFONIC ACIDS

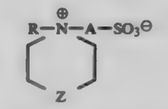
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 737,959, May 28, 1985, Pat. No. 4,578,243, which is a division of Ser. No. 226,300, Jan. 19, 1981, Pat. No. 4,569,992. This application Jan. 9, 1986, Ser. No. 817,328

Int. Cl.^{4} A01N *43/84*

U.S. Cl. 514—222 **2 Claims**

1. Process of treating water to inhibit bacterial growth therein comprising adding to said water an amount, effective to inhibit bacterial growth, of a compound having the formula



where R is alkyl, cycloalkyl, aralkyl and hydroxyalkyl, A is alkylene and Z is S, SO or SO_2.

4,720,493

THIENYLTHIAZOLE COMPOUNDS

Takeshi Kawakita, Nakatsu; Mitsuharu Sano; Mitsuyoshi Yasumoto, both of Fukuoka; Kunio Ohsuga, and Kei-ichiro Haga, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

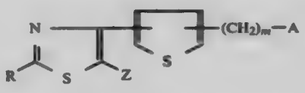
Filed Nov. 20, 1985, Ser. No. 799,989

Claims priority, application PCT Int'l Appl., Nov. 22, 1984, 00562

Int. Cl.^{4} C07D *417/04*; A61K *31/425*

U.S. Cl. 514—230 **4 Claims**

1. A thienylthiazole compound of the formula:

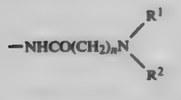


or a pharmaceutically acceptable acid addition salt thereof, wherein

R is (1) amino, (2) guanidino, (3) mono- or di-C_{1-6} alkylamino, (4) C_{2-5} alkenylamino, (5) mono- or diphenylamino which is unsubstituted or substituted on the

phenyl nucleus by at least one substituent selected from the group consisting of halogen, C_{1-4} alkyl, trifluoromethyl, C_{1-4} alkoxy, nitro and amino, (6) C_{2-5} alkanoylamino or (7) benzoylamino which is unsubstituted or substituted on the phenyl nucleus by at least one substituent selected from the group consisting of halogen, C_{1-4} alkyl, trifluoromethyl, C_{1-4} alkoxy, nitro and amino;

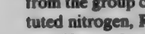
A is (1) amino, (2) mono- or di-C_{1-6} alkylamino, (3) a saturated 5 to 7 membered cyclic ring amino which may further contain at least one heteroatom selected from the group consisting of oxygen and optionally substituted nitrogen, (4) C_{2-5} alkanoylamino, (5) a group of the formula



in which each of R^1 and R^2 is hydrogen or C_{1-10} alkyl, or R^1 and R^2 together with the adjacent nitrogen atom form a saturated or unsaturated 5 to 7 membered heterocycle which may further contain at least one heteroatom selected from the group consisting of oxygen and optionally substituted nitrogen, and n is 0 or an integer of 1 to 3, (6) a group of the formula:



in which R^3 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{2-12} alkanoyl, (d) mono- or di-C_{1-5} alkylamino-C_{1-4} alkyl, or (e) phenyl, naphthyi, benzyl, 2-phenylethyl, 3-phenylpropyl, pyridyl, furyl or thienyl which is unsubstituted or ring-substituted by at least one substituent selected from the group consisting of halogen, amino, nitro, C_{1-4} alkyl, C_{1-4} alkoxy, mono- or di-C_{1-6} alkylamino, mono- or di-C_{1-5} alkylamino-C_{1-4} alkyl and a saturated 5 to 7 membered cyclic amino-C_{1-4} alkyl which may further contain, in the cyclic amino moiety, at least one heteroatom selected from the group consisting of oxygen and optionally substituted nitrogen, R^4 is hydrogen or C_{1-10} alkyl, X is oxygen or sulfur, and each of x, y and z is 0 or an integer of 1 to 3 provided that the sum of x, y and z is 3 or less, or (7) a group of the formula:



in which R^5 is phenyl, naphthyl, benzyl, 2-phenylethyl, 3-phenylpropyl, pyridyl, furyl or thienyl which is unsubstituted or ring-substituted by at least one substituent selected from the group consisting of halogen, amino, nitro, C_{1-4} alkyl, C_{1-4} alkoxy, mono- or di-C_{1-6} alkylamino, mono- or di-C_{1-5} alkylamino-C_{1-4} alkyl and a saturated 5 to 7 membered cyclic amino-C_{1-4} alkyl which may further contain, in the cyclic amino moiety, at least one heteroatom selected from the group consisting of oxygen and optionally substituted nitrogen;

Z is hydrogen or halogen; and

m is 0 or an integer of 1 to 4.

4,720,494

ANTICHOLINERGIC EUCATROPINE ESTERS AND ANTIPERSPIRANT USE THEREOF

Carl Felger, College Park, Md., and Edith Shulman, Grapevine, Tex., assignors to The Gillette Company, Boston, Mass.

Filed Nov. 5, 1984, Ser. No. 668,049

Int. Cl.⁴ A61K *31/495, 31/445;* **C07D** *401/12, 211/46*

U.S. Cl. 514—252 **10 Claims**

1. An ester of eucatropine having reduced mydriatic potency when compared with eucatropine and having a significant antiperspiranty potential as measured by the standard mouse foot antiperspirance assay, in which the ester group is benzoate, p-toluate, p-methoxybenzoate, p-chlorobenzoate, p-nitrobenzoate, 4-dimethylaminobenzoate, α-chlorophenylacetate, isonicotinate, nicotinate, picolinate, 2-pyrazinecarboxylate, 3-quinolinecarboxylate, 4-quinolinecarboxylate, cyclopentanecarboxylate, cyclohexanecarboxylate, cyclohexylacetate, isobutyrate, or octanoate.

4,720,495

BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACIDS USEFUL FOR TREATING BACTERIAL INFECTION

Atsushi Takagi; Masao Yajima; Toshiaki Kikuchi, all of Tokyo, and Masaki Saeki, Matsudo, all of Japan, assignors to Tokyo Tanabe Co. Limited, Japan

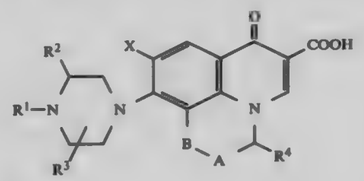
Filed May 20, 1986, Ser. No. 865,530

Claims priority, application Japan, May 24, 1985, 60-110226; May 24, 1985, 60-110227

Int. Cl.⁴ A61K *31/495;* **C07D** *403/04, 401/04*

U.S. Cl. 514—253 **19 Claims**

1. A benzo[ij]quinolizine-2-carboxylic acid of the following formula:



Wherein

A is a methylene group and B is a carbonyl group when A and B are linked by a single bond, or

A and B unite together to form a vinylene group when A and B are linked by a double bond,

R^1 is a hydrogen atom, an alkyl group of 1 to 3 carbon atoms or a 2-hydroxyethyl group,

R^2 and R^3 are hydrogen atoms, methyl groups or ethyl groups and may be identical to or different from each other, R^3 may be attached to the same carbon atom as R^2,

R^4 is a methyl or ethyl group, and

X is a halogen atom;

or a physiologically acceptable salt thereof, or a hydrate of the compound or the salt.

18. Method of using a compound or salt or hydrate of claim 1 for treating bacterial infection in a living subject which comprises administering to such a subject a therepeutically effective amount of such derivative or salt or hydrate of claim 1.

4,720,496

PYRIDOTRIAZOLOQUINAZOLINES AND TRIAZOLOPYRIDOQUINAZOLINES USEFUL AS ANTIALLERGICS

Kurt Schromm, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth, Ingelheim am Rhein, and Armin Fügner, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

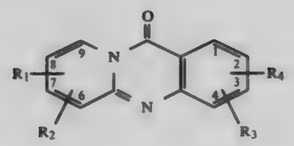
Continuation of Ser. No. 565,141, Dec. 23, 1983, abandoned. This application Jun. 4, 1986, Ser. No. 870,365

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300477

Int. Cl.⁴ A61K *31/505;* **C07D** *471/14*

U.S. Cl. 514—257 **8 Claims**

1. A compound of the formula



wherein

(a)

R_1 is hydrogen, lower alkyl, lower alkoxy or 8-halo;

R_2 is hydrogen, lower alkyl, lower alkoxy or a fused benzene ring; and

R_3 and R_4, together with each other, are —N=N—NH—; or

(b)

R_1 and R_2, together with each other, are —N=N—NH—;

R_3 is hydrogen, lower alkyl, lower alkoxy, 2-halo, 3-halo or 4-halo; and

R_4 is hydrogen, lower alkyl, lower alkoxy or a fused benzene ring;

and non-toxic, pharmacologically acceptable salts thereof formed with an inorganic or organic base.

7. An antiallergic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antiallergic amount of a compound of claim 1.

8. The method of preventing or suppressing allergic reactions in a warm-blooded animal in need thereof, which comprises perorally, parenterally, topically or by inhalation administering to said animal an effective antiallergic amount of a compound of claim 1.

4,720,497

6-PURINYL N-/2-CHLOROETHYL/CARBAMATE AND THIOCARBAMATE AND PROCESS FOR THE PREPARATION THEREOF

Antonin Ceray; Jiri Krepelka, both of Prague; Milan Melka, Hradec Kralova; Milan Miko, Bratislava; Stanislava Pokorna, Prague; Ruzena Reichlova, Prague; Irena Kejhova, Prague; Marta Beitova, Prague, and Jaroslava Grimova, Prague, all of Czechoslovakia, assignors to SPOFA, Spojene Podniky pro Zdravotnickou Vyrobu, Prague, Czechoslovakia

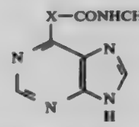
Filed Dec. 23, 1985, Ser. No. 812,139

Claims priority, application Czechoslovakia, Dec. 22, 1984, 10291-84

Int. Cl.⁴ C07D *473/30;* **A61K** *31/52*

U.S. Cl. 514—262 **5 Claims**

1. 6-Purinyl N-(2-chloroethyl)carbamate and thiocarbamate of the formula I



(I)

in which X stands for a bivalent uni-atomic link selected from the group consisting of an oxygen and sulfur atom.

4,720,498

2-ALKYL-THIOERGOLINES AND THEIR USE FOR TREATING ANXIETY

Graham H. Timms, Camberley, and David E. Tupper, Reading, both of United Kingdom, assignors to Lilly Industries Limited, London, England

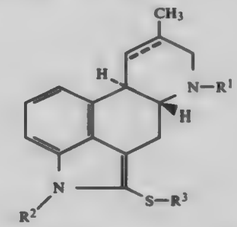
Filed Oct. 28, 1985, Ser. No. 791,856

Claims priority, application United Kingdom, Oct. 31, 1984, 8427536

Int. Cl.⁴ A61K *31/48;* **C07D** *457/02*

U.S. Cl. 514—288 **7 Claims**

1. A compound of the formula



(I)

in which R^1 is hydrogen or C_{1-4} alkyl, R^2 is hydrogen, C_{1-4} alkyl, hydroxy C_{1-4} alkyl, C_{1-4} alkoxy C_{1-4} alkyl, HSC_{1-4} alkyl, C_{1-4} alkyl-S-C_{1-4} alkyl, C_{1-4} alkylthio, or Ph—$(CH_2)_n$—S—, and R^3 is hydrogen, C_{1-4} alkyl, or Ph—$(CH_2)_n$—, where n is 0–2 and each Ph is phenyl or phenyl substituted with a substituent selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, and halo; and salts thereof.

7. A method of treating an animal, including a human, suffering from mild anxiety, which comprises administering an effective amount of a compound of formula (I) as defined in claim 1 or a pharmaceutically-acceptable salt thereof.

4,720,499

TREATING BLOOD VESSEL DISEASES WITH PYRIDO[4,3-B][1,6]NAPHTHYRIDINE-DERIVATIVES

Jürgen Kleinschroth, Deuzlingen; Karl Mannhardt, Elzach-Oberprechtal; Bernd Wegner, and Günter Weinheimer, both of Deuzlingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

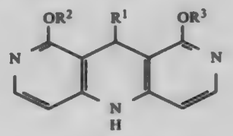
Filed Mar. 9, 1987, Ser. No. 23,585

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609795

Int. Cl.⁴ A61K *31/44;* **C07D** *471/14*

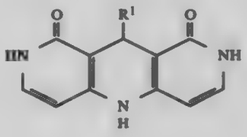
U.S. Cl. 514—293 **14 Claims**

1. A compound of the formula



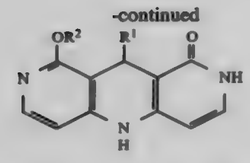
I

or a tautomer thereof selected from the group consisting of



(Ia)

-continued



(Ib)

wherein R^1 is unsubstituted phenyl; phenyl substituted at the 2- or 3-position by halogen, methoxy, difluoromethoxy, cyano, methylthio or trifluoromethyl; phenyl disubstituted in the 2,3-position by methylenedioxy; phenyl disubstituted in the 2,3- or the 2,6-positions by trifluoromethyl or halogen which can be the same or different; naphthyl, or 2,1,3-benzoxadiazolyl and R^2 and R^3, which can be the same or different, are hydrogen, a straight or branched alkyl containing from one to four carbon atoms, or a pharmacologically acceptable salt thereof.

13. A vasospasmolytically effective pharmaceutical composition comprising an effective amount of a compound as defined in claim 1 in combination with a pharmaceutically acceptable carrier.

4,720,500

N-1,8-NAPHTHYRIDIN-2-YL AMIDES USEFUL AS IMMUNOSTIMULANTS

Claude Cotrel, Paris; Claude Guyon, St-Maur-des-Fosses; Gerard Roussel, Soisy-sur-Seine, and Gerard Taurand, Creteil, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jul. 10, 1986, Ser. No. 884,212

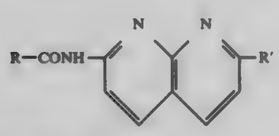
Claims priority, application France, Jul. 11, 1985, 85 10619; Jan. 16, 1986, 86 00555

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/44;* **C07D** *471/04*

U.S. Cl. 514—300 **8 Claims**

1. A substituted amide of the formula:



in which either:

(1) R represents 2-quinolyl, substituted phenyl (the substituent being bromine, chlorine in position -3, trifluoromethyl, alkyloxycarbonyl, or dialkylamino in position -4), dichlorophenyl, trialkyloxyphenyl, benzyl, styryl, benzoyl or anilino, and

R′ represents halogen, phenyl, anilino, or R′ represents phenoxy or 4-chlorophenoxy when R is 2-quinolyl, substituted phenyl (the substituent being bromine, chlorine in position -3, trifluoromethyl, alkyloxycarbonyl, or dialkylamino in position -4), trialkyloxyphenyl, benzyl or styryl, or R′ represents 4-fluorophenyl or 4-alkyloxyphenyl when R is 4-trifluoromethylphenyl or 4-dialkylaminophenyl, or R′ represents 3-bromophenyl when R is anilino, or

(2) R represents phenyl or alkyloxyphenyl and R′ represents phenyl, 4-chlorophenoxy, anilino or 1-pyrrolidinyl, or

R′ represents 2-(or 4-)chlorophenyl, 3-(or 4-)bromophenyl, 4-alkyloxyphenyl or 3,4-dichloro(or dibromo)phenyl when R is phenyl, or

(3) R represents phenyl substituted by halogen in position -3 and

R′ represents 3-(or 4-)fluorophenyl, 3-(or 4-)bromophenyl, 4-chdlorophenyl, 2-(or 3-)alkyloxyphenyl, 3-alkylphenyl, or 3,4-difluoro(dichloro or dibromo)phenyl:

the aforesaid alkyl radicals being straight-chain or branched and containing 1 to 4 carbon atoms each.

8. A pharmaceutical composition useful as an immunostimulant comprising an effective amount of an amide according to claim 1 in combination with one or more compatible, pharmaceutically acceptable diluents or adjuvants.

4,720,501

2-(2-THIENYL)-IMIDAZO(4,5-C)PYRIDINE DERIVATIVES AND SALTS THEREOF USEFUL IN THE TREATMENT OF MYOCARDIAL INSUFFICIENCY

Dieter Binder, Vienna, and Franz Rovenszky, Bruck an der Leitha, both of Austria, assignors to Chemi Linz Aktiengesellschaft, Linz, Austria

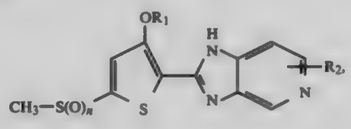
Filed Sep. 30, 1986, Ser. No. 913,235

Claims priority, application Austria, Oct. 9, 1985, 2919/85

Int. Cl.[4] A61K *31/44;* **C07D** *471/04*

U.S. Cl. 514—303 **6 Claims**

1. A 2-(2-thienyl)-imidazo(4,5-c)pyridine derivative of the formula



I

wherein R_1 denotes lower alkyl, R_2 denotes hydrogen or methyl and n denotes 0 or 1, or a pharmaceutically usable acid addition salt thereof of a compound of the formula I.

6. A method for the treatment of congestive heart failure which comprises administering an effective amount of a compound of formula I or an acid addition salt thereof as claimed in claim 1 to a patient suffering from congestive heart failure.

4,720,502

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES AND THEIR USE AS PESTICIDES

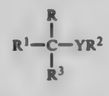
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,571

Int. Cl.[4] C07D *401/14;* **A61K** *31/44*

U.S. Cl. 514—333 **4 Claims**

1. A compound corresponding to the formula



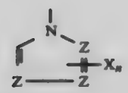
wherein

R represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents pyridyl pyridyl pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,720,503

N-SUBSTITUTED FUSED-HETEROCYCLIC CARBOXAMIDE DERIVATIVES AS DUAL CYCLOOXYGENASE AND LIPOXYGENASE INHIBITORS

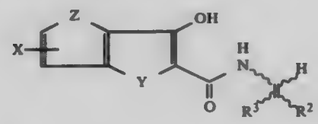
Bruce E. Witzel; Allan N. Tischler, both of Westfield, and Debra L. Allison, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 2, 1985, Ser. No. 761,946

Int. Cl.[4] A61K *31/38, 31/34;* **C07D** *495/02, 493/00*

U.S. Cl. 514—443 **3 Claims**

1. A compound of the formula:



wherein

X is

(a) H;

(b) loweralkyl;

(c) halologeralkyl: or

(d) loweralkenyl; and

Y and Z independently are S or O;

R^2 and R^3 independently are:

(a) loweralkyl;

(b) phenyl or substituted phenyl.

4,720,504

USE OF BIS-PLATINUM COMPLEXES AS ANTITUMOR AGENTS

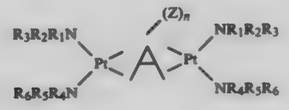
Peter J. Andrulis, Jr., Washington, D.C., and Paul Schwartz, Rockville, Md., assignors to Andrulis Research Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 608,743, May 10, 1984, Pat. No. 4,565,884, which is a continuation-in-part of Ser. No. 493,177, May 10, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 819,967

Int. Cl.[4] A61K *31/28*

U.S. Cl. 514—492 **21 Claims**

1. A method of delivering a diaminocyclohexane platinum-(II) moiety to a tumor susceptible to platinum(II) therapy in a mammal, which method comprises administering to the mammal an amount effective to deliver an antitumor effective amount of said moiety to said tumor of a bis-platinum complex having the formula



wherein A is a ligand having two pairs of platinum-coordinating acidic groups which are each independently a carboxylate, phenolate, sulfonate or phosphonate group, each said pair being capable of coordinating with a platinum ion to form a 5–10 membered chelate ring; Z is a water-solubilizing group; n is 0 or a positive integer, with the proviso that n is 0 only when at least one of said platinum-coordinating acidic groups is sulfonate or phosphonate, or when at least one platinum ion is a Pt(IV) ion; and R_1 and R_4 together form 1,2-cyclohexylene and R_2, R_3, R_5 and R_6 are each H; or a pharmaceutically acceptable salt thereof.

4,720,505

LEUKOTRIENE ANTAGONISTS

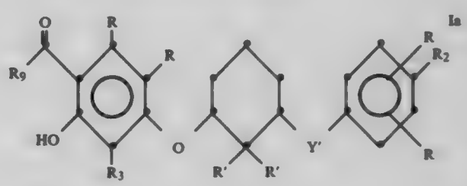
Patrice C. Bélanger; John W. Gillard, both of Quebec, and Joshua Rokach, Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 508,318, Jun. 27, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,784

Int. Cl.[4] C07C *149/40, 147/107, 143/67, 101/00, 151/00, 147/11, 147/13, 101/72*

U.S. Cl. 514—532 **4 Claims**

1. A compound having the formula Ia:



Ia

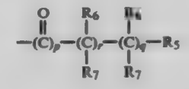
wherein

each R is independently H, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; trifluoromethyl; halogen; or $N(R_4)_2$;

each R′ is independently R_4 or OR_4;

Y′ is oxygen, sulfur, sulfoxide or sulfone;

R_2 is



wherein:

each R_4 is independently H or alkyl of 1 to 6 carbon atoms which may be straight chain or branched;

each R_6 is independently H or alkyl of 1 to 4 carbons;

each R_7 is independently H, OH, or alkyl of 1 to 4 carbons;

R_5 is $COOR_4$;

r and q are each independently 0 to 3; and

p is 0 or 1;

R_3 is alkyl of 1 to 6 carbon atoms which may be straight chain or branched; or alkenyl of 3 to 6 carbon atoms which may be straight chain or branched;

R_9 is alkyl of 1 to 6 carbon atoms which may be straight chain or branched; or a pharmaceutically acceptable salt or acid addition salt thereof.

4,720,506

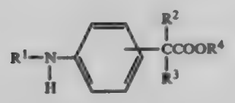
IMMUNOMODULATING AGENT

Hiroaki Munakata, Sagamihara; Makio Kobayashi, Machida; Kazuo Wagatsuma, Machida; Shigeru Sato, Machida; Makoto Tsurufuji, Tokyo; Hiroshi Enomoto, Kyoto; Makoto Sugiyama, Kyoto; Yoshihisa Shibata, Kyoto, and Iwao Morita, Kyoto, all of Japan, assignors to Nippon Shinyaku Company, Limited, Kyoto and Mitsubishi Chemical Industries Limited, Tokyo, both of, Japan

Continuation of Ser. No. 487,012, Apr. 21, 1983, abandoned.
This application May 4, 1987, Ser. No. 45,161
Claims priority, application Japan, May 11, 1982, 61-78893
Int. Cl.[4] A61K *31/24*
U.S. Cl. 514—538 13 Claims

1. A method of treating an autoimmune disease or an allergic disease, comprising:

administering to a subject suffering from said autoimmune disease a formulation of a pharmaceutically effective amount of a phenylacetic acid compound of the formula:



wherein R^1 is hydrogen or C_{2-7} alkanoyl; R^2 and R^3 are each independently hydrogen of a C_{1-4} alkyl; and R^4 is hydrogen or a C_{1-4} alkyl group, or a pharmaceutically acceptable salt thereof, with pharmaceutically acceptable additives.

4,720,507

BIOLOGICAL CONTRACEPTIVE AND CONTRACEPTIVE TECHNIQUE FOR MALES

John P. Wiebe, London, Canada, assignor to University of Western Ontario, London, Canada

Filed Mar. 5, 1984, Ser. No. 586,258
Int. Cl.[4] A61K *31/045*
U.S. Cl. 514—738 9 Claims

1. A method of male contraception comprising injecting a suitable quantity of 1,2,2-trihydroxypropane in a suitable pharmaceutical carrier into the testes.

4,720,508

HALOGENATED SATURATED HYDROCARBONS AND SATURATED HYDROCARBON IN COMBINATION AS ACARICIDAL COMPOUNDS

Jing-Jong Lu, and Radmilo A. Todorovic, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 789,100, Oct. 18, 1985, Pat. No. 4,657,936.
This application Dec. 11, 1986, Ser. No. 940,753
Int. Cl.[4] A01N *27/00, 29/02*
U.S. Cl. 514—758 4 Claims

1. An acaricidal composition comprising acaricidally effective amounts of a combination of two different compounds, wherein the first compound is octadecane and the second compound is selected from the group consisting of 1-chloroundecane, 1-chlorooctadecane, 1-chlorotetradecane, and 1-chlorohexadecane; and

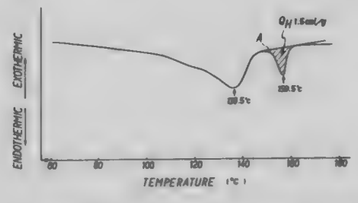
an inert chemical carrier.

4,720,509

PRE-EXPANDED PARTICLES OF PROPYLENE RESIN

Kyoichi Nakamura, Ibaraki, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1987, Ser. No. 53,662
Claims priority, application Japan, May 27, 1986, 61-121486
Int. Cl.[4] C08J *9/22*
U.S. Cl. 521—58 3 Claims



1. In a process for preparing pre-expanded particles of a propylene resin, which comprises

incorporating a blowing agent into propylene resin particles in a pressure vessel,

dispersing the particles into water with stirring,

heating the aqueous dispersion to a predetermined temperature under pressure, and

releasing the aqueous dispersion into a low pressure zone, the improvement which comprises releasing said dispersion at a temperature within a range of about (the melting temperature of the propylene resin particles +1)°C. to about (the meltng point of the propylene resin particles +7)°C., thereby producing pre-expanded particles of propylene resin having two melting temperatures as determined by differential scanning calorimetry, the heat of fusion Q_H for the peak based on the higher melting temperature being 0.5 to 2.3 cal/g.

4,720,510

PROCESS FOR PRODUCING PHENOLIC FOAMS

Gerald C. Marks, Cardiff; Keaneth C. Thomas, Wenvoe, both of Wales, and Per I. Quist, Astorp, Sweden, assignors to BP Chemicals Limited, London, England

Filed May 21, 1985, Ser. No. 736,551
Claims priority, application United Kingdom, May 25, 1984, 8413529; May 30, 1984, 8413789
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—114 14 Claims

1. A process for the production of phenolic foams by curing a phenolic resin with a blowing agent, a hardener, a cell stabilizer and a solvent compatible with the resin, characterised in that in the curing mixture

(a) the phenolic resin has a formaldehyde to phenol mole ratio from 1:1 to 2.5:1 and in combination with any of the solvent inherently present therein has a viscosity of 500–10000 centistokes at 25° C.,

(b) the blowing agent is a halogenated hydrocarbon,

(c) the hardener is a mineral acid,

(d) the cell stabilizer is derived by oxyalkylating castor oil or a hydrogenated derivative thereof with ethylene oxide or mixtures thereof with propylene oxide and/or butylene oxide,

(e) the total compatible solvents content of the reaction mixture inclusive of that present in the resin is from 7–30% by weight of which at least 40% by weight is water, and

(f) the temperature within the mass of the curing resin mixture does not exceed 85° C., and obtaining a foam having:

(i) a stable closed cell content greater than 80%,

(ii) k values less than 0.02 W/m°C. at 10° C.

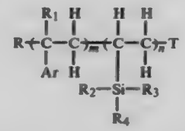
4,720,511

NONREACTIVE CLASS OF SURFACTANTS FOR FOAMING AGENTS IN PLASTICS

Gregory K. Rickle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 758,944, Jul. 25, 1985, Pat. No. 4,673,755.
This application Mar. 26, 1987, Ser. No. 30,185
Int. Cl.[4] C08J *9/00*
U.S. Cl. 521—139 5 Claims

1. The process of mixing a material or mixture of materials selected from the class of compositions of the following general formula



wherein

Ar is selected from the group consisting of phenyl, alkyl substituted phenyl, napthyl alkyl substituted alkyl groups wherein the alkyl substitution contains from 1 to 20 carbon atoms;

R is an alkyl radical containing 1–10 carbon atoms;

R_1 is hydrogen or methyl;

R_2, R_3, and R_4 are individually selected from the group consisting of alkyl and cycloalkyl groups varying from 1–10 carbon atoms, phenyl and alkyl or cyclo alkyl substituted phenyol;

m and v vary independently among the positive integers; and

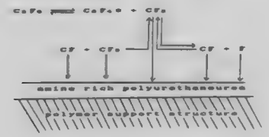
T is the radical obtained from chain termination as a surfactant to lower the surface energy of a hydrocarbon or mixture into essentially hydrocarbon character, which is polymerizable, and polymerizing the surfactant and hydrocarbon or mixture of essentially hydrocarbon character in the presence of an anionic initiator and an expanding agent.

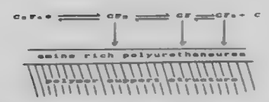
4,720,512

POLYMERIC ARTICLES HAVING ENHANCED ANTITHROMBOGENIC ACTIVITY

Can B. Hu, Dayton, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 24, 1986, Ser. No. 843,323
Int. Cl.[4] C08H *1/00*; A61F *1/00*; C08B *37/10*
U.S. Cl. 523—112 5 Claims





1. A process for imparting improved antithrombogenic activity to a polymeric support surface, which comprises:

(a) coating the polymeric support surface with an amine-rich material selected from the group consisting of a primary amine having a carbon chain length of 2 to 10,000, a polyalkylenimine having 2 to 4 carbon atoms per amine unit and mixtures thereof to give an amine rich surface.

(b) plasma-treating said amine-rich surface and a gaseous material in an ionization chamber whereby hydrophobic groups generated from said gaseous material are introduced to said amine-rich surface to give a hydrophobic amine-rich surface; and

(c) covalently bonding an antithrombogenic agent to said hydrophobic amine-rich material.

4,720,513

ADHESIVE COMPOSITION COMPRISING A CYANOACRYLATE COMPOUND WITH A SILYL ISOCYANATE TREATED SILICA GEL

Makoto Kameyama, Chiba; Masakazu Wakabayashi, Sakura, and Iwakichi Sugiyama, Narashino, all of Japan, assignors to Matsumoto Seiyaku Kogyo Kabushiki Kaisha, Ichikawa, Japan

Filed May 4, 1987, Ser. No. 46,392
Claims priority, application Japan, May 7, 1986, 61-104191
Int. Cl.[4] C08K *9/06, 3/36*
U.S. Cl. 523—203 5 Claims

1. An adhesive composition, which is made thixotropic or gelled by adding a silica gel treated with a silyl isocyanate to an α-cyanoacrylate.

4,720,514

PIGMENT CONCENTRATES FOR RESINS

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 710,887, Mar. 11, 1985, Pat. No. 4,600,736.
This application Feb. 13, 1986, Ser. No. 829,053
Int. Cl.[4] C08K *5/52*
U.S. Cl. 523—351 18 Claims

1. A resinous pigment concentrate comprising a major portion of a resinous polymer containing at least one polymerized conjugated diene monomer in proportions in the range from about 5 to about 40 weight percent, based upon the total resinous polymer; a minor portion of at least one pigment, and a dispersing additive comprising a partial ester of phosphoric acid wherein said partial ester of phosphoric acid is a phosphate ester selected from the group corresponding to the general formula



wherein R is a residue of an alkyl, alkaryl or aryl compound having at least 6 carbon atoms and a reactive hydrogen, selected from the group consisting of alkylphenols, aliphatic alcohols, fatty acids, fatty acid amides, fatty amines, rosin amines, alkyl sulfonamides, alkaryl sulfonamides, alkyl mercaptans or alkylaryl mercaptans, R' (is hydrogen, an alkyl radical of from 1 to 10 carbon atoms or an aryl radical) R'' (is hydrogen, an alkyl radical of from 1 to 10 carbon atoms or an aryl radical) n represents an integer of from 1 to 150, x represents an integer of 1 to 3, y represents an integer of from 0 to 2, and the sum of the integers of x and y is 3.

VOL 1086 ISS 3 JA 19 1988 UMI

4,720,515

EPOXY RESIN COMPOSITION FOR ENCAPSULATING SEMICONDUCTOR

Masatoshi Iji, Fuchu; Masayuki Kobayashi, Isehara, and Shinichiro Asai, Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1986, Ser. No. 863,882

Claims priority, application Japan, May 17, 1985, 60-103691; Nov. 26, 1985, 60-263914

Int. Cl.⁴ C08L *83/00, 63/00*

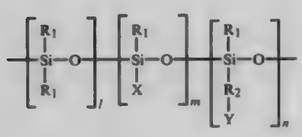
U.S. Cl. 523—435 **15 Claims**

1. An epoxy resin composition for encapsulating a semiconductor comprising:

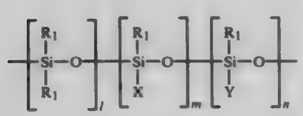
(a) an epoxy resin;

(b) a phenol resin;

(c) a phenol-modified silicon-containing compound obtained by reacting an organic silicone compound selected from the group consisting of a first organic silicone compound having an epoxy equivalent of from 500 to 20,000 and a molecular weight of from 2,000 to 200,000 represented by the following formulae (1-a) and (1-b), a second organic silicone compond having an epoxy equivalent of from 500 to 20,000 annd a molecular weight of from 2,000 to 200,000 represented by the following formula (2), and mixtures of said first and second organic silicone compounds, with from 0.2 to 10 molar equivalents of an organic silicon compound represented by the following formula (3) per molar equivalent of the epoxy group of the compound of the formulae (1-a), (1-b) and (2) and with a phenol resin;



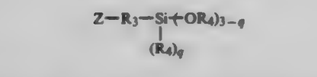
(1-a)



(1-b)



(2)



(3)

wherein in the formulae (1-a), (1-b) and (2) R_1 stands for a hydrogen atom, a methyl group, an ethyl group or a phenyl group, R2 for an alkylene group having 1 to 5 carbon atoms, X for an organic group containing an epoxy group, Y is a polyoxyalkylene group having a polymerization degree of from 5 to 500 and stands for a polyoxyethylene group, a polyoxypropylene group and a copolymer group thereof, and l, m, n, o and p each represents an integer; and wherein the formula (3) Z is a functional group reactable with an epoxy group and stands for a mercapto group, an amino group or a ureido group, R_3 for an alkylene group having 2 to 5 carbon atoms, R_4 for a methyl group or an ethyl group and q is 0, 1 or 2; and (d) an inorganic filler, wherein 5 to 50 parts by weight of (c) is present for each 100 parts by weight of (a).

4,720,516

COMPOSITE MATERIAL WITH IMPROVED PROPERTIES

Kazuo Kishida, Otake; Isao Sasaki, Saeki; Hiroshi Mori, Iwakuni, and Yasuaki Ii, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,378

Claims priority, application Japan, May 24, 1982, 57-87779

Int. Cl.⁴ C08K *7/00, 7/06, 7/22;* C08L *51/06*

U.S. Cl. 523—436 **15 Claims**

1. A polyolefin resin composition comprising:

(a) a polyolefin selected from the group consisting of polyethylene, polypropylene, poly(4-methylpentene-1), ethylene/vinyl acetate copolymer, ethylene/ethylacrylate copolymer, and ethylene/propylene/diene copolymer modified with from 0.05 to 0.8 parts by weight per 100 parts by weight of the polyolefin, of a grafted unsaturated carboxylic acid;

(b) no more than 10 weight %, based on the weight of said modified polyolefin, of a polyfunctional epoxide, polyfunctional amine, polyfunctional isocyanate or mixtures thereof with the proviso that the amount of any given polyfunctional agent is within the range of 0.03 to 5 weight %; and

(c) from 5 to 80 weight % of a reinforcing material, based on the weight of the modified polyolefin of

(i) a fibrous material selected from the group consisting of glass fibers, carbon fibers, graphite fibers, aromatic polyamide fibers, silicon carbide fibers, polysulfone fibers, polyether ketone fibers, alumina fibers, potassium titanate fibers, asbestos fibers, boron fibers or metal fibers; or

(ii) powdery or flaky materials selected from the group consisting of glass flakes, talc, mica, kaolin, clay, diatomaceous earth, calcium carbonate, calcium sulfate, magnesium oxide, carbon black, titanium oxide, powdered metal, alumina, graphite, white carbon, wollastonite, molybdenum disulfide and tungsten disulfide.

4,720,517

COMPOSITIONS STABILIZED WITH N-HYDROXYIMINODIACETIC AND DIPROPIONIC ACIDS AND ESTERS THEREOF

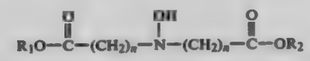
Ramanathan Ravichandran, Yonkers, and Thomas E. Snead, Dobbs Ferry, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,300

Int. Cl.⁴ C08K *5/32;* C10M *133/36*

U.S. Cl. 524—101 **13 Claims**

1. A composition of matter comprising a polymer, resin, mineral fluid or synthetic fluid subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of the formula



wherein R_1 and R_2 are independently hydrogen, alkyl of 4,8 or 14 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms; and n is 1 or 2.

4,720,518

COATINGS WHICH ARE ABRASION RESISTANT

Kohji Y. Chihara, Hudson; Hubert J. Fabris, Akron; Earl G. Melby; James L. Cowell, both of Uniontown, and Harry W. Cocuin, Cuyahoga Falls, all of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed Mar. 5, 1987, Ser. No. 22,182

Int. Cl.⁴ C08K *5/54;* C08L *43/00;* B32B *27/24*

U.S. Cl. 524—267 **21 Claims**

1. A composition useful as a coating comprising a solution in an organic solvent of (I) at least one chlorinated or brominated thermoplastic amide group containing polymer or resin in which the (—NH—) units have been changed to (—NBr—) or (—NCl—) units, (II) dispersed or dissolved in said solution at least one linear or branched siloxane or silicone compound which may be terminally saturated or terminally unsaturated having a viscosity of from about 25 to 2,750,000, or from about 50 to 300,000, centistokes at 25° C. and, optionally dispersed in said solution, (III) at least one finely divided material selected from the group consisting of inorganic and organic fillers and pigments having a particle size of from about 0.1 to 100, preferably from about 2 to 70, microns,

(I) being used in an amount of about 100 parts by weight,

(II) being used in an amount of from 5 to 80 parts by weight and

(III) being used in an amount of from 5 to 60 parts by weight.

4,720,519

PROCESS FOR THE PRODUCTION OF NON-FOAMED MOLDINGS

Wilfried Orywol, Overath; Fritz Ehrhard, Neuss, and Walter Uerdingen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 832,956

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507374

Int. Cl.⁴ C08K *9/12*

U.S. Cl. 524—450 **6 Claims**

1. A process for the production of area modified bubble-free non-foamed moldings in which

(a) an organic polyisocyanate is reacted in a closed or open mold using cast-resin technology with

(b) an organic polyhydroxyl compound and/or a polyepoxide in the presence of

(c) a water chain extender in the form of water adsorbed on either an alkali aluminosilicate or an alkali - alkaline earth aluminosilicate of the zeolite type, the water content based on the weight of said aluminosilicate being from about 4 to about 12 percent

in which the equivalent ratio of isocyanate groups in Component (a) to the hydroxyl and/or epoxide groups in Component (b) is from 1.1:1 to 6:1 and the water in (c) is present in a quantity which is at least equivalent to the isocyanate excess.

4,720,520

METHOD FOR IMPREGNATING ORGANIC FIBERS

Karl Hahn, and Ingomar Kovar, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 807,007, Dec. 9, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 39,811

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503457

Int. Cl.⁴ C08L *83/08*

U.S. Cl. 524—838 **3 Claims**

1. A method for impregnating organic fibers which comprises applying a composition containing (1) an organopolysiloxane having silicon-bonded condensable groups and diorganosiloxane units having two SiC-bonded monovalent hydrocarbon radicals and at least two monovalent SiC-bonded radicals having a basic nitrogen group in which the basic nitrogen groups are present in both monoorganosiloxane units and diorganosiloxane units of the same molecule and the sum of the number of monoorganosiloxane units and diorganosiloxane units having SiC-bonded radicals with basic nitrogen groups does not exceed about 20 percent of the total number of diorganosiloxane units; (2) an organopolysiloxane having at least three Si-bonded hydrogen atoms per molecule; and (3) a catalyst which promotes the condensation of the condensable groups.

4,720,521

FILM-FORMING SILICONE COMPOSITIONS HAVING LUBRICATING PROPERTIES

David E. Spielvogel, Springboro, and Richard J. Zdrahala, Dayton, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 3, 1985, Ser. No. 804,209

Int. Cl.⁴ C08L *83/04*

U.S. Cl. 524—862 **14 Claims**

1. A film-forming composition providing adhesion properties to a substrate in combination with lubricity, characterized by

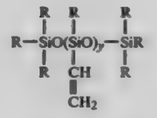
(a) a reactive component for providing adhesion, said reactive component comprising

(1) a first siloxane polymer having the formula selected from the group consisting of



(I)

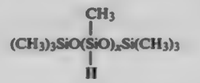
and



(II)

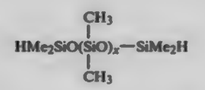
wherein R is selected from the group consisting of alkyl $C_{1\text{-}20}$, haloalkyl, aryl, haloaryl, cycloalkyl, silacyclopentyl, aralkyl and mixtures thereof; x is about 60 to about 1000; and y is about 3 to about 25;

(2) a siloxane cross-linking polymer of the formula



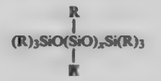
wherein x is about 8 to about 12 and

(3) a siloxane chain-extending polymer having the formula



wherein x is about 140 to about 160;

(b) a non-reactive lubricating siloxane polymer component of the formula



wherein R is selected from the group consisting of alkyl

C_{1-20}, haloalkyl, aryl, haloaryl, cycloalkyl, silacyclopentyl, aralkyl, and mixtures thereof; x is about 20 to about 1350,; and

(c) the mole ratio of vinyl groups to hydrogen groups is within the range of between about 0.010:1 and 0.20:1.

4,720,522

WATER REDUCIBLE ALKYD VINYL COPOLYMER RESINS

Roger A. Schmidt, Chanhassen, and Martin L. Hage, Maple Grove, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Sep. 3, 1986, Ser. No. 903,381
Int. Cl.[4] C08G 63/76; C08L 67/00; C08F 8/00
U.S. Cl. 525—43 30 Claims

1. A water reducible alkyd vinyl copolymer resin having an acid value in the range of from about 30 to about 70, comprising the reaction product of

from about 10 to about 90 percent by weight, based upon the weight of monomers and initiator which are reacted to provide the alkyd vinyl copolymer resin, of an alkyd resin which is the product of a polymerization reaction and which has an acid number in the range of from about 30 to about 70; and

from about 10 to about 90 percent by weight, based upon the weight of monomers and initiator which are reacted to provide the alkyd vinyl copolymer resin, of a vinyl resin which has an acid number in the range of about 30 to about 70;

the vinyl resin being the reaction product of

vinyl carboxylic acid monomer in an effective amount to provide the vinyl resin with an acid value in the range of from about 30 to about 70;

a non-carboxylic acid vinyl monomer having a polymerizable double bond and a molecular weight of about 5,000 or less; and

from about 1 to about 10 percent by weight, based upon the weight of the monomers and initiator in the reaction for the vinyl resin, of a free radical or ionic initiator for the polymerization of the vinyl monomers,

the vinyl resin and the alkyd resin each having acid numbers within 50 percent of the acid number of the alkyd vinyl copolymer resin, and the polymerization reaction for the alkyd resin being carried out in thepresence of the vinyl resin, or the reaction for the vinyl resin being carried out in the presence of the alkyd resin to provide the alkyd vinyl copolymer resin.

4,720,523

BLOCKED DIENEOPHILE FUNCTIONAL MODIFIED AMINOEPOXY RESINS

Ray A. Dickie, Birmingham, and Saiyed B. A. Qaderi, Livonia, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 679,975, Dec. 10, 1984, Pat. No. 4,657,979.
This application Dec. 10, 1986, Ser. No. 943,366
Int. Cl.[4] C08G 59/14; C08L 63/10
U.S. Cl. 525—113 9 Claims

1. A substantially gel-free dieneophile functional aminoepoxy resin of number average molecular weight (Mn) about 1000–18,000, comprising the reaction product of (i) diepoxide reactant, (ii) amine functional blocked dieneophile chain extending reactant consisting essentially of monoprimary amine functional blocked ene, (iii) modifying agent comprising hydroxy functional secondary amine, and (iv) second modifying agent selected from the group consisting of secondary amine terminated butadiene acrylonitrile copolymer resin, carboxy terminated butadiene acrylonitrile copolymer resin, and any mixture thereof, said second modifying agent having number average molecular weight about 1400–4400 and amine or carboxy, respectively, equivalent weight of about 700–2200.

4,720,524

ADHESIVE RESIN COMPOSITION

Tadayuki Ohmae; Mitsuyuki Okada, both of Chiba; Hiroshi Nagai, and Yutaka Mizumura, both of Shiga, all of Japan, assignors to Sumitomo Chemical Company, Ltd. and Toyobo Co., Ltd, both of, Japan

Continuation of Ser. No. 674,791, Nov. 26, 1984, abandoned.
This application Aug. 27, 1986, Ser. No. 902,085
Claims priority, application Japan, Nov. 26, 1983, 58-222796; Jun. 13, 1984, 59-121500
Int. Cl.[4] C08L 67/02
U.S. Cl. 525—173 1 Claim

1. An adhesive resin composition comprising from 40 to 80% by weight of component (A) and from 20 to 60% by weight of component (B), wherein said component (A) is a thermoplastic copolyester resin prepared from (1) a dicarboxylic acid component comprising from 60 to 95 mol% of terephthalic acid and from 5 to 40 mol% of isophthalic acid and (2) a low molecular weight glycol component comprising from 55 to 95% of 1,4-butanediol and from 5 to 45 mol% of diethylene glycol and further from 0.1 to 4 mol%, based on the total carboxylic acid, of polytetramethylene glycol having a number average molecular weight of from 600 to 6,000, which has a melting point of from 100° to 150° C. and a reduced viscosity of at least 0.5; and said component (B) is a copolymer of ethylene and 0.01 to 20 mol% of an unsaturated monomer having at least one functional group selected from the group consisting of an epoxy group, a carboxylic acid group, and a dicarboxylic anhydride group.

4,720,525

METHYLMETHACRYLATE/PHENYLMALEIMIDE COPOLYMER AND STYRENE/MALEIC ANHYDRIDE COPOLYMER CONTAINING POLYMER ALLOYS

Barry D. Dean, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 718,594, Apr. 1, 1985, Pat. No. 4,663,390, which is a division of Ser. No. 538,243, Oct. 3, 1983, Pat. No. 4,514,543. This application Nov. 14, 1986, Ser. No. 930,618
Int. Cl.[4] C08L 35/06, 39/04
U.S. Cl. 525—205 2 Claims

1. A polyblend comprising matrices of a first polymer, second polymer, and a third polymer, wherein

(a) the first polymer is a random copolymer of recurring units of methylmethacrylate and recurring units of N-phenylmaleimide,

(b) the second polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and from about 9.5 to about 12.5 weight percent recurring units of maleic anhydride and a random terpolymer of recurring units of styrene, from about 6 to about 9 weight percent recurring units of maleic anhydride and from about 3 to about 8 weight percent recurring units of N-phenymaleimide, and

(c) the third polymer is selected from the group consisting essentially of a ramdom copolymer of recurring units of styrene and recurring units of acrylonitrile and a random terpolymer of recurring units of styrene, recurring units of acrylonitrile and recurring units of N-phenylmaleimide;

wherein said first polymer is present in an amount of less than about 30 weight percent based on the polymer matrices.

4,720,526

CURED RUBBER COMPOSITIONS OF HIGH MODULUS

Charles M. Roland, Norton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 2, 1986, Ser. No. 869,629
Int. Cl.[4] C08F 4/00, 275/00
U.S. Cl. 525—273 16 Claims

1. Cured rubber compositions having modulii at 10% elongation of from about 50 MPa to about 200 MPa formed by curing, curable rubber compositions comprising:

(a) 100 parts by weight of a rubber selected from the group consisting of natural rubber, nitrile rubber, neoprene and blends thereof;

(b) from about 50 to about 100 parts by weight of a metal dimethacrylate selected from the group consisting of zinc dimethacrylate and magnesium dimethacrylate; and

(c) from about 1.0 to about 6.0 parts by weight of a peroxide curing agent;

at temperatures ranging from about 140° to about 180° C. for time periods ranging from about 10 to about 45 minutes.

4,720,527

NEW FUNCTIONALIZED PERFLUOROPOLYETHERS AND PROCESS FOR THE PREPARATION THEREOF

Gerardo Caporiccio, Milan; Gian T. Viola, Ravenna, and Giuseppe Marchionni, Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Nov. 13, 1986, Ser. No. 929,831
Claims priority, application Italy, Nov. 20, 1985, 22920 A/85
Int. Cl.[4] C07C 51/58, 49/04; C08G 65/32
U.S. Cl. 525—403 5 Claims

1. A process for the scission of perfluoropolyethers of the following classes:

(I) $R_fO(CF_2CF_2O)_nR_f$

(II) $A(CF_2CF_2CF_2O)_nB$

(III) $E(CF_2CF_2O)_m(C_3F_6O)_p(CF_2O)_q$

$$(CFO)_rD$$
$$|$$
$$CF_3 .$$

wherein

n, m, p, q, r are integers:

n varies from 2 to 200,

m, p, q and r vary from 1 to 100,

the sum m+p+q+r varies from 4 to 400,

R_f=CF_3 or C_2F_5,

A=F, OR_f,

B, D=perfluoroalkyls with 1 to 3 C,

E=F, OR'_f where R'_f is a perfluoroalkyl having 1 to 3 C;

which comprises heating the perfluoropolyethers of formulas I, II or III to temperatures ranging from 150° to 380° C. in the presence of a catalyst composed of fluorides, oxyfluorides or oxides of the transition metals selected from among Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zr, Mo, Zn or of Al, Sn, Sb.

4,720,528

SUBSTRATES WITH FLEXIBLE COATINGS FROM EPSILON-CAPROLACTONE MODIFIED ACRYLICS

Roger A. Etzell, Farmington Hills; Bertram J. Miller, Roseville, and Dennis J. Dziekan, Farmington Hills, all of Mich., assignors to BASF Corporation-Inmont Division, Detroit, Mich.

Continuation of Ser. No. 756,247, Jul. 17, 1985, abandoned, which is a division of Ser. No. 726,945, Apr. 26, 1985, Pat. No. 4,546,046, which is a continuation-in-part of Ser. No. 473,868, Mar. 10, 1983, abandoned. This application Aug. 13, 1986, Ser. No. 896,003
Int. Cl.[4] C08F 265/06, 283/00
U.S. Cl. 525—450 16 Claims

1. A coating composition consisting essentially of about 40 to 95% by weight of an epsilon-caprolactone modified acrylic polymer, about 0.5 to 35% by weight of an acrylic microgel resin and about 5 to 45% by weight of an aminoplast resin cross-linking agent, said epsilon-caprolactone modified acrylic polymer having a number average molecular weight of about 1,000 to 6,000, hydroxyl contents from about 1 to 7% by weight, and about 0.25 to 6 moles of epsilon-caprolactone per mole of hydroxyl in the polymer, said coating composition having a solids content of about 35 to 68% by weight and a liquid carrier of about 32 to 65% by weight, said acrylic microgel comprising a polymer prepared by polymerizing a mixture of ethylenically unsaturated monomers at least one of which is difunctional in ethylenic type unsaturation, and at least one of which contains a polar group in an aqueous emulsion in such a manner that microparticles are produced having polar groups oriented on the surface thereof, said polar groups maintained by cross-linking said ethylenically unsaturated monomers, said polar groups maintaining a gel structure in said coating composition.

4,720,529

UV-RAY CURABLE POLYURETHANE COMPOSITION AND COATED OPTICAL FIBER

Takao Kimura, Mito; Shinzo Yamakawa, Katsuta, and Ryotaro Ohono, Machida, all of Japan, assignors to Nippon Telegraph and Telephone Corporation and Japan Synthetic Rubber Company Limited, both of Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,304
Claims priority, application Japan, Mar. 29, 1985, 60-66080
Int. Cl.[4] C08F 283/04; C08G 18/10, 18/67
U.S. Cl. 525—454 10 Claims

1. A UV-ray curable resin composition, comprising a polyurethane having a polymerizable double bond, consisting essentially of units of:

(a) a diene polymer having one or more hydroxyl groups,

(b) a polyether polyol having a number average molecular weight of 300–5,000 in an amount of 0.1 to 5 moles per mole of said diene polymer having a hydroxyl group,

(c) a compound having a polymerizable double bond and a hydroxyl group in an amount of 0.6 to 1.6 moles per mole of the total amount of the diene polymer having the hydroxyl group and said polyether polyol, and

(d) a diisocyanate compound in an amount of 1.3 to 1.8 moles per mole of the total amount of the diene polymer having the hydroxyl group and said polyether polyol, wherein components (a),(b),(c) and (d) are bonded through urethane linkages.

4,720,530

RTV SILICONE PASTES WITH A SHORTENED HARDENING TIME

Thomas Würminghausen, Leverkusen, and Hans Sattlegger, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

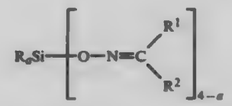
Filed Jul. 1, 1986, Ser. No. 880,622
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524452
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—18 8 Claims

1. A polyorganosiloxane composition which can be stored with exclusion of moisture hardens on access of moisture, comprising

(1) 100 parts by weight of an α,ω-dihydroxypolydimethylsiloxane with a viscosity of between 0.1 and 1,000 Pas,

(2) 0 to 100 parts by weight of an α,ω-bis(trimethylsiloxy)-polydimethylsiloxane with a viscosity of between 0.01 and 10 Pas,

(3) 1 to 10 parts by weight of an oximinosilane of the formula



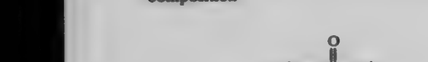
wherein

the symbol R is an alkyl or alkenyl radical with 1 to 4 C atoms,

R^1 and R^2 each independently of one another denote an alkyl radical with 1 to 4 C atoms or hydrogen or

R^1 and R^2 together denote an alkylene radical with 4 or 5 C atoms,

and wherein
a denotes 0 or 1,
(4) 5 to 250 parts by weight of a reinforcing or non-reinforcing filler or a filler mixture,
(5) 0.01 to 1 part by weight of a tin catalyst and
(6) 0.05 to 2.5 parts by weight of an aminoalkylalkoxysilane which contains one or more basic nitrogen atoms bonded with the silicone via at least 3 C atoms, and
(7) 0.05 to 2.5 parts by weight of an additive which accelerates crosslinking selected from the group consisting of
(a) unsubstituted or substituted alkyl or alkenylcarboxylic acids which have up to 20 C atoms and
(b) the silane derivatives of such carboxylic acids with the composition



wherein
R^3 denotes an alkyl or alkenyl radical with up to 4 C atoms,
R^4 denotes an unsubstituted or substituted alkyl or alkenyl radical which have up to 20 C atoms,
b can assume the values 0 to 3.

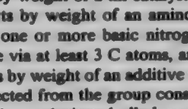
4,720,531

NOVEL SCAVENGERS FOR ONE-COMPONENT RTV COMPOSITIONS

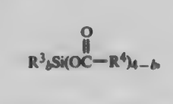
Rack H. Chung, deceased, late of Clifton Park, N.Y. (by Betsy A. Chung, executrix); Roger T. Swiger, Schenectady, N.Y., and Melvin D. Beers, Hudson, Ohio, assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 428,038, Sep. 29, 1982, abandoned. This application Sep. 29, 1986, Ser. No. 912,641
Int. Cl.⁴ C08G 77/06
U.S. Cl. 528—18 **21 Claims**

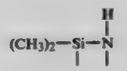
1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising:
(A) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least two alkoxy radicals;
(B) an effective amount of a condensation catalyst; and
(C) a stabilizing amount of scavenger for hydroxy functional groups selected from the group consisting of



and cyclic silazane scavengers having at least one or all of the units of the formula



and the rest of the units, if any, having the formula



where h is 0 or 1.

4,720,532

ORGANOPOLYSILAZANE PRECURSORS TO SILICON NITRIDE-RICH MIXED SIC/Si_3N_4

Dietmar Seyferth, Lexington, and Joanne M. Schwark, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 22, 1986, Ser. No. 899,471
Int. Cl.⁴ C08G 77/04
U.S. Cl. 528—28 **22 Claims**

1. A method for preparing preceramic organosilicon polymers, wherein the method comprises:
(a) reacting in solution anhydrous ammonia with a mixture of R^1SiHX_2, wherein R^1 is a lower alkyl group having from 1 to about 6 carbon atoms, a substituted or unsubstituted cycloalkyl group having from 3 to about 6 carbon atoms, a substituted or unsubstituted lower alkenyl group having from 2 to about 6 carbon atoms, or a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, and X is a halogen, and $RSiX_3$ wherein R is H. a lower alkyl group having from 1 to about 6 carbon atoms a substituted or unsubstituted cycloalkyl group having from 3 to about 6 carbon atoms, or a substituted or unsubstituted lower alkenyl group having from 2 to about 6 carbon atoms, or a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, thereby forming a mixture of precursor polymers; and
(b) reacting said precursor polymers in the presence of a basic catalyst capable of deprotonating the NH functions in said precursors to form said preceramic polymer.

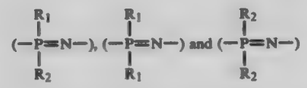
4,720,533

POLYORGANOPHOSPHAZENE CURABLE IN ATMOSPHERE

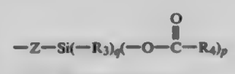
F. Alexander Pettigrew, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 22, 1986, Ser. No. 888,124
Int. Cl.⁴ C08G 77/04
U.S. Cl. 528—28 **32 Claims**

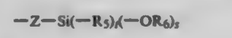
1. A polyorganophosphazene which is moisture curable, said polyorganophosphazene comprising a polymer having in any sequence and proportion, repeating units:



wherein R_1 is a substituted or unsubstituted alkoxide or aryloxide group and R_2 is a group selected from



or



wherein Z is an organo group, R_3 and R_5 are H or hydrocarbyl, R_4 is H or hydrocarbyl, R_6 is lower alkyl, p and s are integers from 1 to 3, q and t are integers from 0 to 2, (p+q) equal 3, and (s+t) equal 3.

4,720,534

NCO-TERMINATED COMPOUNDS FROM ADDUCTS OF MERCAPTO-FUNCTIONAL POLYHYDRIC ALCOHOLS AND VINYL-TYPE SILANES CONTAINING HYDROLYZABLE GROUPS

Debra L. Singer, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 816,079, Jan. 3, 1986, Pat. No. 4,652,664. This application Oct. 20, 1986, Ser. No. 920,396
Int. Cl.⁴ C08G 77/04
U.S. Cl. 528—28 **5 Claims**

1. An addition product of a mercapto-functional polyhydric alcohol and a vinyl-type silane having at least one hydrolyzable group directly attached to a silicon atom, said addition product prepared by reacting said mercapto-functional polyhydric alcohol and said vinyl-type silane in the presence of a free radical initiator wherein said addition product is chain extended by reaction with an organic polyisocyanate.

4,720,535

MOISTURE TEMPERED, STORAGE STABLE SINGLE COMPONENT POLYURETHANE SYSTEMS AND THEIR APPLICATION

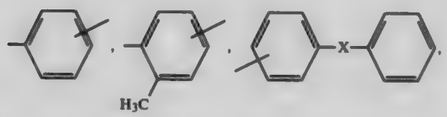
Gisbert Schleier, Heidelberg, and Friedrich Gerold, Haar, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

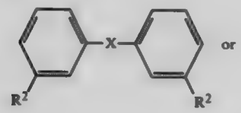
Filed Mar. 2, 1987, Ser. No. 20,951
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607996
Int. Cl.⁴ C08G 18/10
U.S. Cl. 528—59 **7 Claims**

1. A moisture tempered, storage stable single component polyurethane system comprising
(A) a polyurethane prepolymer having an NCO content of from 1 to 10 percent by weight, prepared by the reaction of a higher molecular weight polyol and an aromatic polyisocyanate;
(B) a polyaldimine having the formula



wherein:
R is an arylene radical having the structure







x is a $-CH_2-$, $-C(CH_3)_2-$, $-O-$, $-SO-$, $-SO_2-$ OR $-CO-$ bridge member;
R^2 is a linear or branched alkyl radical having from 1 to 4 carbon atoms;
m is a whole number from 1 to 4;
R^1 is a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, an alkoxy group having from 1 to 20 carbon atoms, or an alkoyloxy group having from 1 to 20 carbon atoms; and
n is a whole number from 2 to 6; and optionally including
(C) an aromatic and/or aliphatic carboxylic acid or toluenesulfonic acid; and optionally further including;
(D) auxiliary agents and/or additives.

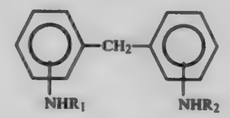
4,720,536

BLENDS OF SECONDARY ALKYL AROMATIC DIAMINES AND POLYHYDRIC ALCOHOLS AS CURING AGENTS IN POLYURETHANE MANUFACTURE

David W. House, Arlington Heights, and Ray V. Scott, Jr., Addison, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

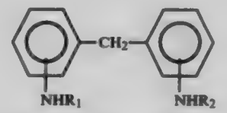
Filed Jun. 6, 1986, Ser. No. 871,226
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.⁴ C08G 18/10, 18/30; C09K 3/00
U.S. Cl. 528—60 **30 Claims**

11. A polyurethane resulting from the reaction of an isocyanate terminated urethane prepolymer, said prepolymer being the adduct of from about 1.5 to about 4.0 equivalents of a polyisocyanate with one equivalent of a polyol, with from about 0.80 to about 1.2 equivalent of a blend of a secondary aromatic diamine of the structure,



where each of the alkyl groups R_1 and R_2 contains from 1 to about 20 carbon atoms, and a polyhydric alcohol containing more than two reactive hydroxy groups per molecule, said blend containing from about 1 to about 19 equivalents amine pre equivalent polyhydric alcohol.

21. A blend for curing urethane prepolymers comprising a secondary aromatic diamine of the structure,



where each of the alkyl groups R_1 and R_2 contains from 1 to about 20 carbon atoms, and a polyhydric alcohol containing more than two reactive hydroxyl groups per molecule, the ratio of equivalents of amine to alcohol being from about 1:1 to about 19:1.

4,720,537

BRANCHED COPOLYETHERKETONES

Edward G. Brugel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1985, Ser. No. 802,027
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.⁴ C08G 8/02, 14/00
U.S. Cl. 528—125 **21 Claims**

1. A copolyetherketone consisting essentially of the condensation product of
(a) diphenyl ether
(b) one or more aromatic diacid halides or their related free acids; and
(c) (3/n)(0.25 to 33) mole %, based on total moles of diphenyl ether and aromatic diacid or diacid halide, of one or more branching agents selected from the group consisting of m-diphenoxybenzene and compounds of the for-

mula R-(COX)$_n$ and their related acids and anhydrides, where R is an aromatic moiety, X is a halogen, and n is an integer from 3 to 6; provided that, when the branching agent is m-diphenoxybenzene, its quantity is in the range of about 0.25 to 2 mole %.

4,720,538

PREPARATION OF AROMATIC POLYAMIDE WITH PHOSPHORUS CONTAINING CATALYST AND DIALKYLAMINO PYRIDINE COCATALYST.

Martin Bertmann, Recklinghausen, Fed. Rep. of Germany, assignor to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 888,729

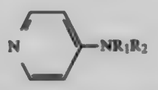
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526822

Int. Cl.^{4} C08G *69/28*

U.S. Cl. 528—336 **13 Claims**

1. A process for preparing an aromatic polyamide, comprising:

(i) polycondensing at least one aromatic dicarboxylic acid with at least one aromatic diamine, in solution, in the presence of (i) a phosphorous-containing catalyst, and (ii) a 4-dialkylaminopyridine of the formula



wherein R_1 and R_2 each, independently, is an alkyl group with 1 to 10 carbon atoms; or R_1 and R_2 together with the nitrogen atom to which they are both bound form a pyrrolidine or piperidine ring, as a cocatalyst, said polycondensation being run at a temperature above 180° C.; and

(ii) isolating at least part of the polyamide obtained.

4,720,539

POLYIMIDE PRECURSOR COMPOSITIONS, THEIR MANUFACTURE, THE RESULTANT POLYIMIDES AND THEIR USE, PARTICULARLY FOR MANUFACTURING ENAMELLING VARNISHES FOR ELECTRIC WIRES

Guy Rabilloud, Grenoble; Paul Marriagi, Seyssuel; Serge Gonzales, Saint Priest, and Bernard Sillion, Lyons, all of France, assignors to Centre d'Etudes des Materiaux Organiques pour Technologies Avancees, Vernaison, France

Continuation of Ser. No. 758,948, Jul. 25, 1985, abandoned. This application Sep. 10, 1986, Ser. No. 920,824

Claims priority, application France, Jul. 25, 1984, 84 11842

Int. Cl.^{4} C08G *69/26*

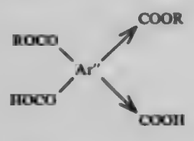
U.S. Cl. 528—353 **29 Claims**

1. A process for preparing a polyimide precursor composition comprising:

(a) a first step of reacting, within a solvent, at least one biprimary aromatic diamine of general formula (2):

$$NH_2—Ar'—NH_2 \quad (2)$$

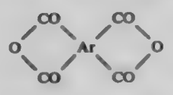
with at least one tetracarboxylic aromatic compound of general formula (3):



(3)

and,

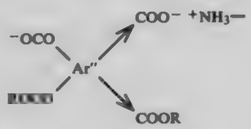
(b) a second step of reacting the product obtained in step (a) with at least one dianhydride of a tetracarboxylic aromatic acid of general formula (1):



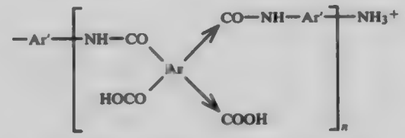
(1)

wherein Ar' is a divalent aromatic radical formed of one or more rings, the two valencies Ar' are on separate carbon atoms, not in ortho or peri position; Ar and Ar'' are tetravalent aromatic radicals formed of one or more rings, the four valencies of which are on separate carbon atoms placed by pairs in ortho or peri position; R is a hydrogen atom or a monovalent hydrocarbon radical, and the arrows indicate the isomerism possibilities, the reactants proportions being from 0.05 to 50 moles of compound of formula (3) and 90 to 110 moles of compound of formula (2) per 100 moles of all the compounds of formulas (1) and (3).

13. An alpha, omega-diamino polyamide-acid of the formula 4:



(4)



wherein Ar' is a divalent aromatic radical formed of one or more rings, the two valencies of Ar' are on separate carbon atoms, not in ortho or peri position; Ar and Ar'' are tetravalent aromatic radicals formed of one or more rings, the four valencies of which are on separate carbon atoms placed by pairs in ortho or peri position; R is a hydrogen atom or a monovalent hydrocarbon radical, and the arrows indicate the isomerism possibilities, and n is 1–2,000.

4,720,540

PROCESS FOR TREATING THERMOPLASTIC POLYMERS

Louis M. Maresca, Belle Mead, and James H. Kawakami, Piscataway, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 469,432, Feb. 24, 1983, abandoned. This application May 14, 1985, Ser. No. 734,245

Int. Cl.^{4} C08F *6/00*; C08J *3/00*

U.S. Cl. 528—482 **5 Claims**

1. A process for improving the color of an aromatic thermoplastic polyarylate polymer by contacting the polymer, after its formation, with an effective amount of a peracid, hydrogen peroxide or other peroxygen compound to achieve polymer decolorization without initiating color-forming side reactions.

4,720,541

PROCESS FOR IMPROVING THE APPLICATION PROPERTIES OF DISAZO PIGMENTS

Wolfgang Rieper, Frankfurt am Main, and Klaus Hunger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

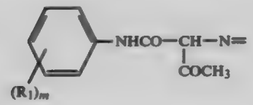
Continuation of Ser. No. 398,896, Jul. 16, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 627,497

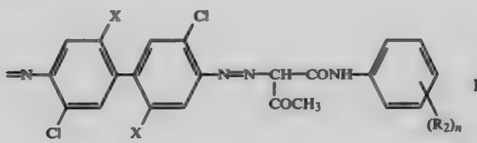
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 3128598; Apr. 1, 1982, 3212105

Int. Cl.^{4} C09B *35/035*; D06P *1/44*; C09D *7/12*

U.S. Cl. 534—576 **8 Claims**

1. A process for improving the application properties of disazo pigments, which comprises adding sulfite ions to the weakly acid to neutral aqueous pigment suspension obtained in the coupling of a disazo pigment having a structure which corresponds to the formula





in which R_1 and R_2 denote identical or different substituents from the group comprising methyl, methoxy, ethoxy and chlorine, X denotes a hydrogen or chlorine atom and m and n independently of each other denote 0 or an integer from 1 to 3 and then heating the pigment suspension for a half to two hours at 50° to 100° C.

4,720,542

FORMAZAN BLUE REACTIVE DYE

Takashi Omura, Ashiya; Yasuo Tezuka, Ibaraki, and Masaki Sunami, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

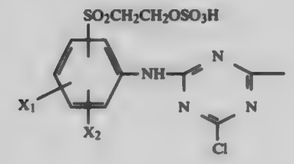
Continuation of Ser. No. 157,446, Jun. 9, 1980, abandoned. This application Jan. 28, 1986, Ser. No. 822,961

Claims priority, application Japan, Jun. 20, 1979, 54-78606

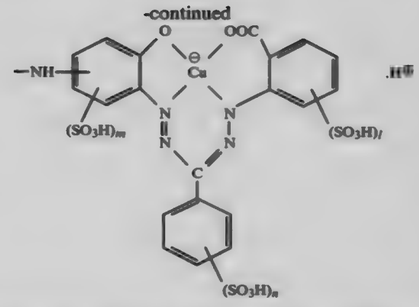
Int. Cl.^{4} C09B *50/00, 62/095, 62/535*; D06P *1/38*

U.S. Cl. 534—618 **5 Claims**

1. A compound represented by a free acid of the formula,



-continued



wherein X_1 and X_2 are each hydrogen, methyl or methoxy m and l are each an integer of 0 or 1 and n is an integer of 0 to 2, provided that the sum of m, n and l is 2 or 3.

4,720,543

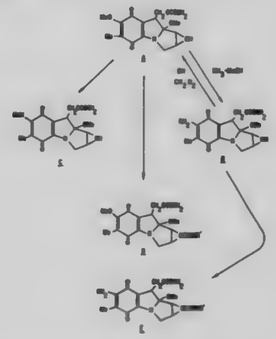
1A-7-SUBSTITUTED DERIVATIVES OF MITOMYCIN AND USES THEREOF

Eugene McPherson, Forestville, Md., and Philip S. Schein, Bryn Mawr, Pa., assignors to Georgetown University, Washington, D.C.

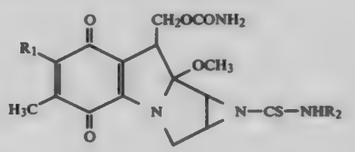
Filed Jun. 6, 1985, Ser. No. 742,045

Int. Cl.^{4} C07D *487/14*; A61K *21/00, 31/40*

U.S. Cl. 536—18.1 **16 Claims**



1. A compound having the formula:



where

R_1 is selected from the group consisting of NH_2, C_1–C_4 alkoxy and a glycosyl residue; and

R_2 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, and a glycosyl residue;

with the proviso that at least one but not both R_1 and R_2 contains a glycosyl residue.

4,720,544

PROCESS FOR THE PREPARATION OF AN ESTER FROM STARCH AND A MONOCARBOXYLIC ACID, AND A COMPOSITION BASED ON THE STARCH ESTER THUS PREPARED

Arend J. Schouten, Peize, Netherlands, assignor to Akzo N.V., New York, N.Y.

Filed May 8, 1986, Ser. No. 861,202

Claims priority, application Netherlands, May 8, 1985, 8501301

Int. Cl.⁴ C08B *31/04*

U.S. Cl. 536—110 **11 Claims**

1. A process for the preparation of a starch ester of a number average molecular weight of 1000–50,000 and a degree of substitution of 0.4–3.0 by esterification of a starch with one or more monocarboxylic acids, characterized in that a mixture of 100 parts by weight of starch, 0.5–9 equivalents per anhydroglucose unit of a monocarboxylic acid containing 1–7 carbon atoms and up to 1000 parts by weight of water is subjected to an esterification reaction at a temperature of 40°–270° C., in which process water is withdrawn from the mixture until the resulting starch ester has the degree of substitution desired.

4,720,545

PROCESS FOR THE PREPARATION OF COMPLEXES OF ONE MOL OF DIMERIZED OR LOW-OLIGODIMERIZED 4,4'-DIISOCYANATODIPHENYLMETHANE AND TWO TO THREE MOL OF 4,4'-DIISOCYANATODIPHENYLMETHANE, CORRESPONDING COMPLEXES, AND THEIR USE FOR POLYURETHANE PRODUCTION

Gerhard Grögler, Leverkusen; Richard Kopp, Cologne, and Heinrich Hess, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 829,056

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506834

Int. Cl.⁴ C07D *403/14, 229/00*

U.S. Cl. 540—202 **10 Claims**

1. In a process for the preparation of a complex by the dimerization of 4,4'-diisocyanatodiphenylmethane in isocyanate-inert solvents in the presence of dimerization catalysts and optionally reaction stoppers, wherein the improvement comprises dimerization in an emulsion of finely divided, liquid diphenylmethane-4,4'-diisocyanate in an apolar solvent as emulsifying agent, the solubility of diphenylmethanediisocyanate at room temperature in said apolar solvent being at the most 25% by weight, and wherein the dimerization reaction is started at or slightly above the melting temperature of diphenylmethanediisocyanate and the reaction mixture, which initially is slightly exothermic, is kept at a temperature of 0° to 40° C. during dimerization.

4,720,546

INTERMEDIATES FOR THE PREPARATION OF SUBSTITUTED 2-PHENYL-1,3-DIOXOLANES

Ivan Kompis, Oberwil, Switzerland, and Ekkehard Weiss, Inzlingen, Fed. Rep. of Germany, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 764,370, Aug. 12, 1985, Pat. No. 4,640,918. This application Nov. 4, 1986, Ser. No. 926,944

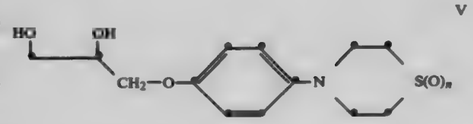
Claims priority, application Switzerland, Aug. 31, 1984, 4177/84

Int. Cl.⁴ C07D *279/12, 417/12*

U.S. Cl. 544—58.2 **3 Claims**

1. A compound, 4-(p-Hydroxyphenyl)-tetrahydro-4H-1,4-thiazine 1,1-dioxide.

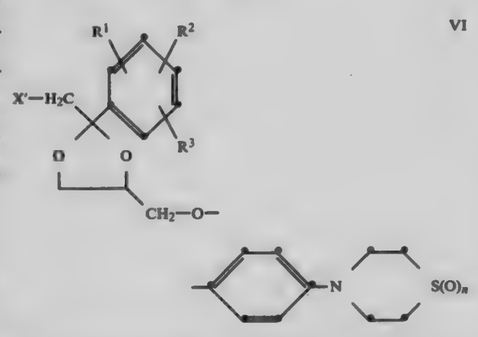
2. A compound of the formula



V

wherein n is the integer 0, 1 or 2.

3. A compound of the formula



VI

wherein R^1, R^2 and R^3 each independently are hydrogen or halogen, X' is a leaving group and n is the integer 0, 1 or 2.

4,720,547

PHOTOCHROMIC COMPOUND AND ARTICLES CONTAINING THE SAME

Won S. Kwak, Akron, and Rodney J. Hurditch, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

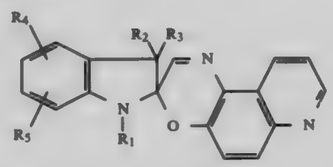
Continuation-in-part of Ser. No. 635,696, Jul. 30, 1984, Pat. No. 4,637,698, which is a continuation-in-part of Ser. No. 548,600, Nov. 4, 1983, abandoned. This application Feb. 5, 1986, Ser. No. 826,428

The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.

Int. Cl.⁴ G02B *5/23*; G02F *1/01*

U.S. Cl. 544—71 **12 Claims**

1. A photochromic compound represented by the following graphic formula:



wherein:

(a) R_1 is selected from the group consisting of C_1–C_8 alkyl, phenyl, phen(C_1–C_4)alkyl, allyl and mono- and di-substituted phenyl, said phenyl substituents being selected from C_1–C_4 alkyl and C_1–C_5 alkoxy;

(b) R_2 and R_3 are each selected from the group consisting of C_1–C_5 alkyl, phenyl, and mono- and disubstituted phenyl, benzyl or combine to form a cyclic ring selected from the group consisting of an alicyclic ring containing from 6 to 8 carbon atoms (including the spiro carbon atoms), norbornyl and adamantyl, said phenyl substituents being selected from C_1–C_4 alkyl and C_1–C_5 alkoxy;

(c) R_4 is selected from the group consisting of hydrogen, C_1–C_5 alkyl, halogen, C_1–C_5 alkoxy, nitro, cyano, C_1–C_4 monohaloalkyl, C_1–C_4 polyhaloalkyl and C_1–C_8 alkoxycarbonyl, and

(d) R_5 is selected from the group consisting of C_1–C_4 monohaloalkyl and C_1–C_4 polyhaloalkyl.

4,720,548

QUINOXALINE ADDUCTS USEFUL AS ANTHELMINTICS

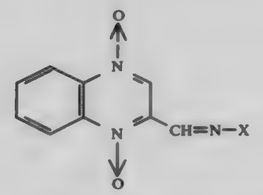
Vernon V. Young, and David R. Bright, both of Terre Haute, Ind., assignors to Angus Chemical Company, Northbrook, Ill.

Division of Ser. No. 716,506, Mar. 25, 1985, Pat. No. 4,629,790, which is a continuation of Ser. No. 329,446, Dec. 10, 1981, abandoned, which is a division of Ser. No. 176,168, Aug. 7, 1980, Pat. No. 4,348,389. This application May 1, 1986, Ser. No. 858,589

Int. Cl.⁴ A61K *31/63, 31/495, 31/635*; C07D *241/52*

U.S. Cl. 544—353 **3 Claims**

1. A compound of the formula



wherein X is 2,4-dinitrophenyl, or 4-amino-4-methylpentyl.

4,720,549

PROCESS FOR THE PREPARATION OF IMIDAZOLYL-METHANE DERIVATIVES

Rudolf Zerbes, and Erik Regel, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

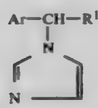
Filed Oct. 27, 1986, Ser. No. 923,535

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538673

Int. Cl.⁴ C07D *233/54*

U.S. Cl. 548—335 **9 Claims**

1. A process for the preparation of an imidazolyl-methane derivative of the formula

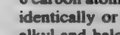


in which

Ar presents phenyl or phenyl which contains one, two or three substituents selected from the group consisting of C_1–C_6-alkyl, halogen, phenyl, phenyl substituted by halogen or C_1–C_6-alkyl phenylthio and phenylthio substituted by halogen or C_1–C_6-alkyl, phenoxy substituted by halogen or C_1–C_6-alkyl, and

R^1 represents straight-chain or branched alkyl having up to 6 carbon atoms, phenyl or phenyl which is singly to triply, identically or differently substituted by halogen, C_1–C_6-alkyl and halogen-C_1–C_6-alkyl,

wherein a ketone of the formula



in which

Ar and R^1 have the abovementioned meaning, is reacted with imidazole in the presence of formic acid.

4,720,550

PROCESS FOR PRODUCING IMIDAZOLYLTHIOPHENALDEHYDES

Bernd-Rainer Günther, Bergheim; Rainer Losch, Bonn, and Klaus Steiner, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & CIE GmbH, Cologne, Fed. Rep. of Germany

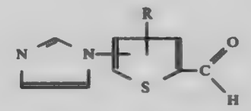
Filed Feb. 6, 1987, Ser. No. 11,544

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606105

Int. Cl.⁴ C07D *409/04*

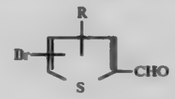
U.S. Cl. 548—336 **6 Claims**

1. Process for producing imidazoylthiophenaldehydes of the general formula I



I

wherein R is hydrogen or methyl, comprising reacting a bromothiophenaldehyde of the general formula II



II

wherein R is hydrogen or methyl, with imidazole present in a molecular excess, in the presence of a copper containing catalyst in aqueous medium at a temperature between 60° C. and the reflux temperature of the reaction mixture.

4,720,551

CHLOROTHIENYL-IMIDAZOLE PROPENONES

Takayuki Fujita, Matsushige; Hiroko Yabe, and Tadashi Akita, both of Tokushima, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

Filed Sep. 12, 1986, Ser. No. 906,432

Claims priority, application Japan, Sep. 26, 1985, 60-124321; Sep. 26, 1985, 60-214322

Int. Cl.⁴ C07D *409/06*

U.S. Cl. 548—336 **2 Claims**

1. 1-(5-Chlorothien-2-yl)-2-(1H-imidazolyl)-3-(2,4-dichlorophenyl)-2-propen-1-one.

4,720,552

PROCESS FOR THE PREPARATION OF ACID ADDITION SALTS OF 4(5)-METHYL-5(4)-THIOMETHYL IMIDAZOLE

Teofil Zizek, and Janko Zmitek, both of Ljubljana, Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o, Ljubljana, Yugoslavia

Filed Apr. 27, 1987, Ser. No. 43,125

Claims priority, application Yugoslavia, May 8, 1986, 745/86

Int. Cl.⁴ C07D *233/64*

U.S. Cl. 548—342 **2 Claims**

1. A process for the preparation of a hydrogenhalide acid addition salt of 4(5)-methyl-5(4)-thiomethyl imidazole of the formula



characterized in that 4(5)-methyl-5(4)-bromomethyl imidazole

hydrobromide is reacted with potassium O-ethyl dithiocarbonate in an aqueous medium at room temperature to O-ethyl-S-(4-methyl-imidazolyl-5-methyl)dithiocarbonate, which is, without isolation, immediately hydrolyzed under nitrogen atmosphere with an aqueous solution of a hydrohalic acid at the reflux temperature of the reaction mixture to 4(5)-methyl-5(4)-thiomethyl imidazole hydrogenhalide.

4,720,553

METHOD FOR SYNTHESIZING N-AMINOPHTHALIMIDE

George E. Lee, Somerville, and Robert J. Heffner, Manville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 14, 1986, Ser. No. 851,844
Int. Cl.[4] C07D *209/48*
U.S. Cl. 548—475 4 Claims

1. A method of synthesizing N-aminophthalimide wherein phthalimide and hydrazine are reacted in a reaction medium consisting essentially of water and alcohol at a volume ratio within the range of from 80:20 to 20:80 at a temperature within the range of from −5° C. to 35° C., said alcohol being methanol, ethanol, n-propanol, iso-propanol or a mixture thereof.

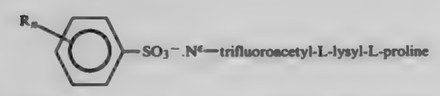
4,720,554

AROMATIC SULFONIC ACID SALTS OF A PROLINE DERIVATIVE

Yasuo Irie; Fusayoshi Kakizaki; Chieko Ishijima; Michito Sumikawa, and Naohiko Yasuda, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 934,563
Claims priority, application Japan, Dec. 6, 1985, 60-274678
Int. Cl.[4] C07D *207/09*
U.S. Cl. 548—533 4 Claims

1. A compound which is:



wherein n is 0 to 5, Cl, Br, F, C_1–C_4 straight chain or branched alkyl, OH, or CF_3.

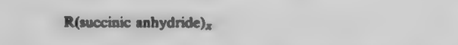
4,720,555

HYDROCARBYL ANHYDRIDES

William D. Nash, The Woodlands, Tex., assignor to Pennzoil Products Company, Houston, Tex.

Filed Sep. 12, 1986, Ser. No. 907,144
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—252 3 Claims

1. A hydrocarbyl poly(succinic anhydride) of the following formula:



wherein R is a hydrocarbyl group derived from a crude or refined hydrocarbon wax having a melting point of below 150° F., and x is an integer ranging from 3 to 8, said hydrocarbyl poly(succinic anhydride) being insoluble in the hydrocarbon wax starting material from which it is produced, the anhydride substituents being randomly located along the hydrocarbon chain, said compound being produced by reacting at least a 2:1 molar excess of maleic anhydride with said hydrocarbon wax in the presence of a free radical generator, the reaction being conducted by adding the anhydride and free radical generator to said hydrocarbon wax over a period of less than about 3 hours at a temperature of about 160° to 190° C., separating the resultant two phase product comprising an upper waxy phase and a lower hard phase and recovering the hydrocarbyl poly(-succinic anhydride) product from said hard phase.

2. A method for the preparation of a hydrocarbon compound substituted with at least three succinic anhydride groups, said anhydride groups being randomly located along the hydrocarbon chain, by a process which comprises:

charging to a reactor a crude or refined hydrocarbon wax having a melting point of below about 150° F., subjecting said hydrocarbon wax to agitation at 160°–190° C. and adding thereto at least a sufficient amount of maleic anhydride to comprise at least at 2:1 molar excess of anhydride to said hydrocarbon wax, during said addition adding dropwise a free radical generator, said additions being carried out over a period of less than about 3 hours, continuing agitation after the addition is complete, separating the resultant two phase produce comprising an upper waxy phase and a lower hard phase, and recovering the hydrocarbyl poly(succinic anhydride) product from said hard phase.

4,720,556

3-OXABICYCLO-(3,1,0)-HEXAN-2-ONES

Jacques Martel, Bondy; Jean Tessier, Viscennes, and André Teche, Nanterre, all of, France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 745,653, Jun. 17, 1985, Pat. No. 4,658,043, which is a division of Ser. No. 447,442, Dec. 6, 1982, Pat. No. 4,540,797, which is a continuation of Ser. No. 253,869, Apr. 13, 1981, abandoned, which is a division of Ser. No. 21,833, Mar. 19, 1979, Pat. No. 4,265,817. This application Nov. 14, 1986, Ser. No. 930,770
Claims priority, application France, Mar. 17, 1978, 78 07778
Int. Cl.[4] C07D *307/93*
U.S. Cl. 549—302 1 Claim

1. A compound selected from the group consisting of (1R,5S) 6,6-dimethyl-4(R)-[(1'R), (2'S), (5'R) 2'-isopropyl-5'-methylcyclohexanoxy]-3-oxabicyclo-(3,1,0)-hexan-2-one and (1R, 5S) 6,6-dimethyl-4(R)-[(1'S), (2'R), (5'S) 2'-isopropyl-5'-methylcyclohexanoxy]-3-oxabicyclo-(3,1,0)-hexan-2-one.

4,720,557

PROCESS FOR PRODUCING A COMPOSITION COMPRISING 1,3,5-TRIOXANE AND METHODS FOR USING SAID COMPOSITION

J. Gordon Erdman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 610,227, May 14, 1986, Pat. No. 4,595,396. This application Sep. 30, 1985, Ser. No. 781,627
Int. Cl.[4] C07D *323/06, 319/06*
U.S. Cl. 549—368 8 Claims

1. A method comprising:

(a) mixing a first stream comprising a light hydrocarbon and carbon dioxide with oxygen to form a second stream;

(b) exposing the second stream to a temperature of about 650° C. to about 1100° C. and a pressure of about 200 psi to about 600 psi in the presence of a metal oxide catalyst, thereby producing a third stream comprising carbon monoxide and hydrogen;

(c) passing the third stream through a first bed comprising a metal oxide catalyst which is maintained at a temperature of about 200° C. to about 400° C. and a pressure of about 200 psi to about 600 psi, thereby converting a first portion of the third stream to methanol;

(d) passing at least a second portion of the third stream through a second bed comprising a metal catalyst which is maintained at a temperature of about 500° C. to about 750° C. and a pressure of about 200 psi to about 600 psi, thereby converting the second portion of the third stream to formaldehyde;

(e) trimerizing, at a temperature of about 0° C. to about 200° C. and at a pressure of about 200 psi to about 400 psi, at least a portion of the formaldehyde to trioxane in the presence of the methanol to thereby produce a composition comprising methanol and trioxane.

4,720,558

PROCESS FOR INVERTING THE CONFIGURATION OF SECONDARY ALCOHOLS

Johannes Kaulen, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,745
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511210
Int. Cl.[4] C07D *317/54;* C07C *31/135, 31/125*
U.S. Cl. 549—443 4 Claims

1. In the process for inverting the configuration of a secondary alcohol in which the hydroxyl group is attached to an asymmetric carbon atom, by esterification of this secondary alcohol with inversion of its configuration, and subsequent saponification of the ester with retention of the configuration of the secondary alcohol, the improvement comprising carrying out the esterification with inversion of the configuration by first converting the seoondary alcohol into an isourea ether and then reacting this isourea ether with a carboxylic acid to give the ester of the carboxylic acid.

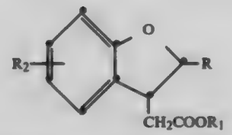
4,720,559

CERTAIN 2,3-DIHYDOBENZOFURAN-3-YL ACETIC ACIDS AND THEIR METHOD OF PREPARATION

Thomas R. Welter, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

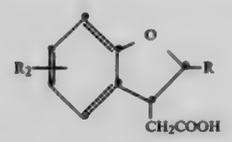
Filed Oct. 9, 1986, Ser. No. 916,975
Int. Cl.[4] C07D *307/80*
U.S. Cl. 549—462 5 Claims

1. A benzofuran having the following structural formula:



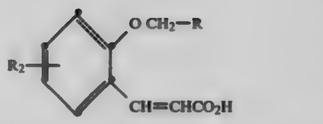
wherein R is alkenyl of 2 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms; R_1 is H, alkali metal, or alkyl of 1 to 4 carbon atoms; and R_2 is alkyl or alkoxy of from 1 to 5 carbon atoms, hydrogen, amino or dialkylamino, nitro, alkyl or aryl thioether wherein the aryl group contains 6 to 10 carbon atoms, or halo.

5. A method of forming a compound of the formula:



wherein R is alkenyl of 2 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms; and R_2 is alkyl or alkoxy of from 1 to 5 carbon atoms, hydrogen, amino or dialkylamino, nitro, alkyl or aryl thioether wherein the aryl group contains 6 to 10 carbon atoms, or halo;

comprising the step of cyclizing a compound of the formula:



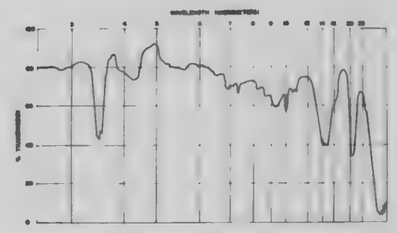
wherein R and R_2 are as defined above, in the presence of a base selected from the group consisting of KOH, NaOH, LiOH, dimsyl sodium, lithium diisopropylaminde, potassium tert-butoxide and mixtures thereof, at room temperature.

4,720,560

HYBRID ORGANOMETALLIC COMPOUNDS, PARTICULARLY FOR METAL ORGANIC CHEMICAL VAPOR DEPOSITION

Benjamin C. Hui, Peabody, Mass.; Jorg Lorberth, Weimar-Niederweimar, Fed. Rep. of Germany, and Andreas A. Melas, Burlington, Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 25, 1984, Ser. No. 664,645
Int. Cl.[4] C07F *5/00*
U.S. Cl. 556—1 19 Claims



1. A compound having the molecular formula:

MR_X

wherein x is 3, each said R substituent is independently selected from lower alkyl, phenyl, alkyl-substituted phenyl, cyclopentadienyl, and alkyl-substituted cyclopentadienyl, at least two of said R substituents are different, and M is an element selected from Gallium and Indium, excluding dimethylcyclopentadienylgallium, dimethylcyclopentadienylindium, diethylcyclopentadienylgallium, and diethylcyclopentadienylindium.

VOL 1086 ISS 3 JA 19 1988 UMI

4,720,561

PREPARATION OF METAL ALKYLS

Donald C. Bradley, Middlesex; Halina Chudzynska, and Marc M. Faktor, both of London, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB85/00116, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04405, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 26, 1985, Ser. No. 817,848

Claims priority, application United Kingdom, Mar. 26, 1984, 8407808; Dec. 7, 1984, 8430979

Int. Cl.[4] C07F *5/00, 5/06*

U.S. Cl. 556—1 13 Claims

1. A method of preparing a Group III metal alkyl which comprises (a) combining a metal alkyl with a ligand to form an adduct of said alkyl with said ligand and (b) heating the adduct to provide thermal dissociation thereof thereby releasing the Group III metal alkyl as a gaseous product, characterized in that the adduct formed is of formula $(R_3M)_yL$ wherein R_3 represents three alkyl groups R which may be the same or different, M represents a Group III metallic element, L represents an aryl-containing Group V donor ligand provided by an organic Lewis base which is stable at 20° C. and y is an integer equal to or less than the number of Group V donor atoms present in the ligand.

(b) a complexing agent selected from the group consisting of:

(i) ethers having the formula R_1OR_2 in which R_1 and R_2 are C_1–C_4 alkyl;

(ii) cyclic ethers having the formula



in which n is an integer from 4 to 7; and

(iii) tertiary amines.

4,720,563

Patent Not Issued For This Number

4,720,562

NOVEL TITANIUM-CONTAINING REAGENTS FOR METHYLENATION AND ANALOGOUS REACTIONS

Dennis B. Malpass, LaPorte, and Andrzej M. Piotrowski, Houston, both of Tex., assignors to Stauffer Chemical Company, Westport, Conn.

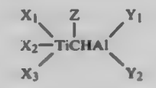
Continuation-in-part of Ser. No. 818,589, Jan. 14, 1986, abandoned. This application Dec. 16, 1986, Ser. No. 939,893

Int. Cl.[4] C07F *7/28*

U.S. Cl. 556—27 20 Claims

1. A composition which comprises a complex of:

(a) a titanium-containing material having the formula



in which X_1 is cyclopentadienyl, chlorine, bromine or C_1–C_6 alkoxy; X_2 and X_3 are independently chlorine, bromine, or C_1–C_6 alkoxy; Y_1 and Y_2 are independently chlorine or bromine; and Z is hydrogen or a C_1–C_{10} hydrocarbyl group; and

4,720,568

ANTIOXIDANT ORGANOGERMANIUM COMPOUND

Norihiro Kakimoto, Tokyo; Mitsuo Namiki; Toshihiko Osawa, both of Aichi, and Kohei Miyao, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,248

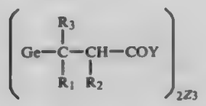
Claims priority, application Japan, Apr. 25, 1984, 59-81921

Int. Cl.[4] C07F *7/30*

U.S. Cl. 556—83 1 Claim

1. An organogermanium compound represented by the general formula:

(I)



wherein if Z is a sulfur atom, Y is a hydroxyl or amino group, (i) and at least one of R_1, R_2 and R_3 is a phenyl group and the other two substituents are selected from the group consisting of a hydrogen atom, an alkyl group, and a phenyl group, (ii) at least two of R_1, R_2 and R_3 are phenyl groups and the other substituent is selected from the group consisting of a hydrogen atom, an alkyl group, a phenyl group, or (iii) all three of R_1, R_2 and R_3 are alkyl groups;

wherein if Z is an oxygen atom and Y is an amino group, then R_1, R_2 and R_3 are independently selected from a hydrogen atom and an alkyl group, and a phenyl group such that R_1, R_2 and R_3 are not all hydrogen atoms; and

wherein if Z is an oxygen atom and Y is a hydroxyl group, then (iv) at least one of R_1, R_2 and R_3 is a phenyl group and the other substituents are selected from the group consisting of a hydrogen atom, an alkyl group and a phenyl group, (v) R_1 and R_3 are selected from the group consisting of an alkyl group and a phenyl group and R_2 is selected from the group consisting of a hydrogen atom, an alkyl group and a phenyl group, or (vi) all three of R_1, R_2 and R_3 are alkyl groups.

4,720,565

PROCESS FOR PREPARING O-ALKYL S-(ALPHA-BRANCHED ALKYL) ALKYLPHOSPHONOTHIOATE

Jean-Michel Brochard, Alfortville, France, and Stanley T. D. Gough, Essex, England, assignors to Rhone-Poulenc Agrochimie, Lyons, France

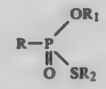
Filed Aug. 28, 1985, Ser. No. 770,214

Claims priority, application France, Sep. 14, 1984, 84 14319

Int. Cl.[4] C07F *9/40*

U.S. Cl. 558—98 12 Claims

1. A process for preparing an O-alkyl S-(alpha-branched alkyl)alkylphosphonothioate of formula:

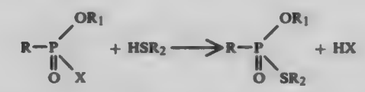


in which:

R is an alkyl group having from 1 to 8 carbon atoms,

R_1 is an alkyl group having 1 to 8 carbon atoms,

R_2 is an alpha-branched alkyl group having from 3 to 8 carbon atoms, wherein an O-(alkyl)alkylphosphonic acid halide is reacted with an (alpha-branched) alkyl mercaptan according to the scheme:



in which R, R_1 and R_2 have the significances given above and X is a halogen atom, in an organic medium in the presence of an acceptor for acid and an auxiliary base, the auxiliary base being employed in a molar proportion of from about 0.5 to 15% based upon the halide reactant.

4,720,566

METHOD AND COMPOSITION FOR INHIBITING ACRYLONITRILE POLYMERIZATION

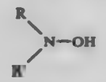
John F. Martin, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 23, 1986, Ser. No. 922,378

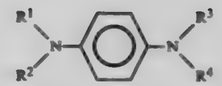
Int. Cl.[4] C07C *121/32*

U.S. Cl. 558—306 6 Claims

1. A method of inhibiting acrylonitrile polymerization in a quench column of a system producing acrylonitrile comprising adding to the acrylonitrile an effective amount for the purpose of (a) a hydroxylamine having the formula



wherein R and R' are the same or different and are hydrogen, alkyl, aryl, alkaryl or aralkyl groups, and (b) a para-phenylenediamine having the formula



wherein R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, alkyl, aryl, alkaryl, or aralkyl groups with the proviso that at least one of R^1, R^2 R^3, or R^4 is hydrogen, wherein: the alkyl, aryl, alkaryl and aralkyl groups have one to about twenty carbon atoms; the total amount of the hydroxylamine and the phenylenediamine is from about 1 ppm to about 10,000 ppm based upon the weight of the acrylonitrile; and the molar ratio of the hydroxylamine to the phenylenediamine is about 1:10 to about 10:1.

4,720,567

NOVEL DIACETYLENIC AND POLYDIACETYLENIC COMPOSITIONS

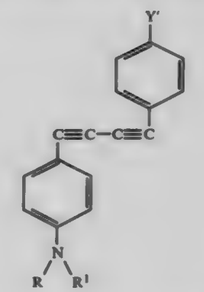
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 854273, Apr. 21, 1986, Pat. No.

Int. Cl.[4] C07C *87/00, 103/00*

U.S. Cl. 558—418 4 Claims

1. A diacetylene compound corresponding to the formula:



where R and R^1 are alkyl groups containing between about 1–20 carbon atoms, and R and R^1 taken together with the connecting nitrogen atom form an alicyclic substituent; and Y' is a substituent selected from nitro, cyano and trifluoromethyl radicals.

4,720,568

BASIC COLORANTS

Manfred Eisert, Ludwigshafen, and Klaus Grychtol, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 735,298, May 17, 1985, Pat. No. 4,597,912, which is a continuation of Ser. No. 188,264, Sep. 17, 1980, abandoned. This application Feb. 7, 1986, Ser. No. 826,987

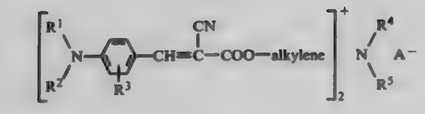
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942185

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] C07C *121/78, 121/70*

U.S. Cl. 558—390 3 Claims

1. A compound of the formula



wherein

A^- is an anion selected from the group consisting of chloride, bromide, sulfate, nitrate, dihydrogen phosphate, methosulfate, ethosulfate, thiocyanate, formate, acetate, propionate, chloroacetate, citrate and lactate;

R^1 is C_1-to C_4-alkyl;

R^2 is β-cyanoethyl or β-chloroethyl;

R^3 is hydrogen or methyl;

R^4 and R^5 independently of one another are hydrogen, C_1-to C_4-alkyl or benzyl; and

the alkylene radicals independently of one another have 2 to 6 carbon atoms and are linear or branched.

4,720,569

CURING AGENT FOR THERMOSETTING RESIN PAINTS

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hyogo, Japan

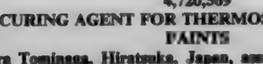
Filed Jul. 30, 1985, Ser. No. 760,503

Claims priority, application Japan, Jul. 30, 1984, 59-157686

Int. Cl.⁴ C07C *125/073*

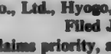
U.S. Cl. 560—26 **8 Claims**

1. A polycarbamic acid ester-type curing agent for thermosetting resin paints, said curing agent containing per molecule at least two groups represented by the following formula

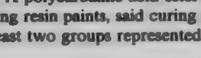


(I)

wherein Y is

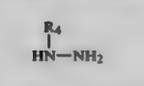


R_2 and R_4, independently from each other, are a hydrogen atom, or an aliphatic hydrocarbon group having 1 to 6 carbon atoms which may be substituted by an amino group, a hydroxyl group or an alkoxy group, or a group of the formula



and R_3 is a hydrogen atom or a monovalent aliphatic hydrocarbon group having 1 to 6 carbon atoms which may be substituted by a hydroxyl group or an alkoxy group, and said curing agent being composed of the reaction product of

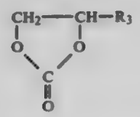
(a) a hydrazine containing at least two active hydrogen atoms and being represented by the following formula



wherein R_4 is as defined above,

(b) a polyepoxide compound having an average molecular weight of 200 to 2,000 and an epoxy equivalent of 100 to 1,000, which is a polyglycidyl ether of a polyphenol, and

(c) an alkylene carbonate represented by the following formula



wherein R_3 is as defined above.

4,720,570

RATE OF CRYSTALLIZING DIPHENYLISOPHTHALATE/DIPHENYLTEREPHTHALATE MONOMER

Gerald M. Boyle, Syracuse, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 14, 1986, Ser. No. 840,352

Int. Cl.⁴ C07C *67/52*

U.S. Cl. 560—78 **3 Claims**

1. A process for improving the rate of crystallization of a diphenylisophthalate/diphenylterephthalate monomer and producing said monomer with a crystal size of about 2 mm comprising the steps of:

a. dissolving said monomer in an organic solvent in the presence of filtration aids selected from the group consisting of diatomaceous earth, activated carbon, and mixtures thereof;

b. filtering and removing said filtration aids to provide a filtered crystallization solution;

c. introducing said filtered solution to a heated crystallization zone;

d. cooling said crystallization solution to precipitate crystallized monomer from the solvent;

e. centrifuging said crystallized monomer to remove solvent from the crystallized monomer; and

f. thereafter drying said crystallized monomer.

4,720,571

POLYOLS FROM SCRAP POLYETHYLENE TEREPHTHALATE AND DIMETHYL TEREPHTHALATE PROCESS RESIDUE

John M. Trowell, St. Simons Island, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 18, 1986, Ser. No. 875,831

Int. Cl.⁴ C07C *69/82, 67/03*

U.S. Cl. 560—91 **18 Claims**

1. A mixture of liquid terephthalate acid ester polyols that is free from solids upon standing and is prepared by

(a) reacting a mixture comprised of scrap polyethylene terephthalate, dimethyl terephthalate process residue and at least two glycols having a molecular weight higher than that of ethylene glycol, in the presence of an esterification/transesterification catalyst, where the mole ratio of glycols to scrap polyethylene terephthalate and dimethyl terephthalate process residue is from about 2:1 to about 6.5:1 and the mole ratio of scrap polyethylene terephthalate to dimethyl terephthalate process residue is from about 96/5 to about 50/50, to yield a reaction product comprising terephthalic acid ester polyols, ethylene glycol and unreacted glycols having a molecular weight higher than that of ethylene glycol, and

(b) subsequently removing glycols from the reaction product from step (a) until from about 2% to about 25% by weight glycols are present in said reaction product.

4,720,572

PROCESS FOR THE PREPARATION OF 4-ACYLOXY-3-OXO-BUTYRIC ACID ESTERS

Mathias Stubbe, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,526

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443678

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—104 **5 Claims**

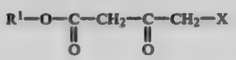
1. A process for the preparation of a 4-acyloxy-3-oxo-butyric acid ester of the formula



in which

R^1 is alkyl with up to 4 C atoms, and

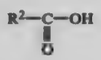
R^2 is alkyl with up to 4 C atoms and optionally substituted by halogen, hydroxyl, alkoxy or phenyl, or is aryl, which comprises reacting a 4-halogenobutyric acid ester of the formula



in which

X is chlorine or bromine,

with a carboxylic acid of the formula



in the presence of at least one of a secondary or tertiary alkylamine, pyridine, piperidine or an ammonium salt of a carboxylic acid as an acid-trapping agent in an organic solvent at a temperature between 0° and 170° C.

4,720,573

PROCESS FOR SYNTHESIS OF GLUTAMIC ACID FROM ACRYLATE, AMIDE AND SYNTHESIS GAS

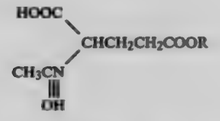
Jiang-Jen Lin, Round Rock, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 31, 1986, Ser. No. 891,094

Int. Cl.⁴ C07C *103/66*

U.S. Cl. 560—171 **13 Claims**

1. A process for the synthesis of a glutamic acid intermediate represented by the structure



wherein R = methyl or ethyl, from the reaction of an acrylate, amide and syngas in the presence of a catalyst comprising a cobalt-containing compound, a bis-phosphine ligand and a solvent at a pressure of 500 to 5,000 psi and a temperature of 50° to 160° C. and thereafter extracting the glutamic acid precursor.

4,720,574

ANTIMICROBIAL COMPOUND BIS (CARBOMETHOXYMETHYL) ADIPATE

August V. Bailey, New Orleans; Gordon J. Boudreaux, Metairie, and Gene Sumrell, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 308,743, Oct. 5, 1981, abandoned, which is a division of Ser. No. 235,812, Feb. 19, 1981, Pat. No. 4,346,043. This application Nov. 20, 1984, Ser. No. 673,299

Int. Cl.⁴ C07C *69/675, 69/44*

U.S. Cl. 560—185 **1 Claim**

1. The antimicrobially active compound bis(carbomethoxymethyl) adipate:

$CH_3OOCCH_2OOCCH_2CH_2CH_2CH_2COOCH_2COOCH_3$

4,720,575

$H_8PMO_{10}VO_{39}$ AND ITS ANHYDRIDE, $PMO_{10}VO_{35}$ AND PREPARATION THEREWITH OF METHACRYLIC ACID AND ITS LOWER ALKYL ESTER

Wilhelm Gruber, Darmstadt, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,529

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3508649

Int. Cl.⁴ C07C *67/30*

U.S. Cl. 560—214 **6 Claims**

1. A heteropolyacid of the formula $H_8PMo_{10}VO_{39}$.

4,720,576

PROCESS FOR DIMERIZATION OF AROMATIC HALIDE COMPOUNDS

Keisuke Wada, Yokohama, and Keiichi Sato, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,998

Claims priority, application Japan, Sep. 25, 1985, 60-211296

Int. Cl.⁴ C07C *51/353, 143/24, 102/00, 41/30, 37/11, 1/26, 120/00*

U.S. Cl. 562—481 **23 Claims**

1. A process for dehalogeno-dimerization reaction of at least one aromatic halide compound selected from the group consisting of 4-chlorophthalic acid, alkali metal salts of 4-chlorophthalic acid and 4-chlorophthalic anhydride which comprises dehalogeno-dimerizing the aromatic halide compound in the presence of a platinum group metal catalyst, carbon monoxide and an alkali metal compound and/or an alkaline earth metal compound, with or without a solvent.

4,720,577

PROCESS FOR THE EXTRACTION OF CARBOXYLIC ACIDS FROM DILUTE AQUEOUS SOLUTIONS

Bernhard Wojtech, Bad Soden am Taunus; Walter Stoppich, Wiesbaden; Dieter Freudenberger, and Knut Riedel, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am (Main), Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,212

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436348

Int. Cl.⁴ C07C *51/42*

U.S. Cl. 562—513 **10 Claims**

1. A process for extracting a carboxylic acid from an aqueous solution, wherein the carboxylic acid is present in an aqueous solution at a concentration of less than 8% by weight, which comprises using as an extracting agent a mixture of an aliphatic amine having at least ten carbon atoms and phenol, phenol substituted by an alkyl group having a total of 1 to 40 carbon atoms, or a naphthol, wherein said extracting agent has a molar ratio of phenol:amine or said phenol substituted by an

alkyl group:amine or naphthol:amine ranging from 0.1:1 to about 1.1:1.

4,720,578

PREPARATION OF FLUORINATED CARBOXYPROPYLATED NON-IONIC SURFACTANTS

Kou-Chang Liu, Wayne, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Jul. 23, 1986, Ser. No. 887,299
Int. Cl.⁴ C07C *143/74*
U.S. Cl. 562—556 **14 Claims**

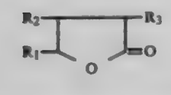
1. The process which comprises reacting an alcohol ether having the formula:

$$CF_3(CF_2)_m—Y—(CH_2CH_2O)_nH$$

with a metal hydroxide having the formula MOH to produce the corresponding salt having the formula:

$$CF_3(CF_2)_m—Y—(CH_2CH_2O)_nM$$

and reacting said salt with a butyrolactone having the formula:



to produce the corresponding carboxypropylated polyethylene glycol salt product having the formula

$$CF_3(CF_2)_m—Y—(CH_2CH_2O)_n—CHR_1—CHR_2—CHR_3—COOM$$

wherein Y is oxygen or $—SO_2N—R$ where R is alkyl having from 1 to 4 carbon atoms; R_1, R_2 and R_3 are each independently hydrogen or alkyl having from 1 to 4 carbon atoms; M is a sodium, potassium or lithium cation; n is an integer having a value of from 2 to 50 and m is an integer having a value of from 3 to 25.

4,720,579

SEPARATION OF CITRIC ACID FROM FERMENTATION BROTH WITH A NEUTRAL POLYMERIC ADSORBENT

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 18, 1986, Ser. No. 943,219
Int. Cl.⁴ C07C *51/42*
U.S. Cl. 562—580 **23 Claims**

14. A process for separating citric acid from a feed mixture comprising a fermentation broth, which process employs an adsorbent selected from the group consisting of a nonionic, hydrophobic, insoluble crosslinked polystyrene polymer and a nonionic, hydrophobic, insoluble crosslinked polyacrylic ester polymer which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(e) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said citric acid by said adsorbent in said adsorption zone and withdrawing a raffinate output stream comprising the nonadsorbed components of said fermentation broth from said adsorption zone;

(f) passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of said citric acid from the adsorbent in said desorption zone;

(g) withdrawing an extract output stream comprising said citric acid and desorbent material from said desorption zone;

(h) passing at least a portion of said extract output stream to a separation means and therein separating at separation conditions at least a portion of said desorbent material; and,

(i) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams.

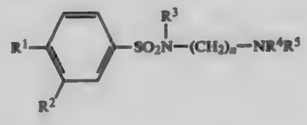
4,720,580

N-(AMINOALKYLENE)BENZENESULFONAMIDES

George C. Buzby, Jr., Blue Bell, Pa., assignor to Americas Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 653,757, Sep. 21, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 850,805
Int. Cl.⁴ C07C *143/78*
U.S. Cl. 564—89 **14 Claims**

1. A compound of the formula:



in which

R^1 is hydrogen, hydroxyl, alkoxy of 1 to 6 carbon atoms or halo;

R^2 is hydrogen, halo or trifluoromethyl, with the proviso that R^2 *is not hydrogen when R1 is hydrogen;*

R^3 is isopropyl, or when R^2 is trifluoromethyl and R^1 is hydrogen, R^3 may be hydrogen;

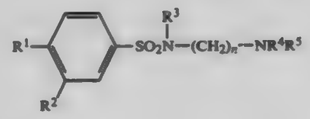
R^4 is isopropyl;

R^5 is hydrogen or isopropyl; and

n is one of the integers 2, 3 or 4;

or a pharmaceutically acceptable salt thereof.

10. An anti-arrhythmic composition comprising an anti-fibrillating amount of a compound of the formula:



in which

R^1 is hydrogen, hydroxyl, alkoxy of 1 to 6 carbon atoms or halo;

R^2 is hydrogen, halo or trifluoromethyl, with the proviso that R^2 is not hydrogen when R^1 is hydrogen;

R^3 is isopropyl, or when R^2 is trifluoromethyl and R^1 is hydrogen, R^3 may be hydrogen;

R^4 is isopropyl;

R^5 is hydrogen or isopropyl; and

n is one of the integers 2, 3 or 4;

or a pharmaceutically acceptable salt thereof.

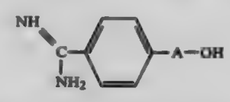
4,720,581

BENZAMIDINE DERIVATIVES

Madeleine Mousse; Henri Demarne, and Robert Filhol, all of Montpellier, France, assignors to Sanofi, France

Filed Jul. 17, 1984, Ser. No. 631,753
Claims priority, application France, Aug. 3, 1983, 83 12824
Int. Cl.⁴ C07C *123/00*
U.S. Cl. 564—247 **6 Claims**

1. A benzamidine compound having a formula



(I)

wherein: A is a linear or branched alkyl chain containing from 3–9 carbon atoms; and pharmaceutically acceptable salts thereof.

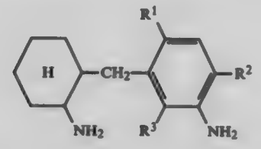
4,720,582

DIAMINES AND A PROCESS FOR THEIR PRODUCTION

Hartmut Knöfel, Odenthal-Erberich; Michael Brockelt, Bergisch-Gladbach, and Stefan Penninger, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,211
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231911
Int. Cl.⁴ C07C *87/52*
U.S. Cl. 564—305 **8 Claims**

1. Diamines corresponding to the formula



wherein

R^1, R^2 and R^3 may be the same or different and represent hydrogen or a C_1–C_4 alkyl group, provided that two of the radicals,

R^1, R^2 and R^3 represent hydrogen.

4,720,583

PROCESS FOR THE ISOMERIZATION OF O-, M- AND/OR P-TOLUIDINE

Klaus Eichler, Eschborn; Ernst I. Leupold, Neu-Anspach; Hans-Jürgen Arpe, and Herbert Baltes, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 740,238
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420707
Int. Cl.⁴ C07C *85/24, 87/56*
U.S. Cl. 564—305 **9 Claims**

1. A process for the isomerization of o-, m-or p-toluidine, or of a mixture of them, on a zeolite catalyst, which comprises contacting the toluidine or the mixture with a zirconium-containing zeolite of the pentasil type wherein the zeolite is synthesized in the presence of zirconium.

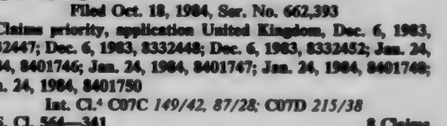
4,720,584

NITRO SUBSTITUTED DIPHENYL ETHERS AND DERIVATIVES THEREOF

Shenghong A. Dai, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 668,540, Nov. 5, 1984, Pat. No. 4,618,727. This application Jun. 30, 1986, Ser. No. 880,539
Int. Cl.⁴ C07C *87/64*
U.S. Cl. 564—315 **4 Claims**

1. An amino-p-hydroxyphenylisopropyl substituted diphenyl ether having the formula



wherein R, R^1, and R^2 are independently selected from the group consisting of alkyl, aryl, and aralkyl, and cycloalkyl; and n, m, and p each have an independent value of 0 to 4, inclusive.

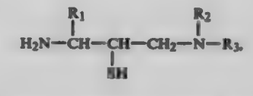
4,720,585

AMINOPEPTIDASE INHIBITORS

Jollie D. Godfrey Jr., Trenton, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc.

Filed Sep. 18, 1985, Ser. No. 777,122
Int. Cl.⁴ C07C *149/24, 149/14*
U.S. Cl. 564—340 **12 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is phenylmethyl or 2-methylpropyl; and

R_2 and R_3 are each independently hydrogen, alkyl, cycloalkyl, hydroxyalkyl, aminoalkyl, aryl, arylalkyl, heteroaryl or heteroarylalkyl.

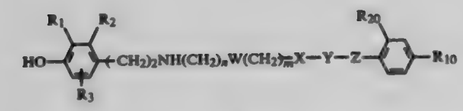
4,720,586

SUBSTITUTED 3,4-DIHYDROXY-PHENYLETHYLAMINO COMPOUNDS

John Dixon, Great Dalby, Melton Mowbray, and Francis Ince, Loughborough, both of Great Britain, assignors to Fisons, plc, Ipswich, England

Filed Oct. 18, 1984, Ser. No. 662,393
Claims priority, application United Kingdom, Dec. 6, 1983, 8332447; Dec. 6, 1983, 8332448; Dec. 6, 1983, 8332452; Jan. 24, 1984, 8401746; Jan. 24, 1984, 8401747; Jan. 24, 1984, 8401748; Jan. 24, 1984, 8401750
Int. Cl.⁴ C07C *149/42, 87/28; C07D 215/38*
U.S. Cl. 564—341 **8 Claims**

1. A compound of formula I,



in which R_1 represents OH,
R_2 and R_3, which may be the same or different, each independently represent hydrogen, fluorine, chlorine, bromine, alkyl C_1 to C_6, nitro, nitrile, $(CH_2)_pR_9$ or SR_9,
W represents a single bond, a 1,2; 1,3; or 1,4-disubstituted benzene ring; a —CH=CH-group or a 1,4-cyclohexanediyl group;
X represents NH,
Y represents $(CH_2)_q$, and R_{20} represents hydrogen, or
Y represents $CR_{15}R_{16}CR_{17}R_{18}$, wherein the carbon atom bearing R_{15} and R_{16} is adjacent to X and in which
R_{17} and R_{18}, together with the carbon atom to which they are attached form a carbonyl group, and R_{15}, R_{16} and R_{20} each represent hydrogen, or
R_{15} and R_{20} together form a chain —CH_2—, and R_{16}, R_{17} and R_{18} each represent hydrogen, or
R_{15}, R_{16}, R_{17} and R_{18} each independently represent hydrogen or alkyl C_1 to C_6 and R_{20} represents hydrogen;
Z represents a single bond, NR_{19}, CH_2, O, CO, S or SO_2, in which R_{19} represents hydrogen or alkyl C_1 to C_6;
n and m each independently represent an integer from 1 to 4 inclusive;
q represents an integer from 1 to 3 inclusive;
p represents 0 or an integer from 1 to 3 inclusive;
R_9 represents phenyl or phenyl substituted by hydroxy, and
R_{10} represents hydrogen or chlorine, provided that
(i) when R_2 and R_3 both represent hydrogen,
X represents NH, Z represents a single bond or CH_2 and R_{20} represents hydrogen,
W does not represent a single bond;
(ii) when R_2 and R_3 both represent hydrogen, W represents a single bond,
X represents NH and Z represents CH_2, then R_{15} does not form a chain —CH_2— with R_{20};
and pharmaceutically acceptable derivatives thereof.

4,720,587

FLUORANTHENE DERIVATIVES

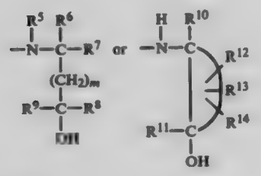
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 496,853, May 23, 1983, Pat. No. 4,532,344. This application Oct. 17, 1984, Ser. No. 661,674
Claims priority, application United Kingdom, May 16, 1984, 8412584
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] C07C *87/78, 87/455, 87/64*
U.S. Cl. 564—387 **6 Claims**

1. A compound of formula (I)

$$ArCH_2R^1 \qquad (I)$$

wherein
Ar is a fluoranthene ring optionally substituted by one or two substituents, said substituents containing not more than four carbon atoms in total when taken together, being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the fluoranthene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl;
R^1 contains not more than eight carbon atoms and is a group



wherein
m is 0 or 1;
R^5 is hydrogen;
R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy;
R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;



is a five- or six-membered saturated carbocyclic ring;
R^{10} is hydrogen, methyl or hydroxymethyl;
R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;
R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl.

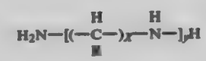
4,720,588

POLYALKYLENE POLYAMINES VIA VAPOR PHASE REACTION USING INERT GAS

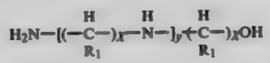
Michael G. Turcotte, Allentown; Cawas A. Cooper, Macungie; Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 16, 1986, Ser. No. 819,646
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—479 **18 Claims**

1. In a process for preparing a noncyclic polyalkylene polyamine which comprises contacting:
(a) an alkylene amine compound having two primary amino groups of the general formula:



wherein
R is hydrogen or a lower alkyl (C_1–C_4) radical,
x is a number from 2 to about 6, and
y is a number from 1 to about 4, and
(b) an alkanolamine compound having primary or secondary hydroxyl groups of the general formula:



wherein
R is hydrogen or a lower alkyl (C_1–C_4) radical,
R_1 is hydrogen or a lower alkyl (C_1–C_4) radical,
x is a number from 2 to about 6, and
y is a number from 0 to about 3,
in the presence of an effective amount of phosphorus-containing compound as catalyst and at a reaction temperature and reaction pressure sufficient to effect reaction between the alkanolamine compound, and the alkylene amine compound, the improvement for effecting said reaction under vapor phase conditions while maintaining high selectivity which comprises:
establishing a reaction zone containing a catalytic bed comprising a phosphorus-containing compound compounded into a particulate material or carried upon a support,
contacting said bed with reactant alkanolamine compound and alkylene amine and an inert gas, and
maintaining sufficient inert gas in the reaction zone such that the dew point temperature of the reactor contents is below the reaction temperature from about 200° to 285° C. at a reaction pressure from 75 to 275 psig.

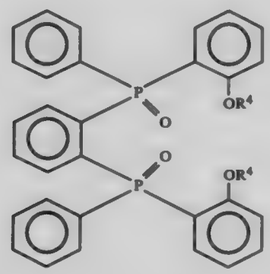
4,720,589

BIS-PHOSPHINEOXIDE COMPOUNDS

Richard L. Wife; Johannes J. M. Snel, and Aart B. Van Oort, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 797,549, Nov. 13, 1985, Pat. No. 4,683,338. This application Mar. 17, 1987, Ser. No. 26,923
Claims priority, application United Kingdom, Nov. 22, 1984, 8429537
Int. Cl.[4] C07F *9/53*
U.S. Cl. 568—15 **4 Claims**

1. Compounds of the general formula



III

wherein R^4=H or an alkyl group with 1 to 4 carbons.

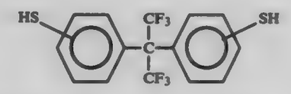
4,720,590

[2,2,2-TRIHALO-1-(TRIHALOMETHYL)]ETHYLIDENE-BISBENZENETHIOLS

Thomas W. Giants, Santa Monica, and Thomas K. Dougherty, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,431
Int. Cl.[4] C07C *148/00, 149/00*
U.S. Cl. 568—65 **4 Claims**

1. 2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene-bisbenzenethiols of the following generic formula:



wherein the thiol groups are positioned meta or para to the ethylidene group.

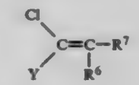
4,720,591

PREPARATION OF CHLORO-OLEFINS

Eberhard Steckhan, Meckenheim; Reinhard Wolf, Koenigswinter-Thomasberg, and Hermann Puetter, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

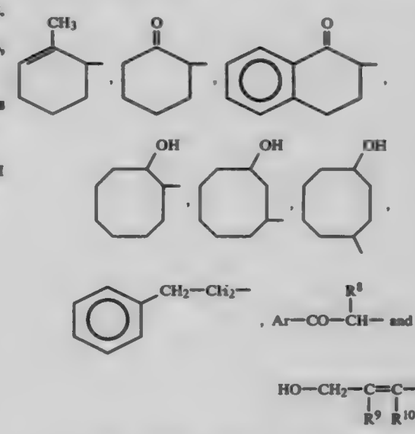
Division of Ser. No. 749,423, Jun. 27, 1985, Pat. No. 4,681,977. This application Dec. 12, 1986, Ser. No. 941,062
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423762
Int. Cl.[4] C07C *49/637*
U.S. Cl. 568—328 **5 Claims**

1. A chloro-olefin of the formula



V

where Y is chlorine or hydrogen, R^6 is hydrogen or methyl, R^7 is one of the radicals



Ar is aryl, R^8 is methyl, hydrogen, chlorine or bromine, and R^9 and R^{10} are each hydrogen or methyl.

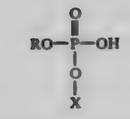
4,720,592

PREPARATION OF CYCLOHEXANONE AND CYCLOHEXANOL

Usamah N. Besmar, Houston; John B. Lyon, Orange; Francis J. Miller, Orange, and Michael T. Musser, Orange, all of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 5, 1986, Ser. No. 904,006
Int. Cl.[4] C07C *29/132*
U.S. Cl. 568—342 **8 Claims**

1. A process for the production of a mixture containing cyclohexanone and cyclohexanol which comprises the following steps in sequence:
(A) contacting a mixture containing (i) cyclohexane, (ii) a cyclohexane oxidation cobalt catalyst which is soluble in cyclohexane, (iii) an organic phosphate ester which is soluble in the mixture and having the formula:



where R is selected from the group consisting of C_4–C_{12} alkyl radicals and C_5–C_8 cycloalkyl radicals, and X is H or R, (iv) cyclohexylhydroperoxide, cyclohexanol, cyclohexanone, and other oxidation products of the oxidation of cyclohexane including diacids, monoacids and hydroxyacids, the amount of organic phosphate ester in said mixture exceeding the amount, on a molar basis, of cobalt in said mixture, with water under conditions such that the water extracts from the mixture a substantial portion of the cobalt catalyst,

(B) separating the water containing the extracted components from the remaining components of the mixture by decantation,

(C) contacting the remaining components of the mixture with a fixed bed Group VIII metal on an inert substrate hydrogenation catalyst and hydrogenating the cyclohexylhydroperoxide in the mixture at an elevated temperature and at a pressure of 140–170 psig, to form cyclohexanone and cyclohexanol.

4,720,593

PROCESS FOR THE PRODUCTION OF 1-METHYLCYCLOPROPANECARBOXALDEHYDE

Juan Andrade, Kleinostheim; Gunter Prescher, Hanau, and Klaus Kohler, Hainburg, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

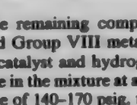
Filed Oct. 22, 1986, Ser. No. 921,473

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537813

Int. Cl.⁴ C07C *45/65*

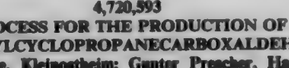
U.S. Cl. 568—420 **5 Claims**

1. A process for the production of 1-methylcyclopropanecarboxaldehyde of the formula



(I)

comprising treating 4-chloro-2-methyl butanal of the formula



(II)

in an inert solvent with a 1.0 to 10.0 fold molar amount of a strong non-nucleophilic base at a temperature between −40° and +70° C.

4,720,594

PROCESS FOR THE PREPARATION OF AROMATIC ALDEHYDES

Jean-Marie Basset, Villeurbanne, and Robert Mutin, Meyzieu, both of France, assignors to Rhone-Poulenc Specialites Chimiques, France

Filed Jun. 13, 1986, Ser. No. 873,964

Claims priority, application France, Jun. 21, 1985, 85 09676

Int. Cl.⁴ C07C *45/49*

U.S. Cl. 568—428 **18 Claims**

1. A process for the preparation of an aromatic aldehyde by hydrocarbonylation of a chloro- or bromoaromatic compound comprising the step of reacting a mixture of carbon monoxide and hydrogen with chloro- or bromoarenetricarbonyl chromium in the presence of an acceptor for an oxygen-free acid selected from the group consisting of alkaline-earth metal oxides and hydroxides, alkali metal or alkaline-earth metal carbonates or bicarbonates, alkali metal or alkaline-earth metal carboxylates, tertiary amines and tertiary nitrogenous heterocyclic bases and of a source of palladium/phosphine complex catalyst at a termperature of from 50° C. to 250° C. and an absolute pressure of carbon monoxide of from 1 to 150 bars.

4,720,595

NOVEL AGENTS CONTAINING THE COMPOUND 3-TRIFLUOROMETHYL-4-NITROPHENOL

Gerhard Frisch, Wehrheim, and Paul Bittner, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

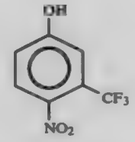
Filed Oct. 22, 1986, Ser. No. 921,739

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537854

Int. Cl.⁴ C07C *79/32*

U.S. Cl. 568—709 **10 Claims**

1. A composition comprising a solid combination product of 30 to 90% by weight of 3-trifluoromethyl-4-nitrophenol of the formula I



(I)

which contains 12 to 20% by weight of water, with 10 to 70% by weight of a basic salt of the alkaline earth series or of the metals Zn(II), Al(III), Fe(II) or Fe(III).

4,720,596

PROCESS FOR REMOVING PHENOLS FROM WATER

Gaylord M. Kissinger, and Isabel M. Gomes de Matos, both of Evansville, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 9, 1986, Ser. No. 940,243

Int. Cl.⁴ C07C *37/70*

U.S. Cl. 568—724 **4 Claims**

1. A process for removing phenol from water which comprises contacting at least a portion of a phenol bearing water stream which results form the acid catalyzed condensation of phenol with acetone with a bisphenol-A melt thereby separating phenol from the water.

4,720,597

PROCESS FOR THE PRODUCTION OF HYDROXYMETHYLCYCLOPROPANE (CYCLOPROPYLMETHANOL)

Werner Otte, Dortsen, and Rudolf Nehring, Marl, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,914

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538132

Int. Cl.⁴ C07C *29/132*

U.S. Cl. 568—814 **17 Claims**

1. A process for the selective production of hydroxymethylcyclopropane, said process comprising hydrogenating a cyclopropanecarboxylic acid ester in the liquid phase in the presence of a catalytic amount of zinc chromite, at a sufficiently high temperature and at a sufficiently high pressure so as to produce hydroxymethylcyclopropane.

4,720,598

PROCESS FOR PREPARING A BASIC LITHIUM PHOSPHATE CATALYST FOR THE ISOMERIZATION OF ALKENE OXIDES

Hubertus B. Scholte, Sittard, Netherlands, assignor to Stamicarbon B.V., Netherlands

Division of Ser. No. 795,643, Nov. 6, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 878,507

Claims priority, application Netherlands, Nov. 28, 1984, 8403616

Int. Cl.⁴ C07C *29/56*

U.S. Cl. 568—908 **7 Claims**

1. A process for the gas phase isomerization of propylene oxide to allyl alcohol which comprises contacting propylene oxide at a temperature of from about 290° C. to about 325° C. with a fixed bed composed of a basic lithium phosphate catalyst prepared by evenly adding an aqueous solution of a phosphate salt or phosphoric acid during a period of at least 6 hours to a homogenously stirred aqueous solution of a lithium compound, on which the precipitated lithium phosphate is washed with water and subsequently calcined to form said catalyst, whereby said allyl alcohol is obtained by isomerization of said propylene oxide.

4,720,599

PREPARATION OF VINYL CHLORIDE BY THERMAL CRACKING OF 1,2-DICHLOROETHANE

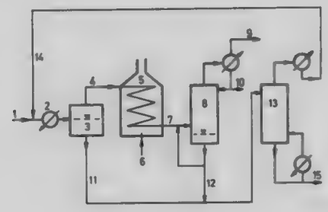
Werner Hebgen, Nussloch; Eckehard Danz, Ludwigshafen; Gerd Krome, Weisenheim, and Erhard Stahnecker, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 424,876, Sep. 27, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 658,464

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140892

Int. Cl.⁴ C07C *17/34*

U.S. Cl. 570—226 **2 Claims**



1. A process for the preparation of vinyl chloride comprising the steps of:

(a) vaporizing liquid 1,2-dichloroethane,

(b) thermally cracking the 1,2-dichloroethane vapor,

(c) cooling the hot reaction mixture which is under pressure by quenching, and

(d) separating the reaction mixture by distillation,

wherein from 1 to 10% by weight of the liquid 1,2-dichloroethane is taken off in or downstream of the vaporizer and mixed with 5 to 15% by weight of the cooled liquid portion of the reaction mixture from the quenching stage (c), the mixture of the liquid 1,2-dichloroethane and the said cooled liquid portion thereafter being worked up by distillation.

4,720,600

PRODUCTION OF MIDDLE DISTILLATE RANGE HYDROCARBONS BY LIGHT OLEFIN UPGRADING

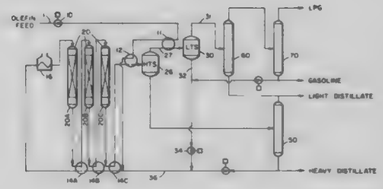
James H. Beech, Jr., Wilmington, Del.; Hartley Owen, Belle Mead, N.J.; Michael P. Ramage, Moorestown, N.J., and Samuel A. Tabak, Wenonah, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 654,348, Sep. 25, 1984, Pat. No. 4,547,612, and a continuation-in-part of Ser. No. 616,376, Jun. 1, 1984, Pat. No. 4,504,691. This application Feb. 8, 1985, Ser. No. 699,882

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.⁴ C07C *2/00*

U.S. Cl. 585—330 **13 Claims**



8. In the continuous process for upgrading lower olefin feedstock to higher hydrocarbons including the steps of combining olefinic feedstock with a pressurized liquid diluent stream comprising C_5^+ olefins, contacting the diluted feedstock with a shape selective medium pore acid zeolite catalyst under reaction conditions at moderate temperature in a pressurized reactor system comprising a series of catalytic reactor beds to convert olefins and recover reactor effluent at reaction conditions; the improvement which comprises:

incrementally decreasing reactor temperature from a first reactor bed in the series to last reactor bed to promote oligomerization in the last reactor bed;

separating reactor effluent in a primary phase separation zone to vaporize light and middle distillate hydrocarbon components into a first vapor phase stream and recover from the primary separation zone a heavy liquid recycle stream, said heavy liquid stream containing at least 50% of those C_{16}^+ hydrocarbons recovered in the reactor effluent;

passing the heavy hydrocarbon recycle stream to said first reactor bed, maintained under conditions to degrade the heavy hydrocarbons;

condensing a light portion of the first vapor phase stream by cooling and recovering from a secondary phase separating zone the dominant portion of a light olefinic recycle stream for further reaction in a lower temperature serial reactor bed to promote oligomerization, said light recycle stream comprising a major portion of C_6 to C_8 hydrocarbons recovered in the reactor effluent; and

recovering an intermediate liquid product stream from the secondary separation zone to obtain a distillate product stream consisting essentially of substantially linear C_9–C_{16} aliphatic hydrocarbons.

4,720,601

PROCESS FOR PREPARING 5-ETHYLIDENE-2-NORBORNENE

Gokfu Suzukamo, Osaka, and Masumi Fukao, Shiga, both of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Aug. 15, 1986, Ser. No. 896,959
Claims priority, application Japan, Oct. 21, 1985, 60-235992; Nov. 21, 1985, 60-262283
Int. Cl.[4] C07C 5/25
U.S. Cl. 585—377 16 Claims

1. A process for preparing 5-ethylidene-2-norbornene which comprises isomerizing 5-vinyl-2-norbornene in the presence of at least one catalyst selected from a group consisting of (a) a solid base catalyst which is prepared by reacting alumina and a alkali metal hydroxide at a temperature of 200° to 500° C. and then reacting the reaction product with an alkali metal at a temperature of 180° to 350° C. and (b) a solid base catalyst which is prepared by reacting water-containing alumina and an alkali metal in such an amount that corresponds to a molar equivalent of water contained in the alumina at a temperature in a range between a melting point of the alkali metal and 500° C. and then reacting the reaction product with the alkali metal in such an amount that the total amount of alkali metal corresponds to 1.01 to 2 times molar equivalent of water contained in alumina, at a temperature of 180° to 350° C.

4,720,602

PROCESS FOR CONVERTING C_2 TO C_{12} ALIPHATICS TO AROMATICS OVER A ZINC-ACTIVATED ZEOLITE

Cynthia T. W. Chu, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 905,104
Int. Cl.[4] C07C 15/393
U.S. Cl. 585—407 18 Claims

1. A process for producing aromatic compounds which comprises contacting under conversion conditions, a feed containing at least 50 weight percent of C_2 to C_{12} aliphatic hydrocarbons with a low acid activity catalyst comprising a crystalline zeolite characterized by a Constraint Index within the approximate range of 1 to 12 and an alpha value no higher than about 45, and an added metal consisting essentially of between from about 0.1 to about 10 percent of zinc based on the total weight of catalyst, whereby aliphatic hydrocarbons present in said feed are converted to aromatic compounds, and recovering said aromatic compounds.

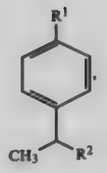
4,720,603

PREPARATION OF P-CYMENE AND HOMOLOGOUS ALKYLBENZENES

Roland Martin, Ludwigshafen, and Walter Gramlich, Edingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

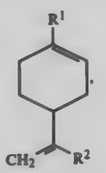
Filed Feb. 20, 1987, Ser. No. 16,941
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607448
Int. Cl.[4] C07C 5/32
U.S. Cl. 585—431 5 Claims

1. A process for preparing an alkylbenzene of the general formula I



(I)

where R^1 is C_1–C_4-alkyl and R^2 is hydrogen or C_1–C_4-alkyl, by catalytic aromatization of an alkenylcyclohexene of the general formula II



(II)

where R^1 and R^2 have the abovementioned meanings, which comprises carrying out the reaction in the gas phase at 150°–350° C. over a catalyst which contains palladium oxide and sulfur and/or selenium or selenium oxide on active carbon.

4,720,604

PROCESS FOR DEHYDROGENATION OF ALKYLAROMATICS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, N.Y.

Division of Ser. No. 449,911, Dec. 15, 1982, abandoned. This application Sep. 14, 1984, Ser. No. 650,395
Int. Cl.[4] C07C 2/64
U.S. Cl. 585—445 12 Claims

1. In a process for the dehydrogenation of para-ethyltoluene to selectively form para-methylstyrene comprising contacting the para-ethyltoluene under dehydrogenation reaction conditions with a catalyst composition comprising:

(a) from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of a potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% of a chromium compound, calculated as chromic oxide,

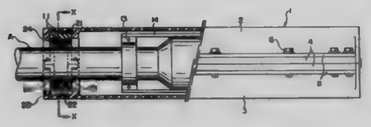
the improvement comprising contacting the para-ethyltoluene with a catalyst composition additionally comprising a modifying component (d) being capable of enhancing the preferential formation of para-methylstyrene and of rendering the para-methylstyrene-containing dehydrogenation reaction effluent especially resistant to the subsequent formation of popcorn polymers when the dehydrogenation of para-ethyltoluene is conducted over the modified catalyst, the modifying component (d) comprising about 1% to 15% by weight of the catalyst composition of a calcium compound, calculated as calcium oxide, and about 1% to 20% by weight of the catalyst composition of a bismuth compound, calculated as bismuth trioxide.

4,720,605

CABLE CLOSURE

Yuzo Tokumaru, and Yuya Iwamoto, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 28, 1986, Ser. No. 901,399
Claims priority, application Japan, Sep. 27, 1985, 60-148822[U]
Int. Cl.[4] H02G 15/08
U.S. Cl. 174—93 2 Claims



1. A cable closure end sealing device comprising:

a sleeve-like rubber body having first and second portions each portion being substantially one half of said sleeve-like body divided longitudinally;

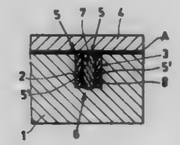
each of said sleeve-like body portions having a plurality of insertion sleeves passed through and embedded in a circumferential portion of said body portions at predetermined circumferential locations, and a pair of plastic side plates having an insertion hole for a cable, said pair of plastic side plates being attached tightly on opposite end surfaces of said rubber body portions by screws screwed into said insertion sleeves.

4,720,606

SEAL IN HOUSING MEANS CONTAINING ELECTRICAL APPARATUSES

Jakob Senn, Via Barazzo, CH-6596 Gordola, Switzerland

Filed Jun. 24, 1986, Ser. No. 877,928
Claims priority, application Switzerland, Jun. 28, 1985, 2748/85
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC 8 Claims



1. A sealing device for sealing two components of a housing means for electrical apparatus to effectively prevent entry of gas, air, and moisture and for shielding against electromagnetic fields comprising:

a first outer, elongated member made of a resilient material said first member including upper and lower surfaces; and

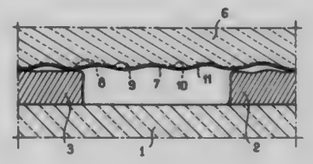
a second inner member having a band-like core made of a resilient material and a thin-film envelope of an electrically conductive material surrounding said core, said second member being inserted into said first member, said second member having top and bottom ends projecting beyond said upper and lower surfaces of said first member.

4,720,607

TACTILE SCREEN FOR DETERMINING THE COORDINATES OF A POINT ON A SURFACE

Frédéric de Moncuit, Paris, France, assignor to Bouseols S.A., Levallois-Perret, France

Filed Jan. 16, 1987, Ser. No. 4,538
Claims priority, application France, Jan. 22, 1986, 86 00862
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 8 Claims



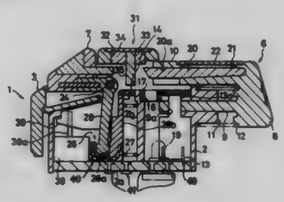
1. A tactile screen for determining the coordinates of a point on a surface, comprising a support (1) provided with relatively spaced conductive strips (2, 3, 4, 5) made up of emitting strips (2, 4) and receiving strips (3, 5) in interjacent relation, said screen being intended to be touched by an object such as a user's finger (1a) in order to establish an electrical bridge between an emitting strip and a receiving strip, said screen being associated with means for measuring the variation in electric potential on each emitting strip and receiving strip in order to deduce therefrom the coordinates of the point of contact of the object aforesaid on the screen, wherein the conductive strips (2, 3, 4, 5) are covered with a membrane (6) in which the surface (7) adjacent to said conductive strips is conductive, the electrical resistance per unit area of said conductive surface being distinctly higher than that of the conductive strips (2, 3, 4, 5) when said membrane (6) is not touched, thereby making it possible to form an electrical bridge between an emitting strip and a receiving strip in the contact zone.

4,720,608

SWITCHING DEVICE HAVING LOCK PLATE

Yukio Mizuta, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Aug. 28, 1986, Ser. No. 901,519
Claims priority, application Japan, Aug. 29, 1985, 60-132342
Int. Cl.[4] H01H 9/20
U.S. Cl. 200—5 B 1 Claim



1. A switching device comprising:

a plurality of first operating elements;

a first mounting means supporting said plurality of first operating elements for axial movement linearly in opposite directions along respective spaced parallel axes, to first and second operating positions;

a second operating element;

second mounting means supporting said second operating element for swiveling movement in opposite directions about an axis to a first and second operating position;

a fixed contact corresponding to each of a plurality of first electrical contacts;

a contact holder, including one of said first electrical

contacts, for each of said first and second operating elements, each said contact holder being disposed to slidably move in first and second opposite directions in response to movement of said respective first and second operating element for bringing said associated electrical contact into and out of physical engagement with said corresponding fixed contact; and

a lock plate common to said first and second contact holders mounted adjacent said contact holders for sliding movement in opposite directions perpendicular to the sliding movement of said contact holders;

said lock plate including mating means for engaging a respective contact holder for locking the associated electrical contact into physical engagement with said corresponding fixed contact upon movement of any one of said first and second operating elements to said second position, said mating means being operative to release said contact holder for unlocking the respective locked first electrical contacts upon movement of any one of said plurality of said first and second operating elements, other than the operating element for the contact holder including the locked first electrical contact, to said second position.

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PUSHBUTTON SWITCH DEVICE

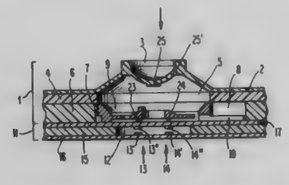
Gerhard Hochgesang, Bad Neustadt/Saale-Lebenhan, and Jurgen Oelsch, Hohenroth, both of Fed. Rep. of Germany, assignors to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Company, Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,736

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536539

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A **11 Claims**



1. A pushbutton switch device comprising at least one switch element, said switch element comprising a switch chamber defined between first and second elastic foils having a space therebetween, two electrically independent contacts protruding from each of said foils into said switch chamber, each of said contacts protruding from said first foil opposing one of said electrically independent contacts protruding from said second foil, said electrically independent contacts forming a first and second contact pair respectively, a switch button arrangement comprising a switch knob arranged for actuation of said first and second switch contact pairs, wherein the stroke of said switch knob needed to actuate said second switch contact pair is greater than the stroke needed for actuation of said first contact pair, and a spring elastic insert placed between the switch knob and one of the foils defining the switch chamber, said insert having an inner region, an outer region, an edge region, a first web and a second web, said inner region and said outer region being connected by said first web, said outer region and said edge region being connected by said second web, such that when said switch knob acts upon said insert, said inner region actuates said first switch contact pair, and upon further acting of said switch knob upon said insert, said inner region actuates said second switch contact pair.

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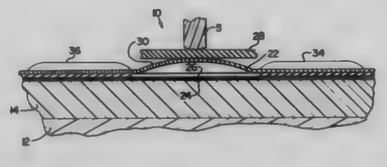
MEMBRANE KEY SWITCH WITH ANTI-INVERSION FEATURE

Robert A. MacHarrie, Hillsborough, N.H., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 19, 1986, Ser. No. 943,973

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A **15 Claims**



1. A membrane switch of the matrix type including a plurality of contact sites and a plurality of layers with means for clamping said layers mechanically together, comprising:

a first layer having at least one first conductive trace thereon defining at least one first contact point for each contact site of said matrix switch;

a flexible second layer having at least one second conductive trace thereon defining at least one second contact point for each said contact site of said matrix switch;

a spacer means between said first and second layers to hold said first and second contact points normally apart;

a third layer comprised of a flexible membrane material, said layer including a curvilinear dimple disposed over said first and second contact points of said first and second layers, said dimple having an upward and inverted position relative to said third layer, such that by pressure to said dimple to move said dimple from its upward to its downward position, said dimple effects closure of said contact site by pressing said second layer against said first layer to electrically engage said at least one second contact point on said second layer with said at least one contact point on said first layer; and

means for stiffening said material of said third layer in the plane of said material parallel to said first and second layers and around the periphery of each said dimple, said stiffening means extending radially outwardly from the center of each said dimple, thus precluding lifting of said third layer of material and locking of said dimple in the downward position upon effecting closure at a contact site.

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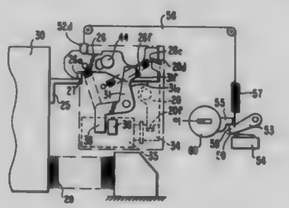
ELECTRO-MANUAL DRAWER LATCH

Shiro Ishii, Garden Grove, Calif., assignor to M-S Corp., Stanton, Calif.

Filed Sep. 2, 1986, Ser. No. 902,952

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—61.61 **20 Claims**



1. An electro-manual drawer latch for a drawer which in a manual mode locks the drawer when the drawer is pushed into a housing from an unlocked position and unlocks the drawer when the drawer is pushed further into the housing from a locked position and which in an electrical mode prevents the drawer from being manually unlocked by pushing the drawer further into the housing from a locked position and instead unlocks the drawer in response to an electrical signal, comprising:

a housing;

a drawer slidably mounted in said housing, said drawer having latch means thereon for locking said drawer in said housing;

spring means disposed between said housing and said drawer for biasing said drawer out of said housing;

locking means disposed in said housing for engaging and disengaging said latch means in a manual mode and in an electrical mode, said locking means engaging with said latch means when said drawer is manually pushed from an unlocked position into said housing to a locked position to thereby lock said drawer in said housing and disengaging with said latch means when said drawer is pushed from said locked position further into said housing when said locking means is in said manual mode and said locking means being prevented from disengaging with said latch means in response to a manual push on said drawer which moves said drawer from said locked position to a position further in said housing when said locking means is in said electrical mode, said locking means disengaging with said latch means in said electrical mode in response to an electrical signal received by said locking means; and

control means connected to said locking means for selectively placing said locking means in either said manual mode or said electrical mode, said control means further supplying said electrical signal to unlock said drawer when said locking means is in said electrical mode.

4,720,612

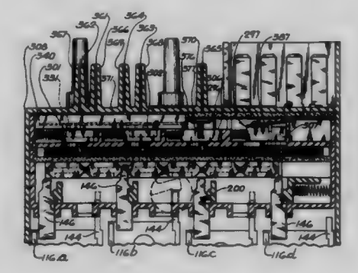
PUSHBUTTON VACUUM-ELECTRIC AIR CONTROL UNIT FOR AUTOMOTIVE VEHICLES

John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Filed Nov. 10, 1986, Ser. No. 930,000

Int. Cl.[4] H01H *9/06*

U.S. Cl. 200—61.86 **21 Claims**



1. A vacuum-electric switch for automotive vehicles, the switch comprising

housing means,

a plurality of pushbuttons movable in the housing means between extended and depressed positions,

a latching mechanism for latching each of said pushbuttons in its depressed position,

the latching means including means operable by depression of each pushbutton for unlatching any previously latched pushbutton,

a block-out mechanism for preventing simultaneous depression of more than one of the pushbuttons,

a plurality of levers swingable by the corresponding pushbuttons between initial and operated positions,

spring means biasing the levers toward their initial positions and thereby also biasing the pushbuttons toward their extended positions,

each of the levers having a first arm operable by the corresponding pushbutton and a second arm movable with the lever,

a plurality of stacked movable selector plates corresponding with the levers and the pushbuttons,

the selector plates being movable between initial and operated positions by the second arms of the levers,

the plates having small size slots and large size slots for receiving the second arms of all of the levers,

each of the plates having one of the small size slots for receiving a particular one of the second arms whereby the particular plate is movable by the corresponding lever,

all of the other plates having large size slots for receiving the second arm of that particular lever so that the second arm of that particular lever is movable idly in the large size slots,

whereby the individual plates are uniquely movable by the corresponding individual levers,

a plurality of control devices having movable control members adapted to be moved by certain of the selector plates between initial and operated positions,

spring means biasing the control members toward their initial positions,

at least one of the control devices being a vacuum control valve,

at least one of the control devices being an electrical switch,

the operating members having operating knobs projecting therefrom,

the selector plates having small size openings and large size openings for receiving all of the knobs,

the large size openings providing for idle movement between the plates and the knobs,

each of the plates having one or more of the small size openings for moving the corresponding knobs and the corresponding control members between their initial and operated positions,

whereby the depression of each pushbutton is operative to move one or more of the control members between their initial and operated positions,

as selected by the provision of one or more small size openings in the corresponding selector plate.

4,720,613

CONTACT ARRANGEMENT FOR LOW-VOLTAGE CIRCUIT BREAKERS WITH MAIN CONTACTS AND BURN-OFF CONTACTS

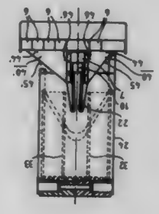
Bernd Adam, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,729

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 3539673

Int. Cl.[4] H01H *33/12*

U.S. Cl. 200—146 R **3 Claims**



1. A contact arrangement for a low-voltage circuit breaker having main contacts for conducting a continuous current and burn-off contacts for igniting a switching arc in the entrance

area of an arc quenching chamber, and further having arcing horns for transferring the switching arc into the arc quenching chamber, at least two main contacts being arranged in a row next to each other and at least one burn-off contact being arranged spaced therefrom, an arc guiding piece of ferromagnetic material being arranged in a space between the main contacts and the burn-off contact, the arc guiding piece having an approximately triangular shape, one edge of the triangular shape disposed adjacent the main contacts, and a further edge disposed adjacent the space between a top edge of the main contacts and a top edge of the associated burn-off contact, said further edge extending past said top edge of the burn-off contact, two edges of the triangular shape of the arc guiding piece forming an acute angle leading to the arcing horn of the associated burn-off contact.

4,720,614

PUSHBUTTON SWITCH WITH LATCHING ARRANGEMENT

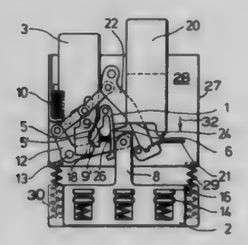
Hans-Jürgen Wulff, Hohenwestedt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,174

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515895

Int. Cl.⁴ H01H 9/20

U.S. Cl. 200—328 **5 Claims**



1. An electrical switch comprising:

first and second electrical contacts;

a movable contact carrier supporting said first contact and movable between an on state in which said first contact conductively contacts said second contact and an off state in which said first contact is spaced from said second contact;

a switching button movable between an on position and an off position;

means connected between said button and said carrier for causing said carrier to move into its on state in response to movement of said button to its on position;

a pivotally mounted two-armed blocking lever interposed between said button and said carrier, said lever having a first arm formed to engage said button when said button is in its on position, and a second arm engaged by said carrier as long as said carrier is not in its off state for causing said first arm to retain said button in its on position as long as said second arm is engaged by said carrier and for permitting said button to move to its off position when said carrier is in its off state, at least said second arm of said lever being elastically deformable, whereby the position of said button is indicative of the state of said carrier; and

a spring biassing said button into its off position,

wherein said button and said first arm of said lever have latch faces placed at a predetermined angle and arranged for cooperatively engaging so that a force exerted by said spring causes said button to exert on said lever a first torque in a direction to urge said latch face of said first arm of said lever out of engagement with said latch face of said button.

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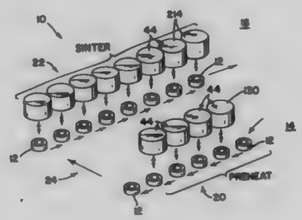
INDUCTION SINTERING PROCESS AND APPARATUS

Jerry R. Dunn, Boaz, Ala., assignor to Tocco, Inc., Boaz, Ala.

Filed Aug. 29, 1985, Ser. No. 770,768

Int. Cl.⁴ H05B 5/00, 6/00

U.S. Cl. 219—10.41 **23 Claims**



1. An apparatus for sintering compacted, unsintered powdered metallurgical workpieces containing volatile and non-volatile constituents comprising:

a plurality of inductor coils aligned in a series between an entry end and an exit end;

means for sequentially moving a workpiece into heating relationship with each of said inductor coils;

means for energizing said inductor coils when a workpiece is in heating relationship therewith, said energizing of said inductor coils being sufficient to progressively raise the temperature of the workpiece to an effective sintering temperature; and,

vent means overlying a portion of the said series of inductor coils adjacent said entry end for exhausting volatile constituents expelled from the workpiece during the initial heating thereof.

4,720,616

POLARITY REVERSAL PULSING METHOD AND APPARATUS FOR EDM

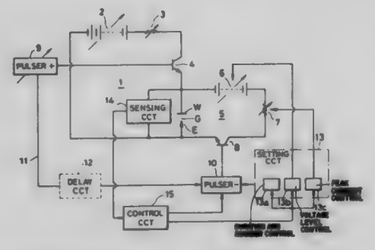
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,326

Claims priority, application Japan, Aug. 21, 1984, 59-173763

Int. Cl.⁴ B23H 1/02

U.S. Cl. 219—69 P **4 Claims**



1. A method of machining a conductive workpiece by means of electroerosive discharges effected across a machining gap between a tool electrode and the workpiece in the presence of a water machining fluid wherein a succession of voltage pulses of regular polarity is applied across the gap between the workpiece and the tool electrode to produce such discharges and at least one pulse of reverse polarity having variable parameters

including pulse width, amplitude and number of pulses occurrences of the reverse-polarity pulses is interposed during a time interval between succeeding regular-polarity pulses, the method comprising the steps of:

(a) sensing the occurrence of a gap open-circuit condition resulting from the application of at least one such regular-polarity pulse; and

(b) in response to said open-circuit condition, temporarily varying at least one of said parameters of said reverse-polarity pulses subsequent to the occurrence of said open-circuit condition.

4,720,617

APPARATUS FOR CONTINUOUS PROCESSING IN THE DIRECTIONS OF X- AND Y-COORDINATES

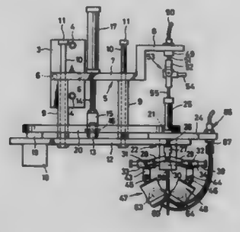
Futoni Hayakawa, and Kazuo Onoda, both of Tokyo, Japan, assignors to Hy-Bec Corporation, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,787

Claims priority, application Japan, Jul. 18, 1985, 60-157056

Int. Cl.⁴ B23K 1/04

U.S. Cl. 219—85 BA **12 Claims**



1. An apparatus for continuous processing of a work piece in the directions of the x- and y-coordinates, comprising

a pair of heat ray sources mounted in a heat ray source assembly for irradiating a corresponding pair of parallel processing lines extending in the direction of the x-coordinate, by focussing a heat ray onto each of said processing lines in a straight line focus having the form of a segment of a line,

means for effecting vertical positioning of said pair of heat ray sources for adjusting the focussing of heat rays onto said processing line,

a turning mechanism for turning said heat ray source assembly through 90° so as to align said pair of line foci with a pair of parallel processing lines extending in the direction of the y-coordinate,

distance adjusting means for adjusting the distance between said pair of parallel line foci by effecting a parallel relative shifting of said pair of heat ray sources,

a masking element for each heat ray source and having a pair of shield members for limiting the width of the heat ray beam discharged from the heat ray source to determine the length of line fouca for each processing in the x- or y-direction, and

masking element actuating means for each of said pair of heat ray sources and comprising means for effecting simultaneous relative shifting of said pair of shield members to limit the width of the heat ray beam and thus to define the length of the line focus.

4,720,618

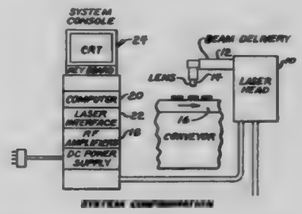
METHOD AND APPARATUS FOR EQUALIZING POWER OUTPUT IN A LASER MARKING SYSTEM

Michael E. Stamer, Lincolnwood, and Stephen A. Kozich, Des Plaines, both of Ill., assignors to Videojet Systems International, Inc., Elk Grove Village, Ill.

Filed Aug. 7, 1986, Ser. No. 894,366

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LA **14 Claims**



1. A method for equalizing the energy outputs of a pluralty of lasers, the outputs being caused to scan a substrate to mark symbols thereon comprising the steps of:

(a) adjusting the on time period of each laser as a function of its energy output relative to a reference value thereby to equalize said energy outputs;

(b) centering the on time periods of said lasers about a common time reference point to maintain marking quality.

4,720,619

DEVICE FOR PIERCING HOLES IN ROD-SHAPED ITEMS

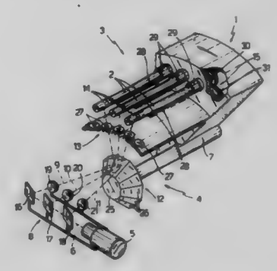
Riccardo Mattei; Armando Neri, both of Bologna; Maichi Castello, Anglié , and Santo R. Gobbi, Pavia, all of Italy, assignors to G.D. Societa per Azioni, Via Pomposia, Italy

Filed Mar. 22, 1985, Ser. No. 714,883

Claims priority, application Italy, Mar. 22, 1984, 3390 A/84

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LK **5 Claims**



1. A device for piercing holes in cigarettes, said device comprising a conveyor to convey along a predetermined path a number of said cigarettes arranged crosswise in relation to the traveling direction of the conveyor; drive means to rotate said cigarettes in relation to said conveyor around their own axes at a given speed; at least one laser source for generating at least one pulsating laser beam; and a focusing device to focus each said laser beam successively onto said cigarettes, said focusing device including a focusing lens mounted on said conveyor adjacent to each of said cigarettes for focusing said laser beam onto said cigarettes, reflecting means comprising a reflecting body shaped essentially in the form of a truncated pyramid, coaxially with and rotating with said conveyor for directing said laser beam successively onto said focusing lenses

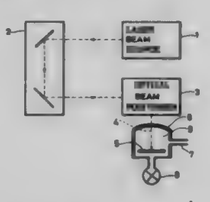
for a predetermined period of time equal to the time it takes each of said focusing lenses to travel with said conveyor over a respective given section of said predetermined path to permit said laser beam to pierce holes in said cigarettes.

4,720,620

METHOD OF CUTTING METAL INTERCONNECTIONS IN A SEMICONDUCTOR DEVICE

Junichi Arima, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,768
Claims priority, application Japan, Nov. 5, 1984, 59-234765
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 437—173 **14 Claims**



1. A method of cutting metal interconnections in a semiconductor device formed on a surface of a semiconductor wafer, said method comprising the steps of:

placing said semiconductor wafer and said semiconductor device in a low pressure gaseous atmosphere maintained at a low pressure in the range 1 to 10 mTorr to facilitate sublimation of said metal interconnections when the metal interconnections are irradiated; and

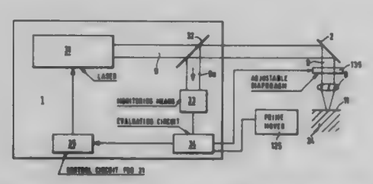
irradiating a laser beam on desired positions of said metal interconnections, to sublimate and thereby cut said metal interconnections at said positions.

4,720,621

METHOD AND APPARATUS FOR REMOVING IMPURITIES FROM METALLIC OBJECTS

Robert Langen, Quierstrasse 29, D-6600 Saarbrücken, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,529
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405700
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 L **24 Claims**



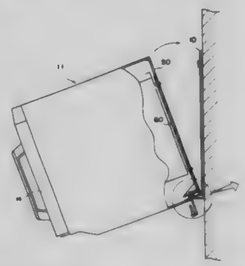
1. A method of removing impurities from the surface of a metallic object, particularly of removing oxidation products from the surface of an object which contains iron or steel, comprising the steps of directing a beam of coherent radiation upon the object to impinge upon and heat the impurities on the surface of the object to evaporation temperature and to thereby effect evaporation of impurities as well as the exposure of the thus cleaned surface to the impinging beam whereby the cleaned surface reflects the beam; and regulating the action of the impinging beam upon the object in dependency on changes in the characteristics of the reflected beam.

4,720,622

WALL-MOUNTED TYPE COOKING APPARATUS

Masao Iwata, Ohmi-Hachiman; Masahiro Tanaka, Ohtsu, and Ichiro Inami, Shiga, all of Japan, assignors to Sanyo Electric Co., Ltd, Japan

Filed Mar. 11, 1985, Ser. No. 710,040
Int. Cl.⁴ A21B *1/00*
U.S. Cl. 219—391 **20 Claims**



1. A wall-mounted type cooking apparatus having a body fixed on a fixing plate mounted on a wall surface, comprising

said fixing plate having

at least one locking member projecting from front surface thereof and having a substantially vertically disposed inserting opening,

at least one supporting member being positioned below said locking member, and

said body having

a back plate on the rear thereof, said back plate having at least one opening into which said locking member is inserted from the rear of said back plate to project in the front of said back plate,

at least one engaging member being positioned below said opening and engaging with said supporting member,

at least one locking bar slidably movable in only a substantially vertical direction and mounted on said back plate for fixing said back plate on said fixing plate by substantially vertically upwardly moving and inserting the uppermost portion thereof into said inserting opening of said locking member projecting through said opening,

a gap is formed between the lower end of said back plate and the rear end of a bottom plate of said body when the back plate is attached to that body,

said gap is formed by at least one spacer projecting toward the rear end of said bottom plate from the lower end of said back plate and engaging said bottom plate.

4,720,623

POWER CONTROL DEVICE FOR A RESISTANCE HEATER IN AN OVEN

John M. DiCesare, Wilmington, and Ludwig C. Semanski, New Castle, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1986, Ser. No. 858,171
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—497 **8 Claims**

1. A power control device for heating and cooling an oven which comprises

(1) an electric heater power control device for controlling the electric power supplied from an alternating current (A.C.) power source to an electric resistance heater in an oven which accurately controls the temperature of the oven at its set temperature which comprises:

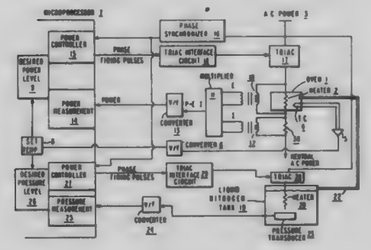
a. microprocessor containing a temperature setting means, a power measuring unit, a power controller unit that uses proportional integral and derivative controller technique and calculating means for determining desired power level; said units and means being operatively interconnected;

b. a temperature measuring means positioned in the oven and electrically connected to to the temperature setting means of the microprocessor whereby a signal is fed from the temperature measuring means to the microprocessor and the desired power level is calculated;

c. a power measuring circuit electrically connected to the power measuring unit of the microprocessor for measuring the power being fed to the heater wherein voltage and amperage values are determined and fed into the power measuring unit; wherein the microprocessor via the calculating means compares the desired power level to the measured power level and feeds the resulting power requirement to the power controller unit of the microprocessor;

d. a triac circuit containing a triac electrically connected to the heater and to the power controller of the microprocessor;

e. a power phase synchronizer electrically connected to the A.C. power source and to the power controller unit; whereby the power controller unit of the microprocessor through the proportional, integral and derivative controller technique synchronizes the A.C. current signal and allows the triac of the triac circuit to fire for a calculated portion of each phase of A.C. current to provide power to the heater in the oven such that the temperature of the oven is accurately controlled at the set temperature;



(2) power control circuit for a cooling unit attached to the oven for maintaining the oven at subambient temperature or for reducing oven temperatures used in combination with the power control device which comprises

a. the microprocessor containing temperature setting means, a gas pressure measuring unit, a power controller unit that uses proportional integral and derivative controller techniques and calculating means for determining gas pressure;

b. a pressure tank containing liquid and gas for cooling and is connected to the oven;

c. a pressure transducer positioned at the tank for measuring pressure in the tank and electrically connected to the gas pressure measuring unit of the microprocessor;

d. a heater unit positioned in the tank which heats the liquid and gas in the tank and thereby forcing the liquid and gas into the oven; and

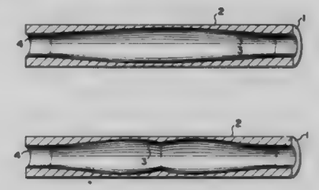
e. a triac circuit containing a triac electrically connected to the heater and to the power controller unit of the microprocessor, whereby the power controller unit of the microprocessor through the proportional, integral and derivative controller technique synchronizes the A.C. current signal and allows the triac of the triac circuit to fire for a calculated portion of each phase of A.C. current to provide power to the heater in the pressure tank to heat liquid in the tank which forces liquid and gas to the oven such that the temperature of the oven is accurately controlled at a subambient set temperature.

4,720,624

NON-UNIFORM RESISTANCE HEATING TUBES

Akira Kikuchi, Tokai; Akira Tobita, Katsuta; Tetsuo Koberi, Mito, and Ryosaku Shibayama, Fujioka, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo and Tokyo Seimitsuka Co., Ltd., Gunma, both of, Japan

Filed Jul. 25, 1984, Ser. No. 634,295
Claims priority, application Japan, Sep. 20, 1983, 58-173871
Int. Cl.⁴ H01C *13/00*
U.S. Cl. 219—553 **5 Claims**



1. A simulated nuclear fuel cluster comprising:

an elongated non-uniform resistance heating tube wherein said tube has a longitudinal axis and a uniform outside diameter and its thickness is molded so that an electric resistance distribution changes in the direction of the longitudinal axis of the tube corresponding to the power distribution state of a nuclear fuel rod.

4,720,625

FUNCTION STRIP ATTACHMENT

Michel D. Arney, Lowell, and Clifford E. LaCoast, Townsend, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 794,210, Nov. 1, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 18,811
Int. Cl.⁴ G06C *7/02*, *25/00*
U.S. Cl. 235—145 R **10 Claims**



CROSS-SECTION OF FUNCTION STRIPS OF THE PRESENT INVENTION

1. Means for exchangeably labelling a row of keys in a keyboard with an optional label comprising:

(1) label bearing means for bearing the label;

(2) a narrow groove in a surface of the keyboard adjacent to the row of keys, the width of the groove being substantially less than the width of the label bearing means; and

(3) groove engaging means attached to the label bearing means so as to project below the label bearing means on the side opposite the label for engaging the groove when inserted therein and disengaging from the groove without damage to the groove engaging means or the groove when the label bearing means is pulled away from the groove with sufficient force to overcome the engagement, whereby the label is easily and repeatedly installable and removable and the groove serves as an aesthetic design element in the keyboard when no label is installed.

VOL 1086 ISS 3 JA 19 1988 UMI

4,720,626

IC CARD PROCESSING METHOD AND PROCESSING DEVICE THEREFOR, AND IC CARD

Seiichi Nishikawa; Koichi Okada, and Teruaki Shiro, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

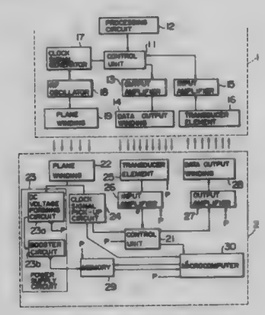
PCT No. PCT/JP84/00247, § 371 Date Jan. 14, 1985, § 102(e) Date Jan. 14, 1985, PCT Pub. No. WO84/04612, PCT Pub. Date Nov. 22, 1984

PCT Filed May 18, 1984, Ser. No. 695,859

Claims priority, application Japan, May 18, 1983, 58-85799

Int. Cl.[4] G06K 7/08

U.S. Cl. 235—449 2 Claims



1. A processing device for an IC card designed so as to supply power and clock signals to an integrated circuit (IC) card on which an electronic circuit including a microcomputer and a memory is mounted and to transmit data to said IC card and receive data therefrom, thus processing said IC card, comprising:

(a) an oscillator for producing an output having a predetermined frequency on the basis of said clock signal,

(b) a first winding for producing a magnetic signal corresponding to the output of said oscillator,

(c) a second winding for producing a magnetic signal indicative of data to be supplied to said IC card, and

(d) a transducer means, comprising a Hall element, for receiving the magnetic signal indicative of data supplied from said ID card.

4,720,627

ION SENSITIVE PHOTODETECTOR

Kenneth P. Quinlan, Newton, Mass., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 3, 1986, Ser. No. 925,954

Int. Cl.[4] H01L 23/56

U.S. Cl. 250—211 J 3 Claims

1. A photodetector, said photodetector comprising:

a planar substrate of semiconductor material, said substrate being doped to form a drain of a modified gate-controlled diode, said substrate having essentially parallel top and bottom surfaces, said substrate having opposing windows formed therein, said windows being separate by a distance less than the thickness of said substrate;

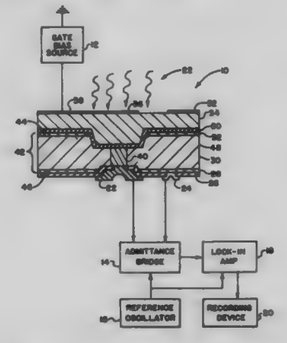
a source, said source being formed between said windows, said source having a highly doped acceptor concentration;

a pair of highly doped donor layers, said donor layers being attached to said top and bottom surfaces of said substrate;

an electrically insulating layer, said insulating layer being deposited on said donor layer on said bottom surface of said substrate and on a window in said bottom surface of said substrate, said insulating layer having contact windows therethrough, one of said contact windows having a bottom surface of said donor layer, the other of said contact windows having a bottom surface of said source, each of said windows having therein electrical contacts for leads;

an electrically insulating and chemically non-reactive layer, said non-reactive layer being deposited on said donor layer on the top surface of said substrate and in a window through said donor layer and into said substrate;

a photoactive layer, said photoactive layer being deposited on said non-reactive layer, said photoactive layer having



therein a porphyrin component and a quinone component, said components being selected to provide a band of wavelengths to which said photodetector shall respond when exposed to a beam of light having said wavelengths therein, a response of said photoactive layer being directly related to the intensity of said beam; and

a gate bias electrode, said electrode being connected to said photoactive layer.

4,720,628

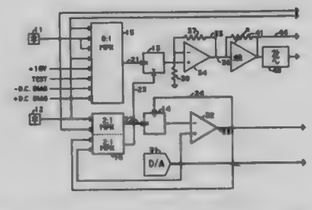
OPTICAL PROCESS FOR DETERMINING THE ENDPOINT OF A PROCESS VIA ANALOG MULTIPLICATION OF PHOTOCELL SIGNALS

Herbert G. Drake, Jr., San Rafael, Calif., assignor to Tegal Corporation, Novato, Calif.

Filed Oct. 27, 1986, Ser. No. 923,367

Int. Cl.[4] G01J 1/42

U.S. Cl. 250—214 R 11 Claims



1. Apparatus for monitoring a luminous process comprising:

plural photocell means each producing an electrical signal dependent upon the luminosity of said process;

analog multiplier means for producing an electrical signal proportional to the product of electrical signals; and

multiplex means for interconnecting said photocell means and said analog multiplier means in predetermined combinations.

4,720,629

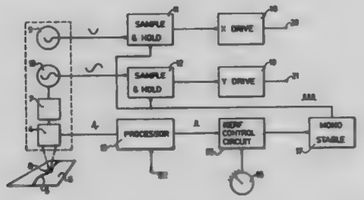
PATTERN TRACER WITH ELECTRONIC KERF CONTROL WITH ADJUSTABLY DELAYED SAMPLING PULSE

Robert E. Parker, Dundas, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

Filed Apr. 28, 1986, Ser. No. 856,404

Int. Cl.[4] G05B 1/00

U.S. Cl. 250—202 4 Claims



1. In an electro optical rotating scanner pattern tracing system including means to generate a sampling pulse indicative of the position of the edge of the pattern with reference to a fore and aft axis of the optical rotating scanner and means to generate reference sinusoids representative of the rotational position of the optical scanner, a kerf control including means to apply an adjustable time delay to said sampling pulse and means to utilize said delayed sampling pulse to sample said reference sinusoids and derive coordinate velocity signals.

4,720,630

ACTIVE OPTICAL CONNECTOR INCLUDING AN ELECTRONIC CIRCUIT BOARD AND AN OPTICAL FIBER

Tamio Takeuchi, Yokohama; Yasumasa Koakutsu, Fujisawa; Junichi Shimizu, Tokyo; Masao Yano; Minoru Ikezawa, both of Yokohama, and Seiichi Onoda, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,275

Claims priority, application Japan, Apr. 5, 1985, 60-70871; Oct. 23, 1985, 60-235215

Int. Cl.[4] H01J 5/16, 40/14

U.S. Cl. 250—227 8 Claims



1. An optical active connector comprising:

an optical fiber constituting a signal transmission line between a plurality of outside electrical devices and having end portions held by a fiber holder;

an electronic circuit board, on which a circuit pattern is formed and circuit elements for optical elements are mounted;

a terminal block having electric terminals, electrically connected to said electronic circuit board;

a light emitting element and a light receiving element electrically connected to said electronic circuit board and optically coupled to said optical fiber; and

a case accommodating said electronic circuit board, said terminal block, said light emitting element, said light receiving element and said fiber holder.

4,720,631

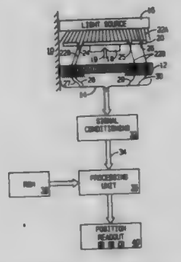
ELECTRO-OPTICAL COMPASS CARD WHEREIN TRANSMISSIVE MEMBER HAS RANDOM PATTERNS THAT REPEAT FOR PARTICULAR ROTATIONAL POSITIONS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

Filed Dec. 12, 1985, Ser. No. 808,296

Int. Cl.[4] G01D 5/34

U.S. Cl. 250—231 SE 17 Claims



1. Apparatus for determining the positioning of a first member relative to a second member comprising:

a first member having a radiant energy source and a multielement array for detecting such radiant energy mounted thereon, said source and said array separated from each other;

a second member positioned between said source and said array for interrupting radiant energy traveling from said source to said array, said member including at least one transmissive area for transmitting such radiant energy therethrough such that a portion of such radiant energy impinges on selected elements of said multielement array in random patterns which random patterns always reoccur for specific relative positions of said first and second members, but change with relative position changes of said members;

means for correlating said random patterns with discrete relative positions of said first and second members; and

output means responsive to said correlating means for indicating a discrete realtive position.

4,720,632

SYNCHRONIZING LIGHT BEAM DETECTOR

Yutaka Kaneko, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,169

Claims priority, application Japan, Jan. 25, 1985, 60-12210; Jan. 30, 1985, 60-16001; Jan. 31, 1985, 60-15372

Int. Cl.[4] H04N 1/10

U.S. Cl. 250—235 16 Claims

1. Light scanning apparatus, comprising:

a light source for emitting a light beam;

deflecting means for deflecting said light beam emitted from said light source over a predetermined angle;

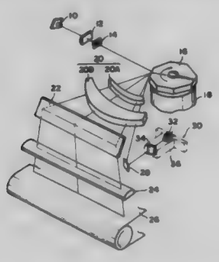
focusing means for focusing said deflected light beam to thereby cause said deflected light beam to scan along an imaginary line;

a cylindrical lens for receiving said light beam passing through said focusing means sampled at a predetermined position; and

light-receiving means having a light-receiving surface for receiving said light beam passing through said cylindrical lens;

wherein said cylindrical lens is arranged with its direction of generatrix in parallel with said scanning line, and said light-receiving surface is so arranged that a conjugate relation is established between a deflecting point of said

light beam at said deflecting means and said light-receiving surface through said focusing means and said cylindri-



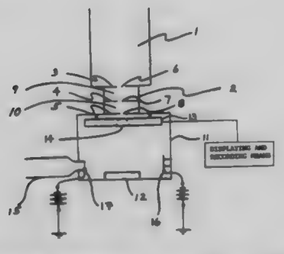
cal lens in a plane perpendicular to the generatrix direction of said cylindrical lens.

4,720,633

SCANNING ELECTRON MICROSCOPE FOR VISUALIZATION OF WET SAMPLES

Alan C. Nelson, Andover, Mass., assignor to Electro-Scan Corporation, Topsfield, Mass.

Filed Jan. 17, 1986, Ser. No. 820,537
Int. Cl.⁴ G01N *23/00*
U.S. Cl. 250—310 **9 Claims**



1. A device for obtaining microscopic data or images of specimens which comprises:

a. an electron source for emitting a beam of electrons into an electron optical vacuum column;

b. the electron optical vacuum column including means for focusing the beam of electrons and means for scanning the surface of a specimen with the focused beam of electrons;

c. a differentially pumped aperture column attached to the electron optical vacuum column and having at least three walls perpendicular to the sides of the differentially pumped aperture column and defining a series of pressure gradients, each wall having an aperture aligned to permit the beam of electrons to pass through the differentially pumped aperture column;

d. a specimen chamber for holding the specimen to be scanned with the focused beam of electrons and capable of being maintained at a pressure which may be different from that of the electron optical vacuum column and the differentially pumped aperture column and attached to the differentially pumped aperture column so as to allow the focused beam of electrons to enter into the specimen chamber;

e. a specimen mount located within the specimen chamber and positioned for supporting the specimen to be scanned with the focused beam of electrons;

f. means within the specimen chamber for preventing the buildup of negative charge on the surface of the specimen;

g. a detector disposed wholly within the specimen chamber and positioned with respect to a specimen supported by the specimen mount so as to detect a signal emitted from the specimen upon the scanning of the specimen with the focused beam of electrons, the detector providing an electrical signal output representative of the signal detected thereby; and

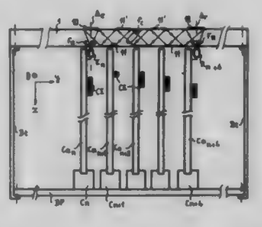
h. means for displaying and recording the information provided by the output from the detector.

4,720,634

DEVICE FOR OPTICAL INTERCONNECTION OF ELECTRONIC COMPONENT CARDS WITHIN A CASE AND A METHOD OF FABRICATION OF SAID DEVICE

Luigi D'Auria, Sceaux; Jean P. Huignard, Paris; Claude Puech, Longjumeau, and Jean P. Herrian, Bures Sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 24, 1986, Ser. No. 832,420
Claims priority, application France, Feb. 26, 1985, 85 02767
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 250—551 **22 Claims**



1. An optical interconnection device for a package containing electronic component cards placed in side-by-side relation, the device being intended to establish at least one optical link between a first card among a plurality of cards of the package and a second card, a light source being implanted on said first card for emitting a divergent beam of light energy in a first mean direction of propagation, a detector which is sensitive to said light energy being implanted on said second card, comprising:

a plate having parallel faces and placed opposite to the light source, said plate being formed of material which is transparent to the light produced by said source(;);

at least the following optical elements being placed on the faces of said plate:

a first optical element having a diffracting structure and placed on a first face of the plate opposite to the light source for receiving the divergent beam and reflecting said beam in the form of at least one collimated beam having a direction of propagation which forms a predetermined angle with the faces of the plate, and which forms a predetermined angle with a reference plane which is perpendicular to the faces of the plate;

reflecting elements arranged alternately on the two faces of the plate for receiving and reflecting the collimated beam along a predetermined path, and a second optical element having a diffracting structure and placed on the first face of the plate for receiving the collimated beam after successive reflections within the plate from alternate reflecting elements along the predetermined path

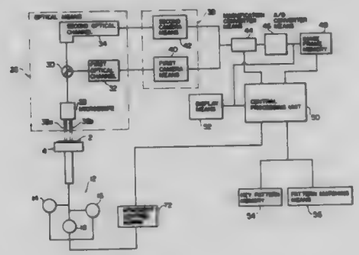
and for reflecting said collimated beam in the form of a convergent beam in a second mean direction of propagation, said beam being received by said light detector which is implanted on the second card, thereby forming a continuous optical path between said first and second cards of the package.

4,720,635

AUTOMATIC ACCURATE ALIGNMENT SYSTEM

Masaori Uga, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,124
Claims priority, application Japan, Dec. 17, 1984, 59-264488
Int. Cl.⁴ G01B *11/27*
U.S. Cl. 250—548 **11 Claims**



1. An automatic accurate alignment system for positioning an object to be worked having a certain pattern on its surface at a required position, said system comprising:

(a) holding means for holding the object to be worked;

(b) moving means for moving the holding means in the x-direction, the y-direction and the *θ*-direction;

(c) camera means for providing an image of at least a portion of the surface of the object held on the holding means and providing analog signals indicative of the densities of x-y matrix arrayed pixels;

(d) an image frame memory for memorizing signals corresponding to the analog signals provided by the camera means;

(e) a key pattern memory for memorizing

(1) a first key pattern signal based upon the signals memorized in the image frame memory, the first key pattern signal indicating a key pattern existing at one specified area in the image,

(2) a first key pattern position signal indicative of the position of the key pattern when the object held on the holding means is positioned at a predetermined position,

(3) a second key pattern signal indicative of the key pattern, and

(4) a second key pattern position signal indicative of the position of the key pattern when the object to be worked is rotated in the *θ*-direction through 90 degrees from the predetermined position, after the second key pattern signal and the second key pattern position signal are determined from the first key pattern signal and the first key pattern position signal;

(f) pattern matching means for performing a first pattern matching based upon the signals memorized in the image frame memory and the first key pattern signal memorized in the key pattern memory, and a second pattern matching based upon the signals memorized in the image frame memory and the second key pattern signal memorized in the keypattern memory; and

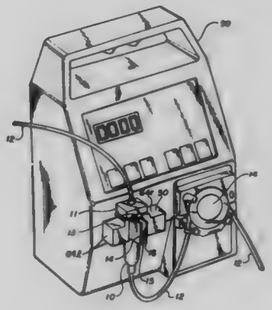
(g) movement control means for performing a first positioning of the object held on the holding means by actuating the moving means in response to the first pattern matching, then, rotating the holding means in the *θ*-direction through 90 degrees and effecting a required coordinate transformation movement in the x-direction and the y-direction, and thereafter, performing a second positioning of the object held on the holding means by actuating the moving means in response to the second pattern matching.

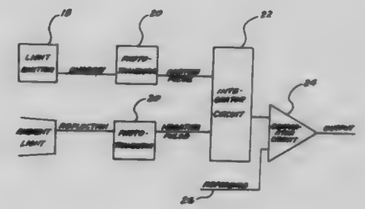
4,720,636

DROP DETECTING SYSTEM WHICH OPERATES UNDER DIFFERENT AMBIENT LIGHT CONDITIONS

James D. Bonner, Jr., Sugarland, Tex., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 637,933, Aug. 6, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 30,276
Int. Cl.⁴ A61M *5/16*; G01N *21/85*
U.S. Cl. 250—573 **8 Claims**





1. A system for detecting the occurrence of drops of falling fluid under different ambient light conditions, comprising:

(a) a drip chamber through which said drops fall in a substantially straight path;

(b) light emission means, located in said chamber on one side of said path, for producing a beam of light adapted to intersect said path;

(c) light responsive means, located in said chamber on another side of said path, for receiving said beam; and

(d) circuit means, coupled to said light responsive means, causing production of a first signal of one polarity when said beam is intercepted by one of said drops under a first ambient light condition, and causing production of a second signal of opposite polarity by reflecting ambient light off of one of said drops and onto said light responsive means under a second ambient light condition characterized by more ambient light than said first condition, whereby said first signal is indicative of the occurrence of one of said falling drops under said first condition, and said second signal is indicative of the occurrence of one of said falling drops under said second condition.

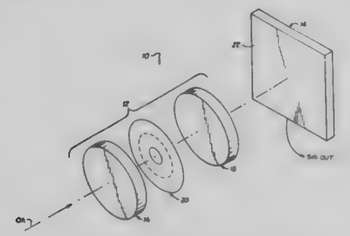
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,637

ELECTRO-OPTICAL IMAGING SYSTEM AND LENS THEREFOR

Peter P. Clark, Acton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 19, 1986, Ser. No. 876,004
Int. Cl.[4] H04N 9/04
U.S. Cl. 250—578 4 Claims



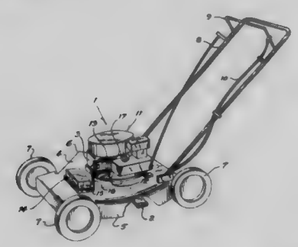
1. An electro-optical imaging system comprising:
an electronic image sensor responsive to radiation from a scene for producing an electrical output signal corresponding to scene radiation imaged thereon, said electronic image sensor having a Nyquist spatial frequency limit; and
a lens for imaging scene radiation onto said electronic image sensor, said lens having rotationally symmetric aberrations over a range of apertures thereof for limiting its spatial frequency response over said range of apertures to a spatial frequency limit substantially equal to said Nyquist limit of said electronic image sensor to substantially eliminate undesirable image patterns due to aliasing.

4,720,638

ELECTRONICALLY COMMUTATED COAXIAL STARTER MOTOR/ALTERNATOR FOR AN INTERNAL COMBUSTION ENGINE

Kenneth A. Vollbrecht, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jul. 31, 1986, Ser. No. 891,167
Int. Cl.[4] F02N 11/08
U.S. Cl. 290—38 R 14 Claims



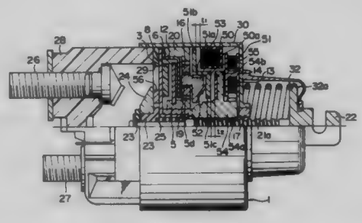
1. In an internal combustion engine having a cylinder and a crankshaft defining an axis of rotation, the improvement of an electronically commutated coaxial starter motor comprising:
a stator mounted on the cylinder coaxially with the crankshaft;
angularly spaced field windings surrounding said stator;
position indicating means coaxially mounted to rotate with the crankshaft;
stationary sensing means mounted to sense the angular position of said position indicating means and generate electrical signals in response thereto;
a rotatable member coaxially mounted to rotate with the crankshaft, said rotatable member including a plurality of circumferentially spaced permanent magnets mounted thereon; and
circuit means responsive to the electrical signals from said sensing means for controlling current flow through said field windings to cause said rotatable member to rotate, said electronic circuitry includes power switching devices each device having a diode connected in reverse polarity and in parallel with its respective power switching device in the circuit for converting alternator output to direct current.

4,720,639

SWITCH DEVICE FOR STARTER OF INTERNAL COMBUSTION ENGINE

Morikazu Sakayanagi, Toyohashi; Kazuhiro Ando, Kariya, and Youichi Hasegawa, Kasugai, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 5, 1986, Ser. No. 903,998
Claims priority, application Japan, Sep. 9, 1985, 60-199188; Jun. 17, 1986, 61-140905
Int. Cl.[4] F02N 11/00
U.S. Cl. 290—38 R 10 Claims



1. A starter switch device for use with a starter motor for an internal combustion engine, said starter switch device comprising:
(a) contact means, including a fixed and a movable contact selectively in contact with said fixed contact, for controlling electric power supply to said starter motor;
(b) shaft means axially movable and having one end carrying said movable contact and an other end adapted for connection to a pinion of said starter motor for displacing said pinion;
(c) means for driving said shaft means including a rotating shaft and a driving body, said driving body engaging with said shaft means for moving said shaft means rectilinearly by rotation of said rotating shaft;
(d) one-way clutch means, provided between said rotating shaft and said driving body, for transmitting a driving force from said rotating shaft to said driving body; and
(e) return means, connected to said driving body, for moving said shaft means back to a position whereat said movable contact is separated from said fixed contact to break a connection therebetween.

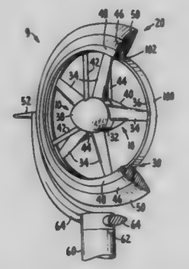
4,720,640

FLUID POWERED ELECTRICAL GENERATOR

Bjorn M. S. Anderson, Woodside, and Reinhold H. Ziegler, Berkeley, both of Calif., assignors to TurboStar, Inc., Menlo Park, Calif.

Filed Sep. 23, 1985, Ser. No. 779,227
Int. Cl.[4] F03B 13/10
U.S. Cl. 290—43 63 Claims

1. An axial flow fluid turbine generator apparatus comprising, in combination:
a central support structure;
a hollow outer support structure surrounding and connected to said central support structure and adapted to pass a steam of fluid between said support structures;
an impellor-rotor rotatably mounted on said central support structure;
said impellor-rotor having a plurality of circumferentially spaced non-magnetic fluid dynamic blade means for transferring energy from the stream of fluid; and
a ring connecting the radial outward end of said blade means;



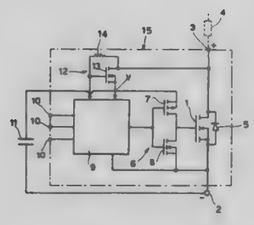
said impellor-rotor including a central hub portion connected to the radial inward end of each of said blade means and each of said blade means having the shape of an airfoil, said airfoil having a positive angle of attack at said central hub portion and an angle of attack at said ring less than said positive angle at said central hub portion.

4,720,641

INTELLIGENT ELECTRICAL POWER DEVICE WITH MONOLITHIC INTEGRATED CIRCUIT

Giuseppe Faini, Cavenago Brianza, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Jun. 10, 1986, Ser. No. 872,488
Claims priority, application Italy, Jun. 10, 1985, 21087 A/85
Int. Cl.[4] H02J 1/10; H02M 3/06
U.S. Cl. 307—18 2 Claims



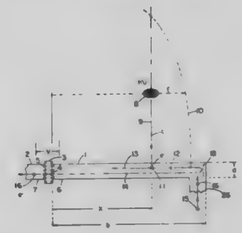
1. An electrical power arrangement comprising:
a MOS power element having a gate, source and drain, said source and drain adapted for connection between first and second source potentials, respectively, for supplying an output potential;
a CMOS pilot circuit connected to said power element in such a manner that it can maintain said power element in a conduction state by applying and preserving a potential on said gate;
a condenser for supplying a driving potential to said pilot circuit;
a charge circuit responsive to said output potential for charging said condenser with said output potential when said power element is in a non-conducting state; and
logic means for causing said non-conducting state of said power element when said conduction state of said power element has a duration which exceeds the discharge time of the condenser.

4,720,642

FEMTO DIODE AND APPLICATIONS

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Continuation-in-part of Ser. No. 462,240, Mar. 2, 1983, which is a continuation-in-part of Ser. No. 330,791, Dec. 15, 1981, Pat. No. 445,050. This application Aug. 3, 1984, Ser. No. 637,405
Int. Cl.[4] H01L 15/00
U.S. Cl. 307—150 27 Claims



1. In a submicron diode well structure for the interchange of photon energy and electron energy, a first cylinder comprising a first metal, a second cylinder comprising a second metal, an insulating substrate, a surface on said substrate, said cylinders having a common axis parallel to said surface, said cylinders being deposited on said surface, said first and second metals having the work functions ϕ_1 and ϕ_2 respectively, first and second plane faces normal to said axis on adjacent ends of said first and second cylinders respectively, said faces being separated by a gap of distance s, an insulating layer in said gap, means for producing an energetic first electron in said first cylinder travelling along said axis, said insulating layer and said first and second metals on said cylinder faces providing an assymetric tunnelling barrier for said energetic electron, a third plane on said first cylinder normal to said comon axis and opposite said first plane, said third plane providing a potential barrier for reflecting said energetic electron, the space in said first cylinder between said first and third planes constituting a potential well for said energetic first electron, first and second terminals, said first and second terminals being connected to said first and second cylinders respectively, said energetic first electron moving back and forth along said axis in said potential well and eventually passing unidirectionally through said barrier from said first cylinder to said second cylinder and to said second terminal, a second electron, said second electron passing from said first terminal into said first cylinder to replace said first electron.

4,720,643

PEAK CATCHER CIRCUIT

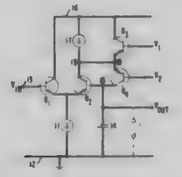
Milton L. Embree, Reading, and Robert F. Lee, Wyomissing, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 310,609, Oct. 13, 1981, abandoned. This application May 15, 1987, Ser. No. 54,072
Int. Cl.[4] H03K 5/153; G11C 27/00; G01R 19/04
U.S. Cl. 307—351 9 Claims

1. A circuit for capturing and presenting the peak value of a signal during a holding period, said circuit comprising first and second transistors connected as a differential pair having a signal input terminal connected to the control electrode of the first transistor, and a signal output terminal connected to the control electrode of the second transistor, wherein a first fixed current means produces a first current between the commonly connected first controlled electrodes of said transistors and a first voltage level terminal, and a second fixed current means

produces a second current between the second controlled electrode of the second transistor and a second voltage level terminal, and further comprising a capacitor connected between the signal output terminal and the first voltage level terminal,

characterized in that a current switching means is connected between the second voltage level terminal and the signal output terminal, wherein the current switching means comprises a pair of complementary transistors connected



one on each side of an intermediate connection to the second controlled electrode of the second transistor, and is responsive to the relative voltage levels at the signal input and output terminals for conducting the difference in current between the second fixed current means and the current in the second controlled electrode of the second transistor to the capacitor when said difference in current is positive, and not conducting said difference in current to the storage device when said difference in current is negative.

4,720,644

LAVET STEPPING MOTOR WITH U-SHAPED COIL CORE

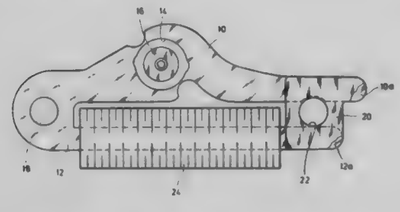
Adolf Sedlak, Wurmberg 2, Fed. Rep. of Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed May 16, 1986, Ser. No. 863,752

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 8521736[U]

Int. Cl.⁴ H02K *37/00*

U.S. Cl. 310—49 R **1 Claim**



1. A stator for a stepping motor of an electric watch comprising an elongated yoke member having a first free end, said yoke member defining a first mounting opening opposite said first free end, a coil arm of substantially uniform width integrally formed on the other end of said yoke member and having a second rounded free end, an exciter coil comprising a self-supporting air coil arranged on said coil arm by being pushed onto said coil arm from said second free end thereof, and also comprising a bridge member connecting said free ends of said yoke member and said coil arm, said yoke member with said coil arm and said bridge member hereby being flat elements made of a magnetizable sheet metal, characterized in that said coil arm is of a greater length than said exciter coil and that said bridge member defines a second mounting opening and rests flat on said free ends of yoke member and coil arm and areally overlaps regions of these elements whereby said mounting plate may be tightened against said first and second free ends with a mounting screw to ensure a magnetic path of good conductance in said regions and wherein said yoke defines a rotor opening opposite a mid portion of said exciter coil and disposed between said mounting openings.

4,720,645

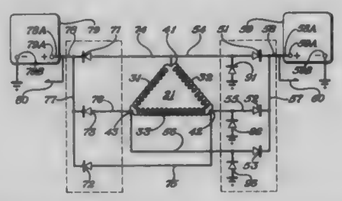
DUAL OUTPUT ALTERNATOR

Lebern W. Stroud, 321 Charleston Pl., Hurst, Tex. 76053

Continuation of Ser. No. 801,137, Nov. 22, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 57,712

Int. Cl.⁴ H02J *7/14*; **H02K** *11/00*

U.S. Cl. 310—68 D **29 Claims**



7. A housing for a dual output alternator of the type having an annular stator core with electrical winding means thereon, comprising:

a metal housing having an annular side wall and an end wall for supporting the annular stator core and its winding means,

a first set of diodes,

a second set of diodes,

first and second metallic heat sink members,

support means for supporting said first and second heat sink members inside of said metal housing spaced from each other and electrically insulated from said metal housing,

said support means supporting said first and second heat sink members near said end wall on opposite sides of a plane passing through the axis of said annular side wall transverse to said end wall,

one of said heat sink members supporting said first set of diodes and electrically connecting their cathodes together,

the other of said heat sink members supporting second set of diodes and electrically connecting their cathodes together,

a first output means electrically connected to said first heat sink member and extending through the wall of said housing and being electrically insulated therefrom, and

a second output means electrically connected to said second heat sink member and extending through the wall of said housing and being electrically insulated therefrom.

4,720,646

CONNECTION TERMINAL ASSEMBLY FOR STATOR COIL

Koichi Torimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1986, Ser. No. 933,513

Claims priority, application Japan, Dec. 3, 1985, 60-186581[U]

Int. Cl.⁴ H02K *5/04*

U.S. Cl. 310—71 **4 Claims**

1. A stator coil assembly for an electric motor, comprising:

(a) a bobbin having a central spool and first and second circular flanges (1*d*, 1*e*) on opposite ends of the spool,

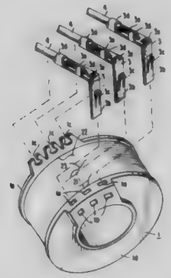
(b) a stator coil (2) wound on the bobbin and having at least two coil wire ends (21, 22),

(c) at least two circumferentially spaced apertures means defined in a portion of the first flange, each aperture means comprising a first radially oriented aperture (1*a*) and a second axially oriented aperture (1*b*) intersecting the first aperture,

(d) least two circumferentially spaced clamping recesses (1*c*) defined in a portion of the second flange in individual axial alignment with the aperture means,

(e) at least two axially elongated terminal plates (3) having external lead wires (4) and the stator coil wire ends individually secured thereto,

(f) one end of each terminal plate being inserted in an associated aperture means and cooperably defining therewith spring back, snap retention means (3*c*; 3*f*),



(g) another, opposite end (3*d*) of each terminal, or a proximate portion of an associated lead wire (4) being retainingly inserted in and cooperable with an associated clamping recess such that each terminal plate is fixedly held in axial alignment with the bobbin, overlying the stator coil, and extending between the first and second flanges, and

(h) an electrically insulating molding resin (5) encapsulating the terminal plates and the connections thereto of the lead wires and the coil wire ends.

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BRAKE MOTOR

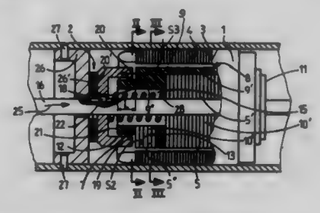
Louis Plumer, Les Mélèzes 4, rue des Artisans, 74300 Cluses, France

Filed Mar. 7, 1985, Ser. No. 709,426

Claims priority, application France, Mar. 27, 1984, 84 04739

Int. Cl.⁴ H02K *7/16*

U.S. Cl. 310—77 **4 Claims**



1. A brake motor comprising:

an asynchronous motor having a squirrel-cage rotor with first and second ends, a first shorting ring disposed at said first end, a second shorting ring disposed at second end, magnetic ring segments extending between said first and second shorting rings, an intermediate shorting ring disposed between said first and second shorting rings for dividing said rotor into a first and a second rotor parts, the ring magnets of the second part being unsaturated when a starting current is applied to the motor; said first, second and intermediate rings being non-magnetic; said rotor having an axial bore extending through said second shorting ring said second rotor part and said intermediate ring; said rotor having an annular rotor face at said second end;

said motor further comprising a stator disposed around said rotor for generating a first magnetic field corresponding to said first rotor part for the rotation of the rotor, and a second magnetic field corresponding to said second rotor part; and a shaft holding said rotor;

a fixed brake plate; and

a rotary brake plate disposed

on said shaft, said rotary brake plate being axially movably disposed between said fixed brake plate and said second rotor end, and having a brake annular face opposite said rotor annular face;

a spring disposed within said bore for urging said rotary brake plate against said fixed brake plate;

said rotary brake plate being pulled away from said fixed brake plate by said second magnetic field when electric current is applied to said motor;

said second shorting ring, intermediary shorting ring and bore cooperating to direct said second magnetic field axially toward said annular faces.

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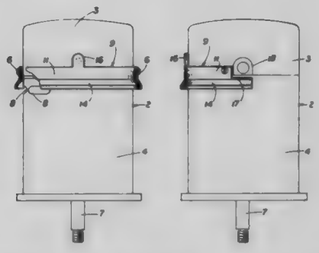
PROTECTIVE COVER FOR SLOTTED MOTOR HOUSING SHELL STRUCTURE

Wayne J. DeVries, Fenton, and Roy C. Eliason, Chesterfield, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 28, 1986, Ser. No. 833,831

Int. Cl.⁴ H02K *5/10*

U.S. Cl. 310—89 **2 Claims**



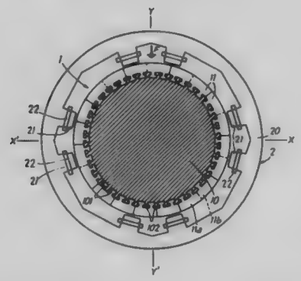
1. An improved housing structure for a motor assembly comprising: a vertically disposed cylindrical outer motor shell having opposed upper and lower end-to-end cylindrical sections sized to snugly overlap into contacting relation at their opposed facing ends and be joined through aligned spaced fastener receiving apertures in said overlapping opposed facing and contacting ends and corresponding fastener extending therethrough; the lower of said cylindrical sections including ventilating slot means adjacent said overlapping sections along one side thereof; a detachable protective cover means including a semi-cylindrical band portion sized to snugly engage the outer face of said shell, said band portion including spaced apertures aligned to correspond with said aligned fastener receiving apertures of said overlapping opposed facing and contacting ends of said housing shell to be fastenable to said housing shell by said fasteners for said joined sections, at least one of said apertures in said band portion being elongated to accommodate for tolerance variations between said cover means and said housing shell; said cover means further including a depending skirt portion integral with and extending downwardly and outwardly from said band portion at an approximately 45° angle from the longitudinal axis of said housing shell when fastened thereto and having a sufficient width, so that said cover means prevents rain falling at a 45° angle from passing through said contacting ends and said ventilating slot means in said lower housing section.

4,720,649

LARGE DIAMETER RADIAL MAGNETIC BEARING

Helmut Habermann, Vernon, and Maurice Brunet, Saint Marcel, both of France, assignors to Societe Europeenne de Propulsion, France

Filed Aug. 8, 1986, Ser. No. 894,798
Claims priority, application France, Aug. 12, 1985, 85 12294
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 13 Claims



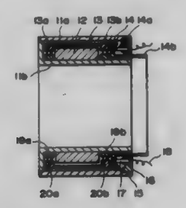
1. A large diameter radial magnetic bearing comprising an inner rotor having an axis of rotation and including a central shaft having an outer periphery, and a stack of ferro-magnetic laminations mounted on said shaft at said outer periphery; and an outer stator comprising a plurality of electromagnets including poles disposed in facing relation to the stack of ferromagnetic laminations on the rotor, said stack of ferromagnetic laminations comprising a plurality of very thin individual lamination segments each extending over a limited angular sector around the periphery of the central shaft, said laminations being distributed in parallel planes to constitute a succession of flat split rings extending peripendicularly to the axis of the rotor, the individual lamination segments in a given plane being offset angularly relative to the individual lamination segments of adjacent planes to provide a staggered stack of laminations, said central shaft having longitudinally extending grooves in the outer periphery thereof, said individual laminations segments including projecting portions which engage in said grooves in the central shaft, said grooves being separated from one another at a pitch of about 9°.

4,720,650

MOTOR

Ryoichi Hanamori, and Hiroshi Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,504
Claims priority, application Japan, Dec. 28, 1985, 60-199901[U]
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—266 1 Claim



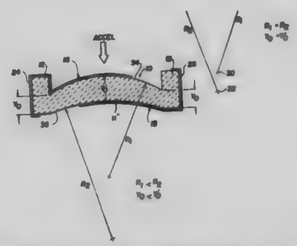
1. A motor comprising:
a first yoke member having a hollow cylindrical shape;
an annular magnet provided on the outside of said first yoke member;
a coil positioned outside said annular magnet, and formed of a self-lubricating resin or oil-containing resin material in the shape of a cylinder of which at least an integrally formed end portion having a face surface thereon radially inwardly protrudes to constitute a bearing portion for contacting ball bearings on the end face surfaces of said protruding portion;
a second yoke member positioned outside said coil; and
a fixed bearing portion formed on said second yoke whereon said ball bearings are disposed between said end face surfaces of said integrally formed end and said fixed bearing portion; and
electric power supply means being attached to said coil for supplying power to said coil.

4,720,651

RESONATOR INSENSITIVE TO PARAXIAL ACCELERATIONS

Mitsuo Nakazawa, Nagano, Japan, and Arthur Ballato, Long Branch, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 386,863, Jun. 10, 1982, abandoned.
This application Apr. 6, 1984, Ser. No. 597,326
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—369 10 Claims



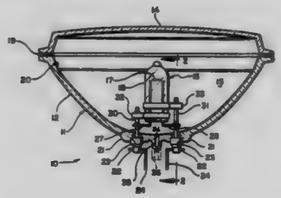
1. A piezoelectric resonator comprising a monolithic circular body of piezoelectric material having a curved inner resonator region including top and bottom surfaces which are respectively convex and concave about a central longitudinal axis, an outer peripheral support region in the form of a circular ring having upper and lower surfaces, the height of said peripheral ring between said upper and lower surfaces extending from the lowermost bottom surface of the adjacent inner region to above the uppermost top convex central surface of said inner region for supporting said inner region in a space within said peripheral ring, said space having a height corresponding to said height of said ring between said upper and lower ring surfaces and being substantially unoccupied directly above and below said top and bottom curved surfaces, said curved inner region being resistant to acceleration forces applied in the direction of said central longitudinal axis, and including a pair of opposing electrodes on the upper and lower surfaces and on the outer side surfaces of said peripheral ring, one electrode extending along an inner side surface of said ring and onto an upper curved surface portion of said inner region from one side of said ring and the other electrode extending along a bottom curved surface portion of said inner region from the opposite side of said ring, the electrode portions of said inner region surfaces being substantially included therewith in said space within said ring.

4,720,652

SEALED BEAM HEADLAMP AND METHOD FOR TESTING ITS SERVICEABILITY

Richard DuBois, Jr., Caldwell, N.J., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 20, 1987, Ser. No. 4,470
Int. Cl.[4] H01K *1/28, 1/50*; H01J *9/42*
U.S. Cl. 313—25 15 Claims



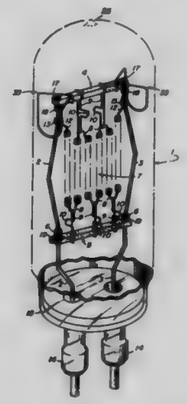
1. A sealed beam lamp, comprising:
an envelope having an outer shell defining a gas-tight enclosure;
an illuminating bulb having a lighting filament sealed within said bulb;
bulb support means mounted on said outer shell for securing said illuminating bulb within said gas-tight enclosure;
means for conducting electrical current coupled to said lighting filament and extending through said outer shell to selectively energize said lighting filament;
said gas-tight enclosure being filled with a relatively nonreactive gas at a pressure in the range of 5 to 50 Torrs.

4,720,653

ELECTRIC LAMP WITH BRIDGE SUPPORT MEMBER PROVIDING BOTH COMPRESSIVE AND AXIAL SUPPORT

Jeffrey P. Buschmann, Lexington; Arnold E. Westlund, Jr., Winchester, and David A. Cox, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 20, 1986, Ser. No. 920,634
Int. Cl.[4] H01J *1/88, 19/42*
U.S. Cl. 313—275 12 Claims



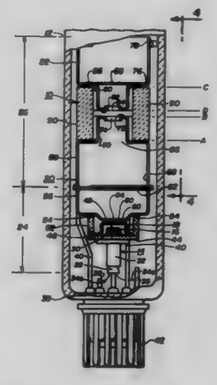
1. In an electric lamp including an hermetically-sealed, light-transmitting envelope having an internal curvilinear wall, a gas mixture within said envelope, at least two support rods extending within the interior of said envelope in a spaced-apart manner, at least one bridge member within said envelope and supported substantially between said support rods, and an electrically conductive filament structure located within said envelope and suspended from said bridge member, the improvement comprising:
at least one support member secured to said bridge member and projecting therefrom and including a U-shaped end portion engaging said internal curvilinear wall of said envelope and a pair of leg portions, each of said leg portions secured to said bridge and projecting therefrom at an angle relative to the other, said support member providing both compressive and axial support for said bridge member and said filament structure suspended therefrom.

4,720,654

MODULAR ELECTRON GUN FOR A CATHODE-RAY TUBE AND METHOD OF MAKING SAME

Karl G. Hernqvist, Princeton, and Donald C. Pultorak, Hamilton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 26, 1986, Ser. No. 935,390
Int. Cl.[4] H01J *29/50*
U.S. Cl. 313—414 7 Claims



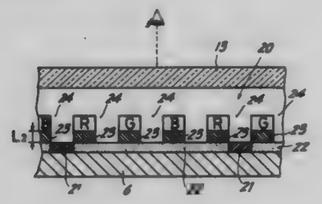
1. An electron gun for a cathode-ray tube including, in combination,
a first gun module comprising at least one cathode assembly, a control grid electrode, a screen grid electrode and a proximal member of a first focusing and accelerating electrode, each of said electrodes of said first gun module having at least one electron beam aperture therethrough, said cathode assembly and said electrodes being attached to a ceramic support member which is the sole supporting interconnection between, and
a second gun module comprising a second focusing and accelerating electrode and a distal member of said first focusing and accelerating electrode, each of said electrodes of said second gun module having at least one electron beam aperture therethrough, said distal member and said second focusing and accelerating electrode being interconnected by at least two insulative spacers disposed and attached therebetween, said distal member of said first focusing and accelerating electrode of said second gun module being joined to said proximal member of said first focusing and accelerating electrode of said first gun module so that said electron beam apertures of said first and said second gun modules are aligned, thereby forming said electron gun.

4,720,655

FLAT COLOR CATHODE-RAY TUBE WITH PHOSPHOR INDEX STRIPES

Katsuhiro Hinotani, Shijyonawate; Hajime Hayama, Nara; Shunichi Kishimoto, Kaizuka; Takashi Miwa, Higashiosaka; Yasuo Funano, Toyonaka, and Kazuhiro Kouno, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 16, 1985, Ser. No. 776,266
Claims priority, application Japan, Sep. 17, 1984, 59-140517
Int. Cl.[4] H01J 29/32, 29/28
U.S. Cl. 313—422 6 Claims



1. A flat, color CRT comprising:
a flat glass tube having first and second walls opposed to each other;
an electron gun means for scanning the inner surface of said first wall with a single beam;
a phosphor screen provided on said first wall inner surface, said phosphor screen including
phosphor index stripes provided on said first wall inner surface arranged at small spacings,
non-luminescence substance provided on said first wall inner surface interposed continuously between said phosphor index strips
strips of metallic layer formed on the upper surface of said non-luminescent substance arranged repeatedly at a small distance from one another in a definite relation to the phosphor index strips, and
red, green and blue primary phosphor color strips being provided on each of said metallic layer strips; and
an observation window provided in said second wall for observing the luminescence of said phosphor color strips of said phosphor screen.

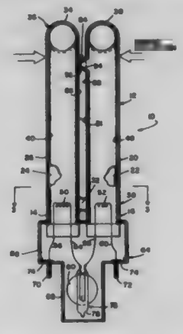
4,720,656

DISCHARGE LAMP HAVING ENVELOPE SUPPORT SPACER

David W. Johnston, Waverly, N.Y., and Charles H. Poirier, Topsfield, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Mar. 12, 1987, Ser. No. 24,955
Int. Cl.[4] H01J 61/30
U.S. Cl. 313—493 17 Claims

1. An arc discharge lamp comprising:
a sealed envelope of light-transmitting vitreous material having a pair of end portions and including at least two longitudinally extending leg members spaced a predetermined distance thereapart and at least one transversely extending envelope portion for interconnection therebetween;
an electrode located within each of said end portions;
an ionizable medium contained within said envelope; and
support spacer means formed from said envelope and being located between said longitudinally extending leg members, said support spacer means being sufficient to prevent breakage of said transversely extending envelope portion



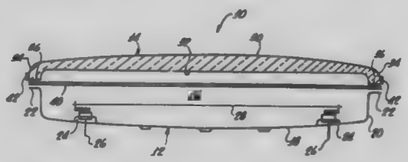
caused by the inward deflection of said longitudinally extending leg members.

4,720,657

IMPLOSION PROTECTION FOR SHALLOW IMAGE DISPLAY DEVICE HAVING FRONT SCREEN WITH REARWARDLY PROJECTING WALLS

Kurt M. Tischer, Wendlingen, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 809,085
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445628
Int. Cl.[4] H01J 29/82, 29/86
U.S. Cl. 313—497 17 Claims



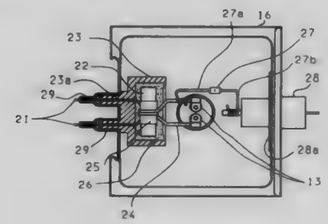
1. A shallow electronic image display device having
a front display screen of glass which is provided on an interior surface thereof with a layer of phosphor,
a metallic tray-shaped back case with a peripheral flange, said back case serving as the rear side of said device,
an areal cathode inside said back case, and
a plate-shaped electron beam control structure between the cathode and the layer of phosphor,
wherein:
said front display screen has a front screen surface in front of said interior surface and a peripheral side wall extending from said front screen surface to a rear edge surface located rearwardly of said interior surface, with said edge in abutting relation with said flange of said back case and
implosion protection means is provided to exert an inwardly directed force upon said peripheral side wall.

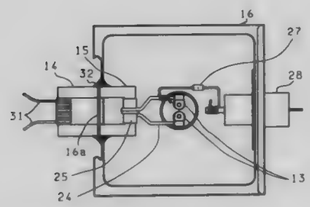
4,720,658

MAGNETRON FILTER APPARATUS

Mamoru Tsuzurahara, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 17, 1986, Ser. No. 840,201
Claims priority, application Japan, Mar. 25, 1985, 60-58374; Jun. 12, 1985, 60-126003
Int. Cl.[4] H01J 25/50
U.S. Cl. 315—39.51 6 Claims





2. A magnetron filter apparatus comprising:
a box type filter case having a bottom and side walls with an open top, the bottom of the box type filter case engaging and being fixed to a cathode input side of a magnetron bulb, and a cover for closing the top of the box type filter case, at least one side wall of the box type filter case having openings therein;
a transformer for supplying a cathode current to the magnetron being disposed within the box type filter case, the transformer including a primary winding;
a filter for preventing leakage of unwanted electromagnetic waves being disposed in the box type filter case; and
an insulation box disposed within the box type filter case, the insulation box having the transformer embedded therein and including integral cylindrical portions for receiving lead wires connected to the primary winding of the transformer, the cylindrical portions of the insulation box being received in corresponding openings in the at least one side wall of the box type filter case for positioning the insulation box within the box type filter case for enabling accuracy in assembly and improvement in reliability of electrical insulation, resistance to vibration and prevention of leakage of electromagnetic waves.

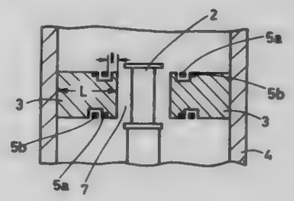
4,720,659

MAGNETRON

Masayuki Aiga, and Tetsuji Hashiguchi, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Apr. 28, 1986, Ser. No. 856,956
Claims priority, application Japan, May 2, 1985, 60-95132
Int. Cl.[4] H01J 23/22
U.S. Cl. 315—39.69 12 Claims

1. A magnetron which comprises:
an anode cylinder ;
a plurality of panel-shaped substantially identical vanes radially arranged in the inner wall of said anode cylinder, said vanes having radially innermost edges in mutually spaced relationship;
strap ring means generally concentric with said anode cylinder for electrically coupling said vanes in an alternate manner;
a cathode disposed within said anode cylinder in spaced relationship to said radially innermost edges, to define an interaction space between said cathode and said innermost edges of said vanes; and
means for providing magnetic fields along the axial direction of said anode cylinder and within said an interaction space,



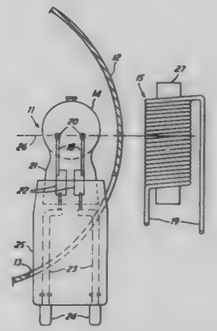
said magnetron generating microwaves at a predetermined basic frequency while inevitably generating higher harmonics accompanying said basic frequency,
said strap ring means having an inside diameter selected so that the ratio l/L exceeds a predefined minimum calculated to produce high degree of suppression of the fifth harmonic of said basic frequency, where l is the distance by which the radially innermost edge of said strap ring means is radially outward of said vane innermost edges and L is the radial extent of said vanes
, said strap ring means suppressing the generation of undesired higher harmonics including said fifth harmonic.

4,720,660

PROJECTOR LAMP

Dennis P. Whelan, Queniborough, England, assignor to Thorn EMI plc, London, England

Filed Jan. 23, 1986, Ser. No. 824,373
Claims priority, application United Kingdom, Jan. 28, 1985, 8502034
Int. Cl.[4] H01J 17/14
U.S. Cl. 315—344 10 Claims



1. A projector lamp comprising a metal halide discharge arc tube including an envelope having a seal portion, two electrodes extending into said envelope and being spaced apart from one another, in side-by-side relationship, to define an arc discharge path therebetween, and means for applying a magnetic field within the envelope, the magnetic field being effec-

tive, in use of the lamp, to regulariae a convective flow of gases relative to the discharge arc and having no substantial effect on the arc path when the lamp is running.

4,720,661

METHOD AND APPARATUS FOR CONTROLLING REEL TENSION

Toshiro Kisakibaru; Tsuguo Gotoh, both of Tokyo; Kazunori Obuchi, and Hirosuke Ohbo, both of Fukuoka, all of Japan, assignors to Yaskawa Electric Mfg. Co., Ltd., Japan

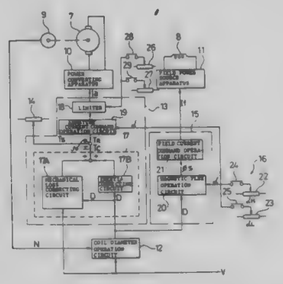
PCT No. PCT/JP85/00012, § 371 Date Sep. 12, 1985, § 102(e) Date Sep. 12, 1985, PCT Pub. No. WO85/03061, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 14, 1985, Ser. No. 776,971

Claims priority, application Japan, Jan. 14, 1984, 59-4274

Int. Cl.[4] H02P *7/06*; B65H *59/38*

U.S. Cl. 318—6 **24 Claims**



1. A method for controlling the reel tension of a reel driving apparatus driven by a DC motor in which the field system of said DC motor is controlled so that the ratio of the field magnetic flux to the coil diameter of the reel becomes constant, the armature current of said DC motor being controlled by an electric power converting equipment, and said reel driving apparatus being controlled so as to keep a constant reel tension, the method comprising the steps of:

selecting the ratio of the field magnetic flux to the coil diameter from the group consisting of a maximum setting value and at least one other setting value below said maximum setting value;

limiting the maximum value of the operating armature current, when said ratio of the field magnetic flux to the coil diameter is less than said maximum setting value, said maximum value of the operating armature current is limited to a value lower than the sum of the armature current, below rated current, and the inertia compensation current, corresponding to the rate of change of the take-up speed; and,

controlling the field system so as to maintain said selected ratio of the field magnetic flux to the coil diameter.

3. A method according to claim 1, wherein a signal which is proportional to the take-up speed is set to a desired value of a counter-electromotive voltage, thereby controlling the field system.

4,720,662

MOTOR HAVING ALTERNATOR COILS

Leslie V. Lanser, 2032 Honey Run Rd., Chico, Calif. 95928

Continuation-in-part of Ser. No. 876,433, Jun. 20, 1986, abandoned. This application Sep. 17, 1986, Ser. No. 908,196

Int. Cl.[4] H02K *29/10*

U.S. Cl. 318—138 **8 Claims**

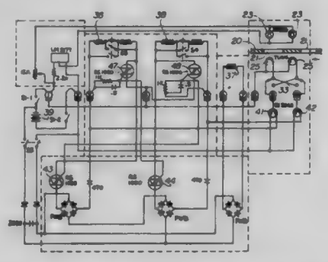
1. A motor comprising

a stator having a plurality of first coils wired in series, a plurality of second coils wired in series and a plurality of third coils wired in series, said second coils being positioned between said first and third coils, said coils being fixed around the periphery of said stator, said first and third coils being wound in opposite directions,

a rotor having a plurality of permanent magnets having alternating N and S poles positioned to sweep past said coils of said stator as said rotor turns,

a shaft fixed to said rotor and rotatable relative to said stator,

a source of dc current, switching means arranged to energize said first coils and said third coils alternately from said source,



a rectifier to supply dc current to said source from said second coils and also alternately from said first and third coils when the latter are not energized from said source,

said second coils being connected to said rectifier to supply dc current to said source at all times when said motor is operating,

and timing means rotatable with said rotor to control said switching means.

4,720,663

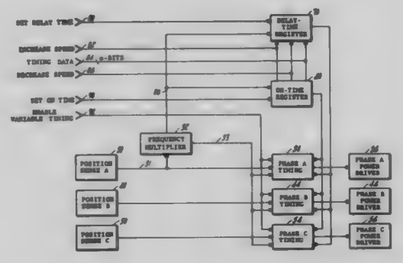
BRUSHLESS MOTOR SPEED CONTROL

David W. Welch, and Dennis R. McCully, both of Columbus, Miss., assignors to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Mar. 31, 1986, Ser. No. 846,397

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—341 **19 Claims**



1. A digital speed control circit for an electric motor having a phase winding which is selectively energized to apply force to a rotor which comprises:

means for receiving an input signal indicative of the rotor position;

delay means for providing a delay interval;

on-time means for providing an on-time interval during which a phase winding should be energized; and

logic means for generating a driver signal to cause said phase winding to be energized, said logic means acting to initiate the delay means to provide the delay interval upon the receipt of the input signal and to initiate the on-time means after the delay interval has elasped, said logic means further acting to generate said drive signal for the duration of the on-time interval.

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WIPER CONTROL SYSTEM

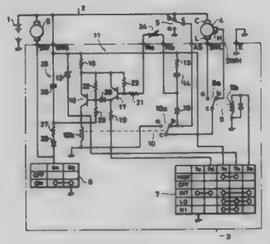
Tadashi Iwamoto; Toshiki Ikeda, both of Hiroshima; Yukio Takaishi, and Noriyuki Suzuki, both of Aichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, both of, Japan

Filed Sep. 18, 1986, Ser. No. 908,733

Claims priority, application Japan, Sep. 19, 1985, 60-142972[U]; Sep. 19, 1985, 60-142973[U]; Sep. 19, 1985, 60-142974[U]

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—444 **10 Claims**



1. A wiper control system comprising:

a wiper motor having a high-speed terminal and a low-speed terminal for operating a wiper at a selected high-speed or a selected low-speed when energized through the corresponding terminal;

a wiper switch operable to select in the alternative at least a high-speed wiping mode, a low-speed wiping mode, and a stop mode;

first circuit means including a first relay having a speed-change relay switch operable to form a partial electric power supply path to said motor through said high-speed terminal at times when said wiper switch selects said high-speed wiping mode and said stop mode, and operable to form a partial electric power supply path to said motor through said low speed terminal at times when said wiper switch selects said low-speed wiping mode;

an autostop switch operative to complete said formed partial electric power supply path for said wiper motor through said speed-change relay switch of said first relay upon initiation of energization of said wiper motor, said electric power supply path being maintained until said wiper returns to a predetermined standby position;

second circuit means including a second relay operative to be energized when said wiper switch selects said high-speed wiping mode and said low-speed wiping mode, to complete said formed partial electric power supply path for said wiper motor through said speed-change relay switch of said first relay;

a window washer liquid spray pump motor operative to be energized at times when a washer switch is operated to its ON position; and

a cooperative circuit for energizing said second relay in response to the operation of said washer switch and to deenergize said second relay at the end of a predetermined time interval after the operation of said washer switch to the OFF position.

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SIGNAL TRANSDUCER

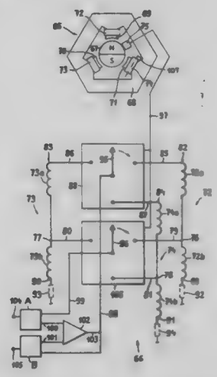
Paul Zwicky, Dielsdorf, Switzerland, assignor to Willi Studer A.G. Fabric für elektronische Apparate, Regensdorf, Switzerland

Filed Oct. 2, 1986, Ser. No. 914,372

Claims priority, application Switzerland, Oct. 7, 1985, 4326/85

Int. Cl.[4] G05B *11/00*

U.S. Cl. 318—687 **9 Claims**



1. A transducer for converting an electric input signal into an electric or mechanical output, said transducer being provided with means for producing a negative source impedance and a single magnetic circuit including a winding and cooperating with said means, said winding having first and second winding parts connected in series end to end and also having a tap connected to the junction of the two parts, said means being connected to said tap, the ratio of the induced electromotive force developed across the first part to the induced electromotive force developed across the second part differing from the ratio of the ohmic resistance of the first part to the ohmic resistance of the second part.

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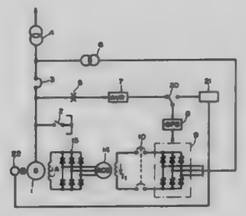
ELECTRIC BRAKING APPARATUS FOR BRUSHLESS EXCITATION SYSTEM GENERATOR

Hiroshi Yokota, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1986, Ser. No. 870,013

Int. Cl.[4] H02P *3/06*

U.S. Cl. 322—10 **2 Claims**



1. An electric braking apparatus for a generator with a brushless exciter, comprising

a circuit breaker connected to a terminal of said generator for short-circuiting the output of said generator,

a rectifying circuit which supplies a field current to said

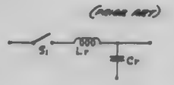
brushless exciter at least during the running of said generator,
a detecting circuit connected to said generator for detecting the number of rotations of said generator, and
a firing angle control circuit connected to said detecting circuit and said rectifying circuit
for controlling a braking current applied from said rectifying circuit to said generator while said circuit breaker short circuits the output of said generator, said braking current being in inverse proportion to the number of rotations of said generator detected by said detecting circuit, to thereby exert a dynamic braking action on said generator to stop it.

4,720,667

ZERO-CURRENT SWITCHING QUASI-RESONANT CONVERTERS OPERATING IN A FULL-WAVE MODE

Fred C. Lee, 1405 Westover Dr., Blacksburg, and Kwang-Hwa Liu, P.O. Box E-3, Blacksburg, both of Va. 24060

Filed Jun. 20, 1986, Ser. No. 877,184
Int. Cl.[4] G05F *1/40*
U.S. Cl. 323—271 12 Claims



1. A quasi-resonant converter for providing regulated power comprising:
(a) a voltage source;
(b) a load;
(c) a low pass filter formed from at least an inductor and a capacitor for filtering signal applied to said load;
(d) bidirectional resonant switch means to be periodically actuated and deactuated, said switch means including a switch, a resonant capacitor, and a resonant inductor, said switch being actuated to a first state to permit a current flow in a first direction from said voltage source to said load and to block a current flow in a second, opposite direction, and being actuated to a second state to permit a current flow in said second direction from said load to said voltage source and to block the current flow in said first direction, for operating said quasi-resonant converter in a full-wave mode; and
(e) said switch means being actuated to its first state to couple said resonant capacitor and said resonant inductor to form a resonant circuit, and to apply a charging current from said voltage source to said resonant capacitor, said resonant capacitor and said resonant inductor having respective selected impedances to establish a resonating current waveform on said resonant inductor, said resonating current waveform being applied to actuate and deactuate said switch means under zero current conditions.

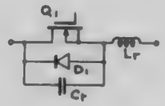
4,720,668

ZERO-VOLTAGE SWITCHING QUASI-RESONANT CONVERTERS

Fred C. Lee, 1405 Westover Dr., Blacksburg, and Kwang-Hwa Liu, P.O. Box E-3, Drapers Meadow, Blacksburg, both of Va. 24060

Filed Jun. 20, 1986, Ser. No. 877,185
Int. Cl.[4] G05F *1/40*
U.S. Cl. 323—271 41 Claims

1. A quasi-resonant converter comprising:
(a) a power source;
(b) a load;
(c) a low pass filter formed from at least an inductor and a capacitor for filtering a signal applied to said load; and
(d) a resonant switch means including:
(1) a switch for connecting said power source to said load and for disconnecting said power source from said load, said switch operative in an on state and in an off state, and
(2) a resonant capacitor and a resonant inductor coupled together at a common node to form a resonant circuit said common node being operatively connected to said switch, said resonant circuit for imposing a voltage



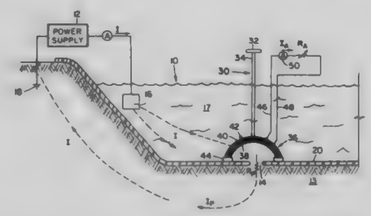
waveform across said switch, said resonant circuit coupled to said switch, and said resonant capacitor and said resonant inductor having respective impedances selected to shape said voltage waveform such that a zero-voltage condition is imposed upon said switch when said switch is disposed to its on state.

4,720,669

GEOMEMBRANE LEAK ASSESSMENT SHELL SHAPED PROBE

Thomas E. Owen, Helotes, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 7, 1986, Ser. No. 849,044
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—546 15 Claims



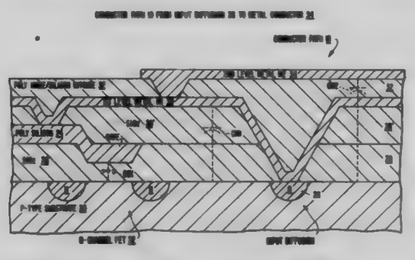
1. An apparatus for determining the size of a leak in a liner, said liner having one face in contact with a conductive liquid contained by said liner and having the opposite face in contact with a conducting material, comprising:
means for producing a voltage drop between said contained liquid and said conducting material, thereby creating a flow of current through said liquid and said liner;
means defining a shell having an inner surface, an outer surface and a lower circumferential rim, said shell being adapted to contain a portion of said liquid adjacent to a leak in said liner with said lower rim in contact with said liner;
a first electrode on said inner surface of said shell, said first electrode in contact with said portion of said liquid contained within said shell;
a second electrode on said outer surface of said shell, said second electrode in contact with a portion of said liquid adjacent to said outer surface of said shell;
means for electrically isolating said first electrode from said second electrode;
means for measuring the flow of current from said first electrode to said second electrode; and
means for correlating said flow of current with the size of said leak.

4,720,670

ON CHIP PERFORMANCE PREDICTOR CIRCUIT

David H. Boyle, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1986, Ser. No. 945,728
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—73 R 5 Claims



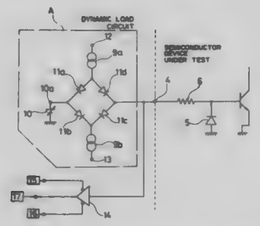
1. An on chip integrated monitoring circuit for characterization of signal propagation speeds on the chip, comprising:
a first depletion mode load device having its drain connected to an input node and its source connected to a common node, having an effective resistance which is a function of process parameters for the integrated circuit chip;
an inverter circuit having a second depletion mode load FET device with its drain connected to drain potential and its source connected to the drain of an enhancement mode active device whose source is connected to ground potential and whose gate is connected to said common node;
a feedback capacitor having a first terminal connected to said source of said second depletion mode load device and its second terminal connected to said common node, having a capacitance which is a function of process control parameters for the integrated circuit chip;
said inverter having an effective gain so that the combination of said inverter and said feedback capacitor represents a capacitance at said common node having a magnitude which is approximately said gain times the capacitance of said feedback capacitor;
an output node coupled to said common node for applying a test probe thereto for measurement of the ratio of a time varying output voltage at said common node with respect to a time varying input voltage at said input node, said ratio characterizing the magnitude of the process parameters for said integrated circuit chip.

4,720,671

SEMICONDUCTOR DEVICE TESTING DEVICE

Tetsuo Tada, and Keiichi Sawada, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 760,776
Claims priority, application Japan, Aug. 6, 1984, 59-165858
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R 4 Claims



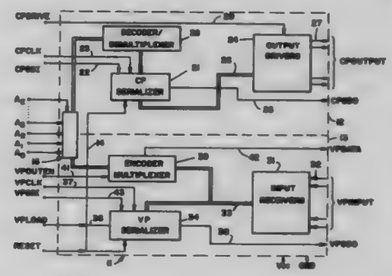
1. A semiconductor device testing device for testing a semiconductor device having input/output terminals, which comprises:
a dynamic load circuit provided for each of the input/output terminals of the semiconductor device, said dynamic load circuit including,
first and second voltage sources,
a first constant current source,
a second constant current source,
a diode bridge connected in series between said first and second constant current sources across said first and second voltage sources, said diode bridge including first and second balanced voltage terminals,
a variable voltage source connected to said first balanced voltage terminal,
the second balanced voltage terminal being connected to a said input/output terminal of said semiconductor device;
a comparator, operatively connected to each of the input-/output terminals of the semiconductor device, for comparing the voltage value obtained at the input/output terminal with a predetermined value to detect whether the internal state of the semiconductor device is a high impedance state or not in order to determine the quality of the electrical connection between the semiconductor device and the testing device.

4,720,672

TESTABILITY SYSTEM

Jon Turino, 96 Sheeren Pl., Suite 101, Campbell, Calif. 95009

Filed Jun. 27, 1984, Ser. No. 625,107
Int. Cl.[1] G01R *15/12, 31/22, 31/28*
U.S. Cl. 324—73 R 6 Claims



1. A testability system for functional circuits comprising
a control point section having a decoder/demultiplexer with means for receiving as inputs parallel control point input data and a serializer connected to receive serial input data means for electrically connecting the output of said decoder/demultiplexer to control points of a circuit under test, and
a visibility point section having input means adapted for connection to visibility point output nodes of said circuit under test and including a serializer for producing visibility point data in serial form and an encoder/multiplexer for producing visibility point data in parallel form all in response to said control point or other data for testing circuit operation.

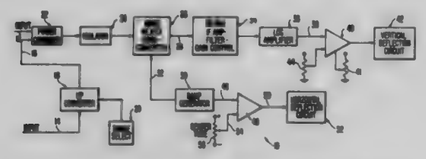
VOL 1086 ISS 3 JA 19 1988 UMI

4,720,673

SPECTRUM ANALYZER AND LOGARITHMIC AMPLIFIER THEREFOR

R. Andrew Hatfield, Richmond, Va., assignor to Avcom of Virginia, Inc., Richmond, Va.

Filed May 15, 1985, Ser. No. 734,115
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B 17 Claims



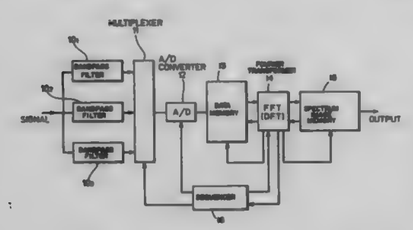
1. A spectrum analyzer comprising:
an input means for receiving electromagnetic signals to be analyzed in a predetermined first frequency band;
means connected to said input means for down-converting said signals to an intermediate frequency, said down converting means including an image reject mixer for reducing the power of images of said signals while down-converting said signals, and means for sweeping a mixer frequency of said image reject mixer through said band to individually down-convert signals at each frequency of said band; and
display means operated in synchronism with said sweeping means for displaying the amplitude of each down-converted signal.

4,720,674

DOPPLER SIGNAL ANALYZING APPARATUS

Yasuhito Takeuchi; Shinichi Sano; Takao Jibiki, and Takao Higashiizumi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 841,522
Claims priority, application Japan, Jul. 20, 1984, 59-150880; PCT Int'l Appl., Jul. 19, 1985, PCT/JP85/00410
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B 3 Claims



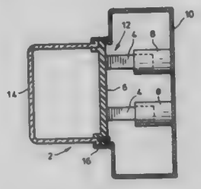
1. A doppler signal analyzing apparatus for acquiring a signal to be analyzed for a prescribed time slot and then for performing a Fourier transform on the acquired signal with Fourier transform means to determine a frequency spectrum of the signal to be analyzed, said apparatus comprising
bandpass means (10_1, 10_2, 10_3) for dividing the signal to be analyzed into a plurality of frequency bands, said bandpass means comprising a first bandpass filter for passing a first frequency band of 12.5 to 100 Hz, a second bandpass filter for passing a second frequency band of 100 to 800 Hz, and a third bandpass filter for passing a third frequency band of 800 Hz to 6.4 kHz;
signal acquiring means (11) for acquiring signals in the frequency bands which have passed through said first bandpass filter over a time slot of 160 msec for 6.25 Hz, through said second bandpass filter over a time slot of 20 msec for 50 Hz, and through said third bandpass filter over a time slot of 2.5 msec for 400 Hz, said signal acquiring means comprising a multiplexer for selecting, one at a time, signals in said first, second and third frequency bands which have passed through said first, second and third bandpass filters, respectively, said multiplexer having inputted thereto 32 data items during the respective time slots for said first, second and third bandpass filters, and generating output signals;
Fourier transform means (14) for carrying out a Fourier transform on each of the signals acquired by said signal acquiring means;
an analog-to-digital converter (12) for converting and outputting said output signals from said multiplexer successively to digital signals;
a data memory (13) for storing said digital signals from said analog-to-digital converter in respective first, second and third frequency bands for the signal to be analyzed,
wherein said Fourier transform means effects Fourier transform on said 32 data items in respective first, second and third frequency bands stored in said data memory; and
a spectrum memory (15) for recording an output signal from said Fourier transform means as bit maps each 2.5 msec for the signals from said first bandpass filter, each 20 msec for the signals from said second bandpass filter and each 160 msec for the signals from said third bandpass filter.

4,720,675

METER LOCKING SYSTEM

Royston G. Bishop, 31 Donlea Dr., Port Colborne, Ontario, Canada L3K 4W8, and William Kirby, R. R. No. 1, Alliston, Ontario, Canada L0M 1A0

Filed Oct. 12, 1984, Ser. No. 659,896
Int. Cl.[4] G01R *11/24, 1/04;* E05B *47/02*
U.S. Cl. 324—110 8 Claims



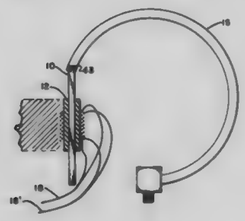
1. A meter locking device for a watt-hour meter installation which comprises firstly a watt-hour meter having a transparent front cover, a base, operative components of the meter supported by the base within the cover, electrical contact blades protruding rearwardly through the base from the operative components, and means on the rear of the base for releasably locking the cover to the base, and secondly a socket for the watt-hour meter for receiving, and together with the transparent front cover, enclosing the meter base, said socket having receptacles therein receiving the contact blades protruding rearwardly through the base, said locking device being independent of any means associated with the installation and external of the socket for retaining the watt-hour meter in the socket, and comprising a locking member secured to one of the rear of the base and the interior of the socket so as to be enclosed within the socket, a releasable latch member normally in locking engagement with the locking member and secured to a second of the rear of the base and the interior of the socket so as to be enclosed within the socket, electrically operated actuator means housed within the socket, and mounted to one of the meter base and the socket, for releasing said latch member from locking engagement with the locking member, receiver means within the socket capable of receiving coded signals impressed on a carrier propagated from outside the meter installation, and means responsive to receipt of a specified coded signal by the receiver means for energizing said actuator means, whereby to release said latch member from said locking memeber to permit withdrawal of the meter from the socket after release of any means external of the socket for retaining the watt-hour meter in the socket.

4,720,676

MAGNETOMECHANICAL TRANSDUCER UTILIZING RESONANT FREQUENCY SHIFTS TO MEASURE PRESSURE IN RESPONSE TO DISPLACEMENT OF A PRESSURE SENSITIVE DEVICE

Philip M. Anderson, III, Chatham, and Jeffrey C. Urbanski, Sparta, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 548,815, Nov. 4, 1983. This application Dec. 5, 1983, Ser. No. 558,084
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] G01L *9/10, 9/14;* G01B *7/14;* G01R *33/00*
U.S. Cl. 324—207 13 Claims



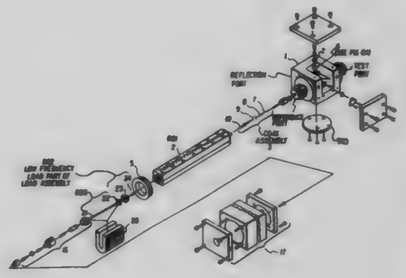
1. A magnetomechanical-resonant-frequency pressure transducer system responsive to the strength of a d.c. bias field on a target, comprising:
a. means including a driving coil co-axial with said target for interrogating said target,
b. generating means for generating an a.c. magnetic field within said coil to effect direct magnetic coupling between said ac magnetic field and said target, said ac magnetic field incorporating the resonant frequency of said target;
c. means including a displaceable pressure sensitive device biasing means for generating said dc bias field and varying means for changing the relative displacement of said pressure sensitive device and said target so as to vary the strength of said dc bias field on said target, thereby applying a variable d.c. bias field to said target to produce changes in the resonant frequency of said target that are correlated with displacement of said pressure sensitive device; and
d. detection means for detecting the resonant frequency produced in said target by the strength of said dc bias field.

4,720,677

R. F. TRIAXIAL DIRECTIONAL BRIDGE

S. Bruce Donecker, Sebastopol, and Julius K. Botka, Santa Rosa, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 568,906, Jan. 9, 1984, Pat. No. 4,588,970.
This application May 16, 1985, Ser. No. 737,300
Int. Cl.[4] G01R *31/02, 27/04*
U.S. Cl. 324—158 F 20 Claims



1. A wide bandwidth R. F. vector bridge configured in a terminated wheatstone arrangement comprising:
a housing having a test port connector means for connecting said bridge to a device under test, having a reference port connector means for connecting said bridge to a load, and having a reflection port connector means for connecting said bridge to electrical devices external to said housing;
a microcircuit located within said housing, said microcircuit further comprising:
a substrate having two parallel faces;
a patterned layer of conductive material on each face of said substrate defining primarily three areas on each face, one a reflection port area, one a reference port area, and one a test port area;
a first pair of capacitors, one on each face of said substrate between said test port area on that face and said reflection port area on that face;
a second pair of capacitors, one on each face of said substrate located between said reference port area on that face and said reflection port area on that face;
eight resistors, with four of said eight resistors located on each face of said substrate, with a first pair of said resistors on each face coupled in series with one of said first pair of capacitors on that face with said one of said first pair of capacitors being connected in series between said first pair of resistors, said series connection of said first pair of resistors and said one of said first pair of capacitors forming a connection between said test port area and said reference port area on that face, and with a second pair of said resistors coupled in series with one of said second pair of capacitors on that face with said one of said second pair of capacitors being located between said second pair of resistors, said series connection of said second pair of resistors and said one of said second pair of capacitors forming a connection between said reference port area and said reflection port area on that face;
first coupling means attached to each of said reflection port areas to form a reflection port, said first coupling means for coupling said reflection port to said reflection port connector means;
second coupling means attached to each of said reference port areas to form a reference port, said second coupling means for coupling said reference port to said reference port connector means;
third coupling means attached to each of said test port areas to form a test port, said third coupling means for coupling said test port to said test port conenctor means; and
said resistors, capacitors, and said first, second, and third coupling means arranged symmetrically about said reflection port to provide equal signal transit times between said reflection port and said reference port and between said reflection port and said test port.

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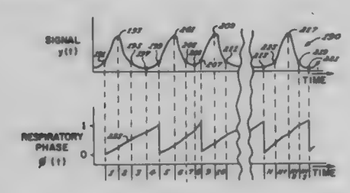
APPARATUS AND METHOD FOR EVENLY DISTRIBUTING EVENTS OVER A PERIODIC PHENOMENON

Gary H. Glover, Delafield, and Norbert J. Pelc, Wauwatosa, both of Wis., assignors to General Electric Company, Waukesha, Wis.

Continuation-in-part of Ser. No. 766,733, Aug. 16, 1985, Pat. No. 4,663,591. This application Sep. 10, 1986, Ser. No. 905,845

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **20 Claims**



10. In a system for reducing artifacts in a desired image due to substantially periodic signal variations occurring in a portion of an object being examined using nuclear magnetic resonance techniques, which techniques include measurement of imaging data about the object portion through the implementation of a plurality of views, wherein each view includes a pulsed magnetic field gradient applied along at least one dimensional axis of the object and the gradient has a parameter value adjustable to a different value in each view so as to encode spatial information into the NMR signal, a method for generating from a signal y(t) whose values are not equally likely a signal $\phi(t)$ whose values are substantially equally likely, said method comprising the steps of:

(a) selecting a predetermined relationship between the signal variations and the parameter value of said magnetic field gradient, wherein selection of said relationship defines a correspondence between a desired parameter value to be implemented in a given pulse sequence and the phase of said signal variations;

(b) generating a signal y(t) indicative of the substantially periodic signal variations;

(c) establishing a historical data base of the signal y(t);

(d) establishing $\phi(t)$ by approximating an equalized and normalized histogram of y(t) from the data base;

(e) measuring the present value of y(t);

(f) providing a present value of $\phi(t)$ in response to measurement of the present value y(t);

(g) selecting a parameter value for said magnetic field gradient using the present value of $\phi(t)$ in accordance with said predetermined relationship;

(h) executing a pulse sequence using the selected parameter value to produce an NMR signal; and

(i) repeating steps (e) through (h) until view data for a complete scan has been collected.

4,720,679

MAGNETIC RESONANCE IMAGING WITH PHASE ENCODED CHEMICAL SHIFT CORRECTION

John L. Patrick, Solon; E. Mark Haacke, University Heights; Nagarjuna R. Linga, Richmond Heights, and Janice E. Hahn, Solon, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Dec. 31, 1985, Ser. No. 815,381

Int. Cl.⁴ G01R *33/20*

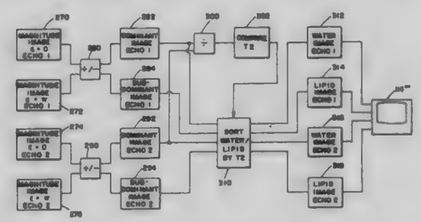
U.S. Cl. 324—309 **49 Claims**

34. An apparatus for generating both a water image and a lipid image in a single magnetic resonance scan, the apparatus comprising:

(a) magnetic resonance excitation means for exciting magnetic resonance in water and lipid dipoles of an image region such that magnetic resonance signal components are generated thereby;

(b) spin magnetization inverting means for inverting spin magnetizations of the resonating dipoles to cause an echo, the inversion means inverting the magnetizations such that water and lipid magnetizations are $n\pi \pm 90°$ out of phase during the echo, where n is an integer including zero;

(c) a receiver for receiving magnetic resonance signal components proximate a first echo when the water and lipid magnetizations are $n\pi \pm 90°$ out of phase;



(d) transforming means for transforming the collected first echo magnetic resonance signal components into a first set of pixel values; and,

(e) a separating means for separating real and imaginary components of the pixel values of the first set between a water image and a lipid image whereby the values transformed from the $n\pi \pm 90°$ out of phase magnetizations enables independent water and lipid images to be collected concurrently during a single scan.

4,720,680

ADJUSTABLE RADIO FREQUENCY COIL FOR NUCLEAR MAGNETIC RESONANCE IMAGING

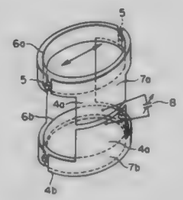
Susumu Nishihara, and Kiyoshi Yoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,446

Claims priority, application Japan, Feb. 18, 1986, 61-31964; Feb. 18, 1986, 61-31966; Aug. 26, 1986, 61-200553; Aug. 26, 1986, 61-200554

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—322 **15 Claims**



1. A radio frequency coil for a nuclear magnetic resonance imaging apparatus comprising:

one or more pairs of plate-like H-shaped electrically conducting members, each of said H-shaped members having a longitudinally-extending web and two flange portions at opposite ends of and perpendicular to said web, each of said H-shaped members being bent into the shape of an arc and being symmetricialy disposed about a common axis so as to form a tube, each of said webs being parallel to said axis and each of said flanges extending circumferentially around said tube towards one another, each flange being electrically connected to a flange of the adjacent H-shaped member, at least one of the H-shaped members of each pair being transversely divided in two at the midportion of its web so as to form two T-shaped plates; and

variable capacitor means having a variable capacitance for electrically connecting the legs of said two T-shaped plates by capacitive coupling.

4,720,681

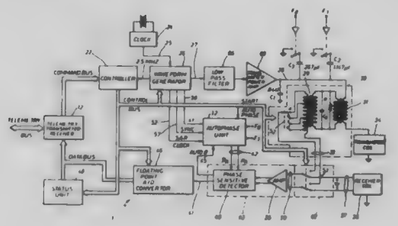
DIGITAL INDUCTION LOGGING TOOL

Paul L. Sinclair, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jun. 8, 1981, Ser. No. 271,367

Int. Cl.⁴ G01V *3/28;* **G01R** *25/00;* **H03M** *1/00*

U.S. Cl. 324—339 **4 Claims**



1. A digital induction resistivity logging tool operated in conjunction with surface equipment, said tool generating correlated floating point digital signals of phase quadrature components of a signal representative of a characteristic of sub-surface formations, the tool comprising:

(a) a system clock for generating a master timing signal for the digital circuits of the tool;

(b) a programmed controller including a first read-only-memory containing firmware routines which are executed by said controller to control the various functions of the tool;

(c) a digital waveform generator responsive to said controller and said system clock for digitally generating a sinusoidal transmitter signal, said generator including,

(i) a second read-only-memory responsive to memory addresses for generating digital signals representative of magnitude values of the transmitter signal,

(ii) an address counter responsive to said controller for generating the second read-only-memory addresses,

(iii) a first digital-to-analog convertor responsive to the digital signals from said second read-only-memory for generating a stair-stp approximation to a sinusoidal waveform,

(iv) a filter for smoothing the stair-step sinusoidal waveform by filtering the harmonics therefrom,

(v) a transmitter amplifier for amplifying the filtered sinusoidal waveform to produce the sinusoidal transmitter signal, and where

(vi) the digital signals stored in said second read-only-memory includes clock generating signals for generating a reference clock signal;

(d) a transmitter coil responsive to the sinusoidal transmitter signal for inducing current flow in the formations surrounding the borehole;

(e) a receiver coil for developing a signal representative of the induced current flow;

(f) an autophase unit responsive to the reference clock signal and to said controller for generating a digital phase reference signal having a frequency which successively changes from a first to a second phase relationship with the transmitter signal in response to commands from said controller, and where the first and second reference signals respectively having the first and second phase relationships are in quadrature to one another, said autophase unit including phase shifting means responsive to the phase error signal for phase shifting the phase reference signal, and where the stored digital signals in said second read-only-memory of said digital waveform generator for geneating the various amplitude levels of the transmitter signal are stored relative to the stored reference clock generating signals with the result that the sinusoidal transmitter signal in said transmitter coil is phase shifted relative to the phase reference signal generated by said autophase unit by an amount which compensates for phase shift errors introduced by circuits in the tool;

(g) a phase sensing means responsive to the receiver signal and the phase reference signal for successively detecting phase quadrature components in an applied input signal, where each detected signal component is that component in-phase with the current phase of the phase reference signal, said phase sensing means including,

(i) a receiver amplifier for amplifying the applied input signal,

(ii) said phase sensing means generating an active phase error signal to said autophase unit indicative of the magnitude of the detected component signal output by said phase sensing means, and

(iii) said autophase shifting the phase of the phase reference signal in a direction to minimize the output signal from said phase sensing means;

(h) means responsive to said controller for selecting either the receiver signal or a test signal representative of the transmitter signal as the signal to be applied to said phase sensing means, said selecting means selecting the test signal during a phase compensation cycle in which the phase reference signal is in phase quadrature with the selected test signal from said selecting means;

(i) a floating point analog-to-digital convertor responsive to the output of said phase sensing means and to said controller, for alternately obtaining digital signals representing the magnitude of the phase quadrature components of the receiver signal, each digital signal representation having an exponent value and a magnitude value, said analog-to-digital convertor including,

(i) a voltage-to-frequency convertor responsive to the detected phase quadrature component signals from said phase sensing means for generating a digital clocking frequency signal whose frequency is proportional to the magnitude of the component signal,

(ii) a first counter for counting clock cycles of the digital frequency signal during a predetermined time period,

(iii) a shift register having a stage for each bit of said first counter and responsive to shift pulses for storing and shifting the resulting count from said first counter at the end of each predetermined time period in a direction to increase the magnitude of the count contained in a predetermined sub-set number of output bits of said shift register, said set of bits having a most significant bit (MSB), and

(iv) a second counter for counting the number of shift pulses applied to said shift register during each predetermined time period, said shift register shifting its stored count one bit position for each shift pulse until the first to occur of either a logic 1 appearing in the MSB or the count in said second counter reaching a predetermined count, the count in said second counter forming the exponent of the floating point conversion value and the sub-set of shift register output bits forming its magnitude; and

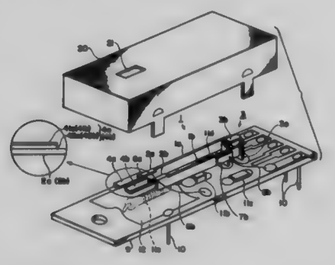
(j) a digital telemetry means associated with the surface equipment and the tool for sending and receiving digital signal, including the digital floating point signals, between the tool and the surface.

4,720,681

SURFACE ELECTRIC POTENTIAL SENSOR

Hiroshi Ikushima; Yoshitsugu Uenishi, both of Hirakata; Yuzo Eto, Neyagawa, and Masashi Kanno, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 27, 1985, Ser. No. 803,216
Claims priority, application Japan, Nov. 29, 1984, 59-252209; Nov. 29, 1984, 59-252210
Int. Cl.[4] G01R 29/12
U.S. Cl. 324—458 5 Claims



1. A surface electric potential sensor for detecting an electric potential on a surface of an object without contacting the surface, comprising:
- a tuning fork made of a single body of a hard elastic material having a base and two legs extending from said base;
- a piezoelectric vibration element mounted on each of said legs at a position near said base for vibrating said tuning fork so that free ends of said legs move alternately toward and away from each other;
- an electrode having a double-layer structure comprising an insulating substrate mounted on each of said free ends of said legs and a high conductivity film provided on said insulating substrate;
- a supporting board for supporting said tuning fork at said base; and
- a shield case for encasing therein said tuning fork, said shield case having a window for introducing lines of electric force radiated from said surface so that said high conductivity film accepts said lines of electric force;
- wherein said high conductivity film alternately opens and closes said window according to vibrations of said tuning fork so as to thereby produce a displacement current corresponding to said lines of electric force.

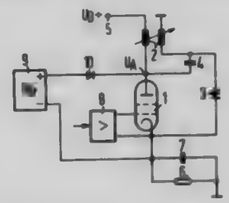
4,720,683

CIRCUIT FOR PREVENTING RETARDING FIELD OSCILLATIONS IN ELECTRON TUBES, ESPECIALLY FOR A PULSE-WIDTH MODULATION STAGE IN TRANSMITTERS

Jochen Stahl, and Ingo Beling, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 644,531, Aug. 27, 1984. This application Jul. 18, 1986, Ser. No. 888,264
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331267
Int. Cl.[4] H03H 11/00; H03G 1/28
U.S. Cl. 328—245 5 Claims

1. Pulse-width modulation stage of a transmitter comprising:
- a tetrode electron switching tube including a plate, connected to a positive supply voltage, at least one control grid, a suppressor grid, and a cathode;
- a load connected between said cathode and a reference potential;
- a drive amplifier connected between said cathode and said control grid for driving said switching tube; and
- a power supply for suppressing retarding field oscillations, generating a retarding field voltage connected at its positive terminal to said plate via a forward biased feeding



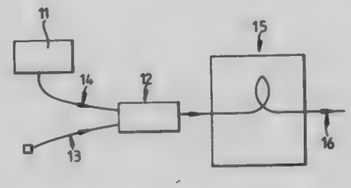
diode and at its negative terminal to a connection point between said cathode and said load.

4,720,684

OPTICAL AMPLIFIER

Kevin C. Byron, Bishops Stortford, United Kingdom, assignor to Standard Telephones and Cables plc, London, England

Continuation of Ser. No. 679,444, Dec. 7, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 888,274
Claims priority, application United Kingdom, Dec. 16, 1983, EJ 33610
Int. Cl.[4] H07F 7/00; H04B 9/00
U.S. Cl. 330—4.3 9 Claims



1. An optical fibre amplifier comprising a length of optical fibre of high Raman cross-section and low transmission loss; a semiconductor laser and drive means therefor, the output of the semiconductor laser comprising a pulsed pump signal; and coupler means having an input for an optical signal, of a first wavelength, to be amplified, an input for the pump signal and an output coupled to an input end of the optical fibre, and wherein in use the fibre is optically pumped by the pump signal at a second wavelength and gain is obtained at the first wavelength in the signal to be amplified by Raman-Stokes interaction, which first wavelength corresponds to one or more Stokes shift from the pump signal.

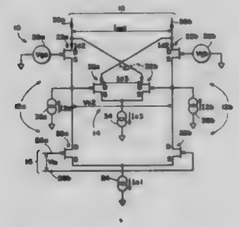
4,720,685

FET TRANSCONDUCTANCE AMPLIFIER WITH IMPROVED LINEARITY AND GAIN

Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 2, 1986, Ser. No. 902,537
Int. Cl.[4] H03F 1/32, 3/45
U.S. Cl. 330—149 19 Claims

1. A field effect transistor amplifier circuit of greater linearity and increased gain, comprising:
- an input amplifier stage comprising a pair of input field effect transistors having their gates connected across a source of input signal voltage;
- an output amplifier stage comprising a pair of output field effect transistors having their sources connected to the outputs of different ones of said input transistors and having their outputs connected to output terminals to provide an output signal current; and
- a correction amplifier stage comprising a pair of compensating field effect transistors connected as a nonlinear common source amplifier stage with their gates connected to the sources of different ones of said output transistors and their drains connected to the outputs of the opposite ones of said output transistors to which their gates are connected.

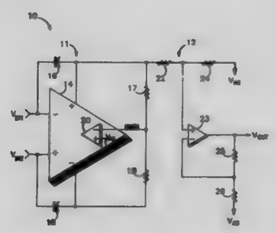


4,720,686

CIRCUIT FOR CONVERTING A FULLY DIFFERENTIAL AMPLIFIER TO A SINGLE-ENDED OUTPUT AMPLIFIER

Alan L. Westwick, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 14, 1987, Ser. No. 3,173
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—258 9 Claims



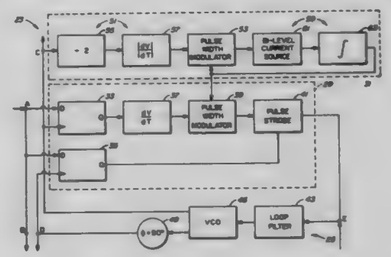
1. A circuit for converting first and second outputs of a fully differential amplifier to a single output, comprising:
- common-mode output voltage control means coupled to the fully differential amplifier for maintaining a predetermined output common-mode voltage of the two outputs of the fully differential amplifier, said control means having a first input connected directly to a predetermined one of the first or second outputs of the fully differential amplifier and having a second input coupled to a reference voltage terminal, and an output for controlling the first and second outputs of the fully differential amplifier; and
- output buffer means coupled to the first and second outputs of the fully differential amplifier for providing the single output.

4,720,687

FREQUENCY LOCKED LOOP WITH CONSTANT LOOP GAIN AND FREQUENCY DIFFERENCE DETECTOR THEREFOR

Vladimir E. Ostoich, San Jose, and Thomas Hornak, Portola Valley, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 20, 1987, Ser. No. 18,095
Int. Cl.[4] H03L 7/06
U.S. Cl. 331—1 A 19 Claims



1. A frequency locked loop comprising:
- a frequency difference detector arranged to receive an input signal and a reference signal, said input signal with an input frequency and said reference signal with a reference frequency, said frequency difference detector being adapted to provide an error signal reflecting the difference in frequency between said input signal and said reference signal;
- a frequency generator for providing said reference signal, said frequency generator being arranged in feedback relation with said frequency difference detector so that the frequency of said reference signal changes in a direction selected to diminish the magnitude of the detected difference in frequency; and
- gain compensation means for causing said error signal to be substantially constant over different reference frequencies for fixed fractional differences between said input frequency and said reference frequency.

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FREQUENCY SYNTHESIZER

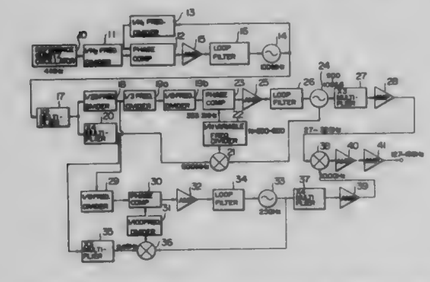
Makoto Hasegawa, Tokyo; Koei Misuiu, Kawasaki, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1986, Ser. No. 862,945
Claims priority, application Japan, May 15, 1985, 60-103024; May 15, 1985, 60-103026; Dec. 16, 1985, 60-283313; Dec. 16, 1985, 60-283314; Dec. 16, 1985, 60-283315; Dec. 16, 1985, 60-283316
Int. Cl.[4] H03L 7/06
U.S. Cl. 331—2 24 Claims

1. A frequency synthesizer comprising;
- first phase-locked loop means having a first voltage-controlled oscillator (VCO) phase-lock-stabilized using a reference quartz oscillator,
- second phase-locked loop means having a second voltage-controlled oscillator, for frequency-converting a signal associated with an output from said first VCO and its own output signal so as to provide a first phase-comparison signal,
- third phase-locked loop means having a third VCO, for creating a second phase comparison signal from the first VCO output and its own output, and
- frequency-converting means for creating a microwave sig-

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nal frequency-converted from a first signal associated with the output from said second phase-locked loop means



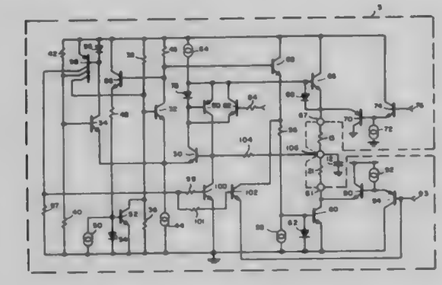
and a second signal associated with the output from said third phase-locked loop means.

4,720,689

HIGH FREQUENCY PRECISION OSCILLATOR WITH SYNCHRONOUS CAPABILITY

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Feb. 10, 1987, Ser. No. 12,887
Int. Cl.[4] H03K *3/282*
U.S. Cl. 331—111 **39 Claims**



1. An oscillator circuit for coupling to a capacitor comprising:

means for setting a peak voltage threshold;

means for setting a valley voltage threshold;

charging current source means for supplying a charging current through a charging terminal to said capacitor;

charging voltage means for receiving a predetermined charging voltage and for maintaining said charging terminal at said predetermined charging voltage whenever said charging current source means is on;

discharging current source means for pulling a discharging current from said capacitor through a discharge terminal;

discharging voltage means for maintaining said discharge terminal at a predetermined discharging voltage whenever said discharging current source means is on; and

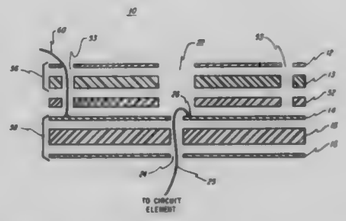
comparator means for switching said charging current source means on and said discharging current source means off in repsonse to said capacitor dropping to a voltage approaching said vally voltage threshold and for switching said charging current source means off and said discharging current source means on in response to said capacitor rising to a voltage approaching said peak voltage threshold.

4,720,690

SCULPTURED STRIPLINE INTERFACE CONDUCTOR

Marc H. Popek, Indian Harbour Beach; Kenneth D. Springer, St. Petersburg; William R. Beaudet, Melbourne, and Ralph D. DiStefano, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 14, 1986, S. ∴ No. 885,557
Int. Cl.[4] H01P *5/12*
U.S. Cl. 333—1 **9 Claims**



1. A stripline interface conductor adapted for receiving a circuit element and for providing spaced apart connections to each lead of the circuit element, said stripline interface conductor comprising:

a first ground plane layer having a first access opening and a plurality of second access openings therein, wherein said plurality of second access openings are spaced at a predetermined distance from said first access opening;

a signal line layer adjacent said first ground plane layer and having a plurality of signal traces thereon, and having an access opening therein, wherein said access opening of said signal line layer is in registry with and smaller than said first access opening of said first ground plane layer, and wherein at first portion of at least one of said plurality of signal traces is exposed through said first access opening of said first ground plane layer, and a second portion of at least one of said plurality of signal traces is accessible through one of said plurality of second access openings, and wherein said circuit traces are closely spaced near said first access opening and spaced farther apart near said plurality of second access openings;

a second ground plane layer adjacent said signal line layer and having an access opening therein, wherein said access opening of sid second ground plane layer is of the same size and in registry with said access opening of signal line layer, and wherein leads of the circuit element are adapted to protrude through said access opening of said line layer and said access opening of said second ground plane layer of connection to said first portion of said plurality of signal traces;

and wherein spaced-apart connections are provided to said signal traces throgh said plurality of second access openings.

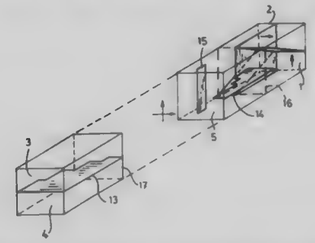
4,720,691

COMPACT WAVEGUIDE APPARATUS ACTING AS A MAGIC T

Emmanuel Rammos, Oegstgeest, Netherlands, assignor to Agence Spatiale Europeenne, France

Filed Sep. 4, 1986, Ser. No. 903,759
Claims priority, application France, Sep. 13, 1985, 85 14091
Int. Cl.[4] H01P *5/20*
U.S. Cl. 333—122 **5 Claims**

1. Waveguide apparatus serving as a magic T, comprising a parallelipiped guide, the internal volume of said guide being divided into two first rectangular waveguides by at least one metal partition extending between a first end of the guide and a first cross-sectional plane, and into two second rectangular waveguides by a septum extending between the second end of the guide and a second cross-sectional plane, the volume contained between the first and second cross-sectional planes forming a fifth waveguide capable of supporting an electromagnetic wave with two perpendicular polarization modes, said two first and said two second rectangular waveguides having their axes parallel to one another and being arranged in alignment with the fifth waveguide, said first rectangular



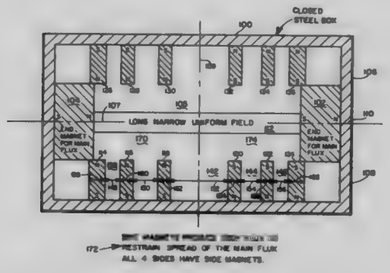
waveguides being of such dimensions that one of them is capable of supporting propagation of a wave of vertical linear polarization and the other one is capable of supporting propagation of a wave of horizontal linear polarization, the fifth waveguide comprising a mode cutoff device positioned on the axis of one of the first rectangular waveguides so as to suppress any undesirable linear polarization mode therein.

4,720,692

LONG, NARROW, UNIFORM MAGNETIC FIELD APPARATUS AND METHOD

Korda K. Jin, Brea, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 664,193, Oct. 24, 1984, Pat. No. 4,605,911. This application Aug. 11, 1986, Ser. No. 895,623
Int. Cl.[4] H03H *9/38*
U.S. Cl. 333—144 **10 Claims**



1. Magnetostatic delay line apparatus comprising:

first and second sources of magnetomotive force located at two displaced points along an axis and polarized to establish primary magnetic field flux lines commencing at said first source, extending along said axis in an outward curving line pattern having flux line components directed both parallel and perpendicular to said axis and ending at said second source;

magnetomotive force source means located along said axis for diverting said magnetic field flux lines from said curving line pattern to a pattern of flux lines extending parallel to said axis between said first and second sources,

said magnetomotive force source means including a plurality of discrete magnetomotive force sources dispersed along said axis and radially thereabout for generating magnetic field lines that are orthogonally oriented with respect to said axis, said discrete magnetomotive force sources being of predetermined finite, non-zero spacial separations measured along said axis, with said predetermined finite non-zero spatial separations being determined in response to the local degree of said outward curvature and the required diversion of said primary magnetic field flux lines to achieve said flux lines extending parallel to said axis;

a cavity receptacle concentric with said axis and communicating therealong between said first and second sources of magnetomotive force; and

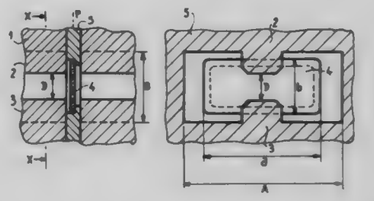
a magnetostatic delay line element lengthwise located within said cavity receptacle surrounded by said parallel extending flux lines.

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RIDGED RECTANGULAR WAVEGUIDE PROVIDED WITH A SEALED WINDOW

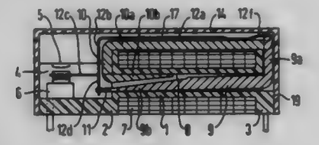
Jacques Tikes, Orsay, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 30, 1985, Ser. No. 815,141
Claims priority, application France, Dec. 28, 1984, 84 19997
Int. Cl.[4] H01P *1/08*
U.S. Cl. 333—252 **8 Claims**



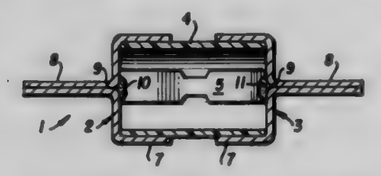
1. A rectangular ridge waveguide having a first opening bounded by long and short sides, a propagation direction substantially perpendicular to a plane parallel to said first opening, waveguide ridges aligned along the waveguide parallel to said propagation direction, and a sealed thin window forming a partition-wall interposed so as to define two adjoining sections in the waveguide, said window being composed of a metallic frame and a substantially thin dielectric plate, the plate having a thickness representing an electric length at least five times shorter than a guided wavelength corresponding to a signal at the highest operating frequency of said waveguide, the frame being pierced by a second opening, and said second opening is sealed by said dielectric plate, the projection of said second opening on said plane perpendicular to said propagation direction being of oblong shape, the longest dimension of said oblong shape being parallel to the long sides of the waveguide, the shortest dimension of said oblong shape being parallel to said short sides, the longest and shortest dimensions of said oblong shape which are parallel respectively to the long and short sides of the waveguide are respectively smaller than the dimensions of said long and short sides of the waveguide, said waveguide being provided with a matching transformer placed in a zone of said waveguide surrounding said window, said zone having a length parallel to said propagation direction, and said length being approximately $\lambda_0/2$, where λ_0 is a wavelength corresponding to a center operating frequency of said waveguide, said transformer being obtained by giving the waveguide ridges a greater thickness inside the zone than outside the zone.

4,720,694
ELECTROMAGNETIC RELAY
Harry Schroeder, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 2, 1986, Ser. No. 858,921
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518424; Oct. 30, 1985, 3538613
Int. Cl.⁴ H01H *62/02*
U.S. Cl. 335—128 17 Claims



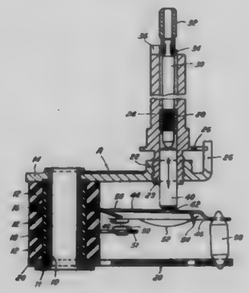
1. An electromagnetic relay comprising:
a hollow coil having a longitudinal coil axis;
a magnetic circuit formed by a stationary part and a moveable part responsive to current in said coil each having surfaces disposed in registry forming a working air gap;
a spring having a fixed end attached at one end of said coil and having a first spring section forming a free spring length substantially co-extensive with the length of said coil parallel to said coil axis, a second spring section at an opposite end of said coil perpendicular to said coil axis and engaging said moveable part for co-movement therewith, and a third spring section extending from said second spring section away from said opposite end of said coil and carrying a contact thereon;
at least one stationary contact disposed in said relay for engaging and disengaging said spring contact in response to said coil current; and
a cover for said relay, said cover and said stationary part of said magnetic circuit forming in combination a space in which said first section of said spring is received, said space being open toward said stationary contact and otherwise closed.

4,720,695
CARTRIDGE FUSE CONSTRUCTION AND ASSEMBLY
Angelo Urani, Ellisville, and Aldino Gaia, St. Louis, both of Mo., assignors to Cooper Industries, Inc., Houston, Tex.
Continuation of Ser. No. 725,769, Apr. 22, 1985, abandoned.
This application Feb. 27, 1987, Ser. No. 20,170
Int. Cl.⁴ H01H *85/16*
U.S. Cl. 337—254 4 Claims



1. In a cartridge fuse comprising a tubular insulating body with two ends, a ferrule disposed at each end of said tubular insulating body, each ferrule having a cylindrical tubular portion with a flattened terminal portion extending therefrom and a fusible strip extending between and electrically connected to said ferrules, the improvement comprising a V-shaped notch disposed at the intersection of the cylindrical tubular portion and the flattened terminal portion of each ferrule, said fusible strip having two free ends, each of said free ends terminating at a respective V-shaped notch and a conductive bonding material disposed between V-shaped notch and the respective free end of the fusible link for electrically connecting said fusible strip to said ferrules.

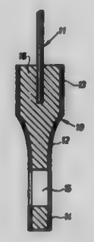
4,720,696
BIMETALLIC THERMOSTAT WITH DUAL CONTROL
Ettore Oldani, and Renzo Cavinato, both of Milan, Italy, assignors to V.E.B.E. Elettromeccanica S.p.A., Milan, Italy
Filed Jan. 10, 1986, Ser. No. 818,116
Claims priority, application Italy, Feb. 4, 1985, 20695/85[U]
Int. Cl.⁴ H01H *37/12, 71/16*
U.S. Cl. 337—347 1 Claim



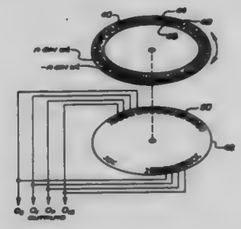
1. A bi-metallic thermostat, comprising:
a supporting structure;
a bi-metal lamina projecting from the supporting structure for deflection in response to temperature changes;
at least one flexible-lamina means projecting from the supporting structure for deflection in response to the deflection of the bi-metal lamina;
contact means on the supporting structure for opening and closing contact in response to the deflection of the flexible-lamina means;
a first male/female coupling having a male and a female element for screw cooperation upon relative rotation, one of the elements being retained on the supporting structure; and
a second male/female coupling having a male and a female element for screw cooperation upon relative rotation, one of the elements of the second male/female coupling being operatively connected with the other element of the first male/female coupling, and the other element of the second male/female coupling being operatively connected to the flexible lamina for variably deflecting the latter, one of the elements of the second male/female element projecting from the first male/female coupling for the relative rotation thereof independently of the latter; and
stop means on both of the first and second male/female couplings for respectively limiting the relative rotation of the elements thereof.

4,720,697
TERMINAL FOR ELECTRICAL RESISTANCE HEATING ELEMENT AND A METHOD FOR THE MANUFACTURE OF SUCH TERMINALS
Venonzio Bizzarri, Hallstahammar, Sweden, assignor to Kanthal AB, Hallstahammar, Sweden
Filed Nov. 7, 1985, Ser. No. 796,184
Claims priority, application Sweden, Nov. 7, 1984, 8405577
Int. Cl.⁴ H01C *1/144*
U.S. Cl. 338—329 3 Claims

1. A terminal for an electrical heating resistance elements having a lead in electrode, wherein the heating resistance element comprises a thin thread of a highly temperature resistant material, which thread has, at at least one end thereof, a terminal of a material of a higher conductivity than that of the resistance thread and having a cross-sectional area which is considerably greater than that of the resistance thread, said terminal comprising an outer, comparatively thin-walled sheathing of an electrically good-conducting oxidation-resistant material, which permits forming by pressing but which is still rigid, said sheathing having the shape of a tube which at one end thereof merges with a flat-pressed tongue having a bore to receive a current conducting member, said sheathing containing a filling of a pliable, good-conducting material of lower melting point than said sheathing, in which filling the end of the element thread has a solidified melted connection.

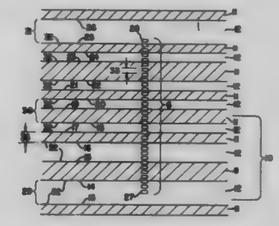


4,720,698
CAPACITIVE ENCODER HAVING MULTIPLE PRECISION OUTPUTS
Raymond Brooke, Calabasas, and Gaston Palombo, Agoura, both of Calif., assignors to Computer Memories, Inc., Chatsworth, Calif.
Continuation of Ser. No. 490,571, May 2, 1983, Pat. No. 4,631,524. This application Nov. 10, 1986, Ser. No. 928,918
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.⁴ H03M *1/30*
U.S. Cl. 340—347 P 5 Claims



1. A high resolution capacitive encoder, comprising:
a first plate having first and second conductive input areas formed thereon, wherein the input areas are separated by a square wave shaped gap having a wavelength Cp;
a second plate whose surface is spaced a predetermined distance form the surface of the first plate, said plates being movable with respect to each other, said second plate including a series of rectangular conductive output areas positioned in facing relation to the gap along the length thereof, each of said output areas having a length equal to one half of the wavelength of the gap and being spaced from adjacent output areas by a distance Cp/N, wherein N is an integer greater than 2;
means for applying a first periodic signal to the first input area;
means for applying a second periodic signal which is the inverse of the first signal to the second input area, wherein the first and second signals will capacitively couple to the output areas to provide an output signal at each output area, whereby the maximum amplitude of each output signal will vary linearly as the first and second plates move with respect to each other and will have a null value when equal portions of the respective output area are capacitively coupled to the first and second input areas, wherein more than one positionally-distinct null outputs are generated as the plates move with respect to each other by an amount Cp/2.

4,720,699
OPTICAL ENCODER USING LINE ARRAY DETECTORS
Ronald H. Smith, 6700 Connecticut Ave., Chevy Chase, Md. 20815
Filed Oct. 28, 1985, Ser. No. 792,115
Int. Cl.⁴ H03M *1/22*
U.S. Cl. 340—347 P 6 Claims



1. Encoder comprised of pattern, line detector array, means of optically superimposing pattern on detector array, using said pattern of bars approximately perpendicular to said linear detector array in which a small difference between detector element spacing and bar image spacing extends over the entire detector array length so that sensing of pattern image position change which is a small fraction of one detector element is made possible, and in which each of a series of contiguous pattern segments embodies features identifying a given segment as a unique member in a numerical sequence, said encoder having electronic processing means cooperating with said pattern and array configurations for determination of a numerical position value using an algorithm characterized in that;
the spacing between adjacent detector elements is designated as a unit length bearing a predetermined relationship to the length of said pattern segments, and the signal amptitude from each detector element is converted to digital form for numerical processing, and
an average value of detector element signal values is computed, and
instances of signal level rising from below average to above average signal or from above to below average are identified as rising and falling transitions respectively, and
an approximate formula relating signal strength to the relative locations of a transition and the center of a detector element spanning the transition is used to calculate the transition location to an accuracy of better than half a detector element spacing, and
positional separation of each pair of adjacent transitions is computed, and
those transitions signifying bits of an identifying address word are located and the identifying address word for a given pattern segment is determined by equating a rising transition to a digital zero and a falling transition to a digital one, and
the rising transitions are treated as a separate group within which the plot of signal value versus detector number approximately fits a straight line which is found by a least squares method, and
the falling transitions are treated as a separate group within which the plot of signal value versus detector number approximately fits a straight line which is found by a least

squares method and which is of opposite slope to the line fitting rising transitions, and

the intersection of best fit lines to rising and falling transition groups is computed, giving a vernier indication of position to an accuracy of a small fraction of a detector element wherein errors related to edge sensing are canceled, and

said segment address word is combined with the detector element number of the detector element spanning the transition defining the most significant bit of the segment address word and with said vernier indication of position to provide an absolute position measurement to an accuracy of a small fraction of a detector element, said absolute measurement being derivable for any position within said series of contiguous pattern segments.

4,720,700

SECURITY SYSTEM AND METHOD FOR ELECTRONIC APPARATUS, PARTICULARLY CAR RADIOS OR SIMILAR AUTOMOTIVE AUDIO EQUIPMENT

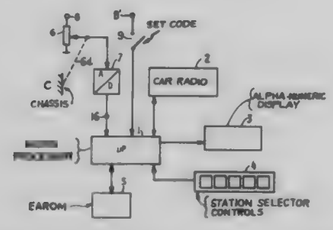
Peter Seibold, Diekholzen, and Karl-Peter Strauss, Hildesheim, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,674

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509562

Int. Cl.⁴ G08B *13/14*

U.S. Cl. 340—568 **23 Claims**



1. Security system for electronic appartus, particularly car radios, audio systems, or the like, installed on a support (C) therefore, and energized by an external power source (8) associated with the support, comprising

memory means (5) for storing a predetermined code word;

code entry means (4,9) for entering the code word into the memory means (5);

means coupled to and energized by the external power source or generating an "apparent present" code upon energization thereof by said external power source (8); means (16,1) for entering the "apparatus present" code in the memory means (5);

removal sensing means (6,7,6') for electrically sensing removal of the electronic apparatus from the support (C) and deenergization of said "apparatus present" code generating means,

said removal sensing means including a random access memory (RAM (6') receiving operating voltage from said source (8) which, upon removal of the apparatus from the support, is interrupted;

and logic means (1) connected to the memory means (5), the code entering means (4), and the removal sensing means (6,7,6') said logic means inhibiting operation of the electronic apparatus (2) after removal from the support and failure to sense the "apparatus present" code, until the code word is again entered into said code entering means and stored in the memory means.

4,720,701

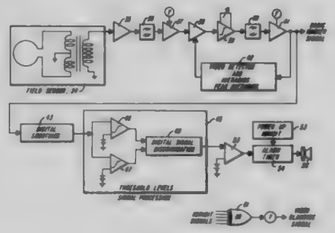
SYSTEM WITH ENHANCED SIGNAL DETECTION AND DISCRIMINATION WITH SATURABLE MAGNETIC MARKER

George J. Lichtblau, 23 Pin Pack Rd., Ridgefield, Conn. 06877

Filed Jan. 2, 1986, Ser. No. 815,823

Int. Cl.⁴ G08B *13/24*

U.S. Cl. 340—572 **110 Claims**



1. Apparatus for detecting the presence of an object within an interrogation zone comprising:

a marker adapted to be secured to said object;

means for applying in said interrogation zone an electomagnetic field having a periodic waveform;

means for monitoring said field in the vicinity of said interrogation zone and detecting disturbances to said field due to the interaction of said marker with said field so as to produce a monitor signal including pulses and noise;

means for removing from said monitor signal substantially all frequency components in the vicinity of the frequency of said periodic waveform of said applied field;

means for detecting pulses in the remaining frequency components of said monitor signal;

signal discrimination and noise rejection means receiving said detected pulses for determining is said detected pulses were caused by said marker and, if so, to produce an alarm indication signal;

said signal discrimination and noise rejection means including a slew rate limited amplifier, the maximum rate of change of voltage with respect to time of the output of said amplifier being limited to be less than a predetermined value; and

means operative in response to production of said alarm indication signal for indicating the presence of said marker within said interrogation zone.

4,720,702

METHOD AND APPARATUS FOR MONITORING THE TENSION OF AN ADVANCING YARN

Gerhard Martens, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jul. 2, 1986, Ser. No. 881,124

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523710

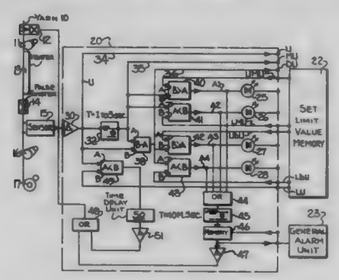
Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—677 **11 Claims**

1. A method of monitoring a variable parameter at a work station comprising the steps of

continuously monitoring the value of the parameter, while continuously determining the mean value of the monitored parameter, and while also continuously determining the differential between the monitored value and the mean value, and

generating an alarm signal whenever the mean value leaves a predetermined tolerance range, or whenever the differential value leaves a second predetermined tolerance range.



4,720,703

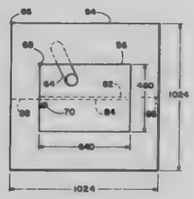
DISPLAY METHOD AND APPARATUS EMPLOYING CURSOR PANNING

Charles B. Schnarel, Jr., Aloha, and Allen Wirfs-Brock, Sherwood, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 637,375, Aug. 2, 1984, abandoned. This application May 4, 1987, Ser. No. 47,573

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—709 **11 Claims**



1. A method of providing a display movable relative to information stored in a pixel bit map memory, comprising:

addressing a portion of said pixel bit map memory to define a visible display wherein the portion addressed represents a viewpoint into the bit map memory, said pixel bit map memory storing a virtual image of greater height and width than is includable within said viewpoint,

controlling the positioning of a cursor relative to the display, said cursor being movable relative to said display by an arbitrary displacement in two dimensions,

detecting the position of said cursor relative to x and y addresses for the bit map memory which represent said viewport in order to determine whether the cursor falls within said viewport,

and altering said addresses as applied to said bit map memory for relatively moving said viewport toward said cursor so as to include said cursor within the visible display when the current position of said cursor is detected as falling outside said viewport wherein said addresses are altered by an arbitrary differential corresponding to said displacement in two dimensions.

4,720,704

DISPLAY

Holm Baeger, Schwalbach, and Hans Wedel, Mühltal, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 687,616

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1984, 3400438

Int. Cl.⁴ G09G *3/36*

U.S. Cl. 340—716 **12 Claims**

1. In a display having at least one region for displaying variable data and at least one region for displaying permanent data, particularly a liquid crystal cell, said display having two support plates which form a chamber therebetween, and a fluid which can be switched between optically different states being located in said chamber, said display further comprising polarizers positioned on surfaces of the support plates facing away from the chamber, transparent elements being located between the support plates in the region of the permanent data, and a source of light positioned on a back side of the cell facing away from an observer located in front of an observer side of the cell, the improvement wherein

the variable data are bright data on a dark background located in a variable-data region; said cell further comprising

a light-impervious layer on the observer side of the cell,

said light-impervious layer having a first cutout in a region of the variable data and a second cutout in a region corresponding to the permanent data, one of said polarizers being located on the observer side of said chamber; and wherein

the observer side of the cell is provided with a transflective layer disposed between said light-impervious layer and said one polarizer in the region of the cutout for the permanent data to enable a viewing of permanent data by light incident upon said observer side of the display and also by light transmitted through the display from a location behind the display.

4,720,705

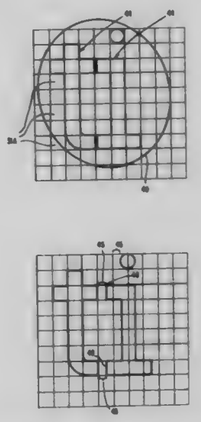
VIRTUAL RESOLUTION DISPLAYS

Satish Gupta, Croton-On-Hudson, N.Y., and Bruce D. Lucas, Pittsburgh, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,570

Int. Cl.⁴ G09G *1/06*

U.S. Cl. 340—724 **6 Claims**



1. A method for improving the viewing quality of a CRT display image by apparently positioning a number of charac-

ters appearing therein at sub-pixel locations, which said number of characters are formed from a plurality of pixels and are actually positionable only at pixel locations, said number of characters being apparently positioned at sub-pixel locations by means of command signals containing sub-pixel address locations, which signals represent commands to position said number of characters at sub-pixel locations in the CRT display field in which the image is formed, the address locations being from file formats and corresponding to pixel locations in a given display field which has a higher resolution than the CRT display field in which the image appears, said method comprising the steps of:

(a) assigning respective intensity values to pixels, so that each pixel has, at any given time, only one intensity value, and so that, the intensity value of any given pixel of the CRT display, is proportional to the sum of weighted averages of bi-level intensity values of corresponding pixels of the given display field, the corresponding pixels being pixels which form a first area of the given display field corresponding to a second area on the CRT display, which second area contains the given pixel of the CRT display field, the bi-level intensity values of the pixels of the first area of the given display field being converted into a single multilevel intensity value to be assigned to the given pixel of the second area; and

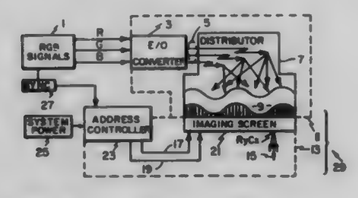
(b) changing certain of the intensity values obtained in step (a), of the pixels forming the number of characters, to corresponding second intensity values by linear interpolation, the intensity value, assigned to CRT pixel whose intensity value is to be changed, being changed by linear interpolation, with an unchanged intensity value assigned to a pixel adjacent to the pixel whose intensity value is to be changed, each pixel still having only one intensity value assigned thereto, whereby the number of characters appear to be positioned at sub-pixel locations to improve the viewing quality of the CRT display image.

4,720,706

METHOD AND APPARATUS FOR ELECTRO-OPTICAL COLOR IMAGING

Edward V. Stine, 7201 Grubby Thicket Way, Bethesda, Md. 20817

Filed Aug. 26, 1985, Ser. No. 769,336
Int. Cl.[4] G09G *3/06, 3/34*
U.S. Cl. 340—783 15 Claims



1. A display device for producing an image comprised of a plurality of pixels, said device comprising:

at least a first and a second light means, each light means for producing in individual response to a video signal visible light radiations having a color different from the other light means;

means for mixing said color radiations;

light screen means for confining said mixed light, said light screen means comprised of a plurality of individually addressable light gates for permitting, when addressed, said mixed color radiations to be emitted; and

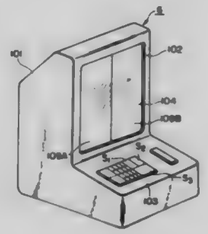
means for selectively addressing said light gates in a timed relationship to said video signal such that a composite multi-color display is produced.

4,720,707

DISPLAY APPARATUS

Motofumi Kouishi; Kazuo Tanaka, both of Yokohama, and Mitsuo Nakamura, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,886
Claims priority, application Japan, Feb. 24, 1984, 59-33621; Mar. 5, 1984, 59-41835; May 10, 1984, 59-93515
Int. Cl.[4] G09G *3/26*
U.S. Cl. 340—792 25 Claims



1. A display apparatus for displaying images formed on an image bearing member, comprising:

a plurality of image bearing members;

holding means for holding the image bearing members in a movable condition;

image forming means for forming a plurality of images on the image bearing members;

display means for simultaneously displaying said plurality of images formed on the image bearing members at an observation position;

a plurality of erasing means each corresponding to a respective image bearing member for erasing at least one of said plurality of images on the respective image bearing member;

drive means for independently moving each of said image bearing members through said image forming means, said display means and said erasing means; and

erasure control means for controlling said erasing means such that an image selected from the plurality of images formed on the image bearing members, and simultaneously displayed at the observation position, is erased by said erasing means.

4,720,708

DISPLAY CONTROL DEVICE

Hiroshi Takeda, Koganei; Shigeaki Yoshida, Sayama, and Koyo Katsura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,594
Claims priority, application Japan, Dec. 26, 1983, 58-243802
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—814 29 Claims

1. A display control device for accessing a memory to read out image data to be displayed on an image device in an image display scanning system in which an image display is formed of horizontal scanning lines with a preselected timing, comprising:

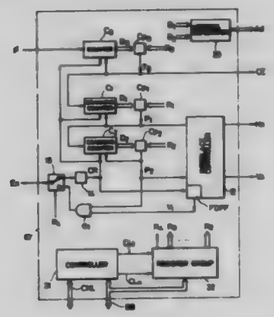
scanning counter means incremented at a rate based on the required timing of access to said memory for generating a count which is repeated in accordance with the preselected timing of said image display scanning system;

address generating means responsive to said scanning counter means for generating sequential addresses for accessing said memory;

timing signal generator means responsive to said scanning counter means for generating a horizontal synchronizing signal and a vertical synchronizing signal based on said count, wherein said timing signal generator means includes means for discriminating between an odd-numbered display field and an even-numbered display field so that said timing signal generating means provides interlace scanning;

synchronizing signal generator means responsive to said timing signal generator means for generating a periodic internal synchronizing signal;

control terminal means for transmitting or receiving a periodic synchronizing signal; and



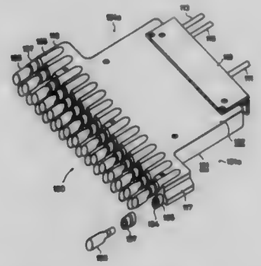
switching means for connecting said control terminal means either to said synchronizing signal generator means for sending out said periodic synchronizing signal or to said scanning counter means and said discriminating means so that a periodic initialization of said scanning counter means is effected and said discriminating means is periodically set to a predetermined state in response to an externally received periodic internal synchronizing signal.

4,720,709

COLOR DISPLAY SYSTEM UTILIZING A MATRIX ARRANGEMENT OF TRIADS

Shigehiro Imamura, Nara, and Tadashi Kobayashi, Ayase, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 13, 1984, Ser. No. 570,680
Claims priority, application Japan, Jan. 13, 1983, 58-3464; Jan. 13, 1983, 58-3465; Jan. 16, 1983, 58-108750
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—815.20 14 Claims



1. A color display system comprising:

(a) a plurality of display units each composed of a body having a front panel, a rear panel, and a pair of rear side recesses, said front panel supporting a plurality of sockets thereon, and a plurality of light-emitting elements mounted respectively in said sockets and capable of emitting light of three primary colors, said light-emitting elements being grouped into a horizontal array of triads of said light-emitting elements on each of said display units, a control circuit unit housed in each said body for controlling said light-emitting elements, said control circuit unit including a printed-circuit board electrically connected to said sockets, and electric connector means mounted on said body and electrically connected to said control circuit unit for external electric connection; and

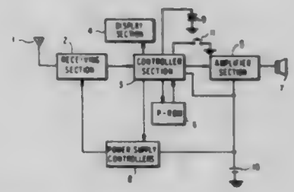
(b) support means for supporting said display units as a matrix of horizontal rows and vertical columns, said support means comprising vertical posts positioned in said rear side recesses in adjacent display units in each of said horizontal rows, said adjacent display units being mounted on said vertical posts.

4,720,710

PAGING RECEIVER HAVING A PLURALITY OF TEST MODES

Masaaki Akahori, and Yoshio Ichikawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 506,131
Claims priority, application Japan, Jan. 18, 1982, 57-104767
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.44 7 Claims



1. A paging receiver comprising:

receiving section means for receiving a carrier wave modulated with a calling signal including a first signal sequence and either a second or a third signal sequence which follows said first signal sequence;

power supply control means for supplying power to said receiving section means when said power supply control means receives a first control signal;

controller section means for supplying said first control signal to said power supply control means for only a first predetermined time period when said controller section means detects said first signal sequence so that said controller section means can detect said second or third signal sequence, supplying said first control signal to said power supply control means in order to shift said receiver to a first test mode when said third signal sequence is detected, shifting said receiver from said first test mode to a final test mode when said controller section means receives a second control signal, reshifting said receiver from said final test mode to normal operation when said controller section means detects a third control signal and inhibiting said receiver from shifting to said first test mode if said third signal sequence is not received within a second predetermined time period either from the turning-on of said receiver or from the reshifting of said receiver to normal operation; and

switch means connected to said controller section means for generating said second and third control signals.

4,720,711

AGILE-BEAM TRACK-WHILE-SCAN RADAR SYSTEM

Elmer C. Quesinberry, Severna Park; Charles D. Morgan, Jr., Arbutus, and Steven J. Clancy, Ellicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 17, 1985, Ser. No. 748,722
Int. Cl.[4] G01S *13/72*
U.S. Cl. 342—96 15 Claims

1. A track-while-scan radar system having a repetitive dwell

period during which track and search dwells are performed, said radar system comprising:

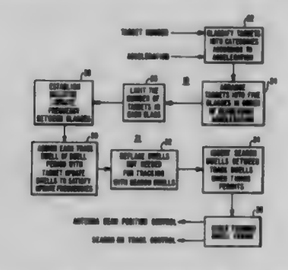
means for transmitting illuminating track and search dwell signals during the dwell period;

means for receiving echo signals from illuminated targets;

means for assigning a predetermined number of track dwell intervals to the dwell period;

means for determining the acceleration of the targets which have returned echo signals;

means for classifying the targets into priority classes depending upon the acceleration of the targets;



means for setting and controlling the frequencies at which each target within each class is updated, said updating being accomplished by transmitting an illuminating track dwell signal during one of the track dwell intervals of the dwell period; and

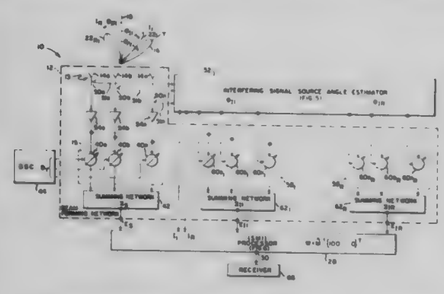
means for placing search dwells at track dwell intervals when the number of targets being tracked is not sufficient to require track dwells at all the intervals to satisfy the update frequency requirements.

4,720,712

ADAPTIVE BEAM FORMING APPARATUS

Eli Brookner, Lexington, and James M. Howell, Hudson, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 12, 1985, Ser. No. 764,803
Int. Cl.[4] G01S *3/16, 3/28*
U.S. Cl. 342—383 5 Claims



1. An antenna system, comprising:

(a) an antenna for receiving energy from a desired signal source and a plurality of interfering signal sources, such interfering signal sources being at different angles θ_I;

(b) a desired signal port;

(c) a plurality of interfering signal ports;

(d) means, coupled to the antenna and responsive to the received energy for producing a desired signal at the desired signal port representative of a beam directed at the desired signal source and for producing signals at the plurality of interfering signal ports representative of differently directed beams;

(e) means, coupled to the antenna, for detecting the presence of an interfering signal source, or sources, and wherein the producing means produces signals at the interfering signal port, or ports, representative of a beam, or beams, directed at the detected interfering signal source, or sources;

(f) gating means having: an input coupled to the plurality of interfering signal parts; an output; and, being responsive to the detecting means, for coupling to the output the portion of the interfering signal port, or ports, producing signals from the detected interfering signal source, or sources, and for inhibiting from passing to the output the remaining portion of the intefering signal port, or ports; and,

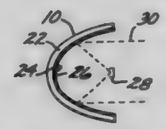
(g) processor means, coupled to the desired signal port and the output of the gating means, for combining the desired signal at the desired signal port with the signal, or signals at the output of the gating means into a composite signal and for weighting the undesired signal, or signals, passing to the output of the gating means by a factor, W, to equalize the product W $G_I(\theta_I)$ and $G_T(\theta_I)$ where $G_T(\theta_I)$ is the gain of the beam directed at the desired signal source at the angle θ_I.

4,720,713

FIBER CERAMIC ANTENNA REFLECTOR

Stanley S. Chang, Palos Verdes Estates, and Hai Bau, Hermosa Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 6, 1986, Ser. No. 915,366
Int. Cl.[4] H01Q *15/16*
U.S. Cl. 343—912 14 Claims



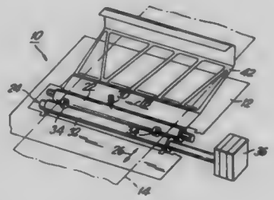
1. An antenna reflector comprising a solid body having at least one parabolically curved surface, said body being composed of a ceramic material wherein a plurality of ceramic fibers are bonded together at their points of intersection to form a rigid structure having open cells dispersed therethrough.

4,720,714

PLOTTER COMPRISING A ROTATABLE PLATEN DISPLACED FROM A SHEET FEEDER

Minagawa Yukio, Yamagata, Japan, assignor to NEC Yonezawa, Ltd., Tokyo, Japan

Continuation of Ser. No. 595,270, Mar. 30, 1984, abandoned.
This application Jan. 27, 1986, Ser. No. 879,847
Claims priority, application Japan, Mar. 31, 1983, 58-47671[U]; Mar. 31, 1983, 58-47672[U]
Int. Cl.[4] G01D *15/24*
U.S. Cl. 346—134 13 Claims



1. A plotter for use in recording a mark on a recording sheet by a marking member during movement of said recording sheet and said marking member, said plotter comprising:

a guide member extending along a first predetermined direction for guiding said movement of said marking member;

first driving means for driving said marking member in said first predetermined direction;

a platen member located at a first predetermined position and having a center axis along said first predetermined direction and a cylindrical body extending along said center axis with a peripheral surface defined thereon, said cylindrical body being disposed opposite to said marking member and rotatable around said center axis;

single sheet feeding means for feeding said recording sheet forwards and backwards in a second predetermined direction orthogonal to said first predetermined direction, said sheet feeding means being disposed only at a second predetermined position which is displaced from said first predetermined position on one side of said platen member in said second predetermined direction with a spacing disposed between said platen member and said sheet feeding means; and

second driving means for driving said sheet feeding means;

said sheet feeding means including: a driving roller extended in parallel with said center axis, said driving roller being rotated by said second driving means; and a pinch roller opposite to said driving roller, said recording sheet being pinched between said driving roller and said pinch roller;

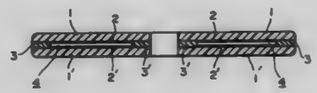
both of said driving and said pinch rollers being adjacent to said cylindrical body so that said recording sheet is not deformed between said cylindrical body and said driving and said pinch rollers when said recording is fed forwards and backwards by said driving roller.

4,720,715

OPTICAL DISC STRUCTURE HAVING AN AIR SANDWICH STRUCTURE

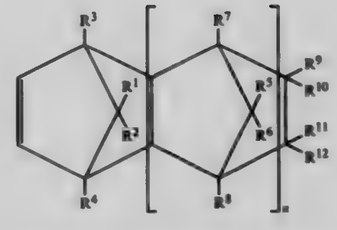
Fujio Omae, Iwakuni, and Masahiro Yamada, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 28, 1987, Ser. No. 7,610
Claims priority, application Japan, Jan. 28, 1986, 61-14761; Jan. 30, 1986, 61-16839
Int. Cl.[4] G01D *9/00*; C08F *4/68*
U.S. Cl. 346—135.1 3 Claims



1. In an optical disc structure for information recording comprising two discs in the form of an annular coaxial plate having optical recording thin layers on one surface thereof, said discs being melt-adhered by ultrasonication via annular coaxial sealing members composed of an outer annular spacer and an inner annular spacer to form an air sandwich structure so that the optical recording thin layers face each other through an air space, provided that one of the optical recording thin layers may be omitted, an improvement wherein

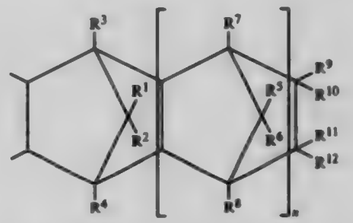
(I) said sealing members and said discs are formed of a copolymer of ethylene with a comonomer represented by the following formula (1)



(1)

wherein R^1 to R^{12}, independently from each other, represent a member selected from the class consisting of a hydrogen atom, halogen atoms and C_1–C_4 alkyl groups, R^9 or R^{10} may be bonded to R^{11} or R^{12} to form a trimethylene or tetramethylene group, n represents zero or a positive number of 1, 2 or 3, and when n represents 2 or 3, two or three of each of R^5 to R^8 groups may be identical or different,

and the comonomer of formula (1) forms units of the following formula (2) in the copolymer



(2)

wherein R^1 to R^{12} and n are as defined above, and

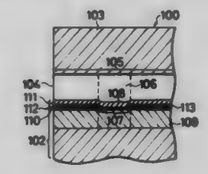
(II) the ethylene copolymer (A) forming said sealing members has an ethylene content (a) of 55 to 80 mole %, the ethylene copolymer (B) forming the discs has an ethylene content (b) of 50 to 70 mole %, and (a)>(b).

4,720,716

LIQUID JET RECORDING HEAD

Masami Ikeda, Machida; Makoto Shibata, Hiratsuka; Hiroto Takahashi, Hiratsuka; Hirokazu Komuro, Hiratsuka; Hiroto Matsuda, Ebina, and Hisanori Tsuda, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 694,317, Jan. 24, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 931,968
Claims priority, application Japan, Jan. 31, 1984, 59-14520
Int. Cl.[4] G01D *15/18*; A05B *3/00*
U.S. Cl. 346—140 R 12 Claims



1. A liquid jet recording head comprising:

a supporting member;

an electrode layer laminated on said supporting member to form mutually confronting electrodes;

a resistive heater layer laminated on said electrodes and said

supporting member in electrical contact with said electrodes to provide a heat generating portion disposed on said supporting member between said mutually confronting electrodes and arranged to correspond to a liquid flow path of the recording head; and

an upper layer laminated on said resistive heater layer, wherein said resistive heater layer and said upper layer form successive protective layers between said electrodes and liquid in said liquid flow path.

4,720,717

RECORDING AND WAVEFORM FORMING APPARATUS

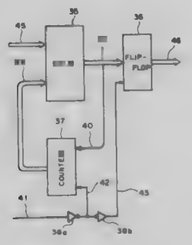
Morio Ohta, and Shizuo Tsuchiya, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 769,692, Aug. 27, 1985, abandoned. This application Apr. 30, 1987, Ser. No. 45,191

Claims priority, application Japan, Aug. 30, 1984, 59-179396

Int. Cl.[4] G02F *1/13*

U.S. Cl. 346—160 **3 Claims**



1. A recording control section for a recording apparatus having a head section for producing a plurality of beams of light modulated in accordance with image information which are incident on a photosensitive surface for producing an electrostatic latent image thereon, said control section comprising:

(a) a light source for producing light;

(b) an array of liquid crystal shutters defined by overlapping signal and common electrodes for selectively effecting the passage of light produced by said light source in accordance with a control signal applied to said electrodes, said control signal including combinations of signals of frequency f_H higher than the frequency f_C which makes the dielectric anisotropy of the liquid crystal zero, and of frequency f_L lower than the frequency f_C; and

(c) control means for generating control signals comprising:

(1) a counter for outputting an address signal when a clock signal is applied;

(2) waveform selector means for outputting an address signal;

(3) storage means for storing a plurality of binary values functionally related to different basic control signals and outputting a data signal in response to the address signals produced by said counter and said waveform selector; and

(4) means responsive to said clock signal and said data signal for producing a drive pattern signal that determines the control signal applied to said electrodes.

4,720,718

REFLEX CAMERA

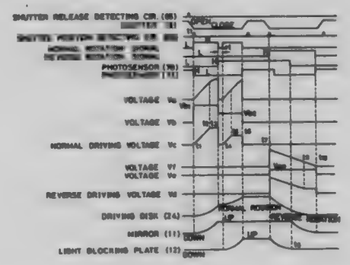
Katsuhiko Yamamoto; Takeshi Yoshino; Masayoshi Hirai; Shiro Hashimoto; Michihiro Shiina; Shigenori Goto, all of Saitama, and Hisashi Hamada, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1987, Ser. No. 12,656

Claims priority, application Japan, Feb. 7, 1986, 61-25563; Feb. 7, 1986, 61-25564; Feb. 7, 1986, 61-25565; Feb. 10, 1986, 61-25915

Int. Cl.[4] G03B *19/12*

U.S. Cl. 354—154 **10 Claims**



1. A reflex camera having a reflex mirror and a light-blocking plate which are pivotally mounted in the reflex camera for swinging-up and -down movement between a viewing position and a photographic position, said reflex camera comprising:

an electric motor disposed in said reflex camera;

driving means coupled to said electric motor for rotary movement;

interlocking means coupled between said driving means and both said reflex mirror and said light-blocking plate for sequentially swinging up and down said mirror and light-blocking plate between said two positions;

position-detecting means for detecting rotated angular positions of said driving means to provide position signals as electric outputs; and

means for controlling the rotation of said motor in accordance with said position signals, thereby to control said swinging-up and -down movement of said mirror and light-blocking plate.

4,720,719

FILM WIND-UP APPARATUS

Hisashi Hamada, Tokyo; Katsuhiko Yamamoto, Saitama; Takeshi Yoshino, Saitama; Masayoshi Hirai, Saitama; Shiro Hashimoto, Saitama; Michihiro Shiina, Saitama, and Shigenori Goto, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1987, Ser. No. 20,013

Claims priority, application Japan, Feb. 26, 1986, 61-40591

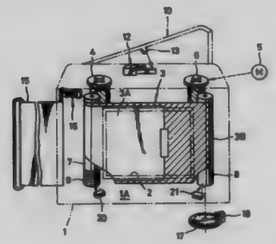
Int. Cl.[4] G03B *1/12, 17/30*

U.S. Cl. 354—173.1 **5 Claims**

1. In a film magazine for housing a film having a backing paper including at least a leading end portion extending from said film and a photosensitive portion, said film magazine being adapted to be detachably mounted on a camera, said magazine comprising an opening defining an exposure aperture, a back cover adapted to open and close for allowing loading and unloading of said film therein, a light-shielding plate removably insertable in said magazine for selectively closing said exposure aperture, and means adapted to be driven by an electric motor of a said camera, for winding said film; the improvement comprising:

control means for enabling and disabling said motor of said camera;

first detecting means for detecting a first condition wherein said leading end portion of said film and said exposure aperture are in facing relation, a second condition wherein said back cover is closed, and a third condition wherein said light-shielding plate has been removed from said magazine, said control means enabling said motor of said camera responsive to simultaneous detection of said first, second and third conditions by said first detecting means; and



second detecting means for detecting a fourth condition wherein a photosensitive portion of said film and said exposure aperture are in facing relation, said control means disabling said motor responsive to detection of said fourth condition by said second detecting means;

whereby the said leading end portion of a said film loaded in said magazine will be automatically wound prior to making exposures.

4,720,720

MOTOR-DRIVEN FILM WINDER FOR CAMERAS

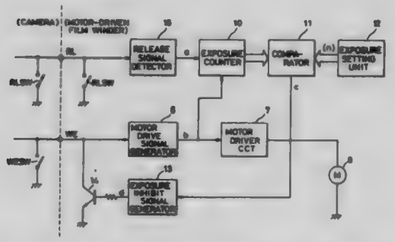
Kunihiko Araki; Tomoya Kitajima; Yoshio Serikawa, all of Tokyo; Mikio Kobayashi, Kanagawa; Hiroshi Terai, Tokyo, and Kenji Koyama, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Optical Industries Co., Ltd., Iwate, both of, Japan

Filed Sep. 18, 1985, Ser. No. 777,250

Claims priority, application Japan, Sep. 18, 1984, 59-195559; Sep. 18, 1984, 59-195560; Sep. 27, 1984, 59-200432

Int. Cl.[4] G03B *1/66*

U.S. Cl. 354—173.11 **8 Claims**



1. A motor-driven film winder for use with a camera, comprising:

a film winding motor energizable in response to an exposure end signal generated from the camera each time an exposure cycle ends;

a counter for counting said exposure end signal, or a drive signal for driving said film winding motor, or a film winding completion signal;

exposure setting means for setting the number of frames to be exposed by the camera; and

exposure inhibit signal generating means for issuing an exposure inhibit signal to said camera when the number of frames set by said exposure setting means coincides with the count of said counter.

4,720,721

FILM WIND-UP CONTROL APPARATUS FOR A CAMERA

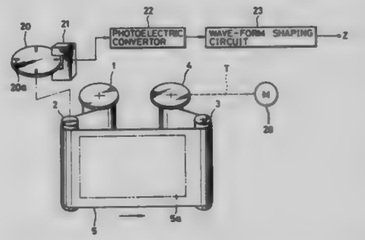
Hisashi Hamada, Tokyo; Katsuhiko Yamamoto, Saitama; Takeshi Yoshino, Saitama; Masayoshi Hirai, Saitama; Shiro Hashimoto, Saitama; Michihiro Shiina, Saitama, and Shigenori Goto, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1987, Ser. No. 13,871

Claims priority, application Japan, Feb. 12, 1986, 61-28705; Feb. 12, 1986, 61-28706

Int. Cl.[4] G03B *1/12, 1/60*

U.S. Cl. 354—173.11 **7 Claims**



6. A film wind-up control apparatus of a camera wherein a film is advanced from a film supply spool to a film take-up spool through an exposure station of said camera, said film advance being in a zigzag direction passing around at least a guide roller located before said exposure station, said apparatus comprising:

means for indicating the possible number of exposures of said film;

means for advancing said film when an exposure is made;

time measuring means for detecting a predetermined period of time and which is adapted to repeat the time measurement every exposure;

means for controlling said film advancing means to advance said film a predetermined length before said time measuring means detects the passage of said predetermined period of time and to advance said film in addition a predetermined extra length after having detected the passage of said predetermined period of time so as to move the part of said film which was previously positioned around said guide roller beyond said exposure aperture; and

means for decreasingly changing said possible exposure number of said film indicated on said indicating means at intervals of a plurality of said predetermined extra lengths of film advance.

4,720,722

BACK LID OF A CAMERA

Kazuhiro Akiyama; Syunji Nishimura, both of Saitama; Nobuyuki Kameyama, Tokyo; Nobuo Tobeyama, Saitama, and Katsuya Kozai, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1986, Ser. No. 912,490

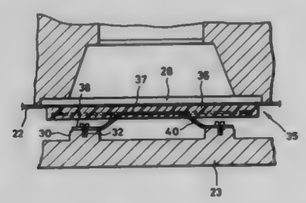
Claims priority, application Japan, Sep. 27, 1985, 60-147839[U]; Oct. 9, 1985, 60-154468[U]

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—203 **4 Claims**

1. In combination with a back lid for opening and closing the

rear of a camera body, a molded plastic plate, and molded in said plastic plate a thin plate of resilient metal, said metal plate



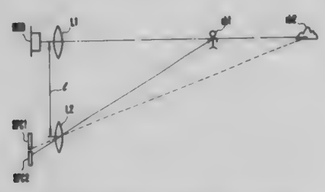
having integral holding arms thereon that emerge from said plastic plate and yieldably engage said lid.

4,720,723

DISTANCE MEASURING DEVICE

Yoshihiro Haruwari; Ryuji Tokuda, both of Tokyo, and Takashi Kobe, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 623,771, Jun. 22, 1984, abandoned.
This application Mar. 20, 1986, Ser. No. 842,067
Claims priority, application Japan, Jun. 24, 1983, 58-114820; Jun. 24, 1983, 58-114921; Jun. 28, 1983, 58-117541; Jul. 13, 1983, 58-127409; Apr. 23, 1984, 59-80162
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 25 Claims



1. A distance measuring apparatus comprising:
light projecting means;
light receiving means for producing in sequence at least two different signals corresponding to the incident angle of a reflection light from a distance measuring object;
integrating means for integrating the first output of said light receiving means for predetermined period of time and performing reverse integration according to the second output of the light receiving means;
detecting means for detecting that the output of said integrating means has reached a predetermined value during said reverse integration;
time counting means for detecting the time of said reverse integration in response to the output of said detecting means; and
distance information producing means for producing information on a distance to said object on the basis of the output of time counting means.

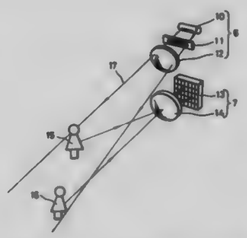
4,720,724

METHOD AND APPARATUS FOR AUTOMATIC RANGE FINDING

Hirokazu Yokoo, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1987, Ser. No. 67,281
Claims priority, application Japan, Jun. 27, 1986, 61-151216
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 5 Claims

1. In an automatic range finding method which comprises projecting a line of light toward a scene including a subject to be photographed; receiving light reflected from the subject by a light sensor having a plurality of photoelectric conversion pixels arranged in m lines and n column, m and n being positive integers, the first line of said plurality of photoelectric conversion pixels receiving light reflected from a subject at a shortest subject distance and the m-th line of said plurality of photoelectric conversion pixels receiving light reflected from a subject at a greatest subject distance; and determining the distance of the subject to be photographed according to a pixel line which contains a pixel receiving said reflected light; the improvement comprising
detecting which photoelectric conversion pixels receive said reflected light;
determining said subject distance according to, when a part



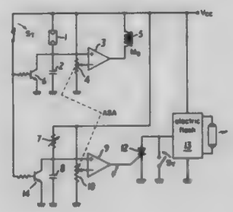
of said reflected light is received by a short distance center pixel range which is defined by pixels arranged between the first to the I-th pixel lines, I being less than m, in at least one pixel column including the middle pixel column, a pixel line contains one of said detected photoelectric conversion pixels within said short distance center pixel range in preference to other pixel lines each of which contains any one of said detected photoelectric conversion pixels, or according to, when no part of said reflected light is received by said short distance center pixel range, a pixel line which contains one of said detected photoelectric conversion pixels nearest to said first pixel line; and
providing a signal representative of said determined subject distance by which the focus of a camera lens is adjusted.

4,720,725

FLASHMATIC DEVICE FOR CAMERAS

Hiroaki Ishida, and Shinji Nagaoka, both of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 646,365, Aug. 30, 1984, abandoned.
This application Jun. 13, 1986, Ser. No. 873,128
Claims priority, application Japan, Aug. 31, 1983, 58-160697
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—414 14 Claims



1. A flashmatic device for a camera equipped with a programmed shutter having sectors serving also as diaphragm blades and adapted to open the aperture gradually with the lapse of time, said flashmatic device comprising:
a flash device operative when triggered to emit light;
a delay circuit operative to start operation in synchronism

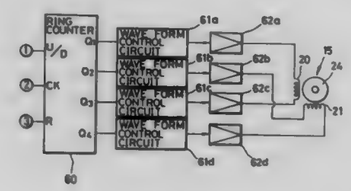
with a shutter opening action to produce a first output signal at a delay time determined according to the subject distance, film sensitivity and intensity of light emitted from the flash device;
a synchronous switch operated by a movable shutter closing member during a shutter closing action to produce a second output signal;
a switching element connected to an output terminal of said delay circuit to receive therefrom the first output signal; and
means for triggering said flash device by the first output signal of said delay circuit or by the second output signal of said synchronous switch whichever is produced earlier.

4,720,726

SHUTTER DRIVING APPARATUS

Shigeo Sato, and Yutaka Yoshida, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1986, Ser. No. 924,166
Claims priority, application Japan, Oct. 28, 1985, 60-239569
Int. Cl.[4] G03B *7/00*; H02P *8/00*
U.S. Cl. 354—439 4 Claims



1. In a camera having a shutter, a stepping motor for opening and closing said shutter, and a pulse generator for supplying a series of pulses to drive said stepping motor; an improvement comprising:
a waveform shaping circuit disposed in electrical circuit between said pulse generator and said stepping motor, said shaping circuit comprising means shaping each of said series of pulses to form a pulse having a leading half gradually increasing in amplitude to a peak amplitude and a trailing half having an amplitude less than said peak amplitude;
whereby said shutter can be smoothly and precisely stopped at a desired position simply by terminating said supply of pulses to said stepping motor.

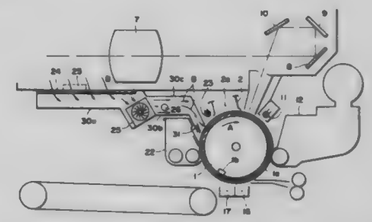
4,720,727

IMAGE FORMING APPARATUS

Yasumi Yoshida, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 833,555, Feb. 27, 1986, abandoned.
This application Mar. 9, 1987, Ser. No. 22,523
Claims priority, application Japan, Mar. 4, 1985, 60-42272; Aug. 21, 1985, 60-183494
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 31 Claims

1. An image forming apparatus, comprising:
an image bearing member;
first heating means for heating said image bearing member;
second heating means for heating air;
means for guiding the air heated to said image bearing member; and



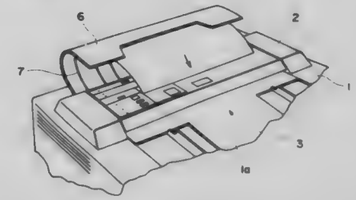
means for controlling said second heating means to operate it during an initial stage of operation of said image forming apparatus.

4,720,728

IMAGE FORMING APPARATUS AND SHEET RECEPTACLE FOR USE THEREWITH

Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 672,673, Nov. 19, 1984, abandoned.
This application Sep. 15, 1986, Ser. No. 907,156
Claims priority, application Japan, Nov. 25, 1983, 58-222619
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—35 H 7 Claims



1. An image formation apparatus having a sheet conveying mechanism, comprising:
an apparatus main body having means for forming an image;
a sheet conveying portion provided on a portion of said main body; and
a receptacle disposed next to an exhaust side of said sheet conveying portion, said receptacle having a radius of curvature such that a sheet, as it is conveyed through an exhaust port of said sheet conveying portion, is ascended while being turned by said receptacle so as to direct the front end of the sheet toward the main body and said receptacle supports the sheet stationarily in a curved state by a resilient force of the sheet after the rear end of the sheet has left the exhaust port so as to become free.

4,720,729

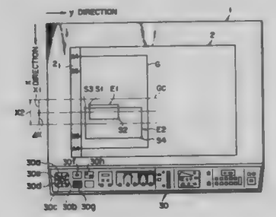
IMAGE FORMING APPARATUS WITH EDITING FUNCTION

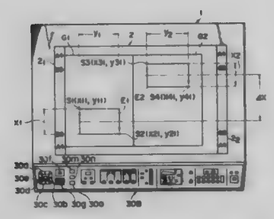
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1985, Ser. No. 809,616
Claims priority, application Japan, Dec. 17, 1984, 59-265780; Jan. 23, 1985, 60-10472; Feb. 20, 1985, 60-33108
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 18 Claims

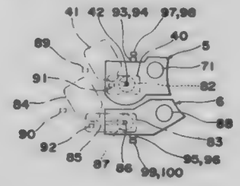
1. An image forming apparatus with an editing function, said apparatus comprising:
an original table on which an original is placed, the original being capable of transmitting light therethrough;

light-transmitting means for emitting the light to the original place on said original table while the light is moved therealong;
shift source specifying means for moving the light from said light-transmitting means along a desired first portion of the original placed on said original table and specifying a shift source;
shift destination specifying means for moving the light from said light-transmitting means along a desired second portion of the original placed on said original table and specifying a shift destination;
first controlling means for calculating position information of the desired first portion specified by said shift source specifying means, position information of a portion excluding the desired second portion specified by said shift destination specifying means, and distance information representing a distance between the desired first and second portions in accordance with shift data of light moved by said light-transmitting means, and for storing the calculated information;
original scanning means arranged to be movable along said original table and having a first optical system for optically scanning the original placed on said original table and a second optical system movable to extract an image reflected by said first optical system from the original with a predetermined magnification;
image forming means for focusing the reflected image extracted by said original scanning means on an image forming medium and developing and forming an image corresponding to the reflected image on the image forming medium;
image erasing means for selectively erasing an image to be formed by said image forming means;
image forming medium feedback means for selectively feeding back to said image forming means the image forming medium with the image formed by said image forming means;
second controlling means for reading out the position information of the desired first portion of the original from said first controlling means during formation of a first image, supplying the readout position information to said image erasing means, and at the same time generating a feedback operation command signal to be supplied to said image forming medium feedback means; and
third controlling means for reading out the distance information representing the distance between the desired first and second portions of the original and the position information representing the portion excluding the desired second portion of the original from said first controlling means and for supplying the readout distance and position information to said second optical system of said original scanning means and said image erasing means.





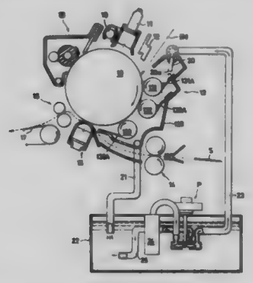
4,720,730
IMAGE FORMING APPARATUS WITH A PLURALITY OF DEVELOPING MEANS
Masazumi Ito, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 2, 1985, Ser. No. 803,677
Claims priority, application Japan, Nov. 30, 1984, 59-254583; Dec. 15, 1984, 59-265074; Dec. 18, 1984, 59-267059; Dec. 18, 1984, 59-267060
Int. Cl.[4] G03G *15/00, 15/08*
U.S. Cl. 355—4 5 Claims



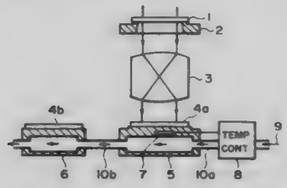
1. In an image forming apparatus in which an electrostatic latent image formed on a photosensitive member is developed and subsequently transferred to a paper, the apparatus comprising;
a plurality of developing means selectively operable for developing the electrostatic latent image,
agitating means provided in each of said developing means for agitating developer contained therein,
means responsive to a power switch for driving each of said agitating means for a predetermined period of time,
means for selecting one of said developing means and driving the same to develop the electrostatic latent image during an image forming cycle, and
means responsive to termination of the image forming cycle for at least driving said agitating means of one of the developing means not used in said image forming cycle for a predetermined period of time.

4,720,731
DEVICE FOR SUPPLYING DEVELOPING SOLUTION
Shigeru Suzuki, Kanagawa; Tuneo Kurotori, Tokyo, and Manabu Mochizuki, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 17, 1985, Ser. No. 745,489
Int. Cl.[4] G03G *15/10*
U.S. Cl. 355—10 20 Claims

1. A device for supplying a developing solution in a copying apparatus having a latent-image carrier, comprising:
(a) a first developing roller disposed closely to the latent-image carrier;
(b) a first scraper having a free end directed downwardly and held in contact with the circumferential surface of said first developing roller remotely from said latent-image carrier;
(c) means for downwardly supplying a developing solution to a first solution pool formed between said first scraper and the circumferential surface of said first developing roller;
(d) means for rotating said first developing roller about its own axis in a direction to move said circumferential surface of the first developing roller for drawing the developing solution upwardly out of said first solution pool and transferring it to said latent-image carrier to develop a latent image thereon with said developing solution;
(e) a second developing roller disposed closely to the latent-image carrier at a location below said first developing roller;
(f) a second scraper having a free end directed downwardly and held in contact with the circumferential surface of said second developing roller remotely from said latent-image carrier, said second developing roller and said scraper being disposed so as to receive developing solution overflowing from said first solution pool, thereby to form a second solution pool between said second developing roller and said second scraper;
(g) means for rotating said second developing roller about its own axis in a direction to move said circumferential surface of the second developing roller for drawing the developing solution upwardly out of said second solution pool and transferring it to said latent-image carrier to develop a latent image thereon with said developing solution.



4,720,732
PATTERN TRANSFER APPARATUS
Shinji Tsutsui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 689,944, Jan. 9, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,954
Claims priority, application Japan, Jan. 30, 1984, 59-13317
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—30 2 Claims



1. An apparatus for sequentially transferring images of a pattern onto a plurality of objects, said appartus comprising:
transfer means for transferring an image of the pattern onto a first object placed at a pattern transfer station;
a supporting chuck for supporting the first object at the pattern transfer station, said supporting chuck having a cavity formed therein;
a supporting stage coupled to said supporting chuck and being operable, when the image of the pattern is being transferred by said transfer means onto the first object supported by said supporting chuck at the pattern transfer station, to support at a non-transfer station a second object onto which the image of the pattern is subsequently to be transferred by said transfer means, said supporting stage having a cavity formed therein;
coupling means having a tube, for coupling said supporting chuck and said supporting stage so that said cavity of said supporting chuck and said cavity of said supporting stage are in fluid communication with each other;
fluid supplying means for supplying a temperature controlling fluid into said cavity of said supporting chuck so that the fluid passes from said cavity of said supporting chuck to said cavity of said supporting stage by way of said tube of said coupling means;
a temperature sensor for sensing the temperature of said supporting chuck being controlled by the temperature controlling fluid; and
a temperature controller for controlling the temperature of the temperature controlling fluid in accordance with the sensing by said temperature sensor, whereby the temperature of the first object supported by said supporting chuck is controlled by the temperature controlling fluid supplied into said cavity of said supporting chuck and wherein the temperature of the second object supported by said supporting stage is roughly controlled by the temperature controlling fluid having been used for the control of the temperature of the first object.

4,720,733
PHOTOGRAPHIC PRINT SET AND METHOD OF PRODUCING THE SAME
Katsumi Ohtake, Tokyo; Kunio Ogura, Miyagi; Tunehiro Koike, Tokyo; Takuya Arai, Tokyo, and Kayoko Shioda, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 21, 1986, Ser. No. 888,389
Claims priority, application Japan, Jul. 19, 1985, 60-109706[U]; Jul. 19, 1985, 60-158333; Jul. 19, 1985, 60-158334; Jul. 19, 1985, 60-158335
Int. Cl.[4] G03B *27/40, 27/50*
U.S. Cl. 355—50 14 Claims



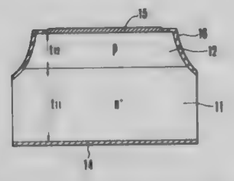
1. A method of making a photographic print set from a roll of negative film, which comprises:
making a print sheet having a row of positive images which are printed with equal spaces therebetween on a web-like printing paper from said negative film;
forming perforated lines along said spaces which allow separating said print sheet so as to provide separate prints of said positive images; and
folding said print sheet alternately oppositely on said perforated lines, thereby providing a coherent and handy photographic print set.

4,720,734
LOW LOSS AND HIGH SPEED DIODES
Yoshihito Amemiya, and Yoshihiko Mizushima, both of Fuchu, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan
Continuation of Ser. No. 416,508, Sep. 10, 1982, abandoned. This application Dec. 1, 1986, Ser. No. 936,949
Claims priority, application Japan, Sep. 11, 1981, 56-143640; Jan. 14, 1982, 57-4301; Feb. 27, 1982, 57-31322; Feb. 27, 1982, 57-31323
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 3 Claims

1. A low loss, high speed and high breakdown voltage diode comprising:
a semiconductor substrate;

a semiconductor layer deposited on the upper surface of the semiconductor substrate and having a thickness dimension W whose value lies between upper and lower predetermined limiting critical values 5 μm<W<30 μm and having a resistivity p above a predetermined lower critical value p>1 Ωcm; first metal electrode means directly formed over the entire surface of the active region of the semiconductor layer and forming a Schottky barrier metal contact with the semiconductor layer, said Schottky barrier metal contact acting as one of the metal electrodes of said diode and forming bidirectional conducting Schottky potential barriers ϕh and ϕB with respect to hole and electron carriers, respectively, said Schottky potential barriers lying within critical values 0.1 eV<ϕh<0.4 eV or 0.7 eV<ϕB<1.0 eV which allows both hole and electron carriers to pass bidirectionally therethrough in opposite directions;

second metal electrode means formed on the lower surface of said semiconductor substrate; and



wherein the said diode is a silicon p-n junction diode, the semiconductor substrate is of n-type, the semiconductor layer is formed of a p-type epitaxial layer, and the said first electrode means makes a Schottky potential barrier with the p-type epitaxial layer to form the said bidirectional conducting Schottky barrier and wherein the said p-type epitaxial layer has the thickness of W and the resistivity of p, the first electrode means is formed by a metal layer having a Schottky potential barrier with a value of ϕh for holes moving from the said metal layer to the p-type epitaxial layer, and the values of p, ϕh, and W are in the range as defined below

P>1 Ωcm

0.15 eV<ϕh<0.35 eV

5 μm<W<30 μm.

4,720,735

PHOTOTRANSISTOR HAVING A NON-HOMOGENEOUSLY BASE REGION

Jun-ichi Nishizawa, 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi 980, Japan

PCT No. PCT/JP83/00290, § 371 Date Apr. 30, 1984, § 102(e) Date Apr. 30, 1984, PCT Pub. No. WO84/01055, PCT Pub. Date Mar. 15, 1984

Continuation of Ser. No. 610,301, Apr. 30, 1984, abandoned. This PCT application Aug. 31, 1983, Ser. No. 903,890

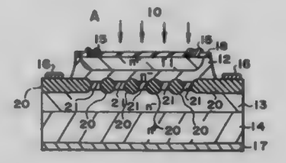
Claims priority, application Japan, Aug. 31, 1982, 57-151950

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **3 Claims**

1. A phototransistor comprising a semiconductor substrate having a first surface and another surface opposite to the first surface and including an emitter electrode, a collector electrode and a base electrode, and an emitter region, a collector region, and a base region having an impurity concentration distribution, and wherein the distribution profile of the impurity concentration in the base region is nonhomogeneous in a base plane perpendicular to a current flow direction between the emitter region and collector region and includes high and low impurity concentration region portions, the base region having a first conductivity type and the emitter region and collector region both having a second conductivity type which is the reverse of the first conductivity type of the base region, photogenerated carriers whose type of conductivity is the same as that of the nonhomogeneous base region are stored in the high impurity concentration region portions of the base region, majority carriers which are injected from the emitter region and photogenerated carriers whose conductivity type is different from the former mentioned photogenerated carriers are permitted to easily pass through the low impurity concentration region portions of the base region, the high and low impurity concentration region portions of the base region are electrically capacitive-coupled together;

The current flow between the emitter region and collector region is controlled by the potential barrier-height relative to the emitter region in the low impurity concentration region portions of the base region, the height of which is capacitively controlled by the potential relative to the emitter region of the high impurity concentration region portions of the base region;



The thickness in the direction from the emitter region towards the collector region of the high impurity concentration region portions of the base region is no less than that of the low impurity concentration region portions of the base region in the same direction so that no neutral region is formed;

The emitter region and the collector region have low impurity concentration region portions formed in the vicinity of the base region which are reverse in conductivity type from that of the base region, and the emitter region is formed in the first surface of the semi-conductor substrate and the collector region is formed in the other surface of the semi-conductor substrate opposite to the first surface and the base region being divided into alternating high and low impurity concentration region portions across a space between the first and the other surface and being buried in the semi-conductor substrate, and the base electrode is contacted on a peripheral high impurity concentration region portion of the base region.

4,720,736

AMORPHOUS SILICON THIN FILM TRANSISTOR

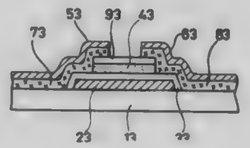
Yutaka Takafuji; Kohei Kishi, both of Nara, and Hirohisa Tanaka, Gose, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 22, 1986, Ser. No. 821,457

Claims priority, application Japan, Jan. 24, 1985, 60-11905

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.7 **6 Claims**



1. A thin film transistor comprising:

a gate electrode formed on an insulating substrate, said gate electrode being the only gate electrode of the transistor;

a first insulating film formed to cover said gate electrode;

a first conducting semiconductor film formed on said first insulating film;

a second insulating film disposed on the entire top surface of said first conducting semiconductor film;

a pair of second conducting semiconductor layers formed, spaced from each other, in contact with the side surfaces of said semiconductor film and said second insulating film; and

first and second electrodes formed in contact only with said pair of second conducting semiconductor layers, respectively.

4,720,737

SEMICONDUCTOR DEVICE HAVING A PROTECTION CIRCUIT WITH LATERAL BIPOLAR TRANSISTOR

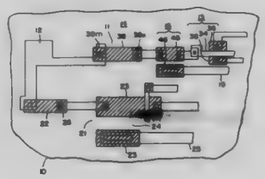
Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

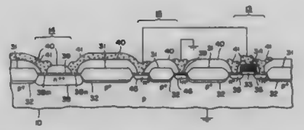
Filed Dec. 22, 1986, Ser. No. 943,867

Claims priority, application Japan, Jan. 30, 1983, 58-119083

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.13 **15 Claims**





1. A semiconductor device including a semiconductor substrate of a first conductivity type, at least one terminal for providing at least one of input and output signals, a protection circuit and an inner element, said protection circuit comprising:

a first protective element comprising a diode having a first impurity region of a second conductivity type opposite to said first conductivity type of said substrate, a first end of said first impurity region being connected to said terminal; and

a second protective element comprising a lateral bipolar transistor having a collector region and an emitter region, both of said collector and emitter regions having the second conductivity type, being formed in said substrate, being arranged to but separate from each other so as to define a base region in said substrate, and being shallower than said first impurity region, a first end of said collector region being connected to a second end of said first impurity region that is spaced from said first end thereof, a second end of said collector region being connected to said inner element, and said emitter region being electrically connected to ground;

wherein said terminal, said first protective element, said second protective element and said inner element are operatively connected in series in the recited order, and said first protective element has a higher surge capacity and higher junction breakdown voltage than that of said second protective element as a result of said first impurity region and said collector region;

so that a protection voltage corresponding to said at least one of said input and output signals is provided by said protection circuit to said inner element.

4,720,738

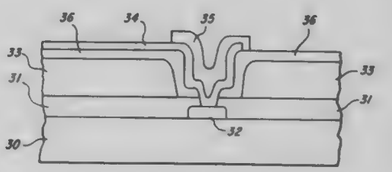
FOCAL PLANE ARRAY STRUCTURE INCLUDING A SIGNAL PROCESSING SYSTEM

Arturo Simmons, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 767,062, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 416,396, Sep. 8, 1982, abandoned. This application Aug. 21, 1986, Ser. No. 898,890

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 357—30 **4 Claims**



1. An integrated detector array and signal processor, comprising:

(a) a substantially planar first substrate containing an electrical circuit on one of the planar surfaces thereof;

(b) a substantially planar second substrate disposed over said one planar surface of said first substrate and containing an array of detectors on the planar surface thereof remote from said first substrate;

(c) a first electrically insulating layer affixed to the surface of said second substrate opposite said surface containing said array, said second substrate being substantially parallel to, affixed to and insulated from said first substrate by said first electrically insulating layer;

(d) an aperture having side walls and extending through said second substrate and said first insulating layer;

(e) a second electrically insulating layer disposed over a surface of said second substrate remote from said first substrate and extending along the walls of said aperture; and

(f) an electrical connection extending from said surface of said second substrate remote from said first substrate, through said aperture in said first insulating layer and second substrate and insulated from said second substrate by said second insulating layer, to said circuit on said first substrate.

4,720,739

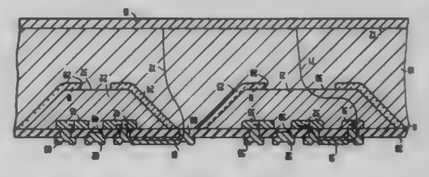
DENSE, REDUCED LEAKAGE CMOS STRUCTURE

James D. Beason, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Nov. 8, 1985, Ser. No. 798,242

Int. Cl.⁴ H01L *27/12, 27/02, 45/00*

U.S. Cl. 357—49 **44 Claims**



1. A semiconductor device comprising:

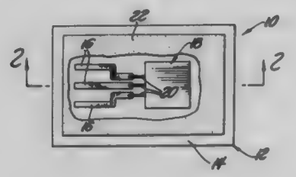
a semiconductor substrate of a first conductivity type having a first surface;
a first semiconductor region of said first conductivity type disposed in a first portion of said first surface of said substrate;
a layer of dielectric material disposed between said first semiconductor region and said substrate so as to provide dielectric isolation between said first semiconductor region and said substrate, said first layer of dielectric material having an aperture therethrough so that the semiconductor material of said first semiconductor region is contiguous with semiconductor material of said substrate;
first conductor means, ohmically coupled to said first surface; and
a continuous ohmic coupling path extending from said first conductor means at said first surface to said first semiconductor region by way of said semiconductor substrate and the aperture through said first layer of dielectric material by way of which the semiconductor material of said first semiconductor region is contiguous with semiconductor material of said substrate.

4,720,740

ELECTRONIC DEVICE INCLUDING UNIAXIAL CONDUCTIVE ADHESIVE AND METHOD OF MAKING SAME

James R. Clements, 5840 Darbwood La., West Bloomfield, Mich. 48033; Terry T. J. Yu, and Laura H. C. Yu, both of 19832 White Oaks Dr., Mt. Clemens, Mich. 48043

Division of Ser. No. 801,745, Nov. 26, 1985, Pat. No. 4,667,401. This application Dec. 19, 1986, Ser. No. 943,509
Int. Cl.[4] H01L *23/28*
U.S. Cl. 357—72 **8 Claims**



1. An electronic device (10) comprising: a substrate (12) including a mounting surface (14) having a plurality of laterally spaced conductive paths (16) thereon; a circuit member (18) mounted on said substrate (12), said circuit member including a plurality of laterally spaced conductive terminals (20) aligned vertically over selected ones of said conductive paths (16); and an adhesive (22) coating said mounting surface (14) for adhering said circuit member (18) to said substrate (12), said adhesive (22) including a resin having about forty percent to fifty percent by weight spaced conductive metal particles between said vertically aligned terminals (20) and conductive paths (16) and being uniaxially conductive vertically therebetween, and said resin including about twenty percent to twenty-five percent by weight spaced conductive metal particles between laterally spaced terminals (20) and conductive paths (16) wherein said resin is a dielectric preventing conductivity between said metal particles therein and being nonconductive laterally therebetween.

4,720,741

ANTISTATIC AND ANTITACK COATING FOR CIRCUIT DEVICES

Theodore F. Schaaf, and Ching-Ping Wong, both of Lawrence Township, Mercer County, N.J., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 26, 1986, Ser. No. 878,717
Int. Cl.[4] H01L *23/30, 23/06*
U.S. Cl. 357—72 **6 Claims**



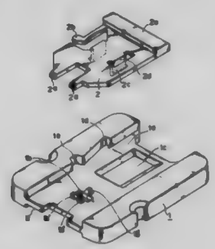
1. An electronic circuit pack assembly comprising at least one circuit element having a cured silicone resin encapsulant thereover said circuit element having conductive leads extending from said circuit element into through-holes provided in a printed circuit board characterized by an inorganic powder applied on the surface of said cured resin which powder substantially eliminates static charge and tackiness of the resin surface.

4,720,742

SEMICONDUCTOR DEVICE CARRIER

Yoshinori Egawa, Hachiohji, and Ryuichi Nakamura, Kawasaki, both of Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,014
Claims priority, application Japan, Mar. 26, 1985, 60-43542[U]
Int. Cl.[4] H01L *23/42*
U.S. Cl. 357—79 **5 Claims**



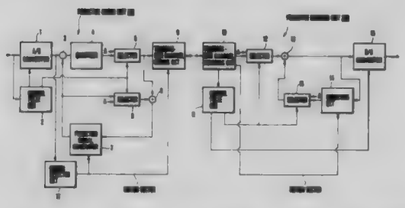
1. An apparatus for carrying a semiconductor device, said apparatus comprising:
a carrier substrate having a generally planar upper surface, said carrier substrate having an open section extending therein that is open at said upper surface, the semiconductor device being disposed in the open section when carried by the apparatus; and
a retaining member slidably mounted on said carrier substrate for moving relative to said carrier substrate along a linear path between first and second positions, said path extending substantially parallel to said upper surface, said retaining member having a retaining section facing said upper surface and which is slidable relative to and over said upper surface toward and away from said open section when the retaining member is moved along said path between said first and said second positions, the retaining section being positioned over the semiconductor device for retaining the semiconductor device in the open section after said retaining member is moved to said first position along said linear path and for releasing the semiconductor device when said retaining member is moved to said second position along said linear path.

4,720,743

PREDICTINE CODING/DECODING SYSTEM FOR BLOCK-FORMED PICTURE SIGNALS

Kazumoto Iinuma; Yukihiko Iijima, both of Tokyo; Hideo Kuroda, and Hideo Hashimoto, both of Kanagawa, all of Japan, assignors to NEC Corporation and Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,683
Claims priority, application Japan, Nov. 9, 1984, 59-236228
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **5 Claims**



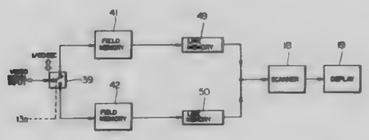
1. In a predictive coding/decoding system for picture signals to form a picture signal as a two-dimensional block, thereby functioning to process said picture signal by using said two-dimensional block as a unit,
the improvement comprising:
means operative to set a prediction signal and a prediction error signal generated in a predictive coding unit to predetermined fixed values, respectively, in a partial picture block produced as a result of the formation of said two-dimensional block.

4,720,744

TELEVISION SYSTEM

Kazuo Washi, and Masanori Ogino, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 6, 1984, Ser. No. 597,745
Claims priority, application Japan, Apr. 7, 1983, 58-59038
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—141 **4 Claims**



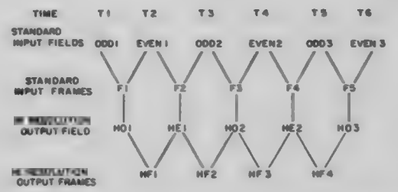
4. A television reception system comprising:
tuner means for receiving a transmitted picture information signal constituted by first and second field information signals each formed of a predetermined number of line information signals occurring at a predetermined horizontal scanning frequency;
field idetification means connected to said tuner means to receive said picture information signal, for identifying said first and second field information signals constituting said picture information signal and providing an identification signal;
first switch means connected to the output of said tuner means, for receiving said picture information signal and in response to said idetification signal for alternately providing the first field information signal by switching said first switch means into one operating state and the second field information signal by switching said first switch means into another operating state;
first memory means, operatively connected to said first switch means, for receiving said first field information signal in the form of odd-numbered line information signals from said first switch means and for storing it during a first field period;
second memory means operatively connected to said first switch means for receiving said second field information signal in the form of even-numbered line information signals from said first switch means and for storing it during a second field period;
read-out means for alternately reading out the line information signals of said first and second field information signals from said first and second memory means substantially during a third field period and comprising first line memory means for storing said odd-numbered line information signals of the first field information signal read out from said first memory means in a period of one line scanning and outputting the respective odd-numbered line information signals in a half period of one line scanning, and second line memory means for storing said even-numbered line information signals of the second field information signal read out from said second memory means in a period of one line scanning and outputting the respective even-numbered line information signals in a half period of one line scanning; and
a scanner which receives the field information signals read out by said read-out means and applies said signals to a display device at twice said predetermined horizontal scanning frequency with non-interlacing in line scanning.

4,720,745

METHOD AND APPARATUS FOR ENHANCING VIDEO DISPLAYS

Sherman DeForest, Del Mar, and S. Dale Seegmiller, Solana Beach, both of Calif., assignors to DigiVision, Inc., San Diego, Calif.

Filed Jun. 22, 1983, Ser. No. 506,826
Int. Cl.[4] H04N *5/208*
U.S. Cl. 358—166 **33 Claims**



1. A method of enhancing the quality of a video signal, comprising the steps of:
generating in real time from an input video signal having a first presentation bandwidth and including a succession of interlaced video fields a set of pixel values representing an image, each of said pixel values comprising a multi-bit digital value representing video signal intensity;
deriving in real time a single set of subpixel values for each said pixel value according to a predetermined function, said function deriving each subpixel value solely from the values of a central pixel and a set of pixels surrounding said central pixel and contained in a video field which is interlaced with the video field containing the central pixel, and said function providing said subpixel values as multi-bit digital values; and
converting in real time only the subpixel values obtained in said deriving step into an output signal corresponding to a

video signal having a second presentation bandwidth higher than said first presentation bandwidth.

4,720,746

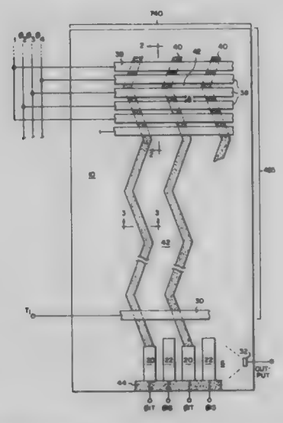
FRAME TRANSFER CCD AREA IMAGE SENSOR WITH IMPROVED HORIZONTAL RESOLUTION

Leslie G. Moore, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,172

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213.28 **4 Claims**



1. A frame transfer CCD area image sensor comprising:

(a) a plurality of spaced transfer channels having resolution cells each of which samples light from an image scene and accumulates photocharge representing the brightness level of an imgae pixel, such resolution cells being arranged to define an array of rows and columns of resolution cells;

(b) channel stops which separate the transfer channels and are arranged to stagger adjacent resolution cells in a channel; and

(c) output register means for sequentially receiving photocharges from each row of resolution cells during a readout operation.

4,720,747

SEQUENTIAL PLANE PROJECTION BY LASER VIDEO PROJECTOR

Ronald P. Crowley, Salem, Mass., assignor to Corporation for Laser Optics Research, Cambridge, Mass.

Filed Apr. 26, 1984, Ser. No. 604,308

Int. Cl.⁴ H04N *5/74*

U.S. Cl. 358—231 **22 Claims**

1. A video imaging system responsive to electrical signals representing an image, comprising:

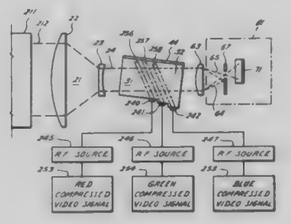
a light source for at least one selected frequency, said source including at least one pulsed laser;

an acoustic-optical cell, said cell including an anisotropic medium for sound transmittal having a first face facing said laser and an electrical signal to sound wave transducer mounted on a face other than said first face, said transducer adapted to produce sound waves which are non-colinear with the light from said laser;

signal means for driving said transducer to produce sound waves modulated to correspond to the electrical signals for a line of the image;

a projection surface; and

sequential plane projection means for causing the light from said medium to play at different positions along said projection surface, whereby each line of the image from said medium is produced at a different physical location on the



projection surface, wherein said pulsed laser is a metal vapor pulsed laser.

4,720,748

CATHODE RAY TUBE

Hiroji Sumiyoshi; Kazuo Omae, both of Shinagawa; Akira Hamanaka, Setagaya, and Yuzuru Watanabe, Shinagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

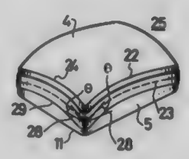
PCT No. PCT/JP84/00401, § 371 Date Apr. 18, 1985, § 102(e) Date Apr. 18, 1985, PCT Pub. No. WO85/01151, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 15, 1984, Ser. No. 726,902

Claims priority, application Japan, Aug. 19, 1983, 58-151801

Int. Cl.⁴ H04M *5/65*

U.S. Cl. 358—246 **2 Claims**



1. A cathode ray tube including:

a front panel having a curved face portion,

a skirt portion joined to said face portion along a curved boundary, said panel having a curved mold match line substantially following the contour of said curved boundary, the distance between said mold match line and said boundary being substantially constant, and

a tension band providing impolsion protection for said tube and trained about said mold match line.

4,720,749

ELECTRONIC PRINT BOARD

Yoshiaki Satake, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 16, 1986, Ser. No. 908,006

Claims priority, application Japan, Sep. 19, 1985, 60-205431

Int. Cl.⁴ H04N *1/40*

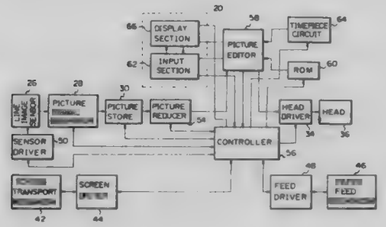
U.S. Cl. 358—280 **8 Claims**

1. An electronic print board for reading graphic information which is written on a surface of said print board, then temporarily storing said graphic information, and then printing out said graphic information, comprising:

extra graphic information generating means for generating predetermined extra information other than said graphic information which is written on said print board;

timepiece means for storing the current date and time;

graphic information editing means for combining and editing said graphic information on said board and said extra graphic information and wherein said graphic information editing means edits said graphic information, extra graphic information and date and time information based on form



information, which is read out of said store means, in such a manner as to arrange said various information in individual positions which correspond to said form.

4,720,750

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1987, Ser. No. 12,441

Claims priority, application Japan, Feb. 28, 1986, 61-42939; Feb. 28, 1986, 61-42948; Feb. 28, 1986, 61-42949

Int. Cl.⁴ G03G *15/052*

U.S. Cl. 358—300 **13 Claims**



1. An image forming apparatus, wherein an electrostatic latent image is formed on an image carrier by a process of electrostatic charge and image exposure and a reproduced image is formed on said image carrier corresponding to the electrostatic latent image, comprising:

original holding means for holding an original document and an area designation sheet, said area designation sheet including means for defining a surrounded area to designate a copy required area of said original document;

scanning means for optically scanning said area designation sheet placed on said original holding means to obtain a light image of the surrounded area therefrom;

optical reading means for generating electrical signals in responce to the light image of the surrounded area corresponding to the required copy area designated on said area designation sheet;

memory means for storing said electrical signals generated by said optical reading means;

charge erasing means for erasing selected portions of the electrostatic charge on said image carrier; and

controlling means for controlling said charge erasing means to erase the electrostatic charge on said image carrier than in the copy required area to be copied, according to the electrical signals read from said memory means.

4,720,751

VIDEO RECORDING APPARATUS WHICH RECORDS CHROMINANCE INFORMATION AT A LOWER FREQUENCY BAND COINCIDENT WITH THE LUMINANCE SIGNAL FREQUENCY BAND

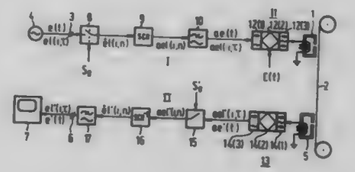
Joseph H. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 472,892, Mar. 7, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 841,035

Claims priority, application Netherlands, Jan. 11, 1983, 8200077

Int. Cl.⁴ H04N *9/491*

U.S. Cl. 358—310 **6 Claims**



1. A video signal processing circuit for preparing an analog color video signal for recording on a recording medium, such analog color video signal comprising, for each line of a video image, an analog color video line signal having a luminance signal component in a predetermined frequency band and a color subcarrier modulated by a chrominance signal component, the modulated subcarrier having a predetermined frequency band at the upper end of the luminance signal frequency band, such signal processing circuit comprising:

(a) a recording signal input for receiving the analog color video signal;

(b) a converter having an input coupled to the recording signal input and an output, said converter sampling each analog color line signal to form it into a time discrete color video line signal comprising a number of successive samples occurring at a sampling rate f_s approximately twice that of the subcarrier frequency, such number being N_i for the ith time discrete color video line signal;

(c) scrambler circuit means having an input coupled to the output of said converter and an output, said scrambler circuit means selecting, in accordance with a predetermined pattern, a number of said time discrete video line signal samples selected from predetermined ones of said time discrete video line signals supplied thereto of a like polarity, such selected samples constituting a time discrete auxiliary line signal corresponding to such video line signals, the ith time discrete auxiliary line signal comprising N_i of such signal samples for each of said auxiliary line signals whereby said chrominance signal frequency band is shifted to the lower portion of said luminance signal frequency band;

(d) means for converting each of said time discrete auxiliary line signals into an analog signal; and

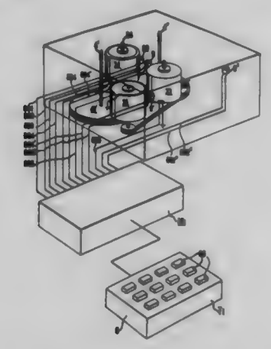
(e) frequency modulation means connected to said converting means for frequency modulating the analog signals produced thereby on a carrier wave, the resulting frequency modulated carrier wave being suited for recording on said recording medium.

4,720,732

SERVOCONTROLLED DEVICE FOR CONTROLLING THE CASSETTE TAPE TRANSPORT MEANS, PARTICULARLY FOR COOPERATION WITH CASSETTE CHANGING DEVICES

Flaminio Antonello, Chiasso, Switzerland, assignor to Neutek Establishment, Vaduz-Liechtenstein, Liechtenstein

Filed Mar. 5, 1986, Ser. No. 836,532
Claims priority, application Switzerland, Mar. 5, 1985, 00996/85
Int. Cl.[4] G11B *15/02, 15/18*
U.S. Cl. 360—71 10 Claims



1. A small size servocontrolled mechanism for controlling the cassette tape transport means, in determining the operation modes of an autoreverse type recorder/player in which it is incorporated. conventionally having at least one cassette (10) with a magnetic tape (1) which is alternately wound around one of two reels (11', 11''), also part of the cassette (10), each reel being keyed and/or keyable to its own shaft (32', 32'') by means of a winding key 31', 31'') driven, directly or indirectly, by at least one motor (33), the tape (1) extending between the two reels (11'and 11'') or idle rollers (12', 12''), also part of the cassette (10), being transported tangential to two capstans (4', 4'') provided with flywheels (40', 40''), at the other side of the tape (1) two rollers (41', 41''), each roller being idle-mounted at the symmetrical, swinging end (42', 42'') of its own arm (43', 43'') and alternately biased by a spring (45) to adhere to the magnetic tape (1) or to the two substantially parallel capstans (4', 4''), directly or indirectly driven by one or more motors (35), and at least one magnetic playback head (44), in wiping contact with the moving tape (1), characterized in that said device comprises at least nine tracks or touching and/or sensing levels (52, 52', 52'', 53, 53', 53'', 54, 54', 54''), distributed over an odd number of parallel, aligned shafts (50, 50', 50''), and to which all the functional members (6', 6'', 7', 7'', 9, 09, 42', 42'', 154) are linked, either directly or indirectly.

4,720,753

AUTO TRACKING APPARATUS FOR SCANNING TRACKS WITH CONTROLLABLE HEAD DISPLACEMENT

Yasuo Iwasaki; Takafumi Nishino, both of Osaka, and Masaaki Kobayashi, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 5, 1986, Ser. No. 829,630
Claims priority, application Japan, Feb. 8, 1985, 60-23885
Int. Cl.[4] G11B *5/588, 21/10*
U.S. Cl. 360—77 2 Claims

1. An auto tracking apparatus for a video tape recorder, comprising:

a reproducing head disposed on the circumference of a rotary cylinder of said video tape recorder, said reproducing head being mounted on a head drive element and arranged to be movable in the direction normal to the plane of rotation of said rotary cylinder;

a drive circuit for displacing said reproducing head by driving said head drive element;

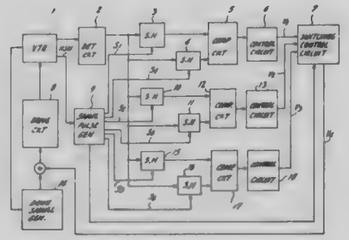
a circuit for performing envelope detection of a high frequency signal reproduced by said reproducing head and for producing an output;

a first group of three sample-and-hold circuits for sampling and holding the envelope detection output for a field of a frame at three times;

a second group of three sample-and-hold circuits for the envelope detection output for the corresponding field of the following frame at the same three times;

a first comparison circuit for comparing the sampled value obtained by the first sample-and-hold circuit of said first group of three sample-and-hold circuits with the sampled value obtained by the first sample-and-hold circuit of said second group of three sample-and-hold, said first comparison circuit producing an output circuits;

a second comparison circuit for comparing the sampled value obtained by the second sample-and-hold circuit of said first group of three sample-and-hold circuit with the sampled value obtained by the second sample-and-hold circuit of said second group of three sample-and-hold circuits, said second comparison circuit producing an output;



a third comparison circuit for comparing the sampled value obtained by the third sample-and-hold circuit of said first group of three sample-and-hold circuit with the sampled value obtained by the third sample-and-hold circuit of said second group of three sample-and-hold circuits, said third comparison circuit producing an output;

three control signal generating circuits respectively responsive to the outputs from said first, second and third comparison circuits, each of said three control signal generating circuits generating a control signal for increasing the output level of said drive circuit when the sampled value obtained by one of said first group of three sample-and-hold circuits is greater than the sampled value obtained by the corresponding one of said second group of three sample-and-hold circuits and generating a control signal for decreasing the output level of said drive circuit when the sampled value obtained by one of said first group thereof is smaller than the same obtained by the corresponding one of said second group thereof; and

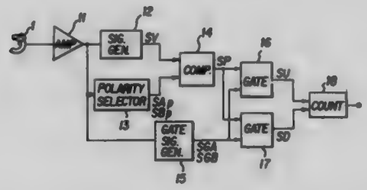
a control circuit responsive to the control signals from said three control signal generating circuits, for outputting to the drive circuit a combined control signal for controlling the displacement of said reproducing head in relation to one field by successively switching the control signals at the three times.

4,720,754

DIGITALLY RESPONSIVE SYSTEM FOR POSITIONING A TRANSDUCER OF A STORAGE APPARATUS

Yoshifumi Mizoshita, Tama, and Susumu Hasegawa, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 6, 1984, Ser. No. 678,852
Claims priority, application Japan, Dec. 8, 1983, 58-232406
Int. Cl.[4] G11B *5/596, 21/10*
U.S. Cl. 360—77 5 Claims



1. A system for detecting a displacement of a first body away from a predetermined data track formed on a second body moving relatively to said first body, for guiding said first body along said data track said second body including a plurality of data tracks for storing data and a plurality of servo tracks parallel to corresponding data tracks, said system comprising:

a plurality of code members stored in each of said servo tracks;

a positioning transducer means fixed to said first body, for sensing positional signals from said code members and generating a positioning pulse train corresponding to the relative movement of said first and second bodies;

a signal generator means for generating a reference voltage changing with time, said reference voltage having a predetermined pattern within a given time period T;

a comparing means for comparing the height of each pulse in said positioning pulse train to said reference voltage; and

a processing means for counting the number m of positioning pulses from said positioning pulse train which exceed said reference voltage and processing said counted number of positioning pulses to provide a signal corresponding to the displacement of said first body from said data track.

4,720,755

TAPE RECORDER

Masao Kamijo, Tokyo, Japan, assignor to Tokyo Pigeon Co., Ltd., Tokyo and Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, both of, Japan

Filed Dec. 2, 1985, Ser. No. 803,459
Claims priority, application Japan, Dec. 3, 1984, 59-255209; Apr. 9, 1985, 60-51673
Int. Cl.[4] G11B *15/00, 17/00*
U.S. Cl. 360—96.3 14 Claims

1. A tape player having a plurality of operational modes, including a stop mode, a reproduction mode, a fast-forwarding mode, and a rewinding mode, said tape player comprising:

a rotatably supported supply reel base and a rotatably supported take-up reel base;

a rotatably driven driving gear;

a drive arm supported for movement between fast-forwarding and rewinding positions and being movable to a neutral position located between said fast-forwarding and rewinding positions;

biasing means for yieldably urging said drive arm toward its fast-forwarding position;

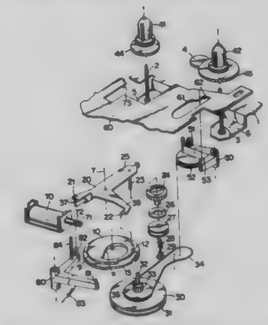
means responsive to said drive arm respectively being in said fast-forwarding and rewinding positions for effecting high-speed rotation of said take-up and supply reel bases, respectively;

a head plate supported for movement between a stop position and a reproduction position, said head plate being movable to a fast-forwarding/rewinding position located between said stop and reproduction positions;

a single operating mode changing solenoid which can be selectively energized for one of a long time interval and a short time interval;

a trigger arm supported for movement between first and second positions and being operatively coupled to said solenoid, said solenoid moving said trigger arm to said first and second positions when said solenoid is respectively de-energized and energized;

a rotatably supported assist gear having a toothed portion which can engage said driving gear and having a non-toothed portion which interrupts engagement of said driving gear and said assist gear when angularly aligned with said driving gear, said assist gear including first, second and third control portions which can engage a portion of said trigger arm when said trigger arm is respectively in its first, first and second positions and when said assist gear is respectively in first, second and third angular positions which are angularly spaced, said driving gear being angularly aligned with said non-toothed portion of said assist gear when said assist gear is in said first, second and third angular positions, engagement of said portion of said trigger arm with said first, second and third control portions of said assist gear respectively preventing rotational movement of said assist gear past its first, second and third angular positions, respectively, and engagement of said portion of said trigger arm with said first, second and third control portions being interrupted by movement of said trigger arm respectively to its second, second and first positions, said assist gear having thereon a first cam cooperable with said drive arm for respectively permitting and preventing movement of said drive arm from its neutral position to its fast-forwarding position when said assit gear is respectively in said third angular position and in angular positions speced from said third angular position, said assist gear further having a second cam thereon; and



cam follower means cooperable with said second cam for moving said head plate in response to rotation of said assist gear, said head plate respectively being positioned in said stop, said reproduction and said fast-forwarding/rewinding positions when said assist gear is respectively in said first, second and third angular positions;

wherein when said head plate is positioned at said stop position by said cam follower means due to said assist gear being positioned in said first angular position by engagement of said portion of said trigger arm and said first control portion, energization of said solenoid for said short time interval interrupts engagement of said portion of said trigger arm and said first control portion and permits said assist gear to be rotated by said driving gear to said second position in which said portion of said trigger arm engages said second control portion so that said second cam and said cam follower means position said head

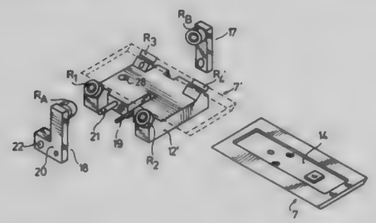
plate in said reproduction position and so that said first cam positions said drive arm in said neutral position, and wherein a subsequent energization of said solenoid for said long time interval interrupts the engagement of said portion of said trigger arm and said second control portion and permits said assist gear to be rotated to said third position in which said portion of said trigger arm engages said third control portion so that said second cam portion and said cam follower means position said head plate in said fast-forwarding/rewinding position and so that said first cam permits movement of said drive arm by said biasing means to said fast-forwarding position.

4,720,756

APPARATUS FOR THE POSITIONING OF OBJECTS HAVING A LOW MASS AND A METHOD OF ASSEMBLY THEREOF

Lambert Kohl, Wachenheim; Bernd Roeger, Battenberg, and Karlheinz Koenig, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,455
Claims priority, application European Pat. Off., Nov. 7, 1984, 84113401.8; Fed. Rep. of Germany, Jun. 1, 1985, 8516071[U]
Int. Cl.⁴ G11B 5/55
U.S. Cl. 360—106 20 Claims



1. Apparatus for positioning objects having a low mass, in particular at least one magnetic head in a magnetic disk memory, comprising

a chassis,

a guide plate on which an object to be positioned is located and having a pair of oppositely inclined longitudinal edge faces and also a pair of longitudinal edge faces which are parallel to the principal plane of the guide plate,

bearing elements to support the guide plate on the chassis for movement relative to the chassis in the longitudinal direction of said edge faces, the bearing elements comprising first bearing means in the form of rotary bearings and guide plate pressing second bearing means, one of the said first and second bearing means being arranged to engage said oppositely inclined longitudinal edge faces of the guide plate, and the other being arranged to engage said edge faces of the guide plate which are parallel to the principal plane of the guide plate, and

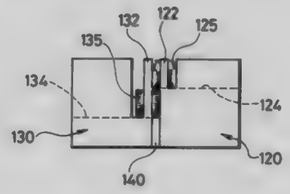
drive means for moving the guide plate in the bearing means, the second bearing means comprising at least one stationary height adjustment element for the guide plate and a guide element which is movable independently of said height adjustment element and spring means being provided for resiliently urging said movable element against the guide plate, the at least one height adjustment element and the movable guide element exhibiting low frictional contact with respect to the guide plate and substantially constant contact being established between the guide plate, the at least one height adjustment element and the first bearing means by the resiliently urged movable guide element.

4,720,757

MAGNETIC HEAD FOR VERTICAL MAGNETIC RECORDING AND PROCESS FOR PRODUCING THE SAME

Takashi Hatanai, and Keishi Nakashima, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 5, 1985, Ser. No. 752,446
Claims priority, application Japan, Jul. 4, 1984, 59-138749; Oct. 9, 1984, 59-212083; Oct. 9, 1984, 59-212084; Oct. 11, 1984, 59-211522
Int. Cl.⁴ G11B 5/17, 5/187, 5/265
U.S. Cl. 360—121 12 Claims



1. A magnetic head for vertical magnetic recording comprising:

a slider subassembly having one side thereof to be disposed in contact with a magnetic recording medium and formed by portions made of a nonmagnetic material holding a recording and reproducing magnetic thin film and an erasing magnetic thin film which are oriented in a direction perpendicular to the magnetic recording medium;

a core block made of magnetic material which is disposed below the other side of the slider subassembly opposite from the magnetic recording medium, said core block having a first leg portion oriented in said perpendicular direction on a recording and reproducing side of said core block located below and extending in contact with said recording and reproducing magnetic thin film of said slider subassembly, a second leg portion oriented in said perpendicular direction on an erasing side of said core block located below and extending in contact with said erasing magnetic thin film of said slider subassembly, a recording and reproducing coil assembled on said first leg portion facing said slider subassembly with its coil axis parallel to said perpendicular direction, and an erasing coil assembled on said second leg portion facing said slider subassembly with its coil axis parallel to said perpendicular direction;

wherein said recording and reproducing coil and said erasing coil are positioned at different heights from each other on their respective leg portions and disposed so as to partially overlap each other when viewed from said perpendicular direction parallel to the axes of the coils.

4,720,758

LOAD DEPENDENT CURRENT LIMITER FOR THE POWER SUPPLY OF A MULTI-MODULE ELECTRONIC SYSTEM

Jeffrey K. Winslow, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 759,569, Jul. 26, 1985, abandoned. This application May 15, 1987, Ser. No. 52,211
Int. Cl.⁴ H02H 3/08
U.S. Cl. 361—93 7 Claims

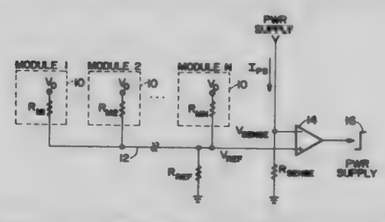
1. Electronic apparatus comprising:

a plurality of load modules each comprising a load element for utilizing current supplied to the load module and a programming element for generating a signal representative of the current requirement of the load element,

a power supply circuit connected to the load modules for supplying current thereto, the power supply circuit having a control terminal for receiving a shutdown signal and being operative to interrupt the supply of current to the load modules on receipt of a shutdown signal,

reference means for utilizing the signals generated by the programming elements of the respective load modules to generate a signal representative of the total current requirement of the load elements of all of said modules,

sensing means for generating a signal that is representative of the total current output of the power supply circuit, and



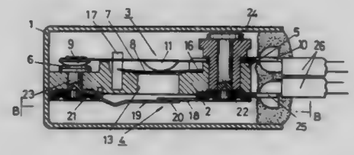
comparison means for utilizing the signals generated by the reference means and the sensing means to compare the total current requirement of the load elements of all of said modules with the total current supplied to the load modules by the power supply circuit, the comparison means providing a shutdown signal to the control terminal of the power supply circuit when an overcurrent condition is indicated.

4,720,759

COMPACT PROTECTOR UTILIZING A BIMETAL AND AN EXCESSIVE RISE PREVENTION PORTION

Shigeru Tabei, Machida, Japan, assignor to Toho Electric Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,561
Claims priority, application Japan, May 15, 1986, 61-109411
Int. Cl.⁴ H02H 5/04
U.S. Cl. 361—105 21 Claims



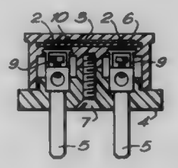
1. A protector comprising a bimetal type protector portion and a fuse unit: said bimetal type protector portion comprising: a contact spring made of a spring material having relatively high electric resistance; a movable contact formed at the tip of said contact spring; an insulating base; the other end of said contact spring being disposed on said base in such a manner that said movable contact can be opened and closed with respect to a fixed contact; a projection formed near the center of said contact spring in such a manner as to project towards said base; and a rocking bimetal disposed operatively on said base in such a manner that its high expansion side comes into contact with said projection of said contact spring; said fuse unit comprising: a fixed fuse plate and a movable fuse plate, each being made of a spring material having relatively low electric resistance, fused to each other by a temperature fuse and disposed on said base; said movable fuse plate being urged in a direction separating from said fixed fuse plate; one of the ends of either said fixed fuse plate or said movable fuse plate being connected electrically to said fixed contact.

4,720,760

ELECTRICAL SURGE PROTECTION

Tom Starr, Sussex, England, assignor to Bowthorpe Emp Limited, Brighton, England

Filed Jul. 24, 1985, Ser. No. 758,615
Claims priority, application United Kingdom, Jul. 24, 1984, 8418779
Int. Cl.⁴ H02H 1/04
U.S. Cl. 361—128 6 Claims



1. An electrical power supply connector, such as a mains electrical power plug having live (L), neutral (N) and earth (E) terminal for engagement with complementary L, N and E socket outlet terminals or a mains electrical socket outlet having such L, N and E socket outlet terminals, said connector including a unitary multiple non-linear resistor device comprising a flat plate of non-linear resistor material having three spaced-apart first electrodes formed on one surface thereof for cooperation jointly with a second electrode formed on the opposite surface of the plate and means electrically coupling each of said spaced-apart first electrodes with a respective one of said L, N and E terminals whereby said non-linear resistor device provides independent surge protection for said connector for all of the surge modes L-N, L-E, and N-E, said first electrodes being spaced apart from each other on said one surface of said plate by such a distance relative to the thickness of the plate and the position of the cooperating second electrode that in the event of a surge overvoltage appearing between any two of said first electrodes, the preferential surge current conduction path therebetween is from one of said any two of said first electrodes through the thickness of the plate or disc to the cooperating second electrode and thence back through the thickness of the plate or disc to the other of said any two of said first electrodes, and the non-linear resistor device furthermore being adapted to fail in a short-circuit mode in the event of an excesive surge current being carried between any two of said first electrodes.

4,720,761

ELECTROMAGNETIC CONTACTOR WITH CURRENT REGULATED ELECTROMAGNETIC COIL FOR HOLDING THE CONTACTS CLOSED

Gary F. Saletta, Penn Township, Westmoreland County; Joseph C. Engel, Monroeville Boro, both of Pa., and John G. Leddy, Brookline, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1987, Ser. No. 16,423
Int. Cl.⁴ H01H 47/00; G01R 21/00
U.S. Cl. 361—152 6 Claims

1. An electrically contactor, comprising:

first contact means;

second contact means in a disposition of electrical continuity with said first contact means;

electromagnetic means with armature means which is mechanically interconnected with said second contact means for maintaining said second contact means in said disposition of electrical continuity with said first contact means in response to the flow of a conduction angle controlled electrical current pulse through a winding of said electromagnet means;

sensing means for sensing an amplitude value of said conduction angle controlled electrical current pulse;

conduction control means connected to said electromagnet means for controlling said electrical current pulse flowing in said winding; and

microprocessor means connected to said sensing means and said conduction control means for comparing said amplitude value of said current pulse with a stored regulation value which is related to said current pulse and for providing a conduction signal to said conduction control means which causes said current pulse to have a conduction angle controlled such that said current pulse is generally maintained at said stored regulation value.

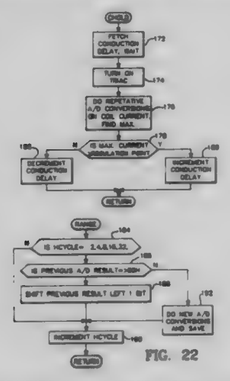


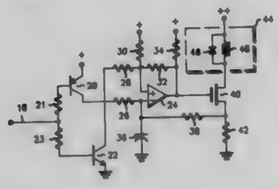
FIG. 22

4,720,762

CURRENT DRIVE CIRCUIT

Ray Estes, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1986, Ser. No. 947,337
Int. Cl.[4] H01H 47/00, 9/00
U.S. Cl. 361—154 17 Claims



1. A circuit for controlling the current in an electrical device, comprising:

a signal source for generating a 3-state signal;

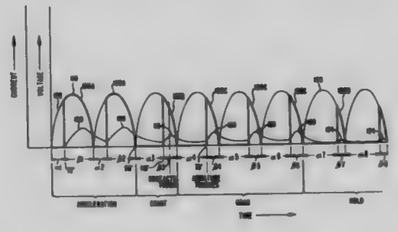
means, responsive to said 3-state signal, for generating a current control signal to control the current in the electrical device at: a pull-in current level in response to a first state of the 3-state signal, a hold current level in response to a second state of the 3-state signal, and an off level in response to a third state of the 3-state signal.

4,720,763

ELECTROMAGNETIC CONTACTOR WITH CONTROL CIRCUIT FOR PROVIDING ACCELERATION, COAST AND GRAB FUNCTIONS

James A. Bauer, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1987, Ser. No. 16,419
Int. Cl.[4] H01H 47/26, 9/00; G01R 19/00
U.S. Cl. 361—154 51 Claims



1. An electrical contactor, comprising:

first contact means;

second contact means for being moved into a disposition of electrical continuity with said first contact means;

electromagnet means with movable armature means which is mechanically interconnected with said second contact means for moving said second contact means into said disposition of electircal continuity with said first contact means in response to the flow of current pulses through a winding of said electromagnet means which current pulse are driven by controlled voltage pulses the amplitude which is free to vary within limits;

spring means disposed to resist the movement of said armature means, the resistance being overcome when a predetermined minimum amount of kinetic energy is applied to said armature means; and

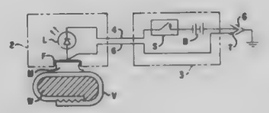
means for supplying electrical power to said winging of said electromagnet means, wherein N of said controlled voltage pulses are provided to said winding, where one of said pulses is conduction angle controlled and adjustable as a function of said voltage amplitude so that the total amount of said kinetic energy which is supplied to said armature means during movement thereof as the result of said electrical current pulses flowing in said winding is substantially equal to said predetermined minimum amount of kinetic energy.

4,720,764

OPERATOR STATIC GROUNDING CORD

Derek A. Lucas, Norwell, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Mar. 2, 1987, Ser. No. 20,479
Int. Cl.[4] H05F 3/02
U.S. Cl. 361—212 17 Claims



1. Electrical apparatus for draining a static charge from an operator to an electical ground comprising:

an electrode for electrical connection to the operator's body;

a terminal for connection to ground; and

a circuit connected between the electrode and ground terminal, wherein the circuit includes:

a battery,

switching means

a current indicator, and

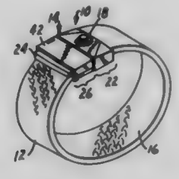
first and second conductors connected between the electrode and ground terminal and forming a loop including the battery, switching means and indicator in series such that closing of the switching means completes a current path through both conductors and the indicator signals integrity of the connection from the body electrode to the ground terminal.

4,720,765

ADJUSTABLE, CONDUCTIVE BODY STRAP

John W. Weise, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 13, 1987, Ser. No. 37,616
Int. Cl.[4] H05F 3/02
U.S. Cl. 361—220 17 Claims



1. An adjustable, conductive body strap, comprising:

a strip of material having a first end and a second end, said strip of material being electrically conductive on at least one surface, being elastomerically extensible in its longitudinal direction, and being of at least a length to enable said strip of material to encircle a body part;

a mechanical connector receiving said first end and said second end of said strip of material to form a closed loop with said strip of material with said at least one surface toward the interior of said closed loop, said mechanical connector having a first part receiving said first end of said strip of material and having a second part receiving said second end of said strip of material;

said first part of said mechanical connector having a recess receiving said first end of said strip of material, said recess being formed with a plurality of spikes upon which said strip of material is impaled and secured;

said second part of said mechanical connector having a transverse bar around which said second end of said strip of material is passed passing firstly interior of said transverse bar and secondly exterior of said transverse bar, said transverse bar having a plurality of spikes mounted on its exterior surface upon which said strip of material may be impaled after said strip of material has been pulled tight around said body part, said second part of said mechanical connector further having a hinged cover for being secured over said spikes of said transverse bar trapping said strip of material thereon; and

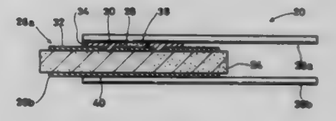
electrical connection means coupled to said strip of material for making electrical contact with said at least one conductive surface and for providing a connection point for an electrical cable capable of connecting said conductive body strap to ground.

4,720,766

CERAMIC CAPACITOR

Yukio Honda, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 12, 1987, Ser. No. 13,669
Claims priority, application Japan, Feb. 20, 1986, 61-36183
Int. Cl.[4] H01G 1/11, 4/06, 4/10
U.S. Cl. 361—275 8 Claims



1. A ceramic capacitor comprising:

a plate type dielectric ceramic member;

electrodes formed on both major surfaces of said dielectric ceramic member, one said electrode formed on at least one said major surface of said dielectric ceramic member having an island electrode part formed on said major surface of said dielectric ceramic member and a peripheral electrode part formed to encircle said island electrode part through a gap region;

a resistor formed to reach said island electrode part and said peripheral electrode part to connect the same with each other; and

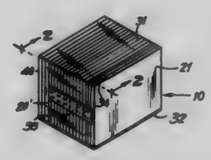
a terminal electrically connected to said island electrode part in a region provided with no resistor thereon.

4,720,767

INTERNALLY FUSED VARIABLE VALUE CERAMIC CAPACITOR AND CIRCUIT

Ning-Hsai Chan, and Bharat Rawal, both of Myrtle Beach, S.C., assignors to AVX Corporation, Great Neck, N.Y.

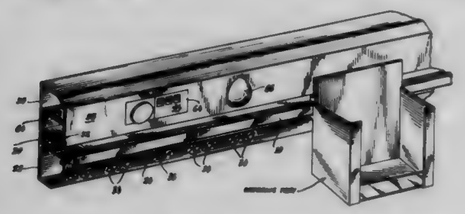
Filed Sep. 22, 1986, Ser. No. 909,680
Int. Cl.[4] H01G 1/11, 4/10
U.S. Cl. 361—275 3 Claims



1. An electronic device comprising an intergrated circuit device having power supply input terminals, a multi-layer ceramic capacitor having a plurality of electrode layers and having a first terminal connected to alternate electrode layers of said capacitor, a second terminal connected to the electrode layers of said capacitor intermediate said alternate electrode layers and a third terminal, a fuse member formed internally of said capacitor and electrically interposed between said third terminal and said intermediate electrode layers, first connector means interposed between a power supply terminal of said intergrated circuit device and said first terminal of said capacitor, second connector means interposed between the other power supply terminal of said intergrated circuit device and said second terminal of said capacitor and power supply means having leads of opposite polarity connected respectively to said first and third terminals of said capacitor, whereby charging currents to said I.C. device from said power supply means, flow through said fuse, and said capacitor is connected directly across said power supply input terminals of said intergrated circuit device with no series connection to said fuse.

VOL 1086 ISS 3 JA 19 1988 UMI

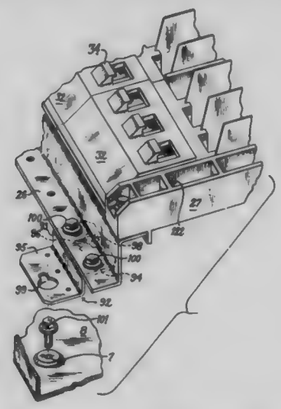
4,720,768
ELECTRICAL MEDICAL RAIL SYSTEM
Ernst Schindele, 505 W. Hill Rd., Stamford, Conn. 06905
Filed Dec. 5, 1986, Ser. No. 938,561
Int. Cl.[4] H02B 1/04
U.S. Cl. 361—334 6 Claims



1. An electrical medical rail system for providing flexible, high and/or low voltage electrical service for medical applications comprising:
- a hollow rail having means subdividing said rail into two or more longitudinal conduits which house the leads of an electrical supply, each of said longitudinal conduits housing the leads of a separate electrical supply,
- aligned outer grooves extending longitudinally along the top and bottom edges of said hollow rail for detachably mounting medical equipment and lighting in said outer grooves on said rail,
- at least one two component longitudinal housing having a first component in the form of a snap-in panel and a second component,
- said second component comprising an integral extrusion extending downwardly from said rail, said two component housing forming a high voltage housing having a high voltage supply positioned therein and fed from a cable positioned in said hollow rail, and
- high voltage electrical components are mounted on said snap-in panel and are adapted to be connected to said high voltage supply in said housing, said snap-in panel closing said two component housing.

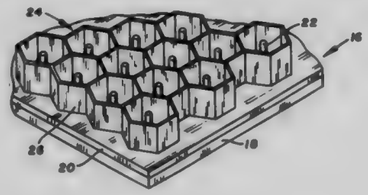
4,720,769
LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY INCLUDING CIRCUIT BREAKER SUPPORT MOUNTING BRACKETS
Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCain, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.
Division of Ser. No. 705,454, Feb. 25, 1985, Pat. No. 4,631,634.
This application Aug. 4, 1986, Ser. No. 892,208
Int. Cl.[4] H02B 1/10
U.S. Cl. 361—353 2 Claims

1. A circuit breaker panelboard assembly comprising:
- closure means comprising opposing side walls and opposing end walls joined by a bottom housing at least one main circuit breaker or at least one main wire terminal lug and a plurality of branch circuit breakers;
- access means movably arranged on said closure means providing access to said main and said branch circuit breakers from outside of said closure means;
- circuit breaker mounting means within said closure supporting said branch circuit breakers and providing electrical connection between said branch circuit breakers and electrical bus bars connectable with an external circuit;
- shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers; and
- a pair of angulated brackets attached at one end to said bottom and at an opposite end to a corresponding pair of mounting rails, said circuit breaker mounting means being arranged across said pair of mounting rails;
- said angulated brackets each comprising a metal plate formed into a top and a bottom step offset from a vertical riser, said top and bottom steps each containing a keyhole shaped opening and a plurality of bolt access openings, said top and bottom keyhole shaped openings each facing



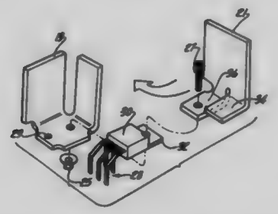
in opposite directions and each defining a large and small diameter passage;
- whereby the small diameter passage on said bottom keyhole shaped opening is opposite in direction from said small diameter passage on said top keyhole shaped opening.

4,720,770
CONSTANT IMPEDANCE INTEGRATED CIRCUIT CONNECTOR
Tom G. Jamesson, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Nov. 3, 1986, Ser. No. 926,154
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—387 20 Claims



1. An integrated circuit device comprising:
- a dielectric body, and a metallized layer including an integrated circuit mounted over the dielectric body;
- a plurality of electrically conductive elongate contacts mounted with respect to the dielectric body, in electrical communication with said integrated circuit, and extending away from said dielectric body in a first direction; and
- a plurality of electrically conductive conduit members mounted with respect to said dielectric body and extending in said first direction, each of said conduit members positioned in spaced apart and surrounding relation to an associated one of said elongate contacts;
- said conduit members being interconnected to form a unitary grid in which said conduit members form a pattern corresponding to the pattern formed by said elongated contacts.

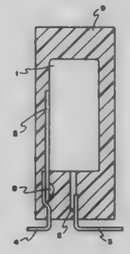
4,720,771
HEAT SINK ASSEMBLY FOR A CIRCUIT BOARD MOUNTED INTEGRATED CIRCUIT
Thomas C. Horton, Madison, Ala., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Continuation of Ser. No. 751,813, Jul. 5, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 20,797
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—388 1 Claim



1. An assembly, including a lower heat sink member and an upper heat sink member, each being separate, for dissipating heat generated by the operation of a semiconductor device having a die bond, electrical leads, a body and a conductive tab having a hole, the semiconductor device being located between the upper and lower heat sink members, the assembly including a circuit board mounting the semiconductor device and comprising:
- a lower heat sink member with a hole adjacent the conductive tab and contacting the bottom of the body and the conductive tab and communicating with the environment surrounding the device and sinking heat from the conductive tab;
- an upper heat sink member sinking heat from the conductive tab and from the body and having an upper flange member holding the body in continuous and tight communication with the lower heat sink member by sandwiching the body therebetween and a lower flange member with a hole adjacent and contacting the conductive tab of the semiconductor to hold the conductive tab in continuous and tight communication with the lower heat sink member by sandwiching the conductive tab therebetween so as not to disturb the die bond within the semiconductor device and to prevent warpage of the conductive tab;
- a fastening means fit through the hole in the lower flange member, the hole in the conductive tab and the hole in the lower heat sink member;
- the fastening means configured such that the lower flange, conductive tab and lower heat sink member are securely mounted together and such that a cushion is provided to prevent warpage of the conductive tab;
- the fastening means further comprising a material which will accept solder from automatic soldering equipment.

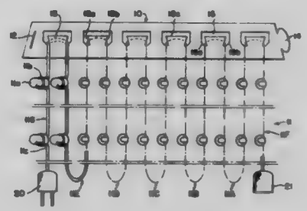
4,720,772
FUSED SOLID ELECTROLYTIC CAPACITOR
Masayuki Yamane; Keiji Iijima, and Kenji Mochizuki, all of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Feb. 6, 1987, Ser. No. 11,541
Claims priority, application Japan, Feb. 7, 1986, 61-17072[U]
Int. Cl.[4] H01G 9/00; B01J 17/00
U.S. Cl. 361—433 11 Claims

1. A fused capacitor assembly comprising:
- a solid electrolytic capacitor body having first and second terminals;
- a heat insulative plate having a first conductor layer provided on a first principal surface thereof, said first conductor layer being connected to said first terminal, a second conductor layer provided on said first principal surface of said insulative plate, said second conductor layer being separated from said first conductor layer by an insulating space, and a third conductor layer provided on a second principal surface of said insulative plate, said third conductor layer being electrically connected to said second conductor layer;
- a fuse element connected between said first conductor layer and said second conductor layer such that said fuse element crosses over said insulating space to provide a gap between said fuse element and said first principal surface of said insulative plate;



- a heat insulative elastic resin coating at least the portion of said fuse element positioned at said insulating space with partial spaces between said fuse element and said elastic resin;
- a first external lead connected to said third conductor layer;
- a second external lead connected to said second terminal;
- an insulating material encapsulating said capacitor body, said insulative plate provided with said first, second and third conductor layers, and said fuse element protected by said elastic resin.

4,720,773
DECORATIVE LIGHT ASSEMBLY
Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199
Filed May 27, 1986, Ser. No. 865,796
Int. Cl.[4] F21V 21/00
U.S. Cl. 362—249 11 Claims



1. A decorative light assembly comprising:
- a long string of lights having a cord extending between light sockets containing bulbs and a plug at an end of said string;
- a collar adapted to surround the trunk of a Christmas tree near the top of the tree and having a circumferential row of mounting devices; and
- said cord engaging said mounting devices at spaced intervals and arranged such that said string of lights has multiple loops draping from said collar between the mounting devices.

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4,720,774

EASILY ASSEMBLED, SMALL STORAGE VOLUME LAMP

Fredric Zarcher, St. Charles, and Daniel A. Wierzbowski, La-Grange, both of Ill., assignors to Vigos Lighting, Compton, Calif.

Filed Mar. 24, 1986, Ser. No. 843,211
Int. Cl.[4] F21V 1/12
U.S. Cl. 362—360 10 Claims



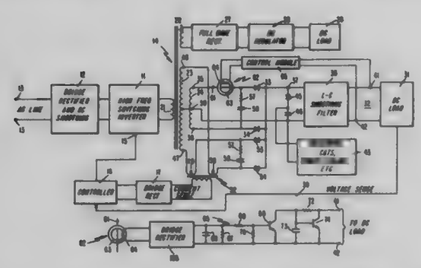
1. A lamp capable of storage in a relatively small space while disassembled and easy rapid assembly comprising:
- a thin base having a plurality of "n" slanted faces defining side faces of a regular, truncated polyhedron;
- a threaded bore in each of said faces;
- a plurality of "n" thin, planar, light transmitting panels each adapted to bear decorative indicia and each having elongated, converging, opposed sides interconnected by a narrow end and a wide end;
- a hole in each of said panels adjacent said narrow end;
- a plurality of "n" threaded fasteners, each having a large head of sufficient size as to be easily rotatable by a human hand, each of said fasteners extending through the hole of an associated panel and into the bore of an associated one of said faces to mount the associated panel thereon so that the sides thereof are relatively close to the adjacent sides of adjacent panels; and
- means for mounting an electrical socket to said base such that the socket opens toward the wide ends of said panels.

4,720,775

INVERTER HAVING SATURATING CURRENT TRANSFORMER CORE FOR MAINTAINING INVERTER CURRENT ABOVE MINIMUM PREDETERMINED LEVEL

Frank Cathell, Descanso, Calif., assignor to Qualidyne Systems, Inc., San Diego, Calif.

Filed Jun. 3, 1986, Ser. No. 870,330
Int. Cl.[4] H02M 3/24
U.S. Cl. 363—15 22 Claims



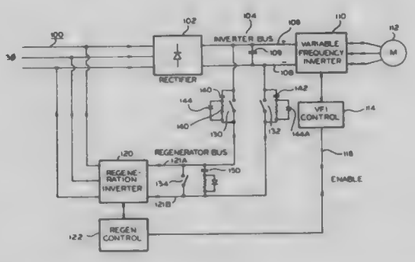
1. A system for supplying plural loads comprising a high frequency switching inverter reasonsive to a DC power supply source, said inverter having an output transformer with plural secondary windings and being of a type that must supply a minimum amount of power to said output transformer for proper operation of all said loads, said plural secondary windings being adapted to be connected to said plural loads, one of said secondary windings being connected to a main output channel, said main output channel including a circuit means responsive to said one secondary winding for supplying current to load terminals of said main channel, means responsive to current in the main channel for maintaining the current in the main channel above a predetermined minimum required for proper operation of the other loads, said last named means including a current transformer in a line of the main channel, the current transformer including a saturating core that saturates in response to a main channel current slightly above said predetermined minimum main channel current and a winding means coupled via the saturating core to the main channel current so that there is substantial magnetic coupling via the core between the main channel current and the winding means while the main channel current amplitude is less than the predetermined minimum channel current and there is slight magnetic coupling between the main channel current and the winding means while the main channel current amplitude is greater than the predetermined minimum channel current, and impedance means connected to be responsive to current in the winding means of the current transformer for loading the main channel so that the main channel current is never less than said predetermined minimum main channel current regardless of whether the impedance between the main channel load terminals causes the main channel current to drive the core into saturation or causes the main channel current to be less than the amplitude which drives the core into saturation.

4,720,776

DC BUS SHORTING APPARATUS AND METHOD FOR POLYPHASE AC INVERTER

John C. Guyeska; J. Michael Liptak, both of Columbia, and Richard W. Roof, Lexington, all of S.C., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 677,709, Dec. 4, 1984, abandoned. This application Jan. 28, 1987, Ser. No. 9,010
Int. Cl.[4] H02M 5/45
U.S. Cl. 363—37 14 Claims



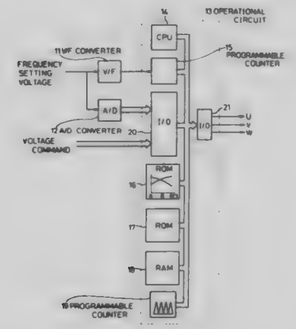
1. An inverter for supplying electric alternating current (AC) to a load, comprising:
- a rectifier energized by an AC power line;
- a first DC bus energized by said rectifier;
- a first plurality of switches for supplying alternating current to said load by switchably connecting said first DC bus to said load, said load capable of supplying electric energy to said first DC bus;
- a second DC bus;
- means for switchably connecting said second DC bus to said first DC bus;
- a second plurality of switches connected to said second DC bus, each one of said second plurality of switches having a conducting state and a nonconducting state, and connected so that electric current may flow from said second DC bus through at least one of said second plurality of switches into said AC power line, whereby said electric energy supplied by said load is directed into said AC power line;
- means for switching each one of said second plurality of switches from said nonconducting state into said conducting state at a predetermined time for each said switch; and,
- means for switchably shorting a positive conductor of said second DC bus to a negative conductor of said second DC bus in order that voltages present on said AC power line reverse bias said switches and thereby assist in extinguishing current flow through said switches.

4,720,777

PULSE WIDTH MODULATION SYSTEM FOR AC MOTOR DRIVE INVERTERS

Osamu Yokoi, Mie, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 14, 1986, Ser. No. 930,530
Claims priority, application Japan, Nov. 18, 1985, 60-258337
Int. Cl.[4] H02M 7/757
U.S. Cl. 363—41 1 Claim



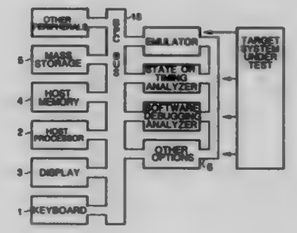
1. A pulse width modulation system for AC motor drive inverters comprising:
- (a) first means for storing data of eight combinations of switching pattern signals representing combinations of on-off conditions of three switching elements;
- (b) second means for storing data of a first time period ratio represented as cos θ corresponding to a phase θ in the range of from 0° to 60° of an electrical angle and data of a second time period ratio represented as cos $(\theta-\pi/3)$;
- (c) third means for producing data of a triangular wave, the cycle of which is 2T where T represents a time period of the electrical angle of 30° or less;
- (d) fourth means for sequentially obtaining data of three kinds of time periods by dividing the cycle T into three intervals at each cycle T by comparing the data of the triangular wave with the data of the first and second time period ratios while the first and second time period ratios change depending on θ in the range from 0° to 60° of the electrical angle; and
- (e) fifth means for operating said fourth means repeatedly so that sequential formation of three predetermined switching patterns for time periods determined by the data of the three kinds of time periods produced sequentially is reiterated at 60° phase increments.

4,720,778

SOFTWARE DEBUGGING ANALYZER

Kevin M. Hall, and Daniel A. Schmelzer, both of Colorado Springs, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Feb. 5, 1985, Ser. No. 699,781
Int. Cl.[4] G06F 11/30, 11/34
U.S. Cl. 364—200 2 Claims



1. Apparatus for acquiring data concerning the execution of software in a target system under test, which comprises:
- static event recognition means, comprising low-level event recognition detectors programmable to produce a first output signal upon the occurrence of a chosen pattern of signals received from the target system under test, and high-level event recognition detectors responsive to said first output signal programmable to produce a second output signal upon the occurrence of a chosen pattern of said first output signals;
- dynamic event recognition means comprising dynamic event recognition detectors programmable to produce a third output signal upon occurrence of a chosen pattern of signals received from the target system under test which represent actuation of a dynamic variable, at least one of said dynamic detectors being reprogrammable during the execution of the target system software to produce a fourth output signal upon the occurrence of a chosen pattern of signals received from the target system which represent access to a dynamically activated variable, and a dynamic sequencer responsive to said third output signal, which reprograms said dynamic detector, said dynamic sequencer also being responsive to said fourth output signal to produce a fifth output signal;
- acquiition memory which receives signals from the target system under test and stores selected signals; and
- a function generator responsive to said second output signals and to said fifth output signals to store data in said acquisition memory.

4,720,779

STORED LOGIC PROGRAM SCANNER FOR A DATA PROCESSOR HAVING INTERNAL PLURAL DATA AND INSTRUCTION STREAMS

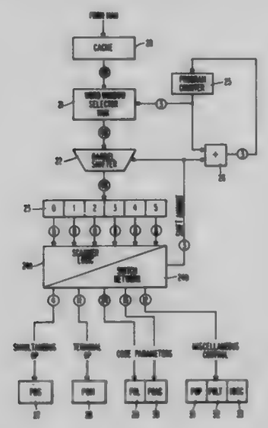
Fred T. Reynard, King of Prussia, Pa., and Richard J. Manco, Riverside, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 28, 1984, Ser. No. 625,612
Int. Cl.[4] G06F 15/16
U.S. Cl. 364—200 6 Claims

1. A data processor coupled to an external memory and having multiple internal data and instruction streams to concurrently activate various units therein in response to a sequential string of object code syllables, said processor comprising:
- an execution unit to execute operator syllables in said object code;
- a reference unit to execute external memory reference syllables in said object code; and
- a program scanner including:
- a scanning register having a plurality of parallel object code

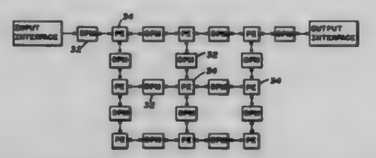
VOL 1086 ISS 3 JA 19 1988 UMI

syllable positions to receive a portion of said string of object code;
a plurality of output registers coupled to said various units of said processor;
a switch network coupling the respective syllable positions of said scanning register to different ones of said output registers; and



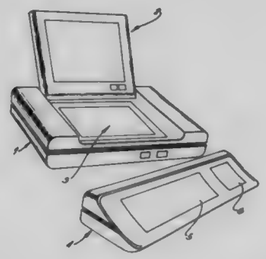
a pluality of storage means, one for each of said syllable positions in said scanning register and coupled to said respective syllable positions to be addressed thereby, said respective storage means being coupled to said switch network and containing control signals indicating which of said syllable positions of said scanning register should be coupled to different ones of said output registers for concurrent transmission of the contents of said syllable positions to said different ones of said output registers.

4,720,780
MEMORY-LINKED WAVEFRONT ARRAY PROCESSOR
Quentin E. Dolecek, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.
Filed Sep. 17, 1985, Ser. No. 777,112
Int. Cl.[4] G06F *15/31, 15/347, 9/38, 13/14*
U.S. Cl. 364—200 **24 Claims**



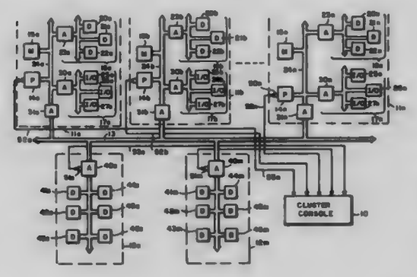
1. A memory linked wavefront array processor comprising:
a linear array of processing elements, each processing element having right and left independent ports,
a means for providing a dedicated data flow path with information storage between each pair of adjacent processing elements and permitting simultaneous data transfer between all adjacent processing elements, said means comprising,
a plurality of dual port memory linking means interspersed in said array between processing elements, each particular memory linking means connected to the right independent port of its left adjacent processing element and the left independent port of its right adjacent processing element for providing a dedicated data flow path with information storage between such adjacent processing elements; and,
a means for providing independent asynchronous local control of each processing element in said linear array, said means comprising,
at least two control flags corresponding with each dual port memory linking means for permitting control of overlapping data flow in that particular dual port memory linking means, and
a local control means within each particular processing element for (a) setting, resetting and testing a control flag corresponding with a dual port memory linking means adjacent to said particular processing element; (b) suspending execution of an instruction by said particular processing element when a tested control flag specified in the instruction is false and, (c) completing the instruction when said flag becomes true, so that the array processor is locally driven to process wavefronts of calculations passing through the array.

4,720,781
DATA PROCESSING TERMINAL HAVING SUPPORT MODULE AND PORTABLE DISPLAY MODULE FOR LIQUID CRYSTAL DISPLAY
William A. Crossland, Harlow; Jack R. Peters, Great Cranfield, Near Dunmow; Harry J. Smith, Sawbridgeworth, all of England, and Frank Astorino, Essex Fells, N.J., assignors to STC PLC, London, England
Filed Nov. 16, 1984, Ser. No. 672,008
Claims priority, application United Kingdom, Nov. 30, 1983, 8331951
Int. Cl.[4] G06F *3/033*
U.S. Cl. 364—200 **11 Claims**



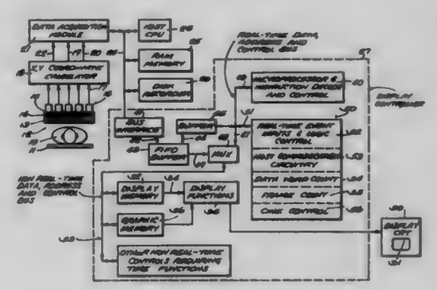
1. A data processing terminal incorporating a visual display unit (VDU), comprising:
(a) a support module, including:
(i) a first central processor,
(ii) a first memory connected to the first central processor for storing application programs for execution by said terminal,
(iii) first control means for communicating commands to the first central processor, and
(iv) an AC power supply for supplying operating power to the support module;
(b) a portable display module, for use independently of the support module, including:
(i) a second central processor,
(ii) second control means for communicating command to the second central processor,
(iii) a smectic liquid crystal flat panel display, comprising said visual display unit, having a plurality of electrically actuated picture elements, which flat panel display is for displaying a whole page of data at a time as a result of actuation of the corresponding picture elements,
(iv) a touch sensitive overlay disposed over the flat panel display and connected to the second central processor for use in manipulating the contents of the display and for entering data when the display module is not attached to the support module,
(v) a second memory connected to the second central processor for storing a number of said pages of data for presentation on said display,
(vi) display interface means for controlling the actuation of said picture elements and thus the display of said data,
(vii) a battery for supplying operating power to the display module; and
(c) means for detachably connecting the display module to the support module to allow the first central processor to control the contents of the display when the display module is connected to the support module.

4,720,782
CONSOLE UNIT FOR CLUSTERED DIGITAL DATA PROCESSING SYSTEM
David Kovalcin, Grafton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jan. 13, 1986, Ser. No. 818,612
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **12 Claims**



1. A cluster console used by an operator to control a plurality of digital system means each having a console port for transmitting system data to said console and for receiving control data from said console, said cluster console comprising input/output means, operator interface means and communications pipe means for coupling data between said input/output means and said operator interface means;
A. said pipe means comprising a plurality of system communications pipe means each associated with one of said digital system means and an operator communications pipe means associated with said operator interface means;
B. said input/output means including:
i. a plurality of port means each for connection to a console port of said digital system means for receiving system data from said and selectively transmitting control data to said digital system means, and
ii. data coupling means connected to all of said port menas for coupling the data from each said port means to the system communications pipe means associated with the digital system means from which the data was received; and
iii. operator data coupling means connected to said operator communications pipe means and all of said port means for receiving data from said operator communications pipe means, determining the digital system means to receive the data and coupling the data to the port means associated with that digital system means; and
C. operator interface means connected to said system communications pipe means and said operator communications pipes and including means for selectively displaying data received from said communication pipe means, said operator interface means further including means for receiving data entered by an operator for transmission to a digital system means and for coupling data to the operator communications pipe means with an identification of the digital system means to receive the data.

4,720,783
PERIPHERAL BUS WITH CONTINUOUS REAL-TIME CONTROL
David A. Roth, Dousman, and Eli BenAric, Fox Point, both of Wis., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 24, 1981, Ser. No. 295,354
Int. Cl.[4] G06F *13/12*
U.S. Cl. 364—200 **1 Claim**



1. A system for maintaining uninterrupted or real-time control and status checking of digital devices that require said control and checking while digital data are being transferred to other digital devices that require only periodic control and checking, comprising:
host processor means and host bus means coupled thereto,
digital data source means coupled to said host bus means,
a multiplexer having first and second input ports and an output port, means for coupling said first input port to said host bus means, said multiplexer responding to commands by coupling and uncoupling said first input port and alternately uncoupling and coupling said second input port and said output port,
control processor means and means for coupling said control processor means to said host bus means for enabling intercommunication between said host processor means and said control processor means and control bus means for coupling said control processor means to said second input port of the multiplexer,
a plurality of digital devices that are designated real-time devices and are coupled to said control bus,
a plurality of digital devices that are designated as non-real-time devices and are coupled to said output port of said multiplexer,
said control processor means responding to a command from said host processor by providing one type of command to which said multiplexer responds by maintaining the coupling between said control bus on said second input port of said multiplexer and said output port and responsive to another command for said host processor by providing another type of command to which said multiplexer responds by uncoupling said control bus on said second input port from said output port of the multiplexer,
said control processor means thereby being able to communicate with and control said real-time devices continuously by way of said control bus and to also commmunicate with said non-real-time devices when said second input port of said multiplexer is coupled to the output port of said multiplexer in response to a command by said control processor means,
and said control processor means thereby being able to continue to communicate with and control said realtime

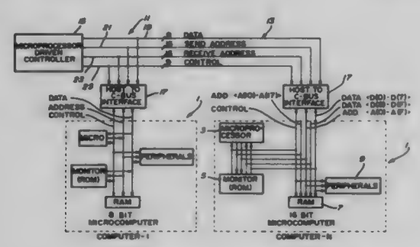
devices by way of said control bus when said multiplexer has been commanded to couple said first input of the multiplexer, to which said host bus is coupled, to the output of the multiplexer for transferring said digital data from said data source to said non-real-time devices.

4,720,784

MULTICOMPUTER NETWORK

Thiruvengadam Radhakrishnan, 1105 Parmesse, Brossard, Quebec, Canada J4W 2C5, and Clifford P. Grossner, 1422 Page St., Chomedey, Laval, Quebec, Canada H7W 3S4

Filed Oct. 18, 1983, Ser. No. 543,065
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **13 Claims**



1. A multicomputer network, comprising a plurality of individual computers where communication patterns between said plurality of individual computers can be altered, for carrying out distributed computing, said distributed computing further comprises decomposing a program into a plurality of different modules that can be concurrently executed by said plurality of computers;

said multicomputer network comprising:

said plurality of individual computers each having a unique address in the network;

an interconnection system for interconnecting said computers to allow different communication patterns;

interface means for connecting said computers to said interconnection system; and

a centralized bus controller for controlling the transmission of messages among said plurality of individual computers in a predetermined sequence and directly from a transmitting computer to a receiving computer;

said bus controller is the sole controller of said interconnection system at all times;

wherein said bus controller comprises:

(A) means for selecting a next computer in said sequence for sending a message;

(B) means for changing said sequence;

(C) means for decoding the address of the receiving computer in said message from said transmitting computer sending said message;

(D) control timing generator means for providing all control signals of said inerconnection system required to effect a message transfer from said transmitting computer to said receiving computer;

(E) a synchronous commmunication interface means for the display of bus status information to an operator to allow for system monitoring;

(F) real time clock means for time stamping each message to aid in error recovery procedures in distributed computing;

(G) processor means for determining the sequence in which means (A) to (F) of the bus controller will be used in the process of controlling the transmission of messages between said plurality of computers;

said interface means comprising a plurality of interface units equal in number to said plurality of said computers;

a separate interface unit being connected to respective separate one of said pluraity of computers, the respective computer to which an interface unit is connected being its host computer;

each said interface unit comprising:

storage means for storing messages to be received and messages to be transmitted by the host computer of the interface unit, said storage means having a status of either empty or full;

means for checking the status of the storage means;

access vector means containing addresses of computers which can communicate with the host computer of the interface unit and addresses of computers with which the host computer of the interface unit can communicate, and the directions of such permitted communications;

where, the access vectors of all the computers of the network together define, and/or redefine, said communication pattern among the computers of the network in order to support different decompositions in distributed computing;

lock means for preventing unauthorized access, by application programs running on the host computer of said interface unit, to said interconnection system;

control register means for setting the mode of the means for checking the status of the storage means;

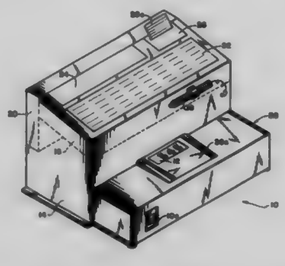
wherein said interconnection system comprises a network bus, each said individual computers comprise an interval system bus, and said processor means of said bus controller comprises a controller system bus.

4,720,785

COMPUTER-ASSISTED SYSTEM FOR TICKETING MANAGEMENT

Bernard Shapiro, Montclair, N.J., assignor to AI Computer Services, Inc., Fresh Meadow, N.Y.

Filed Jun. 19, 1985, Ser. No. 746,624
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—401 **29 Claims**



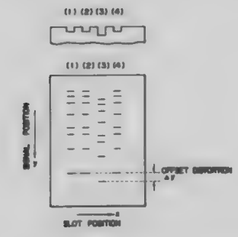
1. A revenue control system for management and pricing of elapsed time events in a parking garage, comprising a multipart pre-printed ticket which can be severed to provide a plurality of ticket portions one of which serves as a claim check which is provided to a customer after check in at the beginning of the elapsed time event and which is re-used during check out at the end of the elapsed time event, said claim check being provided with pre-printed machine readable ticket indicia; scanning means for scanning and inputting said ticket indicia from said claim check each of which uniquely identifies one elapsed time event; data entry means for entering auxiliary input indicia, using said scanning means, each of which further defines one of said elapsed time events; computer means programmed to check-in and validate each pre-printed machine readable ticket indicia on a claim check at the commencement of each elapsed time event, and to check out, meter and price the associated elapsed time event by reading said pre-printed machine readable ticket indicia on said claim check when the customer returns with the claim check at the termination of the elapsed time event, with storage of said ticket and auxiliary input indicia occuring at both check-in and check-out; and printer means for inprinting selected data on each ticket at both the commencement and termination of each elapsed time event, and for printing reports which included selected output data, whereby check-in and check-out can normally be effected only with the claim check which is always in the customer's possession thereby preventing an attendant from checking out before the customer returns with said claim check.

4,720,786

METHOD OF COMPENSATING FOR OFFSET DISTORTION IN ROWS OF ELECTROPHORETIC PATTERNS

Makoto Hara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 21, 1986, Ser. No. 854,381
Claims priority, application Japan, Apr. 19, 1985, 60-85275; Apr. 19, 1985, 60-85276
Int. Cl.[4] C12Q *1/68*; G01N *33/58*
U.S. Cl. 364—413 **25 Claims**



1. A signal processing method for determining base sequence of nucleic acids by subjecting digital signals to signal processing, said digital signals corresponding to an autoradiograph of plural resolved rows which are formed by resolving a mixture of base-specific DNA fragments or base-specific RNA fragments labeled with a radioactive element in one-dimensional direction on a support medium, which comprises steps of:

(1) detecting at least two bands in the lower part of each resolved row and numbering the bands consecutively from the lower end;

(2) obtaining correlation between the the band's number and a resolved distance thereof for each resolved row; and

(3) determining difference in the resolved distance between the resolved rows from the resulting correlation and making correction for resolved position on each row by taking said difference as location deviation of the rows from each other.

4,720,787

METHODS FOR COAGULATION MONITORING

Myatt S. Lipscomb, East Brunswick, N.J., assignor to Ortho Diagnostic Systems Inc., Raritan, N.J. and Innovative Medical Systems Corporation, Warminster, Pa.

Filed Oct. 11, 1985, Ser. No. 786,925
Claims priority, application United Kingdom, Oct. 15, 1984, 8426004
Int. Cl.[4] G01N *33/86*
U.S. Cl. 364—416 **8 Claims**

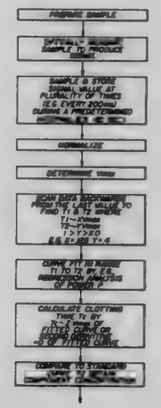
1. In a system for monitoring the presence of a coagulation component in a mixture of coagulation reagent and patient sample by measuring component clotting detection time, and employing a sensor for determining increases in optical density and providing a signal in coordination therewith, a method comprising:

(a) measuring and subsequently storing the values of the signal proportional to the optical property of the mixture at a plurality of times during a predetermined interval after formation of the mixture;

(b) determining the last stored value of the signal at the end of the predetermined interval;

(c) scanning all stored signal values starting with the last stored signal value to determine a time T1 when the measured signal is more than or equal to a fraction X times the last stored signal value;

(d) further scanning the stored signal values starting with the last stored signal value to determine a time T2 when the



measured signal is less than or equal to a fraction Y times the last stored signal value, wherein $1>Y>X>0$;

(e) producing a function relating the stored signal values to the plurality of times by performing a curve fitting analysis of the stored signal values for the times bounded by times T1 and T2; and

(f) determining from the function the time at which the value of the signal is equal to Z times the last stored signal value, wherein $1>Z>0$, whereby the component clotting detection time is determined.

4,720,788

DIAGNOSTIC DENSITOMETER

Tipton L. Goliss, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Continuation of Ser. No. 622,610, Jun. 20, 1984, abandoned. This application May 7, 1987, Ser. No. 49,002
Int. Cl.[4] G06F *15/42*; G01N *33/16*
U.S. Cl. 364—416 **20 Claims**

1. A system for analyzing an electrophoretically separated blood serum sample comprising:

densitometer means for optically scanning a blood serum sample and for providing at least a first visible output, said first visible output including a preliminary determination by the densitometer means of the blood serum protein fractions contained in said sample;

microprocessor means connected to said densitometer means;

said microprocessor means having a data base including at least the normal ranges of the blood serum protein fractions and diagnostic interpretations based upon deviations of one or more of said blood serum sample protein fractions from the normal ranges;

said microprocessor means permitting manual external verification of the first visible output;

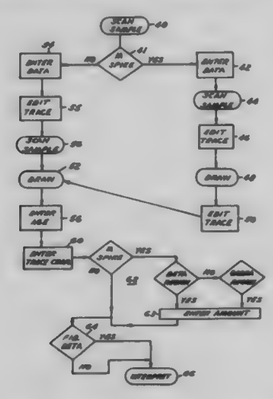
said microprocessor means requiring the manual entry of external data for the sample being scanned, said external data being distinct from any data entered during manual external verification of the first visible output; and

said microprocessor means generating a report based upon a

comparison of the verified visible output and the manually entered external data with data in the data base.

15. In a method of scanning an electrophoretically prepared blood sample in a densitometer and providing at least a first visible output trace which is an analog representation of the optical density of the scanned blood sample including indicating on said first visible output trace a plurality of valleys, the improvement comprising:

providing a digital computer with a data base;



verifying said first visible output trace so that exactly six valleys are indicated; manually providing to said computer external data indicating the presence or absence of an M-spike, said external data being distinct from any data entered during the verifying step; and

comparing in said digital computer said verified first visible output trace and said external data with data in said data base to provide a medical diagnosis.

4,720,789

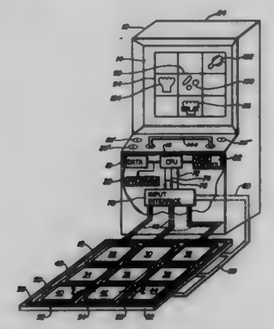
VIDEO EXERCISE OR GAME FLOOR CONTROLLER WITH POSITION INDICATING FOOT PADS

Roger D. Hector, Saratoga; Nolan K. Bushnell, Woodside; Howard Delman, San Jose; Edward Rotberg, Los Altos, and Jon Kinsting, San Jose, all of Calif., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Oct. 31, 1985, Ser. No. 794,161

Int. Cl.[4] G06F *15/44*; A63B *23/04*

U.S. Cl. 364—410 **27 Claims**



1. A video game apparatus comprising:

a video display;

processor means for controlling said video display;

a program memory, containing instructions to operate the apparatus, operatively connected to said processor means;

an input interface operatively connected to said processor means; and

a floor controller including a plurality of weight sensitive pads, operatively connected to said input interface, for generating location signals representing the relative location of at least one of a game operator's feet wherein said processor means responds to said location signals to control said video game.

19. A video exercise apparatus comprising:

a video display;

processor means for controlling said video display;

program memory, containing instructions to operate the exercise apparatus as an exercise device, operatively connected to said processor means;

a floor controller including a plurality of weight sensitive pads, responsive to the location of an operator's feet, operatively connected to said processor means for generating location signals representing the location of an operator's feet; and

wherein said processor means generates displays on said video display in response to said location signals and said instructions effective to designate on said display positions for the operators feet in order to affect an exercise program for the operator.

4,720,790

APPARATUS FOR CONTROLLING STEER ANGLE OF REAR WHEELS OF VEHICLE

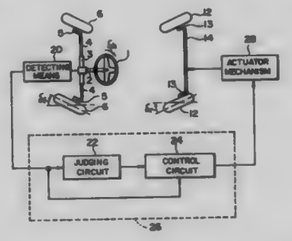
Kazuo Miki, Aichi; Kazumasa Sumi; Katsuhiko Fukui, both of Nagoya; Yasutaka Hayashi, Seto, and Michio Ishiguro, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 15, 1985, Ser. No. 734,332

Claims priority, application Japan, May 21, 1984, 59-102202; Aug. 2, 1984, 59-163428

Int. Cl.[4] B62D *5/06*

U.S. Cl. 364—424 **35 Claims**



1. A rear wheel steer angle controlling apparatus for automatically controlling a steer angle of rear wheels of a vehicle by controlling an actuator mechanism for generating the steer angle of the rear wheels in response to an operation of a steering wheel for generating a steer angle of front wheels of said vehicle, said apparatus comprising:

a steering wheel displacement detecting means for detecting a steering wheel displacement and for generating a steering wheel displacement signal representing the steering wheel displacement;

a judging means for judging a rotation speed of said steering wheel from said steering wheel displacement signal; and

a controlling means for controlling said actuator mechanism in accordance with a result of judgement by said judging means such that:

(a) said steer angle of the rear wheels is generated in the direction counter to a direction of steer angle of the front wheels when said steering wheel is operated at a high rotation speed; and

(b) said steer angle of the rear wheels is generated in the same direction as the steer angle of the front wheels when said steering wheel is operated at a low rotation speed.

4,720,791

METHOD OF PROCESSING SIGNAL OF A STEERING ANGLE SENSOR

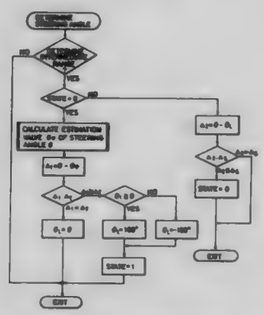
Toshihiko Daido, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jun. 26, 1986, Ser. No. 878,820

Claims priority, application Japan, May 9, 1984, 59-93535

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—434 **5 Claims**



1. A method for generating a steering angle signal for a motor vehicle by processing a signal produced by a steering angle sensor to eliminate erroneous steering angle signal values caused by a floating state of a potentiometer included in the sensor to output the steering angle signal value corresponding to the rotational angle of a rotatable steering handle shaft where the erroneous signal values occur at specific angular positions of the handle shaft when the potentiometer is in the floating state, the method comprising the steps of:

determining the current steering angle signal value outputted by the potentiometer;

determining if the rotational angle of the handle shaft is within a selected range of rotational angles;

calculating an estimated steering angle signal value if the rotational angle of the handle shaft is determined to be within said selected range of rotational angles;

calculating a first difference value corresponding to the difference between said current steering angle signal value and said estimated steering angle signal value;

setting the steering angle signal to the current steering angle signal value if said first difference value is less than a predetermined difference value; and

setting the steering angle signal to a predetermined angle signal value if said first difference value is greater than or equal to said predetermined difference value whereby the steering angle signal is set to the current steering angle signal value if the potentiometer is not in the floating state and is set to said predetermined angle signal value if the potentiometer is in the floating state.

4,720,792

METHOD AND APPARATUS FOR CONTROLLING OPERATION OF A THROTTLE

Hitoshi Kasai, Kawasaki, and Makoto Uriuhara, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki and Isuzu Motors Limited, Tokyo, both of, Japan

Filed Nov. 26, 1984, Ser. No. 674,833

Int. Cl.[4] B60K *41/08*; G06F *15/50*; G05D *17/02*

U.S. Cl. 364—424.1 **11 Claims**

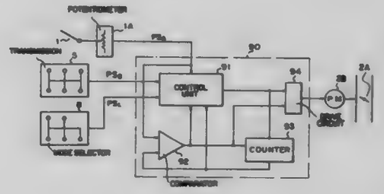
10. A method for operating a throttle valve in a vehicle having an automatic transmission system using a microcomputer, comprising the steps of:

(a) detecting operating data for the vehicle;

(b) comparing the operating data detected in step (a) with contents of a predetermined transmission map and a predetermined throttle valve operation speed map;

(c) determining a throttle valve operating speed in accordance with the comparison of the operating data with the contents of the transmission map and the throttle valve operation speed map; and

(d) controlling the operation of the throttle valve in accordance with the throttle valve operating speed determined in step (c).



11. An apparatus for controlling the operation of a throttle valve in a vehicle having an automatic transmission system, comprising:

sensor means for detecting operating data for the vehicle; and

microcomputer means for controlling the throttle valve by comparing the operating data with data from a predetermined transmission map and a predetermined throttle valve operation speed map, determining a throttle valve operating speed based on the comparison of the operating data with the transmission map and the throttle valve operation speed map, and controlling the operation of the throttle valve in accordance with the throttle valve operating speed.

4,720,793

METHOD AND APPARATUS FOR CONTROLLING DRIVE FORCE OF A VEHICLE EQUIPPED WITH CONTINUOUSLY VARIABLE TRANSMISSION

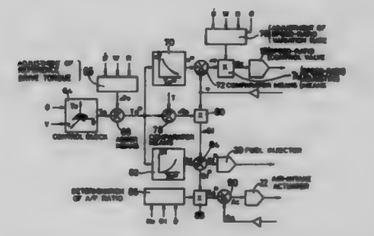
Tomoyuki Watanabe; Takashi Shigemoto; Satuo Tokoro, and Takashi Hayashi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 24, 1985, Ser. No. 779,679

Claims priority, application Japan, Sep. 25, 1984, 59-199879

Int. Cl.[4] B60K *41/18*; F16H *9/12*; G05D *15/01*

U.S. Cl. 364—424.1 **11 Claims**



2. An apparatus for controlling an actual drive force of an automotive vehicle equipped with a continuously variable transmission for transmitting an output of an engine to drive wheels, comprising:

required-output detecting means for detecting a currently required output of the vehicle;
speed detecting means for detecting a current speed of the vehicle;
first determining means for determining a target drive force of the vehicle based on the detected currently required output of the vehicle and the detected current speed of the vehicle, and according to a predetermined relation among said target drive force, said currently required output and said current speed of the vehicle;
second determining means for determining an actual drive force of the vehicle;
adjusting means for comparing the determined target drive force of the vehicle with the determined actual drive force, and controlling at least one of an output of the engine and a speed ratio of the transmission, so that the actual drive force of the vehicle coincides with said determined target drive force.

4,720,794

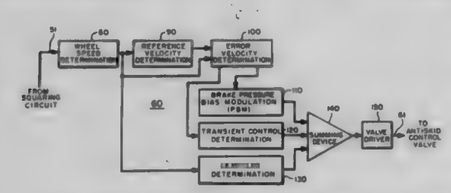
APPARATUS FOR GENERATING A REFERENCE SIGNAL IN A BRAKE CONTROL SYSTEM

Thomas Skarvada, Granada Hills, Calif., assignor to Crane Co., Chicago, Ill.

Continuation-in-part of Ser. No. 363,476, Mar. 30, 1982, abandoned, which is a continuation of Ser. No. 060,573, Jul. 25, 1979, Pat. No. 4,323,969. This application Jul. 1, 1982, Ser. No. 394,130

Int. Cl.⁴ G06F *15/20*; B60T *8/08*

U.S. Cl. 364—426 **31 Claims**



1. An apparatus for generating a reference signal representative of a reference braking condition in a brake control system for a braked wheel, said brake control system including means for generating a wheel signal having a plurality of values which vary in time and are each representative of a respective measurement of a braking condition of the braked wheel at a separate respective time period, said apparatus comprising:
means for determining the value of the wheel signal corresponding to a maximum braking condition from a plurality of values of the wheel signal occurring during a first time interval;
means for generating a conditioned wheel signal indicative of the value corresponding to the maximum braking condition; and
means for generating a reference signal representative of a reference braking condition as a function of the conditioned wheel signal.

4,720,795

SEWING MACHINE INPUT DEVICE HAVING SCALING FUNCTION

Tomoaki Kinoshita; Kunio Takano; Masanori Nukushina, and Yoichi Okiyama, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

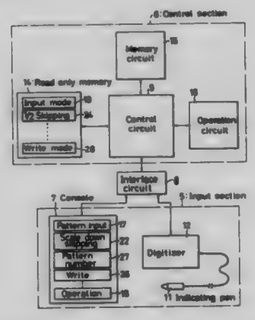
Filed Jul. 30, 1985, Ser. No. 760,610

Claims priority, application Japan, Jul. 31, 1984, 59-118125[U]

Int. Cl.⁴ G06F *15/46*; D05B *19/00*

U.S. Cl. 364—470 **7 Claims**

7. In an electronic inputting device, a method for inputting and storing sewing machine stitching patterns comprising the steps of:
(a) electronically signaling a control circuit that a stitching pattern skip portion will follow in a scaled-down mode with reduced skip portion values;



(b) reading stitching pattern input coordinates from a digitizer in a scaled-down mode; and
(c) converting the scaled-down input coordinates to scaled-up values to recover the reduced values.

4,720,796

TOOL INTERFERENCE CHECKING METHOD

Hajimu Kishi; Masaki Seki, and Takashi Takegahara, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

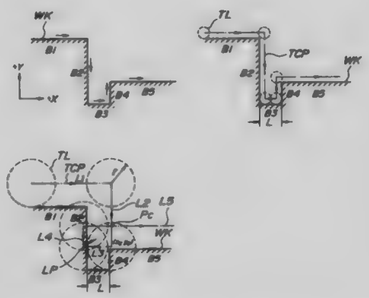
PCT No. PCT/JP84/00053, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04479, PCT Pub. Date Nov. 22, 1984

PCT Filed Feb. 20, 1984, Ser. No. 694,387

Claims priority, application Japan, May 17, 1983, 58-86468

Int. Cl.⁴ G05B *19/00*

U.S. Cl. 364—474 **2 Claims**



1. A tool interference checking method for checking whether a tool will interfere with a workpiece when the tool is transported relative to the workpiece to cut the workpiece on the basis of NC data including a number of blocks, said method comprising the steps of:
(a) obtaining a tool travelling direction indicated by the NC data in each of the blocks;
(b) obtaining a tool offset path by executing tool offset processing based on a diameter of the tool and each block of the NC data;

(c) obtaining a tool travelling direction in each block of the tool offset path;
(d) comparing, for each and every block, the tool travelling direction indicated by the NC data and the tool travelling direction indicated by the tool offset path;
(e) determining that the tool will not interfere with the workpiece when the directions compared in step (d) agree in all blocks;
(f) determining that the tool will interfere with the workpiece if the directions compared in step (d) do not agree in at least one block;
(g) obtaining, when the tool will interfere with the workpiece at an intersection of two segments of the tool offset path, a loop which starts from and ends at the intersection and includes a segment specified by the block in which the tool travelling directions are in non-agreement; and
(h) correcting said NC data so as to eliminate said loop.

4,720,797

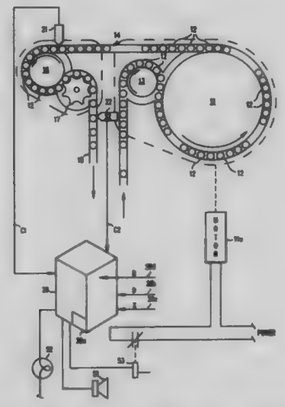
SYSTEM FOR DETECTING JAMS AND OTHER MALFUNCTIONS IN CONTAINER PROCESSING EQUIPMENT

John Somserfield, Los Gatos, and Raymond E. Babb, Fremont, both of Calif., assignors to Peco Controls Corporation, Milpitas, Calif.

Filed May 17, 1985, Ser. No. 735,495

Int. Cl.⁴ B65G *43/00*

U.S. Cl. 364—478 **7 Claims**



1. A method of detecting a malfunction in a container processing system in which said containers sequentially enter a process station and are discharged therefrom after being processed, said process station having a capacity for a first number of said containers at any one time, said method comprising the steps of:
counting the number of said containers entering said process station,
counting the number of normal ones of said containers discharged from said process station,
comparing the counts of said entering containers and said discharged normal containers,
compensating said compared counts for the presence of said first number of containers normally within said process station,
additionally compensating said compared counts for a tolerable level of a second number of containers within said process station which are not countable as normal when they are discharged from said process station,
utilizing the compensated compared counts to signal an excess of entering containers over discharged containers indicative of a malfunction in said process station; and
automatically stopping said processing system upon detection of said malfunction.

4,720,798

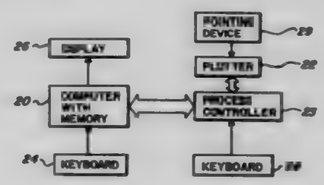
PROCESS FOR USE IN RAPIDLY PRODUCING PRINTED CIRCUIT BOARDS USING A COMPUTER CONTROLLED PLOTTER

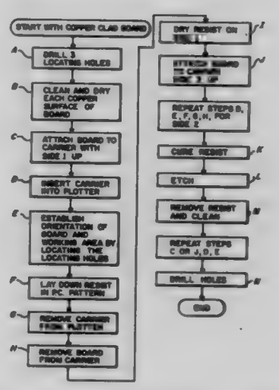
Ronald G. Reed, and John T. Rasper, both of Colorado Springs, Colo., assignors to ProtoCAD, Inc., Colorado Springs, Colo.

Filed Apr. 16, 1985, Ser. No. 725,817

Int. Cl.⁴ B05C *5/02*

U.S. Cl. 364—489 **55 Claims**





1. A process for use in the production of a printed circuit board utilizing a computer and a computer controlled plotter, comprising:
retaining a conductive sheet-clad board in the plotter while performing the following activities on the conductive sheet,
applying resist by capillary effect directly to the conductive sheet from a marking device manipulated by the plotter, and
creating a predetermined printed circuit pattern of resist on the conductive sheet by controlling the plotter to move the marking device relative to a stationary reference and relative to the board.

4,720,799

HYDROLOGIC DATA ACQUISITION SYSTEM

Stanley D. Wolthe, and Peter J. Dillon, both of North Terrace, Adelaide, Australia (5000)

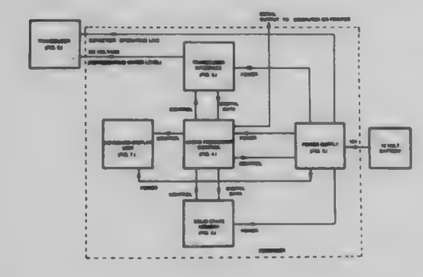
Filed Jun. 19, 1985, Ser. No. 746,603

Int. Cl.⁴ G01F *23/00*; G06F *15/20*

U.S. Cl. 364—509 **7 Claims**

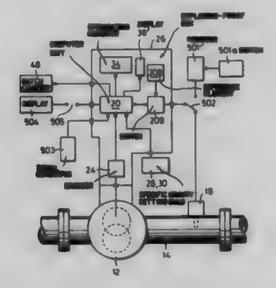
1. A means for recording fluid levels by recording electrical signals comprising:
a transducer;
a transducer interface including a potentiometer and a mea-

ter pulley on and coupled to the potentiometer, said transducer interface providing a signal that indicates an angular position of the potentiometer;
a float for identifying a fluid level position;
a tape having one end attached to the float and extending over the master pulley to a counterweight, means for attaching the other end of the tape to the counterweight;
an impactor proximate said tape adapted to provide impact



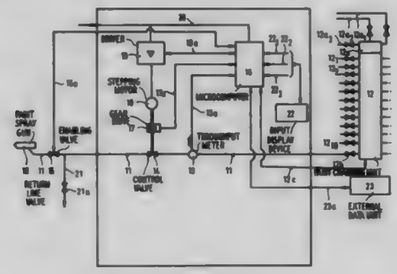
to the tape of sufficient magnitude that resultant movement and oscillation of the tape will overcome static friction in the transducer interface;
a microprocessor that, when energized at preset system time intervals, interrogates said transducer interface, and transfers said dignal from said transducer interface into a solid state data memory; and
a read-out means for reading and displaying said signal from said solid state data memory.

4,720,800
DEVICE FOR MEASURING LIQUID FLOW VOLUME WITH TEMPERATURE COMPENSATING
Takashi Suzuki, and Yasushi Saisu, both of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 631,026, Jul. 16, 1984, abandoned. This application Jun. 17, 1987, Ser. No. 65,685
Claims priority, application Japan, Jul. 20, 1983, 58-130918; Jul. 20, 1983, 58-130919; Aug. 25, 1983, 58-154118; Aug. 26, 1983, 58-154748
Int. Cl.⁴ G01F *1/76, 15/02*
U.S. Cl. 364—510 **2 Claims**



1. An apparatus for measuring the volume of a flowing liquid while compensating for temperature variations in the liquid comprising:
a flow meter having a flow pulse generator for generating a flow pulse signal;
a resistance-type temperature sensing means for continuously detecting the temperature of said liquid and generating an analog temperature signal thereof;
a resistance-type reference means for generating an analog reference signal;
an A/D converter for converting said analog signal from said temperature sensing means or said reference means to a digital output signal;
a switch means for selectively connecting either said temperature sensing means or said reference means to said A/D converter;
an input-output unit connected to said A/D converter, said input-output unit also being connected to said flow pulse generator for receiving said generator flow pulse signal;
means connected to said input-output unit for setting a specific gravity value of the liquid;
displaying means connected to said input-output unit for displaying a calculated volume of liquid; and
computing means connected to said input-output unit comprising:
a read-only memory for storing a first series of volume coefficients for the liquid based on different specific gravities and temperatures, the interval between adjacent volume coefficients for the specific gravities and adjacent volume coefficients for the temperatures being larger than the interval between each two specific gravities to be set and between each two temperatures to be measured;
means for reading the specific gravity value set in by said specific gravity setting means upon receipt of a starting signal, means for calculating a second series of volume coefficients for the set specific gravity value using said first series of volume coefficients stored in the read-only memory, and random access memory means for memorizing said second series of calculated volume coefficients;
means for applying an operating signal to said switch means to connect said reference means with said A/D converter, means for calculating a correction factor for said A/D converter using said reference signal from said reference means, means for calculating a corrected temperature using said correction factor and said temperature signal from said temperature sensing means through said A/D converter, means for calculating a corrected volume coefficient at the corrected temperature using selected data from said second series of calculated volume coefficients memorized in said random access memory means, said random access memory means also memorizing said calculated corrected volume coefficient;
calculating means for correcting said flow pulse signal by adjusting the pulses representing the volume of liquid using said flow pulse signal from said flow pulse generator and the corresponding calculated corrected volume coefficient memorized in said random access memory means, said calculating means providing a unit-pulse calculated volume based on a unit pulse from said flow pulse generator, said calculating means being operable to determine if said unit-pulse calculated volume exceeds a preset unit volume so as to provide a residue fractional value representing the difference between said unit-pulse calculated volume and said preset unit volume; said residue fraction value being temporarily stored in the random access memory means so that said residue fraction value will be added to subsequent unit-pulse calculated volumes based on subsequent unit pulses from said flow pulse generator; and
means for forwarding pulses representing said preset unit volume to said displaying means when the unit-pulse calculated volume and subsequent unit-pulse calculated volumes exceed said preset unit volume.

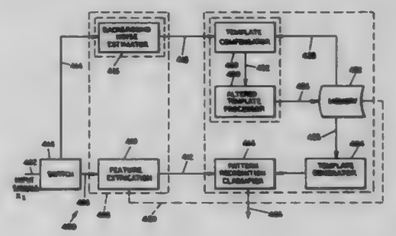
4,720,801
METHOD AND APPARATUS FOR SETTING A THROUGHPUT QUANTITY CONTROL VALVE OF A PAINT SPRAYGUN
Hans-Joachim Boll, Markdorf, Fed. Rep. of Germany, assignor to J. Wagner GmbH, Fed. Rep. of Germany
Filed Jan. 11, 1985, Ser. No. 743,639
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1984, 3413094
Int. Cl.⁴ B05B *12/14*; G06F *15/46*
U.S. Cl. 364—510 **8 Claims**



1. A method of setting a quantity of paint throughput of a motor-driven throughput control value of a paint spraygun, comprising the steps of:
storing a plurality of throughput quantity values as an approximation table representing electrical valve motor acutation signals;
selecting a desired throughput quantity value and applying a corresponding electrical valve motor actuation signal to the motor-driven throughput control valve to set the same approximately as a reference value;
continuously measuring the throughput quantity and producing corresponding actual values;
comparing the reference and actual values and continuously readjusting the motor-driven throughput control valve to the reference value by selectively applying the electrical valve motor actuation signals, representing the stored throughput quantity value, to the motor-driven throughput control valve; and
repeating the steps of selecting, continuously measuring and producing corresponding actual values, comparing the reference and actual values and continuously readjusting the motor-driven throughput control valve in response to each selection of a desired throughput quantity value.

3. Apparatus for setting a quantity of paint throughput of a paint spraying system which has frequent changes of throughput quantities and paints, comprising:
a paint spraygun, a paint changing unit and a paint delivery line connecting said paint spraygun to said paint changing unit, said paint changing unit comprising means for delivering a plurality of different paints;
an enabling valve and a throughput control valve in said paint delivery line;
motor means connected to said throughput control valve and operable to set the quantity of paint flowing through said throughput control valve;
a throughput meter in said paint delivery line operable to produce first electrical signals representing actual paint throughput; and
control means connected to said throughput meter and to said motor means, said control means comprising memory means storing an approximation table of throughput values for the different paints, comparison means for comparing the values represented by said first electrical signals with a corresponding reference value, said control means operable to produce second electrical signals to operate said motor means to adjust said throughput control valve to the corresponding reference value.

4,720,802
NOISE COMPENSATION ARRANGEMENT
John N. Dassoulakis, Arlington Heights, Ill.; Michael E. Ilikainen, Caledonia, Mich.; Michael D. Olinger, Grand Rapids, Mich., and Thomas E. Perfitt, Wyoming, Mich., assignors to Lear Siegler, Santa Monica, Calif.
Filed Jul. 26, 1983, Ser. No. 517,462
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 364—513.5 **27 Claims**

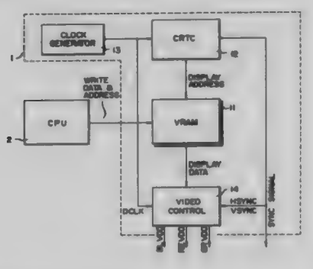


1. In a recognition system having input means for receiving unknown utterances spoken by an operator and generating feature signals representative thereof, storage means for storing sets of reference signals representative of a vocabulary of reference utterances, and comparator means for comparing the feature signals with the sets of reference signals, the improvement which comprises a noise compensation arrangement, the arrangement comprising:
noise estimator means connected to the input means for generating noise estimation signals representative of acoustical background noise occurring during the speaking of the unknown utterances; and
compensation means jointly responsive to the noise estimation signals and the sets of reference signals for altering the sets of reference signals in accordance with the acoustical background noise prior in time to comparison of the reference signals with the feature signals.

4,720,803
DISPLAY CONTROL APPARATUS FOR PERFORMING MULTICOLOR DISPLAY BY TILING DISPLAY
Takatoshi Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 608,193, May 8, 1984, abandoned. This application Apr. 9, 1986, Ser. No. 850,086
Claims priority, application Japan, May 13, 1983, 58-82547; May 13, 1983, 58-82548
Int. Cl.⁴ G06F *15/40*; G09G *1/14, 1/28*
U.S. Cl. 364—521 **5 Claims**

1. A display control apparatus for displaying more than 2^n colors on a screen of a raster scan type color display unit having only n binary color-element signal inputs, where n is an integer larger than 1, comprising:
memory means for storing luminance data corresponding to each of n color elements, to specify respective colors for each of a plurality of dots on the screen, each dot including a plurality of pixels;
clock signal generating means for generating a clock signal synchronized with a display of the dots on the screen, and within one clock period of which said plurality of pixels in each dot are displayed on the screen;
luminance data read out means for supplying address signals to said memory means and for reading out the luminance data of the respective color elements in response to the clock signal; and

video signal controlling means for generating at least three states of a binary color-element signal for each of n color elements in one-dot display period in response to the luminance data for the color element for each dot, and for transmitting the binary color-element signals to the corresponding inputs of the display unit, said states for each



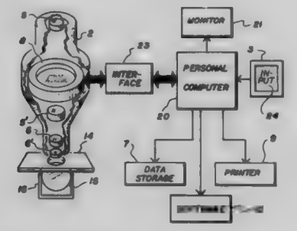
color element including a first state wherein the color-element signal is absent for all pixels in one dot, a second state wherein the binary color-element signal is generated at intervals of at least one-pixel display in the one dot-display period, and third state wherein the binary color element signal is generated for all pixels in one dot.

4,720,804

ELECTRICALLY ADDRESSABLE OPTO-ELECTRONIC INDICATOR FOR MAKING DYNAMIC EVALUATIONS OF MICROSCOPIC OR LARGER SUBJECTS

Sidney D. Moore, 760 Mansfield Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 638,896, Aug. 8, 1984, abandoned. This application Oct. 3, 1986, Ser. No. 915,145
Int. Cl.[4] G02B *21/00*; G06F *15/42*
U.S. Cl. 364—525 18 Claims



1. An optical instrument for examining and evaluating a specimen wherein the instrument has an optical axis, comprising:

means mounted on said optical axis of the instrument for producing an image of the specimen on a plane of focus disposed on said optical axis;

opto-electronic indicator means mounted within the instrument on said optical axis for generating a multiplicity of electrically-addressable indicia which are visible on said plane of focus on the optical axis of the instrument for simultaneous viewing with the image of the specimen; and

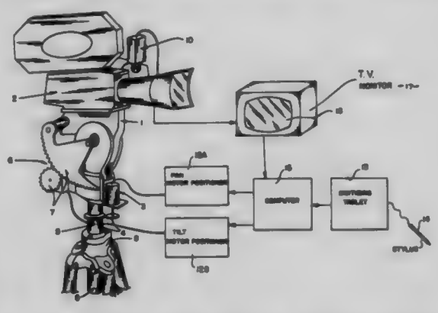
processor means for selectively addressing each of said indicia to cause said indicia to become visible on said plane of focus for viewing thereon with the specimen and for processing the addresses of the selected indicia to define a relationship between the selected indica and the specimen.

4,720,805

COMPUTERIZED CONTROL SYSTEM FOR THE PAN AND TILT FUNCTIONS OF A MOTORIZED CAMERA HEAD

Scott R. Vye, 133 Wadsworth Ave., #3, Santa Monica, Calif. 90405

Filed Dec. 10, 1985, Ser. No. 807,175
Int. Cl.[4] G06F *15/00*; H04N *5/00*
U.S. Cl. 364—525 5 Claims



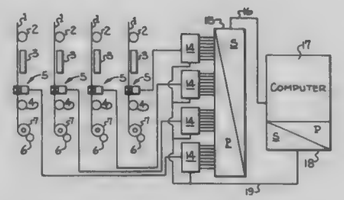
1. A computerized control system for panning and tilting a motorized camera head upon which a television, motion picture or other type of camera, is mounted, for recording a particular scene, said motorized camera head including pan and tilt drive motors, and said system comprising: transparent means including a viewing surface for viewing the actual scene being recorded and for generating digital signals representative of the required panning and tilting operations of the camera head that are required in response to manual movements across said viewing surface thereof; and a computer connected to said generating means and responsive to the digital signals therefrom for generating pan-and-tilt control signals for the motorized camera head.

4,720,806

METHOD AND APPARAUS FOR CENTRALLY COLLECTING MEASURED VALUES

Heinz Schippers; Gerhard Martens, both of Remscheid, and Karl-Werner Frolich, Wuppertal-Langerfeld, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,667
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412115; May 30, 1984, 3420163; Aug. 17, 1984, 3430223; Mar. 1, 1985, 3507178
Int. Cl.[4] G06G *7/48*
U.S. Cl. 364—551 18 Claims



1. A method of centrally collecting measured values of a variable parameter from each of a plurality of monitored work stations, and wherein the parameter is infinitely variable within a given range of variation, and comprising the steps of

continuously monitoring the value of the variable parameter at each of the monitored work stations, and generating a continuous output signal at each station which is a function of the value of the variable parameter,

storing at least the minimum and maximum values of the output signal from each work station and which occur during each of a sequence of short time intervals of predetermined duration, and

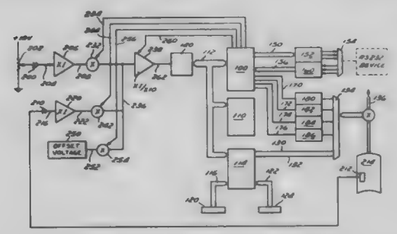
scanning and collecting the stored values for each of the work stations at the end of each of said time intervals.

4,720,807

ADAPTIVE PRESSURE CONTROL SYSTEM

Robert J. Ferran, LaJolla, Calif.; Anthony J. Tessicini, Norwell, and Timothy R. Brown, Westboro, both of Mass., assignors to Vacuum General, Inc., San Diego, Calif.

Filed May 20, 1985, Ser. No. 736,224
Int. Cl.[4] F16K *31/12*; G01N *7/00, 9/00*; G06G *7/57*
U.S. Cl. 364—558 14 Claims



1. In a system having a means for generating flow in a fluid (which fluid has a pressure and a flow rate) and a means for regulating the pressure of the fluid by varying the rate of flow of the fluid, a method of controlling the pressure of the fluid comprising periodically repeating the following steps:

measuring the pressure of the fluid;

recording the measured pressure;

comparing the measured pressure of the fluid with a desired pressure of the fluid (wherein there is a difference between the measured pressure and the desired pressure which difference may be a positive or negative number or zero) to determine the difference between the measured pressure and the desired pressure (wherein said measured pressure is changing at a rate and the rate of change of said measured pressure is itself changing at a rate);

for each repetition of said measuring step for which there was a previous measuring step, determining the rate of change of the measured pressure since the previous measuring step;

calculating a first time required to change from the measured pressure to the desired pressure if the rate of change of the pressure remains constant;

determining the rate at which the rate of change of the pressure is changing;

calculating a second time required for the rate of change of the pressure to become zero;

comparing the first time required with the second time required;

selecting one of the options of increasing the rate of flow, decreasing the rate of flow, and maintaining the current rate of flow depending upon the results of the step of comparing the first and second time; and

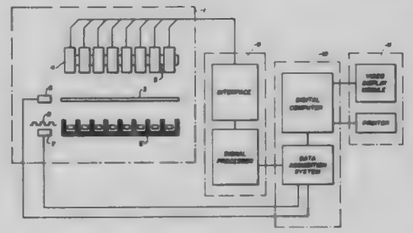
adjusting the means for regulating the pressure so as to vary the rate of flow in accordance with the option selected in said selecting step.

4,720,808

METHOD AND APPARATUS FOR MEASURING SHEET PRODUCTS

Josef Repach, 518-401 Athabasca Avenue, Fort McMurray, Alberta, Canada (T9J 1H2)

Filed May 15, 1985, Ser. No. 734,106
Int. Cl.[4] G01G *19/40*
U.S. Cl. 364—568 5 Claims



1. A method of measuring the weight per unit area, density and thickness of a moving sheet by applying the techniques of penetrating radiometry the method comprising:

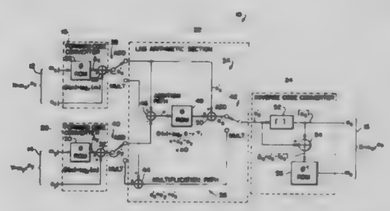
passing the sheet between a stationary linear array of detectors to take a plurality of simultaneous spot readings transverse to the direction of motion of the sheet, said stationary linear array of detectors taking readings in regular increments of time as the sheet advances longitudinally, said regular increments of time being synchronized by a sequence of pulses generated by a linear encoder and being determined by the resolution of said linear encoder, said simultaneous transverse spot readings being taken consecutively as the sheet advances to give a grid-like pattern of spot measurements covering the entire area of the advancing sheet and converting said spot measurements to electronic signals, processing those signals by a data acquisition system, interfaced with a computer adapted to generate data for the physical presentation of the results and presenting the selected measured values of density and thickness in the form of a contour map.

4,720,809

HYBRID FLOATING POINT/LOGARITHMIC NUMBER SYSTEM ARITHMETIC PROCESSOR

Fred J. Taylor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Sep. 21, 1984, Ser. No. 652,628
Int. Cl.[4] G06F *7/38, 5/00*
U.S. Cl. 364—748 8 Claims



1. A processor for performing an arithmetic operation on a pair of input operands in floating point format each having an integer exponent part e and a mantissa part m to provide an output in floating point format having an integer exponent part e_s and a mantissa part m_s, said processor comprising:

an input means for converting the floating point input oper-

ands to intermediate operands in logarithmic number system format, said input means including:

an input mapping device for converting the mantisa m of a floating point input operand to an exponent Δ, said input mapping device satisfying the function

$$\phi(m)=\Delta=\log_r(m),$$

where r is the radix, and

an adder for summing the exponent Δ with the exponent e of the floating point input operand to provide an exponent e' representing the operand in logarithmic number system format;

a logarithmic number system arithmetic means for performing an arithmetic operation on the logarithmic number system intermediate operands and providing an intermediate output in logarithmic number system format represented by an exponent e'$_3$; and

an output means for converting the logarithmic number system intermediate output to the output in floating point format.

4,720,810

ELECTRONIC CONTROL ARRANGEMENT FOR CONTROLLING A PLURALITY OF OUTPUTS IN ACCORDANCE WITH THE ELECTRICAL STATE OF A PLURALITY OF INPUTS

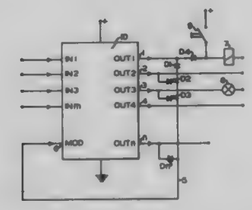
Jurgen Binarsch, Haste, and Dietmar Meyer, Barsinghausen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,406

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223383

Int. Cl.^{4} G06F *15/20*

U.S. Cl. 364—900 **3 Claims**



1. An electronic control arrangement having a plurality of inputs and a plurality of outputs whereby the condition of the outputs is controlled in accordance with the electrical state of the inputs and whereby the electrical state of the outputs controls the electrical state of certain external electrical elements comprising,

(a) a control circuit for sequentially interrogating the plurality of outputs in one-by-one serial fashion during an initial start-up test period,

(b) the sequentially interrogated outputs are coupled to a special-function line,

(c) the special-function line is connected to an additional input of the control circuit for receiving the sequentially interrogated outputs, and

(d) the control circuit selects an appropriate one of several stored programs in accordance with the electrical states of the sequentially interrogated outputs delivered by the output of the special-function line to the additional input of the control circuit.

4,720,811

MICROPROCESSOR CAPABLE OF STOPPING ITS OPERATION AT ANY CYCLE TIME

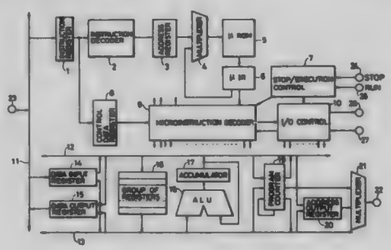
Nobuo Yamaguchi, Higashiyamato, Japan; Kunio Uchiyama, Pittsburgh, Pa.; Haruo Koizumi, Tokyo, Japan; Yoshimune Hagiwara, Hachioji, Japan, and Tadahiko Nishimukai, Sagamihara, Japan, assignors to Hitachi, Ltd., Japan

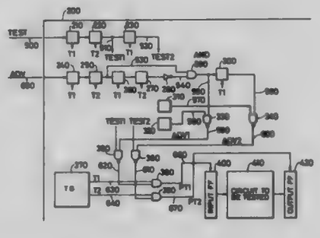
Filed Apr. 25, 1986, Ser. No. 855,942

Claims priority, application Japan, Apr. 26, 1985, 60-88503; Jul. 1, 1985, 60-144254

Int. Cl.^{4} G06F *9/00*

U.S. Cl. 364—900 **2 Claims**





1. A microprocessor comprising:

(1) a logic circuit for effecting a desired logic operation;

(2) a timing pulse generator circuit for generating at least a first timing pulse and a second timing pulse;

(3) an input flip-flop circuit, an output of which is connected to an input of said logic circuit;

(4) an output flip-flop circuit, an input of which is connected to an output of said logic circuit;

(5) means coupled to said timing pulse generator circuit for controlling supply an non-supply of said first timing pulse and said second timing pulse to said input flip-flop circuit and said output flip-flop circuit, respectively, in response to a first input signal for indicating a test mode and a second input signal for indicating a clock advancing operation;

(6) first memory means, an output of which is connected to control said controlling means to supply said first timing pulse to said input flip-flop circuit;

(7) second memory means, an output of which is connected to control said controlling means so as to supply said second timing pulse to said output flip-flop circuit; and

(8) means for inputting test data into said input flip-flop circuit during said test mode; and

wherein said control means includes means for supplying said first timing pulse and said second timing pulse to said input flip-flop circuit and said output flip-flop circuit, respectively, during a normal mode of operation;

wherein said control means includes means for stopping said supply of said first timing pulse and said second timing pulse to said input flip-flop circuit and said output flip-flop circuit in response to said first input signal and for supplying said test data to said input flip-flop circuit from said inputting means during a test mode of operation; and

wherein said control means includes means for controlling the supply and non-supply of said first timing pulse and said second timing pulse to said input flip-flop circuit and said output flip-flop circuit in response to said second input signal, said output of said first memory means and said output of said second memory means during an advanced mode of operation.

4,720,812

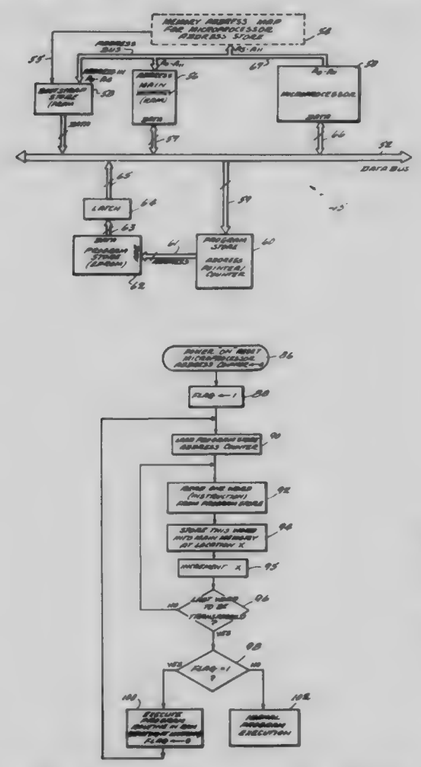
HIGH SPEED PROGRAM STORE WITH BOOTSTRAP

Ming-Luh Kao, and Jong-Keung Cheng, both of Miami, Fla., assignors to Racal-Milgo, Inc., Miami, Fla.

Filed May 30, 1984, Ser. No. 615,362

Int. Cl.^{4} G06F *9/00*

U.S. Cl. 364—900 **14 Claims**



1. A digital signal processing system which automatically loads program instructions from a non-volatile memory means into a main memory means upon initialization, said system comprising:

data bus means for communicating signals associated with program instructions;

address bus means for communicating address signals;

first non-volatile memory means connected to said data bus means and to said address bus means for retaining a first plurality of program instructions and for applying first signals associated with said first plurality of program instructions to said data bus means in response to the presence of first address signals on said address bus means;

second non-volatile memory means connected to said data bus means for retaining a second plurality of program instructions and for applying second signals associated with said second plurality of program instructions to said data bus means in response to a first control signal;

programmable main memory means, connected to said data bus means and to said address bus means and also connected to receive read and write control signals, for storing program instructions associated with signals appearing on said data bus means in response to the presence of second address signals on said address bus means and in response to generation of a write control signal, and for applying the signals associated with said program instructions stored therein to said data bus means in response to presence of second address signals on said address bus means and in response to generation of a read control signal; and

processing means, connected to said data bus means, said address bus means, said main memory and said first memory means, said processing means capable of directly addressing storage locations within said main memory means and said first memory means via said address bus means, for performing the followingn functions upon initialization;

(1) applying first address signals to said address bus means;

(2) generating said first control signal in response to the presence on said data bus means of said first signals applied thereto by said first memory means, thereby controlling said second memory means to apply said second signals to said data bus means;

(3) applying second address signals to said address bus means and generating said write control signal so as to control said main memory means to store program instructions associated with said second signals;

(4) applying second address signals to said address bus means and generating said read control signal so as to control said main memory means to apply to said data bus means the signals associated with said program instructions stored therein; and

(5) performing tasks specified by said stored program instructions in response to said sigtnals applied to said data bus means by said main memory means.

4,720,813

PRINTER INFORMATION INQUIRY COMMUNICATION SYSTEM AND PRINTER

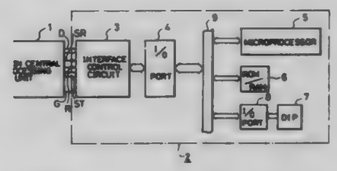
Masahiko Kaneko, Saitama, Japan, assignee to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,733

Claims priority, application Japan, Jan. 26, 1984, 59-11011

Int. Cl.^{4} G06F *3/12*

U.S. Cl. 364—900 **10 Claims**



1. In a computer controlled printer system having status, reset, strobe and data lines, and wherein a printer and a central processing unit of a main device are coupled to each other through a parallel interface control circuit and said printer is controlled by said central processing unit to print information on a receiving medium, a printer information inquiry communication system for transmitting information identifying a characteristic of said printer to said central processing unit, comprising:

means in said main device for asserting a reset signal on said reset line to send a printer information inquiry code onto

said data lines and thereafter to send a strobe signal on said strobe line to said printer; and

means responsive to said strobe and reset signals by said printer for receiving said printer information inquiry code on said data lines and in response transmitting a printer information code on said status signal lines to said central processing unit.

4,720,814

MAGNETIC BUBBLE GENERATOR FOR BUBBLE MEMORY IN HYBRID TECHNOLOGY

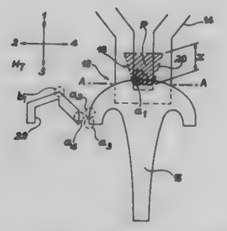
Jean-Marc Fedeli, Le Fontanil; Christine Louis, Saint Egreve, and Christian Piaella, Rives/Fure, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed May 14, 1986, Ser. No. 863,141

Claims priority, application France, May 21, 1985, 85 07620

Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—11 **6 Claims**



1. A magnetic bubble generator for a bubble memory in hybrid technology comprising a magnetic layer in which a magnetic bubble can move under the action of a rotary field, a deposited pattern constituted by a high permeability magnetic material and separated from the magnetic layer by an electric insulating layer, a U-shaped electric conductor placed between said magnetic layer and the deposited pattern and electrically insulated therefrom, the deposited pattern covering the base of the internal space defined by the electric conductor, the portion simultaneously covered by said deposited pattern and the internal space of the electric conductor constituting a nucleation position, wherein the generator comprises an implanted pattern, produced in a fraction of the thickness of the magnetic layer, said implanted pattern at least covering the nucleation position.

4,720,815

SEMICONDUCTOR MEMORY DEVICE IN FORM OF SHIFT REGISTER WITH TWO-PHASE CLOCK SIGNAL SUPPLY

Junji Ogawa, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 19, 1986, Ser. No. 864,248

Claims priority, application Japan, May 20, 1985, 60-107824

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 365—78 **4 Claims**

1. A semiconductor memory device in the form of a shift register with two clock signal lines comprising:

a sequence of shift register elements; and

first and second clock signal lines for supplying said shift register elements with first and second clock signals of first and second phases respectively, said first and second clock signals having waveforms which do not overlap each other;

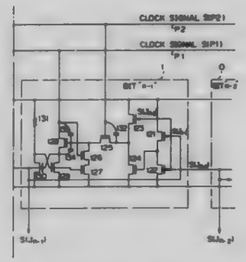
said first clock signal line being connected to even order shift register elements of said shift register, said second clock signal line being connected to odd order shift register elements of said shift register;

each of said shift register elements comprising:

an output node for producing an output signal;

a clock signal supplying node for receiving one of said first and second clock signals;

a gate connected between said output node and said clock signal supplying node and having a control gate;



a charge-up circuit responsive to the output signal of the preceding shift register element for preliminary charging said control node of said gate; and

a discharge circuit responsive to the output of the succeeding shift register element for releasing the charge of said control node of said gate.

4,720,816

PROGRAMMING OF AN EPROM

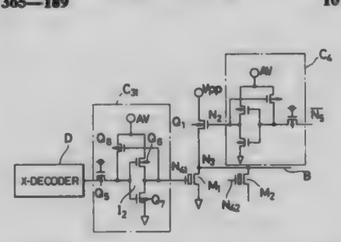
Shigeki Matsuoka, Saita, and Satoshi Kono, Toyonaka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,761

Claims priority, application Japan, Feb. 15, 1985, 60-29143

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **10 Claims**



1. A system for programming an EPROM including at least one bit line having a parasitic capacitance and a plurality of memory cell MOS transistors each having a gate and a pair of source/drain regions one of which is commonly connected to said bit line, said system comprising:

switching means responsive to a first control signal for connecting a programming voltage to said bit line for a first predetermined time period for carrying out programming of a selected MOS transistor; and

applying means for selectively applying said programming voltage to a selected one of said plurality of memory cell MOS transistors for said first predetermined time period, to thereby cause a charge to be stored in said parasitic capacitance of said bit line, and for a second predetermined time period immediately following said first predetermined time period, to thereby cause said charge stored in said parasitic capacitance of said bit line during said first predetermined time period to be discharged through said selected one of said plurality of memory cell MOS transistors during said second predetermined time period.

4,720,817

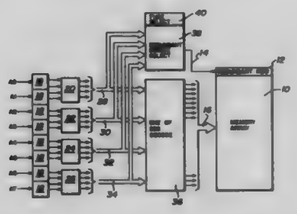
FUSE SELECTION OF PREDECODER OUTPUT

Jimmie D. Childers, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 26, 1985, Ser. No. 706,057

Int. Cl.⁴ G11C *17/00, 7/00*; G06F *11/00*

U.S. Cl. 365—200 **18 Claims**



1. A defect tolerant memory device, comprising:

an array of memory elements arranged in rows and columns, each of said rows having a control input for activation thereof, said rows addressable by an external address having n bits received at terminals of said device, said array having 2^n rows;

a row of redundant memory elements disposed adjacent said array and having a redundant control input for activation thereof;

a plurality of predecode means each for receiving m adjacent bits of the n bits of said address from said terminals and predecoding the m bits from a binary format into one of 2^m mutually exclusive output;

final decode means for receiving the 2^m outputs from each of said predecode means and outputting 2^n mutually exclusive decode outputs, each of said 2^n decode outputs interfaced with said control input of one of the rows in said array;

deactivation means for selectively deactivating one of said 2^n decode outputs from said final decode means; and

redundant decode means for receiving the 2^m outputs from each of said predecode means and being selectively programmable to activate the redundant control input to said redundant row of memory elements when said address from said terminals corresponding to the deactivated one of the rows in said array is input to said predecode means.

4,720,818

SEMICONDUCTOR MEMORY DEVICE ADAPTED TO CARRY OUT OPERATION TEST

Tetsuji Takeguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 17, 1986, Ser. No. 875,090

Claims priority, application Japan, Jun. 17, 1985, 60-131591

Int. Cl.⁴ G11C *29/00*

U.S. Cl. 365—201 **18 Claims**

1. A semiconductor memory device, operatively connected to receive selection signals, for performing a test operation for testing said semiconductor memory device, comprising:

a cell matrix having a memory cell array including:

rows of word lines; and

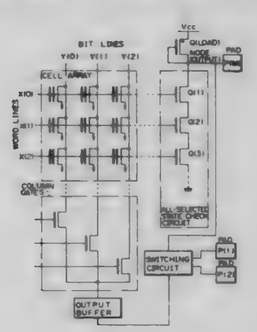
columns of bit lines intersecting said rows of word lines;

column gates connected to said columns of bit lines;

row and column decoders, operatively connected to said cell matrix, for receiving and decoding the selection signals and for performing a selection of all of one of said rows of word lines and columns of bit lines;

a plurality of pads, operatively connected to said row and column decoders, for providing one of input and output terminals for said semiconductor memory device; and

line selection checking means, operatively connected to said cell matrix and said column gates, for forming logic gate circuit means including a plurality of transistors, the gates of said transistors being respectively connected to one of said rows of word lines and columns of bit lines through said column gates, and including one of a voltage and



current detection portion operatively connected to one of said plurality of pads for detecting one of an output voltage and current of said line selection checking means.

4,720,819

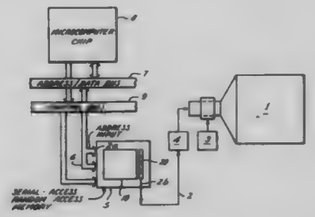
METHOD AND APPARATUS FOR CLEARING THE MEMORY OF A VIDEO COMPUTER

Raymond Pinkham, and Kari M. Guttag, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1983, Ser. No. 567,038

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 365—219 **21 Claims**



1. A method of initializing a video-type system or the like having processor means, memory means, and a video display, said memory means having a plurality of memory cells arranged in rows and columns and having serial register means coupled to said columns, comprising:

deriving a plurality of predetermined data signals in said processor means, storing said derived signals serially in said serial register means in a predetermined sequence,

selecting one of said rows of memory cells in said memory means, and

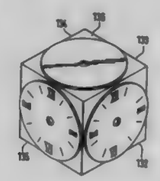
transferring each of said stored data signals from said serial register means to corresponding ones of said cells in said selected row.

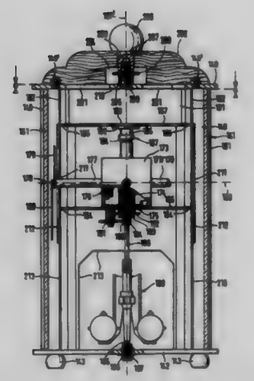
4,720,820

CLOCK, IN PARTICULAR DESK OR WALL CLOCK, WITH ONE OR MORE ANALOG TIME INDICATING DEVICES

Roland Siefert, Im Herrengarten 6, D-7737 Bad Dürrheim, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 888,880
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535801
Int. Cl.[4] G04B *19/00*; G04C *17/00*
U.S. Cl. 368—76 22 Claims





1. Clock such as a desk or wall clock, comprising a clock movement having a vertical axis and provided with a vertical minute drive shaft and a vertical hour drive shaft in operative coaxial arrangement, and

three or four hand systems disposed at 90 degree angles to each other about the vertical axis and whose hand system axes are substantially horizontal and intersect the vertical axis, the hand systems each being provided in operative coaxial arrangement with a minute hand shaft having an auxiliary minute crown gear and an hour hand shaft having an auxiliary crown gear, each of said minute gears meshing in the manner of an angle gear with a common auxiliary minute transmission gear disposed operatively coaxially to the vertical axis and driven by the vertical minute shaft, and each of said hour gears meshing in the manner of an angle gear with a common auxiliary hour transmission gear disposed operatively coaxially to the vertical axis and driven by the vertical hour shaft,

said minute gears each having the same number of teeth as said minute transmission gear with which they mesh, and said hour gears each having the same number of teeth as said hour transmission gear with which they mesh,

the teeth being in mutual engagement having a profile displacement in the manner of a V-plus gear with said minute transmission gear having a diameter larger by at least double the corresponding tooth depth than the diameter of said minute gears and said hour transmission gear having a diameter larger by at least double the corresponding tooth depth than the diameter of said hour gears.

4,720,821

TIMER DEVICE

Jenn-Yuh Ke, P.O. Box 10780, Taipei, Taiwan

Filed Feb. 5, 1986, Ser. No. 826,242
Int. Cl.[4] G04F *8/00*; H01H *7/00*
U.S. Cl. 368—108 5 Claims

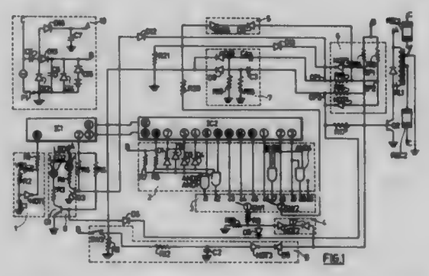


FIG.1

1. A timer device comprised of two digital counters (with) and a time-base pulse generator with adjustable time-base interval being connected to the pulse input pin of the first digital counter and one of the digital output pins of the first digital counter being connected to the pulse input pin of the second digital counter, to make the first digital counter along with its time-base pulse generator working as a time-base pulse generator with adjustable time-base interval for the second digital counter, a timing interval composition unit being composed of a logic circuit, with the digital output pins of the second digital counter being connected to the said timing interval composition unit to produce a timing pulse for each of several different timing intervals to a plurality of contact points of a timing interval selection unit; two switches, each being connected to one of the contact points of said timing interval selection unit receive said timing pulse or another specially designed null pin so as to select either one of the presetted timing intervals under a (cycling) repeat-cycle timing mode or (one-way fixed) one-time timing mode; two bistable circuit triggers which respectively connect to the two said switches and will send pulse to the inputs of bistable circuit when the said switch receives said timing pulse; a bistable circuit which will change states when one of the said switches sends a pulse through said bistable circuit trigger and the other said switch is prevented from sending a pulse; a reset pulse generator which will generate a positive pulse to reset both digital counters when the said bistable circuit changes state; a relay activating circuit which will activate a relay connected to said bistable circuit when the said bistable circuit changes state so as to turn on one load and turn off another load connected to each respective relay.

4,720,822

HIGH FREQUENCY SIGNAL MEASUREMENT METHOD AND APPARATUS

Arne C. Hansen, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1986, Ser. No. 837,117
Int. Cl.[4] G04F *87/00*
U.S. Cl. 368—115 7 Claims

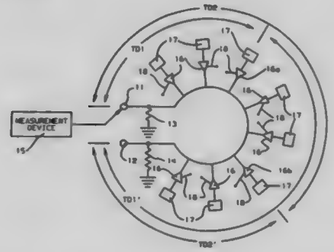
1. An apparatus for measuring the time delay between the introduction of two signals applied to a transmission line comprising;

a transmission line having a propagation delay and a characteristic impedence,

means coupled to the transmission line for introducing two signals into the transmission line, and

means coupled to each end of the transmission line for determining the time between the introduction of said two signals into said transmission line independent of the propagation delay of the transmission line,

said means for determining the time between the signals independent of the transmission line propagation delay, comprising



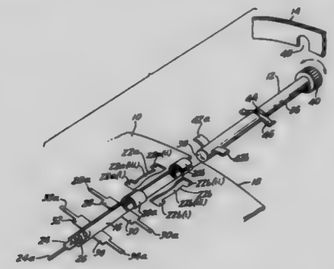
means for measuring the time between the introduction of the two signals at one end of the transmission line, and for measuring the time between the introduction of the two signals at the other end of the transmission line.

4,720,823

PUSH-PULL, STEM-CONTROLLED DIGITAL TIME DISPLAYS

Berj A. Terzian, Briarcliff, N.Y., assignor to Equitime Inc., Briarcliff Manor, N.Y.

Filed Dec. 9, 1986, Ser. No. 939,615
Int. Cl.[4] G04B *27/02*
U.S. Cl. 368—190 22 Claims



1. Push-pull, stem-controlled digital time displays which comprise:

(a) case means for housing the operating parts of a digital time display and for exposing the display to view;

(b) first circuit means including a first circuit terminal for connecting a power source to elements of the operating parts which generate present time indicia in the display when the first circuit terminal is in a closed circuit condition, the supply of power to such elements being discontinued when the first circuit terminal is in an open circuit condition;

(c) a second circuit means for connecting the power source to elements of the operating parts which generate time setting indicia in the display when the first circuit terminal is in an open circuit condition, the supply of power to such elements being discontinued when the first circuit terminal is in a closed circuit condition;

(d) stem means which, relative to the case means, may be pushed inwardly into a first position that places the first circuit terminal in a closed circuit condition and which may be pulled outwardly into a second position that switches the first circuit terminal into an open circuit condition, the stem means also being rotatably mounted to enable it to be turned in clockwise and counterclockwise directions at least while in the second position;

(e) means on the stem means for activating elements of the time setting operating parts which select a time function for setting when the stem means is turned in one of the clockwise and counterclockwise directions and which set the selected time function when the stem means is turned in the other of such directions, whereby:

(i) switching from normal timekeeping to time setting is always performed by pulling the stem means out into its second position;

(ii) selection of a time function for setting is always performed by turning the stem means in one of the clockwise and counterclockwise directions while in its second position;

(iii) setting of a selected time function is always performed by turning the stem means in the other of such clockwise and counterclockwise directions while in its second position; and

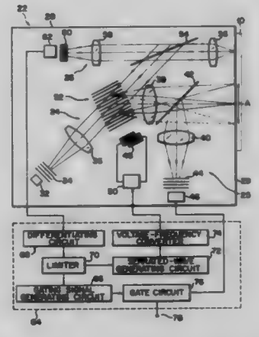
(iv) present time indicia for normal timekeeping are always restored by pushing the stem means into its first position.

4,720,824

INFORMATION READING APPARATUS WITH A LIGHT BEAM SCANNING TECHNIQUE

Anao Hayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,824
Claims priority, application Japan, Dec. 28, 1984, 59-277749; Dec. 28, 1984, 59-277751
Int. Cl.[4] G11B *7/135*, *7/09*; G02B *6/32*
U.S. Cl. 369—44 14 Claims



1. An information reading apparatus for reading information from a record medium having an information recording region in which the information is recorded, and a synchronizing signal recording region in which synchronizing signals corresponding to the information are recorded comprising:

a board having an optical waveguide and a scanning surface opposite the record medium;

emitting means for emitting light into the optical waveguide in a predetermined direction;

first and second photodetecting means;

ultrasonic generating means for generating a surface elastic wave in an optical path of the light emitted from the emitting means to diffract with said elastic wave part of the light emitted from the emitting means;

a first optical system formed in the board, for conducting the light beam diffracted by the elastic wave to the information recording region of the record medium, through the wave guide and the scanning surface, and leading a reflected light beam from the information recording region to the first photodetecting means;

a second optical system formed in the board, for conducting to the synchronizing signal recording region of the record medium, through the waveguide and the scanning surface, a part of the light beam emitted by the emitting means and not diffracted by the elastic wave and leading a reflected light beam from the synchronizing signal recording region to the second photodetecting means; and

signal processing means for driving the ultrasonic generating means in accordance with a synchronizing signal detected by the second photodetecting means to continuously change the frequency of the surface elastic wave during a given time period, and for enabling a signal from the first photodetecting means in accordance with the synchronizing signal.

4,720,825

OPTICAL DATA REPRODUCING DEVICES HAVING IMPROVED TRICK PLAY CAPABILITY

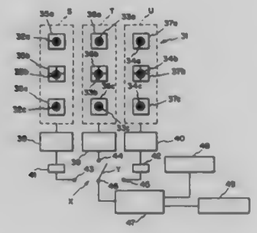
Hiroshi Kokado, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Jan. 31, 1985, Ser. No. 696,742

Claims priority, application Japan, Feb. 6, 1984, 59-18258; Feb. 18, 1984, 59-29219

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—46 **21 Claims**



1. An optical data reproducing device comprising

illuminating means for respectively, simultaneously illuminating at least two continuous separate concentric or spiral data tracks of an optical disk with at least two light beams;

photo-electric conversion means for respectively converting said at least two light beams reflected from said concentric or spiral data tracks into at least two data reproduction electrical signals respectively representative of the entirety of the information recorded at said two tracks;

processing means for processing at least one of said data reproduction electrical signals whereby both of said data reproduction electrical signals are available for processing either simultaneously or selectively; and

where said processing means includes means for switching from one of said two data reproduction electrical signals to the other to provide said selective processing of said one of the two data reproduction electrical signals independent from the other data reproduction electrical signal.

4,720,826

VENTILATION ARRANGEMENT FOR USE IN AN OPTICAL RECORDING DISC

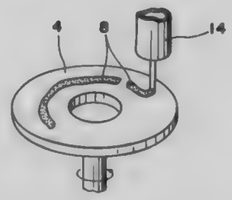
Toshinori Sugiyama, Tsukuba, and Mitsuru Shimizu, Torite, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 18, 1986, Ser. No. 840,863

Claims priority, application Japan, Mar. 20, 1985, 60-54135; Nov. 19, 1985, 60-257856

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 369—283 **33 Claims**



1. An optical recording disc comprising

two disc substrates, each in a cyclindrical shape having a round center hole,

at least one recording layer is formed on the surface of at least one said disc substrate, and

at least one bonding material layer is formed at an inner rim portion and an outer rim portion of the surface of said disc substrate, on the surface of which the recording layer is formed, except for at least one portion of said inner rim portion or said inner and outer rim portion of the surface of the disc substrate where the bonding material is not formed, wherein the bonding material layer is provided to bond said two disc substrates together, so that the surfaces of said disc substrates, on the surface of at least one said disc substrate which at least one recording layer is formed, face each other, thereby forming a space gap between said disc substrates, and said one portion of said inner rim portion or said inner and outer rim portion of the surface of the disc substrate where the bonding material layer is not formed, said space gap acting as a ventilation path through which air can pass from an inside air gap of the optical recording disc, to the outside of the optical recording disc, and reversely.

4,720,827

OPTICAL COMMUNICATION SET

Hideki Kasaji, Kanagawa, Japan, assignor to Anritsu Corporation, Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,899

Claims priority, application Japan, Mar. 26, 1985, 60-59469

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—4 **15 Claims**

1. An optical communication set, comprising:

an optical transmission medium set in an arbitrary optical transmission path length;

first optical communication terminal station means coupled with one end of said optical transmission medium;

second optical communication terminal station means coupled with the other end of said optical transmission medium;

each terminal station means comprising:

master-slave designating means for generating designating information for designating the associated terminal station as a master side and an opposing terminal station as a slave side at a communication starting time at any of said first and said second optical communication terminal stations;

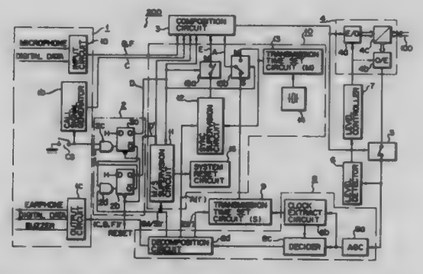
transmitting information input means for inputting transmitting information to be transmitted, at the master side or the slave side;

transmitting time setting means for generating first transmitting time setting information at the master side and second transmitting time setting information at the slave side in response to the designating information;

sync supervision information outputting means for outputting sync supervision information indicating whether or not the first transmitting time setting information of the master side and the second transmitting time setting information of the slave side have a predetermined synchronizing relationship in response to the designating information;

composition means for outputting a transmission burst signal of the master or slave side by combining the transmitting information of the master or slave side with the designating information, the first or second transmitting time setting information and the sync supervision information;

optical transmitting and receiving means for converting the transmission burst signal of the master or slave side into an optical signal to transmit the signal through the optical transmission medium, and for converting a transmission burst signal in the form of an optical signal from the slave or master side into an electric signal when receiving the transmission burst signal;



decomposition means for separating the designating information, the transmitting information, the first or second transmitting time setting information and the sync supervision signal contained in the received transmission burst signal of the slave or master side;

first control means for locking the master-slave designating means to a slave state in response to the separated designating information at the slave side;

second control means for varying the second transmitting time setting information of the slave side during a period indicating that the sync supervision information separated at the slave side does not have said predetermined synchronizing relationship;

third control means for judging whether or not the first transmitting time setting information and the second transmitting time setting information separated at the master side have a predetermined synchronizing relationship, and for supplying the judged result as said sync supervision information to the sync supervision information outputting means; and

receiving information outputting means for outputting the transmitting information separated by said decomposition means as receiving information at the master or slave side.

4,720,828

I/O HANDLER

Donald J. Jones, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 31, 1986, Ser. No. 846,335

Int. Cl.⁴ H04J *3/02, 3/24*

U.S. Cl. 370—85 **4 Claims**

1. An i/o handler for passing data between a host computer and a plurality n of destinations, including an abutting member, a distributing member and a communicating link communicating between said abutting member and said distributing member,

said link comprising a forward data path and a forward data validity path both transmitting in the direction abutting member-to-distributing member, and a return data path, a return data validity path, a readiness signal path, and a sync signal path transmitting in the direction distributing member-to-abutting member,

said distributing member including

n distribution transmit storage elements correspondingly associated with said destination and means for receiving from each of said n destinations and storing in the corresponding distribution transmit storage element data to be forwarded to said computer on said link,

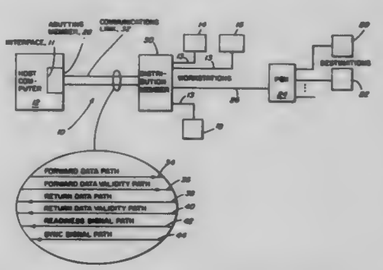
n distribution receive storage elements correspondingly associated with said destinations and means for transmitting to said n destinations data stored in the corresponding distribution receive storage element,

means for generating a periodic sync signal defining a cycle of frame intervals,

means for generating signals defining a subdivision of each of said distribution frame intervals into m distribution channel intervals (m not less than n), n of said m distribution channel intervals being associated each with a corresponding destination,

means for transmitting said sync signal on said sync signal path,

means for transmitting on said return data path during the



i^{th} of said n distribution channel intervals a predetermined number of bits of the data from the corresponding i^{th} distribution transmit storage element,

means for generating a return data validity signal indicative of validity of data transmitted during a distribution channel interval on the return data path, and for transmitting this signal on the return data validity path during the same distribution channel interval,

means for generating during each distribution frame interval a readiness signal associated with a corresponding destination and indicative of readiness of said distribution station to receive data for the corresponding destination, and for transmitting said readiness signals on the readiness signal path,

means for receiving forward data validity signals on the forward data validity path and associating them with the corresponding destinations,

means for receiving, associating with the corresponding destination, and, when accompanied by a concurrent signal of data valid on the forward data validity path, storing in the corresponding distribution receive storage elements data signals received on the forward data path,

said abutting member including

n host transmit storage elements correspondingly associated with said destinations, and means for receiving from said host computer and for storing in the corresponding host transmit storage element data to be dispatched to each of said n destinations,

n host receive storage elements correspondingly associated with said destinations, and means for transferring to said host the contents thereof,

means for receiving on said sync signal path said sync signal, and for deriving therefrom signals defining said distribution frame and channel intervals and signals defining host frame and channel intervals isomorphic to the distribution frame and channel intervals,

means for receiving said readiness signals on said ready signal path and for associating each readiness signal with the corresponding destination,

means for transmitting, if stored, a predetermined number of bits of data from the ith host transmit storage element, on said forward data path during the ith of said n host channel intervals, only when the last corresponding readiness signal received indicated a condition of ready,

means for generating a forward data validity signal indicative of validity of data transmitted during a host channel interval on the forward data path, and for transmitting this signal on the forward data validity path during the same distribution channel interval,

means for receiving return data validity signals on the return data validity path and associating the return data validity signals with the corresponding destinations,

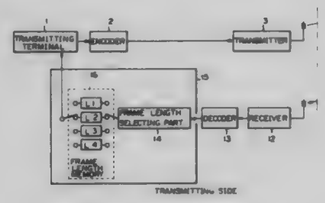
means for receiving, associating with the corresponding destination, and, when accompanied with a signal of data valid on the return data validity path, storing in the corresponding host receive storage elements data signals received on the return data path.

4,720,829

ERROR CONTROL ENCODING SYSTEM

Atsushi Fukazawa; Takuro Sato; Haruhiko Akiyama, and Manabu Kawabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,112
Claims priority, application Japan, Apr. 9, 1985, 60-73537
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—5 **6 Claims**



1. An error control encoding method in data communication for monitoring an error rate of received data and for thereby adaptively changing frame length for data transmission and reception, said error control encoding method comprising the steps of:

(1) preparing a plurality of frame lengths, and selecting one of said lengths in accordance with initial state or an error rate of received data so that a high error rate causes a shorter frame length, said error rate being detected at a transmitting partner or a receiving partner;

(2) encoding input data for each frame unit with redundancies and said selected lengths, and combining a plurality of frames together into a block with an information of said selected length and each frame number;

(3) transmitting said encoded block data to said receiving partner;

(4) decoding received data, and producing error information essentially involving error frame numbers and an error rate of received data;

(5) returning said error information to said transmitting partner;

(6) selecting one of said frame lengths in accordance with said error rate of said received data so that a high error rate causes a shorter frame length;

(7) encoding input data of said error frame numbers for each frame unit with redundancies and said selected current length, and combining a plurality of frames together into a block with information of said current length and said error frame numbers, and

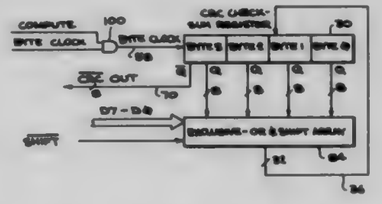
(8) retransmitting said encoded block of error frames to said receiving partner.

4,720,830

CRC CALCULATION APPARATUS HAVING REDUCED OUTPUT BUS SIZE

Sunil P. Joshi, Campbell, and Venkatraman Iyer, Berkeley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,351
Int. Cl.⁴ G06F *11/12*
U.S. Cl. 371—37 **14 Claims**



1. An apparatus for generating a plurality of bytes of CRC data and presenting them one byte at a time in synchronism with a byte clock on a CRC output bus having a number of conductors equal to the number of bits in one byte of said CRC data comprising:

means for storing a plurality of bytes of CRC bits presented at a data input and having a data output for each said CRC bit;

a CRC output bus having one conductor coupled to said data output for each CRC bit in the highest order CRC data byte;

a calculation means having a data outputs coupled to said data inputs of said means for storing and having data inputs coupled to said data outputs of said means for storing and having a raw data input, said calculation means for accepting input data from said means for storing and raw input data at said raw data input and for dividing said raw input data by a predetermined binary number and for presenting the remainder of said division operation at said data inputs of said means for storing as a plurality of bytes of said CRC data; and

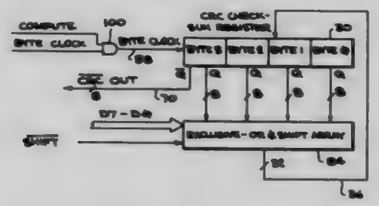
shifting means coupled to said means for storing and to said calculation means for outputting said bytes of CRC data on said CRC output bus one byte at a time by shifting said CRC bytes one byte at a time in synchronization with said byte clock signal into the highest order byte position of said means for storing by deactivating said calculation means and sending the current contents of said means for storing through said calculation means thereby shifting the CRC bytes in said means for storing one byte toward the most significant byte position in said means for storing.

4,720,831

CRC CALCULATION MACHINE WITH CONCURRENT PRESET AND CRC CALCULATION FUNCTION

Sunil P. Joshi, Campbell, and Venkatraman Iyer, Berkeley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,366
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—37 **14 Claims**



1. An apparatus for calculating a plurality of CRC check bits including a CRC checksum register comprised of a plurality of memory cells each having a data input, a data output and a clock input for receiving a clock signal causing storage of any data on said data inputs into said memory cells, said apparatus using an initial condition of all logic 1's wherein said apparatus can be preset to all logic 1's during the same clock cycle when the CRC check bit calculation starts comprising:

preset means having data inputs and having data outputs and having a control input for receiving a control signal having first and second states, each said data input coupled to a data output of said CRC checksum register said preset means for forcing a logic 1 to be placed on said data outputs when said control signal is in said first state and for coupling the data stored in said checksum register memory cells and present on said data outputs to said data outputs of said preset means when said control signal is in a second state;

a calculation means having data outputs coupled to said data inputs of said CRC checksum register and having data inputs coupled to said data outputs of said preset means and having a raw data input, said calculation means for accepting input data at said calculation means data inputs from said CRC checksum register or said preset means and raw input data at said raw data input and for dividing said raw input data by a predetermined binary number and for storing the remainder of said division in said CRC checksum register as said CRC check bits.

4,720,832

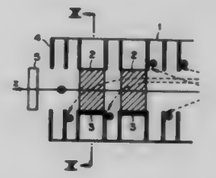
GAS LASER INCLUDING MEANS FOR MAGNETIC DEFLECTION OF IONS

Kyoichi Deki, Himeji, Japan, assignor to Ushio Denki, Tokyo, Japan

Filed Jul. 9, 1986, Ser. No. 883,805
Claims priority, application Japan, Sep. 21, 1985, 60-207796
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—37 **7 Claims**

1. In a gas laser including optical elements arranged on an optical axis therein, an apparatus for preventing contamination of the optical elements by charged particles moving in the direction of the optical axis comprising:

a screen arranged to form a cylindrical path along said axis, such that particles moving in the axial direction and having motion transverse to said axis will impinge upon said screen; and



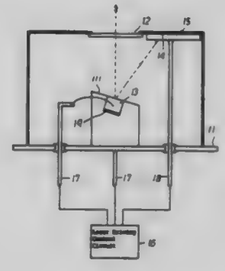
means for applying a magnetic field across said cylindrical path so as to transversely deflect charged particles moving in the direction of said optical axis to impinge upon said screen.

4,720,833

SEMICONDUCTOR LASER APPARATUS

Takahiro Sayama, Tenri; Toshiro Hayakawa, Nara; Kohsei Takahashi, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,868
Claims priority, application Japan, Nov. 30, 1984, 59-254577
Int. Cl.⁴ H01S *3/19*; H01L *23/02, 23/12*
U.S. Cl. 372—44 **10 Claims**



1. A semiconductor laser apparatus comprising:

(1) a semiconductor laser array device including a plurality of laser operation areas disposed in a parallel manner so as to attain optical phase coupling therebetween, said laser operation areas being constructed to propagate first and second emitted laser beams in two different directions with a 180 degree phase shift therebetween from adjacent laser operation areas, said laser beams emitted from said adjacent operation areas exhibiting a far-field pattern having a peak in each of said two different directions; and

(2) a stem structure containing said semiconductor laser array device therein, said stem structure including means for blocking said first emitted laser beam from said semiconductor laser array device and allowing said second emitted laser beam from said semiconductor laser array device to pass outside of said stem structure.

4,720,834

INTERNAL-REFLECTION-INTERFERENCE SEMICONDUCTOR LASER DEVICE

Osamu Yamamoto, Nara; Hiroshi Hayashi, Kyoto; Taiji Morimoto, and Saburo Yamamoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 11, 1985, Ser. No. 807,867
Claims priority, application Japan, Dec. 15, 1984, 59-265079
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **3 Claims**

1. In an internal-reflection-interference semiconductor laser

device having one radiation emitting facet, another facet opposed to said radiation emitting facet, and an internal reflecting section, and comprising:

a semiconductor substrate;

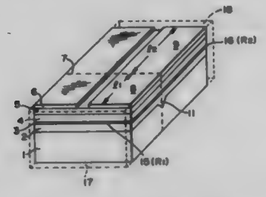
a first electrode formed under said substrate;

a first cladding layer formed on said substrate;

an active layer formed on said first cladding layer;

a second cladding layer formed on said active layer;

a cap layer formed on said second cladding layer;



a first laser operation area ranging from said radiation emitting facet to the internal reflecting section; and

a second laser operation area ranging from the other facet to the internal reflecting section, wherein:

the internal-cavity length l_1 of said first laser operation area is shorter than the internal-cavity length l_2 of said second laser operation area, and the reflectivity R_1 at the radiation emitting facet is smaller than the reflectivity R_2 at the other facet.

4,720,835

INTEGRATED SEMICONDUCTOR LIGHT EMITTING ELEMENT WITH OSCILLATION WAVELENGTH AND PHASE MODULATED LIGHT OUTPUT

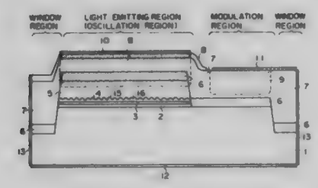
Shigeyuki Akiba, Tokyo; Katsuyuki Utaka, Musashino; Yukio Noda, Yokohama, and Yukitoshi Kushiro, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa K.K., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 767,152

Claims priority, application Japan, Aug. 27, 1984, 59-176838

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—50 12 Claims



1. In a semiconductor light emitting element having a light emitting region comprising a DFB laser having a substrate, a light emitting layer, periodic corrugations defining a diffraction grating, an a pn junction therein the improvement comprising an external modulation region on the substrate for modulating the phase or wavelength of the oscillations of the DFB laser light output having an external light waveguide layer of a larger energy band gap than that of the light emitting layer in direct contact with the DFB laser, a clad layer having a larger energy gap than that of the waveguide layer, a pn junction apart from the pn junction in the DFB laser, an electrode for applying a voltage to the pn junction of the modulation region for varying light output, and at least one semiconductor window region on said substrate at one end of the light emitting element for output of light from the element.

4,720,836

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

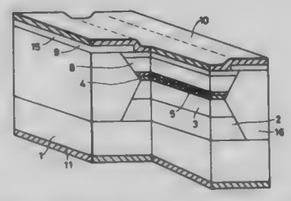
Tadashi Fukuzawa, Setagaya; Hiroyoshi Matsumura, Iruma; Shinji Tsuji; Hitoshi Nakamura, both of Hachioji, and Kenji Hiruma, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,631

Claims priority, application Japan, Sep. 28, 1984, 59-201657

Int. Cl.[4] H01S *3/08, 3/19*

U.S. Cl. 372—96 6 Claims



1. A distributed feed-back semiconductor laser comprising a substrate having a plurality of semiconductor layers including an active layer, said plurality of semiconductor layers having gain regions for radiation, said active layer comprising a superlattice structure of a semiconductor, means for providing current to said gain regions, and means for optical feed-back comprising superlattice regions and disordered semiconductor regions that have been alternately arrayed in the direction of a laser cavity, said disordered semiconductor regions having a band gap larger than that of said superlattice regions.

4,720,837

LADLE FURNACE

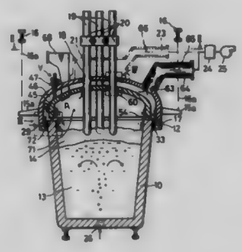
Kenji Kanada, Aichi, Japan, assignor to Daidotokushuko Kabushikikaisha, Japan

Filed Feb. 12, 1986, Ser. No. 828,816

Claims priority, application Japan, Feb. 12, 1985, 60-25066

Int. Cl.[4] C21C *5/38*

U.S. Cl. 373—9 4 Claims



1. In a ladle furnace comprising:

(a) a ladle for accepting molten steel and slag therein, which is provided with an opening at the upper end thereof and an annular outer lid receiving surface at the periphery of said opening;

(b) an outer lid for closing the opening of said ladle, which is provided with an annular lower end surface at the periphery thereof to be mounted on said outer lid receiving surface of the ladle;

(c) electrodes extending through electrode holes provided at the outer lid into the interior of said ladle to generate arc between the molten steel accepted into said ladle and the electrodes thereby to heat said molten steel and slag; and

(d) supplying means for supplying a reducing atmosphere gas to a space within the ladle formed just above the slag and molten steel accepted therein,

the improvement wherein:

said ladle further comprises

(e) an inner lid at the inside of the said outer lid with a predetermined interval so as to form a space therebetween;

said ladle is further provided with an annular receiving surface for said inner lid at the inside of said outer lid receiving surface;

said inner lid is provided with an annular lower end surface at the periphery thereof to be mounted on said inner lid receiving surface of said ladle and electrode holes at the central area thereof, through which the electrodes extend into said ladle; and

said outer lid is provided with a suction port to suck gases entered into the space formed between said outer lid and said inner lid the lower end surface of the outer lid being supported by the outer lid receiving surface, the lower end surface of the inner lid being supported by the inner lid receiving surface, the inner lid being connected, for vertical movement, to the outer lid.

4,720,838

CONTACT CONNECTION BETWEEN A CONTACT ELECTRODE AND A COOLING MEDIUM AND A CURRENT SUPPLY LINES FOR AN ELECTRICAL MELTING FURNACE

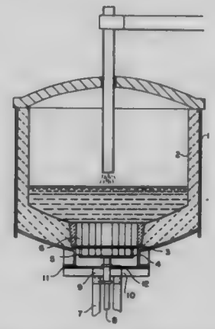
Heinz Guido, Duisburg, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshütte GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1986, Ser. No. 915,223

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1986, 3535689

Int. Cl.[4] H05B *7/00*

U.S. Cl. 373—72 6 Claims



1. A contact connection between a contact electrode and the supply terminal for current and coolant lines of an electric melting furnace, comprising a contact electrode having a base plate, a contact pipe extending outwardly out of said base plate, and a contact sleeve into which said pipe is fitted, said contact sleeve being a part of a current and coolant conduit assembly, and a press-on disk fitted against said contact sleeve to urge it into electrical connection contact with said contact pipe.

4,720,839

EFFICIENCY DATA TRANSMISSION TECHNIQUE

Kamilo Feher, El Macero, Calif.; Kuang-Tsan Wu, Burnaby, Canada; John C. Y. Huang, Palo Alto, and Donald E. MacNally, Campbell, both of Calif., assignors to University of Ottawa, Ottawa, Canada

Filed Dec. 2, 1986, Ser. No. 937,086

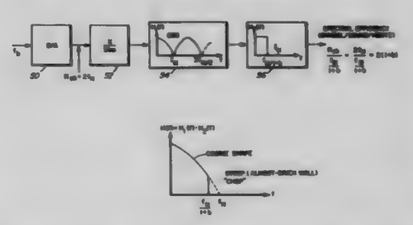
Int. Cl.[4] H04L *25/34;* H04B *15/00*

U.S. Cl. 375—18 25 Claims

1. A data transmission system comprised of:

(a) means for receiving a digital input signal characterized by a predetermined transmission rate,

(b) a half-cosine filter for receiving and filtering said received digital input signal and for providing a filtered output signal, characterized by a transfer function having a transmission null at Nyquist frequency, and



(c) a very steep low-pass filter connected in series with said half-cosine filter, and having a cut-off frequency which is less than the Nyquist frequency by a predetermined amount, for receiving and further filtering said filtered output signal, thereby limiting intersymbol interference and enabling digital signal transmission at a transmission rate greater than the Nyquist rate by said predetermined amount.

4,720,840

COMPLIANT ANTIVIBRATION BAR FOR A STEAM GENERATOR

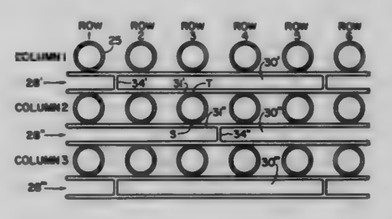
Hermann O. Lagally, Hempfield Township, Westmoreland County; Bernard L. Silverblatt, Mt. Lebanon; Thomas A. Pitterle, Greensburg, and Norman R. Singleton, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 745,980, Jun. 18, 1985, abandoned.

This application Apr. 20, 1987, Ser. No. 40,697

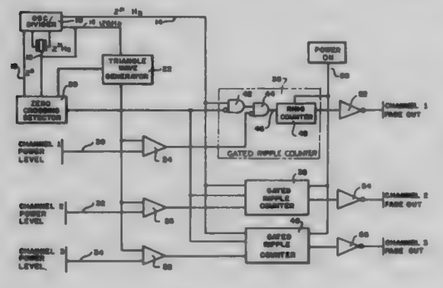
Int. Cl.[4] G21C *9/00;* F28F *7/00, 9/00;* F28D *7/00*

U.S. Cl. 376—285 5 Claims



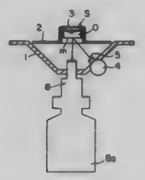
1. A steam generator for a nuclear power plant comprising a shell, a plurality of flow tubes having an approximate U-shaped configuration within said shell and arranged in successive columns and rows so as to form an array having a square pattern with spaces therebetween, and compliant antivibration bars fitting between each successive column of tubes and comprising a pair of parallel arranged flexible strips having a space therebetween and supported along the length thereof by spaced ribs, the spacing of said ribs being at least as long as the spacing of four tubes in a single column of tubes, with each successive and parallel antivibration bar being positioned such that its ribs are staggered relative to the position of the ribs of the preceding and parallel antivibration bar.

4,720,841
MULTI-CHANNEL VOLTAGE-TO-FREQUENCY CONVERTOR
William P. Hooper, Largo, Fla., assignor to Square D Company, Palatine, Ill.
Filed May 15, 1985, Ser. No. 734,740
Int. Cl.[4] G01R *21/06*; H03M *1/56*
U.S. Cl. 377—20 5 Claims



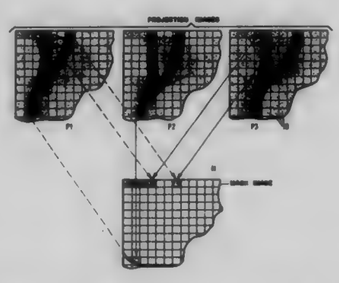
1. A circuit for developing a digital signal that is an integrated measure of an analog voltage comprising:
a source of a signal at a relatively high frequency;
a clock signal that is divided from the high-frequency signal;
means for developing a triangular wave at the clock frequency;
means for starting a measure of a time interval at a zero-crossing of the triangular wave;
means for stopping a measure of the time interval when the triangular wave has an amplitude equal to the analog voltage
means for obtaining a count of cycles of the high-frequency during the time interval; and,
means for accumulating the count as a function of time, which accumulated count is a measure of the integrated analog signal.

4,720,842
APPARATUS FOR DETECTING NICKEL/VANADIUM CONTAINED IN OIL
Akimichi Kira, and Yoshinori Hosokawa, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan
Filed Mar. 25, 1986, Ser. No. 844,018
Claims priority, application Japan, Jun. 8, 1985, 60-124597
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—49 5 Claims



2. An apparatus for detecting nickel and vanadium contained in an oil sample, comprising:
a support means;
a sample table disposed on said support means;
at least one sample cell means disposed on said sample table for containing an oil sample in which the presence of nickel and vanadium is to be detected;
a target type X-ray tube means disposed on said support means for radiating X-rays into said oil sample contained in said sample cell means;
an energy dispersion type fluorescent X-ray detector means disposed on said support means for detecting fluorescent X-rays excited in said oil sample; and
an iron filter means disposed between said X-ray tube means and said sample cell means for converting primary X-rays from said X-ray tube means into secondary X-rays which pass into said oil sample.

4,720,843
METHOD FOR SEPARATING MOVING STRUCTURES FROM A FIXED BACKGROUND IN A SEQUENCE OF X-RAY PROJECTION IMAGES AND EQUIPMENT FOR IMPLEMENTING THIS METHOD
Paul R. Haaker, Hamburg; Erhard P. A. Klotz, Halstenbek; Reiner H. Koppe, Hamburg, and Rolf E. Linde, Hasseldorf, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 17, 1986, Ser. No. 853,279
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514683
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 5 Claims

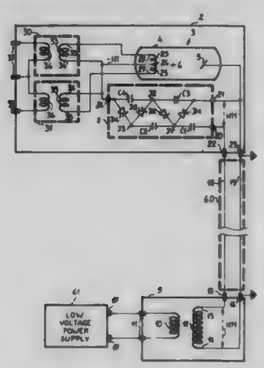


1. A method for X-ray examination comprising the steps of:
obtaining a sequence of X-ray projection images of an area of a patient which depict moving structures against a fixed background;
deriving a mask image from said sequence of images by comparing a group of images in said sequence, on a picture element-by-picture element basis, and choosing for each picture element in the mask image a corresponding picture element value from the plurality of images which represents a minimum absorption value; and
subtracting the mask image from one or more images in said sequence.

4,720,844
HIGH-VOLTAGE GENERATING ASSEMBLY AND AN X-RAY DEVICE
Jean Bougle, Meudon, France, assignor to Thomson-CGR, Paris, France
Filed Mar. 19, 1986, Ser. No. 841,319
Claims priority, application France, Mar. 22, 1985, 8504337
Int. Cl.[4] H05G *1/10*
U.S. Cl. 378—101 8 Claims

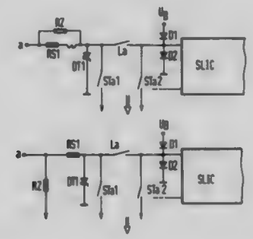
1. An assembly comprising:
a high-voltage generator and x-ray device,
a shield housing which forms an enclosure for said X-ray device and contains an X-ray tube having an anode and a cathode; said X-ray tube being supplied with high voltage by said high-voltage generator,
said generator having a step-up transformer supplied from a low-voltage source which delivers an alternating-current low voltage, wherein said high-voltage generator further comprises at least one voltage-multiplier device which is

mounted within said shield housing and delivers said high voltage to said X-ray tube, said step-up transformer being placed outside said shield housing for generating an intermediate alternating-current high voltage, said step-up



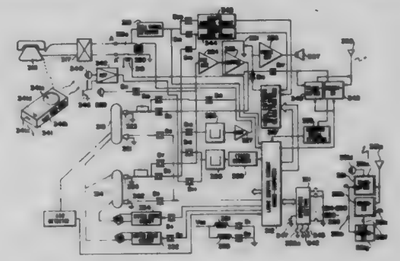
transformer being connected to said voltage-multiplier device by means of a first conductor and a second conductor which carry only said intermediate alternating-current high voltage.

4,720,845
PROTECTIVE CIRCUIT FOR THE OVERVOLTAGE PROTECTION OF A SUBSCRIBER LINE INTERCONNECT CIRCUIT
Robert Lechner, Otterfing; Hans-Werner Rudolf, and Roland Krimmer, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Mar. 2, 1987, Ser. No. 20,636
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613720
Int. Cl.[4] H04M *7/00*; H02H *3/20*
U.S. Cl. 379—27 5 Claims



1. A protective circuit for providing overvoltage protection of a subscriber line interconnect circuit of a digital time multiplex-communication telephone network, having an electronic interface circuit, and for providing overvoltage protection of the electronic switches associated with the subscriber line circuit for test accessibility, comprising:
means providing each conductor of a core pair of the connected subscriber line circuit for each corresponding connection of the subscriber line interconnect circuit with isolation of the separate conductors of the core pair from the connected subscriber line circuit;
a separate test access connection to the conductors of the core pair and to the corresponding connections of the subscriber line interconnect circuits;
a threshold setting element connected to the line side of the said electronic switch for test access to the subscriber line circuit provided for one pair conductor of the same configuration to that of the threshold setting element of the other core pair conductor, through which overvoltages are shunted to ground and by a current path formed by a circuit element having a higher breakover voltage which is provided for each core pair conductor such that a test of the subscriber line circuit may be conducted for line interruption in the event of a current interruption in the subscriber line circuit due to damage of the threshold setting element.

4,720,846
AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS
Motoichi Hattori, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Aug. 1, 1983, Ser. No. 519,417
Claims priority, application Japan, Jul. 30, 1982, 57-133516
Int. Cl.[4] H04M *1/64*
U.S. Cl. 379—79 10 Claims

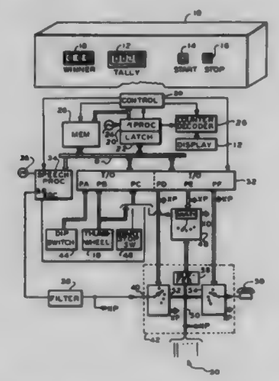


1. An automatic telephone answering and recording apparatus comprising:
recording means for recording an incoming message sent by a caller over a telephone line on a first recording medium;
a speaking circuit;
first means responsive to a call signal sent by the caller for operating to connect the speaking circuit to the telephone line associated with the caller;
second means responsive to said first means for transmitting an answering message previously recorded on a second recording medium over the telephone line to the caller;
detecting means responsive to an ending of the answering message for detecting the state of said recording means as to whether or not it is ready to record an incoming message; and
transmitting means responsive to said detecting means for transmitting to the caller a first aural speech synthesis output identifying the state of said recording means.

4,720,847
ANSWERING DEVICE
Joseph J. Giardina, 32 Judson, Apt. 14B, Edison, N.J. 08837
Filed Apr. 16, 1986, Ser. No. 852,621
Int. Cl.[4] H04M *1/64*
U.S. Cl. 379—88 16 Claims

1. An answering device for answering callers on at least one telephone line, comprising:
detector means adapted to be coupled to said telephone line for sensing a new incoming call thereon and providing in response to said incoming calls a ring signal;
central means coupled to said detector means for providing a command signal varying according to a predetermined sequence, in response to the number of said new incoming call as signified by successive occurrences of said ring signal; and
voice means coupled to said central means and adapted to be

coupled to said telephone line for providing thereon a speech signal waveform in response to said command



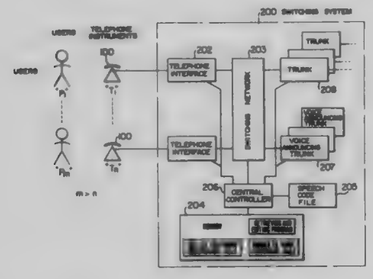
signal, wherein said speech signal waveform automatically changes according to the number of the new incoming call.

4,720,848

COMMUNICATION SYSTEM WITH VOICE ANNOUNCEMENT MEANS

Tadahiko Akiyama, Koriyama, Japan, assignor to Nippo Communication Industrial Co., Japan

Filed Nov. 30, 1984, Ser. No. 676,862
Claims priority, application Japan, Dec. 5, 1983, 58-228429
Int. Cl.⁴ H04M *1/57, 3/42*
U.S. Cl. 379—88 **9 Claims**



1. A communication system with voice announcement means, comprising:

(i) a plurality of terminal devices;

(ii) a switching system connected to said terminal devices, wherein a person identification number is assigned to each user independently of said terminal device and said personal identification number is registered in the switching system as a directory number to get access to a desired person, and having

means for storing elemental coded speech signals from which a vocal announcement of a person's name may be generated, means responsive to signals representing a personal identification number received from a calling terminal device and exclusively representing a called person for identifying the called person's name and a terminal device assigned to the called person,

means responsive to said identifying means for retrieving and editing said elemental coded speech signals from said storing means to form a coded vocal message indicating the called person's name,

means for synthesizing said edited coded message into a vocal message including the name of the called person, and

means for transmitting said speech synthesized vocal message to the called terminal device identified by said identifying means; and

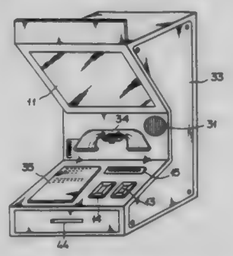
(iii) said terminal devices having means for receiving a speech synthesized vocal message transmitted from said switching system, and means for vocally announcing said speech synthesized vocal message during a signalling period of a call.

4,720,849

INFORMATION DISPLAY APPARATUS

Kou Tayama, Chesscom Service Engineering K.K. Shinjuku NS Bldg 18F, 1, Nishi-Shinjuku 2-Chome, Shinjuku-ku, Tokyo, Japan

Continuation of Ser. No. 623,356, Jun. 22, 1984, abandoned. This application Aug. 26, 1986, Ser. No. 902,051
Claims priority, application Japan, Jan. 18, 1984, 59-6710; Feb. 20, 1984, 59-30018; Mar. 16, 1984, 59-52013
Int. Cl.⁴ H04M *1/26*
U.S. Cl. 379—90 **14 Claims**



1. An information display apparatus, comprising:

a video disk library accommodating a variety of different items of information;

a display section having a first input control, for initiating successive display of said items of information stored in said video disk library upon operation of said first input control by a user, each display having a unique phone number associated and corresponding with the display.

a dial number memory section in which dial numbers of destinations corresponding to said items of information are stored;

a dial number search section for selectively searching a dial number corresponding to the displayed information on the display section from said dial number memory section;

a handset connected to an external telephone circuit; and

actuatable dialing means for automatically dialing said searched dial number;

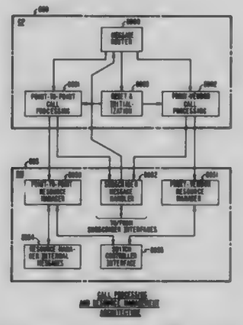
wherein when said handset is lifted off-hook by said user, said dial number search section searches the dial number of the respective item of information being displayed, said dialing means dials said searched dial number, and said handset is automatically connected to a telephone set of the corresponding destination.

4,720,850

COMMUNICATION SYSTEM CONTROL ARRANGEMENT

Lewis B. Oberlander, Buffalo Grove; David A. Spicer, Batavia, and Ralph V. Straube, Naperville, all of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 14, 1986, Ser. No. 840,959
Int. Cl.⁴ H04M *11/08, 7/14, 3/42*
U.S. Cl. 379—90 **20 Claims**



1. A call processing arrangement for generating requirements signals to establish calls in a communication system in response to receipt of message signals from terminal equipment, the arrangement comprising:

first program controlled call processing means responsive to receipt of first message signals having a first portion requesting establishment of calls and having a second portion identifying certain calls, for generating by a single process requirements signals to establish the certain calls;

second program controlled call processing means responsive to receipt of second message signals having a first portion requesting establishment of calls and having a second portion identifying calls other than the certain calls, for generating by a plurality of processes requirements signals to establish each of the other calls, each process for generating requirements signals to establish an individual one of a calling and a called portion of a call; and

signal routing means responsive to receipt of the first and the second message signals from subscriber terminal equipment for processing the second portions of the received signals (a) to identify first message signals and send them to the first processing means and (b) to activate the processes of the second processing means and send second message signals to the processes of the second processing means;

the first and the second message signals having identical first portions to make requests from subscriber terminal equipment for call establishment independent of differences between the first and the second processing means.

4,720,851

METER READER

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Filed Jul. 25, 1985, Ser. No. 758,693
Int. Cl.⁴ H04M *11/00*
U.S. Cl. 379—107 **44 Claims**

1. A method of remotely reading at least one utility meter of a subscriber using telephone communication lines, comprising the steps of:

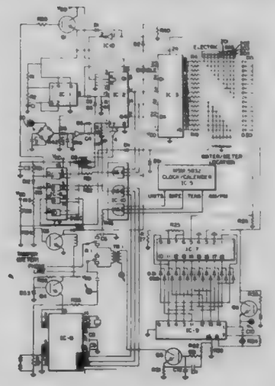
dialing the telephone number of said subscriber;

detecting the occurrence of a predetermined number of ring signals at the subscriber location;

transmitting one of a plurality of coded tones to circuitry connected in parallel across the subscriber's telephone communication line;

detecting if said one of a plurality of transmitted tones matches a predetermined tone after detecting the occurrence of a predetermined number of ring signals;

converting at least one mechanical utility meter to produce electrical voltages representative of utility consumption



by mounting an etched board having a plurality of contacts directly to the utility;

sequentially reading voltages corresponding to the consumption recorded by said at least one utility meter upon detecting that said one of a plurality of transmitted tones matches the predetermined tone; and

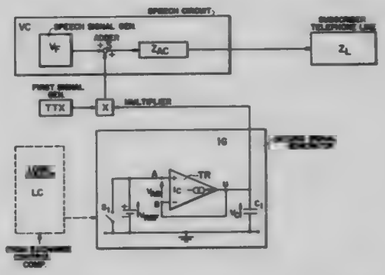
transmitting said sequentially read voltages over said subscriber's telephone communication line.

4,720,852

MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR GENERATING CONTROL SIGNALS FOR DISPLAYING THE TELEPHONE CHARGES TO A SUBSCRIBER

Marco Siligoni, and Mauro Pasetti, both of Milan, Italy, assignors to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Jun. 19, 1985, Ser. No. 746,774
Claims priority, application Italy, Jun. 22, 1984, 21550 A/84
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.⁴ H04M *15/20*
U.S. Cl. 379—124 **1 Claim**



1. A telephone circuit for generating control signals for a subscriber's telephone charge display and forming an interface between a subscriber's telephone line and exchange control components together with a speech circuit of the said subscrib-

VOL 1086 ISS 3 JA 19 1988 UMI

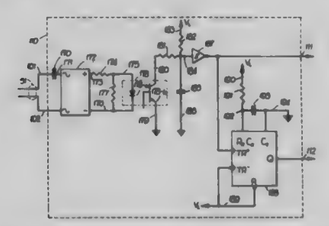
er's line, comprising a generator of speech signals which is coupled to a first voltage signal generator which supplies an AC signal having a predetermined frequency and amplitude which are constant over time, said telephone circuit further comprising a second voltage signal generator for supplying signals spaced uniformly over time and having a trapezoidal pulse waveshape, and which is coupled to said exchange control components which determine the initiation of a rising leading edge and a falling trailing edge of said pulse signals, and a multiplier circuit having a gain which varies in a linear manner with a level of said signals generated by said second generator, said multiplier calculating the product over time of signals supplied by said first and second generators and supplying a voltage signal which is added to signals generated by said speech signal generator contained in said speech circuit of said subscriber's line, wherein said second voltage signal generator comprises a voltage to current converter having first and second input terminals and an output terminal, said converter supplying an output current which is proportional to a voltage between said first and second input terminals for values of this voltage lying between two predetermined threshold values which are of opposite sign and have an identical absolute value and for supplying a current which is kept constant for values of this voltage which are beyond said threshold values, wherein said first terminal of said converter is connected to a constant potential reference via a controlled switch and a constant voltage generator connected in parallel, said exchange control components causing said switch to open and close, and wherein a capacitor is provided, said capacitor having a first terminal connected to said second input terminal and said output terminal of said converter and having a second terminal connected to said constant reference potential, the voltage between said two terminals of said capacitor forming said signal supplied by said second signal generator.

4,720,853

RING SIGNAL DISCRIMINATOR

Aleksander Szlam, Marietta, Ga., assignor to Melita Electronic Labs, Inc., Norcross, Ga.

Division of Ser. No. 752,053, Jul. 5, 1985, Pat. No. 4,677,665.
This application Mar. 9, 1987, Ser. No. 3,643
Int. Cl.[4] H04M 3/54
U.S. Cl. 379—211 6 Claims



1. A ring signal and dial pulse detector for detecting and discriminating among normal ringing signals, call forward reminder ringing signals, and rotary dial pulses on a telephone line and comprising:

a capacitor for blocking D.C. voltages on said telephone line;

optocoupler/isolator means connected across said telephone line and responsive to an input signal for providing a first output signal corresponding to, but electrically isolated from, said input signal;

low pass filter means for eliminating high frequency signals and noise transitions in said first output signal;

voltage comparator means for providing a second output signal responsive to the output voltage of said low pass filter means;

retriggerable timer means responsive to said second output signal for providing a third output signal which is retriggerable and which continues for a predetermined period after the last transition of a predetermined polarity of said second output signal; and

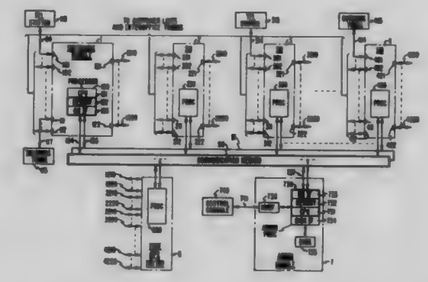
processor means responsive to the pulse width and repetition rate of said second and third output signals for providing a fourth output signal indicative of whether said input signal is a normal ringing signal, a call forward reminder ringing signal, or a rotary dial pulse.

4,720,854

ARCHITECTURE FOR DISTRIBUTED CONTROL TELECOMMUNICATION SYSTEMS

Douglas S. Saad, Naperville, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1985, Ser. No. 810,069
Int. Cl.[4] H04Q 3/47, 11/04
U.S. Cl. 379—269 20 Claims



20. In a distributed control switching system comprising a plurality of modules each comprising a plurality of ports, said modules interconnected via a plurality of intermodule outlets connected to each of said modules, and a commondata communication means connected to each of said modules for transmitting data messages among said modules, a method of setting up a call between a source port and a destination port for communication with a destination station defined by a particular destination directory number, comprising the steps of:

detecting a seizure from said source port in a first of said modules;

receiving data representing said particular destination directory number;

translating said particular destination directory number to find an identity of a second module containing a destination port for communicating with said destination station;

sending a first message to said second module over said common communication means, said first message comprising an identity of said destination port; and

sending a second message to said first module over said common communication means, said second message comprising an identity of an intermodule outlet from said second module to said first module.

4,720,855

TELEPHONE APPARATUS

Kanji Ohnishi, Tokyo; Hiroshi Yasuda, Kanagawa, and Norio Numata, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

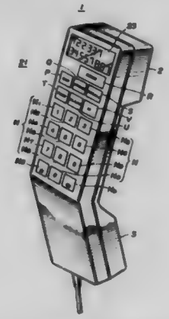
Filed Feb. 20, 1986, Ser. No. 831,283
Claims priority, application Japan, Feb. 21, 1985, 60-33322
Int. Cl.[4] H04M 1/26
U.S. Cl. 379—354 3 Claims

1. A telephone apparatus used for a telephone system in which the telephone apparatus is connected to a remote destination telephone through telephone circuits after an identification number for a subscriber has been transmitted to a telephone company, which comprises:

(a) key entry means including plural dial keys;

(b) memory means for storing the identification number and a plurality of remote destination telephone numbers both entered through the dial keys;

(c) display means for displaying a remote destination telephone number corresponding to an operated dial key; and



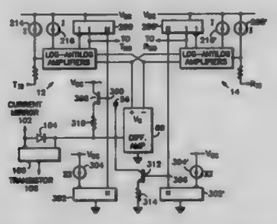
(d) control means for enabling a display of the identification number to be displayed on said displaying means when the identification number is written at a designated address of said memory means but disabling a display of the identification number on said displaying means when the identification number is read from the designated address of said memory means to transmit the number to the telephone company.

4,720,856

CONTROL CIRCUIT HAVING A DIRECT CURRENT CONTROL LOOP FOR CONTROLLING THE GAIN OF AN ATTENUATOR

W. David Pace, Tempe, and Dennis L. Welty, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1986, Ser. No. 902,723
Int. Cl.[4] H04M 1/02, 9/10
U.S. Cl. 379—390 10 Claims



1. A direct current (DC) control loop for setting the gain of an attenuator circuit, the gain of the attenuator circuit being varied in response to a control voltage applied thereto, comprising:

a control circuit for providing the control voltage and including a charge storage means, the magnitude of the control voltage varying as the charge across said charge storage means is varied;

first circuit means for providing a current at an output thereof the magnitude of which is proportional to the gain of the attenuator circuit;

second circuit means for sinking a current of a predetermined magnitude, said second circuit means being coupled to said output of said first circuit means; and

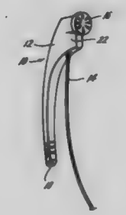
third circuit means responsive to said current provided by said first circuit means becoming equal to said current sank by said second circuit means for maintaining the charge across said charge storage means whereby the control voltage is held at a value corresponding to a desired maximum gain of the attenuator circuit.

4,720,857

MINIATURIZED HEADSET FOR TWO-WAY VOICE COMMUNICATION

Christine Burris, Felton; Robert L. Harris, Rio Del Mar; Victor Kolough; Larry R. Linville, both of Santa Cruz; Charles G. Scott, Aptos, and Robert Young, Santa Cruz, all of Calif., assignors to Plantronics, Inc., Santa Cruz, Calif.

Filed Dec. 6, 1985, Ser. No. 805,907
Int. Cl.[4] H04M 1/05
U.S. Cl. 379—430 17 Claims



1. A two-way voice communication headset, comprising:

a housing;

means, including a microphone, connected to said housing, for converting a wearer's speech to electrical signals;

means, including a receiver, connected to said housing, for converting received electrical signals into sounds;

means including an earpiece assembly carried by said housing, for conveying sounds from the received signal converting means to the wearer's ear;

said earpiece assembly adapted to fit within the concha of either a wearer's left or right ear and outside the auditory canal;

said earpiece assembly including a pair of sound output ports, one of the ports being in alignment with the auditory canal of the wearer's ear regardless of which ear the earpiece is disposed; and

means carried on said housing, for engaging the notch portion of the concha of either of a wearer's ears to support the housing from the wearer's ear and establish rotational positioning of the earpiece assembly relative to the wearer's ear.

4,720,858

TELEPHONE HANDSET/ACOUSTIC COUPLER ADAPTER

Ronald G. Pavelka, Orange, and Oren J. Chesebro, Corona Del Mar, both of Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.

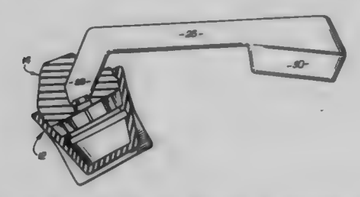
Filed Jan. 31, 1986, Ser. No. 824,857
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—444 3 Claims

1. An adapter for acoustically coupling a telephone handset having a generally rectangular mouthpiece with an acoustic coupler interface device having circular acoustic coupling cups that are designed for use with telephone handsets having a circular mouthpiece and circular earpiece, the adapter comprising:

a circular base portion for mating engagement with a circular acoustic coupling cup of the interface device; and

a generally cylindrical body portion integral with and extending from one side of the base portion, wherein the

body portion has a substantially rectangular opening extending toward the base portion, the opening forming a cavity for receiving a telephone handset mouthpiece, said cavity terminating adjacent the center of the base portion, wherein the adapter includes an acoustic coupling passage



formed in the body and base portions for allowing acoustic transmission from the handset mouthpiece through the cavity and out the base portion; and

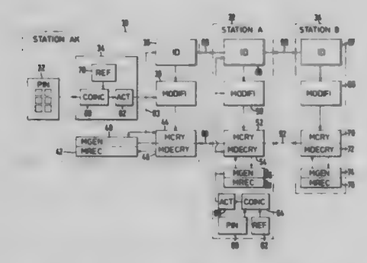
wherein the mouthpiece of the handpiece is coupled to the acoustic coupler via the adapter and the earpiece of the handset is directly coupled to the acoustic coupler.

4,720,859

METHOD AND SYSTEM FOR THE MUTUAL ENCYPHERED INDENTIFICATION BETWEEN DATA COMMUNICATING STATIONS AND STATIONS FOR USE WITH SUCH METHOD AND SYSTEM

Tore I. Aare, Åkersberg; Torgny O. Rustan, Stockholm; Pär Öman, Kungalinger; Rolf J. Blom, Linkoping; Robert Forchheimer, Linkoping; Vilveke A. Fak, Linkoping, and Bror I. Ingemarsson, Linkoping, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,711
Claims priority, application Sweden, Apr. 8, 1981, 8102268
Int. Cl.[4] H04L *9/02*
U.S. Cl. 380—23 **12 Claims**



1. A method for transmitting data messages between a first station (A, 32) belonging to a first class of stations and a second station (B, 34) belonging to a second class of stations, said method comprising the steps of:

a. generating a first identification sequence (cg1) is said first station to be sent to said second station from a first identification number value (a, r1) and a first ciphering key (kb) by means of a first identification ciphering function (E);

b. reproducing said first identification number value in said second station from said first identification sequence by means of a first deciphering key (db) and a second identification ciphering function (D) inverse to said first ciphering function;

c. generating a second identification sequence (cg2) in said second station to be sent to said first station from said reproduced first identification number value, from a second identification number value (b, r2) and a second ciphering key (ka) by means of said first identification ciphering function;

d. reproducing said second identification number value in said first station from said second identification sequence by means of a second deciphering key (da) and said second identification ciphering function;

e. generating a third identification sequence (cg3) in said first station to be sent to said second station from said reproduced second identification number value, by means of a third identification ciphering function (f);

f. in an identifying step by means of comparison of a part of a received identification sequence (cg2, cg3) to a locally generated identification number value (r1, r2) after being operated by said third identification ciphering function: identifying in said first station said second station as belonging to said second class, and identifying in said second station said first station as belonging to said first class;

g. generating identical message ciphering keys (tm) upon said mutual identification in both said first and second stations based on the respective first and second identification number values for use in a message ciphering function which is different from any identification ciphering function; and

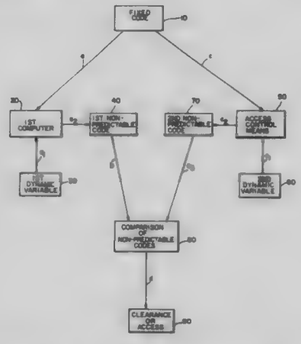
h. generating an encyphered message in at least one of said stations by means of said message ciphering key for transmission to the other station.

4,720,860

METHOD AND APPARATUS FOR POSITIVELY IDENTIFYING AN INDIVIDUAL

Kenneth P. Weiss, Boston, Mass., assignor to Security Dynamics Technologies, Inc., Cambridge, Mass.

Filed Nov. 30, 1984, Ser. No. 676,626
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **3 Claims**



1. An identification system for identifying an individual comprising:

first computer means including first clock means for generating a first time dependent dynamic variable, means for storing a predetermined static variable, first means for utilizing said first time dependent dynamic variable and said static variable to calculate a first non-predictable code in accordance with a predetermined algorithm, and means for providing a visual display of the first non-predictable code calculated at at least a selected time interval;

second computer means including second clock means for generating a second time dependent dynamic variable, means for obtaining said predetermined static variable, second means for utilizing said second time dependent dynamic variable and said static variable to calculate at a selected time interval a second non-predictable code in accordance with said predetermined algorithm, means for obtaining the first non-predictable code displayed during said selected time interval, match means for comparing the second non-predictable code generated during said selected time interval with the first non-predictable code obtained during said selected time interval, and means responsive to a match between said first and second non-predictable codes in said match means for signifying identification;

said first and second computer means independently generating said first and second non-predictable codes for comparison thereof without communication of the second computer means or the second clock means back to the first computer means there being no physical or electrical connection between said first and second computer means; and

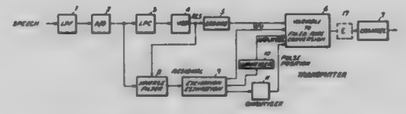
wherein a static variable is communicated to the means for obtaining at the second computer by an individual located at the first computer, the individual to be identified communicating the displayed first non-predictable code and the static variable to the means for obtaining at the second computer.

4,720,861

DIGITAL SPEECH CODING CIRCUIT

John P. Bertrand, Upper Nyack, N.Y., assignor to ITT Defense Communications a Division of ITT Corporation, Nutley, N.J.

Filed Dec. 24, 1985, Ser. No. 813,110
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—36 **7 Claims**



1. An apparatus for converting analog speech to a digital signal for transmission on a low bit rate capacity channel, said apparatus of the type including an analog-to-digital converter for converting analog speech into digital signals with the output of said analog-to-digital converter coupled to a linear predictive coding module (LPC) for providing digital output signals at an output based on a plurality of resonances in said analog speech signal, the improvement in combination therewith of:

vector quantization means having an input coupled to said output of said linear predictive coding module and having stored therein a plurality of separate combinations of bandwidths and frequencies occurring in said plurality of resonances of said analog speech signal for providing at an output a binary number indicative of the difference between a speech sound presently being analyzed and the speech sound immediately before said analyzed sound, said binary number indicative of reflection coefficients of said speech,

a coder having an input coupled to the output of said vector quantization means for providing at an output a digital signal having a lesser number of bits for often occurring reflection coefficients and a greater number of bits for less frequently occurring reflection coefficients,

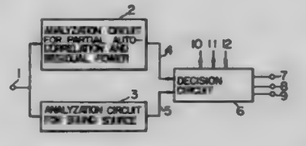
a variable to fixed rate converter having one input coupled to said output of said coder and operative to store said input signal from said coder at said variable rate to output said stored signal at a fixed rate according to the capacity of said channel, with said output of said converter coupled to said channel at a transmitting end.

4,720,862

METHOD AND APPARATUS FOR SPEECH SIGNAL DETECTION AND CLASSIFICATION OF THE DETECTED SIGNAL INTO A VOICED SOUND, AN UNVOICED SOUND AND SILENCE

Kazuo Nakata, Kodaira, and Takanori Miyamoto, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,015
Claims priority, application Japan, Feb. 19, 1982, 57-24368
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—38 **9 Claims**



1. A method of speech signal detection and classification comprising the steps of:

dividing an input signal into blocks at predetermined intervals having a time period which is sufficient for the detection and the classification of the content of each signal block;

extracting from each of said signal blocks a plurality of normalized parameters, which are relatively independent of level variations of the respective input signal, including a first-order partial auto-correlation coefficient (K_1), a normalized residual power (E_N) and a peak value of normalized residual correlation (ϕ); and

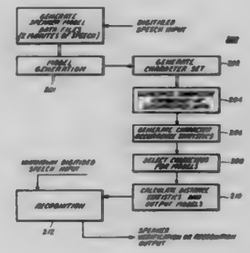
detecting and classifying said input signal corresponding to each of said signal blocks into a voiced sound (V), an unvoiced sound (U) and silence (S) by use of preset thresholds corresponding to particular values of the aboveasid normalized parameters that also represent characteristic boundaries for classification of said input signal into the V, U or S type.

4,720,963

METHOD AND APPARATUS FOR TEXT-INDEPENDENT SPEAKER RECOGNITION

Kung-Pu Li, LaJolla, and Edwin H. Wrench, Jr., San Diego, both of Calif., assignors to ITT Defense Communications, Nutley, N.J.

Filed Nov. 3, 1982, Ser. No. 439,010
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—42 **16 Claims**



1. A method of recognizing an unknown speaker as one of a plurality of speaker candidates from portions of speech of each

of said speaker candidates and said unknown speaker comprising the steps of:

converting digitized samples of said portions of speech of said speaker candidates into frames of speech, each frame representing a point in a preselected multi-dimensional speech space:

generating a character set representative of said speech space comprising a plurality of characters selected from said frames of speech of all of said speaker candidates:

generating a speaker model of each of each speaker candidates, said speaker model comprising a plurality of model characters selected from said character set and representative of an associated speaker's voice characteristics;

converting digitized samples of said portions of speech of said unknown speaker into frames of speech; and

comparing said frames of speech from said unknown speaker with said speaker models to determine which one of said speaker candidates has the greatest likelihood of being said unknown speaker.

4,720,864

SPEECH RECOGNITION APPARATUS

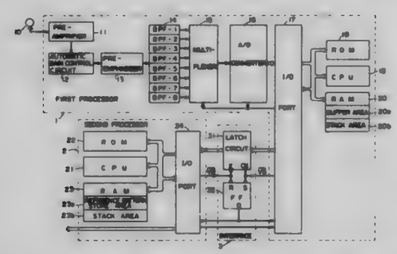
Kiyoshi Tajima; Masayuki Iida, and Hiroki Ohnishi, all of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 2, 1983, Ser. No. 490,302

Claims priority, application Japan, May 4, 1982, 57-74932; Jun. 22, 1982, 57-107871; Feb. 14, 1983, 58-22535; Feb. 14, 1983, 58-22536

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—43 **15 Claims**



1. A speech recognition apparatus comprising a microphone for converting speech into a sequence of electrical aural signals; a first processor which is provided with a first operation control circuit for computation processing to extract features of said sequence of aural signals and obtain feature patterns thereof and a first memory which is controlled by said first operation control circuit and stores said feature patterns, and which carries out feature extraction processing in sequence; a second processor which is provided with a second memory for previously storing a plurality of reference patterns and a second operation control circuit carrying out computation processing for comparing the feature patterns obtained by said first processor with said reference patterns to match each of said feature patterns to a similar reference pattern, and which carries out comparison and distinction processing in sequence; and an interface for transferring said feature patterns from the first processor to the second processor, said interface being controlled by said first and second operation control circuits, said first and second processors operating in parallel with said second processor carrying out said comparison and distinction processing for a feature pattern which has previously been extracted by said first processor while the first processor extracts features of a succeeding portion of aural signals.

4,720,865

MULTI-PULSE TYPE VOCODER

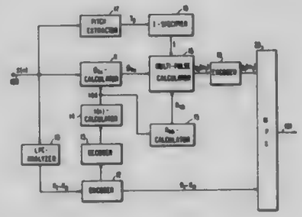
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 625,055

Claims priority, application Japan, Jun. 27, 1983, 58-115338; Aug. 15, 1983, 58-149007

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—49 **9 Claims**



1. A multi-pulse type vocoder comprising:

first means for extracting spectrum information of an input speech signal X(n) in an analysis frame;

second means for developing an impulse response h(n) of a filter specified by said spectrum information;

third means for developing a cross-correlation series $\phi_{Ax}(mi)$ between said input speech signal X(n) and said impulse response h(n) at a time lag mi within a predetermined time range, n representing a sampling time point;

fourth means for developing an auto-correlation series $R_{AA}(n)$ of said impulse response h(n) and a normalized auto-correlation series $R_{AA_1(n)}$ normalized by a power of the auto-correlation series $R_{AA(n)}$;

fifth means for determining the most similar portion of said cross-correlation series ϕ_{Ax} to the auto-correlation series $R_{AA(n)}$;

sixth means for developing a similarity between the cross-correlation series $\phi_{Ax(n)}$ and the normalized auto-correlation series $R_{AA'(n)}$; and

seventh means for providing a pulse having the maximum similarity value and a time position thereat of the most similar portion of said cross-correlation series ϕ_{Ax} as one of said multi-pulses.

4,720,866

COMPUTERIZED STETHOSCOPIC ANALYSIS SYSTEM AND METHOD

Antonio L. Elias, Lexington, Mass., and Mark F. Davis, Pacifics, Calif., assignors to Seaboard Digital Systems, Inc., Prince Edward Island, Canada

Filed Sep. 20, 1985, Ser. No. 778,524

Int. Cl.⁴ A61B *7/00*

U.S. Cl. 381—67 **3 Claims**

1. A computerized stethoscopy accessory for use with a host computer comprising means for detecting sounds in a living body, means for converting said detected sounds to electrical signals, a bank of fixed-center-frequency filters having a range of center frequencies from a lowest to a highest frequency, means for applying said electrical signals to said bank of fixed-center-frequency filters, means for sampling the output of each said filter at a rate at least twice the fixed center frequency of the lowest frequency filter of said bank, an analog-to-digital converter connected to said bank of filters for converting the sampled output of each said filter to digital form, means for processing said sampled outputs in said host computer, and an output device connected to said host computer for displaying said sampled outputs in a predetermined format after processing thereof.

4,720,867

WOOFER SYSTEM FOR AN AUTOMOTIVE AUDIO SYSTEM WITH A PROTECTER THEREFOR

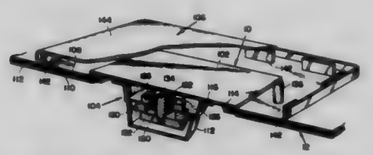
Hiroshi Imai; Takayuki Yanagishima, and Junichi Kanai, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 6, 1984, Ser. No. 628,604

Claims priority, application Japan, Jul. 30, 1983, 58-139875

Int. Cl.⁴ H04R *7/04*

U.S. Cl. 381—86 **16 Claims**



1. A woofer for an automotive audi system comprising:

a vehicle panel which forms part of a vehicle body and which is sufficiently flexible to oscillate at audio frequencies, said vehicle panel including a section adapted to oscillate t produce audio sound;

a driver housing fixed to said section;

a driver unit resiliently suspended within said housing, associated with an audio player for receiving an audio signal produced by said audio player, and fixed to said section of said vehicle panel to drive said section to oscillate at audio frequencies for producing audio sound, said driver unit comprising a support element secured to said vehicle panel, a coil wrapped around said support element, and a driver assembly having a permanent magnet, positioned adjacent said coil for causing oscillation of said support element; and

a protective cover mounted on said vehicle panel, having a major section extending over and parallel to said section of said vehicle panel secured to said vehicle panel at a point outside of said section and near said section, said major section having no openings therein for passage of acoustic vibrations generated by said section of said vehicle panel, said major section being separated by a given distance from the rest position of the opposing surface of said vehicle panel, a support extending between said major section near the peripheral edge thereof and said vehicle panel, said support being formed with at least one opening allowing transmission of acoustic vibrations produced by oscillation of said vehicle panel.

4,720,868

DYNAMIC TRANSDUCER DEVICE

Mutsuo Hirano, Saitama, Japan, assignor to Sanden Corporation, Gunma, Japan

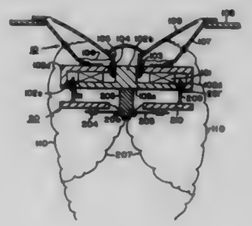
Filed Aug. 22, 1985, Ser. No. 768,341

Claims priority, application Japan, Sep. 3, 1984, 59-184197; Jan. 22, 1985, 60-6203[U]

Int. Cl.⁴ H04R *1/24, 9/00*

U.S. Cl. 381—182 **18 Claims**

1. A dynamic transducer device comprising in combination a magnetic assembly having a permanent magnet, a magnetic yoke with an annular magnetic gap, said yoke being coupled magnetically to said magnet, and a voice coil disposed in said magnetic gap; an additional coil of annular construction disposed in the vicinity of said magnetic assembly; an annular vibratile body having a central aperture, said additional coil being disposed coaxial with said annular vibratile body mechanically connected to and supported by said body, and support means elastically supporting said vibratile body, said support means comprising a support rod, means for mounting said support rod adjacent said magnetic assembly, and a spring plate fixedly mounted on said support rod, said annular vibratile body being connected to said spring plate at equiangularly-spaced positions.



4,720,869

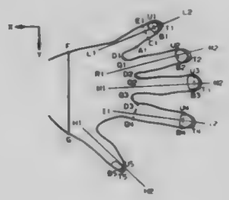
HAND DIMENSION VERIFICATION

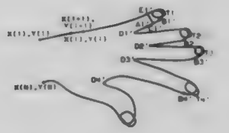
Aspi B. Wadia, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,772

Int. Cl.⁴ G06K *9/00*

U.S. Cl. 382—2 **21 Claims**





1. An improved hand dimension verification system comprising:

a scanner for scanning a hand positioned in a horizontal plane with the fingers thereof spaced apart first at one angle and second at another angle to provide two sets of hand image data, each set being a contour sequence of the

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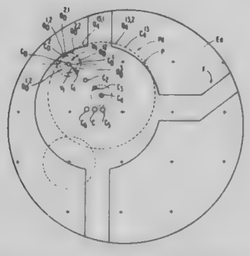
entire hand and image processing means for processing said two sets of hand image data to provide hand verification measurements including finger width, finger length, finger thickness and hand area.

4,720,870

METHOD OF AUTOMATICALLY AND ELECTRONICALLY ANALYZING PATTERNS IN ORDER TO DISTINGUISH SYMMETRICAL PERCEPTIBLE AREAS IN A SCENE TOGETHER WITH THEIR CENTERS OF SYMMETRY

Jean-Marie Billiotte, 8 place des Federes, 93160 Noisy Le Grand; Thierry Bouin, Residence Le Nerprun, 28500 Boutigny; Frédéric Basset, 33 rue Fremicourt, 75015 Paris; Jacques Beauvois, 3 place des Vosges, 75004 Paris, all of France, and Didier Primat, 15 chemin de Bois Caran Collonge Bellerive, 1245 Geneva, Switzerland

Filed Feb. 4, 1987, Ser. No. 10,673
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 13 Claims



1. A method of electronically analyzing patterns in a scene in order to automatically distinguish symmetrical perceptible areas amongst the patterns, said areas being intersected by auxiliary patterns and being disposed randomly in the scene, the method including determining the centers of symmetry of said symmetrical perceptible areas, with said perceptible areas and optionally said auxiliary patterns being distinguishable from the background of the scene by a gray level which, after digitizing, gives rise to a different binary level for pattern pixels and for background pixels;

the method consisting in identifying whether a pattern contains locally one of said symmetrical perceptible areas by:

using a camera to input a window of said scene including an area to be inspected for patterns;

digitizing said window in the form of a digital working image containing a digitized pattern; and

fixing a test point C0 inside a digitized pattern;

said method including the improvement whereby:

a family of concentric circles of increasing diameter dk are drawn or scanned around the test point and are centered thereon, with each circle $C0^k$ being divided into q arcs $Q0^{k1}$, where $1<q$, corresponding to q quarters $O0_1$ distributed around the test point;

so long as the circles of the family remain entirely contained within the digitized pattern, the diameters of the circles are caused to increase successively ($C0^k$, $C0^{k+1}$, . . .);

as soon as a circle $C0^j$ intersects the digitized pattern fd, i.e. as soon as at least one point e of the circle $C0^j$ lies outside the area of the pattern fd and corresponds to digitized background, the number q0 of arcs $Q0^{ij}$ of the circle $C0^j$ lies intersecting the digitized pattern fd is determined;

if only one arc of the circle intersects the digitized pattern (the most usual case), then

a new test point c1 is selected which is shifted away from the preceding test point in the opposite direction to the direction of said arc $Q0^{ij}$ intersecting the pattern; and

the steps of the method are iterated from the new test point, thereby creating a converging sequence of test points so long as each circle Cn^k which intersects the digitized pattern continues to do so with only one of its arcs Qn^{k1};

if the sequence of centers converges on a limiting point or becomes stationary in the vicinity of such a point, it is assumed that:

the pattern probably constitutes a symmetrical perceptible area; and

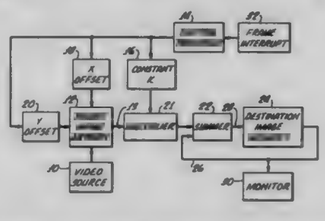
is centered on said point.

4,720,871

DIGITAL IMAGE CONVOLUTION PROCESSOR METHOD AND APPARATUS

James M. Chambers, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 13, 1986, Ser. No. 873,903
Int. Cl.[4] G06K *9/36*; G06F *15/336*
U.S. Cl. 382—42 23 Claims



1. Apparatus for processing digital data representative of a digital array of points of a source image comprising:

means for providing a source image as a digital array of points;

destination image memory means;

control means including convolution means for establishing computational values and a spatial sequence of computational relative to each point in said array;

computational means responsive to said control means for computationally adjusting the value of each point of said source image digital array for transfer to and combination with the value in said destination image memory means in a spatially related position;

means for generating an end of array signal; and

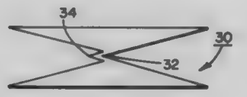
means responsive to said end of array signal for enabling said control means to revise said computational values and spatial sequence of computation relative to each point in said array for subsequent iterative processing by said computational means for a number of iterations determined by the number and values of said computational values whereby said source image is transformed into an array of values in said destination image memory means representative of a convolved image.

4,720,872

THERMOPLASTIC BAG AND METHOD OF FORMING THE SAME

David J. Kaczerwaski, Manchester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 738,629, May 28, 1985, abandoned.
This application Dec. 11, 1986, Ser. No. 940,231
Int. Cl.[4] B65D *30/20*
U.S. Cl. 383—8 9 Claims



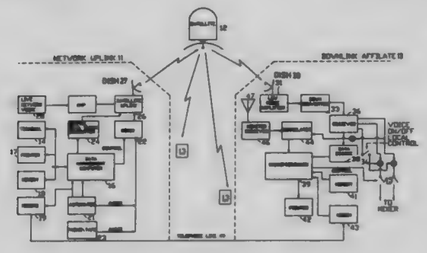
1. A sack made of thermoplastic film, said sack having front and rear panels, an open mouth top portion, two gussetted side walls at opposite sides thereof wherein the innermost reach of the gussetted folds overlap to a comparatively small degree, and at the bottom of said sack is a heat seal weld of all of the layers in their lay-flat condition, including the overlapped regions.

4,720,873

SATELLITE AUDIO BROADCASTING SYSTEM

Ricky R. Goodman, Monte Vista; Jeffre M. Bobicki, Alamosa, both of Colo., and Robert S. Cherry, Redondo Beach, Calif., assignors to Ricky R. Goodman, Tucson, Ariz.

Filed Sep. 18, 1985, Ser. No. 777,201
Int. Cl.[4] H04B *17/00*; H04H *9/00*
U.S. Cl. 455—2 32 Claims



1. A radio network programming and advertising system, comprising,

a network uplink facility at a first location for transmitting network programs, advertising and other information via a communications satellite in geosynchronous orbit and for receiving and processing information relating to local broadcasting of the programs and advertising,

a plurality of local radio station downlink affiliate facilities at various locations remote from the uplink facility for receiving satellite transmissions originating at the uplink facility and for locally broadcasting network programs and advertising and local programming,

the network uplink facility including means for transmitting both audio, with programs and advertising, and digital databursts at intervals, containing data pertinent to the audio and to the operation of the downlink facilities, up to the satellite,

each downlink facility including means for receiving the satellite transmissions from the uplink facility and for converting them into useable form, including means for separating the databursts from the audio, and microprocessor and memory means for receiving, processing and storing the databurst information, correlator means for receiving the actual local broadcast of the downlink radio station and for receiving the network audio program and advertising transmitted from the uplink facility and for comparing them and for noting periods when the local broadcast departs from the network audio and recording such periods of departure, via the microprocessor and memory means,

both the downlink and the uplink facilities including modem means for telephone communication between the uplink and the downlink facilities,

the uplink facility including a data management computer connected to the uplink facility modem means, and a computer terminal and memory connected to the data management computer, and including data transfer means for initiating connection through the modem means and telephone lines between the downlink microprocessor and the data management computer and for causing the downlink microprocessor and memory means to transfer stored data relating to periods of departure of the downlink broadcast from the network audio, into the data management computer of the uplink facility, and

the uplink facility further including automatic billing and payment means associated with the data managment computer for automatically computing bills to advertisers for the local broadcasting of their advertisements and for automatically computing payments due each local station downlink facility for the broadcasting of such advertising, both in accordance with and reflecting said noted periods of departure of each downlink affiliate station from the network audio and whether and to what extent network advertising has been omitted from each local station broadcast.

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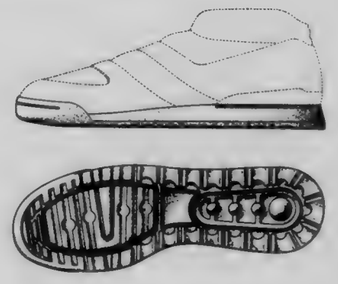
293,730
GUITAR-SHAPED PASTA PIECE
Frank E. Blatnick, Winthrop Harbor, Ill., assignor to Kraft, Inc., Glenview, Ill.
Filed Apr. 30, 1985, Ser. No. 728,749
Term of patent 14 years
U.S. Cl. D1—106



293,731
TEA BAG
Pamela J. Fry, and Michael W. Tafuri, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 13, 1985, Ser. No. 733,157
Term of patent 14 years
U.S. Cl. D1—199



293,732
SHOE OUTSOLE
Brenda C. Kelley, Beaverton, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to Penas, Inc., Portland, Oreg.
Filed Apr. 4, 1986, Ser. No. 847,884
Term of patent 14 years
U.S. Cl. D2—320



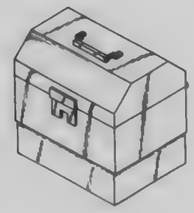
293,733
COMBINED CAP AND FUR SCARF
David Leinoff, 208 W. 29th St., New York, N.Y. 10001
Filed Aug. 29, 1985, Ser. No. 770,790
Term of patent 14 years
U.S. Cl. D2—501



293,734
SURGICAL INSTRUMENT COVER
F. Barry Baya, Seminole, Fla., assignor to Concept, Inc., Clearwater, Fla.
Filed Sep. 27, 1984, Ser. No. 654,729
Term of patent 14 years
U.S. Cl. D3—30.1

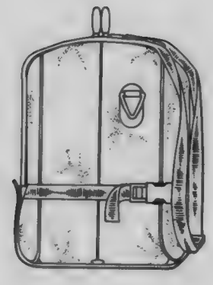


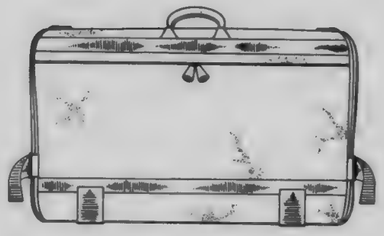
293,735
SONAR CARRYING CASE FOR FISH FINDERS
James D. Ault, 1526 20th Ave., Beaver Falls, Pa. 15810
Filed Feb. 11, 1985, Ser. No. 700,108
Term of patent 14 years
U.S. Cl. D3—38



293,736
COMBINED CARRY-ON, GARMENT BAG AND TOILET KIT ASSEMBLY
Mohsen Ghiasi, 12 Glen Alpine Rd., Piedmont, Calif. 94611
Filed Oct. 25, 1984, Ser. No. 664,581
Term of patent 14 years
U.S. Cl. D3—42



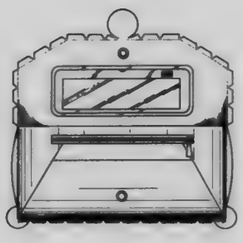




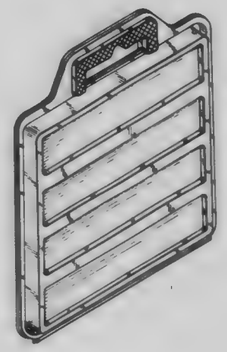
293,737
COMBINED PURSE AND ILLUMINATED COMPACT
Marlene Jones, 2340 Clover Ridge Dr., Dallas, Tex. 75216
Filed Jan. 28, 1985, Ser. No. 695,233
Term of patent 14 years
U.S. Cl. D3—43







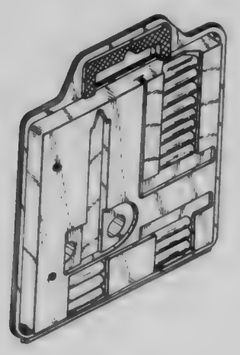
293,738
CARRYING CASE FOR TOY ARTICLES OR THE LIKE
Richard P. Nadeau, Frankfort, N.Y., assignor to Zercom Enterprises, Utica, N.Y.
Filed Jul. 31, 1985, Ser. No. 761,029
Term of patent 14 years
U.S. Cl. D3—73



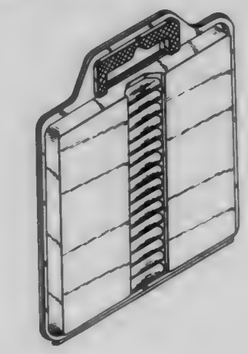


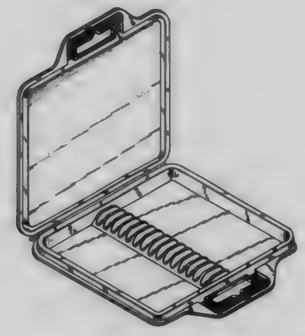
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293,739
CARRYING CASE FOR TOY ARTICLES OR THE LIKE
Richard P. Nadeau, Frankfort, N.Y., assignor to Zorcom Enterprise, Utica, N.Y.
Filed Jul. 31, 1985, Ser. No. 761,082
Term of patent 14 years
U.S. Cl. D3—73



293,740
CARRYING CASE FOR TOY ARTICLES OR THE LIKE
Richard P. Nadeau, Frankfort, N.Y., assignor to Zorcom Enterprise, Utica, N.Y.
Filed Jul. 31, 1985, Ser. No. 761,084
Term of patent 14 years
U.S. Cl. D3—73







293,741
LOW FRONT COMPETITION HOLSTER
Richard D. E. Nichols, Fallbrook, Calif., assignor to Bianchi International, Temecula, Calif.
Filed Oct. 7, 1983, Ser. No. 539,835
Term of patent 14 years
U.S. Cl. D3—101



293,742
CHALK LINE ROLLER
Merriman E. Call, 223 Yorktown Rd., Tabb, Va. 23602
Filed Sep. 19, 1984, Ser. No. 652,097
Term of patent 14 years
U.S. Cl. D4—121



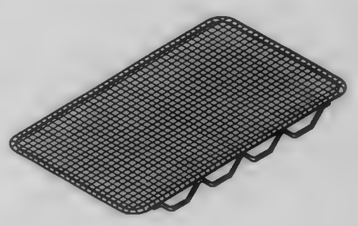
293,743
BAR STOOL
Freddie D. Hoyt, 16175 Via Walter, San Lorenzo, Calif. 94580
Filed Jul. 17, 1985, Ser. No. 755,853
Term of patent 14 years
U.S. Cl. D6—360



293,744
SEAT
Joseph M. Mallison, High Point, N.C., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Jul. 19, 1985, Ser. No. 756,633
Term of patent 14 years
U.S. Cl. D6—381



293,745
BED
Lawrence J. Shiever, Sr., 10384 Bellesu Dr., Twinsburg, Ohio 44087
Filed Mar. 23, 1984, Ser. No. 592,873
Term of patent 14 years
U.S. Cl. D6—382

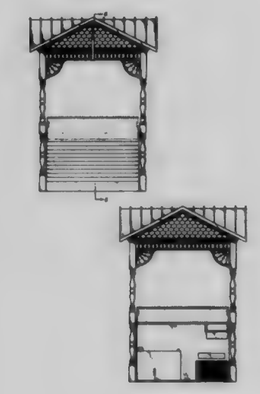


293,746
UTILITY BIN
Michael T. Sayward, 1406 SW. 8 St., Pompano Beach, Fla. 33060
Filed Oct. 22, 1984, Ser. No. 663,492
Term of patent 14 years
U.S. Cl. D6—448



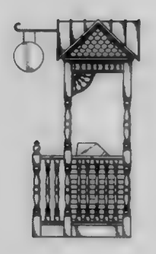
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1988
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293,747
ICE CREAM STATION
Lyle Metzdorf, Houston, Tex., assignor to Blue Bell Creameries, Inc., Brenham, Tex.
Filed Feb. 12, 1985, Ser. No. 700,711
The portion of the term of this patent subsequent to Jan. 19, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—450

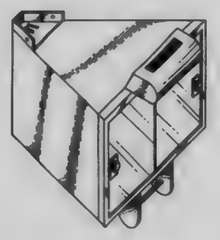


293,748
ICE CREAM STATION
Lyle Metzdorf, Houston, Tex., assignor to Blue Bell Creameries, Inc., Brenham, Tex.
Filed Feb. 12, 1985, Ser. No. 700,712
The portion of the term of this patent subsequent to Jan. 19, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—450

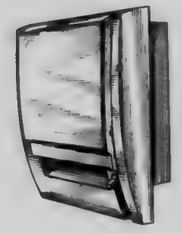




293,749
COMBINED CABINET AND PAPER ROLL HOLDER
Roy D. Murphy, 140 W. Prima Vista Blvd., Port St. Lucie, Fla. 33451
Filed Apr. 11, 1985, Ser. No. 722,008
Term of patent 14 years
U.S. Cl. D6—519

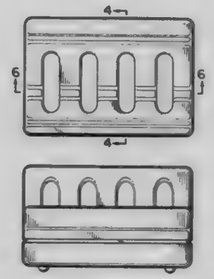


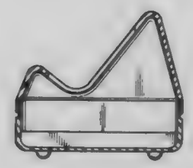
293,750
DISPENSING CABINET
Samuel S. Leotta, Jenkintown, Pa., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Mar. 8, 1985, Ser. No. 709,611
Term of patent 14 years
U.S. Cl. D6—522





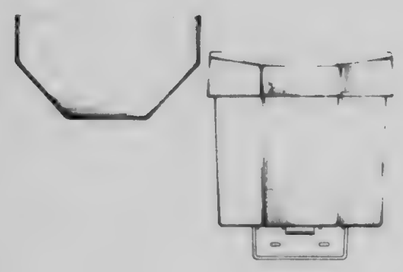
293,751
SOAP STORAGE DISH
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Oct. 28, 1985, Ser. No. 792,208
Term of patent 14 years
U.S. Cl. D6—536



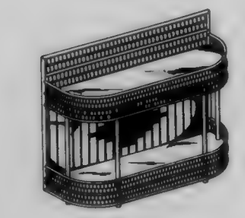


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293,752
SOAP DISPENSER
Robert L. Steiner, Chicago, and Thomas Bajek, Berwyn, both of Ill., assignors to Steiner Company, Inc., Chicago, Ill.
Filed Apr. 22, 1985, Ser. No. 726,007
Term of patent 14 years
U.S. Cl. D6—545



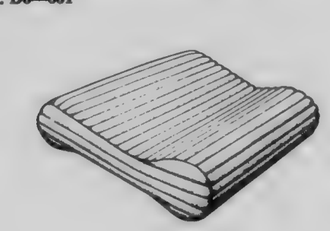
293,753
WALL SHELF
Rick L. Thompson, Des Moines County, Iowa, assignor to Burlington Basket Company, Burlington, Iowa
Filed Mar. 20, 1986, Ser. No. 845,385
Term of patent 14 years
U.S. Cl. D6—570



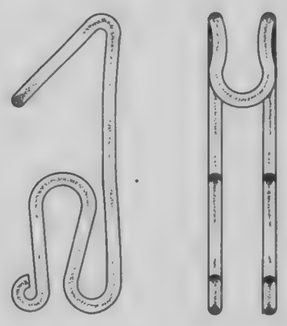
293,754
DUST COVER OR THE LIKE
Jerry D. Howell, Rte. 5, Box 182, Apex, N.C. 28365
Filed Apr. 9, 1984, Ser. No. 598,523
Term of patent 14 years
U.S. Cl. D6—595



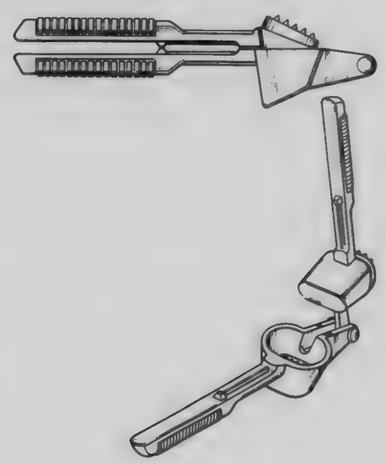
293,755
COVER FOR A CERVICAL PILLOW
Patrick T. Murphy, Winnipeg, Canada, assignor to Omega Posture Systems Inc., Winnipeg, Canada
Filed Sep. 24, 1984, Ser. No. 653,579
Claims priority, application Canada, Apr. 10, 1984, 10-04-84-16
Term of patent 14 years
U.S. Cl. D6—601



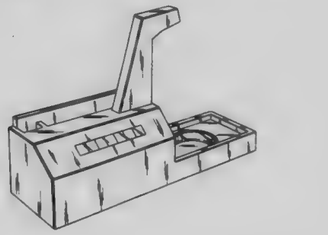
293,756
SPOON HOLDER CLIP FOR A DISH
Willard D. Benson, Rte. 5, Box 145, Philadelphia, Miss. 39350
Filed Mar. 13, 1985, Ser. No. 711,158
Term of patent 14 years
U.S. Cl. D7—73



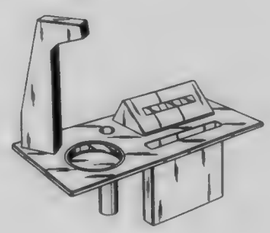
293,757
GARLIC-SQUEEZER
Giampiero Pedrini, Via Val Passiria 31, Brescia, Italy
Filed Sep. 4, 1984, Ser. No. 647,334
Claims priority, application Italy, Mar. 19, 1984, 21282/84[U]
Term of patent 14 years
U.S. Cl. D7—161



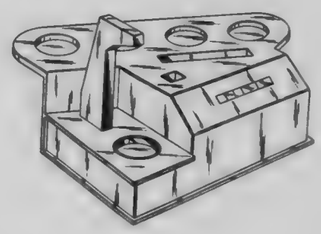
293,758
ELECTRONIC BEVERAGE DISPENSER
Jonathan W. Balisteri, 383 E. 23rd, Newport Beach, Calif. 92660
Filed Dec. 27, 1984, Ser. No. 686,831
Term of patent 14 years
U.S. Cl. D7—312



293,759
ELECTRONIC BEVERAGE DISPENSER
Jonathan W. Balisteri, 383 E. 23rd, Newport Beach, Calif. 92660
Filed Dec. 27, 1984, Ser. No. 686,832
Term of patent 14 years
U.S. Cl. D7—312

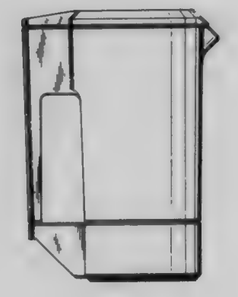


293,760
ELECTRONIC BEVERAGE DISPENSER
Jonathan W. Balisteri, 383 E. 23rd, Newport Beach, Calif. 92660
Filed Dec. 31, 1984, Ser. No. 687,655
Term of patent 14 years
U.S. Cl. D7—312

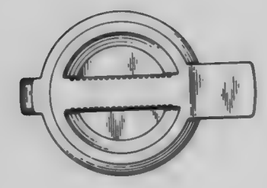


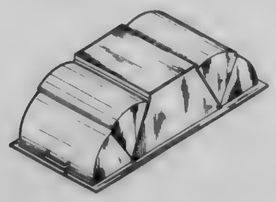
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293,761
SELF HEATING JUG FOR BEVERAGES
Clive St. John Rumble, 51 Hays Mews, London W1X 7RT, England
Filed Jul. 30, 1985, Ser. No. 760,478
Claims priority, application United Kingdom, Feb. 19, 1985, 1025115
Term of patent 14 years
U.S. Cl. D7—317

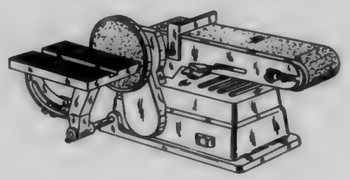


293,762
FOOD COVER
Gerald L. Polley, 1219 Statler, Duncanville, Tex. 75116
Filed Apr. 29, 1985, Ser. No. 728,304
Term of patent 14 years
U.S. Cl. D7—391



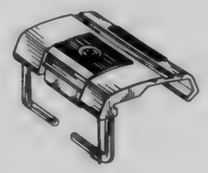


293,763
COMBINED BELT AND DISC SANDER
Robert W. Arehart, Cook County, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 13, 1985, Ser. No. 765,356
Term of patent 14 years
U.S. Cl. D8—62

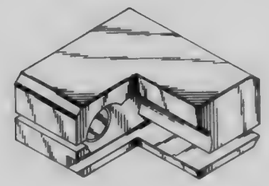


293,764
HINGE
Randall C. Hansen, Gurnee, Ill., assignor to A. L. Hansen Manufacturing Company, Gurnee, Ill.
Continuation of Ser. No. 648,641, Sep. 7, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,252
Term of patent 14 years
U.S. Cl. D8—327

293,765
LOCKING LATCH ASSEMBLY FOR LUGGAGE
Richard Miles, Guildford, and Stephen T. Green, Clanfield, both of England, assignors to Samsonite Corporation, Denver, Colo.
Filed Apr. 23, 1984, Ser. No. 602,870
Claims priority, application United Kingdom, Nov. 1, 1983, 1016033
Term of patent 14 years
U.S. Cl. D8—330



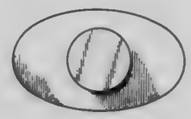
293,766
CORD AND GUIDE UNIT
Joe H. Lamb, 117 W. Fireclay, Salt Lake City, Utah 84107
Filed May 17, 1984, Ser. No. 611,148
Term of patent 14 years
U.S. Cl. D8—356



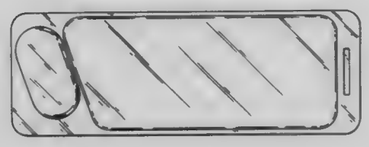
293,767
FOOD TRAY
Frank C. Powers, 24 Peterson Dr., Storm Lake, Iowa 50588
Filed Jul. 12, 1985, Ser. No. 754,404
Term of patent 14 years
U.S. Cl. D9—347



293,768
DUAL CLOSURE CONTAINER
Yasuo Mantani, Toyama, Japan, assignor to Yugen Kaisha Mantani Shoten, Himi, Japan
Filed Jul. 2, 1985, Ser. No. 750,964
Term of patent 14 years
U.S. Cl. D9—403



293,769
PACKAGING CONTAINER
Joseph C. Gilardone, Jr., P.O. Box 6, Virginville, Pa. 19564
Filed Jul. 23, 1985, Ser. No. 758,179
Term of patent 14 years
U.S. Cl. D9—415



293,770
COMBINED CLOSURE AND MEASURING CUP
Samuel Ross, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company
Filed Oct. 9, 1984, Ser. No. 658,729
Term of patent 14 years
U.S. Cl. D9—453



293,771
TELEPHONE SET TEST UNIT OR SIMILAR ARTICLE
Garry Savage, Montreal, Canada, assignor to Pro-Test Electronique Inc., Montreal, Canada
Filed May 6, 1985, Ser. No. 731,311
Term of patent 14 years
U.S. Cl. D10—75

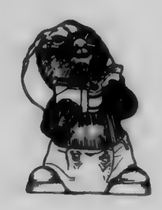


293,772
CHRISTMAS STOCKING
Jean A. Holly, 3151 Kenwood Cir., Anchorage, Ak. 99504
Filed Jun. 10, 1985, Ser. No. 743,002
Term of patent 14 years
U.S. Cl. D11—126

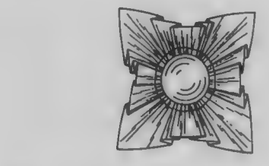


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293,773
TABLE ORNAMENT
Doreen N. Roberts, Gwynedd, Wales, assignor to Pendelfin Studios Limited, England
Filed Jun. 3, 1985, Ser. No. 740,572
Claims priority, application United Kingdom, Mar. 7, 1985, 851024896
Term of patent 14 years
U.S. Cl. D11—158



293,774
FLOWER POT COVER
Donald E. Weder, and Erwin H. Weder, both of Highland, Ill., assignors to Highland Manufacturing and Sales Company, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Aug. 20, 1984, Ser. No. 642,593
The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



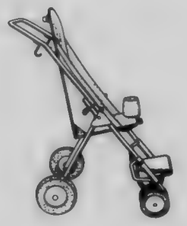


293,775
FLOWER POT COVER
Donald E. Weder, and Erwin H. Weder, both of Highland, Ill., assignors to Highland Manufacturing and Sales Company, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Aug. 20, 1984, Ser. No. 642,595
The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164

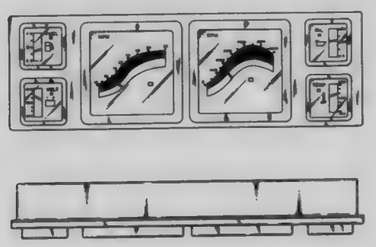




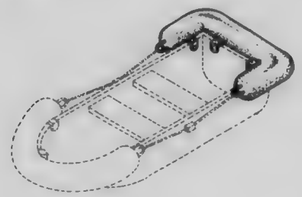
293,776
STROLLER
Torbjörn Maard, Enskede, Sweden, assignor to Alvema Aktiebolag, Bromma, Sweden
Filed Dec. 10, 1985, Ser. No. 807,491
Term of patent 14 years
U.S. Cl. D12—129



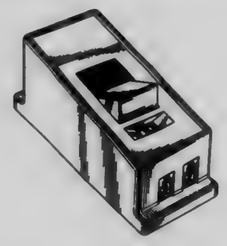
293,777
INSTRUMENT MOUNTING PANEL FOR GAUGES
John P. Flowers, Skagit County, Wash., assignor to Bayliner Marine Corporation, Seattle, Wash.
Filed Jun. 20, 1985, Ser. No. 747,010
Term of patent 14 years
U.S. Cl. D12—192



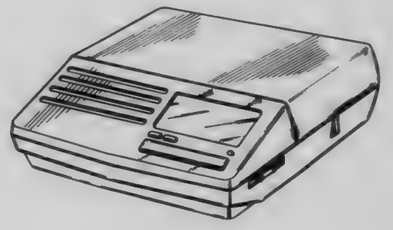
293,778
EMERGENCY FLOATATION FOR BOATS
Mary A. Carbow, 526 A. W. Shore Rd., Ana Cortes, Wash. 98221
Filed Jun. 17, 1985, Ser. No. 745,188
Term of patent 14 years
U.S. Cl. D12—317



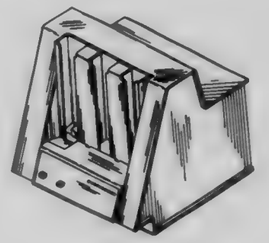
293,779
CONDUCTOR TERMINAL JUNCTION MODULE
Mogens D. Dantoft, 2001 Manor Dr., Burnsville, Minn. 55337
Filed Feb. 13, 1985, Ser. No. 701,396
Term of patent 14 years
U.S. Cl. D13—24



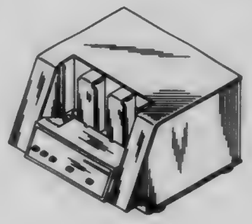
293,780
TELEPHONE ANSWERING UNIT
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel Corporation, Compton, Calif.
Filed Sep. 23, 1985, Ser. No. 779,206
Term of patent 14 years
U.S. Cl. D14—4



293,781
CASSETTE CHANGER
Sandor F. Weisz, Stamford, and Ian R. Jenkins, Westport, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Aug. 6, 1984, Ser. No. 638,004
Term of patent 14 years
U.S. Cl. D14—6

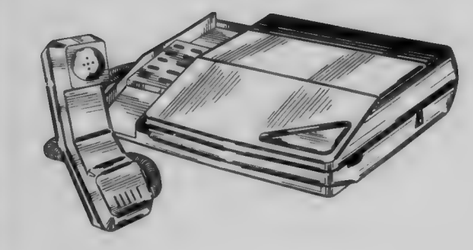


293,782
CASSETTE CHANGER
Sandor F. Weisz, Stamford, and Ian R. Jenkins, Westport, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Aug. 6, 1984, Ser. No. 638,316
Term of patent 14 years
U.S. Cl. D14—6



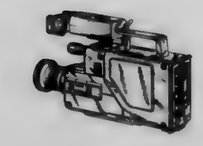
VOL 1086 ISS 3 JA 19 1988 UMI

293,783
COMBINATION TELEPHONE AND ANSWERING SET
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel Corporation, Compton, Calif.
Filed Sep. 23, 1985, Ser. No. 779,236
Term of patent 14 years
U.S. Cl. D14—53

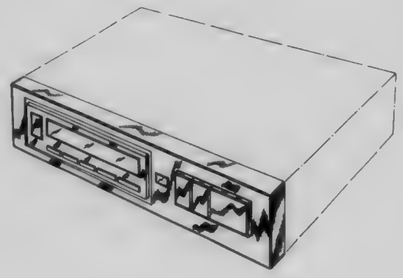


293,784
COMBINED VIDEO CAMERA AND TAPE RECORDER
Shin Miyashita, Tokyo, and Atsushi Fukutomi, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 22, 1985, Ser. No. 714,896
Claims priority, application Japan, Nov. 20, 1984, 59-47857
Term of patent 14 years
U.S. Cl. D14—78





293,785
CONTROL PANEL FOR SATELLITE TELEVISION SYSTEM
Ronald E. Wysong, Centerville; Raymond L. Midkiff, Germantown; Steven C. Koogler, Spring Valley, and Meri Powell, Lebanon, all of Ohio, assignors to R.L. Drake Company, Miamisburg, Ohio
Filed May 14, 1985, Ser. No. 733,827
Term of patent 14 years
U.S. Cl. D14—84





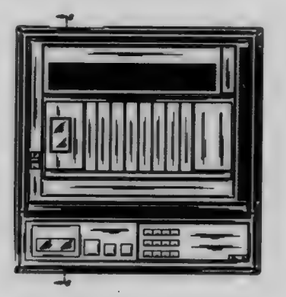
293,786
INDOOR T.V. RECEIVING ANTENNA
Piergiorgio Redaelli, Vimercate, Italy, assignor to Cobra S.r.l., Vimercate, Italy
Filed Jul. 22, 1985, Ser. No. 757,903
Term of patent 14 years
U.S. Cl. D14—86

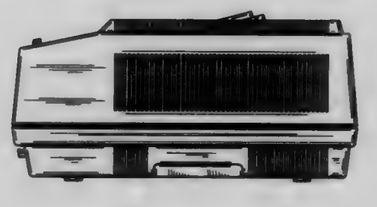


293,787
INDOOR T.V. RECEIVING ANTENNA
Piergiorgio Redaelli, Vimercate, Italy, assignor to Cobra S.r.l., Vimercate, Italy
Filed Jul. 22, 1985, Ser. No. 757,904
Term of patent 14 years
U.S. Cl. D14—88

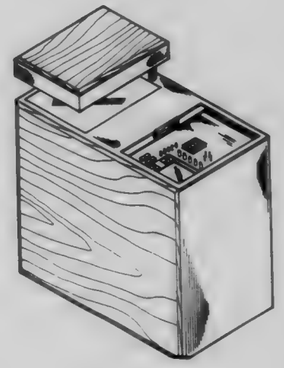


293,788
FACSIMILE MACHINE
Yoshihisa Ooie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 28, 1985, Ser. No. 750,410
Claims priority, application Japan, Jan. 10, 1985, 60-601
Term of patent 14 years
U.S. Cl. D14—94

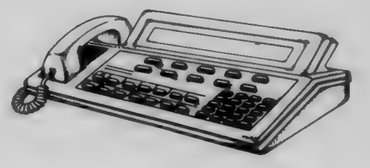




293,789
FACSIMILE TRANSMITTER CONSOLE
Patrick L. Tiffin, San Luis Obispo, Calif., assignor to Ray-Vue Corp., San Luis Obispo, Calif.
Filed Nov. 25, 1985, Ser. No. 801,620
Term of patent 14 years
U.S. Cl. D14—94



293,790
COMBINED VOICE AND DATA TERMINAL OR SIMILAR ARTICLE
Eric Hillmer, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Nov. 19, 1984, Ser. No. 672,878
Term of patent 14 years
U.S. Cl. D14—101



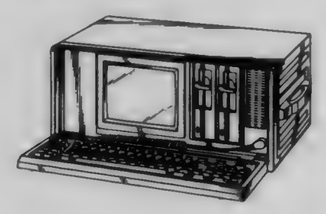
293,791
DIGITAL COMMUNICATION SWITCHING EXCHANGE
Stanley W. Heidenbrand, San Jose, Calif., and Michael Brown, Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 13, 1985, Ser. No. 701,250
Term of patent 14 years
U.S. Cl. D14—102



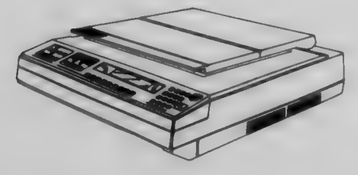
293,792
FAST PASS CARD ENCODING UNIT
James C. Watson, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.
Filed Mar. 14, 1985, Ser. No. 711,860
Term of patent 14 years
U.S. Cl. D14—105



293,793
COMPUTER
Jun Watanabe, Gunma; Takashi Kawabe, Saitama; Chiaki Tsukagoshi, Gunma; Yoshimi Okamoto, Gunma; Masafumi Nakanishi, Gunma; Nobuhiko Hoshino, Gunma, and Takashi Suzuki, Gunma, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed May 7, 1985, Ser. No. 731,679
Term of patent 14 years
U.S. Cl. D14—106



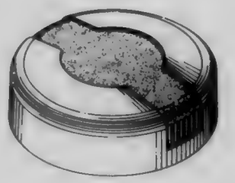
293,794
IMAGE SCANNER
Kenichi Nakade, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 11, 1985, Ser. No. 786,946
Claims priority, application Japan, Apr. 11, 1985, 60-14751
Term of patent 14 years
U.S. Cl. D14—107



293,795
MARK READER
Yoshiro Yamamoto, Funabashi, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1985, Ser. No. 704,213
Claims priority, application Japan, Aug. 27, 1984, 59-35689
Term of patent 14 years
U.S. Cl. D14—116



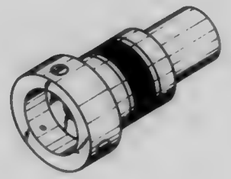
293,796
AIR CLEANER COVER
Neil F. Nagy, San Pedro, Calif., assignor to Intersport Fashions West, Inc., Fullerton, Calif.
Filed Jan. 27, 1985, Ser. No. 749,266
Term of patent 14 years
U.S. Cl. D15—5



293,797
WASTE COMPACTOR CABINET
Richard D. Parker, Rosebud, Mo., assignor to Compaction Disposal Systems, St. Louis, Mo.
Filed Jan. 10, 1985, Ser. No. 690,329
Term of patent 14 years
U.S. Cl. D15—123



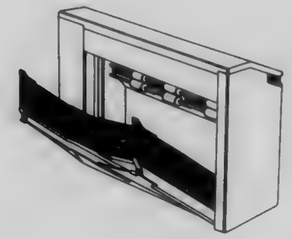
293,798
TOOL FOR HOLDING ROUND THREAD DIES
Herbert Johnson, 6515 Irving Ave., Richfield, Minn. 55423
Filed Jan. 18, 1985, Ser. No. 692,520
Term of patent 14 years
U.S. Cl. D15—140



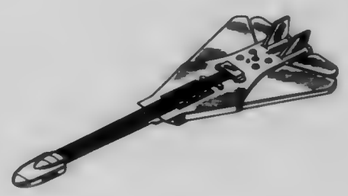
293,799
FOLDABLE STEREO VIEWER
Louis Chevalier, 24, Boulevard du Parc Impérial, 06000 Nice, France
Continuation-in-part of Ser. No. 617,678, Jun. 6, 1984, Pat. No. 4,660,931. This application Jun. 3, 1985, Ser. No. 740,421
Term of patent 14 years
U.S. Cl. D16—18



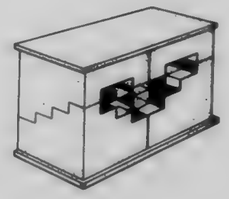
293,800
SORTER FOR ELECTROPHOTOGRAPHIC COPIER
Akira Imai, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 17, 1985, Ser. No. 788,272
Claims priority, application Japan, Aug. 9, 1985, 60-034386
Term of patent 14 years
U.S. Cl. D16—32



293,801
TMS ELECTRICAL GUITAR
Frederick C. Johnson, Jr., 10550 Pepper Brook La., San Diego, Calif. 92131
Filed Sep. 20, 1985, Ser. No. 778,062
Term of patent 14 years
U.S. Cl. D17—18

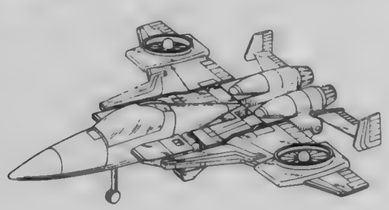


293,802
SEPARABLE MULTI-LEVEL CHESS BOARD PACKAGE OR THE LIKE
Stephen W. Dail, 3000-51 Stonebrook Rd., Raleigh, N.C. 27606
Filed Nov. 13, 1984, Ser. No. 670,950
Term of patent 14 years
U.S. Cl. D21—23



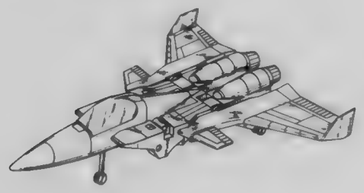
VOL 1086 ISS 3 JA 19 1988 UMI

293,803
RECONFIGURABLE TOY JET-PLANE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1985, Ser. No. 749,192
Claims priority, application Japan, Dec. 27, 1984, 59-54521
Term of patent 14 years
U.S. Cl. D21—87



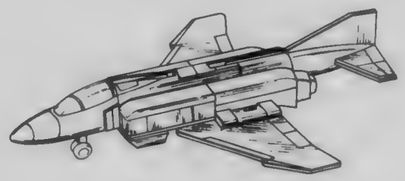


293,804
RECONFIGURABLE TOY JET-PLANE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1985, Ser. No. 749,194
Claims priority, application Japan, Dec. 27, 1984, 59-54520
Term of patent 14 years
U.S. Cl. D21—87



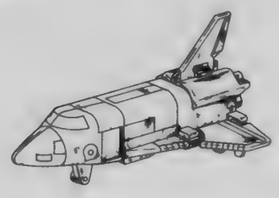


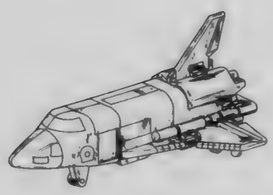
293,805
RECONFIGURABLE TOY JET-PLANE
Kaoru Matsumoto, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 9, 1985, Ser. No. 764,382
Claims priority, application Japan, Feb. 12, 1985, 60-4689
Term of patent 14 years
U.S. Cl. D21—87

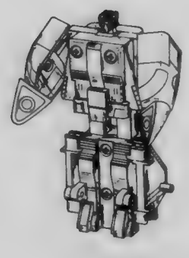




293,806
RECONFIGURABLE TOY SPACE SHUTTLE
Daishiro Shibukawa, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 22, 1985, Ser. No. 806,184
Claims priority, application Japan, Oct. 14, 1985, 60-42969
Term of patent 14 years
U.S. Cl. D21—87







293,807
DOLL
Steven R. Hensley, 1404 Valley View, Mesquite, Tex. 75149
Filed Dec. 3, 1984, Ser. No. 677,531
Term of patent 14 years
U.S. Cl. D21—163



293,808
BALL DROPPING DEVICE FOR BATTING PRACTICE
Henry B. Durham, 405 Chestnut St., Birmingham, Ala. 25206, and Kenneth D. Petty, 3848 Rock Ridge Rd., Irondale, Ala. 35212
Filed Apr. 22, 1985, Ser. No. 725,932
Term of patent 14 years
U.S. Cl. D21—199



293,809
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,712
Term of patent 14 years
U.S. Cl. D21—219



293,810
FISHING LURE
Loren G. Hill, Norman, and Charles E. Williams, Shady Point, both of Okla., assignors to EBSCO Industries, Inc., Birmingham, Ala.
Filed Jul. 22, 1985, Ser. No. 757,672
Term of patent 14 years
U.S. Cl. D22—132

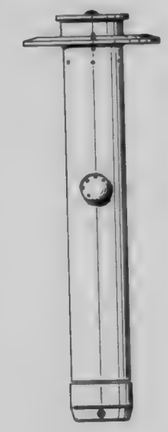


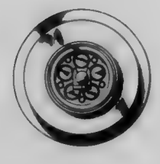
VOL 1086 ISS 3 JA 19 1988 UMI

293,811
MANIFOLD FOR A PLANT WATERING UNIT
James W. Bennington, Box 102, Brandon, S. Dak. 57005, and Emmett G. Neal, 5696 Ferguson, Bartlett, Tenn. 38134
Filed Sep. 26, 1984, Ser. No. 654,554
Term of patent 14 years
U.S. Cl. D23—263

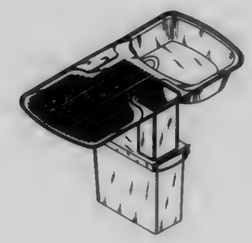


293,812
TANK CLEANING SPRAY HEAD
Samuel O. Roth, West Liberty, Ohio, assignor to Holdren Brothers, Inc., West Liberty, Ohio
Filed Jul. 31, 1985, Ser. No. 761,621
Term of patent 14 years
U.S. Cl. D23—213

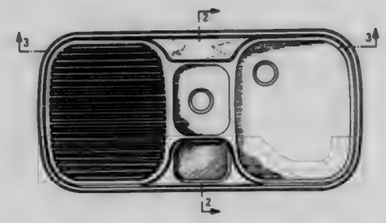




293,813
COMBINED SINK AND WASTE CONTAINER
Reinhard Fischer, Bretten; Manfred Mück, Kürnbach, and Walter Blanc, Oberderdingen, all of Fed. Rep. of Germany, assignors to Blanc GmbH & Co., Oberderdingen, Fed. Rep. of Germany
Filed Aug. 26, 1985, Ser. No. 769,262
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, MRIL/132BR
Term of patent 14 years
U.S. Cl. D23—271

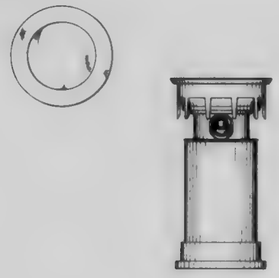


293,814
SINK
Manfred Mück, Kürnbach; Walter Blanc, Oberderdingen, and Dorothee Hiller, Stuttgart, all of Fed. Rep. of Germany, assignors to Blanc GmbH & Co., Oberderdingen, Fed. Rep. of Germany
Filed Feb. 27, 1985, Ser. No. 706,302
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 10 AR 112/84
Term of patent 14 years
U.S. Cl. D23—287

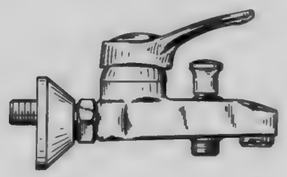


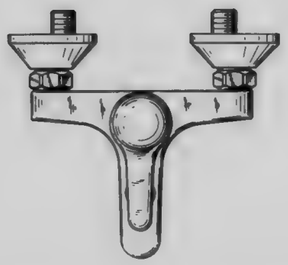


293,815
RISER FOR SPRINKLER HEADS
Loren W. Scott, Redlands, and Charles A. Bickel, Riverside, both of Calif., assignors to The Toro Company, Minneapolis, Minn.
Filed Nov. 12, 1985, Ser. No. 804,006
Term of patent 14 years
U.S. Cl. D23—218



293,816
COMBINED FAUCET AND DIVERTER VALVE FOR A HAND SHOWER
Konrad Bergmann, Wittlich, and Wolfgang Fabian, Mannheim, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.
Division of Ser. No. 777,478, Sep. 18, 1985. This application Apr. 6, 1987, Ser. No. 35,312
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 20 MR 2058
Term of patent 14 years
U.S. Cl. D23—238



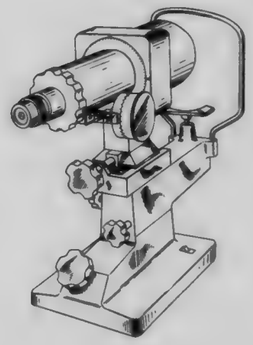


293,817
CONTAINER FOR DEODORIZER
Seiichi Uchiyama, Tokorozawa, Japan, assignor to Car Mate Manufacturing Company Limited, Tokyo, Japan
Filed Jul. 23, 1986, Ser. No. 889,181
Claims priority, application Japan, Jan. 30, 1986, 61-3064
Term of patent 14 years
U.S. Cl. D23—366



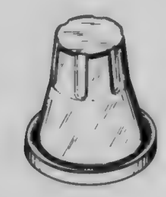


293,818
KERATOMETER OR THE LIKE
Edwin A. Speaker, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sep. 30, 1985, Ser. No. 781,171
Term of patent 14 years
U.S. Cl. D24—17

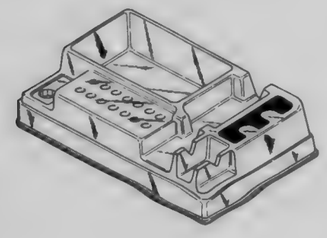


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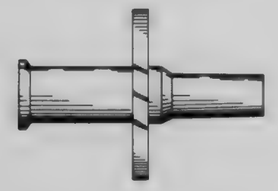
293,819
TEST TUBE CAP REMOVER
Javid R. Alvi, 7970 Larwin Dr., Citrus Heights, Calif. 95610
Filed Jan. 14, 1985, Ser. No. 691,090
Term of patent 14 years
U.S. Cl. D24—29



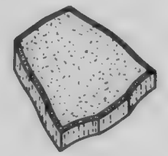
293,820
MEDICAL EQUIPMENT TRAY
Gordon T. Guth, Evanston; James D. Morrow, Oak Park, and Lois R. Sherry, Northfield, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 18, 1985, Ser. No. 695,313
Term of patent 14 years
U.S. Cl. D24—31



293,821
STYLET HOLDER
Vincent L. Vaillancourt, Livingston, N.J., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed Jun. 12, 1985, Ser. No. 743,754
Term of patent 14 years
U.S. Cl. D24—54



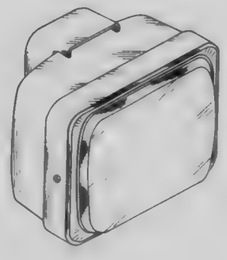
293,822
PAVING STONE
Rolf Scheiwiller, Lindeneggweg 10, CH-3645 Gwatt, Switzerland
Division of Ser. No. 510,219, Jul. 1, 1983, Pat. No. Des. 287,884.
This application Aug. 11, 1986, Ser. No. 895,680
Claims priority, application Switzerland, Jan. 4, 1983, DMA/000170
Term of patent 14 years
U.S. Cl. D25—113



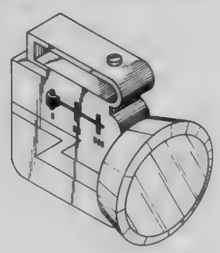
293,823
CANDLE
Monique Fleschi, and Marie-Jacqueline Galhaud, both of Domaine de Peyroulet, Avenue de l'Europe, 33700 - Merignac, France
Filed Dec. 4, 1985, Ser. No. 805,200
Claims priority, application France, Jun. 4, 1985, 85 2597
Term of patent 14 years
U.S. Cl. D26—6



293,824
VEHICLE LIGHT
Matsuo Ichikawa, Takasaki, Japan, assignor to Ichikawa Press Industry Co., Ltd., Japan
Filed Sep. 9, 1985, Ser. No. 774,341
Term of patent 14 years
U.S. Cl. D26—29



293,825
ENERGY SAVING LANTERN
Dorothy Jennings, 10443 Decker, Overland, Mo. 63114
Filed Feb. 11, 1985, Ser. No. 700,463
Term of patent 14 years
U.S. Cl. D26—50



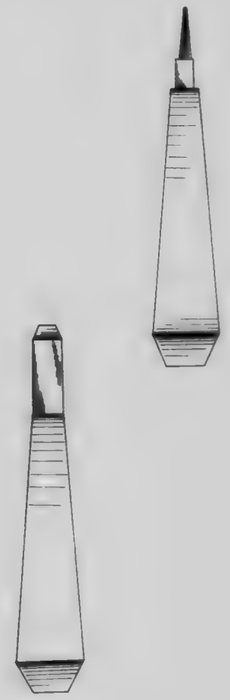
293,826
ELECTRIC CANDLE LAMP
Katarina H. Berg, Erstagatan 22, S-116 36 Stockholm, and Anna U. Berg, Kommendörsgatan 12, S-114 48 Stockholm, both of Sweden
Filed Aug. 20, 1984, Ser. No. 642,385
Claims priority, application Sweden, Feb. 27, 1984, 840649
Term of patent 14 years
U.S. Cl. D26—96



293,827
LIGHTER OR THE LIKE
Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1985, Ser. No. 805,758
Claims priority, application Japan, Jun. 11, 1985, 60-24210
Term of patent 14 years
U.S. Cl. D27—41



293,828
NAIL POLISHING PEN
Sallie Proctor, 15 Hally Ct., Piscataway, N.J. 08854
Filed Jun. 27, 1985, Ser. No. 749,490
Term of patent 14 years
U.S. Cl. D28—7

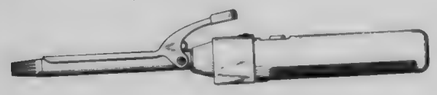


293,829
FACIAL MASK
Beth Johnston, 833 Hunt La., Manhasset, N.Y. 11030
Filed May 31, 1985, Ser. No. 739,865
Term of patent 14 years
U.S. Cl. D28—9



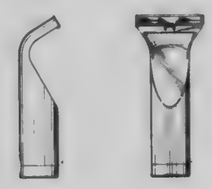
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293,830
CORDLESS ELECTRIC HAIR CURLING IRON OR SIMILAR ARTICLE
Randall Bell, Oak Park; Ralph Lazar, Skokie, both of Ill., and Thomas Dowling, El Paso, Tex., assignors to Helen of Troy Corporation, El Paso, Tex.
Filed Mar. 7, 1986, Ser. No. 838,705
Term of patent 14 years
U.S. Cl. D28—35





293,831
RAZOR HANDLE
Angus J. McGready, Reading, England, assignor to Wilkinson Sword Limited, England
Filed Nov. 27, 1985, Ser. No. 807,057
Claims priority, application United Kingdom, Jun. 1, 1985, 1027120
Term of patent 14 years
U.S. Cl. D28—48



293,832
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 794,422
Term of patent 14 years
U.S. Cl. D28—76



293,833
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 794,423
Term of patent 14 years
U.S. Cl. D28—76



293,834
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 794,424
Term of patent 14 years
U.S. Cl. D28—76



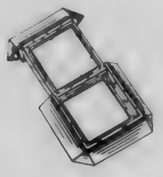
293,835
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 803,860
Term of patent 14 years
U.S. Cl. D28—76



293,836
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 803,875
Term of patent 14 years
U.S. Cl. D28—76



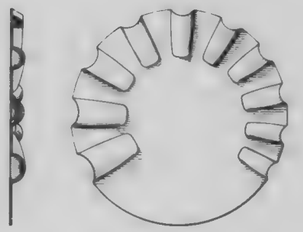
293,837
COSMETIC COMPACT
Theodore Simonetti, New York, N.Y., assignor to L'Oreal, S.A., Paris, France
Filed Oct. 2, 1985, Ser. No. 783,240
Term of patent 14 years
U.S. Cl. D28—83



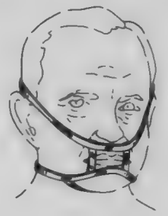
293,838
LIPSTICK CASE OR SIMILAR ARTICLE
Chen Fo-Chun, Chang Hua, Taiwan, assignor to Chuan Hsiang Tang Chemical Industrial Co. Ltd., Taiwan
Filed Sep. 24, 1985, Ser. No. 779,524
Claims priority, application Taiwan, Mar. 14, 1985, 74301188
Term of patent 14 years
U.S. Cl. D28—87



293,839
ARTIFICIAL FINGERNAIL TIP SELECTOR GUIDE AND DISPLAY
Claire Wiesslaw, Wilton, Conn., assignor to Zotos International, Stamford, Conn.
Filed Oct. 1, 1985, Ser. No. 782,369
Term of patent 14 years
U.S. Cl. D28—99



293,840
FACIAL HARNESS
Thomas Parrish, 18040 Midway #153, Dallas, Tex. 75252
Filed Jul. 18, 1985, Ser. No. 757,373
Term of patent 14 years
U.S. Cl. D29—17

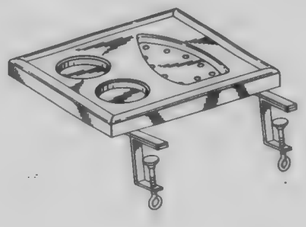


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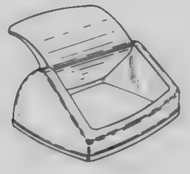
293,841
HOLDER FOR VACUUM CLEANER BAGS OR THE LIKE
Lucille C. Strobel, and Gerald E. Strobel, both of 8305 Sprague Pl., New Carrollton, Md. 20784
Filed Sep. 13, 1985, Ser. No. 775,738
Term of patent 14 years
U.S. Cl. D32—31



293,842
UTILITY TRAY FOR IRONING BOARDS
Daniel W. Titi, 709 Roselawn N.E., and Frances Shaffer, 4877 Mahoning Ave. N.W., both of Warren, Ohio 44483
Filed Sep. 8, 1986, Ser. No. 905,049
Term of patent 14 years
U.S. Cl. D32—73

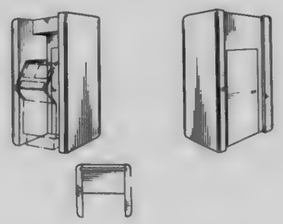


293,843
SWINGING WASTE RECEPTACLE LID
Benjamin Kroll, Gross Gerau, and Jose Garcia-Delgado, Langen, both of Fed. Rep. of Germany, assignors to Dupol Rubbermaid GmbH, Dreieich, Fed. Rep. of Germany
Filed Jun. 21, 1985, Ser. No. 747,489
Term of patent 14 years
U.S. Cl. D34—8



293,844
AUTOMATED TELLER ENCLOSURE
Ernest F. J. Prianzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.
Filed May 13, 1985, Ser. No. 709,410
Term of patent 14 years
U.S. Cl. D99—28





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JANUARY, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Durbin, James L.; and Clemens, Robert M., 4,719,852, Cl. 100-229.00A.

A-LOK Products, Inc.: *See—*
Ditcher, Jack, 4,719,724, Cl. 52-20.000.

A.M.S. S.A.: *See—*
Geiger, Reinold, 4,720,019, Cl. 215-343.000.

A. Nattermann & CIE GmbH: *See—*
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Aaro, Tore I.; Rustan, Torgny O.; Oman, Par; Blom, Rolf J.; Forchheimer, Robert; Fak, Viiveke A.; and Ingemarsson, Bror I., to U.S. Philips Corporation. Method and system for the mutual encyphered indentification between data communicating stations and stations for use with such method and system. 4,720,859, Cl. 380-23.000.

Abbott Laboratories: *See—*
Benner, James D., Jr., 4,720,636, Cl. 250-573.000.

Abdenour, Stephen F.; and Polatas, Stephen M., to B. F. Goodrich Company, The. Aircraft rotating wing seal and method therefor. 4,720,061, Cl. 244-46.000.

Abe, Wataru: *See—*
Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, 4,720,349, Cl. 252-12.000.

Acousis Company: *See—*
Kryter, Karl D., 4,720,109, Cl. 273-164.000.

AcroMed Corporation: *See—*
Steffee, Arthur D., 4,719,905, Cl. 128-69.000.

Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Anti-skid device for motor vehicles. 4,720,152, Cl. 303-113.000.

Adam, Bernd, to Siemens Aktiengesellschaft. Contact arrangement for low-voltage circuit breakers with main contacts and burn-off contacts. 4,720,613, Cl. 200-146.00R.

Adams Hard-Facing Company, Inc.: *See—*
Edmisson, Delmar D., 4,719,862, Cl. 111-7.000.

Adini, Ari. Device for and method of determining changes in linear dimension of objects. 4,719,802, Cl. 73-763.000.

ADIR S.A.R.L.: *See—*
Vincent, Michel; Remond, Georges; and Cudennec, Claude, 4,720,484, Cl. 514-18.000.

Adolph Coors Company: *See—*
Dugan, Larry M., 4,719,844, Cl. 92-80.000.
Dugan, Larry M., 4,719,845, Cl. 92-84.000.

Adshead, Alan: *See—*
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Advanced Micro Devices, Inc.: *See—*
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Aerospatiale Societe Nationale Industrielle: *See—*
Yana, Victor Y., 4,720,060, Cl. 244-17.270.

Agence Spatiale Europeenne: *See—*
Rammos, Emmanuel, 4,720,691, Cl. 333-122.000.

Agency of Industrial Science and Technology, The: *See—*
Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, 4,720,349, Cl. 252-12.000.

AGFA-Gevaert, N.V.: *See—*
De Keyzer, Rene M.; Vermeulen, Leon L.; and Pollet, Robert J., 4,720,447, Cl. 430-244.000.

Agri-Plastics, Inc.: *See—*
Van Gilst, Carl W., 4,719,875, Cl. 119-53.500.

Aho, Jack R.; Dingman, Roger J.; Gee, Larry R.; and Szlachta, Leon R., to General Motors Corporation. Removable window assembly. 4,719,736, Cl. 52-397.000.

Ahroni, Joseph M. Decorative light assembly. 4,720,773, Cl. 362-249.000.

AI Computer Services, Inc.: *See—*
Shapiro, Bernard, 4,720,785, Cl. 364-401.000.

Aiga, Masayuki; and Hashiguchi, Tetsuji, to Sanyo Electric Co., Ltd. Magnetron. 4,720,659, Cl. 315-39.690.

Ainscow, William S.; and Gadgil, Balkrishna B., to Sulzer Brothers Limited. Process for producing magnesium oxide. 4,720,375, Cl. 423-175.000.

Air Products and Chemicals, Inc.: *See—*
Lucadamo, Gene A.; and Rowles, Howard C., 4,720,294, Cl. 62-31.000.
Rowles, Howard C.; Grassi, Kimberly S.; and Bernhard, Dennis P., 4,720,293, Cl. 62-24.000.
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Aisan Kogyo Kabushiki Kaisha: *See—*
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Aisen Seiki Kabushiki Kaisha: *See—*
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Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,720,152, Cl. 303-113.000.
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Ajinomoto Co., Inc.: *See—*
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Akada, Masanori: *See—*
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Akiba, Shigeyuki; Utaka, Katsuyuki; Noda, Yukio; and Kushiro, Yukitoshi, to Kokusai Denshin Denwa K.K. Integrated semiconductor light emitting element with oscillation wavelength and phase modulated light output. 4,720,835, Cl. 372-50.000.

Akita, Tadashi: *See—*
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Akiyama, Haruhiko: *See—*
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Akiyama, Kazuhiro; Nishimura, Syunji; Kameyama, Nobuyuki; Tobayama, Nobuo; and Kozai, Katsuya, to Fuji Photo Film Co., Ltd. Back lid of a camera. 4,720,722, Cl. 354-203.000.

Akiyama, Tadahiko, to Nippo Communication Industrial Co. Communication system with voice announcement means. 4,720,848, Cl. 379-88.000.

Akzo N.V.: *See—*
Schouten, Arend J., 4,720,544, Cl. 536-110.000.
van Aalten, Hendricus A. A.; van Calker, Freerk R.; and Weening, Willem E., 4,720,398, Cl. 427-208.200.

Akzona Incorporated: *See—*
Corbin, Tom F.; Dellinger, Jack A.; and Wagener, Kenneth B., 4,720,328, Cl. 203-37.000.

Alberts, Scott. Securement apparatus. 4,719,773, Cl. 70-18.000.

Alden Research Foundation: *See—*
Lucas, Derek A., 4,720,764, Cl. 361-212.000.

Alek, Robert B.: *See—*
Marchosky, Jose A.; Alek, Robert B.; Moran, Christopher; and Rutledge, Raymond E., 4,719,919, Cl. 128-401.000.

Alexander, Gabriel G.: *See—*
Roche, Joseph R.; and Alexander, Gabriel G., 4,719,937, Cl. 137-114.000.

Alexander, Michael P.; and Sims, William A., to ASC Incorporated. Convertible top structure. 4,720,133, Cl. 296-117.000.

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Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,720,345, Cl. 210-650.000.

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Allied Colloids Ltd.: *See—*
Flesher, Peter; Farrar, David; and Field, John R., 4,720,346, Cl. 210-734.000.

Allied Corporation: *See—*
Anderson, Philip M., III; and Urbanski, Jeffrey C., 4,720,676, Cl. 324-207.000.
Brahim, Karime; and McFarland, Michael J., 4,720,445, Cl. 430-192.000.

Allison, Debra L.: *See—*
Witzel, Bruce E.; Tischler, Allan N.; and Allison, Debra L., 4,720,503, Cl. 514-443.000.

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Hatasi, Takashi; and Nakashima, Keishi, 4,720,757, Cl. 360-121.000.
Sakai, Satoshi; and Hishi, Yuichi, 4,719,692, Cl. 29-603.000.

Alt, Eckhard; and Calfee, Richard V., to Intermedics, Inc. Exercise-responsive rate-adaptive cardiac pacemaker. 4,719,920, Cl. 128-419.0PG.

Alumasc Limited: *See*—
Hyde, Roger J., 4,720,076, Cl. 251-122.000.

Aluminium Pechiney: *See*—
Duval, Christian; Langon, Bernard; Leroy, Michel; and Noizet, Alain, 4,720,333, Cl. 204-241.000.

Amada Company, Limited: *See*—
Kawada, Kijyu; and Ikeda, Nobuyuki, 4,719,830, Cl. 83-170.000.

Amann, Gernot; and Mathis, Christian, to Dereco Dieselmotoren Forschungsund Entwicklungs-AG; and IVECO Fiat S.p.A. Fuel injection installation for an internal combustion engine. 4,719,889, Cl. 123-447.000.

Amemiya, Yoshihito; and Mizushima, Yoshihiko, to Nippon Telegraph and Telephone Public Corporation. Low loss and high speed diodes. 4,720,734, Cl. 357-15.000.

American Cyanamid Company: *See*—
Nagaraj, D. R.; Rothenberg, Alan S.; and Lambert, Alexander S., 4,720,339, Cl. 209-167.000.
Schamper, Thomas J.; Perl, Martin M.; and Warren, James D., 4,720,381, Cl. 424-66.000.

American Home Products Corporation: *See*—
Buzby, George C., Jr., 4,720,580, Cl. 564-89.000.

American Microsystems, Inc.: *See*—
Lee, Jong S., 4,720,034, Cl. 228-37.000.

American Optical Corporation: *See*—
Chu, Nori Y. C., 4,720,356, Cl. 252-586.000.

American Pulverizer Company: *See*—
Graveman, Donald F.; and Strom, Sven B., 4,720,051, Cl. 241-186.300.

American Telephone and Telegraph Company: *See*—
Wojcik, Thaddeus, 4,720,402, Cl. 427-282.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Embree, Milton L.; and Lee, Robert F., 4,720,643, Cl. 307-351.000.
Hartwell, Walter T.; and Zimmerman, Gustavus H., III, 4,719,923, Cl. 128-663.000.
Oberlander, Lewis B.; Spicer, David A.; and Straubs, Ralph V., 4,720,850, Cl. 379-90.000.
Sand, Douglas S., 4,720,854, Cl. 379-269.000.

American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See*—
Schaaf, Theodore F.; and Wong, Ching-Ping, 4,720,741, Cl. 357-72.000.
Wong, Ching-Ping, 4,720,431, Cl. 428-447.000.

Amerock Corporation: *See*—
DeBruyn, William, 4,720,198, Cl. 384-246.000.

Amoco Corporation: *See*—
Maresca, Louis M.; and Kawakami, James H., 4,720,540, Cl. 523-402.000.

AMP Incorporated: *See*—
MacHarrie, Robert A., 4,720,610, Cl. 200-5.00A.
Schwartzman, Benjamin; Clearwater, Russell A.; and Volinskie, Robert, 4,719,697, Cl. 29-867.000.

Amphenol Corporation: *See*—
Schildkraut, Alan L.; and Davis, Alan L., 4,720,155, Cl. 439-108.000.

AMSTED Industries Incorporated: *See*—
Pozo, Jaime F., 4,719,793, Cl. 73-81.000.

Anastasio, Paul C.: *See*—
Biasini, Americole R.; and Anastasio, Paul C., 4,719,835, Cl. 84-279.000.

Anderson, Bjorn M. S.; and Ziegler, Reinhold H., to TurboStar, Inc. Fluid powered electrical generator. 4,720,640, Cl. 290-43.000.

Anderson, Jeff H. Jack device for washing machines. 4,719,685, Cl. 29-252.000.

Anderson, Philip M., III; and Urbanski, Jeffrey C., to Allied Corporation. Magnetomechanical transducer utilizing resonant frequency shifts to measure pressure in response to displacement of a pressure sensitive device. 4,720,676, Cl. 324-207.000.

Andersson, Arvo E., to Outokumpu Oy. Immersible aerator and/or mixer apparatus. 4,720,361, Cl. 261-87.000.

Andersson, Frank: *See*—
Eriksson, Lars; and Andersson, Frank, 4,719,728, Cl. 52-172.000.

Ando, Kazuhiro: *See*—
Sakayanagi, Morikazu; Ando, Kazuhiro; and Hasegawa, Youichi, 4,720,639, Cl. 290-38.00R.

Ando, Minato; Ito, Masaaki; and Mizuno, Fumio, to NGK Spark Plug Co., Ltd. Alumina porcelain compositions. 4,720,471, Cl. 501-136.000.

Andos, Yukinori, to Sharp Kabushiki Kaisha. Industrial robot hand with position sensor. 4,720,130, Cl. 294-64.100.

Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, to Degussa Aktiengesellschaft. Process for the production of 1-methylcyclopropanecarboxaldehyde. 4,720,593, Cl. 568-420.000.

Andrulis, Peter J., Jr.; and Schwartz, Paul, to Andrulis Research Corporation. Use of bis-platinum complexes as antitumor agents. 4,720,504, Cl. 514-492.000.

Andrulis Research Corporation: *See*—
Andrulis, Peter J., Jr.; and Schwartz, Paul, 4,720,504, Cl. 514-492.000.

Angus Chemical Company: *See*—
Young, Vernon V.; and Bright, David R., 4,720,548, Cl. 544-353.000.

Anicon, Inc.: *See*—
Foster, Derrick W., 4,720,395, Cl. 437-241.000.

Anritsu Corporation: *See*—
Kanaji, Hideki, 4,720,827, Cl. 370-4.000.

Anthony, James R.; Lortz, Allan R.; Merrick, David D.; and Wiseman, Michael A., to Indiana Mills & Mfg. Co., Inc. Belt retractor with tongue/buckle controlled locking cam. 4,720,148, Cl. 297-474.000.

Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., to General Electric Company. Method for producing high-aspect ratio hollow diffused regions in a semiconductor body and diode produced thereby. 4,720,308, Cl. 148-33.000.

Anton, Octavian; Van Wouwe, Dirk; Poncelet, Georges; Jacobs, Pierre; and Martens, Johan, to Redco N.V. Silica-particles containing alumina, process for preparing same and the use thereof. 4,720,475, Cl. 502-250.000.

Antonello, Flaminio, to Neutek Establishment. Servocontrolled device for controlling the cassette tape transport means, particularly for cooperation with cassette changing devices. 4,720,752, Cl. 360-71.000.

Antonio, Anthony I., Jr.: *See*—
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,719,945, Cl. 138-154.000.

Aoi, Masashi: *See*—
Ninomiya, Kazunori; Shitama, Katuaki; and Aoi, Masashi, 4,719,698, Cl. 30-43.600.

Aosai, Fumito: *See*—
Tokuda, Shuichiro; Furukawa, Noriyuki; Kinoshita, Ikuo; Nakamoto, Hideo; and Aosai, Fumito, 4,720,165, Cl. 350-96.240.

Appel, David W.; Drost, Adrian D.; and Lau, Jark C., to Kimberly-Clark Corporation. Slotted melt-blown die head. 4,720,252, Cl. 425-80.100.

Apperson, Kenneth P.; and Glass, James D., to Square D Company. Clamp body for cable conductor. 4,719,672, Cl. 24-135.00R.

Aquila, Werner; Nissen, Axel; Kaibel, Gerd; Horner, Michael; and Rebafka, Walter, to BASF Aktiengesellschaft. Distillative separation of liquid mixtures of substances. 4,720,327, Cl. 203-96.000.

Aquilina, Paul C., to Melnor Manufacturing Ltd. Tool handle fastening clip. 4,720,206, Cl. 403-361.000.

Arai, Takuya: *See*—
Ohtake, Katsumi; Ogura, Kunio; Koike, Tunehiro; Arai, Takuya; and Shioda, Kayoko, 4,720,733, Cl. 355-50.000.

Araki, Kunihiko; Kitajima, Tomoya; Serikawa, Yoshio; Kobayashi, Mikio; Terui, Hiroshi; and Koyama, Kenji, to Ricoh Company, Ltd.; and Ricoh Optical Industries Co., Ltd. Motor-driven film winder for cameras. 4,720,720, Cl. 354-173.110.

Arcotronics Italia S.p.A.: *See*—
Savoia, Franco, 4,719,675, Cl. 29-25.420.

Arena, Pat S., to Grumman Aerospace Corporation. Rivet delivery system. 4,720,215, Cl. 406-105.000.

Arima, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Method of cutting metal interconnections in a semiconductor device. 4,720,620, Cl. 437-173.000.

Arita, Hitoshi: *See*—
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,720,480, Cl. 503-227.000.

Armstrong, David W.; Martin, Stanley M.; and Yamazaki, Hiroshi, to Canadian Patents and Development Ltd. Selective production of ethyl acetate and acetaldehyde by microorganisms. 4,720,457, Cl. 435-135.000.

Arney, Michel D.; and LaCount, Clifford E., to Wang Laboratories, Inc. Function strip attachment. 4,720,625, Cl. 235-145.00R.

Arnold, Kenneth E. Water treating in a vertical series coalescing flume. 4,720,341, Cl. 210-262.000.

Arnold, Philip D., to General Motors Corporation. Crankcase manufacturing method. 4,719,677, Cl. 29-156.40R.

Arpe, Hans-Jurgen: *See*—
Eichler, Klaus; Leupold, Ernst I.; Arpe, Hans-Jurgen; and Baltes, Herbert, 4,720,583, Cl. 564-305.000.

Asaba, Yutaka: *See*—
Iwabuchi, Haruo; and Asaba, Yutaka, 4,719,868, Cl. 112-461.000.

Asada, Masaaki: *See*—
Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, 4,720,002, Cl. 192-70.250.

Asahi Glass Company Ltd.: *See*—
Shinkai, Norihiko; Haranoh, Takeshi; Kanazawa, Junetsu; and Hatano, Takashi, 4,720,442, Cl. 430-5.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ito, Takayuki, 4,720,179, Cl. 350-423.000.
Kokado, Hiroshi, 4,720,825, Cl. 369-46.000.
Okura, Zenichi, 4,720,167, Cl. 350-252.000.

Asai Germanium Research Institute: *See*—
Kakimoto, Norihiro; Namiki, Mitsuo; Osawa, Toshihiko; and Miyao, Kohei, 4,720,564, Cl. 556-83.000.

Asai, Shinichiro: *See*—
Iji, Masatoshi; Kobayashi, Masayuki; and Asai, Shinichiro, 4,720,515, Cl. 523-435.000.

Asakawa, Yoshinori, to Kuraray Co., Ltd. Aroma composition. 4,720,354, Cl. 252-522.00R.

Asano, Toshiaki; Takahashi, Sadatoshi; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. High magnification range zoom lens. 4,720,180, Cl. 350-427.000.

Asari, Akira; Masuda, Tsuneharu; Kurita, Masanori; and Ueno, Tsuneya, to Kabushiki Kaisha Kobe Seiko Sho. Hot isostatic press apparatus. 4,720,256, Cl. 425-405.00H.

ASC Incorporated: *See*—
Alexander, Michael P.; and Sims, William A., 4,720,133, Cl. 296-117.000.

ASEA Aktiebolag: *See*—
Bjorklund, Robert, 4,720,393, Cl. 427-58.000.

Ashida, Tadashi: *See*—
Yamamoto, Shozo; Sakauchi, Tsuneo; Ashida, Tadashi; Handa, Koichi; and Nakajima, Masao, 4,719,689, Cl. 29-458.000.

Ashland Oil, Inc.: *See*—
Hettinger, William P., Jr., 4,720,477, Cl. 502-255.000.

Astorino, Frank: *See*—
Crossland, William A.; Peters, Jack R.; Smith, Harry J.; and Astorino, Frank, 4,720,781, Cl. 364-200.000.

Astronics Corporation: *See*—
Winfield, Mason C., 4,720,080, Cl. 254-50.100.

Atago, Takeshi: *See*—
Nagano, Masami; and Atago, Takeshi, 4,719,885, Cl. 123-179.00L.

Atlantic Richfield Company: *See*—
Dean, Barry D., 4,720,525, Cl. 525-205.000.
Sonnenberg, Fred M., 4,720,429, Cl. 428-407.000.

Attwood Corporation: *See*—
Whitley, Warwick M., II, 4,719,870, Cl. 114-218.000.

Audi AG.: *See*—
Hollerweger, Heinz; van den Boom, Johannes; and Kuipers, Geert, 4,720,084, Cl. 267-217.000.

Ausimont S.p.A.: *See*—
Caporiccio, Gerardo; Viola, Gian T.; and Marchionni, Giuseppe, 4,720,527, Cl. 525-403.000.

Austruy, Georges; Cagnon, Francois; Di Paola, Denis; and Vinchon, Andre , to Gaz de France. Installation for heating liquids at different temperature levels. 4,719,878, Cl. 122-31.00R.

Automatic Handling, Inc.: *See*—
Pienta, David J., 4,720,231, Cl. 414-560.000.

Automobiles Citroen: *See*—
Le Salver, Robert; and Poupard, Dominique, 4,720,086, Cl. 267-140.100.

Automobiles Peugeot: *See*—
Le Salver, Robert; and Poupard, Dominique, 4,720,086, Cl. 267-140.100.

Avcom of Virginia, Inc.: *See*—
Hatfield, R. Andrew, 4,720,673, Cl. 324-77.00B.

Averill, Robert G.; and Sidebotham, Christopher G., to Osteonics Corp. Method and apparatus for implanting a prosthetic device. 4,719,908, Cl. 128-92.0VW.

Aviv, Gershon: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,720,345, Cl. 210-650.000.

AVX Corporation: *See*—
Chan, Ning-Huat; and Rawal, Bharat, 4,720,767, Cl. 361-275.000.

Azuma, Hitoshi, to Toyota Jidosha Kabushiki Kaisha. Locking differential with variable friction torque. 4,719,817, Cl. 74-710.500.

B. F. Goodrich Company, The: *See*—
Abdenour, Stephen F.; and Polatas, Stephen M., 4,720,061, Cl. 244-46.000.

Babb, Raymond E.: *See*—
Sommerfield, John; and Babb, Raymond E., 4,720,797, Cl. 364-478.000.

Babler, Fridolin: *See*—
Iqbal, Abul; Pfenninger, Johannes; Rochat, Alain C.; and Babler, Fridolin, 4,720,305, Cl. 106-288.00Q.

Babu, Uma M.; Mia, Abdus S.; and Pancari, Gregory D., to Pitman-Moore, Inc. Progesterone assay method for mammals and monoclonal antibody therefor. 4,720,455, Cl. 435-7.000.

Bachler, Robert; Fonseux, Pierre-Yves; and Jost, Rolf, to Nestec S.A. Preparation of gelled food products. 4,720,390, Cl. 426-573.000.

Baeger, Holm; and Wedel, Hans, to VDO Adolf Schindling AG. Display. 4,720,704, Cl. 340-716.000.

Bahnsen, Heiner: *See*—
Herberich, Wolfgang; Degle, Walter; Bahnsen, Heiner; and Bolzmann, Olaf-Ragnar, 4,719,694, Cl. 29-703.000.

Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, to United States of America, Agriculture. Antimicrobial compound bis (carbomethoxymethyl) adipate. 4,720,574, Cl. 560-185.000.

Bailey, Kelvin E.; and Pope, Daniel B. Multifocus intraocular lens. 4,720,286, Cl. 623-6.000.

Bair, Kenneth W., to Burroughs Wellcome Co. Fluoranthene derivatives. 4,720,587, Cl. 564-387.000.

Baker, Anthony P., to ITT Defense Communications, A Division of ITT Corporation. Liquid crystal optical switching device having reduced crosstalk. 4,720,171, Cl. 350-331.00R.

Baker, Anthony P., to ITT Defense Communications, A Division of ITT Corporation. Liquid crystal optical switching device. 4,720,172, Cl. 350-334.000.

Baker, Anthony P., to ITT Defense Communications, A Division of ITT Corporation. Liquid crystal optical switching device with integrally attached optical fibers. 4,720,174, Cl. 350-347.00V.

Ballato, Arthur: *See*—
Nakazawa, Mitsuo; and Ballato, Arthur, 4,720,651, Cl. 310-369.000.

Ballreich, Kurt; Jensen, Ernst; and Neubert, Helmut, to Dynamit Nobel Aktiengesellschaft. Training cartridge. 4,719,859, Cl. 102-444.000.

Bally Manufacturing Corporation: *See*—
Hector, Roger D.; Bushnell, Nolan K.; Delman, Howard; Rotberg, Edward; and Kinsting, Jon, 4,720,789, Cl. 364-410.000.

Baltes, Herbert: *See*—
Eichler, Klaus; Leupold, Ernst I.; Arpe, Hans-Jurgen; and Baltes, Herbert, 4,720,583, Cl. 564-305.000.

Bando Chemical Industries, Ltd.: *See*—
Kuroda, Hideo; and Taniguchi, Masao, 4,720,317, Cl. 156-250.000.

Bandura, Vitaly: *See*—
St. Cyr, Paul L.; and Bandura, Vitaly, 4,719,810, Cl. 74-89.150.

Banko, Victor F.; and Zickel, Robert E., to Orthospec, Inc. Orthopedic pin placement guide. 4,719,907, Cl. 128-92.0VD.

Bar-B-Quik Corp.: *See*—
Burkhart, William H., 4,719,899, Cl. 126-163.00R.

Barach, Jeffrey T.; and Kamara, Bassie J., to Miles Laboratories, Inc. Process for preserving acid producing bacteria and compositions produced thereby. 4,720,460, Cl. 435-260.000.

Barbe, Karl-Heinz, to Korber AG. Method and apparatus for segregating rod-shaped articles from conveyors in filter tipping and like machines. 4,719,927, Cl. 131-94.000.

Bargain, Raymond: *See*—
Guenin, Gerard; Herubel, Guy; Bargain, Raymond; and De Mendez, Michel, 4,720,270, Cl. 439-161.000.

Barmag AG: *See*—
Martens, Gerhard, 4,720,702, Cl. 340-677.000.
Schippers, Heinz; Martens, Gerhard; and Frolich, Karl-Werner, 4,720,806, Cl. 364-551.000.

Barrett, David S.; and Costain, William B., to Charles Stark Draper Laboratory, Inc., The. Limp material seam joining apparatus with rotatable limp material feed assembly. 4,719,864, Cl. 112-121.120.

Barrows, Thomas H.; and Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Surgical staple. 4,719,917, Cl. 128-334.00R.

Bartmann, Martin, to Huls Aktiengesellschaft. Preparation of aromatic polyamide with phosphorus containing catalyst and dialkylamino pyridine cocatalyst. 4,720,538, Cl. 528-336.000.

Bartusel, Karl-Rudolf; Kriesenger, Alf; and Gatzweiler, Werner, to Saint-Gobain Vitrage. Method and apparatus for bending a glass pane. 4,720,296, Cl. 65-290.000.

BASF Aktiengesellschaft: *See*—
Aquila, Werner; Nissen, Axel; Kaibel, Gerd; Horner, Michael; and Rebafka, Walter, 4,720,327, Cl. 203-96.000.
Eisert, Manfred; and Grychtol, Klaus, 4,720,568, Cl. 558-390.000.
Hebgen, Werner; Danz, Eckehard; Krome, Gerd; and Stahnecker, Erhard, 4,720,599, Cl. 570-226.000.
Kohl, Lambert; Roeger, Bernd; and Koenig, Karlheinz, 4,720,756, Cl. 360-104.000.
Martin, Roland; and Gramlich, Walter, 4,720,603, Cl. 585-431.000.
Schleier, Gisbert; and Gerold, Friedrich, 4,720,535, Cl. 528-59.000.
Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, 4,720,591, Cl. 568-328.000.

BASF Corporation-Inmont Division: *See*—
Etzell, Roger A.; Miller, Bertram J.; and Dziekan, Dennis J., 4,720,528, Cl. 525-450.000.

BASF Farben + Fasern Aktiengesellschaft: *See*—
Ruff, Wolfgang; Liedek, Egon; Berger, Gerhard; and Sonneborn, Hans W., 4,720,304, Cl. 106-288.00Q.

Basset, Frederic: *See*—
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,720,870, Cl. 382-8.000.

Basset, Jean-Marie; and Mutin, Robert, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of aromatic aldehydes. 4,720,594, Cl. 568-428.000.

Bastanzuri, Remberto P., to Scheck, Michael, a part interest. Apparatus for removing ink particles from paper products. 4,719,772, Cl. 68-205.00R.

Battelle Memorial Institute: *See*—
Haour, Georges; Richter, Dag F.; Boswell, Peter; and Wagnieres, Willy, 4,719,962, Cl. 164-461.000.

Bau, Hui: *See*—
Chang, Stanley S.; and Bau, Hui, 4,720,713, Cl. 343-912.000.

Bauer, James A., to Westinghouse Electric Corp. Electromagnetic contactor with control circuit for providing acceleration, coast and grab functions. 4,720,763, Cl. 361-154.000.

Baumann, Joachim; and Graf, Peter, to Siemens Aktiengesellschaft. Temperature-compensated ultrasonic measurement of wall thickness. 4,719,808, Cl. 73-622.000.

Baumgart, Harry. Drumsticks for use with percussion instruments. 4,719,836, Cl. 84-422.00S.

Bausch & Lomb Incorporated: *See*—
Bawa, Rajan, 4,719,657, Cl. 8-453.000.

Bawa, Rajan, to Bausch & Lomb Incorporated. Method of forming iris variegation patterns on contact lenses. 4,719,657, Cl. 8-453.000.

Bayer Aktiengesellschaft: *See*—
Beckhaus, Heiko; Witt, Harro; Becher, Dieter; Dallmeyer, Hermann; and Zarnack, Uwe J., 4,720,326, Cl. 203-14.000.
Grogler, Gerhard; Kopp, Richard; and Hess, Heinrich, 4,720,545, Cl. 540-202.000.
Kaulen, Johannes, 4,720,558, Cl. 549-443.000.
Knofel, Hartmut; Brockelt, Michael; and Penninger, Stefan, 4,720,582, Cl. 564-305.000.
Konigshofen, Heinrich; and Szentivanyi, Zsolt, 4,720,433, Cl. 428-495.000.
Orywol, Wilfried; Ehrhard, Fritz; and Uerdingen, Walter, 4,720,519, Cl. 524-450.000.
Stubbe, Mathias, 4,720,572, Cl. 560-104.000.

Wurminghausen, Thomas; and Sattlegger, Hans, 4,720,530, Cl. 525-18.000.
Zerbes, Rudolf; and Regel, Erik, 4,720,549, Cl. 548-335.000.
BBC Brown, Boveri & Company, Limited: *See*—
Keller, Jakob, 4,719,746, Cl. 60-39.170.
Keser, Helmut; and Voboril, Jan, 4,720,469, Cl. 437-143.000.
Streuli, Adrian, 4,719,756, Cl. 60-597.000.
Beale, Harry A. Glass having controllable infrared transmission. 4,720,430, Cl. 428-432.000.
Beard, Hoyt S.: *See*—
Mitchell, James M., Jr.; Beard, Hoyt S.; and Joyce, Jerry R., 4,719,928, Cl. 131-312.000.
Benson, James D., to Harris Corporation. Dense, reduced leakage CMOS structure. 4,720,739, Cl. 357-49.000.
Beatrice Companies: *See*—
Valle, Louis G., 4,719,956, Cl. 160-178.00C.
Beaudet, William R.: *See*—
Popek, Marc H.; Springer, Kenneth D.; Beaudet, William R.; and DiStefano, Ralph D., 4,720,690, Cl. 333-1.000.
Beauvois, Jacques: *See*—
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,720,870, Cl. 382-8.000.
Beavers, Michael E., to Victor Equipment Company. Adjustable tied-diaphragm gas pressure regulator. 4,719,940, Cl. 137-505.390.
Becher, Dieter: *See*—
Beckhaus, Heiko; Witt, Harro; Becher, Dieter; Dallmeyer, Hermann; and Zarnack, Uwe J., 4,720,326, Cl. 203-14.000.
Beckham, Hugh; and Curtis, Richard, to Coleman Company, Inc., The. Burner for campstove. 4,720,257, Cl. 431-211.000.
Beckhaus, Heiko; Witt, Harro; Becher, Dieter; Dallmeyer, Hermann; and Zarnack, Uwe J., to Bayer Aktiengesellschaft. Process for working-up aqueous amine solutions. 4,720,326, Cl. 203-14.000.
Becton, Dickinson and Company: *See*—
Hu, Can B.; and Solomon, Donald D., 4,720,512, Cl. 523-112.000.
Spielvogel, David E.; and Zdrahala, Richard J., 4,720,521, Cl. 524-861.000.
Bedis, Michael: *See*—
Meyer, Paul A.; and Bedis, Michael, 4,720,233, Cl. 414-686.000.
Beech, James H., Jr.; Owen, Hartley; Ramage, Michael P.; and Tabak, Samuel A., to Mobil Oil Corporation. Production of middle distillate range hydrocarbons by light olefin upgrading. 4,720,600, Cl. 585-330.000.
Beers, Howard L., to Tritec, Inc. Manually operated electrical connector for printed circuit boards. 4,720,156, Cl. 439-260.000.
Beers, Melvin D.: *See*—
Chung, Rack H., deceased; Swiger, Roger T.; and Beers, Melvin D., 4,720,531, Cl. 528-18.000.
Beigel, Bruce G.: *See*—
Logan, Emanuel L., Jr.; Beigel, Bruce G.; and Kelly, Michael A., 4,720,128, Cl. 292-251.500.
Beissel, Dieter: *See*—
Walch, Axel; Wildhardt, Juergen; and Beissel, Dieter, 4,720,343, Cl. 210-500.280.
Beitova, Marta: *See*—
Cerny, Antonin; Krepelka, Jiri; Melka, Milan; Miko, Milan; Pokorna, Stanislava; Reichlova, Ruzena; Kejhova, Irena; Beitova, Marta; and Grimova, Jaroslava, 4,720,497, Cl. 514-262.000.
Belanger, Patrice C.; Gillard, John W.; and Rokach, Joshua, to Merck Frosst Canada, Inc. Leukotriene antagonists. 4,720,505, Cl. 514-532.000.
Belart, Juan; Seibert, Wolfram; and Ocvirk, Norbert, to Alfred Teves GmbH. Slip-controlled brake system for automotive vehicles. 4,720,151, Cl. 303-6.00A.
Beling, Ingo: *See*—
Stahl, Jochen; and Beling, Ingo, 4,720,683, Cl. 328-245.000.
Bell, Gregory E., to General Motors Corporation. Double pivot hinge. 4,719,665, Cl. 16-232.000.
Bell, Robert L., to Fisher Dynamics Corporation. Motor vehicle seat hinge. 4,720,145, Cl. 297-379.000.
Bell, Stephen R., to Richardson-Vicks Inc. Stable pharmaceutical w/o emulsion composition. 4,720,353, Cl. 252-309.000.
Bellettiere, Samuel J.: *See*—
Petronella, Joseph; and Bellettiere, Samuel J., 4,720,352, Cl. 252-308.000.
BenArie, Eli: *See*—
Roth, David A.; and BenArie, Eli, 4,720,783, Cl. 364-200.000.
Bendix France S.A.: *See*—
Gautier, Jean-Pierre, 4,719,842, Cl. 91-369.00A.
Benner, James D., Jr., to Abbott Laboratories. Drop detecting system which operates under different ambient light conditions. 4,720,636, Cl. 250-573.000.
Beresinsky, Isaac, to Moledeth Know-How Export Company (1978) Ltd. Material conveyor and distribution system. 4,720,005, Cl. 198-370.000.
Berfield, Robert C., to Shop-Vac Corporation. Swivable caster. 4,719,664, Cl. 16-47.000.
Berger, Gerhard: *See*—
Ruff, Wolfgang; Liedek, Egon; Berger, Gerhard; and Sonneborn, Hans W., 4,720,304, Cl. 106-288.00Q.
Berger, Hildegard. Temperature control means for evaporators. 4,720,258, Cl. 431-242.000.
Bergeron, Hervin J., Jr. Air circulation system and air flow elements therefor. 4,719,848, Cl. 98-31.000.
Bergeron, Societe Anonyme: *See*—
Daux, Jean-Pierre, 4,720,238, Cl. 415-170.00A.
Bergman, Helmut. Continuous spherical truss construction. 4,719,726, Cl. 52-81.000.
Bernard, Andre. Drywall attachment strips. 4,719,732, Cl. 52-287.000.
Berne, Francois, to Degremont. Method and apparatus for the filtration of a suspension by a granular filtrating layer. 4,720,347, Cl. 210-792.000.
Bernhard, Dennis P.: *See*—
Rowles, Howard C.; Grassi, Kimberly S.; and Bernhard, Dennis P., 4,720,293, Cl. 62-24.000.
Bertram, Hans J. Stock assembly for storing and successively supplying closed loop members for suspending sausages. 4,720,010, Cl. 206-345.000.
Bertrand, John P., to ITT Defense Communications a Division of ITT Corporation. Digital speech coding circuit. 4,720,861, Cl. 381-36.000.
Besmar, Usamah N.; Lyon, John B.; Miller, Francis J.; and Musser, Michael T., to Du Pont de Nemours, E. I., and Company. Preparation of cyclohexanone and cyclohexanol. 4,720,592, Cl. 568-342.000.
Bessinger, Walter L., to Knape & Vogt Manufacturing Co. Lock pin cantilever shelf. 4,720,069, Cl. 248-250.000.
Beta Raven Inc.: *See*—
Volk, Joseph A.; Volt, Joseph A., Jr.; and Tansuwan, Chusak, 4,719,805, Cl. 73-861.030.
Betz Laboratories, Inc.: *See*—
Martin, John F., 4,720,566, Cl. 558-306.000.
Biasini, Americole R.; and Anastasio, Paul C., to RICO Products. Violin chinrest insert. 4,719,835, Cl. 84-279.000.
Bickham, Lane A. Vibration dampening device for attachment to a racket. 4,720,106, Cl. 273-73.00R.
Billings, Roger E. Method and apparatus for electrolyzing water. 4,720,331, Cl. 204-129.000.
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier. Method of automatically and electronically analyzing patterns in order to distinguish symmetrical perceptible areas in a scene together with their centers of symmetry. 4,720,870, Cl. 382-8.000.
Binarsch, Jurgen; and Meyer, Dietmar, to WABCO Westinghouse Fahrzeugbremsen GmbH. Electronic control arrangement for controlling a plurality of outputs in accordance with the electrical state of a plurality of inputs. 4,720,810, Cl. 364-900.000.
Binder, Dieter; and Rovenszky, Franz, to Chemi Linz Aktiengesellschaft. 2-(2-thienyl)-imidazo(4,5-c)pyridine derivatives and salts thereof useful in the treatment of myocardial insufficiency. 4,720,501, Cl. 514-303.000.
Binnersley, Edwin K.; and Krueger, William H., to Du Pont de Nemours, E. I., and Company. Method for producing fiber reinforced thermoplastic material. 4,720,366, Cl. 264-172.000.
Bishop, Randy A.; and Bishop, Victoria A. Adjustable body support device. 4,719,653, Cl. 4-572.000.
Bishop, Royston G.; and Kirby, William. Meter locking system. 4,720,675, Cl. 324-110.000.
Bishop, Victoria A.: *See*—
Bishop, Randy A.; and Bishop, Victoria A., 4,719,653, Cl. 4-572.000.
Bisson, Flavio, to Necchi Societa per Azioni. Small cloth vise for a sewing machine. 4,719,863, Cl. 112-121.120.
Bisson, Flavio; and Cattaneo, Giacomo, to Necchi Societa per Azioni. Sewing machine with control device for the needle driving motor. 4,719,866, Cl. 112-275.000.
Bisson, Flavio, to Necchi Societa per Azioni. Lower wheel fabric feeding device in a column sewing machine. 4,719,867, Cl. 112-318.000.
Bittner, Paul: *See*—
Frisch, Gerhard; and Bittner, Paul, 4,720,595, Cl. 568-709.000.
Bizzarri, Venonzio, to Kanthal AB. Terminal for electrical resistance heating element and a method for the manufacture of such terminals. 4,720,697, Cl. 338-329.000.
Bjorklund, Robert, to ASEA Aktiebolag. Method of manufacturing a layer with electrical conductivity. 4,720,393, Cl. 427-58.000.
Black, Robert S.: *See*—
Kauffman, Abe J.; Black, Robert S.; and Stanley, Arthur J., 4,720,364, Cl. 264-40.500.
Black, William B., to Celanese Corporation. Process for producing self-crimping polyester yarn. 4,720,314, Cl. 156-167.000.
Blalock, William J.: *See*—
Ream, John D.; and Blalock, William J., 4,720,125, Cl. 285-47.000.
Blaser, Dwight A.; Nemanis, Kestutis P.; Zik, James J.; and Hess, Edward C., to General Motors Corporation. Ultrasonic method and apparatus for detecting leaks. 4,719,801, Cl. 73-592.000.
Blatt, Leland F. Fluid pressure operated motor with positive locating device. 4,719,847, Cl. 92-168.000.
Blaupunkt-Werke GmbH: *See*—
Seibold, Peter; and Strauss, Karl-Peter, 4,720,700, Cl. 340-568.000.
Bleicher, Manfred; Bohne, Ulrich; and Wanner, Karl, to Robert Bosch GmbH. Hammer drill. 4,719,976, Cl. 173-109.000.
Blessing, Gerhard, to Hans Grohe GmbH & Co. KG. Wall connection piece for a hand-held shower. 4,719,654, Cl. 4-597.000.
Bloch, Peter; Fischer, Rudolf; and Schwaighofer, Roman, to Maag Gear Wheel & Machine Co. Ltd. Tool for machining tooth flanks and method of finishing tooth flanks. 4,720,220, Cl. 409-33.000.
Blom, Rolf J.: *See*—
Aaro, Tore I.; Rustan, Torgny O.; Oman, Par; Blom, Rolf J.; Forchheimer, Robert; Fak, Viiveke A.; and Ingemarsson, Bror I., 4,720,859, Cl. 380-23.000.

Bloo, Johann: *See*—
Buchinger, Johann; Mistlberger, Bruno; Wolf, Rudolf; Schonberger, Johann; Langer, Thomas; Bloo, Johann; Vilsecker, Kurt; and Haider, Bruno, 4,719,946, Cl. 139-13.00R.
Board, William D. Bicycle cross-bar bag. 4,720,027, Cl. 224-35.000.
Bobicki, Jeffre M.: *See*—
Goodman, Ricky R.; Bobicki, Jeffre M.; and Cherry, Robert S., 4,720,873, Cl. 455-2.000.
Boden, Richard M., to International Flavors & Fragrances Inc. Cyclohexenyl pyridine derivatives, organoleptic uses of same and processes for preparing same. 4,720,481, Cl. 512-10.000.
Boehringer Ingelheim KG: *See*—
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Fugner, Armin, 4,720,496, Cl. 514-257.000.
Boehringer Mannheim GmbH: *See*—
Fey, Werner; Pauli, Manfred; Ruppender, Uwe; and Seidenstricker, Manfred, 4,720,372, Cl. 422-67.000.
Boeing Company, The: *See*—
DeFries, Rene F.; and Riley, Arthur D., 4,720,218, Cl. 408-145.000.
Hamatani, Tomio, 4,720,065, Cl. 244-129.500.
Herndon, Gerald F., 4,720,064, Cl. 244-122.0AG.
James, Milton E.; and Stepien, John A., 4,720,063, Cl. 244-102.00R.
Mittelstadt, Robert F., 4,720,255, Cl. 425-394.000.
Mutter, Harry P., 4,719,684, Cl. 29-235.000.
Boese, Peter: *See*—
Grothe, Horst; Boese, Peter; Kolakowski, Manfred; and Lax, Hermann, 4,719,960, Cl. 164-426.000.
BOGE GmbH: *See*—
Moser, Bernd, 4,719,800, Cl. 73-517.00R.
Moser, Bernd, 4,719,941, Cl. 137-599.000.
Bohm, Horst: *See*—
Schlapp, Albert; Bohm, Horst; and Grimm, Rainer, 4,720,138, Cl. 296-227.000.
Bohm, Valter: *See*—
Zverina, Karel; Kroupa, Petr; Szabo , Josef; Maroszczyk, Veslav; Bohm, Valter; and Cieslar, Antonin, 4,720,083, Cl. 266-275.000.
Bohne, Ulrich: *See*—
Bleicher, Manfred; Bohne, Ulrich; and Wanner, Karl, 4,719,976, Cl. 173-109.000.
Boinot, Jean-Claude: *See*—
Leonard, Henri; Lacour, Bernard; Boinot, Jean-Claude; and Jacoulet, Jean-Paul, 4,720,266, Cl. 433-126.000.
Bokon, William S. Nonhazardous mower. 4,719,743, Cl. 56-294.000.
Boll, Hans-Joachim, to J. Wagner GmbH. Method and apparatus for setting a throughput quantity control valve of a paint spraygun. 4,720,801, Cl. 364-510.000.
Bolzmann, Olaf-Ragnar: *See*—
Herberich, Wolfgang; Degle, Walter; Bahnsen, Heiner; and Bolzmann, Olaf-Ragnar, 4,719,694, Cl. 29-703.000.
Bonde, Robert L.: *See*—
Ruffle, Paul D.; Schiestl, Randall L.; and Bonde, Robert L., 4,719,860, Cl. 102-521.000.
Bonjour, Christian; and Hauser, Charles, to Stellram S.A. Cutter bit for machining by chip removal. 4,720,217, Cl. 407-114.000.
Bonomo, Donald J.; and Paulson, Robert C., to Cox-Uphoff Corporation. Subperiosteal tissue expander. 4,719,918, Cl. 128-344.000.
Borror, Alan L.; and Ellis, Ernest W., to Polaroid Corporation. Thermal imaging method. 4,720,449, Cl. 430-338.000.
Boswell, Peter: *See*—
Haour, Georges; Richter, Dag F.; Boswell, Peter; and Wagnieres, Willy, 4,719,962, Cl. 164-461.000.
Bothe, Lothar: *See*—
Crass, Gunther; Bothe, Lothar; and Janocha, Siegfried, 4,720,420, Cl. 428-216.000.
Botka, Julius K.: *See*—
Donecker, S. Bruce; and Botka, Julius K., 4,720,677, Cl. 324-158.00F.
Bouchard, Donald J. Improved two piece security plate for a door. 4,720,129, Cl. 292-346.000.
Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,720,574, Cl. 560-185.000.
Bougle, Jean, to Thomson-CGR. High-voltage generating assembly and an X-ray device. 4,720,844, Cl. 378-101.000.
Bouin, Thierry: *See*—
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,720,870, Cl. 382-8.000.
Boussois S.A.: *See*—
de Moncuit, Frederic, 4,720,607, Cl. 178-18.000.
Bowden, Charles M.: *See*—
Haus, Joseph W.; Bowden, Charles M.; and Sung, Chi C., 4,720,175, Cl. 350-353.000.
Bowers, John G., to R. E. Bowers & Freeman Limited. Coding box with selectively adjustable printing wheels. 4,719,853, Cl. 101-110.000.
Bowthorpe Emp Limited: *See*—
Starr, Tom, 4,720,760, Cl. 361-128.000.
Boyle, David H., to International Business Machines Corporation. On chip performance predictor circuit. 4,720,670, Cl. 324-73.00R.
Boyle, Gerald M., to Celanese Corporation. Rate of crystallizing diphenylisophthalate/diphenylterephthalate monomer. 4,720,570, Cl. 560-78.000.
BP Chemicals Limited: *See*—
Marks, Gerald C.; Thomas, Kenneth C.; and Quist, Per I., 4,720,510, Cl. 521-114.000.
Soldatos, Anthony C., 4,720,303, Cl. 106-181.000.
Bradford Company: *See*—
Nichols, Glenn R.; Stejskal, Michael F.; and Zink, Robert M., 4,720,013, Cl. 206-506.000.
Bradley, Donald C.; Chudzynska, Halina; and Faktor, Marc M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Preparation of metal alkyls. 4,720,561, Cl. 556-1.000.
Brahim, Karime; and McFarland, Michael J., to Allied Corporation. Copolymers from maleimide and aliphatic vinyl ethers and esters used in positive photoresist. 4,720,445, Cl. 430-192.000.
Braitmaier, Jurgen; and Hammeley, Bodo, to Daimler-Benz Aktiengesellschaft. Roller mandrell chuck. 4,720,114, Cl. 279-2.00R.
Brasted, Lee K.; and Piter, Edward S., to Shell Offshore Inc. Mudmat design. 4,720,214, Cl. 405-227.000.
Brauner, Arne H., to International Paper Company. Moisture-proof, linerless carton with reclosable top membrane. 4,720,015, Cl. 206-621.000.
Breckwoldt, Robert G., to Tripar Incorporated. Non-tobacco smoking materials. 4,719,929, Cl. 131-359.000.
Brenner, Robert A.; Kennedy, William L.; and Mason, Anthony, to Whirlpool Corporation. Clothes rollover agitation system for automatic washer. 4,719,770, Cl. 68-134.000.
Breuer, Bernhard: *See*—
Scharting, Gunter; and Breuer, Bernhard, 4,720,197, Cl. 384-49.000.
Briggs & Stratton Corporation: *See*—
Santi, John D., 4,719,682, Cl. 29-159.200.
Vollbrecht, Kenneth A., 4,720,638, Cl. 290-38.00R.
Bright, David R.: *See*—
Young, Vernon V.; and Bright, David R., 4,720,548, Cl. 544-351.000.
Brimeyer, Dennis A.; and Maneman, Terrence H., to Deere & Company. Tractor front-end weight option. 4,720,122, Cl. 280-759.000.
British Gas Corporation: *See*—
Craigen, Joseph G.; and Dixon, Bryan F., 4,719,806, Cl. 73-861.420.
Streatfield, Roy; and Wilson, Francis D., 4,720,211, Cl. 405-154.000.
Brochard, Jean-Michel; and Gough, Stanley T. D., to Rhone-Poulenc Agrochimie. Process for preparing O-alkyl S-(alpha-branched alkyl) alkylphosphonothioate. 4,720,565, Cl. 558-098.000.
Brockelt, Michael: *See*—
Knofel, Hartmut; Brockelt, Michael; and Penninger, Stefan, 4,720,582, Cl. 564-305.000.
Bronowski, Helmut; and Dahlke, Christian, to J. M. Voith GmbH. Cover for turbines and pumps. 4,720,240, Cl. 415-219.00C.
Bronshtein, Boris. Controlled process for making a chemically homogeneous melt for producing mineral wool insulation. 4,720,295, Cl. 65-2.000.
Brooke, Raymond; and Palombo, Gaston, to Computer Memories, Inc. Capacitive encoder having multiple precision outputs. 4,720,698, Cl. 340-347.00P.
Brookner, Eli; and Howell, James M., to Raytheon Company. Adaptive beam forming apparatus. 4,720,712, Cl. 342-383.000.
Brooks, William S. C.: *See*—
Wicks, Douglas B.; Johnson, Dennis W.; Brooks, William S. C.; and Nelson, Terry J., 4,719,799, Cl. 73-302.000.
Brose Fahrzeugteile GmbH & Co. KG.: *See*—
Mann, Bernd; Dinkel, Emil; and Rampel, Hans, 4,720,073, Cl. 248-430.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; and Hashimoto, Miho, 4,719,865, Cl. 112-221.000.
Brough, Denys W.; and Lawrence, Christopher J., to Rieter Scragg Limited. Apparatus for applying liquids to yarns. 4,719,771, Cl. 68-200.000.
Brown, Timothy R.: *See*—
Ferran, Robert J.; Tessicini, Anthony J.; and Brown, Timothy R., 4,720,807, Cl. 364-558.000.
Browne, Denis B.: *See*—
Schultz, Rainer M.; and Browne, Denis B., 4,720,118, Cl. 280-432.000.
Bruckel, Hans: *See*—
Schonig, Erich; and Bruckel, Hans, 4,720,365, Cl. 264-75.000.
Brugel, Edward G., to Du Pont de Nemours, E. I., and Company. Branched copolyetherketones. 4,720,537, Cl. 528-125.000.
Brunet, Maurice: *See*—
Habermann, Helmut; and Brunet, Maurice, 4,720,649, Cl. 310-90.500.
Bruzzone, Riccardo. Device and attendant equipment for converting a motor-scooter into a vehicle suitable for operating on snowy ground. 4,719,983, Cl. 180-184.000.
Buchinger, Johann; Mistlberger, Bruno; Wolf, Rudolf; Schonberger, Johann; Langer, Thomas; Bloo, Johann; Vilsecker, Kurt; and Haider, Bruno, to Lenzing Aktiengesellschaft. Method of producing a tubular woven fabric and a circular loom for carrying out the method. 4,719,946, Cl. 139-13.00R.
Buell Industries, Inc.: *See*—
Peterson, Francis C.; Perosino, Lorenzo; and Despins, Robert, 4,720,075, Cl. 248-635.000.
Buhler, Hans-Eugen: *See*—
Laue, Karl H.; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; and Buhler, Hans-Eugen, 4,720,376, Cl. 423-239.000.
Burga, Roque F. Fire-resistant material. 4,720,414, Cl. 428-141.000.
Burkhart, William H., to Bar-B-Quik Corp. Depot for granular carbonaceous fuel and method employing the same to provide high efficiency fires for charbroiling and the like. 4,719,899, Cl. 126-163.00R.

Burlington Industries, Inc.: *See—*
Morrison, Elbert F., 4,719,744, Cl. 57-5.000.

Burns, Mark A.: *See—*
Craig, Amy J. K.; Burns, Mark A.; and Monjes, Mary J., 4,720,479, Cl. 503-200.000.

Burr-Brown Corporation: *See—*
Castner, Bryan G., 4,719,696, Cl. 29-830.000.

Burris, Christine; Harris, Robert L.; Kolough, Victor; Linville, Larry R.; Scott, Charles G.; and Young, Robert, to Plantronics, Inc. Miniaturized headset for two-way voice communication. 4,720,857, Cl. 379-430.000.

Burroughs Corporation: *See—*
Reynard, Fred T.; and Manco, Richard J., 4,720,779, Cl. 364-200.000.

Burroughs Wellcome Co.: *See—*
Bair, Kenneth W., 4,720,587, Cl. 564-387.000.

Burt, David A., to ITW Limited. Threaded fastening systems. 4,720,225, Cl. 441-329.000.

Burton, Forrest R., to PDQ Manufacturing Inc. Automatic vehicle washing system. 4,719,932, Cl. 134-57.00R.

Buschmann, Jeffrey P.; Westlund, Arnold E., Jr.; and Cox, David A., to GTE Products Corporation. Electric lamp with bridge support member providing both compressive and axial support. 4,720,653, Cl. 313-275.000.

Bushnell, Nolan K.: *See—*
Hector, Roger D.; Bushnell, Nolan K.; Delman, Howard; Rotberg, Edward; and Kinsting, Jon, 4,720,789, Cl. 364-410.000.

Buslepp, Kenneth J.; Cinpinski, Keaneth J.; and Currie, James H., to General Motors Corporation. Internal combustion engine with throttle tipout dilution reduction. 4,719,893, Cl. 123-571.000.

Butcher, David W.: *See—*
Clark, John A.; Adshead, Alan; and Butcher, David W., 4,720,441, Cl. 430-1.000.

Buzby, George C., Jr., to American Home Products Corporation. N-(aminoalkylene)benzenesulfonamides. 4,720,580, Cl. 564-89.000.

Byrns, James E. Utility tray having foldable handle. 4,720,021, Cl. 220-94.000R.

Byron, Kevin C., to Standard Telephones and Cables plc. Optical amplifier. 4,720,684, Cl. 330-4.300.

C.A. Weidmuller GmbH & Co.: *See—*
Wiebe, Ulrich; and Wilmes, Manfred, 4,719,789, Cl. 72-410.000.

C. R. Bard, Inc.: *See—*
Crittendes, James F.; and White, Bryan J., 4,719,924, Cl. 128-772.000.

C-Tec, Inc.: *See—*
Cooper, Gordon J.; and Rose, Todd N., 4,719,727, Cl. 52-126.600.

Cadaureille, Gerard; Cresson, Patrick; and Vecchionacci, Claude, to Framatome. Device for cleaning the guide tubes of the means of measuring neutron fluxes in a pressurized-water nuclear reactor. 4,720,369, Cl. 376-248.000.

Cadiz, Mariano T.: *See—*
Schwartz, Martin T.; Cadiz, Mariano T.; Clark, Eric G.; D'Souza, Neville G.; Talley, Walter D., III; and Dukatz, Matthew E., 4,720,143, Cl. 297-326.000.

Cagnon, Francois: *See—*
Austruy, Georges; Cagnon, Francois; Di Paola, Denis; and Vinchon, Andre , 4,719,878, Cl. 122-31.00R.

Cairns, James A.; and Stephen, James H., to United Kingdom Atomic Energy Authority. Substrates for electronic devices. 4,720,419, Cl. 428-209.000.

Calfee, Richard V.: *See—*
Alt, Eckhard; and Calfee, Richard V., 4,719,920, Cl. 128-419.0PG.

Cameron Iron Works, Inc.: *See—*
Taylor, William M.; and Schmitz, Thomas R., 4,720,124, Cl. 285-18.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Weickert, Chris A.; and Storrie, Thomas A., 4,719,797, Cl. 73-167.000.

Canadian Patents and Development Ltd.: *See—*
Armstrong, David W.; Martin, Stanley M.; and Yamazaki, Hiroshi, 4,720,457, Cl. 435-135.000.
Sheppard, John D.; and Cooper, David G., 4,720,287, Cl. 44-33.000.

Canamero, Ernest V., to Du Pont de Nemours, E. I., and Company. Package having tearstrip opener. 4,720,011, Cl. 206-455.000.

Cannon, David C.; and Lyles, Stephen P., to Sonoco Products Company. Computer controlled web feed method, apparatus and system for web treatment apparatus such as rotary die cutter. 4,719,855, Cl. 101-426.000.

Canon Denshi Kabushiki Kaisha: *See—*
Kuwayama, Tetsuro; and Nakamura, Yasuo, 4,720,158, Cl. 350-3.690.

Canon Kabushiki Kaisha: *See—*
Asano, Toshiaki; Takahashi, Sadatoshi; and Tsuji, Sadahiko, 4,720,180, Cl. 350-427.000.
Fujiyama, Yasutomo, 4,719,873, Cl. 118-723.000.
Hanamori, Ryoichi; and Yamamoto, Hiroshi, 4,720,650, Cl. 310-266.000.
Harunari, Yoshihiro; Tokuda, Ryuji; and Kobe, Takashi, 4,720,723, Cl. 354-403.000.
Ikeda, Masami; Shibata, Makoto; Takahashi, Hiroto; Komuro, Hirokazu; Matsuda, Hiroto; and Tsuda, Hisanori, 4,720,716, Cl. 346-140.100R.
Ito, Hitomi; and Furuya, Toshitsugu, 4,719,671, Cl. 24-115.00R.
Kando, Masahiro, 4,720,728, Cl. 355-35.00H.
Kawai, Tohru, 4,720,169, Cl. 350-255.000.
Konishi, Motofumi; Tanaka, Kanou; and Nakamura, Mitsuo, 4,720,707, Cl. 340-792.000.
Kuwayama, Tetsuro; and Nakamura, Yasuo, 4,720,158, Cl. 350-3.690.
Okada, Shinjiro; Kanbe, Junichiro; and Katagiri, Kazuharu, 4,720,173, Cl. 350-341.000.
Saitoh, Keishi; Kansi, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,720,443, Cl. 430-17.000.
Tamura, Yasuyuki, 4,720,088, Cl. 267-158.000.
Tsutsui, Shinji, 4,720,732, Cl. 355-30.000.
Yoshida, Yasumi, 4,720,727, Cl. 355-3.00R.

Canon Seiki Kabushiki Kaisha: *See—*
Hanamori, Ryoichi; and Yamamoto, Hiroshi, 4,720,650, Cl. 310-266.000.

Cantello, Maichi: *See—*
Mattei, Riccardo; Neri, Armando; Cantello, Maichi; and Gobbi, Santo R., 4,720,619, Cl. 219-121.0LK.

Cantor, Harvey I.; and Nabel, Gary, to Dana Farber Cancer Institute. Pharmaceutical compositions containing one or more lymphocyte growth factors. 4,720,482, Cl. 514-2.000.

Capelle, Jean-Francois; Leroux, Raoul; and Theroue, Gerard, to Roctest Ltee/Ltd. Borehole extensometer for monitoring relative mass displacements. 4,719,803, Cl. 73-784.000.

Caporiccio, Gerardo; Viola, Gian T.; and Marchionni, Giuseppe, to Ausimont S.p.A. New functionalized perfluoropolyethers and process for the preparation thereof. 4,720,527, Cl. 525-403.000.

Carenco, Alain: *See—*
Menigaux, Louis; Carenco, Alain; and Sansonetti, Pierre, 4,720,468, Cl. 437-129.000.

Cargill, Incorporated: *See—*
Schmidt, Roger A.; and Hage, Martin L., 4,720,522, Cl. 525-43.000.

Carl-Zeiss-Stiftung: *See—*
Siegel, Augustin; and Seidel, Peter, 4,720,191, Cl. 356-237.000.

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DiCesare, John M.; and Semanski, Ludwig C., to Du Pont de Nemours, E. I., and Company. Power control device for a resistance heater in an oven. 4,720,623, Cl. 219-497.000.

Dickie, Ray A.; and Qaderi, Saiyed B. A., to Du Pont de Nemours, E. I., and Company. Blocked dieneophile functional modified amino-epoxy resins. 4,720,523, Cl. 525-113.000.

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Dolecek, Quentin E., to Johns Hopkins University, The. Memory-linked wavefront array processor. 4,720,780, Cl. 364-200.000.

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Golias, Tipton L., to Helena Laboratories Corporation. Diagnostic densitometer. 4,720,788, Cl. 364-416.000.

Gomes de Matos, Isabel M.: *See*—
Kissinger, Gaylord M.; and Gomes de Matos, Isabel M., 4,720,596, Cl. 568-724.000.

Gomes, Rodney A. Beverage can opening and sealing tab. 4,720,022, Cl. 220-269.000.

Gomoll, Guenter; Hauslaib, Wolfgang; and Frank, Gustav, to Mannesmann AG. Adjusting the distance of a print head from a platen. 4,720,200, Cl. 400-59.000.

Gontowski, Walter S., Jr., to Cherry Semiconductor Corporation. High frequency precision oscillator with synchronous capability. 4,720,689, Cl. 331-111.000.

Gonzales, Serge: *See*—
Rabilloud, Guy; Marriagi, Paul; Gonzales, Serge; and Sillion, Bernard, 4,720,539, Cl. 528-353.000.

Goodell, Bradley D.; and Larson, Ronald A., to FMC Corporation. Stiff-backed ramming chain. 4,719,840, Cl. 89-47.000.

Goodman, Irving; and Hiatt, Robert B., to Research Corporation. Tripeptides for control of intestinal motility. 4,720,485, Cl. 514-18.000.

Goodman, Ricky R.; Bobicki, Jeffre M.; and Cherry, Robert S., to Goodman, Ricky R. Satellite audio broadcasting system. 4,720,873, Cl. 455-2.000.

Goodwin, John C.; and Devenyi, Tibor F., to Northern Telecom Limited. Laser-fiber positioner. 4,720,163, Cl. 350-96.200.

Goodwin, Walter W.: *See*—
Davis, Lewis B., Jr.; Goodwin, Walter W.; and Steber, Charles E., 4,719,748, Cl. 60-39.370.

Gordon, Eric M.: *See*—
Godfrey Jr., Jollie D.; and Gordon, Eric M., 4,720,585, Cl. 564-340.000.

Gordon, Hy S., to Hydrocizer Industries, Inc. Exerciser with beverage reservoir. 4,720,098, Cl. 272-122.000.

Goto, Shigenori: *See*—
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,719, Cl. 354-173.100.
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,721, Cl. 354-173.110.
Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; Goto, Shigenori; and Hamada, Hisashi, 4,720,718, Cl. 354-154.000.

Gotoh, Tsuguo: *See*—
Kisakibaru, Toshiro; Gotoh, Tsuguo; Ohuchi, Kazunori; and Ohho, Hirosuke, 4,720,661, Cl. 318-6.000.

Gough, Stanley T. D.: *See*—
Brochard, Jean-Michel; and Gough, Stanley T. D., 4,720,565, Cl. 558-098.000.

Grady, Michael E.: *See*—
Cope, Jonathan C.; Grady, Michael E.; and Warnock, Donald G., 4,719,849, Cl. 99-404.000.

Graf, Peter: *See*—
Baumann, Joachim; and Graf, Peter, 4,719,808, Cl. 73-622.000.

Gramera, Robert E. Visual system differentiating identical sums of two numbered dice. 4,720,108, Cl. 273-146.000.

Gramlich, Walter: *See*—
Martin, Roland; and Gramlich, Walter, 4,720,603, Cl. 585-431.000.

Grange, Pierre, to Radiall Industrie. Hermetic coaxial connector. 4,720,271, Cl. 439-271.000.

Grassi, Kimberly S.: *See*—
Rowles, Howard C.; Grassi, Kimberly S.; and Bernhard, Dennis P., 4,720,293, Cl. 62-24.000.

Graveman, Donald F.; and Strom, Sven B., to American Pulverizer Company. Hammer-type shredder with air deflector. 4,720,051, Cl. 241-186.300.

Graviner Limited: *See*—
Allen, Nicholas S.; and Moore, Peter E., 4,719,973, Cl. 169-61.000.

Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., to Mobil Oil Corporation. Hydrodewaxing method with interstage separation of light products. 4,720,337, Cl. 208-58.000.

Green, Geoffrey F.: *See*—
Patton, William G.; Dilling, Victor H.; and Green, Geoffrey F., 4,719,969, Cl. 165-160.000.

Green, Robert S. Transportable system for providing heat to flowing materials. 4,720,263, Cl. 432-222.000.

Greesman, Joseph, to Transfer Print Foils, Inc. Method for preparing a selectively decorated resin film. 4,720,315, Cl. 156-233.000.

Greiner, Gary; and Furlong, Dale A., to ETS, Inc. Individual filter bag monitoring system for baghouses. 4,719,791, Cl. 73-38.000.

Greune, Christian; and Zotz, Georg, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Valve for a fluid flow engine. 4,719,749, Cl. 60-39.094.

Grimm, Daniel: *See*—
Laue, Karl H.; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; and Buhler, Hans-Eugen, 4,720,376, Cl. 423-239.000.

Grimm, Rainer: *See*—
Schlapp, Albert; Bohm, Horst; and Grimm, Rainer, 4,720,138, Cl. 296-177.000.

Grimova, Jaroslava: *See*—
Cerny, Antonin; Krepelka, Jiri; Melka, Milan; Miko, Milan; Pokorna, Stanislava; Reichlova, Ruzena; Kejhova, Irena; Beitova, Marta; and Grimova, Jaroslava, 4,720,497, Cl. 514-762.000.

Grogler, Gerhard; Kopp, Richard; and Hess, Heinrich, to Bayer Aktiengesellschaft. Process for the preparation of complexes of one mol of dimerized or low-oligodimerized 4,4'-diisocyanatodiphenylmethane and two to three mol of 4,4'-diisocyanatodiphenylmethane, corresponding complexes, and their use for polyurethane production. 4,720,545, Cl. 540-202.000.

Gross, Paul; and Keller, Walter, to Wella Aktiengesellschaft. Hair treatment and process for hair treatment. 4,719,930, Cl. 132-7.000.

Grossner, Clifford P.: *See*—
Radhakrishnan, Thiruvengadam; and Grossner, Clifford P., 4,720,784, Cl. 364-200.000.

Grote, Franz-Josef, to General Motors Corporation. Ashtray, especially for motor vehicles. 4,720,131, Cl. 296-37.900.

Grothe, Horst; Boese, Peter; Kolakowski, Manfred; and Lax, Hermann, to SMS Schloemann-Siemag AG.; and Thyssen Aktiengesellschaft. Apparatus for connecting a dummy strip to the leading end of a casting in the start-up of continuous casting of strip metal. 4,719,960, Cl. 164-426.000.

Grubb, Lawrence B.: *See*—
Williams, D. Michael; and Grubb, Lawrence B., 4,720,283, Cl. 445-69.000.

Gruber, Wilhelm, to Rohm GmbH. $H_8PMo_{10}VO_{39}$ and its anhydride, $PMo_{10}VO_{35}$ and preparation therewith of methacrylic acid and its lower alkyl ester. 4,720,575, Cl. 560-214.000.

Grumman Aerospace Corporation: *See*—
Arena, Pat S., 4,720,215, Cl. 406-105.000.

Grychtol, Klaus: *See*—
Eisert, Manfred; and Grychtol, Klaus, 4,720,568, Cl. 558-390.000.

GTE Products Corporation: *See*—
Buschmann, Jeffrey P.; Westlund, Arnold E., Jr.; and Cox, David A., 4,720,653, Cl. 313-275.000.
Johnston, David W.; and Poirier, Charles H., 4,720,656, Cl. 313-493.000.

Guenin, Gerard; Herubel, Guy; Bargain, Raymond; and De Mendez, Michel, to Souriau & Cie. Electric connector with a contact element of shape-memory material. 4,720,270, Cl. 439-161.000.

Guido, Heinz, to MAN Gutehoffnungshutte GmbH. Contact connection between a contact electrode and a cooling medium and a current supply lines for an electrical melting furnace. 4,720,838, Cl. 373-72.000.

Gunther, Bernd-Rainer; Losch, Rainer; and Steiner, Klaus, to A. Nattermann & CIE GmbH. Process for producing imidazolylthiophenaldehydes. 4,720,550, Cl. 548-336.000.

Gupta, Satish; and Lucas, Bruce D., to International Business Machines Corporation. Virtual resolution displays. 4,720,705, Cl. 340-724.000.

Gurewitz, Richard M. Security deposit bag. 4,720,040, Cl. 232-1.00D.

Gustafson, Stephen R. Portable multi-purpose tent assembly. 4,719,935, Cl. 135-102.000.

Guttag, Karl M.: *See*—
Pinkham, Raymond; and Guttag, Karl M., 4,720,819, Cl. 381-219.000.

Guyeska, John C.; Liptak, J. Michael; and Roof, Richard W., to Square D Company. DC bus shorting apparatus and method for polyphase AC inverter. 4,720,776, Cl. 363-37.000.

Guyon, Claude: *See*—
Cotrel, Claude; Guyon, Claude; Roussel, Gerard; and Taurand, Gerard, 4,720,500, Cl. 514-300.000.

GX-Holding AG: *See*—
Jaeger, Walter, 4,720,058, Cl. 244-3.150.

H-C Industries, Inc.: *See*—
Schetzsle, John; and Corcoran, Michael E., 4,720,018, Cl. 215-252.000.

Haacke, E. Mark: *See*—
Patrick, John L.; Haacke, E. Mark; Linga, Nagarjuna R.; and Hahn, Janice E., 4,720,679, Cl. 324-309.000.

Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., to U.S. Philips Corporation. Method for separating moving structures from a fixed background in a sequence of X-ray projection images and equipment for implementing this method. 4,720,843, Cl. 378-99.000.

Haas, Hanns-Otto: *See*—
Ruger, Manfred; Gensheimer, Valentin; and Haas, Hanns-Otto, 4,719,854, Cl. 101-409.000.

Habermann, Helmut; and Brunet, Maurice, to Societe Europeenne de Propulsion. Large diameter radial magnetic bearing. 4,720,649, Cl. 310-90.300.

Hackler, Erich: *See*—
Laue, Karl H.; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; and Buhler, Hans-Eugen, 4,720,376, Cl. 423-239.000.

Hadermann, Albert F.: *See*—
O'Mara, Dion P.; Hadermann, Albert F.; and Trippe, Jerry C., 4,720,397, Cl. 427-180.000.

Haga, Kei-ichiro: *See*—
Kawakita, Takeshi; Sano, Mitsuharu; Yasumoto, Mitsuyoshi; Ohsuga, Kunio; and Haga, Kei-ichiro, 4,720,493, Cl. 514-230.000.

Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, to Sumitomo Chemical Company, Limited. Benzothiazolones, and their production and use as herbicides. 4,720,297, Cl. 71-90.000.

Haga, Yoshihiro: *See*—
Takiguchi, Hideki; Iijima, Toshifumi; Yagi, Toshihiko; and Haga, Yoshihiro, 4,720,452, Cl. 430-567.000.

Hage, Martin L.: *See*—
Schmidt, Roger A.; and Hage, Martin L., 4,720,522, Cl. 525-43.000.

Hagio, Tsuyoshi: *See*—
Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, 4,720,349, Cl. 252-12.000.

Hagiwara, Yoshimune: *See*—
Yamaguchi, Noboru; Uchiyama, Kunio; Koizumi, Haruo; Hagiwara, Yoshimune; and Nishimukai, Tadahiko, 4,720,811, Cl. 364-900.000.

Hagle, Richard A. Trigger safety status signaling device. 4,719,713, Cl. 42-1.010.

Hahn, Janice E.: *See*—
Patrick, John L.; Haacke, E. Mark; Linga, Nagarjuna R.; and Hahn, Janice E., 4,720,679, Cl. 324-309.000.

Hahn, Peter O.: *See*—
Ho, Paul S. C.; Hahn, Peter O.; Lefakis, Harry; and Rubloff, Gary W., 4,720,401, Cl. 427-250.000.

Haider, Bruno: *See*—
Buchinger, Johann; Mistlberger, Bruno; Wolf, Rudolf; Schonberger, Johann; Langer, Thomas; Bloo, Johann; Vilsecker, Kurt; and Haider, Bruno, 4,719,946, Cl. 139-13.00R.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,720,050, Cl. 241-46.060.

Hall, Andrew W., to General Motors Corporation. Exhaust pipe system. 4,719,752, Cl. 60-322.000.

Hall, George R.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,719,834, Cl. 84-1.030.

Hall, Kevin M.; and Schmelzer, Daniel A. Software debugging analyzer. 4,720,778, Cl. 364-200.000.

Hall, Robert J.; Hall, George R.; and Cookerly, Jack C. Enhanced characteristics musical instrument. 4,719,834, Cl. 84-1.030.

Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, to Fuji Photo Film Co., Ltd. Film wind-up apparatus. 4,720,719, Cl. 354-173.100.

Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, to Fuji Photo Film Co., Ltd. Film wind-up control apparatus for a camera. 4,720,721, Cl. 354-173.110.

Hamada, Hisashi: *See*—
Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; Goto, Shigenori; and Hamada, Hisashi, 4,720,718, Cl. 354-154.000.

Hamanaka, Akira: *See*—
Sumiyoshi, Hiroji; Omae, Kazuo; Hamanaka, Akira; and Watanabe, Yuzuru, 4,720,748, Cl. 358-246.000.

Hamatani, Tomio, to Boeing Company, The. Translatable outward opening plug-type aircraft door and actuating mechanisms therefor. 4,720,065, Cl. 244-129.500.

Hamilton, Stephen: *See*—
Stettner, Keith A.; and Hamilton, Stephen, 4,720,112, Cl. 273-411.000.

Hammeley, Bodo: *See*—
Braitmaier, Jurgen; and Hammeley, Bodo, 4,720,114, Cl. 279-2.00R.

Hanamori, Ryoichi; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Motor. 4,720,650, Cl. 310-266.000.

Handa, Koichi: *See*—
Yamamoto, Shozo; Sakauchi, Tsuneo; Ashida, Tadashi; Handa, Koichi; and Nakajima, Masao, 4,719,689, Cl. 29-458.000.

Haneda, Hideo: *See*—
Nakamura, Mamoru; Haneda, Hideo; Nishio, Shigeru; and Nonoyama, Takao, 4,720,078, Cl. 251-129.150.

Hannewald, Thomas: *See*—
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,719,891, Cl. 123-494.000.

Hans Grohe GmbH & Co. KG: *See*—
Blessing, Gerhard, 4,719,654, Cl. 4-597.000.

Hanselmann, Dieter, to SWF Auto-Electric GmbH. Cleaning device for motor vehicle window panes. 4,719,661, Cl. 15-250.410.

Hansen, Arne C., to International Business Machines Corporation. High frequency signal measurement method and apparatus. 4,720,822, Cl. 368-115.000.

Haour, Georges; Richter, Dag F.; Boswell, Peter; and Wagnieres, Willy, to Battelle Memorial Institute. Method for selectively forming at least one coating strip consisting of a metal or alloy on a substrate consisting of another metal. 4,719,962, Cl. 164-461.000.

Hara, Makoto, to Fuji Photo Film Co., Ltd. Method of compensating for offset distortion in rows of electrophoretic patterns. 4,720,786, Cl. 364-413.000.

Haranoh, Takeshi: *See*—
Shinkai, Norihiko; Haranoh, Takeshi; Kanazawa, Junetsu; and Hatano, Takashi, 4,720,442, Cl. 430-5.000.

Harken, Peter O.; Whitehouse, Robert A.; and Lange, Kenneth E., to Vanguard, Inc. Sailboat traveler car assembly with removable block. 4,719,869, Cl. 114-102.000.

Harrington, Raymond P.: *See*—
Ferrari, Harry; Harrington, Raymond P.; and Ingram, Harry W., 4,720,105, Cl. 273-73.00C.

Harris Corporation: *See*—
Beasom, James D., 4,720,739, Cl. 357-49.000.
Popek, Marc H.; Springer, Kenneth D.; Beaudet, William R.; and DiStefano, Ralph D., 4,720,690, Cl. 333-1.000.

Harris, Robert L.: *See*—
Burris, Christine; Harris, Robert L.; Kolough, Victor; Linville, Larry R.; Scott, Charles G.; and Young, Robert, 4,720,857, Cl. 379-430.000.

Harrison, Ernest R.: *See*—
George, Robert K., Jr.; Trent, Lorton E.; and Harrison, Ernest R., 4,719,987, Cl. 181-114.000.

Hartwell, Walter T.; and Zimmerman, Gustavus H., III, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Noninvasive blood flow measurements utilizing autoregresive analysis with averaged reflection coefficients. 4,719,923, Cl. 128-663.000.

Harunari, Yoshihiro; Tokuda, Ryuji; and Kobe, Takashi, to Canon Kabushiki Kaisha. Distance measuring device. 4,720,723, Cl. 354-403.000.

Hasegawa, Makoto; Misaizu, Koei; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency synthesizer. 4,720,688, Cl. 331-2.000.

Hasegawa, Shigekazu: *See*—
Machida, Satoshi; Hasegawa, Shigekazu; Fukui, Tetsu; and Oota, Yoshimi, 4,719,812, Cl. 74-335.000.

Hasegawa, Susumu: *See*—
Mizoshita, Yoshifumi; and Hasegawa, Susumu, 4,720,754, Cl. 360-77.000.

Hasegawa, Youichi: *See*—
Sakayanagi, Morikazu; Ando, Kazuhiro; and Hasegawa, Youichi, 4,720,639, Cl. 290-38.00R.

Hasenfuss, Stefan; and Kirchhoff, Bernd, to O&K Orenstein & Koppel Aktiengesellschaft. Device for the fastening of hammers in reboundmill rotors. 4,720,052, Cl. 241-192.000.

Hashiguchi, Tetsuji: *See*—
Aiga, Masayuki; and Hashiguchi, Tetsuji, 4,720,659, Cl. 315-39.690.

Hashimoto, Hideo: *See*—
Iinuma, Kazumoto; Iijima, Yukihiko; Kuroda, Hideo; and Hashimoto, Hideo, 4,720,743, Cl. 358-133.000.

Hashimoto, Masakazu: *See*—
Kitano, Tateo; Hashimoto, Masakazu; and Nishiyama, Yuji, 4,720,072, Cl. 248-429.000.

Hashimoto, Miho: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; and Hashimoto, Miho, 4,719,865, Cl. 112-221.000.

Hashimoto, Shiro: *See*—
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,719, Cl. 354-173.100.
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,721, Cl. 354-173.110.
Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; Goto, Shigenori; and Hamada, Hisashi, 4,720,718, Cl. 354-154.000.

Haskins, Steve W.; and McFarland, John R., to Northern Telecom Limited. Modular telephone jack with elastomeric contact member. 4,720,269, Cl. 439-90.000.

Hata, Kazuyoshi, to Minolta Camera Kabushiki Kaisha. Large aperature ratio zoom lens system. 4,720,181, Cl. 350-427.000.

Hatanaka, Teruhiro: *See*—
Yonezu, Kunio; Tsubota, Masaharu; and Hatanaka, Teruhiro, 4,720,440, Cl. 429-57.000.

Hatani, Takashi; and Nakashima, Keishi, to Alps Electric Co., Ltd. Magnetic head for vertical magnetic recording and process for producing the same. 4,720,757, Cl. 360-121.000.

Hatano, Takashi: *See*—
Shinkai, Norihiko; Haranoh, Takeshi; Kanazawa, Junetsu; and Hatano, Takashi, 4,720,442, Cl. 430-5.000.

Hatcher, David O., to Mead-Hatcher, Inc. Storage rack for magnetic tape cartridges. 4,720,153, Cl. 312-13.000.

Hatfield, R. Andrew, to Avcom of Virginia, Inc. Spectrum analyzer and logarithmic amplifier therefor. 4,720,673, Cl. 324-77.00B.

Hattori, Masafumi; and Inoue, Takayuki, to Mitsubishi Petrochemical Co., Ltd. Multi-layer laminated structure. 4,720,425, Cl. 428-340.000.

Hattori, Motoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic telephone answering and recording apparatus. 4,720,846, Cl. 379-79.000.

Hattori, Takashi: *See*—
Kobayashi, Nobuyuki; Hattori, Takashi; and Ito, Toshimitsu, 4,719,888, Cl. 123-440.000.

Haus, Joseph W.; Bowden, Charles M.; and Sung, Chi C., to United States of America, Army. Composite logic gate element and multiplexer for optical computing and optical communication. 4,720,175, Cl. 350-353.000.

Hauser, Charles: *See*—
Bonjour, Christian; and Hauser, Charles, 4,720,217, Cl. 407-114.000.

Hauslaib, Wolfgang: *See*—
Gomoll, Guenter; Hauslaib, Wolfgang; and Frank, Gustav, 4,720,200, Cl. 400-59.000.

Havekost, Peter: *See*—
Dernedde, Robert; Franke, Hans-Joachim; Havekost, Peter; and Klepp, Christian, 4,720,248, Cl. 417-373.000.

Haworth, Inc.: *See*—
Nelson, Patrick C.; and Cool, Donald L., 4,720,071, Cl. 248-406.200.

Hay, Carl M. Hand-pedalling attachment for wheel-chairs. 4,720,117, Cl. 280-250.000.

Hayakawa, Futomi; and Onoda, Kazuo, to Hy-Bec Corporation. Apparatus for continuous processing in the directions of x- and y-coordinates. 4,720,617, Cl. 219-85.0BA.

Hayakawa, Tokuji: *See*—
Katoh, Mitsumi; and Hayakawa, Tokuji, 4,719,833, Cl. 84-1.010.

Hayakawa, Toshiro: *See*—
Suyama, Takahiro; Hayakawa, Toshiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,720,833, Cl. 372-44.000.

Hayama, Hajime: *See*—
Hinotani, Katsuhiro; Hayama, Hajime; Kishimoto, Shunichi; Miwa, Takashi; Funazo, Yasuo; and Kouno, Kazuhiro, 4,720,655, Cl. 313-422.000.

Hayase, Yoshio; Ichinari, Mitsuhiro; Kamei, Kazuo; Taguchi, Junji; Oba, Katsuaki; and Takahashi, Toshio, to Shionogi & Co., Ltd. 2-phenylimino-1,3-thiazolidin-3-organophosphorus compounds having pesticidal activity. 4,720,488, Cl. 514-92.000.

Hayashi, Asao, to Olympus Optical Co., Ltd. Information reading apparatus with a light beam scanning technique. 4,720,824, Cl. 369-44.000.

Hayashi, Hiroshi: *See*—
Yamamoto, Osamu; Hayashi, Hiroshi; Morimoto, Taiji; and Yamamoto, Saburo, 4,720,834, Cl. 372-45.000.

Hayashi, Kenji: *See*—
Eitoku, Kenji; and Hayashi, Kenji, 4,719,795, Cl. 73-118.100.

Hayashi, Koji: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; and Hashimoto, Miho, 4,719,865, Cl. 112-221.000.

Hayashi, Masahiro: *See*—
Matsumoto, Kouichi; Hayashi, Masahiro; and Kajiwara, Toshiyuki, 4,719,784, Cl. 72-242.000.

Hayashi, Takashi: *See*—
Watanabe, Tomoyuki; Shigematsu, Takashi; Tokoro, Setsuo; and Hayashi, Takashi, 4,720,793, Cl. 364-424.100.

Hayashi, Yasutaka: *See*—
Miki, Kazuo; Sumi, Kazumasa; Fukui, Katsuhiko; Hayashi, Yasutaka; and Ishiguro, Michio, 4,720,790, Cl. 364-424.000.

Hayashi, Youichirou: *See*—
Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, 4,720,349, Cl. 252-12.000.

Hayner, Paul F., to Illinois Tool Works Inc. Hydraulic valve assembly. 4,719,942, Cl. 137-625.610.

Haynes International, Inc.: *See*—
Crook, Paul; and Zordan, Richard D., 4,720,435, Cl. 428-677.000.

Hayward, John S. Process for manufacturing printed circuit boards. 4,720,324, Cl. 156-645.000.

Hebgen, Werner; Danz, Eckehard; Krome, Gerd; and Stahnecker, Erhard, to BASF Aktiengesellschaft. Preparation of vinyl chloride by thermal cracking of 1,2-dichloroethane. 4,720,599, Cl. 570-226.000.

Hector, Roger D.; Bushnell, Nolan K.; Delman, Howard; Rotberg, Edward; and Kinsting, Joe, to Bally Manufacturing Corporation. Video exercise or game floor controller with position indicating foot pads. 4,720,789, Cl. 364-410.000.

Heesch, Max O., to ITT Corporation. Manual seat recliner. 4,720,144, Cl. 297-362.000.

Heffner, Robert J.: *See*—
Lee, George E.; and Heffner, Robert J., 4,720,553, Cl. 548-475.000.

Hegemann, Manfred K.: *See*—
Farber, Glean L.; Navarro, Maria C.; Hegemann, Manfred K.; Cohen, Samuel G.; and Cox, Cameron O., 4,720,463, Cl. 435-291.000.

Heha, Herbert: *See*—
Emmert, Hermann; Heha, Herbert; Coertin, Detlev; and Kuhnke, Klaus, 4,720,306, Cl. 134-3.000.

Heimbrodt, Klaus J.: *See*—
Pross, Fritz; Kneib, Rudi; Weikert, Guenther; and Heimbrodt, Klaus J., 4,719,775, Cl. 70-264.000.

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Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Polarity reversal pulsing method and apparatus for EDM. 4,720,616, Cl. 219-69.00P.
Inoue MTP Kabushiki Kaisha: *See*—
Mayumi, Tohru; and Eto, Isamu, 4,720,363, Cl. 264-26.000.
Inoue, Takayuki: *See*—
Hattori, Masafumi; and Inoue, Takayuki, 4,720,425, Cl. 428-340.000.
Interatom GmbH: *See*—
Cyron, Theodor, 4,719,680, Cl. 29-157.00R.
Intermarine S.p.A.: *See*—
Fantacci, Gianfranco; and De Casa, Gianfranco, 4,719,871, Cl. 114-357.000.
Intermedics, Inc.: *See*—
Alt, Eckhard; and Calfee, Richard V., 4,719,920, Cl. 128-419.0PG.
International Business Machines Corporation: *See*—
Boyle, David H., 4,720,670, Cl. 324-73.00R.
Gupta, Satish; and Lucas, Bruce D., 4,720,705, Cl. 340-724.000.
Hansen, Arne C., 4,720,822, Cl. 368-115.000.
Ho, Paul S. C.; Hahn, Peter O.; Lefakis, Harry; and Rubloff, Gary W., 4,720,401, Cl. 427-250.000.
Muggli, Raymond A.; and McCaffrey, Terence P., 4,720,467, Cl. 437-52.000.
Wadia, Aspi B., 4,720,869, Cl. 382-2.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,720,481, Cl. 512-10.000.
International Minerals & Chemical Corp.: *See*—
Lu, Jing-Jong; and Todorovic, Radmilo A., 4,720,508, Cl. 514-738.000.
International Paper Company: *See*—
Brauner, Arne H., 4,720,015, Cl. 206-621.000.
International Technical Research S.A.H.: *See*—
Thissen, Werner P.; and Schillings, Karl H., 4,720,149, Cl. 301-5.00B.
Iqbal, Abul; Pfenninger, Johannes; Rochat, Alain C.; and Babler, Fridolin, to Ciba-Geigy Corporation. Mixtures of pigments. 4,720,305, Cl. 106-288.00Q.
Irie, Yasuo; Kakizaki, Fusayoshi; Ishijima, Chieko; Sumikawa, Michito; and Yasuda, Naohiko, to Ajinomoto Co., Inc. Aromatic sulfonic acid salts of a proline derivative. 4,720,554, Cl. 548-533.000.
Ishida, Hiroaki; and Nagaoka, Shinji, to Seikosha Co., Ltd. Flashmatic device for cameras. 4,720,725, Cl. 354-414.000.
Ishiguro, Michio: *See*—
Miki, Kazuo; Sumi, Kazumasa; Fukui, Katsuhiko; Hayashi, Yasutaka; and Ishiguro, Michio, 4,720,790, Cl. 364-424.000.
Ishii, Hakumi: *See*—
Kikuchi, Kenichi; Kawai, Yoshikane; Satou, Makoto; and Ishii, Hakumi, 4,720,121, Cl. 280-701.000.
Ishii, Shiro, to M-S Corp. Electro-manual drawer latch. 4,720,611, Cl. 200-61.610.
Ishii, Takatoshi, to Kabushiki Kaisha Toshiba. Display control apparatus for performing multicolor display by tiling display. 4,720,803, Cl. 364-521.000.
Ishijima, Chieko: *See*—
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Isogai, Yoshio, to Fujitsu Limited. Method of reflow bonding electronic parts on printed circuit board and apparatus used therefor. 4,720,035, Cl. 228-102.000.
Isuzu Motors Limited: *See*—
Kasai, Hitoshi; and Uriuhara, Makoto, 4,720,792, Cl. 364-424.100.
Ito, Eiichi, to TRW Ehrenreich GmbH & Co. KG. Ball joint. 4,720,205, Cl. 403-140.000.
Ito, Hitomi; and Furuya, Toshitsugu, to Canon Kabushiki Kaisha. Strap connector. 4,719,671, Cl. 24-115.00R.
Ito, Masaaki: *See*—
Ando, Minato; Ito, Masaaki; and Mizuno, Fumio, 4,720,471, Cl. 501-136.000.
Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus with a plurality of developing means. 4,720,730, Cl. 355-4.000.
Ito, Shoji: *See*—
Minoura, Mikio; and Ito, Shoji, 4,720,077, Cl. 251-129.060.
Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens system for use with a compact camera. 4,720,179, Cl. 350-423.000.
Ito, Toshimitsu: *See*—
Kobayashi, Nobuyuki; Hattori, Takashi; and Ito, Toshimitsu, 4,719,888, Cl. 123-440.000.
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Sheet for heat transference. 4,720,480, Cl. 503-227.000.
ITT Corporation: *See*—
Heesch, Max O., 4,720,144, Cl. 297-362.000.
ITT Defense Communications: *See*—
Li, Kung-Pu; and Wrench, Edwin H., Jr., 4,720,863, Cl. 381-42.000.
ITT Defense Communications, A Division of ITT Corporation: *See*—
Baker, Anthony P., 4,720,171, Cl. 350-331.00R.
Baker, Anthony P., 4,720,172, Cl. 350-334.000.
Baker, Anthony P., 4,720,174, Cl. 350-347.00V.
Bertrand, John P., 4,720,861, Cl. 381-36.000.
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IVECO Fiat S.p.A.: *See*—
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Iwabuchi, Haruo; and Asaba, Yutaka, to Tokyo Juki Industrial Co., Ltd. Sewing machine. 4,719,868, Cl. 112-461.000.
Iwamoto, Tadashi; Ikeda, Toshiki; Takaishi, Yukio; and Suzuki, Noriyuki, to Mazda Motor Corporation; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Wiper control system. 4,720,664, Cl. 318-444.000.
Iwamoto, Yuya: *See*—
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Jackson, Robert K.: *See*—
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Jackson, Warren M., to Warren M. Jackson, Inc. Machine for washing particulate workpieces. 4,719,933, Cl. 134-65.000.
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Jaeger, Walter, to GX-Holding AG. Method for tracking a motor-operated flying object. 4,720,058, Cl. 244-3.150.
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Jansz, Hendrik S.; Lips, Cornelis J. M.; Steenbergh, Paul H.; Rink, Hans; and Sieber, Peter, to Ciba-Geigy Corporation. Oligopeptides and intermediates and processes for their manufacture. 4,720,483, Cl. 514-11.000.
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Johnston, David W.; and Poirier, Charles H., to GTE Products Corporation. Discharge lamp having envelope support spacer. 4,720,656, Cl. 313-493.000.
Jones, Donald J., to Wang Laboratories, Inc. I/o handler. 4,720,828, Cl. 370-85.000.
Jones, Kenneth W., to Smith International, Inc. Expendable diamond drag bit. 4,719,979, Cl. 175-329.000.
Jongerius Hanco B.V.: *See*—
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Jongerius, Sebastiaan C. E., to Jongerius Hanco B.V. Measuring device for an apparatus for measuring and delivering predetermined quantities of liquid, for example quantities of water. 4,720,024, Cl. 222-14.000.
Joshi, Sunil P.; and Iyer, Venkatraman, to Advanced Micro Devices, Inc. CRC calculation apparatus having reduced output bus size. 4,720,830, Cl. 371-37.000.
Joshi, Sunil P.; and Iyer, Venkatraman, to Advanced Micro Devices, Inc. CRC calculation machine with concurrent preset and CRC calculation function. 4,720,831, Cl. 371-37.000.
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Katzer, James R.: *See*—
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., 4,720,337, Cl. 208-58.000.

Kauffman, Abe J.; Black, Robert S.; and Stanley, Arthur J., to Trans Plastics, Inc., a part interest. Method for injection molding fiber-reinforced thermoset plastic articles. 4,720,364, Cl. 264-40.500.

Kaulen, Johannes, to Bayer Aktiengesellschaft. Process for inverting the configuration of secondary alcohols. 4,720,558, Cl. 549-443.000.

Kawabe, Manabu: *See*—
Fukasawa, Atsushi; Sato, Takuro; Akiyama, Haruhiko; and Kawabe, Manabu, 4,720,829, Cl. 371-5.000.

Kawabe, Masami: *See*—
Nakayama, Hitoshi; Miura, Nobuo; Morita, Yoshio; and Kawabe, Masami, 4,719,896, Cl. 123-599.000.

Kawada, Kijyu; and Ikeda, Nobuyuki, to Amada Company, Limited. Apparatus for controlling heat deformation of a turret punch. 4,719,830, Cl. 83-170.000.

Kawagoe, Mitsuhiro: *See*—
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,719,751, Cl. 60-285.000.

Kawai, Sadao: *See*—
Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Ogura, Toshihiro, 4,720,387, Cl. 424-472.000.

Kawai, Tohru, to Canon Kabushiki Kaisha. Lens for macro-photography. 4,720,169, Cl. 350-255.000.

Kawai, Yoshikane: *See*—
Kikuchi, Kenichi; Kawai, Yoshikane; Satou, Makoto; and Ishii, Hakumi, 4,720,121, Cl. 280-701.000.

Kawakami, James H.: *See*—
Maresca, Louis M.; and Kawakami, James H., 4,720,540, Cl. 528-482.000.

Kawakami, Masanori, to Ricoh Company, Ltd. Print ribbon replaceable cassette. 4,720,202, Cl. 400-208.000.

Kawakita, Takeshi; Sano, Mitsuharu; Yasumoto, Mitsuyoshi; Ohsuga, Kunio; and Haga, Kei-ichiro, to Yoshitomi Pharmaceutical Industries, Ltd. Thienylthiazole compounds. 4,720,493, Cl. 514-230.000.

Kawana, Frank S., to JAC Creative Foods, Inc. Crustacean forming process. 4,720,391, Cl. 426-250.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kinouchi, Sosuke; Shigemoto, Syuziro; and Kanazawa, Wataru, 4,719,988, Cl. 181-273.000.

Kawashima, Masaharu: *See*—
Tachikawa, Koui; Miura, Yuuichi; Kawashima, Masaharu; and Ogawa, Satoru, 4,719,955, Cl. 160-168.00R.

Kay, Harold. Closet storage system. 4,720,016, Cl. 211-96.000.

Ke, Jenn-Yuh. Timer device. 4,720,821, Cl. 368-108.000.

Kejhova, Irena: *See*—
Cerny, Antonin; Krepelka, Jiri; Melka, Milan; Miko, Milan; Pokorna, Stanislava; Reichlova, Ruzena; Kejhova, Irena; Beitova, Marta; and Grimova, Jaroslava, 4,720,497, Cl. 514-262.000.

Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Gas turbine with a pressure wave machine as the high pressure compressor part. 4,719,746, Cl. 60-39.170.

Keller, Walter: *See*—
Gross, Paul; and Keller, Walter, 4,719,930, Cl. 132-7.000.

Kelly, Michael A.: *See*—
Logan, Emanuel L., Jr.; Beigel, Bruce G.; and Kelly, Michael A., 4,720,128, Cl. 292-251.500.

Kelsey-Hayes Co.: *See*—
Zenker, Richard L., 4,719,796, Cl. 73-121.000.

Kennedy, William L.: *See*—
Brenner, Robert A.; Kennedy, William L.; and Mason, Anthony, 4,719,770, Cl. 68-134.000.

Kent Corporation: *See*—
Hood, Walter J.; Costello, Anthony C.; and Conaway, Eugene L., 4,720,054, Cl. 242-58.000.

Kern, Eckhart: *See*—
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,719,891, Cl. 123-494.000.

Kernforschungsanlage Julich Gesellschaft mit beschranker Haftung: *See*—
Lison, Rudolf; Dienstknecht, Hans; and Sigismund, Egon, 4,720,036, Cl. 228-205.000.

Kernforschungsanlage Julich GmbH: *See*—
Schnabl, Heide; Zimmermann, Ulrich; and Kuppers, Gottfried, 4,720,453, Cl. 435-4.000.

Keser, Helmut; and Voboril, Jan, to BBC Brown, Boveri & Company, Limited. Method for diffusing aluminum. 4,720,469, Cl. 437-143.000.

Keyes Fibre Company: *See*—
Smith, Gary T., 4,720,321, Cl. 156-549.000.

Khilnani, Gul, to Rexnord Inc. Poison resistant combustible gas sensor. 4,720,421, Cl. 428-222.000.

Kikuchi, Akira; Tobita, Akira; Kobori, Tetsuo; and Shibayama, Ryosaku, to Doryokuro Kakunenryo Kaihatsu Jigyodan; and Tokyo Seimitsuka Co., Ltd. Non-uniform resistance heating tubes. 4,720,624, Cl. 219-553.000.

Kikuchi, Kenichi; Kawai, Yoshikane; Satou, Makoto; and Ishii, Hakumi, to Toyota Jidosha Kabushiki Kaisha. Rear suspension for vehicle. 4,720,121, Cl. 280-701.000.

Kikuchi, Toshiaki: *See*—
Takagi, Atsushi; Yajima, Masao; Kikuchi, Toshiaki; and Saeki, Masaki, 4,720,495, Cl. 514-253.000.

Killian, Henry R., to Conbraco Industries, Inc. Apparatus for coupling a valve and rotary actuator. 4,719,939, Cl. 137-315.000.

Kimberly-Clark Corporation: *See*—
Appel, David W.; Drost, Adrian D.; and Lau, Jark C., 4,720,252, Cl. 425-80.100.
Niemi, Paul M., 4,720,320, Cl. 156-504.000.
Vander Wielen, Michael J.; and Taylor, Jack D., 4,720,415, Cl. 428-152.000.

Kimura, Takao; Yamakawa, Shinzo; and Ohono, Ryotaro, to Nippon Telegraph and Telephone Corporation; and Japan Synthetic Rubber Company Limited. UV-ray curable polyurethane composition and coated optical fiber. 4,720,529, Cl. 525-454.000.

Kimura, Yoshio: *See*—
Shinbori, Takeyoshi; Fukumura, Takeo; and Kimura, Yoshio, 4,720,085, Cl. 267-64.160.

Kinoshita, Ikuo: *See*—
Tokuda, Shuichiro; Furukawa, Noriyuki; Kinoshita, Ikuo; Nakamoto, Hideo; and Aosai, Fumito, 4,720,165, Cl. 350-96.240.

Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; and Okiyama, Yoichi, to Tokyo Juki Industrial Co., Ltd. Sewing machine input device having scaling function. 4,720,795, Cl. 364-470.000.

Kinouchi, Sosuke; Shigemoto, Syuziro; and Kanazawa, Wataru, to Kawasaki Jukogyo Kabushiki Kaisha. Muffler. 4,719,988, Cl. 181-273.000.

Kinsting, Jon: *See*—
Hector, Roger D.; Bushnell, Nolan K.; Delman, Howard; Rotberg, Edward; and Kinsting, Jon, 4,720,789, Cl. 364-410.000.

Kipnis, Lyubov S.: *See*—
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Feilmann, Jere D.; and Kipnis, Lyubov S., 4,720,474, Cl. 502-165.000.

Kira, Akimichi; and Hosokawa, Yoshinori, to Horiba, Ltd. Apparatus for detecting nickel/vanadium contained in oil. 4,720,842, Cl. 378-49.000.

Kirby, William: *See*—
Bishop, Royston G.; and Kirby, William, 4,720,675, Cl. 324-110.000.

Kirchhoff, Bernd: *See*—
Hasenfuss, Stefan; and Kirchhoff, Bernd, 4,720,052, Cl. 241-192.000.

Kisakibaru, Toshiro; Gotoh, Tsuguo; Ohuchi, Kazunori; and Ohho, Hirosuke, to Yaskawa Electric Mfg. Co., Ltd. Method and apparatus for controlling reel tension. 4,720,661, Cl. 318-6.000.

Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, to Fanuc Ltd. Tool interference checking method. 4,720,796, Cl. 364-474.000.

Kishi, Kohei: *See*—
Takafuji, Yutaka; Kishi, Kohei; and Tanaka, Hirohisa, 4,720,736, Cl. 357-23.700.

Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, to Mitsubishi Rayon Co., Ltd. Composite material with improved properties. 4,720,516, Cl. 523-436.000.

Kishimoto, Shunichi: *See*—
Hinotani, Katsuhiro; Hayama, Hajime; Kishimoto, Shunichi; Miwa, Takashi; Funazo, Yasuo; and Kouno, Kazuhiro, 4,720,655, Cl. 313-422.000.

Kissinger, Gaylord M.; and Gomes de Matos, Isabel M., to General Electric Company. Process for removing phenols from water. 4,720,596, Cl. 568-724.000.

Kit, Chan Y. Snap-type fastener. 4,719,674, Cl. 24-589.000.

Kitahara, Takahiro: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,720,166, Cl. 350-96.340.
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,720,428, Cl. 428-373.000.

Kitajima, Tomoya: *See*—
Araki, Kunihiko; Kitajima, Tomoya; Serikawa, Yoshio; Kobayashi, Mikio; Terui, Hiroshi; and Koyama, Kenji, 4,720,720, Cl. 354-173.110.

Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, to Kabushiki Kaisha Daikin Seisakusho. Clutch having an adjustable diaphragm spring engaging lever. 4,720,002, Cl. 192-70.250.

Kitano, Tateo; Hashimoto, Masakazu; and Nishiyama, Yuji, to Toyota Jidosha Kabushiki Kaisha. Belt anchor incorporating seat track structure. 4,720,072, Cl. 248-429.000.

Kitate Sangyo Co., Ltd.: *See*—
Yamaguchi, Isaburo, 4,720,260, Cl. 431-325.000.

Kito, Tsutomu; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, to Pilot Ink Co., Ltd. Reversible heat sensitive recording composition. 4,720,301, Cl. 106-21.000.

Klapp, Hartmut, to Jagenberg Aktiengesellschaft. Conveying apparatus for a flat article, particularly a cardboard blank, paper sheets or signatures or the like. 4,719,707, Cl. 34-94.000.

Klein, Marvin B.; Dunning, Gilmore J.; and Valley, George C., to Hughes Aircraft Company. Erase beam apparatus and method for spatial intensity threshold detection. 4,720,176, Cl. 350-353.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Dernedde, Robert; Franke, Hans-Joachim; Havekost, Peter; and Klepp, Christian, 4,720,248, Cl. 417-373.000.

Kleinewefers Textilmaschinen GmbH: *See*—
Tschirner, Wolfgang, 4,719,706, Cl. 34-71.000.

Kleinschroth, Jurgen; Mannhardt, Karl; Wagner, Bernd; and Weinheimer, Gunter, to Godecke Aktiengesellschaft. Treating blood vessel diseases with pyrido[4,3-b][1,6]naphthyridine-derivatives. 4,720,499, Cl. 514-293.000.

Klemm, Gunter, to Ing. Gunter Klemm Spezialunternehmen fur Bohrtechnik. Earth drilling device. 4,719,978, Cl. 175-113.000.

Klepp, Christian: *See*—
Dernedde, Robert; Franke, Hans-Joachim; Havekost, Peter; and Klepp, Christian, 4,720,248, Cl. 417-373.000.

Klier, Shimon; and Novik, Ofer, to Klier, Shimon. Light transmissive insulation apparatus. 4,719,902, Cl. 126-415.000.

Klingel, Hans, to Trumpf GmbH & Co. Tool change mechanism for punch presses and the like. 4,719,691, Cl. 29-568.000.

Klotz, Erhard P. A.: *See*—
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 4,720,843, Cl. 378-99.000.

Kluppel, George E.; and Monroe, Robert C., to Hudson Products Corporation. Fan blade for an axial flow fan and method of forming same. 4,720,244, Cl. 416-224.000.

Knape & Vogt Manufacturing Co.: *See*—
Bessinger, Walter L., 4,720,069, Cl. 248-250.000.

Knapp, Julius Z., to Schering Corporation. Process for manufacturing colored contact lenses and lenses made by the process. 4,720,188, Cl. 351-177.000.

Kneib, Rudi: *See*—
Pross, Fritz; Kneib, Rudi; Weikert, Guenther; and Heimbrodt, Klaus J., 4,719,775, Cl. 70-264.000.

Knickerbocker, Bradford E.: *See*—
Pierce, Frank D.; Knickerbocker, Bradford E.; and Lenker, Don H., 4,720,388, Cl. 426-231.000.

Knight Manufacturing Corporation: *See*—
Knight, William S.; and Saunders, William M., 4,720,047, Cl. 239-675.000.

Knight, William S.; and Saunders, William M., to Knight Manufacturing Corporation. Auger for conveying materials such as manure. 4,720,047, Cl. 239-675.000.

Knoblock, Glenn A.: *See*—
Holdredge, Russell T.; Knoblock, Glenn A.; and Roossien, Charles P., 4,720,142, Cl. 297-300.000.

Knofel, Hartmut; Brockelt, Michael; and Penninger, Stefan, to Bayer Aktiengesellschaft. Diamines and a process for their production. 4,720,582, Cl. 564-305.000.

Knothe, Erich; Meicher, Franz-Josef; Dardat, Klaus; and Maaz, Gunther, to Sartorius GmbH. Analytical balance with scale on top and with weighing chamber lock. 4,719,980, Cl. 177-180.000.

Koakutsu, Yasumasa: *See*—
Takeuchi, Tamio; Koakutsu, Yasumasa; Shimizu, Junichi; Yano, Masao; Ikenoue, Minoru; and Onoda, Seiichi, 4,720,630, Cl. 250-227.000.

Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, to Agency of Industrial Science and Technology, The; and Oiles Industry Co. Ltd. Sliding member of graphite-metal borides. 4,720,349, Cl. 252-12.000.

Kobayashi, Makio: *See*—
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, 4,720,506, Cl. 514-538.000.

Kobayashi, Masaaki: *See*—
Iwasaki, Yasuo; Nishino, Takafumi; and Kobayashi, Masaaki, 4,720,753, Cl. 360-77.000.

Kobayashi, Masayuki: *See*—
Iji, Masatoshi; Kobayashi, Masayuki; and Asai, Shinichiro, 4,720,515, Cl. 523-435.000.

Kobayashi, Mikio: *See*—
Araki, Kunihiko; Kitajima, Tomoya; Serikawa, Yoshio; Kobayashi, Mikio; Terui, Hiroshi; and Koyama, Kenji, 4,720,720, Cl. 354-173.110.

Kobayashi, Nobuyuki; Hattori, Takashi; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,719,888, Cl. 123-440.000.

Kobayashi, Tadashi: *See*—
Imamura, Shigeharu; and Kobayashi, Tadashi, 4,720,709, Cl. 340-815.200.

Kobe, Takashi: *See*—
Harunari, Yoshihiro; Tokuda, Ryuji; and Kobe, Takashi, 4,720,723, Cl. 354-403.000.

Kobler, Ingo, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Printed copy folding and assembly apparatus. 4,720,091, Cl. 270-57.000.

Kobori, Hiromi: *See*—
Sullivan, Cornelius W.; Shizuya, Hiroaki; and Kobori, Hiromi, 4,720,458, Cl. 435-196.000.

Kobori, Tetsuo: *See*—
Kikuchi, Akira; Tobita, Akira; Kobori, Tetsuo; and Shibayama, Ryosaku, 4,720,624, Cl. 219-553.000.

Kochloefl, Karl: *See*—
Schneider, Michael; Wernicke, Hans J.; Kochloefl, Karl; and Maletz, Gerd, 4,720,476, Cl. 502-81.000.

Koehring Company: *See*—
Salani, C. Ranjan, 4,720,207, Cl. 404-90.000.

Koenig, Karlheinz: *See*—
Kohl, Lambert; Roeger, Bernd; and Koenig, Karlheinz, 4,720,756, Cl. 360-106.000.

Koentges, Gerhard, to Elastogran Maschinenbau GmbH. Program-controlled apparatus for the production of moldings from multicomponent plastic, in particular polyurethane. 4,720,253, Cl. 425-145.000.

Koestner, John A. Trailer hook fishing apparatus. 4,719,717, Cl. 43-44.200.

Koga, Kazuo: *See*—
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,719,751, Cl. 60-285.000.

Kogure, Hiroshi: *See*—
Hibino, Yoshitaka; and Kogure, Hiroshi, 4,719,820, Cl. 74-866.000.

Kohketsu, Susumu: *See*—
Nakazawa, Norio; Matsura, Yoshimasa; Takemoto, Tetsuo; and Kohketsu, Susumu, 4,719,757, Cl. 60-602.000.

Kohl, Lambert; Roeger, Bernd; and Koenig, Karlheinz, to BASF Aktiengesellschaft. Apparatus for the positioning of objects having a low mass and a method of assembly thereof. 4,720,756, Cl. 360-106.000.

Kohler, Klaus: *See*—
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,720,593, Cl. 568-420.000.

Koike, Tunehiro: *See*—
Ohtake, Katsumi; Ogura, Kunio; Koike, Tunehiro; Arai, Takuya; and Shioda, Kayoko, 4,720,733, Cl. 355-50.000.

Koizumi, Haruo: *See*—
Yamaguchi, Noboru; Uchiyama, Kunio; Koizumi, Haruo; Hagiwara, Yoshimune; and Nishimukai, Tadahiko, 4,720,811, Cl. 164-900.000.

Kojima, Takao; Nakano, Akira; Matsuura, Toshitaka; and Takami, Akio, to NGK Spark Plug Co., Ltd. Gas sensor with ceramics substrate and method for producing the same. 4,720,394, Cl. 437-234.000.

Kokado, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Optical data reproducing devices having improved trick play capability. 4,720,825, Cl. 369-46.000.

Kokusai Denshin Denwa K.K.: *See*—
Akiba, Shigeyuki; Utaka, Katsuyuki; Noda, Yukio; and Kushiro, Yukitoshi, 4,720,835, Cl. 372-50.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; Namihira, Yoshihori; and Tokiwa, Hideharu, 4,720,162, Cl. 350-96.150.

Kolakowski, Manfred: *See*—
Grothe, Horst; Boese, Peter; Kolakowski, Manfred; and Lax, Hermann, 4,719,960, Cl. 164-426.000.

Kolough, Victor: *See*—
Burris, Christine; Harris, Robert L.; Kolough, Victor; Linville, Larry R.; Scott, Charles G.; and Young, Robert, 4,720,857, Cl. 379-430.000.

Komakine, Takashi: *See*—
Nagatomo, Shigemi; Komori, Minoru; Sakuma, Tsutomu; Kagawa, Noboru; Komakine, Takashi; Iwasaki, Toshinori; and Kudo, Akira, 4,719,755, Cl. 60-525.000.

Komamizu, Hidesi: *See*—
Shimatani, Hiroyuki; Morita, Yasuhiro; and Komamizu, Hidesi, 4,720,120, Cl. 280-671.000.

Komatsu, Kasunari: *See*—
Fukushima, Megumu; Komatsu, Kasunari; Shidahara, Yasuhiro; and Yokomizo, Katihiro, 4,720,335, Cl. 204-424.000.

Komatsu, Tadayoshi: *See*—
Sakamoto, Takao; and Komatsu, Tadayoshi, 4,720,141, Cl. 297-284.000.

Komet Stahlhalter-und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto, 4,719,690, Cl. 29-568.000.

Komori, Minoru: *See*—
Nagatomo, Shigemi; Komori, Minoru; Sakuma, Tsutomu; Kagawa, Noboru; Komakine, Takashi; Iwasaki, Toshinori; and Kudo, Akira, 4,719,755, Cl. 60-525.000.

Kompis, Ivas; and Weiss, Ekkehard, to Hoffman-La Roche Inc. Intermediates for the preparation of substituted 2-phenyl-1,3-dioxolanes. 4,720,546, Cl. 544-58.200.

Komuro, Hirokazu: *See*—
Ikeda, Masami; Shibata, Makoto; Takahashi, Hiroto; Komuro, Hirokazu; Matsuda, Hiroto; and Tsuda, Hisanori, 4,720,716, Cl. 346-140.00R.

Kon, Robert T. Electrically operated animal trap. 4,719,718, Cl. 43-81.000.

Konig, Gunter, to Zinser Textilmachinen GmbH. Texturizing machine for false-twist crimping of synthetic yarns. 4,719,745, Cl. 57-291.000.

Konig, Hubert: *See*—
Muller, Anton; Konig, Hubert; and Wolfbeis, Ludwig, 4,719,669, Cl. 24-68.0TT.

Konigshofen, Heinrich; and Szentivanyi, Zsolt, to Bayer Aktiengesellschaft. Rubber articles consisting of different rubber layers, the production and use thereof. 4,720,433, Cl. 428-495.000.

Konishi, Motofumi; Tanaka, Kanou; and Nakamura, Mitsuo, to Canon Kabushiki Kaisha. Display apparatus. 4,720,707, Cl. 340-792.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Takiguchi, Hideki; Iijima, Toshifumi; Yagi, Toshihiko; and Haga, Yoshihiro, 4,720,452, Cl. 430-567.000.

Kono, Satoshi: *See*—
Matsuoka, Shigeki; and Kono, Satoshi, 4,720,816, Cl. 365-189.000.

Kopp, Richard: *See*—
Grogler, Gerhard; Kopp, Richard; and Heas, Heinrich, 4,720,545, Cl. 540-202.000.

Koppe, Reiner H.: *See*—
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 4,720,843, Cl. 378-99.000.

Korber AG: *See*—
Barbe, Karl-Heinz, 4,719,927, Cl. 131-94.000.

Kotani, Taichiro: *See*—
Nagano, Kentaro; and Kotani, Taichiro, 4,719,693, Cl. 29-618.000.

Kotani, Takeshi; and Matsushita, Soichi, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine siamese port type intake system construction with deflection valve additional to intake control valve. 4,719,886, Cl. 123-308.000.

Kotraro, Reuven: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,720,345, Cl. 210-650.000.

Kouno, Kazuhiro: *See*—
Hinotani, Katsuhiro; Hayama, Hajime; Kishimoto, Shunichi; Miwa, Takashi; Funazo, Yasuo; and Kouno, Kazuhiro, 4,720,655, Cl. 313-422.000.

Kovalcin, David, to Digital Equipment Corporation. Console unit for clustered digital data processing system. 4,720,782, Cl. 364-200.000.

Kovar, Ingomar: *See*—
Huhn, Karl; and Kovar, Ingomar, 4,720,520, Cl. 524-838.000.

Koyama, Kenji: *See*—
Araki, Kunihiko; Kitajima, Tomoya; Serikawa, Yoshio; Kobayashi, Mikio; Terui, Hiroshi; and Koyama, Kenji, 4,720,720, Cl. 354-173.110.

Koyo Seiko Co., Ltd.: *See*—
Daido, Toshihiko, 4,720,791, Cl. 364-424.000.

Kozai, Katsuya: *See*—
Akiyama, Kazuhiro; Nishimura, Syunji; Kameyama, Nobuyuki; Tobayama, Nobuo; and Kozai, Katsuya, 4,720,722, Cl. 354-263.000.

Kozich, Stephen A.: *See*—
Stamer, Michael E.; and Kozich, Stephen A., 4,720,618, Cl. 219-121.0LA.

Kozuka, Kenji: *See*—
Nakasone, Takayoshi; Sibagaki, Tetuo; and Kozuka, Kenji, 4,720,368, Cl. 264-562.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Emmert, Hermann; Hehs, Herbert; Coerlin, Detlev; and Kuhnke, Klaus, 4,720,306, Cl. 134-3.000.

Krebs, Helmut; and Widran, Jerrold. Peristaltic pump with enhanced tube loading features. 4,720,249, Cl. 417-477.000.

Krehl, Hermann: *See*—
Ebert, Charles; Krehl, Hermann; Viertel, Lothar; Hilbert, Bernard; and Walter, Rudiger, 4,720,132, Cl. 296-97.00K.

Kremer, Victor: *See*—
Legille, Edouard; Lonardi, Emile; and Kremer, Victor, 4,720,226, Cl. 414-10.000.

Krepelka, Jiri: *See*—
Cerny, Antonin; Krepelka, Jiri; Melka, Milan; Miko, Milan; Pokorna, Stanislava; Reichlova, Ruzena; Kejhova, Irena; Beitova, Marta; and Grimova, Jaroslava, 4,720,497, Cl. 514-262.000.

Kreuter, Peter. Electromagnetic-positioning system for gas exchange valves 4,719,882, Cl. 123-90.110.

Kriesenger, Alf: *See*—
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Krofske, Kris P., to Special Personal and Financial Planning and Referral Services, Inc. Hermetically sealed anchor construction for use in post tensioning tendons. 4,719,658, Cl. 52-223.00L.

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Langstroth, Steven W. Method and circumferential slider apparatus for balancing lateral force between piston and cylinder wall. 4,719,846, Cl. 92-127.000.

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Schmid, Friedrich; and Maderthaner, Karl, 4,719,887, Cl. 123-283.000.

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Gentilman, Richard L.; Maguire, Edward A.; and Dolhert, Leonard E., 4,720,362, Cl. 264-1.200.

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Schneider, Michael; Wernicke, Hans J.; Kochloefl, Karl; and Maletz, Gerd, 4,720,476, Cl. 502-81.000.

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Guido, Heinz, 4,720,838, Cl. 373-72.000.

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Reynard, Fred T.; and Manco, Richard J., 4,720,779, Cl. 164-202.000.

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Du Buy, Robert V., 4,720,100, Cl. 272-134.000.

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Brimeyer, Dennis A.; and Maneman, Terrence H., 4,720,122, Cl. 160-759.000.

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Markwardt, Michael A., to Encon Industries, Inc. Ceiling fan. 4,720,241, Cl. 416-5.000.

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Cropp, Kenton A., 4,720,358, Cl. 261-111.000.
Glauz, Robert S.; and Holmberg, Joyce D., 4,720,359, Cl. 261-24.000.

Maroney, Ralf P.; and Fishkind, Gregory A., to Plug-In Storage Systems, Inc. Cart for transporting circuit components. 4,720,048, Cl. 280-47.340.

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Zverina, Karel; Kroupa, Petr; Szabo , Josef; Maroszczyk, Veslav; Bohm, Valter; and Ciesiar, Antonin, 4,720,083, Cl. 266-275.000.

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Rabilloud, Guy; Marriagi, Paul; Gonzales, Serge; and Sillion, Bernard, 4,720,539, Cl. 528-353.000.

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Martens, Gerhard, to Barmag AG. Method and apparatus for monitoring the tension of an advancing yarn. 4,720,702, Cl. 340-677.000.

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Schippers, Heinz; Martens, Gerhard; and Frolich, Karl-Werner, 4,720,806, Cl. 364-551.000.

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Anton, Octavian; Van Wouwe, Dirk; Poncelet, Georges; Jacobs, Pierre; and Martens, Johan, 4,720,475, Cl. 502-250.000.

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Renken, Juergen; and Martens, Wilhelm, 4,720,066, Cl. 244-213.000.

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Martin, Roland; and Gramlich, Walter, to BASF Aktiengesellschaft. Preparation of p-cymene and homologous alkylbenzenes. 4,720,603, Cl. 585-431.000.

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Termini, Frank J., 4,719,663, Cl. 16-30.000.

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Brenner, Robert A.; Kennedy, William L.; and Mason, Anthony, 4,719,770, Cl. 68-134.000.

Masonek, Steven J.; and Rabo, Frederick N. Reboring tool. 4,720,219, Cl. 408-201.000.

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Asari, Akira; Masuda, Tsuneharu; Kurita, Masanori; and Ueno, Tsuneya, 4,720,256, Cl. 425-405.00H.

Mathis, Christian: *See*—
Amann, Gernot; and Mathis, Christian, 4,719,889, Cl. 123-447.000.

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Ikeda, Masami; Shibata, Makoto; Takahashi, Hiroto; Komuro, Hirokazu; Matsuda, Hiroto; and Tsuda, Hisanori, 4,720,716, Cl. 346-140.000.

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Kameyama, Makoto; Wakabayashi, Masakazu; and Sugiyama, Iwakichi, 4,720,513, Cl. 523-203.000.

Matsumura, Hiroyoshi: *See*—
Fukuzawa, Tadashi; Matsumura, Hiroyoshi; Tsuji, Shinji; Nakamura, Hitoshi; and Hiruma, Kenji, 4,720,836, Cl. 372-96.000.

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Nakazawa, Norio; Matsura, Yoshimasa; Takemoto, Tetsuo; and Kohketsu, Susumu, 4,719,757, Cl. 60-602.000.

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Hasegawa, Makoto; Misaizu, Koei; and Yamashita, Sadahiko, 4,720,688, Cl. 331-2.000.
Ikushima, Hiroshi; Uenishi, Yoshitsugu; Eto, Yuzo; and Kanno, Masashi, 4,720,682, Cl. 324-458.000.
Imamura, Shigeharu; and Kobayashi, Tadashi, 4,720,709, Cl. 340-815.200.
Iwasaki, Yasuo; Nishino, Takafumi; and Kobayashi, Masaki, 4,720,753, Cl. 360-77.000.

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Kojima, Takao; Nakano, Akira; Matsuura, Toshitaka; and Takami, Akio, 4,720,394, Cl. 437-234.000.

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Maurice, Paul E. Poultry brooder. 4,719,874, Cl. 119-32.000.

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Ross, Gunther; and Schwarz, Volker, 4,719,703, Cl. 33-1.00M.

Mawbey, Gerald W.; and Shinaberry, Robert L., Jr., to General Motors Corporation. Vehicle seat headrest apparatus and method. 4,720,146, Cl. 297-409.000.

Mayumi, Tohru; and Eto, Isamu, to Inoue MTP Kabushiki Kaisha. Method of manufacturing plastic molding. 4,720,363, Cl. 264-26.000.

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Fukushima, Megumu; Komatsu, Kasunari; Shidahara, Yasuhiro; and Yokomizo, Katihiro, 4,720,335, Cl. 204-424.000.
Iwamoto, Tadashi; Ikeda, Toshiki; Takaishi, Yukio; and Suzuki, Noriyuki, 4,720,664, Cl. 318-444.000.

Miyoshi, Akihiko, 4,719,981, Cl. 180-140.000.
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Renken, Juergen; and Martens, Wilhelm, 4,720,066, Cl. 244-213.000.
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Muggli, Raymond A.; and McCaffrey, Terence P., 4,720,467, Cl. 437-52.000.
McCarty, Read S., to Neotech, Inc. Method and means for separation of blood components. 4,720,284, Cl. 494-37.000.
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Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, 4,720,424, Cl. 428-323.000.
McCollester, Duncan L. Vaccine and method for immunotherapy of neoplastic disease. 4,720,386, Cl. 424-88.000.
McConnell, Ronald F.; and Popper, Peter, to Du Pont de Nemours, E. I., and Company. Complex shaped braided structures. 4,719,837, Cl. 87-1.000.
McCoy, Duane C., to Conoco Inc. Reduction of liquid atomizer droplet size. 4,720,290, Cl. 55-10.000.
McCrea, Charles. Manufacturing a plaque with an insert therein. 4,719,688, Cl. 29-445.000.
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Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,720,769, Cl. 361-353.000.
McCully, Dennis R.: *See*—
Welch, David W.; and McCully, Dennis R., 4,720,663, Cl. 318-341.000.
McFarland, John R.: *See*—
Haskins, Steve W.; and McFarland, John R., 4,720,269, Cl. 439-93.000.
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Brahim, Karime; and McFarland, Michael J., 4,720,445, Cl. 430-197.000.
McLaughlin, Stephen D. Flue pipe installation through flammable walls. 4,719,901, Cl. 126-314.000.
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Geczy, Bela; McPherson, James N.; and Toth, Robert G., 4,720,199, Cl. 384-282.000.
McSmith, Dwight D., to United States of America, National Aeronautics and Space Administration. Variable response load limiting device. 4,720,139, Cl. 297-216.000.
Mead-Hatcher, Inc.: *See*—
Hatcher, David O., 4,720,153, Cl. 312-13.000.
Mears, William G., to Mobil Oil Corporation. Automotive nozzle-actuated refueling emission system shutoff valve. 4,719,949, Cl. 141-301.000.
Medeco Security Locks, Inc.: *See*—
Swenson, Ronald D.; and Seaborn, James N., 4,720,041, Cl. 232-16.000.
Medical College of Wisconsin Research Foundation, Inc.: *See*—
Winkelhake, Jeffrey L., 4,720,459, Cl. 435-240.200.
Medical Media Laboratory, Inc.: *See*—
Pestes, Cornelius N., 4,720,017, Cl. 215-227.000.
Melas, Andreas A.: *See*—
Hui, Benjamin C.; Lorberth, Jorg; and Melas, Andreas A., 4,720,560, Cl. 556-1.000.
Melber, Milton R., to Enviroquip, Inc. Diffused aeration system. 4,720,360, Cl. 261-76.000.
Melby, Earl G.: *See*—
Chihara, Kohji Y.; Fabris, Hubert J.; Melby, Earl G.; Cowell, James L.; and Cocain, Harry W., 4,720,518, Cl. 524-267.000.
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Knothe, Erich; Melcher, Franz-Josef; Dardat, Klaus; and Maaz, Gunther, 4,719,980, Cl. 177-180.000.
Melita Electronic Labs, Inc.: *See*—
Szlam, Aleksander, 4,720,853, Cl. 379-211.000.
Melka, Milan: *See*—
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Melnor Manufacturing Ltd.: *See*—
Aquilina, Paul C., 4,720,206, Cl. 403-361.000.
Menigaux, Louis; Carenco, Alain; and Sansonetti, Pierre. Process for the production of a monolithic integrated optical device incorporating a semiconductor laser and device obtained by this process. 4,720,468, Cl. 437-129.000.
Mentrup, Anton: *See*—
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Fugner, Armin, 4,720,496, Cl. 514-257.000.
Merck & Co., Inc.: *See*—
Clare, Kenneth; and Lawson, Margaret A., 4,720,389, Cl. 426-329.000.
Witzel, Bruce E.; Tischler, Allan N.; and Allison, Debra L., 4,720,503, Cl. 514-443.000.
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Belanger, Patrice C.; Gillard, John W.; and Rokach, Joshua, 4,720,505, Cl. 514-532.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Watanabe, Takaji; and Nitta, Katsuhisa, 4,720,438, Cl. 428-697.000.
Merrick, David D.: *See*—
Anthony, James R.; Lortz, Allan R.; Merrick, David D.; and Wiseman, Michael A., 4,720,148, Cl. 297-474.000.
Merrick, Richard H.: *See*—
Reid, Edward A., Jr.; Cook, F. Bert; Winter, Edward M.; Merrick, Richard H.; Purvis, Edgar M., Jr.; and Cremean, Stephen P., 4,719,767, Cl. 62-476.000.
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Fishwick, Alan J.; Jackson, Robert K.; and Wilson, Anthony J., 4,720,261, Cl. 432-36.000.
Metal-Fab, Inc.: *See*—
Ream, John D.; and Blalock, William J., 4,720,125, Cl. 285-47.000.
Meyer, Dietmar: *See*—
Binarsch, Jurgen; and Meyer, Dietmar, 4,720,810, Cl. 364-900.000.
Meyer, Larry P., to Nelson Irrigation Corporation. Large volume sprinkler head with part-circle step by step movements in both directions. 4,720,045, Cl. 239-230.000.
Meyer, Paul A.; and Bedis, Michael, to Deere & Company. Tractor frame for tractor-mounted implement. 4,720,233, Cl. 414-686.000.
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Babu, Uma M.; Mia, Abdus S.; and Pancari, Gregory D., 4,720,455, Cl. 435-7.000.
Micchia, Ronald L.; and Micchia, Sandra K. Under-eye light absorbing device and method. 4,719,909, Cl. 128-156.000.
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Michal, Lawrence W.: *See*—
Hooper, Charles R.; and Michal, Lawrence W., 4,719,765, Cl. 62-264.000.
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Leonard, Henri; Lacour, Bernard; Boinot, Jean-Claude; and Jacoulet, Jean-Paul, 4,720,266, Cl. 433-126.000.
Microsurface Technology Corp.: *See*—
Sirbola, Michael A., 4,720,329, Cl. 204-23.000.
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Mike, Anthony G., to Facet Enterprises, Inc. Integrated power relay for electric starter motor. 4,720,126, Cl. 290-38.00R.
Miki, Kazuo; Sumi, Kazumasa; Fukui, Katsuhiko; Hayashi, Yasutaka; and Ishiguro, Michio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Apparatus for controlling steer angle of rear wheels of vehicle. 4,720,790, Cl. 364-424.000.
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Milek, Robert C. Suspended idler roller for supporting a troughing belt. 4,720,007, Cl. 198-827.000.
Miles Laboratories, Inc.: *See*—
Barach, Jeffrey T.; and Kamara, Bassie J., 4,720,460, Cl. 435-240.000.
Lembach, Kenneth J., 4,720,385, Cl. 424-86.000.
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Miller, Bertram J.: *See*—
Etzell, Roger A.; Miller, Bertram J.; and Dziekan, Dennis J., 4,720,528, Cl. 525-450.000.
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Milloy, Mary E. Pacifier bib. 4,719,650, Cl. 2-49.00R.
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Barrows, Thomas H.; and Froehlich, Harold E., 4,719,917, Cl. 128-334.00R.
Fraser, Andrew D., 4,720,423, Cl. 428-313.500.
Sweeny, Norman P.; Charbonneau, Jack W.; and Wienke, Orville F., 4,720,417, Cl. 428-201.000.
Weiss, John W., 4,720,765, Cl. 361-220.000.
Minolta Camera Kabushiki Kaisha: *See*—
Hata, Kazuyoshi, 4,720,181, Cl. 350-427.000.
Ito, Masazumi, 4,720,730, Cl. 355-4.000.
Minoura, Mikio; and Ito, Shoji, to Aisan Kogyo Kabushiki Kaisha. Fuel injection valve. 4,720,077, Cl. 251-129.060.
Misaizu, Koei: *See*—
Hasegawa, Makoto; Misaizu, Koei; and Yamashita, Sadahiko, 4,720,688, Cl. 331-2.000.
Mistlberger, Bruno: *See*—
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Kuwata, Sinichi; Katoh, Hiromasa; and Ono, Mitsumasa, 4,720,464, Cl. 436-42.000.
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, 4,720,506, Cl. 514-538.000.
Wada, Keisuke; and Sato, Keiichi, 4,720,576, Cl. 562-481.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Arima, Junichi, 4,720,620, Cl. 437-173.000.
Ikejima, Hiroyuki, 4,719,995, Cl. 187-119.000.
Kajiyama, Ryuichi, 4,719,994, Cl. 187-113.000.
Nishihara, Susumu; and Yoda, Kiyoshi, 4,720,680, Cl. 324-322.000.
Tada, Tetsuo; and Sawada, Keiichi, 4,720,671, Cl. 324-73.00R.
Takata, Nobuharu; and Nakashima, Sachio, 4,720,245, Cl. 417-18.000.
Torimoto, Koichi, 4,720,646, Cl. 310-71.000.
Tsuji, Shintaro, 4,719,996, Cl. 187-127.000.
Ujihara, Hideyo, 4,719,993, Cl. 187-101.000.
Wataya, Seiji; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,719,890, Cl. 123-488.000.
Yokota, Hiroshi, 4,720,666, Cl. 322-10.000.
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Nakazawa, Norio; Matsura, Yoshimasa; Takemoto, Tetsuo; and Kohketsu, Susumu, 4,719,757, Cl. 60-602.000.
Mitsubishi Jidosha Kogyo K.K.: *See*—
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,719,751, Cl. 60-285.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo; Takamiya, Bonnosuke; and Nagayoshi, Yoshimasa, 4,719,998, Cl. 192-0.033.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Katayama, Kazuzo; Izaki, Susumu; and Fujita, Ken, 4,720,243, Cl. 416-188.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Hattori, Masafumi; and Inoue, Takayuki, 4,720,425, Cl. 428-340.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, 4,720,516, Cl. 523-436.000.
Takemura, Tohru; Yoshida, Haruhiko; Takahashi, Hiroshi; Fujinaga, Yoshikazu; and Okamoto, Masashi, 4,720,342, Cl. 210-321.790.
Tokuda, Shuichiro; Furukawa, Noriyuki; Kinoshita, Ikuo; Nakamoto, Hideo; and Aosai, Fumito, 4,720,165, Cl. 350-96.240.
Mitsui & Co., Ltd.: *See*—
Takayuki, Usui, 4,719,760, Cl. 62-65.000.
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Omae, Fujio; and Yamada, Masahiro, 4,720,715, Cl. 346-135.100.
Mittelstadt, Robert F., to Boeing Company, The. Apparatus for planar forming of zero degree composite tape. 4,720,255, Cl. 425-394.000.
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Nakayama, Hitoshi; Miura, Nobuo; Morita, Yoshio; and Kawabe, Masami, 4,719,896, Cl. 123-599.000.
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Tachikawa, Koui; Miura, Yuuichi; Kawashima, Masaharu; and Ogawa, Satoru, 4,719,955, Cl. 160-168.00R.
Miwa, Takashi: *See*—
Hinotani, Katsuhiro; Hayama, Hajime; Kishimoto, Shunichi; Miwa, Takashi; Funazo, Yasuo; and Kouno, Kazuhiro, 4,720,655, Cl. 313-427.000.
Miyamori, Shigeyo: *See*—
Shimozawa, Toru; Miyamori, Shigeyo; and Nishimatsu, Masaharu, 4,720,411, Cl. 428-141.000.
Miyamoto, Takanori: *See*—
Nakata, Kazuo; and Miyamoto, Takanori, 4,720,862, Cl. 381-38.000.
Miyao, Kohei: *See*—
Kakimoto, Norihiro; Namiki, Mitsuo; Osawa, Toshihiko; and Miyao, Kohei, 4,720,564, Cl. 556-83.000.
Miyazaki, Kenji: *See*—
Kobayashi, Kazuo; Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Youichirou; and Abe, Wataru, 4,720,349, Cl. 252-12.000.
Miyoshi, Akihiko, to Mazda Motor Corporation. Four-wheel steering system. 4,719,981, Cl. 180-140.000.
Mizoshita, Yoshifumi; and Hasegawa, Susumu, to Fujitsu Limited. Digitally responsive system for positioning a transducer of a storage apparatus. 4,720,754, Cl. 360-77.000.
Mizumura, Yutaka: *See*—
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Mizuno, Fumio: *See*—
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Mizushima, Yoshihiko: *See*—
Amemiya, Yoshihito; and Mizushima, Yoshihiko, 4,720,734, Cl. 357-15.000.
Mizuta, Yukio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switching device having lock plate. 4,720,608, Cl. 200-5.00B.
Mobil Oil Corporation: *See*—
Beech, James H., Jr.; Owen, Hartley; Ramage, Michael P.; and Tabak, Samuel A., 4,720,600, Cl. 585-330.000.
Chu, Chin-Chiun, 4,720,604, Cl. 585-445.000.
Chu, Cynthia T. W., 4,720,602, Cl. 585-407.000.
Clauson, Melvil B.; and Wagner, John R., Jr., 4,720,427, Cl. 428-349.000.
Dellinger, Thomas B., 4,719,977, Cl. 175-61.000.
Duncan, Gary L., 4,720,416, Cl. 428-195.000.
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., 4,720,337, Cl. 208-58.000.
Kaczerwaski, David J., 4,720,872, Cl. 383-8.000.
Mears, William G., 4,719,949, Cl. 141-301.000.
Savins, Joseph G., 4,720,348, Cl. 252-8.554.
Mochizuki, Kenji: *See*—
Yamane, Masayuki; Iijima, Keiji; and Mochizuki, Kenji, 4,720,772, Cl. 361-433.000.
Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; Namihira, Yoshihori; and Tokiwa, Hideharu, to Kokusai Denshin Denwa Kabushiki Kaisha. Device for switching from one light source to another. 4,720,162, Cl. 350-96.150.
Mochizuki, Manabu: *See*—
Suzuki, Shigeru; Kurotori, Tuneo; and Mochizuki, Manabu, 4,720,731, Cl. 355-10.000.
Moledeth Know-How Export Company (1978) Ltd.: *See*—
Beresinsky, Isaac, 4,720,005, Cl. 198-370.000.
Molnar, Richard, to Presto Lock, Inc. Combination lock with combination-changing feature. 4,719,776, Cl. 70-312.000.
Mondeil, Lucien; and Robert, Francois, to Societe Nationale Elf Aquitaine (Production). Method and apparatus for measuring the heating power of combustible gases. 4,720,196, Cl. 374-37.000.
Monforton, Randal J.: *See*—
Lundquist, Burton R.; and Monforton, Randal J., 4,720,410, Cl. 428-136.000.
Monjes, Mary J.: *See*—
Craig, Amy J. K.; Burns, Mark A.; and Monjes, Mary J., 4,720,479, Cl. 503-200.000.
Monroe, Robert C.: *See*—
Kluppel, George E.; and Monroe, Robert C., 4,720,244, Cl. 416-224.000.
Monsanto Company: *See*—
Spilburg, Curtis A.; and Moore, William M., 4,720,486, Cl. 514-18.000.
Montreal Milling Cutter Company, Inc.: *See*—
Foldesi, Istvan, 4,719,739, Cl. 53-306.000.
Moore, Leslie G., to Eastman Kodak Company. Frame transfer CCD area image sensor with improved horizontal resolution. 4,720,746, Cl. 358-213.280.
Moore, Peter E.: *See*—
Allen, Nicholas S.; and Moore, Peter E., 4,719,973, Cl. 169-61.000.
Moore, Sidney D. Electrically addressable opto-electronic indicator for making dynamic evaluations of microscopic or larger subjects. 4,720,804, Cl. 364-525.000.
Moore, William M.: *See*—
Spilburg, Curtis A.; and Moore, William M., 4,720,486, Cl. 514-18.000.
Moran, Christopher: *See*—
Marchosky, Jose A.; Alek, Robert B.; Moran, Christopher; and Rutledge, Raymond E., 4,719,919, Cl. 128-401.000.
Morane, Bruno P., to 'L'Oreal'. Pressurized container for discharging, in a controlled fashion, an improved quality mousse. 4,720,046, Cl. 239-343.000.
Moreau, Jean-Claude A.; and Chaudiere, Francoise, to Societe Anonyme Handisoft. Automatically controlled apparatus for turning pages. 4,719,712, Cl. 40-475.000.
Morgan, Charles D., Jr.: *See*—
Quesinberry, Elmen C.; Morgan, Charles D., Jr.; and Clancy, Steven J., 4,720,711, Cl. 342-96.000.
Mori, Hiroshi: *See*—
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Moriizumi, Hirokazu: *See*—
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Morimoto, Taiji: *See*—
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Morimoto, Yoshiro: *See*—
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Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control apparatus for use in an automotive transmission. 4,719,822, Cl. 74-869.000.
Morita, Iwao: *See*—
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, 4,720,506, Cl. 514-538.000.
Morita, Kouichi: *See*—
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Morita, Yasuhiro: *See*—
Shimatani, Hiroyuki; Morita, Yasuhiro; and Konamizu, Hidesi, 4,720,120, Cl. 280-671.000.
Morita, Yoshio: *See*—
Nakayama, Hitoshi; Miura, Nobuo; Morita, Yoshio; and Kawabe, Masami, 4,719,896, Cl. 123-599.000.
Morris, William F.; Jr. Defrost gas conditioner for air cooled reverse cycle defrost refrigeration system. 4,719,766, Cl. 62-278.000.

Morrison, Elbert F., to Burlington Industries, Inc. Vacuum spinning method. 4,719,744, Cl. 57-5.000.
Morton, Paul H. Siphon-controlled pneumatic displacement pump. 4,720,246, Cl. 417-53.000.
Morton Thiokol, Inc.: *See*—
Hui, Benjamin C.; Lorberth, Jorg; and Melas, Andreas A., 4,720,560, Cl. 556-1.000.
Moser, Bernd, to BOGE GmbH. Accelerometer. 4,719,800, Cl. 73-517.00R.
Moser, Bernd, to Boge GmbH. Throttle valve. 4,719,941, Cl. 137-599.000.
Mosse, Madeleine; Demarne, Henri; and Filhoi, Robert, to Sanofi. Benzamidine derivatives. 4,720,581, Cl. 564-247.000.
Motorola, Inc.: *See*—
Estes, Bay, 4,720,762, Cl. 361-154.000.
Pace, W. David; and Welty, Dennis L., 4,720,856, Cl. 379-390.000.
Westwick, Alan L., 4,720,686, Cl. 330-258.000.
Mousseau, Carlton R., to Owens-Illinois Plastic Products Inc. Method of manufacturing photorelief printing plate using a liquid photopolymer. 4,720,448, Cl. 430-306.000.
Mrowka, Joseph J.: *See*—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,720,769, Cl. 361-353.000.
MSI Data Corporation: *See*—
Pavelka, Ronald G.; and Chesebro, Oren J., 4,720,858, Cl. 379-444.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Greune, Christian; and Zotz, Georg, 4,719,749, Cl. 60-39.094.
MTU Motorern-und Turbinen-Union Munchen GmbH: *See*—
Willkop, Franz; Zaehring, Gerhard; Popp, Joachim; and Ruetsch, Robert, 4,719,747, Cl. 60-39.070.
MTU Munchen GmbH: *See*—
Lemmin, Juergen, 4,719,750, Cl. 60-226.100.
Mueller, Dale E.: *See*—
Pielemeier, John W.; and Mueller, Dale E., 4,719,769, Cl. 68-133.000.
Mueller, Karl F.: *See*—
Goldenberg, Merrill; and Mueller, Karl F., 4,720,187, Cl. 351-160.00R.
Muesco Mallay Houston Inc.: *See*—
Mallay, John B.; and Johnson, A. J., 4,720,251, Cl. 425-67.000.
Muggli, Raymond A.; and McCaffrey, Terence P., to International Business Machines Corporation. Method of forming a capacitor-transistor integrated circuit. 4,720,467, Cl. 437-52.000.
Muller, Anton; Konig, Hubert; and Wolfbeis, Ludwig, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Fastening member for a tire chain. 4,719,669, Cl. 24-68.0TT.
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, to Nippon Shinyaku Company, Limited; and Mitsubishi Chemical Industries Limited. Immunomodulating agent. 4,720,506, Cl. 514-538.000.
Murasugi, Takashi, to Nissan Motor Co., Ltd. Lock-up torque converter having clutch slip control device. 4,720,003, Cl. 192-0.076.
Murata Manufacturing Co., Ltd.: *See*—
Honda, Yukio, 4,720,766, Cl. 361-275.000.
Murphy, Hildegarde J.; and Murphy, Milo E. Key ring separator. 4,719,778, Cl. 70-456.00R.
Murphy, Milo E.: *See*—
Murphy, Hildegarde J.; and Murphy, Milo E., 4,719,778, Cl. 70-456.00R.
Musil, Edward C., to Flexible Steel Lacing Company. Belt fastener with enlarged loop for hinge pin. 4,719,788, Cl. 72-379.000.
Musser, Michael T.: *See*—
Besmar, Usamah N.; Lyon, John B.; Miller, Francis J.; and Musser, Michael T., 4,720,592, Cl. 568-342.000.
Mutin, Robert: *See*—
Basset, Jean-Marie; and Mutin, Robert, 4,720,594, Cl. 568-428.000.
Mutter, Harry P., to Boeing Company, The. Apparatus for inserting seals into internal grooves of valve bores. 4,719,684, Cl. 29-235.000.
Mydans, David. Stable lightweight shelter structure. 4,719,934, Cl. 135-90.000.
Nabel, Gary: *See*—
Cantor, Harvey I.; and Nabel, Gary, 4,720,482, Cl. 514-2.000.
Nagai, Hiroshi: *See*—
Ohmae, Tadayuki; Okada, Mitsuyuki; Nagai, Hiroshi; and Mizumura, Yutaka, 4,720,524, Cl. 525-173.000.
Nagaike, Yasuo: *See*—
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Nagano, Eiki: *See*—
Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, 4,720,297, Cl. 71-90.000.
Nagano, Kentaro; and Kotani, Taichiro, to Tokyo Cosmos Electric Co., Ltd. Resistance element for wound-type variable resistors and method of making same. 4,719,693, Cl. 29-618.000.
Nagano, Masami; and Atago, Takeshi, to Hitachi, Ltd. Electronic control fuel injection device. 4,719,885, Cl. 123-179.00L.
Nagano, Shuji: *See*—
Ida, Shuichiro; Yoshinaka, Toshio; and Nagano, Shuji, 4,719,814, Cl. 74-477.000.
Nagaoka, Shinji: *See*—
Ishida, Hiroaki; and Nagaoka, Shinji, 4,720,725, Cl. 354-414.000.
Nagaraj, D. R.; Rothenberg, Alan S.; and Lambert, Alexander S., to American Cyanamid Company. Flotation beneficiation process for non-sulfide minerals. 4,720,339, Cl. 209-167.000.
Nagata, Yoshihiro: *See*—
Taguchi, Michihiro; and Nagata, Yoshihiro, 4,720,278, Cl. 440-61.000.
Nagatomo, Shigemi; Komori, Minoru; Sakuma, Tsutomu; Kagawa, Noboru; Komakine, Takashi; Iwasaki, Toshinori; and Kudo, Akira, to Kabushiki Kaisha Toshiba. Stirling engine. 4,719,755, Cl. 60-525.000.
Nagayoshi, Yoshimasa: *See*—
Hiramatsu, Takeo; Takamiya, Bonnosuke; and Nagayoshi, Yoshimasa, 4,719,998, Cl. 192-0.033.
Nagy, Neil F.; and Palleva, William. Restraining bar for pickup trucks. 4,720,222, Cl. 410-151.000.
Nakajima, Masao: *See*—
Yamamoto, Shozo; Sakauchi, Tsuneo; Ashida, Tadashi; Handa, Koichi; and Nakajima, Masao, 4,719,689, Cl. 29-458.000.
Nakajima, Toyohei: *See*—
Mieno, Toshiyuki; Nakajima, Toyohei; Okada, Yasushi; and Oono, Nobuyuki, 4,719,895, Cl. 123-589.000.
Nakamoto, Hideo: *See*—
Tokuda, Shuichiro; Furukawa, Noriyuki; Kinoshita, Ikuo; Nakamoto, Hideo; and Aosai, Fumito, 4,720,165, Cl. 350-96.240.
Nakamura, Hitoshi: *See*—
Fukuzawa, Tadashi; Matsumura, Hiroyoshi; Tsuji, Shinji; Nakamura, Hitoshi; and Hiruma, Kenji, 4,720,836, Cl. 372-96.000.
Nakamura, Kiyoshi; Okada, Syozi; and Kumiyama, Toshio, to Kabushiki Kaisha Toshiba. Printer guide member. 4,720,201, Cl. 400-124.000.
Nakamura, Kyoichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pre-expanded particles of propylene resin. 4,720,509, Cl. 521-58.000.
Nakamura, Mamoru; Haneda, Hideo; Nishio, Shigelu; and Nonoyama, Takao, to Aisen Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Solenoid valve. 4,720,078, Cl. 251-129.150.
Nakamura, Mitsuo: *See*—
Konishi, Motofumi; Tanaka, Kanou; and Nakamura, Mitsuo, 4,720,707, Cl. 340-792.000.
Nakamura, Ryuichi: *See*—
Egawa, Yoshinori; and Nakamura, Ryuichi, 4,720,742, Cl. 357-79.000.
Nakamura, Yasuo: *See*—
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Nakanishi, Nobuyasu: *See*—
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Nakano, Akira: *See*—
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Nakashima, Keishi: *See*—
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Nakashima, Sachio: *See*—
Takata, Nobuharu; and Nakashima, Sachio, 4,720,245, Cl. 417-28.000.
Nakasone, Takayoshi; Sibagaki, Tetuo; and Kozuka, Kenji, to Ube-Nitto Kasei Co., Ltd. Method for forming a rod-like molding. 4,720,368, Cl. 264-562.000.
Nakasuji, Norikazu: *See*—
Kito, Tsutomu; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, 4,720,301, Cl. 106-21.000.
Nakata, Kazuo; and Miyamoto, Takanori, to Hitachi, Ltd. Method and apparatus for speech signal detection and classification of the detected signal into a voiced sound, an unvoiced sound and silence. 4,720,862, Cl. 381-38.000.
Nakayama, Hitoshi; Miura, Nobuo; Morita, Yoshio; and Kawabe, Masami, to Honda Giken Kogyo K.K. Capacitive discharge ignition device. 4,719,896, Cl. 123-599.000.
Nakazawa, Mitsuo; and Ballato, Arthur, to United States of America, Army. Resonator insensitive to paraxial accelerations. 4,720,651, Cl. 310-369.000.
Nakazawa, Norio; Matsura, Yoshimasa; Takemoto, Tetsuo; and Kohketsu, Susumu, to Mitsubishi Jidosha Kogya Kabushiki Kaisha. Variable-volume turbocharger. 4,719,757, Cl. 60-602.000.
Namihira, Yoshihori: *See*—
Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; Namihira, Yoshihori; and Tokiwa, Hideharu, 4,720,162, Cl. 350-96.150.
Namiki, Mitsuo: *See*—
Kakimoto, Norihiro; Namiki, Mitsuo; Osawa, Toshihiko; and Miyao, Kohei, 4,720,564, Cl. 556-83.000.
Nanny, Walter C., to Shell Oil Company. Method for sealing, pressure-testing, and transporting a multi-pipe segment. 4,719,687, Cl. 29-407.000.
Nash, William D., to Pennzoil Products Company. Hydrocarbyl anhydrides. 4,720,555, Cl. 549-252.000.
National Conveyor Corporation: *See*—
Ufland, Jared E., 4,720,008, Cl. 198-841.000.
National Gypsum Company: *See*—
Winkowski, Daniel A., 4,719,730, Cl. 52-238.100.
Navarre, Mark A.: *See*—
Savage, Jack W.; Savage, Thomas J.; and Navarre, Mark A., 4,719,861, Cl. 104-165.000.
Navarro, Maria C.: *See*—
Farber, Glenn L.; Navarro, Maria C.; Hegemann, Manfred K.; Cohen, Samuel G.; and Cox, Cameron O., 4,720,463, Cl. 435-291.000.
Nawata, Susumu; Ichikawa, Katsuzo; Sagisaka, Eikichi; and Sugiyama, Masaharu, to Nippon Light Metal Co., Ltd. Apparatus for continuously producing hollow metallic ingot. 4,719,959, Cl. 164-421.000.

NEC Corporation: *See*—
Akahori, Masaaki; and Ichikawa, Yoshio, 4,720,710, Cl. 340-825.440.
Taguchi, Tetsu, 4,720,865, Cl. 381-49.000.
Yamane, Masayuki; Iijima, Keiji; and Mochizuki, Kenji, 4,720,772, Cl. 361-433.000.
NEC Corporation and Nippon Telegraph and Telephone Corporation: *See*—
Iinuma, Kazumoto; Iijima, Yukihiko; Kuroda, Hideo; and Hashimoto, Hideo, 4,720,743, Cl. 358-133.000.
NEC Yonezawa, Ltd.: *See*—
Yukio, Minagawa, 4,720,714, Cl. 346-134.000.
Necchi Societa per Azioni: *See*—
Bisson, Flavio, 4,719,863, Cl. 112-121.120.
Bisson, Flavio; and Cattaneo, Giacomo, 4,719,866, Cl. 112-275.000.
Bisson, Flavio, 4,719,867, Cl. 112-318.000.
Needham, Donald G., to Phillips Petroleum Company. Pigment concentrates for resins. 4,720,514, Cl. 523-351.000.
Nehring, Rudolf: *See*—
Otte, Werner; and Nehring, Rudolf, 4,720,597, Cl. 568-814.000.
Neights, Paul D.; and Stafford, Jay M., to Rexnord Inc. Controlled preload, self-retracting captive fastener assembly. 4,720,223, Cl. 411-11.000.
Nelson, Alan C., to Electro-Scan Corporation. Scanning electron microscope for visualization of wet samples. 4,720,633, Cl. 250-310.000.
Nelson Irrigation Corporation: *See*—
Meyer, Larry P., 4,720,045, Cl. 239-230.000.
Nelson, Patrick C.; and Cool, Donald L., to Haworth, Inc. Split nut mechanical height adjusting mechanism for chair. 4,720,071, Cl. 248-406.200.
Nelson, Ronald E. Hinged foot and ankle brace. 4,719,926, Cl. 128-80.00H.
Nelson, Terry J.: *See*—
Wicks, Douglas B.; Johnson, Dennis W.; Brooks, William S. C.; and Nelson, Terry J., 4,719,799, Cl. 73-302.000.
Nemanis, Kestutis P.: *See*—
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Nenow, Nicola: *See*—
Karlsson, Sven I.; Rudolfsson, John B.; Pettersson, Rolf K.; and Nenow, Nicola, 4,719,708, Cl. 34-155.000.
Neotech, Inc.: *See*—
McCarty, Read S., 4,720,284, Cl. 494-37.000.
Neri, Armando: *See*—
Mattei, Riccardo; Neri, Armando; Cantello, Maichi; and Gobbi, Santo R., 4,720,619, Cl. 219-121.0LK.
Nestec S.A.: *See*—
Bachler, Robert; Fosseux, Pierre-Yves; and Jost, Rolf, 4,720,390, Cl. 426-573.000.
Nestor, Charles R.; and Plyler, Robert G., to General Motors Corporation. Electrical connector having resilient contact means. 4,720,157, Cl. 439-851.000.
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Neutek Establishment: *See*—
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New, Maria I.: *See*—
White, Perrin C.; Dupont, Bo; and New, Maria I., 4,720,454, Cl. 435-6.000.
Newman, Bruce A.; Shigley, John K.; and Fu, Ta-Wei, to Conoco Inc. Premium coking process. 4,720,338, Cl. 208-131.000.
Newman, Donald J.; and Christie, John A., to Ogden Industries Pty. Ltd. Deadbolt assembly. 4,719,774, Cl. 70-131.000.
NGK Spark Plug Co., Ltd.: *See*—
Ando, Minato; Ito, Masaaki; and Mizuno, Fumio, 4,720,471, Cl. 501-136.000.
Kojima, Takao; Nakano, Akira; Matsuura, Toshitaka; and Takami, Akio, 4,720,394, Cl. 437-234.000.
NHK Spring Co., Ltd.: *See*—
Shinbori, Takeyoshi; Fukumura, Takeo; and Kimura, Yoshio, 4,720,085, Cl. 267-64.160.
Nichols, Glenn R.; Stejskal, Michael F.; and Zink, Robert M., to Bradford Company. Nestable and stackable tray. 4,720,013, Cl. 206-506.000.
Niemi, Jouko, to Oy Finnpulva AB. Feeder device for pressure chamber grinder. 4,720,049, Cl. 241-39.000.
Niemi, Paul M., to Kimberly-Clark Corporation. Apparatus for splicing a trailing end of a web from a depleted coil to the leading end of a fresh coil. 4,720,320, Cl. 156-504.000.
Nilsson, Ingvar: *See*—
Rausing, Hans; and Nilsson, Ingvar, 4,720,325, Cl. 162-110.000.
Ninomiya, Kazunori; Shitama, Katuaki; and Aoi, Masashi, to Kyushu Hitachi Maxell, Ltd. Electric shaver with a drive control. 4,719,698, Cl. 30-43.600.
Nippo Communication Industrial Co.: *See*—
Akiyama, Tadahiko, 4,720,848, Cl. 379-88.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Kogaku K.K.: *See*—
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Nippon Kokan Kabushiki Kaisha: *See*—
Matsumoto, Kazuaki; Tsuyama, Seishi; Tagawa, Hisatoshi; and Yamasaki, Yoshitaka, 4,720,307, Cl. 148-12.00R.
Nippon Light Metal Co., Ltd.: *See*—
Nawata, Susumu; Ichikawa, Katsuzo; Sagisaka, Eikichi; and Sugiyama, Masaharu, 4,719,959, Cl. 164-421.000.
Nippon Shinyaku Company, Limited: *See*—
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, 4,720,506, Cl. 514-538.000.
Nippon Steel Corporation: *See*—
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Nippon Telegraph and Telephone Corporation: *See*—
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Pavelka, Ronald G.; and Cheaebro, Oren J., to MSI Data Corporation. Telephone handset/acoustic coupler adapter. 4,720,858, Cl. 379-444.000.

PDQ Manufacturing Inc.: *See—*
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Peacock, Claude F. Simulated work environment ability tester. 4,720,097, Cl. 272-118.000.

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Pelc, Norbert J.: *See—*
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Penninger, Stefan: *See—*
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Pennington, B. Timothy, to Olin Corporation. Method for producing nitrous oxide by reacting ammonia with a molten nitrate salt of an alkaline earth metal. 4,720,377, Cl. 423-400.000.

Pennzoil Products Company: *See—*
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Perach, Asi, to United Technologies Corporation. Control valve assembly. 4,719,943, Cl. 137-625.650.

Perfect Equipment Corp.: *See—*
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Perfitt, Thomas E.: *See—*
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Perkin-Elmer Corporation, The: *See—*
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Perosino, Lorenzo: *See—*
Peterson, Francis C.; Perosino, Lorenzo; and Despins, Robert, 4,720,075, Cl. 248-635.000.

Perrine, Walter E. Trigger release mechanisms for full and semi automatic open bolt weapons. 4,719,841, Cl. 89-189.000.

Perry, Mordechai: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,720,345, Cl. 210-650.000.

Pestes, Cornelius N., to Medical Media Laboratory, Inc. Specimen kits and stopper therefor. 4,720,017, Cl. 215-227.000.

Peterken, William H., to United Industries Corporation. Sleeve anchor. 4,720,224, Cl. 411-36.000.

Peters, Duane; and Peters, Ty C. Mini-shake, twist, and slide horseshoe game. 4,720,107, Cl. 273-109.000.

Peters, Jack R.: *See*—
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Peters, Joseph H., to U.S. Philips Corporation. Video recording apparatus which records chrominance information at a lower frequency band coincident with the luminance signal frequency band. 4,720,751, Cl. 358-310.000.

Peters, Ty C.: *See*—
Peters, Duane; and Peters, Ty C., 4,720,107, Cl. 273-109.000.

Peterson, Arnold N.; and Sprague, Larry A., to Peterson Pacific Corporation. Tree size adaptable debarking/delimbing apparatus. 4,719,950, Cl. 144-208.00J.

Peterson, Francis C.; Perosino, Lorenzo; and Despins, Robert, to Buell Industries, Inc. Shock isolating mount. 4,720,075, Cl. 248-635.000.

Peterson, Jack E., to Dupree, Inc. Lamp analyzer. 4,720,190, Cl. 356-45.000.

Peterson Pacific Corporation: *See*—
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Petrolite Corporation: *See*—
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Petronella, Joseph; and Bellettiere, Samuel J., to Nuodex Inc. Process for the preparation of vanadium-containing mixed metal soap solutions. 4,720,352, Cl. 252-308.000.

Petrovich, Paul A. Multipurpose bayonet system. 4,720,030, Cl. 224-231.000.

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Pielemeier, John W.; and Mueller, Dale E., to Whirlpool Corporation. One way clutch for dual action agitator. 4,719,769, Cl. 68-133.000.

Pienta, David J., to Automatic Handling, Inc. Transfer device. 4,720,231, Cl. 414-560.000.

Pierce, Frank D.; Knickerbocker, Bradford E.; and Lenker, Don H., to Castle & Cooke, Inc. Method for peeling fresh fruits. 4,720,388, Cl. 426-231.000.

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Pinkham, Raymond; and Guttag, Karl M., to Texas Instruments Incorporated. Method and apparatus for clearing the memory of a video computer. 4,720,819, Cl. 365-219.000.

Pioneer Electronic Corporation: *See*—
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Sci-Tec Instruments Inc.: *See*—
Wicks, Douglas B.; Johnson, Dennis W.; Brooks, William S. C.; and Nelson, Terry J., 4,719,799, Cl. 73-302.000.

Scott, Charles G.: *See*—
Burris, Christine; Harris, Robert L.; Kolough, Victor; Linville, Larry R.; Scott, Charles G.; and Young, Robert, 4,720,857, Cl. 379-430.000.

Scott, Norman H.: *See*—
Vora, Bipin V.; and Scott, Norman H., 4,720,336, Cl. 208-46.000.

Scott, Ray V., Jr.: *See*—
House, David W.; and Scott, Ray V., Jr., 4,720,536, Cl. 528-60.000.

Seaboard Digital Systems, Inc.: *See*—
Eliss, Antonio L.; and Davis, Mark F., 4,720,866, Cl. 381-67.000.

Seaborn, James N.: *See*—
Swenson, Ronald D.; and Seaborn, James N., 4,720,041, Cl. 137-16.000.

Seals Eastern Inc.: *See*—
Hertz, Daniel L., Jr., 4,720,113, Cl. 277-165.000.

Sebbah, Jack: *See*—
Viannay, Stephane; and Sebbah, Jack, 4,720,310, Cl. 148-128.000.

Security Dynamics Technologies, Inc.: *See*—
Weiss, Kenneth P., 4,720,860, Cl. 380-23.000.

Sedlak, Adolf, to Timex Corporation. Lavet stepping motor with U-shaped coil core. 4,720,644, Cl. 310-49.00R.

Seegmiller, S. Dale: *See*—
DeForest, Sherman; and Seegmiller, S. Dale, 4,720,745, Cl. 358-166.000.

Seibert, Wolfram: *See*—
Belart, Juan; Seibert, Wolfram; and Ocvirk, Norbert, 4,720,151, Cl. 303-6.00A.

Seibold, Peter; and Strauss, Karl-Peter, to Blaupunkt-Werke GmbH. Security system and method for electronic apparatus, particularly car radios or similar automotive audio equipment. 4,720,700, Cl. 340-568.000.

Seidel, Peter: *See*—
Siegel, Augustin; and Seidel, Peter, 4,720,191, Cl. 356-237.000.

Seidenstricker, Manfred: *See*—
Fey, Werner; Pauli, Manfred; Ruppender, Uwe; and Seidenstricker, Manfred, 4,720,372, Cl. 422-67.000.

Seifert, Peter R., to Daimler-Benz Aktiengesellshaft. Convertible top for vehicles, especially for passenger motor vehicles. 4,720,134, Cl. 296-118.000.

Seikosha Co., Ltd.: *See*—
Ishida, Hiroaki; and Nagaoka, Shinji, 4,720,725, Cl. 354-414.000.

Seiter, Stephen R. Automatic teller machine having motorized drawer. 4,720,154, Cl. 312-319.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,720,796, Cl. 364-474.000.

Seko, Yasuhisa: *See*—
Ono, Nobutaka; and Seko, Yasuhisa, 4,720,057, Cl. 242-118.110.

Seles, Boleslaw. Method and apparatus for finishing a corner joint. 4,719,733, Cl. 52-288.000.

Semanski, Ludwig C.: *See*—
DiCesare, John M.; and Semanski, Ludwig C., 4,720,623, Cl. 219-497.000.

Seneker, Carl A.: *See*—
Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., 4,720,405, Cl. 427-410.000.

Senn, Jakob. Seal in housing means containing electrical apparatuses. 4,720,606, Cl. 174-35.0GC.

Serikawa, Yoshio: *See*—
Araki, Kunihiko; Kitajima, Tomoya; Serikawa, Yoshio; Kobayashi, Mikio; Terui, Hiroshi; and Koyama, Kenji, 4,720,720, Cl. 354-173.110.

Sevastakis, Gus. Method and apparatus for forming matching tapered surfaces on interfitting male and female parts. 4,719,829, Cl. 82-15.000.

Sewe, Kai-Udo: *See*—
Wagner, Fritz; Ristau, Egbert; Li, Zu-yi; Lang, Siegmund; Schulz, Walther; Hofmann, Hans-Jurgen; Sewe, Kai-Udo; and Lindorfer, Walter, 4,720,456, Cl. 435-74.000.

Seyferth, Dietmar; and Schwark, Joanne M., to Massachusetts Institute of Technology. Organopolysilazane precursors to silicon nitride-rich mixed SiC/Si_3N_4. 4,720,532, Cl. 528-28.000.

SGS Microelettronica S.p.A.: *See*—
Faini, Giuseppe, 4,720,641, Cl. 307-18.000.

SGS Microelettronica SpA: *See*—
Siligoni, Marco; and Pasetti, Mauro, 4,720,852, Cl. 379-124.000.

Shabrang, Mani; and Gokey, Daniel A., to Dow Chemical Company, The. Device and method for electroplating a workpiece having axial symmetry. 4,720,330, Cl. 204-25.000.

Shamblin, Bill J.: *See*—
Ravotti, Gary P.; and Shamblin, Bill J., 4,719,731, Cl. 52-239.000.

Shander, Douglas. Hair growth modification with ornithine decarboxylase inhibitors. 4,720,489, Cl. 514-171.000.

Shapiro, Bernard, to AI Computer Services, Inc. Computer-assisted system for ticketing management. 4,720,785, Cl. 364-401.000.

Sharp Kabushiki Kaisha: *See*—
Andou, Yukinori, 4,720,130, Cl. 294-64.100.
Suyama, Takahiro; Hayakawa, Toshiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,720,833, Cl. 372-44.000.
Takafuji, Yutaka; Kishi, Kohei; and Tanaka, Hirohisa, 4,720,736, Cl. 357-23.700.
Yamamoto, Osamu; Hayashi, Hiroshi; Morimoto, Taiji; and Yamamoto, Saburo, 4,720,834, Cl. 372-45.000.

Shaver, Allen L. Apparatus for converting a road vehicle into a snowmobile. 4,719,982, Cl. 180-183.000.

Shefter, Eli: *See*—
Di Luccio, Robert C.; Duggins, Ray B.; and Shefter, Eli, 4,720,384, Cl. 424-78.000.

Shell Offshore Inc.: *See*—
Brasted, Lee K.; and Piter, Edward S., 4,720,214, Cl. 405-227.000.

Shell Oil Company: *See*—
Nanny, Walter C., 4,719,687, Cl. 29-407.000.
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,720,589, Cl. 568-15.000.

Shepard, John K., to Continental Forest Industries, Inc. Corner structure. 4,720,038, Cl. 229-5.700.

Sheppard, John D.; and Cooper, David G., to Canadian Patents and Development Ltd. Low temperature thermal-chemical pretreatment process for peat dewatering. 4,720,287, Cl. 44-33.000.

Sherman, James F., to General Motors Corporation. Transversely mounted transmission arrangement. 4,719,815, Cl. 74-606.00R.

Sherpa, Inc.: *See*—
Zimmerman, Jeff E., 4,720,031, Cl. 224-323.000.

Sherwood Medical Company: *See*—
Farber, Glenn L.; Navarro, Maria C.; Hegemann, Manfred K.; Cohen, Samuel G.; and Cox, Cameron O., 4,720,463, Cl. 435-291.000.

Shiba, Haruo: *See*—
Satoh, Takateru; and Shiba, Haruo, 4,720,055, Cl. 242-74.100.

Shibabuti, Toshio: *See*—
Tsubakimoto, Toshihiro; Hori, Koziro; and Shibabuti, Toshio, 4,719,936, Cl. 137-15.000.

Shibahashi, Yutaka: *See*—
Kito, Tsutomu; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, 4,720,301, Cl. 106-21.000.

Shibata, Makoto: *See*—
Ikeda, Masami; Shibata, Makoto; Takahashi, Hiroto; Komuro, Hirokazu; Matsuda, Hiroto; and Tsuda, Hisanori, 4,720,716, Cl. 346-140.00R.

Shibata, Yoshihisa: *See*—
Munakata, Hiroaki; Kobayashi, Makio; Wagatsuma, Kazuo; Sato, Shigeru; Tsurufuji, Makoto; Enomoto, Hiroshi; Sugiyama, Makoto; Shibata, Yoshihisa; and Morita, Iwao, 4,720,506, Cl. 514-538.000.

Shibayama, Ryosaku: *See*—
Kikuchi, Akira; Tobita, Akira; Kobori, Tetsuo; and Shibayama, Ryosaku, 4,720,624, Cl. 219-553.000.

Shidahara, Yasuhiro: *See*—
Fukushima, Megumu; Komatsu, Kasunari; Shidahara, Yasuhiro; and Yokomizo, Katihiro, 4,720,335, Cl. 204-424.000.

Shigematsu, Takashi: *See*—
Watanabe, Tomoyuki; Shigematsu, Takashi; Tokoro, Setsuo; and Hayashi, Takashi, 4,720,793, Cl. 364-424.100.

Shigemoto, Syuziro: *See*—
Kinouchi, Sosuke; Shigemoto, Syuziro; and Kanazawa, Wataru, 4,719,988, Cl. 181-273.000.

Shigeta, Tsutomu: *See*—
Horiguchi, Hujio; Okabe, Masahide; and Shigeta, Tsutomu, 4,720,228, Cl. 414-32.000.

Shigley, John K.: *See*—
Newman, Bruce A.; Shigley, John K.; and Fu, Ta-Wei, 4,720,338, Cl. 208-131.000.

Shiina, Michihiro: *See*—
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,719, Cl. 354-173.100.
Hamada, Hisashi; Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; and Goto, Shigenori, 4,720,721, Cl. 354-173.110.
Yamamoto, Katsuhiko; Yoshino, Takeshi; Hirai, Masayoshi; Hashimoto, Shiro; Shiina, Michihiro; Goto, Shigenori; and Hamada, Hisashi, 4,720,718, Cl. 354-154.000.

Shikoku Chemicals Corporation: *See*—
Fujita, Takayuki; Iwasaki, Yoshiya; Yabe, Hiroko; and Akita, Tadashi, 4,720,551, Cl. 548-336.000.

Shimada, Shoji, to Iwasaki Kinzoku Kogyo Co., Ltd. Push-button type mechanical pencil. 4,720,203, Cl. 401-94.000.

Shimane, Iwao: *See*—
Yokoyama, Toshio; and Shimane, Iwao, 4,719,883, Cl. 123-146.50A.

Shimatani, Hiroyuki; Morita, Yasuhiro; and Komamizu, Hidesi, to Toyota Jidosha Kabushiki Kaisha. Wheel suspension for motor vehicle. 4,720,120, Cl. 280-671.000.

Shimizu, Junichi: *See*—
Takeuchi, Tamio; Koakutsu, Yasumasa; Shimizu, Junichi; Yano, Masao; Ikenoue, Minoru; and Onoda, Seiichi, 4,720,630, Cl. 250-227.000.

Shimizu, Mitsuru: *See*—
Sugiyama, Toshinori; and Shimizu, Mitsuru, 4,720,826, Cl. 369-283.000.

Shimomura, Setsuhiro: *See*—
Wataya, Seiji; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,719,890, Cl. 123-488.000.

Shimozawa, Toru; Miyamori, Shigeyo; and Nishimatsu, Masaharu, to TDK Corporation. Magnetic recording medium. 4,720,411, Cl. 428-141.000.

Shinaberry, Robert L., Jr.: *See*—
Mawbey, Gerald W.; and Shinaberry, Robert L., Jr., 4,720,146, Cl. 297-409.000.

Shinbori, Takeyoshi; Fukumura, Takeo; and Kimura, Yoshio, to NHK Spring Co., Ltd. Vehicle suspension apparatus. 4,720,085, Cl. 267-64.160.

Shinkai, Norihiko; Haranoh, Takeshi; Kanazawa, Junetsu; and Hatano, Takashi, to Asahi Glass Company Ltd. Photomask blank and photomask. 4,720,442, Cl. 430-5.000.

Shinno, Yoshio, to Kubota Ltd. Combustion chamber with a domed auxiliary chamber for a spark-ignition engine. 4,719,884, Cl. 123-269.000.

Shioda, Kayoko: *See*—
Ohtake, Katsumi; Ogura, Kunio; Koike, Tunehiro; Arai, Takuya; and Shioda, Kayoko, 4,720,733, Cl. 355-50.000.

Shionogi & Co., Ltd.: *See*—
Haysae, Yoshio; Ichinari, Mitsuhiro; Kamei, Kazuo; Taguchi, Junji; Oba, Katsuaki; and Takahashi, Toshio, 4,720,488, Cl. 514-92.000.
Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Ogura, Toshihiro, 4,720,387, Cl. 424-472.000.

Shirato, Takehide, to Fujitsu Limited. Semiconductor device having a protection circuit with lateral bipolar transistor. 4,720,737, Cl. 357-23.130.

Shirley, David, to NL Petroleum Products Limited. Rotary drill bits. 4,720,371, Cl. 419-10.000.

Shiro, Teruaki: *See*—
Nishikawa, Seiichi; Okada, Koichi; and Shiro, Teruaki, 4,720,626, Cl. 235-449.000.

Shitama, Katuaki: *See*—
Ninomiya, Kazunori; Shitama, Katuaki; and Aoi, Masashi, 4,719,698, Cl. 30-43.600.

Shizuya, Hiroaki: *See*—
Sullivan, Cornelius W.; Shizuya, Hiroaki; and Kobori, Hiromi, 4,720,458, Cl. 435-196.000.

Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,719,664, Cl. 16-47.000.

Shu-Hua, Yuan. Spherical scanning system with improved means of wide, adjustable scanning area. 4,720,159, Cl. 350-6.900.

Shulman, Edith: *See*—
Felger, Carl; and Shulman, Edith, 4,720,494, Cl. 514-252.000.

Shuto, Sadanobu; and Deguchi, Naoyasu, to Fuji Photo Film Co., Ltd. Silver halide color reversal light-sensitive material. 4,720,451, Cl. 430-379.000.

Sibagaki, Tetuo: *See*—
Nakasone, Takayoshi; Sibagaki, Tetuo; and Kozuka, Kenji, 4,720,368, Cl. 264-562.000.

Sidebotham, Christopher G.: *See*—
Averill, Robert G.; and Sidebotham, Christopher G., 4,719,908, Cl. 128-92.0VW.

Sieber, Karl G.; and Sieber, Kurt G. Excavation bucket. 4,719,711, Cl. 37-118.00R.

Sieber, Kurt G.: *See*—
Sieber, Karl G.; and Sieber, Kurt G., 4,719,711, Cl. 37-118.00R.

Sieber, Peter: *See*—
Jansz, Hendrik S.; Lips, Cornelis J. M.; Steenbergh, Paul H.; Rink, Hans; and Sieber, Peter, 4,720,483, Cl. 514-11.000.

Siefert, Roland. Clock, in particular desk or wall clock, with one or more analog time indicating devices. 4,720,820, Cl. 368-76.000.

Siegel, Augustin; and Seidel, Peter, to Carl-Zeiss-Stiftung. Method and apparatus for light span microscopic dark-field display of objects. 4,720,191, Cl. 356-237.000.

Siemens Aktiengesellschaft: *See*—
Adam, Bernd, 4,720,613, Cl. 200-146.00R.
Baumann, Joachim; and Graf, Peter, 4,719,808, Cl. 73-622.000.
Herberich, Wolfgang; Degle, Walter; Bahnsen, Heiner; and Bolzmann, Olaf-Ragnar, 4,719,694, Cl. 29-703.000.
Lechner, Robert; Rudolf, Hans-Werner; and Krimmer, Roland, 4,720,845, Cl. 379-27.000.
Oestreich, Ulrich, 4,720,164, Cl. 350-96.230.
Schroeder, Harry, 4,720,694, Cl. 335-128.000.
Stahl, Jochen; and Beling, Ingo, 4,720,683, Cl. 328-245.000.

SIG Schweizerische Industrie-Gesellschaft: *See*—
Lenherr, Harald, 4,720,006, Cl. 198-415.000.

Sigismund, Egon: *See*—
Lison, Rudolf; Dienstknecht, Hans; and Sigismund, Egon, 4,720,036, Cl. 228-205.000.

Sigley, Clebern W.: *See*—
Fagin, Donald R.; Tonn, Howard E.; and Sigley, Clebern W., 4,719,686, Cl. 29-402.080.

Siligoni, Marco; and Pasetti, Mauro, to SGS Microelettronica SpA. Monolithically integratable telephone circuit for generating control signals for displaying the telephone charges to a subscriber. 4,720,852, Cl. 379-124.000.

Sillion, Bernard: *See*—
Rabilloud, Guy; Marriagi, Paul; Gonzales, Serge; and Sillion, Bernard, 4,720,539, Cl. 528-353.000.

Silverblatt, Bernard L.: *See*—
Lagally, Hermann O.; Silverblatt, Bernard L.; Pitterle, Thomas A.; and Singleton, Norman R., 4,720,840, Cl. 376-285.000.

Simmons, Arturo, to Texas Instruments Incorporated. Focal plane array structure including a signal processing system. 4,720,738, Cl. 357-30.000.

Sims, William A.: *See*—
Alexander, Michael P.; and Sims, William A., 4,720,133, Cl. 296-117.000.

Sinclair, Paul L., to Schlumberger Technology Corporation. Digital induction logging tool. 4,720,681, Cl. 324-339.000.

Sing, Peter. Destructible carbon paper. 4,720,408, Cl. 428-43.000.

Singer, Debra L.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. NCO-terminated compounds from adducts of mercapto-functional polyhydric alcohols and vinyl-type silanes containing hydrolyzable groups. 4,720,534, Cl. 528-28.000.

Singleton, Norman R.: *See—*
Lagally, Hermann O.; Silverblatt, Bernard L.; Pitterle, Thomas A.; and Singleton, Norman R., 4,720,840, Cl. 376-285.000.
Sirbola, Michael A., to Microsurface Technology Corp. Apparatus and method for the electrolytic plating of layers onto computer memory hard discs. 4,720,329, Cl. 204-23.000.
Skarvada, Thomas, to Crane Co. Apparatus for generating a reference signal in a brake control system. 4,720,794, Cl. 364-426.000.
Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See—*
Kurt, Hilgarth, 4,719,670, Cl. 24-71.200.
Smith, Gary T., to Keyes Fibre Company. Method and apparatus for manufacturing packaging pads. 4,720,321, Cl. 156-549.000.
Smith, Harry J.: *See—*
Crossland, William A.; Peters, Jack R.; Smith, Harry J.; and Astorino, Frank, 4,720,781, Cl. 364-200.000.
Smith International, Inc.: *See—*
Geczy, Bela; McPherson, James N.; and Toth, Robert G., 4,720,199, Cl. 384-282.000.
Jones, Kenneth W., 4,719,979, Cl. 175-329.000.
Smith, Robert S. Cylindrical cutting tool. 4,720,216, Cl. 407-113.000.
Smith, Ronald H. Optical encoder using line array detectors. 4,720,699, Cl. 340-347.00P.
Smith, William V., to Lectrolarm Custom Systems, Inc. Meter reader. 4,720,851, Cl. 379-107.000.
Smithers, James P., to Conagra, Inc. Bacon slicing apparatus. 4,719,831, Cl. 83-355.000.
Smothers, Paul W.; Coryell, James M.; and Maish, Frederick I., to Werkzeugmaschinenfabrik. Rotary storage magazine. 4,719,839, Cl. 89-1.802.
SMS Schloemann-Siemag AG.: *See—*
Grothe, Horst; Boese, Peter; Kolakowski, Manfred; and Lax, Hermann, 4,719,960, Cl. 164-426.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Vogels, Jochen; Streubel, Hans; and Thorner, Hans O., 4,719,961, Cl. 164-439.000.
Smyrniotis, John: *See—*
Jasenof, Kenneth E.; Lewarchik, Ronald J.; and Smyrniotis, John, 4,720,403, Cl. 427-327.000.
Snead, Thomas E.: *See—*
Ravichandran, Ramanathan; and Snead, Thomas E., 4,720,517, Cl. 524-101.000.
Snel, Johannes J. M.: *See—*
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,720,589, Cl. 568-15.000.
Snyder, Robert F., to Raymond Engineering Inc. Torque wrench with clutches. 4,720,000, Cl. 192-7.000.
Societe Anonyme Handisoft: *See—*
Moreau, Jean-Claude A.; and Chaudiere, Francoise, 4,719,712, Cl. 40-415.000.
Societe Anonyme: Poclain hydraulics: *See—*
Noel, Alain W., 4,719,843, Cl. 92-58.000.
Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Esanu, Andre , 4,720,487, Cl. 514-43.000.
Societe Europeenne de Propulsion: *See—*
Habermann, Helmut; and Brunet, Maurice, 4,720,649, Cl. 310-90.500.
Societe Nationale Elf Aquitaine (Production): *See—*
Mondeil, Lucien; and Robert, Francois, 4,720,196, Cl. 374-37.000.
Soldatos, Anthony C., to BP Chemicals Limited. Thickening agents and the manufacture and use thereof. 4,720,303, Cl. 106-181.000.
Solmat Systems, Ltd.: *See—*
Zaslavsky, Dan, 4,719,759, Cl. 60-641.800.
Solomon, Donald D.: *See—*
Hu, Can B.; and Solomon, Donald D., 4,720,512, Cl. 523-112.000.
Sommerfield, John; and Babb, Raymond E., to Peco Controls Corporation. System for detecting jams and other malfunctions in container processing equipment. 4,720,797, Cl. 364-478.000.
Sonneborn, Hans W.: *See—*
Ruff, Wolfgang; Liedek, Egon; Berger, Gerhard; and Sonneborn, Hans W., 4,720,304, Cl. 106-288.00Q.
Sonnenberg, Fred M., to Atlantic Richfield Company. Foam cups with enhanced coffee retention. 4,720,429, Cl. 428-407.000.
Sonoco Products Company: *See—*
Cannon, David C.; and Lyles, Stephen P., 4,719,855, Cl. 101-426.000.
Sony Corporation: *See—*
Ohnishi, Kanji; Yasuda, Hiroshi; and Numata, Norio, 4,720,855, Cl. 179-354.000.
Sumiyoshi, Hiroji; Omae, Kazuo; Hamanaka, Akira; and Watanabe, Yuzuru, 4,720,748, Cl. 358-246.000.
Souriau & Cie: *See—*
Guenin, Gerard; Herubel, Guy; Bargain, Raymond; and De Mendez, Michel, 4,720,270, Cl. 439-161.000.
Southwest Research Institute: *See—*
Owen, Thomas E., 4,720,669, Cl. 324-546.000.
Sowards, Gregory E. Sports training and practice device. 4,720,095, Cl. 272-77.000.
Sowell, Jerry G. Automatic cooking apparatus. 4,719,850, Cl. 99-404.000.
Special Personal and Financial Planning and Referral Services, Inc.: *See—*
Kriofske, Kris P., 4,719,658, Cl. 52-223.00L.
Spector, Donald. Film-laminate type air freshener. 4,720,409, Cl. 428-46.000.
Speros, Phillip C. Heat exchanger. 4,719,968, Cl. 165-154.000.
Spicer, David A.: *See—*
Oberlander, Lewis B.; Spicer, David A.; and Straubs, Ralph V., 4,720,850, Cl. 379-90.000.
Spielvogel, David E.; and Zdrahala, Richard J., to Becton, Dickinson and Company. Film-forming silicone compositions having lubricating properties. 4,720,521, Cl. 524-862.000.
Spigarelli, Anthony M. Aggregate leveling rake. 4,720,208, Cl. 404-97.000.
Spilburg, Curtis A.; and Moore, William M., to Monsanto Company. Method of inhibiting vertebrate collagenase activity using peptide hydroxamic acid derivatives. 4,720,486, Cl. 514-18.000.
SPOFA, Spojene Podniky pro Zdravotnickou Vyrobu: *See—*
Cerny, Antonin; Krepelka, Jiri; Melka, Milan; Miko, Milan; Pokorna, Stanislava; Reichlova, Ruzena; Kejhova, Irena; Beitova, Marta; and Grimova, Jaroslava, 4,720,497, Cl. 514-262.000.
Sprague, Larry A.: *See—*
Peterson, Arnold N.; and Sprague, Larry A., 4,719,950, Cl. 144-206.000.
Spring, David J., to Pains-Wessex Limited. Pyrotechnic device. 4,719,857, Cl. 102-335.000.
Springer, Kenneth D.: *See—*
Popek, Marc H.; Springer, Kenneth D.; Beaudet, William R.; and DiStefano, Ralph D., 4,720,690, Cl. 333-1.000.
Square D Company: *See—*
Apperson, Kenneth P.; and Glass, James D., 4,719,672, Cl. 24-135.00R.
Guyeska, John C.; Liptak, J. Michael; and Roof, Richard W., 4,720,776, Cl. 363-37.000.
Hooper, William P., 4,720,841, Cl. 377-20.000.
Stafford, Jay M.: *See—*
Neights, Paul D.; and Stafford, Jay M., 4,720,223, Cl. 411-11.000.
Stahl, Jochen; and Beling, Ingo, to Siemens Aktiengesellschaft. Circuit for preventing retarding field oscillations in electron tubes, especially for a pulse-width modulation stage in transmitters. 4,720,683, Cl. 328-245.000.
Stahnecker, Erhard: *See—*
Hebgen, Werner; Danz, Eckehard; Krome, Gerd; and Stahnecker, Erhard, 4,720,599, Cl. 570-226.000.
STAL Refrigeration AB: *See—*
Glanvall, Rune, 4,720,250, Cl. 418-84.000.
Stamer, Michael E.; and Kozich, Stephen A., to Videojet Systems International, Inc. Method and apparatus for equalizing power output in a laser marking system. 4,720,618, Cl. 219-121.0LA.
Stamicarbon B.V.: *See—*
Scholte, Hubertus B., 4,720,598, Cl. 568-908.000.
Standard Elektrik Lorenz AG: *See—*
Tischer, Kurt M., 4,720,657, Cl. 313-497.000.
Standard Telephones and Cables plc: *See—*
Byron, Kevin C., 4,720,684, Cl. 330-4.300.
Stanislawski, Robert E. Instant outdoor cook grill. 4,719,898, Cl. 126-9.00R.
Stanley, Arthur J.: *See—*
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Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, to Merz + Co. GmbH & Co. Certain substituted phenyl esters of nicotinic acid, compositions and methods of using same for treatment of hyperlipidemia. Re. 32,581, Cl. 514-356.000.

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Hori, Kiyoshi: *See*—
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CLASS 24
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68 TT 4,719,669
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135 R 4,719,672
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156.4 R 4,719,677
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157.1 R 4,719,681
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458 4,719,689
568 4,719,690
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603 4,719,692
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703 4,719,694
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CLASS 30
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326 4,719,702

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[illegible] 4,719,705

CLASS 34
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[illegible] 4,719,707
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119 4,719,710

CLASS 37
118 R 4,719,711

CLASS 40
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CLASS 42
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16 4,719,714
87 4,719,715

CLASS 43
1 4,719,716
44.2 4,719,717
81 4,719,718

CLASS 44
33 4,720,287
72 4,720,288

CLASS 47
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CLASS 48
197 R 4,720,289

CLASS 49
171 4,719,720

CLASS 51
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205 R 4,719,722

CLASS 52
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20 4,719,724
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[illegible] 4,719,726
126.6 4,719,727
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238.1 4,719,730
[illegible] 4,719,731
[illegible] 4,719,732
[illegible] 4,719,733
[illegible] 4,719,734
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[illegible] 4,719,737
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CLASS 55
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337 4,720,292

CLASS 56
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291 4,719,745

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39.17 4,719,746
39.37 4,719,748
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285 4,719,751
322 4,719,752
445 4,719,753
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CLASS 68
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200 4,719,771
205 R 4,719,772

CLASS 70
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131 4,719,774
264 4,719,775
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4,719,777
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CLASS 71
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91 4,720,298

CLASS 72
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[illegible] 4,719,782
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[illegible] 4,719,784
[illegible] 4,719,785
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[illegible] 4,719,789
[illegible] 4,719,790

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[illegible] 4,719,799
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[illegible] 4,719,801
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763 4,719,802
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[illegible] 4,719,804
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[illegible] 4,719,806
[illegible] 4,719,807
[illegible] 4,719,809

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[illegible] 4,719,811
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[illegible] 4,719,813
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[illegible] R 4,719,815
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750 R 4,719,818
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[illegible] 4,719,821
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[illegible] 4,719,855

CLASS 102
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521 4,719,860

CLASS 104
165 4,719,861

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181 4,720,303
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CLASS 112
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CLASS 119
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198 E 4,719,892
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[illegible] 4,719,888
[illegible] 4,719,889
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204.21 4,719,910
[illegible] 4,719,911
[illegible] II 4,719,913
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[illegible] 4,719,966

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CLASS 178
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513.5 4,720,802
521 4,720,803
525 4,720,804
4,720,805
551 4,720,806
558 4,720,807
568 4,720,808
748 4,720,809
900 4,720,810
4,720,811
4,720,812
4,720,813
CLASS 365
11 4,720,814
78 4,720,815
189 4,720,816
200 4,720,817
201 4,720,818
219 4,720,819
CLASS 366
221 4,720,194
342 4,720,195
CLASS 368
76 4,720,820
108 4,720,821
115 4,720,822
190 4,720,823

CLASS 369
44 4,720,824
48 4,720,825
283 4,720,826
CLASS 370
4 4,720,827
85 4,720,828
CLASS 371
5 4,720,829
37 4,720,830
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CLASS 372
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45 4,720,834
50 4,720,835
96 4,720,836
CLASS 373
9 4,720,837
72 4,720,838
CLASS 378
37 4,720,196
CLASS 375
18 4,720,839
CLASS 376
248 4,720,369
285 4,720,840
422 4,720,370
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10 4,720,841
CLASS 378
49 4,720,842
99 4,720,843
101 4,720,844
CLASS 379
27 4,720,845
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90 4,720,849
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107 4,720,851
124 4,720,852
211 4,720,853
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354 4,720,855
393 4,720,856
430 4,720,857
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CLASS 380
23 4,720,859
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36 4,720,861
38 4,720,862
40 Re.32,580
42 4,720,863
43 4,720,864
49 4,720,865
67 4,720,866
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182 4,720,868
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2 4,720,869
11 4,720,870
42 4,720,871
CLASS 383
8 4,720,872
CLASS 384
49 4,720,197
246 4,720,198
282 4,720,199
CLASS 400
59 4,720,200
124 4,720,201
208 4,720,202
CLASS 401
84 4,720,203
24 4,720,204
140 4,720,205
361 4,720,206
CLASS 404
90 4,720,207
97 4,720,208
CLASS 405
36 4,720,209
79 4,720,210
154 4,720,211
176 4,720,212
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33 4,720,220
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36 4,720,224
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360 4,720,231
4,720,232
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CLASS 415
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170 A 4,720,238
181 4,720,239
219 C 4,720,240
CLASS 416
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188 4,720,243
224 4,720,244
CLASS 417
28 4,720,245
83 4,720,246
373 4,720,248
392 4,720,247
477 4,720,249
CLASS 418
84 4,720,250
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10 4,720,371
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67 4,720,372
245 4,720,373
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CLASS 423
175 4,720,375
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5 4,720,378
10 4,720,379
40 4,720,380
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70 4,720,382
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86 4,720,385
88 4,720,386
472 4,720,387
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101 4,720,253
208 4,720,254
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405 H 4,720,256
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231 4,720,388
250 4,720,391
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573 4,720,390
CLASS 427
54.1 4,720,392
58 4,720,393
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98 4,720,404
100 4,720,397
208.2 4,720,398
221 4,720,399
243 4,720,400
329 4,720,401
362 4,720,402
327 4,720,403
410 4,720,405
CLASS 428
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36 4,720,407
43 4,720,408
46 4,720,409
136 4,720,410
141 4,720,411
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152 4,720,415
195 4,720,416
203 4,720,417
209 4,720,418
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4,720,421
232 4,720,422
313.5 4,720,423
323 4,720,424
360 4,720,425
344 4,720,426
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373 4,720,428
407 4,720,429
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493 4,720,433
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698 4,720,437
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114 4,720,439
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1 4,720,441
2 4,720,442
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192 4,720,445
213 4,720,446
244 4,720,447
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338 4,720,449
339 4,720,450
379 4,720,451
567 4,720,452
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74 4,720,265
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6 4,720,454
7 4,720,455
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253 4,720,461
260 4,720,460
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42 4,720,464
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173 4,720,470
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CLASS 439
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90 4,720,269
108 4,720,155
181 4,720,270
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271 4,720,271
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668 4,720,274
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861 4,720,276
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37 4,720,284
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101 4,720,488
171 4,720,489
210 4,720,490
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222 4,720,492
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58 4,720,509
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139 4,720,511
CLASS 523
112 4,720,512
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351 4,720,514
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173 4,720,524
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479 4,720,588
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65 4,720,590
328 4,720,591
342 4,720,592
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528 4,720,594
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724 4,720,596
814 4,720,597
908 4,720,598
CLASS 570
226 4,720,599
CLASS 585
330 4,720,600
377 4,720,601
407 4,720,602
431 4,720,603
445 4,720,604
CLASS 604
192 4,720,285
CLASS 623
6 4,720,286

CLASSIFICATION OF DESIGNS

D1—	106	293,730		522	293,750		415	293,769		94	293,788		163	293,807		96	293,826
	199	293,731		536	293,751		453	293,770			293,789		199	293,808	D27—	11	293,827
D2—	150	293,732		661	293,752	D10—	75	293,771		103	293,790		219	293,809	D28—	7	293,828
	301	293,733		570	293,753	D11—	126	293,772		102	293,791	D22—	132	293,810		9	293,829
D3—	30.1	293,734		595	293,754		181	293,773		105	293,792	D23—	213	293,812		35	293,830
	38	293,735		601	293,755		104	293,774		106	293,793		218	293,815		38	293,831
	42	293,736	D7—	73	293,756			293,775		107	293,794		238	293,816		76	293,832
	43	293,737		101	293,757	D12—	129	293,776		116	293,795		263	293,811			293,833
	73	293,738		312	293,758		192	293,777	D15—	1	293,796		271	293,813			293,834
		293,739			293,759		317	293,778		123	293,797		277	293,814			293,835
		293,740			293,760	D13—	24	293,779		143	293,798		286	293,817			293,836
	101	293,741		317	293,761	D14—	1	293,780	D16—	11	293,799	D24—	17	293,818		83	293,837
D4—	121	293,742		391	293,762		6	293,781		32	293,800		19	293,819		87	293,838
D6—	160	293,743	D8—	62	293,763			293,782	D17—	11	293,801		31	293,820		94	293,839
	381	293,744		327	293,764		53	293,783	D21—	23	293,802		54	293,821	D29—	17	293,840
	382	293,745		330	293,765		78	293,784		87	293,803	D25—	113	293,822	D32—	31	293,841
	448	293,746		356	293,766		84	293,785			293,804	D26—	6	293,823		73	293,842
	450	293,747	D9—	347	293,767		86	293,786			293,805		29	293,824	D34—	8	293,843
		293,748		400	293,768		88	293,787			293,806		30	293,825	D99—	28	293,844
	519	293,749															

CLASSIFICATION OF PLANTS

P.—	6,083		74	6,084		76	6,085		88	6,086	

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PATENTS

01 :	4,719,672		4,720,176		4,720,858		4,720,314		4,720,042		4,720,284
	4,720,097		4,720,177		4,720,863		4,720,690		4,720,136		4,720,291
	4,720,263		4,720,190		4,720,871		4,720,739		4,720,137		4,720,356
	4,720,302		4,720,199	08 :	4,719,844		4,720,809		4,720,148		4,720,362
	4,720,373		4,720,216		4,719,845		4,720,812		4,720,418		4,720,449
	4,720,615		4,720,219		4,720,044		4,720,841		4,720,435		4,720,450
	4,720,771		4,720,222		4,720,108	13 :	4,719,673		4,720,460		4,720,482
04 :	4,719,696		4,720,223		4,720,406		4,719,700		4,720,508		4,720,532
	4,719,831		4,720,229		4,720,778		4,719,713		4,720,548		4,720,560
	4,719,846		4,720,234		4,720,798		4,720,415		4,720,596		4,720,625
	4,719,935		4,720,275		4,720,873		4,720,571	19 :	4,719,717		4,720,627
	4,720,059		4,720,288	09 :	4,719,705		4,720,853		4,720,021		4,720,633
	4,720,129		4,720,321		4,719,813	15 :	4,720,022		4,720,122		4,720,637
	4,720,209		4,720,351		4,719,965	16 :	4,720,116	20 :	4,719,660		4,720,642
	4,720,410		4,720,385		4,720,000	17 :	4,719,663		4,719,954		4,720,712
	4,720,856		4,720,388		4,720,048		4,719,667		4,720,125		4,720,747
[redacted] :	4,719,650		4,720,389		4,720,075		4,719,686		4,720,257		4,720,764
	4,719,652		4,720,391		4,720,224		4,719,733		4,720,358		4,720,782
	4,719,656		4,720,392		4,720,236		4,719,788		4,720,359		4,720,840
	4,719,668		4,720,395		4,720,237		4,719,793		4,720,461		4,720,866
	4,719,678		4,720,414		4,720,339		4,719,818	21 :	4,720,232	26 :	4,719,651
	4,719,681		4,720,421		4,720,353		4,719,918		4,720,286		4,719,653
	4,719,685		4,720,439		4,720,584		4,719,923		4,720,477		4,719,665
	4,719,711		4,720,458		4,720,689		4,719,933		4,720,653		4,719,677
	4,719,720		4,720,459		4,720,701		4,720,011	22 :	4,719,848		4,719,718
	4,719,743		4,720,462		4,720,768		4,720,037		4,720,377		4,719,727
	4,719,773		4,720,467		4,720,769		4,720,038		4,720,533		4,719,736
	4,719,778		4,720,470	10 :	4,720,298		4,720,112		4,720,574		4,719,769
	4,719,809		4,720,474		4,720,366		4,720,123		4,720,631		4,719,770
	4,719,824		4,720,502		4,720,374		4,720,143	23 :	4,719,877		4,719,786
	4,719,825		4,720,590		4,720,384		4,720,198		4,719,901		4,719,794
	4,719,834		4,720,611		4,720,400		4,720,249		4,720,012		4,719,796
	4,719,841		4,720,628		4,720,537		4,720,295		4,720,396		4,719,801
	4,719,849		4,720,640		4,720,600		4,720,336	24 :	4,719,697		4,719,815
	4,719,852		4,720,662		4,720,623		4,720,370		4,719,969		4,719,847
	4,719,858		4,720,672	11 :	4,720,504		4,720,403		4,720,128		4,719,892
	4,719,876		4,720,677	12 :	4,719,761		4,720,479		4,720,473		4,719,893
	4,719,899		4,720,687		4,719,772		4,720,536		4,720,489		4,719,943
	4,719,952		4,720,692		4,719,798		4,720,579		4,720,494		4,719,951
	4,719,956		4,720,698		4,719,828		4,720,612		4,720,543		4,720,013
	4,719,971		4,720,713		4,719,839		4,720,618		4,720,699		4,720,026
	4,719,972		4,720,745		4,719,870		4,720,762		4,720,706		4,720,030
	4,720,008		4,720,775		4,719,872		4,720,774		4,720,711		4,720,069
	4,720,027		4,720,789		4,719,913		4,720,802		4,720,780		4,720,071
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	4,720,034		4,720,797		4,720,004		4,720,854		4,719,810		4,720,092
	4,720,040		4,720,804		4,720,009	18 :	4,719,740		4,719,864		4,720,119
	4,720,093		4,720,805		4,720,023		4,719,765		4,719,874		4,720,133
	4,720,109		4,720,807		4,720,098		4,719,851		4,719,925		4,720,142
	4,720,115		4,720,830		4,720,154		4,719,875		4,719,938		4,720,144
	4,720,140		4,720,831		4,720,156		4,719,911		4,720,110		4,720,145
	4,720,159		4,720,839		4,720,215		4,719,957		4,720,160		4,720,146
	4,720,170		4,720,857		4,720,246		4,720,018		4,720,183		4,720,231

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293,743 09 : 293,781 293,763 293,825 39 : 293,731 293,747
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06 : 6,083 12 : 6,084

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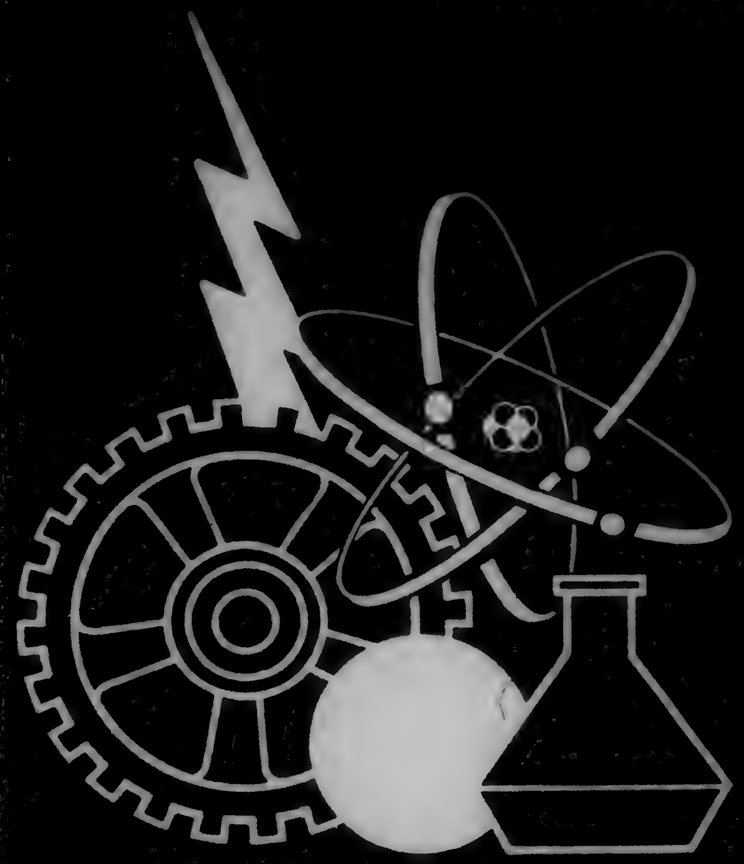
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 30 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected uner PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 31 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Nov. 17, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Change in Location of PCT International Services Division

The PCT International Services Division of the Office of Patent and Trademark Services is scheduled to move from Crystal Plaza 2, Room 7A04, to Crystal Plaza 6, 12th floor, in February 1988. It is anticipated that some disruption in service may result, such as in the ability of the Division to immediately forward corrections of informalities under PCT Article 14 to the International Bureau. Applicants are urged to promptly submit responses to invitations to correct Article 14 defects which are due during the first quarter of calendar 1988, as delay could cause the correction not to reach the International Bureau in time for international publication.

Applicants are reminded that technical preparations for publication are completed by the International Bureau before 15 days prior to international publication and that registered air mail takes approximately five working days to reach the International Bureau from the United States.

Moreover, applicants are cautioned that if a response to an invitation to correct an Article 14 informality is joined together with a request for rectification of an obvious error under PCT Rule 91, the rectification may require the authorization of the International Searching Authority, thus somewhat delaying the forwarding of the response to the International Bureau. Also, any PCT Rule 91 correction must be authorized prior to the expiration of 17 months from the priority date [PCT Rule 91(g)].

In cases in which there may be a question under PCT Article 11 as to whether or not an international application may be accorded an international filing date, in order to prevent possible loss of rights under the Paris Convention, applicants are urged during the first quarter of calendar 1988 to submit international applications to the United States Receiving Office before the end of the priority year under PCT Article 8. If an international filing date under Article 11 cannot be accorded and the priority year has expired, applicant's rights under the Paris Convention may be lost.

The mailing address and telephone number of the PCT International Services Division will remain the same:

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Area Code 703, 557-2003.

Assistance of applicants during the period of the move will be greatly appreciated.

THERESA A. BRELSFORD,
Dec. 23, 1987. *Assistant Commissioner for Administration.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 22, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,494,245 through 4,495,656
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 8, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,413,362	06/328,824	11/8/83
4,413,363	06/356,185	11/8/83
4,413,365	06/308,984	11/8/83
4,413,367	06/389,095	11/8/83
4,413,368	06/318,830	11/8/83
4,413,369	06/291,453	11/8/83

Patent Number	Serial Number	Issue Date
4,413,374	06/273,203	11/8/83
4,413,381	06/283,670	11/8/83
4,413,382	06/228,283	11/8/83
4,413,386	06/338,979	11/8/83
4,413,387	06/266,439	11/8/83
4,413,417	06/363,157	11/8/83
4,413,421	06/368,730	11/8/83
4,413,429	06/275,662	11/8/83
4,413,435	06/221,165	11/8/83
4,413,436	06/384,093	11/8/83
4,413,439	06/348,270	11/8/83
4,413,443	06/343,879	11/8/83
4,413,445	06/372,488	11/8/83
4,413,446	06/294,105	11/8/83
4,413,447	06/242,806	11/8/83
4,413,450	06/282,658	11/8/83
4,413,452	06/281,456	11/8/83
4,413,467	06/393,126	11/8/83
4,413,476	06/220,175	11/8/83
4,413,481	06/399,300	11/8/83
4,413,486	06/358,190	11/8/83
4,413,488	06/219,371	11/8/83
4,413,489	06/303,211	11/8/83
4,413,492	06/307,755	11/8/83
4,413,499	06/311,004	11/8/83
4,413,503	06/365,752	11/8/83
4,413,508	06/300,101	11/8/83
4,413,513	06/268,759	11/8/83
4,413,516	06/360,108	11/8/83
4,413,529	06/303,247	11/8/83
4,413,532	06/362,885	11/8/83
4,413,544	06/340,579	11/8/83
4,413,553	06/295,881	11/8/83
4,413,563	06/267,551	11/8/83
4,413,565	06/373,122	11/8/83
4,413,566	06/288,827	11/8/83
4,413,569	06/261,421	11/8/83
4,413,577	06/439,695	11/8/83
4,413,580	06/268,634	11/8/83
4,413,584	06/269,079	11/8/83
4,413,586	06/380,246	11/8/83
4,413,592	06/428,134	11/8/83
4,413,598	06/233,652	11/8/83
4,413,600	06/367,682	11/8/83
4,413,607	06/247,598	11/8/83
4,413,617	06/362,586	11/8/83
4,413,618	06/318,174	11/8/83
4,413,622	06/333,373	11/8/83
4,413,626	06/266,168	11/8/83
4,413,629	06/370,858	11/8/83
4,413,638	06/359,690	11/8/83
4,413,639	06/391,596	11/8/83
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4,413,651	06/295,205	11/8/83
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4,414,131	06/457,781	11/8/83
4,414,151	06/282,902	11/8/83
4,414,156	06/310,577	11/8/83
4,414,158	06/255,411	11/8/83
4,414,166	06/336,650	11/8/83
4,414,181	06/317,712	11/8/83
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4,414,333	06/315,473	11/8/83
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4,414,359	06/342,670	11/8/83
4,414,366	06/384,857	11/8/83
4,414,374	06/269,298	11/8/83
4,414,375	06/300,189	11/8/83
4,414,384	06/388,049	11/8/83
4,414,399	06/485,313	11/8/83
4,414,413	06/332,797	11/8/83

Patent Number	Serial Number	Issue Date
4,414,418	06/379,718	11/8/83
4,414,429	06/343,290	11/8/83
4,414,441	06/364,641	11/8/83
4,414,444	06/234,546	11/8/83
4,414,445	06/292,251	11/8/83
4,414,464	06/276,759	11/8/83
4,414,473	06/236,804	11/8/83
4,414,480	06/331,524	11/8/83
4,414,499	06/311,122	11/8/83
4,414,501	06/267,274	11/8/83
4,414,520	06/359,663	11/8/83
4,414,522	06/374,496	11/8/83
4,414,542	06/265,016	11/8/83
4,414,600	06/332,469	11/8/83
4,414,610	06/222,028	11/8/83
4,414,632	06/251,825	11/8/83
4,414,659	06/259,796	11/8/83
4,414,670	06/306,843	11/8/83
4,414,673	06/390,331	11/8/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,214,062, Re. S.N. 121,207, Filed Nov. 16, 1987, Cl. 525/470, POLYCARBONATE FILMS OF LOW FLAMMABILITY AND IMPROVED STRESS CRACK RESISTANCE, Rudolf Binsack, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 151

4,583,933, Re. S.N. 121,154, Filed Nov. 16, 1987, Cl. 425/330, MOLD FOR FORMING A FIBER REINFORCED COMPOSITE WHEEL CONSTRUCTION, James A. Woelfel, et al., Owner of Record: *Motor Wheel Corp., Lansing, Mich.*, Attorney or Agent: Robert A. Choate, et al., Ex. Gp.: 134

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Errata

The following registration number was inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of Jan. 31, 1978.

925,011 TM 311 Jan. 31, 1978

Consequently, the above-identified registration is still active.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.
Dec. 17, 1987.

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Nov. 3, 1987, was listed inadvertently.

1,463,816 TM 146 Nov. 3, 1987

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.
Dec. 16, 1987.

The following registration number was inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of Dec. 15, 1987.

1,153,107 TM 195 Dec. 15, 1987

Consequently, the above-identified registration is still active.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.
Dec. 17, 1987.

Patent Terms Extended Under 35 USC 156

Certificates extending the terms with respect to the following patents were issued under the provisions of 35 USC 156 on Dec. 22, 1987.

Patent No. Re. 30,811, granted Dec. 1, 1981, to Stanley J. Dykstra, et al., Owner of Record: Mead Johnson and Co., Title: SUBSTITUTED PIPERIDINES THERAPEUTIC PROCESS AND COMPOSITIONS, Classification: 514–331, Product Trade Name: ENKAID, Term Extended: 2 years

Patent No. 3,632,645, granted Jan. 4, 1972, to John Bernard Bream, et al., Owner of Record: Sandoz Pharmaceuticals Corp., Title: SUBSTITUTED PHENYLACETYL DERIVATIVES OF GUANIDINE, O-ALKYLISOUREAS, S-ALKYLISOTHIOUREAS AND P-NITROBENZYLISOTHIOUREA, Classification: 558–5, Product Trade Name: TENEX, Term Extended: 2 years

Patent No. 3,786,160, granted Jan. 15, 1974, to Wayne E. Barth, Owner of Record: Pfizer Inc., Title: USE OF 2-HYDROXYMETHYL-3-HYDROXY-6-(1-HYDROXY-2-AMINOETHYL)-PYRIDINES AS BRONCHODILATORS, Classification: 514–351, Product Trade Name: EXIREL, Term Extended: 2 years

Patent No. 3,920,818, granted Nov. 18, 1975, to Martin Steinman, Owner of Record: Schering Corp., Title: 1-POLYFLUOROALKYL-1,4-BENZODIAZEPIN--2-THIONES FOR EFFECTING TRANQUILIZATION, SEDATION AND TREATING CONVULSIONS, Classification: 514–221, Product Trade Name: DORMALIN, Term Extended: 2 years

Patent No. 4,167,574, granted Sept. 11, 1979, to Frans Janssens, Owner of Record: Janssen Pharmaceutica, N.V., Title: N-PHENYL-N-(4 PIPERIDINYL) AMIDES, Classification: 514–326, Product Trade Name: ALFENTA, Term Extended: 2 years

Patent No. 4,234,579, granted Nov. 18, 1980, to Wayne E. Barth, Owner of Record: Pfizer, Inc., Title: PENICILLANIC ACID 1,1-DIOXIDES AS BETA - LACTAMASE INHIBITORS, Classification: 514–192, Product Trade Name: UNASYN, Term Extended: 2 years

Patent No. 4,418,208, granted Nov. 29, 1983, to Adrian Nunn, et al., Owner of Record: E. R. Squibb & Sons, Inc., Title: N-SUBSTITUTED IMINODIACETIC ACIDS, Classification: 562–449, Product Trade Name: CHOLETEC, Term Extended: 53 days

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Status of PTO Services

The following is an update of the status of PTO services for December 1987:

Service Item	FY 1988 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	29
Trademarks	30	43
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	2
Mail Coupons	12	6
Letter Orders	16	11
Certified Copies:		
Trademark Registrations	21	28
Applications-As-Filed	17	16**
File-Wrapper/Contents	N/A	29
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	43
Filing Reg. Certificates	Issue Date	Issue Date
Assignments:		
Recording Patent Assignments	20	27***
Receipt Date of Patent Documents Returned		Oct. 30, 1987
Recording Trademark Assignments	20	22
Receipt Date of Trademark Documents Returned		Dec. 11, 1987
Avg. Days from Issue Fee Payment to Issue Date	90-100	88
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	0% on Issue Date****
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.
** The 5% of orders for which fiche are not on site are not included in calculations.
*** Monthly average processing time reduced by 13 days.
**** Deliveries running 4 weeks late due to new GPO printing contractor start-up problems. Improvement expected over the next two months.

HELPFUL HINTS

- *Trademark Post Registration Helpful Hints — Section 8 Affidavit or Declaration Held Insufficient During Post Registration Examination* — The Trademark Act of 1946, Section 8(a) was amended Aug. 27, 1982, Public Law 97-247 (96 Stat. 317), to clarify that the continued use required to be shown in the sixth year under Section 8(a) be use "in commerce." Subsequently the Trademark Rules were amended on Jan. 28, 1983 (48 *Federal Register* 3977), to require that all Section 8(a) affidavits or declarations "state that the registered mark is in use in commerce and specify the nature of such commerce." [37 C.F.R. Section 2.162(e)].

  Some applicants under Section 8(a) are not complying with the requirements that the affidavit or declaration state that the mark is in use "in commerce," and "specify the nature of such commerce." The Office cannot accept an affidavit under Section 8(a) which does not comply with the Act and, if the defect is not corrected before the end of the sixth year, the registration in question will be canceled.

  While the Post Registration Division will allow up to six months to respond to a letter from the Office, a supplemental or substitute affidavit or declaration required by Section 8(a) will not be considered unless it is received before the expiration of the six year anniversary of the registration. It is suggested that registrants file Section 8(a) applications as early as possible between the fifth and sixth year following registration to allow time to submit an affidavit or declaration which is correct, if required.

  Signatures — The corporate title of the affiant/declarant is often missing. Occasionally, the affidavit/declaration is unsigned.

  Assignments — It will speed up the processing of Section 8 affidavits and renewal applications if the affiant/declarant will furnish the reel and frame number and the date(s) of recordation with the USPTO Assignment Section of any relevant assignment, merger, change of name, or other transfer.

  Fees — Many of the affidavits and applications for renewal contain insufficient fees. The fee schedule for these transactions done in the Post Registration area is listed below:

(a) For filing an application for renewal of a registration, per class $300.00
(b) For filing an affidavit under Section 8 of the Act, per class $100.00
(c) For filing an affidavit under Section 15 of the Act, per class $100.00
(d) For filing a combined affidavit under Sections 8 and 15 of the Act, per class $200.00

- *Avoiding Delays in Assignments for New Patent Applications* — The automated patent assignment system is dependent upon bibliographic information that is keyboarded to produce filing receipts and to create records in the PALM system. When assignments are filed before the filing receipt has been produced, their processing is delayed until the bibliographic information is keyed and vertified. Applicants should wait to file assignment documents for new patent applications until the filing receipt is produced to avoid delays.

Jan. 4, 1987

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

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PATENT NOTICES

Certificates of Correction for the Week of Jan. 26, 1988

Re. 32,272	4,635,343	4,668,347	4,682,985
Re. 32,426	4,637,931	4,668,399	4,683,883
D. 290,798	4,639,371	4,668,635	4,684,025
D. 291,494	4,642,467	4,670,058	4,684,554
4,052,966	4,645,333	4,670,583	4,685,122
4,293,307	4,647,388	4,670,656	4,685,199
4,301,461	4,647,423	4,670,700	4,686,474
4,370,337	4,647,968	4,671,642	4,686,752
4,383,841	4,654,435	4,672,589	4,687,309
4,417,042	4,654,874	4,673,559	4,687,644
4,493,450	4,655,486	4,674,115	4,688,593
4,499,293	4,655,701	4,675,332	4,688,842
4,513,674	4,655,847	4,676,399	4,689,755
4,525,237	4,656,516	4,677,198	4,692,843
4,525,639	4,656,784	4,677,553	4,693,537
4,557,902	4,657,278	4,677,875	4,693,584
4,598,985	4,657,682	4,678,149	4,693,587
4,599,479	4,659,862	4,678,602	4,693,881
4,605,697	4,660,236	4,679,341	4,694,290
4,608,927	4,660,820	4,679,473	4,695,176
4,614,712	4,661,633	4,679,814	4,695,181
4,615,295	4,661,945	4,680,079	4,695,191
4,620,744	4,664,356	4,680,128	4,695,978
4,622,544	4,664,404	4,681,090	4,696,640
4,623,701	4,664,576	4,681,602	4,696,708
4,623,708	4,664,659	4,682,019	4,697,059
4,625,556	4,665,076	4,682,207	4,697,731
4,627,037	4,665,179	4,682,307	4,698,524
4,629,209	4,666,820	4,682,628	4,699,729

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box_____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition). Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.
Box 8	All papers for the Office of the Solicitor.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box AF	Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.
Box FWC	Mail related to File Wrapper and Continuations.
Box Interference	Communications relating to interferences and applications and patents involved in interferences.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 19, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	1-12-87
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-23-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-20-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during December 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,543,308 to 3,551,900, inclusive
Plant Patents . . . . . Numbers 3,008 to 3,010 inclusive

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REEXAMINATIONS

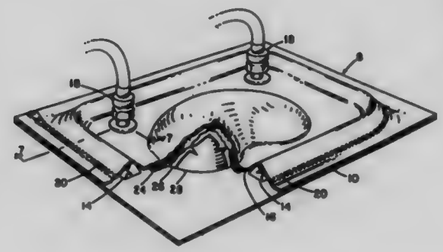
JANUARY 26, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,287,015 (811th)
VACUUM BAG USED IN MAKING LAMINATED PRODUCTS

Harold J. Danner, Jr., 2455 F St., SE. Apt. 106, Auburn, Wash. 98002

Reexamination Request Nos. 90/000,882, Oct. 16, 1985 and 90/000,950, Feb. 3, 1986.
Reexamination Certificate for Patent No. 4,287,015, issued Sep. 1, 1981, Ser. No. 733,107, Oct. 18, 1976.
Filed Feb. 3, 1986, Ser. No. 733,107
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—382



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–5 are cancelled.

[1. A vacuum bag like assembly used in making laminated products in which laminates are adhesively secured together, comprising:

(a) an air tight base plate on which laminations with their applied adhesives are placed;

(b) an air tight upstanding ribbing structure continuously affixed to the air tight base plate and well spaced inwardly from the perimeter of the air tight base plate to surround laminations with their applied adhesives;

(c) a stretchable air tight vacuum bag membrane to be laid across laminations with their applied adhesives and to be extended beyond to completely contact the continuous full length of the air tight upstanding ribbing structure and to be held securely at selected locations along the perimeter of the air tight base plate, while being well stretched into continuous firm air sealing contact with the air tight upstanding ribbing structure, thereby completing a vacuum bag like assembly;

(d) fastening means to secure the stretchable air tight vacuum bag membrane to the air tight base plate along selected portions of the perimeter; and

(e) vacuum means secured in part to the vacuum bag like assembly, whereby a vacuum may be drawn within the vacuum volume determined by the air tight base, the continuous air tight upstanding ribbing structure, and the stretchable air tight vacuum bag membrane, in respect to the continuous air tight seal created along the top of the air tight upstanding ribbing structure.]

B1 4,506,222 (812th)
METHODS OF PRODUCING IMAGE INFORMATION FROM OBJECTS

William A. Edelstein, Schenectady, N.Y.; James M. S. Hutchison; Glyn Johnson, both of Aberdeen, Scotland; Thomas W. T. Redpath, Stonehaven, Scotland, and John R. Mallard, Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Reexamination Request No. 90/001,233, Jan. 4, 1987.
Reexamination Certificate for Patent No. 4,506,222, issued Mar. 19, 1985, Ser. No. 320,953, Nov. 9, 1981.
PCT No. PCT/GB81/00044, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02768, PCT Pub. Date Oct. 1, 1981
PCT Filed Mar. 13, 1981, Ser. No. 320,953
Claims priority, application United Kingdom, Mar. 14, 1980, 8008773
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 3 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2 and 4–9, dependent on an amended claim, are determined to be patentable.

1. A method of deriving image information from an object using nuclear magnetic resonance signals comprising:

subjecting an object to a continuous static magnetic field along an axis and carrying out a set of sequential steps which comprise:

(1) selectively exciting nuclear spins in a selected plane in the presence of a first gradient of the static magnetic field, the direction of said first gradient being perpendicular to said plane;

(2) reversing the direction of the said first gradient and applying a second gradient and a third gradient of the magnetic field, the direction of the second gradient being orthogonal to the direction of the first gradient, and the third gradient having a direction orthogonal to the directions of both the first and second gradients for phase encoding the selected nuclear spins in the direction of the third gradient, *the said first, second and third gradients being all applied simultaneously;*

(3) removing the third gradient and reversing the direction of the second gradient of the magnetic field and holding the said reversed second gradient for reading out the resultant free induction signal from the said object; and

then successively repeating the above set of sequential steps with different values of time integral of the third gradient,

there being a recovery interval between the repetition of successive sets of steps.

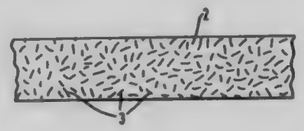
B1 4,543,288 (813th)
FIBRE REINFORCED PLASTICS SHEETS
Bronislaw Radvan, Flackwell Heath; William T. H. Skelding, High Wycombe, and Anthony J. Willis, Marlow, all of England, assignors to The Wiggins Teape Group Limited, United Kingdom
Reexamination Request No. 90/001,132, Nov. 24, 1986.
Reexamination Certificate for Patent No. 4,543,283, issued Sep. 24, 1985, Ser. No. 688,723, Jan. 4, 1985.
Filed Nov. 24, 1986, Ser. No. 688,723
Claims priority, application United Kingdom, Jan. 6, 1984, 8400291
Int. Cl.⁴ B32B *5/06*
U.S. Cl. 428—297

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2 and 6 are cancelled.

Claims 1, 3, 5 and 7 are determined to be patentable as amended.

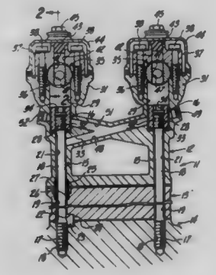
Claim 4, dependent on an amended claim, is determined to be patentable.



1. A solid fibre reinforced plastics material sheet [comprising] *consisting essentially of* 20% to 60% by weight of *glass* reinforcing fibres having a high modulus of elasticity [(as herein defined)], a substantial proportion of the fibres being *single discrete fibers* between 7 and 50 millimeters long and 13 microns or less in diameter, and 40% to 80% by weight of a thermoplastics material.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

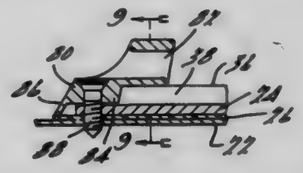
Re. 32,582
CYLINDER HEAD FASTENING STRUCTURE FOR INTERNAL COMBUSTION ENGINES
Yorio Futakuchi, Shizuoka, and Nobuaki Oshiro, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Original No. 4,430,968, dated Feb. 14, 1984, Ser. No. 363,636, May 7, 1982. Application for reissue May 28, 1985, Ser. No. 738,376
Claims priority, application Japan, Mar. 31, 1981, 56-48968
Int. Cl.⁴ F01L *1/46*
U.S. Cl. 123—90.27 **31 Claims**



22. In a construction for an overhead cam internal combustion engine comprising a cylinder head adapted to be affixed to another component of the engine by at least one fastener having a tool receiving portion for tightening thereof and having a bearing cap affixed to the cylinder head and rotatably journaling the overhead camshaft, the improvement comprising said bearing cap having a portion overlying said fastener tool receiving portion, and means defining an access opening passing through said bearing cap and adapted to pass a tool for tightening of said fastener without removal of said bearing cap.

Re. 32,583
ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES
John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236
Original No. 4,427,141, dated Jan. 24, 1984, Ser. No. 443,024, Nov. 19, 1982. Continuation of Ser. No. 242,138, Mar. 9, 1981, abandoned, which is a continuation of Ser. No. 56,373, Jul. 10, 1979, abandoned, which is a division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. Application for reissue Jan. 15, 1986, Ser. No. 819,053
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.⁴ B60R *9/00*
U.S. Cl. 224—326 **31 Claims**

1. An article carrier for an automobile comprising
a plurality of at least two parallel arranged slats disposed on a generally horizontally extending exterior body surface of the automobile and lying closely against said surface, *at least two of said slats being fixedly secured directly to said automobile on said surface independently of one another by separate primary fastening means which separately secures each slat directly to said automobile without contact with any other slat;*
each of said *at least two* slats having major and minor transverse dimensions, with said major dimension being arranged substantially parallel to said body surface and said minor dimension being arranged substantially perpendicular to said body surface, each of said *at least two* slats having a generally horizontally arranged upper article supporting surface adapted to have articles supported directly thereupon, and



a pair of end members disposed one at each end of at least one of said *at least two* slats,
at least one of said end members comprising means for securing articles to said article carrier and including means for securing said slat and said end member to said exterior body surface.

Re. 32,584
METHOD AND COMPOSITION FOR GENERATING NITROGEN GAS
John F. Pietz, Mesa, Ariz., assignor to Talley Industries, Inc., Mesa, Ariz.
Original No. 3,895,098, dated Jul. 15, 1975, Ser. No. 258,271, May 31, 1972. Application for reissue Sep. 12, 1984, Ser. No. 649,573
Int. Cl.⁴ C01B *21/00*
U.S. Cl. 423—351 **23 Claims**

1. A solid composition for generating nitrogen gas substantially free of noxious and toxic impurities *for inflating an air cushion in a vehicle passenger restraint system and capable of substantially fully inflating such cushion in the elapsed time between the occurrence of a primary collision of the vehicle with another object and secondary collisions occurring as a result thereof,* comprising essentially a mixture of alkali metal azide and at least a stoichiometric amount of a metal oxide selected from the group consisting of iron, titanium and copper oxides and mixtures thereof, said metal oxide being capable of reacting exothermically with the alkali metal azide and wherein the metal of the oxide is lower in the electromotive series than the alkali metal of the azide and is a metal other than [the] *an* alkali *metal.*

6. A method for rapidly generating pure nitrogen gas *to inflate an air cushion in a vehicle passenger restraint system whereby such cushion is substantially fully inflated between the occurrence of a primary collision of the vehicle with another object and secondary collisions occurring as a result thereof where such restraint system includes a gas generation apparatus having such air cushion attached to it,* comprising:
a. [providing] *placing in such gas generating apparatus* a homogeneous mixture comprising essentially solid granular alkali metal azide and at least a stoichiometric amount of a metal oxide in solid granular form selected from the group consisting of iron, titanium, and copper oxides and mixtures thereof, said metal oxide being capable of reacting exothermically with the alkali metal azide, the metal of the oxide being lower in the electromotive series than the alkali metal of the azide and the metal of the oxide being other than an alkali metal; and
b. raising the temperature of the mixture sufficiently to ignite it.

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PLANT PATENTS

GRANTED JANUARY 26, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,087
ROSE PLANT—MEIKROTAL VARIETY
Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Aug. 20, 1985, Ser. No. 767,784
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of ground cover rose plant characterized by the following combination of characteristics:
(a) forms attractive semi-double blossoms which are cherry red on the upper surface and carmine red on the under surface,
(b) forms in abundance dark glossy foliage,
(c) exhibits an arching growth habit which forms a plant having a greater width than height,
(d) exhibits good hardiness, and
(e) exhibits good resistance to fungal diseases;
substantially as herein shown and described.

6,088
ROSE-PLANT—MEICOUBLAN VARIETY
Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Aug. 22, 1985, Ser. No. 768,360
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of ground cover rose plant characterized by the following combination of characteristics:
(a) forms in abundance attractive, fully double blossoms which are generally white in coloration,
(b) forms dark glossy foliage,
(c) exhibits a spreading growth habit which forms a plant having a greater width than height,
(d) exhibits good cold hardiness, and
(e) exhibits good resistance to fungal diseases;
substantially as herein shown and described.

6,089
CARNATION NAMED MEI SOL
Giacomo Nobbio, San Remo, Italy, assignor to Klemm & Sohn, Stuttgart-Muhlhausen, Fed. Rep. of Germany
Filed Nov. 15, 1985, Ser. No. 798,302
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—70 1 Claim

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its high productivity of Dianthus purple flowers supported singly on a upright peduncle, the flowers being further characterized by having petals which have smooth margins of a light color, approximating magenta.

6,090
CHRYSANTHEMUM NAMED "BLUE REFLA"
Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Netherlands Antilles
Filed Sep. 12, 1985, Ser. No. 775,407
Claims priority, application Netherlands, Sep. 14, 1984, CHR 928
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinctive variety of Chrysanthemum named Blue Rafla as described and illustrated in the foregoing specification and accompanying drawings.

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PATENTS

GRANTED JAN. 26, 1988

ERRATA

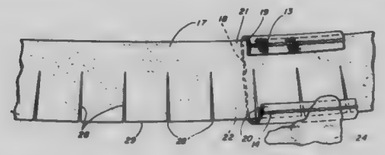
For CLASS	See PATENT NO.
437-192	4,720,908
057-210	4,720,943
362-308	4,721,093
296-097	4,721,310
439-328	4,721,348
210-616	4,721,585
524-139	4,721,774
071-088	4,721,786
362-080	4,722,023

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GRANTED JANUARY 26, 1988

GENERAL AND MECHANICAL

4,720,874
INTERLINING MATERIAL WITH SLITS FOR FACINGS
Warren N. Crawford, Lincolnwood, Ill., assignor to Quick Service Textiles, Inc., Chicago, Ill.
Filed Jul. 23, 1985, Ser. No. 758,206
Int. Cl.[4] A41F 9/02
U.S. Cl. 2—221 17 Claims

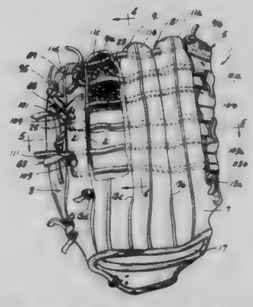


1. A facing for a garment comprising:
(A) a first material comprising an elongated strip of stretchable fabric with first and second long edges having a set of slits therein spaced apart from each other, each of said slits in said set extending across part of the width of said strip from said first edge toward said second edge, each of said slits in said set ending prior to reaching said second edge; and
(B) a second material comprising a stretchable, elongated fabric with third and fourth long edges and having a greater width than said first material, placed in contact with said first material with said third and fourth edges substantially parallel to and folded over said first and second edges, respectively.

8. A garment comprising:
(A) a shell having a first edge; and
(B) a facing in contact with said shell and in proximity to said first edge and having:
(1) a first material comprising an elongated strip of fabric with second and third long edges having a set of slits therein spaced apart from each other, each of said slits in said set extending across part of the width of said strip from said second edge toward said third edge, each of said slits in said set ending prior to reaching said third edge; and
(2) a second material comprising a stretchable elongated fabric with fourth and fifth long edges and having a greater width than said first material, placed in contact with said first material and said shell with said fourth and fifth edges substantially parallel to and folded over said second and third edges, respectively,
said third and fifth edges being stitched to each other and to said shell in close proximity and parallel to said first edge and said second and fourth edges being parallel to said fifth edge but lying further from said first edge than said third and fifth edges.

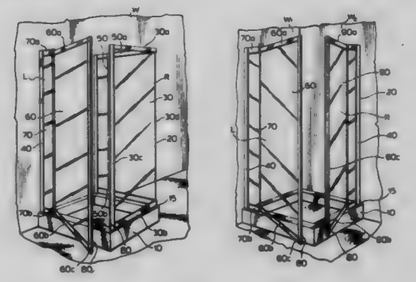
4,720,875
BASEBALL GLOVE WITH ADJUSTABLE WEB AND FINGER STALLS
Roland N. Latina, Belleville, Ill., and Robert L. Clevenhagen, Ava, Mo., assignors to Figgie International Inc., Richmond, Va.
Filed Jan. 15, 1987, Ser. No. 3,632
Int. Cl.[4] A41D 13/08
U.S. Cl. 2—19 11 Claims

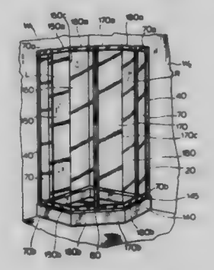
1. A baseball or softball glove comprising front and back walls joined together to form thumb and first-through-last finger stalls separated by intervening crotches, a web between the thumb and the first finger stall, upper lacing interconnecting the thumb stall, web and finger stalls at their upper ends, and lower lacing interconnecting the thumb stall, web and finger stalls between their upper and lower ends, said lower lacing comprising a plurality of reaches of lacing lying in generally parallel planes extending generally at right angles to the finger stalls and spaced above the crotches at intervals along the finger stalls, each reach running continuously along a curvilinear path, as viewed from above the glove, through openings in



the thumb stall, web and finger stalls, the depth of the web relative to the thumb stall and the first finger stall and the spacings between the individual finger stalls being readily adjustable by tightening or loosening said reaches of lower lacing.

4,720,876
SHOWER DOOR SYSTEM
Vincent Tomei; Alfred MacLean, both of Toronto; Michel Morand, Montreal, and John Faveri, Toronto, all of Canada, assignors to Fasco Products Division of Indal Limited, Downsview, Canada
Filed Aug. 11, 1986, Ser. No. 895,677
Int. Cl.[4] A47K 3/22
U.S. Cl. 4—614 42 Claims





1. In combination a shower stall structure for bathtubs or

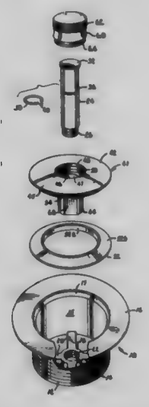
shower basins having a top and bottom comprising at least one opening extending from top to bottom defined by a multiplicity of stiles, each stile extending in both a horizontal and vertical direction abutting an adjacent wall or stile, wherein said at least one opening is closed by more than one closure member spanning across said at least one opening, having pivot mechanisms carried by both said multiplicity of stiles and said more than one closure member at the peripheral extremities thereof wherein said pivot mechanisms are adjustable in position along the respective peripheral edges of at least one of said multiplicity of stiles and said more than one closure member, allowing for dimensional variation of said at least one opening with respect to the dimensions of the corner in which the shower stall is installed.

4,720,878
DISMANTLABLE EVAPORATIVE COOLING SHOWER
Stephen G. Viner, 1066 S. Ogden Dr., Los Angeles, Calif. 90019
Filed Dec. 8, 1986, Ser. No. 939,067
Int. Cl.[4] A47K *3/22*; A47G *23/02*
U.S. Cl. 4—615 4 Claims



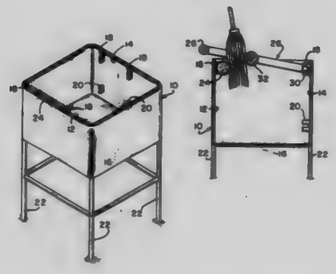
1. A portable water shower assembly comprising: a vertically-extending water feed pipe including at least two dismantlable pipe sections and bearing an interconnected showerhead at its upper end in water flow communication with said feed pipe; a multiple pipe joint connector having a vertically-extending leg and at least three horizontal radially-extending, uniformly-spaced legs, said vertically-extending leg interconnected to the lower end of said water feed pipe; base pipe sections closed at their respective outer ends and interconnected in water flow communication at their inner ends to the radially-extending legs of said pipe joint connector for supporting said water feed pipe in its vertical orientation; and means for introducing water to said assembly for passage through the pipe sections of said water feed pipe to and through said showerhead and for filling said base pipe sections to provide ballast at the base of said shower assembly to maintain said assembly in its vertical orientation during periods of use.

4,720,877
DRAIN CLOSURE
Robert R. Watts, Rte. 2, Box 153, Blue Springs, Mo. 64015
Continuation of Ser. No. 572,741, Jan. 23, 1984, abandoned. This application Jan. 7, 1986, Ser. No. 816,701
Int. Cl.[4] A47K *1/14*; E03C *1/26*
U.S. Cl. 4—286 10 Claims



1. A drain closure for controlling a drain having a strainer body, said drain closure comprising:
- a post adapted to be mounted to the strainer body, said post having an annular groove therein;
- a stopper mounted on said post for sliding movement thereon between open and closed positions, said stopper having a bore in which said groove is enclosed at all positions of said stopper between the open and closed positions;
- seal means on said stopper adapted to seal against the strainer body in the closed position of said stopper and to release from the strainer body in the open position of said stopper; and
- a curved spring element formed by an interrupted metal ring fitted in said groove in a compressed state and expanding outwardly against said stopper within said bore thereof by spring action to exert a spring force on the stopper which maintains said stopper in the open position when the stopper is moved thereto, said spring element providing the sole force acting to hold said stopper in the open position and being overcome by a predetermined force applied to said stopper in a direction to move same toward the closed position.

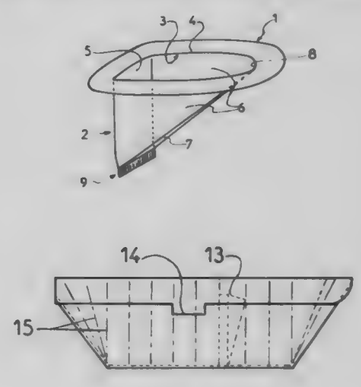
4,720,879
UTILITY SINK WITH PULL-THROUGH ROLLERS
Philipp Rabben, P.O. Box 477, Hallandale, Fla. 33009
Filed Apr. 30, 1987, Ser. No. 44,159
Int. Cl.[4] A47K *1/04*
U.S. Cl. 4—619 4 Claims



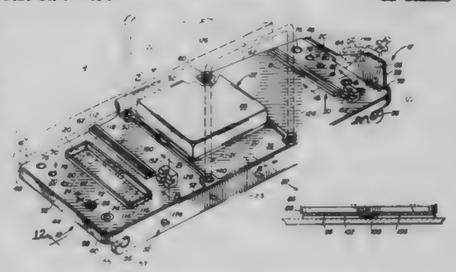
1. A utility sink of generally rectangular shape, having side, forward and rear walls and a bottom surface,
- a drain means positioned in said bottom surface, said drain means connectable with a disposable drainage system,
- removable mop wringing means,
- fixed pivot retainers for said wringing means on said front and rear walls,
- a plurality of fixed legs having the same length supporting said sink in an elevated position;
- said pivot retainers further comprising a base fixedly attached to a wall of the sink,
- parallel upper and lower projections extending from said base perpendicularly from said wall toward the opposite wall, said projections each having a plane horizontal surface in apposition with each other separated by an interplanar space of fixed dimension,
- a horizontal partially cylindrical bushing surface within said base axially parallel to the wall of attachment and to the bottom surface of the sink, and having a cylindrical diameter larger than said interplanar distance, wherein said bushing merges with said apposite plane surfaces;
- said removable wringer means further comprising a cylindrical roller having an axle insertable in said retainers through the said interplanar spaces of said retainers, and
- a pivotable roller arm assembly comprising an elongate handle, two equal parallel arms projecting perpendicularly from the opposite ends of the handle, a compression roller axially supported between said arms, and snap pivot pins projecting from the distal ends of said arms toward each other along a single imaginary axis.

4,720,880
PROTECTIVE LINING FOR TOILETS PROVIDED WITH SEATS
Jean-Paul Barreau, 16 rue de Livet, 49300 Cholet, France
Filed Nov. 25, 1985, Ser. No. 802,169
Claims priority, application France, Jan. 22, 1985, 85 01103
Int. Cl.[4] A47K *17/00*; A61G *9/00*
U.S. Cl. 4—661 22 Claims

1. A protective lining for toilets, said toilets having a toilet seat, said lining made of biodegradable material and comprising:
- (a) a flange adapted to be positioned on said toilet seat; and
- (b) a bag integral with said flange, said bag being substantially water-tight and adapted to be placed in said basin, said bag comprising at least two substantially planar walls fixedly attached to one another at one end to form a bag bottom;
- wherein said bag comprises an internal transverse partition for separating urine from defecation, said partition being located in a front half of said bag;
- wherein said lining comprises means for folding said lining along a plurality of fold lines, said means for folding comprising bellows for fitting said lining into basins having a variety of shapes and sizes.



4,720,881
ANESTHESIA ACCESSORIES
William K. Meyers, P.O. Box 191, Payson, Ariz. 85541
Filed Sep. 8, 1986, Ser. No. 904,368
Int. Cl.[4] A61G *13/00*
U.S. Cl. 5—434 12 Claims



1. An anesthesia accessories unit adapted to be supported on an operating room table for use by an anesthesia provider during surgical procedures, comprising:
- (a) a primary tray assembly supported on one end of the operating room table adapted to receive a head portion of a patient on a central portion thereof;
- (b) a support hole assembly placed on one side of the primary tray assembly to receive and hold syringe members and the like therein;
- (c) a head rest assembly mounted on said central portion of said primary tray assembly having a head rest cushion that is adjustable for changing the angle of the patient's head;
- (d) an attachment assembly connected to a portion of said primary tray assembly adapted to receive and support accessories thereon; and
- (e) an intravenous tubing holder connected to said primary tray assembly;
- (f) said intravenous tubing holder assembly including a tube holder assembly and a stop cock holder assembly; and
- (g) said tube holder assembly having a holder support body provided with a triangular cavity to receive and hold a tube member therein.

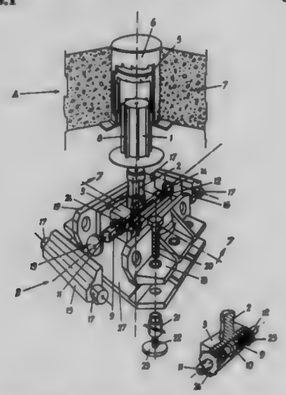
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4,720,882

ANTISEISMIC STOP DEVICE FOR BRIDGE AND VIADUCT GIRDER STRUCTURES

Pellegrino Gallo, No. 3, Via Eleonora Duse, 00197 Rome, Italy

Filed Jan. 30, 1986, Ser. No. 824,062
Claims priority, application Italy, Feb. 4, 1985, 47638 A/85
Int. Cl.[4] E01D *19/08*
U.S. Cl. 14—16.1 8 Claims



1. An antiseismic stop device for bridge and viaduct girder structures, on which of any of said structures, said girder rests on the piers, said device comprising:

a first and a second stop means for each single bridge girder arranged respectively at a point corresponding to a girder slidably connected to a first pier and at a point corresponding to another girder, rigidly connected to a second pier;

each of said stop means being arranged centrally with respect to the intrados of said girder and comprising a central body with a parallelepiped-shaped base resting at its lower face, on sliding members, said sliding members including a coupling of a spherical convex member with a concave seat provided on the bottom plate;

said central body having, at its upper part, vertical pin means adapted for slidably coupling into a first cylindrical seat which is rigidly connected to a counterbox, said counterbox being, in turn, slidably arranged within a second cylindrical seat rigidly connected to said girder structure;

said body having at its upper part a vertical pin means and a longitudinal hole for receiving a threaded piston means at its end portions, said piston means being slidably housed within said longitudinal hole and having a central drum-shaped portion dividing said longitudinal hole into two chambers containing a high viscosity fluid, and hollow cylindrical means at opposite sides of the external end portions of the piston means;

said cylindrical means being externally threaded to engage with said end portions of said hole, the end portions of said piston being convex-shaped which coupled with plate members having concave external seat portions;

impact members having side surfaces for slidably coupling with said concave seat portions, said impact members provided for absorbing longitudinal forces, said impact members being rotatably housed by means of pins within two impact elements, each having a vertical flange extending parallel to the piston axis and a horizontal flange provided at their lower face with a plurality of longitudinal teeth, each tooth engaging within a groove of a bottom plate, fastening means being provided to fasten said impact elements to said bottom plate and to the pier head; and

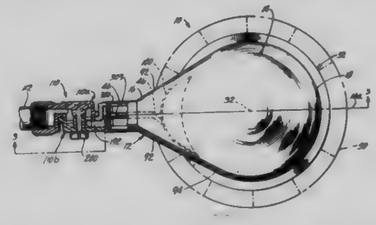
a plurality of layers of hard reinforced rubber materials being interposed between said impact elements and said parallelepiped-shaped base body.

4,720,883

INTERCHANGEABLE ROTARY SCRUB BRUSH NOZZLE WITH SWIVEL

George Sanchez, Chatsworth, Calif., assignor to Clyde Industries Limited, New South Wales, Australia

Filed Aug. 21, 1986, Ser. No. 899,320
Int. Cl.[4] A46B *13/06*; F16L *27/00*
U.S. Cl. 15—4 10 Claims



1. A fluid cleaning apparatus including interchangeable fluid driven rotary scrub brush head and high pressure fluid nozzle, each having an individual fluid inlet for receiving the fluid, and a fluid supply tube, the apparatus comprising:

a fluid passing first swivel part on the fluid supply tube for passing therethrough fluid received from the supply tube;

a fluid passing second swivel part for mounting the head for passing received fluid to the fluid input of the head; and

a fluid passing third swivel part for mounting the nozzle and for passing received fluid to the fluid inlet of the nozzle;

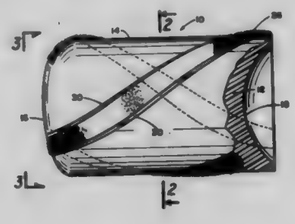
the second and third swivel parts being individually, interchangeably coupled to the first swivel part for receiving and passing fluid passed by the first swivel part, the second and third swivel parts further being adapted for angularly adjusting, respectively, the brush head and the nozzle, relative to the first swivel part and about an axis transverse to the fluid supply tube.

4,720,884

CLEANING PIG WITH DEBRIS FLUSHING ACTION

Gene R. Ralls, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Jan. 29, 1987, Ser. No. 9,143
Int. Cl.[4] B08B *9/04*
U.S. Cl. 15—104.061 9 Claims



1. A cleaning pig for use in a pipeline to be moved through a pipeline by the flow of fluid therethrough comprising:

a cylindrical pig body of external diameter slightly greater than the internal diameter of the pipeline for which the pig is dimensioned, the pig body having a forward end and a rearward end;

a plurality of spaced apart shallow depth channels formed in said pig body cylindrical surface, each channel being in a spiral pattern, each channel extending from adjacent said forward end of said pig body to adjacent said rearward end; and

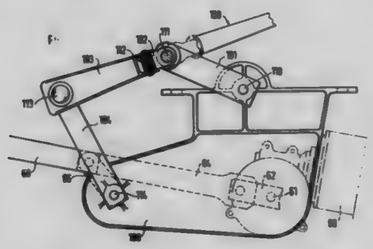
an elongated narrow brush member positioned in each of said channels, each brush member having bristles which extend generally radially outwardly from said pig body and to a diameter greater than said pig body cylindrical surface, the width of said brush members being less than the width of said channels providing at least one fluid flow passageway within each of said channels.

4,720,885

WIPING ARRANGEMENT FOR WINDOWS OF VEHICLES

Andre Leroy, Mons, Belgium, and Jean M. Flamme, Belceil, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 796,578, Nov. 8, 1985, Pat. No. 4,683,605. This application May 6, 1987, Ser. No. 16,989
Claims priority, application Belgium, Nov. 14, 1984, 901052
Int. Cl.[4] B60S *1/02*
U.S. Cl. 15—250.21 8 Claims



1. A wiping arrangement for windows of vehicles, comprising a wiper arm which carries a wiping blade; drive means providing a rotary movement; and swinging transmission means arranged to change the rotary movement of said drive means into a complex alternating movement to said wiper arm, said swinging transmission means including a pushing crank transmission and a subsequently arranged spatial five-link linkage having one degree of freedom, said five-link linkage having five rigid transmission members and hinges connecting said transmission members with one another, said wiper arm being fixedly connected with a rod of said five-link linkage, said transmission members including a frame arranged stationarily with respect to the body of the vehicle, or including the body itself of the vehicle, a swinging member which is connected with said frame via a hinge formed as a pivotal connection, a first rod which is connected with said swinging member via one of said hinges, a second rod which is connected with the first rod via another of said hinges, and a swinging lever driven by said pushing crank transmission, said swinging lever connected with said second rod via a further of said hinges and also connected via still a further of said hinges formed as a pivotal connection with said frame, said hinges provided on said frame being arranged at a distance from one another, said hinge between one of said rods and one of its adjoining members being a spherical one and said hinge between this rod and its other adjoining member being formed as a pivotal connection the axis of which is obliquely located with respect to the axis of one at least of the other pivotal connections comprised in said spatial, five-link linkage.

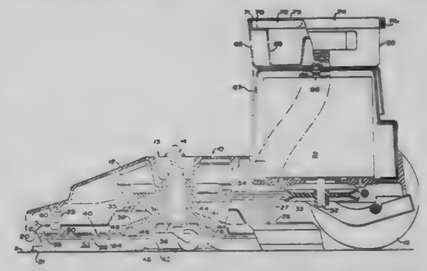
4,720,886

FLOOR POLISHING MACHINE

Rick McLeod, Lake in the Hills, and Gary E. Palmer, Roselle, both of Ill., assignors to Hako Minuteman, Inc., Addison, Ill.

Filed Oct. 17, 1986, Ser. No. 920,714
Int. Cl.[4] A47L *11/204*
U.S. Cl. 15—352 3 Claims

1. In a high speed floor burnishing machine, the combination comprising a pad driver assembly including a pad adapted to contact the floor; a motor for rotating said pad driver assembly at high angular velocity; means for generating a continuous air flow outwardly of said rotating driver assembly for entraining debris generated by said rotating driver assembly; shroud means enclosing said driver assembly; collection means including a filter in fluid communication with said shroud means for receiving said air flow and entrained debris and defining a



generally upright wall having at least a portion being generally cylindrical for routing said air and entrained debris in a generally circular pattern, and further including an upwardly inclined surface for further routing said air toward said filter for filtering out dust and light material from said air, and means for trapping heavier material adjacent the termination of said upwardly inclined surface.

4,720,887

UPPER FILL TUBE CONFIGURATION

Nick M. Bosyj, North Canton, and Donald B. Tschudy, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Continuation-in-part of Ser. No. 820,963, Jan. 22, 1986, abandoned. This application Aug. 25, 1986, Ser. No. 900,003
Int. Cl.[4] A47L *9/14*
U.S. Cl. 15—351 4 Claims



1. An upper fill tube configuration for a vacuum cleaner including;

(a) a flexible bellows for said cleaner extending from a fan of said cleaner,

(b) a bellows adapter tube attached to and fluidly communicating with said flexible bellows and being disposed thereabove,

(c) a duct disposed at least partially above said tube,

(d) said flexible bellows and adapter tube being inserted into said duct and said adapter tube being attached thereto for assembly,

(e) a second tube disposed above said adapter tube and

(f) said second tube being tapered at its lower end on its

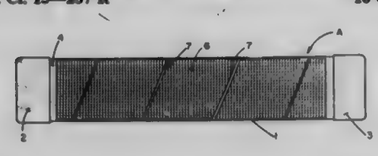
outer surface to provide inserted sealing with an internal tapered portion on said flexible bellows.

4,720,888

WIPING AND CLEANING PAD GRIPPER

John A. Mesz, 7010 Heege Ave., Apt. 206, St. Louis, Mo. 63123

Filed May 9, 1986, Ser. No. 861,581
Int. Cl.[4] B41F *35/00*
U.S. Cl. 15—257 R 10 Claims



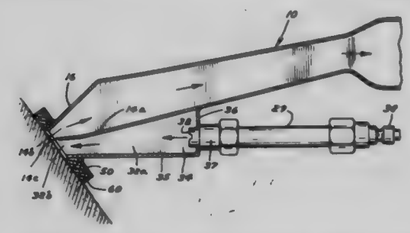
1. A wiping and cleaning pad adhering apparatus for use in holding a pad of material for application in cleaning the surface of a printing plate, proof, film, or the like, the apparatus including a length of bar means having sufficient width to facilitate its grasping by the user, said bar means having at least a pair of surfaces, a hook connecting means permanently applied substantially to at least one of the said surfaces and disposed for gripping onto the pad of material and retaining the same as it is rolled onto the bar means in preparation for usage and application for a cleaning function, said hook connecting means being applied substantially over the length of said bar means, adhesive means securing said hook connecting means to said bar means, said bar means having portions extending laterally to either side of the said applied hook connecting means, said extending portions designed for functioning as hand gripping means for facilitating the operator's holding of the apparatus during usage.

4,720,889

PERIMETER SEAL STRUCTURE FOR A CLEANING HEAD

Dale L. Grave, 125 Queensland La., North, Plymouth, Minn. 55447

Filed Apr. 24, 1987, Ser. No. 42,020
Int. Cl.[4] A47L *11/30*
U.S. Cl. 15—322 11 Claims



1. In connection with a surface covering material cleaning machine, a nozzle structure comprising

a housing member substantially rectangular in transverse section having a vertically tapered forward terminal portion,

said housing having a vacuum chamber and a cleaning chamber therein,

a cleaning fluid line extending into said cleaning chamber,

an adjustable air port into said cleaning chamber,

a flange disposed about said terminal portion adjacent the end portion thereof,

a seal member removably disposed to overlie said flange,

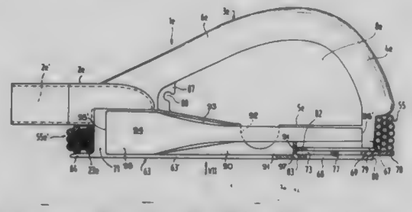
said seal member being arranged and constructed as to provide therethrough a predetermined admission of air, and said admission of air being balanced with the air admitted through said port.

4,720,890

VACUUM CLEANER HANDLE

Gernot Jacob, Weissach, Fed. Rep. of Germany, assignor to Progress-Elektrogeraete Mauz & Pfeiffer GmbH & Co., Fed. Rep. of Germany

PCT No. PCT/EP85/00420, § 371 Date Apr. 2, 1986, § 102(e) Date Apr. 2, 1986, PCT Pub. No. WO86/01089, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 16, 1985, Ser. No. 857,920
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430402
Int. Cl.[4] A47L *9/00, 9/32*
U.S. Cl. 15—323 24 Claims



1. A vacuum cleaner handle, said handle comprising:

a handle tube having a straight end portion; and

a handle member, said handle member including:

a connection part connected to said straight end portion of said handle tube;

a handle section having a first and a second end, said first end being connected to said connection member, said handle section extending substantially parallel along most of its length relative to said straight end portion of said handle tube and extending from said connection part; and

a holding part, said holding part including:

a handle bar member having a first end and a second end, said first end of said handle bar member being connected at said second end of said handle section, said handle bar member extending in a direction somewhat back towards said connection part at an acute angle with respect to said straight end portion of said handle tube; and

a connection member extending between and connecting said second end of said handle bar member and said connection part forming a one piece closed loop handle;

wherein at least a portion of said connection member extends at an angle relative to said handle bar member, whereby said handle member can be gripped at different angles relative to said handle tube by either said handle bar member of said connection member to facilitate manipulation of the handle.

4,720,891

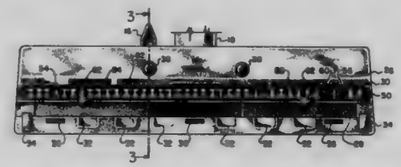
MEMBER WITH DEFORMABLE BRUSH RETAINING TABS

David B. Rennecker, Canton, and Clyde E. Hill, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Oct. 20, 1986, Ser. No. 920,431
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—371 2 Claims

1. A resiliently mounted movable brush strip and bottom plate arrangement wherein; said bottom plate includes an elongated air slot and an elongated brush strip slot, said brush strip slot being disposed parallel to and spaced transversely to said air slot, a common wall extending in an elongated direction between said slots and bordering one edge of each of them, a second wall bordering another side of said brush strip slot

and extending in said elongated direction, a resilient means disposed in said brush strip slot for resiliently urging said brush strip outwardly of said brush strip slot, said common wall being continuous and unrelieved in its elongated direction and having at least one tab portion extending from it transversely over a portion of said brush strip slot, said tab portion being relatively non deformable for retaining and leveling said brush strip in said slot, said second wall also being continuous except



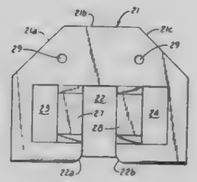
for being relieved at spaced locations to form relatively deformable spaced tabs having notches on their opposite sides that extend transversely over a portion of said brush strip slot for aiding in leveling said brush strip in said slot and for deformably permitting passage of said brush strip into said slot during mounting of it whereby said walls form a protective well and an alignment arrangement for said brush strip and said resilient means while still sealing off said brush strip slot from said air slot.

4,720,892

BRUSH ROLLER ATTACHMENT REPAIR KIT MEMBER AND METHOD OF REPAIRING A VACUUM CLEANER

Winfred C. Parker, and Randy L. Parker, both of 6220 Commodore La., Oklahoma City, Okla. 73132

Division of Ser. No. 789,736, Oct. 21, 1985, Pat. No. 4,662,027. This application Feb. 9, 1987, Ser. No. 12,390
Int. Cl.[4] A47L *9/08*
U.S. Cl. 15—392 3 Claims



1. A subcombination for use in a repair kit for vacuum cleaners for replacement of a worn key slot in a vacuum cleaner housing comprising:

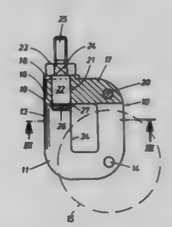
a U-shaped attachment plate member having a central elongated opening in a lengthwise direction of the plate member sized to a key slot dimension and having elongated slots to either side of said central elongated opening disposed between the upper end of the plate member and the U-shaped bend in the plate member where said central elongated opening extends through the U-shaped bend in the attachment plate member.

4,720,893

CASTER

Dieter Mellwig, Wermelskirchen, and Wilfried Kurbjuhn, Radevormwald, both of Fed. Rep. of Germany, assignors to Albert Schulte Söhne GmbH & Co., Wermelskirchen, Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,444
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509863; Feb. 14, 1986, 3604586
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—35 R 16 Claims



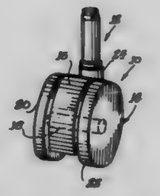
1. In a caster, the combination of a one-piece frame comprising two spaced-apart prongs and a substantially vertical web connecting said prongs to each other; a discrete supporting member disposed between and affixed to said prongs, said web and said supporting member having cooperating male and female coupling means; a wheel rotatably mounted in and disposed between said prongs, said supporting member including a brake shoe adjacent to the periphery of said wheel; means for moving said brake shoe toward and into engagement with the periphery of said wheel; a kingbolt rotatably journalled in said supporting memeber; and means for releasably locking said supporting member against rotation relative to said kingbolt, said locking means being reciprocable in said supporting member between operative and inoperative positions and said moving means including means for moving said locking means to said operative position in response to movement of said shoe toward and into engagement with the periphery of said wheel.

4,720,894

CASTER PINTLE HAVING A SLEEVE WITH A RING CENTERING MECHANISM

Richard Deasy, Torrance, and Henry J. Folson, Redondo Beach, both of Calif., assignors to ITW Limited, Fastex Division, Basingstoke, Great Britain

Continuation of Ser. No. 856,408, Apr. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 661,847, Oct. 17, 1984. This application Jul. 30, 1987, Ser. No. 81,619
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—37 2 Claims



1. A caster pintle comprising a metallic elongated cylindrical body with a reduced diameter portion formed at one end, a resilient non-metallic sleeve mounted on said reduced diameter portion, the outer end of said reduced diameter portion formed to retain said sleeve and fixedly retaining said sleeve onto said reduced diameter portion, said sleeve having a circumferential groove formed intermediate its ends, a plurality of radial out-

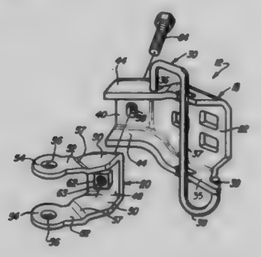
wardly protruding ribs of resilient deformable material integrally formed around said circumferential groove, a resiliently deformable friction ring mounted within said groove, the diameter of said circumferential groove being substantially smaller than the internal diameter of said friction ring in its normal unflexed condition and the outer end of said ribs being disposed on an imaginary circle having a diameter substantially the same as said internal diameter of said friction ring to thereby permit said friction ring to remain centered with respect to the axis of said cylindrical body while allowing said ring to be collapsed during the assembly of the caster pintle into a complementary socket.

4,720,895

QUICK-DISCONNECT DOOR HINGE

Russell H. Peebles, Grosse Pointe Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 14, 1986, Ser. No. 918,219
Int. Cl.[4] E05D *7/10, 11/10, 5/00*
U.S. Cl. 16—264 **5 Claims**



1. In an improved quick disconnect and connect hinge assembly of the type having a body half adopted to be secured to the body of a vehicle and a door half pivotally connected by a pintle pin about a vertical hinge axis to the body half, the improvement wherein:

said body half compriaes a main member adapted to be secured to said vehicle body and a U-shaped extension member pivotally connected by said pintle pin to said door half;

said body half main member having a mounting portion adapted to abut the vehicle body and a channel shaped portion including a bight wall and a pair of side flanges extending normal thereto;

said body half U-shaped extension member having a planar base wall and a pair of right angled side flanges, said base wall side flanges in the form of parallel legs projecting outwardly therefrom, each said leg terminating in a knuckle having a hole for the reception of said pintle pin,

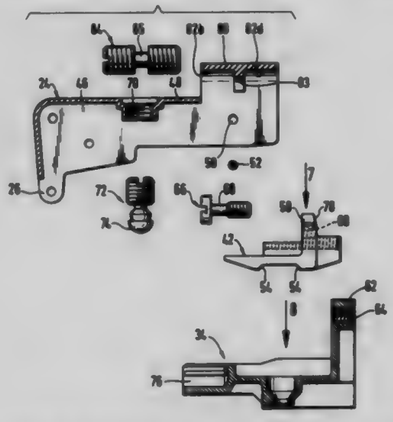
said body half main member channel-shaped portion sized to receive said body half U-shaped extension member in a juxtaposed nested manner, and aligned aperture means in said extension member base wall 3nd main member bight wall adapted to receive a single fastener therethrough such that said main member and said extension member are positively clamped together by said single fastener thereby obviating both separable and relative rotational movement between said members.

4,720,896

CABINET HINGE

Horst Lautenschläger, Reinheim, and Gerhard Lautenschläger, Brombach 1-Werres, both of Fed. Rep. of Germany, assignors to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,078
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516480
Int. Cl.[4] E05D *5/00*
U.S. Cl. 16—382 **6 Claims**



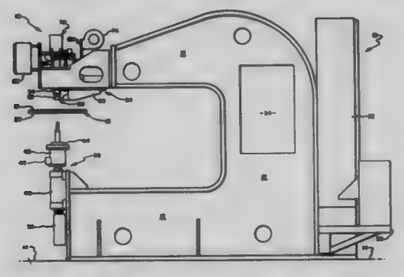
1. A hinge for pivotally connecting a door leaf to a cabinet carcase having a carcase frame projecting at right angles from carcase walls, the carcase frame having an edge defining a clear door opening, the door leaf when closed being inside the clear door opening; said hinge comprising: a cup for mounting in a recess in the door leaf, a mounting plate for mounting on the carcase frame, an elongated supporting arm adjustably mounted on said mounting plate end overreaching the edge of the carcase frame and having a free first and extending approximately at right angles from the mounting plate toward the cup, and extending into the cup when the door leaf is in the closed position, said supporting arm also having a second end remote from the first end, a four-joint mechanism having two hinge links, said hinge links having first ends pivotally mounted in said cup, and second ends pivotally mounted to said first end of said supporting arm, an intermediate piece at the second end of the supporting arm, said intermediate piece being arranged and releasably held on said mounting plate and on said supporting arm for displacement lengthwise of the supporting arm, a threaded spindle coupling said intermediate piece and said supporting arm, said spindle being disposed parallel to the direction of displacement of the arm and being in threaded engagement with one of said arm and intermediate piece, while being connected to the other one of said arm and intermediate piece so as to be rotatable, but non-displaceable axially relative thereto, said intermediate piece and said mounting plate each having a projection extending substantially at right angles to the direction of displacement of the supporting arm and reaching above the supporting arm, eahc projection having at least one bore each, said bores being aligned with each other, at least the bore in the projection of the mounting plate being a threaded bore, and a mounting screw having a shaft passing through said bores for joining the two projections, the projections lying one behind the other in the direction of displacement of the supporting arm, and the aligned bores running in the direction of displacement of the supporting arm, said second end of said supporting arm having a cutout to accommodate said projections.

4,720,897

AUTOMATIC FASTENING MACHINE WITH BRUSHLESS ELECTRIC MOTOR FOR DRILL SPINDLE DRIVE

William E. Orrell, West Seneca, and Mark J. Andrews, Niagara Falls, both of N.Y., assignors to Gemcor Engineering Corp., Buffalo, N.Y.

Filed Aug. 30, 1985, Ser. No. 771,368
Int. Cl.[4] B23P *23/02*; B23B *47/06*
U.S. Cl. 29—26 A **14 Claims**



1. In automatic fastening machine comprising a frame, drilling means carried by said frame for drilling a fastener receiving hole in a workpiece and means carried by said frame for installing a fastener in the hole drilled in said workpiece, said drilling means comprising a drill spindle having an axis of rotation and a drilling tool at one end thereof and rotatably mounted in a ram movable on said machine frame toward and away from the workpiece, the improvement comprising;

(a) a brushless synchronous a.c. servomotor including an output shaft having an axis of rotation, said motor having a torque range from about 40 lb.-in. to at least about 60 lb.-in., a speed range of from about 200 r.p.m. to at least about 5000 r.p.m., a low profile and small size and maximum weight of about 10 pounds and a cycling capability of about 30 times per minute; and

(b) means for connecting said motor directly to said drill spindle with the axis of rotation of said motor shaft coincident with the axis of rotation of said drill spindle.

4,720,898

REPLACEMENT OF SPLIT PINS IN GUIDE TUBES

Raymond M. Calfo, Braddock Hills; Raymond P. Castner, Monroeville, and George F. Dailey, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

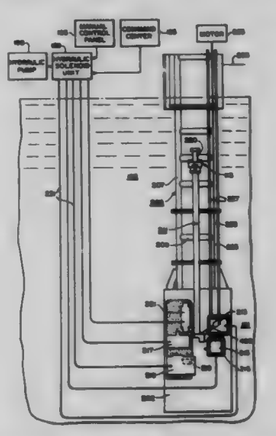
Filed Jan. 6, 1984, Ser. No. 817,857
Int. Cl.[4] B23P *6/00*
U.S. Cl. 29—33 K **20 Claims**

1. Apparatus for replacing the old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, said guide tube and said old split-pin assemblies being radioactive, the said apparatus including a work station submerged in a pool of water, a plurality of tools in said work station, each tool for carrying out an operation in the replacement of said old split-pin assemblies, by new split-pin assemblies, the said tools carrying out their respective operations (each herein designated as a "main operation") in a predetermined sequence, the said apparatus also including a comand center external to said pool for controlling said tools remotely to enable each tool to carry out its main operation in its turn, each main operation of each tool including a plurality of sub-operations to be carried out in a predetermined sequence to complete a main operation of each tool, each said tool including:

(a) means for carrying out each of its sub-operations in its turn, and

(b) means, responsive to the completion of each sub-operation, for conditioning the next sub-operation carrying-out means in the sequence to carry out automatically said next sub-operation; and

the said apparatus also including means, connected to said conditioning means of each said next sub-operation and to said command center, for actuating said carrying out means to carry out said each next sub-operation automatically whereby said sub-operations following conditioning on the completion of a prior sub-operation in the sequence



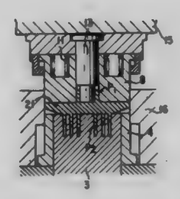
are carried out automatically each in its turn until the corresponding tool main operation is completed and each tool main operation is carried out each in its turn until the replacement of the old split-pin assemblies of said guide tube by new split-pin assemblies is completed.

4,720,899

METHOD OF MANUFACTURING SCROLL MEMBERS FOR USE IN A ROTARY COMPRESSOR

Hiroyuki Ando, Komatsu, and Isamu Matsumoto, Ishikawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,641
Claims priority, application Japan, Jun. 25, 1985, 60-136782
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R **5 Claims**

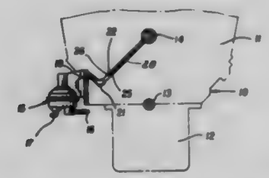


1. A method of manufacturing a scroll member for use in a rotary compressor, comprising the steps of:

heating a material which has been preformed into substantially frusta-conical body consisting of a flat upper surface portion having a cylindrical projection formed in the center portion thereof and consisting of a lower surface portion having a conical surface and a flat projecting bottom surface; and

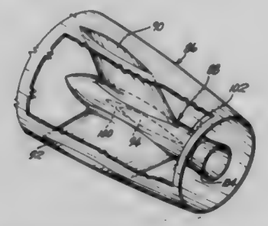
forging the material by a forging apparatus to apply a backward and forward extrusion to the material.

4,720,900
METHOD OF INSTALLING A FUEL PUMP
Oliver L. Perry, P.O. Box 1632, High River, Alberta, Canada TOL 1B0
Filed Jul. 16, 1986, Ser. No. 886,173
Int. Cl.[4] B23P 15/00, 7/00
U.S. Cl. 29—156.4 R 2 Claims



1. A method of replacing a fuel pump on an engine having a cam-operated fuel pump push rod and having a bolt engaged within a threaded opening in one end of the engine whose axis is aligned with said push rod and across the axis of the push rod when the push rod is in its proper operating position relative to a fuel pump arm, the method comprising the steps of removing said engine bolt from said threaded opening, installing in said threaded opening a push rod holding screw of sufficient length to contact the push rod, turning said holding screw in the threaded opening until the forward end of the holding screw engages the push rod and exerts holding pressure thereon, removing the existing fuel pump from the engine, installing a new fuel pump thereon with the arm of said pump properly engaging said push rod being held by the holding screw, removing the holding screw from said threaded opening, and reinstalling said bolt therein.

4,720,901
METHOD OF POSITIONING AN AIRCRAFT JET ENGINE NOISE SUPPRESSOR IN A CONVERGENT JET ENGINE NOZZLE
Joseph M. Johnson, Bothell, and Russell L. Thornock, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Division of Ser. No. 410,525, Aug. 23, 1982, Pat. No. 4,567,960.
This application Nov. 12, 1985, Ser. No. 797,152
Int. Cl.[4] B21D 53/00
U.S. Cl. 29—157 C 10 Claims



1. A method of positioning an aircraft jet engine noise suppressor in a convergent jet engine nozzle, that at a nozzle pressure ratio of about 2.0 for takeoff entrains sufficient ambient air for internal ventilation to provide adequate engine noise suppression, and at a nozzle pressure ratio of about 3.0 for cruise flight ambient air is substantially reduced or shut off without the aid of moving parts, comprising:
providing said nozzle, said nozzle having wall means longitudinally bounding a substantially open portion, the wall means converging toward a downstream exhaust end;
inserting and connecting vent means through said wall means and within said nozzle open portion, said vent means including duct means for carrying ambient air through the wall means, into the nozzle, and to the nozzle downstream end to mix with engine exhaust gas at takeoff;
said duct means having upstream inlet and downstream outlet ends;
fixing the inlet in the wall means to entrain ambient air during takeoff; and
fixing and positioning the outlet end of the duct means with respect to the nozzle exhaust end so that the entrained ambient air flows into the gas exhaust during takeoff to substantially reduce the engine noise and so that ambient air flow is substantially restricted or is shut off entirely during cruise flight; said duct means being of substantially decreased low drag configuration, relative to air flow therethrough and gas flow therearound, said duct means being continuously open between and at upstream and downstream ends and being fixed in shape and position.

4,720,902
ONE STEP TENSION EXPANDER AND METHOD OF USING
Kenneth P. Gray, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 22, 1986, Ser. No. 944,686
Int. Cl.[4] B21D 53/02
U.S. Cl. 29—157.3 C 6 Claims

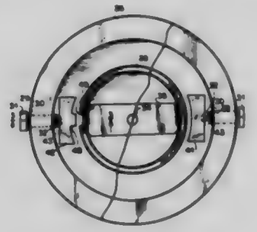


1. A method of tension expanding and then belling a partially assembled plate fin heat exchanger having a plurality of apertured plate fins parallelly spaced between two apertured tube sheets and a plurality of hairpin tubes extending through the apertures wherein the open ends of the tubes are positioned for the tension expansion and belling operation at a single manufacturing station, comprising the steps of:
locating the partially assembled plate fin heat exchanger in the single station so that a tube sheet proximate the open end of the tubes is adjacent a combination expanding and belling tool of the single station whereby the open end of the tubes are axially aligned with a row of tubes;
acting on a bend end of the hairpin tubes with a receiver means which matingly engages the bend end to bias the tube sheet proximate the open end of the tubes toward the expanding and belling tool so that a desired length of the tube extends beyond the proximate tube sheet:
expanding the walls of the hairpin tubes outwardly into contact with generally only the desired length of the tube extending beyond the proximate tube sheet and the tube sheet proximate the open end of the tubes with the expanding tool while the bend end is biased:
clamping the expanded walls of the hairpin tubes in a clamp means to prevent the hairpin tubes from moving while removing the receiver means from contact with said bend end and tension expanding the remainder of the hairpin tubes to lock the tubes against the fins and remaining tube sheet; and
unclamping the expanded walls of the hairpin tubes while again acting on a bend end with the receiver means and driving the belling tool into the open ends of the tubes to form radially expanded bells.

4. An aparatus for partially expanding in compression the hairpin tubes of a plate fin heat exchanger having a plurality of apertured plate fins parallelly spaced between two apertured tube sheets and the tubes extending through the apertures and then completing the expansion of the tubes in tension and then belling the tubes at a single operating station comprising:

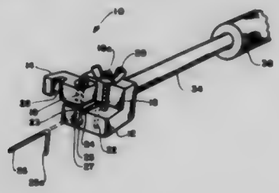
receiver means for engaging bend ends of the hairpin tubes, said receiver means being arranged to bias the hairpin tubes a desired length through a tube sheet proximate the open ends of the hairpin tubes:
expander means having an expander rod with an expander bullet arranged to pass through an axially aligned tube to expand the tube through said desired length in compression expansion;
clamping means for clamping the expanded tube along said desired length previously expanded, whereby said expander means completes expanding the tube its entire length in tension expansion, and
beller means movably mounted on said expander rod for belling said desired length in compression.

4,720,903
TOOL FOR ASSEMBLY AND DISASSEMBLY OF PLANETARY FOR AUTOMATIC TRANSMISSION
Sanford Lando, 44 Brookdale Ct., Highland Park, N.J. 08904
Filed Dec. 12, 1986, Ser. No. 940,888
Int. Cl.[4] B21D 39/00; B23P 11/00
U.S. Cl. 29—243.52 6 Claims



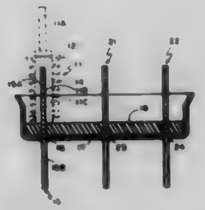
1. A tool for removing and forming a lance on a retainer of the planetary of an automatic transmission comprising:
(a) a circular base having a raised curved exterior section and a raised curved interior section spaced apart by a gap, said interior section having an indentation in the outer wall of said curved interior section;
(b) a first insert fittable within said gap having a curved front wall facing said interior section of the same curvature as said interior section;
(c) a second insert fittable within said gap having a protrusion in the front wall thereof capable of registering with such indentation; and
(d) means for exerting inward compression between said first and second inserts against said interior section.

4,720,904
HINGE PIN PULLER
Anthony M. Palla, Jr., 820 Hensler Dr., Charleston, W. Va. 25312
Filed Sep. 16, 1986, Ser. No. 907,778
Int. Cl.[4] B27B 27/02
U.S. Cl. 29—275 6 Claims



1. A tool head, comprising:

4,720,905
PIN RELEASING
Lionel J. Bibeault, 50 E. Kirkbrae Glen, Lincoln, R.I. 02865
Filed Oct. 16, 1986, Ser. No. 919,710
Int. Cl.[4] H01R 37/07; H01R 43/00
U.S. Cl. 29—446 10 Claims



1. Header apparatus comprising,
wall means for supporting throughpins,
at least one throughpin having an inside portion and an outside portion,
support means for supporting said throughpin in insulatedly separating relationship from said wall means,
releasable pin means formed with an opening for engaging said inside portion in conducting relationship,
meltable conducting material for electrically and mechanically connecting said releasable pin means to said inside portion,
mechanical stop means on said releasable pin means for obstructing expansion of spring means,
and spring means interposed between said mechanical stop means and said wall means in compression for propelling said releasable pin means away from said inside portion when said meltable conducting material melts in the presence of an overheated environment in which said header is located.

10. A method of making the header apparatus of claim 1 which method includes the steps of inserting said throughpin through an opening in said wall means surrounded with glass at the opening,
baking the glass at high temperature of the order of 2000° F.,
soldering said releasable pin means to the inside portion of said throughpin at a temperature of the order of 700° F.,
adding an epoxy layer to the inside of said wall means,
placing said spring means around said releasable pin means with one end bearing against said epoxy layer,
compressing said spring means,
and inserting said mechanical stop means in said circumferential annular groove,
and allowing said spring means to expand until the other end thereof engages said mechanical stop means.

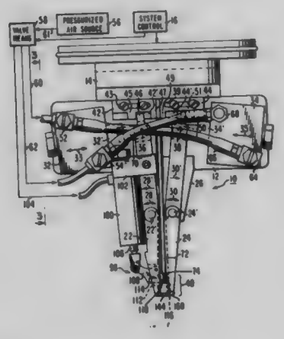
VOL 1086 ISS 4 JA 26 1988 UMI

4,720,906

PNEUMATIC INSULATION DISPLACEMENT TERMINAL WIRE INSERTION TOOL

Brian G. Kesler, Plainsboro, N.J., and George J. Whitley, Philadelphia, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 23, 1985, Ser. No. 779,099
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—566.1 16 Claims



1. A pneumatic wire insertion tool for inserting a wire into electrical engagement with an insulation displacement terminal (IDT) on a substrate, said terminal including a set of spaced tines extending in a given direction for receiving said wire at one end thereof and further including tine support structure at the other end thereof for securing said tines to a post extending approximately normal to said direction, said tool comprising:

a support adapted to be attached to an automatic insertion tool head which locates and moves the tool relative to said IDT;

a first element movably secured to the support having an open state and a terminal support state, said element including a portion having a groove therein adapted for receiving and mating with said tine support structure in said support state, said groove and support structure being dimensioned such that said receiving groove tends to align said tines relative to said groove;

a second element having an open state and a wire insertion state movably secured to the support spaced from the first element, said second element including a wire insertion member adapted to mate with said tines in said insertion state for pushing said wire into said electrical engagement with said aligned tines;

wire feed means secured to the support for feeding said wire between and aligned with said groove and said insertion member; and

pneumatic actuating means coupled to the support and elements for initially pneumatically moving said first element from its open state to its support state at a first rate sufficiently low to seat and align said tine support structure in said groove and thereby align said tines relative to said second element and for then pneumatically moving said second element in said insertion state at a second rate significantly greater than said first rate to push said wire into said engagement toward the first element, said first element supporting said tines at said tine support structure during said wire pushing.

4,720,907

IDENTIFICATION SYSTEM

Werner Rapp, Geislingen, Fed. Rep. of Germany, assignor to Euchner & Co., Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,392
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541676
Int. Cl.[4] G09F *11/02*
U.S. Cl. 29—568 23 Claims



1. System for marking and identification of objects, particularly work implements such as tools and work piece supports required in manufacturing processes, having modules with an electronically readable marking, which modules are to be arranged on the objects to be marked, and an evaluating device with at least one pick-up capable of reading the marking, whereby each module contains at least one oscillating circuit to produce a characteristic resonant frequency or resonant frequency combination, comprising:

(a) ten groups of modules of various resonant frequency or resonant frequency combination are provided, whereby each of these groups is associated with one of the numerals 0 through 9;

(b) the modules to be fixed to the object are selected and arranged according to the numeral selected for the marking of the object; and

(c) the surface of each module is provided with a numeral which anyone can read in the form of the numeral represented thereby which indicates the meaning of said module as a code element;

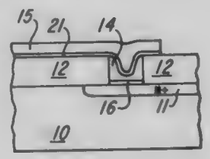
wherein said objects to be marked are provided with a support with depressions, particularly bores, arranged in a row to receive the modules for marking.

4,720,908

PROCESS FOR MAKING CONTACTS AND INTERCONNECTS FOR HOLES HAVING VERTICAL SIDEWALLS

Kendall S. Wills, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 11, 1984, Ser. No. 630,471
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—192 5 Claims



1. A method of making a semiconductor device comprising the steps of:

applying a coating of an insulator material on a face of a semiconductor body;

forming in said coating a contact hole having substantially vertical sidewalls;

depositing a first barrier layer of refractory metal over said contact hole so as to cover a bottom surface thereof;

depositing a first conductor on said face by an isotropic deposition method whereby said sidewalls are coated, and anisotropically etching said first conductor to leave said first conductor on the sidewalls;

depositing a second barrier layer of a refractory metal over said face, and covering said first conductor on the sidewalls of said contact hole;

depositing a second conductor coating on said face to substantially fill said contact hole, and

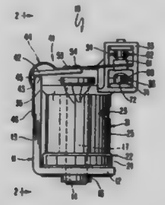
patterning said second conductor coating and said second barrier layer concurrently to leave a conductor strip on said face extending into said contact hole.

4,720,909

METHOD OF MANUFACTURING MINIATURE POWER SWITCHING RELAYS

Michael W. Knight, Fort Branch, and Paul G. Feil, Evansville, both of Ind., assignors to AMF Inc., White Plains, N.Y.

Division of Ser. No. 546,860, Oct. 31, 1983, Pat. No. 4,596,972.
This application Feb. 18, 1986, Ser. No. 830,117
Int. Cl.[4] H01H *49/00*
U.S. Cl. 29—606 10 Claims



1. A method for manufacturing relays which includes the step of attaching a core member to a core-supporting member, characterized in that said method further includes the step of extending said core member through a coil assembly comprising a non-conductive bobbin and a coil wound around said bobbin, and further characterized in that said attaching step comprises the step of thereafter press-fitting said core member and said coil assembly positioned thereon a selected distance into core-receiving means in said core-supporting member for mounting said core member and coil assembly thereon to said core-supporting member and for positioning said core member and said coil assembly relative to other components of said relay.

4,720,910

METHOD FOR PREPARING ENCAPSULATED CATHODE MATERIAL

John K. Rourke; Gerhart Schwab, both of Chillicothe, and Dale R. Shackle, Springboro, all of Ohio, assignors to MHB Joint Venture, Dayton, Ohio

Filed Jan. 16, 1987, Ser. No. 63,336
Int. Cl.[4] H01M *4/04*
U.S. Cl. 29—623.5 11 Claims

1. A method for preparing a cathode material comprising the steps of:

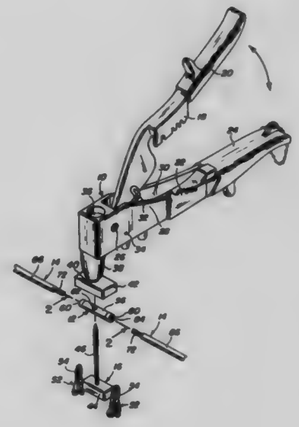
forming a dispersion of an insertion compound, and an inorganic salt in a solution of a polymer in a volatile solvent, and spray drying said dispersion to remove said solvent and thereby form particles having said insertion compound as a core material encapsulated in a polymeric shell containing said inorganic salt.

4,720,911

CONTACT PRESS TOOL AND ELECTRIC CONNECTOR

Iosif Tubasa, 1480 E. 17th St., Brooklyn, N.Y. 11230

Filed Apr. 16, 1986, Ser. No. 852,760
Int. Cl.[4] H01R *43/04, 4/24*
U.S. Cl. 29—752 4 Claims



1. An electric connector comprising:

(a) an outer housing of non conductive material and having a uniform outer cylindrical periphery;

(b) a sleeve of conductive material carried within said housing said sleeve being of shorter length than said outer housing and centrally disposed therein, whereby said sleeve accommodates a stripped wire and the portions of the housing on either side of the sleeve accommodates the unstripped wire, the ends of the sleeve forming stops for the insulation; and

(c) a hole of predetermined size transverse to a horizontal axis of said housing and said sleeve, centrally disposed along said axis concurrent with a diameter of said housing and passing entirely through said housing and said sleeve to accommodate a rod passing therethrough with compression members on either side of the rod to facilitate compression said housing and said sleeve to crimp the insulated and and unisulated parts of the wire inserted within the connector.

2. A gun-like contact press tool comprising: a first arm; a second arm pivotally mounted with respect to the first arm; spring means for spring connection of the two arms; a cylindrical member operated to extend between a retracted and an extended position by movement of said arms; a cylindrical cavity in said cylindrical member; means in said cavity for securing a rod inserted therein; an anvil with a central through hole connected to the cylindrical member, the through hole being aligned with the cavity, and a separate press member having a rod centrally disposed thereon and extending therefrom said rod receivable within the through hole and into the cavity for securement therein, whereby an electrical connector can be sandwiched between the anvil and the press member to be crimped upon operation of the arms with retracting the cylindrical member.

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4,720,912

MACHINE FOR PROVIDING CABLE LEAD ENDS WITH TIPS OR SIMILAR CONNECTING ELEMENTS BY CRIMPING (1)

Hans Fröhlich, Todiweg 46, D-7968 Wangen im Allgau, Fed. Rep. of Germany

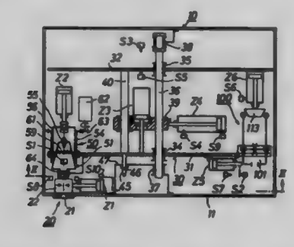
PCT No. PCT/EP85/00086, § 371 Date Nov. 7, 1985, § 102(e) Date Nov. 7, 1985, PCT Pub. No. WO85/04288, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 8, 1985, Ser. No. 800,603

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408772

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—753 **9 Claims**



1. A machine for fastening a connector to a cable end, the connector comprising a crimpable sleeve for surrounding the cable end, said sleeve comprising at least one collar and a tubular portion of smaller width than the collar width, said machine comprising:

(1) an inlet to receive the cable end;

(2) a crimping means for crimping said connector sleeve around said cable end;

(3) a supply container for the connectors; and

(4) means to feed separated individual connectors from the supply container, said feed means comprising, (a) a slide having two fingers spaced a distance between one and much less than two legnths of the connectors; and (b) a slide guide, the slide and slide guide comprising openings which permit only one connector to pass when the slide is moved transversely with respect to the slide guide; (c) a first finger in the feed means comprising a keyhole-shaped opening having a wide portion and a slot whose width is smaller than the collar width but larger than the width of the tubular portion; and (d) a second finger in the feed means positioned downstream of the first finger and comprising an opening positioned beneath the slot, said opening being wider than the collar width;

said slide moving between a first position to receive a connector and a second position to deliver a connector;

said slide guide comprising a rib cooperating with the slide fingers, said rib having an opening wider than the collar width, said opening being positioned so that, when the slide is in the first position, the rib opening is aligned with the wide portion of the keyhole opening, and, when the slide is in the second position, said opening is aligned with the opening in the second finger of the slide.

4,720,913

MECHANISM FOR JOINING TAPE LEADERS

Friedrich R. Hertrich, Boulder, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

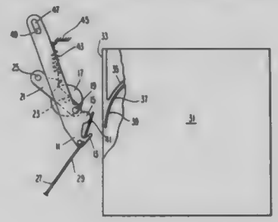
Division of Ser. No. 578,766, Feb. 13, 1984, Pat. No. 4,662,049. This application Jan. 31, 1986, Ser. No. 824,189

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.⁴ B23P *19/00*

U.S. Cl. 29—819 **10 Claims**

1. A mechanism for joining a first tape leader with a second tape leader, said first tape leader having one end secured to a take up tape reel and a second end with a tab supported by a stem section that is narrower than said tab, said second tape leader having one end connected to tape on a supply tape reel rotatably positioned within a housing and a second end with a locking slot therein, wherein said locking slot comprises a first portion sized to permit said tab to pass therethrough and a second portion toward the second end of said second tape leader, said second portion sized to prevent said tab from passing therethrough, while permitting said stem section to pass therethrough, whereby, upon locking said first and second tape leaders together, tape may be transferred between said



take up tape reel and said supply tape reel along a tape path, said mechanism comprising:

means for positioning said first tape leader substanially within the tape path, and means for guiding said housing from and inactive position to an active position such that the movement of said housing to the active position causes said tab of said first tape leader to enter and extend through said first portion of said locking aperture so that rotation of the take up reel to pull said first tape leader draws said stem section into said second portion of said locking aperture to thereby lock said first and second tape leaders together.

4,720,914

METHOD FOR FORMING THICK FILM CIRCUIT USING ROTATABLE NOZZLE HAVING WIDE DISCHARGE HOLE

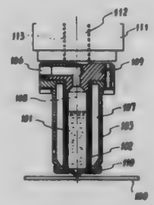
Yukio Maeda; Shinichi Kudou, and Akira Kabeshita, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

PCT No. PCT/JP84/00380, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/01067, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 26, 1984, Ser. No. 841,865

Int. Cl.⁴ H05K *3/20*

U.S. Cl. 29—846 **6 Claims**



1. A method for forming a thick film circuit on a substrate, comprising discharging a thick film past from a paste discharging hole provided at one end of a drawing nozzle to draw a desired pattern, said paste discharging hole having a substantially wide configuration in a longitudinal direction and said drawing nozzle being freely rotatable about an axis of rotation

so that the longitudinal direction of said paste discharging hole is normal to the direction in which said drawing nozzle is moved with respect to said substrate.

4,720,915

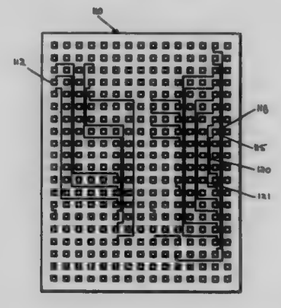
PRINTED CIRCUIT BOARD AND PROCESS FOR ITS MANUFACTURE

James D. Kennedy, El Cajon; Scott G. McCurdy, Anaheim, and Stanley R. Ruggio, La Verne, all of Calif., assignors to True Grid, Ltd., Orange, Calif.

Filed Mar. 25, 1986, Ser. No. 843,515

Int. Cl.⁴ H05K *3/02*

U.S. Cl. 29—847 **5 Claims**



1. A process for producing a printed circuit board comprising the steps of:

(a) covering a nonconductive substrate with a conductive film;

(b) then removing certain predetermined portions of said conductive film such that the remaining film forms a standarized array of pads and traces electrically interconnecting each pad to every other pad;

(c) then covering less than all of said traces with a protective material, wherein said protective material is resistant to contact with both molten solder and etching soltuion; and

(d) then removing with an etching solution only the traces which are not covered by said protective material.

4,720,916

PROCESS FOR PRODUCING PROTECTIVE ENVELOPES IN WHICH CORRESPONDING ELECTRIC-ELECTRONIC CIRCUIT COMPONENTS ARE DIPPED

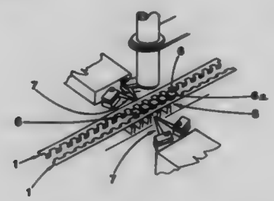
Giorgio Ventura, Castelmaggiore, Italy, assignor to Arcotronics Italia S.p.A., Sasso Marconi, Italy

Continuation of Ser. No. 749,745, Jun. 28, 1985, abandoned. This application Oct. 8, 1986, Ser. No. 915,877

Claims priority, application Italy, Jul. 27, 1984, 3538 A/84

Int. Cl.⁴ H05K *13/00*

U.S. Cl. 29—856 **29 Claims**



1. A process for producing protective envelopes in which portions of corresponding electric-electronic circuit components are encased, comprising the steps of:

(a) forming a plurality of conductor strips, each strip having conductor projections extending from one side of said strip;

(b) welding corresponding projections of two aligned conductor strips to intermediate corresponding conductor elements, thereby forming a circuit components unit composed of a plurality of aligned circuit components;

(c) creating an elongated mold having at least one longitudinal impression with a bottom surface, said impression suitable to receive said circuit components unit;

(d) stably inserting said unit into the mold with the circuit components positioned in said impression and spaced from said bottom surface;

(e) pouring a liquid sealant into said impression and over said circuit components thereby encapsulating only the components of said unit and forming a one piece block, and setting said sealant;

(f) separating said mold from said one piece block, with said conductor projections at least partially projecting from said one piece block; and

(g) cutting said block into a plurality of small blocks made of solidified sealant, inside each of which is contained one corresponding circuit component from which electrical terminations protrude.

4,720,917

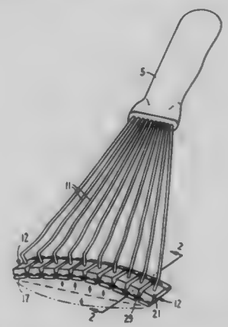
FLEXIBLE BLADE CONTOUR RAZOR

Terry S. Solow, 410 Playa Blvd., La Selva Beach, Calif. 95076

Continuation-in-part of Ser. No. 775,827, Sep. 13, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 947,352

Int. Cl.⁴ B26B *21/00*

U.S. Cl. 30—49 **17 Claims**



1. A flexible, contour-following razor system for shaving variably contoured shaving surfaces, comprising:

handle means, and

connecting means carried by said handle means, and

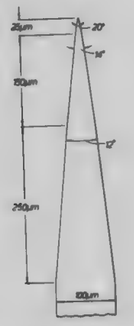
a plurality of blade-holder housings carried by said connecting means, and

one continuous, flexible blade that flexes during shaving in a direction perpendicular to the plane of said blade and is carried by said plurality of blade-holder housings.

4,720,918
RAZOR BLADES

Francis R. Carry, 3 Carlisle Gardens, Twyford, Berkshire; Joan Pumfrey, Herns House, Gallowstree Common, Reading, Berkshire; Edwin L. Glasson, 35 Emmetts Park, Binfield, Bracknell, Berkshire; Romuald Kozlowski, deceased, late of Hanwell, and by Jadwiga Kozlowska, legal representative, 54 Greenford Avenue, Hanwell, London, all of England (by said Edwin L. Glasson, legal representative)

Continuation of Ser. No. 634,110, Jul. 18, 1984, abandoned. This application Jun. 4, 1986, Ser. No. 870,622
Claims priority, application United Kingdom, Nov. 19, 1982, 8233014; PCT Int'l Appl., Nov. 14, 1983, PCT/GB83/00288
Int. Cl.[4] B26B *21/54*
U.S. Cl. 30—346.55 6 Claims



1. A razor blade having a cutting edge tip of a material which has a higher yield strength than stainless steel, the cross-sectional shape of which up to a distance of forty micrometers from the extreme edge is defined by the equation:

$$w = ad^n$$

in which w is the thickness in micrometers of the tip at a distance d in micrometers from the extreme edge of the blade; a is a factor of proportionality not greater than 0.8; n is an exponent having a value in the range 0.65 to 0.75; and the width w obtained from the said equation is reduced in inverse proportion to the square root of the ratio of the yield strength of said tip material to that of stainless steel.

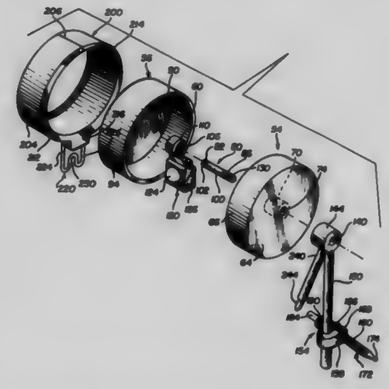
4,720,919
TREE STAND BOW SIGHT

Charles A. Saunders, P.O. Box 476, Industrial Site, Columbus, Nebr. 68601-0476

Filed Oct. 31, 1986, Ser. No. 925,158
Int. Cl.[4] F41G *1/40*
U.S. Cl. 33—265 22 Claims

1. A bow sight for tree-stand archery use, said bow sight comprising bracket means for attachment of said bow sight to an archery bow, and means securing said bracket means to said bow sight, frame means including wall means of said bow sight defining a drum-like chamber for housing a pendulous element therein, shaft means and means securing said shaft means to extend into said chamber, a pendulous element mounted on said shaft means interiorly of said chamber for swinging arcuate movement there within, sight means for sighting on a target, means including arm means interconnecting said sight means to said pendulous element for pivotal movement therewith, and damping means for acting on said pendulous element for enhancing attenuation of arcuate movement of said element initiated by angular rotational repositioning of the bow during sighting on a target,

band means grippingly embracing said wall means of said chamber exteriorly thereof and being rotational for selective annular orientation of said band means with respect to said wall means of said chamber, locking means affixed to and carried by said band means for securing said sight means in selectable positions with reference to and against

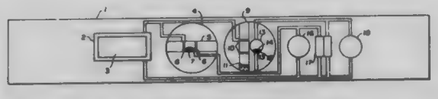


movement with respect to said wall means of said chamber, for facilitating optional use of said bow sight for shooting on the ground.

4,720,920
LEVEL WITH ELECTRONIC SIGNALS

Arthur L. Tudek, 507 Indiana Ave., Glassport, Pa. 15045

Filed Jan. 28, 1982, Ser. No. 343,486
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 1 Claim



1. A level for gauging predetermined horizontal and vertical planes, comprising three mercury type switches disposed at right angles to each other, two of said switches when simultaneously operated indicating said predetermined vertical plane and two other of them when simultaneously operated, indicating said predetermined horizontal plane, two of said mercury type switches being arranged closely together in cruciform relationship and the other extending along the longitudinal axis of the level and wherein the second switch of each of said two cannot be actuated until the first switch is bridged and actuates a signal.

4,720,921
NAVIGATIONAL INSTRUMENT

Eugene N. Beaudry, R.D. 2, Box 309, Hinesburg, Vt. 05461

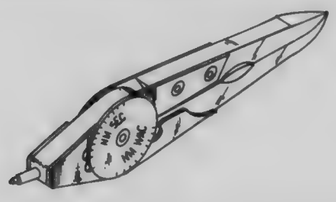
Filed May 22, 1986, Ser. No. 866,210
Int. Cl.[4] G01B *3/16, 21/20*
U.S. Cl. 33—457 22 Claims

1. A navigational instrument comprising:

first and second legs, each transparent at least in part, each leg having an upper end and a tip defined by a lower end, each leg being tapered toward the lower end, said upper end of said first leg defining an opening to a channel disposed within said first leg for frictionally receiving a writing instrument;

pivot means coupling said first and second legs in the vicinity of their upper ends; and

a first mensuration means disposed about the pivot means preselectively calibrated for measuring distances on a map

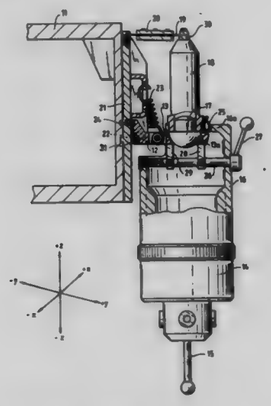


wherein the separation between said tip at the lower end of said first leg and said tip at the lower end of said second leg correlates to a reading on said first mensuration means.

4,720,922
ANTI-COLLISION DEVICE FOR THE SENSING HEAD OF A MEASURING MACHINE

Bernhard Strauss, Natthein, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,111
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532184
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—559 10 Claims

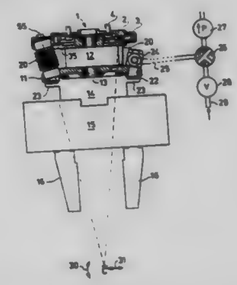


1. An anti-collision probe suspension for a coordinate-measuring machine or the like, comprising a bracket adapted for connection to the machine in such manner as to establish a vertical arm connected to a horizontal arm, a probe head having a yieldable suspension connection to said bracket, said head having a central axis which is vertical in an at-rest connected condition of pendulous suspension from said horizontal arm, the suspension connection comprising coacting ball and socket elements which are self-centering on said axis and wherein the socket element provides a generally conical seat on which the ball element may ride in response to an off-axis displacement of said head, the suspension connection including means establishing anchorage against torsional displacement of said head about said axis while also yielding for other possible relative displacement of said head with respect to said support member.

4,720,923
REMOTE CENTER COMPLIANCE SYSTEM

Brian P. Quinton, Hayling Island, and Garry E. Scott, Fareham, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,265
Claims priority, application European Pat. Off., Apr. 17, 1985, 85302687.0
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—644 8 Claims



1. A variable remote center compliance system for compliantly connecting between a pair of interfaces in which the system restricts movement a a remote center to certain directions, each such movement being resisted by a respective stiffness, the system comprising:

a support arm;

an interface forming part of said support arm,

an operator device,

a further interface forming part of said operator device,

at least three gas-tight spring bellows interconnecting said support arm interface and said operator device interface,

connection means for connecting the interiors of said bellows in common,

a selectively variable gas pressure source and a vacuum source,

and switch valve means for selectively connecting between the variable pressure source and the vacuum source to said connecting means whereby the gas pressure in said bellows may be varied so as to vary the compliance of the system and the vacuum may be applied to remove any compliance.

4,720,924
MICROWAVE DRYING OF PHARMACEUTICAL GELATIN CAPSULES

Julien J. Hradecky; Joseph Sobarsky, both of Kitchener, and David C. T. Pei, Waterloo, all of Canada, assignors to R & J Engineering Corporation, Kitchener, Canada

Filed Nov. 3, 1986, Ser. No. 926,059
Int. Cl.[4] F26B *23/08*
U.S. Cl. 34—1 11 Claims



1. In a capsule manufacturing machine in which pin bars

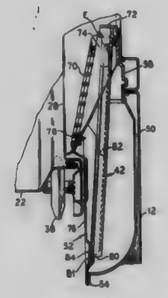
carrying wet gelatin capsule halves on metal pins projecting from said pin bars pass through a drying tunnel in which temperature and humidity conditions are controlled, the improvement comprising at least one microwave transmitter disposed adjacent at least a portion of said drying tunnel for radiating said pin bars in said tunnel to dry said gelatin capsule halves.

4,720,925

LINT FILTER HOUSING FOR A DRYER

James I. Czech, Lincoln Township, Berrien County; Creston J. Bruce, St. Joseph Township, Berrien County, and Onavie L. Griffith, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 22, 1986, Ser. No. 945,018
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—82 **14 Claims**



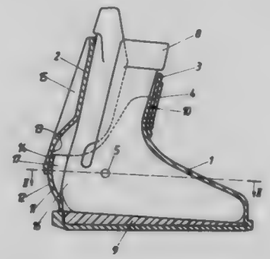
1. A dryer for drying fabric articles, comprising:
a cabinet;
a dryer drum rotatably mounted within said cabinet for holding a quantity of articles to be dried;
means for providing a flow of heated air within said dryer drum, said air flow means including means for exhausting air from said dryer subsequent to the air passing within said dryer drum;
means for rotating said dryer drum at least during the flow of heated air within said dryer drum;
a lint filter housing forming a part of said air exhausting means downstream of said dryer drum;
a lint filter removably mounted in said lint filter housing, said lint filter having a lint accumulating face directed upstream with respect to the air flow when said filter is in said filter housing;
said lint filter housing having an imperforate first peripheral region disposed at a first distance from said lint accumulating face, said lint filter housing having an imperforate second midportion region disposed at a second distance from said lint accumulating face, said first peripheral region extending along at least three sides of said lint accumulating face and partially around said second midportion region, said first distance being less than said second distance;
whereby lint accumulation on said lint filter is restricted by said first region as compared to possible lint accumulation at said second region.

4,720,926

SKI BOOT

Herbert Marxer, Schaan, Liechtenstein, assignor to Lange International S.A., Fribourg, Switzerland

Filed Sep. 30, 1986, Ser. No. 913,700
Claims priority, application Switzerland, Jan. 17, 1986, 174/86
Int. Cl.[4] A43B *5/04, 23/28*
U.S. Cl. 36—117 **7 Claims**



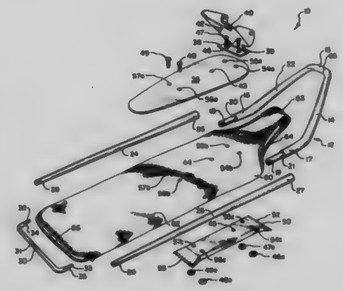
1. A ski boot composed of a lower shell (1) comprising the sole and the vamp and surrounding the heel and of an upper (2) in one or two parts, articulated on this lower shell at two points (6, 7) coinciding at least approximately with the joint of the user's foot and covering the top edge of the said lower shell surrounding the heel, wherein the said lower shell (1) has on the outside, at the rear, a rounded portion (12) which extends over most of the height of the shell and of which the radius of curvature of the vertical mid-section is centered on the axis (5) passing through the pivot points (6, 7) of the upper, and where the inner surface (13) of the lower back part of the upper has a rounded portion similar to the said rounded portion (12) of the shell and of the same radius likewise centered on the pivot axis of the upper, means (17, 18; 20; 23; 28) being provided inside the rounded part (11) of the shell to limit, at the rear, the space intended for receiving the skier's heel.

4,720,927

DEMOUNTABLE SNOWSHOE WITH FLEXIBLE FRAME

Sherman T. Abegg, 307 S. 600 West, Layton, Utah 84041

Filed Dec. 3, 1986, Ser. No. 937,385
Int. Cl.[4] A63C *13/00*
U.S. Cl. 36—122 **21 Claims**



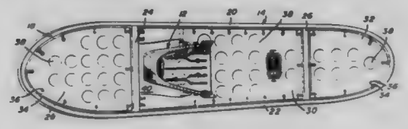
1. A snowshoe comprising:
a flexible framework comprising;
a plurality of rigid elements; and
a plurality of rotatable joints interconnecting said rigid elements into said flexible framework:
a fabric deck mounted to said flexible framework, said fabric deck holding said rigid elements together into said flexible framework, said fabric deck allowing said flexible framework to be flexible through rotation of said rotatable joints; and
a shoe securing means for releasably securing a shoe to said fabric deck.

4,720,928

COMBINATION OF SNOWSHOE AND HARNESS

Guy Faber, 550 Desportes, Neutachel, Quebec, and Richard Faber, 276 Cloutier, Loretteville, Quebec, both of Canada

Filed Oct. 24, 1986, Ser. No. 923,047
Int. Cl.[4] A63C *13/00*
U.S. Cl. 36—122 **20 Claims**



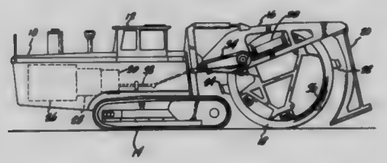
1. In combination,
(a) a snowshoe comprising:
(i) a frame structure including a peripheral frame;
(ii) a decking carried by said structure; said decking including a toe-receiving opening; and
(iii) a flexible bridging member extending transversely of said peripheral frame and defining a transverse axis; said member having opposite ends engaging the peripheral frame and transversing said opening in the aft area thereof;
(b) a harness fixedly secured to said bridging member, comprising:
(i) a lower jaw member adapted to receive, on an upper face thereof, the front sole portion of a user's boot;
(ii) clamp means fixed to the underface of said lower jaw member securing said harness to said bridging member;
(iii) an upper jaw member pivotably connected, at the fore end thereof, to said lower jaw member and cooperating therewith for engaging said front sole portion along the peripheral edge thereof; and
(iv) cooperating means on said lower and upper jaw members for maintaining said harness in engagement with said edge of said front sole portion; and
(c) a strap having opposite ends thereof attached to said harness and being adapted to extend over and secure a boot when engaged in said jaw members, whereby, during use, said boot engaged in said jaw members and secured by said strap, pivots about said transverse axis, with front portions of said harness and said boot pivoting in the opening of said decking.

4,720,929

TRENCHING DEVICE

Gerald E. Umberson, Alta Loma, Calif., assignor to Capitol Trencher Corporation, San Dimas, Calif.

Filed Feb. 14, 1986, Ser. No. 829,779
Int. Cl.[4] E02F *5/08*
U.S. Cl. 37—91 **10 Claims**



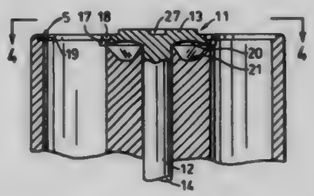
1. In a trenching apparatus comprising a vehicle having a power train comprising at least an engine, transmission and power output shaft from said transmission; a motive system for moving the vehicle; an adjustable boom assembly attached to said vehicle; a cutting wheel rotatably attached to said boom assembly; and drive means connecting said cutting wheel to said power train for causing said cutting wheel to rotate; the improvement comprising a torsional limiting device connected between said power train and said drive means, said device comprising:
(a) a planetary ring gear assembly having a sun gear journaled in said device, a planet gear rotatable on a planet carrier journaled in said device, said planet gear rotatable on said planet carrier, interposed between and in geared relationship with said sun gear and a ring gear which is journaled in said device, said sun gear attached to said power output shaft from said transmission and said planet carrier attached to said drive means;
(b) a plurality of friction discs moveably keyed to said ring gear such that rotation of said ring gear causes said friction discs to rotate;
(c) a plurality of reaction plates moveably keyed to said device, each said reaction plate being sandwiched between two said friction discs; and
(d) piston means attached to said device for forcing said friction disc and reaction plates together under force.

4,720,930

FIREARM WITH FOREIGN MATTER RECEIVING CAVITIES

Paris H. S. Schreiber, General Delivery, Port Carling, Ontario, Canada P0B 1J0

Filed Feb. 22, 1985, Ser. No. 704,584
Int. Cl.[4] F41C *1/00, 15/00*
U.S. Cl. 42—62 **13 Claims**



1. A firearm having a magazine for cartridges which is movable between a battery position and an open loading position, and having members presenting surfaces which are in mating contact when the magazine is in battery position, said members being movable to a position for extracting spent cartridges prior to loading the firearm in which said surfaces are spaced apart, wherein at least one of said surfaces has at least one cavity for receiving foreign matter during loading, said at least one cavity having opposed walls; each wall terminating in a portion of said at least one surface which portions are in mating contact with said surface of the other member when the magazine is in battery position, and wherein said cavity is devoid of any actuatable mechansim of the firearm when the magazine is in battery position.

4,720,931

SHOTGUN LOADING

Hans S. Jensen, Borgergade 28, Magleby 4672 Klippinge, Denmark

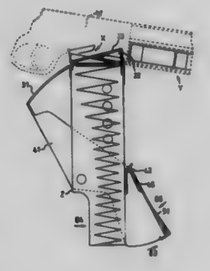
Filed Apr. 20, 1987, Ser. No. 39,688
Claims priority, application United Kingdom, Apr. 26, 1986, 8610277
Int. Cl.[4] F42B *39/06*; F41C *27/00*
U.S. Cl. 42—87 **10 Claims**

1. A charger for loading cartridges into a shotgun tubular magazine having catch means for preventing backwards mo-

tion of cartridge(s) during said loading, the charger comprising:

(a) a housing for containing at least one column of cartridges, wherein said column cartridges will be arranged side by side and one above the other, the housing comprising a mouth through which said housed cartridges can pass successively into and out of the housing;

(b) keeper means for releasably keeping said cartridges in the housing;



(c) bias means for biassing said housed cartridges into a first path of motion leading toward the housing mouth;

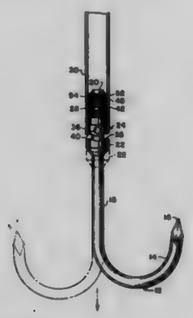
(d) ejector means for ejecting from the housing successive cartridges into the magazine via the housing mouth, the ejector means being adapted to move in a second path of motion, this path leading to the rear end of an ejecting cartridge, that cartridge thereby having been provided with components of motion corresponding to the first and second paths, and thereby becoming oriented relative to the magazine.

4,720,931

SWIVEL TYPE GAFF HOOK

Alessio Bovino, P.O. Box 454, Fishkill, N.Y. 12524

Filed May 22, 1987, Ser. No. 52,993
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 **6 Claims**



1. A gaff hook comprising:

a rod member including a hook part having a pointed end and a shank part extending axially from an end of said hook part opposite said pointed end and terminating in a top end;

a first generally cylindrical collar fixed coaxially to said shank part near said top end and having a first engaging surface facing in the axial direction toward a top end portion of said shank part;

a second generally cylindrical collar having an axial bore for freely receiving the top end portion of said shank part, said second collar having a second engaging surface facing and formed to engage said first collar on said first engaging surface;

bias means at said top end portion between said second collar and the top end of said shank part, for urging the second engaging surface of said second collar against the first engaging surface of said first collar with a certain force to prevent free rotation of said second collar relative to said shank part; and

an elongated handle having a bottom opening for receiving the top end portion of said shank part including said bias means, said handle being fixed to said second collar;

wherein in the absence of an axial force sufficient to separate said first and said second collars fully against the action of said bias means, said rod member can undergo swiveling movement relative to said handle only when a certain torque sufficient to overcome the force preventing the free rotation of said second collar is imparted to said rod member by a hooked object, and in the presence of an axial force sufficient to counter the action of said bias means and separate the first and the second engaging surfaces fully, said rod member can undergo said swiveling movement when a torque substantially less than said certain torque is imparted by said hooked object.

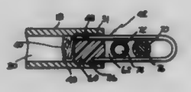
4,720,933

DIVING SPEAR AND SLING FASTENING APPARATUS THEREFOR

Rodney C. Stude, 8163 E. Mineral Dr., Englewood, Colo. 80110

Filed Jul. 14, 1986, Ser. No. 885,288
Int. Cl.[4] A01K *81/04*
U.S. Cl. 43—6 **11 Claims**





1. A diving spear comprising:

(a) an elongate shaft having a front end and a rear end;

(b) sling means for thrusting said shaft attached to said rear end of said shaft and comprising resilient tubing means having an elongate central cavity and a first end and a second end;

(c) sling attachment means for fixedly attaching said sling means to said rear end of said shaft means comprising:

(i) threaded bore means in a terminal end portion of said rear end of said elongate shaft;

(ii) a wire member having a first leg portion, a second leg portion, and a bend portion connecting said leg portions, each said leg portion engaging a surface portion of said threaded bore means, said bend portion being positioned rearwardly of said threaded bore portion;

(iii) sealing matrix means positioned in said threaded bore means in sealing engagement with said leg portions of said wire member positioned in said threaded bore means, whereby said wire member is fixedly held in said threaded bore means and whereby said sealing matrix means, said wire member leg portions and bend portion, and said terminal end of said shaft means define an attachment loop;

(iv) said first end and said second end of said resilient tubing means being inserted through said attachment loop;

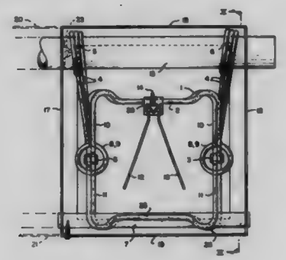
(v) resilient tubing stop means operably associated with said first end and said second end thereof for preventing said first end and said second end from being removed from said attachment loop.

4,720,934

READILY DISSEMBLED SMALL ANIMAL TRAP

William J. Gompers, 824 McLaughlin Run Rd., Bridgeville, Pa. 15017

Filed Sep. 2, 1986, Ser. No. 902,522
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—99 **1 Claim**



1. A small animal trap comprising:

(a) a frame having an entranceway for small animals and an exit opposite said entranceway,

(b) animal grasping apparatus actuable by coil springs under tension on contact by a small animal,

(c) a bar or pipe passing through said coil springs to retain the trap in place in the frame, said bar or pipe being readily removeable to disconnect the grasping apparatus from the frame,

(d) latch means for temporarily retaining said bar or pipe in place to maintain said animal grasping apparatus within the frame, and

(e) a stabilizing guide in the bottom of said frame to prevent free swinging of said animal grasping apparatus.

4,720,935

SOD-GROWING COMPOSITION AND METHOD OF USING IT

Richard B. Rogers, Brentwood, and Robert D. Goodrich, Camarillo, both of Calif., assignors to Pacific Sod, Ltd., Camarillo, Calif.

Filed Jun. 20, 1986, Ser. No. 876,738
Int. Cl.[4] A01C *1/04*
U.S. Cl. 47—56 **10 Claims**

1. A composition particularly adapted for use as a germinating and growing medium for grass, comprising:

50 to 90 percent by dry weight of water-absorptive wood fibers ranging in length up to about one inch; and

10 to 50 percent by dry weight of substantially non-water-absorptive cellulose particles having smooth exterior surfaces and maximum dimensions of less than about one inch;

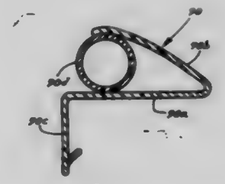
wherein the wood fibers and cellulose particles are thoroughly mixed together to form a germinating and growing medium for grass that resists formation of an air-impervious sheet when spread in a uniform layer, wetted and then dried.

4,720,936

EXTRUDED WEATHER STRIP STRUCTURE

Robert T. Ellington, Covington, Ga., assignor to Astro Plastics, Covington, Ga.

Filed Nov. 7, 1986, Ser. No. 928,181
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—480 **4 Claims**



1. An elongated weather strip structure, as for a casement window, having in combination

a body member of a hard resilient material,

a leg portion of said body member adapted to be inserted into a slot in a frame member of said window,

means retaining said leg portion in said slot,

an arm portion of said body member angled oppositely of said leg portion and forming an acute angle with said body member, and

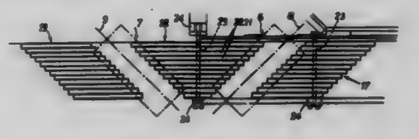
a member of form retaining compressible material integral with an adjacent free end portion of said arm disposed between said arm portion and said body member and co-acting therewith in forming a weather seal.

4,720,937

AUTOMATIC DEBURRING MACHINE FOR PARTS OF SMALL SIZE

Robert Tioche, St. Clement, France, assignor to Societe Elan, Sens, France

Filed May 22, 1986, Ser. No. 865,668
Claims priority, application France, Sep. 10, 1985, 85 13405
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—76 R **13 Claims**



1. Surface abrading apparatus for deburring parts of relatively small size including:

(a) an endless conveyor mat upon which parts are carried;

(b) at least first and second abrasive heads, each abrasive head spanning the width of said conveyor mat and rotatively mounted in overlying tangential relation to the conveyor mat about an axis positioned at an angular orientation to the longitudinal axis of the conveyor mat and wherein the rotational axes of said first and second abrasive heads are perpendicular with respect to one another; and

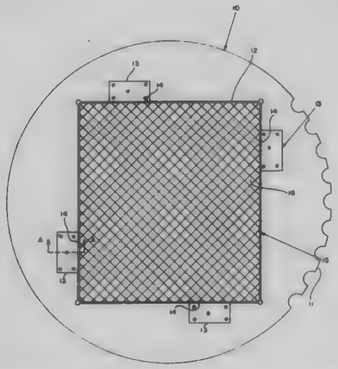
(c) at least first and second parts presser members overlying said conveyor mat, each including a plurality of endless belts rotatively mounted in independent adjacent parallel relation to one another and the longitudinal axis of said conveyor mat and each including means for resiliently biasing each belt in contact with the conveyor mat to transfer parts to and from said first and second heads.

4,720,938

DRESSING FIXTURE

Anatoly Gouis, Chicago, Ill., assignor to General Signal Corp., Stamford, Conn.

Filed Jul. 31, 1986, Ser. No. 891,376
Int. Cl.[4] B24B 7/00
U.S. Cl. 51—131.1 1 Claim



1. A fixture for dressing the surface of a circular platen mounted for rotation about a vertical axis comprising;

(a) a substantially flat flexible circular carrier formed from a relatively thin material adapted to be placed upon the surface of the circular platen to be dressed,

(b) said carrier provided with a central opening for receiving a surface dressing member within its periphery,

(c) a substantially flat surface dressing member having a thickness greater than said circular carrier and a configuration corresponding to said center opening and of a size equal to said center opening so as to occupy the entire center opening so that one of its flat surfaces has full facial engagement with the surface to be dressed,

(d) said dressing member being made from a matallic material and having it's full flat surfaces formed to provide a rasp face,

(e) means for rotating said carrier and said dressing member about its vertical axis independently of the rotation of the surface to be dressed, and

(f) a series of retaining blocks mounted on the exposed surface of said carrier each providing a substantially straight edge adapted to contact the exposed edges of said dressing member for drivingly rotating said dressing member with said carrier as said carrier is rotated about its vertical axis relative to the surface being dressed.

4,720,939

WIDE BELT SANDER CLEANING DEVICE

Steven C. Simpson; Ronald D. Witt, both of Kansas City, Mo., and Gregory E. Volkland, Merriam, Kans., assignors to Simpson Products, Inc., Lenexa, Kans.

Filed May 23, 1986, Ser. No. 867,331
Int. Cl.[4] B24B 53/10
U.S. Cl. 51—135 R 11 Claims

1. A cleaning device for a wide belt sanding machine, the sanding machine including an abrasive belt that revolves around a roller during normal operation; said cleaning device comprising:

(a) a frame adapted to be attached to the sanding machine; said frame extending into the sanding machine in a close proximity to the roller;

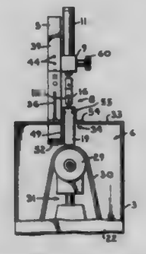
(b) a mounting tube with opposite ends, said mounting tube being pivotably connected to said frame at one of said ends;

(c) withdrawal means connected to said mounting tube and including a fluid-actuated lifting cylinder mounted on said mounting tube and having a piston and piston rod;

(d) projection means connected to said mounting tube and including a fluid-actuated pressing cylinder mounted on said mounting tube and having a piston and piston rod;

(e) a retaining assembly connected to outer ends of said lifting cylinder piston rod and said pressing cylinder piston rod; said retaining assembly including a cartridge holder connected to said piston rod outer ends, said cartridge holder extending generally parallel to the sanding machine roller; said retaining assembly further including a cartridge sized to be received onto said cartridge holder and removable therefrom;

(f) a block of cleaning material for removing accumulated material from the abrasive belt when in a contact position therewith; said block being held by said cartridge in close proximity to the abrasive belt;



(g) control means associated with said withdrawal means and protection means; said control means selectively actuating said lifting cylinder to maintain the cleaning block in a withdrawn position away from said abrasive belt; said control means alternatively actuating said pressing cylinder for applying a greater and opposite force than does said lifting cylinder for moving said retaining assembly and the associated cleaning block toward the abrasive belt and into said contact position therewith for cleaning thereof; and

(h) said mounting tube and said retaining assembly being pivotably movable between an operative position with said block within said sanding machine and a block replacement position with said block at least partly outside said sanding machine.

4,720,940

ROTARY DRUM SANDER

Gary L. Green, 17065 Judicial Rd., Lakeville, Minn. 55044

Continuation-in-part of Ser. No. 778,712, Sep. 23, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 934,007
Int. Cl.[4] B24B 41/00
U.S. Cl. 51—166 R 16 Claims

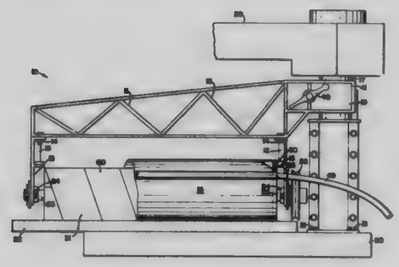
1. A drum sander accessory for radial arm saws of the type having a vertical adjustable column supporting a horizontal saw arm which is parallel to a horizontal work table and having a motor with a drive shaft, comprising:

(a) a sanding cylinder substantially parallel to and spaced above said work table, having an inside and outside, and having a first end proximate said vertical column and an opposite second end, the outside of said cylinder having an abrasive strip thereon and the inside of said cylinder having a central shaft extending therethrough and beyond each end of said sanding cylinder;

(b) two vertical carriage legs attached to and extending above each end of said sanding cylinder, said vertical carriage legs each having an aperture to accommodate said central shaft;

(c) a substantially horizontal carriage arm spaced above said sanding cylinder, having a first and second end corresponding to said first and second end on said sanding cylinder, connected on each end to said vertical carriage legs;

(d) a clamp rigidly connected to said first end of said carriage arm which is clamped onto said vertical column for vertical adjustment and tightening of said sanding cylinder;



(e) a driven pulley having a central bore through which said first end of said central shaft is inserted; and

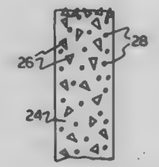
(f) an arbor drive pulley connected to said drive shaft of said radial arm saw and connected to said driven pulley by means of a belt, whereby said sanding cylinder is rotated and wood is sanded when inserted beneath said sanding cylinder.

4,720,941

SELF-COOLING, NON-LOADING ABRADING TOOL

John R. Belieff, DeLeon Springs, Fla., and Clarence E. Southward, Milan, Mich., assignors to Jo-Ed Enterprises, Inc., DeLeon Springs, Fla.

Filed Jun. 23, 1986, Ser. No. 877,137
Int. Cl.[4] B24D 5/10
U.S. Cl. 51—204 4 Claims



1. A self-cooling, non-loading abrading tool for sanding, grinding, or polishing a work piece comprising a plurality of abrasive particles embedded in a binder matrix, said binder matrix formed of at least 75% by weight of a polymeric resin selected from the group containing polytetrafluoroethylene and polymonochlorotrifluoroethylene.

4,720,942

APPARATUS FOR ABRADING CONTACT LENS EDGES

Jack D. Miller, 5535 19th Ave., North, St. Petersburg, Fla. 33710

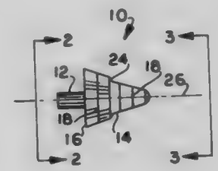
Filed Mar. 10, 1986, Ser. No. 837,816
The portion of the term of this patent subsequent to Apr. 26, 2004, has been disclaimed.
Int. Cl.[4] B24D 7/18
U.S. Cl. 51—206 P 4 Claims

1. A device for abrading the edges of a contact lens, comprising:

a generally cone-shaped member having an axis of rotation corresponding to a longitudinal axis of symmetry of the cone;

said cone-shaped member being formed of two distinct cone-shaped sections extending along said longitudinal axis with the degree of taper in the longitudinal direction of a first and second one of said cone-shaped sections being the same with an annular region of substantially greater degree of taper connecting the first and second sections;

a plurality of independent annular grooves formed in each of said cone-shaped sections at longitudinally spaced intervals along their extent;



each of said grooves having a different width for abrading contact lens edges having different thicknesses;

each of said grooves having a different concave in configuration radius of curvature at its lowermost region for abrading contact lens edges to obtain

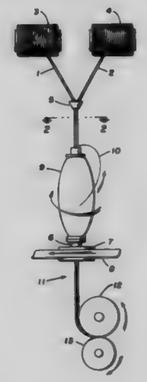
desired radius of curvature of the lens edges.

4,720,943

CORD STRUCTURE

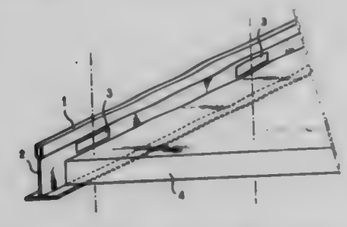
Harold D. Arrant, Milton, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 3, 1986, Ser. No. 926,167
Int. Cl.[4] D02G 3/48, 3/38
U.S. Cl. 57—210 15 Claims



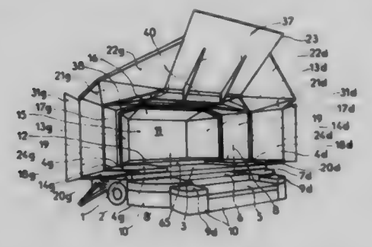
1. A tire cord comprising (1) a core consisting of at least one drawn, oriented yarn composed of continuous filaments of a synthetic polymer, wherein said drawn, oriented yarn(s) each contains less than four turns of twist per inch of yarn length and (2) a wrapper yarn wound helically around said core forming spaced-apart helices along the length thereof.

4,720,944
SUSPENDED CEILING PANEL RETAINING SYSTEM
Paul Loicq, 12 Rue des Fonds Verts, Erquy Sur Otse (Val de Marne), France
Continuation of Ser. No. 870,616, Jun. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 755,617, Jul. 16, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 8,291
Int. Cl.[4] E04B 5/57
U.S. Cl. 52—1 2 Claims
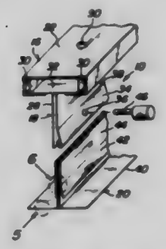


1. A panel retaining suspended ceiling comprising
(a) a framework of support sections having upstanding webs and flanges extending laterally from the webs, the laterally extending flanges providing support ledges,
(b) ceiling panels suspended on the framework, the ceiling panels extending between the webs of the support sections and resting upon the ledges, and
(c) memory metal alloy flat plate members having memorized L-shapes, the flat plate members being attached to the webs of the support sections for holding the panels in place on the framework in the event of a rise in temperature to a critical value, the memory metal alloy flat plate members having at least the legs of the L-shapes disposed at a level higher than the ceiling panels resting on the ledges, and the memory metal alloy flat plate members reverting to their memorized L-shapes upon the temperature reaching the critical value whereby the legs of those members extend over the panels and hold the panels in place on the framework.

4,720,945
THEATER STAGE WITH MULTIPLE SPACE EXTENSIONS
Yves Berranger, St. Sebastien sur Loire; Jean-Maurice Bouchard, Laval; Yves Guerin, Saco sur Loire, and Jean-Marc Soria, Vallet, all of France, assignors to Enterpa, Clisson, France
Filed Sep. 26, 1986, Ser. No. 912,793
Claims priority, application France, Sep. 27, 1985, 85 14565
Int. Cl.[4] E04H 3/28
U.S. Cl. 52—7 13 Claims



1. A theater stage consisting of an elongate base chassis (1) resting on legs or props and preferably on wheels, of the type equipped with at least one side extension which is in the form of at least one mobile floor capable, furthermore, of forming a level which is offset in relation to the central floor arranged on the chassis, which stage comprises side extensions on each side of the central floor, which consist, on the one hand, at the rear of the said central floor and forming an upper level, of a high floor sliding over the central floor and, on the other hand, on the front part of the said central floor and forming the lower levels, of a low floor sliding under the central floor and comprising one or more levels.

4,720,946
METHOD AND STRUCTURE FOR INSTALLING DROP CEILING TILES CLOSE TO CEILING
Saverio J. Paglierello, 1577 W. 3rd St., Brooklyn, N.Y. 11204
Filed May 8, 1986, Ser. No. 860,908
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—39 5 Claims

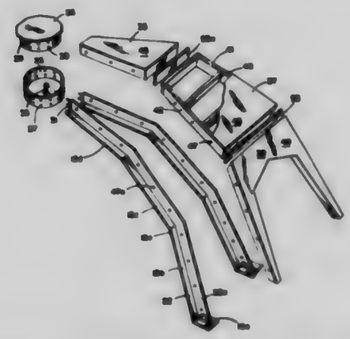


1. A grid lock system for installing drop ceiling tiles close to a ceiling comprising:
(a) a plurality of grid clip holders externally attached to a ceiling;
(b) a plurality of T-clips removably inserted into said grid clip holders, wherein each of said grid clip holders includes an elongated C-shaped track having a first set of open gaps to allow for said T-clips to be inserted therein after said grid clip holder is attached to said ceiling and a second set of open gaps including retaining arms to allow for the attachment of said grid clip holder to said ceiling and into which said T-clips are slid and therein retained; and
(c) a plurality of main T-members slidably inserted into a said T-clips in which said ceiling tiles are placed into said main T-members so that said ceiling tiles are close to said ceiling.

4,720,947
DOME-SHAPED BUILDING STRUCTURE
Joseph D. Yacabouci, P.O. Box 1606, Lake Placid, Fla. 33852
Division of Ser. No. 731,675, May 7, 1985, Pat. No. 4,663,898.
This application Nov. 10, 1986, Ser. No. 929,070
Int. Cl.[4] E04D 1/32, 1/98; E01D 27/34; E04H 9/02
U.S. Cl. 52—81 1 Claim

1. A dome-shaped building structure having a perimeter, said structure comprising:
(a) a ring, serving as the common locus of components used to form a roof;
(b) A plurality of flat trapezoidal panels with a narrow top and a wide bottom, the narrow top being coupled to said ring, said panels being assembled one next to the other so as to form a roof, each panel having solid end walls at the top and bottom;
(c) flat trapezoidal sections, with a narrow top and wide bottoms, corresponding in number to said trapezoidal panels, each section having solid end walls at the tops and bottoms, the section tops being sized to fit the bottoms of the roof panels, an asphalt impregnated shim between the panels and sections, with bolts passing through the panel walls and the section walls and the shims so as to couple each section to a panel;

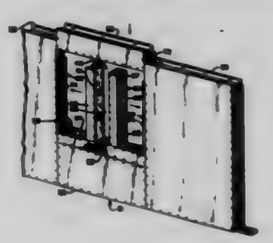
(d) a plurality of flat inverted U-shaped building arches with side walls and top and bottom covers, said side walls, with said top and bottom covers, forming a pair of legs for each of said arches, each of said arches having a top with a top wall, shaped to fit the wide bottoms of said trapezoidal sections, each of said arches top walls and said sections wide bottoms likewise having an asphalt impregnated shim therebetween, and likewise being coupled with bolts passing therethrough, said legs having bottoms defining the bottoms of the arches, said arches corresponding in number to said trapezoidal sections, also a structural base portion affixed to said leg bottoms for use in coupling each leg to a pier;



(e) side walls on each of said panels, said sections and said arches, with bolts passing through the side walls on adjacent panels to securely hold the panels, sections and arches alongside one another to form an enclosed structure; and
(f) a pier assembly at the base portion of each of said leg bottoms, to support said dome-shaped structure, said pier assembly including a pier and coupling means, said pier consisting of an elongated concrete pile with vertical rods having hook ends and a central eyelet, said concrete pile being reinforced with wire mesh disposed within said pier, and an actuator interposed over said eyelet between said pier and said structural base portion, said actuator serving as a cushion between the structure and the pier.

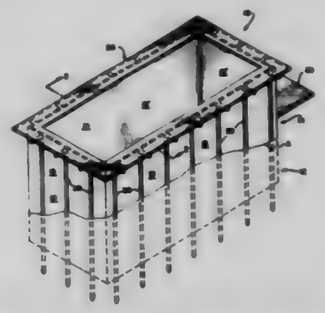
4,720,948
INSULATED BUILDING CONSTRUCTION
Harold B. Hanley; Kenneth L. Norberg, and John P. Devine, all of Watertown, S. Dak., assignors to Enercept, Inc., Watertown, S. Dak.
Continuation of Ser. No. 832,256, Feb. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 454,543, Dec. 30, 1982, Pat. No. 4,578,909. This application Mar. 11, 1987, Ser. No. 24,884
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—90 7 Claims

1. Building construction apparatus for mounting on a floor, comprising:
first, second and third prefabricated panels, each panel having interior and exterior skins and an insulating core fastened therebetween, said second panel being vertically shorter than said first and third panels, said second panel including a lower frame plate;
first and second post means for supporting a load above said floor, said first and second post means supporting said second panel above the floor to define an opening, said opening having vertical and horizontal dimensions;
first means for fastening said first post means between said first and second panels;
second means for fastening said second post means between said second and third panels; and
panel means for partially filling said opening by reducing said horizontal dimension, said panel filling means including a fourth prefabricated panel having opposite ends and extending from said floor to said lower frame plate,



said fouth panel being fastened to said first post means, said fourth panel comprising interior and exterior secondary skins and a secondary core fastened therebetween, said fouth panel also having a vertical frame plate fastened along one side of said secondary core to provide a structural member in place of said first post means for connection with a door.

4,720,949
HYBRID SWIMMING POOL
Lawrence H. Taylor, P.O. Box 49-58, 48th Street Station, Union City, N.J. 07087
Continuation of Ser. No. 788,644, Nov. 19, 1985, abandoned.
This application Jan. 29, 1987, Ser. No. 9,097
Int. Cl.[4] E04H 3/18
U.S. Cl. 52—169.7 3 Claims



1. A swimming pool structure comprising sheet metal side walls, means for retaining and supporting said side walls in a rectangular configuration including, a rectangular frame parallel to the ground outlining the top edge of the pool, said rectangular frame positioned parallel to the ground and outlining the top edge of the pool several inches above the intended water level line, said rectangular frame supported by a multiplicity of rigid vertical side support members attached at their tops to said rectangular frame and projecting downwardly substantially for about one foot into the ground along the sides of a shallow excavation made to fit the planar dimension of the pool bottom so that the lower major portion of the pool lies below ground level with the upper remaining substantial part of the pool being located above the ground level, sheet metal attached to the inner surface of the side support members and extending from the rectangular top frame to the lowest level of the pool.

4,720,950

SPACERS FOR USE IN MULTIPLE-PANE WINDOWS OR THE LIKE

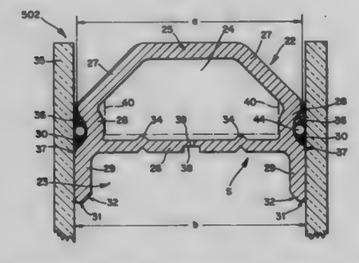
Franz Bayer, Elzach, and Karl Grosch, Wuppertal, both of Fed. Rep. of Germany, assignors to Franz Xaver Bayer Isolierglasfabrik, Elzach, Fed. Rep. of Germany

Division of Ser. No. 598,444, Apr. 9, 1984, Pat. No. 4,627,263. This application Jul. 25, 1986, Ser. No. 890,621

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312764; Oct. 12, 1983, 3337058

Int. Cl.[4] E06B *7/12*

U.S. Cl. 52—172 **16 Claims**



1. A spacer for use in multiple-pane windows or the like, comprising an elongated member including an elbow and two sections flanking said elbow, said member having a tubular portion, a supply of desiccant at least partially filling said tubular portion, and two extensions extending laterally of said tubular portion, disposed in two substantially parallel planes and being spaced apart from one another, said extensions having outer sides which are adjacent the inner sides of two spaced-apart panes when the spacer is installed in a multiple-pane window and said tubular portion including two sidewalls having outer sides, the distance between the outer sides of said sidewalls being less than the distance between the outer sides of said extensions and each of said sidewalls being adjacent one of said planes and being integral with the respective extension.

4,720,951

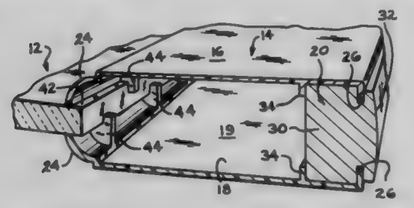
FRAME ASSEMBLY FOR DOORS, WINDOWS AND THE LIKE

John E. Thorn, Sylvania, Ohio, and Michael L. Skidmore, Orland, Ind., assignors to Therma-Tru Corp., Toledo, Ohio

Filed Mar. 24, 1986, Ser. No. 843,224

Int. Cl.[4] E06B *3/00*

U.S. Cl. 52—208 **34 Claims**



1. An improved frame assembly for doors, windows and the like comprising:

a frame defining an opening for receiving and retaining a central panel, a central panel positioned within said frame, said central panel defining an edge about its exterior perimeter, said frame including a first skin and a second skin in opposed relationship and defining a cavity therebetween, said first and second skins each having an interior and exterior edge, said central panel being in contact with and held between said interior edges of said first and second skins, said edge of said central panel extending into said cavity, said first and second skins having a plurality of support ribs positioned within said cavity and adjacent said interior edges for supporting said edge of said central panel, said support ribs having a first surface which is flush with said interior edges of said first and second skins and a second surface which is substantially perpendicular to said first surface and which abuts said edge of said central panel, an insert positioned between said first and second skins, said exterior edges of said first and second skins being separated by and in contact with said insert, said cavity containing a foamable insulating material which fills said cavity and surrounds said edge of said central panel to form a weather resistant seal between said frame and said edge of said central panel.

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DEVICE FOR ANCHORING SLABS

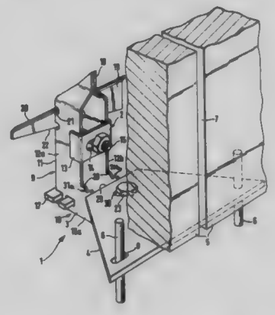
Siegfried Fricker, Wurmberger Strasse 30-34, D-7135 Wiernsheim, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 33,693

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611072

Int. Cl.[4] E04B *1/38*

U.S. Cl. 52—235 **21 Claims**



1. An anchoring device adapted to anchor a first structure to a second structure, comprising:

a support member including a toothed support portion and means for engaging a first structure;

a holder member including a toothed holder portion engageable with said toothed support portion and means for engaging a second structure; and

adjustable means for securely engaging said toothed support portion with said toothed holder portion, at least one of said toothed support portion and said toothed holder portion having a plurality of arcuate teeth such that said support and holder members may be engaged to one another at different angles.

4,720,953

PARTITION WITH BUILT-IN FLOOR-CABLE RISER

Kiyoshi Onishi, Kanagawa; Toshikazu Enami, Ibaraki, and Mobuo Masuoka, Tokyo, all of Japan, assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 9, 1986, Ser. No. 905,731

Claims priority, application Japan, Jan. 21, 1985, 60-8900

Int. Cl.[4] E04F *17/08*; E04H *1/00*

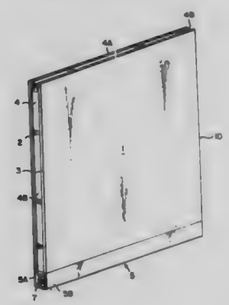
U.S. Cl. 52—221 **11 Claims**

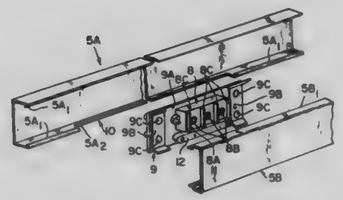
1. In an electricl partition for connection to flat multiconductor cable, a baseboard apparatus, comprising:

an elongate channel having a bottom wall and two sidewalls projecting therefrom, the two sidewalls being spaced from each other and defining an opening therebetween, each sidewall including adjacent its distal end an engagement element;

a floor-cable riser connector including connecting means for electrically connecting conductors of a flat multiconductor cable to selected conductors of another cable supported in said channel; and

a support member supporting said floor-cable riser connector in said channel, means cooperatively engaging said support member and said bottom wall of said channel for adjustably moving said support member and thereby said floor-cable riser connector from a first position wherein said support member is freely movable longitudinally within said channel to a second position wherein said support member engages said channel engagement elements for fixed retention within said channel.





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SCREEN CEILING ASSEMBLY

Albert E. Scoones, Brisbane, Australia, assignor to Hunter Douglas International, N.V., Curacao, Netherlands Antilles

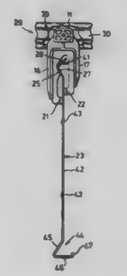
Filed Nov. 14, 1986, Ser. No. 930,832

Claims priority, application Australia, Nov. 20, 1985, 50203/85

Int. Cl.[4] E04B *5/52*; F21V *17/02, 7/00*

U.S. Cl. 52—489 **11 Claims**

1. A screen ceiling assembly comprising a plurality of spaced carrier members, connectable to a support structure, to form a common plane through said carrier members; a multiplicity of spaced elongate ceiling panels each having its own longitudinal axis, said panels being positioned at an angle to said common plane; clip means interconnecting each ceiling panel with at least one of said carrier members; and a pivotal connection associated with each clip means, effective to allow each ceiling panel to be pivoted about an axis parallel to its longitudinal axis, whereby each panel may be disposed at a desired angle or angles with respect to said common plane, wherein said pivotal connection is formed directly between each clip means and an associated carrier.



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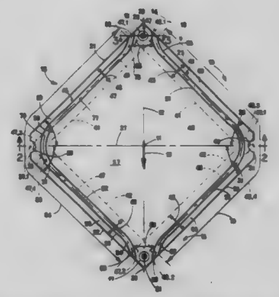
TILE

Patrick J. Kane, Vancouver, Canada, assignor to Creative Metal Designs Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 709,208, Mar. 7, 1985, Pat. No. 4,691,492. This application Nov. 4, 1986, Ser. No. 926,954

Int. Cl.[4] E04D *1/18*

U.S. Cl. 52—519 **20 Claims**



1. A tile adapted to cooperate with similar tiles to form a tiled surface over a backing means, the tile being a relatively thin sheet having:

(a) a periphery having first and second side edges intersecting at upper and lower corners, and being disposed symmetrically about a central longitudinal axis extending between the corners and adapted so that, when the tile is installed, the central axis coincides essentially with a line defining free water flow down the tile, the tile having a lateral axis disposed normally to the central axis to divide the tile into upper and lower tile portions,

(b) first and second raised ribs having respective rib axes extending symmetrically as mirror images of each other on each side of the central longitudinal axis, each rib having upper and lower rib portions on opposite sides of the lateral axis which are interconnected so as to extend continuously between the upper and lower tile portions to increase stiffness of the tile, the rib axes being mirror images of each other about the lateral axis, and the upper rib portions being generally complementary to the lower rib portions so that the lower rib portions of an upper tile can fit over the upper rib portions of a lower tile, the ribs intersecting the respective side edges at positions spaced laterally from, but generally adjacent to, the upper and

lower corners to provide first and second intermediate edge portions extending between the intersections of the first and second ribs with the first and second side edges respectively,

(c) a generally flat first side margin of the tile extending between the first intermediate edge portion and the first rib; and a similar generally flat second side margin of the tile extending between the second intermediate edge portion and the second rib, so that the tile has essentially flat side margins extending along most of the first and second side edges to provide an adequate overlap with adjacent tiles,

(d) upper and lower clearance means provided adjacent the upper and lower corners respectively, the clearance means having respective raised portions with openings passing therethrough to receive respective fasteners for securing the tile to the backing means, and

(e) first and second clearance means adjacent the first and second side edges respectively to cooperate with clearance means of adjacent tiles to locate side edges of the tile.

4,720,956

PLATE PROFILE

Per Wiklund, 58 A Kungsgatan, S-961 36 Boden, Sweden

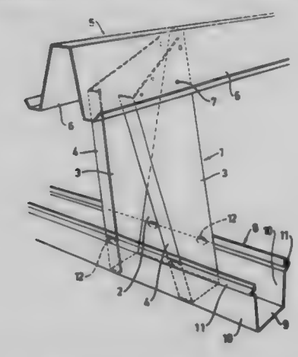
PCT No. PCT/SE86/00026, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04373, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 24, 1986, Ser. No. 924,840

Claims priority, application Sweden, Jan. 25, 1985, 8500361; Apr. 10, 1985, 8501763

Int. Cl.[4] E04C *2/08*; E04B *1/40*; E04D *3/30*

U.S. Cl. 52—648 6 Claims



1. A plate profile intended to be fitted to an anchoring profile connected with a suport and to carry another plate profile in the region of its upper end, wherein the plate profile has an upright central portion with an upwardly decreasing width, that two lateral portions extending transversely to the central portion start from said central portion, the lateral portions extending vertically between the anchoring profile and the further plate profile, that the plate profile has means for engagement with the anchoring profile, wherein the means for engagement with the anchoring profile comprises tongues and the anchoring profile has folds arranged in its longitudinal direction and cooperating with the tongues, and the lateral portions are connected with the further plate profile by way of attaching means in the region of their upper end, the lateral portions having an upwardly increasing width.

4,720,957

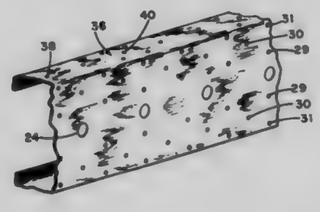
STRUCTURAL COMPONENT

Herbert R. Madray, P.O. Box 712, Okeechobee, Fla. 33472

Continuation-in-part of Ser. No. 709,317, Jan. 22, 1985, which is a continuation-in-part of Ser. No. 496,960, May 23, 1983, Pat. No. 4,551,957. This application Nov. 12, 1985, Ser. No. 797,029

Int. Cl.[4] E04B *1/18*; E04C *3/32*

U.S. Cl. 52—732 14 Claims



1. A modular structural component for framing buildings and the like, comprising:

an elongated member having a C-shaped cross-section formed by a central web portion and two flange portions attached to the web portion;

the web portion having a first pattern of apertures, the first pattern of apertures comprising longitudinally spaced large diameter pilot holes adapted to receive a pilot pin from a cut-off die mechanism, and a longitudinally repeating pattern of smaller diameter apertures, the smaller diameter apertures being provided as three spaced longitudinal rows of apertures at each lateral side of the pilot holes, including an innermost row adjacent the pilot holes, a middle row and an outermost row, the longitudinal spacing between apertures in the respective rows being equal, the innermost and outermost rows of apertures being laterally aligned, the middle rows of apertures being staggered relative to the innermost and outermost rows, providing apertures at the longitudinal midpoints between successive apertures in the innermost and outermost rows; and,

the flange portions having a second pattern of apertures, the second pattern of apertures comprising a longitudinally repeating pattern including a pentad with a hole at each corner defining an imaginary rectangle, and a hole at the center of each rectangle, the first and second patterns of apertures repeating in multiples of a predetermined length, whereby the components can be formed in multiples of said predetermined length and connected and interconnected to form structures of innumerable sizes and shapes.

4,720,958

OBJECT ALIGNING AND PACKING SYSTEM

Andrew K. Wright, and Steven C. Forberger, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1987, Ser. No. 19,161

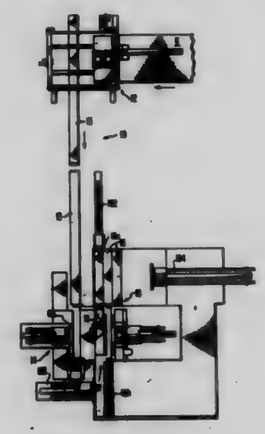
Int. Cl.[4] B65B *35/36*, *61/22*

U.S. Cl. 53—157 24 Claims

1. A system for aligning and packing substantially flat objects moving along a first conveyor nonaligned, and in irregularly spaced rows comprising:

a first mechanism for separating said rows of objects and for aligning said objects in rows substantially normal to said conveyor, said first mechanism including an elongated row separating member, and an elongated object aligning member, said elongated members extending substantially the full width of said first conveyor and substantially normal to said first conveyor, said row separating member having a high coefficient of friction for grasping a row of said objects and separating said row of objects from the other rows, said object aligning member engaging the edges of said objects to align all objects in said row, said first mechanism also feeding said objects onto a second conveyor;

a packing mechanism for transferring a preselected number of said objects from said second conveyor to a container located at a loading area;



container moving means for vertically moving said container a distance substantially equal to the thickness of said objects whereby a plurality of layers of objects are stacked in said container; and

means for placing a strip of protective material between each of said layers of objects in said container.

4,720,959

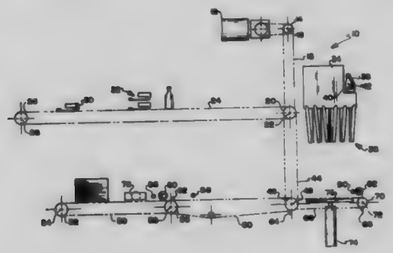
CONTINUOUS CASE PACKER

Chris E. Robinson, Akron, and Robert W. McGill, Munroe Falls, both of Ohio, assignors to Figgie International, Richmond, Va.

Continuation of Ser. No. 796,566, Nov. 8, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,574

Int. Cl.[4] B65B *5/00*

U.S. Cl. 53—247 20 Claims



1. A case packer, comprising:

a first conveyor assembly for receiving and transporting containers;

a stationary and non-translating packing head at an end of said first conveyor assembly for receiving the containers in an ordered arrangement; and

a second conveyor assembly for receiving and transporting cases to a position beneath said packing head, said second conveyor assembly comprising first and second conveyor sections which are interconnected for exclusive and continuous operation together, said first and second conveyor sections being longitudinally aligned, said first conveyor section adapted for receiving cases from said second conveyor section, said first conveyor section cycling at a rate which is an integral multiple of the cycle rate of said second conveyor section, said first and second conveyor sections having means for engaging and pushing a rearward portion of the cases, the number of said means for engaging and pushing on said second conveyor section being an integral multiple of the number of said means for engaging and pushing on said first conveyor section.

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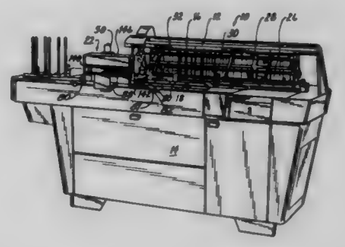
SHEET COLLATING APPARATUS AND METHOD

Ronald J. Green, 12788 - 91st Ave., N., Seminole, Fla. 33542

Filed Feb. 4, 1986, Ser. No. 825,815

Int. Cl.[4] G01G *23/28*

U.S. Cl. 53—447 29 Claims



1. A method of collating sheets into sets from stacks of sheets wherein the number of sheets in each collated set may be greater than the number of stacks which can be supported within the collating machine comprising the steps of:

supporting a predetermined number of stacks of sorted sheets in a collating machine having a predetermined number of trays for supporting the stacks;

sequentially advancing sheets from the trays to mechanisms for sheet transport while transporting the advanced sheets to thereby collate the sheets into preliminary sets;

sequentially transporting the preliminary collated sets to a terminal point;

receiving and storing a plurality of preliminary collated sets in a hopper for set storage adjacent the terminal point;

moving the preliminary collated sets from the hopper for set storage to one of the trays;

supporting the preliminary collated sets in its tray;

supporting a predetermined number of additional stacks of sorted sheets in others of the trays;

sequentially advancing preliminary collated sets from its tray to the mechanisms for sheet transport and sequentially advancing additional sheets from the others of the trays to the mechanisms for sheet transport while transporting the advanced preliminary collated sets and additional sheets whereby preliminary collated sets and additional sheets are collated into final collated sets; and

transporting the final collated sets sequentially to the terminal point.

4,720,961

CHICKEN SORTING DEVICE

C. Wane Jordan, Macon, Mo., assignor to Conagra, Inc., Omaha, Nebr.

Filed Jan. 13, 1986, Ser. No. 818,611

Int. Cl.[4] B65B *5/10*; G01G *19/32*

U.S. Cl. 53—502 32 Claims

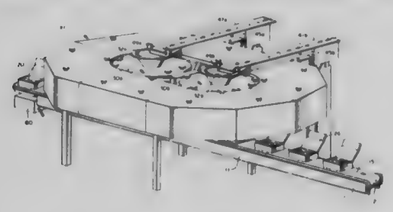
1. An apparatus for filling a package with a predetermined weight of irregularly shaped, different sized items comprising:

controller means;

first weighing means for passing to said controller means information relating to the weight of a first quantity of items in said package, said weight of said first quantity of items being less than said predetermined weight;

a plurality of pockets each adapted to transfer items deposited therein to a discharge opening upon receipt of a control signal so that said items deposited therein are passed to said package;

means for sorting said items to said plurality of pockets, said means comprising a plurality of gates each associated with a corresponding one of said pockets and a plurality of transfer means each associated with a corresponding one



of said gates, each of said transfer means adapted to transfer items to said associated gate upon receipt of a signal from said controller means and each of said gates adapted to open upon receipt of a signal from said controller means thereby causing said items transferred to said gate by said associated transfer means to be released into said associated pocket, said means for sorting including second weighing means for passing said controller means information relating to the weight of each of said items;

said controller means passing a control signal only to a selected one of said pockets whose items, when combined with said first quantity of items in said package, most nearly equals said predetermined weight.

4,720,962

APPARATUS FOR PICKING UP AND CONVEYING CROP OR OTHER MATERIAL

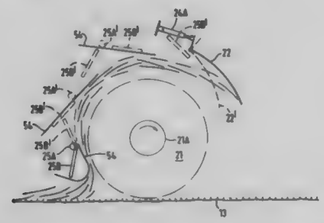
Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

Filed Feb. 13, 1985, Ser. No. 701,197

Claims priority, application United Kingdom, Feb. 14, 1984, 8403838; Jan. 29, 1984, 8416568; Jul. 29, 1984, 8221910

Int. Cl.⁴ A01D *75/18*

U.S. Cl. 56—10.2 **16 Claims**



1. Apparatus for picking up and conveying crop comprising:

a mobile frame for movement across the ground;

a high speed conveying rotor for rotation about an axis transverse to the direction of forward movement of the apparatus and substantially parallel to the ground for picking up and conveying crop, the conveying rotor comprising an inner core structure and a plurality of outwardly extending crop engaging elements, said crop engaging elements being made of non-metallic material so as to provide an outer annular zone of the rotor which is free of metal components;

a hood extending at least around part of the front half of the rotor and defining between the hood and part of the periphery of the rotor a crop flow passage along which crop is conveyed by the rotor;

drive means for driving the conveying rotor in rotation in a sense such that rotor picks up crop and conveys the crop upwardly and rearwardly over the rotor, the drive means being arranged to drive the rotor in rotation at a speed such that the rotor accelerates the crop during movement of the crop through the passage defined between the hood and the periphery of the rotor, such that at least during acceleration the periphery of the rotor moves faster than the crop, and such that after the conveying the crop is released from the rotor at least predominantly by centrifugal effect;

detection means for detecting unwanted objects conveyed by the rotor with the crop, the detection means comprising a metal detector for detecting metal by sensing an atypical response to a signal generated by the metal detector caused by the presence of metal in the crop stream, and an impact detector for detecting impacts on the inner side of the hood of unwanted objects other than crop, both the metal detector and the impact detector being mounted on the hood at positions forward of a vertical plane passing through the rotor axis, the metal detector being mounted at a position close to the entrance to the said crop flow passage with its field of detection directed downwardly and rearwardly and extending into the outer annular zone of the rotor which is free from metal components, and

diverting means for diverting for a short period of time that portion of the crop stream containing the unwanted object so that it is prevented from proceeding further in the general direction of normal crop flow, said diverting means comprising a moveable member which is positioned to the rear of the rotor centre and which is moveable into the path of the crop stream leaving the rotor, so as to deflect an unwanted object out of the normal path of crop flow downwardly to the ground.

4,720,963

METHOD OF DETECTING STONES IN THE INTAKE OF A FIELD CHOPPER

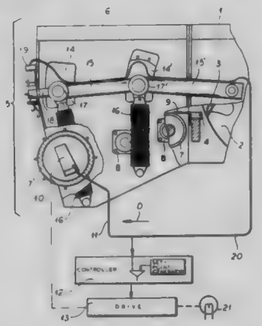
Burkhard Weiss, Weigsdorf-Köblitz; Arthur Hauschild, Sebnitz, and Erich Herrmann, Polenz, all of German Democratic Rep., assignors to Veb Kombinat Fortschritt-Landmaschinen, Neustadt/Sachsen, German Democratic Rep.

Filed Oct. 2, 1986, Ser. No. 914,634

Claims priority, application German Democratic Rep., Oct. 4, 1985, 281453

Int. Cl.⁴ A01D *75/18*; A01F *29/16*

U.S. Cl. 56—10.2 **5 Claims**



1. A method of detecting a hard foreign body in a stream of cut crop being moved by a conveyor in an agricultural machine to a crop comminuter of the machine, the method comprising the steps of:

compressing the stream of cut crop transversely of its displacement direction between a pair of feed elements one of which is movable toward and away from the other;

generating an actual-value output corresponding to the acceleration of the movable element toward and away from the other element;

comparing the output with a set point corresponding to an acceleration level not normally exceeded by the element when the crop stream contains no hard foreign objects and generating an error signal when the actual-value output exceeds the set point; and

stopping advance of the conveyor on generation of the error signal.

4,720,964

MOWER

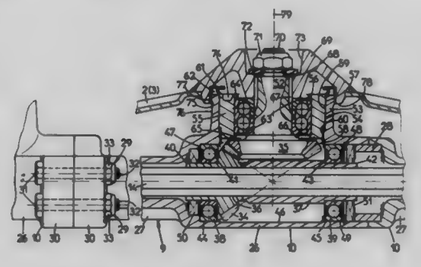
Rino Ermacora, and Horst Neuerburg, both of Saverne, France, assignors to Kuhn s.a., Saverne, France

Filed Jul. 5, 1985, Ser. No. 751,879

Claims priority, application France, Jul. 6, 1984, 84 10916

Int. Cl.⁴ A01D *34/00, 69/06*

U.S. Cl. 56—13.6 **13 Claims**



1. A mower comprising:

(a) a plurality of rotary cutting elements each of which is provided with at least one cutting tool;

(b) a housing located under said plurality of rotary cutting elements, said housing comprising bearing cylinders each one of which has a bore;

(c) at least some of said plurality of rotary cutting elements being mounted on an associated shaft guided in rotation in a journal bearing around an upwardly directed axis, said journal bearing being housed in the bore of the associated one of said bearing cylinders;

(d) transmission means supported by said housing for driving in rotation said at least some of said plurality of rotary cutting elements around the corresponding one of said upwardly directed axes, said transmission means comprising a transmission shaft and a plurality of pairs of gear wheels, each pair of gear wheels transmitting movement from said transmission shaft to the accosiated shaft on which is mounted the associated one of said plurality of rotary cutting elements;

(e) the bore of one of said bearing cylinders having a smallest diameter and the gear wheel of the associated one of said pairs of gear wheels mounted on the shaft mounted in said one of said bearing cylinders having an outside diameter, said smallest diameter being greater than said outside diameter; and

(f) fastening means fastening each of said journal bearings in the bore of the associated one of said bearing cylinders, and adjustment means operable between one of said bearing cylinders and the associated one of said journal bearings for continuously adjusting the operating play of the associated pair of gear wheels in an adjusting area, said fastening means and said adjusting means comprising a threaded part on the outside surface of each od said journal bearings which is screwed into a threaded part in the bore of the associated one of said bearing cylinders.

4,720,965

EQUIPMENT FOR PRODUCING COMPACTED WAFERS FROM PLANTS AND STALKS

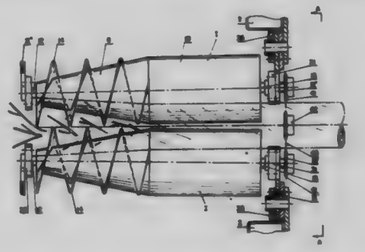
Gedalyahu Manor, and Dan Wolf, both of Haifa, Israel, assignors to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Apr. 22, 1986, Ser. No. 854,545

Claims priority, application Israel, May 20, 1985, 73234

Int. Cl.⁴ A01P *45/02*

U.S. Cl. 36—95 **18 Claims**



1. A plant-compacting device adapted for attachment to a movable agricultural plant-cutting or stalk-uprooting implement, for compacting cut or uprooted plant parts into generally cylindrical rope- or sausage-shape compacted plant material, and for cutting said compacted plant material into disc-shaped wafers, the plant-compacting device having a front area for receiving said cut or uprooted plant parts, and a rear area for delivering said wafers, the plant-compacting device further comprising:

frame means;

at least three elongated rollers mounted on said frame means adjacent or at said front area of the plant-compacting device, each roller having a longitudinal axis, said rollers being positioned with their longitudinal axes generally parallel to the direction of movement of said plant-cutting or stalk-uprooting implement, and a central space being defined between said rollers, said central space defining the intended diameter of said compacted plant material; each of said rollers comprising:

a substantially cylindrical rear portion;

a substantially frusto-conical front portion, said front portion having a broad-threaded screw attached to its substantially conical outer surface, the outer diameter of said screw being substantially commensurate with the diameter of said rear portion;

a front axle extending from said front portion; and

a rear axle extending from said rear portion;

said front and rear axles being coupled to said frame by means of respective bearings so that said rollers are rotatably mounted by their respective axles;

means for rotating said at least three rollers in the same direction of rotation;

said cut or uprooted plant parts being received at the front area of said plant-compacting device and being fed into said central space between said rollers;

elastic means for urging said rollers towards said central space, so as to exert pressure on cut or uprooted plant parts which are guided into said central space between said rollers to be compacted into said rope- or sausage-shape compacted plant material; and

cutting means arranged at the rear of said rollers for cutting said compacted plant material into wafers of a predetermined length.

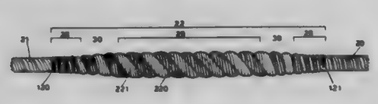
VOL 1086 ISS 4 JA 26 1988 UMI

4,720,966

PROCEDURE FOR SPLICING YARNS

Claudio Spermazia; Roberto Badiali, both of Pordenone, and Luciano Bertoli, Sale' all of Italy, assignors to Officine Savio S.p.A., Pordenone, Italy

Filed Nov. 4, 1982, Ser. No. 439,320
Claims priority, application Italy, Aug. 3, 1982, 83430 A/82
Int. Cl.[4] B65H *69/06*; D01H *15/00*
U.S. Cl. 57—22 **15 Claims**



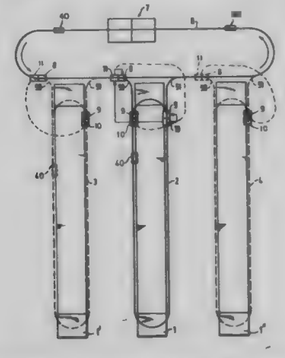
1. A procedure for splicing yarns comprising separately untwisting positively twisted individual yarns beyond a substantially nil twist to a negative twist of at least 15% of the original positive twist, coupling said negatively twisted individual yarns to form a coupled tract, retwisting said coupled yarns to form single twisted yarns until said negative twist in each yarn is eliminated and the fibers in each yarn are parallel and continuing to retwist said yarns so as to impart to the single twisted yarns a twist almost the same as the positive twist comprised in the original positively twisted individual yarns.

4,720,967

TRANSPORT APPARATUS FOR ROVING BOBBINS FOR A GROUP OF SPINNING MACHINES

Hermann Güttler, Uhingen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,687
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601832
Int. Cl.[4] D01H *9/02, 9/10, 9/18*; B65H *67/04*
U.S. Cl. 57—281 **13 Claims**



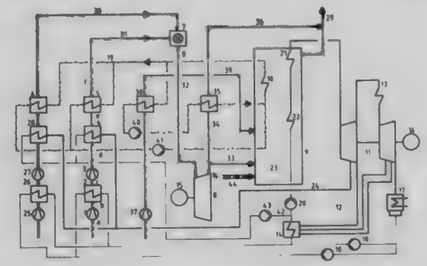
1. A transport apparatus for a plurality of roving bobbins for a group of spinning machines comprising:
- a closed circulating path for each of said spinning machines;
- a plurality of suspended roving bobbin carriages movable independently of each other each equipped either with full or empty roving bobbins which are movable along each of said closed circulating paths;
- a loading station from which a plurality of said full roving bobbins are deliverable;
- a transport path w ich runs through said loading station which replaces at least one of said empty roving bobbins on said suspended carriages with at least one of said full roving bobbins;
- a plurality of connecting paths connecting said transport path with each of said circulating paths so as to remove said suspended carriages with said empty roving bobbins from and feed said suspended carriages with said full roving bobbins to said circulating paths;
- a switch controllable depending on the filling state of the approaching one of said suspended carriages being positioned at each branch of said connecting paths with said transport bath or with said circulating paths; and
- a plurality of drive motion devices which keep said suspended carriages in constant circulation on said transport path and said circulating paths.

4,720,968

METHOD AND APPARATUS FOR DRIVING AN ELECTRICAL POWER PLANT

E. H. Klaus Knizia, Blumenweg 17, 5804 Herdecke, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,620
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503611
Int. Cl.[4] F02C *6/18, 7/10*
U.S. Cl. 60—39.02 **6 Claims**



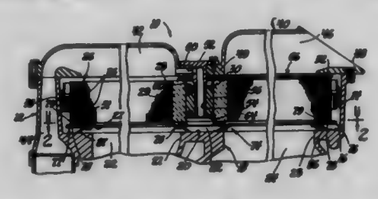
1. In a method of driving an electrical power plant by the combined operation of a gas turbine and a steam turbine spaced from said gas turbine, a steam power plant including a furnace for supplying steam to said steam turbine, comprising the steps of heating combustion air and feeding the heated combustion air to said gas turbine, compressing the air fed to said gas turbine, heating the compressed air in a multi-stage manner initially by steam from said steam power plant and then by a heated liquid heat carrier, where the heated liquid heat carrier is at low pressure in the range of atmosphere to 2.7 bar with the heat carrier remaining liquid to temperatures up to 1,000° C., and heating the liquid heat carrier in said steam power plant.

4,720,969

REGENERATOR CROSS ARM SEAL ASSEMBLY

Anthony V. Jackman, Indianapolis, Ind., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 15, 1981, Ser. No. 311,334
Int. Cl.[4] F02C *1/105*; F02G *1/005, 3/005*
U.S. Cl. 60—39.512 **4 Claims**



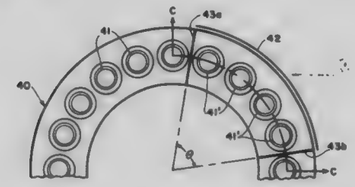
1. In a gas turbine engine having block means defining a pressurized air passage and a hot exhaust gas passage and a cross arm partition separating portions of said air and said exhaust passages, a regenerator disc on said block means intersecting said air and said exhaust passages and rotatable to transfer heat from said exhaust gas to said pressurized air and including an inboard surface, and rim seal means between said disc inboard surface and said block means operative to prevent pressurized air and exhaust gas leakage around the periphery of said disc, an improved cross arm seal assembly comprising, a platform generally coextensive with said cross arm partition disposed between the latter and said disc inboard surface, a porous and compliant support layer on a surface of said platform facing said disc inboard surface, a seal and wear layer on said support layer defining a barrier to gas passage and sealingly engaging said disc inboard surface, dike means between said seal and wear layer and said platform preventing communication through said support layer between said air and said exhaust passages, seal means between said platform and said cross arm partition preventing communication between said air and said exhaust passages across said cross arm partition, and means on said block means and on said platform operative to direct air from said pressurized air passage to and through said support layer thereby to cool said seal and wear layer.

4,720,970

SECTOR AIRFLOW VARIABLE GEOMETRY COMBUSTOR

Dale A. Hudson, Beavercreek, and Kenneth N. Hopkins, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1982, Ser. No. 439,492
Int. Cl.[4] F02C *3/00*
U.S. Cl. 60—39.36 **5 Claims**



1. A combustor, comprising:
- a. a plurality of annularly disposed fuel nozzles for supplying fuel for combustion;
- b. means defining an annularly-shaped combustion zone near said fuel nozzles;
- c. means defining an annularly-shaped air plenum surrounding said fuel nozzles and having a plurality of openings near said fuel nozzles for supplying air for fuel combustion in said combustion zone;
- d. wall means separating a predetermined angular sector of said annular air plenum from the remainder thereof, said angular sector including a predetermined portion of said plurality of fuel nozzles, whereby the airflow within said plenum to said predetermined portion of said fuel nozzles is isolated from the airflow to the remaining fuel nozzles of said combustor not within said sector; and
- e. valve means for controlling the flow of air only through said sector.

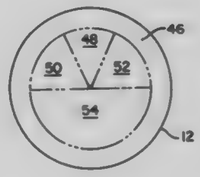
4,720,971

METHOD FOR DISTRIBUTING AUGMENTOR FUEL

Thomas L. DuBell, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 29, 1986, Ser. No. 902,346
Int. Cl.[4] F02K *3/10*
U.S. Cl. 60—204 **7 Claims**

1. A method for distributing a flow of fuel over a circular flow area in a gas turbine engine augmentor, the flow of fuel having a current flow rate variable over a range of flow rates, comprising the steps of:
- dividing the augmentor flow area into a plurality of sub-areas, one sub-area being annular in shape and disposed adjacent the augmentor interior surface, and the other sub-areas being sectors of the circular area remaining within the one annular sub-area;
- dividing the range of flow rates into a series of sub-ranges, the series comprising
  - a pilot sub-range including the initial and lowest augmentor fuel flow rates,



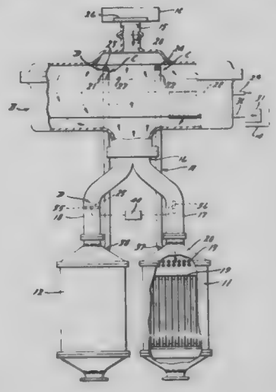
  - a full thrust sub-range including the highest and maximum augmentor fuel flow rates, and
  - one or more intermediate sub-ranges including all augmentor fuel flow rates between the pilot and full thrust sub-ranges;
- allocating one or more sub-areas to each fuel flow rate sub-range, the sector sub-areas being sub-ranges, and the annular sub-area being allocated to only the full thrust sub-range; and
- distributing the flow of fuel to those sub-areas allocated to sub-ranges corresponding to fuel flow rates up to and including the current rate of fuel flow.

4,720,972

LOW ENERGY REGENERATION SYSTEM FOR PARTICULATE TRAP FOR AN INTERNAL COMBUSTION ENGINE

V. Durga N. Rao, Bloomfield Township, Oakland County, and Wallace R. Wade, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1986, Ser. No. 919,947
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—274 **19 Claims**



14. A method of regenerating a particulate trap of an internal combustion engine having exhaust gas arranged to pass

through said trap for making said collection, the method comprising:

(a) reducing the temperature of said exhaust gas received from a primary exhaust conduit to facilitate condensation of hydrocarbons on said particulates;

(b) dividing said exhaust flow between parallel exhaust conduits;

(c) interposing a trap in each of said parallel exhaust conduits;

(d) selectively syphoning a portion of said exhaust gas around said heat exchanger without substantial loss of heat to thereby expose said portion to the frontal face of one trap; and

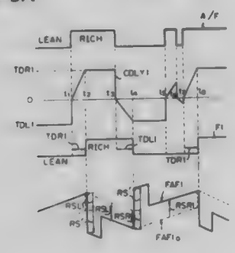
(e) augmenting the temperature of said syphoned exhaust gas, if needed, to ignite the particulates of said one trap.

4,720,973

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING DOUBLE-SKIP FUNCTION

Toshiyasu Katsuno, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 19, 1986, Ser. No. 830,866
Claims priority, application Japan, Feb. 23, 1985, 60-33671
Int. Cl.[4] F02D *41/14*
U.S. Cl. 60—274 **50 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstram, respectively, of said catalyst converter for detecting a cncentration of a specific component in an exhaust gas, comprising the steps of:

comparing the output of said upstream-side air-fuel ratio sensor with a first predetermined value;

gradually changing a first air-fuel ratio correction amount in accordance with a result of the comparison of the output of said upstream-side air-fuel ratio sensor with said predetermined value;

shifting said first air-fuel ratio correction amount by a first skip amount during a predetermined time period after the result of the comparison of said upstream-side air-fuel ratio sensor is changed;

shifting said first air-fuel ratio correction amount by a second skip amount smaller than said first skip amount after said predetermined time period has passed;

comparing the output of said downstream-side air-fuel ratio with a second predetermined value;

calculating a second air-fuel ratio correction amount in accordance with the comparison result of the output of said downstream-side air-fuel ratio sensor with said second predetermined value; and

adjusting the actual air-fuel ratio in accordance with said first and second air-fuel ratio correction amounts;

wherein said gradually-changing step comprises the steps of:

gradually decreasing said first air-fuel ratio correction amount when the output of said upstream-side air-fuel sensor is on the rich side with respect to said first predetermined value; and

gradually increasing said first air-fuel ratio correction amount when the output of said upstream-side air-fuel sensor is on the lean side with respect to said first predetermined value; and

wherein said step of shifting by said first skip amount comprises the steps of:

shifting down said first air-fuel ratio correction amount by said first skip amount for said predetermined time period after the result of the comparison of said upstream-side air-fuel ratio sensor is switched from the lean side to the rich side; and

shifting up said first air-fuel ratio correction amount by said first skip amount for said predetermined time period after the result of the comparison of said upstream-side air-fuel ratio sensor is switched from the rich side to the lean side; and

wherein said step of shifting by said second skip amount comprises the steps of:

shifting up said first air-fuel ratio correction amount by said second skip amount after said predetermined time period has passed after the result of the comparison of said upstream-side air-fuel ratio sensor is switched from the lean side to the rich side; and

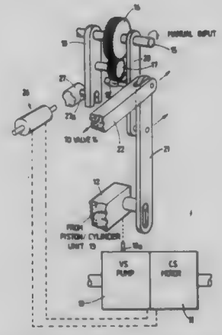
shifting down said first air-fuel ratio correction amount by said second skip amount after said predetermined time period has passed after the result of the comparison of said upstream-side air-fuel ratio sensor is switched from the rich side to the lean side.

4,720,974

SERVO-MECHANISM FOR USE IN A HYDROSTATIC TRANSMISSION

David A. Cockerum, Gloucester, England, assignor to Commercial Hydraulics Gloucester Ltd., Gloucester, England

Continuation of Ser. No. 890,886, Jul. 28, 1986, abandoned, which is a continuation of Ser. No. 682,315, Dec. 17, 1984, abandoned. This application May 26, 1987, Ser. No. 56,270
Claims priority, application United Kingdom, Sep. 29, 1984, 8424658
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—389 **9 Claims**



1. A servo-mechanism comprising a first angularly movable member movable in accordance with a first mechanical input, a second angularly movable member movable in accordance with a second mechanical input co-axially with the first movable member, a third angularly movable member movable coaxially with said first and second members, one of said three members forming a planet pinion carrier of an epicyclic gear train which also includes a sun gear fast with another of said three members, an annular gear segment fast with the remaining one of said three members and a planet pinion rotatably mounted on the planet pinion carrier and meshed with the sun gear and the annular gear segment, a power control device having an input element, linkage means connecting said remaining one of said three members to said input element, power operated means connected to said power control device for control thereby and having an output member movable under the influence of power supplied via said power control device and feedback means connecting said output member to said linkage means, whereby movement of said remaining one of said three members effects displacement of the input element via said linkage means, and said power operated means, responsive to a predetermined amount of displacement of said input element, causes said output member to cancel said displacement of said input element via said feedback means.

4,720,975

CONTROL VALVE

William C. Gunter, Tulsa, Okla., assignor to Ramsey Winch Company, Tulsa, Okla.

Filed May 15, 1986, Ser. No. 863,775
Int. Cl.[4] F15B *15/00*
U.S. Cl. 60—442 **6 Claims**



1. A control valve for controlling a reversible winch motor and winch brake, the winch motor having first and second ports, entry of a pressurized fluid in the first port while permitting fluid to drain from the second port rotating the winch motor in a first direction to raise a load, entry of a pressurized fluid in the second port while permitting fluid to drain from the first port rotating the winch motor in the opposite direction to lower a load, the winch motor being operated by a three position operating valve, the neutral position of the operating valve draining raise and lower lines, the raise position of the operating valve providing pressurized fluid to the raise line and draining the lower line, the lower position of the operating valve providing pressurized fluid to the lower line and draining the raise line; and the winch brake being releasable by entry of pressurized fluid into a brake release chamber communicating hydraulically with the control valve, the control valve comprising:

a valve body defining a cylindrical valve chamber centered on a first axis, the cylindrical valve chamber opening into a first spring chamber at a first end of the valve chamber and opening into a second spring chamber at the opposite end of the valve chamber;

a cylindrical valve spool slidable along the cylindrical valve chamber;

first spring means for progressively resisting movement of the valve spool into the first spring chamber;

second spring means for progressively resisting movement of the valve spool into the second spring chamber;

the raise and lower lines and first and second ports each individually being hydraulically connected with a recess formed into the valve body through the surface of the cylindrical valve chamber, the recesses being spaced along the length of the cylindrical valve chamber along the first axis;

said valve spool having means for preventing fluid drain from the first port of the winch motor when the operating valve is in the neutral position so that the control valve acts as a hydraulic brake;

the valve spool having means to urge the spool valve into the first spring chamber in response to the presence of pressurized fluid in the lower line when the operating valve is in the lower position and metering flow from the first port to the raise line to drain as a function of the pressure in the lower line to act as an over center valve;

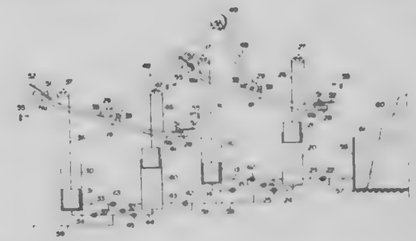
said control valve further having means for connecting the brake release chamber to pressurized fluid when the operating valve is positioned in the raise and lower positions.

4,720,976

METHOD OF POWER GENERATION AND ITS APPARATUS UTILIZING GRAVITATION FORCE AND BUOYANCY

Myung K. Kim, 9018 Dolfield Rd., Owings Mills, Md. 21117, and Se E. Lee, Seoul, Rep. of Korea, assignors to Myung Kyoon Kim, Owings Mill, Md.

Filed Dec. 30, 1986, Ser. No. 947,805
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] F03G *3/00*
U.S. Cl. 60—495 **11 Claims**



1. An apparatus for the generation of power which comprises:

at least first cylinder and at least second cylinder,

at least first float member and at least second float member disposed in said at least first and second cylinders,

a lever arm pivotably disposed above the cylinder, the end portions of said arm lever being operatively connected to said respective float members, said lever arm containing weight members and defining a path for guiding said weight members to traverse said lever arm between said end portions,

a crank member rotatably disposed on a crank shaft, said crank member connected to the center portion of said lever arm through connecting rods and guide-gears,

a dam which provides a source of water,

means for removing water from said dam and alternatively introducing and removing said water to and from said at least first and second cylinders, whereby when the water from said dam is introduced into said at least first cylinder and, simultaneously, removed from said at least second cylinder, said at least first float member is caused to rise in the first cylinder and said at least second float member is caused to fall in the second cylinder, causing the lever arm to pivot about its axis which, in turn, causes to weight members to relocate from one end portion of the lever arm to the other end portion thereof, and causing the crank to rotate about its crank shaft for the generation of power.

4,720,977

METHOD AND DEVICE FOR OPERATION OF A SUPERCHARGED INTERNAL COMBUSTION ENGINE

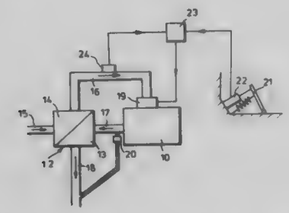
Klaus Giesen, and Dietrich Distler, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,614

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440821

Int. Cl.[4] F02B *33/44*

U.S. Cl. 60—605.2 10 Claims



1. A method for operating and accelerating an internal combustion engine assisted by a turbo-supercharger having a turbine driven by exhaust gas energy of exhaust gas delivered from the engine through an exhaust gas line, the engine including an acceleration pedal and

a wastegate in the exhaust gas line ahead of the turbine, the wastegate opening automatically upon exceeding a predetermined supercharger pressure, the method comprising the step of:

increasing the exhaust gas energy delivered to the turbine for a short period of time by reducing internal efficiency of the engine when the acceleration pedal is fully depressed and the supercharger pressure prior to depression of the accelerator pedal is below said predetermined pressure.

4,720,978

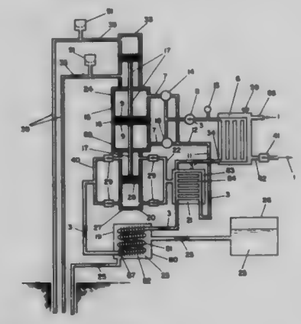
SOLAR-POWERED RANKINE CYCLE PUMPING ENGINE

John P. Spacer, P.O. Box 127, Sandia Park, N. Mex. 87047

Filed Jan. 13, 1986, Ser. No. 818,359

Int. Cl.[4] F03G *7/02*

U.S. Cl. 60—641.8 8 Claims



1. A heat engine comprising:

(a) a source of heating fluid;

(b) a two phase working fluid;

(c) a first heat exchanger for heating said working fluid with energy from said heating fluid;

(d) first double acting cylinder means comprising opposing ends, and a piston which reciprocates within said cylinder means between said ends, said piston being affixed to a piston rod which extends through at least one of said ends;

(e) means for doing work operably connected to said piston rod;

(f) means connected to said first heat exchanger for passing only working fluid above predetermined pressure and temperature;

(g) a pair of three-way valves positioned between said first cylinder means and said working fluid passing means and between said first cylinder means and a second heat exchanger, each of said valves connecting a separate one of said opposing ends of said first double acting cylinder means, beyond the length of travel of said piston within said cylinder, to said fluid passing means for conducting pressurized working fluid from said first heat exchanger into said cylinder means end and to said second heat exchanger for exhausting said working fluid from said cylinder means end into said second heat exchanger;

(h) condenser means;

(i) double acting cylinder circulating pump means for pumping said working fluid through a working loop, said circulating pump means containing a piston connected to said piston rod of said first cylinder means, said circulating pump means having ends containing working fluid inlet and outlet check valves positioned beyond piston travel, said circulating pump means being disposed for pumping said working fluid through said working loop from said condenser means, through said circulating pump means, said second heat exchanger, said first heat exchanger, said pressure and temperature sensitive fluid passing means and said three-way valves, into said first cylinder means, back through said three-way valves, through said second heat exchanger and back into said condenser means; and

(j) means for operating said three-way valves to control working fluid entry into and exit from said first double acting cylinder means to cause said heat engine to do work.

4,720,979

AIR SUPPLY BUSHING ARRANGEMENT FOR A GAS TURBINE ENGINE COMBUSTION CHAMBER

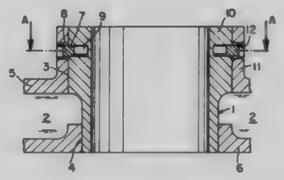
Paul Mink, Unterschleissheim, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1986, Ser. No. 915,101

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535443

Int. Cl.[4] F02C *1/00*; F02G *3/00*

U.S. Cl. 60—752 10 Claims



1. Combustion chamber arrangement for a gas turbine engine of the type having a double-walled annular flame tube composed of spaced apart inner and outer flame tube wall segments, said arrangement comprising:

air supply busing means for interconnecting air openings in the respective inner and outer flame tube segments whereby air flow is accommodated from outside the outer flame tube segment to inside the inner flame tube segment,

and resilient retention means for detachably resiliently retaining the air supply bushing means at one of the inner and outer flame tube segments, said resilient retention means including spring element means engageable in an annular groove at one of the inner and outer flame tube segments.

4,720,980

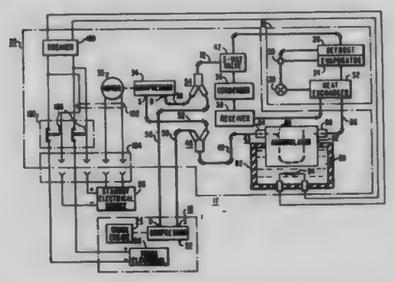
METHOD OF OPERATING A TRANSPORT REFRIGERATION SYSTEM

Leland L. Howland, Belle Plaine, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 4, 1987, Ser. No. 21,851

Int. Cl.[4] F25B *41/00, 1/10*

U.S. Cl. 62—81 3 Claims



1. A method of enhancing the defrost cycle of a truck refrigeration system which lacks a dedicated prime mover of the internal combustion type, comprising the steps of:

providing a transport refrigeration system having a first compressor operatively coupled to the engine of the associated truck, a second compressor operatively coupled to an electric motor, and a single refrigeration circuit including a condenser, evaporator, accumulator, and valve means operable to provide cooling and defrost cycles utilizing the discharge gas of one of the compressors,

using the discharge gas of the first compressor in the single refrigeration circuit when the truck engine is operating,

connecting the electric motor to an electrical standby source when the truck engine is not operating,

using the discharge gas of the second compressor in the single refrigeration circuit when the electrical motor is connected to the electrical stand-by source,

providing heat storage means in heat exchange relation with the accumulator,

and providing electrical resistance means for continuously storing heat in the heat storage means while the single refrigeration circuit is connected to either one of the first and second compressors, at the lowest heat storage rate which will provide adequate heat build up between defrost cycles to vaporize liquified refrigerant introduced into the accumulator during a defrost cycle,

said step of providing electrical resistance means including the steps of:

connecting the electrical resistance means to the electrical system of the associated truck when the first compressor is operative,

and connecting the electrical resistance means to an electrical stand-by source when the second compressor is operative.

4,720,981

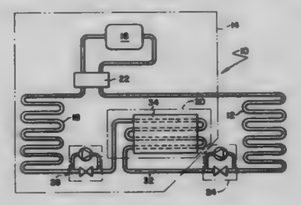
COOLING OF AIR CONDITIONING CONTROL ELECTRONICS

Robert W. Helt, Tyler, and George N. Sawyer, Flint, both of Tex., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 23, 1986, Ser. No. 946,452

Int. Cl.[4] F25B *41/00*

U.S. Cl. 62—113 20 Claims



1. An air conditioning system comprising:

an outdoor section;

a heat exchanger disposed in said outdoor section;

a second heat exchanger, said second heat exchanger being connected to said first heat exchanger by a refrigerant liquid line;

a variable speed compressor disposed in said outdoor section;

means for delivering refrigerant from said compressor to one of said first and said second heat exchangers;

means for controlling the speed of said compressor over a predetermined continuous range of speeds; and

means for transferring heat from said means for controlling into refrigerant in said liquid line.

4,720,982

MULTI-TYPE AIR CONDITIONER WITH OPTIMUM CONTROL FOR EACH LOAD

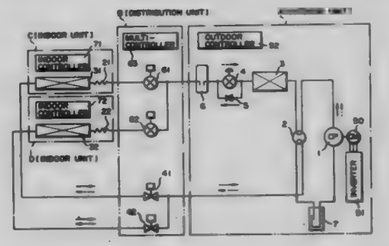
Keiichirou Shimizu, Fujinomiya, and Yukifumi Gotou, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 27, 1986, Ser. No. 923,643

Claims priority, application Japan, Oct. 28, 1985, 60-240960

Int. Cl.[4] F24F *3/00*

U.S. Cl. 62—204 7 Claims



1. A multi-type air-conditioner with an optimum control for each load, comprising:

a single outdoor unit having at least an inverter for supplying drive power of a predetermined frequency, a compressor motor driven at a variable speed upon reception of the drive power from said inverter, a variable-capability compressor coupled to said compressor motor, and an outdoor heat exchanger coupled to said compressor;

a plurality of indoor units each having at least an indoor heat exchanger and means for detecting an air-conditioning load of said indoor heat exchanger, each said air-conditioning load detecting means comprising means for setting

a desired temperature, means for detecting a room temperature, and means for producing a detected temperature signal, the frequency of the detected temperature signal corresponding to the difference between the desired temperature and the detected room temperature;

distributing means for parallel-connecting said single outdoor unit to said plurality of indoor units to constitute respective refrigeration cycles, said distributing means having at least a plurality of electromotion-type flow control valves provided at one end of said respective indoor units and a plurality of electromagnetic opening/-closing valves provided to the other end of said respective indoor units;

first control means for receiving each said detected temperature signal from each said detected temperature signal producing means and producing first a corresponding predetermined control signal for respectively controlling the degree of opening of each of said plurality of electromotion-type flow control valves to a predetermined value in accordance with the respective detected temperature signal;

second control means for receiving each said detected temperature signal from each said detected temperature signal producing means and producing a corresponding second predetermined control signal for respectively controlling the opening and closing states of each of said plurality of electromagnetic opening/closing valves in accordance with the respective detected temperature signal; and

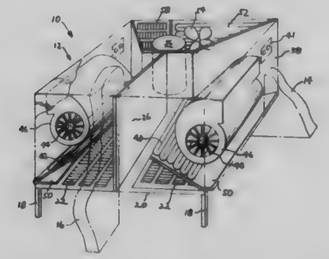
third control means for receiving all of the detected temperature signals from said detected temperature signal producing means, calculating a total air-conditioning load of said respective indoor heat exchangers in accordance with the detected temperature signals, and producing third predetermined control signals for controlling an output frequency of said inverter in accordance with the total amount of detected temperature signals corresponding to total air-conditioning load.

4,720,983

HEATER/COOLER UNIT

Alvin Mintz, Pepper Pike, Ohio, assignor to Shaker Tinning & Heating Co., Cleveland, Ohio

Filed Nov. 17, 1986, Ser. No. 931,137
Int. Cl.⁴ F25D *23/12*
U.S. Cl. 62—259.1 **18 Claims**



1. Air conditioning apparatus especially adapted for cooling adjacent rooms in a motel, hotel, hospital or like structure, comprising:

a first evaporator disposed in one room;

a second evaporator disposed in an adjacent room;

a condenser disposed outside the rooms but in fluid communication with both the first and second evaporators;

a compressor disposed outside the rooms but in fluid communication with the condenser and with a return side of the first and second evaporators;

control means for controlling the fluid flow through each evaporator, the control means permitting fluid flow through the first evaporator to be controlled independently of fluid flow through the second evaporator; and

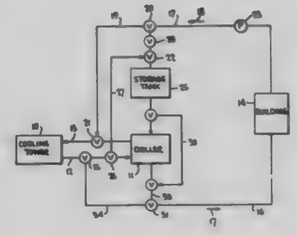
a housing exposed to the atmosphere through the exterior wall of the structure and forming a portion of the common interior wall of the rooms, the evaporators, condenser, compressor, and control means being disposed within the housing.

4,720,984

APPARATUS FOR STORING COOLING CAPACITY

Douglas A. Ames, Huntington Beach, Calif., assignor to Transphase Systems, Inc., Huntington Beach, Calif.

Filed May 23, 1986, Ser. No. 866,445
Int. Cl.⁴ F25D *17/02*
U.S. Cl. 62—434 **16 Claims**



1. Apparatus for storing the cooling capacity of a chilled liquid to provide cooled liquid to a building having heat exchange means therein, comprising the combination of

a cooling tower for providing liquid at a temperature related to the dry and wet bulb temperatures of the ambient air,

a chiller including a condenser and chiller conduit means for transporting liquid between said cooling tower and said condenser to cool the latter,

building conduit means for transporting liquid between said cooling tower and said building heat exchange means to cool said building,

a storage tank containing packages of eutectoid salt compositions and tank conduit means for transporting liquid between said tank and said cooling tower, and

valve means in said tank conduit means and said chiller conduit means for alternatively directing liquid between said cooling tower and the condenser of said chiller to cool said condenser, and between said cooling tower and said tank to store coolness in said eutectoid salt packages.

4,720,985

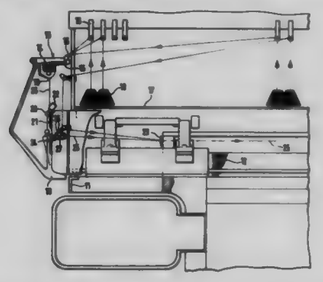
YARN TENSION REGULATING DEVICE FOR KNITTING MACHINES

Ernst Goller, Reutlingen, and Fritz Walker, Kusterdingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 54,896
Claims priority, application Fed. Rep. of Germany, May 28, 1986, 3617991
Int. Cl.⁴ D04B *15/44*
U.S. Cl. 66—146 **6 Claims**

1. A yarn tension regulating device for a yarn guided from a yarn spool through yarn guide members, a yarn tensioner and a yarn stop motion to the working position of a knitting machine, with a yarn tension sensor and a yarn brake which is automatically adjustable in dependence upon the indication of the yarn tension sensor, characterised in that there is located directly in front of the automatically adjustable yarn brake (20), in the direction of movement of the yarn, a yarn forwarding device (13) which relieves the tension imparted to the yarn

(25) in its path from the yarn spool (18) to the yarn brake (20), and in that, between the yarn brake (20) and the yarn tension



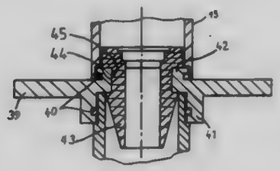
sensor (24) which follows it in the direction of yarn movement, there is located a known yarn take-up (pivoted lever 21).

4,720,986

SPOOL MOUNTING APPARATUS AND METHOD OF USING THE SAME

Hans Fuchs; Hans Baumgartner, both of Uerikon, and Alfred Freitag, Männedorf, all of Switzerland, assignors to Maschinenfabrik Schärer AG, Erlenbach, Switzerland

Filed May 31, 1985, Ser. No. 740,026
Claims priority, application Switzerland, Jun. 12, 1984, 2823/84; Apr. 29, 1985, 1811/85
Int. Cl.⁴ D06F *17/04*
U.S. Cl. 68—198 **37 Claims**



35. An apparatus for mounting package-containing spools for the joint treatment of a series of such spools, comprising:

a carrier;

at least one perforated tube mounted at said carrier and through which perforated tube there can be supplied a treatment fluid;

said at least one perforated tube possessing an upper end and a lower end;

a clamping locking memer releasably connectable to said upper end of said at least one perforated tube;

a base plate releasably connectable to said lower end of said at least one perforated tube;

a first cap member sealingly arranged intermediate said base plate and a bottom spool of a series of package-containing spools mounted at said at least one perforated tube;

a second cap member sealingly arranged intermediate said clamping locking member and a top spool of said series of package-containing spools mounted at said at least one perforated tube;

each one of said first cap member and said second cap member comprising a sealing cap member and an elastic sealing cap member;

said sealing cap member comprising two collar-shaped protrusions extending to opposite sides of said sealing cap member and bounding a cenral aperture formed in said sealing cap member;

said elastic sealing cap member being provided with a circumferential groove;

one of said two collar-shaped protrusions being engaged with said circumferential groove provided at said elastic sealing cap member;

each said spool comprising a sleeve having a first sleeve end portion and a second sleeve end portion;

said sealing cap member, when arranged at said base plate, sealingly accommodating the first sleeve end portion of the sleeve of the bottom spool in said series of package-containing spools, at said one collar-shaped protrusions on a side remote from said elastic sealing cap member, and sealingly accommodating said base plate by means of the other one of said two collar-shaped protrusions; and

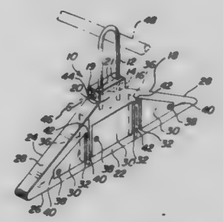
said sealing cap member, when arranged at said clamping locking member, sealingly engaging said clamping locking member with said one collar-shaped protrusion on a side thereof which is remote from said elastic sealing cap member, and sealingly accommodating by means of the other one of said two collar-shaped protrusions, said second sleeve end portion of said sleeve of the top spool in said series of package-containing spools.

4,720,987

MULTI PURPOSE LOCK DEVICE

Ronald Moss, 350 Ocean Pkwy., Brooklyn, N.Y. 11226

Filed Jun. 2, 1986, Ser. No. 869,661
Int. Cl.⁴ E05B *67/22*
U.S. Cl. 70—39 **1 Claim**



1. A multi purpose lock device incorporated in an item having a member, said lock device comprising:

(a) a shackel in the form of a U-shaped rod;

(b) a housing means incorporated within said member and in the form of a parallelpiped having a cylindrical cavity centrally disposed therein, and a set of holes perpendicular to said cavity which coacts with said shackel, two holes also disposed in said member of said item with said holes in said member being of a predetermined diametral size, depth and location so as to coact with said shackel; and

(c) a lock cylinder carried by said housing means containing a set of holes which coact with said shackel said lock cylinder being in the general form of a cylinder of predetermined size to be received within said cavity, said externally manipulatable of said item, wherein said multi purpose lock device is incorporated in a hanger comprising:

(i) a front panel of essentially triangular form with a plurality of cut outs:

(ii) a back panel of essentially triangular form;

(iii) a bottom panel of rectangular form;

(iv) a pair of sides of rectangular form;

(v) a plurality of doors;

(vi) a plurality of hinges of conventional design;

(vii) a plurality of lock sets; and

(viii) said front panel, said back panel, said sides and said housing means secured together to form a solid form which is essentially triangular; wherein said doors are affixed to said hinges, said hinges conventionally mounted to said front panels so as to coact with said cut outs of said front panel, said locks disposed to lock said door in closed disposition.

4,720,988

METHOD FOR THE PROFILING COLD-ROLLING OF RINGS WITH TANGENTIAL EXPANSION

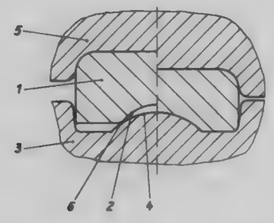
Bartke, Kristine, Dohna; Gaebler, Dieter; Peter Heinrich, both of Karl-Marx-Stadt, and Harald Schiller, Luckenwalde, all of German Democratic Rep., assignors to VEB Kombinat Waelzlager u. Normteile, Karl-Marx-Stadt, German Democratic Rep.

Filed Mar. 11, 1986, Ser. No. 838,650

Claims priority, application German Democratic Rep., Apr. 1, 1985, 274668

Int. Cl.[4] B21H 1/12

U.S. Cl. 72—105 4 Claims



1. A method of profiling an internal or external surface of a ring, employing a single cold rolling step, comprising

forming a preliminary profile on an internal or external annular surface of a workpiece ring by a metal-shaping process other than cold rolling, said preliminary profile having distinctly defined lateral peripheral profile edges spaced from respective lateral walls of the workpiece ring; and

bringing into and maintaining in rolling engagement with the preliminarily-profiled workpiece ring surface a rolling tool having formed on a working surface thereof facing said preliminary-profiled workpiece ring surface a final desired profile shaped to make local contact with each of said lateral peripheral profile edges of said preliminarily-profiled work-piece ring surface at the beginning of cold rolling to compressively stress said workpiece ring by said local contact before cold rolling effected by contact of the tool with the workpiece ring substantially increases contact of the tool profile with the preliminarily-profiled workpiece ring surface to conform the profile of the workpiece ring to the profile of the tool, wherein aid compressive stress mititgates tensile stress in the workpiece ring resulting from axial tangential displacement of workpiece ring material and enlargement of workpiece ring diameter during cold rolling to prevent the formation of cracks and deflects in the workpiece ring during cold rolling, whereby only a single cold rolling step is necessary to provide a profiled filed ring having a final desired profile.

4,720,989

METHOD OF AND APPARATUS FOR ROLLING AN I-BEAM BLANK

Carlo Panunzi, Differdange; Henri Grober, Esch; Joseph Sbarra, Soleuvre, and Albert Zenner, Differdange, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Jun. 13, 1986, Ser. No. 874,224

Claims priority, application Luxembourg, Jun. 13, 1985, 85950

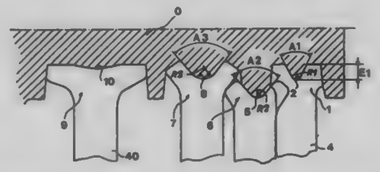
Int. Cl.[4] B21B 1/00

U.S. Cl. 72—221 3 Claims

1. A method of rolling an I-beam blank from a bloom, comprising the steps of:

(a) forming peripheries of a pair of rolling-mill rolls each with a plurality of axially spaced grooves forming respective pairs cooperating to shape opposite flange edges of a bloom fed between said rolls, respective triangular-section ridges rising from a base of each groove and having different apex angles and rounded apexes of different radii, the apex radii increasing with increasing apex angle of said ridges, a further triangular-section ridge projecting from each periphery between two of said grooves therein;

(b) rolling with said rolls into opposite edges of said bloom respective central triangular-section notches in at least one pass for each of said ridges rising from a base of a respective groove and until the respective edge of said



bloom bottoms on the respective base, and for said further ridge whereby the formation of said notches by at least one of said ridges involves unconfined spread of material of the bloom at the respective edge;

(c) sequencing the rolling of said triangular-section notches into said edges by said ridges so that the radius and apex angle of the notches are progressively increased from ridge to ridge; and

(d) thereafter pressing said notches generally out of and generally flattening the bloom edges in at least one final rolling pass between said rolls and in ridge-free grooves formed therein.

4,720,990

EJECTOR MECHANISM FOR ECCENTRIC PRESSES

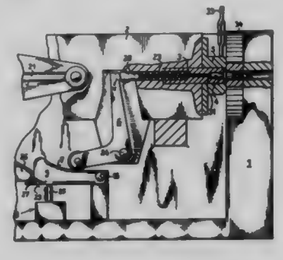
Alois Weller, Erkrath, Fed. Rep. of Germany, assignor to Th. Kieserling, Postfach and Albrecht GmbH & Co., Solingen, both of, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,126

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1984, 3437282

Int. Cl.[4] B21J 13/14

U.S. Cl. 72—427 22 Claims



1. An ejector mechanism for an eccentric press comprising a machine frame;

driving means attached to the machine frame;

a slide supported in the machine frame and attached to the driving means such as to provide a motion of the slide, where the slide includes

a tool for maintaining a work piece in position, said tool having a hole;

a pusher pin passing through a hole in the slide for engaging the work piece, which pusher pin is positioned to eject the work piece out of the tool;

a lever contacting an end of the pusher pin;

a cam curve supported in a fixed position at the machine frame for contacting the lever at times during a motion of the slide and retracable at a selected point during the press operating cycle;

a control means attached to the machine frame for controlling a positioning of the cam curve at said selected point.

4,720,991

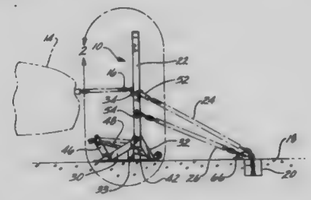
SINGLE ANCHOR SECONDARY SAFETY TIE DOWN FOR A PULLING APPARATUS

Charles J. Kuhn, Tujunga, Calif., assignor to Kuhn Manufacturing Co., Inc., Sun Valley, Calif.

Filed Nov. 3, 1986, Ser. No. 926,393

Int. Cl.[4] B21D 1/12

U.S. Cl. 72—457 17 Claims



1. In a pulling apparatus which includes a post assembly, guide means on the post assembly, power means on the post assembly, flexible pulling means having one end connected to the power means and extending into engagement with the guide means with the other end adapted for connection to a work piece, and primary flexible anchor means having one end secured to the post assembly with an opposite end adapted for connection to an anchor pot on the floor, a safety tie down assembly comprising:

secondary flexible anchor means having a first end adapted for connection to the post assembly;

a safety line anchor for passive removable engagement with the anchor pot and having means for engagement with the primary anchor line when the primary anchor line is held in tension between the post assembly and the anchor pot as a pulling force is applied by the pulling chain; and

attachment means on the safety line anchor for connection to a second end of the secondary anchor means; so the secondary anchor means restrains movement of the pulling apparatus along the line in which the pulling force is directed should the restraint provided by the primary anchor means fail.

4,720,992

CALIBRATION SEQUENCE AND METHOD FOR AN ELECTRONIC COMPASS

Ronald F. Hormel, Mount Clemens, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

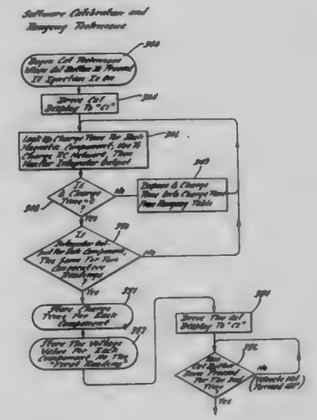
Continuation of Ser. No. 813,897, Dec. 27, 1985, Pat. No. 4,622,843. This application Nov. 17, 1986, Ser. No. 931,766

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.[4] G01C 17/38

U.S. Cl. 73—1 E 2 Claims

1. A calibration method for use in an electronic compass control circuit that includes a microcomputer, a flux-gate, a flux-gate driver, a bandpass filter, a synchronous detector, an integrator and a summing amplifier; the control circuit equipped with a ranging circuit that includes an operational amplifier with resistive negative feedback connected to the output of the integrator; an RC charging network connected to the non-inverting input to the operational amplifier; a gate switch connected between the RC charging network and the microcomputer such that the microcomputer charges the RC charging network when the gate switch is closed; and comparator means to respond to the output of the integrator to control the operation of the gate switch; the calibration technique for use with a vehicle equipped with a display for indicating information to the operator of the vehicle and a calibration button for communication between the operator of the vehicle and the electronic compass control circuit; the calibration technique comprising:



positioning the vehicle in an open area;

engaging the calibration button;

waiting for an indication from the display that a first reading has been taken by the electronic compass control circuit;

turning the vehicle 180 degrees;

engaging the calibration button; and

waiting for an indication from the display that a second reading has been taken by the electronic compass control circuit.

4,720,993

SEMICONDUCTING OXYGEN SENSORS

Sukhyinder P. S. Badwal, Mulgrave, Australia, assignor to Commonwealth Scientific & Industrial Research Organization, Campbell, Australia

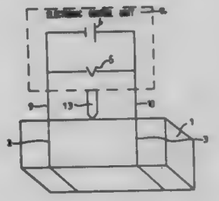
PCT No. PCT/AU85/00247, § 371 Date Jun. 16, 1986, § 102(e) Date Jun. 16, 1986, PCT Pub. No. WO86/02731, PCT Pub. Date May 9, 1986

PCT Filed Oct. 14, 1985, Ser. No. 882,883

Claims priority, application Australia, Oct. 29, 1984, PG7876

Int. Cl.[4] G01N 27/12, 27/14

U.S. Cl. 73—23 17 Claims



1. A sensor for the measurement of oxygen partial pressures in hot gases comprising a semiconducting nonstroichiometric

VOL 1086 ISS 4 JA 26 1988 UMI

oxide sensing material and a pair of mutually spaced electrodes in contact with said material, the said material being in the form of a solid solution in uranium dioxide of at least one other metal oxide having an oxygen/metal (O/M) atom ratio of less than two, and the uranium/other metal (U/M) atom ratio being such that the said material has n-type conductivity.

4,720,994

METHOD AND APPARATUS FOR THE DETECTABLE RELEASE OF GASES

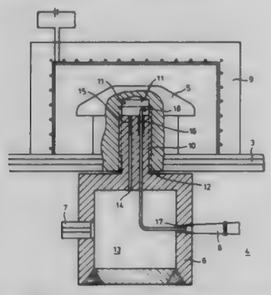
Winfried Kessels, Burgdalf; Klaus Müller, Braunschweig-Stöckheim, and Martinus Telgmann, Greven, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung mbH, Neuherberg, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 891,371

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527397

Int. Cl.⁴ G01M *3/00*

U.S. Cl. 73—49.3 **14 Claims**



1. Apparatus for detectably releasing a gas into the interior of a sealed container comprising:

a first container which is sealed from the exterior; a second container in the form of a cartridge disposed within said first container and containing a gas under pressure which is to be released into the interior of said first container; fastening means for fastening said cartridge within said first container at a defined location; first means, defining a gas flow path, and including a throughbore in the wall of said cartridge and a capillary tube, for connecting the interior of said cartridge to the interior of said first container; a thermally responsive opening means, disposed in said first means, for normally sealing said first means and said cartridge; and an acoustical indicating means, comprising a whistle disposed in said first means, for providing an acoustical indication in response to the flow of gas through said first means when said opening means in actuated.

4,720,995

METHOD OF DETERMINING THE VOLUME OF A SECTION OF AN UNDERGROUND CAVITY

William R. Thiel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 9, 1986, Ser. No. 849,662

Int. Cl.⁴ G01F *17/00*

U.S. Cl. 73—149 **16 Claims**

1. A method comprising:

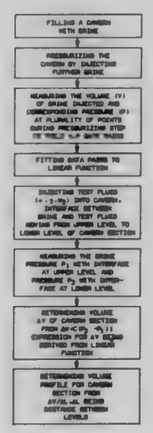
(a) filling an underground cavity with a first fluid;

(b) pressurizing the cavity by injecting further first fluid into the cavity after step (a) until a predetermined first fluid pressure is reached;

(c) measuring the total volume of first fluid injected into the cavity in step (b) and also measuring the corresponding first fluid pressure at a plurality of points during step (b) to yield a set of volume-pressure data pairs, wherein each data pair includes a volume value V and a corresponding first fluid pressure value P;

(d) fitting a linear mathematical function relating V and P to the set of data pairs;

(e) injecting a second fluid into the cavity after step (b) so as to form an interface between the first fluid and the second fluid, the interface being moved during said second fluid injection from a first level to a second level, wherein the first and second levels define therebetween a cavity section which is occupied by second fluid at the completion of this step;



(f) measuring the first fluid pressure when the interface is at the first level and also the first fluid pressure when the interface is at the second level; and

(g) determining the volume of second fluid occupying the cavity section by utilizing the pressure values measured in (f) and the linear mathematical function of (d), said volume of second fluid also being the volume of the cavity section.

4,720,996

POWER CONTROL SYSTEM FOR SUBSURFACE FORMATION TESTING APPARATUS

Michael J. Marsden, Houston, and Dean C. Minehart, Sugarland, both of Tex., assignors to Western Atlas International Inc., Houston, Tex.

Filed Jan. 10, 1986, Ser. No. 818,528

Int. Cl.⁴ E21B *49/00*

U.S. Cl. 73—155 **8 Claims**

1. Apparatus for providing full-wave alternating current power signals from a surface power source to an electric powered hydraulic system inductive load within a subsurface instrument suspended in a borehole by an electric wireline, comprising:

signal processing circuitry located at said earth's surface;

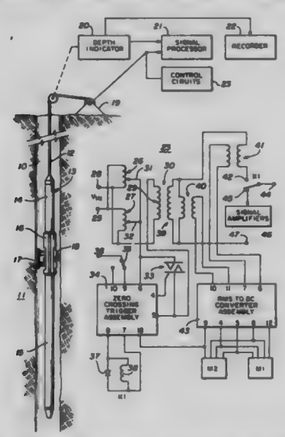
a power source of alternating current power signals located at said earth's surface;

first switching means for automatically switching said electric wireline from said signal processing circuitry and into electrical communication between said power source and said load;

second switching means for supplying said full-wave alternating current power signals to said load;

trigger means for automatically enabling said second switching means on a selected zero crossing of said power signals; and

first delay means for enabling said trigger means after a preselected time delay from switching said wireline into electrical communication between said power source and said load, thereby enabling said trigger means on the next zero crossing of said power signals following said time delay and providing full-wave alternating current power signals to said load.



4,720,997

MATERIAL LEVEL MONITOR

Roni K. Doak, 15021 Kimberly La., Houston, Tex. 77079, and Frank Poag, Rte. 2, Box 104T2, Rosenberg, Tex. 77471

Filed Dec. 1, 1986, Ser. No. 936,701

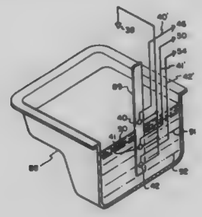
Int. Cl.⁴ G01F *23/22*

U.S. Cl. 23—295 **13 Claims**

1. An electronic monitor adapted for sensing a predetermined level of a varying volume of a substance within a reservoir, said substance having a density substantially higher than the density of air, said monitor including:

a level-sensing circuit, a reference circuit, a comparator circuit, a logic circuit, and an electric current source applying current to said circuits;

said level-sensing circuit including at least one level-sensing thermistor positioned within the reservoir adjacent to and below said predetermined level;



said reference circuit including a reference thermistor positioned so as to remain in the air adjacent to and above said predetermined level, said reference thermistor providing temperature compensation for said level-sensing circuit, thereby preventing erroneous level monitoring when the substance in the reservoir undergoes a large temperature change;

each thermistor being connected in series circuit, and said series circuits being connected in parallel;

said electric source applying current to each series circuit, whereby each thermistor becomes heated and develops a voltage thereacross which is substantially proportional to its resistance;

each thermistor being connected to said comparator circuit which compares the voltage across the reference thermistor with the voltage across the level-sensing thermistor and provides a resultant voltage depending on the substance level within the reservoir; and

said logic circuit uses said resultant voltage to provide an indication whether the level of the substance is at or below said predetermined level.

4,720,998

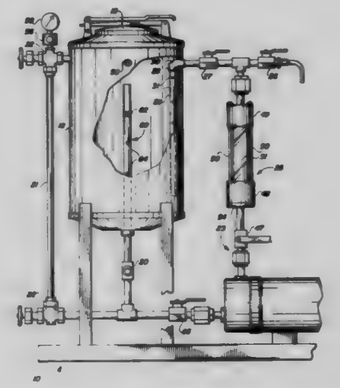
CRUDE OIL SAMPLING SYSTEM

James D. Hogue, P.O. Box 126, Sundown, Tex. 79372

Filed Jun. 13, 1986, Ser. No. 874,053

Int. Cl.⁴ G01N *9/12, 9/36*

U.S. Cl. 73—444 **9 Claims**



1. Method of evaluating the quality of a mixture of liquids flowing through a flow conduit over a long period of time comprising the steps of:

accumulating a large isolated sample of the liquid by pumping successive small samples of the liquid into a closed sample vessel during said long period of time;

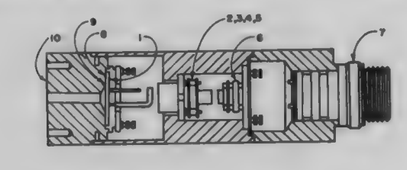
mixing the large isolated sample by connecting a centrifugal pump suction to a plurality of outlets located at different elevations within the interior of the sample vessel, and pumping the contents of the vessel through an outlet of a nozzle located within a mixing chamber, and flowing the mixture from the mixing chamber to a down comer having a plurality of inlets located within said sample vessel;

forming an annular area about the nozzle discharge by providing an upwardly diverging cone about the end of the nozzle and thereby cause great turbulence to occur within the mixing chamber;

isolating a hydrometer within a transparent enclosure, connecting the enclosure to the sample vessel after the contents of the vessel have been thoroughly mixed so that the hydrometer is suspended in the mixed sample;

reading the hydrometer; and, withdrawing a sample from the mixed contents of the sample vessel so that the components of the mixture of liquids can be measured and identified.

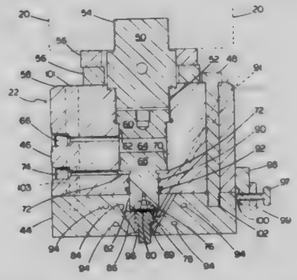
4,720,999
UNIVERSAL PRESSURE TRANSDUCER
Robert E. Olson, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 30, 1986, Ser. No. 880,245
Int. Cl.[4] G01L 7/08, 9/04
U.S. Cl. 73—706 2 Claims



1. A pressure transducer comprising:
a frame which has a pressure port header which allows the transducer to be mechanically mounted at a point where a measurement of pressure is required;
an isolation diaphragm which is mounted within said frame and is displaced by pressure which enters the pressure point header in the frame;
an active diaphragm which is mounted in said frame in proximity to said isolation diaphragm and is displaced by pressure generated by said isolation diaphragm when the isolation diaphragm is displaced;
a Wheatstone bridge circuit which is mounted on the active diaphragm, said Wheatstone bridge circuit receiving input electrical signals and producing output electrical signals which are proportional to the pressure exerted on the pressure transducer;
a means for thermally isolating the active diaphragm from the isolation diaphragm, said thermally isolating means conveying pressure from the isolation diaphragm to the active diaphragm when the isolation diaphragm is displaced while thermally insulating the active diaphragm from the isolation diaphragm; wherein said thermally isolating means comprises a reservoir of silicone oil placed in said frame between said isolation diaphragm and said active diaphragm to hydraulically conduct pressure from the isolation diaphragm to the active diaphragm while providing some thermal insulation about the active diaphragm, said thermal insulation preventing thermal corruption of the output electrical signals of said Wheatstone bridge circuit;
a case mounted connector which is housed in said frame and has a plurality of pins to conduct an input signal from an external voltage source and to output said output electrical signals from said Wheatstone bridge circuit; and
a voltage regulator circuit which is electrically connected to said case mounted connector and said Wheatstone bridge circuit to convert said input voltage signal from said external voltage source into the input electrical signals by rectifying said input voltage signal into a direct current signal and regulating amplitudes of the input voltage signal to produce said input electrical signals with varied amplitudes so that the output signals of the Wheatstone bridge are varied to fit operational parameters of test measuring equipment used with the pressure transducer.

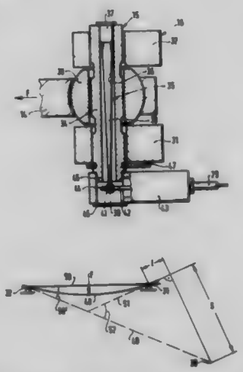
4,721,000
AXIAL LOADING MATERIAL TESTING
David W. Scanlon, Rehoboth, Mass., assignor to Instron Corporation, Canton, Mass.
Filed Sep. 19, 1986, Ser. No. 909,271
Int. Cl.[4] G01N 3/08, 3/02
U.S. Cl. 73—833 22 Claims

1. Apparatus for testing comprising:
load means for applying tensile and compressive loads, said load means comprising a loading component, and
a grip connected to said load means, said grip comprising
a grip plate having means for engaging the end of an elongated sample having a longitudinal axis,
a grip body having one end connected to said grip plate and another end connected to said loading component, said loading component having a load axis,
concentricity adjustment means for lockably adjusting the concentricity of said plate with respect to said body, and



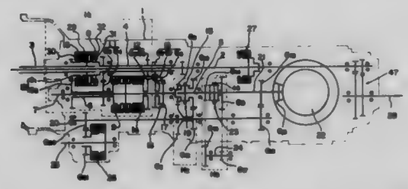
angle adjustment means for lockably adjusting the angle of said plate with respect to said body,
whereby, when said end of said sample is engaged by said plate, said longitudinal axis and said load axis can be aligned with respect to concentricity and angle, locked in place and maintained in alignment during tensile and compressive testing by said concentricity adjustment means and said angle adjustment means.

4,721,001
ARRANGEMENT FOR MECHANICAL MEASUREMENT AND REGULATION OF PULLING FORCE OF TRACTOR
Horst Hesse; Günther Schwerin, both of Möglingen, and Werner Steprath, Dormagen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 10, 1985, Ser. No. 753,672
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427907
Int. Cl.[4] A01B 63/112
U.S. Cl. 73—862.57 11 Claims



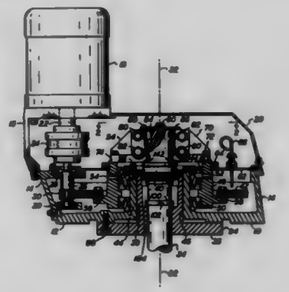
1. An arrangement for mechanical measurement and for regulation of a pulling force of a tractor having a linkage including a plurality of links and lifting means arranged to adjust the linkage in dependence on a pulling force, the arrangement comprising two housing-fixed bearing points; a bending-elastic element arranged to take up pulling forces; sensing means arranged to sense bending of said bending-elastic element and to act upon the lifting means, said sensing means including a gauge stick which is not bending-elastic in a measuring direction, said gauge stick having one end which is fixedly mounted in said bending-elastic element and another free end from which a control signal is taken in the form of a displacement, said bending-elastic element being formed as a pin arranged to support one of the links between said housing-fixed bearings points and having an inner hollow, said gauge stick being arranged in said hollow of said pin and formed so as to extend substantially between said bearing points, said pin being arranged in said bearing points with a play therebetween with said play being sufficient to thereby form relative to said bearing points a two-side freely lying support, while said gauge stick is formed as a free support which is fixedly clamped in the region of one of said bearing points and whose free end extends outwardly beyond the region of the other bearing point, said gauge stick being connected with said pin in a connecting point, said pin being bendable along a bending line, said pin and said gauge stick being formed so that the control signal is determined at least by a magnitude of distance associated with an angle which is enclosed between a tangent to said bending line of said pin in bent condition at said connecting point of said gauge stick and the position of said pin in unloaded condition, said magnitude of distance being measured in the region outwardly beyond the other bearing point.

4,721,002
CLUTCH TYPE CHANGE SPEED APPARATUS FOR WORKING VEHICLE
Yasuyuki Horii, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan
Filed Nov. 13, 1985, Ser. No. 797,544
Claims priority, application Japan, May 25, 1985, 60-112845; May 29, 1985, 60-116162
Int. Cl.[4] F16H 3/08
U.S. Cl. 74—329 10 Claims



1. A clutch type change speed apparatus for a working vehicle comprising:
a first transmission shaft (3) acting as in input shaft,
a second transmission shaft (4) connectable to said first transmission shaft (3),
a fourth transmission shaft (7) acting as an output shaft,
a third transmission shaft (6) connectable to said fourth transmission shaft (7),
a first gear mechanism (10) connected to said third transmission shaft (6),
a second gear mechanism (11) disposed between said second transmission shaft (4) and said third transmission shaft (6),
a third gear mechanism (12) connected to said second transmission shaft (4),
a first clutch (13) for connecting said first transmission shaft (3) to said first gear mechanism (10),
a second clutch (8) for connecting said first transmission shaft (3) to said second transmission shaft (4),
a third clutch (9) for connecting said third transmission shaft (6) to said fourth transmission shaft (7), and
a fourth clutch (14) for connecting said fourth transmission shaft (7) to said third gear mechanism (12),
wherein a first speed (F1) is produced by interconnecting said first transmission shaft (3), said first gear mechanism (10), said second gear mechanism (11), said second transmission shaft (4), said third gear mechanism (12) and said fourth transmission shaft (7),
a second speed (F2) is produced by interconnecting said first transmission shaft (3), said second transmission shaft (4), said third gear mechanism (12) and said fourth transmission shaft (7),
a third speed (F3) is produced by interconnecting said first transmission shaft (3), said first gear mechanism (10), said third transmission shaft (6) and said fourth transmission shaft (7), and
a fourth speed (F4) is produced by interconnecting said first transmission shaft (3), said second gear mechanism (11), said third transmission shaft (6) and said fourth transmission shaft (7),
whereby said four forward speeds are progressively obtained by use of said three gear mechanisms in one input drive range.

4,721,003
MIXER DRIVE APPARATUS
William F. Hutchings, Fairport, and George C. McIntosh, Dansville, both of N.Y., assignors to General Signal Corp., Rochester, N.Y.
Filed Mar. 31, 1986, Ser. No. 846,317
Int. Cl.[4] F16H 1/06
U.S. Cl. 74—421 R 18 Claims



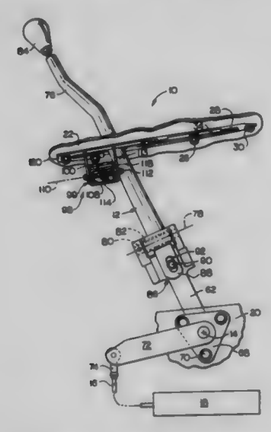
1. Mixer drive apparatus which comprises a housing having a collar, said collar having an inside and an outside and defining on the inside thereof a hole having a first axis which extends through said collar and said housing, a rotatable hub coaxial with said collar and disposed on the outside of said collar, a gear mounted on said hub and rotatable therewith, a drive shaft having a second axis parallel to and spaced from said first axis, a pinion on said drive shaft coupled to said gear, a coupling member on said hub and bridging said collar and said hole, an impeller shaft cantilevered from said coupling, said impeller shaft extending through said hole along said first axis and being located by said coupling to define an annular gap between said impeller shaft and said collar in said hole, said gap having a width radially of said impeller shaft substantially larger than the running clearance for said impeller shaft and providing space for a seal assembly.

4,721,004
TRANSMISSION GEAR SELECTOR APPARATUS
Kevin W. Ward, Davenport, Iowa, assignor to Caterpillar Inc., Peoria, Ill.
Filed Jan. 16, 1987, Ser. No. 4,013
Int. Cl.[4] F16H 57/06
U.S. Cl. 74—476 14 Claims

1. A transmission gear selector apparatus of the type including a frame, a member defining a profiled guide slot, a gear shift lever assembly having a lower lever portion mounted on the frame for pivotal movement about a first axis and an upper

lever portion mounted in the lower lever portion for pivotal movement about a second axis generally normal to the first axis and extending upwardly through the guide slot, the improvement comprising:

the guide slot having a generally longitudinal plane and first and second operating positions located therealong at the laterally opposite sides of the plane; and



inhibitor means for blocking generally direct longitudinal movement of the lever assembly from the first position, to the second position, and requiring a circuitous movement of the upper lever portion away from the plane and then toward the plane under increased resistance with longitudinal movement of the lever assembly between the first and second positions.

4,721,005

ROBOT APPARATUS

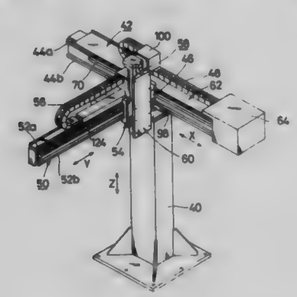
Takeo Yoshiji, Sakado; Kimitake Uuyama, Sayama; Nobuyoshi Shimada, and Takayuki Hoshino, both of Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 870,999

Claims priority, application Japan, Jun. 6, 1985, 60-123304

Int. Cl.[4] B25J *5/02*; G05G *11/00*

U.S. Cl. 74—479 **4 Claims**



1. A robot apparatus comprising

a rail unit including a rail extending in the direction of an axis of a Cartesian coordiante system having X-, Y- and Z-axes,

an X-axis slide unit movable in a first direction on said rail unit,

a Y-axis slide unit mounted on said X-axis slide unit and movaable in a second direction normal to said first direction,

a Z-axis slide unit mounted on said Y-axis slide unit and movable in a third direction normal to said first and second directions,

said X-axis slide unit having an X-axis drive mechanism, said Y-axis slide unit having a Y-axis drive mechanism, and said Z-axis slide unit having a Z-axis drive mechanism,

said rail unit including a first pair of parallel horizontal rail members which are vertically spaced from each other, said X-axis slide unit being mounted on said first pair of parallel horizontal rail members,

said Y-axis slide unit including a second pair of parallel horizontal rail members which are vertically spaced from each other,

a Y-axis slide base being mounted on said second horizontal rail members, and

said Z-axis slide unit being fixed to said Y-axis slide base.

4,721,006

MECHANISM FOR CIRCULAR GUIDING

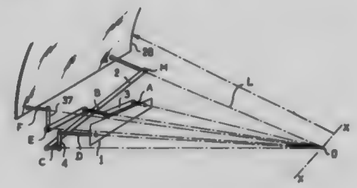
Michel Darmon, 68 boulevard Pasteur, 75015 Paris, France

Filed Apr. 15, 1985, Ser. No. 722,983

Claims priority, application France, Apr. 13, 1984, 84 05901

Int. Cl.[4] G05G *1/04*; E05F *11/44*

U.S. Cl. 74—519 **3 Claims**



1. A mechanism for guiding a driven member (28) having a first driven axis (L) and a second driven axis (F), so that any point (M) of said first driven axis (L) follows a path (TU) substantially in the form of a segment of a circle having its center (O) at a finite distance on an intersection of said driven axes (L, F) with each other, whereas said second driven axis (F) is guided so as to angularly position said driven member (28) along said first driven axis (L), said mechanism including:

a stationary carrier member (1);

a movable member (2) articulated to said driven member (28) along said first driven axis (L);

means connected to said movable member and defining first (B) and second (C) main axes which are carried by said movable member and intersect at said center (O);

a crank (3) articulated to the movable member (2) along said first main axis (B) and to the carrier member (1) along an axis (A) extending through said center (O) so as to guide said first main axis (B) along a first conical path (Cb) having its apex at said center (O);

means (3, 4) for guiding said second main axis (C) relative to the carrier member (1) along a second substantially conical path (Cc) having its apex at said center (O); and

means (37, 41) for guiding a parallelism axis (E) attached to the crank (3) and passing through the center (O), along a third conical path (Ce) having as its axis said second driven axis (F);

wherein:

on the one hand, the angle (h) between the two main axes (B, C), and, on the other hand, the conical paths of the main axes, allow the mechanism to take a reference position in which a main plane (PP) containing said main axes also contains the axis (A) of said first conical path (Cb),

in said reference position, said main plane (PP) is at an angle (U) substantially in the range between 60° and 120° to a plane which intersects orthogonally along said second main axis (C) the second conical path (Cc),

in said reference position, a plane containing the parallelism axis (E) and the axis (F) of the third conical path (Ce) forms, with a plane containing the first main axis (B) and the parallelism axis (E), an angle substantially equal to the angle (U) between the main plane (PP) and the plane orthogonally intersecting along the second main axis (C) the second conical path (Cc),

the parallelism axis (E) is substantially in a plane containing the first main axis (B) and the axis (A) of the first conical path (Cb); and

the mechanism substantially satisfies the following equations:

$$\sin 2x = 2\frac{\sin h \cdot \sin(h+r)}{\sin r}$$

$$\sin 2y = \frac{2\sin(y-r)}{\sin(x-h)}\sin(x+y-h-r)$$

$$V \simeq 0$$

where:

x denotes the angle between said second main axis (C) and said driven axis (L);

r denotes the angle at the apex of the first conical path (Cb);

h denotes the angle between the two main axes;

y denotes the angle between the parallelism axis (E) and the axis (A) of the first conical path (Cb);

V denotes the angle between the main plane (PP) and a plane containing the second main axis (C) and the first driven axis (L)

4,721,007

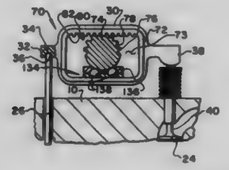
VARIABLE RATIO LEVER ARM MECHANISM

William W. Entzminger, P.O. Box 835067, Richardson, Tex. 75083

Division of Ser. No. 556,407, Nov. 30, 1983, abandoned. This application Feb. 13, 1987, Ser. No. 15,547

Int. Cl.[4] G05G *1/04*; F01L *1/34*; F16H *35/08*

U.S. Cl. 74—522 **8 Claims**



1. Rocker arm apparatus for use in combination with a valve stem and push rod of an internal combustion engine comprising an elongated body member having a first end portion for engaging the valve stem and having a second end portion for engaging the push rod, said body member having an elongated slot located intermediate said first and second end portions; shifting means received within the elongated slot and movably disposed along said body member in said slot; and, positioning means including mating toothing portions carried by said body member and said shifting means, said positioning means establishing a point of pivotal engagement between said shifting means and said elongated body member and allowing controlled translation of said shifting means within said slot, characterized in that said shifting means is a geared fulcrum member disposed in mating toothing engagement with said elongated body member, and further characterized in that a roller bearing assembly is disposed intermediate said fulcrum member and said elongated body member for providing rolling support for said fulcrum member.

5. An adjustable length rocker arm assembly comprising a base with a support rigidly mounted thereon, said support having a rod seat and a toothed rack separated by a slot, a fulcrum rod received in said slot and movable relative to the support and having curved sector and a toothed sector, said toothed rod sector engaging said toothed rack, a rocker arm pivotally supported on the fulcrum rod, an actuator arm coupled to said rod for simultaneously rotating and translating said rod relative to said rack, characterized in that, in order to increase the accuracy of adjustment, a roller bearing assembly is disposed between the rod curved sector and the rod seat, wherein the toothed rod sector is rollable along the toothed rack, and the roller bearing assembly is rollable along the rod seat.

4,721,008

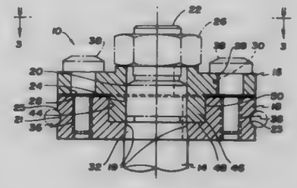
ADJUSTABLE STEERING WHEEL HUB

George J. Stoops, Northville, and William A. Grabowski, Dearborn, both of Mich., assignors to American Motors Corporation, Southfield, Mich.

Continuation of Ser. No. 835,542, Mar. 3, 1986, abandoned. This application Jan. 17, 1987, Ser. No. 65,074

Int. Cl.[4] B62D *1/04*; F16D *1/00*; F16L *23/00*; G05G *1/10*

U.S. Cl. 74—552 **6 Claims**



1. In combination with a vehicle steering mechanism having a steering wheel and a rotatable steering shaft including means for fixedly engaging said steering wheel for rotation with said steering shaft, said means comprising a set of circumferential splines on said steering shaft, the improvement comprising:

a means for selectively, angularly adjusting said steering wheel in infinitely variable increments with respect to said steering shaft regardless of the length, the width, and the distance between the splines,

wherein said adjusting means comprises a two piece hub having a first hub member and a second hub member, and a tapered portion of said steering shaft adjacent said set of splines;

said first hub member including a means for engaging the splines on the rotatable steering shaft, and an axially elongated annular wall;

said second hub member including aperture means for rotatably receiving the steering shaft, said aperture means being defined by a tapered peripheral wall engaging at least a portion of the tapered portion of the steering shaft;

said second hub member also including a means for fixedly securing the steering wheel to said second hub member, and a central recess receiving said axially elongated wall; and

a means for selectively locking said first member with said second member in a fixed, angularly adjustable position.

6. In combination with a vehicle steering mechanism having a steering wheel and a rotatable steering shaft including means for fixedly engaging said steering wheel for rotation with said steering shaft, said means comprising a set of circumferential splines on said shaft, the improvement comprising:

a two piece hub having a first hub member and a second hub member, and a tapered portion of said steering shaft adjacent said set of splines;

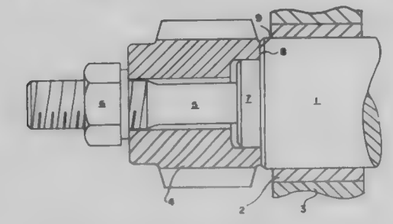
said first hub member including a circumferentially splined aperture adapted to engage said splines on said rotatable steering shaft, and an axially elongated, annular wall;
said first hub member also including at least one arcuately shaped, eccentric aperture;
said second hub member having a tapered aperture defined by a tapered peripheral wall engaging at least a portion of the tapered portion of the steering shaft, said second member also including at least one threaded aperture radially registering with each said arcuately shaped aperture,
means for securing the steering wheel to said second hub member, and a central recess receiving said axially elongated wall; and
at least one threaded fastener having an enlarged head and adapted to extend through said at least one arcuately shaped aperture in said first hub portion so as to become threadably engaged in said registering threaded aperture.

4,721,009

GEAR WHEEL SHAFT ASSEMBLY

Axel G. Berle, Geel, and Björn S. J. Fredeus, Berchem, both of Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 13, 1982, Ser. No. 377,616
Claims priority, application Sweden, Jul. 15, 1981, 8104377
Int. Cl.⁴ F16H *33/00, 1/12, 1/20*
U.S. Cl. 74—640 **3 Claims**



1. A gear wheel and drive shaft assembly for a motor comprising a gear wheel (4) driven by said motor for transmitting torque to a drive shaft (1) which is journalled in a bearing (2), a reduced diameter hub member projecting from one end of said drive shaft and defining an annular peripheral friction surface (8) on said drive shaft (1), an axle bolt (5) of reduced diameter extending from said hub member, said gear wheel having an open-ended central bore permitting slidable engagement between said gear wheel and said axle bolt, said bore terminating at one open end in an enlarged recess fitting snugly about said hub member and permitting frictional engagement between said gear wheel and said annular friction surface, said axle bolt extending beyond the other open end of said central bore and being provided with means (6) for forcing and retaining said gear wheel in positive frictional drive contact with said annular friction surface.

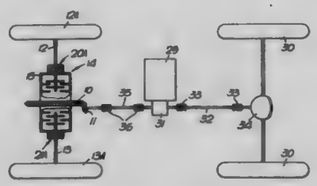
4,721,010

DIFFERENTIAL DRIVE ARRANGEMENT

Anthony J. Sheldon, Freshwater, and Anthony P. R. Rolt, Stratford-on-Avon, both of Great Britain, assignors to Harry Ferguson Limited, London, England

Continuation of Ser. No. 661,134, Oct. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 390,526, Jun. 21, 1982, abandoned. This application Dec. 5, 1986, Ser. No. 939,251
Claims priority, application United Kingdom, Jun. 26, 1981, 8119769; Feb. 12, 1982, 8200419
Int. Cl.⁴ F16H *35/04*
U.S. Cl. 74—650 **14 Claims**

1. A motor vehicle drive transmission comprising, in combination:
first and second drive axle assemblies having respective drive input members and respective road wheels;
drive line means arranged for delivering positive drive simultaneously to each of said drive input members and with fixed speed-difference therebetween;
positive drive differential gear means arranged in one of said drive axle assemblies for transmitting drive torque differentially and positively from the associated drive input member to the associated road wheels; and



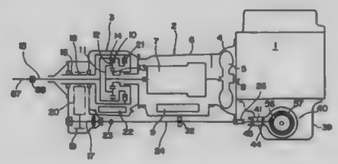
slip coupling means arranged in the other of said drive axle assemblies for transmitting drive torque from the associated drive input member to the associated road wheels, the slip coupling means being arranged to provide by slip action both intra-axle differential rotation between its associated road wheels and inter-axle differential rotation between such associated wheels and the road wheels of said one drive axle assembly while avoiding positive drive differential gear means arranged in the other of said drive axle assemblies.

4,721,011

FOUR WHEEL DRIVE POWER TRANSMISSION SYSTEM WITH FRONT PROPELLER SHAFT INCLUDING NO UNIVERSAL JOINTS CONNECTING TRANSFER DEVICE TO FRONT DIFFERENTIAL

Seitoku Kubo; Yutaka Taga, and Kunio Morisawa, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 3, 1986, Ser. No. 903,241
Claims priority, application Japan, Sep. 4, 1985, 60-195282
Int. Cl.⁴ F16H *37/06, 57/02*
U.S. Cl. 74—665 T **4 Claims**



1. A four wheel drive power transmission system for a vehicle with an engine, a pair of front wheels and a pair of rear wheels, comprising:
a speed change device affixed to an axial end of said engine and operationally coupled to said engine so as to receive rotational power therefrom;
a first power distribution device affixed to an axial end remote from said engine of said speed change device and operationally coupled to said speed change device so as to receive rotational power therefrom, said first power distribution device having first and second mutually sidewardly shifted and oppositely directed rotational power output shafts for distributionally supplying two rotational power outputs respectively either for said pair of front wheels or said pair of rear wheels or vice versa, said second output shaft being positioned sidewardly of a principal body of said first power distribution device and directed toward said engine;

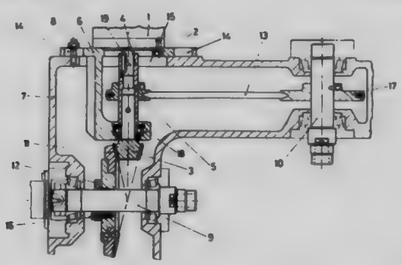
a first propeller shaft coupled to said first rotational power output shaft of said first power distribution device for supplying rotational power to either said pair of front wheels or said pair of rear wheels which are remote from said engine;
a second power distribution device mounted to said engine and having a rotational power input shaft substantially aligned with said second rotational power output shaft of said first power distribution device for receiving a rotational power input therefrom and two rotational power output shafts for distributionally supplying two rotational power outputs for the pair of either said rear wheels or said front wheels which are closer to said engine;
a second propeller shaft firmly mounted at one end thereof to said second rotational power output shaft of said first power distribution device so as to be firmly supported thereby and to be rotationally driven thereby, another end of said second propeller shaft being rotationally coupled with said rotational power input shaft of said second power distribution device by a spline engagement; and
a radial bearing mounted to said speed change device for rotatably supporting an axially intermediate portion of said second propeller shaft.

4,721,012

POWER TRANSMISSION FOR MACHINE TOOLS

Jose A. Y. Donazar, Legazpia, Spain, assignor to ALECOOP, S. Coop., Spain

Filed Dec. 4, 1985, Ser. No. 804,678
Claims priority, application Spain, Dec. 4, 1984, 283.154
Int. Cl.⁴ F16H *37/06, 35/06, 1/14*
U.S. Cl. 74—665 G **1 Claim**



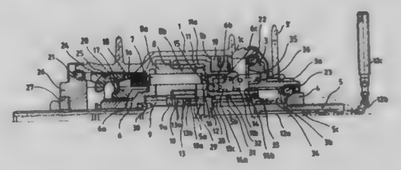
1. A power transmission device, comprising a housing having means for mounting a motor so that the projected axis of the motor shaft extends into the housing, a first housing portion extending from the motor mount generally in the same direction as the motor shaft axis and carrying a first driven shaft extending perpendicular to the axis of the motor shaft, and a second housing portion extending generally perpendicular to the axis of the motor shaft and carrying a second driven shaft extending generally parallel to the motor shaft axis, a motor support shaped and dimensioned for mounting onto the motor mount of the housing, said motor support carrying a shaft support and a driving shaft positioned for connecting onto the end of the motor shaft in alignment therewith, said driving shaft and the first driven shaft having engaging driving gears, said driving shaft and the second driven shaft having aligned pulleys, wherein said motor mount allows transverse adjustment of the driving shaft to allow adjustment of the spacing of said pulleys, said engaged driving gears being movable axially in relation to the first driven shaft to allow such adjustment.

4,721,013

MULTI-SPEED HUB FOR BICYCLES OR THE LIKE

Werner Steuer, Schweinfurt, Fed. Rep. of Germany, and Eduard Bergles, Graz, Austria, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,862
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440067
Int. Cl.⁴ F16H *3/44*
U.S. Cl. 74—750 B **66 Claims**



1. A multi-speed hub for bicycles or the like comprising
a hub shaft (5) having an axis,
a driver (3) rotatably mounted on aid hub shaft (5), said driver (3) being provided with at least one chain sprocket (3'),
a hub sleeve (1) rotatably mounted on said hub shaft (5),
planetary gear means within said hub sleeve (1), said planetary gear means including
a planet carrier (6) rotatably mounted about said hub shaft (5), at least one planet gear member (8) rotatably mounted on said planet carrier (6), said planet gear member (8) being provided with a large planet gear (8*a*) and with a small gear (8*b*),
a small sun wheel (9) for meshing engagement with said large planet gear (8*a*) and a large sun wheel (10) for meshing engagement with said small planet gear (8*b*), said sun wheels (9, 10) being selectively lockable against rotation about said hub shaft (5), an internal gear (11) rotatably mounted about said hub shaft (5), said internal gear (11) being in meshing engagement with one of said planet gears (8*a*, 8*b*),
and further comprising
a torque transmission member (14) in continuous engagement with said driver (3) and selectively engageable with one of said planet carrier (6) and said internal gear (11) for selective common rotation therewith about said hub shaft (5),
first one-way coupling means (19, 1*b*) between said internal gear (11) and said hub sleeve (1),
second one-way coupling means (18, 1*a*) between said planet carrier (6) and said hub sleeve (1),
one single speed-change control means (12*c*, 12*b*, 12*a*) introduced from one single end of said hub shaft (5) into a respective bore (5*c*) of said hub shaft (5), said speed-change control means (12*c*, 12*b*, 12*a*) being adapted for selectively coupling said torque transmission member (14) with respective ones of said planet carrier (6) and said internal gear (11) and for inactivating said first one-way coupling means (19, 1*b*),
said speed-change control means (12*c*, 12*b*, 12*c*) being connected to at least one thrust block (12) slidably mounted within a slot (5*b*) of said hub shaft (5) and being movable through a plurality of axially spaced positions in response to operation of said speed-change control means (12*c*, 12*b*, 12*a*),
in a fifth axial position of said thrust block (12), which position is at maximum spaced from said one single end of said hub shaft (5), said small sun wheel (9) being free for rotation about said hub shaft (5), said large sun wheel (10) being locked against rotation about said hub shaft (5), said torque transmission member (14) being in torque transmitting engagement with said planet carrier (6), said first one-way coupling means (19, 1*b*) being active,

in a fourth axial position of said control member (12), which is nearer to said one single end of said hub shaft (5), said small sun wheel (9) being locked against rotation about said hub shaft (5), said large sun wheel (10) being freely rotatable about said hub shaft (5), said torque transmission member (14) being still in torque transmitting engagement with said planet carrier (6), said first one-way coupling means (19, 1*b*) being still active,

in a third axial position of said thrust block (12), which is still nearer to said one single end of said hub shaft (5), said small sun wheel (9) being locked against rotation about said hub shaft (5), said large sun wheel (10) being freely rotatable about said hub shaft (5), said torque transmission member (14) being in torque transmitting engagement with said internal gear (11), said first one-way coupling means (19, 1*b*) being still active.

in a second axial position of said thrust block (12), which is still nearer to said one single end of said hub shaft (5), said small sun wheel (9) being locked against rotation about said hub shaft (5), said large sun wheel (10) being freely rotatable about said hub shaft (5), said torque transmission member (14) being in torque transmitting engagement with said internal gear (11), said first one-way coupling means (19, 1*b*) being inactivated,

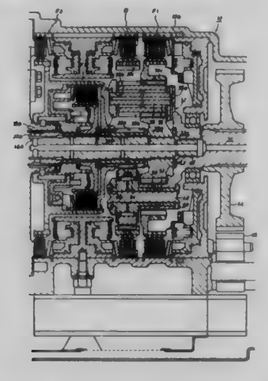
in a first axial position of said thrust block (12), which is nearest to said one single end of said hub shaft (5), said small sun wheel (9) being freely rotatable about said hub shaft (5), said large sun wheel (10) being locked against rotation about said hub shaft (5), said torque transmission member (14) being in torque transmission engagement with said internal gear (11), said first one-way coupling means (19, 1b) being inactivated.

4,721,014

PLANETARY CARRIER FOR PLANETARY GEAR TRANSMISSION

Masahiro Ohkubo, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,470
Claims priority, application Japan, Nov. 11, 1985, 60-252554
Int. Cl.[4] F16H *3/44, 57/10*
U.S. Cl. 74—750 R 8 Claims



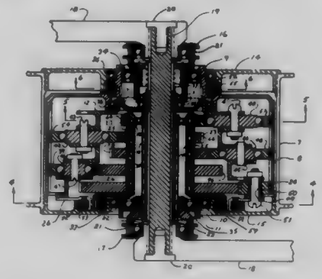
1. In a planetary gear transmission having a planetary gear train wherein first and second planetary gears meshing with each other are carried by a common planetary carrier and both planetary gears are meshed with separate sun gears and ring gears respectively; a planetary carrier for a planetary gear transmission, in which said planetary carrier is divided into plate members facing each other, a plurality of bosses are provided on one of the plate members, said two plate members are fastened together by connecting means provided internally of said bosses, said connecting means includes a stepped cylindrical member having a large diameter portion spacing said plate members apart and rotatably mounting one of said planetary gears, and bearing holes carrying a shaft mounting the other planetary gear are provided to both of said fastened plate members.

4,721,015

THREE STAGE PLANETARY DRIVING WHEEL FOR PEDAL POWERED VEHICLES

Dirck T. Hartmann, 4121 Morningstar Dr., Huntington Beach, Calif. 92649

Filed Sep. 8, 1986, Ser. No. 904,941
Int. Cl.[4] F16H *3/70, 3/62*
U.S. Cl. 74—750 B 5 Claims



1. An improved three stage planetary driving wheel for a pedal powered vehicle including a frame, said wheel having a rotational axis and comprising:

a central hub;

a pedal drive shaft mounted on said axis of said planetary driving wheel for concentric rotation with said hub;

a planet gear carrier mounted for concentric rotation about said pedal drive shaft;

multiple sets of different size planet gears rotatably carried by said planet gear carrier, including multiple planet gears of the same size in each set;

an internally toothed ring gear in constant mesh with all of said multiple sets of planet gears and mounted for rotation about said pedal drive shaft;

ring gear locking teeth on an exposed outboard end of a cylindrical extension of said ring gear;

drive fitting splinded to said pedal drive shaft and axially operative for selectively engaging said ring gear or said planet gear carrier for driving said ring gear or said planet gear carrier, respectively, from said pedal drive shaft;

drive fitting positioning means;

a sun gear carrier mounted for concentric rotation about said pedal drive shaft;

multiple externally toothed sun gears rotatably mounted on said sun gear carrier with each of said multiple sun gears in constant mesh with one of said multiple sets of planet gears;

sun gear locking means operative for selectively locking any one of said multiple sun gears to said sun gear carrier;

sun gear carrier locking teeth on an exposed outboard end of a cylindrical extension of said sun gear carrier;

first stage free-wheel ratchet means coupled between said hub and said planet gear carrier for driving said hub;

second stage free-wheel ratchet means coupled between said hub and said ring gear for driving said hub;

third stage free-wheel ratchet means coupled between said hub and said sun gear carrier for driving said hub;

a vehicle frame interface fitting on each side of said hub;

a ball bearing inside of each vehicle frame interface fittings centering on each end of said pedal drive shaft; and

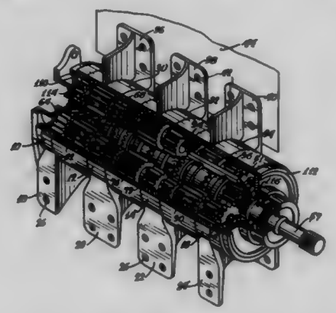
a pedal crank arm fixed on each end of said pedal drive shaft for rotation outboard of said vehicle frame interface fittings.

4,721,016

MULTIPLE-STAGE GEARED ROTARY ACTUATOR

Wesley A. Burandt, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 23, 1984, Ser. No. 633,871
Int. Cl.[4] F16H *1/28*
U.S. Cl. 74—801 2 Claims



2. A geared rotary actuator for translating a high-speed low-torque drive into a low-speed high-torque drive output for moving a member comprising, a series of driven sun gears, a plurality of ring gears with one set of ring gears being fixed and in spaced relation and a second set of ring gears being movable and one in each space between fixedx ring gears and with the movable ring gears surrounding the sun gears, a plurality of tubular planet gear shafts associated with each sun gear and each having a central gear in mesh with the sun gear and said surrounding movable ring gear and a pair of outer gears at opposite sides of the central gear in mesh with the fixed ring gears, said tubular planet gear shafts associated with a sun gear being in alignment with and rotating about the sun gear in the same direction as the tubular planet gear shafts associated with an adjacent sun gear, the tubular planet gear shafts of adjacent sun gears being in spaced-apart end-to-end relation, and a tensioned bolt fitted within the tubular planet gear shafts with an assembly clearance and common to and having a length greater than the overall length of a group of axially aligned tubular plant gear shafts to preload said adjacent tubular planet gear shafts and support the ends thereof against deflection under load to maintain said outer gears in full mesh with said fixed ring gears.

4,721,017

INDEXING TABLE

Arne R. Jorgensen, Lombard, and Dennis E. Tiberius, Naperville, both of Ill., assignors to Snow Manufacturing Company, Bellwood, Ill.

Filed Jul. 14, 1986, Ser. No. 885,542
Int. Cl.[4] B23B *29/24;* B23Q *17/24*
U.S. Cl. 74—813 L 12 Claims

1. An indexing table comprising:

a stationary base;

a workpiece supporting table having a support shaft journalled for rotation relaitve to said base;

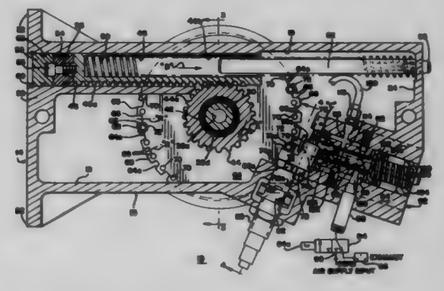
drive means for rotating said table in one direction about a central longitudinal axis of said support shaft;

an indexing wheel on said shaft having a plurality of index slots at angularly spaced apart intervals around said axis for securing said table in a rotational position corresponding to a selected one of said slots;

shot pin means movable between a locking position for engaging a selected slot in said wheel to hold said table in said selected rotational position, and a retracted position permitting successive indexing rotation of said table;

stop means for arresting the indexing rotation of said table as successive selected slots of said wheel approach said shot pin means for permitting said shot pin means to move into said locking position,

said stop means including at least one stop member adapted to be attached to said indexing wheel at a selected position thereon in predetermined relation to a corresponding selected one of said slots, a stop cam lever supported



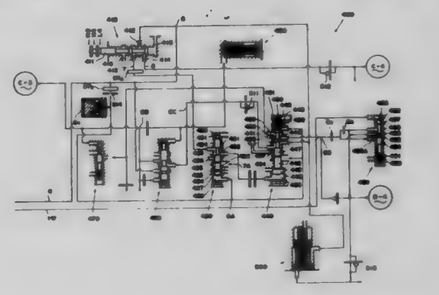
independently of said index wheel and movable relative thereto between a stop position for stopping engagement against said stop member attached on said wheel for arresting the rotation of said wheel at a selected rotational position and a released position spaced out of the path of said stop member attached on said wheel for permitting said wheel to rotate, and resilient shock absorber means activated for arresting the rotation of said wheel after the engagement of said stop member attached on said wheel against said stop cam lever.

4,721,018

TRANSMISSION CONTROL HAVING A PLURALITY OF SPEED CHANGING RATIOS FOR CONTROLLING A TRANSMISSION SYSTEM

Yoshiharu Harada, Toyota; Yutaka Taga, Aichi; Seiichi Nishikawa, Toyokawa; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 21, 1986, Ser. No. 820,178
Claims priority, application Japan, Jan. 19, 1985, 60-007768
Int. Cl.[4] B60K *41/18;* F16H *37/00*
U.S. Cl. 74—866 12 Claims



1. A transmission control device which controls the operation of a transmission system which includes a main transmission and a sub transmission, comprising:

a control means which effects a change-over of the main

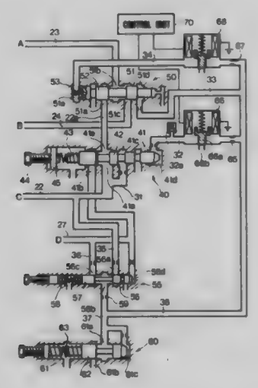
transmission between different speed gears in accordance with a level of the torque output from an engine when speed modes of the sub transmission are changed over, and wherein the gear selected by the main transmission is shifted up when the level of the torque input to the sub transmission is greater than a predetermined value.

4,721,019

CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Hiroyuki Nakamura, Higashiyamato, and Yoshihiko Morimoto, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,060
Claims priority, application Japan, Jun. 29, 1985, 60-143472
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—866 14 Claims



1. In a control system for an infinitely variable transmission for transmitting power of an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable disc, the system including a first hydraulic cylinder for shifting the disc, the transmission comprising a driven pulley having a hydraulically shiftable disc, and the system including a second hydraulic cylinder for operating the disc of the driven pulley, the transmission comprising a belt engaged with both pulleys, the system including a first hydraulic circuit having first passage means and a pump for supplying oil through the first passage means to the first and second hydraulic cylinders, a line pressure control valve in the first hydraulic circuit having a shiftable spool for controlling line pressure of the oil supplied by the pump, and a transmission ratio control valve in the first hydraulic circuit having a shiftable spool for controlling the oil controlled by the line pressure control valve and supplied to the first hydraulic cylinder for the drive pulley to change the transmission ratio of the transmission, the improvement in the system comprising

a second hydraulic circuit having a regulator valve communicating with the first passage means and operative to provide control oil having a constant pressure, and having second passage means for supplying the constant pressure control oil to the transmission ratio control valve so as to shift the spool of the transmission ratio control valve,

control valve means in the second passage means for controlling the amount of the constant pressure control oil supplied to the transmission ratio control valve,

sensing means for sensing operating conditions of the engine and the transmission and for producing signals dependent on the operating conditions,

first means responsive to the signals from the sensing means for producing an output signal,

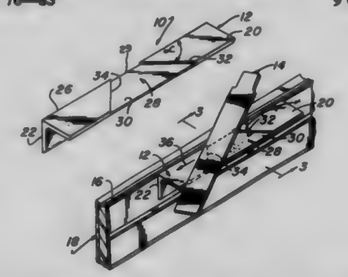
second means responsive to the output signal for producing an operating signal for operating the control valve means, such that the shifting of the spool of the transmission ratio control valve is controlled to control changing speed of the transmission ratio.

4,721,020

SKI SHARPENING GUIDE AND METHOD OF EMPLOYING SAME

Gary B. Stumpf, 27 Guernsey Hollow, Stockbridge, Vt. 05772

Filed Oct. 27, 1986, Ser. No. 923,554
Int. Cl.[4] B23D *69/02*; B24B *9/04*
U.S. Cl. 76—83 9 Claims



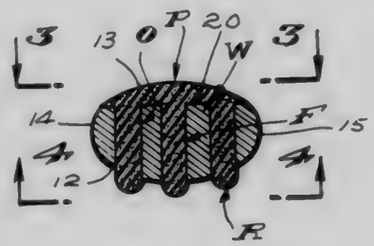
1. A ski sharpening guide comprising an angle member having an outer, upper surface for supporting a cutting tool and an outer rear surface for engaging a bottom of a ski during a sharpening operation, said upper surface including a chip-receiving recess therein, said recess having a bottom wall spaced from the upper surface of the angle member, whereby a cutting tool supported on said upper surface will be spaced from the bottom wall of the recess.

4,721,021

HANDLE STRUCTURE

Phillip S. Kuzzair, 750 E. Carson #10, Carson, Calif. 90745

Filed Sep. 10, 1986, Ser. No. 905,550
Int. Cl.[4] B25C *1/00*
U.S. Cl. 81—22 5 Claims



1. An improved handle structure for manually manipulated devices comprising an elongate vertically extending handle of flexible elastic material, the handle has upper and lower ends, a central longitudinal axis, a central vertical plane with opposite inner and outer sides and intersecting with said axis, oppositely disposed elongate front and rear edge portions extending parallel with the central axis and on planes normal to said central plane, oppositely disposed elongate inner and outer sides spaced laterally outward from the inner and outer sides of and substantially parallel with said central vertical plane, a plurality of longitudinally extending through slot openings with upper and lower ends spaced below and above said upper and lower ends of the handle, said slot openings are in spaced relationship between the front and rear edge portions on planes normal to said central vertical plane, said slot openings open at said inner and outer sides of the handle and define a plurality of elongate thin, flat, longitudinally extending parallel webs with upper and lower ends, said webs are substantially rectangular in cross section with their major cross sectional axes normal to and with their minor cross sectional axes parallel with said central vertical plane, said webs are strong and substantially non-yielding in advance of forces directed laterally onto and through the handle and are yieldingly flexible in advance of forces directed forwardly and rearwardly onto and through the handle between the upper and lower ends thereof, a flat finger-supporting pad of resilient yieldingly compressible synthetic, rubber-like material secured to and substantially coextensive with said outer side of the handle, and elongate resilient yieldingly compressible flanges of synthetic, rubber-like material in said slot openings between said webs and yieldingly transmitting forces between said webs and dampening vibratory movement thereof, said flanges.

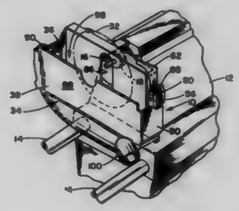
(e) a cam guide on said sliding block member and operatively receiving said cam, whereby movement of said cam shaft to a predetermined angular position precisely locates said key holder subassembly with said cross bore aligned with said interior recess of said outer driven member.

4,721,023

SAW GUARD SYSTEM

Robert L. Bartlett, Dayton; John G. Legler, Huber Heights, and Harold E. Folkerth, Dayton, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Jun. 20, 1986, Ser. No. 877,698
Int. Cl.[4] B27B *5/26*
U.S. Cl. 83—100 26 Claims

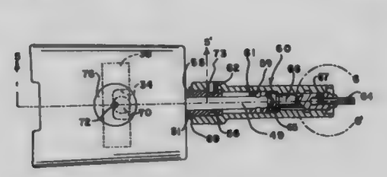


4,721,022

WRENCHING TOOL

Ronald W. Batten, Torrance, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Jan. 27, 1986, Ser. No. 823,009
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—56 16 Claims



1. A rotational wrenching tool having a housing supporting an outer, rotationally driven member with a central bore having an interior wall recess and a key holder subassembly axially-slidably received in said central bore of said driven member, and including:

(a) a sliding block member axially-movably mounted in said housing;

(b) a key holder member fixedly coupled to said sliding block member and having a longitudinal receiving bore in one end with a cross bore intersecting said receiving bore, and a detente member seated in said cross bore;

(c) a cam shaft received through a sidewall of said housing;

(d) a cam carried on the end of said cam shaft within said housing;

1. For use with a multipurpose woodworking tool of the type having a motorized headstock with a quill spindle for mounting circular saw blades and the like thereon, a quill supporting said spindle and protruding outwardly from said headstock, and a saw table having a support frame and a tabletop pivotally mounted thereon, the tabletop having an elongated blade slot therethrough, a saw guard system comprising:

a rear portion having a rear face sized to cover a lower portion of a circular tool and means for attaching said rear portion to a headstock quill;

a front portion having a front face sized to cover a lower portion of a circular tool;

means for adjustably attaching said rear portion to said front portion to form a pocket therebetwen having an upwardly opening mouth such that said front face is displaceable toward and away from said rear face, whereby said pocket and said mouth may be varied in width to accommodate rotary tools of varying thicknesses therein and provide a minimum clearance between said portions and a rotary tool in said pocket during use; and

port means communicating at an inner end thereof with said pocket and having an outer end adapted to be attached to vacuum hose means.

4,721,024

Patent Not Issued For This Number

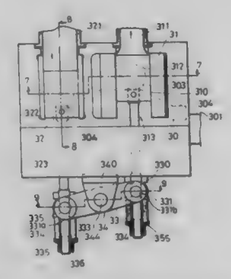
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,025

EQUILIBRIUM APPARATUS OF CUT-OFF MECHANISM FOR HIGH-SPEED NUT FORMER

Yun-Te Chang, No. 172, Erh-Hang Tsun, Jen-Te Hsiang, Tainan Hsien, Taiwan

Filed Apr. 15, 1987, Ser. No. 38,790
Int. Cl.[4] B26D *5/08, 7/00;* B21D *53/24*
U.S. Cl. 83—615 2 Claims



1. An equilibrium apparatus of cut-off mechanism for a high-speed nut former comprising:

a cutting unit including a first driven piece adapted to mount fixedly a cutting tool thereon and having a first gap provided in said driven piece, a first extension rod connected securely to said first driven piece, and a first roller mounted rotatably on said first driven piece within said first gap;

a push plate drivable to effect straight reciprocating motion in a first direction and having a continuous push surface always abutting with said first roller for pushing said cutting unit to move in a second direction perpendicular to said first direction, said push surface including an planar intermediate portion located at a first level, two planar side portions located on the opposite sides of said planar intermediate portion at a second level different from said first level, and two slope portions each interconnecting said planar intermediate portion and one of said planar side portions;

a counterweight unit, located parallel to said cutting unit, including a second driven piece carrying a counterweight thereon and having a second gap provided in said second driven piece, a second extension rod connected securely to said second driven piece, and a second roller mounted rotatably on said second driven piece within said second gap and always abutting with said push surface of said push plate so that said second driven piece is capable of being pushed by said push plate to move in said second direction, said second roller being located in a spaced relation with said first roller so that it is moved onto said planar intermediate portion of said push surface when said first roller is moved onto one of said planar side portions of said push surface and so that it is moved onto one of said planar side portions of said push surface when said first roller is moved onto said planar intermediate portion of said push surface;

a coupler, mounted pivotally on the machine table of said nut former at the central portion thereof so that it can rotate about its pivoted point to movably interconnect said first and second extension rods at the opposite ends thereof in such a manner that said first and second extension rods are capable of effecting straight motion;

a spring device disposed on said first and second extension rods for absorbing the shock produced from the cutting action of said cutting tool and for biasing said first and second extension rods to move in a third direction which is opposite to said second direction;

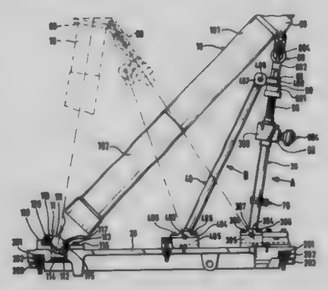
whereby, when one of said cutting unit and said counterweight unit is pushed by said push plate to move in said second direction, the other of said cutting unit and said counterweight unit is moved stably in said third direction by said resilient device and said coupler, that is, said cutting unit and said counterweight unit are always pushed to effect straight reciprocating motion in opposite directions so that the equilibrium of said cut-off mechanism is achieved.

4,721,026

MORTAR

Inigo Arana Ibarra, Vizcaya, Spain, assignor to Esperanza y Cia, S.A., Spain

Filed Apr. 9, 1986, Ser. No. 849,752
Claims priority, application Spain, Mar. 17, 1986, 292.982[U]; Mar. 17, 1986, 292.984[U]; Mar. 26, 1986, 553.428
Int. Cl.[4] F41F *1/06;* F41G *5/00*
U.S. Cl. 89—37.05 11 Claims



1. A mortar, characterized because it is comprised of a barrel mounted upon a base platform with:

(a) means of spacial pivotal linking between said barrel and said base platform;

(b) means for tipping the barrel in a vertical plane which comprises:

(b_1) a tripod with parallel legs that are pivotally attached to said base platform, and fitted with a raising mechanism, said parallel legs extending from and being parallel from said base platform to said raising mechanism;

(b_2) a lower stop, located upon one of the tripod legs, to act as a minimum elevation angle limiter to operate in conjunction with:

(b_3) a main spindle which is driven by the raising mechanism and makes the barrel tip, where said spindle is connected to said barrel through the cross control mechanism which travels in relation thereto thanks to a guide collar;

(b_4) a set of rear legs which are parallel and likewise pivotally attached to said base platform, and mounted upon the spindle each with a set of pressure rings, said rear legs extending from and being parallel from said base platform to said spindle;

(c) a mechanism for sweep control for crosswise adjustment of the barrel.

4,721,027

DOUBLE ACTING LINEAR ACTUATOR

William F. Keller, West Covina, and Richard D. Sibley, Anaheim, both of Calif., assignors to Koso International, Inc., Santa Fe Springs, Calif.

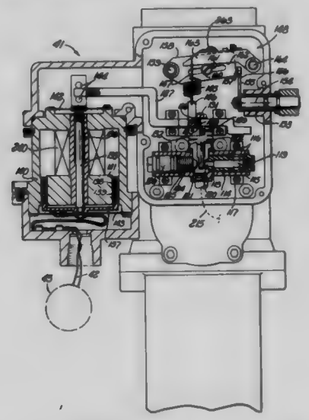
Filed Nov. 16, 1981, Ser. No. 321,444
Int. Cl.[4] F15B *15/17*
U.S. Cl. 91—387 27 Claims

1. A double acting actuator comprising:

a fluid actuated unit including a body containing a wall movable in opposite directions by pressure fluid in two chambers at opposite sides of the wall and having a smaller effective area exposed to the fluid in a first of said chambers than to the fluid in the second chamber;

a source of pressurized fluid connected to said first chamber;

a three way valve unit including a body structure containing a valve chamber and having an inlet opening introducing pressurized fluid from said source into said valve chamber, an outlet opening conducting pressure fluid from said chamber, and a third opening communicating with said valve chamber at a location essentially between said inlet and outlet openings and leading to said second chamber of said fluid actuated unit;



said valve unit including a valve element movable in said valve chamber between said inlet opening and said outlet opening and operable by such movement to vary the pressure applied to said second chamber through said third opening;

a control element downstream of said outlet opening operable to vary the discharge of fluid from said valve chamber through said outlet opening; and

means responsive to variations in the pressure of fluid between said outlet opening and said control element to actuate said valve element in correspondence therewith.

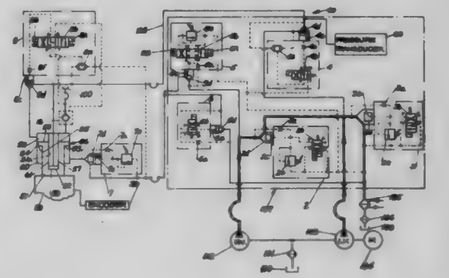
4,721,028

CONTROL SYSTEM FOR HYDRAULIC PRESSES

Delbert E. Lucas, Fairfield, Ohio, and Stephen J. Lieland, Lawrenceburg, Ind., assignors to Cincinnati Incorporated, Cincinnati, Ohio

Division of Ser. No. 480,720, Mar. 31, 1983, Pat. No. 4,524,582.
This application Apr. 2, 1985, Ser. No. 718,948
Int. Cl.[4] F15B *11/10*
U.S. Cl. 91—433 3 Claims

1. A control system for controlling the movement of the slide of a fully hydraulic press of the type having a hydraulic circuit for supplying hydraulic fluid under pressure to a piston mounting said slide, said control system comprising processor means for controlling the downward and upward movements of the slide and for reversing the direction of slide travel at a predetermined point, and hydraulic circuit control means responsive to said processor means for controlling the supply of hydraulic fluid to said piston to cause said slide to move upwardly or downwardly, said processor means including means for causing said slide to move downwardly at a plurality of preselected speeds, means for causing said slide to move upwardly at a plurality of preselected speeds, means for reversing downward travel of the slide at a preselected point in response to the detection of one of a predetermined slide position and tonnage, and adaptive decompression means for gradually relieving the hydraulic pressure in said hydraulic circuit at the end of said working stroke as a function of the pressure



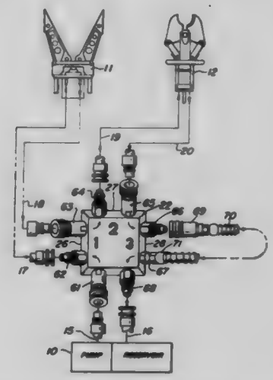
in said hydraulic circuit at the end of the downward movement of the slide.

4,721,029

PRESSURIZED FLUID SUPPLY MEANS FOR RESCUE TOOLS

Kenneth F. Hoffman, Schwenksville, and Robert J. Linster, Southampton, both of Pa., assignors to Hale Fire Pump Company, Conshohocken, Pa.

Filed Jun. 3, 1986, Ser. No. 869,994
Int. Cl.[4] F15B *11/16*
U.S. Cl. 91—520 24 Claims



1. In a pressurized fluid supply for a plurality of hydraulically powered rescure tools wherein a single power unit, as a pump, has a supply line for delivering the fluid under pressure and a return line through which the fluid is returned to the power unit, and wherein each of the rescue tools has a suply line for delivering pressurized fluid to an intake thereof and a return line for returning fluid from an exhaust thereof,

a series flow connector block means having a plurality of internal flow passages,

each of said internal flow passages providing flow communication between a pair of ports formed in an external surface of said block means,

a flow connector fitting associated with each of said ports and mounted on the external surface of said block means to extend from an associated port externally of said block means,

each of said fittings being constructed and arranged to deliver the fluid from its associated port and the flow pas-

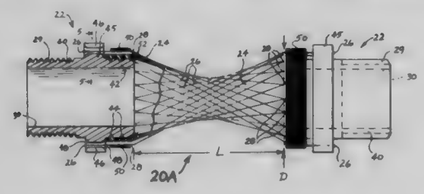
sage communicating therewith to a flow line connected to the fitting to extend externally of said block means,
said external flow lines including
a power unit supply line being connected to to a first fitting associated with one port of a first passage,
a supply line of a first rescue tool being connected to a second fitting associated with the other port of said first passage,
a return line of the first rescue tool being connected to a third fitting associated with one port of a second passage,
a supply line of a second rescue tool being connected to a fourth fitting associated with the other port of said second passage,
flow line means for connecting the return line of the second rescue tool to a fifth fitting associated with one port of a third passage, and
a power unit return line being connected to a sixth fitting associated with the other port of said third passage,
whereby the fluid flows from said power unit serially through the supply and return lines of said first and second rescue tools and back to said power unit by way of said first, second and third passages in said block means.

4,721,030

HYPERBOLOID OF REVOLUTION FLUID-DRIVEN TENSION ACTUATORS AND METHOD OF MAKING

Henry M. Paynter, 35 Scotland Rd., Reading, Mass. 01867

Filed Jul. 16, 1985, Ser. No. 755,605
Int. Cl.[4] F01B *19/04*
U.S. Cl. 92—92 19 Claims



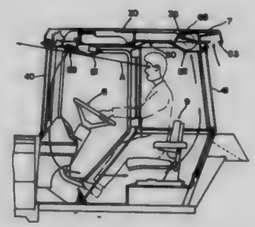
1. A fluid-driven, tension actuator having an axis and being axially contractible upon inflation by fluid under pressure for converting fluid pressure energy into axial contraction displacement, comprising:
a pair of axially aligned and axially spaced ring-shaped end fittings adapted to move between maximum and minimum axial separation from each other,
a tubular resilient, flexible, stretchable, elastomeric shell extending between said end fittings and being connected in air-tight relationship to both of said end fittings,
a multiplicity of relatively inextensible, flexible strands extending between said and fittings and each being anchored to both of said end fittings,
said strands being adjacent to the exterior surface of said tubular shell,
a first plurality of said strands being extendible as straight lines and upon their extension as straight lines each being oriented at the same first pitch angle when the end fittings of the actuator are at their maximum axial separation from each other,
a second plurality of said strands being extendible as straight lines and upon their extension as straight lines each being oriented at the same second pitch angle when the end fittings of the actuator are at said maximum axial separation from each other,
said first and second pitch angles all having the same absolute value but said second pitch angles being of the opposite sense from said first pitch angles,
the absolute value of said first and second pitch angles being in the range from 60° to 120°,
said strands all being straight lines when the end fittings of the actuator are at their maximum axial separation from each other and each lying along a respective straight line generator element of an hyperboloid of revolution bounded at its opposite ends by said end fittings,
at least one of said end fittings providing a passage therethrough communicating with the interior of said elastomeric shell for enabling said shell to be inflated and deflated, and
said elastomeric shell upon full inflation with fluid under pressure stretching into a generally spherical surface of revolution with said strands each bowing convex outwardly away from the axis pulling said end fittings toward each other to their minimum axial separation for producing axial contraction of the actuator.

4,721,031

TRACTOR CABIN

Masaru Nakata, Sakai; Kenichi Sato, Osaka; Izumu Kawai; Katsumi Ohishi, both of Sakai; Mitsuhiko Obe, Izumiotsu; Takao Nishikawa, Sakai; Yoshaburo Shimizu, Kawachinagano, and Kenji Hinoue, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 14, 1986, Ser. No. 863,219
Claims priority, application Japan, Jun. 12, 1985, 60-89372[U]
Int. Cl.[4] B60H *1/00*
U.S. Cl. 98—2.09 5 Claims



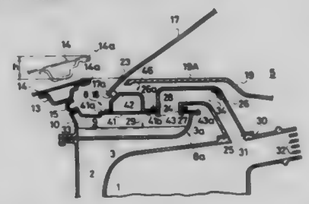
1. An air conditioner assembly for a tractor cabin including
a main framework assembly (10) including struts (11–16) and a top framework (20),
a top covering (7) mounted on the top framework (20),
a windshield (40) attached to the main framework assembly (10) through a mounting element (54) provided peripherally of the windshield,
said air conditioner assembly (30) mounted between the top framework (20) and the top covering (7), with a ceiling assembly (50) covering the air conditioner assembly (30), said air conditioner including a front, side and rear,
front outlet vent means (58) for supplying hot defrosting air, side outlet vent means (64) for supplying a mixture of hot and cold air, and intake vent means (70) directed downwardly in the rear,
said front outlet vent means (58) being disposed in a front region of the ceiling assembly and adapted to direct air flow against the windshield, said side outlet vent means (64) being disposed in intermediate lateral regions of the ceiling assembly to direct air flow toward and to the sides of the driver, and said intake vent means (70) including an inside air intake vent (66) disposed in a rear region of the ceiling assembly (50) of the cabin interior and an outside air intake vent (67) disposed in a projection (53) overhanging rearwardly from the ceiling assembly (50),
a rear glass (41) inclined forwardly to meet an opening area of the intake vent means (70) with at least a ninety degree angle formed between said intake vent and said rear glass, and
an overhead console box (51) disposed in the ceiling assembly (50) rearwardly of the front outlet vent means (58) and projecting to a greater extent into the cabin than the front outlet vent means, said console box (51) having a lower end (62) thereof located substantially on a straight line (A) extending from eye level with the driver to a lower edge of an upper portion of the mounting element (54).

4,721,032

ARRANGEMENTS FOR FORMING AUTOMOBILE COWL STRUCTURES

Toshinori Sakamoto, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Aug. 1, 1986, Ser. No. 891,947
Claims priority, application Japan, Aug. 5, 1985, 60-120688[U]
Int. Cl.[4] B60H *1/28*
U.S. Cl. 98—2.16 12 Claims



1. An arrangement for forming an automobile cowl structure comprising:
a windshield supporting frame with a closed cross section, for supporting a lower end of a front windshield and composed of (a) a cowl top member formed in the shape of a bank protruding upward and extending along the front windshield in the direction of the width of an automobile body construction and (b) a cowl cover panel having said cowl top member fixed thereon, said cowl cover panel having a prolongation incorporated therewith and horizontally extending backward beyond a rear end portion of said cowl top member, and
an upper dash panel having a rear end wall portion thereof connected to the prolongation of said cowl cover panel at its upper end, said rear end wall portion being disposed to be distant in a backward direction relative to the closed cross section of said windshield supporting frame, so that a space formed between said cowl cover panel and the upper dash panel extends in a backward direction beyond the closed cross section of said windshield supporting frame.

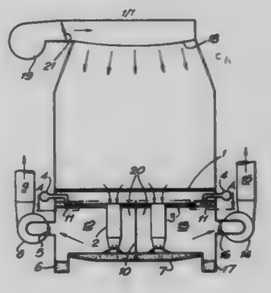
4,721,033

METHOD AND APPARATUS FOR REMOVING SPRAYED MATERIAL FROM THE AIR EXHAUSTED FROM A SPRAY BOOTH

Ivan Bloomer, London, and Ian H. Lynham, Stratford-upon-Avon, both of England, assignors to Haden Drysys International Limited, London, England

PCT No. PCT/GB85/00445, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/02022, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 30, 1985, Ser. No. 893,300
Claims priority, application United Kingdom, Oct. 1, 1984, 8424678
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 9 Claims

1. A spray booth comprising:
an enclosure in which material is sprayed;
an air inlet path in communication with said enclosure;
a substantially horizontally extending sub-floor arranged at the base of said enclosure and defining an air outlet chamber in communication with said enclosure;
partition means dividing said air outlet chamber into at least two separate chambers;
an air exhaust duct extending from said enclosure and in communication with each of said separate chambers;
means for supplying cleaning liquid to said sub-floor;
means for extracting air laden with the sprayed material from said enclosure through said separate chambers;



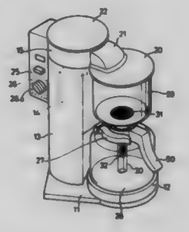
washing means in each of said separate chambers arranged such that said air laden with the sprayed material flows therethrough in intimate contact with said cleaning liquid; and
means for independently controlling the volume of air flowing through each of said separate chambers.

4,721,034

COFFEE MAKER OR LIKE BEVERAGE MAKING DEVICE

Nobuo Shimomura, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1986, Ser. No. 942,342
Claims priority, application Japan, Jan. 31, 1986, 61-020987; Feb. 5, 1986, 61-023521
Int. Cl.[4] A47J *31/047*
U.S. Cl. 99—280 7 Claims



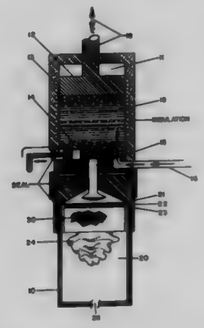
1. A coffee maker or like beverage making device comprising:
(a) a lower container for containing water;
(b) a heater for applying heat to said lower container;
(c) an upper container for containing a material such as coffee powder, said upper container having a water feed tube, said water feed tube having a portion thereof insert into said lower container;
(d) a filter provided in said upper container for preventing transfer of the material into said lower container and allowing a beverage such as coffee to be made to transfer into said lower container through said water feed tube;
(e) a pressure reducing valve communicating said lower container with the atmosphere when opened; and
(f) a means for opening said pressure reducing valve for a

predetermined period of time corresponding to a soak-like processing period of time after a predetermined short period of time from the time when hot water in said lower container starts to transfer to said upper container through said water feed tube and further closing said pressure reducing valve when the predetermined period of time elapses.

4,721,035
INFUSION EXTRACTOR

Franklin R. Chang-Diaz, Webster, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Sep. 30, 1986, Ser. No. 913,446
Int. Cl.[4] A47J *31/36*
U.S. Cl. 99—297 **18 Claims**



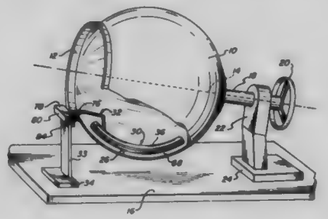
1. An apparatus for infusion extraction of an infusible material, by a solvent comprising:
an hermetically sealed first chamber adapted for receiving the solvent,
an hermetically sealed second chamber in fluid communication with the first chamber, wherein the solvent contacts the infusible material and wherein an extract of the desired constituents is formed;
transfer means for transferring the solvent, independent of gravity forces, from the first chamber to the second chamber and for transferring the extract from the second chamber to the first chamber;
and a separator means associated with the second chamber adapted for separating the extract from an extraction residue.

4,721,036
APPARATUS FOR MIXING KETTLE CONTENTS

John M. Brandt, and Gerry C. Zekert, both of Suffolk, Va., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 7, 1986, Ser. No. 916,312
Int. Cl.[4] A47J *27/00;* B01F *9/02*
U.S. Cl. 99—348 **19 Claims**

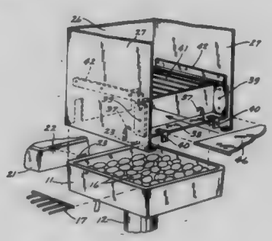
1. A processing apparatus for comestibles comprising:
a kettle having an opening at one end thereof for access for insertion and removal of said comestibles, said kettle having a generally concave shape and being rotatable about an axis with respect to a supporting base, said kettle having a concave surface generally symmetric with respect to said rotation axis;
means for rotating said kettle about said axis;
a device for mixing said comestibles, said device being stationary with respect to said rotating kettle and comprising an elongate substantially rigid bar, said bar having a concave shape and spaced from said rotating concave surface of said kettle, said bar contacting said comestibles during rotation of said kettle and continuously turning said comestibles to provide substantially uniform heating of said comestibles.



4,721,037
SMOKER APPARATUS FOR AN OUTDOOR BARBECUE GRILL

John J. Blosnich, 134 Millsboro Rd., Rices Landing, Pa. 15357

Filed Dec. 29, 1986, Ser. No. 947,393
Int. Cl.[4] A47J *37/07, 37/04*
U.S. Cl. 99—482 **2 Claims**

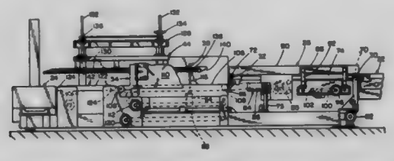


1. A combination smoker attachment and grill comprising:
container means having an open top, a closed bottom, front and rear sidewalls for holding heat retaining lava rock;
hinge means for selectively attaching or detaching a pivoting lid onto said container means, said hinge means comprising a pair of members extending rearwardly from the top and rear of said rear sidewalls;
a grate;
means attached to said container means for selectively holding said grate near said open top thereof above said rock, and permitting said grate to be removed from said container means;
means attached to said container means for selectively heating said lava rock;
a metal cabinet having a rear wall, a pair of sidewalls connected to said rear wall, a removable front wall and a top wall;
a tray means for holding wood chips disposed above said lava rock;
means attached to a lower portion of said cabinet means for holding said cabinet onto the top and covering said container means;
a plurality of grates disposed above said metal tray means and attached to said container means for holding food to be smoked.

4,721,038
STATION FOR FORMING STACKS OF FOLDED CARTONS

Charles W. Eldridge, Beverly, Mass., assignor to Post Machinery, Inc., Portsmouth, N.H.

Filed Oct. 22, 1986, Ser. No. 921,748
Int. Cl.[4] B30B *9/30*
U.S. Cl. 100—8 **11 Claims**



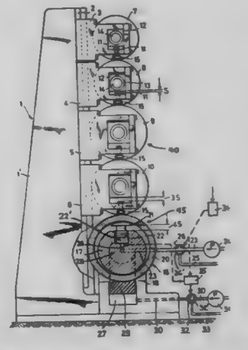
1. A stacking station adapted for disposition between the output of machinery for forming folded cartons by folding and gluing carton blanks, and a strapping machine for applying a strap about a stack of said folded cartons to form a bundle, said machinery providing a series of said cartons in shingle form with the cartons inclined and overlapped, said stacking station comprising:
an upstream conveyor for receiving the cartons from said machinery, said upstream conveyor having an input end disposed at substantially the same level as the output of said machinery and an output end which is vertically adjustable;
an intermediate conveyor for moving stacks of cartons toward said strapping machine and having a receiving end aligned to receive cartons from said upstream conveyor, said receiving end being disposed at a lower level than said output end;
gate means associated with said intermediate conveyor and defining with said intermediate conveyor a pocket for forming a stack of said cartons, said gate means being positioned to define the downstream end of said pocket, said gate means being movable between a blocking position wherein said gate means extends above said intermediate conveyor a distance greater than the height of the stack to be formed and a release position wherein said gate means does not interfere with movement of a formed stack toward said strapping machine,
further comprising generally horizontally extending compression means overlying said intermediate conveyor, forming the top of said pocket and extending to at least adjacent to said strapping machine, so that the formed stacks engage said compression means and said compression means stabilizes the stacks and limits the height of the formed stacks as they move toward said strapping machine.

4,721,039
METHOD AND CONTROL APPARATUS FOR SEPARATING THE ROLLS OF A CALENDER

Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Sulzer-Escher Wyss AG, Zürich, Switzerland

Filed Feb. 13, 1987, Ser. No. 14,782
Claims priority, application Switzerland, Feb. 18, 1986, 00655/86
Int. Cl.[4] B30B *15/16;* B21B *31/32*
U.S. Cl. 100—47 **9 Claims**

1. A method for separating the rolls of a calender containing a roll stand and equipped with a plurality of superimposed rolls, comprising the steps of:
providing as one of the superimposed rolls a bottom roll having a non-rotatably mounted carrier which is substantially vertically movable by means of hydraulic carrier support devices pressurizable by means of a pressurized medium and upon which non-rotatably mounted carrier there is supported by means of at least one hydraulic support element pressurizable by means of a pressurized medium a roll shell which is movable in substantially vertical direction;
separating the rolls of the calender by lowering the pressure in the hydraulic carrier support devices and the pressure exerted upon the at least one hydraulic roll shell support element such that both said carrier and said hydraulic roll shell are moved substantially vertically downwards; and

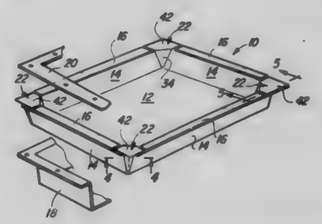


said step of lowering the pressure entails the initialization of the lowering of the pressure in the hydraulic carrier support devices with a predeterminate time-delay after the initialization of the lowering of the pressure exerted upon said at least one hydraulic roll shell support element.

4,721,040
SEAMLESS PRESSURE RESPONSIVE DIAPHRAGM INSTALLATION

Robert Mau, Howell, Mich., assignor to Filtra-Systems Company, Farmington, Mich.

Filed Aug. 11, 1986, Ser. No. 895,233
Int. Cl.[4] B30B *5/02, 15/06;* B31B *1/26, 3/90*
U.S. Cl. 100—211 **2 Claims**



1. A pressure responsive diaphragm installation comprising:
a rigid housing member forming a generally rectangular cavity having a bottom, upright sides, and corners at the intersections thereof together defining a pressure chamber,
said housing member further having a flange portion extending about the periphery of said cavity;
a diaphragm of a flexible material, said diaphragm constructed by:
folding the peripheral edge region of a flat rectangular sheet of said material upward from a center region along bottom folds spaced from the peripheral edge thereof a distance equal to the depth of the sides of said housing member cavity combined with the width of the flange portion thereof;
forming upright corners at each corner of said flat rectangular sheet to be interfit with said housing member cavity, by

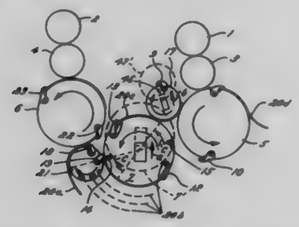
folding said material along a pair of corner folds at each corner extending from the intersection of each bottom fold and each aligned with a respective one of the bottom folds;
gathering a tapered loop of excess material inwardly at each corner as said sides are raised up by folding along said bottom folds;
folding a top section of each of the sides outwardly along respective flange folds to form a flange portion along each side configured to overlie said housing member flange portion; and
forming a pleat on either side of each corner in said flange portion by folding along a pair of transverse flange folds to allow the top of the gathered loop of material at each corner to lie flat across said corner in the form of a tab curving from the loop of excess material, whereby seamless diaphragm corners are provided; and
a rigid clamping member shaped to overlie said housing member and diaphragm flange portions, whereby enabling sealing of said diaphragm flange portion against said housing flange portion.

4,721,041

DEVICE FOR A SERIES-PRODUCED SHEET-FED OFFSET ROTARY PRESS

Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1986, Ser. No. 910,491
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535694
Int. Cl.[4] B41F *21/10, 5/22*
U.S. Cl. 101—230 **4 Claims**



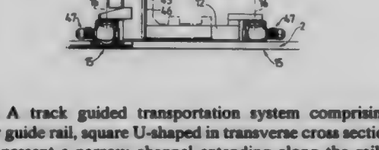
1. A sheet-fed offset rotary press having spaced first and second impression cylinders, each having a respective cooperating blanket cylinder, said first and second impression cylinders each having sheet grippers;
a sheet transfer system between said first and second impression cylinders including, in succession, a transfer cylinder having sheet grippers, a transfer drum having sheet grippers, and a turning drum having sheet grippers for grasping a trailing sheet end, said turning drum being rotatably engaged with said second impression cylinder;
said impression cylinders and transfer drum each having a diameter twice the size of said blanket cylinders, the distance between said impression cylinders being less than the diameter of said transfer drum; means for displacing said transfer cylinder out of engagement with said first impression cylinder,
means for displacing said transfer drum out of engagement with said turning drum and into raised engagement with said first and second impression cylinders, and means for selectively rotating said transfer drum in first and second rotational directions;
whereby the sheet transfer system functions for selective sheet movement between two operational modes, a first mode for multi-color printing on one side of the sheet, and a second mode for perfecting printing;
wherein in the first mode the transfer drum is rotated in a first rotative direction and raised into engagement with each of said impression cylinders with the transfer cylinder being displaced from each said first impression cylinder and said transfer drum for performing one-sided multicolor printing; and in the second mode, the transfer drum is lowered into engagement with the turning drum, the transfer cylinder is lowered into engagement with said first impression cylinder and said transfer drum for performing perfecting printing.

4,721,042

MISSILES WITH ANNULAR FLARE

Richard P. Moate, Stevenage, United Kingdom, assignor to British Aerospace PLC, London, England

Filed Oct. 31, 1986, Ser. No. 925,236
Claims priority, application United Kingdom, Oct. 31, 1985, 8526849
Int. Cl.[4] F42B *4/26*
U.S. Cl. 102—343 **5 Claims**



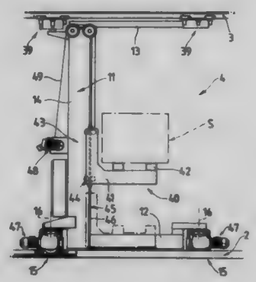
1. A self-propelled missile for being tracked following launch, comprising:
a main body portion;
a propulsion motor housed within said main body portion;
a propulsion efflux outlet disposed in an aft portion of the body portion on the longitudinal axis of the missile and arranged to exhaust propulsion efflux rearwardly; and
an annular flare surrounding the propulsion efflux outlet and extending coaxially with respect to said longitudinal axis, said flare including an annular element of pyrotechnic material and an annular outlet for exhausting pyrotechnic efflux rearwardly.

4,721,043

TRACK GUIDED TRANSPORTATION SYSTEM

Jack L. Pudney, Dandenong, and Richard M. Baird, East Malvern, both of Australia, assignors to Bridge & Plate Constructions Pty., Ltd., Dandenong, Australia

Filed Feb. 25, 1986, Ser. No. 833,830
Claims priority, application Australia, Mar. 1, 1985, PG9534
Int. Cl.[4] B61B *13/04;* **E01B** *25/12*
U.S. Cl. 104—121 **23 Claims**



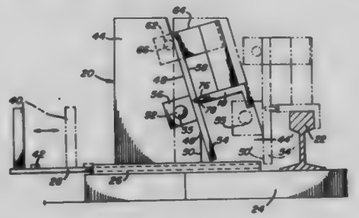
15. A track guided transportation system comprising: a lower guide rail, square U-shaped in transverse cross section so as to present a narrow channel extending along the rail, the bottom of the U providing a bottom face and the legs of the U each providing a pair of opposing inner side faces and outer side faces spaced outwardly from respective inner side faces; an upper guide rail extending above and parallel to the lower guide rail; and, a transportation vehicle having a plurality of mounting assemblies through which the vehicle is mounted to and between the lower and upper rails for travel therealong, at least one of the mounting assemblies mounting the vehicle to the lower rail and at least one other of the mounting assemblies mounting the vehicle to the upper rail, the mounting assembly of the lower guide rail including one only supporting wheel for rolling centrally along the rail channel on the bottom face to support the vehicle during travel, the supporting wheel having an unflanged annular tread surface in rolling contact with the bottom face, and at least one stabilizing roller in the track channel extending generally between the inner side faces alternately and in rollable engagement with one or other of the inner side faces at any one time in order to laterally stabilize the vehicle durng travel, the mounting assembly of the lower guide rail also including at least one guide element selectively movable for engagement with and disengagement from the lower rail outer side face, engagement occuring only at track junction regions in order to directionally steer the mounting assembly of the lower guide rail and thus steer the vehicle through the junction regions.

4,721,044

RAIL CAR SKID INSERTION DEVICE

Meryl M. Hall, Sr., HC 69 Box 76, Herndon, W. Va. 24726

Filed Sep. 16, 1986, Ser. No. 908,034
Int. Cl.[4] B61H *7/06*
U.S. Cl. 104—259 **18 Claims**



1. Device for impeding the movement of a rail car on a rail track having a rail head; comprising:
a skid of dimensions allowing placement on the rail head of the rail track, said skid being operative to hinder the rotation of a wheel of the rail car; and
insertion means slidable along a guideway for inserting said skid on the rail head of the rail track.

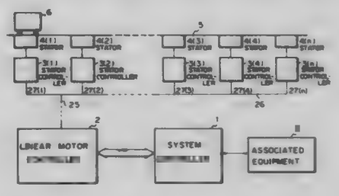
4,721,045

TRANSPORT CONTROL SYSTEM WITH LINEAR MOTOR DRIVE

Kazuyoshi Okawa, Hachiouji; Kazumasa Moriya, Urawa; Tomoyuki Kashiwazaki, Kawasaki; Hiroshi Kawashima, Ebina, and Yoshitaka Murakawa, Fuchu, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 5, 1985, Ser. No. 708,586
Claims priority, application Japan, Mar. 6, 1984, 59-43587; Mar. 6, 1984, 59-43588; Mar. 6, 1984, 59-43589; Mar. 6, 1984, 59-43590; Mar. 6, 1984, 59-43591
Int. Cl.[4] H02K *41/00;* **B60L** *15/22*
U.S. Cl. 104—290 **4 Claims**

1. A transport control system with linear motor drive comprising:
a rail-path for providing a route of transport;
a carrier adapted to be driven along said rail-path by linear motor drive;
a plurality of stator portions coupled to said rail-path to produce a driving force in association with said carrier; and
a main controller for deriving a plurality of optimum velocities of said carrier at stator portions regarding a predetermined ideal rail-path and for sending velocity data of said optimum velocities to stator portions respectively;
each of said stator portions including a stator, a stator driver



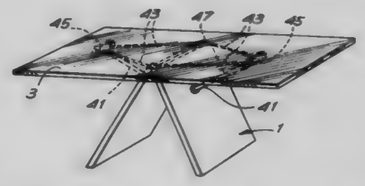
energizing said stator so as to produce said drive force from said stator, and a stator controller coupled to said stator driver and said main controller for modifying said optimum velocities received from said main controller according to a velocity characteristic of said rail-path among said stator portion and adjacent stator portion and for controlling said stator driver according to said modified optimum velocities.

4,721,046

STRUCTURE FOR FITTING, WITH A BASE, A PLANE AND SUPPORTS FORMED BY TENSION RODS AND STRUTS

Luciano Cionini, Pisa, Italy, assignor to Lavorazione Artigiana Onice di Luciano Cionini & C.S.a.c., Italy

Filed Jun. 24, 1986, Ser. No. 878,040
Claims priority, application Italy, Jun. 28, 1985, 11713/85[U]
Int. Cl.[4] A47B *13/02*
U.S. Cl. 108—150 **2 Claims**



1. A structure comprising two dihedral slabs forming a supporting base, said slabs having upper edges that are adjacent to each other and lower edges that are spaced apart from each other, two supports each comprising three stems, with the stems of each support each having first ends that converge together at a support area, and opposite second ends that diverge away from each other, said support areas being in a common plane and being positioned on opposite sides of said upper edges of said slabs, each support being connected between one of said slabs and one of said support areas, and a plane top supported on said upper edges of said slabs and on said support areas, said stems of each support comprising a lower strut connected between one slab at a location spaced downwardly from the upper edge of that slab, and one of said support areas, and said stems of each support comprising a tension rod connected between said upper edge of one slab and one of said support areas.

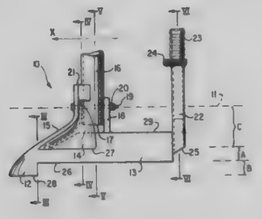
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4,721,047

APPARATUS FOR PLANTING SEED AND FERTILIZER

Aimee J. Stauch, Box 369, Esterhazy, Saskatchewan, Canada S0A 0X0

Filed Feb. 21, 1986, Ser. No. 831,554
Claims priority, application Canada, Mar. 28, 1985, 477780
Int. Cl.[4] A01C 5/00
U.S. Cl. 111—73 9 Claims



1. A fertilizer attachment for a seed drill provided with furrow opening means and a seed delivery tube having an outlet behind said furrow opening means, said attachment comprising:

an additional rearwardly sloping furrow opening means of narrower width than said furrow opening means of the seed drill for opening a narrow slot-like opening in soil, said additional furrow opening means having a lower end;

a narrow upright plate-like shoe member having forward and rearward ends, said shoe member being at least as wide as said additional furrow opening means, and said shoe member being located immediately behind said additional furrow opening means;

a fertilizer delivery tube having an outlet located immediately behind the rearward end of the shoe member; and

attachment means for attaching said attachment to said seed drill such that said attachment is capable of being attached with: said additional furrow opening means extending forward of, and in alignment with, said furrow opening means of the seed drill with said lower end of said additional furrow opening means extending below the furrow opening means of the seed drill, and

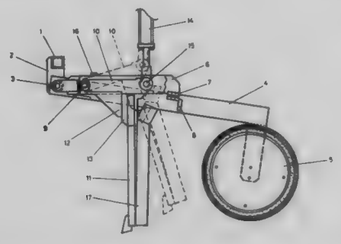
said shoe member extending below the outlet of the seed delivery tube with said seed delivery outlet located between the forward and rearward ends of the shoe member.

4,721,048

TRASH SEEDER

Roy M. Fuss, 21 Leslie Street; Eric W. Fuss, 3 Heller Street, and Jarvis R. Fuss, 143 Tourist Road, all of Toowoomba, Queensland, Australia 4350

Filed Oct. 22, 1985, Ser. No. 790,073
Claims priority, application Australia, Oct. 29, 1984, PG7893
Int. Cl.[4] A01C 5/00
U.S. Cl. 111—85 9 Claims



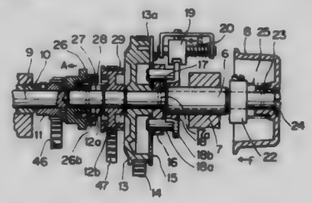
1. A trash seeder comprising an implement frame carrying at least one seeding tyne, and a press wheel rearwardly of said seeding tyne, said press wheel being carried by a rigid main frame pivoted to said implement frame, said seeding tyne being pivoted rearwardly of said main frame pivot to a second frame pivoted to said implement frame, said second frame adapted to apply downward force to said rigid main frame, and resilient means applying downward pressure to said tyne, said seeding tyne being pivotable upwardly relative to said rigid main frame to clear an obstruction while downward pressure is maintained on said press wheel.

4,721,049

SELECTING MECHANISM OF A DOUBLE-FUNCTION SEWING MACHINE

Susumu Hanyu, and Akio Koide, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 33,032
Claims priority, application Japan, Apr. 11, 1986, 61-53488
Int. Cl.[4] D05B 1/14
U.S. Cl. 112—168 5 Claims



1. A selecting mechanism for a double-function sewing machine which is provided with two stitching mechanisms for different sewing operations within a single machine frame, the selecting mechanism comprising a drive shaft (6) which is rotatably supported on the machine frame and is connected at one end with an axially movable flywheel and is driven by a drive source via a belt wheel body; a first belt wheel (29) which is idle rotatably on the drive shaft and is operatively connected to a first stitching mechanism; an upper shaft belt wheel (11) which is secured on an upper shaft (9) of a second stitching mechanism, said upper shaft being rotatably supported in the machine frame and being coaxial with the drive shaft and having a rotation transmitting part; a slider (26) provided on said drive shaft between said upper shaft belt wheel (11) and said first belt wheel (29), said slider having a rotation transmitting part for selectively engaging either of the belt wheels, said slider being rotation-fixed with the drive shaft and movable in an axial direction of the drive shaft; a switching shaft (30) which is rotatably supported in the machine frame and is rotated by an external switching operation; moving means for moving the slider so as to connect the slider to the switching shaft; rotation checking means checking the rotation of for the switching shaft; and a release device which releases the rotation checking means by axially moving the flywheel.

4,721,050

FEED DEVICE FOR A SEWING MACHINE

Nobuyuki Naganuma; Fujio Horie, and Kenji Matsubara, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 18, 1986, Ser. No. 931,853
Claims priority, application Japan, Nov. 20, 1985, 60-260441
Int. Cl.[4] D05B 27/14, 27/22
U.S. Cl. 112—315 12 Claims

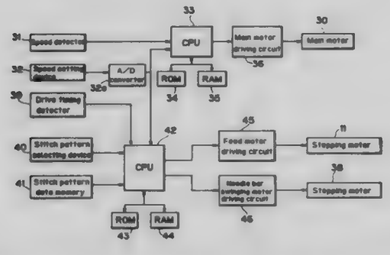
1. A feed device for a sewing machine including a needle, a main motor driving reciprocatively said needle, speed control means controlling the rotating paeed of said main motor, and feed means for feeding a work to be sewn; wherein said feed means comprises,

a feed member engageable with said work,

a stepping motor driving said feed member directly to impart feed motion to said work,

signal generating means generating a feed signal corresponding to the magnitude of the feed stroke of said feed motion in phase with the reciprocation of said needle,

a detecting means for detecting a drive timing corresponding to a predetermined phase of said needle, and



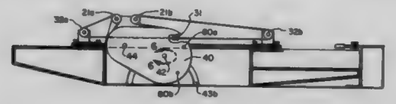
feed control means responsive to said feed signal and a speed signal corresponding to the rotating speed of said main motor for controlling the period of command pulses to be supplied to said stepping motor so that said feed motion may be carried out between said drive timing and a given timing just before said needle contacts said work.

4,721,051

TANDEM WINCH REELS

James E. F. Willard, P.O. Box 3244, Rte. AIA, Gulfstream, Fla. 33444

Filed Dec. 23, 1985, Ser. No. 812,130
Int. Cl.[4] B63B 41/00
U.S. Cl. 114—141 12 Claims



1. Apparatus comprising a tandem-reel winch system, a line and a centerboard keel; wherein said tandem-reel winch system comprises a first cylindrical reel, a second cylindrical reel in series with said first reel, and a means for rotating said reels; wherein said line is wound in a first direction around said first reel; wherein said line runs from said first reel around a substantial portion of the periphery of said keel to said second reel; wherein said line is wound in a reverse direction around said second reel; and wherein said keel can be raised or lowered by rotation of said reels.

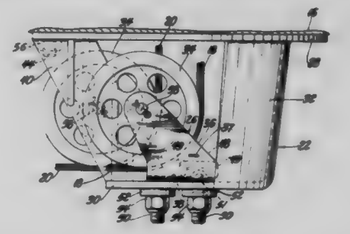
4,721,052

PEDESTAL WHEEL STEERING SYSTEM HAVING UNIVERSAL SELF-ADJUSTING IDLER

Malcolm J. Smiley, Mentor, and Bruce Groves, Seven Hills, both of Ohio, assignors to Merriman/Yacht Specialties, Inc., Grand River, Ohio

Filed Oct. 25, 1985, Ser. No. 791,583
Int. Cl.[4] B63H 25/10
U.S. Cl. 114—160 8 Claims

1. A boat steering assembly (10) of the type having a pedestal steering actuator (11) in a hollow column (12) mounted on a boat sole (16) and a pair of steering cables (18, 20) leading from the actuator (11) through a substantially vertical orientation and then through a pulley assembly (22,26) and then in substantially horizontal orientation to a rudder assembly (24), said steering assembly (10) comprising: a depending bracket assembly (22) mounted under the sole (16), a universal self-adjusting idler pulley means (26) mounted under the pedestal column (12) below the bolt sole (16) by said depending bracket assembly (22) for swiveling and toggling to maintain alignment of the steering cables (18, 20) with the rudder assembly (24) as the steering cables (18, 20) extend down from the steering actuator (11) and about said pulley means (26), said bracket assembly (22) disposed on the outside of the turn of the cables (18, 20)



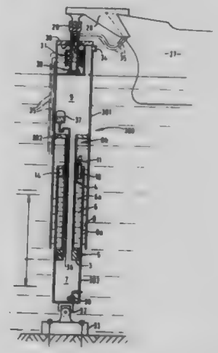
through said pulley means (26) and including a housing having a flange (28) for engaging the boat sole (16) and a mounting plate (30) spaced from said flange (28) and suspended therefrom by a connecting wall (32), said pulley means (26) being universally mounted to said mounting plate (30) to suspend said pulley means (26) in tension from said bracket assembly (22) toward said flange (28).

4,721,053

MOTION COMPENSATORS AND MOORING DEVICES

Robert W. Brewerton, 68 Betenson Avenue, Sevenoaks, Kent, England

Filed Dec. 19, 1984, Ser. No. 683,673
Claims priority, application United Kingdom, Dec. 23, 1983, 8334384
Int. Cl.[4] E21B 19/08
U.S. Cl. 114—230 20 Claims



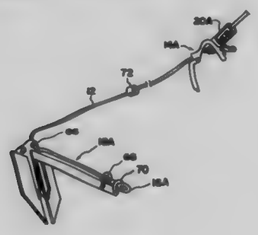
1. An underwater motion compensator installation to accommodate relative movement between interconnected objects which are relatively movable, comprising: first telescopically acting means for coupling to a first object; and

second telescopically acting means for coupling to a second object, said first and second means being located beneath a depth of water,

said first and second means also for: (1) defining a variable, gas containing volume therebetween, which gas containing volume expands as said first and second means move farther apart from one another, (2) allowing telescopic movement therebetween to elongate the connection between the objects, which telescopic movement is resisted

by a restoring force produced by said expansion of said gas containing volume against ambient water pressure at said depth.

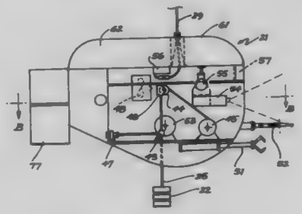
4,721,054
ANCHOR DEVICE
Satoru Kobayashi, 33-8 Taishido 5-chome, Setagaya-ku, Tokyo-to 154, Japan
Filed May 20, 1986, Ser. No. 865,115
Claims priority, application Japan, May 30, 1985, 60-115232
Int. Cl.[4] B63B *21/46*
U.S. Cl. 114—299 15 Claims



1. An anchor device comprising
a flexible rope having a free end,
retaining means having opened and closed positions for detachably retaining said free end of said rope, said retaining means being attached to said rope and normally held at a position which is separated from said free end of said rope by a certain distance, said retaining means opening responsive to a weight striking it, said retaining means holding said free end of said rope when said retaining means is closed, and said retaining means releasing said free end of said rope when said retaining means is opened,
anchoring means having a shank and at least one grasping member extending backwardly from one end of said shank for grasping solid matter at the bottom of a body of water, said anchoring means being attached to said rope so that said one end having said grasping member is positioned remote from said free end of said rope, and said one end of said shank being secured to said rope at a position which is closer to said free end of said rope than to a middle point of the extension of said rope between said retaining means and said free end of said rope, and
a weight slidably engaging said rope and dropped downwardly along said rope to impinge against said retaining means for opening said retaining means so that said free end of said rope is released from said retaining means in readiness for raising the anchor.

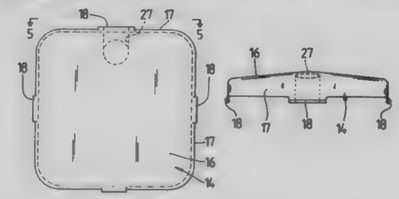
4,721,055
REMOTELY OPERATED UNDERWATER VEHICLE
John T. Pado, Leeming, Australia, assignor to Underwater Systems Australia Limited, Perth, Australia
PCT No. PCT/AU85/00008, § 371 Date Oct. 9, 1985, § 102(e) Date Oct. 9, 1985, PCT Pub. No. WO85/03269, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 17, 1985, Ser. No. 781,271
Claims priority, application Australia, Jan. 17, 1984, PG3231
Int. Cl.[4] B63G *8/00*
U.S. Cl. 114—331 17 Claims

1. A remotely operated submersible vehicle comprising positive buoyancy means, a winch, a cable stored on said winch and passing through guide means, said cable being adapted to have a clump weight attached to a free end thereof such that, when said clump weight is made sufficiently heavy to overcome the buoyancy of the positive buoyancy means, the vertical position of the vehicle, from a seabed over which it is operating, can be adjusted by winding cable onto, or off from



said winch, the guide means being horizontally movable within the vehicle to maintain the trim of the vehicle.

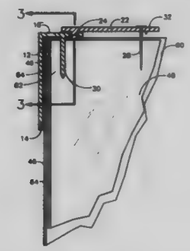
4,721,056
VISUAL INDICATOR CAP FOR A TELECOMMUNICATION CABLE TERMINAL PEDESTAL
Larry J. Steeley, 2401 Regent Cir., Birmingham, Ala. 35226
Filed Jul. 23, 1987, Ser. No. 76,915
Int. Cl.[4] G08B *5/00*; H02G *9/02*
U.S. Cl. 116—209 5 Claims



1. A visual indicator cap for telecommunication cable terminal pedestals having a watershed cover comprising:
(a) a substantially square cover portion having depending sidewalls and rounded corners, said cover portion being conformable to the shape of said watershed cover;
(b) a latch member depending from each sidewall of said cover portion with each latch member having an inwardly facing groove-like portion for engaging the edge of said watershed cover; and
(c) a scored removable portion proximal one of said latch members cooperatively positioned for passage of telecommunictions cables from said pedestal therethrough.

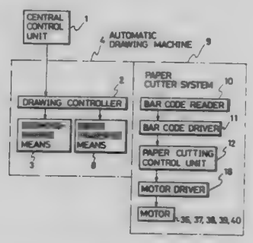
4,721,057
INDEXING DEVICE FOR BOOKS
Anthony E. Vigil, 40 Saddlehorn Trail, Monument, Colo. 80132
Filed Mar. 19, 1986, Ser. No. 841,154
Int. Cl.[4] B42D *9/00*
U.S. Cl. 116—238 8 Claims

6. An indexing device adapted as a bookmark for marking a reader's place in a book, having a spine, a pair of cover boards and a plurality of leaves, comprising:
mounting means for securing a base to said book,
said mounting means including a base member having a first leg portion adapted to extend alongside the spine of the book and a second leg portion adapted to extend over a joint portion of said leaves, and a finger projecting from said second leg portion in spaced relation to said first leg portion and positioned to be inserted into the gutter portion of said book;
an arm member pivotally mounted to said base and extending alongside a gathering of said leaves;
a trunnion pin on one of said base and said arm member and a complementary hole on the other of said base and arm member sized to receive said trunnion pin, said trunnion pin terminating in an outward flange whereby said base and arm member may be snap-fitted together, said trunnion pin being split into segments sized to exert radially



frictional force against said hole for resisting relative pivotal movement of said base and arm member; and
a prong mounted adjacent a free end of said arm member whereby said prong may extend in between two consecutive leaves to indicate the reader's place in said book.

4,721,058
PAPER CUTTING UNIT OF AUTOMATIC DRAWING MACHINES
Mamoru Hayamizu, and Nobuo Tsukada, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Feb. 28, 1985, Ser. No. 706,482
Claims priority, application Japan, Mar. 2, 1984, 59-40652
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—665 13 Claims

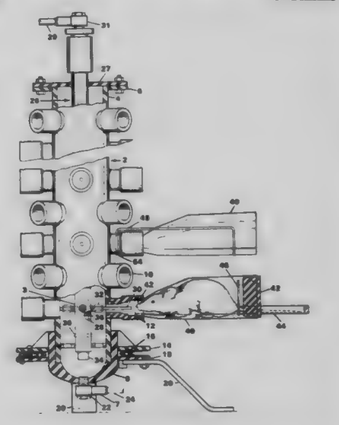


2. A drawing system for making drawings of different sizes on a longitudinally advanced roll of drawing paper and for automatically cutting the drawing paper to preselected sizes, the drawing system comprising: drawing means for making a draing of any one of a predetermined number of desired sizes on a section of a roll of drawing paper and for encoding the section of drawing paper with coded data relating to the desired lengthwise and widthwise size of the drawing; decoding means for reading and decoding the coded data and for producing control signals relating to the desired lengthwise and widthwise size of the drawing; and cutting means for cutting the drawing paper in the lengthwise and widthwise directions in accordance with the control signals to obtain a cut piece of drawing paper containing thereon the drawing of the desired size as determined by the coded data.

4,721,059
NONCLAY CATBOX FILLER
H. Edward Lowe, 21525 Allegheny St., Cassopolis, Mich. 49031, and Ricky L. Yoder, Elkhart, Ind., assignors to H. Edward Lowe, Cassopolis, Mich.
Continuation of Ser. No. 714,450, Mar. 21, 1985, abandoned.
This application Aug. 27, 1986, Ser. No. 901,963
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—1 21 Claims

15. A filler material for use in a cat litter box, said filler material comprising plant fiber granules, formed by growth agitation procedures, said filler material having an appearance which resembles that of naturally occurring clay, said granules possessing the physical and chemical properties of a naturally occurring clay based substance.

4,721,060
NOSE-ONLY EXPOSURE SYSTEM
William C. Cannon, Richland; Edward W. Bass, Kennewick, and John R. Decker, Jr., Pasco, all of Wash., assignors to Battelle Memorial Institute, Columbus, Ohio
Filed Jul. 17, 1986, Ser. No. 887,572
Int. Cl.[4] A61D *7/04*; A01K *1/03*; A61B *5/08*
U.S. Cl. 119—15 5 Claims



1. An exposure system for delivering gaseous material to the noses of a considerable number of experimental animals, comprising;
(a) a vertical outer cylindrical manifold having a removable cover on its upper end and a substantially closed lower end;
(b) a turntable supporting said outer manifold at its lower end;
(c) a plurality of reducing couplings mounted at different levels on said outer manifold with their smaller ends extending through the walls of said manifold and their larger ends extending outwardly therefrom;
(d) at least two spaced apart O-rings within the larger ends of each of said reducing couplings;
(e) a plurality of bottles, each of said bottles having a body portion of sufficient size to receive the body of a rodent and a reduced end portion of sufficient size to receive the head of said rodent and terminating in a neck fitting snugly within said O-rings, said bottles being supported by said O-rings;
(f) an inner manifold within said outer manifold and spaced therefrom, leaving an annular passageway;
(g) a closure for the lower end of said inner manifold;
(h) a plurality of tubes, each having an open inner end in communication with, but readily detachable from, said

inner manifold, and an open outer end adjacent to said neck of one of said bottles;

(i) said inner manifold having an inlet for gaseous material at its upper end and said outer manifold having an outlet at its lower end;

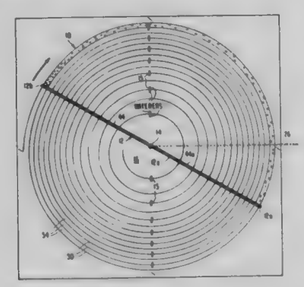
(j) whereby gaseous material will flow through each of said tubes to the nose of each rodent and out through said passageway, and whereby said device can be disassembled by removing said bottles, disconnecting said tubes from said inner manifold, removing the cover of said outer manifold and withdrawing said inner manifold.

4,721,061

APPARATUS FOR GRAZING MANAGEMENT AND PASTURE IRRIGATION

Monteine McNatt, P.O. Box 396, Alamogordo, N. Mex. 88310

Filed Sep. 16, 1985, Ser. No. 776,665
Int. Cl.[4] A01K *3/00*; B05B *3/18*
U.S. Cl. 119—20 **27 Claims**



1. A system for controlling the movement of animals in a pasture and for the irrigation of said pasture, said system comprising means for urging the animals to travel along a predetermined labyrinthine path defined by a stationary spiral electric fence at a predetermined rate, such that the herd grazes on every portion of the pasture in sequence over a given period of time, said means for urging further comprising means for irrigating substantially the entire pasture.

4,721,062

METHOD OF RAISING ROOSTING FOWL

Thomas D. Williams, and Roger Williams, both of Miami, Fla., assignors to Quail Roost Quail Farms, Miami, Fla.

Filed Apr. 4, 1985, Ser. No. 719,865
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—21 **29 Claims**

1. A process for raising roosting fowl, comprising:

subjecting hatched fowl to red light for a period sufficient to induce enlarged reproductive organs in said fowl, and providing sufficient light for said fowl to become aquainted with their surroundings;

stopping said red light and subjecting said fowl to a decreased amount of light; and

then subjecting said fowl to substantially total darkness until the fowl reach a desired state of growth.

4,721,063

KNOCK-DOWN ANIMAL FEEDER

Frank W. Atchley, 461 Walnut St., Napa, Calif. 94558

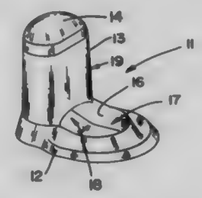
Filed Sep. 25, 1986, Ser. No. 911,460
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—52 R **15 Claims**

1. A knock-down animal feeder, including;

a base member having a concavity in the upper surface thereof, the forward portion of said concavity being shaped to define an open feeding dish;

a tubular feed dispensing member, comprising a continuous curved sidewall defining a tubular member having opposed, open, first and second ends;

means for assembling said first end of said feed dispensing member to said base member in generally permanent fashion, including at least one detent receiving recess and at least one detent projection formed in complementary fashion in said members and disposed for mutual engagement to resist separation of said members, at least one of said members being formed of resilient material in the



region of said detent recess and detent projection whereby said detent projection is engagable with said recess by forcing said members together;

means for releasably closing said second end of said feed dispensing member to permit filling of said feed dispensing member without separating said feed dispensing member and said base member, including a lid removable secured to said second end of said closed curved sidewall;

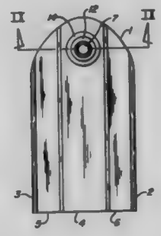
said first end of said closed curved sidewall being in open flow communication with the back portion of said concavity to deliver feed gravitally from said feed dispensing member to said open feeding dish.

4,721,064

ANIMAL EAR TAG

Gregory J. Deak, Newburg; Michael C. Sander, Evansville; Harold E. Bechtold, Evansville, and Cecil R. Gurganus, Evansville, all of Ind., assignors to GenCorp Inc., Akron, Ohio

Continuation-in-part of Ser. No. 092,137, Jan. 17, 1985, abandoned. This application Sep. 20, 1985, Ser. No. 778,109
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—156 **4 Claims**



1. A substantially flat animal ear tag having on one side at least one central section integral with and disposed lengthwise of said tag and being substantially thicker than the body of said tag, said tag having an area, said thick section occupying at least one third of said tag area, said tag having edges, said tag having integral beads, said edges of said tag extending lengthwise and parallel to said central section and having a thickness essentially the same as that of said central section, said tag having been extruded at a temperature of below about 150° C., preferably at a temperature below about 125° C. and said tag

having a round, hollow connector, said entire tag except for said connector having a composition comprising

I. a vinyl chloride polymer selected from the group consisting of homopolyvinylchloride, vinyl chloride-vinyl acetate copolymer containing up to about 50% by weight of vinyl acetate, and vinyl chloride-vinylidene chloride copolymer containing up to about 50% by weight of vinylidene chloride, and mixtures of the same,

II. a plasticizer or mixtures of plasticizers for said vinyl chloride polymer in an amount sufficient to obtain the required flexibility for the vinyl chloride polymer and to assist in migration and exudation of insecticide,

III. a migratory and volatile insecticide in an amount of from about 5 to 100 parts by weight per 100 parts by weight of the vinyl chloride polymer, and

IV. conventional compounding ingredients for said vinyl chloride polymer,

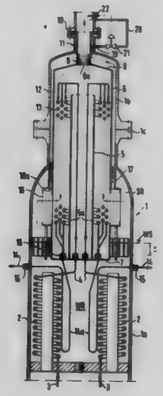
said central section having an end portion, said end portion having a centrally located hole, said round hollow connector disposed in said hole, said connector having a back plate for pressing against the remaining side of said tag to hold said connector to said tag, and said tag capable of rotation about said connector.

4,721,065

PROCESS AND APPARATUS FOR COOLING HOT PROCESS GAS FROM A PRESSURE GASIFICATION REACTOR

Horst Mohrenstecher, and Ulrich Premel, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmuller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 9,411
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602935
Int. Cl.[4] F22D *1/00*
U.S. Cl. 122—7 R **6 Claims**



1. A heat exchanger comprising:

an upright pressure vessel including a water space and a saturated steam space above said water space;

a water inlet to said water space;

at least one heating surfaces package;

a gas inlet for passing hot process gas under pressure to said heating surfaces package;

at least one water separator arranged in said saturated steam space and

at least one superheater heating surfaces package arranged in said saturated steam space, through which superheater heating surfaces package dewatered saturated steam is flowing and which is connected to said heating surfaces package and to a gas outlet, respectively, by means of process gas tubes in such a manner that the process gas flows through the superheater heating surfaces package in countercurrent with respect to be saturated steam and

a steam outlet connected to said superheater heating surfaces package;

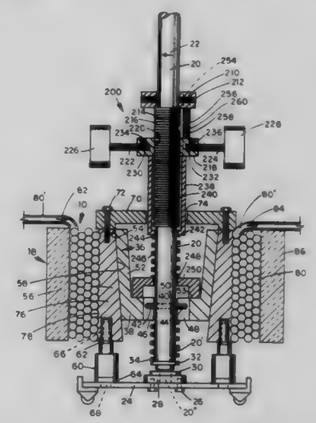
the superheater heating surfaces package being disposed in an annular space between a central tube and a guiding sleeve closed at least at its lower end by a bottom, said annular space being connected at one end thereof to said saturated steam space, the guiding sleeve extending with its closed lower end beyond the minimum water level in the water space, and at least the process gas tubes forwarding the process gas from said heating surfaces package passing through the bottom of the guiding sleeve in such a manner that the process gas tubes are in a range of passing through the bottom biased on one side always by steam and on the other side by water.

4,721,066

SELF-ADJUSTING FAIL SAFE FRICTION HEATER SYSTEM

William E. Newman, Sr., 207 Doncaster Rd., Joppa, Md. 21085, and Desmond J. Farrow, Sr., North East, Md., assignors to William E. Newman, Sr., Joppa, Md.

Filed Dec. 9, 1986, Ser. No. 939,851
Int. Cl.[4] F22B *3/06*
U.S. Cl. 122—26 **11 Claims**



1. A system for friction-heating of fluid for use at a remote location, and having: a housing with an interior wall of conical contour and an exterior wall, tubing on the housing for heating of fluid therein by the housing, a driveshaft, a rotor with an axis of rotation and an exterior wall of conical contour fitting the housing interior wall in position for rotation of the rotor by the driveshaft relative to the housing causing heating of said rotor and housing; and means for transferring fluid heated, characterized by: means for connecting the rotor for rotation by the driveshaft within a predetermined range of relative positions of rotor and housing along said axis, means for automatically disconnecting said connecting of the rotor from the drive shaft when said predetermined range is exceeded, said rotor being subject to wear relative to said housing by said rotation and causing said range to be exceeded, the means for connecting comprising: the driveshaft having a lower portion with a transverse structure thereon, the rotor having structure defining an axial slot, the transverse structure being in a range of driving positions within the axial slot, and the means for disconnecting comprising said wear causing said rotor to descend relative to the housing and the axial slot to lower with

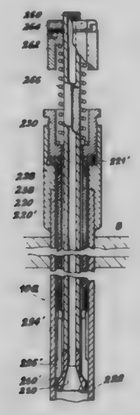
said descent and remove said transverse structure from with the axial slot.

4,721,067

DEVICE FOR INJECTING A LIQUID INTO A TUBE AND STEAM GENERATOR COMPRISING THIS DEVICE

Jean-Edmond Chaix, Pierrevert; Michel Metteey, Equilles, and Jean-Paul Badoux, Le Puy Sainte Reparade, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 29, 1985, Ser. No. 739,009
Claims priority, application France, May 29, 1984, 84 08414
Int. Cl.[4] F22B *1/06*
U.S. Cl. 122—32 2 Claims



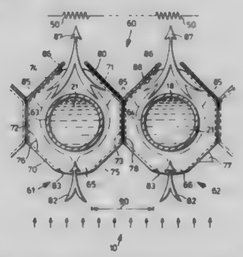
1. A steam generator having an envelope, a tube place located within the envelope and subdividing the latter into a water box and a heat exchange zone, an inlet and an outlet for a primary fluid located in the heat exchange zone of the envelope, an inlet and an outlet for a secondary fluid in the water box, a ferrule dividing the water box into a central inlet zone and a peripheral steam outlet zone located externally of said central inlet zone, a plurality of tubes having an inlet end and an outlet end for the secondary fluid, said inlet ends of the tubes being fixed to the tube plate in the inlet zone of the water box, and said outlet ends of the tubes being fixed to the tube plate in the outlet zone of the water box, each tube having: a linear portion at the inlet end, a helical portion surrounding said linear portion, as well as a device for injecting secondary fluid into the tube, said device having a cannula disposed within the inlet end of the tube and having a passage cross-section for the secondary fluid, followed, in the secondary fluid circulation direction, by a divergent portion, a sleeve being positioned between said cannula and the linear portion of the tube, means for centering the cannula relative to the linear portion of the tube, said means comprising at least one slot, an internal cone formed in the sleeve, an external cone formed on a bottom part of the cannula, said cones cooperating with one another, and means for elastically applying the outer cone to the inner cone, said means for applying the outer cone to the inner cone being constituted by locking means located at the upper end of the cannula and by a spring interposed between said locking means and a plug screwed onto a top part of the tube, the passage cross-section of the fluid in the cannula being such that the speed of said fluid exceeds 0.7 m/s.

4,721,068

GAS-FIRED BOILER PLANT

Juan Bassols Rheinfelder, Hasselt; Norbert Bednarek, Kelmis, both of Belgium, and Jacob J. Marijnen, Nieuwenhagen, Netherlands, assignors to Rendamax AG, Zug, Switzerland

Filed Dec. 2, 1986, Ser. No. 936,884
Claims priority, application European Pat. Off., Dec. 10, 1985, 85115685.1
Int. Cl.[4] F22B *23/06, 37/10*
U.S. Cl. 122—367 C 6 Claims



1. Gas-fired boiler comprising a burner bed extending over a flat surface and heat exchanger pipes arranged above the burner bed, parallel to the said surface, the heat exchanger tubes comprising pipes equipped with a plurality of flat ribs which extend substantially radially from the said pipes, which are provided in spaced arrangement over the length of the said heat exchanger pipes, which exhibit roughly the shape of annular rings and which are provided with bent-off portions formed by folding over marginal areas exhibiting roughly the shape of circle segments, and the flue gases rising from the burner bed flowing through the gaps formed between the said ribs and pipes, wherein said bent-over edges are inclined, at least partly, relative to the surface of said burner bed, said ribs being subdivided over their periphery into eight sections of substantially equal size which, except for two diametrically opposite sections, are provided with said bent-over edges, and wherein in the mounted condition of said heat exchanger the sections not provided with such bent-over edges are disposed in vertical arrangement, one above the other, relative to the surface of said burner bed and provided with openings permitting the hot flue gas rising from said burner bed to enter and/or leave the gaps, the openings and the diameter of said pipes being sized in such a manner that the direction of flow of the rising flue gases is changed several times so that the flue gases flow around said pipes along a substantially semi-circular path.

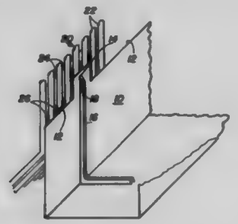
4,721,069

TERMINATION FOR BOILER CASING EXPANSION ELEMENT

Edward W. Kreider, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 19, 1987, Ser. No. 64,047
Int. Cl.[4] F22B *37/06, 37/10*
U.S. Cl. 122—511 11 Claims

1. An attachment arrangement for a membrane tube wall of a vapor generator, the attachment arrangement comprising a casing having an edge and an attachment surface near the edge, an extension plate connected to the casing and extending beyond the edge, said extension plate having an attachment surface, an attachment area extending over the attachment surfaces of the casing and the extension plate and being attached to the tube wall, the casing having a slot extending therein, the slot extending past the edge into the extension plate, an expansion element straddling the slot and being connected to the casing and to the extension plate on opposite sides of the slot and the expansion element having a termination covering an end of the slot and connected to said extension plate whereby thermal expansion and contraction of said casing in the vicinity of said attachment area is compensated for



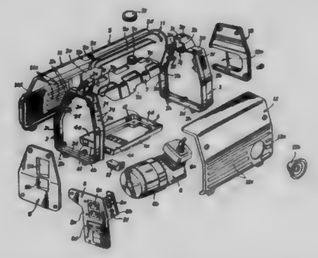
by said expansion element and termination to resist tearing and deformation of said casing in said attachment area.

4,721,070

PORTABLE ENGINE-OPERATED WORKING MACHINE

Yoshio Tanaka, and Tadahiro Yaguchi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 785,684, Oct. 9, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 39,836
Claims priority, application Japan, Oct. 9, 1984, 59-152606[U]
Int. Cl.[4] F02B *63/04*
U.S. Cl. 123—2 7 Claims



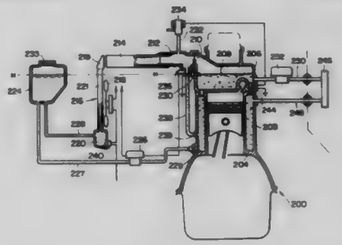
1. A hand carriable portable engineoperated working machine comprising:
- an engine and a working machine coupled to said engine and driven thereby;
- a pair of transverse frame members for supporting for carrying said engine and said working machine attached to and driven said engine, each member of said pair of transverse members having at least a transverse horizontal top bar and a pair of vertical bars integral with and extending downwardly from the opposite ends of said transverse horizontal top bar;
- a bottom member interconnecting the lower ends of said frame members;
- said engine and said working machine being mounted on said bottom member; and
- a carrying handle for lifting, through said transverse frame members, and for carrying said engine and said working machine mounted on said bottom member, said handle extending in the longitudinal direction and being connected at its opposite ends to said transverse top bars of said frame members.

4,721,071

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Kazuyuki Fujigaya, Yokosuka; Yoshinori Hirano, Yokohama, and Hitoshi Shimoosesono, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 14, 1986, Ser. No. 918,052
Claims priority, application Japan, Oct. 15, 1985, 60-157563[U]; Oct. 23, 1985, 60-235428; Mar. 25, 1986, 61-66790; Apr. 4, 1986, 61-77843; Apr. 4, 1986, 61-77844
Int. Cl.[4] F01P *3/22*
U.S. Cl. 123—41.21 23 Claims



1. In an internal combustion engine having a structure subject to high heat flux
a cooling system comprising:
- a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and discharged in gaseous form;
- a radiator in fluid commuication with said coolant jacket which receives coolant vapor produced therein and condenses it to its liquid form, said radiator including a small collection vessel disposed at the bottom thereof;
- a reservoir in which coolant is stored, said reservoir being fluidly interposed between the collection vessel of said radiator and said coolant jacket;
- a level sensor disposed in said coolant jacket, said level sensor being arrange to sense the level of liquid coolant in said coolant jacket falling below a predetermined level and issues a signal indicative thereof, said predetermined level being selected to be such that said structure subject to high heat flux is immersed in a predetermined depth of liquid coolant;
- a pump which pumps liquid coolant from said reservoir to said coolant jacket through a coolant return conduit, said pump being responsive to said level sensor in a manner to maintain the level of liquid in said coolant jacket at said predetermined level;
- a first temperature sensor disposed in said radiator;
- a second temperature sensor disposed in said coolant jacket; and
- a device associated with one of said radiator, said coolant jacket and said reservoir, said device being responsive to one at least one of said first and second temperature sensors for controlling the pressure within the cooling system.

12. In a method of cooling a internal combustion engine the steps of:
- introducing liquid coolant into a coolant jacket, permitting the coolant to boil and discharging the coolant in vaporized form;
- condensing the coolant vapor discharged from said coolant jacket in a radiator to form a condensate;
- storing liquid coolant in a reservoir;
- returning the condensate formed in said radiator to said reservoir;
- sensing the level of coolant in said coolant jacket using a level sensor;
- pumping liquid coolant from said reservoir to said coolant

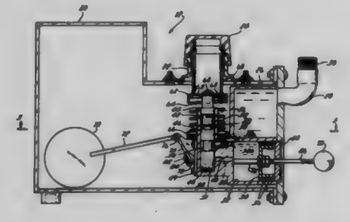
VOL 1086 ISS 4 JAN 26 1988 UMI

jacket in response to the level sensing step indicating that the level of liquid coolant in the coolant jacket is below a predetermined level;
sensing the temperature of the condensate formed in said radiator;
sensing the temperature of the coolant in said coolant jacket; and
controlling a device associated with one of the radiator, the coolant jacket and the reservoir in a manner which controls the pressure prevailing within the cooling system.

4,721,072
OIL METERING DEVICE FOR SUPPLYING OIL TO A FUEL TANK

Theodore J. Holterman, Milwaukee, and William F. Ziehm, Wauwatosa, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 687,870, Dec. 31, 1984. This application Jul. 3, 1985, Ser. No. 751,721
Int. Cl.[4] F01M 3/00
U.S. Cl. 123—73 AD 30 Claims



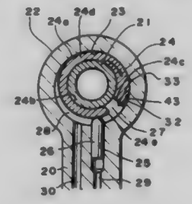
1. A fuel tank including a first container means adapted to contain a fuel mixture, the first container means including an inlet opening adapted to receive fuel, a second container means adapted to contain a second liquid, and means for selectively delivering a measured quantity of the second liquid from said second container means to said first container means when fuel is added to said first container means, the volume of the second liquid being delivered to said first container means being proportional to the volume of fuel added to said container means, said means for selectively delivering a measured quantity of said second liquid including means defining a metering chamber and means for alternatively providing fluid communication between said metering chamber and said first container means and between said metering chamber and said second container means.

4,721,073
COMPRESSION RATIO CHANGING DEVICE USING AN ECCENTRIC BEARING FOR AN INTERNAL COMBUSTION ENGINE

Takao Naruoka, Mishima, and Yoshihito Moriya, Takahama, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1986, Ser. No. 890,605
Claims priority, application Japan, Oct. 25, 1985, 60-162928[U]
Int. Cl.[4] F02B 75/04
U.S. Cl. 123—78 BA 17 Claims

1. A compression ratio changing device for an internal combustion engine comprising:
a connecting rod defining a lock-pin hole therein, the lock-pin hole opening at a small end hole of the connecting rod and extending along an extension of a radius of the small end hole;
a piston-pin extending through the small end hole;
an eccentric bearing rotatably interposed between the connecting rod and the piston-pin, the eccentric bearing having a cylindrical outside surface and a cylindrical inside surface eccentric with respect to the outside surface, the eccentric bearing defining: (a) a lock hole extending in a radial direction of the eccentric bearing, (b) a guide groove formed in a radially outer portion of the eccentric bearing, the guide groove extending in a circumferential direction of the eccentric bearing from the lock hole, (c) a colliding surface formed by one portion of a surface of the lock hole, the colliding surface being opposed to the guide groove and extending radially outwardly further than a deepest portion of a bottom surface of the guide groove,

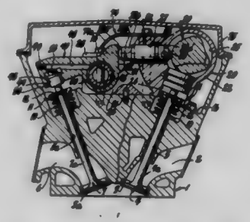


and (d) a deformation absorbing groove formed in a radially outer portion of the eccentric bearing, the deformation absorbing groove beginning from the lock hole and extending away from the lock hole in a circumferential direction of the eccentric bearing, the deformation absorbing groove forming a space for absorbing a deformation of the eccentric bearing in cooperation with a surface of the connecting rod;
a lock-pin slidably inserted in the lock-pin hole; and
means for driving said lock-pin, the means being fluidly connected to the lock-pin hole.

4,721,074
ENGINE VALVE TRAIN MODULE

Rick C. Wirth, Hearietta, N.Y., and Edward L. DeKiep, Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1986, Ser. No. 941,015
Int. Cl.[4] F01L 1/12
U.S. Cl. 123—90.23 2 Claims

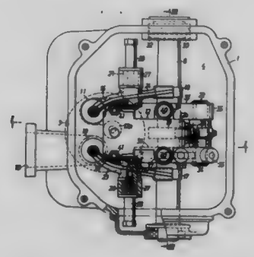


1. In a reciprocating internal combustion engine of the type having an engine block means defining at least one cylinder with a first port and a second port in flow communication therewith, a first valve and a second valve reciprocably located to control flow through the first and second ports, respectively, and normally biased to a port closed position, the improvement comprising a valve train module that includes a housing adapted to be secured by machine screws to the engine block means above the first and second valves; an engine driven camshaft having axial spaced apart first and second cam lobes operatively supported for rotation in said housing; a lifter guide bore in said housing located substantially coaxial with the reciprocating axis of said first valve; a direct acting hydraulic lash adjuster operatively supported in said lifter guide bore with one end thereof engaging said first cam lobe and at its opposite end being operatively connected to said first valve; a follower guide bore in said housing operatively aligned relative to said second cam lobe; a hollow rocker shaft operatively fixed in said housing in parallel spaced apart relationship to said engine driven camshaft; a rocker arm pivotably supported intermediate its ends by said rocker shaft, said rocker arm having a stepped socket therein at one end thereof, the opposite end of said rocker arm having a bifurcated configuration defining a pair of spaced apart flat surfaced arms with an interconnecting abutment surface; a hydraulic lash adjuster operatively positioned in said stepped socket and thus located so as to operatively engage said second valve; a roller follower reciprocably journaled in said follower guide bore with one end thereof operatively engaging said second cam lobe, said roller follower at its opposite end having spaced apart flats slidably received between said flat surfaced arms of said rocker arm and an arcuate outer edge surface engaging said abutment surface of said rocker arm; a first passage means in said housing for supplying fluid to said direct acting hydraulic lash adjuster; and, a second passage means in said rocker shaft and in said rocker arm for supplying fluid to said hydraulic lash adjuster in said rocker arm.

4,721,075
DIESEL ENGINE

Hiroshi Kasai, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,129
Claims priority, application Japan, Jan. 8, 1986, 61-1667
Int. Cl.[4] F01L 1/12, 1/46
U.S. Cl. 123—90.23 5 Claims

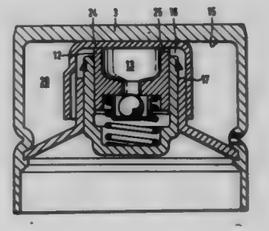


1. A diesel engine comprising an intake valve, an exhaust valve, a unit injector which is constituted by unitarily connecting an injection nozzle and an injection pump, and a cam shaft for drivin said intake and exhaust valves and said injection pump, wherein said injection nozzle and said injection pump are connected together into an L-shaped configuration, said cam shaft being located to pass below the injection pump, a pair of first and second rocker shafts being disposed separately on opposite sides of said unit injector, these first and second rocker shafts rockably carrying an intake rocker arm which operatively connects said intake valve and said cam shaft and an exhaust rocker arm operatively connecting the exhaust valve and said cam shaft, respectively.

4,721,076
SELF-ADJUSTING HYDRAULIC VALVE TAPPET

Dieter Goppelt, Aurachtal, and Dieter Schmidt, Nuremberg, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 930,767
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542197
Int. Cl.[4] F01L 1/14
U.S. Cl. 123—90.55 4 Claims



1. A self-adjusting hydraulic valve tappet arranged in a guide bore of a cylinder head of an internal combustion engine and being contacted at one end face by a cam of a cam shaft and bearing with a second end face against an end of a valve stem, the tappet comprising a cup shaped housing (1) comprised of a hollow cylindrical wall (2) closed at one end by an end member (3) against the outside of which the cam abuts and a cylindrical guide sleeve (6) concentric with the cylindrical wall (2) and arranged at its end away from said end member (3) in the center of an annular flange element (5) which at its outer circumference merges into the cylindrical wall (2) of the housing (1) and guide sleeve (6) is spaced at an opposite end from said end member (3), a self-adjusting hydraulic play compensating element (10) being guided for longitudinal movement inthe guide sleeve (6) and comprising an inner piston (12) and an outer piston (11) slidingly receiving the inner piston (12), the two pistons telescoping and defining oil pressure chamber (22) which communicates through a bore in the inner piston (12) closed by a check valve (21) with a central oil reservoir (13) disposed in inner piston (12) defined by the inner surface (15) of said end member (3) and a wall of inner piston (12) which abuts against the inner surface (15), the outer piston (11) is mounted for longitudinal movement in the guide sleeve (6) and abuts at its closed end against the end of the valve stem, an annular oil reservoir (20) defined by said hollow cylindrical wall (2), said guide sleeve (6), said hydraulic play compensating element (10), said end member (3) and said flange element (5) and supplied with oil from outside said reservoir through a bore, a sleeve (17) beginning from said end member (3) is sealed where it abuts said end member against said oil reservoir (20) and engages the outer surface of said guide sleeve (6) and extends close to flange element (5), characterized in that a longitudinal channel (19) is formed at a single region between the sleeve (17) and the guide sleeve (6) to permit oil transfer from said annular oil reservoir (20) into the annular space (16) defined by said sleeve (17) and said inner piston (12).

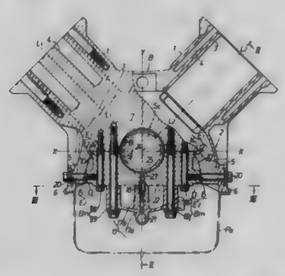
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,077

CRANKSHAFT SUPPORTING STRUCTURE FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Koichi Fukue, and Masatoshi Chosa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1985, Ser. No. 802,583
Claims priority, application Japan, Nov. 28, 1984, 59-250720
Int. Cl.[4] F02F 7/00
U.S. Cl. 123—195 R 11 Claims



1. A crankshaft supporting structure for a cylinder block of an internal combustion engine, comprising, a plurality of journal walls extendng laterally across the cylinder block and bieng longitudinally spaced along the crankshaft, a recess formed in each journal wall with inwardly and downwardly facing first mating surfaces at an upper extremity of said recess, the cylinder block having skirt portions extending downwardly from the recesses on each lateral end of the journal walls, a bearing cap mounted in the recess in each journal wall and having means cooperating with the journal wall for rotatably supporting the crankshaft, each said bearing cap having outwardly and upwardly facing first first mating surfaces for engaging said journal wall first mating surfaces, mating inwardly facing vertical surfaces on each said skirt portion and outwardly facing vertical surfaces on each bearing cap, a longitudinally extending bridge, a pair of vertical bolts extending through the bridge and each bearing cap and threadedly engaging said journal wall, horizoatal bolts extending through the skirt portions and threadedly engaging each lateral side of each bearing cap, and said bridge having a main oil gallery defined therein for passage of lubricating oil therethrough and communicating with lubricating oil passages formed through said bridge and said bearing caps for communicating oil to the crankshaft.

4,721,078

LPG FUEL SHUTOFF SYSTEM

Toru Watanabe, and Katuya Miyata, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

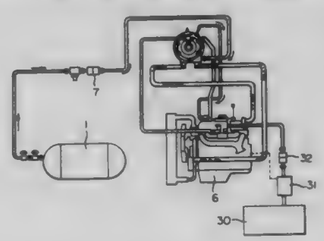
Filed May 13, 1986, Ser. No. 862,756
Claims priority, application Japan, May 24, 1985, 60-110217
Int. Cl.[4] F02B 77/00
U.S. Cl. 123—198 DB 2 Claims

1. An LPG fuel shutoff system for use with a vehicle having an LPG fule engine and having a solenoid valve to supply and shut off LPG fuel, including:

a relay having a relay contact which is closed when an electric current is fed to a coil of said relay;

a pressure switch having a first position and a second position and adapted to be in said first position when engine oil pressure rises above a predetermined level;

and an oil lamp adapted to light when said engine oil pressure is below said predetermined level, and wherein a solenoid coil of said solenoid valve is connected at one side to a battery through an ignition switch and a fuel switch, said solenoid coil also being connected, at another side of said solenoid coil, in series to said relay contact and said pressure switch in said second position respectively, the coil of said relay being connected to the solenoid valve



side of said ignition switch through a starting switch, said oil lamp being connected between said ignition switch and said pressure switch.

4,721,079

ROTARY ENGINE

Orphey A. Lien, P.O. Box 666, North Star Rte., Poplar, Mont. 59255

Filed Sep. 15, 1986, Ser. No. 907,580
Int. Cl.[4] F02B 53/00
U.S. Cl. 123—241 20 Claims



1. An engine, comprising:

a frame including members forming portions of inner and outer concentric spherical surfaces and a hollow shaft, said frame also including first means for supporting said members with respect to said hollow shaft, said hollow shaft passing through space encircled by said spherical surfaces;

a rotatable drive shaft extending through said hollow shaft;

second means for rotatably supporting said drive shaft with respect to said hollow shaft;

means for forming a variable volume combustion chamber between said spherical surfaces;

third means for rotatably supporting said chamber forming means on said hollow shaft, said third supporting means including means for driving said drive shaft;

first means for charging said combustion chamber with air;

second means for charging said combustion chamber with fuel to create an air-fuel mixture;

means for igniting said air-fuel mixture to create combustion products;

means for exhausting combustion products from said combustion chamber; and

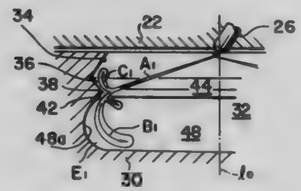
means for cooling said engine.

4,721,080

STRUCTURE OF COMBUSTION CHAMBER IN DIESEL ENGINE

Takeshi Meriyama, Joyo; Jun Isomoto; Tatsuro Nakagami, both of Kyoto; Hiroo Takahashi, Mukeo, and Takao Maeda, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP85/00058, § 371 Date Oct. 3, 1985, § 102(e) Date Oct. 3, 1985, PCT Pub. No. WO85/03738, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 14, 1985, Ser. No. 787,794
Claims priority, application Japan, Feb. 15, 1984, 59-26857; May 28, 1984, 59-78531; Sep. 22, 1984, 59-143997; Feb. 7, 1985, 60-20819
Int. Cl.[4] F02B 19/08
U.S. Cl. 123—276 44 Claims



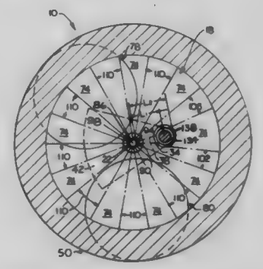
1. A combustion chamber structure in a diesel engine of a direct injection type having a cylinder block (20), a cylinder head (22) disposed above the cylinder block (20), a piston (30) fitted in a cylinder (28) of the cylinder block (20), a combustion chamber (32) which is formed as a recess in a top part (30*a*) of the piston (30) and whose upper surface is covered with the cylinder head (22), and a fuel injection nozzle (26) disposed in the cylinder head (22) for injecting fuel into the combustion chamber (32), characterized in that the combustion (32) is formed in the shape of a geometrical rotating body; that the combustion chamber (32) has a side wall (32*a*) and this side wall (32*a*) comprises a guide wall (34) which becomes larger in inside diameter downwardly from an opening edge portion (33) of the combustion chamber (32), a first fuel reflection wall (36) formed below the guide wall (34) so that it becomes smaller in inside diameter downwardly, a second fuel reflection wall (38) formed below the first fuel reflection wall (36) approximately in parallel with a central axis (lo) of the combustion chamber (32), and a lower side wall (48*a*) formed below the second fuel reflection wall (38), having a concavely curved shaped at its upper portion and connected at its lower portion to a bottom (32*b*) of the combustion chamber (32); that the combustion chamber (32) is composed of a first combustion chamber (44) surrounded by the guide wall (34), first fuel reflection wall (36) and second fuel reflection wall (38) and a second combustion chamber (48) formed below the first combustion chamber (44) and surrounded by the lower side wall (48*a*); and that spout orifices of the injection nozzle (26) are disposed so that in a top dead-center position of the piston (30), the fuel spray from the nozzle (26) is directed to a junction (42) between the first combustion chamber (44) and the second combustion chamber (48) and to the second fuel reflection wall (38) to cause the fuel spray to be reflected by the junction (42) and the second fuel reflection wall (38) into the first and second combustion chambers (44) and (48) so that the fuel spray is mixed with air in the first and second combustion chambers (46) and (48).

4,721,081

FLAME INCUBATING AND PROPAGATING APPARATUS FOR A FUEL COMBUSTION SYSTEM

Zledonis I. Krauja, East Peoria; Jeffrey J. Krieger; Scott F. Shafer, both of Peoria, and Craig A. Kroeger, East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 3, 1986, Ser. No. 870,266
Int. Cl.[4] F02M 61/14
U.S. Cl. 123—298 21 Claims



1. A fuel combustion system for a direct-injection internal combustion engine including an open combustion chamber, a plurality of fuel spray orifices each having a centerline axis directed outwardly into the open combustion chamber, comprising:

a fuel ignition-initiating means projecting directly into the open combustion chamber and spaced a preselected distance from a selected fuel spray orifice and also spaced from the centerline axis of the selected fuel spray orifice; and

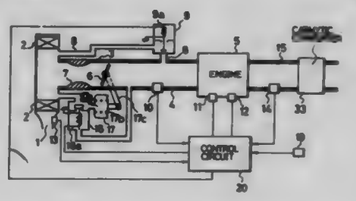
baffle means for intercepting a preselected portion of a respective fuel stream spray from the selected fuel spray orifice during engine operation, for temporarily confining and maintaining that intercepted portion of fuel within ignitable proximity to the fuel ignition-initiating means until an initially-localized flame of burning fuel is started, and for controlledly directing the resultant expanding flame of burning fuel to all of the other fuel streams sprayed from the other fuel spray orifices, said baffle means being positioned in spaced relation partially around said fuel ignition-initiating means.

4,721,082

METHOD OF CONTROLLING AN AIR/FUEL RATIO OF A VEHICLE MOUNTED INTERNAL COMBUSTION ENGINE

Yoshitaka Hibino; Takeshi Fukuzawa, and Atsushi Tetsuno, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1987, Ser. No. 6,042
Claims priority, application Japan, Jan. 22, 1986, 61-012403
Int. Cl.[4] F02M 3/00
U.S. Cl. 123—339 1 Claim



1. A control method of controlling an air/fuel ratio of an internal combustion engine having a throttle valve and an idle

rotational speed control device by which an opening degree of the throttle valve is increased when a unit of large electric load is operating while the engine is idling, the control method comprising steps of:

detecting an idling operation of said internal combustion engine;

controlling, when said idling operation is detected, an air/fuel ratio of mixture to be supplied to said internal combustion engine to a lean side with respect to a target air/fuel ratio which is to be used in a steady state operation of said internal combustion engine;

detecting an operation of said unit of large electric load during the idling operation of said internal combustion engine; and

controlling the air/fuel ratio of mixture to be supplied to said internal combustion engine to a further lean side with respect to said target air/fuel ratio when said operation of said unit of large electric load is detected.

4,721,083

ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH STALL PREVENTIVE FEATURE AND METHOD FOR PERFORMING STALL PREVENTIVE ENGINE CONTROL

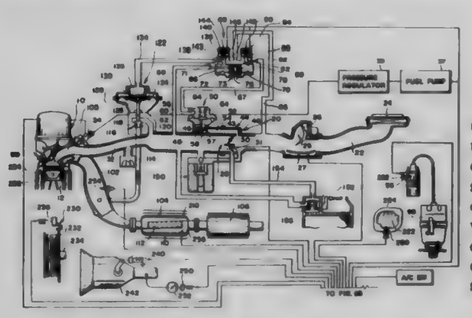
Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 31, 1984, Ser. No. 666,360

Claims priority, application Japan, Nov. 4, 1983, 58-205930; Jan. 20, 1984, 59-5192[U]

Int. Cl.⁴ F02M *3/06*

U.S. Cl. 123—339 **48 Claims**



10. A stall preventive control system for an internal combustion engine comprising:

a first sensor for monitoring a preselected engine operation parameter and producing a first sensor signal indicative thereof;

a second detector for detecting a preselected engine operating condition of the basis of a pattern of variations over time in said first sensor signal and producing a second detector signal indicative thereof;

third means, responsive to said second detector signal and including means for storing a preset engine operating condition variation pattern over time, which preset pattern is representative of engine operation having a high possibility of resulting in engine stall, for comparing said variation pattern as indicated by said second detector signal and said preset pattern for detecting incipient engine stall based on said second detector signal and producing a third signal when incipient engine stall is detected; and

fourth means, associated with said third means and responsive to said third signal, for performing an engine stall preventive operation in which the magnitude of engine output torque relative to the load on the engine is increased.

4,721,084

METHOD FOR CONTROLLING AN OXYGEN CONCENTRATION SENSOR FOR SENSING AN OXYGEN CONCENTRATION IN AN EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

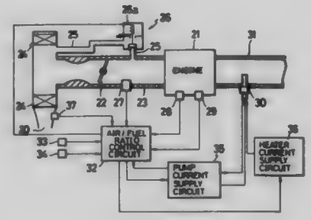
Tomohiko Kawanabe; Masahiko Asakura; Minoru Muroya; Katsuhiko Kimura; Noritaka Kushida, and Hiroshi Hasebe, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,854

Claims priority, application Japan, Sep. 25, 1985, 60-211235; Sep. 26, 1985, 60-213571

Int. Cl.⁴ F02D *5/00*

U.S. Cl. 123—440 **5 Claims**



1. A method for controlling an oxygen concentration sensor used in an air/fuel ratio control system for an internal combustion engine, said oxygen concentration sensor including: an oxygen concentration sensing unit disposed in an exhaust passage of said internal combustion engine, said sensing unit including an oxygen pump element and a sensor cell element which define a diffusion restricted region therebetween, each of said elements including a solid electrolyte member having oxygen ion permeability and a pair of electrodes sandwiching said electrolyte member therebetween;

pump current supply means for supplying a pump current across the electrodes of said oxygen pump element so as to maintain a voltage generated across the electrodes of said sensor cell element thereby causing said sensing unit to monitor a magnitude of said pump current which is substantially in proportion to the oxygen concentration in the exhaust gas; a heater element for heating said oxygen pump element in accordance with a magnitude of a current supplied thereto; and a source of heater current for supplying a heater current to the heater element, comprising:

a load detection step for detecting a magnitude of an engine load;

a pump current control step for normally supplying said pump current to said oxygen pump element, and stopping the supply of the pump current to said oxygen pump element when it is detected by said load detection step that the engine is operating in a predetermined high load range; and

a heat current control step for supplying said heat current to said heater element, and reducing the magnitude of said heater current to said heater element or stopping the supply of the pump current when it is detected by said load detection step that the engine is operating in said high load range at least for a predetermined time period.

4,721,085

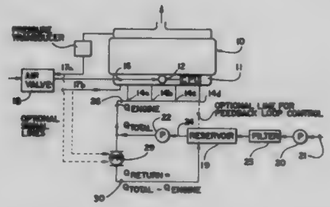
VARYING AREA FUEL SYSTEM FOR COMBUSTION ENGINE

William D. Adams, P. O. Box 461, Austell, Ga. 30001, assignor to William D. Adams and Karen M. Adams, both of Austell, Ga.

Continuation-in-part of Ser. No. 455,002, Jan. 3, 1983, Pat. No. 4,524,744. This application Jun. 20, 1985, Ser. No. 746,951

Int. Cl.⁴ F02D *9/08, 41/34*

U.S. Cl. 123—442 **8 Claims**



1. Fuel injection apparatus for a spark ignition internal combustion engine having at least one cylinder and an air inlet, an injection nozzle for injecting fuel into said cylinder, a fuel feed line for supplying fuel under pressure to said injection nozzle, said fuel feed line being one leg of a return fuel circuit, said fuel circuit further including a fuel reservoir, a pump for pumping fuel from said reservoir and for creating pressure in said fuel feed line, a pressure relief valve communicating with said fuel circuit for maintaining a predetermined pressure, valve means connected in said fuel circuit between said fuel feed line and said nozzle for controlling the amount of fuel to said nozzle, driver controlled throttle valve means in said air inlet, means for controlling said fuel circuit valve means so that the amount of fuel is at least partially directly related to the position of said throttle valve means, an air valve upstream of said throttle valve means for controlling air flow to said air inlet, and means for opening said air valve in reponse to increased air demand by said engine, the amount of fuel and the position of said air valve being controlled independently of each other.

4,721,086

SYSTEM FOR CONTROLLING FUEL INJECTORS TO OPEN ASYNCHRONOUSLY WITH RESPECT TO THE PHASES OF A HEAT ENGINE

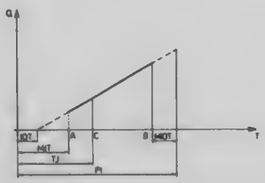
Michele Scarnera, Monzuno, and Franco Ciampolini, Bologna, both of Italy, assignors to Weber S.p.A., Turin, Italy

Filed May 6, 1986, Ser. No. 860,066

Claims priority, application Italy, May 10, 1985, 67429 A/85

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—478 **8 Claims**



1. An electronic fuel injection control system for a heat engine, said engine including at least one fuel injector having a fuel delivery rate which is linear with a periodic opening time of said injector, when said injector opening time lies in a range between a minimum opening time MIT and the difference between an opening period PI and a minimum rest time MIOT; said system comprising:

a first processor means for determining a theoretical opening time TJ of said injector; and

a second means for synchronous opening of said injector for a time equal to TJ and a period equal to PI when TJ lies in said range, and for opening said injector asynchronously with said period PI while maintaining an opening time of at least MIT and a rest time of at least MIOT, when TJ lies outside said range.

4,721,087

FUEL SUPPLY CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

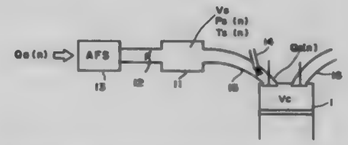
Yoshiaki Kanno; Katsuya Nakamoto, and Jiro Sumitani, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,609

Claims priority, application Japan, Apr. 18, 1986, 61-90927

Int. Cl.⁴ F02D *41/18*

U.S. Cl. 123—488 **2 Claims**



1. A fuel supply control apparatus for an internal combustion engine, being provided with a throttle valve for adjusting an air intake quantity of said internal combustion engine to be controlled, an air flow sensor for detecting the air intake quantity adjusted by said throttle valve, an AN detecting means which detects the output of said air flow sensor at a predetermined crank angle of said internal combustion engine to thereby detect a ratio of said output to the number of revolutions of said internal combustion engine, an AN computing means which, when the detecting result of said AN detecting means is represented by Qa, the (n−1)th air intake quantity and (n)th air intake quantity by said internal combustion engine at the predetermined crank angles thereof are represented by Qe(n−1) and Qe(n) respectively, and the filter constant is represented by K, computes Qe(n) from the following equation:

$$Qe(n)=K\cdot Qe(n-1)+(1-K)\cdot Qa$$

and a control means for controlling a fuel supply quantity to said internal combustion engine on the basis of the output Qe(n) of said AN computing means, is characterized in that said filter constant K is varied corresponding to an operating condition of said internal combustion engine.

4,721,088

METHOD FOR CONTROLLING AN OXYGEN CONCENTRATION DETECTION APPARATUS WITH A HEATER ELEMENT

Toshiyuki Miwa; Toyobei Nakajima; Yasushi Okada, and Nobuyuki Oono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,427

Claims priority, application Japan, Nov. 29, 1985, 60-269095

Int. Cl.⁴ F02M *51/00, 7/00*

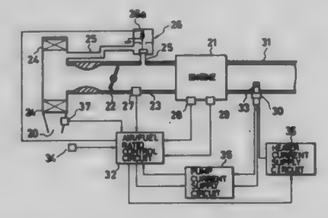
U.S. Cl. 123—489 **2 Claims**

1. A method for controlling an oxygen concentration detection apparatus of an internal combustion engine having an exhaust gas passage, which apparatus includes an oxygen concentration sensing element provided in said exhaust gas passage and producing an output signal representing an oxygen concentration in an exhaust gas of the engine and a heater element connected to said oxygen concentration sensing element and operative to heat said oxygen concentration sensing

VOL 1086 ISS 4 JA 26 1988 UMI

element when a heater current is supplied thereto, the method comprising:

a detection step for detecting a temperature of the engine immediately before a start of a supply of said heater current; and



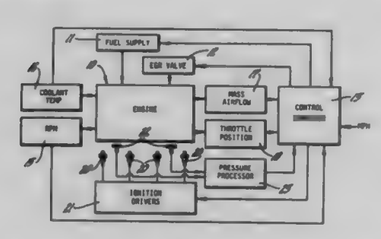
a control step for controlling a magnitude of said heater current from the start of the supply of said heater current, for a time period which is determined correspondingly to said temperature of the engine detected by said detection step, to be lower than a magnitude of the heater current after an elapse of said time period.

4,721,089

ADAPTIVE DILUTION CONTROL FOR IC ENGINE RESPONSIVE TO LPP

James H. Currie, Rochester; Kenneth J. Ciupinski, Sterling Heights; Kenneth J. Buslepp, Utica; Douglas K. Mehaffey, Troy; Edward J. Jensen, Rochester, and Leroy E. Medendorp, Romeo, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1987, Ser. No. 24,296
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 9 Claims



1. A dilution control for an internal combustion engine having a rotating crankshaft, a combustion chamber, means for providing a fuel charge of controllable dilution to the combustion chamber, means for igniting the fuel charge and sensing the timing, relative to a reference crankshaft rotational position, of the resulting peak combustion pressure comprising, in combination:

means effective to detect the relationship between the ignition timing and the timing of peak combustion pressure in the vicinity of a desired timing of peak combustion pressure; and

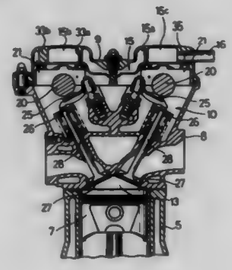
means effective to increase dilution if the detected relationship includes a timing of peak combustion pressure retarded with respect to the desired timing and to decrease dilution if it does not.

4,721,090

BLOW-BY GAS RECIRCULATING APPARATUS

Hisashi Kato, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,435
Claims priority, application Japan, Jun. 3, 1985, 60-120245
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—572 9 Claims



1. A blow-by gas recirculating apparatus for returning blow-by gases from the crankcase of an internal combustion engine to an intake passage thereof, comprising:

a cylinder head;

a cylinder head cover mounted on said engine cylinder head;

a DOHC valve mechanism housed in said cylinder head;

a shield panel attached to said cylinder head cover in substantially covering relation to said DOHC valve mechanism;

a breather chamber defined between said cylinder head cover and said shield panel and communicating with both the interior of said cylinder head and an air intake unit of the internal combustion engine;

said breather chamber extending longitudinally of said cylinder head cover and comprising a central first, second and third chamber sections each extending longitudinally substantially the full length of the cylinder head; and

said second and third breather chamber sections being located one on each side of said first breather chamber section, said first through third breather chamber sections being interconnected by passages for causing blow-by gas passing from the interior of the cylinder head to flow longitudinally for substantially the entire length of the cylinder head cover through each of the first, second and third breather chambers, in that order, to the intake unit of the internal combustion engine.

4,721,091

BALL PROJECTILE MACHINE

Michael G. Ridley, 6 Velmead Road, Fleet, Aldershot, Hampshire, and Peter M. Will, 10 Pirbright Road, Farnborough, Hampshire, both of United Kingdom

Filed Apr. 3, 1986, Ser. No. 847,643
Claims priority, application United Kingdom, Apr. 10, 1985, 8509201
Int. Cl.[4] F41F *7/00*
U.S. Cl. 124—26 7 Claims

1. A ball projecting machine comprising, in combination:

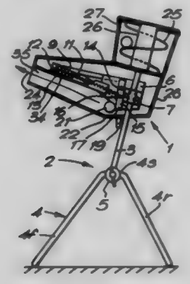
a frame;

a launch tube in the frame for receiving a ball at rest at one end thereof;

a ball striker rotatably mounted on a shaft, said shaft journaled in the frame, said shaft generally transverse to the direction of projected ball travel in the launch tube, said striker extending radially from the shaft a distance sufficient to extend into striking contact with a ball at the one end of the launch tube for projecting the ball from the tube a said striker is rotated through an arc by unidirectional rotation;

a first one way clutch mechanism for attaching a manual handle means to the shaft;

a second one way clutch mechanisms for attaching the shaft to the housing to limit the direction of driven rotation of the striker by the handle means in said unidirectional sense;



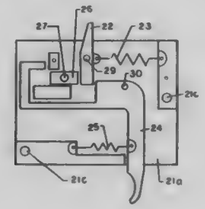
a tension spring attached between the striker and the frame in position to be stressed when the striker is rotated in said unidirectional sense by the shaft to stretch the spring, said spring acting on the striker to rotate the striker in the unidirectional sense into contact with the ball in the tube when the spring is strained to its maximum.

4,721,092

TRIGGER DEVICE FOR CROSS BOWS, WITH AUTOMATICALLY ACTIVATED SAFETY MEANS

Shimon Waiser, P.O. Box 360 Midwood Station, Brooklyn, N.Y. 11230

Filed May 9, 1986, Ser. No. 861,606
Int. Cl.[4] F41B *5/00*; F41C *17/00*
U.S. Cl. 124—40 18 Claims



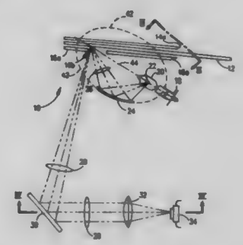
1. In a projectile shooting device, a projectile pusher; trigger means including a trigger and a turnable catch for holding said projectile pusher in a cocked position and for releasing said projectile pusher therefrom; said catch being positioned so as to be turned during cocking of said projectile pusher; and safety means for preventing unintentional shooting, said safety means including a movable intermediate element movable between fire and safe positions and cooperating with said catch so that when said catch turns during cocking said intermediate element is moved under the action of said catch to the safe position into an engagement with said trigger to lock said trigger and to prevent unintentional turning of the latter and to thereby prevent unintentional shooting, said movable intermediate element arranged so that it performs longitudinal motion under the action of said catch.

4,721,093

LINE ILLUMINATION SYSTEM

Michael K. Bullock, Matthews, and Frederick C. Miller, Charlotte, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 27, 1986, Ser. No. 879,687
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—308 5 Claims



1. An apparatus for illuminating a line on a document to generate a reflected image which, when focused on a planar sensor has a substantially uniform intensity over the illuminated portion of said sensor, the apparatus comprising:

a mirror including a cylindrical ellipse section having an axis extending parallel to the illuminated line on said document and flat end mirrors extending perpendicular to said axis, said elliptical mirror positioned so that one foci of the ellipse is coincident with said line on said document to be imaged onto said sensor;

a lens for focusing illumination reflected from said document onto the sensor; and

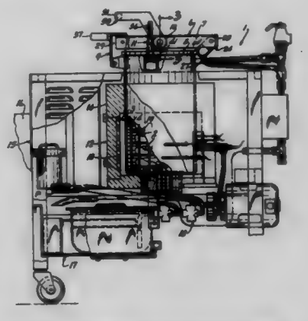
a light source including two lamps having filaments extending along the other foci of the ellipse, said two lamps being positioned inwardly of said flat end mirrors so that the reflected illumination from said lamps has a substantially uniform illumination intensity over the illuminated portion of said sensor.

4,721,094

DEEP OIL COOKER COVER APPARATUS

Louis Nett, Cambridge, Wis., assignor to Gallina Corporation, Waukesha, Wis.

Filed Apr. 2, 1986, Ser. No. 847,326
Int. Cl.[4] F24D *1/00*
U.S. Cl. 126—369 12 Claims



1. A pressurized cooking apparatus comprising

a cooking pot formed of a heat transmitting material and adapted to contain a cooking liquid and having a top sealing wall, a clamp bar member having a pivotal connection pivotally mounted to said cooking pot and projecting

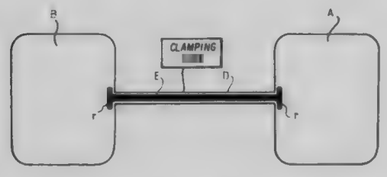
over said pot to a free end, a mechanical releasable latch unit interconnected between the pot and outer free end of the clamp bar member, said latch unit having a disengaged position with the clamp bar pivoted toward the cooking pot and engaged by upward pivoting of said bar member, a cover member having an annular sealing means adapted to rest in abutting sealing engagement with the upper edge of said cooking pot, a cam unit connected to said clamp bar and to said cover member to form an intergrated assembly with said member movable with said clamp bar and including a movable cam element adapted to spread said clamp bar and cover member, an operating handle connected to said cam element for moving said cam element, said cam element having a release position wherein said cover member abuts said cooking pot and said latch unit is in said disengaged position to permit limited upward movement of said cover member to provide release of residual pressure in the cooking pot, and said cam element having a locking position operable to spread said clamp bar relative to said cover to simultaneously force said cover into engagement with the cooking pot and simultaneously lift said clamping bar to effect closing engagement of said latch unit.

4,721,095

DEVICE FOR CONTROLLING THE FLOW OF A FLUID AND A PROSTHETIC ORGAN EQUIPPED WITH THIS DEVICE

Pierre Rey, Thorigny; Jacqueline Leandri, Paris, and Clement Abbou, Fontenay /s/ Bois, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Sep. 14, 1984, Ser. No. 650,496
Claims priority, application France, Sep. 14, 1983, 83 14607
Int. Cl.[4] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R 10 Claims



1. A device for controlling the flow of a fluid in a duct, comprising:

first and second flexible activating bags containing an activating fluid;

a connecting tube for connecting said first and second bags;

valve means responsive solely to the pressure of said activating fluid obtained by manual deformation of one of said first and second activation bags,

said valve means comprising a valve seat in the form of a rod located inside said connecting tube,

wherein said connecting tube comprises a valve element formed of a flexible plastic material for sealing clamping said rod,

said first bag being adapted to effect upon deflation by manual deformation, the re-establishment of the flow of fluid in a duct, whereas the second activating bag is adapted to effect, also by deflation by manual deformation, cancelling of said flow;

clamp means for reinforcing the sealing clamping of said rod in a rest condition inside said connecting tube, and

means for preventing said rod from leaving said connecting tube under the effect of said pressure wherein the clamping action of said connecting tube and said clamp means is overcome solely by said pressure.

4,721,096

PROCESS FOR REPLICATING BONE MARROW IN VITRO AND USING THE SAME

Brian A. Naughton, and Gail K. Naughton, both of Yorktown Heights, N.Y., assignors to Marrow-Tech Incorporated, Albany, N.Y.

Continuation of Ser. No. 853,569, Apr. 18, 1986, abandoned.
This application Apr. 3, 1987, Ser. No. 36,154
Int. Cl.[4] A61B *19/00*; C12N *5/02*
U.S. Cl. 128—1 R 12 Claims

1. A process for treating a person whose bone marrow has been destroyed or lost its functional ability, said process comprising the steps of:

I. obtaining a bone marrow sample from a donor; and then

II. replicating the bone marrow sample in vitro to produce a replicated bone marrow containing hematopoietic stem cells having marrow repopulating activity; and then

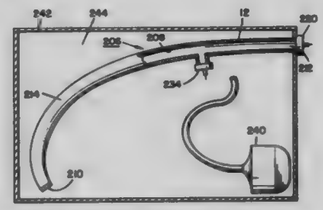
III. infusing the replicated bone marrow containing hematopoietic stem cells into the person to restore hematopoiesis in the person.

4,721,097

ENDOSCOPE SHEATHS AND METHOD AND APPARATUS FOR INSTALLATION AND REMOVAL

Frank D. D'Amelio, Naugatuck, Conn., assignor to Circon Corporation, Santa Barbara, Calif.

Filed Oct. 31, 1986, Ser. No. 925,603
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 17 Claims



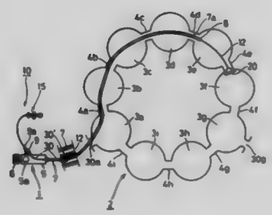
1. Apparatus to facilitate the placement of a sheath upon the core of an endoscope and to facilitate its removal therefrom, the apparatus comprising a tube of relatively rigid, air-impervious material having an internal configuration similar to that of the core upon which the sheath is to be placed but of a slightly larger cross-sectional configuration, the tube having a closed distal end and an open proximal end for receiving the endoscope, the proximal end being provided with a removable first cap axially located with respect to the tube, the tube being provided with a second removable cap at an intermediate portion of the tube and radially located with respect to the tube whereby a sheath may be inserted into the tube with the first cap removed and the second cap unremoved to maintain the air pressure within the tube greater interior of the sheath than exterior of the sheath for holding the sheath in position against the interior surface of the tube for thereby allowing the positioning of the endoscope within the sheath and tube, the radial cap being removable for the relief of the lower pressure exterior of the sheath for the release of the sheath from the tube and onto the core, a coupling lip on the tube for supporting the radial cap and for coupling with a source of negative pressure whereby when a core with a sheath thereon is positioned within the tube, a vacuum may be drawn through the lip in the tube external of the sheath to pneumatically separate and remove the sheath from the endoscope.

4,721,098

GUIDING AND/OR MEASURING INSTRUMENT FOR ENDOSCOPE APPARATUS

Yoshio Watanabe, Kawaguchi, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Japan

Filed Oct. 14, 1986, Ser. No. 918,554
Claims priority, application Japan, Dec. 3, 1985, 60-185625; Jul. 7, 1986, 61-103241
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 12 Claims



1. An endoscope apparatus comprising:

an endoscope including an operating body provided therein with an inserting opening, a inserting portion extending from said operating body and adapted to be inserted into an object to be inspected, and a guide channel extending through said operating body and said inserting portion and in communication with said inserting opening;

an elongated inserting instrument insertable from said inserting opening into and through said guide channel so as to have a distal end portion projected from a distal end of said inserting portion;

said elongated inserting instrument comprising a yieldable tubular envelope having proximal and distal ends thereof respectively located adjacent said operating body and said distal end of said inserting portion when said inserting instrument is inserted from said inserting opening into and through said guide channel, fixed wire means having one end thereof fixedly secured to said distal end of said tubular envelope, an elongated rod-like member having one end thereof connected to the other end of said fixed wire means, push-pull wire means extending through said tubular envelope, said push-pull wire means having one end thereof connected to the other end of said rod-like member and the other end projecting from said proximal end of said tubular envelope, and an operating member connected to the other end of said push-pull wire means; and

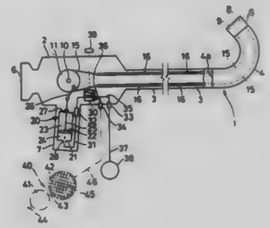
said operating member being movable relative to said proximal end of said tubular envelope for pushing and pulling said push-pull wire means so as to move said rod-like member between an inoperative position where said rod-like member has its longitudinal axis extending substantially in coaxial relation to said tubular envelope and an operative position where said rod-like member has its longitudinal axis extending across an extended line of said tubular envelope.

4,721,099

OPERATING MECHANISM FOR BENDABLE SECTION OF ENDOSCOPE

Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Japan

Filed Oct. 22, 1986, Ser. No. 922,020
Claims priority, application Japan, Oct. 30, 1985, 60-165697[U]; Oct. 30, 1985, 60-165698[U]; Oct. 30, 1985, 60-165699[U]; Nov. 11, 1985, 60-172320[U]; Dec. 10, 1985, 60-189054[U]; Aug. 25, 1986, 61-128284[U]
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 28 Claims



1. An endoscope comprising:

(a) an operating body;

(b) an inserting portion extending from said operating body and having a distal end section formed into a bendable section;

(c) at least one angularly movable member mounted within said operating body for angular movement around a predetermined axis;

(d) at least one pair of operating wire means having their respective one ends operatively connected to said angularly movable member and the respective other ends operatively connected to said bendable section;

(e) at least one operating member arranged exteriorly of said operating body;

(f) first connecting means for operatively connecting said angularly movable member and said operating member to each other;

(g) at least one hydraulic actuator means disposed within said operating body and including a cylinder, a piston slidably received in said cylinder and cooperating with the same to define therein a cylinder chamber supplied with a hydraulic pressure, and a piston rod having one end thereof connected to said piston;

(h) second connecting means for operatively connecting the other end of said piston rod of said hydraulic actuator means to said angularly movable member to transmit a force from said hydraulic actuator means to said angularly movable member;

(i) at least one hydraulic pressure source means arranged exteriorly of said operating body;

(j) at least one passageway means connecting said hydraulic pressure source means and said cylinder chamber of said hydraulic actuator means to each other, for permitting the hydraulic pressure to be supplied from said hydraulic pressure source means into said cylinder chamber.

4,721,100

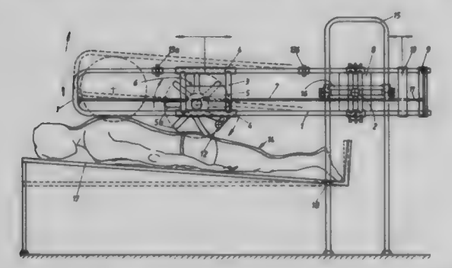
CANTILEVERED, HORIZONTALLY SLIDABLE MASSAGE BRUSH HAVING AN ADJUSTING COUNTERWEIGHT

Gerhard G. Hengl, Jueptnergasse 17/1/14, A-1220 Vienna, Austria

Filed May 7, 1986, Ser. No. 860,504
Claims priority, application Austria, May 8, 1985, 1381/85
Int. Cl.[4] A61H *15/00*, *7/00*
U.S. Cl. 128—57 1 Claim

1. A massaging machine comprising a roller having a plural-

ity of outwardly extending resilient fingers thereon, a vertically swinging horizontally-elongated frame along which the roller is mounted for sliding movement, the frame being mounted intermediate its ends but more closely adjacent one end than adjacent the other end, for vertical swinging movement about a horizontal axis on a fixed support, the frame thus having a relatively long portion on one side of said horizontal axis and a relatively short portion on the other side of said



horizontal axis, the roller being mounted for sliding movement along said relatively long portion, a counterweight mounted for sliding movement along said relatively short portion, and means simultaneously moving the roller and the counterweight toward or away from each other with a velocity that varies directly as the distance of the roller and the counterweight from said horizontal axis, thereby to maintain substantially constant the pressure with which the roller bears on a user positioned beneath the roller.

4,721,101
MEDICAL APPLIANCE

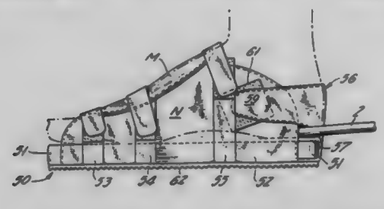
Arthur M. N. Gardner, and Roger H. Fox, both of Devon, England, assignors to Electro-Biology, Inc., Parsippany, N.J.

Division of Ser. No. 889,376, Aug. 1, 1986, which is a continuation-in-part of Ser. No. 763,686, Aug. 8, 1985, Pat. No. 4,614,180, and a continuation-in-part of Ser. No. 794,443, Nov. 4, 1985, Pat. No. 4,614,179, said Ser. No. 763,686, is a continuation-in-part of Ser. No. 621,499, Jun. 18, 1984, abandoned, said Ser. No. 794,443, is a continuation-in-part of Ser. No. 751,150, Jun. 2, 1985, abandoned, which is a division of Ser. No. 621,499,. This application Sep. 26, 1986, Ser. No. 911,987

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] A61H *23/00*

U.S. Cl. 128—64 12 Claims



1. A medical appliance, comprising circumferential-tie means adapted to peripherally envelop essentially only and to conform generally to the instep region of a foot and to the plantar region of the foot within the span between the ball and heel of the foot, a single inflatable bag adapted for retention within and by said circumferential-tie means, said bag having an active-surface portion longitudinally limited to said span and conformable to the sole of the foot within said span, and means to inflate and deflate said bag in a recurrent cycle wherein single-pulse delivery of inflation pressure is within two seconds, with deflation commencing at termination of single-pulse delivery, the deflation being for such period of time as is necessary for return of blood to the veins of the foot, said last-defined means including means to retain inflation of said bag for a period up to five seconds prior to commencement of deflation.

4,721,102
TRACTION DEVICE

Bruce Pethybridge, Church Street, Whorouly, Victoria, Australia (3735)

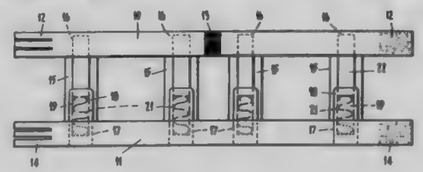
PCT No. PCT/AU85/00318, § 371 Date Aug. 6, 1986, § 102(e) Date Aug. 6, 1986, PCT Pub. No. WO86/03672, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 17, 1985, Ser. No. 910,092

Claims priority, application Australia, Dec. 18, 1984, PG8618

Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 4 Claims



1. A traction device comprising:
an upper flexible band and a lower flexible band extending generally parallel to one another;
means for securing said bands tightly around the perimeter of the torso of a person to define respective continuous anchoring means for the device at spaced apart locations on the torso;
straps, connected to the upper and lower bands, for preventing the bands from exceeding a predetermined spacing; and
a plurality of biasing means coupled to the bands so that the biasing force of the biasing means is distributed around the torso at the spaced apart locations through said tightly secured bands to place the area of the torso between the spaced apart locations in traction, the biasing means being coupled to the bands so that at least two of the biasing means are located at each of the front and back regions of the torso to increasingly support the torso as the person progressively leans forward and backward, the biasing means being formed from material having a generally rectangular cross-section and having a generally flat overall cross-section so as not to stand out from the wearer.

4,721,103
ORTHOPEDIC DEVICE

Yosef Freedland, 11871 Artesia Blvd., Artesia, Calif. 90701

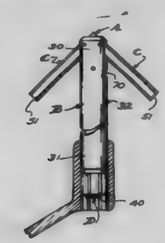
Continuation-in-part of Ser. No. 696,991, Jan. 31, 1985, Pat. No. 4,632,101. This application Aug. 18, 1986, Ser. No. 899,033

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YW 18 Claims

1. An implant device for fixating bone portions in a living body comprising an elongate, vertical shaft defining the central axis of the device, said shaft has an upper deployment end portion and a lower securement end portion, said shaft has a plurality of circumferentially spaced elongate longitudinally extending radially outwardly opening strut accommodating recesses with upper and lower ends in its deployment end portion; first cam means parts on said shaft related to each recess; an elongate vertical sleeve with an upper deployment end portion and a lower securement end portion is engaged about and is shiftable axially relative to said shaft, said sleeve has circumferentially spaced longitudinally extending and radially opening strut accommodating slots, each registering

with a related recess; first pivot means parts related to each slot at the upper end portion of said sleeve on a turning axis normal to and extending transverse the radial plane of the recess; a plurality of elongate flat blade-like struts with inner pivot ends and outer free ends, each strut is engaged in a related slot and recess with its flat plane parallel with said radial plane thereof; a second pivot means part at the pivot end of each strut and engaged with said first pivot means parts related to the slot in which the strut is engaged, said struts are pivotally movable relative to said sleeve between unactuated positions where



they extend longitudinally within their related slots and recesses to actuated positions where they extend radially and axially outward from said slots and recesses; a lever arm projects from the pivot end of each strut and into its related recess; each lever arm has second cam means parts engaged with the first cam means parts in its related recess to pivot said arm between its unactuated and actuated positiions upon axial movement of said shaft relative to said sleeve; and manually accessible and operable drive means at and between said securement end portions of said shaft and sleeve to move said shaft axially relative to said sleeve.

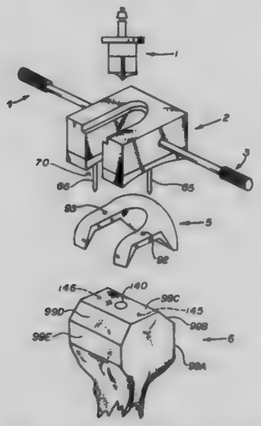
4,721,104
FEMORAL SURFACE SHAPING APPARATUS FOR POSTERIOR-STABILIZED KNEE IMPLANTS

Michael E. Kaufman, Bartlett, Tenn., and Leo A. Whiteside, Chesterfield, Mo., assignors to Dow Corning Wright Corporation, Arlington, Tenn.

Filed Dec. 2, 1985, Ser. No. 803,368

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 VW 7 Claims



1. An apparatus for completing the preparation of a distal femur which has been partially shaped to receive a femoral component of a posterior- stabilized knee implant prosthesis having an intercondylar stabilizing housing wherein said femur has been shaped to contain a flat distal femoral surface, said apparatus comprising, in combination:
(a) a template having a bottom adapted to be placed on said flat distal femoral surface such that a slot having a U-shaped perimeter and being of substantially the same size and shape as the stabilizing housing passing through said template is situated over that portion of said femur which is to be removed to provide a shaped recess in said distal femur for the receipt of the stabilizing housing of said femoral component, wherein the open-ended portion of said slot of said template opens in the direction of the posterior portion of the femur when the template is placed on the femur, said slot being adapted to cooperte with and closely engage the sides of
(b) a drilling means, said template having a sufficient thickness between the bottom and the top of said template to thereby direct said drilling means into said femur, relative to said flat distal femoral surface, to create at least a major portion of said recess, there being a stop means present on said drilling means to control the depth to which said drilling means enters said femur so that the depth of the recess created matches the height of the stabilizing housing of the implant to be fixed to said distal femur.

4,721,105
DEVICE FOR FIXING AN INTRA-UTERINE CONTRACEPTIVE DEVICE TO THE UTERINE WALL

Dirk Wildemeersch, Vossenlul 8, Knokke-Heist, Belgium 8300

Filed Mar. 21, 1985, Ser. No. 714,704

Claims priority, application Belgium, Mar. 29, 1984, 212661

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—130 20 Claims





1. For use with an intrauterine contraceptive device (IUD), a device for insertion and fixation of the IUD to the uterine fundus of a female in the immediate post-partum or post-abortal period, which comprises:
a thread (10) affixable to the IUD (9; 40) and affixed to a retaining member (10'; 14; 15; 19),
a needle (2; 26; 29; 44) for the insertion of the retaining member (10'; 14; 15; 19) affixed to the thread into the uterine muscle,
a protecting member (4; 22; 33; 40) for the needle including a receiving member (4; 22; 30; 41, 41') for the IUD,
an actuating member (3; 27; 31; 43) for the needle, movable with respect to the receiving member,
means (5,6,7; 25,28; 35,36; 48,49) for temporarily locking the actuating member with respect to the receiving member, wherein
the device extends backwards to form a gripping member (8; 25,27; 32,33; 47,45),
the retaining member (10'; 14; 15; 19) loosely engages the needle (2; 26; 29; 44),

means (4; 22; 30; 49) are provided for achieving and maintaining a traction on the thread (10), said traction means adapted to ensure the cooperation of the retaining member (10'; 14; 15; 19) with the needle (2; 26; 29; 44) as long as the means (5,6,7; 25,28; 35,36; 48,49) for locking the actuating member with regard to the protecting member are not disengaged and the IUD is not released from its receiving member (4; 22; 30; 41,41').

4,721,106

PIEZOELECTRIC TRANSDUCER FOR DESTRUCTION OF CONCRETIONS INSIDE THE BODY

Günther Kurtze, Weinheim/Bergstrasse, and Rainer Riedlinger, Karlsruhe, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Continuation of Ser. No. 752,584, Jul. 8, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 63,693

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3425992

Int. Cl.⁴ A61B *17/00*; A61H *23/02*

U.S. Cl. 128—328 **7 Claims**



1. In a piezoelectric transducer for destruction of concretions inside a body, said transducer comprising a cap having an inner surface with a partially-spherical curvature with a given radius from a point, said cap having a back surface, a plurality of piezoelectric ceramic elements for producing sonic pulses being mounted on the inner surface to form a mosaic of elements with the output of the sonic pulses from said mosaic of elements being focussed at said point, the improvements comprising the cap being of a metal with an wave impact resistance of the metal corresponding at least substantially to the wave impact resistance of the material of the ceramic elements, and the cap having means for scattering sonic pulses entering into the cap from the elements to prevent the back surface of the cap from reflecting a focussed wave of sonic pulses at said point.

4,721,107

INSTRUMENT FOR ULTRASONIC LITHOTRIPSY

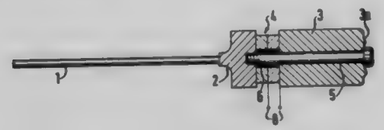
Ulrich Bolg, Sulzfeld; Werner Krauss, Maulbronn, and Helmut Wurster, Oberderdingen, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1986, Ser. No. 870,784

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520133

Int. Cl.⁴ A61B *17/22*

U.S. Cl. 128—328 **6 Claims**



1. An instrument for ultrasonic lithotripsy by applying oscillations from a probe to a stone to be disintegrated, said instrument comprising a piezo-electric transducer including at least a pair of ceramic discs arranged between a proximal end member and a distal end member, an electric generator for energizing said transducer with a pulse operation and a probe extending from said distal end member, said distal end member having a mass less than the mass of the proximal end member and the disc having an impedance selected so that said transducer will have no specific natural resonance frequency in the preset range of operating frequencies and will be substantially reflection-free at the proximal end member.

4,721,108

GENERATOR FOR A PULSE TRAIN OF SHOCKWAVES

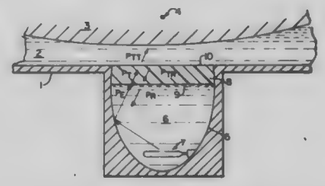
Gerold Heine, Oberuhldingen, and Othmar Wess, Immenstaad, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,088

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240691

Int. Cl.⁴ A61B *17/22*

U.S. Cl. 128—328 **12 Claims**



1. In an apparatus for generating pulse trains of shockwaves for the contactless comminution of concretions in living bodies, comprising a shockwave source including a spark gap, and a reflector for focusing including a hollow ellipsoid filled with a propagation medium, the spark gap being mounted in one focal point of the ellipsoid, the ellipsoid having an opening,

the improvement comprising layer means across said opening for generating a plurality of shockwaves having a thickness equal to its propagation speed of sound multiplied by a time period between about 5 and 0.05 microseconds and made from a material having an impedance different from that of the propagation medium, said layer means being mounted in such a manner that it is crossed by the shockwave field, propagation medium being present on opposite sides of the layer means.

4,721,109

TEMPORARY ANASTOMOTIC DEVICE

Maureen A. Healey, 98 Oceanside Dr., P.O. Box 374, Scituate, Mass. 02066

Filed Apr. 8, 1986, Ser. No. 849,287

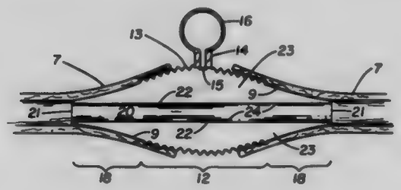
Int. Cl.⁴ A61B *17/04*; A61M *29/00*; A61F *2/04*

U.S. Cl. 128—334 R **3 Claims**

1. An anastomotic device for temporarily rejoining and reforming damaged blood vessels, comprising:

a flexible, tubular casing, made of expansible material, having an inner and an outer face, a center section and two end sections, the center section being made of a material more expansible than that of the two end sections and said center section containing corrugations about its general circumference, and the two end sections of said tubular casing being smooth about their general circumference;

a cylinder having two ends and an inner and outer face, not subject to collapse or kinking, concentrically positioned within the casing, extending to and open at both ends of the casing, and so joined to the casing as to form an enclosed chamber around and between the outer face of the cylinder and the inner face of the casing; and



means for introducing an inflating substance into said enclosed chamber.

4,721,110

RESPIRATION-CONTROLLED CARDIAC PACEMAKER

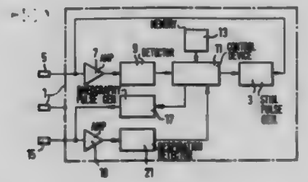
Michael S. Lampadius, Rothenberg Süd 18, D-8113 Kochel am See, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,481

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428975

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—419 PG **12 Claims**



1. A respiration-controlled cardiac pacemaker comprising:

a stimulating pulse generator for generating stimulating pulses at a controllable basic stimulation rate;

a rheography pulse generator for generating rheography pulses in synchronism and at a predetermined timed interrelationship with said stimulating pulses;

a respiration detector responsive to said rheography pulses and generating a respiration signal indicative of a patent's respiration rate;

means for providing a predetermined respiration signal-basic stimulation rate-characteristic; and

control means for controlling said basic stimulation rate of said stimulating pulse generator according to said predetermined respiration signal—basic stimulation rate—characteristic in response to said repiration signal.

4,721,111

MEDICAL ELECTRODE AND METHOD OF MAKING THE ELECTRODE

Raymond I. Muttitt, Norwich, England, assignor to Sciotronic Limited, Newmarket, England

PCT No. PCT/GB85/00241, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO86/00008, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 6, 1985, Ser. No. 830,585

Claims priority, application United Kingdom, Jun. 8, 1984, 8414673

Int. Cl.⁴ A61B *5/04*; H01R *43/00*

U.S. Cl. 128—640 **8 Claims**

1. A medical electrode comprising:

a support of double-sided liquid-impermeable plastics adhesive tape having two faces and formed with a through-hole;

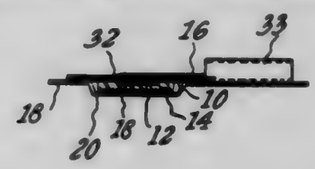
an electrode plate of metal foil liquid-tightly adhered to a first face of the support to cover the through hole;

a connector of metal strip adhered to face-to-face contact with the second face of the support, electrically connected through the through-hole to the electrode plate and having a free end extending beyond an edge of the support;

a protective plastics film coextensive with the support adhered to the second face of the support so as to overlie the connector strip;

a contact pad of open-celled plastics foam adhered to the first face of the support beneath and in electrical contact with the electrode plate and impregnated with a conductive gal; and

a protective liquid-impermeable plastics film at least coextensive with the support and attached to the first face thereof, a dome formed in said film acting as a container for the pad.



4,721,112

BONE EVALUATION METHOD

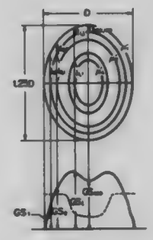
Yoshio Hirano, Tokyo, and Yasuhiro Uotani, Saitama, both of Japan, assignors to Teijin Limited, Japan

Filed Oct. 31, 1985, Ser. No. 793,387

Claims priority, application Japan, Nov. 2, 1984, 59-230077

Int. Cl.⁴ A61B *6/00*

U.S. Cl. 128—659 **5 Claims**



4. A method for evaluating bone comprising the steps of:

(a) determining a bone pattern from a plurality of bone portions (i) by measuring the photodensity of an X-ray photograph, at a constant distance, of the long bone of a limb or (ii) by photon absorptiometry from each portion of the long bone of a limb;

(b) smoothing and symmetrizing the bone pattern of each portion to modify the same;

(c) determining a bone density distribution in each portion by setting a bone model having an elliptic bone cross-sectional external shape, a zonate bone cortex, and a bone density decreasing portion in the inside of the bone cortex from the modified bone pattern;

(d) classifying, by color, the bone density distribution in each portion based on the density values in each bone density distribution;

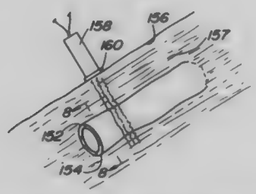
(e) converting an X-ray image of the X-ray photograph of the bone of the limb, or an image obtained from the pho-

ton absorptiometry of the bone of the limb to an image of the bone density distribution; and
(f) evaluating the bone based on the image of the bone density distribution.

4,721,113
METHOD OF PREDICTING THE OCCURRENCE OF DEEP VEIN THROMBOSIS BY NON-INVASIVE MEASUREMENT OF VESSEL DIAMETER

Gwendolyn J. Stewart, Bala Cynwyd; Marvin C. Ziskin, Philadelphia; Charles M. Philips, Philadelphia; Philip D. Alburger, Philadelphia, and John W. Lachman, Philadelphia, all of Pa., assignors to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Sep. 20, 1985, Ser. No. 778,589
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661 3 Claims



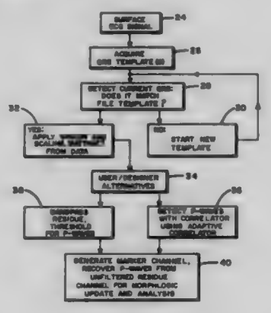
1. A procedure for predicting the occurrence of deep vein thrombosis by observing intra-vessel diameter changes using non-invasive pulse generating techniques comprising the steps of:
(a) immobilizing a part of a subject having a vein;
(b) positioning a probe over the vein of the part of the subject;
(c) generating an incident ultrasonic pulse and directing the incident pulse toward an anterior wall of the vein;
(d) receiving echoes indicative of the presence of each of anterior and posterior walls of the vein and being caused by an acoustic discontinuity therebetween, each echo being a reflected pulse having a leading and a trailing edge;
(e) providing an indication of the time difference between the occurence of the trailing edge of the echo indicative of the presence of the anterior wall and the leading edge of the echo indicative of the presence of the posterior wall, the difference being an indication of vein diameter and the vein diameter being calculated therefrom;
(f) providing a real time analog recording of vein diameter versus time;
(g) monitoring changes in vein diameter over time while the subject is undergoing a surgical procedure;
(h) predicting, based upon magnitude of dilations in vein diameter, whether deep vein thrombosis will occur.

4,721,114
METHOD OF DETECTING P-WAVES IN ECG RECORDINGS

Robert A. DuFault, Roseville, and Ana C. Wilcox, St. Paul, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Feb. 21, 1986, Ser. No. 831,519
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 2 Claims

1. A method for automatically detecting P-waves in a continuous electrocardiograph (ECG) signal stream, irrespective of the presence of P-R disassociation, comprising the steps of:
(a) converting said ECG signal stream to a digital representation;
(b) adaptively developing from the digitized ECG signal stream at least one basic QRS morphologic prototype by the coherent averaging of a number of QRS complexes in said ECG signal stream;
(c) aligning said basic QRS prototype with similar QRS complexes in said ECG signal stream by a normalized convolution process;
(d) multiplying said basic QRS prootype by a mathematical window function for tapering said prototype smoothly to zero at its respective edges while preserving its essential shape at the center;



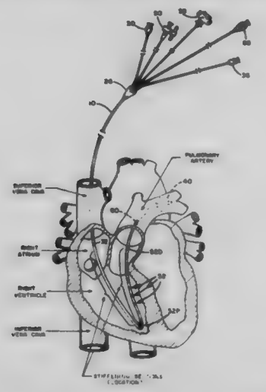
(e) scaling the windowed QRS prototype to provide an amplitude/energy match with said signal stream at the points of alignment;
(f) subtracting the scaled and windowed prototype from said signal stream at the points of alignment to form a residue waveform signal principally made up of P-waves, residual R-wave energy and ectopic beats;
(g) smoothing said residue signal with a linear band pass filter; and
(h) comparing said residue signal to a predetermined linear threshold, the energy amplitudes in said residue signal exceeding said threshold being idenified as P-waves.

4,721,115
DIAGNOSTIC CATHETER FOR MONITORING CARDIAC OUTPUT

Robert C. Owens, Forest Lake, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Feb. 27, 1986, Ser. No. 833,244
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—713 7 Claims

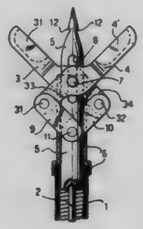
1. A diagnostic catheter for use in measuring cardiac output in the right ventricular chamber comprising:
(a) an elongated, multi-lumen, flexible member having a distal end and a proximal end, a first lumen extending the entire length of said member and terminating in a distal port, a second port extending through the side wall of said member at a location immediately proximate of said distal end of said flexible member and a second lumen extending from said proximal end of said member to said second port;
(b) an expandable sleeve surrounding said member and spanning said second port, said sleeve inflatable by a fluid introduced into the proximal end of said second lumen;
(c) a plurality of ring electrodes secured to the outer surface of said member at predetermined axial spacing including a distal ring electrode located a first predetermined distance proximal of said distal end of said flexible member, a proximal ring electrode located a second predetermined distance greater than said first predetermined distance from said distal end of said flexible member and a further plurality of intermediate ring electrodes disposed between said distal ring electrode and said proximal ring electrode;
(d) a plurality of electrical conductors extending longitudinally through a third lumen in said flexible member from said proximal end of said flexible member and individually connected to separate ones of said plurality of ring electrodes;
(e) a first stiffening member disposed in a fourth lumen in said flexible member and extending from said first predetermined distance to said second predetermined distance; and
(f) a second stiffening member also disposed in said fourth lumen in said flexible member and extending from a location proximal of the proximal end of said first stiffening member for a third predetermined distance, the spacing between the opposed ends of said first and second stiffening members in said fourth lumen creating a zone in which said flexible member can bend without kinking the lumens of said multi-lumen flexible member, said first and second stiffening members positioning said proximal ring electrode at the apex of the ventricle of the heart, said distal ring electrode near the pulmonic valve and said intermediate ring electrodes out of contact with endocardial tissue.



4,721,116
RETRACTABLE NEEDLE BIOPSY FORCEPS AND IMPROVED CONTROL CABLE THEREFOR

Jean-Marie Schistgen, 45, Avenue Victor Hugo, 75116 Paris, and Bruno Zeitoun, 23, rue Daubenton, 75005 Paris, both of France

Filed Jan. 3, 1986, Ser. No. 870,238
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—751 3 Claims



1. Biopsy forceps comprising a control cable sheath, a control wire longitudinally movable within said sheath, two cup-shaped cutting jaws at one end of said sheath having cavities to enclose a sample of tissue and a common pivot articulation and each separately articulated to a control link rod, a needle located within the jaws, and a control handle at the other end of said sheath connected to said control wire, and further comprising, in accordance with the invention;
attachment of said common pivot (7) of said jaws to an extension (6) of said sheath (1);
attachment of said control wire (2) to said needle (5);
articulation of said control link rods (9, 10) to said needle (5) on a common pivot (11), said control link rods (9, 10) extending from their said common pivot (11) to their said respective separate articulations (31, 32) to said jaws (3, 4) located on respective extensions (33, 34) of said jaws extending beyond said common pivot thereof (7) in respective rearward directions of said jaws;
a longitudinal aperture (8) in said needle for passage of said common pivot (7) of said jaws, said common pivot (7) of said jaws (3, 4) passing through said aperture (8) in said needle (5) so that said needle (5) may be moved longitudinally past said common pivot (7) of said jaws (3, 4) by actuation of said control wire.

4,721,117
TORSIONALLY STABILIZED GUIDE WIRE WITH OUTER JACKET

Craig E. Mar, Fremont; Lambert J. Diettrich, Danville, and David W. Morrison, San Jose, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Apr. 25, 1986, Ser. No. 856,492
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 16 Claims



1. In a guide wire for use in the vascular system: an elongated shaft having a relatively flexible distal end portion, a helical coil extending over the distal end portion of the shaft and a substantial portion of the shaft proximal to the relatively flexible distal end portion, said helical coil being affixed to the shaft at its ends and at a point between its ends, and a jacket of polyethylene heat shrunk about the shaft proximally of the helical coil and having a thickness corresponding to the thickness of the wire which forms the coil and an outer diameter substantially equal to the outer diameter of the coil.

4,721,118
PERVENOUS ELECTRICAL PACING LEAD WITH FOLDABLE FINS

Donald L. Harris, Miami Beach, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Continuation of Ser. No. 797,011, Jan. 21, 1986, abandoned, which is a division of Ser. No. 495,636, May 18, 1983, Pat. No. 4,585,013, which is a continuation-in-part of Ser. No. 225,703, Apr. 20, 1981, abandoned. This application Mar. 27, 1987, Ser. No. 32,981
Int. Cl.[4] A61N *1/05*
U.S. Cl. 128—785 10 Claims



1. A finned pervenous lead for electrically connecting an electrical generator with an internal organ, comprising:
a flexible electrically conductive insulated lead having a first preselected lead diameter and proximal and distal ends, said proximal end having means for electrically connecting said lead to the electrical generator, a distal electrode

VOL 1086 ISS 4 JA 26 1988 UMI

assembly connected to said distal end of said lead, said distal electrode assembly including a distal electrode tip portion having a second preselected diameter slightly in excess of the lead diameter, an intermediate body portion proximal to said distal electrode tip having a third preselected diameter which is less than the electrode tip diameter, an axis and at least two tissue-engaging, thin, flexible, flat fins which are circumferentially sidewise deflectible and which project radially outwardly from different radial locations on said intermediate body portion at about the same axial location on said intermediate body portion, each fin extending outwardly in a plane which includes the axis of said intermediate body portion and each fin being attached to said intermediate body portion at a fold line extending substantially parallel to the axis of said intermediate body portion, substantially an entire flat side of each of said fins being capable of folding circumferentially about said fold line against, contacting and conforming to the adjacent circumferential surface of said intermediate body portion without overlapping when said fins are bent in the same sense around said intermediate body portion and about said fold lines

whereby the diameter of a cylindrical envelope defined by said fins on said lead and folded against said intermediate body portion can be kept as small as possible and no greater than substantially the outer diameter of a French 7 lead during insertion withdrawal after deployment to project radially of the lead and interference by the projecting fins with an introducer sheath through which the lead is fed into the vascular system can be reduced by manually twisting the lead about its axis to fold the fins at said fold lines around and against the circumferential surface of the intermediate body portion in a non-overlapping manner.

4,721,119

ROD MAKING MACHINE WITH MEANS FOR ADJUSTING THE POSITION OF WRAPPING MATERIAL

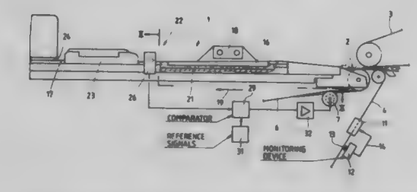
Dieter Ludszeweit, Hamburg, and Jürgen Gömann, Dassendorf, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,262

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3544769

Int. Cl.[4] A24C *5/18, 5/24;* **B31C** *13/00*

U.S. Cl. 131—69 **9 Claims**



1. In a machine for converting a continuous stream of fibrous material and a continuous web of wrapping material into a rod-like product, the combination of a wrapping mechanism; means for directing the web toward said mechanism; means for transporting the stream to said mechanism; means for conveying the web and the stream through said mechanism including an endless conveyor arranged to receive the web from said directing means and the stream from said transporting means and to transport the web and the stream in the mechanism along a predetermined path; adjustable guide means for said conveyor; means for applying to the web adhesive during transport through said mechanism; means for monitoring the position of said conveyor in said mechanism and for generating signals denoting the monitored position of the conveyor; and means for adjusting said guide means in response to said signals.

4,721,120

SMOKING ARTICLES

Colin C. Greig, Redlynch; Richard R. Baker, Southampton; Frederick J. Dashley, New Milton, and Anthony D. McCormack, Crowborough, all of England, assignors to British-American Tobacco Company Limited, London, England

Continuation-in-part of Ser. No. 606,360, May 2, 1984, Pat. No. 4,624,268. This application Sep. 17, 1986, Ser. No. 908,340

Claims priority, application United Kingdom, May 17, 1983, 8313604

Int. Cl.[4] A24D *1/02*

U.S. Cl. 131—365 **16 Claims**

1. A smoking article comprising a smoking material rod enwrapped in a paper wrapper, said wrapper including aluminium hydroxide and at least one organic acid salt of the group I & II metals, so that the reduction in visible sidestream smoke emanating from said smoking article when lit is at least 30% of that from a comparable lit smoking article having a conventional wrapper and smoked under comparable conditions.

4,721,121

COMBINATION PRESSING COMB DRYER AND BLOW DRYER

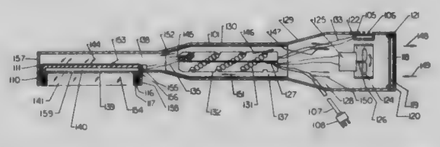
Charles R. Adams, 1932 W. 25th St. #12, Los Angeles, Calif. 90018

Continuation-in-part of Ser. No. 672,126, Nov. 16, 1984, Pat. No. 4,570,651. This application Feb. 14, 1986, Ser. No. 829,503

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] A45D *20/00*

U.S. Cl. 132—9 **5 Claims**



1. For use in styling hair a combination pressing comb and blow dryer comprising:

an elongated housing defining a cylindrical handle portion, an enlarged end portion, a reduced end portion arranged in a substantially linear serial configuration, and a continuous internal cavity extending through said enlarged end portion, said handle portion, and said reduced end portion;

a metal comb assembly serially attached to said reduced end portion defining a first plurality of teeth, a first plurality of serrations spaced between each of said teeth in said first plurality of teeth, a heater element cavity, and a plurality of air passages;

a first heating element supported within said heating element cavity of said metal comb;

a second heating element supported within said handle portion of said internal cavity;

an electrically driven air impeller supported within said enlarged end portion of said internal cavity, said air impeller operable in a first direction in which air is drawn through said serrations, said air passages, and said internal cavity and expelled from said enlarged end portion of said housing and a second direction in which air is drawn into said enlarged portion of said elongated housing and is driven through said internal cavity and said air passages and is expelled through said serrations; and

control means, supported by said elongated housing and coupled to said electrically driven air impeller and said first and second heating elements, for selectively controlling the temperature of said interior comb and said electrically driven air impeller and for individually operating said first and second heating elements.

4,721,122

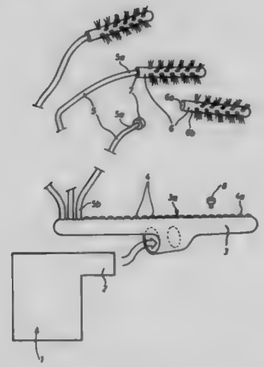
BRUSHING AND DRYING APPARATUS FOR HAIR

Jürgen Sahm, Weidstrasse 17, Kindhausen, Switzerland

Continuation of Ser. No. 515,287, Jul. 19, 1983, which is a continuation of Ser. No. 176,747, Aug. 20, 1980, abandoned. This application Aug. 27, 1985, Ser. No. 770,292

Int. Cl.[4] A45D *1/00*

U.S. Cl. 132—9 **2 Claims**



1. A hair drying apparatus comprising:

a cabinet mounted on a mobile base which has a distributor having at the top thereof, a substantially flat, horizontal upper surface provided with a plurality of individual, flexible hoses communicating with the interior of said distributor through said upper surface;

means for introducing heated air into the interior of said distributor comprising heating elements adjacent the bottom thereof;

blower means for blowing ambient air through said heating elements into the interior of said distributor;

a plurality of drier means; and

a plurality of drier means connectors adapted to connect individual, drier means with said individual flexible hoses.

4,721,123

CATHETER REPROCESSING SYSTEM

Louis C. Cosentino, Wayzata; Daniel A. Baker, Minnetonka; Edward J. Mikolajczyk, Minneapolis; Russel L. Hoeker, Maple Grove, and Jo-Ann B. Maltais, Minneapolis, all of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Filed Oct. 23, 1986, Ser. No. 922,205

Int. Cl.[4] B08B *3/04, 9/00, 11/02*

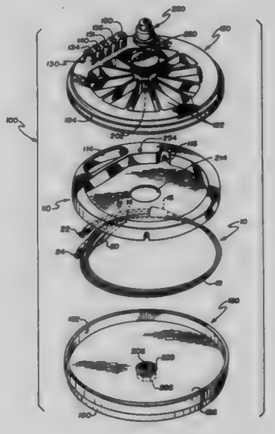
U.S. Cl. 134—57 R **16 Claims**

1. A system for reprocessing catheters having a catheter hub, body, at least two lumens and a balloon; said system comprising:

(a) cleaning means for supplying catheter cleaning solution to the lumens and outside of a catheter;

(b) balloon test means for testing the balloon strength and filling volume and for displaying strength and volume date;

(c) rinsing means for removing said cleaning solution from the catheter; and



(d) means for monitoring the condition of the catheter during reprocessing.

4,721,124

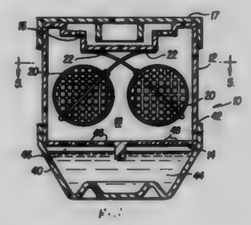
OPTOMETRIC SOFT AND RIGID CONTACT LENS CLEANING AND STORAGE SYSTEM

Barry Tuerkheimer, 238 S. University Dr., Plantation, Fla. 33324, and Robert Cranmore, 815 NW. 57th St., Ft. Lauderdale, Fla. 33309

Filed Dec. 1, 1983, Ser. No. 556,973

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—138 **4 Claims**



4. A storage, cleaning and sterilization system for soft and rigid contact lenses, comprising:

a lens supporting means for retaining one or more contact lens rotatably disposed and exposed to circulating fluid for cleaning by irrigation;

a cleaning means connected to said lens supporting means for cleaning said lens through irrigation of the lens by circulation of a cleaning fluid within said cleaning means, said cleaning fluid being directed in streams to impact on the surface of said lens to effect the cleaning of said lens and to cause rotation of said lens so that essentially the entire surface of said lens is exposed to the washing effect of said streams;

said cleaning means includes an irrigation means, said irrigation means connected to said lens supporting means in fluid communication for providing cyclic circulation of the fluid into said lens supporting means to impact onto the contact lens in said lens supporting means;

said irrigating means includes a pump means and a fluid circulating means, said pump means connected to said lens supporting means in fluid communication for cyclically

providing a quantity of the fluid under pressure to said fluid circulating means, said fluid circulation means connected to said pump means in fluid communication for providing circulation of directed streams of pressurized fluid in a helical shape onto said lens supporting means to impact onto the contact lens in said lens supporting means;

said circulating means includes a fluid directing means in fluid communication with said lens supporting means connected to said pump means in fluid communication for directing a spray of a plurality of directed streams of fluid onto the lenses;

said pump means includes a compressible resilient housing means in a generally water-tight connection to said lens storage means in fluid communication;

said housing means for providing storage of said fluid and cyclic propulsion of said fluid onto said fluid directing means by manual compression and resilient expansion of said housing means; and

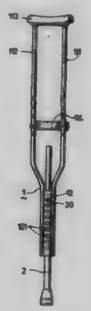
said fluid directing means includes a plurality of angled aperture means in a floor of said cleaning means for providing a plurality of streams of upwardly propelled fluid forming a helically shaped spray impacting upon the contact lens in said lens supporting means and said fluid directing means providing for draining of said fluid back into said pump means during resilient expansion of said housing means.

4,721,125

HEIGHT ADJUSTABLE CRUTCH

Mei-Chin Wang-Lee, No. 6, Jen-Shou Street, Hsin-Ying City, Tainan Hsien, Taiwan

Filed Dec. 22, 1986, Ser. No. 943,997
Int. Cl.[4] A61H 3/02
U.S. Cl. 135—69 11 Claims



1. A walking aid readily adjustable for use by individuals of varying sizes, comprising:

(a) an extruded one piece integral leg support member,

(b) at least three spaced aligned sections integrally formed in said leg support member,

(c) said at least three spaced aligned sections including a pair of outer sections and a central section,

(d) said outer sections having upper and lower portions,

(e) said lower portions of said outer sections having upper and lower ends,

(f) said lower portions of said outer sections extending substantially parallel to said central section,

(g) said upper portions of said outer sections including upper and lower segments,

(h) said lower segments of said upper portions of said outer sections extending upwardly from and forming an angle with said central section,

(i) said upper segments of said upper portions of said outer sections extending upwardly from said lower segments and substantially parallel to said central section,

(j) said central section including upper and lower ends and a hollow passageway extending between said upper and lower ends,

(k) said upper end of said central section and said upper ends of said lower portions of said outer sections being positioned in a substantially common horizontal plane,

(l) said lower ends of said central section and said lower ends of said lower portions of said outer sections being positioned in a substantially common horizontal plane,

(m) said lower portions of said outer sections being joined to and extending along substantially the entire length of said central section such that said lower portions of said outer sections and said central section form a substantially solid piece,

(n) a leg slidably positioned in said hollow passageway of said central section, and

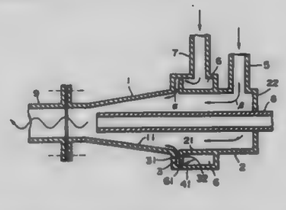
(o) means operably associated with said central section for adjustably securing said leg thereto.

4,721,126

METHOD OF GENERATING SPIRAL FLUID FLOW AND THE DEVICE THEREFOR

Kiyoshi Horii, 5-8-15-501, Kamimeguro, Meguro-ku, Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,424
Claims priority, application Japan, Sep. 9, 1985, 60-197620
Int. Cl.[4] F16K 11/00
U.S. Cl. 137—1 6 Claims



1. A method of generating a spiral fluid flow, comprising the steps of; preparing a device such that an annular-slit is formed between a large diameter end of a main conical cylinder having a small diameter end connectable to a long conveyance pipe line and an end of a subcylinder, an inner wall surface of the annular-slit on the main cylinder side being smoothly curved so as to change to an inner wall of the main cylinder, an angle of inclination θ of the conical portion being determined to tan $\theta = \frac{1}{3}$ to $\frac{1}{5}$, an inner wall surface of the annular-slit on the subcylinder side being sharply bent so as to change to an inner wall of the subcylinder; and

supplying a pressurized gas through to the annular-slit to generate a high speed spiral flow within the long conveyance pipe line.

4,721,127

METHOD AND APPARATUS FOR UNDERGROUND TANK CLEANING

Carter B. Conlin, 820 Gessner, Suite 1010, Houston, Tex. 77024

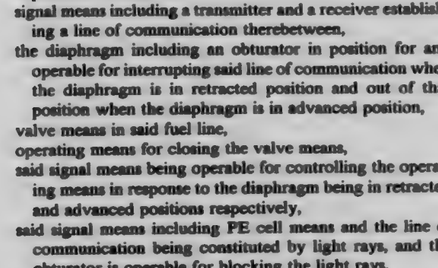
Filed Aug. 15, 1986, Ser. No. 897,143
Int. Cl.[4] B08B 9/12
U.S. Cl. 137—15 21 Claims

4. An apparatus for removing contaminants from an underground storage tank, comprising:

a flexible suction hose for insertion into said tank;

a pump for pumping contaminants from said tank to a receiving drum; and

a piping manifold for connection between said suction hose and said pump and between said pump and said receiving drum, said manifold having a bypass valve for varying the rate of suction by said pump from said tank and said manifold having a backflush valve means for alternatively



connecting a discharge of said pump to said suction hose or to said receiving drum.

4,721,128

SAFETY SHUTOFF VALVE—ELECTROMECHANICAL

Amando C. Padilla, Apartado Postal 187, Hermosillo, Sonora, Mexico

Filed Sep. 15, 1986, Ser. No. 909,169
Int. Cl.[4] F16K 17/164
U.S. Cl. 137—456 11 Claims

1. Safety shutoff means for a fuel line comprising, a chamber in the line arranged for the flow therethrough of the fuel in the line,

a diaphragm in the chamber subject to the pressure of the fuel therein, and movable between a retracted position and an advanced position,

means biasing the diaphragm toward retracted position and operable for moving it to that position at low pressure of the fuel, the diaphragm being biased toward advanced position by the fuel and movable to that position at high pressure of the fuel,

signal means including a transmitter and a receiver establishing a line of communication therebetween,

the diaphragm including an obturator in position for and operable for interrupting said line of communication when the diaphragm is in retracted position and out of that position when the diaphragm is in advanced position,

valve means in said fuel line,

operating means for closing the valve means,

said signal means being operable for controlling the operating means in response to the diaphragm being in retracted and advanced positions respectively,

said signal means including PE cell means and the line of communication being constituted by light rays, and the obturator is operable for blocking the light rays,

the chamber including an inner casing of transparent material sealingly interposed in the fuel line, and

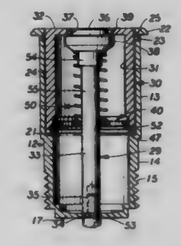
the signal means being exterior to said casing with the transmitter and receiver on opposite side thereof and the casing therebetween.

4,721,129

RELIEF VALVE

Gilbert Sousa, Placerville, Calif., assignor to Robert H. Holland, Diamond Springs, Calif.

Filed Jun. 29, 1987, Ser. No. 66,997
Int. Cl.[4] F16K 31/12
U.S. Cl. 137—508 16 Claims



1. A relief valve comprising:

a main housing having a throughbore and an inner wall surrounding the throughbore with an annular shoulder on said inner wall between the open ends of said housing;

a piston reciprocally and slidably mounted in said housing of an outer diameter greater than the inner diameter of said housing between said shoulder and one open end thereof, the overall length of said piston being substantially the same as the overall length in said housing between said shoulder and the other open end thereof, said piston also having a throughbore and open at each end with an integral annular flange surrounding the opening in said piston remote from said one open end of said housing;

a post having an enlarged head mounted in the throughbore of said piston and said housing having its enlarged head normally disposed in the opening surrounded by the annular flange of said piston with the outer surfaces of said head and said flange when said head is normally disposed in said opening being substantially flush and said enlarged head having a flange portion of an outer diameter greater than the outer diameter of the remainder of said head abutting against the underside of said flange when said head is normally disposed in said opening, said post further including an elongated shank extending from said head and secured to said housing adjacent the other open end thereof; and

resilient means associated with both said post and said piston for normally resiliently biasing said piston in a direction inwardly of said housing whereby, when said piston is moved away from said one open end of said housing, said resilient means returns said piston back to its normal position wherein the outer surfaces of said head of said post and said flange are flush.

4,721,130

VALVE STRUCTURE OF HYDRAULIC BUFFER

Makoto Hayashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 15, 1986, Ser. No. 941,834
Claims priority, application Japan, Dec. 27, 1985, 60-293193
Int. Cl.[4] F16K 15/14
U.S. Cl. 137—512.15 2 Claims

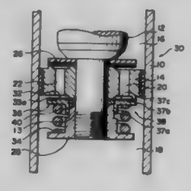
1. A valve structure of a hydraulic buffer provided with a member for partitioning the interior of a cylinder into two liquid chambers and having at least a port for affording communication between both liquid chambers, comprising:

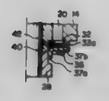
a valve body formed of a leaf spring for opening and closing said port and being capable of flexing about fulcrums which have different distances from a free end therof;

a spring for biasing the valve body toward said member;

a spring seat disposed movably between said spring and said valve body; and

an annular spacer formed separately from the spring seat and disposed movably between said valve body and said spring seat, an outer diameter of the spacer being smaller than those of said valve body and spring seat, there being





formed radially outwardly of the spacer and between the valve body and the spring seat an annular space having an axial depth which is substantially constant at all radial points thereof,

wherein an outer peripheral edge of a surface of the spacer contacting said valve body provides one of said fulcrums.

4,721,131

CONTROL DEVICE FOR VALVES AND THE LIKE

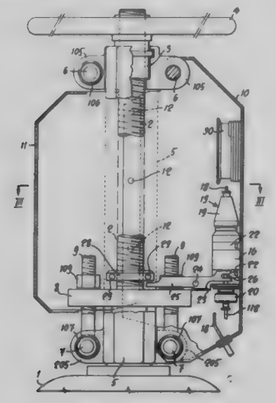
Jacques Ciordinik, and Federico Ciordinik, both of Bologna, Italy, assignors to Cl.KA.RA. S.p.A., Italy

Filed Feb. 25, 1987, Ser. No. 18,698

Claims priority, application Italy, Feb. 26, 1986, 12436 A/86; Aug. 26, 1986, 12534 A/86

Int. Cl.⁴ F16K *37/00*

U.S. Cl. 137—554 **19 Claims**



1. A control device for a valve and the like, including at least one control switch (13) which is inserted in at least one electrical or optical conductor (18,118), and is connected to a valve actuating means in such a manner that it will be automatically actuated upon the opening and closing of the valve, thus interrupting the conductor (18,118) or re-establishing its continuity during the valve opening and closing movement, said conductor (18,118) being comprised in any warning and/or control circuit, and the opening or the closing position of said switch (13) generating a signal to detect and/or record the actuation of the valve and/or to activate a television inspection system, characterized in that said control switch (13) is formed by a connector including two complementary and co-axial connector members (14,15), one of which (14) is stationary and the other of which (15) is movable axially and is urged towards one of its open or close positions by a spring (17) and is held in the other of its open or close positions thereof (i.e. closing or opening position) by an associated movable portion (2) of the valve actuating means in the position assumed by said portion at the end of its stroke for closing or opening the valve, said device further including displaceable means operatively connecting said movable portion (2) to said movable connector member (15), said displaceable means serving to warn or detect any actuation of said valve actuating means.

4,721,132

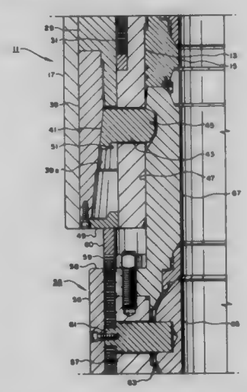
SUBSEA FLOWLINE QUICK DISCONNECT COUPLING

Robert C. Houlgrave, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 4, 1987, Ser. No. 11,163

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 137—614.06 **3 Claims**



1. A quick disconnect coupling for a flowline, comprising in combination:

a receptacle and a mandrel connector, each having a flow passage therethrough, the receptacle connector having a receptacle for insertion over a mandrel of the mandrel connector, the mandrel having an annular groove on its sidewall;

a ball valve mounted in the passage of each connector and rotatable between open and closed positions;

rotating means mounted to each ball valve for moving each ball valve between the positions;

a latch member mounted to the receptacle connector for generally radial movement between engaged and released positions with the groove of the mandrel; and

means carried by the receptacle connector including a hydraulically actuated piston for moving the latch member between the engaged and released positions, and for engaging the rotating means in response to movement of the piston for moving the rotating means to open and close the valves at the same time the latch member is moved between the engaged and released positions.

4,721,133

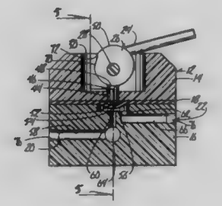
MULTIPLE USE VALVING DEVICE

Leif J. Sundblom, Castro Valley, Calif., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 781,129, Sep. 26, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 946,675

Int. Cl.⁴ F16K *11/22*

U.S. Cl. 137—883 **13 Claims**



13. A multiple use valving device for use in an ophthalmic micro-augery system between at least one fluid flow source and at least one ophthalmic microsurgery instrument utilizing the fluid flow, said fluid flow being selected from but not limited to the set of pressurized gas, liquid and vacuum, comprising:

a valve housing having at least one inlet opening each connectable to a fluid flow source, an outlet opening connectable to each said ophthalmic microsurgery instrument utilizing the fluid flow, and a channel connecting each said inlet and each corresponding said outlet opening;

a deformable but resilient sealing member positioned within said valve housing, moveable between a first position outside of each said channel and a second position interposed into each said channel for sealingly blocking said channel from any fluid communication between each said inlet and the corresponding said outlet opening;

a manual control member for each said channel, having an open position and a closed position, operably attached to said valve housing for selectively and manually controlling movement of said sealing member between said first and second positions for the corresponding said channel, said manual control member including an eccentric cam pivotable about an axle which is secured to the valve housing, said eccentric cam having a generally curved periphery except for a flattened portion terminating in a raised stop, said flattened portion and raised stop corresponding with the closed position of the manual control member; and

an actuator means being responsive to each said manual control member and positioned within said valve housing to abutt and deform said sealing member into said second position when said manual control member is placed in said closed position, and being responsive to the resiliency of said sealing member to be pushed away from said channel when said manual control member is in said open position so that said sealing member is in its said first position, said actuator means following the periphery of the manual control member until reaching the flattened portion and stop, the flattened portion causing the actuator means to be locked in a position whereby it deforms said sealing member into said second position, the stop disallowing any further movement of the manual control member towards the closed position.

4,721,134

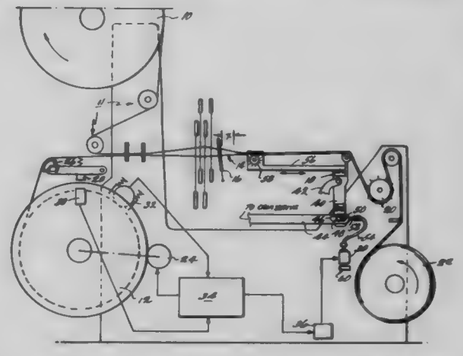
TERRY LOOP RATIO CONTROL DEVICE

Martin C. Dorman, Opelika; James F. Byrd, Auburn, and Earl Whaley, La Fayette, all of Ala., assignors to West Point Pepperell, Inc., West Point, Ga.

Filed Aug. 4, 1986, Ser. No. 892,822

Int. Cl.⁴ D03D *39/22*

U.S. Cl. 139—25 **6 Claims**



6. In a terry weaving machine of the kind including a first supply beam from which pile warp yarn is dispensed, a second supply beam from which ground warp yarn continuously is dispensed, a reciprocally operable reed and a rocking bar past which said pile and ground warp yarns are directed, said rocking bar being intermittently operable for displacement from a first position towards said reed to a second position and then returning from said second position to the first position, the invention comprising:

means for sensing the rate at which the pile warp yarn is dispensed from the first supply beam to produce a first electrical signal;

circuit means responsive to: said first signal, to data representative of the rate at which ground warp yarn is continuously dispensed, and to a pre-programmed desired pile-to-ground warp ratio, to produce an output signal, said output signal being produced when a difference between the desired pile-to-ground warp ratio and an actual pile-to-ground warp ratio, calculated by said circuit means from said first signal and said data, exceeds a threshold level; and

means responsive to said output signal for altering the distance between the second position of the rocking bar and said reed to thereby alter the height of terry produced when the rocking bar is in the second position.

4,721,135

LOOP-FORMING ASSEMBLY FOR WEAVING MACHINE

Noritaka Tsubota, Uozu; Ryuichi Muraoki, Toyama, and Takeo Kanada, Kurobe, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,055

Claims priority, application Japan, Dec. 28, 1985, 60-298526

Int. Cl.⁴ D03D *39/20*

U.S. Cl. 139—46 **7 Claims**

1. A loop-forming assembly in a weaving machine for weaving a web of surface fastener tape having a multiplicity of warp pile loops formed of loop-forming warp threads on one side thereof, said assembly comprising:

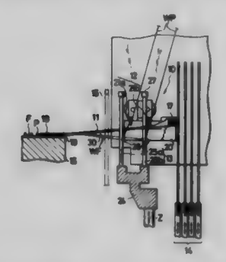
(a) a lancet unit including a plurality of parallel spaced lancets each extending forwardly between and in parallel to a corresponding adjacent pair of ground warp threads beyond a cloth fell of the machine;

(b) a leno deflector extending transversely of said lancets

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between the fell and a harness of the machine, and including a plurality of eyelets through which the loop-forming warp threads are threaded respectively, said deflector being kept free from the lancets and reciprocable in a substantially axial direction thereof so as to deflect the course of the loop-forming threads alternately to one side and then to the other side of corresponding lancets respectively; and

(c) a gate hook unit including a plurality of pairs of spaced gate hook bars disposed immediately downstream of said leno deflector and each pair extending vertically at the



opposite sides of the corresponding one of said lancets such that said gate hook bars are kept free from the respective lancets and from said leno deflector, and each pair of gate hook-bars being vertically reciprocable in timed relation to said leno deflector to thereby capture the thus laterally deflected loop-forming warp thread by one of hook portions defined thereon to lower the thread alternately at one side and then at the other side of the corresponding lancet so as to pass the thread over the latter in a staggering fashion to thereby form of the warp pile loops.

4,721,136

BINDING COMB SHAPING DEVICE

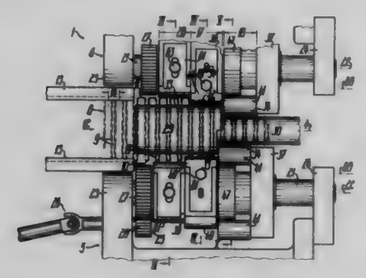
Guido Negro, Neuffen, Fed. Rep. of Germany, assignor to bielomatik Leuze GmbH & Co., Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,172

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523557

Int. Cl.⁴ B21F *45/16*

U.S. Cl. 140—71 R **34 Claims**



1. A binding comb shaping device (1) for manufacturing binding combs from binding comb blanks (8) for comb binding of sheet layers, each of said binding comb blanks (8) having longitudinal boundaries, comb webs (9) arranged transversely between said longitudinal boundaries in a comb partition unit (14) and said binding combs having a bent profile in a view parallel to a longitudinal direction thereof, said shaping device (1) comprising:

a base means (2) supporting operational parts of the shaping device;

at least one bending stage (17, 18) having at least one bending device (15, 16) supported by said base means (2), said bending device (15, 16) having a shaping anvil (29, 30) defining a plane (7) of engagement for engaging the binding comb blank (8), said shaping anvil (29, 30) further defining a median longitudinal plane (4) oriented substantially at right angles to said plane (7) of engagement, said shaping anvil (29, 30) having at least one shaping edge (33, 34);

at least one bending tool (40, 41) having a bending face (42, 43) provided for a bending engagement with the shaping edge (33, 34);

means for rotatably driving said bending tool (40, 41) in an operation movement around a tool axis (22) with respect to and towards said shaping edge (33, 34) while having the bending comb blank (8) interposed between said shaping edge (33, 34) and said bending edge (42, 43);

at least one tool porter (36, 37) for bearing a respective bending tool (40, 41), said tool porter (36, 37) being displaceable with respect to said base means (2) by a displacement bearing;

at least one headstock (5, 6) rotatably mounting a respective tool porter (36, 37) in a porter bearing for holding the tool axis (22) in a bending operation position,

wherein the at least one headstock (5, 6) is displaceably mounted with respect to said base means (2) in a direction transverse to said median longitudinal plane (4).

4,721,137

APPARATUS FOR WITHDRAWING LIQUID FROM CLOSED RECEPTACLE

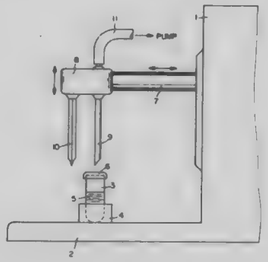
Paul Müller, Steinhausen, Switzerland, assignor to Kontron Holding A.G., Zurich, Switzerland

Filed Oct. 7, 1986, Ser. No. 916,332

Claims priority, application Switzerland, Oct. 9, 1985, 4356/85

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—65 **3 Claims**



1. An apparatus for withdrawing liquid from a receptacle closed by a penetrable cover, which comprises:

(a) puncturing tool means for puncturing the receptacle cover;

(b) cannula means for entering the receptacle through the aperture produced by the puncturing tool means and withdrawing liquid from the receptacle;

(c) holding arm means to which the puncturing tool means and cannula means are commonly affixed in a parallel side-by-side relationship at a certain distance from one another; and

(d) driving means for effecting horizontal and vertical movements of the holding arm means relative to the receptacle cover and for aligning the puncturing tool means with the receptacle cover such that in a first of two vertical descents of the holding arm means the puncturing tool means alone pierces the cover, thereby creating a channel,

and in a second vertical descent the cannula means penetrates the cover through the channel previously created by the puncturing tool means.

4,721,138

CONTINUOUSLY ROTATING FILLING DEVICE WITH BOTTLE CONTROL MEANS

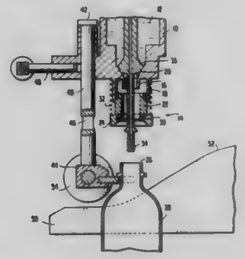
Adriano Simonazzi, via La Spezia 241/A, 43016 Parma, Italy

Filed Oct. 31, 1986, Ser. No. 925,589

Claims priority, application Italy, Nov. 11, 1985, 3599 A/85

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—150 **4 Claims**



1. A bottle filling machine comprising a continuously rotating head having a reservoir therein, a plurality of bottle filling means mounted on said head in controllable communication with said reservoir, a tappet slidably mounted in said head adjacent each bottle filling means, prehensile bottle gripping means secured to the lower end of each tappet for gripping and supporting a bottle, cam means mounted on said bottle filling machine for engagement by said tappet upon rotation of said head to raise said tappet and the bottle carried thereon into filling position in contact with said valve means and latch means selectively engageable with each tappet for maintaining said tappet in the elevated position during the filling operation of each bottle.

4,721,139

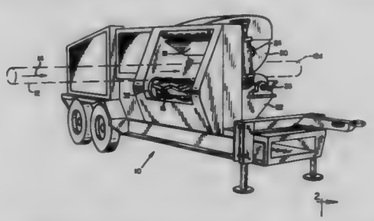
FEED ROLL FOR DEBARKING/DELIMBING APPARATUS

Arnold N. Peterson, Eugene, and Larry A. Sprague, Dexter, both of Oreg., assignors to Peterson Pacific Corporation, Pleasant Hill, Oreg.

Filed Jul. 13, 1987, Ser. No. 72,394

Int. Cl.⁴ B27C *1/12*; B27L *1/00*

U.S. Cl. 144—246 C **5 Claims**



1. In a log processing apparatus having a processing station with an inlet and outlet to the processing station, a feed roll for receiving a bundle of logs and providing the additional function of spreading the logs from a stacked to a side-by-side arrangement for processing, said feed roll comprising; a multiple-sided base member having corners formed at the side junctures, spindles projected from each end of the base member and rotatably mounting the feed roll at a position adjacent the inlet of the apparatus for driven rotation of the roll to thereby induce movement of logs placed thereon into the processing station.

4,721,140

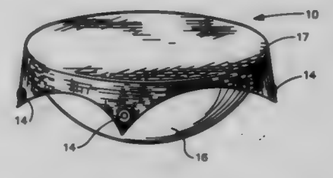
COVER DEVICE FOR PREVENTING SPATTERS DURING THE HEATING OF FOOD

Stanley W. Coker, Aurora, Colo., assignor to Timothy J. Martin, Lakewood, Colo.

Filed Feb. 25, 1987, Ser. No. 18,505

Int. Cl.⁴ B65D *65/02*

U.S. Cl. 150—52 R **12 Claims**



1. A screen device adapted to cover a container of food during cooking and heating in order to prevent food spatters, said container has a food support surface and an upstanding rim therearound, the screen device comprising:

a sheet of flexible, open-weave material configured in a selected geometric shape having a surrounding peripheral edge and a margin adjacent said edge, said sheet sized to be placed across the container and overlap said rim; and

a plurality of weight elements secured to said sheet at spaced-apart locations along said peripheral margin whereby said weight elements cause said margin area to hang downwardly alongside said container thereby maintaining a central portion of said sheet in an extended position across said container.

4,721,141

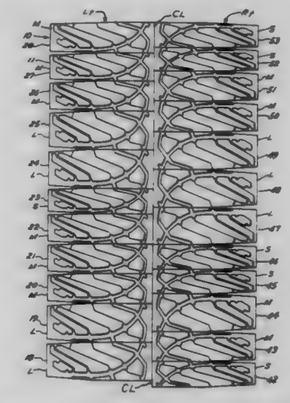
ASYMMETRICAL TIRE PITCHING TECHNIQUEN

Jean Collette, Michamps, and Alain Klepper, Neufchâteau, both of Belgium, assignors to The Goodyear Tire and Rubber Company, Akron, Ohio

Filed May 21, 1986, Ser. No. 865,448

Int. Cl.⁴ B60C *11/00*

U.S. Cl. 152—209 A **2 Claims**



1. In a tire adapted to rotate around an axis and having an outer surface defining a circumferentially extending centerline that defines a center plane perpendicular to the axis which

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divides the tire into first and second portions, the tire including a first series of design cycles having at least first, second and third different lengths extending circumferentially around the tire in the first portion and a second series of design cycles having at least first, second and third different lengths extending circumferentially around the tire in the second portion, an improved arrangement of the design cycles in which:

the number of design cycles in the first and second portions is equal;

and

the lengths of the design cycles in the first portion substantially have the ratios 17–21–26 and the lengths of the design cycles in the second portion substantially have the ratios 6–7–9.

4,721,142

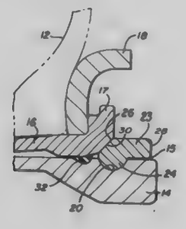
RIM & LOCK RING

William C. Foster, Creve Coeur, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 854,249, Apr. 21, 1986, abandoned. This application Jun. 29, 1987, Ser. No. 68,705

Int. Cl.⁴ B60B *25/18*

U.S. Cl. 152—410 **11 Claims**



1. A method of forming a rim construction for mounting a tire comprising the steps of:

a. forming a base member,

b. machine an annular groove in said base member to a predetermined fine tolerance and cross-section,

c. forming an annular bead seat ring with a radially and outwardly extending flanged portion having a chamfered outer edge surface,

d. positioning said annular bead seat ring over said base member,

e. cold extruding an annular lock ring with a projection having a cross-section fine tolerance corresponding to said groove cross-section fine tolerance,

f. integrally forming a lip extending outwardly from said annular lock ring to prevent twisting of said lock ring, and

g. positioning said lock ring projection in uniform engagement with said machined groove with a surface on said lock ring matching and abutting said chamfered outer edge surface of said annular bead seat ring.

4,721,143

PNEUMATIC TIRE WITH EXCELLENT RIDE FEELING

Hironobu Fukushima, Kodaira, and Masahiro Takayama, Musashino, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,582

Claims priority, application Japan, Jan. 11, 1985, 60-2895

Int. Cl.⁴ B60C *3/00*

U.S. Cl. 152—454 **3 Claims**

1. A passenger car pneumatic tire giving excellent ride feeling, wherein a tread is reinforced by a belt consisting of plural metal cord layers piled so that the cores in one metal cord layer are intersected with those of a juxtaposed metal cord layer; the following relations are met:

$$-1.5 \leqq [(S/So)-1] \times 100 \leqq -0.1$$

in which S is the maximum tire width in the state that the tire is fitted to a normal rim while being filled with air at an internal pressure of 1.7 kg/cm² and So is the tire maximum width after being mounted onto a rim but prior to the air pressure being applied to the tire;

$0.70 \leqq R/S \leqq 0.75$ in which R and S are a width between



beads and the maximum tire width, respectively, of an inflated tire;

a center portion of the tread does not vary in a radial direction between before and after said internal pressure being applied to the tire; and

the tire from near the shoulder portion to the buttress portion outwardly swells when the internal pressure is applied to the tire.

4,721,144

PNEUMATIC RADIAL TIRES FOR PASSENGER CARS

Hideo Hara; Motonori Bundo, both of Tokyo, and Yoshihiro Makino, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,726

Claims priority, application Japan, Apr. 10, 1984, 59-69913

Int. Cl.⁴ B60C *15/06, 9/08*

U.S. Cl. 152—541 **4 Claims**

1. In a pneumatic radial tire for a passenger car having improved riding comfort against vibration comprising; a carcass of a radial ply cord structure wound around each of bead cores from inside toward outside to form a turnup, and a bead filler disposed just above the bead core between the carcass and the turnup thereof, said bead filler comprising a hard rubber stock and soft rubber stock, the improvement in said passenger car radial tire wherein said soft rubber stock is composed of a rubber composition having a complex modulus of elasticity of 1×10^8 to 8×10^8 dyn/cm² and a sin δ of 0.3 to 0.5 under a strain energy of 10^4 dyn/cm².

4,721,145

TIRE MOUNTING AND DEMOUNTING MACHINE

Basil D. White, 3611 Lynehill Rd., Lauder Hill, Fla. 33319

Filed Apr. 8, 1987, Ser. No. 35,992

Int. Cl.⁴ B60C *25/06*

U.S. Cl. 157—1.2 **6 Claims**

1. A device for fitting a well obstructor onto a wheel for a beaded pneumatic tire, which wheel has an axial hole therethrough, a circumferential well, and a peripheral rim having a maximum external diameter, said device comprising

a wheel support assembly for supporting said wheel, said wheel support assembly having an upwardly extending spindle, said spindle having internal female threads axially disposed therein and an exterior dimensioned such that said spindle is freely insertable through said axial hole in said wheel;

a removable bead pusher assembly, said bead pusher assembly including a thrust collar, said thrust collar having a central hole therethrough which is dimensioned to slidably fit over the exterior of said spindle, at least two pusher arms connected to said thrust collar, each of said pusher arms having a generally radially extending portion which extends radially a distance greater than the maximum external diameter of said rim and a generally downwardly extending portion having a terminus, a circumferential bead pusher ring connected to said terminus of each of said pusher arms, said pusher ring having a minimum internal diameter greater than the maximum external diameter of said rim;

a removable thrust assembly including a male threaded member and a thrust member, said male threaded member having a first end, a second end and threads adapted to threadably mate with said female threads in said spindle,



said thrust member being connected to said first end of said male threaded member and having a thrust base adapted to bear against said thrust collar; and

means for rotating said thrust assembly with said male threaded member threadably mated into said female threads of said spindle to cause said thrust base of said thrust member to bear against said thrust collar to progressively push said bead pusher assembly in the axial direction against said pneumatic tire, thereby to axially compress said tire and expose said wheel well to facilitate fitting of said well obstructor onto said wheel well.

4,721,146

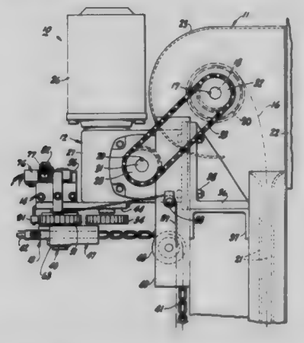
ROLLING DOOR OPERATING MECHANISM

Russell Wardlaw, San Rafael, Calif., assignor to The Cookson Company, San Francisco, Calif.

Filed Jan. 12, 1987, Ser. No. 2,573

Int. Cl.⁴ A47G *5/02*

U.S. Cl. 160—310 **10 Claims**



1. A rolling door operating mechanism for moving a rollable curtain or the like between raised and lowered positions, comprising a frame, first means mounted on said frame for driving the rollable curtain from a first power source between such positions and including first gear means synchronously rotatable with movement of the curtain, switch means serving to couple and uncouple said drive means from the power source, second means for driving the curtain from a second power source in lieu of said first power source and including a shaft rotatably mounted on said frame, said shaft having a drive gear rotatably arranged thereon for selective driving engagement with said first gear means, means serving to rotate said drive gear, switch actuation means on said shaft arranged for selective engagement with said switch means, first stop means arranged for engagement with said switch actuation means for arresting rotation of said shaft when driving the curtain from said second power source, second stop means arranged for engagement with said switch actuation means serving to arrest rotation of said shaft when driving the curtain from said first power source, means serving to shift said second stop means to become disengaged from said switch actuation means when driving the curtain from said second power source, and clutch means serving to permit said drive gear to rotate on said shaft when said switch actuation means engages either said first or second stop means and serving to rotate said shaft for moving said switch actuation means to or from said stop means.

4,721,147

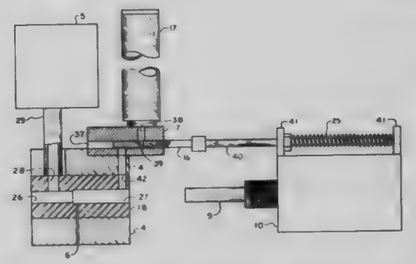
APPARATUS FOR FORMING SMALL OBJECTS SUCH AS BULLETS

James P. Evans, 503 Washington St., Cedar Falls, Iowa 50613

Filed Dec. 3, 1984, Ser. No. 677,512

Int. Cl.⁴ B22D *17/10, 18/02, 27/11*

U.S. Cl. 164—155 **5 Claims**



1. An apparatus for making small lead objects such as bullets, said apparatus comprising a forming die for the object to be produced, said die having two open ends means for supplying a measured amount of lubricant into the forming die in the vicinity of one of said open ends, a first ram punch movable into and out of one of said open ends of the forming die, a second ram punch movable into and out of the other of said open ends of the forming die, means for supplying a predetermined amount of flowable lead into the forming die, means for causing the ram punches to exert high pressure on the lead in the die, control means for controlling the supply of lubricant and lead and the movement of the ram punches in timed sequence so as to apply high pressure to the lead in the forming die while the lead is still in a plastic state, and means to eject a formed object from the forming die after the object is formed.

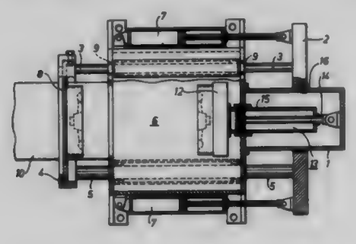
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,148

MOULDING SYSTEM FOR MAKING MOULD PARTS

Soren E. Knudsen, Lynge, Denmark, assignor to Dansk Industri Syndikat A/S, Denmark

Filed Dec. 23, 1986, Ser. No. 945,590
Claims priority, application Denmark, Jan. 3, 1986, 19/86
Int. Cl.[4] B22C *15/08*
U.S. Cl. 164—187 6 Claims



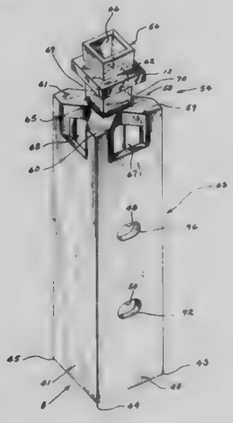
1. A moulding system for making mould parts by compacting sand or other like material between a vertical squeeze plate (12) and a vertical swingable plate (8), forming movable end walls of a squeeze chamber (6), and where the swingable plate (8) swings away after compaction to allow mould part passage from the squeeze chamber by further advance movement of the squeeze plate (12), characterized in that the swingable plate (8) is journalled in a foremost yoke (4), which connects with a pull yoke (2) placed behind the squeeze chamber by means of a rigid frame structure parallel with the longitudinal axis of the chamber.

4,721,149

LOST FOAM CASTING SYSTEM WITH HIGH YIELD SPRUE

William G. Hesterberg, Rosendale; Wilfred A. Pagel, Fond du Lac, and Gordon L. Stiller, Omro, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Feb. 17, 1987, Ser. No. 15,744
Int. Cl.[4] B22C *9/04, 7/02*
U.S. Cl. 164—244 19 Claims



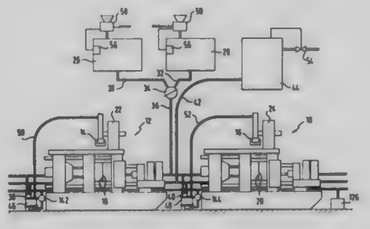
1. A lost foam casting system comprising:
a flask for holding particulate media;
a source of molten metal;
a pattern assembly formed of evaporative foam material and placed in said flask and surrounded by said particulate media, such that upon application of said molten metal to said pattern assembly, said foam material vaporizes and is replaced by said metal in the shape of said pattern assembly, said vaporized foam material escaping into the interstices in said particulate media, said pattern assembly comprising one or more work pieces of given respective patterns for yielding cast metal parts and comprising a sprue connected by one or more in-gates to said workpieces for communicating said molten metal through said sprue to said in-gates and then to said workpiece, said sprue having a plurality of feed passages interconnected by support walls providing a relatively rigid structure, said feed passages passing more molten metal than said support walls, said in-gates being fed with molten metal from respective said feed passages.

4,721,150

DEVICE FOR SUPPLYING SPRAY UNITS FOR DIE CASTING MACHINES WITH A FLUID CONTAINING WATER AND ADDITIVES

Helmut Thurner, Schwaberwegen, Fed. Rep. of Germany, assignor to Bayrisches Druckgusswerk Thurner GmbH & Co. KG, Markt Schwaben, Fed. Rep. of Germany

PCT No. PCT/EP85/00666, § 371 Date Jun. 6, 1986, § 102(e) Date Jun. 6, 1986, PCT Pub. No. WO86/03438, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 4, 1985, Ser. No. 878,972
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444182
Int. Cl.[4] B22C *3/00*; F04B *41/00*
U.S. Cl. 164—267 16 Claims



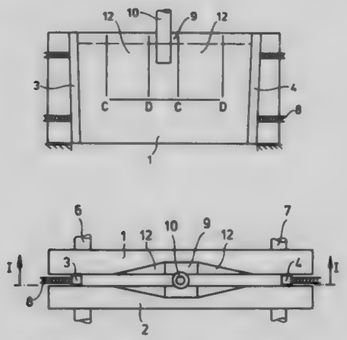
1. A device for supplying a plurality of spray units, each for a die casting machine, with a fluid containing water and additives for cooling, cleansing and/or lubricating, comprising:
at least one first central tank for storing water containing additives, the concentration of the additives being the maximum necessary for the casting materials, molds, and methods utilized in conjunction with the die casting machine;
a further central tank for storing water;
a mixing valve for each spray unit having a first inlet connected to said at least one first central tank and a second inlet connected to said further central tank, an outlet, and means for adjusting the proportion of liquid from said at least one first central tank and said further central tank delivered through said outlet; and
a pump for each spray unit having an inlet connected to the outlet of a respective mixing valve, and an outlet connected to the respective spray unit.

4,721,151

MOLD FOR CONTINUOUS CASTING OF METAL STRIP

Hans Streubel, Ekrath, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,625
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1986, 3601501
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—418 9 Claims



1. A mold for continuously casting strip metal comprising:
a pouring tube for pouring molten metal,
a transversely narrow mold cavity formed by broad and narrow walls, said cavity having an inlet at one end of the mold and an outlet at the other end, said cavity positioned to receive molten metal from said tube,
flared walls in the inlet end of said cavity defining a widened pouring zone which tapers inwardly in the direction of flow of said metal to a point downstream in said mold at which the walls become parallel to form a reflex angle corner,
lower ends of the flared walls of said pouring zone terminating along a transversely extending line which is substantially normal to the axis of flow of said metal, and
the reflex angle betwee said flared walls over which the stock bends as it moves through the mold and the axis of the stock flow at a maximum angles (alpha) in the area of the centerline of the mold and diminishing gradually to 0 degrees toward the narrow sides of the mold cavity along said transversely extending line.

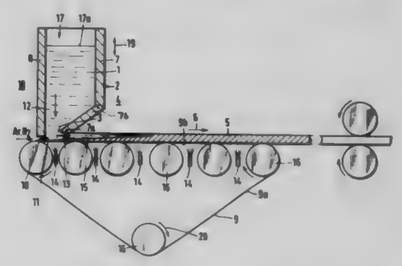
4,721,152

APPARATUS FOR CONTINUOUS CASTING

Wolfgang Reichelt, Moers; Klaus Schwerdtfeger, Goslar, and Peter Voss-Spilker, Kempen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 750,420, Jun. 28, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,734
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423834
Int. Cl.[4] B22D *11/06, 11/10*
U.S. Cl. 164—429 5 Claims

1. Apparatus for continuously casting steel for obtaining a substantially flat casting comprising:
a vessel having a bottom opening defined by side walls and by a rear wall and a front wall;
a moving planar metal belt disposed underneath said opening and defining a casting gap together with said front wall, the rear wall extending more downwardly than the front wall, to about 0.2 to 1.0 mm from the belt; and
the rear and front walls of the vessel ending at different levels so that the bottom opening has a horizontal as well as a vertical component, said front wall having an inwardly extending hinged portion with a lower edge which is slanted such that it is substantially parallel to the surface



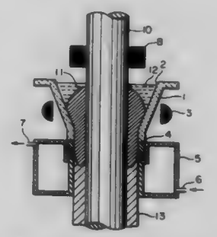
of the belt the hinged portion being adjustable to vary the vertical component of said opening.

4,721,153

HIGH-CHROMIUM COMPOUND ROLL

Yoshikazu Sano; Michio Haga, and Toshio Okitsu, all of Kitakyushu, Japan, assignors to Hitachi Metals, Inc., Japan

Filed Sep. 12, 1986, Ser. No. 906,747
Int. Cl.[4] B22D *11/12, 19/00*
U.S. Cl. 164—448 14 Claims



1. A compound roll for rolling composed of a shell made of high-chromium cast iron and a core made of cast or forged steel, said shell being metallurgically bonded to said core by casting a high-chromium cast iron melt around the already prepared core, and said shell having a residual compressive stress of at least 20kg/mm$_2$ imparted by a heat treatment comprising quenching.

4,721,154

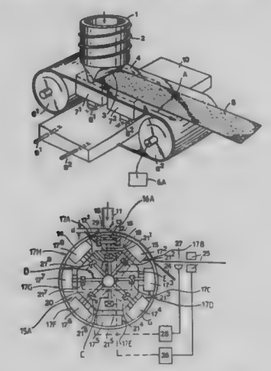
METHOD OF, AND APPARATUS FOR, THE CONTINUOUS CASTING OF RAPIDLY SOLIDIFYING MATERIAL

Alfred Christ, Zurich; Rolf Lehmann, Rudolfstetten, and Hans-Wister Schlaepfer, Rickenbach, all of Switzerland, assignors to Sulzer-Escher Wyss AG, Zürich, Switzerland

Filed Mar. 11, 1987, Ser. No. 24,425
Claims priority, application Switzerland, Mar. 14, 1986, 01052/86
Int. Cl.[4] B22D *11/06, 11/16, 11/22*
U.S. Cl. 164—452 32 Claims

1. An apparatus for continuously casting a rapidly solidifying material, comprising:
a substantially slot-like nozzle for infeeding a rapidly solidifying material in a hot liquid state;
a movable wall movable past said substantially slot-like nozzle at a close spacing from said substantially slot-like nozzle;
means for moving said movable wall past said substantially

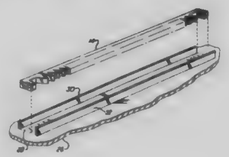
slot-like nozzle and in a predetermined direction of movement;
cooling means for cooling said movable wall;
said movable wall comprising a material having high heat conductivity;
the rapidly solidifying material, in the hot liquid state, flowing through said substantially slot-like nozzle onto said movable cooled wall, solidifying on said movable cooled wall and, after movement of said movable cooled wall through a predetermined distance, being detachable from said movable cooled wall in the form of a continuously cast foil;
said movable cooled wall being elastically flexible to a predetermined extent;
said cooling means containing at least one cooling support element;
said at least one cooling support element being displaceable along a predetermined support direction substantially perpendicular to said movable cooled wall;
said cooling means comprising cooling pressure fluid means for displacing under the action of a preselected cooling pressure fluid said at least one cooling support element along said predetermined support direction;
said at least one cooling support element being arranged directly opposite to said substantially slot-like nozzle and on one side of the movable cooled wall and which side is remote from said substantially slot-like nozzle;

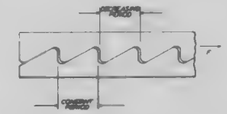


said at least one cooling support element being provided with at least one bearing surface supplied with said cooling pressure fluid by said cooling pressure fluid means for cooling and supporting said movable cooled wall;
a stationary traverse; and
said at least one cooling support element being supported at said stationary traverse.

16. A method of continuously casting a rapidly solidifying material, comprising the steps of:
moving a movable wall at a predetermined speed through a closed travelling path in a predetermined direction of movement;
feeding to one side of said moving wall hot liquid constituting a rapidly solidifying material through a substantially slot-like nozzle which is arranged substantially transversely relative to said moving wall and at a predetermined spacing from said moving wall;
supporting said moving wall on an other side of said moving wall and which other side is remote from said substantially slot-like nozzle, and at least substantially directly opposite to said substantially slot-like nozzle by means of at least one cooling support element;
passing a cooling fluid through said at least one cooling support element in order to support and cool said moving wall and said hot liquid constituting the rapidly solidifying material passed through said substantially slot-like nozzle to said one side of said moving wall and thereby continuously casting a foil of said rapidly solidifying material on said one side of said moving wall;
displacing under the action of said cooling fluid said at least one cooling support element along a predetermined support direction such that there is obtained an appropriate spacing between said substantially slot-like nozzle and said movable wall and
detaching said foil of said rapidly solidifying material from said one side of said moving wall at a predetermined detachment location downstream of said substantially slot-like nozzle as viewed in said predetermined direction of movement of said moving wall.

4,721,155
SAWTOOTH CARD RETAINER
Christopher T. McNulty, Terryville, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed May 7, 1986, Ser. No. 860,393
Int. Cl.[4] H05K *7/20*
U.S. Cl. 164—80.2 **1 Claim**

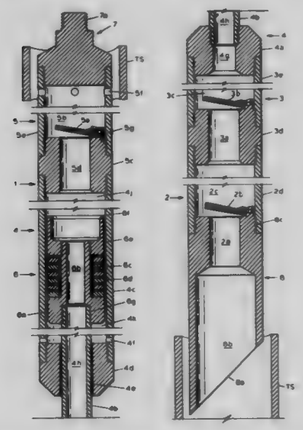


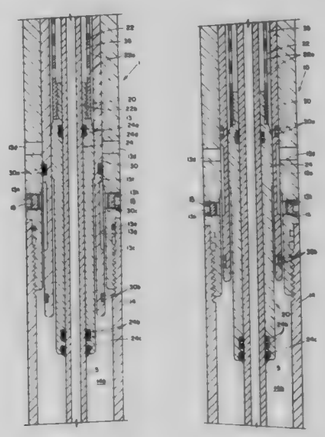


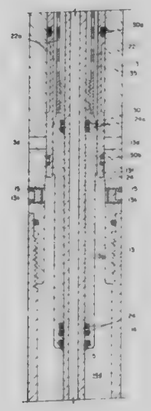
1. A printed circuit board heat sink retainer, comprising:
a first sawtoothed piece bonded to an internal chassis wall between a pair of ribs integral to said wall and butted up against one of the ribs, wherein the distance between successive teeth is constant;
a second sawtoothed piece loosely held between the ribs for mating its sawteeth with the teeth of the first piece, wherein the distance between successive teeth decreases in the direction of a spread apart and hold force; and
spread apart and hold means, for providing said spread apart and hold force for spreading and holding said first and second pieces apart such that the second piece pushes against a heat sink inserted between it and a rib.

4,721,156
WELL CLEAN OUT APPARATUS
John F. Campbell, Rte. 2, Box 11-C, Youngsville, La. 70592
Filed Apr. 3, 1987, Ser. No. 33,663
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—99 **9 Claims**

9. A well clean out tool, including:
an elongated generally tubular body having an upper end and a lower end and a telescoping intermediate section, said intermediate section having a piston and cooperating bore to serve as a pump, said pump achieving a pumping action when the upper end of said body is axially reciprocated relative to said lower end of said body;
a piston situated in said body, said piston comprising, a core, a stack of a plurality of piston ring washers axially and transversely confined, on said core, for limited axial and transverse movement relative thereto, said washers having an outer diameter which allows some transverse movement relative to a cooperating bore, to allow particles that enter clearances between piston and cooperating bore to work past the loose washers.







4,721,157
FLUID SAMPLING APPARATUS
Vel Berzin, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.
Filed May 12, 1986, Ser. No. 862,491
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—169 **16 Claims**

1. Apparatus for extracting virgin fluid from a selected formation of a subterranean well isolated by a pair of vertically spaced packing units, comprising: an outer tubular housing sealably connectable between said packing units to lie adjacent to the selected formation; at least one radial port in the wall of said outer tubular housing communicating with the well annulus between said outer tubular housing and the selected formation; a hollow mandrel slidably mounted within said tubular outer housing and defining an isolated annular sampling chamber in the annulus between said hollow mandrel and the bore of said outer tubular housing; the bore of said hollow mandrel being communicable with a surface source of fluid pressure; a valve sleeve shiftably mounted within said annulus adjacent said radial port; first sealing means on the exterior of said valve sleeve preventing communication between said radial port and said sampling chamber in the run-in position of said apparatus; means responsive to a first fluid pressure in said hollow mandrel for axially shifting said valve sleeve from said run-in position to a first position to open communication between said radial port and said sampling chamber; thereby permitting flow of virgin fluid from the selected formation into said sampling chamber; second sealing means on said valve sleeve operative in a second axial position of said valve sleeve to block communication between said radial port and said sampling chamber; and means responsive to a second higher fluid pressure in said hollow mandrel bore for further shifting said valve sleeve to said second position.

4,721,158
FLUID INJECTION CONTROL SYSTEM
James A. Merritt, Jr., Levelland, and Gary L. Brelsford, Katy, both of Tex., assignors to Amoco Corporation, Chicago, Ill.
Filed Aug. 15, 1986, Ser. No. 896,997
Int. Cl.[4] E21B *44/00, 47/00, 47/06*
U.S. Cl. 166—250 **24 Claims**

1. A method of controlling the injection of fluid into a plurality of spaced wellbores using a single remote terminal unit

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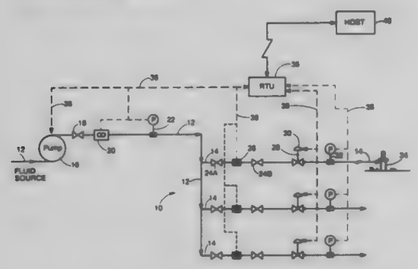
located at a fluid distribution system to direct fluid from a fluid source to each of the spaced wellbores, comprising:

(a) determining for each wellbore high/low fluid flow rate limits and high/low fluid pressure limits;

(b) utilizing the remote terminal unit, measuring, at the fluid distribution system, the fluid flow rate and the fluid pressure for each wellbore;

(d) utilizing the remote terminal unit, comparing the measured fluid flow rate and the fluid pressure for each wellbore to the determined limits; and

(d) adjusting, at the fluid distribution system, the flow of fluid to each wellbore that has a measured fluid flow rate and/or fluid pressure outside of the determined limits unitl the measured flow rate and the fluid pressure are within the determined limits.



11. A system for controlling the injection of fluid into a plurality of spaced wellbores using a single remote terminal unit located at a fluid distribution system to direct fluid from a fluid source to each of the spaced wellbores, comprising:

means for measuring, at the fluid distribution system, the fluid flow rate and the fluid pressure for each wellbore;

the remote terminal unit comprising comparison means for comparing the measured flow rate and fluid pressure for each wellbore to high/low fluid flow rate limits and high/low fluid pressure limits inputted thereinto; and

means for adjusting, at the fluid distribution system, the flow of fluid to each wellbore that has a measured fluid flow rate and/or fluid pressure outside of the inputted limits therefore, to bring the measured flow rate and the fluid pressure within the inputted limits.

4,721,159

METHOD AND DEVICE FOR CONVEYING CHEMICALS THROUGH BOREHOLE

Katsutoshi Ohkochi; Mamoru Shinozaki, both of Funabashi; Toshiyuki Ohshita, Hirakata; Masayasu Kitano, Kashihara, and Seizo Kamata, Fukuoka, all of Japan, assignors to Takenaka Komuten Co., Ltd. and Sekiso Co., Ltd., both of, Japan

Filed Nov. 4, 1986, Ser. No. 926,640

Claims priority, application Japan, Jun. 10, 1986, 61-134180; Jul. 14, 1986, 61-165395; Jul. 15, 1986, 61-166081

Int. Cl.[4] E21B *33/13*

U.S. Cl. 166—286 **6 Claims**

1. A method of conveying chemicals through a borehole, comprising the steps of:

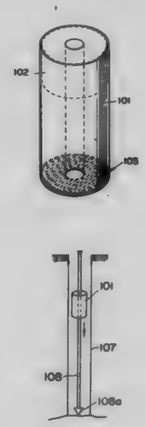
preparing a capsule at least partially comprising a fragile material;

charging the capsule with chemicals for stopping lost circulation in the borehole; and

lowering the capsule toward the location of the lost circulation so that at least a portion of said capsule is destroyable by a drilling rod placed in the borehole, the drilling rod acting also as a means for halting lowering of said capsule, the rod having a means at a front end thereof for opening the capsule, whereby the chemicals are diffused.

3. A system for conveying chemicals through a borehole, comprising:

a capsule mountable on a drilling rod so as to embrace the rod, the capsule being annular in cross section, the capsule having a bottom plate made from a destroyable material, the capsule having magnets embedded in its upper surface and disposed circumferentially, the capsule being charged with chemicals for stopping borehole lost circulation; and



a weight mountable on the drilling rod so as to embrace the rod in the same manner as the capsule, the weight being annular in cross section, the weight being made from a magnetically permeable material, the weight being suspended by a wire, the weight acting to destroy the bottom plate of the capsule and also to recover the capsule via magnetic attachment thereto.

4,721,160

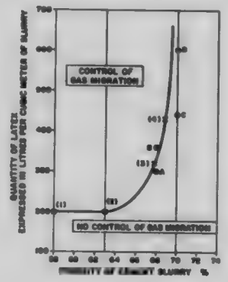
COMPOSITION FOR A LIGHTWEIGHT CEMENT SLURRY FOR CEMENTING OIL AND GAS WELLS

Philippe Parcevaux, and Patrick Sault, both of St. Etienne, France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Aug. 19, 1985, Ser. No. 767,002

Int. Cl.[4] C04B *2/35*; E21B *33/14*

U.S. Cl. 166—293 **16 Claims**



1. A homogeneous lightweight cement slurry for cementing the annulus of an oil or gas well, comprising:

cement, an extender in the form of solid particles, a styrene-butadiene latex, and water, having a specific gravity lying substantially in the range from 1.2 to 1.6 and having a volume ratio of the liquid phase of the slurry to the total volume of the slurry of less than about 70%.

9. A method of cementing the annulus of a wellbore by pumping an aqueous cement slurry through the wellbore and into the annulus said aqueous cement slurry comprising

cement, an extender in the form of solid particles, a styrene-butadiene latex, and water, having a specific gravity lying substantially in the range from 1.2 to 1.6 and having a volume ratio of the liquid phase of the slurry to the total volume of the slurry of less than about 70%.

4,721,161

METHOD FOR DECREASING PERMEABILITY AROUND A WELLBORE

William C. Richardson, Bellaire; Lawrence E. Whittington, Katy, and Lawrence R. Morrow, Richmond, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,452

Int. Cl.[4] E21B *33/138*

U.S. Cl. 166—295 **24 Claims**

1. A method for decreasing formation permeability in an underground formation around a wellbore, comprising:

injecting an aqueous solution having a pH of about 0.9 to about 3.5 into the formation surrounding a wellbore,

said aqueous solution comprising about 2% to about 20% by weight of lignosulfonate, about 2% to about 20% by weight of monomer of acrylic acid, a sufficient amount of an initiator of persulfate to copolymerize the lignosulfonate and the monomer, and about 0% to about 3.0% by weight of a metal salt having a cation of iron, titanium, vanadium, chromium or molybdenum.

4,721,162

FLUID LEVEL CONTROLLED SAFETY VALVE

Ronald E. Pringle, Houston, and Paul W. Black, Sugarland, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Aug. 29, 1984, Ser. No. 645,574

Int. Cl.[4] E21B *34/06*

U.S. Cl. 166—319 **10 Claims**

1. A fluid level actuated well safety valve for use in a fluid well conduit through which fluid is pumped comprising,

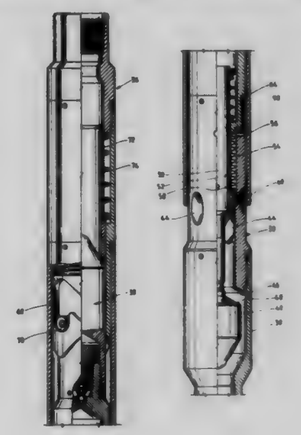
a body adapted to be inserted into the conduit, said body including a passageway for the passage of well fluid upwardly through the conduit,

a valve in the passageway including a valve seat and a valve element for opening and closing said passgeway,

biasing means in the body and connected to the valve element and acting in a direction to open said valve, and

fluid responsive means connected to the valve element and positioned downstream of the valve and

said body including port means between the fluid responsive means and the exterior of the body for communicating the hydrostatic force of the fluid in the conduit to the fluid responsive means for moving the fluid responsive means





in a direction to close said valve when the hydrostatic fluid pressure overcomes the biasing means.

4,721,163

SUBSEA WELL HEAD ALIGNMENT SYSTEM

Peter J. R. Davis, Aberdeen, Scotland, assignor to Texaco Limited, London, England

Filed Feb. 27, 1986, Ser. No. 834,167

Claims priority, application United Kingdom, Mar. 1, 1985, 8505328

Int. Cl.[4] E21B *23/00, 33/043*

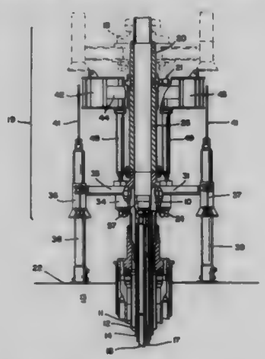
U.S. Cl. 166—341 **6 Claims**

1. The combination with a subsea well comprised of a well casing embedded into the ocean floor to define an elongated tubing passage enclosing tubing strings, and having a casing upper end at the ocean floor, a well head fixed to said well casing upper end adapted to removably receive a Christmas tree having downwardly extending fluid conduits engageable with said tubing strings, and a guide cable system extending between the well head and the water's surface to slidably guide equipment between the well head and the water's surface, of:

an orientation spool engaging said guide cable system and including an upstanding guide column removably engag-

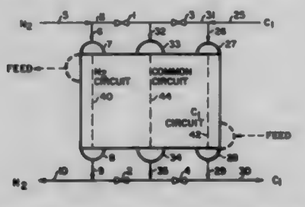
VOL 1086 ISS 4 JA 26 1988 UMI

ing the well head, being aligned therewith to define a guide passage coaxially of said elongated tubing passage,
a tubing hanger removably positioned within said well casing and supportably engaging said tubing strings with the upper ends thereof aligned in an upward direction,
detent means movably mounted in said upstanding guide column, and being actuatable to retractably position a forward section thereof into the guide passage, and
an elongated tubing running tool detachably engageable with said tubing hanger, to facilitate raising and lowering



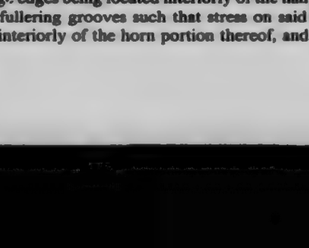
the latter through said guide passage, and having a guide shoe depending from the running tool lower end,
whereby when actuated to an advanced position, said detent forward section will engage the running tool guide shoe to rotatably align the tubing hanger as the latter is lowered through the guide passage, thereby to align the respective tubing string upper ends for registry with the downwardly extending Christmas tree conduits when the Christmas tree is lowered along said cable system onto said well head.

4,721,164
METHOD OF HEAT EXCHANGE FOR VARIABLE-CONTENT NITROGEN REJECTION UNITS
Donald W. Woodward, New Tripoli, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Sep. 4, 1986, Ser. No. 904,121
Int. Cl.[4] F25J 3/02; E21B 43/24, 43/00
U.S. Cl. 166—372 **2 Claims**



1. In a given project to recover crude oil and natural gas from an underground reservoir via an enhanced oil recovery process utilizing nitrogen injection and rejection units, wherein at least a portion of a feed stream from the reservoir is precooled before distillation to separate a nitrogen fraction and a methane fraction, the improvement comprising precooling the feed stream by heat exchange with the nitrogen and methane fractions in a plate-fin heat exchanger with at least three circuits:
(a) utilizing a first circuit as a nitrogen circuit to condut all of the nitrogen coolant during the first part of the project life, and a minor portion of the the total nitrogen coolant during the second and last part of the project life,
(b) utilizing a second circuit as a methane circuit to conduct a minor portion of the methane coolant during the first part of the project life, and all of the methane coolant during the second and last part of the project life,
(c) utilizing a third circuit as a common circuit to conduct the remaining major portion of the methane coolant during the first part of the project life, and the remaining major portion of the nitrogen coolant during the second and last part of the project life, and
(d) switching from methane coolant to nitrogen coolant in the third circuit when nitrogen coolant flow exceeds methane coolant flow.

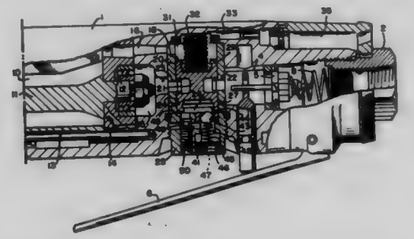
4,721,165
HORSESHOE
Eugene D. Ovnicek, Kalispell, Mont., assignor to World Wide Horseshoes, Inc., Whitefish, Mont.
Filed May 6, 1986, Ser. No. 860,017
Int. Cl.[4] A01L 1/04
U.S. Cl. 168—24 **7 Claims**



1. Horseshoe device for attachment to a horse's hoof, comprising:
(a) a generally U-shaped body made of substantially solid material and having a toe portion and a pair of arcuate branch portions with heel areas at the ends thereof, said body having a top, substantially planar, side for contacting a horse's hoof and including fullering grooves and nail holes therein for attaching said body to said hoof,
(b) said toe portion being shaped generally linearly straight across between said branch portions so as to extend under and be spaced rearwardly of the toe of said horse's hoof a predetermined distance, said toe portion having front and rear edges extending from near said top side of said body,
(c) said toe portion having a bottom side which includes ground engaging grab plate means with a ground contact surface thereon so that said toe portion is of a predetermined thickness, said ground contact surface being generally straight and located generally directly below the tip of the coffin bone in said hoof such that ground contact by said toe portion of said horseshoe is also generally directly below said tip of said coffin bone,
(d) said grab plate means has end sections thereof which angle rearwardly such that they are of an angle coincident with the angle at which said branches extend rearwardly from said straight toe portion, said body including ridge edges extending rearwardly from the ends of said grab plate end sections, said ridge edges being thicker near said grab plate end sections and angling upwardly to define a higher and thinner ridge edge through the quarter portion of said shoe body,
(e) said ground contact surface of said grab plate means and said ridge edges being located interiorly of the nail pattern of said fullering grooves such that stress on said hoof is shifted interiorly of the horn portion thereof, and

(f) said branches of said horseshoe having a predetermined amount of raised and thickened area in the heels thereof.

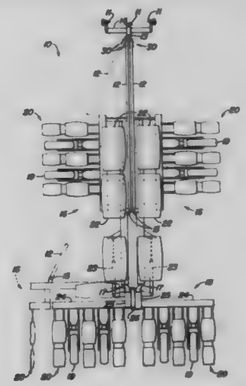
4,721,166
AUTOMATIC SHUT-OFF VALVE FOR POWER TOOLS
John M. Clapp, Sayre, and Charles J. Hix, Jr., Ulster, both of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Mar. 21, 1986, Ser. No. 842,457
Int. Cl.[4] B25B 23/145
U.S. Cl. 173—12 **3 Claims**



1. A fluid-driven power tool having:
a casing containing a motor, an inlet passageway for selectively feeding motive fluid including an on/off valve means to said motor and an exhaust passageway for exhausting fluid from said motor;
a fluid-actuated valve located in said inlet passageway and movable between alternate positions including an open position allowing motive fluid to flow to said motor and a closed position preventing motive fluid from flowing to said motor;
first valve-operating means including means for establishing relatively constant pressure and means for adjustable controlling the rate of pressure rise urging said valve to its closed position;
second valve-operating means communicating with said exhaust passageway and operative, when subject to fluid pressure, to urge said valve to its open position against the forces of said first valve-operating means; and
said first and second valve-operating means being arranged so that said valve will move to its closed position in response to the drop in fluid pressure in said exhaust passageway when said motor slows down, wherein the improvement comprises:
said first valve-operating means further including means for preventing high pressure motive fluid from venting to atmosphere during the interim period of initiating motor shutdown and stopping the selective feeding of motive fluid.

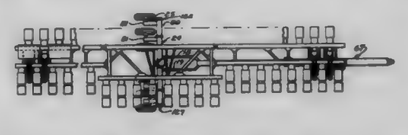
4,721,167
HITCH FLEXING HINGE
Gordon L. Salley, Moline, Ill., and Donald K. Landphair, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 592,627, Mar. 23, 1984, abandoned.
This application Aug. 12, 1986, Ser. No. 895,755
Int. Cl.[4] A01B 73/06, 59/042
U.S. Cl. 172—311 **16 Claims**

1. In an implement frame having a pair of a transversely disposed frame sections, a horizontal fore-and-aft pivot interconnecting said frame sections enabling vertical flexing of said frame sections, and a pair of draft beams each having a forward end attached to a drawbar of a draft vehicle and a rearward end attached to one of said frame sections, the improvement comprising:
a hitch hinge attached to each of said draft beams intermediate said drawbar and a respective frame section, each said hinge including a body section, said body section including means for attaching each said draft beam such that said draft beam is permitted to oscillate and is movable about a longitudinal axis with respect to aid body section, thereby allowing the draft beam to move as the implement frame sections flex; wherein each said draft beam is a tube and



said body section of said hinge is received within one end of said tube; and
wherein said body section includes a portion having walls disposed to contact the inside walls of said tube as the tube rotates a predetermined distance about a longitudinal axis.

4,721,168
AGRICULTURAL IMPLEMENT WITH RAISABLE LIFT FRAME ROTATABLE ABOUT VERTICAL AXIS
Jon E. Kinzenbaw, R.R. 1, Box 184, Williamsburg, Iowa 52361
Filed Sep. 23, 1985, Ser. No. 779,164
Int. Cl.[4] A01B 73/00
U.S. Cl. 172—311 **25 Claims**



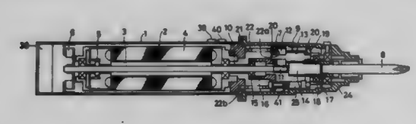
22. An agricultural implement adapted to be pulled by a tractor with a hitch and convertible between a use position and a transport position without unhitching from the tractor, comprising: a carrier frame including a plurality of ground support wheels; draft tongue means connected to said carrier frame for connecting said carrier frame to the tractor hitch for permitting pivotal movement between said tractor and said implement about a hitch axis; lift frame means including a laterally elongated integral lift frame and plurality of ground-engaging work units spaced along said lift frame, said lift frame being extended in a direction transverse of the direction of travel of said tractor when said lift frame is in the use position; powered lift linkage means connecting said lift frame to said carrier frame for selectively lifting said lift frame and said work units to a first raised position wherein said work units are above the ground to permit said implement to turn and to a second raised position above said first raised position, wherein all of said work units are above said carrier frame and above said ground support wheels in said second raised position; and power swing means for rotating said lift frame in said second raised position about a vertical axis between said use position and said transport position in which said lift frame is elongated in the direction of travel and characterized in that said vertical axis of rotation of said lift frame is substantially on the center line of said implement and proximate the mid-point of said lift frame

in its direction of elongation and is located forwardly of at least two of said ground support wheels of said carrier frame.

4,721,169
ELECTRIC DRIVER WITH TORQUE-ADJUSTABLE CLUTCH MECHANISM

Takeshi Nagasawa, Nara; Jiro Kataoka, Kawanishi; Isamu Hashimoto, and Yoshihiro Ikemoto, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1986, Ser. No. 862,947
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—12 **3 Claims**

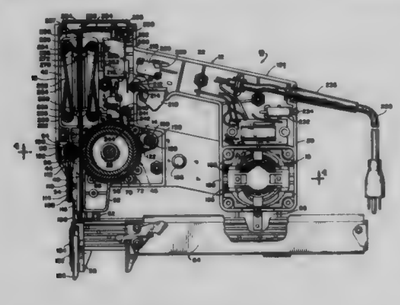


1. An electric driver comprising:
(a) a bit;
(b) a brushless motor for providing the rotation for said bit;
(c) a control circuit for controlling a rotational speed of a drive shaft of said brushless motor; and
(d) transmission means provided between said bit and said drive shaft for transmission from said drive shaft to said bit, said transmission means including clutch means operated to release said bit from a driven connection with said drive shaft when a transmission torque from said drive shaft to said bit exceeds a predetermined value, said clutch means including a gear system which is arranged to be circumferentially rotatable with respect to said drive shaft and said bit and further including a second elastic member, said predetermined torque value being variable by means of said second elastic member, said gear system comprising at least first and second pinions and first and second gears, said first pinion being integrally connected to an end of said drive shaft and said second gear being connected to an end of said bit, and said first gear being integrally coaxially connected to said second pinion, said first gear being engaged with said first pinion and said second pinion being engaged with said second gear.

4,721,170
FASTENER DRIVING TOOL

Jeffrey P. Rees, Aurora, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Sep. 10, 1985, Ser. No. 774,543
Int. Cl.[4] B25C *1/06*
U.S. Cl. 173—13 **43 Claims**



1. A tool for driving fasteners comprising:
a support structure;
impact means including flywheel means mounted on said support structure and fastener driving means driven by said flywheel means;
an electric motor having a base movably mounted on said support structure and spaced from said flywheel means;
a flexible element interconnecting said flywheel means in the rotor of said electric motor;
means for urging the base of said electric motor in the direction to increase the tension in said flexible element to a predetermined value; and
means for releasably securing the base of said electric motor to said support structure, whereby the tension in said flexible element may be adjusted to said predetermined value by releasing said securing means to permit said urging means to increase the tension in said flexible element to said predetermined value.

4,721,171
OPENING DEVICE FOR DRILL RODS FOR AN EXTENSION ROD DRILLING EQUIPMENT

Jarmo Leppänen, Ylöjärvi, Finland, assignor to Oy Tampella Ab, Tampere, Finland

Filed Sep. 26, 1986, Ser. No. 911,783
Claims priority, application Finland, Oct. 22, 1985, 854120
Int. Cl.[4] E21B *3/00*
U.S. Cl. 173—164 **5 Claims**



1. An opening device for drill rods in an extension rod drilling apparatus, comprising
a feeding beam;
a drilling machine displaceable along the feeding beam;
a stationary retaining centralizer for a drill rod, said centralizer supported on the feeding beam and positioned along a drilling axis, said centralizer further including gripping means for gripping a drill rod within the retaining centralizer;
a drive mechanism;
a gripping centralizer for the drill rod, said gripping centralizer positioned between the retaining centralizer and the drilling machine, and wherein
the drive mechanism is connected to the stationary retaining centralizer for actuating the gripping means and rotating the drill rod within the stationary retaining centralizer, and wherein
the gripping centralizer is provided with a first actuating means for displacing the gripping centralizer in the direction of said drilling axis.

4,721,172
APPARATUS FOR CONTROLLING THE FORCE APPLIED TO A DRILL BIT WHILE DRILLING

J. Ford Brett, Tulsa; Tommy M. Warren, Coweta, and Warren J. Winters, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 22, 1985, Ser. No. 801,124
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175—26 **8 Claims**

1. An assembly connected within a drillstring below a downhole turbine or motor and above a drill bit for controlling the quantity of fluid passing to the drill bit, comprising:
a housing having a fluid passageway extending therethrough for permitting fluid passage from the downhole turbine or motor to the drill bit;
sensing means mounted within the housing for sensing a parameter associated with the torque applied to the drill bit;
valve means mounted within the housing; and

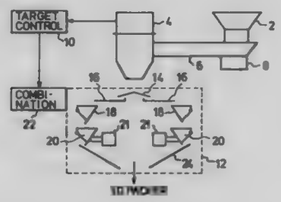


means acting between the sensing means and the valve means for regulating the quantity of fluid passing to the drill bit in response to the operation of the sensing means by venting a portion of the fluid to the exterior of the housing through the valve means.

4,721,173
AUTOMATIC WEIGHING SYSTEM WITH DENSITY RATIO CONTROL OF VOLUME

Ryuichi Hirota, Miki, and Shinichi Inoue, Kobe, both of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Mar. 16, 1987, Ser. No. 26,296
Claims priority, application Japan, May 2, 1986, 61-102562
Int. Cl.[4] G01G *19/22, 19/52*
U.S. Cl. 177—25 **6 Claims**

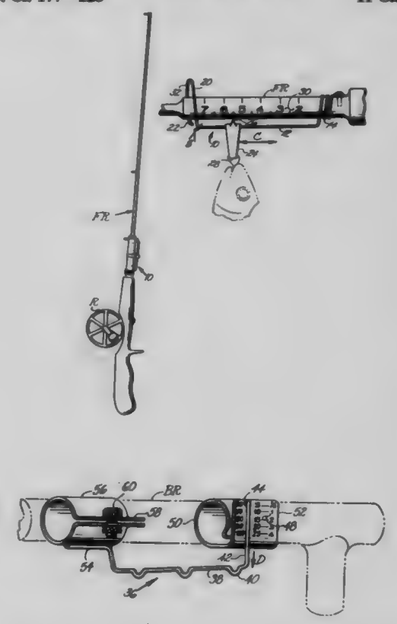


1. An automatic weighing device for delivering quantities of product having substantial variance in apparent density, each quantity having a weight value equal or approximate to a target weight; said device comprising weighing means for weighing out said quantities of product, means for measuring an apparent density of product fed to said weighing means, and means for controlling said target weight based upon said measured apparent density; characterized in that said target weight controlling means comprises
means for calculating a ratio of said measured apparent density to a reference density,
means for multiplying said target weight by said calculated ratio to provide a corrected target weight, and
means for comparing said measured apparent density with a predetermined lower threshold density and said reference density to actuate alarm means when said measured apparent density is lower than said lower threshold density, to provide the uncorrected target weight to said weighing means when said measured apparent density is between said lower threshold density and said reference density, and to provide said corrected target weight to said weighing means when said measured apparent density is higher than said reference density.

4,721,174
FISH WEIGHT SCALE

Richard C. Letzo, 5845 Deerhollow La. East, Sarasota, Fla. 33582

Filed Jul. 6, 1987, Ser. No. 69,638
Int. Cl.[4] G01G *3/00, 19/52*
U.S. Cl. 177—225 **11 Claims**



1. A light-duty fish weight scale connectable to a generally horizontally positionable elongated support such as a fishing pole, a boat safety rail, or the like, said fish weight scale comprising:
a shank formed of a length of relatively slender, flexible, resilient material connectable at one end to the elongated support;
said shank spaced generally parallel and adjacent to the elongated support when said one end of said shank is connected thereto;
weight indicia connectable to the elongated support adjacent said shank;
said shank moveable in cantilever fashion about said one end between an unweighted position wherein it is undeflected to a weighted position wherein it is deflected away from the elongated support;
means for releasably imposing a fish's weight onto said shank when the elongated support is generally horizontal whereby said shank is moved into said deflected position;
said shank deflection viewable in relation to, and readable on, said weight indicia.

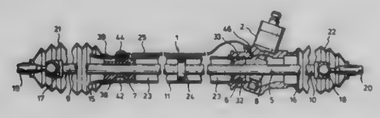
4,721,175
RACK AND PINION STEERING GEAR ASSEMBLY

Philip M. Butler, Mudgley, Great Britain, assignor to TRW Cam Gears Limited, Clevedon, England

Filed Nov. 24, 1986, Ser. No. 933,782
Claims priority, application United Kingdom, Dec. 6, 1985, 8530121
Int. Cl.[4] B62D *5/22*
U.S. Cl. 180—148 **12 Claims**

1. A rack and pinion steering gear assembly comprising a

rack bar longitudinally displaceable within a tubular housing in response to rotation of a pinion; an end of the rack bar having a linkage extending therefrom from which linkage a steering output is derived; flexible enclosure means extending from the linkage to the housing to provide a sealed cover therebetween which accommodates longitudinal displacement of the rack bar; a bush mounted in the housing and within which the rack bar is slidably borne for its longitudinal displacement; means retaining the bush longitudinally relative to the housing; said



bush having a peripheral recess adjacent to the housing wall and a longitudinally extending conduit which communicates between the recess and the interior of the enclosure means, and wherein a tubular plug is provided which is located within an aperture in the housing wall to communicate with said peripheral recess so that the interior of the enclosure means can breathe by way of the conduit and peripheral recess through said tubular plug during longitudinal displacement of the rack bar.

4,721,176

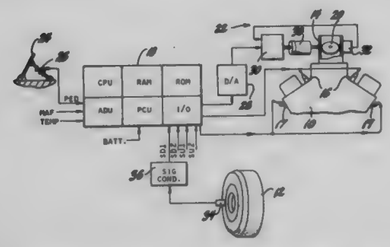
VEHICLE TRACTION CONTROL SYSTEM

Daniel F. Kabasin, Rochester, and Donald D. Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 874,073, Jun. 13, 1986, abandoned. This application Nov. 28, 1986, Ser. No. 935,971

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **5 Claims**



1. A traction control system for a vehicle having an internal combustion engine with combustion chambers into which an air and fuel mixture is drawn and ignited to undergo combustion, a wheel driven by the engine and a non-driven wheel, the driven wheel being liable to slipping in the event excessive torque is applied thereto by the engine, the system comprising, in combination:

air flow control means including a throttle valve for regulating mass air flow into the engine in response to a vehicle operator air flow command;

means for determining driven wheel slip that is a function of the difference between the driven and undriven wheel speeds; and

means responsive to predetermined excessive values of the determined driven wheel slip for (A) adjusting the air flow control means to reduce, after an air flow control delay, the mass air flow into the engine to reduce the torque applied to the driven wheel after the air flow control delay and (B) adjusting a predetermined engine parameter to produce a substantially instantaneous reduction in the torque applied to the driven wheel for a predetermined time period substantially equal to the air flow control delay to provide a reduction in torque applied to the driven wheel by the engine during the air flow control delay.

4,721,177

DEVICE FOR DIRECT DRIVING OF WHEELS

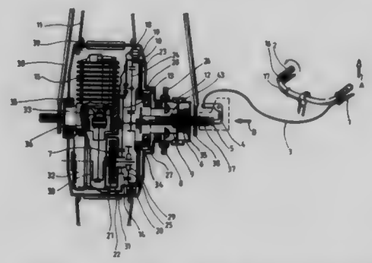
Wang Qizhen, 5 Zigiang Street, Chang-chun, China

Filed Mar. 26, 1986, Ser. No. 844,176

Claims priority, application China, Apr. 1, 1985, 85101503

Int. Cl.[4] B62M *7/12*

U.S. Cl. 180—205 **13 Claims**



1. An apparatus, adapted for use in direct-driving wheels of minivehicles such as motorbikes or motor cycles, and in particular bicycles, comprising:

a wheel axle, fixed to a vehicle frame;

a wheel hub, rotatable about said wheel axle;

a flywheel mounted on the outer periphery of said wheel hub and connecting to a pedal-driving mechanism;

an engine, positioned inside said wheel hub and fixed on said wheel axle, the main journal axis of a crankshaft of said engine being offset from, and parallel to, said wheel axle;

a transmission, disposed between said engine and the wheel hub, providing at least two stages of power reduction;

a clutch means to automatically connect said transmission from said engine and said wheel hub during operation, said clutch means automatically disconnecting said transmission from said engine and said wheel hub when said engine is stopped; and

an engine starting mechanism, disposed substantially inside said wheel hub, and attached to a first stage of said power reduction in said transmission unit for controllably transmitting the wheel hub rotation to the engine crankshaft.

4,721,178

MULTI-WHEELED VEHICLE

Norihiko Ito, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,246

Claims priority, application Japan, Aug. 8, 1985, 60-173102; Oct. 5, 1985, 60-222175; Apr. 10, 1986, 61-81139

Int. Cl.[4] B62J *35/00*

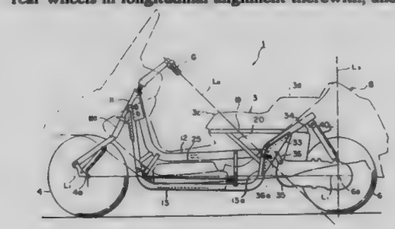
U.S. Cl. 180—215 **6 Claims**

1. A multi-wheeled vehicle having longitudinally spaced front and rear axles, a front and rear wheel rotably mounted to said axles, and a steering mechanism operably connecting said front wheel and having at least one handle, comprising:

a body frame structure including a head pipe mounting said steering mechanism and structural members extending downwardly and rearwardly from said head pipe below the level of a first reference line extending between said front and rear axles;

a power unit including an engine drivingly connecting said rear wheel being substantially coincident with said first reference line and having one end pivotally connecting said body frame structure and the other end rotably mounting said rear wheel;

a fuel tank mounted on said body frame structure below the level of said first reference line intermediate said front and rear wheels in longitudinal alignment therewith; and



a seat mounted on said body frame structure above said first reference line, said seat extending forwardly of a second reference line extending between said steering mechanism handle and the tangent to the front circumferential face of said rear wheel.

4,721,179

DOUBLE SWING-ARM MOTORCYCLE FRAME

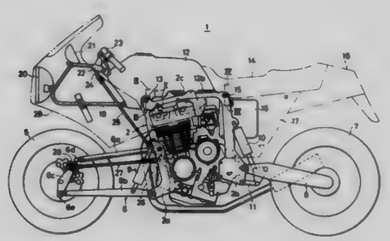
Ken Yamaguchi; Akio Kawano, and Keiji Ono, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 919,160

Claims priority, application Japan, Oct. 15, 1985, 60-229579; Oct. 15, 1985, 60-229580

Int. Cl.[4] B62K *25/26*

U.S. Cl. 180—219 **9 Claims**



1. A motorcycle, comprising:

an engine unit having a front portion and a rear portion and including an engine and a gearcase;

a front wheel;

a rear wheel;

a front swing arm (6) bearing said front wheel;

a rear swing arm (8) bearing said rear wheel;

a left and right side frame, each comprising;

a front bracket (2*a*) pivotally supporting a rear end of said front swing arm, said front bracket being fixed to said front portion of said engine unit,

a rear bracket (2*b*) pivotally supporting a front end of said rear swing arm, said rear bracket being fixed to said rear portion of said engine unit, and

connecting means connecting said front and rear brackets and including a first vertical piece extending upwardly from said front bracket in front of said engine, a second vertical piece extending upwardly from said rear bracket to the rear of said engine, and a horizontal piece 2*c* extending longitudinally between respective upper portions of said two vertical pieces;

said motorcycle further comprising:

a handle bar supported by said horizontal piece;

a fuel tank supported by said horizontal piece; and

a seat supported by said horizontal piece.

4,721,180

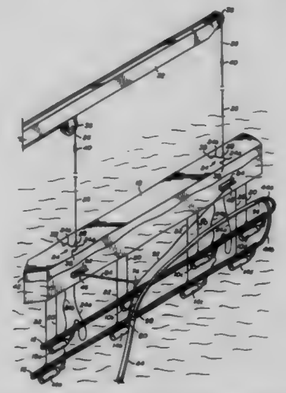
MARINE SEISMIC SOURCE ARRAY

Tor A. Haughland; Mark Houston, and Philip M. Fontana, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 26, 1986, Ser. No. 935,280

Int. Cl.[4] G01V *1/00*; B63B *21/16*

U.S. Cl. 181—111 **2 Claims**



1. A deployment apparatus for a marine seismic source array comprising:

a first elongated member having a plurality of sources attached thereto;

a second elongated member having a plurality of sources attached thereto;

a float;

means for suspending said first elongated member beneath said float so that said seismic sources attached thereto are at a first selected water depth when said float is floating on the water surface;

means for suspending said second member beneath said float so that seismic sources attached thereto are at a second selected water depth different from said first depth when said float is floating on the water surface;

hoisting means affixed to said elongated members and slidably engaged with said float for retracting said first and second elongated members to engage the underside of said float and for lowering said elongated members to said different selected depths; and

said first and second elongated members being adapted to engage said float to lift said deployment apparatus from the water.

4,721,181

BASE PLATE LOCATOR FOR SEISMIC SOURCE

Tom P. Airhart, and Andrew B. Woodrow, both of Plano, Tex., assignors to Atlantic Richfield Co., Los Angeles, Calif.

Filed Mar. 31, 1986, Ser. No. 846,393

Int. Cl.[4] G01V *1/04*

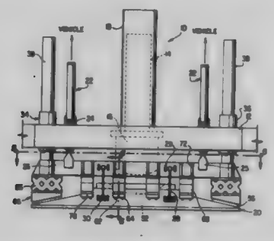
U.S. Cl. 181—114 **3 Claims**

1. In combination with a vehicle and an impulsive seismic source carried thereby having a freely-movable baseplate for engaging the surface of the earth beneath the vehicle and receiving an impact from a moving mass, apparatus for maintaining relative alignment between the vehicle and the baseplate comprising:

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(a) lift means secured to the vehicle and disposed extensibly between the vehicle and the baseplate;
(b) elastic means exhibiting three-dimensional elasticity fixed dependently to the lift means;
(c) first and second means positioned between and secured respectively to the baseplate and the elastic means for mechanically coupling the lift means to the baseplate, such first and second means forming in combination at least one projection and one matching indentation adapted to enter slidably into load-bearing engagement with each other

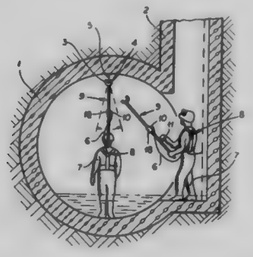


responsive to extension of the lift means so as to transmit vehicle weight to the baseplate and further transmit lateral force on the baseplate to the elastic means; and
(d) the projection and indentation each comprising a pair of flat surfaces convergent to form a ridge extending generally parallel to the plane of the baseplate wherein the ridge of the projection is angularly misaligned with that of the indentation such that the engagement of the projection with the indentation induces strain in the elastic means opposing such misalignment.

4,721,182
PERSONNEL SAFETY DEVICE FOR AN UNDERGROUND DUCT PARTICULARLY A SEWER PIPE

Arnfried Brinkmann; Udo Heuser, and Ernst F. Lehners, all of Essen, Fed. Rep. of Germany, assignors to Fahrleitungsbau Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 32,336
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613710
Int. Cl.[4] A62B *35/00*
U.S. Cl. 182—3 14 Claims

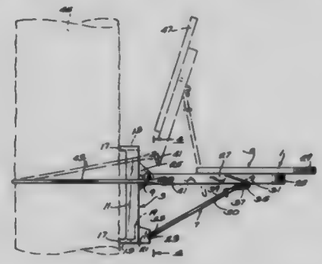


1. In a safety device for a person in an underground duct, comprising a guide rail spacedly attached by a plurality of spaced fasteners to a roof of said duct and a traveling body movable on and along said guide rail which is connected with a safety tether to a safety belt worn by said person, the improvement wherein said traveling body comprises:
a safety rod;
a pivotally openable and closable end piece located at one end of said safety rod;
a retaining eye for said safety tether on said rod; and
an end piece actuating handle at the other end of said safety rod.

4,721,183
TREE SEAT

Edmund T. Koniecka, 2621 - 10th St. S., Wisconsin Rapids, Wis. 54494

Filed Apr. 13, 1987, Ser. No. 37,426
Int. Cl.[4] A45F *3/26*; A01M *31/02*
U.S. Cl. 182—182 7 Claims



1. A tree seat comprising:
a. bracket means for bearing against a vertical support, the bracket means having a notch at a first end and a central cutout;
b. seat means pivotally attached to the bracket means at a second end thereof for pivoting between an unfolded operative configuration wherein the plane of the seat means is generally perpendicular to the plane of the bracket means and a folded inoperative configuration wherein the plane of the seat means is generally parallel to the plane of the bracket means;
c. a generally V-shaped support brace having a first end pivotally mounted to the seat means and a free end, the support brace being pivotable between a closed position wherein it is generally parallel to the seat means and an open position wherein it makes an angle with the seat means;
d. a spring mounted to the seat means for biasing the support brace to the open position; and
e. a pin secured to the seat means for defining the open position of the support brace at an angle whereby the support brace free end is automatically engagable with the bracket means notch to support the seat means when the seat means is pivoted to the unfolded operative configuration.

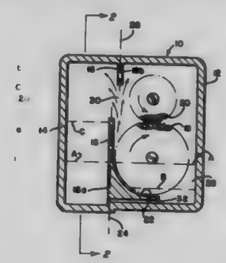
4,721,184
OIL CONTROL SYSTEM

Brian D. Sowards, Mocksville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 28, 1987, Ser. No. 8,026
Int. Cl.[4] F01M *9/06*, *9/10*
U.S. Cl. 184—6.12 3 Claims

1. An oil control system, comprising:
a housing;
a pair of gears confined, and rotatable on parallel axes, within said housing;
an oil reservoir; and
separate, first and second means for effecting fluid communication between said housing and said reservoir; wherein
said housing and reservoir share a common top and a common base, and have a common wall interposed therebetween;

one of said gears is in adjacency to said base, and comprises means for impelling oil from said housing to said reservoir via one of said first and second means;
said wall has an opening therein which defines one of said first and second means;
said wall has two, straight separate portions;
one of said portions rises, perpendicularly, from said base, and the other of said two portions depends, perpendicularly, from said top;
said portions subsist in separate, parallel planes and define, therebetween, an open, vertical space which provides an

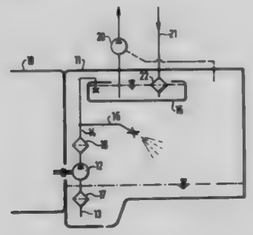


unobstructed pathway for impelled oil to loft, freely, into said reservoir;
said one and other portions have linear, terminal edges, spaced-apart from each other, which, therebetween define said opening as a rectilinear void;
said other gear of said pair thereof is in adjacency to said top, and said axis thereof is at a prescribed distance from said top;
said terminal edge of said other portion is at a given distance from said top which is less than said prescribed distance, whereby impelled oil can freely loft into adjacency to said top and lubricate uppermost portions of said other gear.

4,721,185
OIL CONTAINER ARRANGEMENT FOR VEHICLES

Dieter Weigle, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 856,771
Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516710
Int. Cl.[4] F01M *9/10*; F16H *5/04*
U.S. Cl. 184—6.12 5 Claims

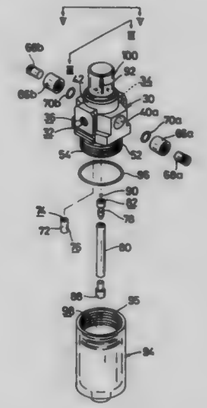


1. A container arrangement for supplying with oil a hydraulic system and a transmission of a vehicle, the arrangement comprising means containing a supply of oil to be used both for a hydraulic system and a transmission of the vehicle; a lubricant pump for supplying oil to the transmission; a hydraulic pump for supplying oil to the hydraulic system; and an additional container located above an oil level in said means and accommodating filtered oil, said hydraulic pump arranged to aspirate always filtered oil from said additional container for supplying the hydraulic system.

4,721,186
LUBRICATOR

Masaki Fujiwara, Saitama, Japan, assignor to SMC Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,563
Claims priority, application Japan, Apr. 15, 1985, 60-55764[U]
Int. Cl.[4] F01M *1/08*
U.S. Cl. 184—55.1 3 Claims



1. A lubricator comprising:
a body having a passage for a fluid under pressure, a pair of holes communicating perpendicularly with said passage in diametrically opposite relation, and a restriction member threadedly mounted in each of said holes to define a variable restriction in said passage;
a case securely mounted on said body and having a chamber communicating with said passage and capable of storing oil, and
a dropping window communicating with said chamber through an oil conduit tube and a dropping tube and also communicating through a passageway with said passage downstream of said restriction members in the direction of flow of the fluid through said passage.

4,721,187
LIFT TRUCK MAST STRUCTURE

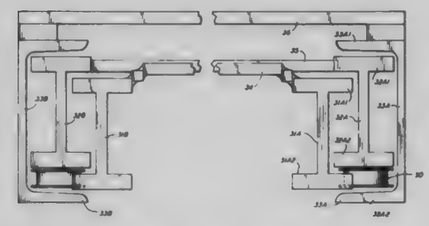
Ernest J. Riddle, Branchton, Canada, assignor to The Raymond Corporation, Greene, N.Y.

Filed Mar. 23, 1987, Ser. No. 29,249
Int. Cl.[4] B66B *9/20*
U.S. Cl. 187—9 E 6 Claims

1. A lift truck with an improved telescopic mast structure comprising:
a U shaped mast base mainframe section,
an I shaped outer telescopic mast section movably positioned inside said U shaped mast base section,
an I shaped inner telescopic mast section movably positioned inside said outer telescopic mast section,
a fork carriage mounted on said inner telescopic section, a hydraulic cylinder on said fork carriage,
hydraulic hoses connected to said base mainframe section and to said cylinder, said hoses being reeved to move with said mast sections,
a chain connecting the inner and outer telescopic sections so that inner telescopic section moves at twice the speed of the outer telescopic section,

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said chain being located inside said U shaped channel element that forms the mast mainframe and in front of the I member of the outer telescopic section and alongside of



the front part of the I member of the inner telescopic section,

whereby the chain is in a protected location and it does not add any length to the truck.

4,721,188

CONTROL APPARATUS FOR A.C. ELEVATOR

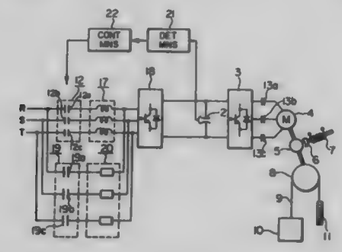
Hiroshi Araki, and Tooru Tanahashi, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 1, 1987, Ser. No. 32,541

Claims priority, application Japan, Apr. 3, 1986, 61-77068

Int. Cl.⁴ B66B *1/06*

U.S. Cl. 187—119 **6 Claims**



1. A control apparatus for an A.C. elevator, comprising:

a converter which is connected to an A.C. power source through a first contact, and by which A.C. power fed from the A.C. power source is converted into direct current,

a smoothing capacitor which smooths the D.C. output of said converter,

an inverter by which a smoothed output from said smoothing capacitor is inverted into A.C. power of variable frequency,

an induction motor which is driven by the A.C. output of said inverter and which operates a cage of the elevator,

impedance elements which are connected between the A.C. power source and said converter,

detection means to detect a build-up rate of a charged voltage of said smoothing capacitor, and

control means to generate a signal for closing said first contact when the output of said detection means does not exceed a predetermined value.

4,721,189

RETARDERS SUITABLE FOR WAGON SPEED CONTROL

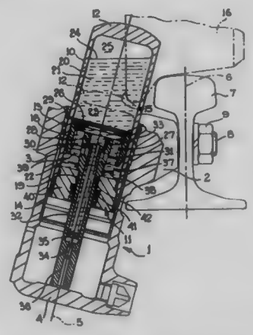
David E. Bick, Newent, England, assignor to Dowty Hydraulic Units Limited, Cheltenham, England

Filed Feb. 19, 1986, Ser. No. 831,364

Claims priority, application United Kingdom, Feb. 27, 1985, 8505059

Int. Cl.⁴ B61K *7/02*; F16F *9/49*; B61B *1/00*

U.S. Cl. 188—62 **6 Claims**



1. A retarder, suitable when mounted in association with a rail of a railway track for reducing the speed of a wagon rolling along said track, including an hydraulic unit comprising a hollow member, a piston slidably housed in said member, and a piston rod, a portion of that unit, for retardation of said wagon, being disposed in the path of a wheel of said wagon, and said portion when engaged, directly or indirectly, by a said wheel being deflected by, and out of the path of, said wheel to permit the wheel to pass the retarder, wherein the ratio of the diameter of said piston to the diameter of said piston rod is in the range 2.80:1 to 6.00:1 and the ratio of the diameter of said piston to the available length of stroke of said unit is in the range 0.53:1 to 1.20:1.

4,721,190

MECHANICAL ACTUATING DEVICE FOR SPOT-TYPE DISC BRAKES

Herbert Schmidt, Unterliederbach; Wilhelm Haberland, Frankfurt, and Wolfgang Endler, Hofheim/Ts., all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

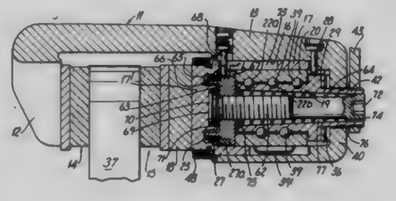
Continuation of Ser. No. 201,942, Oct. 29, 1980, abandoned.

This application Nov. 17, 1982, Ser. No. 442,342

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946851

Int. Cl.⁴ F16D *65/56*

U.S. Cl. 188—71.9 **9 Claims**



1. A mechanical actuating device for a spot-type disc brake comprising:

a brake caliper embracing the periphery of a brake disc, said caliper having a cylindrical bore disposed in one leg

thereof having a longitudinal axis parallel to an axis of rotation of said brake disc;

an actuating spindle disposed in said cylindrical bore coaxial of said longitudinal axis;

an actuating nut disposed in said cylindrical bore coaxial of said longitudinal axis encircling said actuating spindle, said actuating nut cooperating with said actuating spindle such that a brake shoe actuating member is advanced toward said brake disc when a relative axial displacement between said actuating spindle and said actuating nut occurs due to a relative rotation between said actuating spindle and said actuating nut caused by an actuating means coupled to one of said actuating spindle and said actuating nut; and

an automatic brake pad clearance adjusting device disposed within said cylindrical bore including:

an adjusting spindle and an adjusting nut arrangement disposed in said cylindrical bore coaxial of said longitudinal axis, one end of said adjusting spindle being connected to said brake shoe actuating member for axial movement therewith during a braking operation, said actuating spindle being immovable axially and being rotatable against a resistance with respect to said brake shoe actuating member, and the end of said adjusting spindle remote from said brake disc being accessible from the outside of said one leg and adapted to be turned for adjustment thereof, said adjusting nut having said axial displacement of said actuating nut and said actuating spindle transmitted thereto during a braking operation, means for restoring said adjusting spindle on release of said actuating means, said restoring means comprising a compression spring bearing against said adjusting spindle and actuating spindle, and

a unidirectional clutch device disposed in said cylindrical bore coaxial of said longitudinal axis in an operative relationship with said adjusting nut and with a radial peg extending through a wall of said cylindrical bore to drive said adjusting spindle and adjusting nut arrangement, said clutch device being entrained with said adjusting spindle and adjusting nut to advance said adjusting spindle toward said brake disc when a nominal brake pad clearance is exceeded.

4,721,191

DISC BRAKE

Frederick S. Dowell, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Nov. 19, 1981, Ser. No. 322,784

Claims priority, application United Kingdom, Nov. 26, 1980, 8037881; Nov. 26, 1980, 8037938

Int. Cl.⁴ F16D *65/10, 65/78, 13/60*

U.S. Cl. 188—218 XL **4 Claims**



1. A multiple-disc brake comprising an annular disc stack in the form of interleaved sets of axially movable rotor and stator discs of annular form, a housing containing oil or other coolant which encloses the disc stack, and an actuator for axially moving the interleaved discs into engagement with each other to apply the brake, each rotor or stator disc having on each side thereof an annular friction band which provides the only frictional contact with any co-operating disc, one set of discs being provided with a series of circumferentially spaced generally radially extending through slots which extend from one periphery of the stack across the friction bands thereof and terminate at locations outside said friction bands, the other set of discs being provided with a series of circumferentially spaced generally radially extending coolant access cut-outs which extend from the other periphery of the stack and which do not extend into said friction bands, whereby portions of the slots periodically overlap the cut-outs during relative rotation of the rotors and stators only at locations outside said friction bands to provide a radial flow path for coolant across the stack.

4. An annular rotor or stator disc for use in a multiple-disc brake, the disc having an annular friction band which is split into a number of generally arcuately-shaped areas of friction contact by a series of circumferentially spaced generally radially extending slots which pass completely through the disc in an axial sense, each slot opening through a periphery of the disc and being defined by two edges which extend away from said periphery radially across the friction band and terminating at locations outside the friction band, said edges being inclined to each other and not lying on radii of the disc so that the slot tapers in a radial sense whereby the slot will execute a sissors like action when passing over the slots in a similar co-operating disc during a brake application thus reducing torque fluctuations and wear.

4,721,192

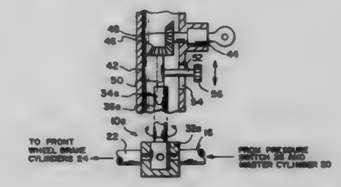
ANTI-THEFT DEVICE FOR VEHICLES

Roberto C. Cano, Calle 24, Blq. 41, #24, Santa Rosa, Bayamon, P.R. 00619, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Oct. 27, 1986, Ser. No. 923,763

Int. Cl.⁴ B60R *25/08*

U.S. Cl. 188—353 **3 Claims**



1. An anti-theft hydraulic brake device for a motor vehicle having a steering shaft and a key operated ignition switch and a brake system having a brake pedal connected to a master cylinder with a conduit extending from the master cylinder to wheel brake cylinders and a normally off pressure switch in the conduit electrically connected to brake lamps and battery, the wheel brake cylinders and the pressure switch responsive to depression of the brake pedal, the device comprising:

(a) a valve installed within the conduit between the pressure switch and wheel brake cylinders; and

(b) means for activating said valve located in the steering shaft and extending to said valve to keep said wheel brake cylinders locked in position after the brake pedal is released so that the motor vehicle cannot be driven until said valve is deactivated wherein said activating means comprises

(i) a telescopic extension arm extending up from said valve through the steering shaft adjacent the key operative ignition switch;

(ii) a pair of matching bevel gears, one of said bevel gears connected to upper end of said telescopic extension arm while the other of said bevel gears being connected to the ignition switch whereby the ignition switch can operate said valve; and

(iii) a post extending transversely from said upper end of said telescopic extension arm through a slot in the steering shaft, said post having a knob at free end thereof so as to selectively move said upper end of said telescopic

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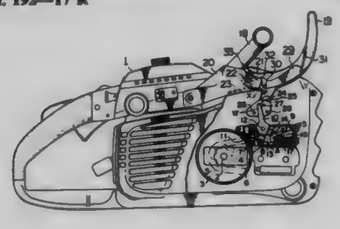
extension arm up and down for engaging and disengaging said bevel gears, connecting said valve to the ignition switch and disconnecting said valve from the ignition switch as an additional safety factor.

4,721,193

EMERGENCY BRAKING SYSTEM OF CHAIN SAW

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,437
Claims priority, application Japan, Oct. 18, 1984, 59-157566[U]
Int. Cl.[4] F16D 67/02
U.S. Cl. 192—17 R 9 Claims



1. An emergency braking system of a chain saw adapted to apply, in case emergency, a braking force to a clutch drum by means of a braking band wound thereon connected with a lever of an actuation device on a body of the chain saw, said clutch drum being rotated by a rotary shaft of an engine through a centrifugal clutch, comprising

a hand guard located in front of a front handle bar of said chain saw , said hand guard being pivotally supported by the body of the chain saw and urged by a biasing force of a spring to move pivotally while its lower end is located in spaced juxtaposed relation to the lever of the actuation device, and

an inertia trigger functioning as an inertia member pivotally supported at one end thereof by the hand guard, said inertia trigger effectively biasing the hand guard from moving pivotally in said forward direction,

wherein a sufficient kicking upward of said saw blade or a sufficient pressing forward of said hand guard by an operator using the chain saw triggers said inertia trigger, thus providing a braking force to said braking drum, said inertia trigger rotating in the same one direction as said hand guard for both types of triggering for applying said braking force to said braking drum.

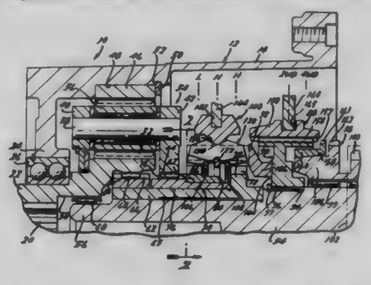
4,721,194

CLUTCH ROCKER MECHANISM FOR TRANSFER CASE

Barry L. Frost, DeWitt, N.Y., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 14, 1986, Ser. No. 917,938
Int. Cl.[4] F16D 11/12, 21/02
U.S. Cl. 192—48.91 4 Claims

1. In a coupling device for a motor vehicle gearbox of the kind including first and second shafts aligned on a common axis, at least one relatively rotatable coupling member coaxial with said shafts being provided with a set of axially spaced external spline teeth of predetermined pitch and diameter, means for engaging said coupling member with said first shaft, a cylindrical drive shell having inner and outer annular surfaces surrounding said coupling member set of external spline teeth in a concentric manner, means for engaging said drive shell with said second shaft, said drive shell formed with a plurality of axially directed equally circumferentially spaced radially extending slots, said drive shell inner surface formed with an annular medial groove arranged symmetrical with respect to a transverse medial plane, a pair of annular side grooves arranged symmetrical with respect to and axially spaced from said medial groove transverse medial plane, said medial groove and each said side groove being discontinuous in that they are interrupted by said axially directed drive shell slots, a rocker key located in each said slot defining inner and outer radially directed faces each protruding beyond said shell inner and outer surfaces, respectively; each said rocker key inner face formed with a spline tooth on each end thereof, each said rocker key inner face formed with a center notch and a pair of side notches, an annular center spring and a pair of annular side springs captured in said shell medial groove and said shell side grooves, respectively; such that said center spring is received in each rocker key center notch and each said side spring is received in its associated rocker key side notch, each said rocker key normally aligned in its neutral centered position symmetrically disposed with respect to said medial plane, each said rocker key outer surface formed with a central depression, an annular shift ring surrounding said drive shell in a coaxial manner with said common axis, means supporting said shift ring for axial reciprocal movement from a



neutral position aligned in said medial transverse plane, said shift ring having a cam surface in engagement with each said rocker key central depression, whereby said shift ring being operatively effective when moved axially in one direction a predetermined distance from its neutral centered position to an engaged position such that said shift ring cam surface pivots each said rocker key about said center spring from its neutral position causing one of said pair of side springs to be compressed by each said rocker key one side notch, and resulting in each said rocker key one end tooth drivingly engaging its associated external spline teeth such that drive torque is adapted to be transmitted between said first and second shafts, and whereby upon said shift ring being returned to its neutral centered position said one annular side spring being operative to resiliently bias each said rocker key to its neutral centered position disconnecting said first and second shafts wherein said one side spring is again captured in its associated shell side groove and each said rocker key other side notch again contacts said other side spring.

4,721,193

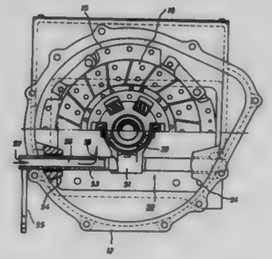
CLUTCH COOLING SYSTEM

Hidekazu Majima, Yawata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Apr. 1, 1985, Ser. No. 718,304
Claims priority, application Japan, Apr. 9, 1984, 59-71564
Int. Cl.[4] F16D 13/72
U.S. Cl. 192—113 A 1 Claim

1. In a clutch having a housing and a release fork with a clutch release bearing on said release fork at the center of said clutch in said housing, said fork having one end projecting out of said clutch housing and extending from said release bearing at the center of said clutch in said housing to said one projecting end horizontally and at right angle to an output shaft of said clutch at a position slightly lower than said output shaft and said release bearing, the projecting end of said fork being fitted into a boss formed on said clutch housing and being freely rotatably supported thereby, a lever fixed at its base end

to said end of said fork projecting outward from said clutch housing said lever being free at its opposite end, a clutch operating mechanism connected to said free end of said lever and



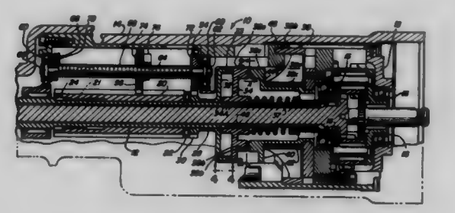
an air passage extending through said fork from said projecting end to said release bearing, said air passage having an air inlet opening at said projecting end and an air outlet opening at said release bearing end.

4,721,196

OVERTRAVEL STOP

John C. Layer, Caledonia, and Jeffrey D. Metcalf, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 29, 1986, Ser. No. 823,791
Int. Cl.[4] F16D 65/14, 71/00
U.S. Cl. 192—141 18 Claims



1. An overtravel stop for a rotary shaft, comprising:

a fixing stop having at least a pair of stop jaws disposed at different radii from the axis of the rotary shaft;

shift means about the rotary shaft and adapted to rotate with the shaft within a selected travel limit, the shift means bieng associated with a stop member having at least a pair of stop jaws disposed at the same different radii as the stop jaws of the fixed stop;

means for rotationally shifting the shift means with respect to the shaft when the shaft reaches its travel limit; and

means for axially moving the stop member into engagement with the fixed stop when the shift means rotationally shifts with respect to the shaft.

18. An overtravel stop for a rotary shaft, comprising:

a fixed stop having at least one stop jaw with a load relieving negative rake angle;

a stop member on the rotary shaft engageable with the fixed stop when the shaft reaches a selected travel limit, the stop member having at least one stop jaw with a negative rake angle complementary to the rake angle of the stop jaw of the fixed stop; and

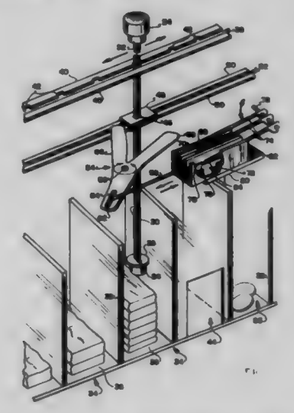
torsional shock absorber means behind the fixed stop for transmitting torque therefrom to ground.

4,721,197

VENDING MACHINE

Arlan Hoffman, 5137 Coldbrook Dr., Mantua, Ohio 44255

Filed Feb. 24, 1986, Ser. No. 832,077
Int. Cl.[4] G07F 5/02
U.S. Cl. 194—235 5 Claims



1. A coin-operated, manually manipulated vending machine device comprising:

a plurality of limited access article storage bins;

retrieval means for removing articles from said bins by adhesion with a pressure-sensitive adhesive and dispensing said articles;

retrieval release means for rendering said retrieval means inoperable until predetermined coins are inserted in the device;

a housing for components of said device, wherein access to said storage bins by an operator of the device is only possible through use of said means retrieval comprising a rod having said pressure-sensitive adhesive disposed on the bottom thereof, said rod being capable of being transferred to, and lowered into said storage bins and into contact with said articles so that the articles adhere to said adhesive, and said rod being capable of subsequent removal from said bin and transfer to an area of the device where the operator can access the rod and remove the articles therefrom, and wherein said rod can only reach said storage bins by being manually propelled along a rod slot, passage along which is controlled by said retrieval release means that only permits rod passage if predetermined coins have been inserted into the device, and prevents passage if they have not been so inserted.

4,721,198

PROBE CARD CLAMPING AND CHANGING MECHANISM

Atsushi Yajima, and Katsuyoshi Iguchi, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,502
Claims priority, application Japan, Nov. 13, 1985, 60-254297; Nov. 21, 1985, 60-179602
Int. Cl.[4] B65G 47/00
U.S. Cl. 198—345 6 Claims

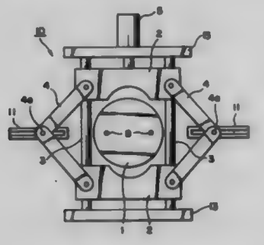
1. A probe card clamping and changing mechanism comprising:

(a) a probe card clamping mechanism (10), said probe card clamping mechanism comprising:

(b) a pair of clamping blocks (2) each having a groove 6 for receiving a portion of the periphery of a probe card (1), and two guide holes (7) formed at the opposite ends thereof, respectively;

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(c) a pair of guide members (3) slidably received through the guide holes (7) of the clamping blocks (2) so as to slidably support the clamping blocks (2) axially slidably for parallel motion with the respective grooves (6) of the clamping blocks (2) facing each other;
(d) two pairs of links (4), one end of one of each pair of links and one end of the other link being joined pivotally with a pin (4a), the other end of the former link (4) being joined pivotally to one end of one of the clamping blocks (2), the other end of the latter link (4) being joined pivotally to one end of the other clamping block (2);
(e) an actuator (5) connected to one of the clamping blocks (2) to move the same clamping block (2) toward and away from the other clamping block (2);



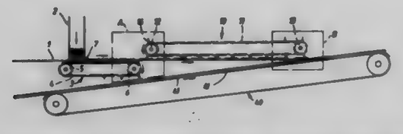
(f) a pair of guide rails (11) for guiding the pins (4a), respectively, for movement perpendicular to the direction of movement of the clamping blocks (2);
(g) a probe card conveying mechanism including a probe card conveying member (20) provided with positioning pins (9) fitting the positioning holes (8) of the probe card (1), and capable of being moved vertically and laterally relative to the probe card clamping mechanism (10) to convey the probe card (1) to a clamping position in the probe card clamping mechanism (10) and to remove the probe card (1) from the probe card clamping mechanism (10).

4,721,199

METHOD AND APPARATUS FOR ORIENTATING CAN ENDS

Andreas G. Ioannides, Begbroke, England, assignor to Metal Box plc, Reading, England

Filed Dec. 1, 1986, Ser. No. 936,233
Claims priority, application United Kingdom, Dec. 17, 1985, 8531053
Int. Cl.[4] B65G 47/24
U.S. Cl. 198—388 11 Claims



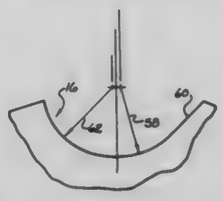
1. Apparatus for orientating circular can ends each having an eccentric aperture formed in the central portion thereof and encompassing the geometric centre of the can end, the apparatus comprising means for supplying a stream of like can ends one by one to a first station at which the geometric centre of each successive can end is located to receive an elongate finger mounted for movement such that the free end of the finger follows a path which passes through the geometric centre of the can end at the first station whereby the finger enters into the aperture in the can end; the path of the free end of the finger having a run which extends downstream of the first station, a support track for the can ends extending parallel to the run of the free end of the finger and along which each can end is drawn by the finger after it has entered the aperture in the can end and thereby orientated such that the aperture trails behind the finger either in a first stable position in which the finger is located in that part of the aperture remote from the geometric centre of the can end or in a second unstable position in which the finger is located in that part of the aperture nearest to the geometric center of the can end, and means adjacent the support track positioned to engage each can end as it is drawn along the support track by the finger to cause the can end to pivot about th finger so as to disturb can-ends orientated in the second unstable position and initiate their reorientation to the first stable position as the finger draws them along the support track.

4,721,200

CAN FILLING SYSTEM TO PREVENT DAMAGE TO CANS

Larry M. Dugas, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Continuation of Ser. No. 821,151, Jan. 21, 1986, Pat. No. 4,664,159, which is a continuation of Ser. No. 652,728, Sep. 21, 1984, abandoned. This application Feb. 20, 1987, Ser. No. 16,930
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] B65G 47/84
U.S. Cl. 198—480.1 8 Claims



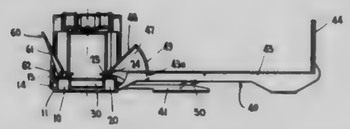
1. A can filling device for minimizing damage to beverage cans during filling comprising:
rotating filler wheel means for supporting and transporting said cans in a substantially circular path in a substantially horizontal plane with the axis of said cans substantially parallel to a substantially vertical axis;
filler wheel pocket means disposed on said rotating filler wheel means for supporting said cans and having upper and lower arm portions with rigid sustantially semi-circularly shaped can pockets formed therein for holding said cans along substantially vertically displaced upper and lower portions of said cans which are spatially separated along said axis of said cans to prevent radially inward and tangential displacement of said axis of said cans from said substantially vertical axis;
star wheel means for supporting and transferring cans in said substantially horizontal plane from a can supply to said filler wheel pocket means;
star wheel pocket means disposed in said star wheel means and having a curved surface comprising adjoining arcs of a circle having substantially the same radius but spaced apart center points for transferring said cans to said filler wheel pocket means with sufficient clearance to prevent damage to the cans; and
each of said arcs of a circle having a radius only very slightly larger than the radius of each can.

4,721,201

TRANSFER STATION WITH FEEDER DEVICE HAVING PIVOTABLE BOX COMPARTMENT AND COOPERATING METERING HUMPS

Michael Oldengott, Witten, and Klaus Schäffer, Marl, both of Fed. Rep. of Germany, assignors to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,091
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3529949
Int. Cl.[4] B65G 47/20
U.S. Cl. 198—535 4 Claims



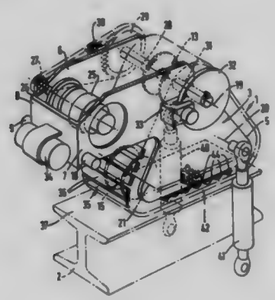
1. A mobile transfer station for treating bulk materials which includes a support structure having first and second rectilinear beam members; a conveyor movably mounted between said beam members; and a feeder device for depositing bulk materials to be treated onto said conveyor, said feeder device including (a) a box compartment which is pivotally connected to a first of said beam members to be in a non-tilted receiving position or in tilted discharge positions, said box compartment including a floor which has recesses therein adjacent said first beam member; (b) a ground plate which is pivotally connected to said first beam member and is located below said box compartment; (c) at least one hydraulic lifting cylinder connected between said ground plate and said box compartment; and (d) a plurality of metering humps which are connected to said first beam member and which respectively extend in the recesses in the floor of said box compartment, said metering humps having upper surfaces which are inclined downwardly toward said conveyor, said metering humps functioning to control the discharge of bulk materials from said box compartment onto said conveyor as said box compartment is tilted.

4,721,202

FRICTIONAL DRIVE UNITS

Melvyn T. Fryer, Willenhall, and John P. Rogers, Coven, both of England, assignors to Dowty Boulton Paul Limited, Wolverhampton, England

Filed Mar. 4, 1986, Ser. No. 836,013
Claims priority, application United Kingdom, Mar. 21, 1985, 8507353
Int. Cl.[4] B65G 19/00
U.S. Cl. 198—725 7 Claims



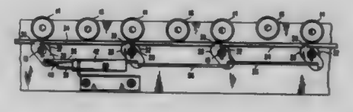
1. A frictional drive unit suitable for sliding an elongate structural member longitudinally when said frictional drive unit is attached to a support sructure carrying the structural member for longitudinal motion relative thereto, comprising a frame; at least two sprocket assemblies mounted in the frame; bearings in said frame for supporting said sprocket assemblies for rotation about respective axes which are spaced apart and parallel to one another; reversible motor means carried by said frame and drivingly connected to at least one of said sprocket assemblies; an endless track surrounding the sprocket assemblies to be driven by said at least one sprocket assembly, wherein the track comprises a plurality of elongate friction pads drivingly engageable with the structural member to slide the structural member in the direction of its length and transversely with respect to the pads, the pads extending parallel to the axes of rotation of the sprocket assemblies and being individually articulated together, and each pad having at least one roller assembly connected thereto with which the sprocket assemblies are in engagement; and a plurality of load dissipation assemblies comprising a number of rollers which are spring loaded into engagement with that portion of the track which at any instant is in frictional engagement with the structural member, said engagement being along the length of said portions between respective sprocket assemblies and on its surface remote from the structural member, wherein said track portion engaging the rollers is adapted to be urged into engagement with said structural member by force application means interconnecting the frictional drive unit and the support structure.

4,721,203

POWERED ACCUMULATING CONVEYOR APPARATUS

Thomas Kimball, Toms River, and Harold Pfeiffer, Forked River, both of N.J., assignors to Unex Conveying Systems, Inc., Jackson, N.J.

Filed May 9, 1986, Ser. No. 861,777
Int. Cl.[4] B65G 13/06
U.S. Cl. 198—781 12 Claims



1. A powered accumulating conveyor apparatus comprising:
(a) a housing means;
(b) a plurality of conveying zones being positioned adjacent to one another to form an accumulating conveyor, each of said conveying zones including;
(1) a plurality of conveying roller means rotatably mounted with respect to said housing means, said conveying roller means being in spaced relation extending horizontally parallel with respect to one another;
(2) a plurality of mounting stud means movably mounted extending through said housing immediately below each of said conveying rollers means, each of said mounting stud means including a first end thereof adjacent said conveying roller means and a second end thereof on the opposite side of said housing with respect to said conveying roller means;
(3) a retaining means fixedly secured with respect to each of said second end of said mounting stud means;
(4) a biasing means positioned between each of said retaining means and said housing means for biasing them away from one another;
(5) a braking means pivotally mounted with respect to each of said mounting stud means, said braking means including an abutment edge extending outwardly therefrom toward said conveying roller means thereadjacent;
(6) an abutment roller means rotatably mounted about said mounting stud means between said braking means and said housing means and adjacent to said braking means,

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said abutment roller means being adjacent to one of said conveying roller means;

(7) a drive belt means positioned between said abutment roller means and said conveying roler means and being longitudinally movable with respect thereto, said drive belt means being in abutment with respect to said conveying roller means and with respect to said abutment roller means to allow frictional driving of said conveying roller means responsive to longitudinal movement of said drive belt means, said braking means being pivotally movable about said mounting stud means to simultaneouly abut said conveying roller means and to selectively urge said drive belt means out of frictional engagement with respect to said conveying roller means;

(8) a plurality of connecting link members attaching said braking means with respect to one another within a conveying zone and being movable to selectively cause simultaneous movement of each of said braking means and urge said abutment edges thereof against said conveying roler means to move said mounting stud means and said biasing roller secured thereto and said drive belt means away from said conveying roller means to cease driving thereof and to prevent rotational movement of said conveying roller means by frictional engagement with respect thereto; and

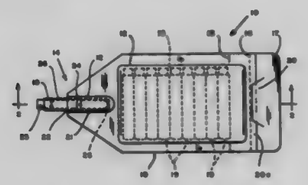
(9) a drive member operatively connected to one of said braking means and responsive to being actuated to move said braking means and said connecting link members to the disengaged position with said abutment edge thereof in abutting contact with respect to said conveying roller means to halt conveying within the zone.

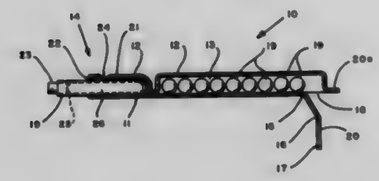
4,721,204

PACKAGE FOR HOLDING AND USING AMPULES

William S. Shoe, 101 N. Racebrook Rd., Woodbridge, Conn. 06525

Filed Jan. 2, 1987, Ser. No. 37
Int. Cl.[4] B65D *85/42, 83/04*
U.S. Cl. 206—210 8 Claims





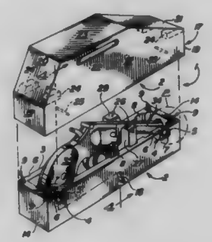
1. A package for containing a plurality of breakable liquid-containing glass ampules and for holding said ampules, individually, during the breakage thereof, said package comprising a closed compartment designed to contain a plurality of identical prep swab ampules, each comprising a breakable glass capsule containing a liquid, a flexible plastic vial enclosing said capsule and a swab tip capping said vial and being penetrable by said liquid when said glass capsule is broken, said compartment including recloseable means for the removal of individual ampules therefrom, said package also comprising an integral, flexible sleeve means for receiving and holding said ampules, individually, to permit finger pressure to be applied through said sleeve means and through said plastic vial to break the glass capsule of the ampule, to provide additional protection of the fingers against the penetration of glass from each said ampule during the breaking of the glass capsule thereof.

4,721,205

GUN CONTAINER

Brent E. Burt, 3555 Cedar Creek Dr. #107, Shreveport, La. 71119, and Clinton E. Burt, Sr., 2816 Meriwether Rd., Shreveport, La. 71108

Filed May 8, 1986, Ser. No. 861,144
Int. Cl.[4] B65D *43/12, 85/00*
U.S. Cl. 206—317 7 Claims



1. A gun container for securing a firearm compriaing:

(a) a hollow base member shaped to receive the firearm;

(b) a plurality of generally U-shaped grooves provided in the sides of said base member adapted to respectively receive rigid pins for movement downwardly, forwardly and upwardly therein;

(c) a cover adapted to fit over said base member;

(d) a plurality of rigid pins projecting from the sides of said cover inwardly of said cover toward said base, said rigid pins adapted to engage and traverse said grooves, respectively, when said cover is manipulated downwardly, forwardly and upwardly in sequence with respect to said base member;

(e) a plurality of pressure pins provided in spaced relationship in said base member and adapted for exerting pressure on said cover when said cover is fitted on said base member; and

(f) a plurality of pin blocks provided in said cover in alignment with said pressure pins, adapted for engaging said pressure pins when said cover is fitted on said base member.

4,721,206

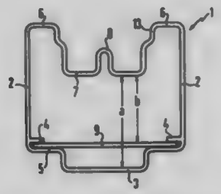
RACK FOR SEMI-FINISHED AND FINISHED PRODUCTS

Max Vötter, Malching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 791,006, Oct. 24, 1985, abandoned.
This application Oct. 31, 1986, Ser. No. 924,102
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441483
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—334 9 Claims

1. A rack for semi-finished and finished products, particularly for electrical pin coil formers with coil former pins secured to a coil former flange, and for coils fitted with these coil formers, suitable for use both as a conveyor track for the semi-finished product (pin coil formers) and as a packaging rack for the finished products (coils), the rack comprising a sectional rail with a tunnel-shaped cross-section generally adapted to the product, the rack further comprising means for adjusting the clearance height of the sectional rail between a

first predetermined value of a essentially being equal to slightly greater than the height of the finished product and a second predetermined value of b essentially being equal to slightly



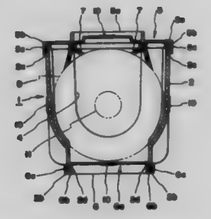
greater than the height of the semi-finished product, and the means for adjusting comprising a strip adapted for insertion into said rack.

4,721,207

HARD DISK CONTAINER

Shoji Kikuchi, Tokyo, Japan, assignor to Tenbo Electric Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,213
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—334 6 Claims



1. A hard disk container comprising:

a container body having a plurality of spaced parallel U-shaped disk receiving grooves provided in an inner surface thereof and having end openings provided in opposite ends thereof to expose central holes of the hard disks therethrough and having upper and lower openings provided in upper and lower portions thereof;

continuous upper and end protrusions integrally mounted on said container body on the upper portion adjacent said upper opening and on the ends adjacent to said end openings, and a continuous lower protrusion integrally mounted on said container around said lower opening;

an upper cover removably mounted on the upper portion and over the ends of said container body for closing said upper opening and said end openings;

a positioning protrusion on the upper face of said upper cover;

the lower face of said upper cover having continuous upper and end grooves therein in which said continuous upper and end protrusions are engaged;

a continuous sealing upper projection integrally provided on the wall of said continuous upper and end grooves, said continuous upper and end protrusions having a continuous sealing recess therein in which said continuous upper projection is resiliently sealingly engaged;

a lower cover removably mounted on the lower portion of said container body for closing said lower opening and having a positioning recess in the lower surface thereof in which a positioning protrusion on a next lower container can engage for permitting the containers to be stacked on each other;

said lower cover having a continuous lower groove around the upper surface thereof in which said continuous lower protrusion is engaged;

a continuous sealing lower projection integrally provided on the wall of said continuous lower groove, said continuous lower protrusion having a continuous sealing recess therein in which said continuous sealing projection is resiliently sealingly engaged;

a plurality of pairs of brackets detachably mounted on said upper cover and projecting into said disk receiving grooves for resiliently engaging hard disks in said container body so as to position the hard disks in the disk receiving grooves; and

humidity absorbing means provided in at least one of said container body and said upper and lower covers for absorbing humidity from the inside of said disk container.

4,721,208

RAZOR DISPLAY PACKAGE

Donald Thorpe, Madison, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 16, 1987, Ser. No. 3,963
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—353 5 Claims



1. A razor pack adapted to hold a plurality of razors of substantially identical configurations, each with a razor head and a handle, extending downward from said head comprising in combination:

(a) a container made of card having two facing, essentially parallel side surfaces with a bottom edge and a top edge, said top edge of each of said side surfaces forming a raised stop portion near the rear end of said side surfaces, and said plurality of razor handles extending between said side surfaces and said plurality of said razor heads extending transversely above said side surfaces; and

(b) a sleeve of thermoplastic material extending frontward from and butting against said stop portion, said sleeve having a top, sides extending essentially parallelly downward from said top and essentially parallel to said card side surfaces, and a bottom portion extending inward from each side extending toward said razor handles, said bottom having downwardly extending flanges at each inward edge attached to said card side surfaces, said sleeve designed to surround said razor head top, side and at least a portion of said bottom.

4,721,209

FILM CARRIER CASE FOR THE EXPOSURE AND THE TREATMENT OF A RADIOGRAPHIC FILM

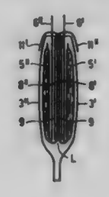
Livio Guazzotti, Turin, Italy, assignor to Electrochemical International Limited, Guernsey, Channel Islands

Filed Mar. 6, 1987, Ser. No. 22,729
Claims priority, application Italy, Mar. 18, 1986, 67212 A/86
Int. Cl.[4] B65D *81/32*
U.S. Cl. 206—455 9 Claims

1. In a film carrier light-proof case, comprising an envelope formed by two mutually connected walls, having a first portion, a second portion and a connection portion between said first and second portions of the envelope, a radiographic film enclosed in said first portion of the envelope, at least one bag containing chemical products in a liquid state for the develop-

ment and fixing treatments of a film enclosed in said second portion of the envelope, and means for intentionally tearing said bag also enclosed in said second portion of the envelope, and wherein said bag has an end turned towards said connection portion of the envelope, and said connection portion provides a passageway between said first and second portions of the envelope

the improvement that each said bag has a first extension and a second extension, said first extension starts laterally from said bag end, is bent along the bag and projects from the

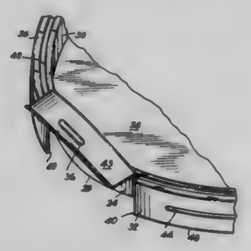


end of said second portion of the envelope, and said second extension starts centrally from said bag end, and extends along a part of the length of said second portion of the envelope in a direction parallel to said first extension; that said tearing means comprises an elongate member made of a stiff material, which is bent on itself to form two branches, and that said tearing means encloses between said branches the second extensions of all the bags, it extends beyond the length of said second portion of the envelope and it has two tangs which are bent outside the two walls of said envelope.

4,721,210
TAMPER-EVIDENT PACKAGE

Richard R. Lawrence, 39 Maschouis, Wilbraham, Mass. 01095; Charles R. Malsbury, R.F.D. #1, Palmer, Mass. 01069, and Glenn Moreau, 27 Amherst St., Granby, Mass. 01033

Filed Nov. 18, 1986, Ser. No. 931,837
Int. Cl.[4] B65D *41/48, 41/62*
U.S. Cl. 206—459 52 Claims



1. Tamper-evident package for storing and dispensing comestibles and the like, comprising:

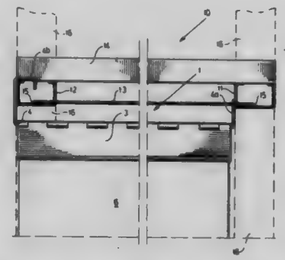
a. cup formed of a sidewall member having at its open end a rim with an unrolled peripheral edge; and

b. lid configured and dimensioned for engagement with said cup at its open end such that when said lid is snapped onto the cup over said open end, said lid includes a panel member having along its periphery an annular rib configured and dimensioned so as to snap-fittingly and sealingly engage with said cup at its open end, said annular rib formed of an inner wall member, an outer wall member having at least two spaced apart detent ribs of predetermined length for securing engagement with said cup peripheral edge at least when said lid is pried off, and a top wall member joining said inner and outer wall members, said outer wall member having adjacent at least one of said detent ribs a pair of tear lines disposed with said respective detent rib being between said pair of tear lines so that when said lid is pried to disengage at least one of said detent ribs, at least one of said tear lines is broken, said top wall having a hinge groove therealong engaging said rim of said cup so as to provide a pressure and a vacuum seal and so that when said outer wall member is pulled outwardly away from engagement with said cup peripheral edge, at least a portion of said outer wall breaks from the remaining portion at least at said tear lines and hinges about said groove while said pressure and said vacuum seal engagement remains intact to provide evidence of unauthorized tampering.

4,721,211
HANGING ARRANGEMENT FOR HOLDING SHEET-LIKE ARTICLES

Tommie Lundberg, Vikingstad, Sweden, assignor to LICA Landberg International Center AB, Stockholm, Sweden

Filed Jun. 4, 1985, Ser. No. 741,094
Claims priority, application Sweden, Jun. 8, 1984, 8403116
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—46 6 Claims



1. The combination of (1) a hanging arrangement for holders for holding sheet-like articles, such as drawings, charts and the like and (2) said holders, each holder comprising two parts which are swingable about a horizontal pivot shaft, which are adapted to embrace the upper edge of a respective vertically suspended article and which are pressed towards one another by means of one or more spring means, said hanging arrangement comprising a frame structure having horizontally extending inner and outer mutually parallel frame parts which are perpendicular to said pivot shaft, and a plurality of spaced, parallel hanger rods extending transversely therebetween and parallel to said pivot shaft, the ends of each hanger rod being fixedly attached to a respective frame part, wherein the holder has at one end thereof an inner hook member means hanging upon, and a respective hanger rod, and at the other end thereof has an outer hook member means hanging on the outer frame part, whereby the outer hook member means may be disengaged from the outer frame part so that the inner hook member means may be slidably displaced along the hanger rod to allow access to said suspended article, the outer hook member means, when hanging on the outer frame part, being displaceable along and parallel to, the outer frame part.

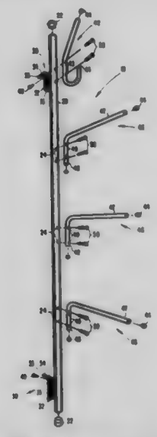
4,721,212
MODULAR ARTICLE SUPPORT UNIT

Richard B. Lowe, 8615 Algecrias, Apt. 2A, Indianapolis, Ind. 46250

Filed Oct. 9, 1986, Ser. No. 917,475
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—86 8 Claims

1. A modular support and storage unit comprising a vertically oriented elongated member having at least one storage

and support device removably attached thereto, a plurality of mounting means for removably attaching said elongated member to the door hinges of a door, each of said mounting means comprising an L-shaped bracket having a vertical portion and a horizontal portion, said horizontal portion having an opening therethrough for allowing the insertion of a door hinge pin therethrough for attaching said mounting means to the door hinges said vertical portion having a vertically extending elongated slot, said mounting means being spaced apart and in vertical alignment with each other and adapted for mounting said elongated member in close proximity to said door hinges,

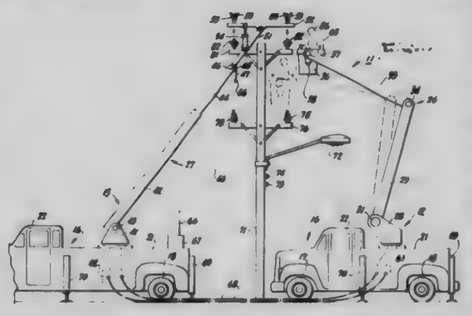


said elongated member having a plurality of first attaching openings along the length thereon on the side opposite said hinge mounting means; said at least one article support means being removably attached to said elongated member by attaching means inserted into said attaching openings in said elongated member said elongated member further having second attaching openings on the same side thereof as said hinge mounting means whereby fastening means engage the elongated slot of said bracket and said second openings thereby adjustably mounting said hinge mounting means to said elongated member.

4,721,213
EQUIPMENT AND METHOD FOR INSTALLING APPARATUS AT ELEVATED LOCATIONS

Jay M. Eitel, 130 Selby La., Atherton, Calif. 94025

Filed Mar. 13, 1987, Ser. No. 25,522
Int. Cl.[4] B66C *13/40*
U.S. Cl. 212—160 10 Claims

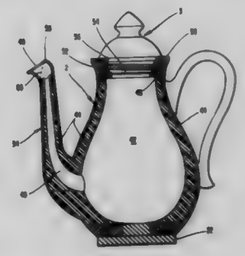


1. In equipment for installing apparatus at an elevated location at a site, an aerial lift and a crane located at the site, each of the aerial lift and the crane comprising a vehicle, a boom structure mounted on the vehicle and control means for the boom structure whereby the outer extremity of each of the boom structures can be rotated about a vertical axis raised and lowered about a horizontal axis and moved toward and away from the vehicle, at least one of the boom structures having a workman's bucket carried thereby and the other of the boom structures having means carried thereby for lifting apparatus to an elevated location, means accessible to the workman on the workman's bucket for operating the control means of each of the boom structures whereby a single workman on a workman's bucket can control the operation of both boom structures thereby permitting the workman to position himself in close proximity to the work to be performed and also permitting the workman to readily observe the lifting and positioning of the apparatus carried by the other boom structure as the work is to be performed with respect to the apparatus.

4,721,214
INSULATED POT WITH POURING SPOUT

Stephan H. A. Wandel, Barlachweg 9, 2800 Bremen 33, Fed. Rep. of Germany

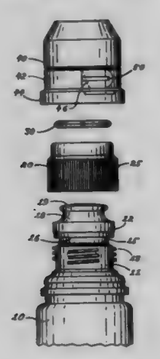
PCT No. PCT/EP84/00287, § 371 Date May 22, 1985, § 102(e) Date May 22, 1985, PCT Pat. No. WO85/01202, PCT Pub. Date Mar. 28, 1985
Continuation of Ser. No. 740,906, May 22, 1985, abandoned.
PCT filed May 19, 1987, Ser. No. 52,203
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 8327217
Int. Cl.[4] A47G *23/04; A47J 41/00*
U.S. Cl. 215—13.1 2 Claims



1. An insulated vessel comprising a container of plastic material having an opening at a top portion, and a glass flask received and held within said container, said container portion formed by an upper portion provided with a handle and a lower portion, the upper and the lower portion joined at a separating line, the upper portion provided with a recess adjacent the separating line, the lower portion provided with an edge region adjacent the separating line, the edge region and the recess being in flush engagement, a pouring spout integrally formed with the container and having a pouring opening extending freely up to a height of the top opening, the separating line extending through a base of the pouring spout such that an upper section of the base is integral to the upper portion and a lower section of the base is integral to the lower portion, the glass flask being provided with a tubular extension projecting into the pouring spout to a point slightly below the pouring opening, an intermediate space defined between the glass flask provided with the tubular extension and said container provided with the pouring spout, said space being filled with insulating material of polyurethane foam; and, tensioning means provided in said container for directly acting on said flask and holding said flask in a substantially fixed position.

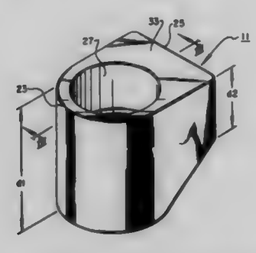
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,215
EXPANDABLE RING CLOSURE DEVICE
Francois X. Bertaud, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Continuation of Ser. No. 816,911, Jan. 8, 1986, abandoned. This application Aug. 28, 1986, Ser. No. 901,707
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—32 8 Claims



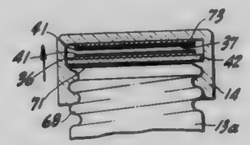
1. A closure device for use with a blow-fill-seal container, said container having an integral cap and body portion, said cap including a top, a cap abutment at said top, and a cap groove below said cap abutment, said body portion including a threaded neck and being connected to said cap by a frangible line of weakness between said cap and said neck, said closure device comprising in combination, a substantially circular outer ring means, and a separate substantially circular expandable ring means, said outer ring means including a lower portion and an upper portion, said lower portion having internal threads compatible with said neck thread, said upper portion forming a force transmittance means bearing on said expandable ring means, and said expandable ring means being adapted to be captively carried in said cap groove in between said force transmittance means and said cap abutment so that rotation of said outer ring means in either direction transmits force through said force transmittance means to rupture said frangible line of weakness thereby permitting opening of said container.

4,721,216
HOLDER FOR DRINKS AND THE LIKE
Bobby L. Kinder, HC74, Box 195, Graham, Tex. 76046
Filed Feb. 24, 1987, Ser. No. 18,024
Int. Cl.[4] B65D *23/00, 81/18*
U.S. Cl. 215—100.5 3 Claims



1. A holder for containers for drinks and the like comprising a unitary structure that is adapted for safely holding a drink container in surroundings involving an unlevel surface and a person; said unitary structure being formed of an insulating material; having an arcuate first end of a first depth and a squared off second end of a second depth; having a receptacle formed therein sufficiently deep to hold a drink container and specifically greater than two inches in depth; said insulating material serving to reduce heat transfer between said drink and the surroundings; said holder being adapted to sit between the legs of the person with said first end adapted to fit the intercrural region between the legs with second end extending away from said inter-crural region toward the knee; said first depth being greater than said second depth for obtaining a more nearly level condition for the drink container than the unlevel surface and sufficient for forming a bottom that has an angle alpha with respect to the horizontal that is greater than 10° and less than 45°; said holder facilitating safe retrieval and replacement of the drink container.

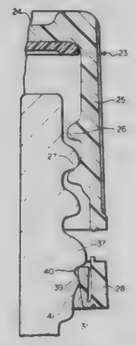
4,721,217
TAMPER EVIDENT OPTICALLY VARIABLE DEVICE AND ARTICLE UTILIZING THE SAME
Roger W. Phillips; Vernon C. Spellman; Wayne L. Gossett, and Marc A. Kamerling, all of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.
Filed Aug. 7, 1986, Ser. No. 894,320
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—230 21 Claims



11. In a tamper evident article, the article having first and second parts which are movable with respect to each other, and a tamper evident optically variable device disposed between and secured to the first and second parts and exhibiting a color shift with change in viewing angle, the tamper evident optically variable device having first and second layers with a spacer layer and a release layer disposed between the first and second layers, the release layer forming a part of the optically variable device and permitting separation of the optically variable device into two separate parts to destroy the optically variable color characteristics of the optically variable device when the first and second parts are moved with respect to each other.

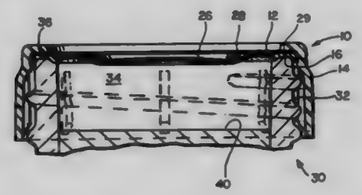
4,721,218
TAMPER INDICATING PACKAGE
James L. Gregory, Toledo, and Steven R. Wolfe, Maumee, both of Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Feb. 17, 1987, Ser. No. 15,764
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 6 Claims

1. A tamper indicating package comprising:
a container having a finish having a free end,
a closure comprising a base wall and a peripheral skirt,
a tamper indicating band connected to the skirt along a weakened frangible line,
a stop ring flexibly connected to said band and extending radially inwardly and axially toward the base wall of the closure,
said finish and said closure having interengaging means which are engageable and disengageable by relative rotation between the closure and containers,
said finish having a first annular bead,
a second annular bead spaced axially from said first annular bead,
a first surface defining a recess between said beads, and
a second surface extending from said second bead radially inwardly and axially away from the free end of the finish,
said stop ring normally engaging the second surface when said closure is engaged with said container such that when the closure is rotated to remove the closure from the container, said stop ring is moved axially and flexes over



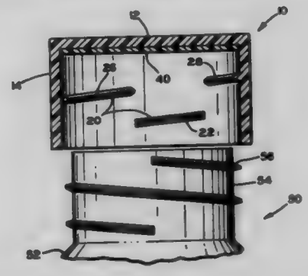
the second bead bringing the free end of the stop ring into engagement with said first bead and continued relative rotation of the closure causes the band to be severed along the weakened line leaving the band with the free end of the stop ring in said recess, and when the closure is reapplied to the container, the free edge of said skirt engages said stop ring to move the ring out of engagement with the recess and force the ring to fall away from the skirt.

4,721,219
COMPOSITE, VACUUM INDICATING CLOSURE
Paul W. Dullabaun, and William E. Fillmore, both of Toledo, Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Nov. 17, 1986, Ser. No. 931,271
Int. Cl.[4] B65D *45/10*
U.S. Cl. 215—274 14 Claims



8. In combination with a container containing a vacuum-packed product therein, and having a finish portion for receiving a closure to close and seal said container, said finish portion having a rim and an outwardly projecting and helically extending thread for engagement with a closure, a closure in engagement with said thread and sealingly engaging said finish portion, said closure comprising:
a metal lid portion having an outside diameter, said metal lid portion spanning and sealingly engaging said finish of said container, said metal lid portion including a generally centrally located vacuum indicating button, an annular portion surrounding and extending radially outwardly from said vacuum indicating button, and a second annular portion surrounding and extending radially outwardly from said annular portion, said vacuum indicating button being movable relative to said second annular portion, under the influence of subatmospheric pressure conditions in said container, between a first position which indicates that such subatmospheric pressure conditions do not exist and a second position which indicates that such subatmospheric pressure condition do exist; and
a ring portion, said ring portion being molded from a thermoplastic material and having an annular skirt which surrounds said finish portion of said container including said thread, said annular skirt having a bottom, said ring portion further having an annular flange with an inside diameter, said annular flange extending generally radially inwardly from an end of said annular skirt and being adapted to engage at least a peripheral portion of said metal lid portion and to urge said at least a peripheral portion of said lid portion against said rim of said container, said annular skirt portion of said ring portion being provided with radially inwardly projecting bead means, said radially inwardly projecting bead means being spaced from said annular flange, said metal lid portion being mechanically engaged between said annular flange and said radially inwardly projecting bead means in a snap fit, said annular skirt further having a circumferential series of spaced-apart, generally vertically extending rims formed integrally with said annular skirt engaging said thread of said finish portion to maintain said closure in sealing engagement with said finish portion of said container, each of said ribs being subject to deformation upon engagement with said finish portion of said container, whereby said closure may be applied to said finish portion of said container by a push-on motion and may be removed from the same finish portion by a twist-off motion, each of said ribs having a deeper portion that is disposed away from said annular flange of said ring portion, said deeper portion of each of said ribs projecting radially inwardly to a greater extent than any other portion of said each of said ribs and serving to offset any stretching that may occur near the bottom of said annular skirt away from said annular flange.

4,721,220
THREADED CONTAINER AND CLOSURE
John D. Northup, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Aug. 29, 1986, Ser. No. 901,848
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—307 16 Claims



1. A package, comprising:
(a) a container having a cylindrical neck with an opening formed therein for dispensing the contents, said neck having thread means for mating with a closure thread means, said neck thread means being formed on a helical path on a surface thereof, said neck helical path extending for more than one full turn around said neck surface thereby having vertically overlapping portions,
(b) a closure for said container including a top wall, a cylindrical side wall depending from said top wall, and thread means for mating with said neck thread means, said closure thread means being formed on a helical path on a surface of said side wall which corresponds to and mates

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with said neck helical path, said closure helical path extending for more than one full turn around said side wall thereby having vertically overlapping portions,

(c) said thread means on one of said neck and closure side wall being a continuous screw thread along the entire length of said helical path on a surface thereof,

(d) said thread means on the other of said neck and closure side wall including interrupted thread segments formed on the helical path thereof, said thread segments being spaced from each other by interruptions which are vertically aligned with thread segments formed on an overlapping portion of the helical path, each said interruption being at least as long as a thread segment aligned therewith,

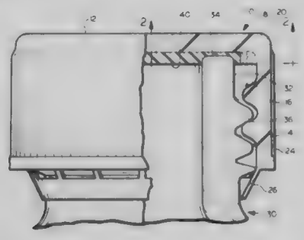
(e) said continuous screw thread and said interrupted thread having cooperative lengths which require at least two hand operations to remove the closure from the neck, thereby permitting internal pressure relief through said interrupted threads before the closure thread means are completely disengaged from the neck thread means.

4,721,221

MOLDED PLASTIC CLOSURE WITH SEALING LINER

Jacques J. Barriac, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jan. 20, 1987, Ser. No. 4,452
Int. Cl.⁴ B65D *53/04*
U.S. Cl. 215—350 **46 Claims**



1. A closure for sealingly engaging the finish portion of a container, the finish portion of the container terminating in a rim and including closure engaging means, said closure comprising, in combination:

a top portion adapted to span the finish of the container;

an annular skirt extending downwardly from said top portion and being adapted to surround an upper portion of the finish portion of the container, including the rim, said skirt including engaging means for securely engaging the finish portion of the container;

an annular member extending downwardly from said top portion, said annular member being separated from said annular skirt and forming an annular space therebetween;

a plurality of spaced apart ribs positioned in an annular array in said annular space, each of said ribs extending between said annular skirt and said annular member;

sealing liner means positioned inside of said annular member and against said finish portion of said container, said sealing liner means being adapted to be compressed between said top portion of said closure and at least the rim of the finish portion of the container,

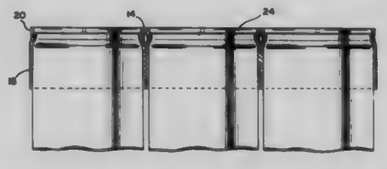
whereby said closure may sealingly engage the finish portion of the container when said closure is securely engaged to the finish portion of the container, said ribs being adapted to reinforce said annular member against deformation when said closure sealingly engage the finish portion of the container.

4,721,222

COMBINATION BEVERAGE CAN CARRIER DEVICE AND DRINKING ACCESSORY

James Haythornthwaite, 567 Main Road, Hudson, Quebec, Canada J0P 1J0

Filed Jul. 31, 1986, Ser. No. 890,858
Int. Cl.⁴ B65D *21/02*; A47G *19/22*
U.S. Cl. 220—234 **9 Claims**



1. A combination beverage can carrier device and drinking accessory comprising:

a plurality of releasably detachable connected hollow cylindrical shaped extension members, each sized so that its inside circumferential surface can fit snugly around the circumference of a can, each member being cylindrical over substantially its entire length and sized so that its length is no longer than the length of a can, and further designed so that when detached from said other members, each member is capable of lengthwise telescopic movement along the outer periphery of its associated can so as to extend beyond the top rim of a can and define a drinking cup large enough to accommodate a volume of liquid to be drunk while said member remains attached to said can;

means for connecting said members to each other at their top surfaces and at the top of the associated cans such that the entire length of each of said members rests flush on the outer surface of its associated can by means of frictional forces exerted both on the external surface of the can and on the top rim of the can and in parallel rows to form a carrier device;

means for detaching said members from each other; and

means for carrying said device.

4,721,223

CONTAINER ASSEMBLY FOR FASTENING A STABILIZING ARRANGEMENT ON A CONTAINER

Kjell M. Jakobsen, Hjallese, Denmark, assignor to Aktiebolaget Platmanufaktur AB, Sweden

Continuation of Ser. No. 862,119, May 12, 1986, abandoned, which is a continuation of Ser. No. 759,661, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 299,167, Apr. 30, 1981, abandoned, which is a continuation of Ser. No. 56,558, Jul. 11, 1979, abandoned, which is a division of Ser. No. 928,539, Jul. 27, 1978, Pat. No. 4,196,039, which is a continuation-in-part of Ser. No. 793,737, May 4, 1977, abandoned. This application Feb. 18, 1987, Ser. No. 15,989
Claims priority, application Sweden, May 10, 1976, 7605265
Int. Cl.⁴ B65D *23/00*
U.S. Cl. 220—69 **11 Claims**



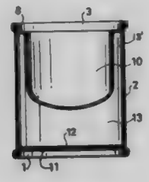
1. A composite package comprising a container of plastic material adapted for receiving a liquid and including a side wall and bottom of convex shape, and a stabilizing foot mounted on the container to provide a support therefor, said stabilizing foot being constituted of resilient plastic material in cup shape with a central portion and an upstanding rim, said stabilizing foot being fixed to said container in an elastically deformed state in which the stabilizing foot provides said support while said rim is pressed radially inwards against the wall of the container, said central portion of said stabilizing foot being welded to the bottom of the container in said elastically deformed state and elsewhere being unconnected to the container, said stabilizing foot including an annular projection extending downwardly and outwardly from the portion welded to the container, said projection being hollow and forming an annular support foot, said rim extending upwardly from said projection into smooth peripheral sliding engagement with the wall of the container, said elastically deformed state in said support foot being developed by axially pressing said central portion of said foot and said bottom of said container against one another to axially displace the central portion of the foot relative to said rim to develop a bending moment in said foot which remains, after the foot is welded to the container, to cause said rim to be pressed radially inwards against said container in tight engagement with said container, without fixation thereto, to enable the rim to slide axially on said container, said smooth sliding engagement of said rim with said container being at a location spaced radially from the welded connection of said central portion of said stabilizing foot with the bottom of the container to establish two distinct regions of contact between the foot and container, one region being the welded region at the central portion where the foot presses against the container with a force acting axially of the foot and the other region being an unconnected region in which the rim of the foot presses against the container with a force having a component acting radially of the foot.

4,721,224

PRESSURE VESSEL HAVING PRESSURE RELEASING MECHANISM

Chouji Kawabata, Gunma, Japan, assignor to Nittoseiki Kabushiki Kaisha, Gunma, Japan

Filed Dec. 31, 1986, Ser. No. 948,414
Int. Cl.⁴ B65D *83/14*
U.S. Cl. 220—89 A **3 Claims**



1. A drug atomizing vessel comprising

a metallic inner cylinder having a bottom, said inner cylinder containing a drug to be atomized,

a metallic outer cylinder with a respective bottom, said outer cylinder being concentrically connected at a top part thereof with a top part of said inner cylinder, so that said bottom of said inner cylinder extends approximately halfway to said bottom of said outer cylinder and so that a concentric space separates said inner cylinder from a respective upper cylindrical part of said outer cylinder,

liquid passing means in said bottom of said outer cylinder for allowing liquid to enter therethrough into said outer cylinder without releasing pressure from between said inner and outer cylinders,

an exothermic agent in said outer cylinder between said bottoms of said cylinder and in said concentric space between said cylinders, for providing pressure when said liquid enters via said liquid passing means into said outer cylinder,

wherein

said top portin of said inner cylinder is formed in the shape of a flange extending at right angles to the walls of said cylinders toward said outer cylinder and with a further part extending up an inner surface of the top of the outer cylinder and to be double seamed with the top of said outer cylinder,

score lines are concentrically provided in a surface of said flange in the vicinity of where it connects to said further part extending up, and

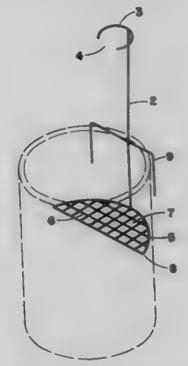
said flange is torn apart from said further part at said score lines when said pressure is provided.

4,721,225

PAINT BRUSH VALET

Edward J. Sobel, 2758 Olson Ave., Grand Junction, Colo. 81503

Filed Feb. 24, 1987, Ser. No. 17,816
Int. Cl.⁴ B65D *25/00*; B44D *3/12*
U.S. Cl. 220—90 **1 Claim**



1. In combination: a paint brush valet and a cylindrical paint container, the paint brush valet comprising a base portion member, said base portion member being substantially level and having a semi-circular shape generally conforming to the inner cylindrical wall of the paint container, said base being suspended substantially below a top access opening of said cylindrical paint container and extending horizontally and away from said inner cylindrical wall to the approximate center of said paint container, said base being in the form of a semi-circular grid defining a series of openings which provide passageways for paint drainage, a base supporting upright member extending upwardly from said base and protruding through said access opening, a paint brush handle supporting member affixed to said upright member above said access opening, and an attaching member affixed to said upright for attaching over the brim of the paint container.

4,721,226

WASTE CONTAINER-BAG DISPENSER COMBINATION

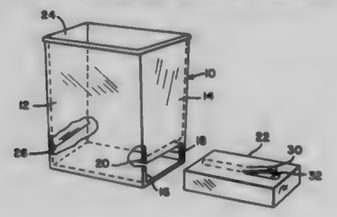
Edward P. Yurko, 5967 McKinley St., Merrillville, Ind. 46410

Continuation of Ser. No. 660,309, Nov. 12, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 906,324
Int. Cl.⁴ B65D *25/16*
U.S. Cl. 220—407 **6 Claims**

1. The combination of a waste container comprising a unitary structure including a base and upright side walls defining upwardly an open volume, one of the said side walls having an opening into the open volume adjacent the base, a projection on said one side wall adjacent the top edge of said opening extending inwardly in said container and being spaced from the

base of said container, a projection on another side wall of said container extending inwardly in said container, said projection being spaced from said base and being aligned with said inwardly extending projection adjacent said opening; and

a bag dispensing box containing a plurality of bags positioned on said base in said container, filling part of said



open volume, said box being sized to fit within said opening and to extend between said opening and said other side wall and be retained on said base of said container by said inwardly extending projections provided on said side walls of said container and said box being otherwise exposed to said open volume, whereby said box may be easily placed by being slid into said opening.

4,721,227

FIRE-RESISTANT CONTAINER

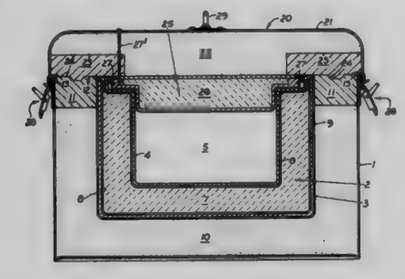
John T. Hughes, Worcester, and Michael Hardiman, Stourport-on-Severn, both of United Kingdom, assignors to Micropore International Limited, Droitwich, United Kingdom

Filed Jan. 3, 1986, Ser. No. 815,856

Claims priority, application United Kingdom, Jan. 10, 1985, 8500624

Int. Cl.⁴ F27D *11/00*

U.S. Cl. 220—429 **12 Claims**



1. A container for protecting magnetic media from fire, which container comprises a base and a cover, the base comprising an outer casing of fire and impact resistant material and an inner container defining a storage cavity for the magnetic media, the outer casing and the inner container being separated by thermal insulation material, wherein the thermal insulation material is maintained under compressive stress so as to provide the sole support for the inner container and to maintain the inner container firmly in position within the outer casing and to expand when the outer casing expands as a result of exposure to higher temperature, said thermal insulation material comprising a microporous material compacted to a density above 150 kg/m^3.

4,721,228

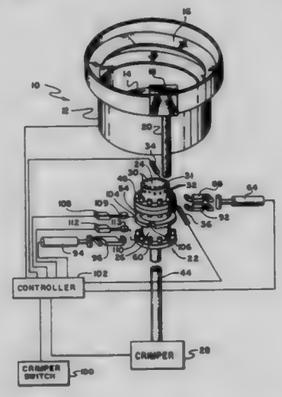
APPARATUS FOR DISPENSING ELONGATED SMALL MECHANICAL PARTS

Abraham Bejerano, Costa Mesa, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 3, 1985, Ser. No. 718,909

Int. Cl.⁴ G07F *11/00*

U.S. Cl. 221—13 **14 Claims**



1. A buffer assembly for handling small elongated components, comprising:

means for receiving individual components in a generally random time sequence and storing a quantity thereof in a circular array of vertical chambers which are each closed except at their opposite ends; and

means for dispensing the components one-at-a-time from said chambers upon demand for utilization, said dispensing means comprising a member rotatably mounted on a generally vertical central axis coaxial with said circular array and having a single generally vertical passageway therethrough, said passageway having an upper inlet end adapted to register with coresponding ones of said chambers and a lower outlet end located on said axis for dispensing components at a single location.

4,721,229

OUTPUT STACKER FOR A DOCUMENT PROCESSING FACILITY

Josef Dempf, Klosterlechfeld, and Erich Moser, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 820,787

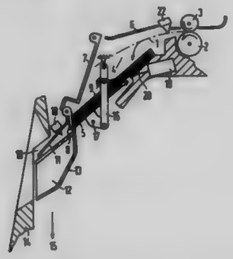
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502505

Int. Cl.⁴ B65H *31/26, 31/30*

U.S. Cl. 221—13 **9 Claims**

1. A document processing facility whose operation is initiated by a user-associated authorization card which is pluggable into a badge reader, including a housing with an access opening extending therethrough and an output stacker in said housing which is accessible through said access opening, said output stacker having a document seating surface movable between a document output position and a deposit position, and holding devices for documents offered for removal in the output stacker; a deposit stacker which is positioned in said housing below said output stacker so as to be inaccessible from the outside; a communicating opening formed between a bottom edge of said document seating surface and said deposit stacker when said document seating surface is in said deposit position; a drive device for moving said document seating surface back and forth between said document output position and said deposit position in which the documents fall through

said communicating opening into said deposit stacker after being released by said holding devices, comprising the improvement that said document seating surface is downwardly inclined toward said access opening when in said output position, that said holding devices comprise at least two spring elements resiliently supported on said document seating surface and that a trough-like projecting member forming a re-



cessed grip area is rigidly attached to the underside of said document seating surface, said projecting member having a forwardly directed edge below said seating surface terminating in alignment with a bottom edge of said access opening when said output stacker is in said document output position and, thus, closing said communicating opening for said deposit stacker.

4,721,230

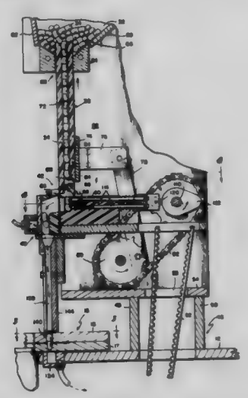
CAPSULE RECTIFICATION APPARATUS

Hugh P. McKnight, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 24, 1986, Ser. No. 822,129

Int. Cl.⁴ B65G *47/24;* B65H *9/10*

U.S. Cl. 221—173 **3 Claims**



1. In an apparatus for handling two-piece capsules comprising hopper means for containing capsules in a randomly oriented manner, feeding means for extracting randomly ordered linear arrays of capsules from the hopper means and a delivery means for delivering rectified capsules to a receiving means, the improvement comprising a rectifying means for orienting each linear array of capsules from one of random order to one of uniform order comprising a block having a series of parallel keyhole-shaped slots including a wider portion and a narrower portion situated so as to receive capsules from the feeding means into the wider portion of each slot, a turning blade reciprocally positioned adjacent the wider portion of the slots for extension into the slot to turn the capsules from a position wholly within the wider portion of the slot to a position partially within the wider portion of the slot and partially within the narrower portion of the slot, each capsule thus turned being situated wholly within one of the upper half and lower half of the slot, a plurality of ejecting pins projectable into both the upper and lower halves of each slot for ejecting the capsules from the slot through the narrower portion thereof and a pair of cams mounted for rotation on a common shaft for actuating the turning blade and the ejecting pins.

4,721,231

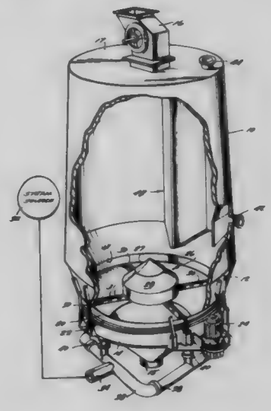
CHIPS BIN BLOCKAGE PREVENTING

Johan C. F. C. Richter, Nice, France, assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Sep. 8, 1980, Ser. No. 184,976

Int. Cl.⁴ D21C *7/08*

U.S. Cl. 222—146.4 **12 Claims**



1. A vessel for holding and discharging loose bulk material, comprising

a main vessel body having an interior open cross-sectional area A, and substantially vertical elongated side walls, and having a loose bulk material inlet at the top thereof;

a generally funnel-shaped discharge portion extending downwardly from the bottom of said main vessel body, and having a bottom portion thereof with an interior open cross-sectional area A′, wherein A′ is substantially less than A, with a loose bulk material outlet from the bottom portion; and

means for providing a plurality of spaced void volumes in loose bulk material flowing downwardly from said inlet to said outlet, adjacent the intersection between said main vessel bottom at said side walls and said funnel-shaped discharge portion, so that the loose bulk material will not hang-up and block said bulk material outlet, said means consisting of a plurality of prismatic elements, each attached to the interior side walls of said main vessel body and substantially vertically extending at least a portion of the length of said main vessel body, and each terminating at generally the bottom of said main vessel body.

4,721,232

ANTI-CLOGGING STRUCTURE FOR CONTAINERS

George J. Federighi, 70 - 13th St., San Francisco, Calif. 94103

Filed Jul. 18, 1986, Ser. No. 886,781

Int. Cl.⁴ B65D *83/06*

U.S. Cl. 222—196.5 **1 Claim**

1. A device for facilitating dispensing of a substance from a container by shaking thereof, the container having a base at one end and at least one opening at the opposite end through which said substance is dispensed, comprising a housing hav-

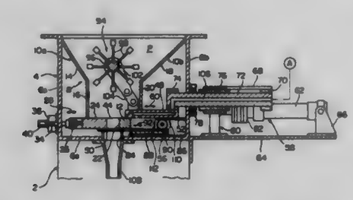
VOL 1086 ISS 4 JA 26 1988 UMI

ing a resilient sidewall extending upwardly and having a continuous upper edge defining an upper opening, said upper opening configured to receive said base of said container in frictionally retained, sealing engagement, stop means for limiting entry of said base of said container into said opening, comprising an annular flange extending radially inwardly from said sidewall and continuously about the inner surface thereof and spaced below said opening, said flange having an inner diameter less than said base to prevent insertion of said base therebeyond, a bottom wall extending across a lower edge of said



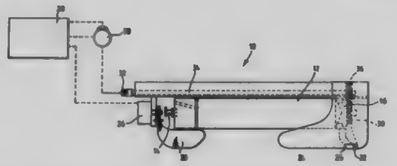
sidewall and defining with the lower surface of said base and said sidewall a closed chamber beneath the container, a movable weight freely disposed within said chamber, said weight comprising a cylindrical disk, said disk having a diameter slightly less than the diameter of said chamber and a smooth, flat, continuous upper surface adapted to impact on said lower surface of said base and said bottom wall, and aperture means extending from said chamber to the exterior thereof to provide pressure equalization with ambient atmospheric pressure when said container is in sealing engagement in said upper opening.

4,721,233
POWDER FEEDING APPARATUS
Mamoru Asada, Numazu, Japan, assignor to Akatake Engineering Co., Ltd., Shizuoka, Japan
Filed Sep. 9, 1985, Ser. No. 773,977
Int. Cl.[4] G01F *11/02, 11/36*
U.S. Cl. 222—245 **3 Claims**



1. A powder metering and feeding apparatus, comprising:
a powder storage receptacle with an open under surface;
metering means positioned below the open under surface of said receptacle, said metering means including a stationary member having a plurality of metering chambers formed therein at predetermined intervals, each of the metering chambers havig an upper opening for receiving the powder from said receptacle and a lower opening for discharging the powder;
an upper shutter member for selectively opening and closing the upper opening of the metering chambers;
a lower shutter member for selectively opening and closing the lower opening of the metering chambers;
means for opening and closing movement of said upper and lower shutter members; and
metering adjustment means for adjusting the volumes of the metering chambers, said metering adjustment means including a movable member for simultaneously adjusting the volume of the metering chambers and a plurality of adjusting members movably mounted on said movable member for separately adjusting the volume of each of the metering chambers and slidably disposed in the metering chambers, whereby by moving said movable member all of said adjusting members are simultaneously moved so as to simultaneously adjust the volume of each of the metering chambers and by moving individually each of said adjusting members the volume of each of the metering chambers is individually adjusted separate from one another.

4,721,234
CREASE SETTING APPARATUS
Derek W. Spence, Nr. Bingley, United Kingdom, assignor to Wool Development International Limited, West Yorkshire, United Kingdom
Filed Oct. 7, 1986, Ser. No. 916,563
Claims priority, application United Kingdom, Oct. 8, 1985, 8524802
Int. Cl.[4] B65D *88/54*
U.S. Cl. 222—327 **7 Claims**

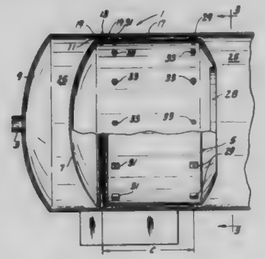


1. An apparatus for the application of crease setting compositions which comprises at least one moveable arm which is inserted into a leg of a pair of trousers to be creased, the arm carrying near one end thereof an applicator head comprising a cartridge having a nozzle for the application for crease setting composition, and guide means spaced from the nozzle for locating the nozzle within the crease to be treated characterized in that the guide means is to be received in the crease of the trouser leg and moveable transversely of the direction of motion of the trousers in order to remain located in the trouser crease during movement of the latter, means rotatably mounting said cartridge and means operatively connecting said rotatable cartridge with said guide means for directing the nozzle to follow in the motion track of said guide means.

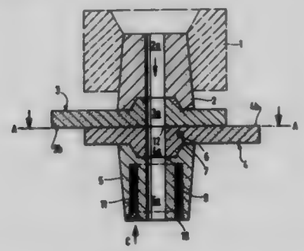
4,721,235
TANK FOR TRANSPORT AND STORAGE OF SEMISOLID AND FLUID MATERIALS
M. Burnell Watson, Box 34, Dorsey, Ill. 62021
Filed Aug. 8, 1986, Ser. No. 894,952
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—389 **13 Claims**

1. In an elongate tank for transport or for storage in bulk of semisolid and fluid materials, such as grease and oil, said tank having an outlet at one end thereof for the material contained therein, said tank being of generally cylindric internal cross-section; a generally cylindric piston sized to slide in the tank and adapted to be moved in a direction toward said outlet thereby to force material in the tank through the outlet, said piston having a circumferential channel therearound adjacent one end thereof, said channel carrying an elastic annular seal therein, said seal being hollow and expandable and having pressurizing means for varying the pressure within the seal between atmospheric pressure and a pressure higher than atmospheric wherein the seal expands and presses against the internal surface of the tank with the pressure such that when

the piston slides in the tank the seal is maintained in sliding engagement with the internal surface thereby to wipe the material therefrom and to seal the piston relative to the tank, and means for holding the piston against canting in the tank comprising a plurality of pads fastened to said piston and extending radially outwardly therefrom beyond the periphery of the piston for engagement with the internal surface of the tank, said pads being of low friction material to permit said piston to slide freely in said tank, said pads being spaced axially of the piston from said seal a distance sufficient to prevent canting of the piston.

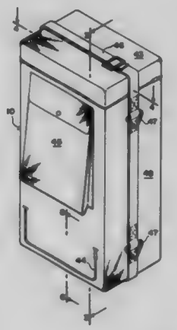


4,721,236
APPARATUS FOR MINIMIZING WEAR ON REFRACTORY PARTS FOR VALVE CLOSURES
Udo Muschaer, Tönisvorst, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany
Continuation of Ser. No. 704,468, Feb. 22, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 941,523
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406941
Int. Cl.[4] B22D *41/00*
U.S. Cl. 222—591 **12 Claims**



1. In a metal pouring ladle of the type having a gate valve for stopping flow of molten metal from the ladle in use, said gate valve comprising a refractory body including a passage for flow of molten metal, said refractory body being porous and having wearing surfaces which are prone to depletion and wear by contact with flow of said molten metal, an arrangement to minimize said wear of said refractory surfaces, comprising:
arcuate shaped repository means totally enclosed in and disposed within said refractory body and disposed in proxmity to and oriented toward said wearing surfaces, said repository means having stored therein a supply of liquid heat sensitive impregnation agent which generates protective lubricants which penetrate the refractory pores when heated by said flow of molten metal and which reaches said refractory surfaces from within said repository through refractory body pores at said surfaces, whereby any wear of said refractory surfaces in use is minimized; and
means for replenishing said heat sensitive impregnation agent while in a liquid state into said totally enclosed repository means being disposed at least partially in said refractory body; and said means for replenishing including a charging lock which is used to close and seal the repository.

4,721,237
PORTABLE COOLER FOR A NUMBER OF BEVERAGE CANS
Peter C. Leslie, 201 A St., Wilmington, Del. 19801
Filed Nov. 3, 1986, Ser. No. 926,343
Int. Cl.[4] A45F *3/20*
U.S. Cl. 224—148 **13 Claims**



1. A portable cooler apparatus for a number of beverage cans comprising:
(a) a box-like chamber of monolithic construction having forward, rear and opposed side wall panels arranged in a substantially rectangular configuration and a bottom panel perpendicularly joined to the lowermost extremities of said wall panels, said panels having interior and exterior surfaces, and said forward wall panel having an access aperture located adjacent said bottom panel,
(b) self-supporting thermally insulative material disposed upon the exterior surfaces of said panels,
(c) a coolant-confining container removably insertable into said chamber and positioned by the interior surfaces of said panels, said container having a serpentine contour comprising a series of parallel recesses of horizontally elongated substantially semi-circular cylindric shape joined by intervening peaks and adapted to hold beverage cans in vertically descendable disposition, and further having a closable port for the entrance or egress of coolant substance,
(d) door means associated with said access aperture, and
(e) a carrying jacket of fabric construction which snugly fits about said chamber and having lid means to close said chamber, carrying straps, and closure means associated with said door means.

4,721,238
SPRING RETAINER SHOULDER HOLSTER
Randy R. Shoemaker, LaVerne, Calif., assignor to Tex Shoemaker & Sons, Inc., San Dimas, Calif.
Filed Nov. 25, 1985, Ser. No. 801,203
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—243 **14 Claims**

6. A shoulder holster for releasably retaining an automatic handgun which has a body with a hammer cover, a handle with a butt, a barrel with a muzzle, and a trigger guard, in a predetermined position on a users body, said holster including:
a sheath formed to cover at least a portion of the body of the automatic handgun with the butt of the handle and the

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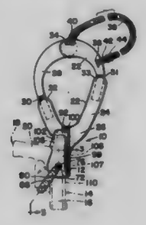
trigger guard extending therefrom forwardly and the barrel extending therefrom downwardly, said sheath having:

first and second sides;

a closed back;

an open front;

a closed top positioned between said closed back and open front; and



a downwardly facing pocket extending beneath said closed top adapted for engagement with the hammer cover; and

a resilient loop extending between said first and second sides across said open front, said resilient loop being adapted to engage the automatic handgun between its trigger guard and barrel and to bias its hammer cover up into said pocket.

4,721,239

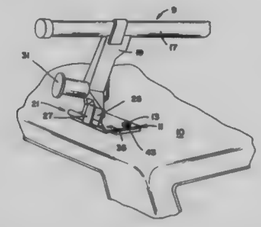
BRACKET ASSEMBLY FOR AUTOMOBILE RACKS

Samuel C. Gibbs, III; Bradley S. Bishop, and James B. O'Brien, all of Los Altos, Calif., assignors to Konakorp, Oakland, Calif.

Filed Jul. 22, 1986, Ser. No. 888,819

Int. Cl.⁴ B60R *9/00*

U.S. Cl. 224—322 **4 Claims**



1. An automobile roof rack system including a bracket plate assembly fastened to a selected one of a side wall and a roof of an automobile, and a roof rack formed for the support of articles thereon and having a rack mounting assembly thereon including hook means releasably coupled to said bracket plate assembly, wherein the improvement in said roof rack system comprises:

said bracket plate assembly including a bracket plate having a generally planar surface fastened in parallel relation to said selected one of said side wall and said roof, said bracket plate having a flange portion extending laterally from said planar surface in a direction away from said vehicle, and said flange portion having a W-shaped transverse cross section for coupling of said rack mounting means to one set of surfaces on said flange portion when said bracket plate is fastened to said roof and coupling of said rack mounting means to another set of surfaces on said flange portion when said bracket plate is turned end-for-end and fastened to said side wall.

4,721,240

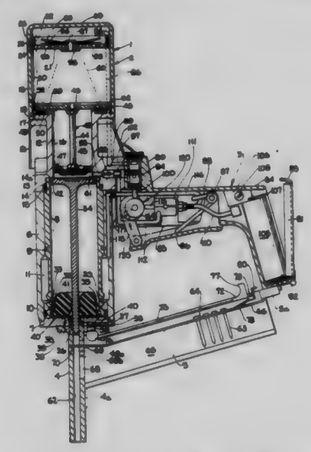
CAM-CONTROLLED SELF-CONTAINED INTERNAL COMBUSTION FASTENER DRIVING TOOL

Gilbert A. Cotta, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jul. 2, 1986, Ser. No. 881,343

Int. Cl.⁴ B25C *1/08*

U.S. Cl. 227—10 **22 Claims**



1. An internal combustion fastener driving tool comprising a housing, upper and lower coaxial cylinders located within said housing, said upper cylinder having a closed upper end and an open lower end, said lower cylinder having a closed lower end and an open upper end, said open cylinder ends being adjacent to and in communication with each other, a piston assembly in said upper cylinder, said piston assembly being shiftable between a normal retracted position adjacent said open lower end of said upper cylinder and an actuated position adjacent said closed upper end of said upper cylinder, means biasing said piston assembly to said normal retracted position, a piston/driver assembly located in said lower cylinder and comprising a piston affixed to an elongated driver, said driver extending through a perforation in said closed lower end of said lower cylinder, said piston/driver assembly being shiftable within said lower cylinder between a normal retracted position with said piston of said piston/driver assembly at said open upper end of said lower cylinder and an extended fastener driving position, said piston assembly and said piston/driver assembly when in their normal positions defining therebetween a combustion chamber, ignition means in said combustion chamber, a chamber in said housing containing pressurized combustion air, the upper end of said upper cylinder being connected to said combustion air chamber through a one-way valve, a return air chamber in said housing, the lower end of said lower cylinder being connected to said return air chamber, a source of gaseous fuel under pressure within said housing, and control means for sequentially introducing into said combustion chamber a measured amount of gaseous fuel from said source, for introducing into said combustion chamber a measured amount of air from said combustion air chamber creating an air/fuel mixture, for actuating said ignition means to combust said air/fuel mixture in said combustion chamber thereby shifting said piston assembly of said upper cylinder from its normal retracted position to its actuated position replenishing air under pressure in said combustion air chamber and thereby shifting said piston/driver assembly from its normal retracted position to its fastener driving position driving a fastener and introducing air under pressure from said lower cylinder to said return air chamber and for exhausting spent products of combustion from said combustion chamber and lower cylinder permitting said piston assembly to return to its normal retracted position under the influence of said biasing means and said piston/driver assembly to return to its normal retracted position under the influence of pressurized air from said return air chamber.

4,721,241

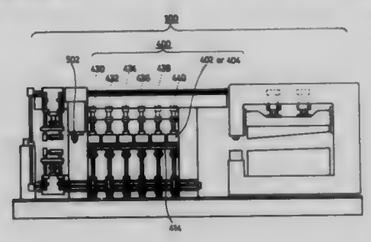
WELDING APPARATUS ASSEMBLED TOGETHER WITH GRINDING DEVICE

Hiroyasu Yusa, and Namio Suganuma, both of Okayama, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Nov. 21, 1986, Ser. No. 934,209

Int. Cl.⁴ B23K *37/02, 37/04, 37/06, 9/02*

U.S. Cl. 228—5.7 **5 Claims**



1. A welding apparatus provided with a shearing means for shearing ends of preceding and succeeding steel plates, a welding means with welding torch for performing butt welding of the sheared ends, a clamping means for clamping the steel plates and a backing strip for backing up the welding joint during welding, comprising;

(a) a grinding means for grinding the welded joint of the steel plate, said grinding means assembled together with the welding apparatus and located at a position behind the welding torch in the moving direction thereof for performing butt welding, grinding wheels of said grinding means being movable along the welded joint of the steel plates; and

(b) a shift mechanism for shifting upper clamping dies of said clamping means between two clamping positions respectively for welding and grinding.

4,721,242

PACK FOR LIQUIDS HAVING EDGE PROTECTION, PROCESS FOR THE PRODUCTION THEREOF AND APPARATUS FOR CARRYING OUT THE PROCESS

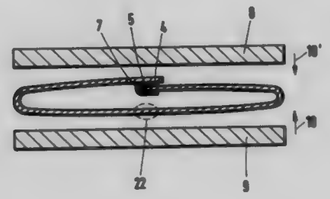
Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Finance & Trading S.A., Pully, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 866,883

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519955

Int. Cl.⁴ B65D *5/42*

U.S. Cl. 229—48 R **9 Claims**



1. A pack for liquids, the pack comprising a plastics strip and walls formed from a carrier material coated on at least one side with plastics material,

the pack having side walls of a tubular configuration, a longitudinal sealing seam, and a bottom having a transverse sealing seam,

the longitudinal sealing seam including overlapping interior and exterior edge portions of the side walls, the interior edge portion having a cut edge and interior and exterior surfaces, the plastics strip being laid in a cross-sectional U-shape around the interior edge portion, and the plastics strip being sealed onto both the interior and exterior surfaces of said interior edge portion.

4,721,243

LIQUID CARRYING CONTAINER AND BLANK

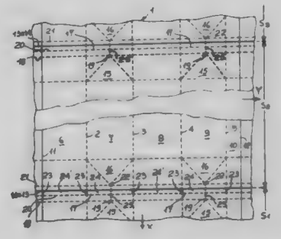
Franco Mercurio, Milan, Italy, assignor to Elopak A/S, Lier, Norway

Continuation of Ser. No. 652,458, Sep. 19, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 910,807

Claims priority, application Italy, Sep. 20, 1983, 22929 A/83

Int. Cl.⁴ B65D *5/06*

U.S. Cl. 229—137 **1 Claim**



1. A rectangular container blank having two straight side edges and upper and lower edges comprising:

four side panels and a narrower fifth side closure panel defined by score lines parallel to each other and the side edges and score lines at an upper edge and at a lower edge of the panels at right angles to the parallel score lines, the fifth panel being seamable to another panel in forming a container;

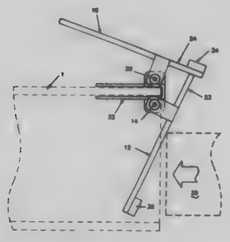
upper and lower closure panels defined by extensions of the parallel score lines and further score lines outside of the side panels at right angles to the parallel score lines, alternate ones of which closure panels provide triangles defined by score lines exending from the respective upper and lower edges of the adjacent side panels to an apex at the further score line, one triangle on each closure panel having a base coincident, respectively, with the upper or lower edge of the adjacent side panels, the triangles permitting folding of the closure panels to form upper and lower closures of the container;

lip panels adjacent each closure panel defined by extensions of the parallel score lines to the upper and lower edges of the blank and a score line joining the apices of the upper and lower closure triangles and respectively the lower and upper edge of the blank, at least the lip panels at the top end of the blank having an intermediate score line parallel to and lying between the upper edge of the blank and the further score line separating the closure and lip panels; and

short cut lines extending from the upper edge of the blank to the intermediate score line along said extensions of the parallel score lines forming the respective side panels.

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4,721,244
NEWSPAPER BOX SIGNAL DEVICE
Rodney D. Armstrong, 15850 Mennel, Grafton, Ohio 44044
Filed May 7, 1987, Ser. No. 47,618
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—34 10 Claims



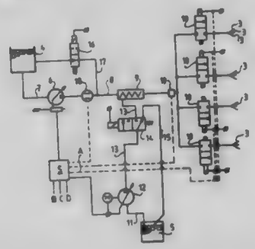
1. In an apparatus for signaling the delivery of articles, such as mail, newspapers, or parcels, for examples, in a receptacle having enclosing walls forming a substantially cylindrical shaped elongated enclosure having a major axis, which receptacle is open at at least one end, said open end being the opening for receiving deliveries, and having no closure for said open end, which apparatus comprises:

a. a trigger element that is pivotally connected to the enclosing wall of said receptacle adjacent said open end, which trigger element in an untripped position blocks at least a portion of said open end so that placing said article into the receptacle through said open end requires pushing said trigger element out of the way to a tripped position in which said trigger element is mainly within said receptacle and is substantially parallel to the major axis of said enclosure and adjacent a wall of said enclosure, thus leaving the opening free of significant obstruction by said trigger element;

b. a signal flag element that is pivotally connected to the said enclosing wall of said receptacle, which flag element is mainly outside of said receptacle, and which flag element operatively connects with said trigger element such that when said trigger element is in an untripped position, said flag element is substantially parallel to the outer surface of said enclosing wall, which position is the untripped position of said flag element, and when said trigger element is in a tripped position, said flag element is substantially perpendicular to said enclosing wall, which position is the tripped position of said flag element;

c. an operative connection between said trigger element and said signal flag element comprising planar extensions of the proximal end of each said element, the planar extension of te trigger element lies in a plane which is substantially parallel to and which may be coplanar with the pivot axis of said trigger element, and the planar extension of the signal flag element lies in a plane which is substantially parallel to and which may be coplanar with the pivot axis of said flag element, which two pivot axes are substantially parallel but not colinear, which planar extensions are each longer than the distance between said pivot axes, and which planar extensions slidably engage one another directly and through no other interconnecting means as each said element pivots on its respective pivot axis.

4,721,245
METHOD AND AN APPARATUS FOR SPRAYING A LIQUID
Adriaan van Zwooden, Rijsenhout, Netherlands, assignor to Multinorm B.V., Netherlands
Filed May 12, 1986, Ser. No. 862,266
Claims priority, application Netherlands, May 13, 1985, 8501365
Int. Cl.[4] A01M *7/00*
U.S. Cl. 239—10 18 Claims



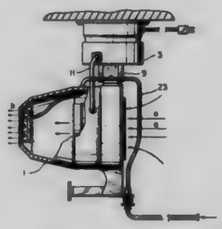
1. A method for spraying a liquid admixture such as a herbicide solution onto a field, which comprises the steps of:

(a) separately pumping a carrier liquid and an active liquid into admixture with each other to obtain a finite, desired concentration of the active liquid in the carrier liquid and discharging the liquid admixture at such finite, desired concentration in the form of spray;

(b) directing the sprayed liquid admixture onto a field while it is being swept at a controlled speed of travel over the field; and

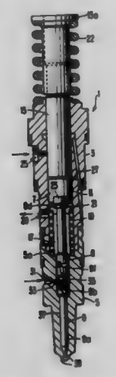
(c) varying the quantity per unit of time at which the finite, desired concentration of liquid admixture is sprayed in accord with variations of the speed of travel to effect a uniform distribution of the active liquid onto the field.

4,721,246
VAPORIZATION SYSTEM
Gaston Lefebvre, Florimont, and Denis Chamberland, Dorion, both of Canada, assignors to Microspray International Inc., Quebec, Canada
Continuation-in-part of Ser. No. 682,988, Dec. 18, 1984, abandoned, which is a continuation of Ser. No. 409,928, Aug. 20, 1982, abandoned. This application Sep. 24, 1985, Ser. No. 779,570
Int. Cl.[4] B05B *3/10*
U.S. Cl. 239—70 7 Claims



1. A system for producing a continuous circular spray of a treating liquid inside an enclosure which comprises in combination, a single spray application, a rotary table capable of making complete continuous revolutions about axis thereof, said rotary table comprising a hollow cylindrically-shaped housing, a top fixedly engaged with respect to the upper periphery of said hollow housing to enable fixed mounting of said housing, a shaft downwardly depending from said top and axially extending in said housing short of lower portion thereof, said shaft being connected to said top to be maintained fixed with respect to said housing, a base mounted at the lower portion, and cooperating means between said lower portion of said housing and said base to enable said base to be freely rotatable relative to said housing, a sleeve mounted at the bottom of said shaft and extending partly up said shaft, bearing means between said sleeve and the lower portion of said shaft to permit free rotation of said sleeve, said sleeve being formed with an outwardly projecting continuous circular flange, bolt means to connect said flange to said freely rotatable base and to enable said base to be rotated upon rotation of said sleeve, motorized means incorporated in said housing to cause rotation of said sleeve thereby rotating said freely rotatable base, and means for mounting said spray applicator on said base so as to enable said spray applicator to direct a continuous spray of a treating liquid all around the axis of said rotary table following rotation of said spray applicator, and means for feeding said treating liquid to said spray applicator.

4,721,247
HIGH PRESSURE UNIT FUEL INJECTOR
Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Sep. 19, 1986, Ser. No. 909,208
Int. Cl.[4] F02M *45/00, 53/04, 55/00*
U.S. Cl. 239—91 21 Claims



1. A periodic fuel injector, comprising

(a) an injector body containing a central bore and an injection orifice at the lower end of the body,

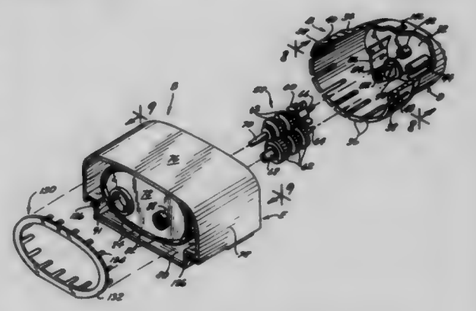
(b) metering means for metering a variable quantity of fuel for injection through said injection orifice on a periodic basis dependent upon the pressure of fuel supplied to said injector body, said metering means including a lower plunger mounted for reciprocal movement within said central bore

(c) hydraulic timing means for varying the timing of each periodic injection of metered fuel dependent upon the pressure of a hydraulic timing fluid supplied to said injector body, said hydraulic timing means including an upper plunger mounted for reciprocal movement within said central bore and an intermediate plunger mounted for reciprocal movement within said central bore between said upper and lower plungers, said timing fluid being supplied to a timing fluid chamber between said upper and intermediate plungers;

(d) valve means for opening and closing passage means for draining timing fluid from said timing fluid chamber; and

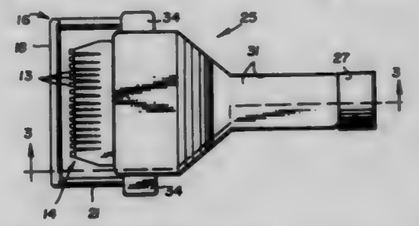
(e) a spring mounted in said central bore and acting upon said lower plunger as a means for biasing said intermediate plunger upwardly, for controlling lifting of said lower plunger, and for controlling opening of said valve means.

4,721,248
READILY ASSEMBLEABLE OSCILLATING SPRINKLER
Ho Chow, Cliffside Park, N.J., assignor to Jet Stream, Inc., Wilmington, Del.
Filed Apr. 14, 1986, Ser. No. 852,030
Int. Cl.[4] B05B *3/16, 3/00, 1/00*; F16D *1/00*
U.S. Cl. 239—242 8 Claims



1. In an oscillating sprinkler, a housing on which a sprinkler tube is adapted to be mounted and within which driving means for said sprinkler tube is received, said housing comprising a first section having an end wall for carrying said tube and an output member driven by said driving means and having a side wall, water input means for said sprinkler, said housing comprising a second section having an end wall for carrying said water input means and having a side wall sealingly engaging said side wall of said first section, one of said sections carrying projecting spring fingers and the other of said sections having openings into which said spring fingers are adapted to be received, said spring fingers then resiliently engaging said one section for inhibiting separation of said sections after said sections have been assembled.

4,721,249
LOW NOISE SAFETY AIR NOZZLE
B. Dean Lassiter, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed May 19, 1986, Ser. No. 864,216
Int. Cl.[4] B05B *1/28, 15/04*
U.S. Cl. 239—288.5 18 Claims



1. A blow-off nozzle assembly comprising:

a multi-channel substantially flat air jet nozzle presenting a plurality of individual jets disposed in a generally side-by-side linear array;

means for preventing deadending of said nozzle while not significantly increasing the noise level of the nozzle, said deadending preventing means comprising a generally oblong shaped guard defining a generally oblong shaped opening which is significantly larger than the dimensions of said linear array of jets; and

means for mounting said guard so that said oblong shaped opening is spaced a predetermined distance from said

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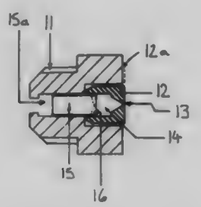
nozzle in the direction of air flow from said nozzle such that the noise level of the nozzle does not significantly increase, and said linear array is substantially centered within a geometric projection of said opening.

4,721,250

METHOD AND APPARATUS FOR EFFECTING CONTROL OF ATMOSPHERIC TEMPERATURE AND HUMIDITY

John Kennedy, and Eric Watson, both of Palm Springs, Calif., assignors to Canadian Microcool Corporation, Vancouver, Canada

Continuation-in-part of Ser. No. 744,235, Jun. 13, 1985, abandoned. This application Jun. 3, 1986, Ser. No. 868,556
Int. Cl.[4] B05B 1/34
U.S. Cl. 239—383 5 Claims



1. An environmental control system for atmospheric control of temperatur and/or humidity in a given area which comprises, a water supply means, means for filtering said water to remove particles having a diameter greater than 10 microns therefrom, means for pumping said filtered water to an elongated conduit positioned within said given area at a pressure of 500–700 psi, said conduit having incorporated thereon a plurality of spaced apart nozzles each of which is provided with a spray orifice having a diameter of about 10 microns to thereby generate a spray pattern of microscopic water particles for rapid evaporation with resultant cooling and/or humidification, each of said nozzles comprising (a) a housing inserted into said conduit, (b) an insert positioned within the forward portion of said housing formed with an orifice passage having a diameter of about 10 microns for projecting said spray pattern of microscopic particles from said nozzle, said insert having a cylindrical chamber therein positioned inward of said orifice, (c) a cylindrical chamber within said housing extending rearward of said insert said chamber being coextensive with and having the same diameter as the chamber within said insert, (d) a closely fitting rotatable cylindrical impeller positioned within said chambers in said housing and said insert, having a diameter only slightly less than the diameter of said chambers, to provide a proper degree of turbulence, said impeller being adapted to slide back and forth longitudinally of said chamber,

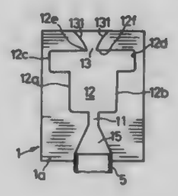
(e) said insert being positioned to project forward of said housing by a distance of about 0.005–0.020 inches in order to prevent retention of water droplets at the orifice exit after cessation of water flow to minimize deposition of minerals and avoid clogging of the orifices.

4,721,251

FLUID DISPERSAL DEVICE

Yasuo Kondo, Okazaki; Koji Miura, Gamagori; Osamu Maeda, Okazaki; Makoto Kuroyanagi, Kariya, and Takao Oshiro, Toyoake, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Continuation of Ser. No. 757,844, Jul. 22, 1985, abandoned. This application May 5, 1987, Ser. No. 47,601
Claims priority, application Japan, Jul. 27, 1984, 59-157872; Dec. 18, 1984, 59-266904; May 15, 1985, 60-103603; May 20, 1985, 60-107190
Int. Cl.[4] B05B 7/12, 1/08
U.S. Cl. 239—412 16 Claims



1. A fluid dispersal device comprising:

a housing having wall means defining a first chamber and a second chamber, which is stepwise widened from said first chamber, in the interior of said housing, said first chamber being unobstructably comunicated with said second chamber

a fluid inlet port in a wall of said housing for introducing pressurized fluid thereinto;

a nozzle in said housing and communicated with said fluid inlet port for jetting the pressurized fluid from said fluid inlet port into said first chamber as a fluid jet; and

an outlet throat in a wall of said housing for jetting the fluid jet from said second chamber;

said wall means being composed of

deflection wall means partly defining said first chamber, for sucking and deflecting the fluid jet jetted from said nozzle due to the interaction therewith in one deflecting direction, said deflection wall means extending sidewards from said nozzle and then extending towards only said outlet throat,

branch wall means for branching the deflected fluid jet into two branch flows, one branch flow flowing into said outlet throat and jetting from said outlet throat, and the other branch flow flowing sidewards in said second chamber, and

turn wall means extending from said deflection wall means stepwise and in part defining said second chamber for turning said other branch flow and colliding the turned other branch flow with the deflected fluid jet in a direction generally perpendicular to the jetting direction of the deflected fluid jet to push the deflected fluid jet in a direction opposed to the one deflecting direction,

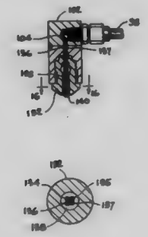
said deflection wall means having two opposed deflection wall portions, said turn wall means having two opposed concave-shaped turn portions, the distance between said opposed turn wall portions being larger than that between said opposed deflection wall portions, said branch wall means having two spaced branch wall portions, each projecting from a downstream end of said throat and spaced from each other through a predetermined distance, and said outlet throat being defined in part by said opposed branch wall portions.

4,721,252

HOT-MELT SPUTTERING APPARATUS

Douglas E. Colton, Salinas, Calif., assignor to Slautterback Corporation, Monterey, Calif.

Continuation-in-part of Ser. No. 704,892, Feb. 22, 1985, Pat. No. 4,602,741, which is a continuation of Ser. No. 493,710, May 11, 1983, abandoned. This application May 14, 1986, Ser. No. 863,088
Int. Cl.[4] B05B 1/14, 7/06, 7/16
U.S. Cl. 239—424.5 15 Claims



1. An apparatus for the spraying of hot-melt material or the like comprising,

a nozzle having a hot-melt material path and a plurality of gas flow paths and having a nozzle outlet, said hot-melt material path terminating at said nozzle outlet, said gas flow paths defining inner flow paths being suppliable with a stream of gas, said hot-melt material path defining an outer flow path surrounding said inner flow path at said nozzle outlet and being separately suppliable with a stream of hot-melt material, said inner flow paths extending at least as far as said nozzle outlet, said stream of hot-melt material being projectable into the surrounding atmosphere from said outer flow path at said nozzle outlet, the gas breaking up said stream of hot-melt material into an area-wide spray of droplets.

12. In an automated assembly line for the hot-melt adhesive sealing of cartons with top and bottom flaps, in which hot-melt material is dispensed from a heated dispenser, a hot-melt spray system comprising,

a first nozle assembly means for directing hot-melt material onto top flaps of a carton, said first nozzle assembly means having a first nozzle manifold and a firt plurality of nozzles delivering a hot-melt outflow stream, said first nozzle manifold connected to a first heated hot-melt dispenser head in a hot-melt transfer relationship,

a second nozzle assembly means spaced apart from the first nozzle assembly means for directing hot-melt material onto bottom flaps of said carton, said second nozzle assembly means having a second nozzle manifold and a second plurality of nozzles delivering a hot-melt outflow stream, said second nozzle manifold connected to a second heated hot-melt dispenser head in a hot-melt transfer relationship,

means for injecting a gas stream coaxially within the hot-melt outflow streams of the first and second nozzle assembly means, thereby breaking up a stream of hot-melt material, said means for injecting a gas stream including a plurality of tubular gas flow conduits, there being at a least two tubular gas flow conducts in each nozzle, each tubular gas flow conduit being parallel to said hot-melt outflow stream within at least a portion of one of said nozzle, and

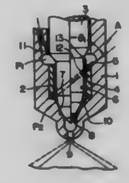
means for supplying gas into said plurality of tubular gas flow conduits.

4,721,253

INTERMITTENT TYPE SWIRL INJECTION NOZZLE

Masaaki Noguchi; Masaharu Sumiyoshi; Yujiro Oshima, and Masatoshi Yamada, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Oct. 4, 1985, Ser. No. 784,062
Claims priority, application Japan, Nov. 14, 1984, 59-241483
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] B05B 1/30; F02M 47/00
U.S. Cl. 239—464 1 Claim



1. An intermittent type swirl injection nozzle comprising:

a nozzle body comprising a guide hole and a bottom portion on which a spray hole and a body seat are formed;

a fuel supply source for supplying fuel;

a needle valve slidably inserted and reciprocally moved within said guide hole of said nozzle body, said needle valve having a tip portion for seating on said body seat to open and close said spray hole;

a swirl chamber formed downstream of said fuel supply source and upstream of said spray hole, said swirl chamber being defined between said nozzle body and said needle valve, and said swirl chamber communicating with said spray hole when said tip portion of said needle valve is not seated on said body seat, and said tip portion of said needle valve being located downstream of said swirl chamber when said tip portion is seated on said body seat;

a swirl passage connected to said swirl chamber and provided around a longitudinal axis of said needle valve for giving a swirl flow influence around said axis of said needle valve to fuel flowing when said needle valve is lifted from said body seat to open said spray hole;

a straight passage connected to said swirl chamber and provided between said nozzle body and said needle valve in a region where they slidably contact for giving the fuel a straight flow influence in an axial direction of said needle valve;

inlet means, provided downstream of said fuel supply source and upstream of said swirl chamber, for communicating said fuel supply source with said straight passage and said swirl passage; and

means (4) for separating said straight passage from said swirl passage and preventing the fuel having the swirl flow influence from mixing with the fuel having the straight flow influence before entering said swirl chamber, said separating means being disposed between said nozzle body and said needle valve,

wherein said swirl and straight passages satisfy at least one of the following conditions:

(1) the sum of first and second effective flow areas (K_1+K_2) of said swirl and straight passages relative to a third effective flow area (K_3) of said spray hole is within a range of 1 to 5;

(2) the first effective flow area (K_1) of said swirl passage relative to the second effective flow area (K_2) of said straight passage is within a range of 0.2 to 2;

(3) the angle (ϕ_1) of said swirl passage relative to the axis of said needle valve is within a range of 5° to 60°; and

(4) the fuel pressure (P_2) in said swirl chamber relative to the fuel pressure (P_1) at said inlet means is within a range of 0.4 to 0.95,

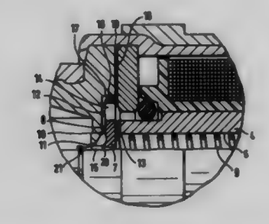
and wherein said swirl passage is defined between said sepa-

rating means and an inner surface of said nozzle body which faces said needle valve, and said straight passage is defined between said needle valve and said separating means.

4,721,254
ELECTROMAGNETICALLY ACTUATABLE FUEL-INJECTION VALVE

Martin Hora, Rotenburg, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 805,086
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444457
Int. Cl.[4] F02M 51/06
U.S. Cl. 239—585 4 Claims



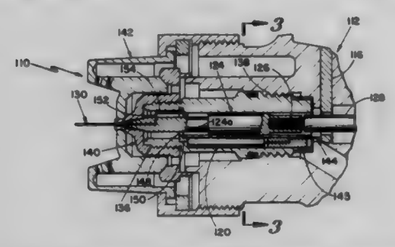
1. In an electromagnetically actuatable fuel-injection valve for injection systems of internal combustion engines, the valve having a valve housing, a soft-iron core located within the valve housing and carrying a stationary solenoid winding, an annular seat, a valve closure plate which forms an armature and coaxially faces said core with the formation of an air gap, a compression spring biasing said plate against said annular seat; and wherein said seat surrounds an outlet of said valve, a radially circumferential edge of said plate is guided axially and is movable along a guide of said valve, said valve correspondingly surrounding said edge, the improvement wherein

the valve closure plate has a coaxially protruding plug, said plug extending at least partway into said outlet, said plug having a concave-fillet-shaped transition towards an outlet-side surface of said valve closure plate.

4,721,255
ELECTROSTATIC RESISTIVE STUD

Robert J. Lind, Robbinsdale, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Mar. 19, 1986, Ser. No. 841,278
Int. Cl.[4] B05B 5/02
U.S. Cl. 239—690 3 Claims



1. In an electrostatic spray gun of the type having fluid passages therein for the passage of fluid therethrough, and having passages therethrough for containing electrically conductive components for carrying a voltage to a forwardly projecting electrode, the electrode and a forwardmost fluid passage being in axial alignment, the improvement comprising:

a fluid ejection orifice proximate the forward end of said forwardmost fluid passage;

a fluid valve adapted for seating in fluid sealing relationship in said fluid ejection orifice;

a conductor in said fluid valve, said conductor having a segment projecting forwardly through said fluid ejection orifice to form said forwardly projecting electrode, and said conductor having a further segment projecting outwardly then rearwardly from said fluid valve into said forwardmost fluid passage;

a fluid stud having a rear end and a passage through which said fluid valve passes;

a portion of said fluid passage being formed between said fluid stud and said fluid valve;

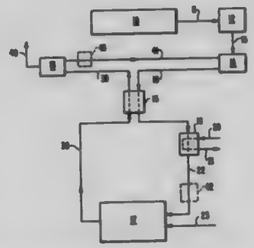
a resistive element having a forward end and being located in one side of said fluid stud and extending axially therethrough; and

means electrically connecting said resistive element forward end with said rearwardly projecting segment, said resistive element extending from said connecting means said rear end.

4,721,256
COMMINUTION OF COAL, ORES AND INDUSTRIAL MINERALS AND ROCKS

Geoffrey J. Lyman, Tarragindi, Australia, assignor to University of Queensland, Queensland, Australia

PCT No. PCT/AU85/00173, § 371 Date Mar. 25, 1986, § 102(e) Date Mar. 25, 1986, PCT Pub. No. WO86/00827, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 26, 1985, Ser. No. 852,309
Claims priority, application Australia, Jul. 26, 1984, PG6235
Int. Cl.[4] B02C 19/18
U.S. Cl. 241—1 8 Claims



1. A method of comminuting minerals in a continuous comminution system including the steps of:

(a) crushing the minerals to form mineral particles;

(b) conveying the mineral particles to a feeder;

(c) separately conveying to the feeder a stream of cryogenic process fluid in the form of a liquified relatively chemically inert gas selected from the group consisting of liquid carbon dioxide and liquid nitrogen;

(d) combining the mineral particles and said cryogenic process fluid and conveying the particles in the stream of cryogenic fluid to a comminutor;

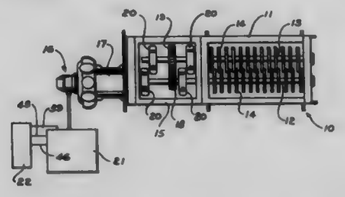
(e) passing said mineral particles and said process fluid through a zone in said comminutor comprised of mechanically induced high frequency vibratory energy thereby comminuting said mineral particles; and

(f) separating the comminuted particles from the cryogenic stream of process fluid.

4,721,257
ROTARY SHREDDING APPARATUS

Robert M. Williams, Ladue, Mo., and Harold J. Groves, Granite City, Ill., assignors to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Dec. 4, 1986, Ser. No. 937,975
Int. Cl.[4] B02C 25/00
U.S. Cl. 241—36 6 Claims



1. In a rotary shredding apparatus having counter-rotating cutter supporting shafts, reversible fluid pressure driven motor means connected to said shafts for driving said shafts in a forward shredding direction and for driving said shafts in a reverse direction to clear a jam in said apparatus, a hydraulic fluid flow circuit connected to said motor means and including fluid pump means to cause fluid flow in said fluid flow circuit at a predetermined nominal flow rate and fluid flow directing valve means in said fluid flow circuit in advance of said motor means, and control means connected to said flow directing valve means for sequencing said flow directing valve means in a forward shredding direction, or reverse jam clearing direction of said motor means, and for sequencing said flow directing valve means into a neutral position; the improvement therein comprising the combination of:

(a) a fluid flow rate sensing device in said fluid flow circuit between said pump means and said fluid flow directing valve means, said sensing device being rendered operative upon the sensing of a reduced rate of fluid flow of the order of about 10% of the predetermined nominal flow rate; and

(b) means operatively connecting said sensing device with said control means on detecting said reduced rate of fluid flow for sequencing said flow directing valve means to its neutral position to determine the existence of a malfunction in the fluid flow circuit.

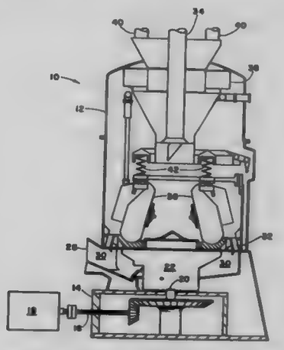
4,721,258
ROLL-AND-RACE PULVERIZER WITH ROTATING THROAT

Donald R. Dougan, North Canton; Gerald W. Peters, Canal Fulton, and William C. Kish, Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 808,130, Dec. 12, 1985, Pat. No. 4,697,145.
This application Jun. 17, 1987, Ser. No. 63,544
Int. Cl.[4] B02C 15/06
U.S. Cl. 241—57 2 Claims

1. A pulverizer throat assembly for a roll-and-race pulverizer having an annular opening for mounting circumferentially rotatable airfoil vanes within said annular opening, comprising:

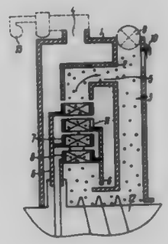
a pulverizer throat, mountable within the annular opening and having a configuration defined by a circular outer throat wall having an inlet radius of curvature R1, a circular inner throat wall having an inlet radius of curvature R2, a throat ledge cover, and circumferentially rotatable airfoil vanes, said vanes having a teardrop shape at a lower end and an airfoil shape on a portion of an upper end of a length L1, said upper end having a constant thickness, said vanes radially extendable within the annular opening across the radial width thereof and at circumferentially spaced locations between successive vanes such that a ratio of the airfoil length L1 to a minimum distance between vanes D2 is greater than 1.0 and less than 5.0, and such that a ratio of the radii of curvature R1 and R2 to the radial width of the annular opening is greater than 0.5 and less than 1.5, and wherein the vanes are vertically extendable within the annular opening at an angle from the horizontal with their upper ends in advance with respect to the circumferential direction of rotation thereof.



4,721,239
DISINTEGRATOR

Bella U. Shagarova; Olev G. Reemet, both of Mustamyae tee, 149, kv. 113; Aare P. Purga, bulvar Gagarina, 12, kv. 6, all of Tallin, and Oleg N. Tikhonov, 17 linia 40, kv. 53, Leningrad, all of U.S.S.R.

PCT No. PCT/SU85/00003, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04822, PCT Pub. Date Nov. 7, 1985
PCT Filed Jan. 17, 1985, Ser. No. 829,126
Claims priority, application U.S.S.R., Apr. 23, 1984, 3736671
Int. Cl.[4] B02C 13/22
U.S. Cl. 241—57 2 Claims



1. A disintegrator comprising:

a housing having a charging pipe;

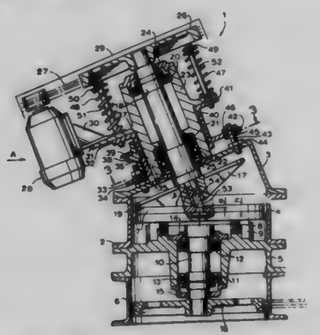
a plurality of rotors mounted in said housing such that adjacent rotors are capable of being rotated in opposite directions;

carrier means secured to each said rotor in radially displaced rows;

beaters secured on said carrier means; and

at least one of said carrier means in at least one row including at least one substantially radially directed side with at least one opening or slot.

4,721,260
DISC CRUSHER
Ivan V. Genev, Sofia, Bulgaria, assignor to N I I Po Cherna Metalurgia, Sofia, Bulgaria
Filed Jul. 21, 1986, Ser. No. 888,532
Claims priority, application Bulgaria, Jul. 19, 1985, 71152
Int. Cl.[4] B02C 7/14
U.S. Cl. 241—101.2 9 Claims



1. A disc crusher comprising a case with a cover in which a disc having a top surface is seated, and a first shaft mounted in a bearing body and disposed at an angle with respect to the disc surface, on which shaft there is mounted a cone, the generatrix of the cone being parallel to the top surface of the disc, while the bearing body together with the shaft and the cone is displaceable axially forming thus a crushing gap between the generatrix of the cone and the top surface of the disc,

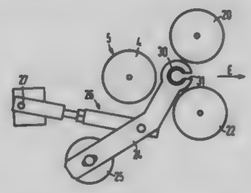
the bearing body being provided with a flange, on which flange there are arranged a plurality of shock absorbing springs; and

a joining body having upper and lower flanges, the flange of the bearing body being joined to the upper flange of the joining body, by means of stud bolts passing freely through holes in the flange of the bearing body, the upper flange, and said springs, and said joining body being joined by means of its lower flange to the cover of the case;

said joining body comprising a top ring with said upper flange and a bottom ring with said lower flange, said top and bottom rings being provided on their external surfaces with threads, the threads of the top ring being pitched opposite to the threads of the bottom ring so that the axial displacement of the bearing body, the shaft and the cone which forms the crushing gap is effected twice as fast as were said threads not oppositely pitched.

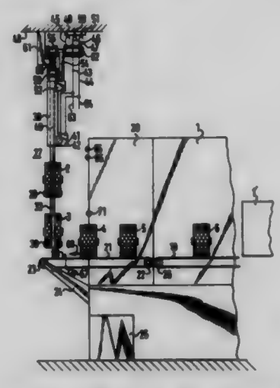
4,721,261
WINDING APPLIANCE FOR TOROIDAL CORE COILS
Juergen Kaiser, Regensburg, and Rudolf Kerler, Pielmuehle, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 16, 1986, Ser. No. 863,860
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520497
Int. Cl.[4] H01F 41/08
U.S. Cl. 242—4 B 3 Claims

1. A winding appliance for toroidal core coils comprising a toroidal core attaching device, including an annular magazine for magazining wire to be wound on said toroidal core, wherein said magazine is conducted through the toroidal core opening, is equipped with rotatably seated casters for wire guidance, and is interrupted in a region of its length, and wherein the toroidal core and the magazine are rotatable around their rotationally symmetrical axes which are preferably aligned perpendicular to one another, including a wire feed which is fashioned such that the beginning of the wire is guided between two casters to an element for attaching the beginning of the wire which is distinct from the magazine and which is also arranged distinct from the toroidal core and which releases the beginning of the wire in the course of the winding operation, and including adjustaable brushes which press against the magazined wire with a pressure corresponding to the desired winding tension, having the improvement that said toroidal core attaching device comprises a receptacle sleeve



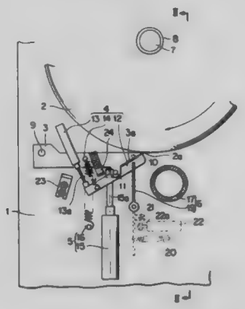
for said toroidal cores, said receptacle sleeve being held on a pivotable arm by means of which said receptacle sleeve is pivotable into the orbit of said magazine and wherein said sleeve is open in a region of its generated surface which is directed to the center of said magazine in a winding position and said receptacle sleeve and said toroidal core forming a clamp therebetween for said wire which is accessible at said open region of said receptacle.

4,721,262
TEXTILE MACHINE FOR PRODUCING CROSS-WOUND BOBBINS
Manfred Langen, Moenchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany
Continuation of Ser. No. 844,814, Mar. 27, 1986, abandoned.
This application Jun. 19, 1987, Ser. No. 61,603
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511816
Int. Cl.[4] B65H 67/06
U.S. Cl. 242—35.5 A 13 Claims



1. Textile machine for producing cross-wound bobbins, comprising a winding machine, a head end of the textile machine, a cycling conveyor disposed at said head end for transporting cross-wound bobbins from said winding machine in a given cycling direction, at least one bobbin frame movable relative to said cycling conveyor between loading positions and a transport position in which the entire width of said bobbin frame as seen in said given cycling direction is disposed above said cycling conveyor, said cycling conveyor fully loading said bobbin frame with cross-wound bobbins from said cycling conveyor from one side of said bobbin frame, means for moving said bobbin frame across said given cycling direction, said bobbin frame including vertical carriers and pairs of mutually spaced apart carrier elements disposed on said vertical carriers for supporting at least one row of cross-wound bobbins at least at one level, said carrier elements of each pair being disposed at substantially the same height above said cycling conveyor and being mutually spaced apart by a given distance, said cycling conveyor being narrower than said given distance, said bobbin frame having vertical openings formed therein from below permitting passage of said cycling conveyor between said vertical carriers, and at least one lifting device for adjusting the relative height of said bobbin frame and said cycling conveyor.

4,721,263
DEVICE FOR AUTOMATICALLY STRIPPING AND DELIVERING FORE END OF A PAPER ROLL
Masaru Miyazaki, Tokyo, Japan, assignor to Japan Tobacco, Inc., Japan
Filed Jan. 17, 1986, Ser. No. 820,882
Claims priority, application Japan, Jan. 28, 1985, 60-9167[U]
Int. Cl.[4] B65H 19/00
U.S. Cl. 242—55 6 Claims



1. A device for automatically stripping and delivering a leading end of a paper roll, said device comprising:

a stripping lever having a fore end movable into and out of contact with the paper roll;

a bobbin driving means for rotating a bobbin with the paper roll wound thereon so that the leading end of the paper roll is rotatable into contact with a fore end portion of said stripping lever;

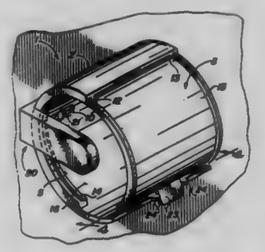
a pawl member mounted on said stripping lever for movement into and out of contact with the fore end of the stripping lever to grip the leading end of the paper roll conjointly with the fore end of the stripping lever when the paper roll leading end is in contact with the fore end of the stripping lever;

a stripping lever driving means for moving said stripping lever into a first position in abutment with the paper roll and pivoting the stripping lever away from the paper roll into a second position after gripping of the leading end of the paper roll by both the stripping lever and said pawl member occurs;

a sucking and delivering means for sucking the leading end of the paper roll after it is stripped and drawn out away from the roll by both said stripping lever and said pawl member into said second position to enable transferring movement of said leading end from the stripping lever and pawl member to another location; and

a stationary base plate to which the stripping lever, bobbin driving means, pawl member, stripping lever driving means and sucking and delivering means are mounted, said first and second positions lying along an arcuate path along which the fore end of the stripping lever moves.

4,721,264
CHILD-PROOF TOILET TISSUE DISPENSER
Giovanna F. Muscarello, 1865 E. Fountain St., Mesa, Ariz. 85203
Filed Jan. 15, 1987, Ser. No. 62,843
Int. Cl.[4] B65H 19/00; B65D 85/66
U.S. Cl. 242—55.53 4 Claims



1. An accessory for a conventional toilet tissue roll holder comprising:

(A) a first, stationary component, said first component being generally in the form of an incomplete cylinder and having first and second open ends, said first component having an arcuate cross sectional configuration comprehending the range between one-half and five-eights of a full circle, said first component further including:

1. a coupling region situated intermediate the circumferential reach of said stationary component and disposed generally parallel to the axis thereof, said coupling region having inside and outside faces and:
   a. being elongated and flattened on said outside face thereof;
   b. having a pair of spaced apart elongated apertures between said inside and outside faces, said apertures being disposed in alignment with one another and generally parallel to the axis of said first component;
2. a first circumferentially extending, inwardly directed guide disposed proximate said first open end of said first component;
3. a second circumferentially extending, inwardly directed guide disposed proximate said second open end of said first component;

(B) a second, movable component, said second component being generally in the form of an incomplete cylinder and having first and second open ends, said second component having an arcuate cross sectional configuration comprehending approximately one-half of a full circle, said second component further including:

1. a first circumferentially extending, outwardly directed flange disposed proximate said first open end of said second component;
2. a second circumferentially extending, outwardly directed flange disposed proximate said second open end of said second component;

(C) the respective distances between said guides and between said flanges being such as to permit said first and second flanges to slideably cooperate, respectively, with said first and second guides;

whereby, said accessory may be emplaced over a standard wall-mounted toilet tissue holder by removing the screws holding the same, positioning said accessory over the holder with said apertures over the screw holes in the wall and replacing the screws, said first and second flanges being captured by said first and second guides to permit rotation of said second component coaxially within said first component between alternative protected, closed and unprotected, open positions, the protected position preventing toilet tissue to be withdrawn from its roll and the unprotected position permitting toilet tissue to be withdrawn from its roll.

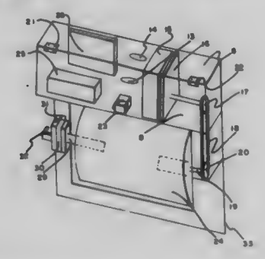
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,265

ELECTRONIC TOILET TISSUE DISPENSER

Junior F. Hawkins, 3120 W. 16th, Wichita, Kans. 67203

Filed Jun. 9, 1986, Ser. No. 872,061
Int. Cl.[4] B65H *16/00*; G01V *9/04*
U.S. Cl. 242—55.53 18 Claims



1. A toilet tissue dispenser comprising a box having a back and four upstanding walls connected to the back such that the tops of the four upstanding walls form an opening; a panel means having four panel sides integrally bound to each other and secured to the tops of the four upstanding walls and flanging outwardly therefrom; a generally L-shaped compartment means mounted on two panel sides, said compartment means comprising a control compartment means secured to one panel side and a guard compartment means mounted to a panel side contiguous to the panel side that supports the control compartment; a drive motor means mounted in said control compartment means; a control circuit means mounted in said control compartment means for controlling the operation of said drive motor means; a night sensor means mounted in said control compartment means and communicating with ambient light such that when ambient light does not strike the night sensor means said control circuit means can not energize the drive motor means; a day sensor means mounted in said control compartment means and communicating with said ambient lighting such that if ambient lighting is striking the night sensor means, then interrupting the ambient lighting to the day sensor means causes the control circuit means to energize the drive motor means; a stop member mounted to the panel side that is opposed to the panel side that supports the guard compartment; a bracket assembly superimposed over the stop member and slidably mounted transverse to the panel side that is opposed to the panel side that supports the guard compartment; and a means secured to said stop member and to bracket assembly for biasing said bracket assembly away from said stop member.

12. A method for dispensing toilet tissue comprising the steps of:

(a) providing a panel means circumscribing a box;

(b) mounting rotatably a roll of toilet tissue to the panel means such that said roll of toilet tissue rotates in said box spacedly;

(c) providing a night sensor means in a control compartment means supported by said panel means wherein said night sensor means communicates with ambient light such that when ambient light does not strike the night sensor means a control circuit means mounted in said control compartment means can not energize a drive motor means to rotate the roll of toilet tissue in order to dispense toilet tissue therefrom;

(d) providing a day sensor means in said control compartment wherein said day sensor means communicates with ambient lighting such that if ambient lighting is striking the night sensor means, then interrupting the ambient lighting to the day sensor means causes the control circuit means to energize the drive motor means to rotate the roll of toilet tissue in order to dispense toilet tissue therefrom;

(e) striking the night sensor means with ambient lighting;

(f) covering contactless the day sensor means to interrupt ambient lighting to the day sensor means causing the control circuit means to energize the drive motor means and commence the rotating of the roll of toilet tissue;

(g) maintaining said covering step (f) until the desired amount of toilet tissue has rotated off of the roll of toilet tissue; and

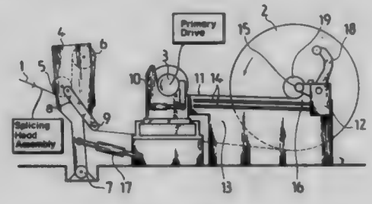
(h) removing said covering step (f) such that the day sensor again communicates with the ambient lighting to cause the control circuit means to deengage the drive motor means and stop the rotating of the roll of toilet tissue.

4,721,266

CONTINUOUSLY RUNNING REWINDER WITH PRESSURE ROLLER

Pekka Haapanen; Harri Kuoss; Ari Björkman, all of Järvenpää ; Rauno Hagel, and Ari Lassila, both of Helsinki, all of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Filed Sep. 15, 1986, Ser. No. 906,981
Claims priority, application Finland, Sep. 17, 1985, 853553
Int. Cl.[4] B65H *19/29, 19/30*
U.S. Cl. 242—56 R 7 Claims



1. A continuously running rewinder system comprising:

a reel-up drum on which a paper web can be wound;

roll stands for rotatably supporting said reel-up drum;

primary drive means for rotating said reel-up drum supported on said roll stands;

a pressure roller assembly including a pressure roller via which the web is routed to pass onto said reel-up drum and which can be actuated from an open position towards said roll stands to a closed position so as to press said pressure roller against said reel-up drum providing a nip for the web therebetween;

a splicing head assembly for facilitating a continuously running reel-up drum change from said reel-up drum to an additional reel-up drum;

a pressing bar movable between an upper position and a lower position with a path of movement located in the space between said pressure roller and said reel-up drum and via which the path of the web is routed to pass;

whereby when said pressing bar is in its lower position and said pressure roller assembly is in its open position, said pressing bar holds the web at a lower position than that of the nip;

a rail-carriage combination for transporting a nearly completed roll on said reel-up drum from said roll stands to an exit position; and

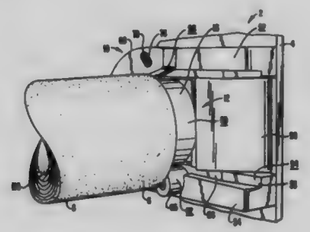
movable secondary drive means adapted to be switched for said primary drive means for driving said reel-drum during movement of the nearly completed roll on said reel-up drum to the exit position during a web splicing and severing operation.

4,721,267

MOUNTING ASSEMBLY FOR A ROLL OF MATERIAL

Robert L. Nieto, Concord; Joseph B. Camacho, and David J. Devine, both of San Jose, all of Calif., assignors to Beason, Inc., Mountain View, Calif.

Filed Mar. 7, 1986, Ser. No. 837,457
Int. Cl.[4] B65H *16/06, 23/06*
U.S. Cl. 242—68.4 15 Claims



13. A print media roll mounting assembly for use at at least one end of a roll of print media to mount the print media roll to a support structure, the print media roll of the type having an outer circumference, end surfaces and a hollow core with open ends, the assembly comprising:

first and second core inserts, each manipulable between expanded and retracted conditions, each including a radially expandable first portion insertable within the open end of the hollow core when in the retracted condition;

first and second means for radially expanding the first ends of the first and second core inserts so to secure the core inserts within the hollow core;

the core inserts each including a second portion positioned external of the hollow core; and

first and second insert support assemblies, mountable to the support structure, for rotatably supporting the second portions of the core inserts, each core insert support including:

a frame;

the frame defining a guide path for directing movement of the print media roll between a first position at an entrance of the guide path and a second position along the guide path;

a core insert contact surface for engagement with the second portion of the core insert when the print media roll is at the second position;

means for biasing the second portion of the core insert against the contact surface to create a drag force on the core insert retarding rotational motion of the core insert and print media roll therewith;

a flipper, positioned along the guide path and movable between a free movement position and a blocking position, for blocking movement of the core insert and print media roll therewith from the second position to the first position when in the blocking position and for permitting movement of the core insert and print media roll therewith from the second position to the first position when in the free movement position, the flipper including a core insert edge contact portion;

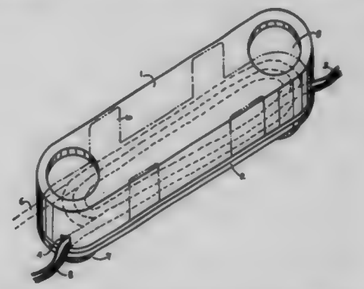
means for biasing the flipper towards the blocking position so the core insert edge contact portion applies an axially directed force to the print media roll so the flippers of the first and second insert support assemblies bias the print media roll toward each other when in the blocking position.

4,721,268

MODULAR POWER CORD AND CABLE ORGANIZER

Lawrence Lerner, Beverly Hills, and Stephen P. Diskin, Los Angeles, both of Calif., assignors to Mega/ERG Inc., Beverly Hills, Calif.

Filed Oct. 9, 1986, Ser. No. 916,865
Int. Cl.[4] B65H *75/34*
U.S. Cl. 242—85.1 3 Claims



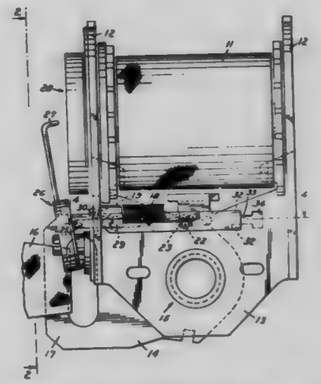
1. A modular power cord and cable organizer including, a cover component and base component of substantially similar elongated dimensions, said cover component fitting over said base component and held together by friction fit to form an elongated container having a longitudinal axis, a pair of openings at each end of the longitudinal axis of said container to permit entry and exit of any of a variety of cables or power cords when the cables or power cords are coiled and inserted into said container, and connecting means located in said base and cover components to provide interconnection of a multiplicity of said containers into a single multiple-container device.

4,721,269

SHOULDER BELT COMFORT FEATURE RELEASE

Ronald S. Gulette, Farmington Hills, and James A. Gavagan, Centerline, both of Mich., assignors to Irvin Industries Incorporated, Rochester Hills, Mich.

Filed Apr. 16, 1986, Ser. No. 852,541
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.7 9 Claims



1. Combination lap and shoulder belt restraining system including a mounting frame, a shoulder belt windup spool mounted in said frame, arresting means for arresting rotation of said windup spool in the windup direction to relax shoulder belt tension, means engaging the lap belt for sensing tension in

said lap belt and means responsive to said sensing means for releasing said arresting means from its operative arresting condition to assure full shoulder belt retraction upon relaxation of the lap belt tension when the occupant disengages the lap belt, and means responsive to said sensing means for restoring said winding arresting means to its operative arresting condition upon tensioning of the lap belt when the occupant engages the lap belt.

4,721,270

MISSILE GUIDANCE SYSTEMS

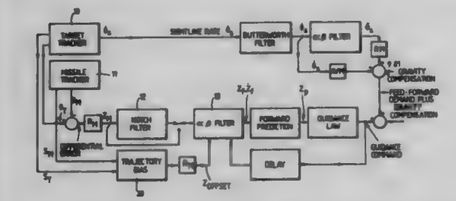
David Salkeld, Stevenage, United Kingdom, assignor to British Aerospace plc, London, England

Filed Oct. 31, 1986, Ser. No. 925,256

Claims priority, application United Kingdom, Oct. 31, 1985, 8526850

Int. Cl.[4] F41G *7/30*

U.S. Cl. 244—3.11 **3 Claims**



1. A missile guidance system including missile tracker means for outputting missile directional data representative of the angular direction of said missile and missile subtense data representative of the angular subtense of said missile, target tracker means for outputting target directional data representative of the angular direction of said target and target subtense data representative of the angular subtense of said target, processing means for processing said missile directional data and target directional data to generate a guidance command adapted to maintain said missile on a sightline connecting the target and the tracker, comparator means for comparing said missile subtense data and said target subtense data, and trajectory bias means responsive to the output of said comparator means for applying an offset to said guidance command when the ratio of the missile subtense to the target subtense exceeds a predetermined value.

4,721,271

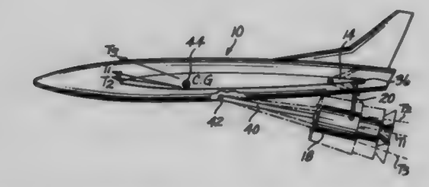
DEVICES AND METHOD FOR ROCKET BOOSTER VECTORING TO PROVIDE STABILITY AUGMENTATION DURING A BOOSTER LAUNCH PHASE

Sidney E. Goldstein, Kirkland, and Ronald J. Pera, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 14, 1985, Ser. No. 701,381

Int. Cl.[4] B64C *15/12*

U.S. Cl. 244—75 R **24 Claims**



14. An aircraft having a rocket booster motor coupled thereto for providing additional stability and control required during a booster launch phase so that the rocket booster thrust is directed in response to controls in the basic aircraft, comprising:

means coupling a rocket booster motor to the aircraft to respond to flight controls in the aircraft so that the rocket thrust vector is directed relative to the center of gravity of the aircraft to maintain stability of the aircraft, to prevent generation of excessive torques, to avoid placing additional demands on the aircraft structure, to avoid severely limiting of available aerodynamic control at low launch speeds, and to provide pitch, roll, and yaw control;

the aircraft having aerodynamic control surfaces for coupling to controls in the aircraft for augmenting stability in the post launch phases of climb, speed flight, and landing;

said means for coupling including supporting links;

a forward link of said links having a forward end ball joint connected to the aircraft aft of its center of gravity and having a rear end fixed to the rocket motor;

a first rear link having pivotal joints at both ends and being connected at one end to an aerodynamic control surface on one side of the aircraft and on one side of the rocket motor;

a second rear link having pivotal joints at both ends and being connected at one end to an aerodynamic control surface on the other side of the aircraft and the other side of the rocket motor;

a transverse link having one end connected to the other end of said first rear link and having its other end connected to the other end of said second rear link, said links being joined in pivotal connections;

a pivot sleeve connected to said rocket motor and through which said transverse link is slidably and rotatably engaged; and

a roll and yaw actuator having its operable shaft having its outer end joined to the rocket motor in a ball and socket connection, the operation of the shaft by the actuator being to move the motor transversely with respect to the aircraft;

said actuator being joined to one of said rear links at its other end and to a corresponding end of said transverse link in a ball and socket connection, and being operated by the flight controls.

4,721,272

EMERGENCY REMOVER DEVICE FOR EJECTING AIRCRAFT CANOPIES

Nordhaus, John P., Northbrook, Ill., assignor to Scot, Incorporated, Downers Grove, Ill.

Filed Jan. 23, 1987, Ser. No. 6,136

Int. Cl.[4] B64C *1/14*

U.S. Cl. 244—122 AF **11 Claims**

1. A pilot actuated emergency aircraft canopy ejector device, said device comprising:

a telescoping cylinder assembly, one end of said assembly being adapted to be mounted within the aircraft in thrust resisting relation thereto and the other end of said assembly being connected to the canopy,

said assembly including an inner cylinder, an intermediate cylinder, and an outer cylinder in telescoped substantially coaxial retracted relation,

said inner cylinder at one end of same defining with said assembly one end a chamber for receiving a ballistic gas generating cartridge and at the other end of same forming said other end of said assembly and defining a fitting formed for providing a pivotal axis connection to the canopy,

said fitting slidably mounting within same a release piston extending longitudinally of said inner cylinder and having an enlarged piston head mounted for shifting movement longitudinally of the inner cylinder and a stem projecting towards said pivotal axis and received in said fitting,

said release piston stem having a necked portion formed intermediate its end,

with the inner cylinder defining a ballistic gas expansion chamber that is open to the cartridge chamber and exposed to said piston head,

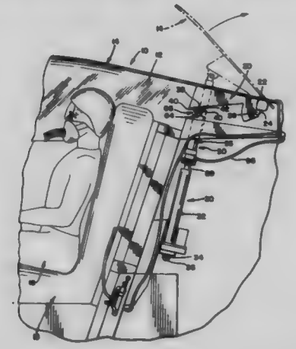
said fitting adjacent said release piston stem being apertured and shiftably receiving an inner latch member that is fully retracted within said fitting when said inner latch member engages said release piston stem necked portion,

with the intermediate cylinder adjacent one end of same being seated adjacent said one end of said assembly and adjacent the other end of same defining a through aperture radially aligned with said inner cylinder aperture when said one end of same is seated adjacent said one end of said assembly,

with the intermediate cylinder being mounted within said outer cylinder for movement longitudinally thereof in the direction of said other end of said assembly and with the outer cylinder being fixed adjacent one end of same to said one end of said assembly against movement longitudinally thereof and defining a recess adjacent the other end thereof that is radially aligned with apertures,

an outer latch member interposed between said outer cylinder recess and said inner latch member and within said intermediate cylinder aperture,

said outer cylinder recess including a cam surfacing that serves to biss said latch members radially inwardly of said assembly when said inner cylinder is pressurized by the ballistic gas from the cartridge when the latter is ignited,



with said inner cylinder being formed adjacent its one end with an external recess that is aligned circumferentially of said assembly with said latch members and apertures,

and first means for precluding ejection of said inner cylinder from said intermediate cylinder when moved longitudinally and outwardly of said other end of said intermediate cylinder, and second means for precluding ejection of said intermediate cylinder from said outer cylinder when said intermediate cylinder is moved longitudinally and outwardly of said other end of said outer cylinder,

whereby, when a cartridge disposed in said cartridge chamber is ignited to emit ballistic gas under pressure into said inner cylinder the pressure of the ballistic gas drives said release piston in the direction of said assembly other end to dispose its necked portion in coplanar relation with said latch member, said latch members are cammed radially inwardly of said assembly to release said inner cylinder from said intermediate cylinder, and said inner cylinder moves in said direction outwardly of said intermediate cylinder to the extent permitted by said first ejection precluding means, whereupon said outer cylinder recess cam surfacing cams said outer said latch member into said inner cylinder external recess to release said intermediate cylinder from said outer cylinder, whereupon said intermediate cylinder moves in said direction outwardly of said outer cylinder to the extent permitted by said second ejection precluding means,

and the momentum of the canopy including said fitting, in moving in said direction, on coming into effect of said second ejection precluding means, frees said fitting from said release piston stem for effecting ejection of the canopy from the aircraft.

4,721,273

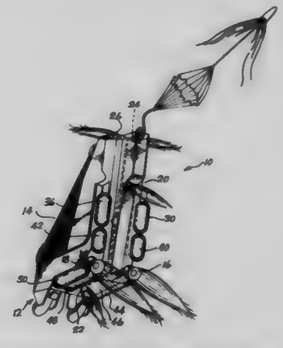
LIFE-THREAT ASSESSMENT AND CONTROL COMMAND FOR AIRCREW ESCAPE SYSTEMS

Arun K. Trikha, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 8, 1986, Ser. No. 894,785

Int. Cl.[4] B64D *25/10*

U.S. Cl. 244—122 AE **21 Claims**



1. A method of effecting crewmember escape from a flying vehicle, comprising:

providing the vehicle with an escape device which can be separated from the vehicle;

positioning the crewmember in said escape device; and

separating the crewmember and the escape device from the vehicle when it is desired to effect an escape, including:

at the start of separation sensing the altitude above ground of the escape device, the sink rate of the escape device and the roll angle of the escape device;

dividing the altitude above ground by the sink rate to obtain a first time value which increases with an increase in altitude above ground and decreases with an increase in sink rate;

dividing the roll angle by a desired rate of roll angle correction to obtain a second time value which increases with roll angle and decreases with the desired rate of roll angle correction;

subtracting the second time value from the first time value to obtain a third time value; and

in response to the third time value being larger than a predetermined time value, controlling the escape to subject the crewmember to a relatively low injury risk level, and in response to the third time value being smaller than said predetermined time value, controlling the escape to occur faster, attended by the crewmember being subjected to a higher injury risk level.

4,721,274

GIMBAL ASSEMBLY

Robert C. Erb, 433 Brockmont Dr., Glendale, Calif. 91202

Filed Aug. 21, 1985, Ser. No. 768,407

Int. Cl.[4] B60R *1/10*; G02B *7/18*

U.S. Cl. 248—179 **12 Claims**

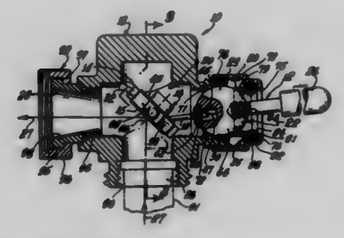
1. A gimbal assembly including a mirror element and comprising

a ring adapted for pivotal mounting about a first axis,

said mirror element pivotally mounted in and to said ring about a second axis,

VOL 1086 ISS 4 JA 26 1988 UMI

a shaft attached to said mirror element for actuating it in motions about the first and second axes,
a structural frame member,
swivel means mounted in said frame member operatively connected to and controlling said shaft,
means mounted on said structural frame member for maintaining said swivel means therein,
said shaft being attached to said mirror element at an angular inclination relative to the axis of said element,



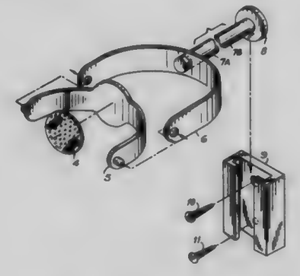
said swivel means comprising
(1) a swivel member having a bore,
(2) gripping means mounted on said swivel member about said bore and gripping said shaft which extends freely into said bore, and
(3) lever means connected to said swivel member in opposing relation to said bore.

4,721,275
STEADY LEVELORS
David B. Benton, 3200 N. Chickasaw, Beverly Hills, Fla. 32665, and George Spector, 235 Broadway RM 3815, New York, N.Y. 10007
Filed Dec. 19, 1986, Ser. No. 943,714
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—188.4 **1 Claim**



1. A steady leveling device for a tall narrow piece of furniture comprising:
(a) an L-shaped bracket having a vertical flange and a horizontal flange;
(b) a hexagonal sleeve having a threaded aperture therethrough, said sleeve mounted vertically to outer surface of said vertical flange of said L-shaped bracket;
(c) means for mounting said L-shaped bracket to a corner of a base of the furniture;
(d) a threaded rod having an adjustment operating slot at upper end and a point at lower end, said rod rotatably journaled in said aperture of said hexagonal sleeve so that said point can penetrate through carpet, underlayment and dig into floor underneath to stabilize the base of the furniture;
(e) said horizontal flange of said L-shaped bracket having a hollow chamber therein with a vertical counter sunk threaded hole therethrough and a horizontal slot adjacent said holes with a horizontal hole extending outwardly therefrom;
(f) a mounting screw received through said vertical hole, said screw having an upper threaded portion with point and lower pinion portion with an adjustment operating slotted head;
(g) a rack member having a stop portion at one end and a threaded aperture within said end, said rack member extending horizontally outwardly from said slot into said hollow chamber with said stop portion captured within said slot and said rack member in engagement with said pinion portion of said mounting screw; and
(h) a thin threaded screw having a slotted head, said thin screw placed through said horizontal hole and received within said threaded aperture of said rack member whereby when said threaded aperture of said rack member will travel horizontally to turn said mounting screw to travel upward to secure said horizonal flange to horizonal surface of the base of the furniture.

4,721,276
PIVOTING BEVERAGE DOCK
Ernest Moss, 157-16 13th Ave., Beechhurst, N.Y. 11357
Filed Apr. 3, 1986, Ser. No. 847,738
Int. Cl.[4] A47K *1/09*
U.S. Cl. 248—311.2 **7 Claims**

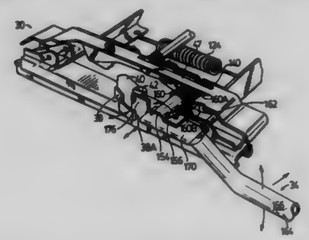


1. A beverage dock, comprising: means for mounting; a retaining bracket in communication with said means for mounting; and, a free-swinging, open-faced support platform having first cooperable releasable mating means, a receptacle having a second cooperable releasable mating means cooperating with the first cooperable releasable mating means, said support platform connected to said retaining bracket by means permitting relative movement between the support platform and the retaining bracket wherein said support platform is capable of movement relative to said retaining bracket, said support platform being capable of holding a container or a container receptacle of conforming or non-conforming configurations and lengths and being capable of replacement by one or more containers or container receptacles of varying widths.

4,721,277
LEVER ASSEMBLY FOR MANUAL SIX-WAY SEAT ADJUSTMENT
Alfred Hessler, and Andrzej Bartczak, both of Markham, Canada, assignors to Magna International Inc., Markham, Canada
Filed Feb. 4, 1986, Ser. No. 825,973
Int. Cl.[4] B60N *1/02*
U.S. Cl. 248—393 **2 Claims**

1. A lever assembly for manual six-way seat adjustment of the position of a seat having a seat cushion carried on a track secured to a seat base which permits only one adjustment to be made at one time, either seat cushion inclination or longitudinal positioning of the seat along a track from one position to another,
(a) forward and backwards along a track from one position to another position;
(b) raising or lowering the front of the seat relative to the rear of the seat, and

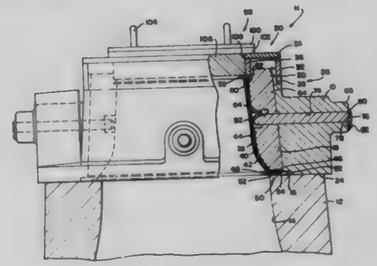
(c) raising or lowering the rear of the seat relative to the front of the seat, the lever assembly comprising a lever, the lever being pivotally secured in a holder carried by the seat base to pivot towards the seat to thereby cause the removal of removebly securable securing means normally carried by the base securing the base of the seat to the track to be removed releasing the base of the seat permitting slidable movement of the base of the seat on the track and permitting the base of the seat to be secured at said another position along the track when the lever is released urging the securing means to secure the base of the seat to the track, the lever also being rotatable in a vertical direction without releasing the base of the seat for movement in the track either clockwise or counterclockwise to permit activation of a system for permitting vertical adjustment of the seat cushion, the lever assembly operating with a seat adjustment assembly for adjusting



the inclination and vertical position of a seat cushion of a seat, the seat adjustment assembly comprising a pair of pawls normally releasably fixed against pivoting by their engagement with an assembly disposed between them and which pawls when released one at a time, permit adjustment of the inclination and vertical position of the seat cushion, the assembly between the pawls comprising a cam assembly carrying opposed peripheral circular portions and another portion adjacent each circular portion facing each other and being closer to one another than the circular portions are close to one another and the ends of the pawls engaging the assembly, and each pawl carrying a recess corresponding in shape to the circular cam portion to which they are engaged and whereby means are provided for displacing the cam assembly and thus the pawls to permit adjustment and means for returning the cam assembly and pawls to their normal position.

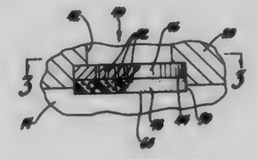
4,721,278
LIGHTWEIGHT REUSABLE HOT TOP
Ean Vallak, Geneva, Switzerland; Hannes Vallak, Grythyttan, Sweden, and Charles B. Childs, Jr., Marietta, Ga., assignors to Re-Top USA, Inc., Arlington, Va., by said Charles B. Childs, Jr. and Re-Top International Limited, St. Helier, by said Ean Vallak and Hannes Vallak
Filed Oct. 14, 1986, Ser. No. 918,314
Int. Cl.[4] B22D *7/10*
U.S. Cl. 249—106 **46 Claims**

21. A combination of a reusable hot top and a metal receiving mold having an upper seating portion, the hot top comprising:
(a) a metal shell having an aperture therethrough providing an inner wall and said shell having an upper end portion and a lower end portion for seating on said seating portion;
(b) liner means having a thickness not exceeding 0.3 inches positioned in said aperture spaced from said inner wall and being axially movable relative to said upper and lower end portions;
(c) liner retainer means associated with said shell and being engaged with and retaining said liner means in said aperture when said shell is lifted from the mold and being disengaged from said liner means when said shell is seated on the mold;
(d) first thermal seal means positioned around a bottom portion of said liner means for engagement with said seating portion and thereby preventing contact of said liner means with said mold so that heat conductance between said liner means and said mold is prevented;
(e) liner positioning means associated with said upper end portion; and,



(f) second thermal seal means positioned around an upper portion of said liner means for engagement with said liner positioning means and thereby preventing contact of said liner means with said liner positioning means so that heat conductance therebetween is prevented and being disengaged from said liner means when said shell is lifted from said mold.

4,721,279
FOAM MOLD EQUIPPED WITH A SELF-CLEANING MOLD VENT ASSEMBLY
Mark A. Oleszko, Warren; Angelika J. Coyle, Utica; Richard S. Draganski, Troy, and Darryl Marbury, Madison Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 27, 1986, Ser. No. 866,974
Int. Cl.[4] B29C *33/10, 67/20*
U.S. Cl. 249—141 **2 Claims**



1. A mold equipped with a self-cleaning mold vent assembly for molding a unitary foamed article comprising a first mold member sealingly engaging a second mold member for shaping said foamed article, a second mold member coacting with said first mold member in a closed position to define a mold cavity of fixed length and width for shaping said foamed article, said first mold member having a mold wall equipped with a self-cleaning mold vent assembly constructed of a rigid apertured plate member and a sacrificial filter member, said sacrificial filter member disposed against the plate member in a recessed area of the mold wall such that said filter member extends partially beyond the mold wall into the mold cavity, said plate member and filter having a diameter substantially smaller than the length and width of said mold cavity.

4,721,280

INJECTION MOULDING CORE FOR PIPE BENDS

Rudolf Barzinsky, Vlotho, Fed. Rep. of Germany, assignor to Agru Alois Gruber & Sohn Offene Handelsgesellschaft, Bad Hall, Austria

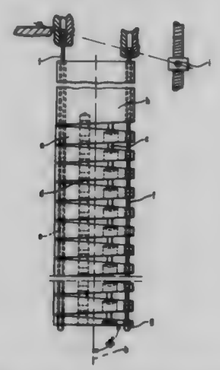
PCT No. PCT/DE85/00115, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04604, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 10, 1985, Ser. No. 811,838

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414231

Int. Cl.[4] B22C 9/10; B29C 33/48

U.S. Cl. 249—185 1 Claim



1. Injection molding core for pipe bends having at least one straight pipe terminal portion which core includes at least one straight end piece and multiple wedge-shaped segments which are connected by means of at least two flexible tension elements, each adjacent the periphery of said wedge-shaped segments to form under tension a curved injection mold core portion, the surface of which in the curved state is free of voids that would accept the flow of material during molding and centering elements provided on each of the wedge-shaped segments to prevent displacement or torsion of said segments during molding.

4,721,281

ACTUATING DEVICE FOR THROTTLE VALVE

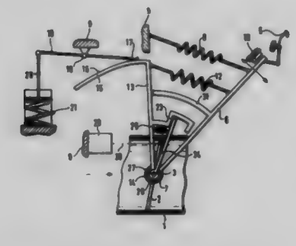
Alfred Kratt, Trossingen; Hermann Nusser, Markgröningen; Gunther Plapp, Filderstadt, and Helmut Schwarz, Backnang, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 30,190

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625282

Int. Cl.[4] G05G 7/14

U.S. Cl. 251—54 3 Claims



1. An actuating device for a throttle valve rotatably supported in an intake tube of an internal combustion engine and intended for controlling an aspirated air quantity flowing therethrough comprising said throttle valve being connected to a throttle valve shaft and being actuatable in a damped manner via an actuating lever by a throttle control means, counter to a force applied by at least one restoring spring, said actuating lever being supported rotatably with respect to said throttle valve shaft and being arranged to engage an intermediate lever by means of a helically-embodied follow-up drawing spring, said intermediate lever being rotatably supported with respect to the throttle valve shaft to act upon a throttle valve lever connected to said throttle valve shaft, the intermediate lever being connected to a cam disk provided with a curved camming surface, rotational motion of said intermediate lever being damped by an associated damper element, said throttle valve lever being engaged by an electromagnetically actuatable idling actuator in an opening direction of the throttle valve, said throttle valve lever being connected to one end of at least one helically-embodied uncoupling spring, said uncoupling spring further secured at the other end to the intermediate lever, said throttle valve lever being drawn by said uncoupling spring against a coupling stop on the intermediate lever, whereby when the intermediate lever is adjusted out of the idling position in an opening direction of the throttle valve, a greater damping action is produced than when the intermediate lever is adjusted out of a partial-load position in the opening direction of the throttle valve.

4,721,282

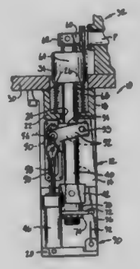
VACUUM CHAMBER GATE VALVE

Michael J. Shawver, Hayward, and Robert T. Lobianco, Sunnyvale, both of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed Dec. 16, 1986, Ser. No. 942,516

Int. Cl.[4] F16K 31/122

U.S. Cl. 251—62 15 Claims



1. A gate valve assembly for mounting on a port in a chamber wall, said gate valve comprising:

an elongate housing having means at one end for sealing to the chamber wall about the port;

a bearing block pivotally mounted within the housing;

a shaft slidably received by the bearing block and extending through said one end of the housing;

a gate member attached to one end of the shaft;

an expandable seal member sealing the shaft to the housing to prevent leakage through the one end; and

means in the other end of the housing for translating the shaft through the bearing block and for pivoting the bearing block to move the gate member between an opened position and a closed position.

4,721,283

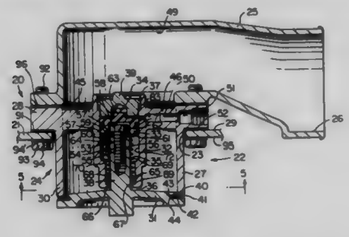
VENT VALVE CONSTRUCTION FOR A STORAGE TANK, STORAGE TANK CONTAINING THE SAME AND METHOD OF MAKING THE SAME

Fred A. Wilson, Middletown, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Dec. 8, 1986, Ser. No. 938,852

Int. Cl.[4] F16K 31/122

U.S. Cl. 251—63.4 23 Claims



1. In a vent valve construction for a storage tank that has a wall means defining a storage compartment therein and an opening therethrough leading from the exterior of said wall means to said storage compartment, said vent valve construction comprising a body member having an annular flange portion for engaging against said wall means around said opening thereof on the exterior thereof and an annular valve seat portion for passing through said opening and being disposed in said storage compartment, a movable valve member carried by said body portion for opening and closing said valve seat portion to and from said storage compartment, said body member having a tubular portion substantially concentrically disposed in said flange portion and said valve seat portion, piston means operatively interconnected to said valve member and being disposed in said tubular portion to define a pressure chamber therein, and spring means operatively associated with said valve member to tend to maintain said valve member in its closed position with said valve seat portion in opposition to the force of any fluid pressure directed to said pressure chamber and tending to move said valve member to its open position, the improvement wherein said tubular portion has opposed open ends one of which is adapted to be disposed in said storage compartment and the other of which is adapted to be accessible from the exterior of said wall means, said valve member having a stem projecting through said one open end of said tubular portion to operatively interconnect said valve member to said piston means, and removable closure means closing said other open end of said tubular portion.

4,721,284

VALVE PLUG DESIGN

Michael B. Bankard, Houston, Tex., assignor to Norriseal Controls, Houston, Tex.

Filed Nov. 6, 1986, Ser. No. 927,581

Int. Cl.[4] F16K 25/00, 47/00

U.S. Cl. 251—86 4 Claims

3. A valve unit comprising:

(A) a seat having;

(i) a circular orifice section;

(ii) a beveled conical section integral with said orifice section;

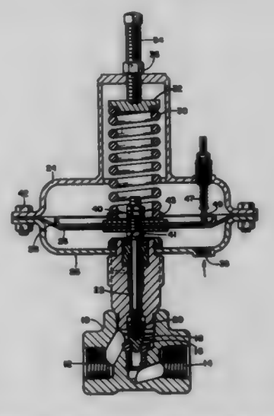
(B) a plug including:

(i) a section of a sphere, said plug having means for achieving a universal positive seating action irrespective of slight misalignment of said sphere section relative to said circular orifice section;

(ii) a first conical section made an integral part of said section of a sphere and arranged such that said section of a sphere provides positive sealing and said first conical section provides precise characterized flow control rates that always continuously varied during a first range of heights of said spherical plug section off said seat beveled conical section as long as said first conical section is within said passageway;

(iii) a second reduced diameter, conical section made an integral part of said first conical section and arranged such that said second conical section provides precise characterized flow control rates that are always continuously varied during a second range of heights of said spherical plug section off said seat beveled conical section as long as said second conical section is within said passageway; and

(iv) a contoured point section made an integral part of said second conical section for the streamlining of fluid flow



through said orifice section throughout the first and second range of heights of said spherical plug section off said beveled conical valve seat section, wherein the size and angular changes in the plug conical sections and the seat orifice section allows the rate of flow to increase proportionate to the percent of valve opening to achieve excellent fluid throttling in a variety of flow characteristics;

(C) a valve stem connected to said plug;

(D) a valve body in which said seat is located and having an inlet and an outlet;

(E) a means to bias said stem in a selected direction; and

(F) a spring to apply force to said plug when in contact with said seat.

4,721,285

CABLE DRIVE SYSTEM INCLUDING APPARATUS FOR CONTROLLING NORMAL FORCE APPLIED TO CABLE

Robert G. McMichael, 8617 Piney Branch Rd., Apt. 2, Silver Spring, Md. 20901

Filed Sep. 23, 1986, Ser. No. 910,608

Int. Cl.[4] B01D 17/04; B65H 20/00

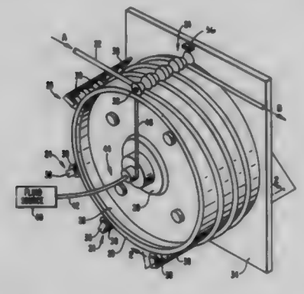
U.S. Cl. 254—333 27 Claims

1. A cable drive system comprising:

variable diameter support means for supporting a portion of a cable to be driven;

guide means for guiding the cable so that the portion of the cable is maintained substantially in contact with said variable diameter support means and so that the portion of the cable is wound helically about said variable diameter support means and so that the portion of the cable is wound helically about said variable diameter support means, said variable diameter support means and said guide means applying a normal force to the portion of the cable which is substantially in contact with said variable diameter support means; and

means for varying the diameter of said variable diameter support means while the cable is being driven, so as to



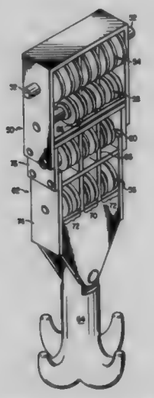
controllably vary the normal force applied to the portion of the cable supported by said variable diameter support means during operation of said cable drive system.

4,721,286

SPLIT BLOCK FOR EXTENDED TRAVEL

John E. Hey, Houston, Tex., and H. Patrick Ragland, Thibodaux, La., assignors to AMCA International Corporation, Hanover, N.H. and McDermott Incorporated, New Orleans, La.

Filed Jul. 24, 1985, Ser. No. 758,355
Int. Cl.[4] B66D *3/08*
U.S. Cl. 254—399 5 Claims



1. A crane block defining a central main fall symmetry line for vertical rope travel during movement of a rope hoist comprising:

a crown block for mounting to a crane boom and having a first row of relatively large diameter sheaves in tandem with a second row of relatively small diameter sheaves;

a movable block having a third row of relatively small diameter sheaves reeved with said second row;

a traveling block having a fourth row of relatively large diameter sheaves reeved with said first row;

one of said second or third rows having said sheaves canted with respect to said main fall symmetry line for vertical travel of said rope between said second and third rows of said sheaves;

connecting means for removably securing said movable block with said traveling block for lifting relatively heavy loads over relatively small vertical travel;

connecting means for removably securing said movable block in a two-blocked configuration beneath said crown block for lifting relatively lighter loads over relatively extended vertical travel;

detachable support means on said traveling block for defining a set of outboard sheaves on either side of said main fall symmetry line and a set of inboard sheaves across said main fall symmetry line;

means for detaching said outboard sheaves from said inboard sheaves for further extending vertical travel of said traveling block and reducing the size of said traveling block when said movable block is attached to said crown block; and

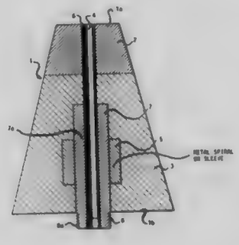
means for removably attaching said detachable support means for said outboard sheaves to said movable block to reduce rope and sheave wear and to reduce down-haul weight when extended vertical travel is required for relatively light loads.

4,721,287

SLEEVE FOR BLOWING SOLID MATERIALS INTO A MOLTEN METAL BATH AND METHOD FOR USE THEREOF

Manfred Winkelmann, Krefeld, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 19, 1986, Ser. No. 831,137
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505821
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—47 26 Claims



1. A method for blowing solid materials into a molten metal bath through a closure section of a ladle when said ladle contains said molten metal bath, said method comprising the steps of:

providing a sleeve passing from the exterior to the interior of said closure section of said ladle, said sleeve including:

a unitary body for one piece insertion into said closure section of said ladle, said unitary body having a flow channel therein for blowing said solid materials therethrough;

said unitary body having a forward sleeve section, for facing said molten metal bath, a middle sleeve section and a rear sleeve section;

said forward sleeve section comprising an insulating material having a lower thermal conductivity than that of said middle sleeve section and also said forward sleeve section comprising an insulating material having a lower thermal conductivity than that of said rear sleeve section;

said flow channel comprising a tube disposed within said sleeve for blowing the solid materials therethrough;

metal heat conducting means immediately surrounding and contacting said tube over a substantial portion of the combination of said middle sleeve section and said rear sleeve section; and

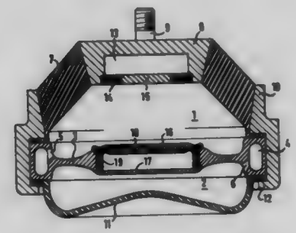
introducing said solid materials into said molten metal bath through said sleeve.

4,721,208

TWO-CHAMBER ENGINE MOUNT WITH HYDRAULIC DAMPING

Rainer Andrä, Limburg, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 742,293
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1984, 3421119
Int. Cl.[4] B60G *15/04*; F16F *15/04, 7/10*; F16M *13/00*
U.S. Cl. 267—219 7 Claims



1. Two-chamber engine mount with hydraulic damping, comprising an engine side to be connected to an engine, fluid-filled chambers having rubber-elastic peripheral walls including a chamber disposed closer to said engine side, an intermediate plate disposed between said chambers having a conduit disposed therein through which said chambers are interconnected, said intermediate plate having an upper surface, an engine support plate at said engine side having a first membrane chamber formed therein, a first membrane closing off said first membrane chamber from said fluid-filled chamber closer to said engine side, said intermediate plate having a second central membrane chamber formed therein in the form of a cylindrical recess formed in said upper surface of said intermediate plate defining a rim of said intermediate plate at said recess and an open side of said recess, and a second membrane closing off said open side from said fluid-filled chamber closer to said engine side and being sealingly connected to said rim of said intermediate plate.

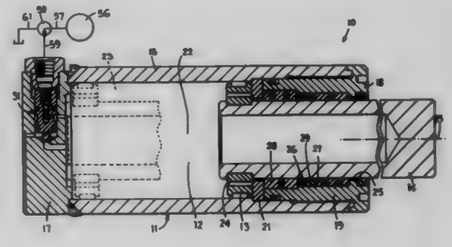
4. Two-chamber engine mount with hydraulic damping, comprising an engine side to be connected to an engine, fluid-filled chambers having rubber-elastic peripheral walls including a chamber disposed closer to said engine side, an intermediate plate disposed between said chambers having a conduit disposed therein through which said chambers are interconnected, an engine support plate at said engine side having a first membrane chamber formed therein, a first membrane closing off said first membrane chamber from said fluid-filled chamber closer to said engine side, said intermediate plate having a second central membrane chamber formed therein, a second membrane closing off said second membrane chamber from said fluid-filled chamber closer to said engine side, said second membrance having an upper portion, a substantially hollow, cylindrical ring integral with said second membrane and forming a lateral limit of said second membrane chamber at said upper portion of said second membrane, a cup-shaped rigid bottom part inserted into said cylindrical ring and forming a lower limit of said second membrane chamber, and an annular intermediate plate part disposed outside said cylindrical ring, said plate part having said conduit disposed therein interconnecting said fluid-filled chambers.

4,721,289

COMBINED CHECK AND EXHAUST VALVE FOR HIGH PRESSURE GAS SPRING

Ransom J. Heanelia, Plymouth, Mich., assignor to Rantom, Inc., Canton, Mich.

Continuation-in-part of Ser. No. 757,969, Jul. 23, 1985, Pat. No. 4,662,616. This application Nov. 21, 1986, Ser. No. 934,217
Int. Cl.[4] F16F *9/43*
U.S. Cl. 267—64.28 13 Claims



1. In combination, a gas spring arrangement comprising:

a gas spring unit having a housing, a piston rod means relatively slidably supported within said housing and projecting outwardly therefrom, the piston rod means being slidably movable relative to the housing between a first position wherein the rod means extends outwardly of the housing through a substantial extent and a second position wherein the rod means is substantially telescoped within the housing, the housing and the rod means cooperating to define a pressure chamber therebetween for containing a quantity of high-pressure gas therein;

first passage means formed at least partially in said housing and communicating with said pressure chamber for supplying high-pressure gas thereto;

one-way check valve means associated with said first passage means for permitting high-pressure gas to be supplied into said pressure chamber while preventing flow of said gas in the opposite direction;

second passage means formed at least partially in said housing for providing communication between said pressure chamber and a low-pressure discharge point, such as the atmosphere;

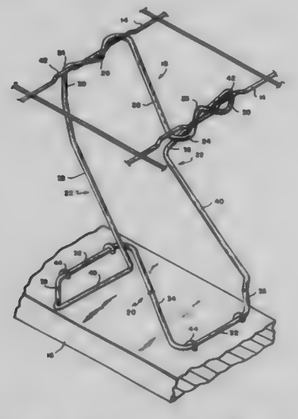
flow-control valve means associated with said second passage means for controlling flow of pressure fluid therethrough from said pressure chamber to said low-pressure discharge point, said flow-control valve means including an annular valve seat associated with and surrounding said second passage means, and a movable control valve element movable between open and closed positions, said control valve element when in said closed position being disposed in sealing engagement with said annular valve seat for preventing flow through said second passage means to said low-pressure discharge point;

said first passage means at least upstream of said check valve means being independent of and sealingly isolated from said second passage means at least downstream of said annular valve seat; and

control means for controlling movement of said flow control valve element between said open and closed positions, said control means including first means responding to the pressure in said first passage means upstream of said check valve means and second means responsive to the pressure in said second passage means downstream of said annular valve seat for controlling movement of said control valve element between said open and closed positions.

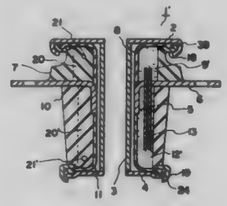
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,290
BENT WIRE SPRING UNIT
Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.
Continuation of Ser. No. 675,892, Nov. 28, 1984, abandoned. This application Apr. 2, 1987, Ser. No. 35,271
Int. Cl.[4] F16F *3/00*
U.S. Cl. 267—103 **1 Claim**



1. A bent wire spring unit for disposition between a base frame and a grid frame disposed in spaced, parallel relation to each other, comprising a lower attaching element for attaching it to the base frame and an upper attaching element for attaching it to the grid frame, said lower and upper attaching elements being disposed in spaced, parallel planes and said upper attaching element comprising in the the same plane, longitudinally-spaced, bent lengths of wire and said lower attaching element comprising in the same plane, longitudinally-spaced, parallel, straight lengths of wire, a first diagonal length of wire connected at its opposite ends to the opposite ends of the longitudinally-spaced, bent lengths of wire of the upper attaching element, a second diagonal length of wire connected at its opposite ends to the corresponding opposite ends of the longitudinally-spaced, parallel, straight lengths of wire of the lower attaching element such that the diagonal lengths of wire of the upper attaching element and the lower attaching element are situated in a common plane perpendicular to the upper and lower attaching elements, and transversely-spaced, parallel, substantially perpendicular supports connecting the lower and upper attaching elements such as to permit the upper and lower attaching elements to move relative to each other in response to pressure applied perpendicularly to the upper attaching element, said supports comprising transversely-spaced, parallel, vertically-disposed, V-shaped lengths of wire, each embodying exclusively diverging, straight upper and lower legs disposed exclusively in a common plane perpendicular to the attaching elements with the legs of one of the V-shaped lengths of wire facing in a direction opposite to the legs of the other V-shaped length of wire and with the extremities of the upper legs of V-shaped lengths of wire integrally connected with the upper attaching element and the extremities of the lower legs integrally connected with the lower attaching element, said upper legs being of greater length than said lower legs so that the apices of the V-shaped lengths of wire being situated closer to the lower attaching elements than to the upper attaching elements and wherein the apices extend transversely with respect to the parallel lengths of wire of the upper and lower attaching elements a distance less than the distance between said longitudinally-spaced lengths of wire of said upper and lower attaching elements and wherein the V-shaped lengths of wire lap each other in spaced, parallel planes such that said upper legs cross each other in opposite directions in said vertical, spaced, parallel planes and said lower legs cross each other in opposite directions in said vertically-spaced, parallel planes.

4,721,291
VIBRATION-PREVENTING RUBBER DEVICE
Katsunori Makihayashi, Toyota; Kenji Murase, Suzuka, and Motoo Kunihiro, Tsu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi and Toyo Tire & Rubber Co., Ltd., Osaka, both of, Japan
Filed Jul. 3, 1986, Ser. No. 882,140
Claims priority, application Japan, Jul. 5, 1985, 60-146579
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—140.1 **6 Claims**

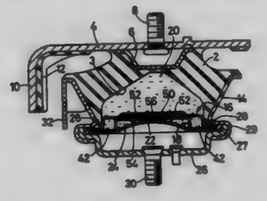


1. A vibration-preventing device comprising:
an inner cylinder;
an upper plate;
a lower plate;
a partition wall positioned outside said inner cylinder and interposed between said upper plate and said lower plate, said upper plate and said lower plate being connected to said inner cylinder;
an upper vibration-preventing rubber member interposed between said partition wall and said upper plate;
an upper elastic film disposed between said upper vibration-preventing member and said inner cylinder;
an upper damper liquid chamber being defined by said upper vibration-preventing rubber member, said partition wall and said upper elastic film;
a lower vibration-preventing rubber member interposed between the partition wall and the lower plate;
a lower elastic film disposed between said upper vibration-preventing members and said inner cylinder;
a lower damper liquid chamber being defined between said partition wall, said lower elastic film and said lower vibration-preventing rubber member; and
a first orifice, said upper damper liquid chamber communicating with said lower damper liquid chamber through said first orifice, at least one of said upper damper liquid chamber and said lower damper liquid chamber being horizontally divided into a plurality of damper liquid subchambers by rubber division plates, said division plates being integral with one of said vibration-preventing rubber member and connected with at least one of said upper and lower elastic films, adjacent ones of said damper liquid subchambers communicating directly with each other through additional orifices horizontally located in said each division plate.

4,721,292
FLUID-FILLED ELASTIC MOUNTING STRUCTURE
Siro Saito, Kani, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan
Filed Jul. 24, 1986, Ser. No. 888,865
Int. Cl.[4] F16F *5/00, 9/00*
U.S. Cl. 267—140.1 **7 Claims**

1. A fluid-filled elastic mounting structure including (a) an elastic member having therein a cavity which is open at one end; (b) partition means cooperating with said elastic member to define an operating chamber which is disposed on one side of the partition means, said operating chamber including said cavity and being filled with an incompressible fluid; (c) a closure member at least a portion of which is formed from a flexible diaphragm, said closure member being disposed on the other side of said partition means and cooperating with the partition means to define therebetween an equilibrium chamber filled with the incompressible fluid; (d) fluid-path means for defining an orifice which communicates with said operating chamber and said equilibrium chamber; and (e) a movable member in the form of a plate supported by said partition means such that said movable member is movable over a predetermined distance by a force applied to said fluid in said operating chamber,

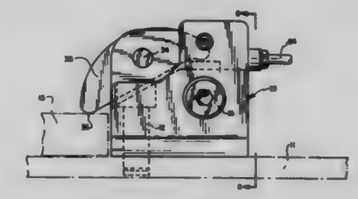
said partition means comprising a generally hat-shaped outer member and a generally hat-shaped inner member each of which includes a cup-shaped portion and a flange portion extending radially outwardly from an open end of said cup-shaped portion, said outer and inner members being assembled with said cup-shaped portions thereof open on the same side such that said cup-shaped portion of said inner member is accommodated within said cup-shaped



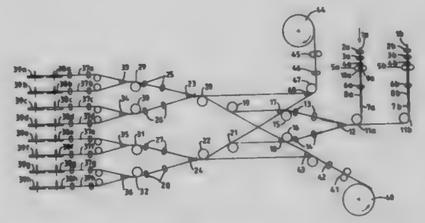
portion of said outer member, said flange portions of said inner and outer members being superposed on each other;
support means for retaining said hat-shaped outer and inner members at said flange portions thereof superposed on each other, by means of caulking of said support means so as to grip said superposed flange portions;
each of said cup-shaped portions of said outer and inner members comprising a cylindrical wall and a bottom wall closing one of opposite open ends of said cylindrical wall, the cylindrical walls of said outer and inner members cooperating to define an annular space which communicates with said operating and equilibrium chambers, and thereby functions as said orifice; and
the bottom walls of said cup-shaped portions of said outer and inner members cooperating to define a generally flat space in which said movable member is received movably over said predetermined distance, said bottom walls of said outer and inner members having first and second communication means which communicate with said operating chamber and said equilibrium chamber, respectively, so that a pressure of the fluid in said operating chamber acts on the fluid in said equilibrium chamber through movements of said movable member within said generally flat space.

4,721,293
SELF-LOCKING CLAMPING DEVICE
Jack H. Schron, Chagrin Falls, and Lawrence H. Seidel, Mentor, both of Ohio, assignors to Jergens, Inc., Cleveland, Ohio
Filed Aug. 12, 1986, Ser. No. 895,882
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—32 **11 Claims**

1. A compact pressure-operated clamping device comprising a body, double acting piston means reciprocable in said body along a first line of action in response to selectively applied fluid pressure, said piston means providing a camming surface inclined relative to said first line of action at a locking angle, and a clamping pin in said body providing follower means at one end engageable with said camming surface, said clamping pin being guided in said body for reciprocable movement along a second line of action perpendicular to said camming surface and being reciprocable along said second line of action in response to reciprocation of said camming means, said camming surface causing said piston means to frictionally lock in said body when clamping forces are applied and even when fluid under pressure is not supplied thereto, said body providing a cylindrical bore along which said piston means reciprocates, the side of said bore opposite said clamping pin engaging said piston means and providing a reaction surface supporting said piston means against forces applied thereto by said clamping pin, the engagement between said reaction surface and said piston means producing a frictional force providing a substantial amount of self-locking action of said piston means.



4,721,294
DEVICE FOR FOLDING AND CONTINUOUS HANDLING OF PRINTED MATERIALS
Godber Petersen, Augsburg, Fed. Rep. of Germany, assignor to MAN - Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany
Filed Jul. 18, 1985, Ser. No. 756,780
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427570
Int. Cl.[4] B41L *43/12*
U.S. Cl. 270—37 **7 Claims**



1. Device for folding and further handling of moving printed material, in which cutting devices provide cut items and deliver printed and cut material by means of belt conveyor systems to one or more folding units to form folded products, after which the folded products are processed by at least one of: assembly, pay-out delivery,
characterized by
a plurality of folding tables (**38***a*–**38***h*);
rentention and alignment devices (**50***a*–**50***d*) associated with the respective folding tables;
folding blades (**43**) located above respective folding tables;
deflectors (**12**, **17**, **18**, **43**, **48**, **23**, **24**, **33**, **34**, **35**, **36**), disposed following the cutting devices (**5***a*, **5***b*, **41**, **46**),
braking stages (**13**, **14**, **25**–**28**; **37***a*–**37***h*) located between and downstream of the deflectors,
for delaying and guiding the cut items to be folded (**7***a*, **7***b*, **8***a*, **8***b*) and transporting the cut items onto one of the plurality of folding tables (**38***a*–**38***h*), on which they are aligned and retained by the retention and alignment devices (**50***a*–**50***d*) and can be pushed by means of a respec-

tive folding blade (43) into a briefly closable folding gripper (38*a*) in order to produce a fold and form folded items, further transport devices (55) transporting the folded items (49) onto a collecting table (39) for assembly with a plurality of previously folded items (60) from other folding tables (49) with identical folds to form the folded products; and

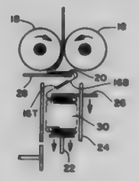
a pushing blade (63) disposed above the collecting table (39) for pushing the folded assembled items (49, 60) forming said folded products into movable receiving containers (64*a*–64*c*) disposed below the collecting table (39).

4,721,295

APPARATUS AND PROCESS FOR SEPARATING STACKS OF SHEETS INTO BUNDLES

John M. Hathaway, Green Bay, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 12, 1986, Ser. No. 895,777
Int. Cl.[4] B65H *41/00*
U.S. Cl. 270—52.5 17 Claims



1. A process for separating a bundle of folded sheets from a stack of folded sheets, said stack being on a vertically displaceable elevator, said bundle having a predetermined number of sheets, said process comprising the steps:

(a) inserting a first separator plate into said stack, thereby defining said bundle;

(b) inserting a second separator plate into said stack above said first separator plate; and

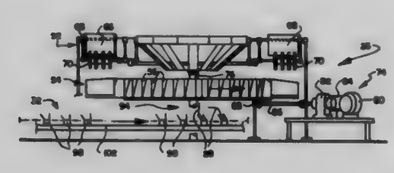
(c) cooperatively lowering said elevator and said first separator plate, such that said elevator and said first plate hold a bundle therebetween and said bundle is effectively separated from said stack.

4,721,296

SHEET MATERIAL HANDLING APPARATUS

Harry E. Mowry, Plattsburg, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed May 27, 1986, Ser. No. 866,697
Int. Cl.[4] B65H *5/30*
U.S. Cl. 270—55 9 Claims



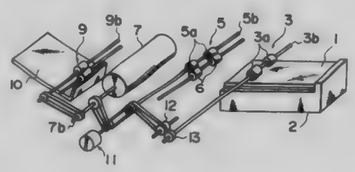
1. An apparatus comprising a plurality of hoppers for holding sheet material, first conveyor means defining a plurallity of collating spaces movable past each of said hoppers in turn, feed means for feeding sheet material from each of said hoppers to each of said collating spaces in turns during movement of said collating spaces past said hoppers to sequentially form sheet material assemblages at each of said collating spaces, and second conveyor means for sequentialy gripping the sheet material assemblages being transported by said first conveyor means and conveying the gripped sheet material assemblages away from said collating spaces, said second conveyor means including a plurality of gripper means each of which is operable from an open condition to a closed condition to clampingly grip a sheet material assemblage which is at least partially disposed in one of said collating spaces, said first conveyor means including means for enabling the sheet material assemblages to drop downwardly from each of said collating spaces in turn upon sequential movement of the collating spaces to a first location, said second conveyor means including means for moving each of said plurality of gripper means in turn beneath said first conveyor means at the first location with each of said gripper means being movable into alignment with a respective collating space at least along a portion of the path of movement of the gripper along the first location and in the open condition and opening upwardly at the beginning of the first location to enable sheet material assemblages to sequentially drop downwardly into said gripper means, and said second conveyor means including means for operating each of said gripper means in turn from the open condition to the closed condition to clamping grip the lower portion of the sheet material assemblage at the first location while the upper portion of the sheet material assemblage is disposed in a respective collating space in said first conveyor means.

4,721,297

SHEET FEYDER

Kazunori Katayama, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,666
Claims priority, application Japan, Mar. 30, 1985, 60-67562
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—10 4 Claims



1. A sheet feeder, comprising:

first rolling means for entering a sheet into a feeding course;

second interposed rolling means displaced from said first rolling means along said feeding course;

said first and second rolling means each being mounted on shafts provided with one-way clutch means; and

common drive means for rotatably driving said shafts of said first and second rolling means such that rotation of said shafts in a first direction causes said first rolling means to feed a sheet to feeding course and said second rolling means to stop said sheet in rectitude and rotation of said shafts in a second direction causes said second rolling means to continue said sheet along said feeding course and said first roller means to stop.

4,721,298

BI-STABLE PAPER SEPARATOR

Edgar R. Pitcher, Jr., Dallas, Tex., assignor to Light Signatures, Inc., Los Angeles, Calif.

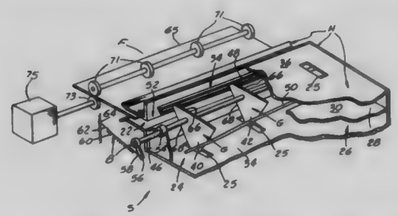
Filed Aug. 29, 1986, Ser. No. 901,711
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—303 7 Claims

1. A separator for segregating alternate individual sheets of paper for example in a sequential stream into two separate streams, comprising:

a housing defining an entry passage for said sequential stream of sheets and further defining a pair of separate offset exit passages;

guide means mounted in said housing for selectively deflecting said sheets in said sequential stream of said entry passage alternately into a different one of said exit passages; and

bi-stable means for mounting said guide means in said housing between said entry passage and said exit passages so



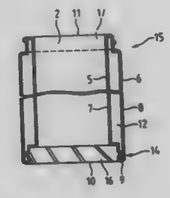
that said guide means may assume either one of two stable positions, each for directing said sheets into said different exit passages, said guide means, said bi-stable means and said housing means being constructed and arranged whereby said guide means is acturated to shift between said stable positions by the force exerted on said guide means by the passage of each individual sheet as said sheet passes said guide means into one of said exit passages.

4,721,299

STRUCTURE ASSEMBLED FROM STRUCTURAL MEMBERS

Rainer W. Schlientz, Zurich, Switzerland, assignor to Ludopark AG., Zug, Switzerland

Filed Jan. 8, 1985, Ser. No. 689,860
Claims priority, application Switzerland, Jan. 11, 1984, 129/84
Int. Cl.[4] A63B *9/00, 17/00*
U.S. Cl. 272—113 6 Claims



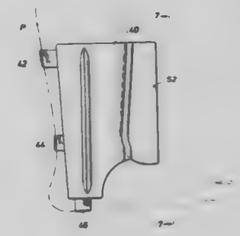
1. A gymnastic or playground structure assembled from a plurality of structural members in random spatial arrangement wherein at least one of the structural members comprises a hollow body having sidewalls defining the contour of said hollow body, said sidewalls comprising two substantially parallel lateral wall portions defining a space therebetween and end wall portions unitarily connecting said lateral wall portions so as to define a closed space wherein said sidewalls are provided with at least one opening penetrating said sidewalls for allowing access to the interior of said hollow body, said lateral wall portions and said end wall portions of said structural members are made from plastic and the closed space formed between said lateral wall portions and said end wall portions is filled with a material whose density differs from that of the material of said lateral wall portions and said end wall portions and said sidewalls are provided with connecting means for coupling said structural members together in the area of said end wall portions, said connecting means comprises an internal threaded socket on one of said end wall portions and an external threaded socket on the other of said end wall portions such that the internal socket of one structural member is connected to the external socket of the other structural member.

4,721,300

EXERCISE ENHANCING DEVICE

Horacio J. Guzman, 15702 Craighurst, Houston, Tex. 77059

Division of Ser. No. 616,497, Jun. 4, 1984, Pat. No. 4,632,387.
This application Nov. 3, 1986, Ser. No. 903,941
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—116 2 Claims



1. An exercise enhancing device for use in an aquatic environment, including:

A flexible leg jacket adapted to be secured adjacent the ankle of a person desiring to perform leg exercises in the aquatic environment;

means for releasably securing said leg jacket to the foot and leg of the person desiring to perform leg exercises;

a pair of fins fixedly mounted on said flexible leg jacket, each said fin having a first edge connected to said leg jacket and a second edge disposed radially outwardly from said leg jacket, said pair of fins disposed in substantially a common plane when said leg jacket is releasably secured to the person desiring to exercise to provide an enhanced water resistance to movement of the device in the direction perpendicular to the plane of said first and second fins;

a slot formed on said leg jacket for removably receiving a fin disposed substantially perpendicular to said first and second fins; and

a third fin removably received in said slot to provide an enhanced water resistance to movement of the device in a direction parallel to the plane of said first and second fins for enhancing side kick exercises.

4,721,301

EXERCISE MACHINE

Thomas P. Drake, Orangeville, Canada, assignor to Calar Home Products Limited, Orangeville, Canada

Filed Aug. 13, 1986, Ser. No. 896,051
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 2 Claims

1. An exercise machine comprising in combination:

(a) a fixed frame for supporting the vertical lifting of a movable weight,

(b) a movable weight supported in said frame for vertical lifting,

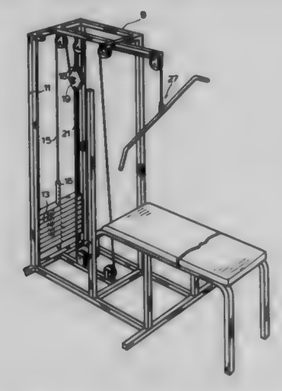
(c) first cable means attached to a first end ot the movable weight,

(d) a first pulley and fixed block therefor attached to the frame at a position spaced vertically above the movable weight, the first pulley receiving the first cable means;

(e) a second pulley and movable block therefor, the movable block mounted at an uppermost portion to a second end remote the first end of the first cable means and mounted at a lowermost portion to a first end of second cable means, the second pulley receiving the first cable means;

(f) a third pulley and fixed block therefor attached to the frame at a position spaced vertically above the movable weight, the third pulley receiving the portion of the first cable means intermediate the portion thereof received by the second pulley and the second end of the first cable means;

(g) second cable means attached at a first end to the lowermost portion of the movable block of the second pulley;



(h) at least a fourth pulley and fixed block therefor attached to the frame at a position spaced vertically below the first fixed pulley and third fixed pulley, the fourth pulley receiving the second cable means

(i) handle means attached to a second end of the second cable means, suitable for grasping by a person applying force to the handle means for lifting the movable weight whereby the amount of force applied by a person grasping the handle means necessary for lifting the weight is multiplied by a factor of about three (3).

4,721,302

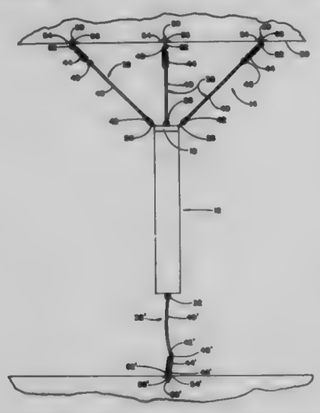
PUNCHING BAG AND SUSPENSION SYSTEM

Randy L. Murphy, 501 Linden Ave., Kinston, N.C. 28501

Filed Apr. 16, 1986, Ser. No. 852,646

Int. Cl.[4] A63B *69/00*

U.S. Cl. 272—78 **10 Claims**



1. A punching bag and suspension and mounting system therefore, comprising: an elongated punching bag having both a top and a bottom; a plurality of equally spaced attachment means directly secured the top of said punching bag; upper connecting means for suspending said punching bag from an overhead support structure; said upper connecting means consisting of a plurality of equally spaced flexible rope-like members having lower ends connected directly to the attachment means and upper ends connected directly to the overhead support structure; each flexible rope-like member extending acutely and outwardly from the punching bag such that the punching bag is suspended inwardly from the various points of connections of each flexible rope-like member with the overhead structure; means for controlling the movement of the lower portion of said punching bag in response to punches being absorbed by the punching bag, said control means including means for limiting the movement of the lower portion of said punching bag outside of a selected area but allowing the lower portion of said punching bag to freely and randomly move within that selected area; and said control means including a flexible rope like retainer normally loosely connected directly to the lower portion of said punching bag and extending therefrom where said flexible rope like retainer is connected to an underlying structure.

4,721,303

CONVERTIBLE MULTI-FUNCTION PHYSICAL EXERCISER

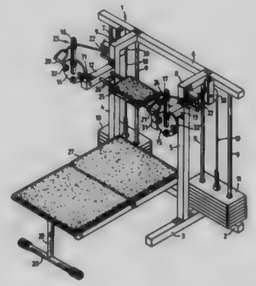
Patrick C. Fitzpatrick, P.O. Box 460, Villa Anthela, Camino Del Higueral, Fuentes Es Tanto, San Pedro de Alcantara, Marbella, Spain

Filed Jan. 31, 1986, Ser. No. 824,813

Claims priority, application United Kingdom, Jan. 31, 1985, 8502646

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—117 **23 Claims**



1. A convertible physical exercising device comprising a body, a movable member on the body and adapted to be engaged and moved by a user from a rest position, resistance means providing resistance to movement of the movable member, an elongate flexible element operatively coupling the movable member and the resistance means so that resistance force is exerted on said movable member through said elongate flexible element, a final guide over which the elongate flexible element is trained, support means supporting the final guide which support means is pivotally mounted on the body for movement in an arc about a substantially horizontal axis for permitting the support means to be positioned in a plurality of different angular positions relative to the body, whereby the position of the final guide on the body can be adjusted to vary the rest position of the movable member to permit the movable member to be moved in various different planes from its various rest positions to vary the direction of force exerted by the elongate flexible element on the movable member so that the exercising device can be used to perform a range of different exercises.

4,721,304

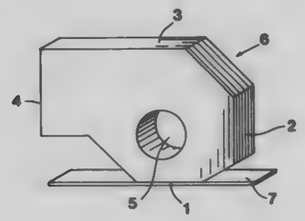
RACKET STRING TENSIONING DEVICE

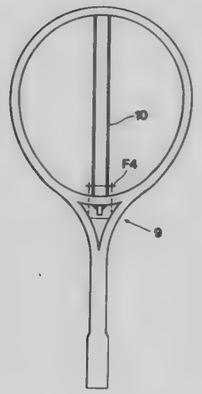
Anthony L. Zavilenski, Jr., 5542 Fernhill Cir., Huntington Beach, Calif. 92649, assignor to Anthony L. Zavilenski, Jr., Huntington Beach, Calif.

Filed Sep. 13, 1985, Ser. No. 755,891

Int. Cl.[4] A63B *49/00*

U.S. Cl. 273—73 E **2 Claims**





1. The combination of a racket and a tensioning device; said racket comprising a head portion and a handle portion connected thereto, said head portion having string holes formed therein for the reception of strings;

said tensioning device comprising a block having a hole located therethrough, said device further comprising a plurality of substantially flat surfaces each lying in a particular plane, substantially all of said planes defined by said substantially flat surfaces being parallel to the axis of said hole in said block, the distance between a first of said substantially flat surfaces and the axis of said hole in said block being less than the distance between a second of said substantially flat surfaces and the axis of said hole in said block; said tensioning device being located on the exterior surface of said head portion between adjacent string holes such that one of said substantially flat surfaces is in contact with the exterior surface of said head portion; whereby a string can be passed through one of the string holes in said head portion, through the hole in said block and through another string hole in said head portion so that said tensioning device can be rotated from a position where said first substantially flat surface is in contact with the exterior surface of said head portion to a position where said second substantially flat surface is in contact with the exterior surface of said head portion so as to increase the tension in said string.

4,721,305

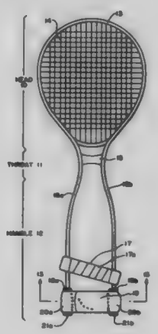
NATURAL GRIP RACQUET

John B. Cadlip, P.O. Box 1040, Los Altos, Calif. 94022

Filed Nov. 27, 1985, Ser. No. 802,582

Int. Cl.[4] A63B *49/08*

U.S. Cl. 273—73 J **12 Claims**



1. In a racquet of the type including a frame defining a head portion and frame extensions extending from said head portion converging to a throat and extending to form a handle terminating at a butt end, the improvement comprising said frame extensions being spaced apart along the length of the handle a sufficient distance so as to accommodate therebetween the hand of a player, a grip adapted to be grasped by a player's hand in its natural position mounted transversely between said frame extensions spaced from the butt end thereof and inclined with respect to the frame extensions to naturally receive the hand whereby the frame extensions form a continuation of the forearm and band means extending between said extensions at said butt end for engaging the wrist of a player when he grasps the grip.

4,721,306

HOCKEY SAFETY NET

James G. Shewchuk, 1988 Pacific Avenue, Winnipeg, Manitoba, Canada R2R 0G4

Continuation-in-part of Ser. No. 851,967, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 709,770, Mar. 8, 1985, abandoned. This application Jan. 5, 1987, Ser. No. 685

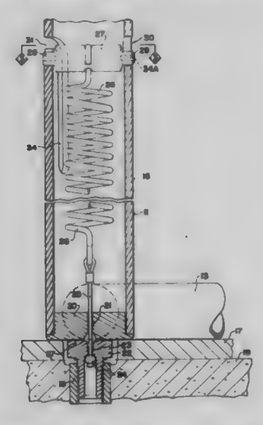
Claims priority, application Canada, Apr. 24, 1984, 452636

Int. Cl.[4] A63B *63/00*

U.S. Cl. 273—127 B **11 Claims**

1. A goal structure for attachment to an ice surface comprising a pair of vertical goal posts each having a hollow interior and arranged for attachment of a lower end thereof to the ice surface, a cross-bar rigidly interconnecting said goal posts at upper ends thereof in spaced upstanding position and a net support member extending rearwardly of and between the posts and rigidly attached to said lower ends thereof so that the goal structure defines a rigid body for supporting a net rearwardly of a face defined between the goal posts which can sit on the ice surface upon a base defined by the lower ends of the posts and an underside of said net support member, and a kit of parts for attachment of the goal structure to the ice surface, said kit comprising first and second spring means for mounting within the hollow interior of respective ones of said posts, first attachment means for attaching one end of each of said spring means within said goal post to the goal structure and second attachment means for attaching an opposed end of each of said spring means to the ice surface through the other end of the goal post, said second attachment means comprising a flexible cable having one end attached to the opposed end of the spring means, a receiving member for engagement in the ice surface,

releasable fastening means attached to an opposed end of the cable and arranged for readily releasable engagement to said receiving member directly beneath said lower end of the post, and guide block means in said lower end of the goal post defining a narrow aperture through which the cable passes to said fastening means such that when attached, the spring means can apply spring tension between the goal post and the ice



surface through the cable, said receiving member defining an upper surface which is at a height no greater than that of the ice surface and which is shaped such that the guide block means can move freely laterally thereto whereby a sufficient impact force on the goal post causes the goal post to move laterally relative to the ice surface and to pull said cable through said guide block means against spring tension.

4,721,307

SLOT MACHINE

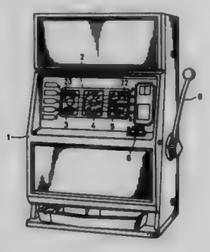
Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Mar. 17, 1987, Ser. No. 27,185

Claims priority, application Japan, Mar. 17, 1986, 61-37609[U]

Int. Cl.⁴ A63F *5/04*

U.S. Cl. 273—143 R **5 Claims**



1. In a slot machine having a plurality of symbol series which are disposed side by side and movable lengthwise independently, means for selecting combinations of symbols on winning lines in a display window, and means for paying out coins as dividends when said selected symbol combinations coincide with any one of a plurality of predetermined prize-winning symbol combinations; the improvement that at least one of said symbol series includes at least one special mark; and said coin pay-out means is adapted to pay out coins as a special dividend when there occurs on said winning line any one of said predetermined prize-winning symbol combinations at least one of whose symbols is replaced with said special mark.

4,721,308

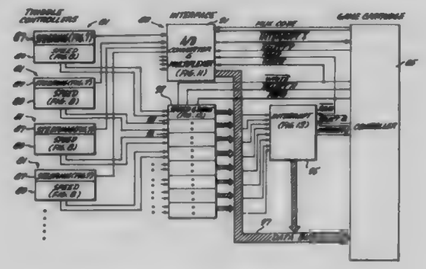
THUMB TWIDDLE OPERATED AMUSEMENT DEVICE

James A. Trimble, 7352 - 58th Ave., NE., Seattle, Wash. 98115

Filed Jun. 5, 1986, Ser. No. 870,957

Int. Cl.⁴ A63H *33/26*

U.S. Cl. 273—148 B **32 Claims**



1. A thumb twiddling device comprising:

a flat housing sized to be held between a user's hands, said housing including elongate aperture means suitable for receiving the fingers of a user and a cylindrical aperture suitable for rotatably receiving a wheel;

a wheel rotatably mounted in said cylindrical aperture in said housing, said wheel including a slot positioned such that the thumbs of a user's hand can be positioned at the ends of said slot when said housing is held between a user's hands and the fingers of the user's hands are located in said elongate aperture means; and,

electronic means for sensing the rotation of said wheel and producing a fluctuating signal whose frequency is related to the frequency of rotation of said wheel suitable for controlling a display.

4,721,309

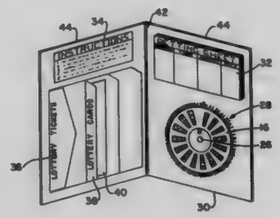
LOTTERY NUMBER SELECTION DEVICE AND WAGERING KIT

Gary L. Miesel, 1636 Plain, NE., Canton, Ohio 44714

Filed Oct. 14, 1986, Ser. No. 918,073

Int. Cl.⁴ A63F *3/08*

U.S. Cl. 273—148 R **7 Claims**



1. A number selection device comprising in combination:

a base on which numbers are printed in a plurality of concentric circles, at least some of said numbers being radially aligned, and

a disc having a plurality of window openings therein, comprising elongated, radially disposed window openings covered with a transparent film, the film over said elongated window openings being furnished with a plurality of different designs disposed radially thereon, certain of said designs appearing in a color different from the color of certain other of said designs, wherein said disc has a number indicator on its periphery, said disc being of smaller diameter than the outermost concentric circle of numbers on said base, and wherein said base and said disc are rotatably connected relative to each other at their respective centers, said base, window openings, designs, and numbers being so located relative to each other that numbers on the base may be made to appear for observation within said window openings and within said designs when said disc is properly mechanically rotated relative to said base.

7. A number selection device according to claim 1 which further comprises a folio to which said base is attached, and a pad of betting record sheets, a set of instructions for operating said number selection device, and a plurality of holders for holding lottery material attached to said folio.

4,721,310

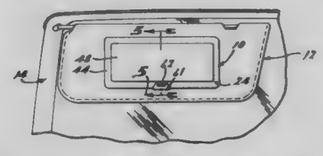
VEHICLE ACCESSORY ASSEMBLY FOR MOUNTING ON A VISOR OR OTHER INTERIOR PANEL

James A. Gavagan, Center Line; Leslie R. Hinds, and Mark Lobanoff, both of Troy, all of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Continuation-in-part of Ser. No. 007,120, Jan. 27, 1987, which is a continuation-in-part of Ser. No. 795,520, Nov. 6, 1985, which is a continuation-in-part of Ser. No. 746,676, Jun. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,280, Jul. 2, 1984, abandoned. This application Feb. 12, 1987, Ser. No. 13,656

Int. Cl.⁴ B60J *3/02*

U.S. Cl. 296—97 H **44 Claims**



1. A vehicle accessory assembly adapted for mounting on an interior vehicle panel, said accessory assembly comprising: an accessory device interconnectable with the interior vehicle panel at a generally fixed location thereon; a top-hinged accessory door pivotally interconnectable with the interior vehicle panel for selective pivotal movement about a pivot axis between a closed position wherein said accessory device is substantially covered and an open position wherein said accessory device is substantially exposed; resilient biasing means for resiliently biasing said accessory door toward said open position; latch means for releasably retaining said accessory door in said closed position, said latch means being selectively actuable to release said accessory door, said resilient biasing means urging said accessory door into said open position when said latch means is slectively actuated to release said accessory door; and damper means for dampening said pivotal movement of said accessory door.

4,721,311

MECHANICAL SEAL ASSEMBLY WITH COOLANT CIRCULATION TUBE

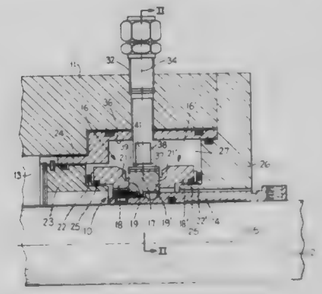
Kenneth G. Kakabaker, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 928,506, Nov. 7, 1986, abandoned. This application May 5, 1987, Ser. No. 48,502

Int. Cl.⁴ F16J *15/38*

U.S. Cl. 277—22 **12 Claims**

1. In a mechanical seal construction for creating a sealed relationship between a housing and a rotatable shaft, said seal construction including a seal rotor disposed within a cavity in the housing in surrounding relationship to the shaft and being sealingly and nonrotatably coupled thereto, the seal rotor defining a pair of first annular and axially directed rotatable seal faces formed on opposite axial ends thereof, and a pair of seal stators disposed in surrounding relationship to said shaft and nonrotatably and sealingly secured relative to said housing, said pair of seal stators being axially spaced apart and disposed in axially straddling relationship to said seal rotor, each said seal stator defining thereon a second annular and axially directed nonrotatable seal face formed thereon and maintained in sliding sealing engagement with an opposed one of said first seal faces, an annular chamber for coolant defined radially between said housing and said rotor and axially between said pair of stators, and a closed circulation system including said annular chamber for recirculating coolant therethrough to effect cooling of said seal faces, said circulation system including inlet and outlet openings communicating with said annular chamber at circumferentially spaced locations, and closed piping means disposed externally and connected between said inlet and outlet openings for defining a closed system permitting coolant to be recirculated from said outlet back to said inlet, the improvement comprising:



said exit opening being defined by a flow tube which projects radially through said housing and defines an outlet passage for coolant therethrough, said flow tube terminating at its radially inner end in a tubular tip part which projects radially into said annular chamber, said tubular tip part terminating in a free end which is positioned closely adjacent a circumferential exterior wall of said rotor, said tubular tip part having a windowlike opening formed in a sidewall thereof, said opening having a height as measured in said radial direction which extends over a majority of the radial height of said annular chamber, and said windowlike opening having a width as measured circumferentially of said flow tube which extends transversely through a distance which is a majority of but less than the maximum transverse cross-sectional dimension of the outlet passage, said windowlike opening in a circumferential direction which is opposite to the direction of rotation of said seal rotor.

4,721,312

CASSETTE SEAL FOR A SHAFT

Jörg Hornberger, Schriesheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,936

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505464

Int. Cl.⁴ F16J *15/32, 15/34, 15/54*

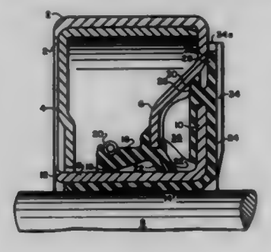
U.S. Cl. 277—37 **4 Claims**

1. In a cassette seal having an outer ring for mounting the cassette seal on a structure, a first inward, annular projection of the outer ring, a protective sleeve coaxially inside the outer ring for sealing about a shaft axially therethrough and for rotation therewith relative to the outer ring, a lipped sealing ring sealingly affixed to the first inward, annular projection of

the outer ring sealingly engaging with a resilient bias a radially outside surface of the protective sleeve, an outward, annular projection of the protective sleeve, and a resilient protective ring on the outward, annular projection of the protective sleeve having a lip sealingly pressing against the inward, annular projection of the outer ring for protecting the sealing ring from foreign bodies, the improvement comprising:

a substantially-radial, axial-defining countersurface on the inward, annular projection of the outer ring in axial engagement with a corresponding portion of the lip of the protective ring for a substantially-radial seal zone therebetween;

at least one, generally-axial, channel-defining projection operatively connected to at least one of axially-opposite sides of the outward, annular projection of the protective sleeve for defining at least one channel which is open



outwardly in the radial direction and axially in the direction of the channel-defining projection; and

a second inward, annular projection of said outer ring spaced axially from said first inward, annular projection, said outer ring forming a U-shaped cross-section defining a sealing space for a fluid, said sealing ring extending axially between said first and said second annular projections;

wherein the side of the outward, annular projection of the protective sleeve having the at least one, channel-defining projection is the axially outermore side thereof and the at least one, channel-defining projection extends radially across the lip of the protective ring; and

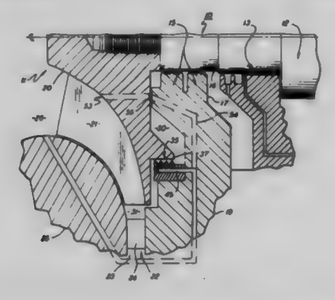
wherein the at least one, channel-defining projection has a radial outermost portion which extends axially across the radially outermost end of the lip of the protective sleeve.

4,721,313

ANTI-EROSION LABYRINTH SEAL

Hans Pennink, Clifton Park, N.Y., assignor to Atlas Copco Comptec, Inc., Voorheesville, N.Y.

Filed Sep. 12, 1986, Ser. No. 906,752
Int. Cl.[4] F16J *15/447*
U.S. Cl. 277—53 **15 Claims**



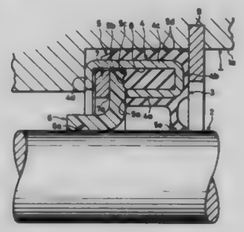
1. An anti-erosion gas seal assembly that includes a rotating seal component mounted upon a moving member of a rotating machine and stationary seal component mounted upon a fixed member of the machine to establish a gas barrier between two different pressure regions within the machine, said seal further including an annular body mounted on one of the components having a plurality of spaced apart teeth projected toward the other component to form a series of labyrinth cavities between adjacent teeth whereby gas moves centrifugally within the cavities, said annular body having an enclosed passage positioned beneath the cavities, a series of bleed holes connecting each of the cavities with the passage, each bleed hole being positioned to capture solids entrained in said centrifugal gas flow and direct the solids into said passage, and venting means for connecting the passage with a remote zone outside the seal area whereby gas entrained solids captured in the passage are conducted away from the seal into said remote zone.

4,721,314

LIP SEAL DEVICE

Hiroshi Kanayama; Kelichi Shimazaki, and Makoto Shibata, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Filed Mar. 23, 1987, Ser. No. 28,836
Claims priority, application Japan, May 2, 1986, 61-102659
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—152 **18 Claims**



1. A seal device comprising:

a casing surrounding a circumference of a rotary shaft;

a seal member attached on said casing; and

a lip seal sandwiched at its outer circumferential portion between said seal member and a spacer supported by said casing, said lip seal being in slidable contact at its inner-circumferential surface with an outer circumferential surface of said rotary shaft to thereby seal the contacting portion therebetween;

wherein said casing in an axial section comprises a first section of an inner-circumferentially and axially extending portion disposed at an inner circumferential side and extending axially, a second section of a first radially extending portion extended radially outwards from a first end portion of said first section, a third section of an outer-circumferentially and axially extending portion extending axially from a first end portion of said third section, in parallel with said first section from a radially outer end portion of said second section, and a fourth section of a second radially extending portion extended radially inwards from a second end portion of said third section;

wherein said seal member has at least a ring-shaped seal portion accomodated between said first, second and third sections and confronted with said fourth section; and

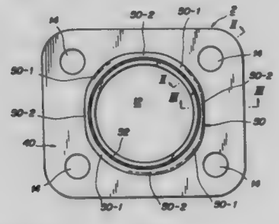
wherein said outer-circumferential portion of said lip seal is sandwiched between said seal portion and said fourth section and wherein said outer-circumferential portion at a side of said second section confronts said seal portion for sealing.

4,721,315

METALLIC CYLINDER HEAD GASKET

Kosaku Ueta, Urawa, Japan, assignor to Nihon Metal Gasket Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 916,251, Oct. 7, 1986, abandoned. This application May 11, 1987, Ser. No. 49,008
Claims priority, application Japan, Dec. 27, 1985, 60-292894
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **12 Claims**



1. A metallic gasket comprising:

a base plate comprising an elastic metal plate having a combustion chamber hole and at least one bolt hole therethrough;

an annular bead provided in said base plate so as to surround said combustion chamber hole;

said bead having a spring constant which increases as the distance of the bead from the bolt hole increases, thereby allowing a uniform sealing pressure to be applied to a sealing portion; and

compensating means provided along the edge of said combustion chamber hole of said base plate so as to surround said hole;

the thickness of said compensating means gradually increasing as the distance from the bolt hole increases.

4,721,316

CREEPER

Kirt E. Whiteside, Ostrander, Ohio, assignor to Whiteside Mfg. Company, Delaware, Ohio

Filed Sep. 22, 1986, Ser. No. 910,201
Int. Cl.[4] B62B *11/00*
U.S. Cl. 280—32.6 **16 Claims**



1. A mechanics creeper including a first thin rectangular upper sheet of resin having a planar upper surface for supporting the mechanic, said upper sheet being connected to a second thin lower sheet of resin, each of said sheets having two ends and two sides, said ends and sides being joined at their periphery, a head rest near one end of the upper sheet, and four casters connected to the lower sheet for engaging a substrate to hold the lower sheet of the creeper out of contact with the substrate,

said first sheet including an integral ridge extending along both sides and the end having the head rest, said ridge projecting upwardly from the upper surface to provide mechanical strength and stability,

said first sheet being formed integrally with the second sheet and said second sheet being spaced from the upper sheet, said lower sheet including a plurality of ribs projecting upwardly from said lower sheet to engage said first sheet, said ribs extending substantially parallel to each other and substantially perpendicular to said ends, there being no ribs extending parallel to the ends, the engaging portions of the ribs and the first sheet being bonded together to hold the sheets in spaced apart relationship and to provide mechanical stability and strength to the creeper,

a plurality of truncated cone shaped projections extending from the lower sheet into contact with the first sheet, each cone shaped projection being aligned with a plurality of ribs and being spaced from each rib, the contacted portions of the first sheet and projections being bonded to each other,

the joined ends of the upper and lower sheets farthest from the head rest being configured to have a smooth rounded surface not projecting upward from said planar upper surface whereby no obstruction will engage the body or legs of a prone mechanic lying on said planar surface with his head on the headrest,

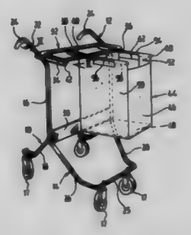
said planar surface having no elevational change except for said head rest and said integral ridge.

4,721,317

TROLLEY WITH REMOVABLE CONTAINERS FOR THE USE OF CUSTOMERS IN SUPERMARKETS

Jean P. Avot, Les Loges en Josas, France, assignor to Societe Anonyme dite: Livratel, Versailles, France

Filed Apr. 3, 1986, Ser. No. 847,637
Claims priority, application France, Apr. 12, 1985, 85 05543; Jun. 27, 1985, 85 09784
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—33.99 F **13 Claims**



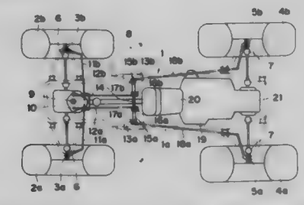
1. A trolley for the use of customers in supermarkets, of the type comprising a base mounted on orientable wheels, two vertical uprights and cross pieces joining said uprights together at their lower part and at their upper part, said trolley further comprising at least two tubular sleeves fixed to the upper part of the uprights or to the upper cross piece, in a substantially horizontal position perpindicular to the plane formed by the uprights, each of said sleeves having a longitudinal slit which extends along the bottom of the sleeve, and said sleeves serve for holding parallelepipedic bags comprising at their upper part two hooking straps formed by flexible strips fixed by one of their ends to the upper edge of the sidewalls of the bag, and which are bent back and fixed on themselves at their other end, so that in the passages formed by the two straps relative to each longitudinal side of the bag two rigid rods may be introduced, each rod being slid, over a portion of its length, inside one of the sleeves, and the straps passing through the slits in the sleeves, wherein the straps of the bag are held tight about the rods by means of resilient tubular sheaths, split longitudinally and having an internal diameter slightly less than of the rods and an external diameter less than the internal diameter of the sleeves, the ends of the sleeves being flared out so a to facilitate introduction of the rods.

4,721,318

STEERING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Makoto Hase, Hamamatsu, and Akihiko Kaneko, Kosai, both of Japan, assignors to Suzuki Motor Company Limited, Shizuoka, Japan

Filed Mar. 31, 1986, Ser. No. 846,194
Claims priority, application Japan, Apr. 8, 1985, 60-72765; Oct. 25, 1985, 60-239081
Int. Cl.[4] B62D 7/14
U.S. Cl. 280—91 18 Claims



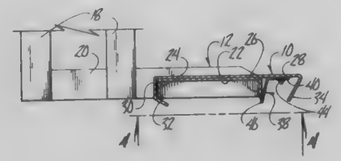
1. A steering system for use in a vehicle which comprises, in combination, a steering shaft means, a steering arm means mounted integrally with said steering shaft means, a pair of tie rod means for steering a pair of front wheels connected pivotally at their one end to said steering arm means, a linkage rod means for steering a pair of rear wheels connected pivotally at their one end to said steering arm means, linkage lever means mounted rotatably about a linkage shaft means provided on a frame structure of the vehicle said frame structure including side frames, said linkage rod means being connected pivotally to linkage arm means on the inner ends of said linkage lever means, a pair of tie rod means for steering a pair of rear wheels connected pivotally to linkage arm means on the outer ends of said linkage lever means, wherein an engine is disposed between said pair of tie rod means for steering a pair of rear wheels, and said pair of tie rod means for steering the pair of rear wheels are disposed extending generally above and in a parallel relationship with respect to said side frames of said frame structure of the vehicle.

4,721,319

REMOVABLE STEP COVER AND EXTENDER

Jerry D. Dale, 3701 Piute Tr., Austin, Tex. 78739

Filed Oct. 8, 1986, Ser. No. 916,947
Int. Cl.[4] B60R 3/02
U.S. Cl. 280—169 8 Claims



1. A vehicle step and removable step cover and extender comprising,

a vehicle step having a top flat side and front and rear downwardly extending flanges,

a cover plate matingly engaging said top flat side of said vehicle step and having an extension portion which extends beyond said front flange, and front and rear sides and a downwardly extending flange along said rear side engaging said downwardly extending flange on the rear of said vehicle step to limit forward movement of said cover plate,

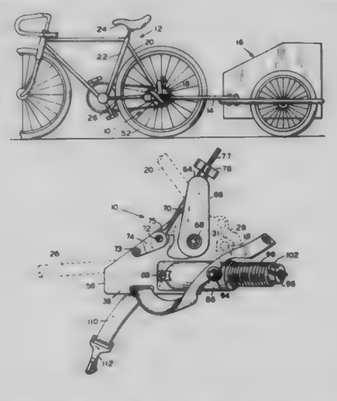
a lock means positioned on the bottom side of said extension portion of said cover plate including a lock element extending downwardly and rearwardly into locking engagement with said downwardly extending front flange of said vehicle step.

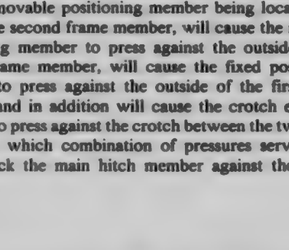
4,721,320

BICYCLE TRAILER HITCH

Bruce W. Creps; Donald A. George; Peter B. Berry; John E. Siekert; Robert C. Nyquist, and Jeffrey B. Nyquist, all of Eugene, Oreg., assignors to Burley Design Cooperative, Inc., Eugene, Oreg.

Filed Apr. 27, 1987, Ser. No. 42,793
Int. Cl.[4] B62K 27/12
U.S. Cl. 280—204 8 Claims





1. A bicycle trailer hitch for connecting a bicycle trailer to a bicycle, wherein the bicycle trailer has a trailer tongue, and the bicycle has on each side, for support of a rear axle and wheel, a first frame member and a second frame member which converge at an angle adjacently ahead of the rear axle, the convergence forming a crotch between said two frame members; the bicycle trailer hitch comprising:

a. a main hitch member, having a front, a rear, an outer side positioned away from the bicycle, and an inner side positioned toward the bicycle;

b. a crotch engaging member, attached to the rear inner side of the main hitch member and extending inwards towards the bicycle so as to be positioned within the crotch between the first frame member and the second frame members, whereat it engages said crotch;

c. a fixed positioning member located on the inner side of the main hitch member forward of the crotch engaging member, and extending inwards towards the bicycle so as to be located adjacent to the first frame member outside of the angle formed by the first and second frame members;

d. a movable positioning member, attached to the main hitch member and extending inwards toward the bicycle so as also to be located adjacent to the second frame member outside of the angle formed by the first and second frame members;

e. means for causing movement of said movable positioning member toward the inside of the angle formed by the first and second frame members;

f. wherein said movement of the movable positioning member, the movable positioning member being located outside of the second frame member, will cause the movable positioning member to press against the outside of the second frame member, will cause the fixed positioning member to press against the outside of the first frame member and in addition will cause the crotch engaging member to press against the crotch between the two frame members, which combination of pressures serve to securely lock the main hitch member against the crotch between the two frame members, and thereby attach the bicycle trailer hitch to the bicycle; and

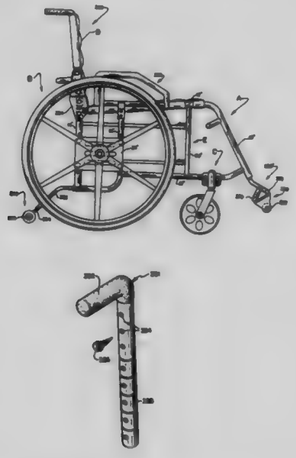
g. means for connecting the trailer tongue to the main hitch member.

4,721,321

WHEELCHAIR WITH ADJUSTABLE REAR CANES

Gilbert E. Haury, Grafton; Nathalal G. Patel; Walter G. Lockard, both of Elyria; Thomas R. Wiatrak, Brunswick, and Neal J. Carran, Fairview Park, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Division of Ser. No. 548,370, Nov. 3, 1983, Pat. No. 4,595,212, Continuation-in-part of Ser. No. 442,037, Nov. 16, 1982, Pat. No. 4,500,102. This application Mar. 10, 1986, Ser. No. 837,743
Int. Cl.[4] B62M 1/14
U.S. Cl. 280—242 WC 8 Claims



1. A wheelchair comprising:

a frame assembly including a lower frame portion and a back frame portion, the lower frame portion and back frame portion joined by an associated connecting structure, the back frame portion including two generally vertical tubular members, each generally vertical tubular member defining at least one mechanical fastener receiving aperture therein;

an operator supporting means including a lower supporting portion operatively connected with the lower frame portion for supporting the operator and a back supporting portion operatively connected between the tubular members for supporting the operator's back;

a pair of rear wheel mounting assemblies for selectively mounting a pair of rear wheels to the frame assembly;

a pair of front wheel mounting assemblies for selectively mounting a pair of front wheels to the lower frame portion; and,

a pair of L-shaped rear canes, each cane including:

a first portion defining a hand grip and a second portion extending generally perpendicular to the first portion, the second cane portion defining a plurality of alternating apertures and score lines, the apertures being spaced at preselected regular intervals from each other, the score lines being spaced at said preselected intervals from each other to facilitate shortening the cane second portion by multiples of said preselected interval, the cane second portion being disposed in telescopic receipt with one of the generally vertical tubular members with one of the cane second portion apertures aligned with one of the generally vertical tubular member apertures, mechanical interconnection means between the associated connecting structures and the rear tubular members for limiting the telescopic receipt between the cane telescopic receipt portions and the rear tubular members, such that severing the cane telescopic receipt portions at corresponding ones of the score lines shortens the telescopic receipt portions and enables the hand grips to be positioned lower without interference from the associated connecting structures; and,

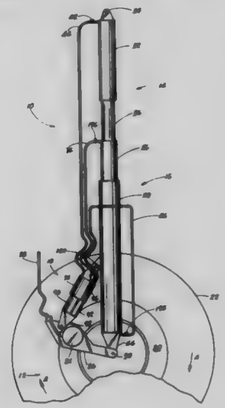
a fastener extending through the aligned cane second portion and generally vertical tubular member apertures to fix the cane to the frame with the hand grip portion at one of a plurality of preselected heights.

4,721,322

ANTI-DIVE BRAKING APPARATUS

Robert W. Hawkins, 622 DeNova, LaCanada, Calif. 91011

Filed Jun. 17, 1986, Ser. No. 875,347
Int. Cl.[4] B62K 25/08
U.S. Cl. 280—276 10 Claims



1. A vehicle anti-dive braking apparatus comprising:

(a) brake means rotatably mounted on the axle of a wheel of said vehicle;

(b) anti-dive means mounted on the frame of said vehicle;

(c) a suspension strut mounted on the axle of said wheel of said vehicle and in sliding engagement with said anti-dive means, said suspension strut further comprising:

i. a damper cylinder in sliding engagement with said anti-dive means;

ii. a bottom casing attached to the axle of said vehicle and in sliding engagement with said damper cylinder;

iii. a first damper housed within said bottom casing;

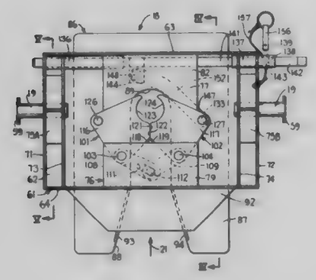
iv. a first spring damper housed within said bottom casing; and

v. a second spring damper housed within said bottom casing; and,

(d) means attached to said brake means and in fluid communication with said anti-dive means and said suspension strut for hydraulically actuating said anti-dive means and said suspension strut.

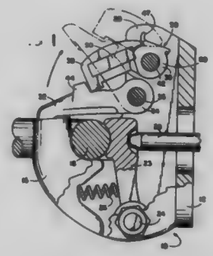
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,323
FIFTH WHEEL HITCH
Felix S. Czuk, Kalamazoo, Mich., and Robert S. Bowen, Shipshewana, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Jul. 17, 1986, Ser. No. 887,149
Int. Cl.[4] B62D *53/10*
U.S. Cl. 280—433 19 Claims



1. A trailer hitch which is mountable on an upwardly facing surface of a vehicle capable of movement in a forward direction and which can releasably grip a coupling element on a trailer, comprising: a base; means for fixedly securing said base to the upwardly facing surface of the vehicle; and coupling means supported on said base and adapted to releasably couple the coupling element on the trailer to said hitch; said coupling means including: a hitch member having an upwardly facing surface thereon and having a slot which extends forwardly thereinto from a rear edge thereof, which opens through said upwardly facing surface and which is adapted to receive therein a portion of the coupling element on the trailer; first and second jaws supported for relative movement between a gripping position in which said jaws can releasably grip a portion of the coupling element of the trailer and a release position in which the coupling element can be moved into and out of said slot in said hitch member substantially free of engagement with said jaws; and selectively actuable actuating means for effecting movement of said jaws from said gripping position to said release position thereof; wherein said actuating means includes an elongate, approximately horizontal actuating member extending approximately transversely to said forward direction and supported for lengthwise movement between first and second positions, and a single link element which extends between and is operatively coupled to said actuating member and said first jaw, said link element causing said first jaw to respectively move between said gripping and release positions thereof in response to movement of said actuating member between its first and second positions; wherein said coupling means includes means for causing said second jaw to respectively move between its gripping and release positions in response to movement of said first jaw between its gripping and release positions; wherein said link element has a first end supported on said actuating member for pivotal movement about a first pivot axis and has a second end supported on said first jaw for pivotal movement about a second pivot axis, said first and second pivot axes being parallel and extending approximately normal to said actuating member and said slot; and wherein as said actuating member is moved from its first to its second position, it passes through a toggle position in which a line extending radially between said first and second pivot axes is perpendicular to said actuating member.

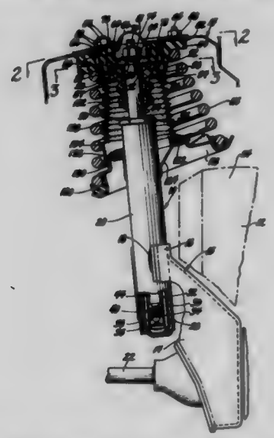
4,721,324
LOCKING MECHANISM FOR TRAILER COUPLING
William Blacklaw, 4434 SE. 25th, Portland, Oreg. 97202
Filed Feb. 19, 1987, Ser. No. 16,565
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—504 4 Claims



1. A locking mechanism for a trailer coupling of the type having a body which is attached to a towing vehicle, a drawbar receiving pintle, a latch which engages the extremity of the pintle to prevent removal of the drawbar therefrom, and a pawl which is rotatable between a locking position where it is in interlocking engagement with the latch and an unlocking position above the latch, said locking mechanism comprising:
(a) catch means associated with the pawl for engaging the body when said pawl is in its locking position for preventing the rotation of said pawl from said locking position;
(b) means for disengaging said catch means from said body;
(c) lock means for preventing unintentional disengagement of said catch means from said body;
wherein said pawl has a cavity defined medially therein and said catch means includes;
(i) a pair of elongate prongs;
(ii) said prongs each having one end which is located within said cavity and is rotatably joined to said pawl;
(iii) said prongs being oriented such that they are rotatable between a first position where the other ends thereof protrude out of said cavity and a second position where said other ends are enclosed within said cavity; and
(iv) biasing means for normally placing said prongs in said second position.

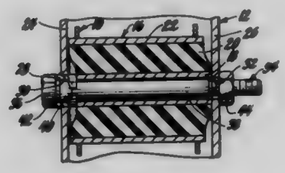
4,721,325
SUSPENSION STRUT WITH QUICK TAKE-APART UPPER MOUNT
John M. Mackovjak, Romeo, and Marvin J. Hyma, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 19, 1986, Ser. No. 932,403
Int. Cl.[4] B60G *11/14*
U.S. Cl. 280—668 5 Claims

1. In a wheeled automotive vehicle having a body with suspension support structure, a serviceable vehicle suspension strut with hydraulic shock absorber means operatively mounted therein, said strut mounting a road wheel of said vehicle to said support structure, said support structure having an access opening for servicing said shock absorber means, said strut comprising an outer support tube operatively connected to the vehicle road wheel and extending upwardly therefrom, said hydraulic shock absorber means operatively mounted within said support tube and separable therefrom, said shock absorber means incorporating a piston and piston rod operatively mounted therein, a suspension spring having a lower end mounted to the support tube and extending upwardly thereabout, an upper mount assembly for said strut, said upper mount assembly having a retention cup assembly which receives the loads from said suspension spring, a piston rod shear mount assembly mounted in said retention cup assembly, and jounce bumper assembly means mounted by quick release retention means to said retention cup assembly, and nut means securing said piston rod shear mount assembly to said piston rod and cover plate means securing said piston rod shear mount assembly therein, said shear mount and jounce bumper



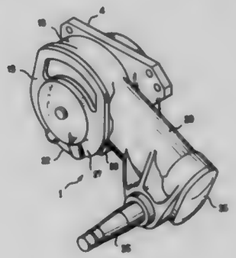
assemblies being readily removable to provide an axial opening to the upper portion of said support tube to provide access to the interior thereof through a removable retainer means fastened to the upper end of said support tube thereby allowing for the onboard service of said strut.

4,721,326
SUSPENSION JOINT
Peter Masoe, Clawson, and Philip C. Boggs, Jr., Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 30, 1987, Ser. No. 8,852
Int. Cl.[4] F16B *13/06*
U.S. Cl. 280—673 3 Claims



1. In a vehicle having a suspension support bracket and a suspension member with a bushing that has a sleeve, an improved joint for fastening said bushing to said bracket without deforming said bracket, comprising,
first and second generally parallel bracket walls spaced apart a distance that is greater than the length of said bushing sleeve,
a radially expandable cylindrical sleeve that is abuttable with said bushing sleeve, said abutted expandable and bushing sleeves having a total length that is slightly greater than the spacing between said bracket walls plus the thickness of said bracket first wall,
said bracket first wall further having a circular opening therethrough with a diameter greater than the unexpanded outside diameter of said expandable sleeve,
said bracket second wall further having an opening therethrough opposed to the opening in said bracket first wall and sufficiently small that said bushing sleeve cannot pass therethrough, and,
a bolt having a head larger than the diameter of said bracket first wall opening and a threaded shaft sufficiently narrow to be fitted through said expandable sleeve except for a conical expander portion that tapers from said shaft to a greatest diameter at said head, said greatest diameter being just sufficient to radially expand the outside of said expandable sleeve to the diameter of said bracket first wall opening,
whereby said bushing sleeve may be fastened between said bracket walls by placing said expandable sleeve over said bolt shaft and inserting said bolt shaft through said bushing sleeve and bracket wall openings with said expandable sleeve extending axially through said bracket first wall opening with radial clearance and then tightening said bolt so that said bolt expander portion pulls said expandable sleeve into abutment with said bushing sleeve and then pulls both sleeves together axially toward said bracket second wall without resistance until said bushing sleeve and abutted expander sleeve are axially stopped by said bracket second wall, further tightening of said bolt acting to draw said expander portion axially within said expandable sleeve to expand said expandable sleeve radially outwardly until the outside thereof is forced radially into the edge of said bracket first wall opening to anchor said expanded sleeve relative to said bracket first wall and said bolt head engages said expandable sleeve with axial clearance from the outside of said bracket first wall, thereby clamping said bushing sleeve between said anchored expandable sleeve and said second wall to form a complete secure bushing-bracket joint without deforming said bracket walls toward one another.

4,721,327
SUSPENSION UNIT FOR VEHICLES WITH BUILT-IN DAMPER
Jean-Marc Chauveau, Chaville, and Claude A. Chambon, Orsay, both of France, assignors to Lucas France S.A., Paris, France
Filed Sep. 19, 1986, Ser. No. 909,831
Claims priority, application France, Sep. 19, 1985, 85 13935
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—705 29 Claims



1. Suspension unit for vehicles comprising:
a support adapted to be attached to a framework of the vehicle,
a longitudinal arm,
means coupling a rolling member to said arm defining a transverse first axis of rotation of said rolling member relative to said arm,
means coupling said arm to said support defining a transverse second axis of rotation of said arm relative to said support, said second axis being parallel to said first axis and offset from it longitudinally,
means coupling said arm to said support defining an angular equilibrium position of said arm for rotation about said second axis relative to said support and elastically en-

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abling rotation of said arm about said second axis relative to said support in two opposite directions from said angular equilibrium position,

two complementary friction brake members,

means immobilizing said friction brake members against rotation about said second axis respectively relative to said arm and said support,

means pressing together said friction brake members,

means conditioning the force with which said pressing means press said friction brake members together according to the speed of rotation of said arm about said second axis relative to said support in a first direction, and

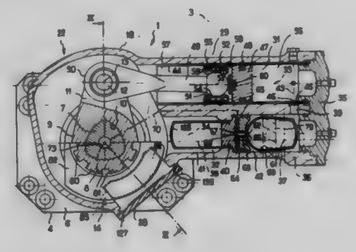
means conditioning the force with which said pressing means press said friction brake members together according to the speed of rotation of said arm about said second axis relative to said support in a second direction opposite to said first direction.

4,721,328

OSCILLATING ARM SUSPENSION UNIT FOR VEHICLES

Jean-Marc Chauveau, Chaville, and Claude A. Chambon, Orsay, both of France, assignors to Lucas France S.A., Paris, France

Filed Sep. 19, 1986, Ser. No. 909,778
Claims priority, application France, Sep. 19, 1985, 85 13934
Int. Cl.[4] B60G *11/32, 11/26*
U.S. Cl. 280—705 **10 Claims**



1. Suspension unit for vehicles comprising:

a support adapted to be fastened to a framework of the vehicle,

a longitudinal arm,

means coupling a rolling member to said arm defining a transverse first axis about which said rolling member rotates relative to said arm,

means coupling said arm to said support defining a transverse second axis about which said arm rotates relative to said support, said second axis being parallel to said first axis and offset relative to it in a longitudinal direction,

a longitudinal cylinder within said arm,

a piston slidable longitudinally within said cylinder and delimiting with it a fluid-tight enclosure,

a compressible fluid in said enclosure serving as spring means,

a rod linking said piston and said support,

means pivoting said rod to said support for rotation about a transverse third axis parallel to said second axis and offset relative to it transversely, and

means pivoting said rod to said piston for rotation about a transverse fourth axis parallel to said third axis and comprising:

a slide member sliding longitudinally within said cylinder and juxtaposed longitudinally to said piston on the same side as said rod,

means pivoting said rod to said slide member to rotate about said fourth axis, and

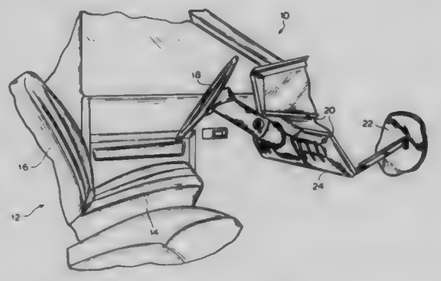
means coupling said slide member to said piston and permitting mutual transmission of longitudinal forces but not permitting mutual transmission of transverse forces.

4,721,329

ELASTICALLY RESTORING KNEE BOLSTER FOR MOTOR VEHICLES

Russel Brantman, New City, N.Y., and John N. Hatfield, Long Valley, N.J., assignors to Breed Corporation

Filed Apr. 11, 1986, Ser. No. 850,950
Int. Cl.[4] B60R *21/045*
U.S. Cl. 280—751 **12 Claims**



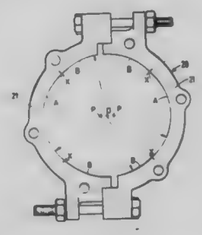
1. A device for engaging the knees of a vehicle occupant during a collision, said device comprising: a frame; a deformable backing plate disposed on said frame; a layer of resilient material disposed on said backing plate and positioned to store kinetic energy from said lower body portion during collision and then retransmit the stored energy to said lower body portion by applying a restoring force thereto a layer of crushable material which absorbs energy from said lower portion by permanent deformation wherein said layer of resilient material is disposed between said layer of crushable material and said backing plate; and support brace means for securing said frame to said vehicle body.

4,721,330

PIPE CLAMP DEVICE

Ian Woodhouse, Burton-on-Trent, England, assignor to Silvertown House, London, England

Filed Nov. 18, 1985, Ser. No. 798,854
Claims priority, application United Kingdom, Nov. 21, 1984, 8429364
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—177 **11 Claims**



1. In a pipe clamp device for the compression of a sealing gasket relative to a socket and spigot joint forming part of an assembly including a socket-carrying pipe and a spigot-carrying pipe, a shoulder being provided on the socket-carrying pipe, a clamping ring comprised of a plurality of interconnectable portions each having a peripheral gasket-engaging surface adapted for disposition around the spigot-carrying pipe, said

gasket engaging surfaces forming a substantially continuous gasket engaging surface when assembled, compression means operatively connecting said portions and acting between said portions in a direction substantially parallel to a tangential direction such that compressing operation of said compression means causes radially inward contraction of said portions and consequential radial compression of the gasket, an annular anchor device provided for disposition around the socket-carrying pipe adjacent the joint and having an internal peripheral surface engageable with a shoulder on the socket-carrying pipe, and connecting means adapted to connect the clamping ring to the anchor device for applying a generally axial clamping force between the clamping ring and anchor device and thereby to the gasket, the improvement wherein:

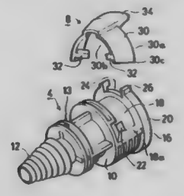
the internal peripheral surface of the anchor device comprises two pairs of curved surfaces, said curved surfaces in each pair being diametrically opposed to one another when the anchor device is disposed around the socket-carrying pipe, each curved surface extending for only a part of said internal peripheral surface, the internal radius of one pair of said curved surfaces being different from the internal radius of the other pair of said curved surfaces for enabling one of said pairs of said curved surfaces to match a shoulder on a different outer diameter socket-carrying pipe, around which the anchor device is disposed, than the other pair of said curved surfaces.

4,721,331

QUICKLY ATTACHABLE CONNECTORS PARTICULARY FOR USE AS A HOSE COUPLER

Noam Lemelshtrich, Haeshel Street 57, Herzlia Pituach, Israel

Filed Sep. 9, 1986, Ser. No. 905,150
Claims priority, application Israel, Mar. 31, 1986, 78369
Int. Cl.[4] F16L *37/14*
U.S. Cl. 285—305 **20 Claims**



11. A female connector member for use in a quickly-attachable connector assembly with a male connector member having an annular locking rib, comprising: a housing formed with a socket having a longitudinal axis and open at one end for receiving the male connector member and further formed with a pair of circumferentially-spaced openings through a wall of the housing leading into said socket; and a locking member having a flexible arcuate section received on the outer face of said housing, and a pair of locking elements normally projecting through said openings into said socket for locking the male connector member when inserted therein;

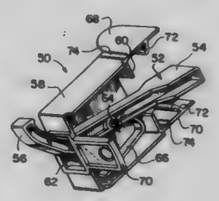
characterized in that said flexible arcuate section of the locking member is of a curved trapezoidal configuration and is received within a recess of a curved rectangular configuration formed in the outer face of the housing, the sides of said recess constituting cam surfaces engageable with the ends of said flexible arcuate section such that depressing the arcuate section causes opposed corners thereof to slide past the ends of said housing recess with a snap-action, thereby to move the locking elements with a snap-action outwardly to a releasing position.

4,721,332

WINDOW LOCK

William S. Sturman, South Point, Ohio, assignor to Rollyson Aluminum Products, Incorporated, South Point, Ohio

Filed Aug. 22, 1986, Ser. No. 899,289
Int. Cl.[4] E05C *3/04*
U.S. Cl. 292—128 **5 Claims**



1. A window lock for use in conjunction with a window sash and a cooperating frame to retain the sash in position with respect to the frame, said lock comprising:

a latch having an elongated bar and a laterally extending hook portion;

a latch housing including a forward wall having a forward opening defined therethrough, and a rearward wall disposed oppositely on said housing from said forward wall, said rearward wall defining a rearward opening therethrough;

said latch being connected to said latch housing for pivotal movement along a plane normal to said forward and said rearward walls, said elongated bar extending through said forward and said rearward openings, and said hook portion extending along said plane from said elongated bar outside said forward opening;

means for applying pivotal biasing force to said latch in the direction of said hook portion to bias said latch into a normal position;

means for selectively securing said latch in said normal position including a first tab pivotally connected to said housing and a first catch means secured to said first tab for engaging said housing along said rearward opening to secure said first tab in contact with said latch to prevent pivotal movement of said hook portion; and

means connected to said housing for engaging said latch to selectively counteract said biasing force and retain said latch away from said normal position.

4,721,333

ARRANGEMENTS FOR FORMING BUMPER STRUCTURES OF AUTOMOBILES

Akie Morio, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

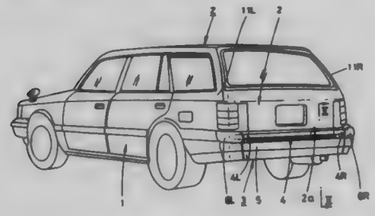
Filed Dec. 5, 1986, Ser. No. 938,422
Claims priority, application Japan, Dec. 10, 1985, 60-278570
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—146 **14 Claims**

1. An arrangement for forming a bumper structure of an automobile having a rear door mounted on a body thereof to be openable and closing, the arrangement comprising;

a bumper including a lower member fixed to a rear end portion of the body at a position lower than the rear door and an upper member attached to a lower end portion of the rear door, said upper member having end portions elongating oppositely in a direction of the width of the body beyond the rear door, and

a pair of receiving members attached to the rear end portion of the body so as to bear relation to said end portions of said upper member elongating oppositely beyond the rear door when the rear door is closed so that an impact load

dealt to said upper member of the bumper from behind is partially propagated through said receiving members to



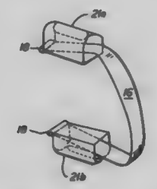
the body and thereby impact load imposed on the rear door is reduced.

4,721,334

APPARATUS FOR ASSISTING IN THE USE OF CHOPSTICKS AND METHOD FOR MAKING SAME

Daniel T. Nakatsu, 117 Westwood Dr., San Francisco, Calif. 94111

Filed Apr. 7, 1986, Ser. No. 849,179
Int. Cl.[4] A47G *21/10*; A47J *43/28*
U.S. Cl. 294—99.2 **11 Claims**



1. A device for assisting in the use of chopsticks comprising spring means, in the form of a resilient band;
attachment means comprising a chopstick receiving sleeve having a base formed at each end of said resilient band; and
securing means being a pressure means within each sleeve integral therewith and in addition thereto operable to engage and apply pressure against a chopstick inserted into said sleeve.

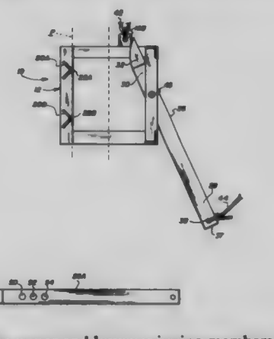
4,721,335

PULLER FOR FENCE POSTS OR THE LIKE

Paul Krenek, Jr., Rte. 2, Box 125A, East Bernard, Tex. 77435

Filed Nov. 7, 1986, Ser. No. 928,251
Int. Cl.[4] B66C *1/44*
U.S. Cl. 294—104 **4 Claims**

1. An apparatus for use in pulling elongated objects such as fence posts out of the ground, comprising:
(a) a rigid structural member constituting a frame having a vertically oriented opening therethrough, and the opening having a size that is slightly larger than the cross-section of the largest post that is to be pulled from the ground, such that the post may be inserted into the opening by the act of lowering the frame over the post, and the frame constituting an open framework of permanently connected members forming a cage-like structure into which a post that is to be lifted out of the ground is inserted;
(b) means located at the top of said frame for transferring lifting loads to the frame;
(c) a pair of spaced gripping members positioned within the opening and at the back of the frame, and said gripping members being oriented so as to face inwardly and be generally horizontal when the frame is suspended vertically, and one of said gripping members being above the other so as to define upper and lower gripping members, and said gripping members constituting pieces of angle iron which are oriented so that the apex of the angle iron is pointed inwardly of the frame, such that a sharp edge is presented by each of the two gripping members to any post that is inserted interiorly of the frame;
(d) a handle pivotally mounted on the front of the frame in such a way that it passes through the vertical plane established by the front of the frame, and said handle having a relatively long portion lying outside the frame and a relatively short portion extending interiorly of the frame, and the handle being mounted such that the distal end of the short portion is adapted to be moved between horizontal



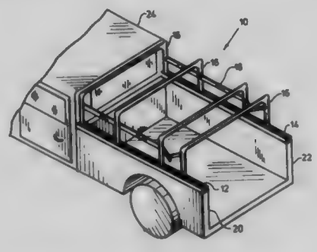
planes through the upper and lower gripping members on the back of the frame, and the handle having means at its distal end for fostering connection with a rope, whereby the handle may be manipulated with a rope from a remote location and whereby a fence post may be engaged without the necessity of having a person standing immediately next to the post; and
(e) a post-contacting element mounted on the distal end of the short portion of the handle, and said element being configured to bear against a post that is inserted vertically through the frame, whereby the frame may be selectively lifted and any post which is wedged between the post-contacting element and the gripping members will be similarly lifted.

4,721,336

FLEXIBLE CAP FOR A TRUCK BED

Hazel R. Jones, Mechanicsburg, Pa., assignor to Flex-A-Cap, Arlington, Va.

Filed Oct. 22, 1986, Ser. No. 906,414
Int. Cl.[4] B62D *25/06*
U.S. Cl. 296—100 **19 Claims**



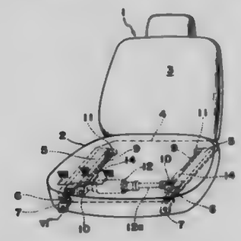
1. A new and improved truck bed cover comprising:
guide track means fixedly securable to side sections of said truck bed;
slide means slidably guidingly movable within said guide track means;
cover support means operably attached to said slide means; and,
flexible cover means selectively attachable to said cover support means and,
pivotable brace means having a plurality of pivot points interposed between spaced apart members forming said cover means, said pivot points all being in axial alignment.

4,721,337

MOTOR DRIVEN SEAT SLIDE MECHANISM

Toshihiko Tomita, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 9, 1987, Ser. No. 12,544
Claims priority, application Japan, Feb. 10, 1986, 61-27434; Feb. 10, 1986, 61-18069[U]
Int. Cl.[4] F16M *13/00*; A47C *1/02*
U.S. Cl. 297—344 **9 Claims**



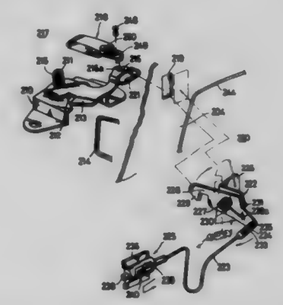
1. A motor-driven seat slide mechanism comprising:
a cushion assembly including a base plate;
spaced apart, first and second telescopically extendable guide rail structures one for each side of the cushion assembly, each of said telescopically extenable guide rail structures including upper and lower guide rail members connected one above the other for axial movement relative to each other, said upper and lower guide rail members being connected to the base plate and a floor panel of an automobile body structure, respectively;
an electrically powered drive motor;
at least one gear box connected to said upper guide rail member at one end of the base plate and including a worm gear and a worm wheel drivingly meshed with said worm gear, said worm gear being drivingly coupled with the drive motor;
a releaseable bearing means rigidly connected to said upper guide rail member of the first telescopically extendable guide rail structure at an end of the base plate opposite said one end;
a constraint member mounted to an automobile floor panel and having a threaded bore through which a screw shaft threadingly extends; and
the screw shaft extending in a direction parallel to the longitudinal axis of said upper guide rail member in spaced relation thereto, said screw shaft having one end portion journalled removably to the releaseable bearing means and the opposite end portion removably coupled with the worm wheel within the gear box.

4,721,338

ARRESTING DEVICE FOR REAR SEAT BACK

Nobuaki Kondo, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 27, 1986, Ser. No. 844,599
Claims priority, application Japan, Apr. 3, 1985, 60-71431
Int. Cl.[4] B60N *1/04*
U.S. Cl. 297—379 **2 Claims**



1. An engaging device for arresting the movement of a rear seat back relative to a chassis, which seat back is arranged to be forward-inclinable to communicate a passenger room with a trunk room, which are separated by said seat back, through an opening, said device comprising:
releasable engaging means for holding the rear seat back in an engaged stand-up position, said rear seat back inclinable when released from said releasable engaging means;
locking means for locking said releasable engaging means against release such that the rear seat back is prevented from being inclined forwardly from said engaged stand-up position; and
operating means disposed in the trunk room for unlocking said locking means when a trunk room lid is raised, whereby only when the operating means is operated by opening a trunk room lid to unlock said locking means can the rear seat back be released by said releasable engaging means;
said releasable engaging means comprising a first striker element fixed relative to the chassis, and a lever provided with the rear seat back, said lever engageable with the first striker;
said locking means comprising a second striker attached to the lever of the releasable engaging means, and a lock plate connected with the chassis, said plate engageable with the second striker to hold the lever in engagement with the first striker, and said operating means comprises an operating device provided in the trunk room for controlling the engagement/disengagement of the lock plate.

4,721,339

ROCK CRUSHING DEVICE AND A METHOD THEREOF

Mitsuya Sakai, Kashiwara; Kenji Hagimori, and Toshinori Asahi, both of Osaka, all of Japan, assignors to Okumura Corporation, Osaka, Japan

Filed Oct. 23, 1985, Ser. No. 790,534
Claims priority, application Japan, Oct. 23, 1984, 59-160155
Int. Cl.[4] E21C *37/06*
U.S. Cl. 299—1 **4 Claims**

1. A method for crushing a rock comprising the steps of:
inserting an expandable member into a borehole formed in the rock;
expanding said expandable member in response to pressure of a liquid material by injecting thereinto said liquid material from a source;
measuring the instantaneous liquid pressure injected into the

expandable member by a liquid pressure measuring device;

processing the measured instantaneous liquid pressures at respective time intervals by a processor connected to said liquid pressure measuring device which has established therein an initial predetermined pressure value and a certain pressure difference value;

comparing in sequence, by said processor, said measured instantaneous liquid pressures with said initial predetermined pressure value;

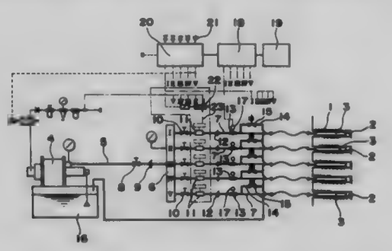
updating said initial predetermined pressure value with said measured instantaneous liquid pressure if said measured instantaneous liquid pressure exceeds said initial predetermined pressure value so as to determine a maximum measured instantaneous pressure;

obtaining, by said processor after said initial predetermined pressure has been updated to be said maximum measured instantaneous pressure, a pressure difference value which represents the difference between said initial predetermined pressure and said measured instantaneous pressure; and

stopping the injection of liquid material into said expandable member when said pressure difference value processed by the processor in consecutive measurements of said instantaneous pressure measured by the measuring device exceeds the certain pressure difference value.

3. A rock crushing device for crushing a rock comprising:

an expandable member connected to a liquid source by a



liquid supply conduit for being expanded by pressure of liquid material injected thereinto after said expandable member has been inserted into a borehole formed in the rock;

a liquid pressure measuring device provided in said conduit for measuring an instantaneous liquid pressure of said liquid injected into said expandable member;

a processor connected to said liquid pressure measuring device and having established therein an initial predetermined pressure value and certain pressure difference value, for processing at respective time intervals the measured instantaneous liquid pressure, comparing in sequence said measured instantaneous liquid pressures with said initial predetermined pressures, updating said initial predetermined pressure value with said measured instantaneous liquid pressure if said measured instantaneous liquid pressure exceeds said initial predetermined pressure value so as to determine a maximum measured instantaneous pressure, obtaining after said initial predetermined pressure has been updated to be said maximum measured instantaneous pressure, a pressure difference value which represents the difference between said initial predetermined pressure value and said measured instantaneous pressure; and

means for stopping the injection of liquid material into said expandable member when said pressure difference value processed by the processor in consecutive measurements of said instantaneous pressure measured by the measuring device exceeds the certain pressure difference value.

4,721,340

PROCESS FOR CONTROLLING THE MOVEMENT OF AN UNIVERSALLY SWIVELLABLE CUTTING ARM AS WELL AS CONTROL DEVICE FOR PERFORMING THIS PROCESS

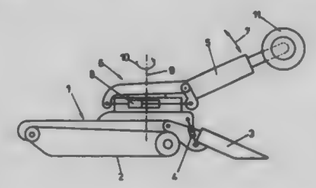
Herwig Wrulich; Alfred Zitz, and Otto Schetina, all of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria

Filed Sep. 22, 1986, Ser. No. 909,887

Claims priority, application Austria, Oct. 14, 1985, 2973/85

Int. Cl.⁴ E21C *25/06, 35/24*

U.S. Cl. 299—1 **8 Claims**



1. Apparatus for controlling the movement of a universally swivellable cutting arm comprising:

a first hydraulic drive means for lifting and lowering the cutting arm;

a second hydraulic drive means for swivelling the cutting arm transverse to the lifting and lowering direction;

means for actuating said first and second hydraulic drive means to advance the cutting arm along a predetermined path, said actuating means including means for introducing a predetermined volume of hydraulic fluid to said first hydraulic drive means simultaneously to introducing hydraulic fluid to said second hydraulic drive means, whereby the cutting arm may be driven along a first horizontal stroke, a short sloping stroke and at least a second horizontal stroke, the path of the second horizontal stroke being separated from the path of the first horizontal stroke by a predetermined vertical distance.

4,721,341

CUTTING HEAD FOR A SELECTIVE CUTTING MACHINE

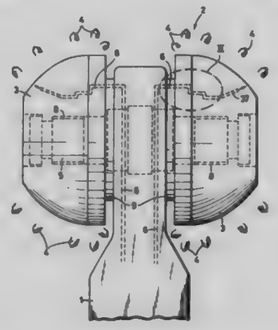
Gerhard Maschewski, Dortmund, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Postfach, Fed. Rep. of Germany

Filed Oct. 9, 1986, Ser. No. 917,014

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3537961

Int. Cl.⁴ E21C *7/08*

U.S. Cl. 299—81 **26 Claims**



1. A cutting head for a selective cutting machine, the cutting head being rotatably mounted on a boom, the cutting head

including a plurality of spray nozzles, a plurality of control ducts for feeding pressurised water to the spray nozzles, and a control surface surrounding and arranged concentrically with respect to the axis of rotation of the cutting head, the control ducts leading from the control surface and being connected to a high pressure water supply line via a piston having a free end surface which is dimensioned and arranged to slidably contact only an angular segment of the control surface, with the remainder of the control surface being free from contact with the free end surface of the piston, the piston being provided with a passage passing therethrough, one end of the piston passage being connected to the high pressure water supply line, and the other end of the piston passage terminating in a control opening formed in said free end surface of the piston.

4,721,342

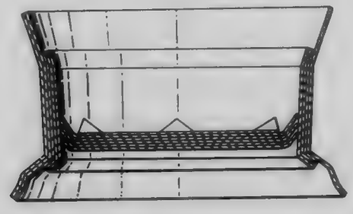
FIBER REINFORCED SYNTHETIC MATERIAL WHEEL

Vernon A. Daniels, Canton; Joonmin Park, Farmington Hills, and Steven Ivanyi, Walled Lake, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,674, Dec. 28, 1981, Pat. No. 4,532,097. This application Mar. 7, 1985, Ser. No. 709,470

Int. Cl.⁴ B60B *5/02*

U.S. Cl. 301—63 PW **18 Claims**



1. A compression moldable pre-form of a synthetic material wheel, which pre-form comprises:

a substantially planar spider portion comprising random, chopped fiber reinforced resin;

a first tubular section comrpising fiber reinforced resin sheet surrounding said spider portion about an axis substantially normal to the plane of said spider portion; and

a second tubular section comprising fiber reinforced resin sheet surrounding and substantially coaxial with said first tubular section, extending axially in both directions beyond said first tubular section, said fiber reinforced resin sheet of said first tubular section and said second tubular section each comprising random, chopped fiber and continuous fiber.

4,721,343

HYDRAULIC BRAKING PRESSURE CONTROL APPARATUS FOR AN ANTI-LOCK BRAKING SYSTEM OF MOTOR VEHICLES

Shohei Matsuda, Utsunomiya; Yoshihiro Iwakawa, Haga, and Makoto Sato, Kamifukuoka, all of Japan, assignors to Honda, Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

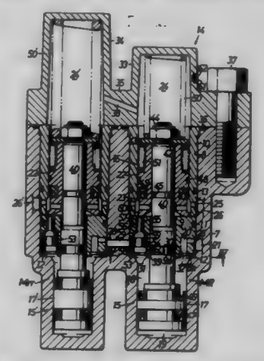
Filed Jun. 18, 1986, Ser. No. 875,601

Claims priority, application Japan, Jun. 20, 1985, 60-93416[U]

Int. Cl.⁴ B60T *8/42*

U.S. Cl. 303—6 C **17 Claims**

1. In a hydraulic braking pressure control apparatus for vehicles provided with a hydraulic braking pressure modulator, said apparatus comprising a partition located in a cylinder bore formed in a casing to divide said cylinder bore into a first cylinder portion and a second cylinder portion, the first cylinder portion having therein a first piston slidably fitted to define an input hydraulic chamber on the side facing the partition communicating with a master cylinder and a control chamber on an opposite side remote from the partition, the control chamber being capable of communicating with a control liquid pressure source, the second cylinder portion having a second piston slidably fitted therein and operatively connected to the first piston, the second piston defining an output hydraulic chamber on the side facing the partition communicating with a wheel brake, said partition being provided with a valve mechanism adapted to disconnect communication between the input hydraulic chamber and the output hydraulic chamber in re-



sponse to a displacement of the first piston toward the partition, the improvement comprising a piston rod having opposite ends, said piston rod extending through said partition in sealed movable relation, said first piston being secured to one of said opposite ends of said piston rod, said second piston being mounted axially relatively movably on the other end of said piston rod and means axially biassing said second piston towards said partition.

4,721,344

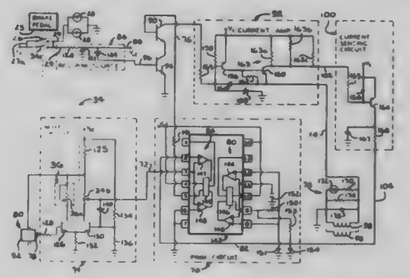
ELECTRIC BRAKE CONTROLLER

John S. Frait, Ann Arbor; Michael D. Warner, Oak Park, and David T. Ayers, Birmingham, all of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 22, 1984, Ser. No. 663,638

Int. Cl.⁴ B60T *13/74*

U.S. Cl. 303—20 **5 Claims**



2. An improved electronic controller for energizing electrically operated brakes in a towed vehicle in response to a demand by a driver in a towing vehicle having at least one brake light for connection to a vehicle power supply through a normally open brake light switch, the brake light switch operable by the vehicle driver to close and generate an activation signal having a magnitude substantially equal to the voltage level of the vehicle power supply, the activation signal being generated at a junction between the brake light and the brake light switch, said controller comprising:

control means responsive to the activation signal for generating a brake driving signal to energize the brakes; and

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means connected between the junction and said control means and operative to supply the activation signal to said control means only when the voltage level at the junction is above a predetermined level to prevent lower level signals present at the junction from being supplied to said control means when the brake light switch is open.

4,721,345

ACTUATOR OF ANTI-SKID DEVICE FOR MOTOR VEHICLES

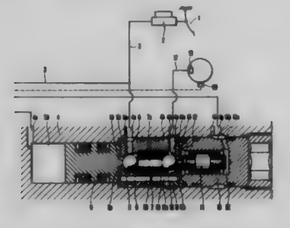
Takumi Nishimura, Chiryu; Tadao Saito, Nagoya; Nobuyasu Nakanishi, and Noboru Noguchi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 3, 1986, Ser. No. 881,696

Claims priority, application Japan, Jul. 3, 1985, 60-102344[U]

Int. Cl.⁴ B60T *8/42, 8/34*

U.S. Cl. 303—113 **4 Claims**



1. An anti-skid device for motor vehicles, comprising:

a hydraulic circuit connecting a brake master cylinder with a wheel brake cylinder;

a first valve disposed in said hydraulic circuit and dividing said hydraulic circuit into a brake master cylinder side hydraulic circuit and a wheel brake cylinder side hydraulic circuit, said first valve being movable between a first position wherein said master cylinder side hydraulic circuit and said wheel brake cylinder side hydraulic circuit have substantially the same pressure, and a second position wherein said wheel brake cylinder side hydraulic circuit has substantially less pressure than does said master cylinder side hydraulic circuit;

an electric motor;

a pump for generating working fluid pressure, wherein said pump is connected to an output of said motor such that said pump is driven by said motor;

an accumulator communicating with an output of said pump for accumulating working fluid pressure generated by said pump;

a pressure reducing piston movable between an inactive position in engagement with said first valve for maintaining said first valve in said first position, and an active position out of engagement with said first valve whereby said first valve can assume said second position and the capacity of said wheel brake cylinder side hydraulic circuit is increased, said pressure reducing piston including means for assuming said inactive position in response to the application of the working fluid pressure to a working fluid pressure chamber associated with said pressure reducing piston;

a working fluid chamber side hydraulic circuit for communicating working fluid with said working fluid pressure chamber;

a second valve in said working fluid chamber side hydraulic circuit and comprising means for supplying said working fluid pressure to said working fluid pressure chamber when a motor vehicle wheel associated with said wheel brake cylinder side hydraulic circuit is rotating in a normal condition, said second valve also comprising means for releasing said working fluid pressure from said working fluid pressure chamber when locking of the wheel is imminent, whereby said pressure reducing piston can move to said active position so that said first valve can move to said second position in which said wheel brake cylinder side hydraulic circuit has substantially less pressure than does said master cylinder side hydraulic circuit;

a third valve comprising means for controlling the working fluid pressure supplied to said working fluid pressure chamber to a value corresponding to the hydraulic pressure in the brake master cylinder side hydraulic circuit, said third valve including one side valve section comprising means for selectively communicating said accumulator and said working fluid pressure chamber, an other side valve section comprising means for selectively communicating said working fluid pressure chamber and a drain circuit, a piston movable in opposition to the hydraulic pressure in said working fluid pressure chamber to a position for closing said other side valve section and opening said one side valve section, and means responsive to the hydraulic pressure of said brake master cylinder side hydraulic circuit for moving said piston to said position,

wherein said one side valve section includes a valve body and a seat member having an internal opening, and wherein said other side valve section includes a valve body slidably and fluid tightly fitted into said internal opening of said seat member of said one side valve section, thereby forming a fluid chamber defined by said seat member, said valve body of said one side valve section and said valve body of said other side valve section, wherein said valve body of said other side valve section includes an orifice, and wherein said fluid chamber is in communication with said working fluid chamber said hydraulic circuit via said orifice.

4,721,346

HYDRAULIC ANTI-SKID BRAKING SYTEMS FOR VEHICLES

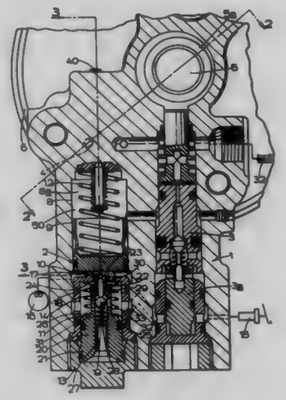
David C. Hurst; Alfred Yardley, and Robert A. Anderson, all of West Midlands, England, assignors to Lucas Industries Public Limited Company, Great Britain

Filed Mar. 1, 1985, Ser. No. 707,440

Claims priority, application United Kingdom, Mar. 7, 1984, 8405903; Jul. 2, 1984, 8416801

Int. Cl.⁴ B60T *8/42, 8/48*

U.S. Cl. 303—115 **13 Claims**



1. An hydraulic anti-skid braking system for vehicles comprising a vehicle brake, a supply for operating fluid for applying said brake, skid sensing means for sensing the presence of skid conditions at said wheel during braking and thereupon to produce skid signals, a modulator assembly for modulating the supply of fluid from said supply to said brake in accordance with said skid signals, and a power source for controlling brake re-application following correction of said skid, wherein said modulator assembly comprises a housing having a bore, a de-boost piston working in said bore and movable between an advanced inoperative position and a retracted position, a control valve assembly with which said de-boost piston is adapted to co-operate and which is adapted to control communication between said brake and said supply, said control valve assembly being movable between an open position when said de-boost piston is in said advanced position and a closed position when said de-boost piston is in said retracted position, means defining a space in said bore in which fluid from said power source is adapted to be trapped to hold said de-boost piston in said inoperative advanced position, and a dump valve for maintaining said trapped volume of fluid in said space, said dump valve being movable in response to a skid signal from an normally closed position in which fluid is trapped in said space into an open position in which fluid is dumped from said space, and fluid is released from said brake at a first rate for pressures below a pre-set level, and restrictor means additional to said dump valve are incorporated for controlling the release of fluid from said brake at a second rate lower than said first rate for pressures above said pre-set level, said restrictor means comprising means defining a restrictor for determining said second rate, and a pressure-responsive member operable in response to pressures above said pre-set level to bring said restrictor into operation to determine said second rate of fluid release, whereby upon operation of said dump valve fluid is released from said brake only at said second rate for all pressures above said pre-set level.

10. An hydraulic anti-skid braking system for vehicles for vehicles comprising a vehicle brake, a supply for operating fluid for applying said brake, skid sensing means for sensing the presence of skid conditions at said wheel during braking and thereupon to produce skid signals, a modulator assembly for modulating the supply of fluid from said supply to said brake in accordance with said skid signals, and a power source for controlling brake re-application following correction of said skid, wherein said modulator assembly comprises a housing having a bore, a de-boost piston working in said bore and movable between an advanced inoperative position and a retracted position, a control valve assembly with which said de-boost piston is adapted to co-operate and which is adapted to control communication between said brake and said supply, said control valve assembly being movable between an open position when said de-boost piston is in said advanced position and a closed position when said de-boost piston is in said retracted position, means defining a space in said bore in which fluid from said power source is adapted to be trapped to hold said de-boost piston in said inoperative advanced position, and a dump valve for maintaining said trapped volume of fluid in said space, said dump valve being movable in response to a skid signal from an normally closed position in which fluid is trapped in said space into an open position in which fluid is dumped from said space, and wherein restrictor means are incorporated for reducing the rate at which fluid is released from said brake on each occasion that said dump valve moves into said open position in response to a skid signal, at least at pressures above a pre-set level, wherein said restrictor means comprises a pressure-responsive member which is movable in a bore, and means for reducing the rate at which fluid is released form the brake adapted to be brought into operation by said pressure-responsive member, and wherein said pressure-responsive member comprises a piston, a valve member, a spring for loading said piston in one direction to hold said valve member in an open position, said piston being movable in the opposite direction in response to an increase in pressure to permit said valve member to move into a closed position, and a restrictor being provided to permit a restricted flow past said valve member when said valve member is in said closed position.

4,721,347

CABINET DRAWER LOCKING SYSTEM

George N. Kritselis, Wooddale, Ill., assignor to The Remline Tool Storage Company, Inc., Yorkville, Ill.

Filed Feb. 20, 1987, Ser. No. 17,320

Int. Cl.⁴ C05C *9/10*

U.S. Cl. 312—219 **9 Claims**



1. An improved drawer locking apparatus for use in a sliding drawer cabinet having at least one drawer, said apparatus comprising: a key operated lock means mounted in said cabinet, a shaft means rotatably mounted in said cabinet connected at its one end to said key lock means and extending rearwardly in said cabinet and having at it other end and offset lever means, linkage means mounted at the rear interior of said cabinet pivotly connected at one end thereof to said lever means and having a latch bar engaging surface at its other end, a spring biased latch bar means pivotly mounted at the rear of said cabinet said latch bar means being pivotal between a latch and unlatch position against said spring bias by coaction with said latch engaging surface of said linkage means, and a latch bar engaging and locking means on said drawer including one surface means adapted to maintain said drawer in a locked position when the drawer is closed by engagement with said latch bar means and a second means on the latch bar engaging and locking means for slidably engaging and displacing said latch bar means against the spring bias to an unlocked position.

4,721,348

ELECTRICAL EDGE CONNECTOR FOR A SUBSTRATE

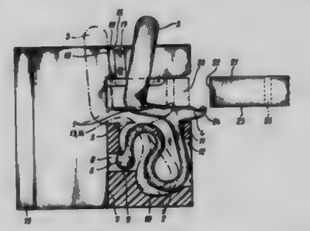
Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1987, Ser. No. 15,612

Claims priority, application Netherlands, Feb. 17, 1986, 8600397

Int. Cl.⁴ H01R *9/09, 13/629*

U.S. Cl. 439—328 **8 Claims**



1. An electrical edge connector for electrically contacting a substrate comprising:

a housing having a cutout open at the top, said cutout being defined by a rear wall, front wall and a bottom wall of the housing,

a clamp means hingedly connected to said housing, said clamp means including a spring portion, a strike portion, and a clamp portion which are adapted to cooperate with one another, said spring portion being disposed in said cutout, said strike portion having an extended arm projecting outwards from the housing through the open top of the cutout, said clamp portion having a rounded boss

projecting towards the front of the housing, one end of said spring portion being disposed in said housing cutout and being received at least partially in an opening formed in one of the walls of said housing, said one end serving as a hinge point for said clamp means,

whereby through the action of the spring portion, the clamp is maintained in a rest position permitting the insertion of a substrate into the connector housing without hindrance from the clamp portion, and whereby as the substrate is inserted, an edge of the substrate abuts against said strike portion and moves said strike portion to cause said clamp means to move from the position of rest to a clamping position wherein said clamp portion exerts additional force on said substrate to hold it in the connector housing, and wherein said clamp means can be returned by hand to the position of rest from the clamping position by moving the extended arm.

4,721,349

TRANSPARENT HEAT-MIRROR

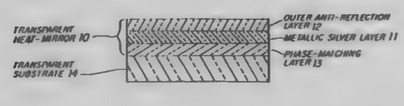
John C. C. Fan, Chestnut Hill, and Frank J. Bachner, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 365,533, Apr. 5, 1982, Pat. No. 4,556,277, which is a continuation of Ser. No. 690,696, May 27, 1976, Pat. No. 4,337,990, which is a continuation-in-part of Ser. No. 498,160, Aug. 16, 1974, abandoned. This application Dec. 2, 1985, Ser. No. 804,664

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.[4] G02B *5/28*

U.S. Cl. 350—1.7 **1 Claim**



1. A composite film comprising a continuous, discrete silver layer sandwiched between two continuous, discrete, transparent layers each having a thickness of greater than about 150 Å, said silver and transparent layers having thicknesses that cooperate to provide said composite film with significantly higher solar energy transmission compared to the silver layer alone and with high infrared reflectivity.

4,721,350

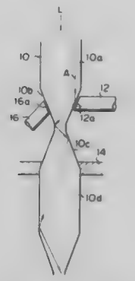
LIGHT DISTRIBUTION ARRANGEMENT

Kei Mori, 3-16-3-501, Kasuinoge, Setagaya-ku, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,090

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **14 Claims**



1. An arrangement for distributing light propagating through a main conduction path into a branch conduction path, comprising a first light conducting member defining the main conduction path and having an axis extending from a source of light supply, said first light conducting member comprising a first cylindrical portion, a first conical portion tapering from said first cylindrical portion, a second conical portion flaring from said first conical portion, and a second cylindrical portion extending from said second conical portion; a second light conducting member defining the branch conduction path, said second light conducting member having a light receiving surface, said second light conducting member being movable toward and away from the first conical portion of the first light conducting member to thereby move said light receiving surface into and out of contact with said first conical portion such that when said light receiving surface contacts said first conical portion, the light being transmitted through the first light conducting member passes into said second light conducting member and when said light receiving surface is out of contact with said first conical portion, the light being transmitted through the first light conducting member will advance through the first light conducting member without passing into said second light conducting member, whereby the passage of light into said second light conducting member is controlled by said movement of said second light conducting member.

4,721,351

METHOD AND APPARATUS FOR VARIABLE ATTENUATION OF AN OPTICAL WAVEGUIDE

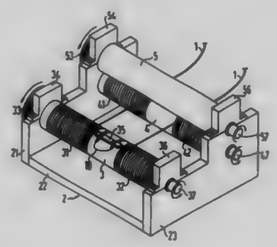
Wolfgang Goepfert, Feldkirchen; Walter Proebster, Munich, and Dieter-Josef Will, Pullach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,810

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332631

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **18 Claims**



1. A method for variably attenuating a flexible monomode guide comprising the steps of:

curving at least a portion of said waveguide about a radius of curvature for causing radiation losses as a result of said curving; and

selectively varying the length of said portion of said waveguide subjected to said curving for selectively varying the attenuation of said waveguide.

4,721,352

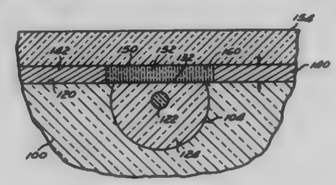
POLARIZING APPARATUS AND METHOD UTILIZING AN OPTICAL FIBER

Wayne V Sorin, Mountain View; Karen Liu, and Herbert J. Shaw, both of Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 833,819, Feb. 26, 1986, abandoned. This application Feb. 27, 1986, Ser. No. 833,953

Int. Cl.[4] G02B *5/30*

U.S. Cl. 350—96.15 **21 Claims**



1. An apparatus, comprising:

a single mode optical fiber having an input end portion for receiving light and an output end portion for outputting said light, said fiber having a core and a cladding, the refractive index of said core higher than the refractive index of said cladding, the cladding having a cladding surface intermediate said input and output end portions which is sufficiently close to the core to expose the evanescent field of said light at a selected location along the length of said fiber; and

a plurality of liquid crystal molecules in communication with said evanescent field at said selected location to form an interaction region, said liquid crystal molecules having at least two states of orientation, a first of said states providing a first refractive index for light propagating in said fiber in a first polarization, and a second refractive index for light propagating in said fiber in a second polarization, orthogonal to said first polarization, a second of said states providing a third refractive index for light propagating in said fiber in said first polarization and a fourth refractive index for light propagating in said fiber in said second polarization, at least one of said first and second refractive indices being less than the refractive index of the core so that light propagating in said polarization corresponding to said at least one of said first and second refractive indices is well-guided by said optical fiber when said liquid crystal molecules have said first state of orientation, and at least one of said third and fourth refractive indices being less than the refractive index of the core so that light propagating in said polarization corresponding to said at least one of said third and fourth refractive indices is well-guided by said optical fiber when said liquid crystal molecules have said second state of orientation.

4,721,353

OPTICAL TRANSMISSION SYSTEM COMPRISING A MONOMODE OPTICAL TRANSMISSION FIBRE HAVING A TAPERED END PORTION

Giok D. Khoe, and Andreas H. M. Hoovers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

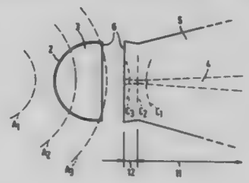
Filed Jan. 17, 1986, Ser. No. 819,574

Claims priority, application Netherlands, Oct. 30, 1985, 8502964

Int. Cl.[4] G02B *6/32*

U.S. Cl. 350—96.18 **8 Claims**

1. An optical transmission system comprising a radiation source, a monomode optical transmission fibre having an end portion in which the core diameter varies, and a lens system interposed between the radiation source and the transmission fibre, characterized in that toward the lens the diameter of the core of the transmission fibre decreases to a smallest diameter



from which it increases to a largest diameter which is smaller than the diameter in the straight portion of the fibre.

4,721,354

DEVICE FOR POSITIONING AN OPTICAL FIBRE

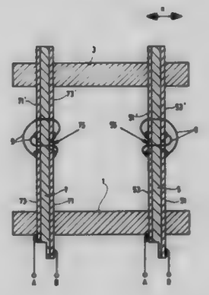
Herbert H. Kaspar; Manfred T. L. Leonartz, both of Aachen; Heinrich A. Oepen, Stolberg, and Hermann J. H. Wehr, Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 30, 1985, Ser. No. 814,932

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1985, 3500356

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **15 Claims**



1. A device for positioning an end of an optical fiber with respect to a reference plane, said device comprising:

a housing having a reference plane;

a first pair of electromechanical deflector elements, said deflector elements being arranged parallel to each other, said deflector elements being deflected in a first direction when an electrical signal is applied thereto, said deflector elements having first and second oppositie ends, the first ends being connected to the end of the optical fiber, the second ends being connected to the housing;

a second pair of electromechanical deflector elements, said deflector elements being arranged parallel to each other, said deflector elements being deflected in a second direction perpendicular to the first direction when an electrical signal is applied thereto, said deflector elements having first and second opposite ends, the first ends being connected to the end of the optical fiber, the second ends being connected to the housing; and

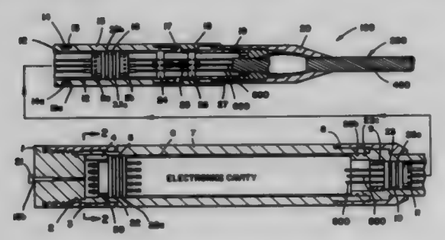
a third pair of electromechanical deflector elements, said deflector elements being arranged parallel to each other, said deflector elements being deflected in a third direction perpendicular to the first and second directions when an electrical signal is applied thereto, said deflector elements having first and second opposite ends, the first ends being connected to the end of the optical fiber, the second ends being connected to the housing.

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4,721,355
OPTICAL CABLE CONNECTOR ASSEMBLY INCLUDING BREAKABLE LINK AND PROCESS USING SAME

Gordon Gould, Great Falls, Va., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 22, 1984, Ser. No. 623,855
Int. Cl.[4] G02B *6/36*; E21B *29/00*; H02G *3/00*; H04H *9/00*
U.S. Cl. 350—96.20 17 Claims



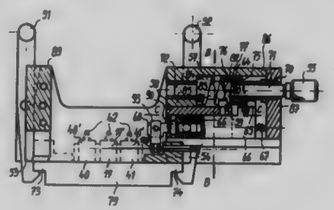
1. A cable connector capable of detachably connecting a device to an armored optical fiber cable through a mechanical and electrical interface, said connector comprising:
a connector housing, said housing having opposed ends;
means for anchoring the armor wires of said cable at a first end of said connector housing;
a breakable link in said connector housing adjacent to said means for anchoring, said breakable link having inner passages to pass the conductor elements and the optical fiber core of said cable therethrough;
means for retaining said breakable link between said means for anchoring and a retaining collar in said connector housing;
a first means for sealing said connector housing adjacent to said retaining collar to seal said optical fiber core and said conductor elements passing therethrough within said connector housing;
means for retaining said first means for sealing in a fixed position in said connector housing;
a second means for sealing said connector housing spaced apart from said first means for sealing and forming an end of said connector housing opposed to said first end, said first and second means for sealing defining a pressure sealed electronics cavity therebetween, wherein said conductor elements and said optical fiber core passing through said first means for sealing terminate therein; and
means for forming a detachable pressure tight electrical interconnection between said electronics cavity and a device on said end of said connector housing opposed to said first end.

15. A process for transmitting an electrical signal from a well logging sond along an armored optical fiber cable comprising:
connecting a sond to the cable connector, said connector comprising a connector housing, said housing having opposed ends, means for anchoring the armor wires of said cable at a first end of said connector housing, a breakable link in said connector housing adjacent to said means for anchoring, said breakable link having inner passages to pass the conductor elements and the optical fiber core of said cable therethrough, means for retaining said breakable link between said means for anchoring and a retaining collar in said connector housing, a first means for sealing said connector housing adjacent to said retaining collar to seal said optical fiber core and said conductor elements passing therethrough within said connector housing, means for retaining said first means for sealing in a fixed position in said connector housing, a second means for sealing said connector housing spaced apart from said first means for sealing and forming an end of said connector housing opposed to said first end, said first and second means for sealing defining a pressure sealed electronics cavity therebetween, wherein said conductor elements and said optical fiber core passing through said first means for sealing terminate therein, said electronics cavity contains means for converting optical to electrical signals and electrical to optical signals, means for forming a detachable pressure tight electrical interconnection between said electronics cavity and said sond on said end of said connector housing opposed to said first end;
converting said electrical signal from said sond into an optical signal; and
transmitting said optical signal through the optical fibers in said armored optical fiber cable.

4,721,356
DEVICE FOR MUTUALLY ENGAGING THE OPTICAL FACES OF AT LEAST ONE PAIR OF OPTICAL FIBRES IN A CONNECTION DEVICE

Marie C. Sostor, Reuil Malmaison, and Jean M. Giraud, Maisons Lafitte, both of France, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Jan. 22, 1985, Ser. No. 693,157
Claims priority, application France, Jan. 24, 1984, 84 01052
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 6 Claims

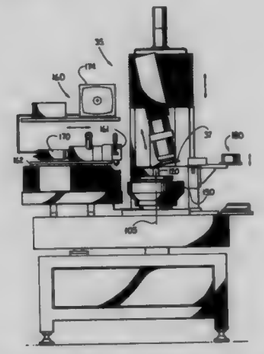


1. a device for mutually engaging the optical faces of at least one pair of optical fibres in a connecting device, comprising:
a base plate comprising means for removably mounting said plate in a given position with respect to said connecting device, and said base plate constructed for having at least one of said fibres supported in a predetermined position thereon;
at least one pair of clamping members movable between a rest position wherein at least another of said fibres is left free and an active position wherein the at least another fibre is clamped in a manner for being displaced in order to perform mutual fibre face engagement with the at least one fibre on the base plate, and wherein each clamping member comprises an arm urged by a spring into rotation about an axis thereof, and the rotation of which about the respective axes between one or the other of the rest and active positions is controlled by a slide; and
means for displacing said clamping members toward one optical fibre of said pair when said clamping members are in said active position.

4,721,357
METHODS OF AND APPARATUS FOR RECONFIGURING OPTICAL FIBER CONNECTOR COMPONENTS AND PRODUCTS PRODUCED THEREBY

Joseph S. Kovalchick, Middlesex County, N.J.; John M. Palmquist, Gwinnett County, Ga., and Ralph A. Treder, Jr., Mercer County, N.J., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Height, N.J.

Filed Nov. 27, 1985, Ser. No. 802,492
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 24 Claims

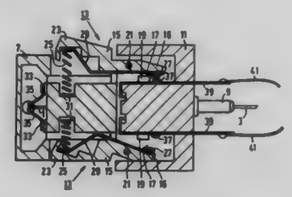


1. A method of reconfiguring an end portion of a plug which is adapted to terminate an end portion of an optical fiber, said method including the steps of:
holding the plug, which includes a passageway within which is adapted to be disposed an end portion of an optical fiber, on a support having an axis of rotation, the plug being held such that the end portion of the plug is exposed;
causing relative motion between the axis of rotation and the plug to cause a centroidal axis of a beam of light within the passageway along the end portion of the plug to be substantially coincident with the axis of rotation; and
reconfiguring the exposed end portion of the plug to cause the axis of the light beam in the end portion of the plug to be in a predetermined location with respect to an alignment surface of the reconfigured end portion.

4,721,358
OPTICAL AND ELECTRICAL CONNECTOR DEVICE

Johannes W. Faber, and Jacques P. Klomp, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,098
Claims priority, application Netherlands, Dec. 5, 1984, 8403691
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 6 Claims

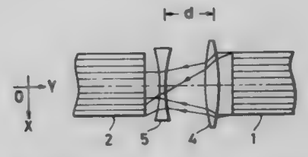


1. A device for optical connection of a number of optical fibres to a corresponding number of optical elements, including a first connector housing in which end portions of the optical fibres are secured and a second connector housing in which the optical elements are secured, which two connector housings, after the connection has been established, are detachably coupled by means of at least one locking device comprising a first locking portion which is situated at a first end of a lever provided on the first connector housing and a second locking portion which cooperates with the first locking portion and which is provided on the second connector housing, characterized in that near each of the two locking portions there is provided an electrical contact member, the said contact members being electrically interconnected in the locked condition and being separated from one another upon unlocking.

4,721,359
ILLUMINATING OPTICAL SYSTEM FOR ENDOSCOPES

Kimihiko Nishioka, and Susumu Takahashi, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,581
Claims priority, application Japan, Jun. 8, 1984, 59-117931
Int. Cl.[4] G02B *23/26*
U.S. Cl. 350—96.26 8 Claims

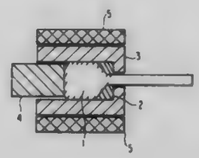


1. An illuminating optical system for endoscopes provided with a light supplying side light guide, a light receiving side light guide spaced from and aligned with said light supplying side light guide, and a connecting optical system arranged between said light supplying side light guide and said light receiving side side light guide and causing light emitted from said light supplying side light guide to be incident upon said light receiving side light guide, wherein both said light supplying side light guide and said light receiving side light guide are formed of a plurality of optical fibers, said connecting optical system is an afocal system including a lens having positive refractive power and a lens having negative refractive power arranged in turn from the side of said light supplying side light guide.

4,721,360
INFRARED LIGHT TRANSMITTING FIBER

Kazuhito Murakami, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 12, 1981, Ser. No. 262,877
Claims priority, application Japan, May 12, 1980, 55-62630
Int. Cl.[4] G02B *6/00*
U.S. Cl. 350—96.34 12 Claims



1. A fine polycrystalline infrared light transmitting fiber prepared by hot extrusion of an alkali metal halide of sodium, potassium, or rubidium having incorporated therein at least 100 ppm of an alkaline earth metal element.

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4,721,361

REAR PROJECTION IMAGE VIEWING SYSTEM

Johannes C. van de Ven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 862,064, May 12, 1986, abandoned. This application Jan. 17, 1987, Ser. No. 63,739

Claims priority, application Netherlands, Jan. 28, 1986, 8600184

Int. Cl.⁴ G03B *21/60*

U.S. Cl. 350—128 **17 Claims**



1. In a rear projection system comprising:

an enclosure having an opening;

a rear projection screen connected to said enclosure and having a rear surface and a front surface, for transmitting light impinging on said rear surface to said front surface, said light passing through said opening, wherein said screen includes means for diffusing said light and is arranged such that at least a portion of ambient light impinging on said front surface is transmitted into said enclosure; and

at least one image source and at least one projection device in said enclosure, said projection device being arranged to project light from said image source onto said rear surface;

the improvement wherein said rear projection screen has a maximum transmissivity for said ambient light;

said rear projection screen further has at least one anti-reflecting surface; and

said system includes means for preventing ambient light, transmitted through said screen, from being reflected back onto said anti-reflecting surface.

4,721,362

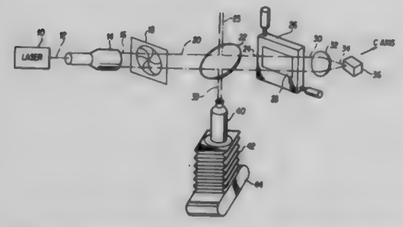
PHASE GRADIENT CONTRAST MICROSCOPE

Philip S. Brody, Bethesda, and Richard P. Leavitt, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1985, Ser. No. 739,749

Int. Cl.⁴ G02B *27/00, 27/42, 21/06;* **G03H** *1/02*

U.S. Cl. 350—320 **11 Claims**



1. A method for producing an intensity image of the component of the spatial derivative of optical phase retardation in a particular direction from a transparent phase object comprising the steps of:

producing a beam of collimated coherent light;

directing said beam of collimated coherent light through a transparent phase object substantially located on a plane;

directing said beam of collimated coherent light, after it has passed through said transparent phase object, to real time photorefractive holographic means for producing and recording a hologram of said transparent phase object;

incrementally shifting the position of said transparent phase object;

directing said beam of collimated coherent light through said incrementally shifted transparent phase object;

directing said beam of collimated coherent light, after it has passed through said incrementally shifted transparent phase object, to said real time photorefractive holographic means for generating a phase conjugate beam of said transparent phase object;

directing said phase-conjugate beam of said transparent phase object through said shifted transparent phase object;

directing said phase-conjugate beam of said transparent phase object, after it has passed through said shifted transparent phase object, to observing means; and

positioning said observing means back or forward from said plane, close to the transparent phase object, but not in the plane of the object, sufficiently far back or forward for a viewer to obtain an intensity image of the component of the spatial derivative of optical phase retardation in a particular direction.

4,721,363

TEMPERATURE CONTROL DEVICE FOR LIQUID CRYSTAL OPTICAL SHUTTER

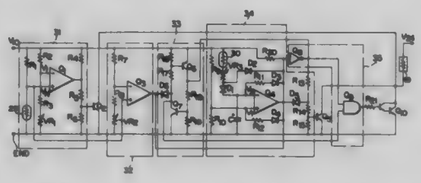
Hideaki Inoue, Tokyo, Japan, assignor to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,107

Claims priority, application Japan, Oct. 29, 1985, 60-243743

Int. Cl.⁴ G02F *1/13;* **H03K** *3/26*

U.S. Cl. 350—331 T **13 Claims**



1. A temperature control device for a liquid crystal optical shutter in a recording apparatus, comprising:

a heater energization control means for receiving a power source voltage, detecting a temperature of said liquid crystal optical shutter, and controlling energization of a heater in said liquid crystal optical shutter according to a detected temperature until said liquid crystal optical shutter reaches a predetermined temperature;

a temperature limiting means for receiving the power source voltage and deenergizing said heater when the temperature of said liquid crystal optical shutter exceeds a preset temperature;

a first temperature controlling means connected to said temperature limiting means, for detecting an ambient temperature on the basis of a signal from a temperature detector arranged near said liquid crystal optical shutter and for controlling to deenergize said heater in a temperature region exceeding the preset temperature; and

a second temperature controlling means, connected to said first temperature controlling means, and for generating a control output to prevent energization of said heater when the temperature of said liquid crystal optical shutter exceeds the preset temperature.

4,721,364

DAZZLE-FREE MIRROR WITH PHOTOCELL IN A NON-DAZZLE-FREE PORTION

Hiroshi Itoh; Yasutoshi Suzuki, both of Obu; Tsuyoshi Fukada, Nagoya; Shinya Ohmi, Anjo, and Kunihiko Hara, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

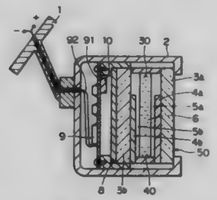
PCT No. PCT/JP84/00010, § 371 Date Aug. 9, 1985, § 102(e) Date Aug. 9, 1985, PCT Pub. No. WO85/03136, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 19, 1984, Ser. No. 767,799

Claims priority, application Japan, Dec. 29, 1983, 58-248579

Int. Cl.⁴ G02F *1/133;* **G02B** *17/00*

U.S. Cl. 350—332 **8 Claims**



1. A dazzle-free reflection mirror having a mirror surface, comprising:

an electro-optical element of which transparency is changed by applying an electric field thereto extending over a lower portion of said mirror surface to be dazzle-free, a remaining portion of said mirror surface being non-dazzle-free;

means for reflecting light provided behind said electro-optical element and said non-dazzle-free portion, at least the portion of said reflection means provided behind said non-dazzle-free portion being a translucent mirror layer passing a part of incident light therethrough;

means, provided behind said translucent mirror layer, for detecting light incident through said non-dazzle-free portion and said translucent mirror layer; and

means for applying an electric field to said electro-optical element to effectuate the dazzle-free operation of said dazzle-free portion in response to the detection of said light detecting means, whereby only said dazzle-free portion of said mirror surface can assume a dazzle-free condition.

4,721,365

ELECTRONIC DEVICE INCLUDING PANELS WITH ELECTRICAL ALIGNMENT MEANS

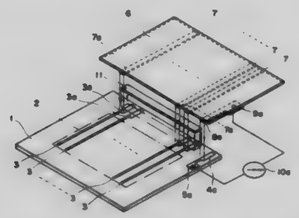
Norihisa Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,096

Claims priority, application Japan, Nov. 21, 1984, 59-244364

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—336 **11 Claims**



1. An electronic device comprising a first panel on which a plurality of first terminals are disposed at a pitch in parallel with each other, a second panel on which a plurality of second terminals are disposed in parallel with each other and at substantially the same pitch as that for the first terminals, and a pair of dummy electrodes respectively disposed on the first and the second panel; said pair of dummy electrodes having widths which are smaller than the widths of or the spacings between the first and second terminals, respectively, and being disposed in such a manner that said pair of dummy electrodes are electrically connected to each other when the first and second terminals are disposed in alignment with each other before the first and second panels are secured to each other.

4,721,366

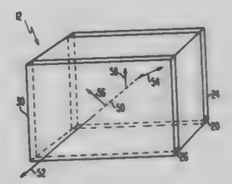
ILLUMINATION OF A LIQUID CRYSTAL DISPLAY

Richard W. Nosker, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 7, 1985, Ser. No. 784,960

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—345 **8 Claims**



1. In a liquid crystal display including a liquid crystal cell and means for illuminating said cell,

said cell comprising:

first and second light transmissive substrates, each having first and second major surfaces, said substrates being disposed such that said first surfaces face one another and said second surface of said first substrate being the light entry surface for illumination of the cell;

electrode structures on said first major surfaces;

a liquid crystal between said substrates, said liquid crystal having a directior wherein said cell has a principal viewing plane which contains the midpoint director and a normal to one of said second major surfaces;

the improvement comprising:

said means for illuminating said cell providing an output beam which is substantially collimated in said principal viewing plane and which is substantially uncollimated in an orthogonal plane which is substantially perpendicular to said principal viewing plane and contains said normal;

wherein the thickness of said liquid crystal between said substrates corresponds to the first Gooch-Tarry minimum for said cell at a wavelength between about 400 and 700 nanometers; and

wherein the angular distribution of the uncollimated light in said orthogonal plane is substantially a Lambert distribution.

4,721,367

LIQUID CRYSTAL DEVICE

Kazuo Yoshinaga, Machida; Akira Tsuboyama, Tokyo; Kazuharu Katagiri, Tama, and Osamu Taniguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,235

Claims priority, application Japan, Apr. 1, 1985, 60-66640; Apr. 23, 1985, 60-85399

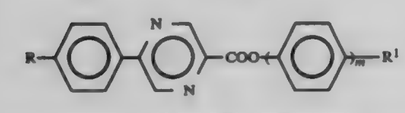
Int. Cl.⁴ G02F *1/13;* **C09K** *19/34;* **C07D** *241/02*

U.S. Cl. 350—350 S **28 Claims**

1. A liquid crystal device comprising a cell structure including a pair of base plates and a liquid crystal compound represented by the formula (I) shown below or liquid crystal composition containing the compound and interposed between the

pair of base plates; said liquid crystal compound or composition being in a smectic phase formed through a phase transition from a higher temperature phase, a face of at least one of said pair of base plates having been provided with a function of preferentially orienting the axes of the liquid crystal molecules contacting the face in one direction:

formula (I)

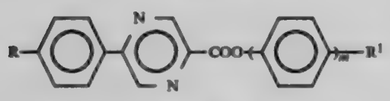


(I)

wherein R is an alkyl or alkoxy group having 1–18 carbon atoms; m is 0 or 1; R^1 is an alkyl group having 1 to 18 carbon atoms when m is 0 and is an alkyl or alkoxy group having 1–18 carbon atoms when m is 1.

22. A liquid crystal device, comprising: a plurality of picture elements arranged in a plurality of rows, each picture element comprising a pair of oppositely spaced electrodes and a liquid crystal compound represented by the formula (I) shown below or a liquid crystal composition containing the compound interposed between the electrodes, the liquid crystal compound or composition showing at least two stable states and being oriented to one of said at least two stable states, said liquid crystal device being driven by a line-by-line writing scheme wherein a writing signal is applied to the picture elements row by row, and the written state of one row of picture elements to which the writing signal has been applied is retained until the subsequent writing signal is applied to the row of picture elements;

formula (I)



(I)

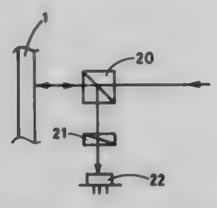
wherein R is an alkyl or alkoxy group having 1–18 carbon atoms; m is 0 or 1; R^1 is an alkyl group having 1 to 18 carbon atoms when m is 0 and is an alkyl or alkoxy group having 1–18 carbon atoms when m is 1.

4,721,368

OPTICAL SYSTEM IN A MAGNETO-OPTICAL MEMORY DEVICE

Toshihisa Deguchi; Tetsuya Inui; Yoshikazu Fujii, all of Nara, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1984, Ser. No. 668,796
Claims priority, application Japan, Nov. 8, 1983, 58-210370
Int. Cl.⁴ G02B *5/30*
U.S. Cl. 350—377 **10 Claims**



1. An optical system for use with a magneto-optical memory device having a recording medium of a magnetic thin-film with a magnetic anisotropy in a direction perpendicular to the main surface thereof, said optical system being for further use with a laser for reproduction purposes, said optical system comprising:

a beam splitter disposed in an optical path of said optical system; and

a multi-coated, dielectric, thin-film deposited on a reflection surface of said beam splitter, said multi-coated, dielectric, thin-film exhibiting an optical characteristic which satisfies the condition:

$$n\pi-(\pi/4)\leqq\delta\leqq n\pi+(\pi/4)$$

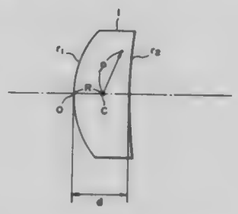
where n is an integer and δ is the phase shift between the P-wave and the S-wave which are reflected or transmitted from said beam splitter.

4,721,369

GRADIENT INDEX SINGLE LENS

Jun Hattori; Shigeyuki Suda, and Rohra Aruna, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1986, Ser. No. 908,255
Claims priority, application Japan, Sep. 18, 1985, 60-206052
Int. Cl.⁴ G02B *3/00*
U.S. Cl. 350—413 **4 Claims**



1. A gradient index single lens having:

a first surface convex toward the object side, said first surface lying on the object side when said lens is used at a reduction magnification;

a second surface concave toward the image side, said second surface lying on the image side when said lens is used at a reduction magnification; and

an index distribution formed in the interior of said lens, said index distribution having a sphere-symmetrical distribution about a certain point on the optical axis.

4,721,370

ADAPTIVE GAS LENS

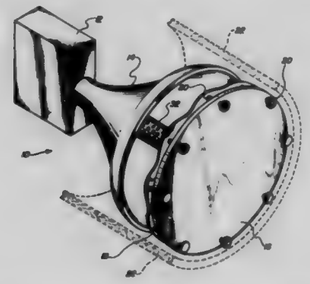
Philip J. Goode, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 30, 1981, Ser. No. 248,736
Int. Cl.⁴ G02B *1/06*; H01S *3/08*
U.S. Cl. 350—418 **8 Claims**

1. A device for altering the optical path length of a light beam comprising:

means for injecting a gas across the path of a light beam, said injection means comprising a horn member and a wall member spaced from the wide end of the horn member, said horn member and wall member defining a gas feed channel with an adjustable dimension so that the adjustable dimension of the gas feed channel can be varied as desired,

said wall member comprising a circular rigid plate, a circular movable plate affixed centrally to said rigid plate between the rigid plate and the horn member, and adjustment



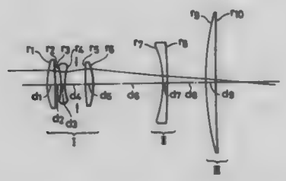
means for changing the space between the movable plate and the periphery of the horn member.

4,721,371

VARIABLE FOCAL LENGTH LENS SYSTEM

Toshihiro Imai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,642
Claims priority, application Japan, Oct. 18, 1985, 60-232902
Int. Cl.⁴ G02B *15/16*
U.S. Cl. 350—427 **4 Claims**



1. A variable focal length lens system comprising a first, second and third lens units wherein said first lens unit comprises three lenses and has positive refractive power, said second lens unit comprises a negative lens, and said third lens unit comprises a positive lens, said variable focal length lens system being arranged to vary the focal length of said lens system as a whole from the short focal length to the long focal length by moving said first lens unit and said second lens unit toward the object side along the optical axis, said variable focal length lens system being further arranged to fulfill the conditions (1) and (2) shown below:

$$0.2<|l_{2W}/f_W<0.28 \quad (1)$$

$$0.9<|f_2|/f_W<1.2 \quad (2)$$

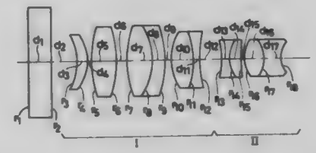
where, reference symbol l_{2W} represents the airspace between the second and third lens units in the position of the short focal length, reference symbol f_2 represents the focal length of the second lens unit, and reference symbol f_W represents the focal length of the lens system as a whole in the position of the short focal length.

4,721,372

OBJECTIVE LENS SYSTEM FOR AN ENDOSCOPE

Akira Yokota, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,132
Claims priority, application Japan, Mar. 28, 1984, 59-58368
Int. Cl.⁴ G02B *9/62, 21/02*
U.S. Cl. 350—464 **6 Claims**



1. An objective lens system for an endoscope comprising a first lens component arranged as a positive meniscus lens concave toward the object side, a second lens component arranged as a positive lens, a third lens component arranged as a positive cemented doublet consisting of a positive lens element and a negative lens element cemented together, a fourth lens component arranged as a positive cemented doublet consisting of a positive lens element and a negative lens element cemented together, a fifth lens component arranged as a negative cemented doublet consisting of a negative lens element and a positive lens element cemented together, and a sixth lens component arranged as a negative cemented meniscus doublet consisting of a positive lens element and a negative lens element cemented together and arranged to be concave toward the image side, said objective lens system for an endoscope being arranged to fulfill the conditions (1), (2) and (3) shown below:

$$0.05/f\leqq(n_4-n_5)/r_8\leqq0.08/f \quad (1)$$

$$0.03/f\leqq(n_6-n_7)/r_{11}\leqq0.06/f \quad (2)$$

$$0.1/f\leqq(n_9-n_8)/r_{14}\leqq0.15/f \quad (3)$$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbols n_4 and n_5 respectively represent refractive indices of the lens elements on the object side and image size in the third lens component, reference symbols n_6 and n_7 respectively represent refractive indices of the lens elements on the object side and image side in the fourth lens component, reference symbols n_8 and n_9 respectively represent refractive indices of the lens elements on the object side and image side in the fifth lens component, reference symbol r_8 represents the radius of curvature of the cemented surface in the third lens component, reference symbol r_{11} represents the radius of curvature of the cemented surface in the fourth lens component, and reference symbol r_{14} represents the radius of curvature of the cemented surface in the fifth lens component.

4,721,373

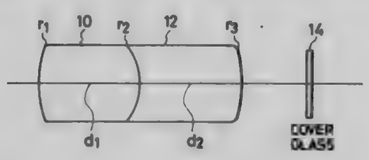
LENS SYSTEM FOR USE WITH AN OPTICAL DISK

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 931,821
Claims priority, application Japan, Nov. 19, 1985, 60-260644
Int. Cl.⁴ G02B *9/10*
U.S. Cl. 350—482 **7 Claims**

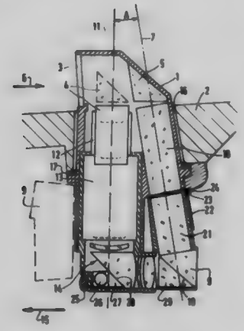
1. A lens system consisting of a single lens unit comprising a positive lens element and a negative lens element cemented to said positive lens element, said lens elements satisfying the following conditions:

(1) $\nu_+ - \nu_- > 20$; and
(2) $\Delta N_+ / \Delta N_- < 0.1$ and $\Delta N_- > 0$
wherein ν_+ is the Abbe number of the positive lens element,



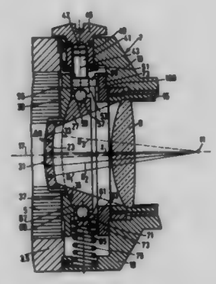
ν_- is the Abbe number of the negative lens element, ΔN_+ is the temperature coefficient of the refractive index of the positive lens element, and ΔN_- is the temperature coefficient of the refractive index of the negative lens element.

4,721,374
COMBINED NIGHT/DAY VIEWING APPARATUS HAVING A LARGE FIELD
Fernand R. Loy, Sceaux, and Jean-Luc Eaple, Chatenay Malabry, both of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 14, 1986, Ser. No. 829,575
Claims priority, application France, Feb. 22, 1985, 85 02576
Int. Cl.[4] G02B *23/08, 23/10, 23/12, 23/16*
U.S. Cl. 350—538 **8 Claims**



1. A combined night/day viewing apparatus for driving a vehicle and contained in a single housing comprising
a night path constituted by a first input reflector, an objective, a light intensifier tube, and a bent ocular, said first input reflector being movable between an active position and a concealed position, in said active position causing light beams originating from the field of view to deviate in the direction of the optical axis of the night path,
first concealing means for moving said first input reflector from said active position to said concealed position, in said concealed position being out of the path of said light beams,
a day path constituted by an optical system having an enlargement 1 and comprising a second input reflector and a second output reflector, said second input reflector being situated behind the active position of the first input reflector and causing said light beams to deviate in the direction of the optical axis of the day path when said first input reflector is in the concealed position, the optical axes of the day path and the night path being coplanar, said second output reflector being movable between an active position and a concealed position, in said active position being situated behind said bent ocular,
second concealing means for moving said second output reflector from said active position to said concealed position, said second concealing means being linked with said first concealing means so that the first input reflector and the second output reflector are concealable alternately by manipulation of the second output reflector.

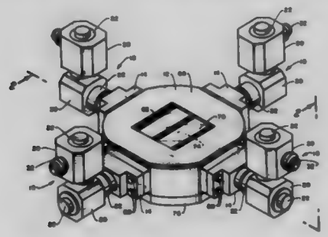
4,721,375
VIEWING APPARATUS WITH ADJUSTABLE ALIGNMENT MARKER SUPPORT
Hendrikus A. M. van Dulmen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 2, 1986, Ser. No. 903,045
Claims priority, application Netherlands, Sep. 11, 1985, 8502480
Int. Cl.[4] G02B *23/00, 23/16*; H01J *31/49*
U.S. Cl. 350—538 **4 Claims**



1. A viewing apparatus comprising an image intensifier which is arranged between an objective and an ocular and is provided with an output screen facing the ocular, an alignment member having an alignment marker support displaceable in two orthogonal directions with respect to the output screen being arranged between the output screen and the ocular, characterized in that the alignment marker support comprises an input screen having a first spherical contour substantially corresponding to a second spherical contour of the output screen arranged opposite thereto, which alignment marker support is rotatable about a first and a second axis of rotation which are at right angles to each other and intersect each other at a virtual point of rotation located on an optical axis of the viewing apparatus, the centers of curvature of the first and second spherical contour substantially coinciding with the virtual point of rotation of the alignment marker support.

4,721,376
NON-REACTIVE FLUID CONNECTION DEVICE FOR COOLED MIRRORS
Anthony N. Fusbchetto, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 29, 1986, Ser. No. 902,243
Int. Cl.[4] G02B *7/18, 5/08*
U.S. Cl. 350—610 **4 Claims**

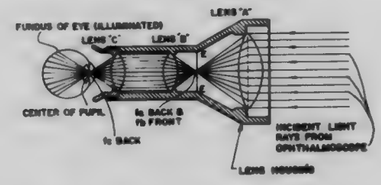
1. In a system having a fluid cooled mirror and provided with at least one inlet and outlet for the flow of fluid to cool said mirror,
means providing non-reactive fluid connection joints between a source of fluid under pressure and said mirror;
said means providing the non-reactive connection means comprises a stack of manifold blocks with each manifold having an internal sleeve which is formed with passageways which are pressure balanced so that there are no radial or axial forces reactive to the flow of fluid wherein said non-reactive means decouples the mirror from the influence of fluid flowing in response to pressure and prevents jitter due to fluid connections to said inlet and outlet which would otherwise transfer vibrations to said mirror.



4,721,377
HIGHLY-REFRACTIVE PLASTIC LENS
Tadanori Fukuda, Otsu; Sadayuki Sakamoto, Shiga, and Masami Saito, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Continuation of Ser. No. 777,147, Sep. 18, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 20,156
Claims priority, application Japan, Sep. 19, 1984, 59-194881; Nov. 2, 1984, 59-230309
Int. Cl.[4] G02C *7/02*
U.S. Cl. 351—159 **8 Claims**

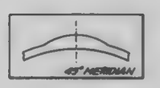
1. A plastic lens which comprises a copolymer of (A) 20 to 85 percent by weight of dibromostyrene with (B) 15 to 80 percent by weight of at least one member selected from the group consisting of aliphatic diacrylate, dimethacrylate, triacrylate and trimethacrylate, and (C) less than 60 percent by weight of mono-acrylate, or monomethacrylate having a nucleus-halogen substituted aromatic ring, said copolymer being in the form of a lens.

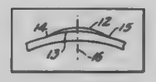
4,721,378
CONDENSING-IMAGE FORMING OPTICAL SYSTEM FOR INDIRECT OPHTHALMOSCOPY
David Volk, 3336 Kersdale Rd., Pepper Pike, Ohio 44124
Filed Sep. 24, 1985, Ser. No. 779,799
Int. Cl.[4] A61B *3/12*; G02B *13/18*
U.S. Cl. 351—205 **5 Claims**



1. A compact condensing-image forming and image inverting optical system for indirect ophthalmoscopy for providing an upright aerial image of the fundus of the examined eye comprising a coaxial system of three bixconvex high powered double aspheric lenese of glass or plastic identified as lenses A, B and C fixed in predetermined spaced relation to each other along a longitudinal axis and with each lens being disposed with its major axis substantially perpendicular to a source of light rays, lens A being disposed to initially receive light rays from said source of light rays and to project said rays onto its adjacent lens B, lenses A and B being spaced from each other by a distance equal to the sum of the front focal distance $f_{B\,front}$ of lens B and the back focal distance $f_{A\,back}$ of lens A, lenses B and C being spaced apart at a distance equal to the sum of the front focal distance $f_{C\,front}$ of lens C and the back focal distance $f_{B\,back}$ of lens B, the said light rays incident upon lens A converging therefrom to the back focus $f_{A\,back}$ of lens A which focus is also the front focus $f_{B\,front}$ of lens B, said light rays from $f_{B\,front}$ of lens B being refracted through lens B to a parallel bundle of light rays which are incident upon lens C, said lens C converging said light rays toward its back focus $f_{C\,back}$ at the center of the entrance pupil of the eye, and after refraction by the cornea of the examined eye an image of said light source is formed at the center of the pupil of the eye and said light rays then diverge to illuminate the fundus, homocentric bundles of diverging light rays from points in the illuminated fundus passing through the pupil and emerging from the cornea as homocentric bundles of parallel light rays which are then incident upon the adjacent surface of lens C and refracted by said lens C whereby an inverted image of the fundus is formed in the anterior focal plane of lens C, said inverted image is then the object of lens B, and light rays from said inverted image being then refracted by lens B whereby said light rays then proceed as homocentric bundles of parallel light rays with the chief ray of all bundles passing through the anterior focus $f_{B\,front}$ of lens B and proceed to lens A, and after refraction by said lens A, a reinverted upright aerial image is formed in the anterior focal plane of said lens A which image may then be viewed by means of an indirect ophthalmoscope.

4,721,379
APPARATUS FOR ANALYSIS AND CORRECTION OF ABNORMAL REFRACTIVE ERRORS OF THE EYE
Francis A. L'Esperance, Englewood, N.J., assignor to LRI L.P., New York, N.Y.
Division of Ser. No. 691,923, Jan. 16, 1985, Pat. No. 4,669,466. This application Jan. 23, 1986, Ser. No. 877,510
Int. Cl.[4] A61B *3/10, 17/36*
U.S. Cl. 351—212 **12 Claims**

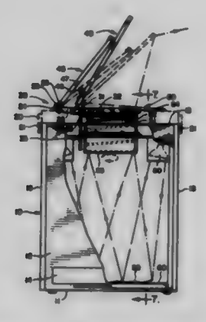




1. In combination, for performing ophthalmological surgery by selective ablation of the optically used central area of the anterior surface of the cornea with penetration into the stroma to achieve a predetermined sculpturing volumetric removal of corneal tissue, said ablation being substantially without formation of scar tissue and therefore not impairing the optical transparency of remaining corneal tissue, a topography-display unit with provision for storage of digital data and adapted to present from storage a comparative display of measured and desired ideal curvatures of the cornea, an ultraviolet-laser unit with means to direct ultraviolet radiation to the optically used central area of the anterior surface of the cornea to selectively ablate the same by photodecomposition, and means connected to both said units for controlling stroma-penetrating volumetric removal of corneal tissue from the optically used central area in accordance with the difference between said measured and desired ideal curvatures of the cornea.

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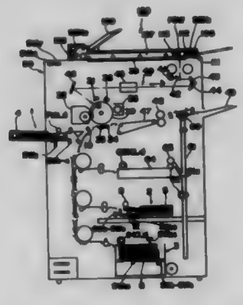
4,721,380
PORTABLE OPAQUE PROJECTOR
Stephen Gryglas, Long Grove, Ill., assignor to Constantin Systems, Inc., Chicago, Ill.
Continuation of Ser. No. 704,398, Feb. 22, 1985, abandoned. This application Apr. 23, 1987, Ser. No. 42,563
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—66 11 Claims



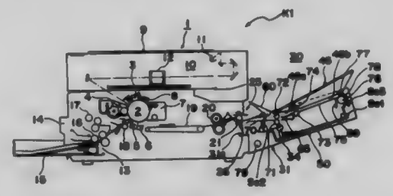
1. An opaque projector characterized by a transportable mode and an operable mode comprising:
case means including end panels, side panels, a base, and a top surface;
removable mirror means;
lens means; and
means attached to said lens means for removably mounting said removable mirror above said top surface at an acute angle with respect to said lens means,
said attachment means comprising a sliding collar means;
said sliding collar means substantially surrounding said lens means and defining an aperture slightly larger than the outer diameter of a cooperating portion of said lens means, whereby said sliding collar means is rotatable about said lens means;
means cooperating with said lens means for retaining said sliding collar means on said lens means while permitting rotation of said sliding collar means; and
means cooperating with said sliding collar means to retain said sliding collar means in a fixed horizontal radial position relative to said case means, independent of said rotation of said lens means with respect to said case means.

4,721,381
DUPLEX COPYING APPARATUS
Hirokazu Matsuo, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 708,255, Mar. 5, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 941,086
Claims priority, application Japan, Mar. 6, 1984, 59-43278; Apr. 27, 1984, 59-87129
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 32 Claims

13. A copying apparatus having a duplex copying capability for copying an image of a first document on the front face of a copy paper and an image of a second document on the rear face of the copy paper, the apparatus comprising:
means for storing the size or orientation of the first document or the copy paper;
means for detecting the size or orientation of the second document;
means for discriminating whether the image of the second document is within the frame of the rear face of the copy paper by comparing the stored size or orientation and the detected size or orientation; and
means for suspending the copying operation for the second document when a mis-match between the size or orientation of the copy paper and that of the second document is discriminated by the discriminating means.

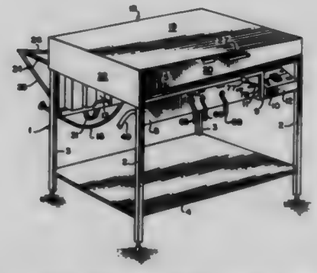


4,721,382
COPYING APPARATUS HAVING A SHEET REFEEDING DEVICE
Masazumi Ito, Toyohashi; Masaaki Oyabe, Aichi; Shigeru Sawada, and Masaru Komura, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 28, 1987, Ser. No. 7,781
Claims priority, application Japan, Jan. 29, 1986, 61-18504; Jan. 29, 1986, 61-18505; Jan. 29, 1986, 61-18506; Jan. 29, 1986, 61-18507; Jan. 29, 1986, 61-18508; Jan. 29, 1986, 61-18509; Jan. 29, 1986, 61-18510; Jan. 29, 1986, 61-18511; Jan. 29, 1986, 61-18512; Jan. 29, 1986, 61-18513; Jan. 29, 1986, 61-18514; Jan. 29, 1986, 61-18516; Jan. 29, 1986, 61-18517; Jan. 29, 1986, 61-18518; Jan. 29, 1986, 61-18519; Jan. 29, 1986, 61-18520
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH 57 Claims



1. A copying apparatus comprising:
a recording means which forms an image on copy paper sheets fed from a sheet feeding portion and discharges the copy paper sheets to a sheet ejecting portion;
a sheet cassette for accommodating the copy paper sheets, which is detachably mounted on said sheet ejecting portion and said sheet feeding portion;
a copy receiving tray;
a mode selecting means for selecting a first mode in which the discharged copy paper sheets are accommodated in said copy receiving tray and a second mode in which the discharged copy paper sheets are accommodated in said sheet cassette mounted on said sheet ejecting portion;
a cassette detecting means for detecting said sheet cassette at said sheet ejecting portion; and
a control means for controlling said mode selecting means in accordance with detection states of said cassette detecting means.

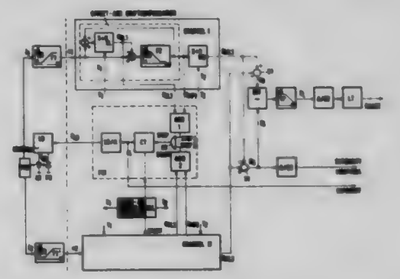
4,721,383
PROOFING MACHINE
Michael J. Simon, P.O. Box 37500, Louisville, Ky. 40233
Filed Jan. 21, 1987, Ser. No. 5,769
Int. Cl.[4] G03B *27/20*
U.S. Cl. 355—91 8 Claims



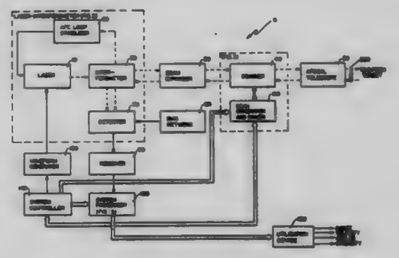
1. In a proofing machine, a frame having a work supporting surface, a plurality of vacuum channels in said surface for holding proof paper and negatives in contact therewith, a source of vacuum connected to said vacuum channels and vacuum controls for selectively applying vacuum from said vacuum source to said vacuum channels, locator pins supported relative to said frame for endwise movement between positions in which the ends thereof extend above said work supporting surface and are adapted to be received within locating holes in the negatives or are disposed below said work supporting surface, means for moving said locator pins selectively between said positions, and a light carriage having a top wall and depending side walls, supporting means for mounting said carriage over said frame with the top wall thereof spaced from and substantially parallel to said work supporting surface and with the side walls extending toward said work supporting surface to define a light chamber, said supporting means providing for movement of said light carriage between a closed position in which the top wall overlies said work supporting surface and an open position in which negatives and proof paper are adapted to be loaded onto said work supporting surface, a plurality of lamps mounted and distributed in said light carriage beneath said top wall to provide uniform illumination over said work supporting surface, and control means adapted to be actuated upon movement of said light carriage into the closed position to energize said lamps and means for automatically deenergizing the lamps at the completion of the exposure cycle.

4,721,384
OPTICAL-ELECTRONIC RANGEFINDER
Johannes Dietrich, Gilching, and Bernd Hartmann, Schwifting, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt E.V., Bonn, Fed. Rep. of Germany
Filed Jan. 27, 1986, Ser. No. 822,870
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502634
Int. Cl.[4] G01C *3/00, 5/00*; G03B *3/00, 13/18*
U.S. Cl. 356—1 14 Claims

1. A circuit arrangement for processing voltages on the output of a light transmitter of an optical-electronic rangefinder, said rangefinder including a light transmitter in the form of a CW laser diode transmitting a well focussed high intensity light beam, a light receiver having a position sensitive detector, the central axis of the light transmitter and the optical axis of the light receiver defining a predetermined acute angle therebetween, a pulse-electronic circuit for controlling the light transmitter and an amplifier circuit for transforming the currents received from the position detector into proportional voltages, said circuit arrangement comprising two high pass filters in two separate channels for converting the output currents of the position detector in the light receiver into measuring light voltages, said channels each having means for offset and drift compensation and an after-connected sample hold block, a dividing unit for dividing the difference of said measuring light voltages formed in a difference amplifier by the sum of said measuring light voltages formed in a sum amplifier, and a low-pass filter and an analog-digital converter for applying said quotient to a look-up chart, said look-up chart supplying the value of the range.



4,721,385
FM-CW LASER RADAR SYSTEM
Albert V. Jelalian, Bedford; Wayne H. Keene, Medfield; Charles M. Sonnenschein, Brookline; Clarke E. Harris, and Clifford E. Morrow, both of Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 733,846, Feb. 11, 1985, abandoned, which is a continuation of Ser. No. 353,446, Mar. 1, 1982, abandoned. This application Dec. 9, 1986, Ser. No. 940,156
Int. Cl.[4] G01C *3/08, 1/00*; G01B *11/26*
U.S. Cl. 356—5 18 Claims



1. In combination:
means for generating an electromagnetic beam of continuous wave energy with a predetermined beamwidth;
means for frequency modulating said continuous wave energy;
means for scanning said modulated beam of continuous wave energy through a predetermined region;
wherein the frequency modulating means modulates the frequency of the continuous wave energy in a modulation period greater than the time said frequency modulated beam is scanned through portion of the predetermined region equal to said beamwidth;
means for receiving portions of said frequency modulated beam of continuous wave energy reflected by a target; and
means for determining the range of the target, said target range determining means comprising means for mixing said received, target-reflected portions with an instantaneous portion of said frequency modulated beam of con-

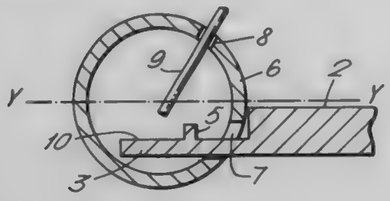
tinuous wave energy to produce a beat signal having a frequency representative of the range of the target.

4,721,386
THREE-AXIS ANGULAR MONITORING SYSTEM
Philip W. Collyer, Stamford, Conn., assignor to Barnes Engineering Company, Shelton, Conn.
Filed Jul. 18, 1986, Ser. No. 888,032
Int. Cl.[4] G01B *11/26*; G01C *1/00*
U.S. Cl. 356—152 **16 Claims**



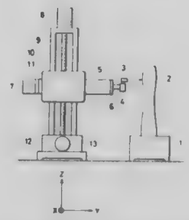
1. A three-axis angular monitoring system for detecting angular movement of a reflective element mounted on a remote element whose angular postion is desired to be known, comprising:
said reflective element being mounted on a predetermined axis,
a first optical apparatus comprising an autocollimator having a source of radiation, means for producing a beam from said source, a first beam splitting means in said beam for providing a first and a second path for said beam passing through said beam splitting means, first detector means in said second path passing through said beam splitting means for detecting radiation from said source, and a first lens positioned between said beam splitting means and said reflective element for collimating said beam aimable at said reflective element,
a second optical apparatus having at least a second lens means aimable at said reflective element and a second detector means for detecting radiation from said source in optical alignment with said second lens means,
said first and second optical apparatuses having said first and second lens means aimed at said reflective element at equal angles on opposite sides of said predetermined axis for providing off-axis viewing of said reflective element by said first and second detector means for monitoring the angular movement of said reflector element.

4,721,387
GRAPHITE PROBE AND ELECTROTHERMAL ATOMIZER INCLUDING SUCH A PROBE
Alistair A. Brown, Linton, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 5, 1986, Ser. No. 927,784
Claims priority, application United Kingdom, Nov. 12, 1985, 8527865
Int. Cl.[4] G01N *21/74*
U.S. Cl. 356—312 **7 Claims**



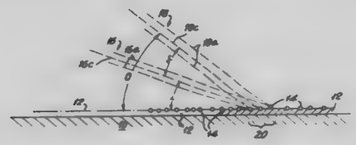
1. A graphite probe for an electrothermal atomiser, the probe comprising a stem portion and a head portion characterised in that the head portion is provided with a ridge which is dimensioned and positioned to have a heating rate similar to that of the rest of the probe head and to provide a barrier impeding the spread of liquid samples from the head to the stem when the probe head is heated within an atomiser.

4,721,388
METHOD OF MEASURING SHAPE OF OBJECT IN NON-CONTACTING MANNER
Yusuke Takagi; Yoshio Kojima; Kazuo Moriguti, and Tsunehiko Takakusagi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 4, 1985, Ser. No. 784,501
Claims priority, application Japan, Oct. 5, 1984, 59-208244
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 **11 Claims**



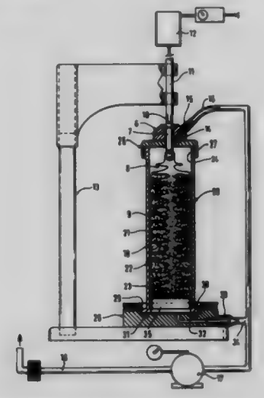
1. A method of measuring the shape of an object in a non-contacting manner by using a shape-measuring apparatus including a light spot detecting sensor for measuring the distance between said object and said sensor in non-contacting manner by using a light spot, means for driving said light spot detecting sensor, an arithmetic and control unit adapted to receive signals representative of the distance measured by said light spot detecting sensor and the movement of said sensor driven by said driving means, subject said signals to computation and control the operations of said sensor and said driving means, comprising the steps of:
providing at least one reference point, of which the coordinate in ' n object coordinate system is already known, on an ob ct to be measured, said object coordinate system bein[illegible] for defining the shape of said object;
driving said light spot detecting sensor so as to apply a light spot therefrom to said reference point and thereby determine the coordinate value of said reference point in a measuring coordinate system for determining the movement of said shape-measuring apparatus;
determining the relative positional relation between said two coordinate systems by said arithmetic control unit by using the coordinate values thus determined and the coordinate values in said object coordinate system;
measuring various points on said object by said light spot detecting sensor to determine the coordinate values corresponding to the various points measured;
comparing the measured values obtained in said measuring step with design values which correspond to the various points on said object and have been inputted into said arithmetic and control unit in advance, one of the measured and design values being modulated with the relative positional relation so as to be coordinate values in the same coordinate system.

4,721,389
METHOD AND APPARATUS FOR MEASURING RETROREFLECTIVITY OF A REFLECTIVE LAYER ON A SURFACE
Robert Dejaiffe, Oak Ridge, N.J., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.
Filed Apr. 18, 1985, Ser. No. 724,774
Int. Cl.[4] G01N *21/55*
U.S. Cl. 356—445 **18 Claims**



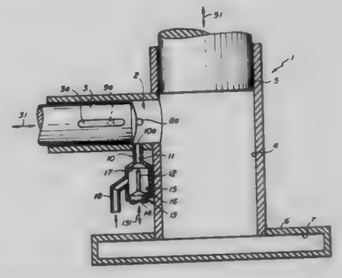
1. A method of measuring retroreflectivity of a reflective layer on a surface, comprising:
illuminating a portion of said reflective layer with a laser beam of a predetermined wavelength emanating from a laser source while said portion is exposed to ambient light, said wavelength being in the range of from about 600 nm to about 650 nm and said laser beam being incident on said layer at a particular incidence angle (i), said incident beam being reflected in the direction generally back toward its source at least partially at a particular observation angle (o), said incidence angle and said observation angle being separated by a divergence angle (δ);
filtering the laser light reflected at said observation angle through a narrow pass filter centered on said predetermined wavelength;
picking up said filtered light with a photometer; and
producing an electric signal corresponding to the amount of light incident on said photometer, said signal thus corresponding to the retroreflectivity of the illuminated portion of said reflective layer.

4,721,390
METHOD FOR PRODUCING BONE CEMENT FOR FIXING PROSTHESES AND DEVICE FOR CARRYING OUT SAID METHOD
Lars A. A. Lidgren, Lund, Sweden, assignor to Mit AB, Sjobo, Sweden
Filed Oct. 17, 1985, Ser. No. 788,743
Claims priority, application Sweden, Oct. 19, 1984, 8405232
Int. Cl.[4] B01F *13/06*
U.S. Cl. 366—139 **12 Claims**



11. A device for producing bone cement, comprising:
container means for receiving ingredients of a bone cement, said container means including movable plunger means for urging contents from said container;
means for mixing ingredients received in said container; and
means for inducing a vacuum upon opposing sides of said plunger means during operation of said mixing means.

4,721,391
IMPINGEMENT MIXING DEVICE WITH AUXILIARY INPUT AND PROCESS FOR PRODUCING PLASTIC PARTS
Adolf Bauer, Olching, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany
Filed Apr. 1, 1986, Ser. No. 846,947
Claims priority, application European Pat. Off., Apr. 1, 1985, 85103920.6
Int. Cl.[4] B01F *5/04, 17/00*; B29C *67/22*; C08G *18/14*
U.S. Cl. 366—171 **26 Claims**

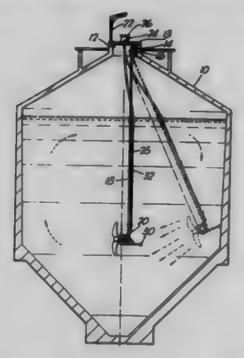


1. A method for producing plastic parts or objects comprising the steps of:
introducing reactive components into a mixing chamber through opposing inlet ports so that the compounds flow out of the mixing chamber;
introducing an additional component to the mixing chamber through a radial component inlet port;
controlling the introduction of the additional component by reciprocating a cleaning piston in said radial component inlet part.

4,721,392
METHOD AND A DEVICE FOR INSTALLATION OF A MIXER
Hjalmar Fries, Spanga; Roland Narholm, Vaxholm, and Bengt Thomaeus, Djursholm, all of Sweden, assignors to Flygt AB, Solna, Sweden
Filed Apr. 3, 1986, Ser. No. 847,809
Claims priority, application Sweden, Apr. 4, 1985, 8501700
Int. Cl.[4] B01F *7/06*
U.S. Cl. 366—241 **4 Claims**

1. A submersible mixer apparatus for a tank having significant depth in relation to its diameter and having an opening at its upper portion, comprising in combination:
an electrical submersible mixer having propeller type blades;
a shock absorber extending rearward of the blades of the mixer;
a support connected to the interior wall of the tank adjacent to the opening; and
an elongated guide element having two opposed ends and along which the mixer is guided for positioning in the tank, one of said ends being mounted for pivotal movement on said support to permit movement of said element in response to the action created by the mixer during operation and the second of said ends being free to move toward the tank wall and supporting the mixer and absorber in a substantially perpendicular position with respect to the longitudinal axis of said element, such that the

reaction force produced by the mixer blades during operation causes pivotal movement of the guide with said mixer and absorber moving toward a point on the interior surface of the tank to be supported against the tank wall during the operation, and the reaction force is partly counteracted by gravity which reduces the supporting pressure against the tank wall.

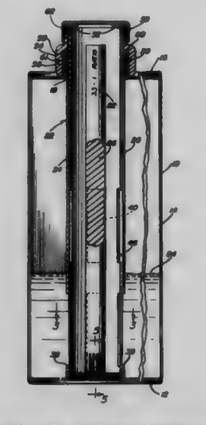


4,721,393

RATIO MIX CONTAINER

Gerald M. Kwast, 7920 Skillings Dr., Corvallis, Oreg. 97330

Filed Dec. 22, 1986, Ser. No. 944,520
Int. Cl.[4] B01F *13/00*
U.S. Cl. 366—341 13 Claims



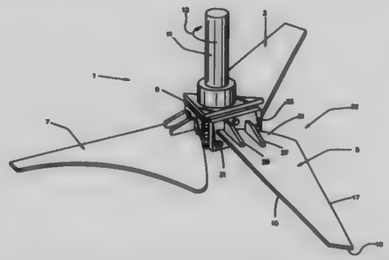
1. A variable ratio mix device including a container having an upwardly facing surface, a port in said upwardly facing surface, an upstanding, upwardly opening and open top hollow compartment assembly removably positionable within said container through said port and extending at least substantially the full height of said container therewithin below said port, said assembly defining upper and lower openings communicating the interior of said assembly with the upper and lower portions of the interior of said container exteriorly of said assembly and including closure means for selectively opening and closing said openings from exteriorly of said container, upstanding internal liquid volume displacement means insertable into and removable from the interior of said assembly and extending at least substantially the full height thereof within said container, the interiors of said compartment and said volume displacement means including corresponding height portions throughout substantially the full vertical extents thereof having at least substantially the same horizontal cross-sectional ratio.

4,721,394

MIXING BLADE CONSTRUCTION

Leo V. Casto, Brecksville, and Peter M. Reif, Lyndhurst, both of Ohio, assignors to Pro-Quip, Inc., Macedonia, Ohio

Filed Jun. 24, 1985, Ser. No. 747,859
Int. Cl.[4] B01F *5/10*
U.S. Cl. 366—343 8 Claims



1. A versatile mixing blade construction for mixing liquids in containers which blade reduces the need for additional blades as a depth of the liquid to be mixed increases, said mixing blade construction comprising:

a hub means attachable to a drive shaft for rotation about an axis of rotation; and,

impeller blade means mountable on said hub means, said impeller blade means including a root portion for attachment to said hub means and a tip portion forming a free end of said blade means, said blade means having a curved, airfoil configuration with a leading edge extending from said tip portion to said root portion and being straight and transverse to the axis of rotation and a trailing edge tapering from a first position close to the leading edge of said means at the tip portion to a second position farther than said first position from the leading edge near the root portion wherein said trailing edge is straight between said first and said second positions;

said blade means having an angle of attack substantially below the stall angle for avoiding blade surface turbulence and flow separation when said blade construction is mixing liquids whereby said blade construction compensates for and takes into account all drag effects resulting from mixing said liquid.

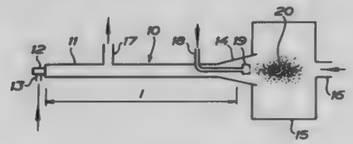
4,721,395

METHOD AND APPARATUS FOR INCREASING THE TURBULENCE IN A GAS EXPOSED TO LOW FREQUENCY SOUND

Mats A. Olsson, Björkrisvägen 15, S-161 39 Bromma, and Hans-Bertil Hakansson, Igelkottsvägen 3, S-612 00 Finspång, both of Sweden

PCT No. PCT/SE86/00019, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/04263, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 22, 1986, Ser. No. 916,543
Claims priority, application Sweden, Jan. 22, 1985, 8500276
Int. Cl.[4] B01F *11/00, 11/02;* B01J *19/10;* B06B *1/20*
U.S. Cl. 366—348 15 Claims

1. Method for increasing the turbulence in a gas exposed to low frequency sound produced by a sound generator including a tubular resonator having an open end, characterized in that the sound generator is operated at one of the resonance frequencies of the resonator, having a maximum frequency of 150 Hz, and that said gas is flown into the tubular resonator through the open end thereof and is discharged from the resonator substantially in a region where the sound pressure of the standing wave in the resonator has a node, after having passed through a substantial length of the resonator.

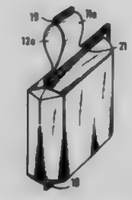


4,721,396

BAG AND METHOD OF MANUFACTURING THE SAME

Karl-Heinz Sengewald, Kreisstrasse 16, 4802 Halle in Westfalen 1, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,906
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508123
Int. Cl.[4] B65D *33/10*
U.S. Cl. 383—8 14 Claims



1. A method of manufacturing bags or the like packages of thermoplastic film and including a bag body made of an elongated hose or a half-hose and having an opening which is closed after filling the bag body, and only one loop-shaped griping handle connected to said body, the method comprising the steps of producing side folds in said hose; making a first weld seam on said hose in the direction transversal to the elongation of said hose and a separation cut closely adjacent to said first weld seam, also in said transversal direction to separate a single bag from the hose; providing a second weld seam also in said transversal direction and at a distance from said first weld seam, correaponding to the height of said gripping handle, so as to connect two opposite walls of the bag being produced to each other; and making a lateral cut in the region between sid first weld seam and said second weld seam in both walls of the bag at each side of the bag as considered in said transversal direction, so as to obtain said only one loop-shaped gripping handle.

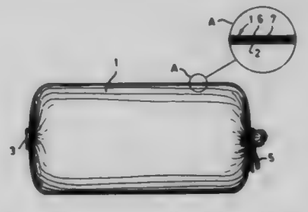
4,721,397

FLEXIBLE RECEPTACLE FOR FLUIDS

Alf Kautar, Karleby, Finland, assignor to Oy Fluid-Bag AB, Jakobstad, Finland

PCT No. PCT/FI85/00089, § 371 Date Jul. 15, 1986, § 102(e) Date Jul. 15, 1986, PCT Pub. No. WO86/02911, PCT Pub. Date May 22, 1986
PCT Filed Nov. 13, 1985, Ser. No. 889,936
Claims priority, application Finland, Nov. 16, 1984, 844505
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—70 7 Claims

1. A flexible receptacle for fluids, said receptacle comprising a substantially cylindrical outer casing having two end faces and one mantle face and an inner bag positioned within said casing, said bag being provided with filling and emptying means, said casing being formed by a hose which is turned inside out upon itself thereby providing an inner wall and an outer wall, whereby that end face of said casing positioned adjacent to a folding line of the hose along which said hose is doubled up is twisted around the central axis of the receptacle.

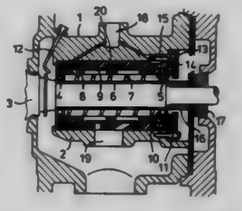


4,721,398

BEARING DEVICE FOR ROTARY MACHINE

Kazuya Miyashita, Chiba; Akihiro Ookita, Yokohama, and Shingo Yamauchi, Ichikawa, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 12, 1986, Ser. No. 895,750
Claims priority, application Japan, Aug. 22, 1985, 60-127280; Aug. 26, 1985, 60-128953
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—99 7 Claims



1. A bearing device in a rotary machine of the type having ball bearins mounted in an oil film damper which in turn is disposed in a bearing housing, the improvement comprising said oil film damper being monolithic and of a semi-float type in which one portion thereof provides a supporting portion and at least one end thereof maintained free to provide an oil film forming portion, said monolithic oil film damper including a Rahmen or rigid frame positioned between said supporting portion and the oil film forming portion and having a plurality of angularly spaced apart beam-like arms inter-connecting said supporting portion and said oil film forming portion, a bearing sleeve, means on said bearing sleeve supporting said oil film damper supporting portion, and a jet nozzle mounted on said bearing housing and having a nozzle hole in opposed relationship with the ball bearing so that a jet of lubricating oil is directly issued against said ball bearing from exterior of said oil film damper.

4,721,399

PLAIN BEARING PROVIDED WITH A DEVICE FOR LOCALLY DETERMINING THE TEMPERATURE OF ITS SLIDING

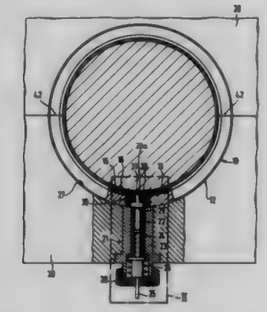
Hans Grosskurth, Walluf, and Fritz Schwarz, Langenselbold, both of Fed. Rep. of Germany, assignors to Braunschweiger Hüttenwerk GmbH, Braunschweig, Fed. Rep. of Germany

Continuation of Ser. No. 735,917, May 20, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 920,950

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418443

Int. Cl.[4] F16C *17/24*; G01K *1/16*

U.S. Cl. 384—448 15 Claims



1. A plain bearing apparatus body comprising:

a support body defining an outer circumference and having an inner surface coated with a sliding layer, said support body being formed with at least one bore extending through said support body to said sliding layer at a location at which the temperature is to be determined;

a bearing housing havng a nest for receiving said support body; and

measuring means for determining the temperature of said sliding layer at said location, said measuring means including:

a heat conductor element fixedly arranged within said bore of said support body; and

a sensor for temperature sensing and measuring received in said nest, said heat conductor element having one end section in thermally conductive connection with said sliding layer and extending within said bore towards said outer circumference of said support body and being in thermally conductive contact at an opposite end section with said temperatrue sensing and measuring element, said support body being provided at its circumference with a guide track aligned with said heat conductor element in such a manner that upon turning in said support body into said bearing housing said temperature sensing and measuring element is retracted by said guide track and allowed to run along said circumference until being in alignment with said heat conductor element.

4,721,400

HAMMER UNIT FOR PRINTERS

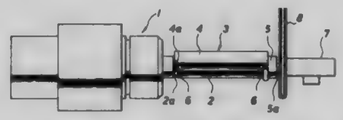
Notsu Risei, Yamato; Ooike Hideki, Kawasaki, and Kaneko Mitsushiro, Yokohama, all of Japan, assignors to Fuji System Machines Co., Ltd., Hiharigaoka-Zama, Japan

Filed Jan. 16, 1986, Ser. No. 819,815

Int. Cl.[4] B41J *9/133*

U.S. Cl. 400—157.1 1 Claim

1. A hammer unit for character printing with character heads which have a type face which comprises a solenoid having a plunger part, the front end of the plunger part being positioned directly opposite to and close to the type face of the character head, said plunger part having a plunger tip which is detachable and attachable to the plunger part in a direction perpendicular to the axis of said plunger part, said plunger tip consisting of a body which encircles the cylindrical side of the plunger part and a cap part which covers the front end of the plunger part and which hits against said type face, at least said cap part of the plunger tip being made of a synthetic resin,



wherein said body of said plunger tip has a rear end and a front end, said plunger part has a circumferential groove and said body has an inwardly projecting portion in said rear end, said inwardly projecting portion engaging said groove in said plunger part.

4,721,401

PRINTHEAD CONTROL

Jerry W. Malcolm, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,431

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—121 5 Claims



1. In a matrix printer printing system wherein multiple printing passes are permitted to complete printing of characters along a print line and platen is indexed for each printing pass, a method of reducing a need for reverse indexing, said method comprising:

scanning a line of characters to determine a maximum number of character bits required to print each of said characters along a print line;

printing said entire characters or portions thereof along said print line during a first pass;

indexing said platen, in response to said scanning step, only to an extent required to complete printing of said line of characters; and

selectively printing remaining portions of said characters along said print line during a subsequent pass when said maximum number of character bits exceeds a predetermined number of character bits.

4,721,402

PAPER FEED MECHANISM INCLUDING LOWER PINCH ROLLERS

Hirokaru Nakajima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 573,477, Jan. 24, 1984, abandoned. This application Sep. 30, 1986, Ser. No. 913,578

Claims priority, application Japan, Feb. 3, 1983, 58-16826

Int. Cl.[4] B41J *13/03*

U.S. Cl. 400—637 6 Claims

1. A paper feed mechanism including lower pinch rollers, comprising:

a rotatable paper feed roller;

a plurality of pinch rollers;

lever means for pivotally supporting said plurality of pinch rollers;

a first side plate disposed at a predetermined position;

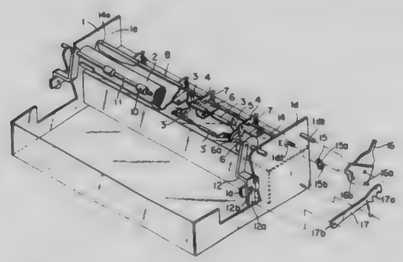
a shaft having a substantially D-shaped cross-section in the vertical direction relative to the axial direction thereof for engaging with said lever means, one end of said shaft abutting against said first side plate to define movement of the one end of said shaft in the axial direction thereof;

a second side plate for rotatably and pivotally supporting the other end of said shaft;

bracket means arranged between said first side plate and said second side plate for rotatably holding said shaft with a semi-cylindrical bearing portion;

an intermediate transmission member arranged on a side opposide said bracket means relative to said second side plate, having a substantially D-shaped hole into which said shaft is fitted and a pin member extending from said intermediate transmission member substantially in parallel with said shaft when said shaft is fitted into said D-shaped hole; and

actuation means having a groove portion for engaging said pin member, disposed on said second side plate so as to confine said intermediate transmission member between said actuation means and said second side plate, and abutting against the other end of said shaft to define movement of the other end of said shaft in the axial direction of said shaft, and for rotating said shaft to bring said pinch rollers into contact with and away from said paper feed roller.



4,721,403

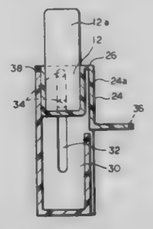
TWO-PIECE SOLID DEODORANT DISPENSING PACKAGE WITH HINGED COVER

Gerald B. Zinnbauer, Bay Village, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Nov. 12, 1986, Ser. No. 929,562

Int. Cl.[4] B43K *21/00*

U.S. Cl. 401—82 21 Claims



1. A solid deodorant dispensing package comprising:

a six-sided container having wall means defining a generally parallelepiped-shaped cavity with a dispensing opening along one of the sides of the container;

a cup for holding a solid deodorant positioned within said cavity of said container, said cup being moveable toward and away from said dispensing opening between a dispensing position that is adjacent to said dispensing opening and a storage position that is away from said dispensing opening;

a solid deodorant having a first portion that is contained within said cup and a second portion that extends away from said cup, at least a portion of said second portion extending through said dispensing opening when said cup is in said dispensing position, said at least a portion of said second portion being contained within said cavity when said cup is in said storage position; and

closure means foldably attached to said cup and being foldable with respect to said cup for closing said dispensing opening when said cup is in said storage position.

4,721,404

SYNTHETIC RESIN PEN UNIT

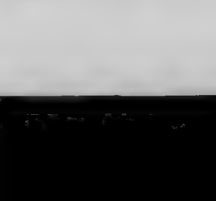
Akio Ito, and Hiroshi Kato, both of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Japan

Continuation of Ser. No. 878,396, Jun. 19, 1986, which is a continuation of Ser. No. 202,815, Oct. 31, 1980, abandoned. This application Feb. 2, 1987, Ser. No. 9,542

Claims priority, application Japan, Apr. 14, 1980, 55-50482[U]; Sep. 10, 1980, 55-129067[U]

Int. Cl.[4] B43K *1/06*

U.S. Cl. 401—198 6 Claims



1. In a pen unit in the form of a bar obtained by fusing a plurality of synthetic resin elements in the axial direction thereof to define a pen unit having a cylindrical outer member of annular cross-section and a plurality of linear members extending inwardly from the inner wall of the cylindrical member; the improvement compriisng:

the unit including at least three bent members and additionally, straight members and protrusions;

said straight members arranged such that they extend radially inwardly toward said central axis at equal circumferential intervals from the inner wall of said cylindrical member with top portions that terminate short of said central axis;

said bent members extending inwardly from the inner wall of said cylindrical member such that said bent members are arranged at equal circumferential intervals, each of said bent members having a base portion connected to said cylindrical member and inclined in one direction with respect to an imaginary line connecting the base of said bent member to the central axis of said cylindrical member with each parallel to and adjacent to a straight member and each bent member having an inclined top portion which extends toward the central axis from said base portion in a second direction with respect to said imaginary line, said top portion terminating short of the central axis and short of the top portion of the straight members;

said small protrusions extending inwardly from the inner wall of said cylindrical member such that said small protrusions are arranged at equal circumferential intervals one between pairs of a parallel straight member and bent member so as to provide in the cavity of said cylindrical member a plurality of voids serving as ink passages joined to define between said members and protrusions and said cylindrical member throughout the length of said unit essentially equidistant ink passages.

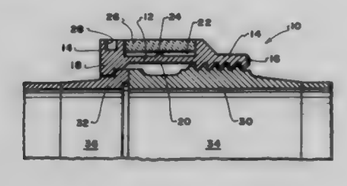
VOL 1086 ISS 4 26 JA 1988 UMI

4,721,405

TENSIONED COUPLING ASSEMBLY

Grant M. Loberg, Los Angeles, and Rodney R. Gross, Pacific Palisades, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,338
Int. Cl.[4] F16D *9/00*
U.S. Cl. 403—2 **11 Claims**



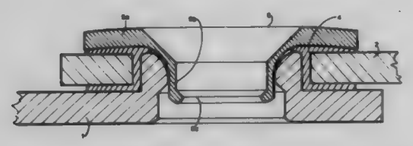
1. An externally mounted, pre-tensioned coupling assembly for connecting tubular members comprising:
(a) a tensioned annular member including opposing coupling means;
(b) said tensioned annular member having a central segment portion intermediate the coupling means and being thinner than the coupling means;
(c) an annular recess formed by said central segment portion and said opposing coupling means of said tensioned annular member; and
(d) a removable tension-maintaining annular member seated within the annular recess.

4,721,406

FRICTION PIVOT JOINT FOR A WINDOW STAY

Ronald P. Davis, 77 Breaker Bay Road, Wellington, New Zealand

Filed Jun. 23, 1986, Ser. No. 877,275
Claims priority, application New Zealand, Jun. 28, 1985, 212599; Oct. 9, 1985, 213772
Int. Cl.[4] F16C *17/12*
U.S. Cl. 403—163 **20 Claims**



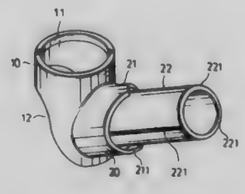
1. A friction pivot joint for use between two components such as two arms, an arm and a frame or sash plate of a window stay, said friction pivot joint comprising:
a first of said components having a first aperture; and an annular periphery surrounding said first aperture;
an annular shoulder surrounding and projecting from said annular periphery;
a second of said components having a second aperture; said second component being juxtaposed to said first component, said second component including a wall surrounding said second aperture, and said second aperture having a diametrical extent greater than the diametrical extent of said shoulder to permit said shoulder to fit within said second aperture in an assembled condition of said first and said second components;
a self-lubricating and wear-resisting bushing interposed between said shoulder and said wall for prevention of contact therebetween; and
means fixing said components together and extending through said joint, said fixing means including means for pressure fixing said fixing means within said first aperture directly to and below said shoulder for applying friction creating pressure to said joint.

4,721,407

JOINT FOR A BICYCLE FRAME

King Lie, No. 19, Shua Fan Road, Ta Chia Town, Taichung Hsien, Taiwan

Filed Jul. 23, 1986, Ser. No. 888,346
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—205 **2 Claims**



1. A joint for a bicycle frame including a head tube, a top tube and a down tube, said top tube and said down tube each having a certain diameter, said joint comprising:
a first sleeve for receiving said head tube;
a second sleeve projecting laterally from said first sleeve, said second sleeve receiving at least one of said top tube and said down tube, said second sleeve comprising;
an inner tube having a diameter slightly less than the diameter of at least one of said top tube and said down tube, said inner tube having an outer surface with means controlling the thickness of an adhesive formed thereon; and
an outer tube surrounding said inner tube, said outer tube having a diameter slightly greater than the diameter of at least one of said top tube and said down tube, said outer tube having an inner surface with an adhesive layer formed thereon, said inner tube and said outer tube being coaxially aligned and integrally formed with said first sleeve, said inner tube and said outer tube having a circumferential clearance thereinbetween, said circumferential clearance receiving an end of said at least one of said top tube and down tube, and said adhesive surfaces of both said inner tube and said outer tube bonding with the end of said at least one of said top tube and down tube inserted in the circumferential clearance to form a bond between said second sleeve and said at least one of said top tube and down tube.

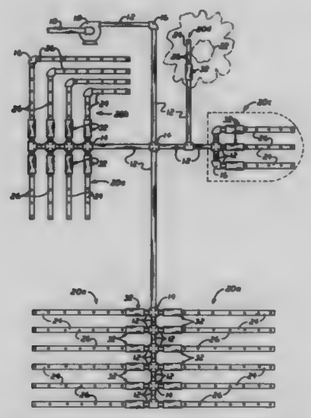
4,721,408

WATER DISTRIBUTION SYSTEM

Robert F. Hewlett, P.O. Box 270938, Tampa, Fla. 33688

Filed Oct. 22, 1986, Ser. No. 921,389
Int. Cl.[4] E02B *13/00*
U.S. Cl. 405—48 **9 Claims**

1. An improved water distribution system of the type including a source of water, at least one main delivery conduit and means for passing water from the source through the main delivery conduit, wherein the improvement comprises at least one irrifluent pipe disposed in fluid communicating relation to the main delivery conduit by control filter means attached in interconnecting relation between said irrifluent pipe and the main delivery conduit, said irrifluent pipe comprising an inner fluid conduit and an outer cover fixedly attached in spaced apart relation thereto, said inner fluid conduit comprising at least one aperture formed therethrough and said outer cover overlying said aperture; said outer cover being fixedly attached to said inner fluid conduit by a plurality of water stop means, one of said plurality being on opposite sides of said aperture, an end of said irrifluent pipe remote from said control filter means being capped.

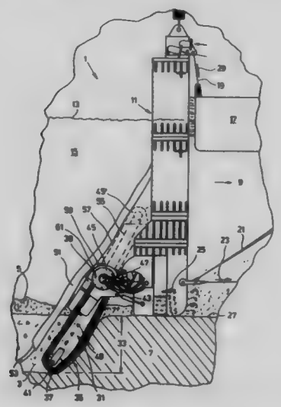


4,721,409

METHOD AND DEVICE FOR PROGRESSIVELY PRODUCING AN UNDERWATER LAYING-OUT CHANNEL

Rudolf Harmstorf, Stauffenbergstrasse 6m, 2000 Hamburg 55, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,541
Int. Cl.[4] F16L *1/04*; E02F *5/02*
U.S. Cl. 405—163 **5 Claims**



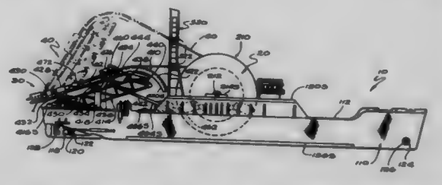
1. A method for progressively producing an underwater channel in which an object such as a cable or the like is to be laid out and buried in an underwater ground comprised of a base layer of a formation solid enough to resist the formation of a channel by a flushing operation and requiring a mechanical loosening operation to form the channel, said method being characterized by the steps of lowering the mechanical loosening device through the water and any layers overlying the base layer to the base layer, supporting the mechanical loosening device upon the base layer and below any ground formation that is not resistive against flushing, and advancing the mechanical loosening device through the base layer and operating the mechanical loosening device for forming a channel in the base layer to a depth that extends downwardly from the upper surface of the base layer and effecting a flushing operation above the upper surface of the base layer for removing any layers above the base layer in the area of the channel.

4,721,410

REEL PIPE COATING AND LAYING VESSEL AND PROCESS

Carlos E. Recalde, Irvine, Calif., assignor to Santa Fe International Corporation, Alhambra, Calif.

Filed Jan. 29, 1985, Ser. No. 696,188
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—166 **37 Claims**



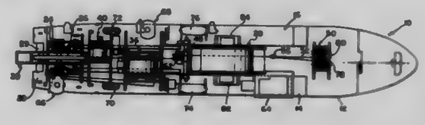
1. A reel pipelaying vessel having a rotatably mounted reel for storage and for continuously unspooling of a pipeline and containing thereon pipe conditioning means located downstream of the reel in the direction of unspooling; said pipe conditioning means being adapted for straightening and for providing tension for said pipeline; said vessel including weight coating means adapted for continuously applying at least one weight coating layer to said pipeline as said pipeline moves continuously through said coating means, said coating means being located downstream of said pipe conditioning means in the direction of unspooling.

4,721,411

MULTI-REEL OPERATIONAL LINES LAYING VESSEL

Carlos E. Recalde, Irvine, Calif., assignor to Santa Fe International Corporation, Alhambra, Calif.

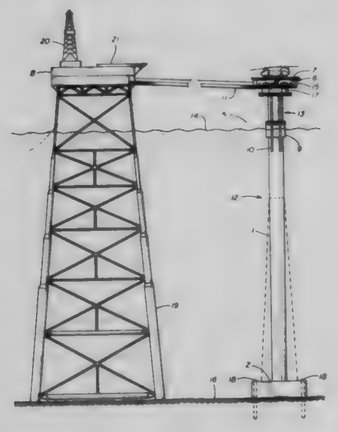
Division of Ser. No. 646,112, Aug. 31, 1984, Pat. No. 4,687,376.
This application Feb. 2, 1987, Ser. No. 10,298
Int. Cl.[4] F16L *1/04*; B63B *35/04*
U.S. Cl. 405—168 **5 Claims**



1. A method of converting a single pipeline laying vessel having a main storage reel and a pivotal ramp pipe straightening and tensioning assembly to a multi-reel pipe laying vessel for the layout of an operational lines array within which a rigid walled pipeline is contained; said method comprising the steps of:
removing the pivotal support ramp and pipe straightening and tensioning equipment from the deck of said vessel;
installing at least one auxiliary operational lines storage reel on said vessel in the unspooling direction of the pipeline stored on the main reel;
installing a operational lines laying device adjacent the stern of said vessel, the laying device including operational lines supporting means adapted for providing moving contact for each of a plurality of operational lines and said means interconnected and adapted for moving the operational lines at a common velocity for permitting layout from the vessel in a downward juxtaposed configuration; and
providing the main reel and the auxiliary reels with motive

power means having both spooling direction power and unspooling direction braking systems.

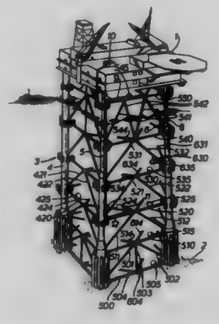
4,721,412
OFFSHORE SAFETY ESCAPE PLATFORM
Robert D. King, 5400 Mitchelldale, Suite A-3, Houston, Tex. 77092, and Steven G. Jennings, Houston, Tex., assignors to Robert D. King, Houston, Tex.
Filed Jul. 1, 1986, Ser. No. 880,999
Int. Cl.[4] E02D *21/00*; B63B *35/44*; E01D *1/00*
U.S. Cl. 405—195 **15 Claims**



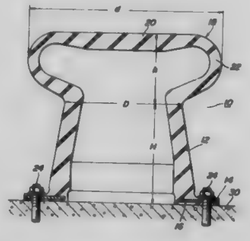
1. Emergency escape platform apparatus comprising:
(a) an escape platform disposed in spaced apart relation from a drilling platform;
(b) two flexible base cables connected horizontally adjacent to one another and in tension between said escape platform and said drilling platform;
(c) two flexible hand cables conneted (1) horizontally adjacent to one another; (2) vertically adjacent respectively above said base cables; and (3) in tension between said escape platform and said drilling platform;
(d) spacer bar means vertically connecting a respective base cable to a respective hand cable at selected intervals;
(e) walkway means horizontally disposed between and connecting said two base cables to provide a walkway for crew members between said drilling platform and said escape platform;
(f) cable tensioning means in connection with said base cables and said hand cables for respectively maintaining said cables under selected tension while permitting relative movement between said escape platform and said drilling platform;
(g) cable releasing means in respective connection with said base cables and said hand cables for releasing all said cables when desired.

4,721,413
MARINE PLATFORMS
Henri Crohas, Meudon, and Rene Blondy, Ris Orangis, both of France, assignors to Compagnie Francaise des Petroles, Paris, France
Filed Oct. 14, 1981, Ser. No. 311,230
Claims priority, application France, Dec. 4, 1980, 80 25736
Int. Cl.[4] E02D *21/00*; G01M *3/08*
U.S. Cl. 405—211 **6 Claims**

1. A marine platform, comprising: a structure including a lattice of hollow tubular elements sealingly joined to one another, a plurality of pickups individually mounted on selected ones of said tubular elements for detecting leakage of a fluid through a tubular element wall, each of said pickups comprising an autonomous, long life energy source and acoustic signal transmission means for transmitting, in the form of binary coded acoustic signals, messages relating to an address of the transmitting pickup and data detected thereby, a signal acquisition unit (10) disposed on a non-submerged part of said platform, and a submerged intermediate transmission means (11) for receiving acoustic signals transmitted from said pickups through the water and connected by cable means (12) to said signal acquisition unit, said acoustic signals being composed of two distinct frequencies defining two possible states of a binary bit.



4,721,414
MARINE FENDERS
Hitoshi Akiyama, Zushi, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 10, 1986, Ser. No. 837,633
Claims priority, application Japan, Mar. 9, 1985, 60-46729
Int. Cl.[4] E02B *3/22*
U.S. Cl. 405—212 **3 Claims**



1. A marine fender mounted to a berthing wall and made from an elastomeric material, comprising; a main cylindrical portion having a fitting flange on its base end, and a closed head portion formed by outwardly extending the front end of the main cylindrical portion, wherein rigidities of said main cylindrical portion and a contact part of said head portion are greater than that of a peripheral part of said head portion joining said main cylindrical portion and said marine fender satisfies the following relations:

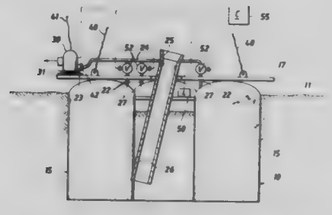
$$\frac{1}{4} \leqq h/H \leqq 1,$$

and

$$1 < d/D \leqq 3,$$

wherein h is a height of the closed head portion, H is a height of the main cylindrical portion, d is an outer diameter of the closed head portion and D is an outer diameter of the small size part of the main cylindrical portion.

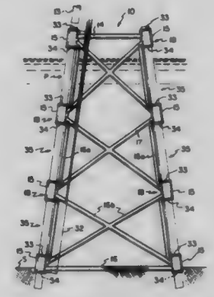
4,721,415
WELL BASE IN OCEAN FLOOR
Howard L. Shatto, Houston, Tex., assignor to Shell Offshore Inc., Houston, Tex.
Filed Jun. 6, 1986, Ser. No. 871,338
Int. Cl.[4] E02D *7/00, 29/00*; E21B *33/043*
U.S. Cl. 405—226 **9 Claims**



1. A method of positioning a wellhead apparatus at a selected angle in the ocean floor, the method comprising:
providing a plurality of open-bottomed containers having an open-end well conductor guide to receive a downwardly-directed well conductor and form an underwater wellhead through which a well may be drilled and produced;
providing ports near the top and through the wall of each of said containers for evacuating water therefrom;
providing a pump removably engageable with said wellhead apparatus, said pump having a suction port in fluid communication with the containers of said wellhead apparatus;
providing a power transmitting cable operatively engageable with said pump and lowerable therewith to acitvate said pump;
providing valves connected to the ports of each of said containers for selectively controlling water flow therefrom;
positioning said pump so that the suction port of said pump communicates with each of said containers;
lowering said wellhead apparatus until it is on the ocean floor with the top of said apparatus being above the ocean floor to form a base for well equipment;
determining the level of each of said containers relative to the vertical;
actuating said pump using the power transmitting cable to create suction within each of said containers;
actuating said valves selectively to achieve a desired level of each of said containers relative to the vertical;
terminating suction within each of said containers when each of said containers has sunk into the ocean floor to a selected depth and at the selected angle;
disconnecting said pump from said wellhead apparatus; and
raising said pump and power transmitting cable to the ocean surface.

4. A wellhead apparatus adapted to be positioned on the ocean floor, said apparatus comprising:
a plurality of containers adapted to be positioned in the ocean floor in close fixed proximity to each other, each of said containers having a port through the wall thereof near the upper end thereof;
a removable pump operatively engageable and disengageable with said wellhead apparatus, said pump having a suction port in fluid-flow communication with each of said ports of each of said containers for evacuating water from each of said containers and applying a vacuum thereto;
a plurality of fluid conduits in communication between the interior of each of said containers and said suction port of said pump;
valves in operative communication with said ports of each of said containers for selectively controlling water from from each of said containers in response to the angle of each of said containers relative to the vertical during normal operations;
a supporting device positioned central to each of said containers, said supporting device having a downwardly-directed opening therethrough for receiving a well conductor therein;
a landing surface formed adjacent said opening and carried by said supporting device, said landing surface being adapted to engage a well conductor positioned in said opening;
a cooperating connector carried by said pump and said wellhead apparatus for connecting said wellhead aparatus to said pump in a weight-supporting and fluid-communicationg manner;
means for lowering said wellhead apparatus from a point above the water surface to the ocean floor, said means being adapted to be secured to the wellhead apparatus; and
a power transmitting cable operatively engageable with said pump and lowerable therewith to activate said pump.

4,721,416
SUBMERSIBLE OFFSHORE DRILLING AND PRODUCTION PLATFORM JACKET
Eberto Gracia, Houston, Tex., assignor to International Building Systems, Inc., Houston, Tex.
Filed Dec. 12, 1986, Ser. No. 940,935
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—227 **1 Claim**



1. A submersible offshore jacket assembly conprising:
a plurality of elongated pilings having a first diameter;
a plurality of sleeves of a diameter greater than said first diameter and associated with each piling in surrounding relationship thereto;
said plurality of sleeves being aligned longitudinally on said plurality of pilings; said longitudinally aligned plurality of sleeves being spaced longitudinally from the next adjacent longitudinally aligned plurality of sleeves on said plurality of pilings;
top horizontal braces secured to and extending between said uppermost plurality of longitudinally aligned sleeves on said plurality of pilings;
bottom horizonal braces secured to and extending between said lowermost plurality of longitudinally aligned sleeves on said plurality of pilings;
a diagonal brace arrangement between the longitudinally spaced plurality of longitudinally aligned sleeves from said top to said bottom horizontal brace, said diagonal brace arrangement being formed by each of said plurality

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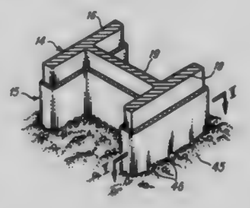
of longitudinally aligned sleeves having a diagonal brace secured thereto and extending diagonally to and secured with one of said sleeves of the next adjacent, longitudinally aligned plurality of sleeves on said plurality of pilings;
vertical braces adjacent and extending parallel to each of said plurality of pilings and secured to one of said diagonal braces extending between adjacent, longitudinally aligned and longitudinally spaced sleeves;
each of said plurality of pilings including a flood valve at the lower end thereof for flooding the interior of each of said plurality of pilings to thereby sink the assembly to the bottom of a submerged surface;
a reach rod within each of plurality of said pilings connected to said flood valve and accessible at the upper end of each of said pilings for actuating and de-actuating said flood valve; and
means to introduce grout into each of said sleeves to secure said plurality of longitudinally spaced sleeves in position along said pilings in longitudinal spaced relation, said means including:
upper and lower seal means adjacent the upper and lower end, respectively, of each of said sleeves for sealing with said elongated piling extending therethrough; and
means for communicating grout to said upper and lower seal means of each of said sleeves and to the annulus between each of said sleeves and said piling extending therethrough for sealing each of said sleeves with said respective piling which is surrounds.

4,721,417
COMPLIANT OFFSHORE STRUCTURE STABILIZED BY RESILIENT PILE ASSEMBLIES
Michael P. Piazza; Richard H. Gunderson, both of Houston, Tex.; Jerome Q. Burns, San Diego, Calif., and Peter A. Lunde, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Nov. 10, 1986, Ser. No. 929,539
Int. Cl.⁴ E02B *17/02*
U.S. Cl. 405—227 **5 Claims**



1. A compliant offshore platform, comprising:
a vertically extending tower having a bottom end portion proximate the ocean bottom;
a pluality of piles extending uward from the ocean bottom adjacent said tower; and
a plurality of resilient coupling elements, each of said coupling elements resliently securing said tower to one of said piles, said coupling elements each including:
a coupling housing defining a vertically extending cylindrical recess;
a first sleeve situated at an upper position within said housing to define an upper annular region intermediate said housing and first sleeve;
a second sleeve situated at a lower position within said housing to define a lower annular region intermediate said housing and second sleeve;
elastomeric material occupying at least a portion of each annular region, said elastomeric material having a radially outer surface supported by said housing and a radially inner face suported by the corresponding one of said sleeves, whereby loads are transferred from said housing to said sleeve through deformation of said elastomeric material; and
one of said sleeves being secured to one of said piles and the other of said sleeves being secured to said tower, whereby movment of said tower relative to said pile is resiliently resisted by deformation of said elastomeric material.

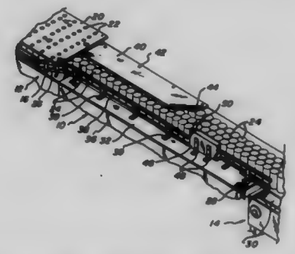
4,721,418
FRICTION BARRIER PILE JACKET
Frankie A. R. Queen, 668 Nottingham Dr., Lawrenceville, Ga. 30245
Filed Dec. 15, 1986, Ser. No. 941,770
Int. Cl.⁴ E02D *5/60, 5/22*
U.S. Cl. 405—231 **8 Claims**



1. In combination, a pile including substantially smooth vertical surfaces to be surrounded by backfill and a friction barrier pile jacket surrounding said pile to be held in abutment with said pile by the backfill, said jacket comprising sheet material of a shape conforming to the shape of the vertical surfaces of the pile, said sheet material comprising opposed inner and outer surfaces and spacer means normally maintaining said inner and outer surfaces in spaced parallel relationship, said inner surfaces of said sheet material facing the pile to be maintained in a relatively smooth shape by the outer surfaces of the pile and said outer surfaces of the sheet material to be engaged by the backfill with indentations formed by the backfill in said outer surfaces of the sheet material and increasing the coefficient of friction between the backfill and said outer surface, whereby any downward forces applied by the backfill to the jacket tend to move the jacket downwardly about the pile substantially without transmitting a major portion of the downward forces to the pile.

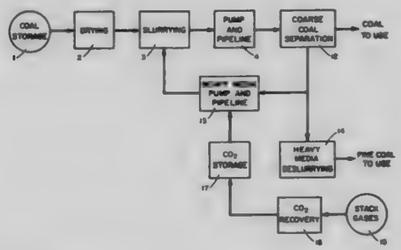
4,721,419
CONTAINER NESTING APPARATUS
Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.
Filed Jun. 9, 1986, Ser. No. 871,808
Int. Cl.⁴ B65G *51/00*
U.S. Cl. 406—88 **12 Claims**

1. Air operated handling apparatus for nesting cylindrical articles which are conveyed en mass from a first upsteam location to a second downstream location in a three row width having an equilateral triangular configuration in which all articles are contiguous, said apparatus comprising:
a nesting table extending from said upstream location to said downstream location and having a surface, two parallel side edges and an underside with a prearranged pattern of flotation air jets in said surface slanted in a downstream direction and communicating said surface and said underside of said table, said side edges being spaced apart a distance which is greater than three articles diameters;
a plenum connectable to a source of air under pressure and attached to the underside of said table surface;
spaced side guides along each side edge through which air from the air jets can escape;
an imperforate cover spaced above said nesting table a distance slightly greater than the height of said articles and extending longitudinally from said upstream location to a point which is upstream from said downstream location and extending across a portion of said table so that a high pressure area is created under said cover which forms a



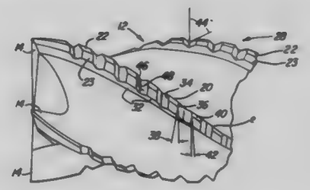
first row of articles along one of said side edges, a second row of articles along the other of said side edges and a third row of articles in the space between the first and second row of articles, the third row of articles being urged toward the second row of articles into nesting relationship by the high pressure, wherein said cover extends laterally from one of said side edges toward the other of said side edges and is spaced from said other side edge a distance approximately equal to one article diameter; and
means located downstream of said cover and upstream of said downstream location for converging and holding the articles in a contiguous nesting equilateral triangular configuration at said downstream location.

4,721,420
PIPELINE TRANSPORTATION OF COARSE COAL-LIQUID CARBON DIOXIDE SLURRY
Chakra J. Santhanam, Lexington, Mass.; Richard W. Hanks, Orem, Utah, and R. Peter Stickles, Concord, Mass., assignors to Arthur D. Little, Inc., Mass.
Filed Sep. 3, 1985, Ser. No. 771,851
Int. Cl.⁴ F17C *7/02*
U.S. Cl. 406—197 **5 Claims**



1. A method for the pipeline transportation of coarse particles of coal which are too large to form a stable slurry in liquid CO_2, comprising the steps of:
(a) slurrying coarse particles of coal up to ¾-inch in diameter with a dense liquid CO_2 media in an amount of 40–60% of coarse coal particles with respect to the dense media; said dense media formed by incorporatig fine coal particles in liquid CO_2 in an amount of 30–50% with respect to the liquid CO_2; said fine particles capable of forming a stable suspension in liquid CO_2 whereby the coarse particles may be transported in the dense media by means of a pipeline;
(b) introducing the slurry into a pipeline; and
(c) flowing the slurry through the pipeline.

4,721,421
CUTTING TOOL WITH CHIP BREAKERS
Roger L. Klinger, Millersburg, Pa., assignor to Brubaker Tool Corporation, Millersburg, Pa.
Filed Oct. 3, 1986, Ser. No. 915,112
Int. Cl.⁴ B23C *5/10*
U.S. Cl. 407—63 **17 Claims**



1. A rotary cutting tool comprising:
a shank body portion;
a cylindrical cutting body portion adjacent said shank body portion, said cutting portion having a longitudinal axis and a plurality of helical blades separated by helical flutes extending the length of said cutting portion, each of said helical blades having a leading face side, a trailing face side spaced from said leading face side and a relieved land surface bridging said leading face side and said trailing face side, said plurality of helical flutes and blades being at a first predetermined helix angle; and
a plurality of spaced V-shaped notches transversely interrupting said relieved land surface, said plurality of spaced V-shaped notches being at a second predetermined helix angle, said second predetermined helix angle being opposite said first predetermined helix angle such that said plurality of spaced V-shaped notches are located in staggered positions from one of said plurality of blades to an adjacent other of said plurality of blades to form a plurality of cutting edges at the intersection of said leading face side and said relieved land surface, said plurality of spaced V-shaped notches transversely interrupting said relieved land surface further defining a plurality of longitudinally spaced apart cutting teeth on each of said plurality of blades, each of said cutting teeth being spaced a predetermined distance apart along said second predetermined helix angle and further having a leading face edge, a trailing face edge spaced from said leading face edge, and a flat land therebetween, said plurality of spaced V-shaped notches transversely interrupting said relieved land surface further having a straight line root surface tapered radially inwardly toward said longitudinal axis of said cutting body portion to define a flat groove relief angle such that said plurality of cutting edges, said leading face edge, and said trailing face edge of each of said plurality of cutting teeth have a positive relief.

4,721,422
BORING BAR
Ignatius Konwal, 335 Parkview Ave., Elmhurst, Ill. 60126
Filed Aug. 22, 1986, Ser. No. 899,152
Int. Cl.⁴ B23B *27/16*
U.S. Cl. 408—233 **11 Claims**

1. A boring bar providing an elongated body having a free

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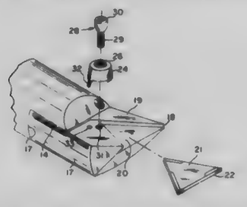
end configuration that provides an attachment area for a bar extension member comprising;

(a) a removable body extension member being semi-circular in cross section and providing a substantially flat bearing surface projecting axially beyond said boring bar,

(b) means for removably attaching said body extension member to the free end of the boring bar,

(c) a cutting element positioned upon said flat bearing surface of said body extension member, outwardly of the elongated body of the boring bar and having a cutting edge extending beyond the free end of said body extension member,

(d) a clamp of a size to overlie a portion of said cutting element and said flat surface for securing said cutting element thereon, with said clamp lying within the periphery of the elongated body of the boring bar,



(e) said clamp providing a conically shaped passage therethrough for the reception of a threaded fastener,

(f) a threaded fastener having a conically shaped head to mate within said conically shaped passage formed in said clamp when projected therein and threadable into said body extension at a point beyond the end of the boring bar for clamping said cutting element to the free end of said body extension member, and

(g) a yieldable positioning stud depending from said clamp and freely projectable into an aperture formed in the flat bearing surface of said body extension member adjacent and parallel to the point of threadable contact of said fastener with said body extension member that permits free rocking movement of said clamp relative to said cutting element during the clamping of said cutting element onto said flat bearing surface of said body extension member.

4,721,423

CHUCK

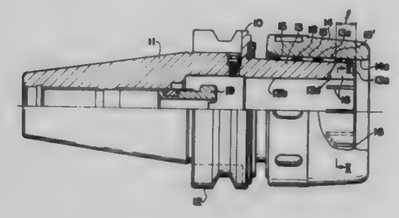
Haruaki Kubo, Higashi Osaka, Japan, assignor to Daishowa Seiki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,602

Claims priority, application Japan, Oct. 7, 1986, 61-154146[U]; Oct. 7, 1986, 61-154147[U]

Int. Cl.⁴ B23B *31/04*

U.S. Cl. 409—234 **13 Claims**



1. A chuck comprising:

a chuck body;

a chuck cylinder for gripping a straight shank of a cutting tool directly or through a straight collet, which projects ahead from a one side of said chuck body in a mated fashion to each other and has a straight internal peripheral surface corresponding either to the straight shank of the cutting tool or to the straight collet as well as an external tapered peripheral surface;

a tightening rotary sleeve having a tapered internal peripheral surface corresponding to said tapered external peripheral surface of the chuck cylinder so as to be fitted rotatably outside the chuck cylinder;

a plurality of needle rollers being interposed between said rotary sleeve and said chuck cylinder in such a manner a to revolve spirally with relation to the external peripheral surface of the chuck cylinder;

slits being configured substantially inwardly axially from a top end face of said chuck cylinder and radially at intervals around a top end part of the chuck cylinder while communicating with the internal and external peripheral surfaces which are opposite to one another.

4,721,424

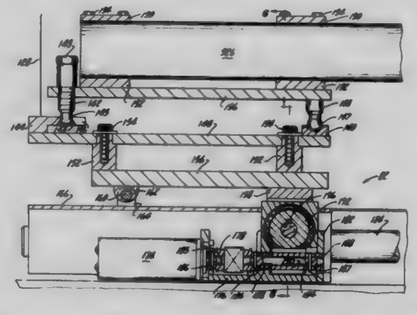
SEMICONDUCTOR WAFER BOAT LOADER RELEASEABLE MOUNTING

Robert E. Aldridge, Anaheim; Russell Elloway, Riverside; William O. Fritz, Anaheim; Ralph D. Goff, and Michael J. Herrera, both of Placentia, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

Division of Ser. No. 719,409, Apr. 3, 1985, Pat. No. 4,636,140. This application Jun. 30, 1986, Ser. No. 880,460

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 414—182 **11 Claims**



1. Apparatus for loading articles into and unloading articles from a furnace chamber having an opening therein, said chamber including a loading axis along which the articles travel during loading and unloading of the chamber, comprising:

a base;

a guide mounted on the base and extending parallel to said loading axis;

a carriage slidably mounted on said guide;

an elongate arm having a longitudinal axis extending parallel to the loading axis, one end of said arm being adapted to support at least one of said articles thereon and to pass through said opening into said chamber; and,

coupling means for removably mounting, and precisely positioning, the opposite end of said arm on said carriage in cantilever relationship to said one end, said coupling means including:

(1) means for supporting a portion of said arm on said carriage, said supporting means defining a pivot allowing pivotal movement of said arm about a substantially horizontal axis extending transversely of the longitudinal axis of said arm, and

(2) quick release means for normally holding said opposite end of said arm in a fixed position on said carriage but quickly releasing said arm for removal from said carriage in response to pivotal movement of said arm relative to said carriage in one direction about said horizontal axis.

4,721,425

APPARATUS FOR CONVEYING BULK MATERIAL IN SILOS

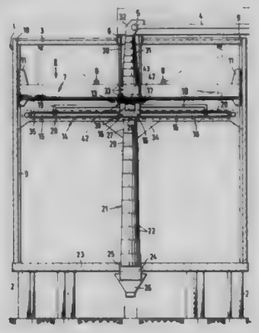
Günter Ströcker, Holzwickede, Fed. Rep. of Germany, assignor to Gustav Schade Maschinenfabrik GmbH & Co., Dortmund, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 854,439

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514858

Int. Cl.⁴ B65G *65/38*

U.S. Cl. 414—298 **20 Claims**



1. In an apparatus for conveying bulk material in a silo with a vertical axis, comprising

feed means for dumping bulk material introduced into the silo, and discharge means for discharging bulk material from the silo, which discharge means comprises clearing means for removing material from the top surface of bulk material within the silo, and which is movable vertically and rotatably within the silo, and a gravity-descent tube in the silo, which tube has top and bottom ends defining a bulk material inlet at the top end thereof, to receive material from the clearing means, is telescopic and is coupled to the clearing means so as to follow vertical movement of the clearing means,

the improvement comprising:

a bridge girder having at least two ends adjacent the silo walls, and extending horizontally across the silo,

vertical guides on the silo wall, engaging said ends of said bridge girder, thereby constraining said girder against rotation,

lifting means to raise and lower said girder, in said silo,

a rotary joint supporting said clearing means from and beneath said briidge girder, for said clearing means to move vertically with said bridge girder, and pivot around the vertical axis of the silo,

drive means associates with said rotary joint for rotating said clearing means relative to said bridge girder,

a feed conveyor at the top of the silo, distributor means carried by said bridge girder to dump incoming bulk material, and a telescopic feed tube having top and bottom ends and arranged to receive incoming material discharging from said feed conveyor, the said tube descending to said bridge girder and having its lower end connected to said bridge girder whereby said tube telescopically retracts and extends to follow vertical movement of said distributor means as carried by said bridge girder.

4,721,426

BRIDGE PLATE

Edward A. Bell, and Roger D. Sims, both of Munster, Ind., assignors to Stanrail Corporation, Hammond, Ind.

Filed Aug. 1, 1986, Ser. No. 892,033

Int. Cl.⁴ B61D *49/00*; B65G *67/00*

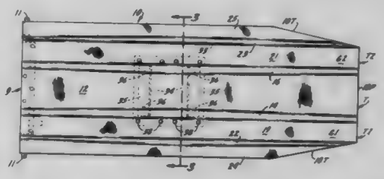
U.S. Cl. 414—340 **2 Claims**

1. A bridge plate for moving vehicles between railroad auto-rack cars and comprising an elongated aluminum plate to be paired with a like plate for receiving respectively, the left and right sets of wheels of the vehicle, said plate having in cross section:

outer sides extending the length of the plate; an intermediate upright truss (T) extending lontudinally between the ends of the bridge plate; said intermediate truss including a top land (12) joined to downwardly extending side webs (14,16) with the land constituting the surface on which one set of wheels will ride;

two inverted bracing trusses (T1,T2) respectively positioned between and connecting the intermediate truss and said outer sides;

said bracing trusses each having one side respectively (14,16) in common with the intermediate truss, each having a flat bottom flange (19,21), and each having an upwardly extending web (22,23) joined, respectively, to said outer sides;



a reinforcing plate (33') positioned beneath the intermediate truss and joined by rivets, each having a shank and a pair of heads, to the underside of said flats (19,21);

and vertical webs (34) positioned between the reinforcing plate and the underside of the intermediate truss for transferring a load on the top land (12) to the reinforcing plate; said vertical webs having slope sides generally parallel to but spaced inward of the opposed surfaces of the bracing trusses, whereby beam loading on the webs (34) is transmitted directly to the reinforcing plate (33') so it will not buckle while the rivet heads in turn transfer loading on plate (33') to the bottom flanges (19,21), and whereby additionally beam loading on the side webs (14,16) is applied as shearing forces to the shanks of the rivets.

4,721,427

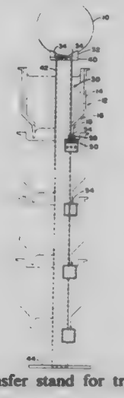
WAFER TRANSFER STAND

John D. Sanders, Orange, and Jerry A. Taylor, Corona, both of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

Filed May 12, 1987, Ser. No. 48,868

Int. Cl.⁴ B65G *65/30*

U.S. Cl. 414—417 **3 Claims**



1. A wafer transfer stand for transferring closely spaced

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semiconductor wafers from a bottomless cassette having a side member, comprising:

an upwardly facing comb for receiving the wafers from the cassette;

a post extending downwardly from the comb;

a cassette support, means mounted to the post below the said comb for supportably engaging the side member of the cassette whereby the cassette may be lowered over the comb to transfer the wafers from the cassette and the empty cassette may be stored on the support means below said comb.

4,721,428

TENNIS BALL RETRIEVER

David C. Rohrer, Gaston, and Daniel F. Rohrer, Redmond, both of Oreg., assignors to Double D Corporation, Forest Grove, Oreg.

Filed Sep. 10, 1986, Ser. No. 905,857
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—439 4 Claims



1. A tennis ball retrieving apparatus comprising:

a wheeled vehicle to ride upon a tennis court playing surface or like surface,

gathering means for gathering balls on said surface as the vehicle travels therealong, and for directing the balls to a loading zone,

a pair of feed wheels on said vehicle having opposed portions to grip each ball at the loading zone and feed each ball toward a conveying zone, said feed wheels being driven by traction contact with the playing surface,

a storage means providing a storage zone for the balls located at a level above the loading zone, and

conveying means at the conveying zone to direct balls upwardly to the storage zone, said conveying means comprising a chute extending from the loading zone to the storage zone and operable to direct balls from the former to the latter,

said feed wheels being operable to cause upward movement of the balls in said chute by feeding successive balls into said chute to urge previously fed balls along said chute in successive fashion.

4,721,429

TRAVERSING APPARATUS FOR LONG AND HEAVY ARTICLE

Yoshitada Fujita, Kobe, and Sadashi Hanada, Miki, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 11, 1985, Ser. No. 807,692
Claims priority, application Japan, Dec. 24, 1984, 59-272557
Int. Cl.[4] B60P *3/40*
U.S. Cl. 414—458 8 Claims

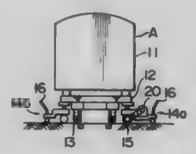
1. A traversing apparatus for a long and heavy article, said apparatus having four independent trucks, each truck being initially independently movable relative to the article and comprising:

a truck frame;

support wheels mounted under said truck frame to support the truck for movement on the ground surface;

a lifting means mounted on said truck frame for lifting and lowering an article to and from a predetermined level at which the article is to be carried by the trucks, including a vertically movable jack and an article supporting member connected to an upper end of said jack, said article supporting member being provided at an upper surface thereof with a protruding means which is adapted to connect with means including a corresponding recess formed in an underside of the article to fix said article supporting member against lateral movement relative to the underside of the article when said article supporting member is raised and is connected with the underside of the article;

a guide wheel mounted under said truck frame to steer and set the truck into a predetermined position under the connecting means on the underside of the article with said support wheels of each truck aligned in a precise common orientation with support wheels of the other trucks set



under the article, allowing the article to be moved when carried by the four trucks in the direction determined by the common orientation of the support wheels, said guide wheel being movable to a level above the ground surface after the truck is set under said article;

the four independent trucks including two self-propelled driving trucks, each driving truck having a driving unit mounted on the truck frame and connected to operate one of said support wheels as a driving wheel to propel the truck and the article carried thereby on the ground surface in said direction;

whereby the article may be traversed by steering each truck manually into a predetermined position under the connecting means in the underside of the article with said support wheel of each truck aligned in a precise common orientation with support wheels of the other trucks set under the article, raising the article to a predetermined level by operating the lifting means on all four trucks and raising the guide wheels on all four trucks, and traversing the article by means of the driving units to propel the trucks and the article carried thereby on the ground surface in a direction determined by the orientation of the support wheels.

4,721,430

RAILROAD TRACK VEHICLE

Mark E. Littke, Kamloops, and Jack Buss, Delta, both of Canada, assignors to Brentwood Enterprises Ltd., Burnaby, Canada

Continuation of Ser. No. 548,664, Nov. 4, 1983, abandoned. This application Mar. 23, 1987, Ser. No. 30,289
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—537 6 Claims

1. A vehicle for transporting heavy equipment by rail, said equipment having a hydraulic system, the vehicle comprising:

(a) a frame having a longitudinal axis and a surface capable of supporting heavy equipment;

(b) a first axle and wheel assembly having a first pair of wheels rigidly connected to a first axle for rotation therewith, each wheel of the first pair of wheels being electrically insulated from the first axle by an electrically insulated plate located between an annular wheel plate integral with each wheel of the first pair of wheels and an intermediate plate coupled to the first axle;

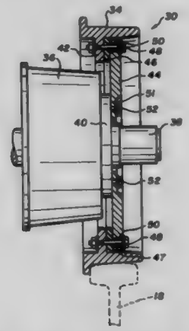
(c) means for rotatably coupling the first axle and wheel assembly to the frame such that the first axle and wheel assembly is rotatable relative to the frame about a horizontal axis parallel to the longitudinal axis of the frame;

(d) means for cushioning rotation of the first axle and wheel assembly relative to the frame about the horizontal axis;

(e) a second axle and wheel assembly connected to the frame and having:

(i) an axle;

(ii) a second pair of wheels rigidly connected to the second axle for rotation therewith, each wheel of the second pair of wheels being electrically insulated from the second axle by an electrically insulated plate located



between an annular wheel plate integral with each wheel of the second pair of wheels and an intermediate plate coupled to the second axle;

(iii) a casing enclosing the axle and extending towards the wheels, the second axle being rotatable in the casing; and

(iv) a pair of brakes having drums mounted on the second axle between the casing and each of the wheels of the second pair of wheels;

(f) a drive train for the vehicle including a hydraulic motor operatively connected to the second axle for driving the second axle and wheel assembly;

(g) ramp means on at least one side of the vehicle, which can be reversibly lowered to an inclined position, for providing a ramp upon which the heavy equipment can be loaded on, or unloaded from the vehicle; and

(h) means for stabilizing the vehicle when said heavy equipment is operating on the surface of the frame.

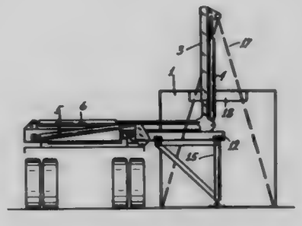
4,721,431

SELF LOADING SYSTEM

Bernd Ostermeyer, Stuart Hwy., Berrimah, Northern Territory, Australia 5788

PCT No. PCT/AU85/00017, § 371 Date Oct. 30, 1985, § 102(e) Date Oct. 30, 1985, PCT Pub. No. WO85/03481, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 5, 1985, Ser. No. 787,799
Claims priority, application Australia, Feb. 6, 1984, PG3484
Int. Cl.[4] B60P *1/54*
U.S. Cl. 414—542 3 Claims

1. A self-contained loading apparatus for a transport vehicle, the apparatus comprising lifting means mounted on the transport vehicle at each end of a container or goods to be loaded, each lifting means comprising a lifting post adapted to move transverse of the vehicle on a guide track, a guide track extension to extend the guide track from the side of the vehicle, a stabilizing leg pivoted to said guide track extension to engage the ground, means to move the lifting post to a central position of the container or goods to be lifted, means attaching the lifting post to the goods or container onto the guide track extension, at which point the goods or container can be lowered to the ground, each lifting post being mounted on a slide to slide in the guide track, the slide having mounted thereon



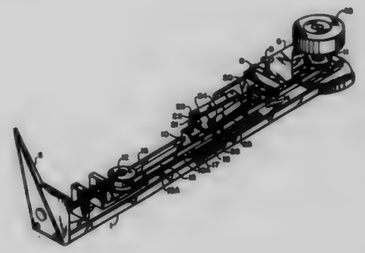
one end of a hydraulic ram having its outer end connected to a bracket connected to the guide track extension and pivoted to the adjacent end of the guide track whereby actuation of the first hydraulic ram moves the track extension from an upright transport position to an extended position extending away from the transport vehicle, and locking means being provided to lock the track extension in this extended position.

4,721,432

APPARATUS FOR PRODUCING RECIPROCATING MOTION FOR PAINTING, SANDING OR COATING

Fitzroy P. Cargill, 942 Tilden St., Bronx, N.Y. 10469

Filed Sep. 10, 1986, Ser. No. 905,519
Int. Cl.[4] B24B *23/04*; F16H *19/06*
U.S. Cl. 414—749 1 Claim



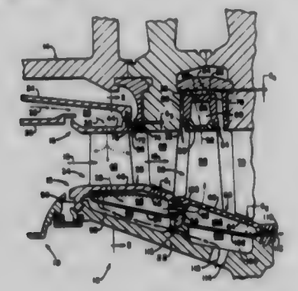
1. An apparatus for producing reciprocating motion adaptable for the transportation of a variety of functional means and a transport mechanism comprising: a pair of spaced apart pulleys, a continuous drive belt of resilient material entrained about the pulleys, switch actuated motor means for driving the pulleys and the belt in both directions, at least one belt cam permanently attached to the belt gripped by an article carrier against the belt by means of a first cam holder and spring mechanism which causes the belt cam to move the article carrier in one direction until the article carrier contacts a distance terminator at a desired distance, at which point the article carrier stops with the belt and pulley still in motion causing the spring mechanism holding the first cam holder against the belt to release its grip on the belt cam to allow the belt cam to continue around the pulley to be gripped by a second cam holder, transporting the article carrier in an opposite direction.

4,721,433

COOLABLE STATOR STRUCTURE FOR A GAS TURBINE ENGINE

John J. Piendel, Manchester, and Albert H. McKibbin, Colchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1985, Ser. No. 810,497
Int. Cl.[4] F01D 25/12
U.S. Cl. 415—115 9 Claims



1. In an axial flow rotary machine of the type having an annular flow path for working medium gases which extends axially through the engine about a longitudinal axis, having a first region in flow communication with a source of cooling fluid, a second region in flow communication with the working medium flow path, and having a stator assembly bounding said flow path which includes a casing extending circumferentially about the flow path and an array of coolable stator vanes integrally attached to the casing at a first location, each stator vane extending inwardly from the casing across the working medium flow path, the improvement which comprises:

seal means spaced radially from the array of vanes and from the casing leaving an outer chamber between the seal means and the casing and a plurality of inner chambers, one at each vane, between the seal means and the array of stator vanes;

conduit means in flow communication with said inner chambers and said second region;

wherein the first region is radially inwardly of the annular flow path, wherein the second region is not adjacent to the casing and wherein a flow path for cooling fluid extends in a radially outward direction from the first region through the array of coolable stator vanes, into said inner chambers, through the conduit means to the second region and thence into the annular flow path and wherein the outer chamber spaces the flow path for cooling air from the casing at the first location to block the transfer of heat by convection from the vane cooling air to the casing.

4,721,434

DAMPING MEANS FOR A STATOR

Larry A. Marshall, Tequesta, and David A. Lewis, Stuart, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 3, 1986, Ser. No. 937,590
Int. Cl.[4] F01D 5/10
U.S. Cl. 415—119 10 Claims

1. A cast stator having a continuous shroud on one end and a non-continuous shroud on the other end concentrically disposed relative to the continuous shroud, circumferentially spaced vanes mounted between said continuous shroud and non-continuous shroud, a spring-like damper member contiguous to said non-continuous shroud prestressing said non-continuous shroud to load each of said vanes to limit movement thereof, and said spring-like damper member being in frictional engagement with and continuous around the periphery of said non-continuous shroud to dissipate the energy occasioned



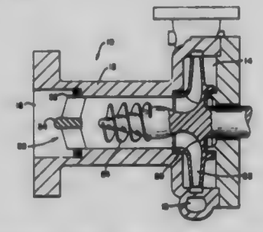
when said vane moves relative to said spring-like damper member.

4,721,435

FLUID FLOW CONTROL MEANS FOR PUMPS AND THE LIKE

Leong P. Kuah, Pomona, Calif., assignor to Borg-Warner Industrial Products, Long Beach, Calif.

Filed Apr. 30, 1986, Ser. No. 857,666
Int. Cl.[4] F04D 13/12
U.S. Cl. 415—143 12 Claims



1. In combination with a fluid machine adapted to move fluids, said machine including a housing having a pumping chamber, conduit means leading from the housing exterior to said pump chamber, rotodynamic means arranged for rotation in said pumping chamber for creating a fluid flow in a first direction in said conduit means and which, when operated at flow rates much less than optimum efficiency point, causes a swirling fluid backflow in a second direction which forms a fluid boundary layer about fluid flowing toward said chamber, operative means for retarding the cavitational surge effects said backflowing fluid has on said machine operation, said operative means comprising:

a fixedly positioned annulus assembly including a series of radially curved and axially straight blades disposed within said conduit means transversely of the centerline thereof for forcing the swirling and recirculating fluid flow toward the center of said conduit means whereby retarding the cavitational surge effects created thereby and without interfering with the fluid flowing in the first direction, said annulus assembly being independent of and spaced from said rotodynamic means.

4,721,436

PROCESS AND INSTALLATION FOR CIRCULATING FLUIDS BY PUMPING

Claude Lepert, Annecy le Vieux, France, assignor to Etablissements Pompes Guinard, Courbevoie, France

Filed May 7, 1987, Ser. No. 47,628
Claims priority, application France, May 21, 1986, 86 07204
Int. Cl.[4] F04D 13/04
U.S. Cl. 417—53 5 Claims

1. A process for pumping fluid of high viscosity which comprises:

passing liquid of lower viscosity than the fluid and miscible therewith, under pressure, to the intake of a turbine of a turbo-machine comprising a pump having an intake and an outlet and the turbine which has an intake and an outlet separate from those of the pump and which is fixed on a same shaft as the pump to obtain an expanded liquid at the outlet of the turbine,



mixing with the fluid a part of the expanded liquid which issues from the outlet of the turbine, to obtain a mixture, and

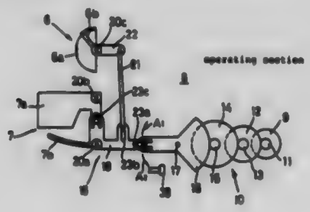
drawing in the mixture of the expanded liquid and the fluid by way of the intake of the pump.

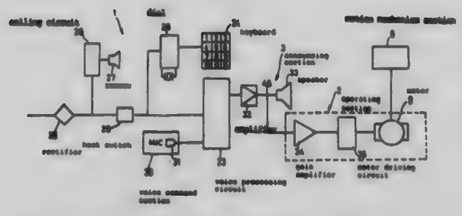
4,721,437

ANIMATED ANNUNCIATOR APPARATUS

Isao Mitamura, and Hitoshi Otaka, both of Tokyo, Japan, assignors to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,885
Claims priority, application Japan, Jan. 22, 1986, 61-11722
Int. Cl.[4] H04M 1/02
U.S. Cl. 379-388 4 Claims





4. An animated annunciator apparatus comprising:

telephonic means for transmitting and receiving telephone signals including a speech signal;

announcing means for receiving said speech signal and for generating a voice control signal varying in accordance with said speech signal; and

animation means, having movable elements, for receiving said voice control signal and for moving said movable elements in synchronism with said voice control signal and in synchronism with reception of said speech signal by said telephonic means, and including:

motor means for providing in response to said voice control signal, a first rotative force in a first direction and a second rotative force in a second direction;

a gear train mechanism operatively connected to said motor means and being rotated by said first rotative force and by said second rotative force; and

linkage elements connected to said gear train mechanism so that said movable elements selectively move in the first direction and in the second direction in response to said motion control signal and so that said movable elements move in synchronism with and track said speech signal.

4,721,438

MOTOR-DRIVEN FLUID PUMP

Tsutomu Ichinomiya, and Koichi Ishino, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 14, 1987, Ser. No. 38,165
Claims priority, application Japan, Apr. 24, 1986, 61-095164
Int. Cl.[4] F04B 39/08; A61B 5/02
U.S. Cl. 417—316 18 Claims



1. In a fluid pump for delivering fluid into a vessel to be pressurized thereby comprising:

a housing with an intake port and a discharge port;

a pump chamber formed in the housing in fluid communication with the intake port and the discharge port;

a pumping member defining a boundary of the pump chamber and movable in a reciprocatory manner between a first position of expanding the pump chamber and a second position of contracting the pump chamber;

a reversible electric rotary motor having an output shaft;

driving linkage means operatively connecting the output shaft of the motor and the pumping means so as to translate the rotary motion of the output shaft into a reciprocating motion of the pumping member between said first and second position for alternately drawing fluid into the pump chamber through said intake port and discharging the fluid through the discharge port, said drive linkage means allowing the reverse translation of the reciprocating motion of the pumping member to the rotary motion of the output shaft when the motor stops rotating;

a release port in a fluid path downstream of said discharge port for rapidly releasing pressurized fluid, said release port being provided with a release valve movable between a closed position and an open position; and

release valve actuation means operatively connected to the output shaft of the motor to be driven thereby for actuating said release valve into the closed position upon the output shaft being rotated in the forward direction and actuating said release valve into the open position upon the output shaft being rotated in the reverse direction; the improvement comprising:

said valve actuation means including delay means which provides a delayed response action in opening the release valve upon the reversal of the rotating direction of said output shaft from the forward direction to the reverse direction, said delayed response being such that the initia-

VOL 1086 ISS 4 JA 26 1988 UMI

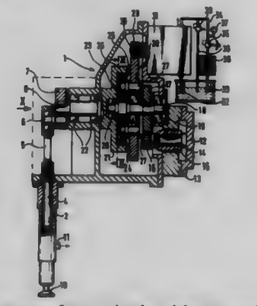
tion of opening the release valve is inhibited until the output shaft rotates in the reverse direction through an angle of more than 180 degrees from the reversing point, whereby inhibiting an unintentional opening of the release valve due to said reverse translation of the reciprocating motion of the pumping member to the rotary motion of the output shaft.

4,721,439

PISTON PUMP AND DRIVE THEREFOR

Guenter Leinweber, Lahnau, Fed. Rep. of Germany, assignor to Wiwa Wilhelm Wagner GmbH & Co. KG, Lahnau, Fed. Rep. of Germany

Filed May 15, 1986, Ser. No. 863,579
Int. Cl.[4] F04B *9/02;* **F16H** *47/04*
U.S. Cl. 417—319 **3 Claims**



1. A piston pump for use in the airless spraying of liquids, said piston pump having a reciprocal piston therein, and a drive means for effecting a reciprocating of said piston, comprising:

a first rotatable shaft and first connecting means for facilitating connection of said first shaft to a drive motor,

differential gear means having a first rotatable input shaft and first and second output shafts, said differential gear means including means for effecting, when a load is applied to said second output shaft, (1) a rotating of said second output shaft in response to a stoppage of rotation of said first output shaft and (2) an acceleration and deceleration in the speed of rotation of said first output shaft as the load applied thereto is decreased and increased, respectively;

second connecting means for connecting said first rotatable shaft to said first rotatable inupt shaft;

an eccentric disk connected to said first output shaft, a connecting rod interconnecting said eccentric disk to said reciprocal piston for reciprocating said piston and causing an outflow of fluid from said piston pump;

a hydraulic circuit comprising a series connected hydraulic pump and an adjustable throttle valve; and

third connecting means for connecting said second output shaft to said hydraulic pump for placing a rotation resisting load on said second output shaft so that as said reciprocal piston approaches its two dead center positions, the work performed by said piston will be reduced and a force exerted by said connecting rod on said eccentric disk and said first output shaft will be reduced to thereby cause said first output shaft to rotate faster to move said piston quickly through said dead center positions and the non-uniformity of said outflow of fluid from said piston pump to be reduced.

4,721,440

LINEAR GAS COMPRESSOR

Ralph Hurst, Clifton Park, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Feb. 13, 1987, Ser. No. 14,298
Int. Cl.[4] F04B *17/04, 39/06*
U.S. Cl. 417—371 **9 Claims**

1. A linear air compressor, comprising:

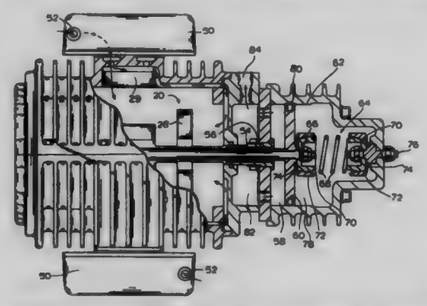
a motor housing having an internal area defining a closed volume;

a motor positioned within said motor housing;

intake means for allowing the ingress of air into the motor housing;

guide means comprising at least two guide shafts maintained at a spaced distance with respect to each other and supported in said housing;

said guide shafts having an inlet port communicating with the interior area of the motor housing and an outlet port providing an outlet for air from the interior area, wherein in operation of the compressor air passing between the



intake means and outlet port passes through the interior area of the motor housing and through the guide shafts so as to cool said guide shafts;

plunger means supported by said guide means for reciprocal movement thereon within said housing and stator members supported in the housing and positioned above and below said plunger means; and

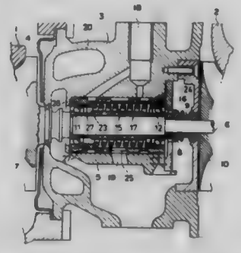
wherein during the operation of said compressor said plunger means reciprocates on said guide means.

4,721,441

BEARING DEVICE FOR TURBOCHARGER

Kazuya Miyashita, Chiba, and Nobuyuki Ikeya, Tokyo, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 771,047, Aug. 30, 1985, abandoned. This application Jul. 9, 1987, Ser. No. 70,617
Claims priority, application Japan, Sep. 3, 1984, 59-132772[U]; Feb. 12, 1985, 60-17126[U]; Feb. 12, 1985, 60-17127[U]
Int. Cl.[4] F04B *17/00;* **F16C** *27/00*
U.S. Cl. 417—407 **12 Claims**



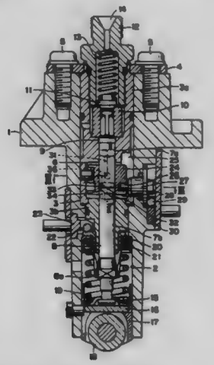
1. A turbocharger comprising: a turbine casing, a compressor casing, a bearing casing interposed between said turbine and compressor casings, a turbine ball bearing unit adjacent to said turbine casing, and a compressor ball bearing unit adjacent to said compressor casing, a turbine shaft supported by said bearing units, a one-piece monolithic oil film damper mounted in said bearing casing to be interposed between said bearing casing and said ball bearing units, said oil film damper being spaced from said bearing casing to define a gap with said bearing casing for essentially the entire length of said oil film damper and engaging both of said ball bearing units, means for injecting oil into said gap for floatingly mounting said oil film damper in said bearing casing, and a pin loosely connecting said oil film damper to said bearing casing to prevent rotation of said oil film damper relative to said bearing casing, said pin being received in a slot defined in said oil film damper and in a slot defined in said bearing casing to allow said oil film damper to float with respect to said bearing casing.

4,721,442

FUEL INJECTION PUMP

Noritoshi Tanaka, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,960
Claims priority, application Japan, Apr. 17, 1985, 60-57321
Int. Cl.[4] F04B *7/04, 39/10;* **F02M** *59/20*
U.S. Cl. 417—499 **3 Claims**



1. A fuel injection pump comprising:

a plunger for injecting fuel; and

a control sleeve extending around said plunger along the outer surface thereof and slidable relative to the outer surface for controlling the injection of fuel by said plunger, said control sleeve having a cut-off port open at the inner surface thereof,

said plunger having a longitudinal hole extending axially therein and open at an upper end thereof, a first lateral hole extending therein from said longitudinal hole to an end that is open to the outer surface of the plunger, a second lateral hole extending therein from said longitudinal hole to an end that is open to the outer surface of the plunger, and an inclined groove extending along the outer surface of the plunger between and open to the respective ends of said lateral holes that are open to the outer surface of the plunger, said inclined groove extending in a direction that is inclined relative to the direction in which said longitudinal hole extends, said inclined groove for communicating with said cut-off port when the plunger is slid over a distance relative to the control sleeve, the distance over which the plunger must be slid to communicate the inclined groove with the cut-off port being adjustable by rotation of the plunger within the control sleeve.

4,721,443

DISCHARGE VALVE RETAINER FOR A COMPRESSOR

Charles C. Allen, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 16, 1987, Ser. No. 25,960
Int. Cl.[4] F04B *39/10, 21/02*
U.S. Cl. 417—539 **9 Claims**

1. A fluid compressor comprising:

a cylinder block defining at least two cylinders with pistons operable therein for compressing a fluid;

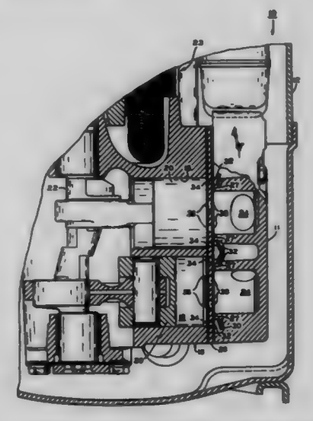
a valve plate on said cylinder block including at least one suction port and at least one discharge port for each of said cylinders;

annular discharge valve means mounted on said valve plate cooperating with each of said cylinders and operable for sealing the discharge ports associated therewith;

suction valve means for each of said cylinders operable for sealing said suction ports associated therewith; and

a valve retainer for limiting discharge valve travel, said retainer mounted on said valve plate, and comprising a first annular portion and a second annular portion adjacent said first portion positioned to retain said discharge valve means between said retainer and said valve plate;

first and second means for securing said first annular portion to said valve plate at substantially diametrically opposed locations on said first annular portion; said first annular portion curving upwardly from said valve plate on both sides of said diametrically opposed locations and terminating in upper ends;



first and second means for securing said second annular portion to said valve plate at substantially diametrically opposed locations on said second annular portion, said first annular portion curving upwardly from said valve plate on both sides of its said diametrically opposed locations and terminating in upper ends;

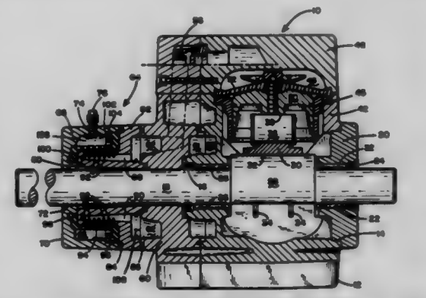
whereby the joined annular portions are in tension in a center region of said retainer to thereby provide increased rigidity.

4,721,444

FLUID PUMP INCORPORATING PULSATION DAMPENER SURROUNDING ITS SHAFT

Ramon Pareja, Edina, Minn., assignor to Hypro Corp., St. Paul, Minn.

Filed Dec. 8, 1986, Ser. No. 938,969
Int. Cl.[4] F04B *11/00*
U.S. Cl. 417—540 **2 Claims**



1. In a fluid handling system of the type including a pump including a pump housing and having a motor-drivable shaft journaled for rotation in said housing, said pump receiving a working fluid at a first pressure and delivering said working

fluid at an outlet at a second substantially higher pressure, the improvement comprising:

a pulsation dampener including a rigid, cup-shaped cover member attached to said housing and defining a hollow cavity and having a pump shaft receiving bore extending through an end wall thereof, a portion of said cavity being in fluid communication with said outlet;

a rigid baffle member located in said cover member concentric with said motor drivable shaft and having perforations over a portion of its surface;

a tubular diaphragm concentrically surrounding said baffle member to effectively divide said hollow cavity into two compartments, one of said compartments being exposed to said portion of said cavity through said perforations; and

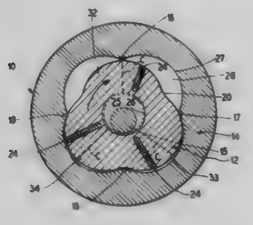
means for pressurizing the other of said two compartments to a predetermined positive pressure.

4,721,445

OUTER ENVELOPE TROCHOIDAL ROTARY DEVICE HAVING A ROTOR ASSEMBLY HAVING PERIPHERAL RELIEFS

Ralph Hoffmann, Eden Prairie, Minn., assignor to Compression Technologies, Inc., Eden Prairie, Minn.

Filed Dec. 31, 1986, Ser. No. 948,126
Int. Cl.⁴ F01C *1/02, 21/08*
U.S. Cl. 418—61 B **15 Claims**



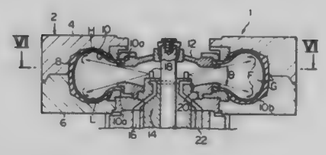
1. A rotor assembly for use in an outer envelope trochoidal rotary device, the rotor assembly rotating within a cavity defined by a housing, and having an outer peripheral surface defining a trochoidal curve, including at least one tapped hole located in a peripheral surface of a lobe of the rotor assembly, and a balancing member located within the tapped hole for balancing the rotor assembly, the tapped hole being located at a point forward of a centerline of the lobe in the direction of the rotor assembly rotation.

4,721,446

TIRE VULCANIZER

Seiso Ichikawa, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,423
Claims priority, application Japan, Apr. 7, 1986, 51-52311[U]
Int. Cl.⁴ B29C *35/04*
U.S. Cl. 425—44 **6 Claims**



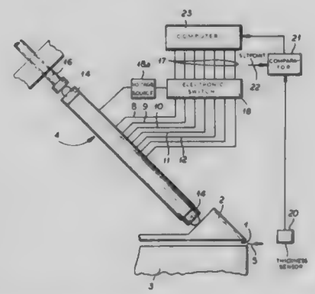
1. A tire vulcanizer comprising
a metal mold assembly
a bladder within said metal mold assembly,
a gas supply assembly arranged at a central portion of said metal mold assembly and adapted to supply pressure and heating gas to said bladder,
and diffusion means provided in said gas supply assembly,
said diffusion means being a plurality of diffusion nozzles each formed with a V-shaped notch extending in an upward and downward direction with respect to an axially extending axis of said diffusion nozzle so that said pressure and heating gas is diffused at an angle of between 30 and 45 degrees in said upward and downward direction.

4,721,447

SHAPING TOOL FOR AN EXTRUDER OR CALIBRATOR FOR THERMOPLASTIC MATERIAL

Bernhard Erckmann, Wuppertal, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,742
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530383
Int. Cl.⁴ B29C *47/92*
U.S. Cl. 425—141 **9 Claims**



1. In a shaping device, particularly for an extruder tool or calibrator unit, for an extruder for thermoplastic material comprising at least one outlet-defining adjustable lip and an opposing lip, at least one positioning member acting on said adjustable lip and a control and regulating mechanism for the thickness of the extruded product from said extruder, said positioning member being a part of said control and regulating mechanism and being a piezoelectric translator connected to a voltage source, the improvement wherein said positioning member comprises a plurality of piezoelectric disks positioned opposing each other which are combined in a plurality of groups according to operation and according to electrical circuitry considerations and said groups of said piezoelectric disks individually and in totality being connectable to said voltage source, said positioning member having m of said piezoelectric disks where

$$m = e(2^x)_n$$

$$x = 1,2,3 \ldots$$

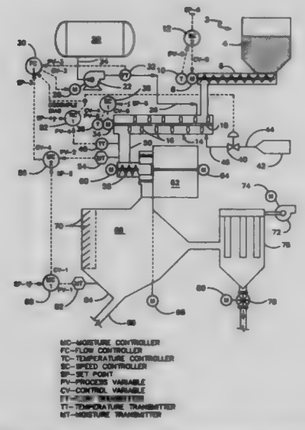
and wherein n represents the group and is equal to one or an integer greater than one and $(2^x)_n$ is the number of said piezoelectric disks in each of said groups.

4,721,448

PELLETIZER WITH MOISTURE CONTROL SYSTEM

Mark R. Irish, Westminster, and Martin B. Hull, Lakewood, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Dec. 19, 1985, Ser. No. 811,006
Int. Cl.⁴ A23N *17/00;* **B01F** *15/04*
U.S. Cl. 425—144 **5 Claims**



1. A moisture control system for use in a pelletizing process comprising:

holding means for holding a continuous supply of dry ingredients;

means for transferring at variable rates portions of said dry ingredients to a mixer-conditioner;

means for supplying a fluid at variable rates to said mixer-conditioner;

means for supplying steam at variable rates to said mixer-conditioner;

means in said mixer-conditioner for mixing said dry ingredients, said fluid and said steam to form a granular material;

means for feeding said granular material to a mill;

means for measuring the moisture content of said granular material as it passes from said mixer conditioner to said means for feeding said granular material to said mill;

means for generating a signal representative of said moisture content of said granular material;

means for transmitting said signal of said moisture content of said granular material to a granular moisture controller;

means in said granular moisture controller for comparing said signal of said moisture content of said granular material to a set point indicating a desired moisture content for said granular material and for performing a calculation thereon to produce a calculated set point signal;

means for transmitting said calculated set point signal to a fluid flow controller;

means in said fluid flow controller responsive to said calculated set point signal from said granular moisture controller to vary the rate of supply of said fluid so as to vary the amount of said fluid being supplied to said mixer-conditioner;

means for sensing the temperature of said granular material as it passes from said mixer-conditioner to said means for feeding said granular material to said mill;

means for generating a signal reresentative of said temperature;

means for transmitting said signal to a temperature controller;

means in said temperature controller for comparing said signal to a set point indicating a desired temperature for said granular material and for performing a calculation thereon to produce a control variable signal; and

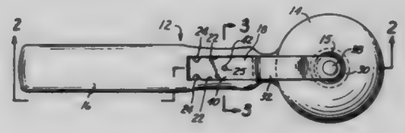
means in said temperature controller responsive to said control variable signal to vary the rate at which said steam is being supplied so as to vary the amount of said steam being supplied to said mixer-conditioner.

4,721,449

ICE CREAM SCOOP

Scott Alberts, 3074 N. Lima St., Burbank, Calif. 91504

Filed Feb. 25, 1987, Ser. No. 18,423
Int. Cl.⁴ B29C *33/44*
U.S. Cl. 425—187 **7 Claims**



1. An ice cream scoop comprising:

(a) a generally hemispherically shaped hollow scoop having a centrally disposed aperture;

(b) a handle connected to said scoop, said handle having:

(i) an elongated channel formed therein, said channel including a base wall; and

(ii) locking means extending over said elongated channel in a spaced apart relationship with said base wall of said channel for forming an enclosure having a top wall and a bottom wall;

(c) ejection means removably connected to said handle for ejecting ice cream contained within said scoop, said ejection means comprising:

(i) a piston having a generally cylindrically shaped body telescopically receivable within said aperture formed in said hollow scoop and a circumferentially extending flange portion connected to said cylindrically shaped body; and

(ii) a connector element having a first end removably connected to said piston, a second end portion receivable within said enclosure of said handle defined by said base wall and said locking means, and means for biasing said flange portion of said piston into engagement with said scoop when said second end portion of said connector element is received within said closure of said handle.

4,721,450

DEVICE FOR PRODUCING CERAMIC MOULDINGS WITH SPRING MOUNTED INJECTION HEAD

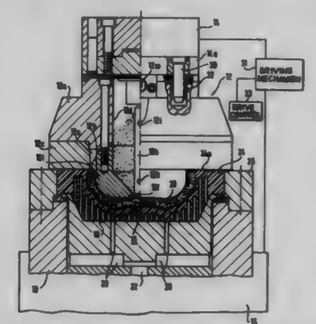
Eugen Bühler, Bartenbach; Klaus Strobel, and Karl Schwarzmeir, both of Selb, all of Fed. Rep. of Germany, assignors to Eugen Buhler & Hutschenreuther AG

Filed May 7, 1986, Ser. No. 860,519
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517447
Int. Cl.⁴ B30B *9/28*
U.S. Cl. 425—405 H **12 Claims**

1. A device for producing ceramic moldings comprising a first mold carrier carrying a first mold unit, a second mold carrier carrying a second mold unit, mold carrier moving means operatively connected with said first mold carrier and with said second mold carrier a spring suspension system being provided between one of said first and second mold carriers and the respective mold unit, said first and said second mold carriers being movable by said mold carrier moving means through a path of relative movement between a first relative position and a second relative position, said first mold unit and said second mold unit defining in said second relative position

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of said mold carriers a closed mold cavity, said mold cavity being open in said first relative position, said first and said second mold units being provided with respective sealing faces sealingly engaging each other in said second relative position of said mold carriers such as to seal said mold cavity against atmosphere, said spring suspension system being stressed at a maximum in said second relative position of said mold carriers and being at least partially relaxed in said first relative positive of said mold carriers, said spring suspension system maintaining engagement of said sealing faces for a predetermined por-

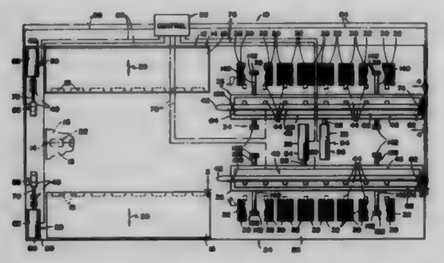


tion of said path of relative movement of said mold carriers when said mold carriers relatively move from said second relative position to said first relative position, the pressure of engagement of said sealing faces decreasing during said predetermined portion of said path of movement, said mold cavity being provided with at least one evacuation orifice for evacuating said mold cavity in said second relative position, said mold cavity being further provided with at least one inlet opening for admitting particulate ceramic material into said closed mold cavity under the suction action of said vacuum within said closed mold cavity.

4,721,451
IN-MOLD LABEL DISPENSER FOR PLASTIC BLOW MOLDING

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Mar. 31, 1987, Ser. No. 33,069
Int. Cl.[4] B29C *49/04, 49/24*
U.S. Cl. 425—503 **16 Claims**

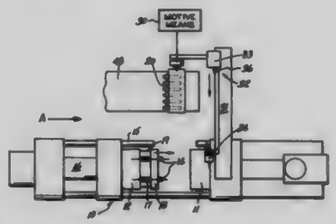


1. An in-mold label dispenser for a plastic blow molding machine including a mold having a pair of mold sections each of which includes a cavity section, and said mold sections being movable toward and away from each other between an open position spaced from each other and a closed position where the cavity sections thereof cooperate to define an enclosed cavity in which blow molding is performed, the in-mold label dispenser comprising: a base having first and second portions located on opposite sides of the mold; a label magazine mounted on the first base portion on one side of the mold; a rectilinear slideway assembly mounted on the first base portion; a support mounted by the rectilinear slideway assembly on the first base portion for rectilinear movement; a first actuator that moves the support rectilinearly on the slideway assembly between an aligned position with respect to the open mold and a label transfer position; a shuttle mounted on the support for rectilinear movement therewith and for rectilinear movement with respect thereto toward and away from the mold; the shuttle including a first locator; at least one label carrier mounted on the shuttle in a fixed relationship with respect thereto and being operable to carry a label for transfer from the label magazine to the mold; an operator mounted for movement on the support and being connected to the shuttle to move the shuttle between withdrawn and inserted positions with respect to the mold; said shuttle being located adjacent the label magazine in the withdrawn position to permit the label carrier thereon to receive a label therefrom; the operator then moving the shuttle to the inserted position with the support positioned by the first actuator in the aligned position to position the label carrier and the label carried thereby between the mold sections of the open mold; a second locator mounted on the second base portion for rectilinear movement parallel to the rectilinear movement of the support on the first base portion; a second actuator that moves the second locator rectilinearly between an aligned position with respect to the open mold and a transfer position; the first and second locators being engaged as the shuttle is moved to the inserted position with the first and second actuators providing the positioning in the aligned positions; the first and second actuators moving the support and the engaged locators rectilinearly to the transfer position where the label on the label carrier is transferred to one of the mold cavity sections; and a control for operating the first and second actuators and the operator in coordination with each other to provide the transfer of labels from the magazine to the mold.

4,721,452
APPARATUS FOR PRODUCING HOLLOW PLASTIC ARTICLES

Frank W. Delfer, III, Caledon East, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Mar. 23, 1987, Ser. No. 29,166
Int. Cl.[4] B29C *45/42, 45/72*
U.S. Cl. 425—547 **6 Claims**

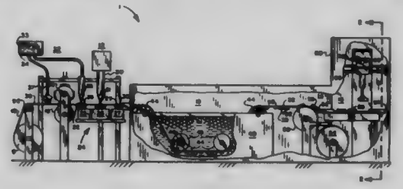


1. An apparatus for producing hollow plastic articles which comprise:
an injection molding machine including a first mold portion having at least one cavity therein and a second mold portion having at least one elongate core seating in said cavity in mold-closed position to form a first number of hot hollow plastic articles in an injection molding cycle, and means for reciprocating said mold portions form said mold-closed position to a mold-open position forming a gap between said mold portions;
a carrier plate having at least two sets of cavities therein for cooling said hollow plastic articles, with the number of cavities corresponding to a multiple of at least two times the number of hollow plastic articles produced in an injection molding cycle;
means for moving the carrier plate into and out of said gap;
means for aligning one set at a time of said carrier plate cavities to juxtapose said aligned set of cavities with said hollow plastic articles formed in an injection molding cycle; and
means for transferring said hollow plastic articles to said juxtaposed cavities.

4,721,453
APPARATUS FOR ENCAPSULATING SEMICONDUCTORS

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Mar. 5, 1986, Ser. No. 836,654
Int. Cl.[4] B29C *39/02, 39/26, 39/38*
U.S. Cl. 425—94 **18 Claims**

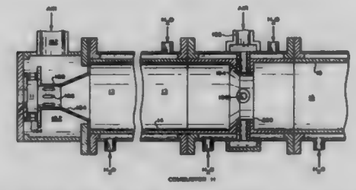


1. An apparatus for encapsulating a semi-conductor, comprising: premolded encapsulant positioning means for placing an premolded encapsulant in contact with a semiconductor and means for receiving the encapsulant and semiconductor to liquify and cure the encapsulant, encapsulating the semiconductor, means for moving a semiconductor to the encapsulant positioning means and to said means for curing, means for forming the premolded encapsulant and storage means for the encapsulant, said positioning means being located to withdraw the premolded encapsulant from said storage when placing the encapsulant on the semiconductor.

4,721,454
METHOD AND APPARATUS FOR BURNING NITROGEN-CONTAINING FUELS

Robert M. Schirmer; Henry E. Alquist, and Ellsworth H. Fronm, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 932,820, Aug. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,361, May 27, 1977, abandoned. This application Jun. 10, 1981, Ser. No. 272,442
Int. Cl.[4] F23M *3/04*
U.S. Cl. 431—10 **1 Claim**

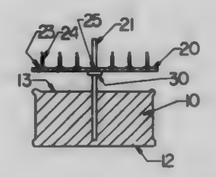


1. A method for fuel rich combustion of a fuel and production of a plurality of fuel lean flame fronts, comprising:
introducing and intimately mixing said fuel and at least one stream of a first volume or air, adjacent the upstream end of each of a plurality of combustion zones and in proportions sufficient to produce a plurality of fuel-rich mixtures, of said fuel and said first volume of air, each of said plurality and fuel-rich mixtures having a fuel/air ratio above the stochiometric ratio;
passing each of said plurality of fuel-rich mixtures through a combustion zone while burning the same under fuel-rich conditions, without further addition of air and produce a plurality of moving fuel-rich flame fronts containing unburned and partially burned fuel;
abruptly terminating the fuel-rich combustion in each of said plurality of combustion zones by, at least in part, introducing and intimately mixing at least one stream of a second volume of air into each of said plurality of fuel-rich flame fronts, said second volume of air being in an amount sufficient to produce a plurality of moving fuel-lean flame fronts, each of said plurality of fuel-lean flame fronts having an overall fuel/air ratio below the stochiometric ratio;
supplying said first volume of air and said second volume of air for all of said plurality of combustion zones by a common air plenum surrounding said plurality of combustion zones; and
discharging each of said plurality of moving fuel-lean flame fronts into the heated section of a combustion system, wherein said heated section of said combustion system is substantially larger than the plurality of combustion zones and accordingly each of said plurality of fuel-lean flame fronts is abruptly expanded when discharged into said heated section of said combustion system.

4,721,455
BIRTHDAY CAKE COVER AND CANDLE HOLDER

Irving Barfus, 824 Hoover St., Los Angeles, Calif. 90005

Filed Nov. 17, 1986, Ser. No. 931,146
Int. Cl.[4] F23D *3/16*
U.S. Cl. 431—295 **12 Claims**



1. A cake cover and candle holder comprising:
an elongated support having a first portion for insertion into a cake, a second portion, and an expanded portion intermediate said first and second portions;
a generally planar cover having a planar surface and defining a center aperture and a plurality of candle recesses;
said cover being supported by said elongated support above the cake bypassing said second portion through said center aperture and resting said cover upon said expanded portion of said elongated support.

4,721,456
COMBUSTION ELEMENT FOR A RADIANT ENERGY BURNER AND METHOD OF MAKING SAME

Dirk N. Granberg, El Paso, Tex., and John P. Elsing, Oconomowoc, Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

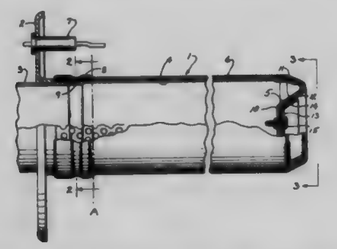
Filed May 8, 1986, Ser. No. 860,787
Int. Cl.[4] F23D *14/12;* B21D *53/00*
U.S. Cl. 431—328 **8 Claims**

1. In a radiant energy burner, a combustion element comprising a porous metal support having an inner end disposed to be connected to a source of gaseous fuel and having an outer end, an end closure closing off said outer end, said support having a circumferential groove disposed adjacent said inner end, a sleeve of ceramic fibers braided directly on the outer surface of

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said support and extending within said groove, the portion of said sleeve disposed in said groove being free of external clamping means, an outer end of said sleeve projecting beyond the outer end of said screen, and attaching means for attaching the outer end of the sleeve to said end closure.

6. A method of making a combustion element for a radiant energy burner, comprising the steps of forming an open ended foraminous metal cylindrical support, said support having an



inner end disposed to be connected to a source of a gaseous fuel and having an outer end, closing off the outer end of said support with an end closure, braiding strands of a ceramic material directly on the outer surface of the support adjacent said inner end, continuing the braiding along the length of the support and beyond the outer end to form a braided sleeve, with the outer end of the sleeve projecting beyond the outer end of said support, and attaching said projecting end of the sleeve to said end closure.

4,721,457

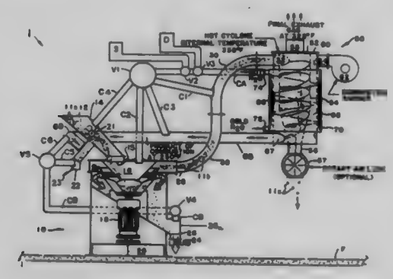
METHOD AND APPARATUS FOR CLEANING AND DRYING METAL CHIPS

Larry D. Areaux, Portage, and Robert H. Dudley, Richland, both of Mich., assignors to Pre-Melt Systems, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 866,795, May 23, 1986. This application May 28, 1987, Ser. No. 55,785

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—58 **50 Claims**



1. In a metal chip cleaning and drying apparatus, the combination comprising

cyclone separator means having a wall, said wall being of heat-conducting material and having inner and outer surfaces, and having inlet means for the entry into said cyclone separator means of gas-entrained metal chips,

outlet means for the exit of dried chips from said cyclone separator means,

outlet means at the opposite end of said cyclone separator means for the exit of exhaust gases therefrom,

combustion chamber means about the outer surface of the wall of said cyclone separator means for the combustion of fuel therein,

inlet means into said combustion chamber means for the entry of heat and flame thereinto,

burner means associated with said inlet means into said combustion chamber means and with fuel source means,

outlet means for exit of gaseous products of combustion from said combustion chamber means,

and source means for hot water and/or steam plus conduit means for conveyance of said hot water and/or steam into said cyclone separator means via said cyclone separator chip inlet means.

4,721,458

GAS FEEDING DEVICE FOR FEEDING A COMBUSTIBLE GAS MIXTURE CONSISTING OF AT LEAST TWO COMPONENTS

Hans-Jürgen Conrad, Rutesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

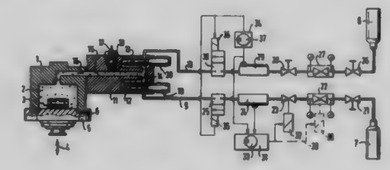
PCT No. PCT/DE86/00084, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/05725, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 5, 1986, Ser. No. 932,503

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511731

Int. Cl.[4] F23C *11/04*

U.S. Cl. 432—205 **3 Claims**



1. In a gas mixture feeding device for feeding a combustible gas mixture consisting of at least two gas components into a combustion chamber of a thermal deburring installation for treating work pieces by means of temperature and pressure shocks formed by igniting the gas mixture, comprising a feeding line for each gas component, an adjustable dosaging device provided in each feeding line for the amount of gas and the mixing ratio of the gas components, the improvement comprising a control circuit for said dosaging device, said control circuit being adjustable to different mixing ratios and including a through-flow amount metering means (**24** or **29**) provided in each of the feeding lines (**9, 10**), a measuring value comparator (**31**), and said dosaging device including a valve (**22** or **23**) provided at least in one of the feeding lines and controlled by said measuring value comparator, and shut-off valves (**35,25** or **30,36**) provided in each feeding line between the flow amount metering means and the combustion chamber (**2**); and storage and counting means provided in one of said feeding lines, said shut-off valves reacting to a signal issued by said storage and counting means (**34**) which is connected to a respective flow amount metering means in accordance with a through flow of a preselectable amount of gas.

4,721,459

MODULAR, INSULATING KILN CAR TOP

Albert E. Fitz, Philo, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

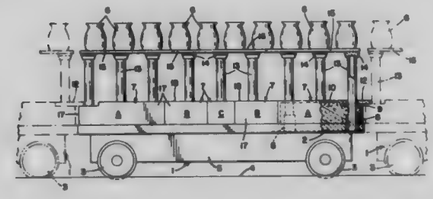
Filed Jun. 30, 1986, Ser. No. 880,599

Int. Cl.[4] F27B *9/26*; F27D *1/12*

U.S. Cl. 432—241 **7 Claims**

1. In combination, a kiln car having a chassis which provides a support surface, a non-loadbearing, heat-insulated car top assembly, and a post means extending down to said support surface of said kiln car for carrying a load of ware in spaced-above position with respect to said car top assembly, said

non-loadbearing, heat-insulated car top assembly comprising at least two spacedapart, generally parallel rows each of a multiplicity of modular, relatively thin, hollow refractory members aligned along opposite edges of an essentially rectangular support surface of said car, said post means passing through said modular members and being supported by sleeve means inside of said members which sleeve means receive said post means, said modular members, in a given row, disposed in



heat-insulating, abutting relationship with each other, each of said members having a top, outer outer side surfaces and containing an insulating amount of refractory insulation, all said surfaces embracing an inner cavity, said top, outer surface of at least four of said members having at least one opening therein communicating with said inner cavity, with the support surface of said car, between said spaced-apart, parallel rows of said refractory members, having dispersed thereover, a layer of insulating refractory.

4,721,460

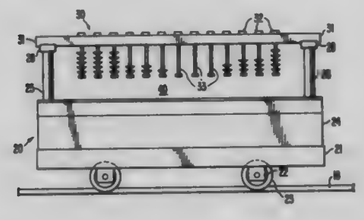
TILE FIRING SUPPORT STRUCTURE

James D. Bushman, Pittsburgh, and Richard K. Moffat, Eighty-four, both of Pa., assignors to Swindell Dressler International Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1987, Ser. No. 21,505

Int. Cl.[4] F27D *1/12*; F27B *9/26*

U.S. Cl. 432—241 **14 Claims**



1. Apparatus for supporting, conveying and firing a plurality of tiles, comprising:

a tunnel kiln having a fuel burner in a sidewall thereof, said kiln having a set of rails running therethrough;

a kiln car having a structural base supported on wheels which travel along the set of rails;

a support structure mounted on the kiln car base including a pair of refractory support posts extending vertically upwardly from the base, said support structure supporting a refractory cross-beam;

a pair of refractory rods hung vertically from the cross-beam and spaced along the length thereof, each of the rods having a plurality of tile supports along the length thereof for supporting a plurality of tiles between the pair of rods, the vertically hung rods having bottom ends which are positioned a vertical distance above the base thereby providing a substantially open firing space between the tile supports and the base,

the fuel burner being positioned to inject hot combustion gases into the open firing space as the kiln car travels along the set of rails and past the fuel burner.

4,721,461

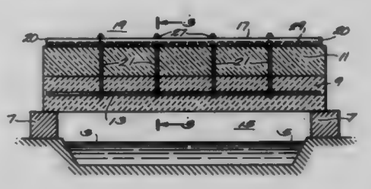
INSULATIVE PANEL LAMINA

Richard A. Falk, 600 Flamingo Dr., Ft. Lauderdale, Fla. 33301

Continuation of Ser. No. 821,966, Jan. 24, 1986, abandoned. This application Jan. 27, 1987, Ser. No. 11,356

Int. Cl.[4] F27D *1/00*; F23M *5/00*

U.S. Cl. 432—247 **8 Claims**



1. A self-reinforcing insulative panel lamina for being supported by spaced vertical supports comprising:

a. a one piece refractory slab having top and bottom surfaces and longitudinally opposed ends, the refractory slab being adapted to be vertically supported by the vertical supports on the bottom surface adajcent the longitudinally opposed ends to thereby create an unsupported interior portion between the vertical supports and adapted to be exposed to very high temperatures;

b. at least on reinforcing rod extending longitudinally through the refractory slab;

c. a one piece insulation layer having top and bottom surfaces and longitudinally opposed ends, the insulation layer being approximately coextensive in area with the refractory slab, the insulation layer bottom surface being in contact with and supported by the top surface of the refractory slab;

d. support means supported on the top surface of and extending between the opposed longitudinal ends of the insulation layer for being supported solely by th e refractory slab and insualtion layer and in thermal separation from the refractory slab, the support means having ends terminating between the insulation layer opposed longitudinal ends and over the vertical supports acting on the refractory slab bottom surface; and

e. tie means for joining the support means to the reinforcing rod,

so that the longitudinally opposed ends of the refractory slab and insulation layer provide the sole support for the ends of the support means to thereby enable the portion of the support means between the ends thereof to reinforce the unsupported interior of the refractory slab and the support means is unaffected by high temperatures to thereby adequately support the reinforcing rods and refractory slab exposed to high temperatures.

4,721,462

ACTIVE HOLD-DOWN FOR HEAT TREATING

Earl R. Collins, Jr., La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1986, Ser. No. 921,573

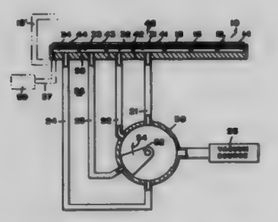
Int. Cl.[4] F27D *5/00*; B25B *11/00*

U.S. Cl. 432—253 **10 Claims**

1. A vacuum hold down apparatus for holding a thin workpiece comprising:

a wall which forms a support surface defining a plurality of zones, said wall having a plurality of holes with at least one hole in each of said zone;

means for applying a vacuum to said holes to hold a workpiece to said surface, said applying means being constructed to repeatedly stop applying said vacuum to different of said zones at different times while continuing to apply said vacuum to others of said zones such that a zone



where a vacuum is not applied may be interposed between zones where vacuum is aplied;

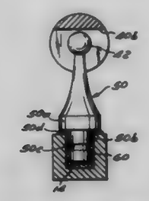
whereby the workpiece may change dimension by undergoing movement relative to the support surface in a zone where vacuum is not applied while workpiece is held to the support surface at zones where vacuum is applied.

4,721,463

INTERCHANGEABLE DENTAL ARTICULATORS

Robert L. Lee, 22575 Barton Rd., Grand Ter., Colton, Calif. 92324

Filed Sep. 30, 1986, Ser. No. 913,727
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—54 16 Claims



14. A dental articulator comprising:

a lower frame having a rear upwardly extending frame member with a pair of spaced sockets formed in the upper surface of said member;

a pair of condyle support pedestals each having a lower end positioned in a respective one of said sockets but being smaller than said sockets;

a pair of condylar elements each mounted on the upper end of a respective one of said pedestals to define a hinge axis through the centers of said elements;

bonding material positioned in said socket in the space between the socket walls and said pedestal ends forming the only connecting means between the socket walls and the pedestal ends.

4,721,464

METHOD AND APPARATUS FOR MAKING A DENTAL MODEL

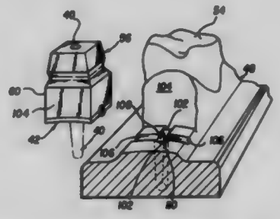
Mack L. Roden, 1095 Idlewood Dr., and Steven D. Adams, 3980 Midway Dr., both of Baker, Oreg. 97814

Filed Jun. 17, 1985, Ser. No. 745,481
Int. Cl.[4] A61C *19/00*
U.S. Cl. 433—74 37 Claims

1. A curved parting guide for use in dental prosthetics, said parting guide comprising:

a. a sheet of material having a convex surface and a concave surface;

b. a longitudinal guide in said convex surface and in said concave surface; and,



c. a lateral guide in said convex surface and in said concave surface.

4,721,465

DENTAL DAM WITH INTEGRAL DEFORMABLE FRAME

Steven G. Barasz, 83 Surrey La., Guilford, Conn. 06437

Filed Mar. 17, 1987, Ser. No. 26,853
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—137 13 Claims



1. A one piece dental dam designed to be discarded after a single use, said dam comprising:

a. a thin elastomeric web adapted to be placed over a patient's face to cover the patient's mouth during a dental procedure and selectively rupturable to form an opening to allow one or more teeth to be exposed; and

b. a frame permanently bonded to said web, said frame forming a border for said dam at a periphery of said web, said frame being manually deformable to conform generally to the contours of a patient's jaw and cheeks whereby the dam can be packaged in a flat form and then custom fitted onto a patient's face during use, the frame being operable to stretch the web over the patient's face.

4,721,466

TOOTH BLOCKS

Roland Thalheimer, 9437 Oakwood Manor La., St. Louis, Mo. 63126

Filed Apr. 14, 1986, Ser. No. 851,941
Int. Cl.[4] A61C *13/00*
U.S. Cl. 433—171 1 Claim



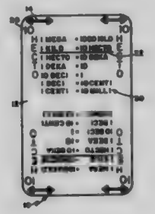
1. A tooth block comprising a horizontal bar which is horizontally deformable and includes a plurality of outwardly extending deformable retentions, each of said retentions being smaller in cross section at the bar than outwardly therefrom, and a plurality of artificial teeth, each tooth being fixedly mounted on an individual retention in spaced separation from the bar and from each other tooth and being movable therewith as its retention is selectively positioned with respect to the horizontal axis of the bar, whereby each tooth and its respective retention may be selectively positioned and held securely with respect to the bar and each other tooth independent of the movement and positioning of every other tooth and its respective retention.

4,721,467

METRIC SYSTEM TEACHING/PLAYING CARDS

Mark A. Havens, P.O. Box 80534, San Diego, Calif. 92107

Filed Dec. 23, 1985, Ser. No. 812,715
Int. Cl.[4] G09B *19/00*; A63F *1/00*
U.S. Cl. 434—187 9 Claims



1. A deck of metric system teaching/playing cards comprising:

a suit having:

a plurality of cards; each card having a front side and a back side; each front side bearing a unique distinguishing value comprising a multiple of ten and a metric prefix; and

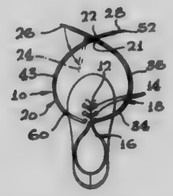
wherein a plurality of said cards have a distinguishing value which, although differing in expression, is equivalent in real value to said distinguishing value of another of said cards.

4,721,468

TRAINING SHOELACE

Dean D. Alexander, 5681 Edgecliff, Yorba Linda, Calif. 92686, and James S. Stanfield, P.O. Box 1983, Santa Monica, Calif. 90406

Filed Mar. 6, 1985, Ser. No. 708,797
Int. Cl.[4] G09B *19/00*; A43C *9/00*
U.S. Cl. 434—260 5 Claims



1. A shoelace for use by young children or the handicapped which, after being threaded through the eyelets of a shoe so its opposite end portions are free for trying a bow, facilitates the tying of the bow, comprising:

a shoelace of a widthe which enables it to be threaded through the eyelets of a shoe, and which has opposite end portions that are each stiff enough to substantially retain the shape to which they are bent and unbent, but which each resists bending and unbending with a low enough resistance to permit children to easily bend the shoelace end portions during the typing of a bow with them;

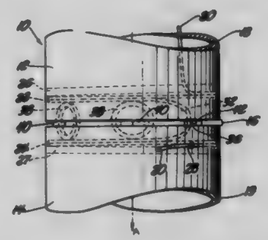
said shoelace including a limp fabric body and a solid bendable metal wire lying loosely within the body and of a thickness of between 10 and 40 thousandths inch within said body.

4,721,469

TURNING CORD

John A. Carlson, Wayne, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Oct. 10, 1986, Ser. No. 917,527
Int. Cl.[4] H01R *39/00*
U.S. Cl. 439—13 24 Claims



1. An assembly to eliminate slack in a length of cord extending between first and second members co-axially rotatable relative to one another about an axis of rotation, said assembly comprising; a first member (12, 112) rotatable about a rotational axis (A, AA), a second member (14, 114) disposed on said axis (A, AA) axially spaced from said first member (12, 112), a cord (20, 120) having a first coiled length (22, 122) coiled about said axis (A, AA) and supported by said first member (12, 112), said cord (20, 120) having a second coiled length (24, 124) coiled about said axis (A, AA) and supported by said second member (14, 114), control means (34, 134) responsive to relative rotation between said first (12, 112) and second (14, 114) members for coiling said cord (20, 120) into one of said coiled lengths (22, 24, 122, 124) while simultaneously uncoiling said cord (20, 120) out of the other coiled length (24, 22, 124, 122) while simultaneously moving said loop (32, 132) about said axis (A, AA), said control means characterized by rolling means (38, 138) between said coiled lengths (22, 24, 122, 124) for rolling along said cord (20, 120) in one of said coiled lengths (22, 24, 122, 124) while simultaneously rolling along said cord (20, 120) in the other coiled length (24, 22, 124, 122).

4,721,470

KEYS FOR ELECTRICAL CONNECTORS

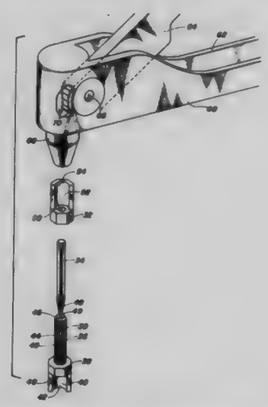
David T. Humphrey, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1987, Ser. No. 37,921
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—55 4 Claims

1. A dual sided key adapted to secure header and shroud connectors together on opposite sides of a printed circuit board, the key adapted to fit in respective aligned polygonal recesses formed in each header and shroud, the key comprising:

an integral elongated male part having a longitudinal axis, an interconnected head, shaft, and guide stud, all located on the axis, the head having a polygonal cross-section adapted to fit in one of the header and shroud recesses and a bore lying on the axis, the shaft being knurled, the guide stud having a portion of reduced diameter to define a breakaway point where it joins the shaft, and

a female part polygonal in cross-section adapted to fit in the other of the header and shroud recesses, the female part



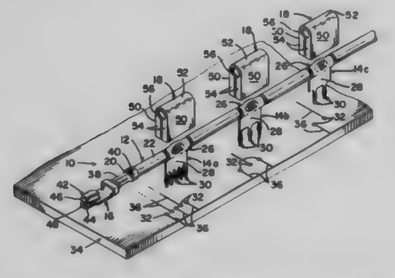
having a bore, sized to receive the shaft with an interference fit.

4,721,471

POWER BUS SYSTEM FOR PRINTED CIRCUIT BOARDS

Arthur L. Mueller, West Chester, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 31, 1986, Ser. No. 900,969
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—78 2 Claims



1. A power bus system for use with a flexible electrical wire in distributing power on a printed circuit board, said system comprising:

one or more electrical contact means for being positioned at one or more locations on a circuit board and being electrically connected to a flexible electrical wire intermediate the ends thereof, each of said electrical contact means having plate means with one edge being formed back around towards said plate means to provide an open wire receiving means adapted to be closed and crimped around said electrical wire and further having a plurality of space apart pin means extending outwardly from an opposite edge of said plate means, said pin means being adapted to be electrically engage conductive means on said circuit board; and

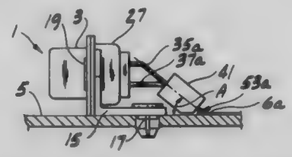
one or more protective dielectric housing means for removably covering each of said one or more electrical contact means, said housing means having bight means for being received over said wire receiving means and skirt means hingedly mounted on and extending from each side edge of said bight means, said skirt means being adapted to be resiliently flexed laterally outwardly relative to said bight means to permit positioning said bight means over said wire receiving means and then to return to the original position relative to said bight means to shield said plate means.

4,721,472

FIXED CONNECTOR FOR MAKING ELECTRICAL CONNECTIONS TO SURFACE-MOUNT TYPE PRINTED BOARD

Jack T. Gentry, and John T. Gentry, both of Springfield, Mo., assignors to Positronic Industries, Inc., Springfield, Mo.

Filed Jun. 10, 1986, Ser. No. 872,515
Int. Cl.[4] H01R 23/72
U.S. Cl. 439—79 17 Claims



1. A fixed connector for use in making electrical connections from an electrical cable having a plurality of conductors to a printed board having surface-mount type conductive traces, the electrical cable having a free cable connector connected to the plurality of conductors, the fixed connector comprising:

connector means having generally parallel rows of connector contacts for electrical conduction with the conductors of the electrical cable, the centers of the connector contacts in one row being staggered in relation to the centers of the connector contacts in an adjacent row, each connector contact for electrical conduction with one of the plurality of conductors of the electrical cable, said connector means connectable to the free cable connector;

a plurality of electrically conductive contact tails, each in engagement with and extending from a respective connector contact; and

aligning means made of an insulating materal for aligning the contact tails, the aligning means having a plurality of holes which receive the contact tails and align such tails into a single row, each hole receiving a respective contact tail, the contact tails protruding from the aligning means remote from the connector means for surface mounting attachment to the conductive traces on the printed board.

4,721,473

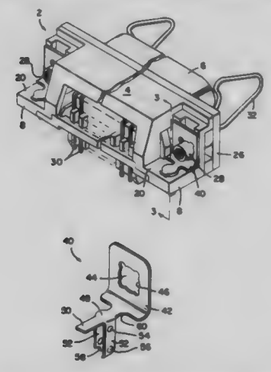
RETENTION FEATURE FOR PRINTED CIRCUIT BOARD MOUNTED CONNECTORS

Henry L. DelGuidice, Winston-Salem, and Roger J. Flaherty, Greensboro, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1986, Ser. No. 932,072
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—79 19 Claims

1. A retention member for retaining a shielded electrical connector to a printed circuit board and for commoning said shielded connector to a ground trace on said printed circuit board, the connector having an insulative housing having a base portion which is mountable to the printed circuit board and a front face portion which is perpendicular to the base portion, the insulative housing having at least one hole through the base portion of the housing, the depth of said at least one hole being less than the thickness of said base portion, the electrical connector further comprising a front shielded portion which includes at least one commoning post extending rearwardly through at least one aperture in the front face portion of the insulative housing, the retention member comprising:

a stamped and formed conductive member having a first plate portion which is profiled to lie adjacent to the upper surface of the base portion of said connector housing, said first plate portion having two legs extending downwardly therefrom, each said leg portion having a first and second retaining means, said first set of retaining means being profiled to fit substantially adjacent to the lower end of the hole in the base portion, and said second set of retaining means being profiled to fit substantially adjacent to the lower end of a through hole on said printed circuit board, and a second plate portion profiled to overlie the aperture from the rear thereof, said second plate portion include means to retain the commoning post and the second plate portion together, thereby affixing the shielded portion and the insulative housing together and commoning the shielded portion to a ground trace on the printed circuit board adjacent to the throughhole.

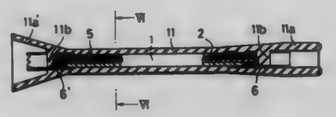


4,721,474

HIGH TENSION FEEDING CABLE AND A METHOD OF MANUFACTURING THE SAME

Toshiaki Kanno, and Masahiro Kanda, both of Gotenba, Japan, assignors to Yazaki Corporation, Japan

Filed Sep. 11, 1986, Ser. No. 906,293
Claims priority, application Japan, Sep. 11, 1985, 60-199310
Int. Cl.[4] H01R 13/514, 43/00
U.S. Cl. 439—125 8 Claims



1. A high tension feeding cable, comprising:

(a) a body of cable which comprises a high tension core for supplying a high tension current, and an inner covering layer provided on the outer surface of said high tension core,

(b) cylindrical terminals, attached to the ends of said cable body, for connecting the high tension core to mating electrical apparatus,

said cylindrical terminals having a connecting section which connects the inside and outside of the cylindrical terminals,

said cylindrical terminals being attached to said cable body so as to have the connecting sections positioned in the neighborhood of the end surface positions of the ends of said cable body, and

(c) terminal caps, provided on the end sections of the body of cable with the cylindrical terminal, for protecting said cylindrical terminals and further for connecting the high tension feeding cable mechanically to mating electrical apparatus,

said terminal caps comprising (i) a surrounding section that surrounds at least a part of said cylindrical terminal and cable body, and (ii) a projected section that projects from the outside surface to the inside surface of the cylindrical terminal through the connecting section in said cylindrical terminal;

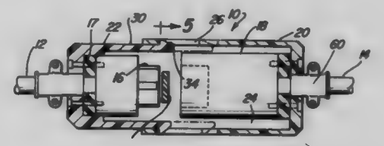
wherein, on the outer periphery of said cable body, there is provided an outer covering layer which substantially covers the cable body in its entire length, and in addition, is molded in a united body with said terminal caps on both ends of the cable body.

4,721,475

SAFETY SHROUD FOR AN ELECTRICAL CONNECTOR

Roland A. Burke, Jr., 6650 Loud Dr., Oscoda, Mich. 48750

Filed Nov. 20, 1986, Ser. No. 932,576
Int. Cl.[4] H01R 13/44
U.S. Cl. 439—133 17 Claims



1. A shrouded electrical connector assembly comprising:

a socket;

a plug which is insertable into said socket to make electrical content therewith;

first annular shroud means surrounding said plug and extending past said plug toward said socket;

second annular shroud means surrounding said socket and extending past said socket toward said plug, one of said first annular shroud means and said second annular shroud means being telescopically receivable in the other of said first annular shroud means and said second annular shroud means to permit said plug to be inserted into said socket, said one of said first annular shroud means and said second annular shroud means being partly telescoped into the other of said first annular shroud means and said second annular shroud means to a partly telescoped position before said plug is inserted into said socket;

aperture means in said first annular shroud means and extending across said first annular shroud means between said plug and said socket;

aperture means in said second annular shroud means and extending across said second annular shroud means between said plug and said socket, said aperture means in said second annular shroud means being in alignment with said aperture means in said first annular shroud means when said first annular shroud means and said second annular shroud means are in said partly telescoped position; and

locking bar means, said locking bar means, said locking means being insertable between said socket and said plug when said first annular shroud means and said second annular shroud means are in said partly telescoped position to prevent said plug from making electrical contact with said socket, said locking bar means being selectively withdrawable from between said plug and said socket to permit said plug to make contact with said socket.

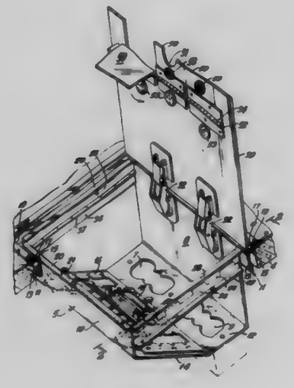
VOL 1086 ISS 4 JAN 26 1988 UMI

4,721,476

ELECTRICAL CONNECTION BOX USED IN CONJUNCTION WITH RAISED FLOORS

Richard B. Zeliff, Ramsey, and Gerson Feiner, So. Woodcliff Lake, both of N.J., assignors to Interchangeable Hatches Inc., Cliffside Park, N.J.

Filed Dec. 23, 1985, Ser. No. 812,646
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—142 **11 Claims**



1. An electrical connector unit adapted for use in combination with a raised floor wherein the raised floor is spaced above the regular floor so that there is a space between the floors for wire and cables to be electrically connected to the electrical connector, there being a plurality of substantially rectangular openings through the raised floor, comprising:

a. substantially rectangular frame means adapted to fit within one of the openings in said raised floor;

b. sling shaped means extending downwardly from opposing sides of the frame adapted to receive a variety of electrical connections,

c. means connected to said frame adapted to rest on the top surface of said raised floor so that the electrical connector is suspended in the space between the regular floor and the raised floor, and

d. locking means having a first and a second position connected to said frame adapted to engage said raised floor to maintain the electrical connector unit in plane in a first position and to permit removal of the electrical connector in a second position.

4,721,477

PLUG CONNECTOR FOR IC MODULES

Karl Lotter, Sesselbahnstr. 7, 8959 Buching, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,557
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543955
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—264 **17 Claims**

1. A plug connector for IC modules, comprising

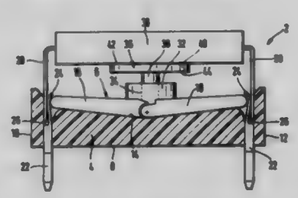
(a) an insulating connector body (4);

(c) a plurality of female contacts (22), which are provided in the connector body (4) in an arrangement corresponding to the plurality of contact tabs of an IC module (30) and each of which comprises an end portion which constitutes a soldering tab and extends through the connector body (4), and upper end portions (24), which constitute spring and contact elements;

(c) clamping means (6), which comprise at least two clamping plates (16, 18) provided with a pivotal connection, which extends in the longitudinal direction of said clamping means, which clamping plates have outer edges (90, 92) which engage the spring and contact elements (24), wherein the clamping plates (16, 18) in a release position are upwardly inclined from the top surface (14) of the connector body (4) in a cable-like configuration, and in a clamping position the clamping plates define a plane that is parallel to the bottom surface (8) of the connector body (4) and the spring elements (24) are adapted to be forced against the longitudinal side faces of the contact tabs (28) of the IC module (30);

(d) stop means (24) for limiting the opening movement of the clamping plates (16, 18) to a gablelike configuration assumed in the release position; and,

(e) a bearing surface, which is formed on the top surface (14) of the connector body and which is engaged by at least part of the surface of the clamping plates (16, 18) when they are in at least one position which differs from the release position, of the clamping plates;



(f) wherein the clamping means (6) are movable beyond the clamping position to a locking position, in which the clamping plates (16, 18) are downwardly inclined toward each other and toward the top surface (14) of the connector body (4) and at least a portion of the bottom surfaces (86, 88) of said clamping plates (16, 18) are in contact with said top surface (14),

wherein the improvement comprises:

(g) each of the clamping plates (16, 18) has adjacent to their common pivotal connection top edges (60, 98) and a chamfer (62) which extends in the longitudinal direction of the clamping plate and is so arranged that when the clamping means (6) are in their release position the chamfer (62) defines a first bearing line and the edge (60) constitutes a second bearing line and both bearing lines are parallel to the plane of the female contacts (22) and define a bearing plate (64).

4,721,478

WATER SEALED ELECTRICAL CONNECTOR

Toshimitsu Sonobe, Tokyo, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 15, 1986, Ser. No. 896,894
Claims priority, application Japan, Aug. 23, 1985, 60-184351; Aug. 23, 1985, 60-184352
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—278 **7 Claims**

1. A connector assembly to a wire terminated by a conductive contact, comprising:

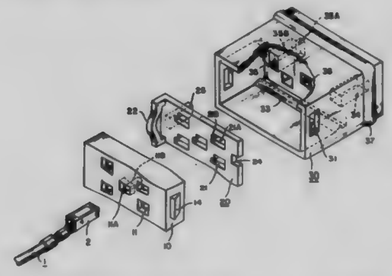
an insulative housing (30) having a cavity extending into a front surface thereof and a hole (36) communicating with said cavity and extending into a rear portion of said housing for receipt of said contact;

sealing means (37) extending exteriorly on the housing around its rear portion for providing a seal when said housing (30) is inserted into a connector header (40);

a rubber bush 10 sealably received in said housing cavity and having a hole (11) aligned with said hole (36) in said housing for sealed receipt of said contact;

a movable retention member (20) supported by said housing adjacent said hole (36) in said housing and having a latching portion (21B) for latching engagement with said contact for retaining said contact in said hole (36); and

an opening (34) extending into said housing through said rear portion thereof and communicating with said retention member to permit the entry of a tool to engage said movable retention member so as to move said latching portion away from the latching position and thereby allow withdrawal of said contact from said housing hole.

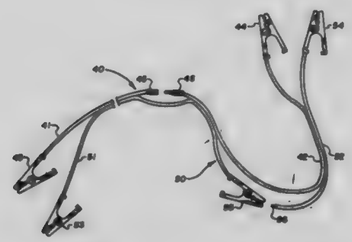


4,721,479

SAFETY JUMPER CABLES

Curtis Shuman, 11600 N. 10575 W., Tremonton, Utah 84337

Continuation-in-part of Ser. No. 676,774, Nov. 19, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 920,696
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—503 **3 Claims**



1. A pair of jumper cables for coupling between weak and strong batteries used as sources of power for starting combustion engines wherein the cable provides a transmission line for conducting power from the strong battery to the weak battery, said battery cables comprising:

a first insulated conductor cable for attachment between positive terminals of the respective batteries, said first cable including two cable segments, each having a conductive clamp at a distal end which is adapted for attachment to the battery terminal and an attachment means coupled at a remaining medial end, said attachment means being adapted for establishing an electrical connection between the respective conductive distal clamps when in a coupled configuration while providing an open, nonconducting circuit when in a noncoupled configuration; and a second insulated conductor cable for attachment between negative terminals of the respective batteries, said second cable including two cable segments, each having a conductive clamp at a distal end which is adapted for attachment to the battery terminal and an attachment means coupled at a remaining medial end, said attachment means being adapted for establishing an electrical connection between the respective conductive distal clamps when in a coupled configuration while providing an open, nonconducting circuit when in a noncoupled configuration;

the attachment means for the first cable comprising an alligator clamp at one medial end for coupling to an exposed medial end of the same first conductive cable, said exposed end being adapted in size and shape for firm attachment by the alligator clamp;

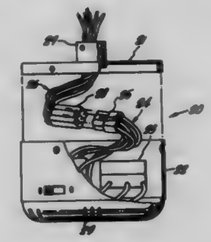
the attachment means in the second cable comprising a detachable plug and receptacle respectively coupled to the medial ends of the second conductive cable and adapted to mate for closing a conductive path between the distal clamps of the cable.

4,721,480

DETACHABLE CEILING FAN SWITCH UNIT

Yau Yung, Hong Kong, Hong Kong, assignor to Shell Electric Mfg. (Holdings) Co., Ltd., Hong Kong, Hong Kong

Filed Aug. 1, 1985, Ser. No. 761,159
Int. Cl.[4] H01R *13/60, 13/66*
U.S. Cl. 439—527 **9 Claims**



1. A switch unit for a ceiling fan, comprising a housing including an upper housing part securable to motor housing and being adapted to receive first wiring means for connection to said motor and to an electrical power supply, and a lower housing part which contains the switch-gear for the motor and is readily removable from and connectible to said upper housing part by a user, said lower housing part having second wiring means for connecting said switch-gear to the motor and the electrical power supply, said second wiring means being adapted to be readily connectible to and disconnectible from said first wiring means by a user, wherein said lower housing part is substantially cup-shaped and said upper housing part comprises a substantially flat lid formed with a central hollow boss for the passage of said first wiring means, and such lid interengaging within the cup-shaped lower housing part whereby the lid is unseen by a user, and wherein said lower housing part has at least one ventilating aperture in a base portion thereof for cooling air to flow upwardly into the unit, said second wiring means terminating in at least one first unitary electrical connector, and said upper housing part including said first wiring means, said first wiring means terminating in at least one second unitary electrical connector readily connectible to and disconnectible from said first unitary electrical connector.

4,721,481

REPLACEABLE RF CONNECTOR

H. Erwin Greilmann; Gerald K. Hein, both of Beaverton; Brian A. Ohleneier, and Randy C. Karambelas, both of Aloha, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 9, 1986, Ser. No. 872,343
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—581 **4 Claims**

1. A replaceable RF connector comprising:

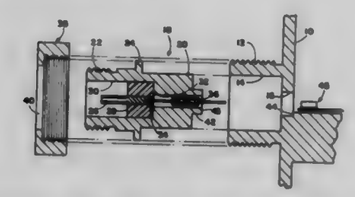
a receptacle mounted on a housing, the receptacle having a cavity with a non-cylindrical shape having a throughhole extending between the cavity and the interior of the housing;

an RF connector having a connector end, a receptacle end

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shaped to conform closely to the shape of the receptacle cavity so that rotation of the RF connector within the receptacle cavity is prevented, the receptacle end having an impedance compensated fuse cavity, and a flange integral between the connector end and the receptacle end;

means for retaining the receptacle end of the RF connector in the receptacle cavity; and



a replaceable fuse which fits within the impedance compensated fuse cavity and is electrically connected at one end to a central conductor within the RF connector, the other end extending from the impedance compensated fuse cavity through the throughhole so that when the RF connector is attached to the receptacle by the retaining means the other end of the replaceable fuse is electrically connected to an electrical circuit within the housing.

4,721,462

CONNECTOR HOUSING

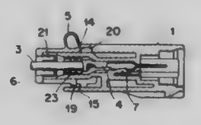
Kiyohito Fukuda; Masanori Tsuji, and Sumio Nagano, all of Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan

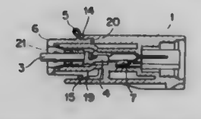
Filed Feb. 13, 1987, Ser. No. 15,205

Claims priority, application Japan, Feb. 18, 1986, 61-031911

Int. Cl.⁴ H01R *13/40*

U.S. Cl. 439—595 **6 Claims**





1. A connector housing comprising:

a housing body having a terminal receiving chamber for receiving a terminal connected with a lead wire, a tapered portion formed on an inner wall of said terminal receiving chamber is such a manner as to be converged in a direction of insertion of said terminal, and first and second locking means formed on an outer periphery of said housing body;

a cover for preventing disengagement of said terminal, having first and second engaging portions to be engaged with said first and second locking means, repsectively, a terminal insertion hole into which said terminal is inserted, and a flexible projection provided around said terminal insertion hole; and

an elastically deformable soft band for integrally connecting said housing body with said cover; wherein said terminal is inserted under a first engaging condition where said second locking means of said housing body is merely in contact with said second engaging portion of said cover, and said flexible projection is urged along said tapered portion to stop a rear end of said terminal under a second engaging condition where said second locking means is fixedly engaged with said second engaging portion.

4,721,483

SHIELDED CONNECTOR ASSEMBLY FOR FLAT BRAIDED CABLE

Robert G. Dickie, New Market, Canada, assignor to Northern Technologies Ltd., Markham, Canada

Continuation-in-part of Ser. No. 580,521, Feb. 15, 1984, which is a continuation-in-part of Ser. No. 499,314, Apr. 28, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 831,231

Int. Cl.⁴ H01R *13/643*

U.S. Cl. 439—610 **13 Claims**





1. A cover assembly for a connector and the end of a flat cable having a dielectric coating encasing shield braid and inner conductors, said connector being connected to said cover assembly comprising:

a first sheel half and a mating second shell half forming together, when mated, an enclosure having a front side wall, and at least one other side wall;

a front opening in said front side wall in which said connector is attached so that the front face of side connector faces outwardly of said cover assembly;

a flat passage extending away from an opening in said other side wall through which said cable extends outwardly of said cover assembly, ssaid flat passage being formed by said first and second half shells when mated;

at least two flat compressible inserts each having a flat inner surface and a substantially flat coextensive outer surface;

said inserts being disposed in said flat passage such that the inner surface of each insert contacts said cable adjacent said other side wall when said assembly is closed to uniformly clamp said cable about the inner flat surfaces of said inserts to maintain shielding integrity;

a sliced section of dielectric outer coating and shielded braid being compressed between the outer surfaces of said inserts and said enclosure when said shell halves are mated thereby providing electrical grounding between said shell halves and said shielding braid; and

said shell halves providing a substantial hollow interior region within said cover assembly, thereby enabling a single cover assembly to accommodate a variable number of cable sizes, while simultaneously maintaining shielding integrity, strain relief and grounding.

4,721,484

INTEGRATED CIRCUIT PACKAGE WITH TERMINALS HAVING RECEPTACLES WITH ELASTIC CONTACTS

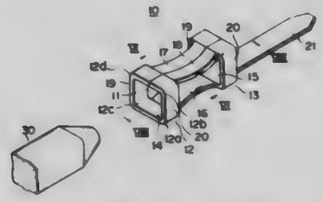
Haruo Sakamoto, Tokyo, and Fumihiro Kawai, Kawasaki, both of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1987, Ser. No. 3,234

Claims priority, application Japan, Jan. 29, 1986, 61-11500[U]

Int. Cl.⁴ H01R *13/11*

U.S. Cl. 439—842 **7 Claims**



1. An electrical terminal having a receptacle at one end for receiving an electrical pin, said receptacle having a substantially rectangular parallelepiped configuration and comprising:

first and second end frames spaced apart from one another, each end frame having a substantially rectangular opening and including a base member, two side members extending perpendicularly from each side of the base member, and a split top opposite said base member formed from two separate top members extending toward each other from each respective side member;

a base contact section extending between the base members of the first and second end frames; and

first and second elastic top contact sections extending respectively between said first and second end frames opposite said base contact section, said first elastic top contact section extending between respective ones of said top members of the first and second end frames, said second elastic top contact section extending between respective others of said top members of the first and second end frames, both said first and second elastic top contact sections extending substantially parallel to one another and both top contact sections being curved inwardly toward the base contact section;

whereby when said pin is inserted into the receptacle, the engagement between said pin and the elastic base contact section and the first and second top contact sections will cause the side members of at least the first end frame to swing outward thus separating the first and second elastic top contact sections.

4,721,485

FLYWHEEL MAGNETO COVER FOR MARINE PROPELLER ENGINE

Tomonori Suzuki, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

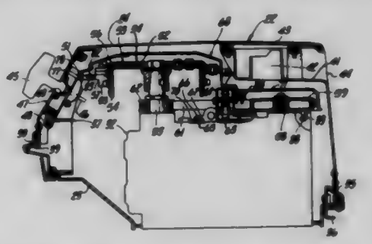
Continuation of Ser. No. 643,657, Aug. 23, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 920,932

Claims priority, application Japan, Aug. 24, 1983, 58-153148

Int. Cl.⁴ B63H *21/00*

U.S. Cl. 440—77 **8 Claims**

1. A cowling arrangement for the power head of an outboard motor which outboard motor is adapted to be attached as a unit to an associated watercraft, said unit comprising an internal combustion engine having an output shaft carrying a flywheel, a ring gear carried by said flywheel and cooperable with a first starter for normal starting of said engine, an outer cowling enclosing said engine and having a readily removable portion disposed contiguous to said flywheel, and a flywheel cover enclosing said flywheel and detachably connected to said engine independent of said readily removable outer cowling portion for retention thereof relative to said engine upon removal of said readily removable outer cowling portion, an emergency rope starter associated with said flywheel and having a manually operable pull member for emergency starting of said engine, said emergency rope starter and said manually operable pull member completely enclosed by said flywheel cover, said flywheel cover being detachably connected to said engine for removal thereof without the use of any tool for access to said emergency starter.



4,721,494

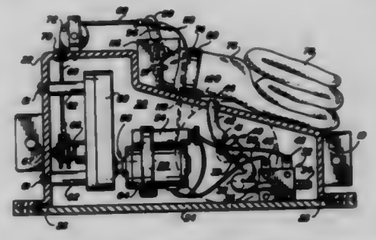
AUTOMATIC MARKER BUOY RELEASE MECHANISM

Robert J. Goettel, 8101 W. Montebello Ave., Glendale, Ariz. 85303

Filed Aug. 8, 1986, Ser. No. 894,569

Int. Cl.⁴ B63B *22/00*

U.S. Cl. 441—6 **20 Claims**



1. A self-contained marker buoy release mechanism for marking the location of a submerged boat comprising:

(a) a housing for mounting on the boat, said housing defining an air tight interior compartment;

(b) an inflatable marker buoy releasably carried on the exterior of said housing;

(c) means connected between the exterior of said housing and said marker buoy for tethering said marker buoy to said housing;

(d) inflating means including a supply of compressed gas, said inflating means being coupled to said inflatable marker buoy and being actuatable for supplying the compressed gas to said inflatable marker buoy for inflation thereof;

(e) electric power supply means;

(f) electric operating means coupled to said inflating means and being operable for actuating said inflating means;

(g) circuit means connected between said power supply means and said electric operating means; and

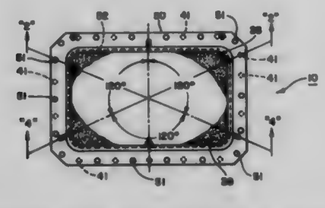
(h) a normally open differential pressure switch for sensing the differential pressure between the interior compartment of said housing and the exterior thereof, said differential pressure switch being electrically mounted in said circuit means for holding said circuit means open when the sensed differential pressure is below a predetermined value and completing said circuit means when the sensed differential pressure exceeds the predetermined value.

4,721,487
LIFE LINE APPARATUS
Newton J. Cochran, One Elm Ave., Wellesley, Mass. 02170
Filed Jan. 8, 1987, Ser. No. 1,520
Int. Cl.[4] B63C 9/26
U.S. Cl. 441—80 1 Claim



1. A life line apparatus, comprising:
a. life jacket means securable to a user;
b. flexible life line means fixedly secured to said life jacket means;
c. pocket means formed in said life jacket means, said flexible life line means being removably retained within said pocket means; and,
d. suction cup attachment means secured to a free end of said flexible life line means, said suction cup attachment means being removably retained within said pocket means, said suction cup attachment means comprising a plurality of suction cups fixedly secured along spaced apart sections of said flexible life line means, thereby to permit said user to utilize said plurality of suction cups as steps to climb upon a structure.

4,721,488
APPARATUS FOR TENSING A SHADOW MASK FOIL
Lawrence W. Dougherty, Sleepy Hollow, and James R. Fendley, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Feb. 21, 1986, Ser. No. 831,696
Int. Cl.[4] H01J 9/227
U.S. Cl. 445—30 11 Claims



1. Apparatus for use in the fabrication of an envelope section of a color cathode ray tube, said envelope section comprising a faceplate having a target surface and further having a shadow mask foil support frame affixed to said faceplate and circumscribing said target surface, said apparatus comprising:
a pedestal having registration affording means associated therewith;
a tensing structure including a fixture comprising means for clamping the edge of a shadow mask foil to support and maintain said foil taut, and
anvil means for engaging a peripheral portion of said clamped foil to induce a deflection of said foil and, thereby, a predetermined tension in said foil;
first indexing means for effecting repeatable registrations between said fixture and said pedestal registration affording means; and
second indexing means for registrably mounting said faceplate upon said tensing structure with said foil support frame disposed in a confronting relation to said tensioned shadow mask foil.

4,721,489
ILLUMINABLE FIGURINE
David Galoob, 335 St. Francis Blvd., San Francisco, Calif. 94127
Continuation-in-part of Ser. No. 561,311, Dec. 14, 1983, abandoned. This application Oct. 2, 1985, Ser. No. 783,001
Int. Cl.[4] A63H 33/36, 3/00
U.S. Cl. 446—23 2 Claims

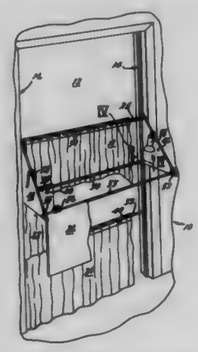


1. An illuminable figurine, comprising
a substantially opaque representation of one of a human, human-type, animal and animal-type creature having a torso having a chest having a section of substantially translucent material, a chest cavity, a closed back of a determined area and a hole formed through said back and covering less than one third of the area of said back; and
an intermittent source of illumination mounted in said cavity and having a rotatable wheel extending through said hole through said back, said source of illumination producing sparks creating intermittent flame-like illumination in said chest cavity under manual rotation of said wheel, said flame-like illumination being visible from outside said figurine at said translucent section, whereby said translucent section appears to be aflame upon internal illumination of said chest cavity.

4,721,490
PLAY THEATRE
Edward F. Drangelis, 45799 Greenridge, Northville, Mich. 48167
Filed Feb. 12, 1986, Ser. No. 828,771
Int. Cl.[4] A63H 33/00
U.S. Cl. 446—82 9 Claims

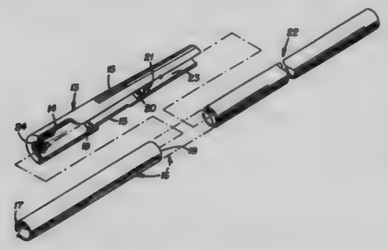
1. A kit for making a miniature theatre from disassembled components for use in a doorway having a pair of doorjambs, said kit comprising; a pair of generally planar support members, a top curtain having a first rod pocket, a first spring biased rod adapted to suspend said top curtain therefrom and to extend through said first rod pocket, a pair of side curtains having respective second and third rod pockets, a second spring biased rod adapted to suspend said side curtains therefrom and extend through said second and third rod pickets, a bottom curtain having a fourth rod pocket and a third spring biased rod adapted to extend through said fourth rod pocket to suspend said bottom curtain therefrom and to extend in compression between the doorjamb, said curtains defining an opening for a stage, said first and second rods also adapted to compressibly extend between each support member to hold said support members between the first and second rods and the doorjamb, said support members each having rod support

means, and a fourth rod, so that when the support members are positioned between the first and second rods and the door



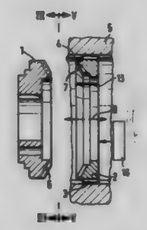
jamb, the fourth rod is adapted to be supported, in a laterally spaced relation, from the doorway.

4,721,491
BALLOON INFLATION VALVE
Bradley H. Buchanan, San Francisco, Calif., assignor to M & D Industries, Inc., Brisbane, Calif.
Filed Dec. 15, 1986, Ser. No. 941,616
Int. Cl.[4] A63H 27/10; F16K 31/00
U.S. Cl. 446—222 20 Claims



1. An inflation valve for filling an inflatable member with a pressurized fluid comprising
a valve body defining a longitudinal passage and at least one fill port communicating with said passage, said fill port formed through a sidewall of said body transversely of said passage,
fill tube means, defining a conduit having an open distal end, insertable into said passage for movement from a first position to a second position longitudinally displaced from said first position,
first sealing means disposed in said passage for applying sealing pressure radially inwardly on said fill tube means for maintaining said open distal end in open communication with said fill port when said tube means is in its first position, and
second sealing means disposed in said passage for applying sealing pressure radially inwardly on said fill tube means for sealing-off communication of said open distal end with said fill port when said tube means is moved to its second position, said fill port being positioned longitudinally between said first and second sealing means.

4,721,492
OVERLOAD COUPLING HAVING A RADIALLY VARIABLE COUPLING GEAR
Ruprecht Maurer, Bad Homburg, Fed. Rep. of Germany, assignor to Ringspann Albrecht Maurer K.G., Homburg, Fed. Rep. of Germany
Continuation of Ser. No. 817,691, Jan. 10, 1986, abandoned. This application Jan. 21, 1987, Ser. No. 8,085
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502566
Int. Cl.[4] F16D 7/04
U.S. Cl. 464—38 11 Claims



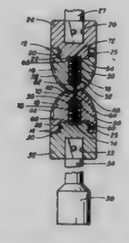
1. An overload coupling having coaxially arranged first and second coupling halves in axial alignment, said second coupling half supported in a structural part, said structural part including serrations on its inner circumference that forms a fitting sliding engagement with serrations on an outer circumference of said second coupling half, said second coupling half is axially displaceable and is held in form-fitting engagement with said first coupling half by means of at least one spring, a face gear disposed on corresponding facing surfaces of said first and second coupling halves for effecting a mutual form-fitting engagement of said first and second coupling halves, each of said face gears includes flanks wherein the flanks of said face gears rest on one another during transmission of a torque and generate an axial force component acting in a direction of disengagement of said second coupling half from said first coupling half and a radial force component toward said structural part, and said axially displaceable second coupling half includes at least one radial separation section (13) and a restoring force, and said second coupling half during transmission of torque is radially variable counter to said restoring force and when said first and second coupling halves are engaged circumferential play between said serrations on said structural part and said second coupling are eliminated.

4,721,493
UNIVERSAL JOINT WITH INTERMESHING CURVILINEAR GEARS
Robert R. Lane, 1117 Larchmont La., Oklahoma City, Okla. 73116
Filed Jul. 14, 1986, Ser. No. 885,458
Int. Cl.[4] F16D 3/16
U.S. Cl. 464—157 17 Claims

1. A universal joint comprising:
first body means having a central axis and a curved surface defining a pole on said axis, said first body means further having a plurality of spaced teeth extending from said pole along said curved surface;
second body means adjacent said first body means, said second body means having a central axis and a curved surface defining a pole on said central axis of said second body means, said second body means further having a plurality of spaced teeth extending from said pole of said second body means along said curved surface of said second body means, said first and second body means being relatively pivotable such that said central axes thereof may be moved between an aligned position and a position angularly displaced from one another, said teeth

on said curved surface of said second body means being adapted for meshing engagement with said teeth on said curved surface of the first body means for relative rotation between said first and second body means regardless of the position of angular displacement of said central axes;

flexible and resilient connecting means for interconnecting said first and second body means and maintaining said teeth in said meshing engagement during relative pivotation of said first and second body means in any direction and mutual rotation therebetween;



a first O-ring disposed adjacent said pole of said first body means and coaxial therewith for guiding at least a portion of said flexible and resilient connecting means when said central axes are in a position of angular displacement; and

a second O-ring disposed adjacent said pole of said second body means for guiding another portion of said flexible and resilient connecting means when said central axes are in a position of angular displacement.

4,721,494

DRIVE TRANSMISSION STRUCTURE FOR TRACTOR

Tetsuaki Hayashi, Osaka; Hiroshi Itatani, Sakai; Niro Rando, Sakai; Mikio Yuki, Sakai; Nobuyuki Yamashita, Sakai; Hiroyuki Ogasawara, Izumi; Mitsuaki Miyata, Sakai; Kazuaki Kurohara, Sakai; Fumihiro Ikeda, Osaka, and Yutaka Nakata, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 12, 1986, Ser. No. 862,477

Claims priority, application Japan, Sep. 2, 1985, 60-134312[U]; Dec. 27, 1985, 60-202715[U]; Jan. 9, 1986, 61-1515[U]; Jan. 9, 1986, 61-1516[U]

Int. Cl.⁴ F16H *7/02*

U.S. Cl. 474—88 **5 Claims**

1. A drive transmission structure for a tractor comprising an engine output shaft (13), a transmission (19), and a belt drive system for transmitting power from the engine output shaft (13) to the transmission (19), the belt drive system including

a belt type stepless change speed mechanism (18) having a split pulley assembly (32) provided with two split pulley sections, and swing means for swinging the split pulley assembly (32) toward the engine output shaft (13) and the transmission (19),

a first belt means (21) for transmitting the power from the engine output shaft (13) to the split pulley assembly (32),

a second belt means (22) for transmitting the power from the split pulley assembly (32) to the transmission (19),

a tension pulley type clutch mechanism (40) adapted to act on one of the first belt means (21) and the second belt means (22), and

a first control means (100) for controlling the belt type stepless change speed mechanism (18);

wherein the split pulley assembly (32) includes a rotary shaft (29) attached to the swing means (28), two outer pulley members (30A, 30B) fixed to the rotary shaft (29), and an inner pulley member (31) slidable on the rotary shaft (29) between the two outer pulley members (30A, 30B), the two outer pulley members in combination with the inner pulley member defining the split pulley section;

wherein the tension pulley type clutch mechanism (40) includes an arm (42) swingable on an axis (Y) parallel to the rotary shaft (29), and a tension pulley (41) attached to the arm (42); and

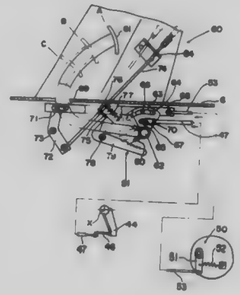
wherein the swing means (28) of the split pulley assembly (32) is swingable on the axis (Y) on which the arm (42) of the tension pulley type clutch mechanism (40) is swingable.

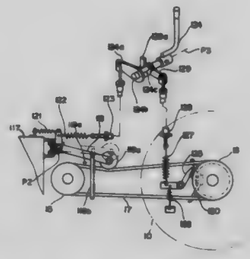
5. A drive transmission structure for a tractor comprising an engine output shaft (13), a transmission (19) including a brake mechanism (50), and a belt drive system for transmitting power from the engine output shaft (13) to the transmission (19), the belt drive system including:

a belt type stepless change speed mechanism (18) having a split pulley assembly (32) provided with two split pulley sections, and swing means for swinging the split pulley assembly (32) toward the engine outtput shaft (13) and the transmission (19);

a first belt means (21) for transmitting the power from the engine output shaft (13) to the split pulley assembly (32);

a second belt means (22) for transmitting the power from the split pulley assembly (32) to the traansmission (19);





a tension pulley type clutch mechanism (40) adapted to act on one of the first belt means (21) and the second belt means (22); and

a clutch and brake control mechanism (60) for controlling the brake mechanism (50) and the tension pulley type clutch mechanism (40);

wherein the clutch and brake control mechanism (60) includes a clutch and brake pedal (61) adapted to disengage the clutch mechanism (40) when depressed to a first depth (B) and to actuate the brake mechanism (50) when depressed to a second depth (C), and a lock mechanism (81) for engaging and locking the pedal (61) against return when the pedal (61) is depressed to the second depth (C), the lock mechanism (81) being switchable by means of a hand lever (74); and the brake mechanism (50) being directly operable by a movement of the hand lever (74) in a direction different from a direction in which the hand lever (74) is moved for switching the lock mechanism (81).

4,721,495

AUTOTENSIONER

Yoshiro Kan, Fujisawa; Isao Sato, Sagamihara, and Toshiki Watanabe, Kamakura, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

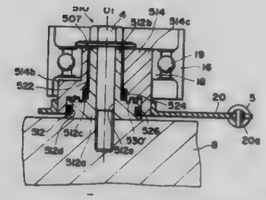
Filed Aug. 28, 1986, Ser. No. 901,257

Claims priority, application Japan, Sep. 1, 1985, 60-198664; Mar. 26, 1986, 61-65903; May 21, 1986, 61-75316[U]

Int. Cl.⁴ F16H *7/12*

U.S. Cl. 474—135 **12 Claims**





1. An autotensioner for a timing belt of an engine, comprising:

a stationary portion fixed to an engine block;

displaceable means supported for rocking movement about an axis of said stationary portion and having a cylindrical outer member surrounding said stationary portion and rotatable about an axis offset from the first-mentioned axis, said outer member engaging said timing belt so as to rotate upon operation of said timing belt;

tension imparting means for biasing said displaceable means to impart a predetermined tension to the belt; and

vibration absorbing means provided between said fixed portion and said displaceble means so as to absorb fluctuation of the tension of the belt.

4,721,496

TOOTHED BELT

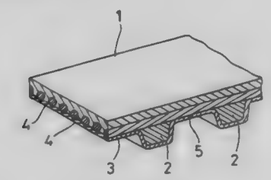
Nobuyuki Yokoyama, and Shigehiro Isshiki, both of Yamatokoriyama, Japan, assignors to Unitta Co., Ltd., Yamatokoriyama, Japan

Filed Nov. 5, 1986, Ser. No. 927,493

Claims priority, application Japan, Dec. 27, 1985, 60-298919

Int. Cl.⁴ F16G *5/08, 5/20*

U.S. Cl. 474—205 **3 Claims**



1. A toothed belt comprising:

(1) a back surface section and tooth section that are made of a hydrogenated acrylonitrilebutadiene copolymer (H—NBR) with a hydrogenation rate of 80% or more,

(2) a tooth cloth that covers said tooth section and tooth lands positioned between the adjacent tooth sections, said tooth cloth adjacent tooth sections, said tooth cloth being made of industrial nylon raw fiber with a viscosity relative to sulfuric acid of 2.6 to 2.8, a tensile strength of 5 g/denier or more, and a fineness of single fibers of 5 denier or less, and

(3) a plurality of core fibers running through the inside of said back surface section with a core fiber diameter of 0.9 to 1.1 mm and a ratio of said core fiber diameter to said tooth cloth thickness in the range of 1.8 to 5.0, said core fibers being made of glass fiber filaments with a first twist number of 1.7 to 2.6 twists/inch, and a final twist number of 1.8 to 2.3 twists/inch, twisted together.

4,721,497

CONNECTOR FOR BELT-LIKE MEMBERS THAT ARE SUBJECTED TO TENSION

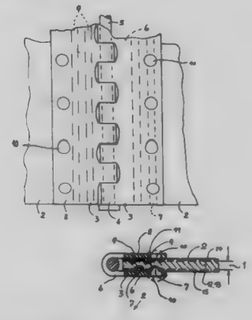
Andreas Jäger, Burgdorf, Fed. Rep. of Germany, assignor to Arnold Jäger, Fed. Rep. of Germany

Filed Sep. 24, 1986, Ser. No. 911,104

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533932; Aug. 22, 1986, 3628616

Int. Cl.⁴ F16G *11/02*

U.S. Cl. 474—255 **4 Claims**

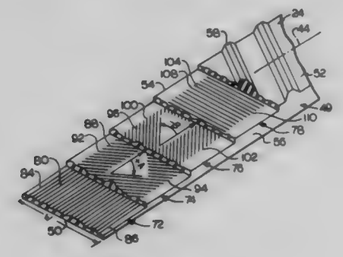


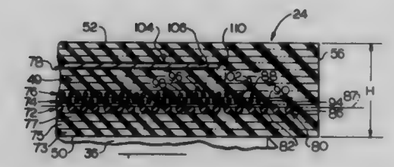
1. A connector for connecting the two ends of a rotating belt-like member that is subjected to tension; the belt-like member is provided with reinforcement means, and is essentially made of rubber or rubber-like materials; said connector comprising:

two U-shaped fittings that are interconnected in an articulated manner, each of said fittings being provided with two legs having surfaces that face one another, with a given one of said ends of said belt-like member, in the mounted state, being disposed between said facing surfaces of said legs of a given one of said fittings, whereby said fitting is secured to said belt-like member via fastening means; said facing surfaces of said legs are each furthermore provided with projection means that extend transverse to the direction in which said belt-like member rotates, with one of said projection means of a given one of said legs being disposed across from the space between two projection means of the facing leg; the thickness of said belt-like member is such, and the distance between said facing surfaces of said legs is such, that in the mounted state said reinforcement means is deformed in a wavelike manner in conformity to the configuration of said projection means; transverse rod means for effecting said interconnection of said fittings, with at least a portion of said projection means of a given one of said fittings being disposed between said fastening means and said transverse rod means, the greatest portion of said projec-

tion means of a given one of said fittings being disposed between said fastening means and said transverse rod means, the distance between successive ones of said projection means on a given one of said legs being approximately 3/2 of the distance between said facing surfaces of said legs, and the height of said projection means measured from said facing surfaces of said legs being approximately ⅓ to ½ of said distance between said facing surfaces; said belt-like member further comprising said reinforcement means in the form of a unit of rubberized fabric plies, and two respective rubber-like cover layers on opposite sides of said unit, with said cover layers each comprising about ¼ of the total thickness of said belt-like member, and said unit comprising about ½ of said total thickness.

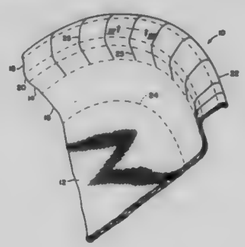
4,721,498
ENDLESS ELASTOMERIC DRIVE BELT
Robert J. Grob, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Continuation of Ser. No. 852,043, Apr. 14, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 31,204
Int. Cl.⁴ F16G 1/12
U.S. Cl. 474—261 **16 Claims**

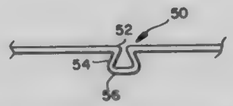




1. An endless elastomeric drive belt comprising:
an endless body having an interior surface and a longitudinal first plane therethrough;
a first ply portion in the body having first cable means for sustaining tension loads and including at least one relatively inextensible cable oriented in substantially parallel relation to the first plane, the first cable means defining a second plane substantially contiguous therewith parallel to the interior surface;
a second ply portion in the body having second cable means for increasing the longitudinal, transverse and oblique stiffness of the drive belt and including a plurality of second cables arranged at a positive bias angle to the first plane and defining in use a first shear stress and first strain level; and
a third ply portion in the body having third cable means for increasing the longitudinal, transverse and oblique stiffness of the drive belt and including a plurality of third cables arranged at a negative bias angle to the first plane and defining in use a second shear stress and second strain level, the second and third ply portions being differently constructed so as to substantially neutralize the first and second shear stresses generated from tensile loading of the belt while bending by apportioning the first and second strain levels in approximate proportion to the distance of the second and third cable means from the second plane.

4,721,499
METHOD OF PRODUCING A RIGID PAPERBOARD CONTAINER
Ronald P. Marx, Lakewood; Patrick H. Wnek, Menasha, and Denny R. Garns, Appleton, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.
Division of Ser. No. 777,873, Sep. 20, 1985, Pat. No. 4,606,496. This application Jun. 3, 1986, Ser. No. 870,024
Int. Cl.⁴ B31B 1/28
U.S. Cl. 493—152 **13 Claims**



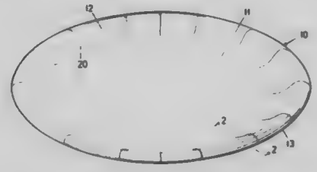


9. A method of forming a container from a flat, substantially homogeneous blank of fibrous substrate, comprising the steps of:
(a) shaping said blank into a formed container having a bottom wall, an up-turned side wall extending from the bottom wall, a rim outwardly extending from the side wall and a lip downwardly curving from said rim and including a plurality of radially-extending, circumferentially-spaced pleats formed in said side wall, rim, and lip, each said pleat including at least three layers of said blank; and
(b) applying sufficient heat and pressure to said side wall and rim to decrease the thickness thereof to less than that of said blank and to transform each said pleat into a substantially integrated fibrous structure in which the constituent layers generally lack individual identity, each said structure having a density greater than and a thickness substantially equal to adjacent areas of said side wall and rim.

4,721,500
METHOD OF FORMING A RIGID PAPER-BOARD CONTAINER
Gerald J. Van Handel, Neenah; John L. Petit, Appleton, and Patrick H. Wnek, Sherwood, all of Wis., assignors to James River-Dixie Northern, Inc., Norwalk, Conn.
Division of Ser. No. 764,965, Aug. 12, 1985, Pat. No. 4,609,140. This application Jun. 3, 1986, Ser. No. 870,038
Int. Cl.⁴ B31B 1/28
U.S. Cl. 493—152 **13 Claims**

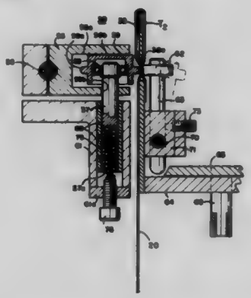
1. A method of forming a container from a flat blank of fiber substrate, comprising the steps of:
(a) shaping said blank into a formed container having a bottom wall, an upturned sidewall extending from the periphery of the bottom wall and an overturned rim extending from the periphery of the side wall;

(b) during said shaping step, forming a plurality of radially-extending, circumferentially-spaced pleats in said rim, each said pleat including at least three layers of fibrous substrate; and
(c) applying heat and pressure to said rim sufficient to de-



crease the thickness thereof to less than that of said blank and to transform each said pleat into a substantially integrated fibrous structure in which the constituent layers generally lack individual identity, each said structure having a density substantially greater than and a thickness approximately equal to adjacent areas of said rim.

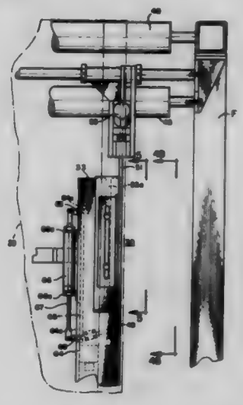
4,721,501
APPARATUS FOR PRODUCING A MACHINE-DIRECTION HEAT SEAL
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 8, 1986, Ser. No. 904,444
Int. Cl.⁴ B31B 23/64, 23/86
U.S. Cl. 493—193 **11 Claims**



1. Apparatus for producing a machine-direction heat seal in opposing layers of thermoplastic film in a hem in a moving web of thermoplastic film comprising:
a blok supported on one side of the hem,
a plurality of rollers mounted on said block at spaced locations in tandem in the direction of web movement for engaging one of the opposing layers of film along the path of the hem in the direction of web movement, said block having a corresponding plurality of surfces each of which is engaged by a side of one of said rollers,
means for heating said block and its plurality of surfaces,
means for maintaining said rollers in contact with said plurality of surfaces on said block for heating said rollers by conduction from said block, and
means supported on the opposite side of the web comprising a plurality of back-up rollers for engaging the other opposing layer of film in the hem and cooperating with said plurality of heated rollers to press together the opposing layers of films in the hem, said plurality of heated rollers and said plurality of back-up rollers being freely rotatable whereby movement of the web through the heat sealing apparatus causes the pluralities of rollers to rotate and heat seal the opposing layers of film in the hem in the direction of web movement.

6. In a machine for making bags having front and back panels from thermoplastic film, apparatus for heat sealing a pair of hems in a moving web of the thermopalstic film, each of the hems comprising folded oppposing layers of the web in the front and back panels, comprising:
a first support means supported on one side of one of the hems,
a plurality of rollers mounted on said first support means at spaced locations in tandem in the direction of web movement for engaging one of the layers of film in the one hem along a first path in the direction of web movement,
a second support means supported on one side of the second hem,
a plurality of second rollers mounted on said second support means at spaced locations in tandem in the direction of web movement for engaging one of the layers of film in the second hem along a second path in the direction of web movement,
means for heating each of said plurality of rollers, and
means supported between the pair of hems comprising a plurality of back-up rollers for engaging the other layers of film in the hems and cooperating with the pluralities of heated rollers to press together the opposing layers of film in each of the hems, said back-up rollers being alternated so that every other back-up roller is used as the back-up for the heated rollers sealing the hem on the front of the bag and alternate back-up rollers are used for the back-up of the heated rollers sealing the hem on the back of the bag to minimize separation distance between the hems during the heat sealing operation,
said pluralities of heated rollers and said plurality of back-up rollers being freely rotatably whereby movement of the web through the heat sealing apparatus causes the pluralities of rollers to rotate and heat seal the opposing layers of the web in the pair of hems along the respective paths in the direction of web movement.

4,721,502
APPARATUS FOR SEALING A HEM IN A MOVING WEB OF FILM
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 8, 1986, Ser. No. 904,441
Int. Cl.⁴ B31B 23/64, 23/86
U.S. Cl. 493—193 **13 Claims**



1. Apparatus for sealing a hem in a panel of a moving web of folded thermoplastic film comprising:
structure including a two-sided surface having the moving web passing on one side of said surface and an edge of the

web wrapped around said surface on the other side of said surface forming the hem in two layers of the web in the direction of movement of the web prior to leaving said surface, said structure having an opening in said surface extending along the path of movement of the hem;

means carried by said structure on said other side of said surface for engaging the layer of the hem wrapped around said other side for maintaining the moving web of film tightly around said surface and against the opposite sides thereof to avoid formation of wrinkles in the film during the heat sealing of the hem;

means supported adjacent said opening in said surface for heat sealing together the two web layers in the hem in the direction of movement of the web while the web is moving and prior to the sealed hem leaving said surface, said heat sealing means comprising a plurality of heated rollers mounted in tandem in the direction of movement of the web and supported at said one side of said surface, said rollers being positioned to extend through said opening in said surface; and

backup means positioned on said other side of said surface in alignment with said opening for cooperation with said heated rollers to engage the opposite side of the hem for heat sealing the hem while the web is moving and prior to the sealed hem leaving said surface.

4,721,503

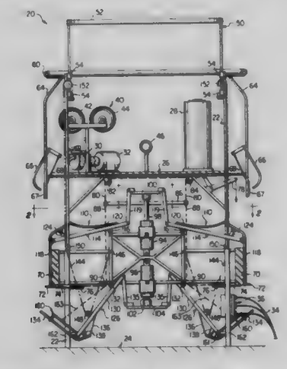
AGRICULTURAL STORAGE BAG FOLDING APPARATUS AND METHOD

David H. Rasmussen and Walter L. Jay, both of Blair, Nebr., assignor to Ag-Bag Corporation, Astoria, Oreg.

Continuation of Ser. No. 708,557, Mar. 5, 1985, abandoned. This application Jun. 18, 1987, Ser. No. 61,609

Int. Cl.[4] B65H *45/107*; B31B *1/26*

U.S. Cl. 493—413 **21 Claims**



1. An apparatus for folding flexible tubular material, comprising:

a frame having an upper end and a lower end;

a plurality of fold supporting surfaces mounted about the periphery of the frame between the upper and lower ends thereof for supporting successive folds of flexible tubular material;

aligning means beyond the supporting surfaces for aligning successive portions of the flexible tubular material with the fold supporting surfaces;

a plurality of upper arms mounted on the frame about the fold supporting surfaces for movement between retracted and extended positions;

a plurality of lower arms mounted on the frame below the fold supporting surfaces for movement between retracted and extended positions;

actuating means mounted on the frame for alternately extending and retracting the upper and lower arms into and out of engagement with the fold supporting surfaces and thereby forming the flexible tubular material into a series of folds each extending parallel to the fold supporting surfaces;

an unwinding mechanism for supporting a roll of flexible tubular material within the frame adjacent the upper end thereof; and

an advancing mechanism, including a subframe slidably mounted on the upper end of the frame and means for reciprocating said subframe upwardly a predetermined distance above the upper end of the frame, thereby withdrawing tubular flexible material upwardly from the unwinding mechanism and downwardly a predetermined distance toward the upper end of the frame, thereby releasing the flexible tubular material for movement toward the fold supporting surfaces.

4,721,504

APPARATUS AND METHOD FOR FOLDING CUT SHEET PAPER

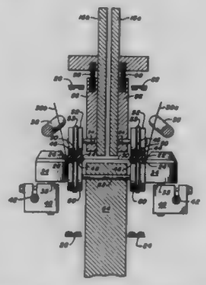
John Cogswell, Needham, and Robert F. Fokos, Wayland, both of Mass., assignors to Sequa Corporation, New York, N.Y.

Continuation of Ser. No. 497,642, May 24, 1986, Pat. No. 4,588,393. This application Mar. 4, 1986, Ser. No. 835,956

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.[4] B31B *1/58*

U.S. Cl. 493—440 **26 Claims**



1. Apparatus for forming at least one fold in a non-creased, sheet of paper, moving in a first direction, comprising:

at least one pair of opposed belts each having a first surface that positively and continuously grips said sheet as it traverses said apparatus, with at least one portion of each said sheet projecting from one edge of at least one of said gripping belts, said one edge defined by the intersection of said first surface and a second side surface of each of said belts extending in said first direction and against which said projection portion is folded, said one edge moving with said belts, said moving one edge defining the location of said fold, said location being indepedent of any characteristics of said sheet,

means for advancing said belts in a manner that carries said gripped sheet through said apparatus with substantially no relative motion between said belts and said sheet,

means associated with said moving one edge for progressively rotating said projecting portion about and against said moving one edge as said sheet advances through said apparatus, to produce a single line fold in said paper product at said moving one edge and

means for providing control over the lateral position of said belts throughout said rotation, said means including a continuous structure formed integrally with said belt and extending continuously along a rear surface of said belt that is opposite said first surface.

4,721,505

CENTRIFUGAL SEPARATOR

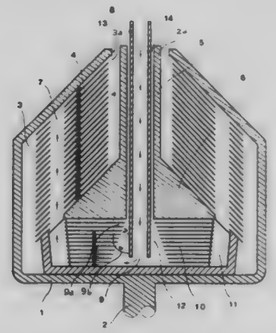
Claes Inge, Saltsjoe-Duvnäs; Torgny Lagerstedt, Stockholm; Leonard Borgstroem, Bandhagen; Claes-Goeran Carlsson, Tullinge; Sven-Olof Naebo, Tyresoe; Hans Moberg, Stockholm, and Peter Franzen, Tullinge, all of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

Filed Oct. 23, 1986, Ser. No. 924,993

Claims priority, application Sweden, Oct. 30, 1985, 8505128

Int. Cl.[4] B04B *7/08*

U.S. Cl. 494—74 **14 Claims**



1. In a centrifugal separator having a rotor, a separation chamber in said rotor, a conduit having a discharge opening within the rotor for supplying liquid mixture to be separated, a plurality of annular discs arranged coaxially with the rotor and spaced from one another, a central receiving chamber formed by said discs in the rotor for receiving liquid from said conduit, the spaces between said discs forming passageways connecting said receiving chamber with said separating chamber, the improvement which comprises a channel communicating with the receiving chamber in a zone along its axial extension for removing gas therefrom in an axial direction, the discharge opening of said supply conduit being positioned so that a plurality of said passages lie between said discharge opening and said zone, said supply conduit and said discs being arranged to maintain at the discharge opening a body of liquid extending through at least certain of said passages, the supply conduit being of a length such that its discharge opening is positioned within the body of liquid during operation of the rotor, whereby liquid mixture supplied through said conduit forms a liquid phase continuous with said liquid body.

4,721,506

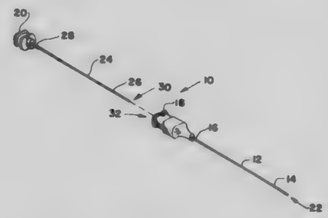
FLAT-INCLINED TIP NEEDLE

Leonides Y. Teves, 623 - 39th St. West, Bradenton, Fla. 33505

Filed Nov. 7, 1986, Ser. No. 928,187

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—51 **7 Claims**



1. An epidural needle for providing liquid communication with a space proximate the dura mater of a spinal cord of a patient comprising:

a needle shaft having a first end and a second end with an axial channel extending therebetween;

said second end of said needle shaft having an attachment means for providing a liquid tight engagement with the syringe;

said first end of said needle shaft having an inclined surface and a rounded and blunted point;

a solid rod having a first end and a second end and being slidably receivable into said axial channel of said needle shaft such that said first end of said solid rod is aligned with said first end of said needle shaft;

said first end of said solid rod having an inclined surface and a rounded and blunted point;

said point of said needle shaft and said point of said solid rod together defining a unitary tip configuration having a blunt portion and an inclined portion;

said blunt portion of said unitary tip forming an end face disposed at an angle of about 80° to 100° relative a longitudinal axis of said needle shaft whereby said unitary tip avoids nicking, piercing, severing, or perforating the veins, arteries, nerves and dura of the patient in traversing the spinal ligaments in and entering a space proximate the dura mater of the spinal cord of the patient to provide liquid communication with the space when the solid rod is withdrawn from the axial channel of the needle shaft.

4,721,507

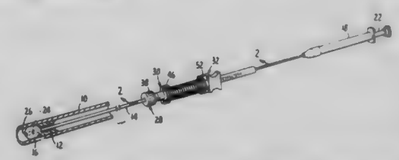
SHEAR FORCE GAUGE AND METHOD AND APPARATUS FOR LIMITING EMBOLECTOMY SHEAR FORCE

Albert K. Chin, Palo Alto, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Filed Jun. 5, 1986, Ser. No. 872,048

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—100 **6 Claims**



1. An improved embolectomy apparatus comprising: an elongate catheter having a through lumen; a balloon secured to the catheter proximate one end thereof in sealed fluid communication with the lumen; a syringe secured to the catheter proximate the other end thereof in sealed fluid communication with the lumen; first means slidably carried by the catheter to selectively grip the catheter through frictional engagement therewith, said apparatus including means to adjust the degree of frictional engagement between the first means and the catheter to permit the first means to slip relative to the catheter to limit the tension applied to the catheter; second means secured to the first means to apply force thereto and tension to a catheter gripped thereby; and third means operatively associated with the second means to sense the force applied to the first means through the second means.

4,721,508

OSTOMY PROSTHESIS

Thomas A. Burton, Rochester, Minn., assignor to Waters Instruments, Inc., Rochester, Minn.

Filed Oct. 9, 1984, Ser. No. 658,766

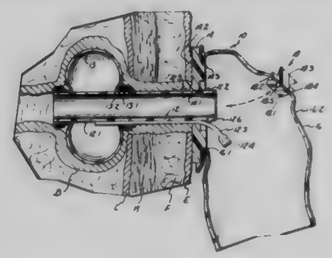
Int. Cl.[4] A61F *5/445*

U.S. Cl. 604—338 **9 Claims**

1. An ostomy prosthesis connectable to the stoma of a patient and including a drainage tube having an inner end portion insertable within the stoma of a patient and an outer end portion, securing means carried by the inner end portion for secur-

VOL 1086 ISS 4 JAN 26 1988 UMI

ing the latter to the stoma deep to the facia, and plate means for flatly abutting the skin of a patient adjacent the stoma, means connecting the outer end portion of the drainage tube to the plate means, the plate means including an orifice positioned to



define, with the outer end portion of the drainage tube, a passageway for the evacuation of bowel contents, an ostomy bag having a mouth, and means sealing the mouth to the, plate means about the passageway to enable the bag to receive bowel contents therefrom.

4,721,509

PROSTHETIC SPHINCTER DEVICES

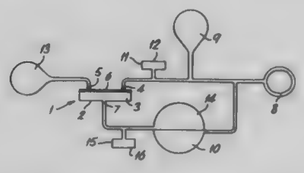
Michael D. Craggs, London, England, assignor to National Research Development Corporation, London, England

Filed May 12, 1986, Ser. No. 861,894

Claims priority, application United Kingdom, May 13, 1985, 8512069

Int. Cl.⁴ A61F *2/08*

U.S. Cl. 623—14 **8 Claims**



1. A prosthetic sphincter device in the form of a closed pressure-fluid system operable by the recipient to control a body duct, which device comprises:

first and second reservoirs respectively to hold working pressure fluid at a varying pressure and controlling pressure fluid at a preset pressure;

inflatable duct-obturating means;

first and second pumps respectively operable to inflate and deflate said obturating means;

a valve having a through passageway defined at least in part by an element movable to open and close the same; and

a chamber having a wall in the form of a self-sealing septum allowing flow of fluid therethrough by way of an injection instrument;

said first reservoir, second pump and obturating means being connected with said valve at one end of said passageway to form a first end portion of a working fluid circuit;

said first pump being connected with said valve at the other end of said passageway to form a second end portion of said working fluid circuit;

said second reservoir being connected with said valve to form a controlling fluid circuit operable to effect passageway closing movement of said element under said preset pressure;

said first and second pumps being operable to convey fluid in said working circuit respectively from said first to second end portion thereof and in the opposite manner, while in each case said controlling circuit acts on said valve to hold said end portions of said working circuit to and from which fluid is conveyed respectively at an elevated pressure not greater than said preset pressure and at a relatively lower pressure, to cause deflation and inflation of said obturating means; and

said chamber being connected with said second reservoir in said controlling circuit to allow adjustment of said preset pressure.

4,721,510

ARTIFICIAL FOOT

John E. Cooper, Leatherhead, and Alan Wilcox, Richmond, both of England, assignors to J. E. Hanger & Company, Limited, London, England

Filed Feb. 24, 1987, Ser. No. 17,725

Claims priority, application United Kingdom, Feb. 28, 1986, 8605026

Int. Cl.⁴ A61F *2/66*

U.S. Cl. 623—55 **15 Claims**



1. An artificial foot comprising in combination:

a hollow flexible cosmesis having a sole formed with an instep region and a region spaced from the instep region that flexes relative to the instep region during ambulation;

a keel member in the cosmesis having a lower region fixed to the sole at the instep region and having an upper region by which it is intended to be fixed to upper parts of the leg;

leaf spring means having a basal region held to the keel member at the instep region of the sole and having a terminal region that rests on the deformable region of the cosmesis; and

snubbing means extending from the keel member in cantilevered relationship thereto, said snubbing means being spaced below said cosmesis and being in spaced overlying relationship to the leaf spring means which is deformable into contact with said snubbing means by ground reaction, the stiffness of the leaf spring means being such that during ambulation the leaf spring means provides a primary path by which ground reaction is transmitted to the keel and that ground reaction causing the leaf spring means to contact the snubbing means is transmitted to the keel via an overload path through the snubbing means.

4,721,511

LEACH RESISTANT ANTIMICROBIAL FABRIC

John J. Kupits, Newtown, Pa., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 5, 1984, Ser. No. 658,331

Int. Cl.⁴ A61K *31/695, 9/70*

U.S. Cl. 8—188 **14 Claims**

5. A bioactive fabric comprising:

a non-woven substrate selected from the group consisting of polypropylene and polyethylene;

from about 0.7 to about 1.05% by weight of an alkoxy silicone quaternary amine; and

from about 0.1 to about 0.75% by weight of triethanolamine titanium chelate.

4,721,512

PROCESS FOR AFTERTREATING DYED CELLULOSIC MATERIAL

Rosemarie Töpfl, Dornach; Heinz Abel, and Jörg Binz, both of Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1986, Ser. No. 925,058

Claims priority, application Switzerland, Nov. 25, 1985, 5021/85

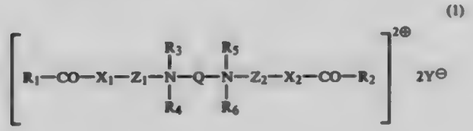
Int. Cl.⁴ D06M *1/00*

U.S. Cl. 8—188 **18 Claims**

1. A process for aftertreating dyed cellulosic fibre material, which comprises treating said material with an aqueous liquor comprising

(A) a diquaternary ammonium salt of formula

(1)



wherein

Q is a divalent aliphatic hydrocarbon radical of 2 to 12 carbon atoms which may be interrupted in the chain by oxygen atoms and is unsubstituted or substituted by hydroxy groups,

R_1 and R_2 are each independently of the other an aliphatic radical of 6 to 24 carbon atoms,

R_3 to R_6 are each independently of the other lower alkyl, hydroxy-lower alkyl or lower alkoxy-lower alkyl,

X_1 and X_2 are each independently of the other oxygen or —NH—,

Z_1 and Z_2 are each independently of the other C_2–C_6alkylene, and

$Y^{\ominus}$ is an anion of a strong inorganic or organic acid, and

(B) a polybasic nitrogen-containing polycondensate.

4,721,513

CATHODE PREPARATION METHOD FOR MOLTEN CARBONATE FUEL CELL

James L. Smith, Lemont; James W. Sim, Evergreen Park, and Eugenia H. Kucera, Downers Grove, all of Ill., assignors to The United States of America represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 28, 1982, Ser. No. 343,606

Int. Cl.⁴ H01M *6/00*

U.S. Cl. 29—623.5 **10 Claims**

1. A method of preparing a cathode structure for use in a fuel cell with a molten carbonate salt electrolyte comprising:

providing a porous sintered plaque of nickel metal that is substantially free of lithium;

oxidizing the nickel metal in said porous plaque substantially free of lithium to form nickel oxide by contact with an oxygen containing gas at a temperature of no more than about 600° C. to 700° C.; and

subsequently adding to said plaque a limited amount of lithium salt at a temperature of no more than 600°–700° C. to lithiate said nickel oxide to a lithium level of about 1–6 atom percent lithium while maintaining the structure integrity of said plaque.

4,721,514

COAL GASIFICATION METHOD USING COAL POWDER

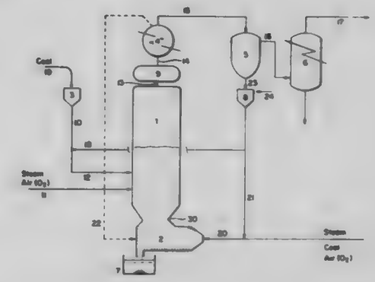
Kenichi Kikuchi, Yokohama; Akio Suzuki, Kawasaki, and Tetsuro Mochizuki, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 649,291, Sep. 11, 1984, abandoned, which is a continuation of Ser. No. 316,529, Oct. 29, 1981, abandoned. This application Apr. 24, 1986, Ser. No. 858,882

Claims priority, application Japan, Oct. 31, 1980, 55-152144

Int. Cl.⁴ C10J *3/54*

U.S. Cl. 48—202 **6 Claims**



1. A coal gasification method comprising:

(a) providing a gasification vessel having a reaction chamber and a combustion chamber in fluid communication with and positioned below the reaction chamber, said reaction chamber separated from said combustion chamber by a reduced area throat portion and an intermediate diverging portion extending from said throat portion to said reaction chamber, said vessel having an outlet spaced from said throat portion and maintaining a gas velocity at said throat portion between 20–24 m/s;

(b) establishing a heated gasification zone in said reaction chamber by combusting a fuel-air mixture within said combustion chamber;

(c) reducing the size of a raw coal to particles having a size of less than about 3 mm;

(d) injecting the raw coal particles at a feed rate of 40–100 kg/h, steam and oxygen or air into said reaction chamber at a point spaced downstream from the intermediate diverging portion and about midway between the throat and the outlet pipe, said steam and oxygen or air providing a steam to oxygen ratio of from about 0.6 to about 1.5;

(e) reacting said raw coal powder, steam and oxygen or air in said reaction chamber at a temperature of from about 1070° C. to about 1180° C. under fluidized bed gasification conditions to produce product gas, char and ash;

(f) agglomerating said ash in said reaction chamber as a consequence of said fluidized bed gasification conditions until said ash attains a grain diameter between 2.5 mm and 10 mm and a density greater than 1.1 g/m^3 of char particles and thereby drops from said reaction chamber, through said throat to said combustion chamber against the velocity of a gas stream rising from said combustion chamber;

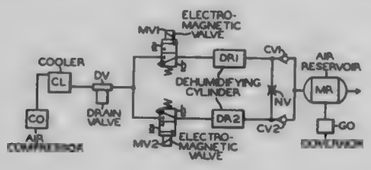
(g) removing said product gas and said char from said reaction chamber through the outlet pipe;

(h) separating said product gas and said char;
(i) injecting said separated char into said combustion chamber together with oxygen or air and steam;
(j) combusting said char in said combustion chamber at a temperature of about 1600° C. to produce a heated product gas stream that passes upwardly through said throat and reaction chamber and is accelerated by the reduced cross section of said throat and thereby acts as the fluidizing gas to establish the fluidized bed gasification condition in the reaction chamber;
(k) fusing said agglomerated ash dropped into said combustion chamber and ash otherwise formed during combustion; and
(l) withdrawing said fused ash from said combustion chamber.

4,721,515
CONTROL SYSTEM OF A DUAL-CYLINDER TYPE DEHUMIDIFIER

Yasuhisa Hata, Akashi; Osamu Akamatsu, and Masaki Kitaue, both of Kobe, all of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Nov. 19, 1986, Ser. No. 932,121
Claims priority, application Japan, Nov. 25, 1985, 60-265604
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—162 6 Claims



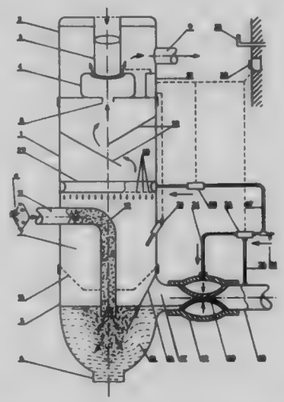
1. An air drying system comprising a pair of cylindrical dehumidifiers containing a desiccating medium, an air compressor supplying moist air to the inlet of one of the cylindrical dehumidifiers and flowing toward the outlet of one of the cylindrical dehumidifiers so that the moist air is dehumidified and is dried by the desiccating medium in one of the cylindrical dehumidifiers and letting a portion of this dry air from the one cylindrical dehumidifier to flow through the other cylindrical dehumidifier from its outlet to its inlet so that the desiccating medium in the other of the cylindrical dehumidifiers is regenerated, means for setting the time period for dehumidification, means for operating the air compressor for a time period which is longer than the set time period, means for switching the dehumidification cylinder from dehumidifying to regenerating at the set time period, and means for stopping the air compressor but retaining the condition within the dehumidification cylinder as it was before the stopping of the air compressor and for reversing the condition within the dehumidification cylinders when the air compressor is restarted.

4,721,516
CENTRAL VACUUM CLEANING INSTALLATION WITH WATER FLUSHING

Gabriel Barsacq, Biarritz, France, assignor to Aspiramatic (Societe a Responsabilite Limtee), France

Filed Feb. 13, 1986, Ser. No. 829,027
Claims priority, application France, Jan. 17, 1986, 86 00731
Int. Cl.[4] B01D *47/02*
U.S. Cl. 55—218 10 Claims

1. A central vacuum cleaning system comprising:
(a) permanent ducts with suction orifices and located in a building;
(b) a vacuum apparatus in fluid communication with said permanent ducts and comprising:
(1) a central suction means for producing suction in said permanent ducts;
(2) means for removing dust from air drawn into said permanent ducts;
(3) means comprising a perforated annular conduit within said vacuum apparatus;
(4) fluid outlet means comprising fluid outlet valve means; and
(c) means to generate a flushing effect within said vacuum apparatus:

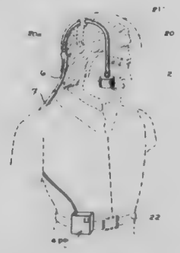


(1) a three-way valve in communication between said fluid outlet valve means and a pressurized source of water;
(2) a two-way valve in parallel to said threeway valve and in communication between said perforated annular conduit and said pressurized source of water; and
(3) time control means for said valves for actuating a cycle of operation comprising closing said fluid outlet valve means, passing water through said perforated annular conduit for a predetermined time period, and opening said fluid outlet valve means.

4,721,517
SAMPLING DEVICE FOR COLLECTING FUME

Yves Cloutier, Montreal, Canada, assignor to IRSST - Institut de Recherche en Sante et en Securite du Travail du Quebec, Montreal, Canada

Filed Mar. 6, 1987, Ser. No. 23,116
Int. Cl.[4] B01D *35/02*
U.S. Cl. 55—270 16 Claims



1. A sampling device for collecting at least part of air-borne particles in a workman's breathing zone, said device comprising a cassette provided with an inlet, an outlet and an air filter, a vacuum pump and a flexible tubing of determined length connecting the vacuum pump to the outlet of the cassette so that a portion of the air-borne particles in said breathing zone, is drawn through said filter and is collected thereon, wherein:
a deformable metallic tubing is positioned between one end of the flexible tubing and one end of a short tubing connected to the outlet of the cassette, and
at least one fastening means is provided for fixing the deformable metallic tubing to at least one strap intended to be tightened around a workman's head.

9. A sampling device for collecting air-borne particles in a workman's breathing zone, said device comprising a cassette provided with an inlet, an outlet and an air filter, a vacuum pump and a flexible tubing of determined length connecting the vacuum pump to the outlet of the cassette so that a portion of the air born particles in said breathing zone, is drawn through said filter and is collected thereon, wherein:
a deformable metallic tubing is positioned inside a portion of the length of the flexible tubing, and
at least one fastening means is provided for fixing the portion of the flexible tubing containing said deformable metallic tubing, to at least one strap intended to be tightened around the workman's head.

4,721,518
MOLD FOR PRESS-MOLDING GLASS ELEMENTS

Hideto Monji, Katano; Masaki Aoki, Mino; Hideo Torii, Higashiosaka, and Hideyuki Okinaka, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 10, 1985, Ser. No. 807,230
Claims priority, application Japan, Dec. 10, 1984, 59-259328
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] C03B *5/18*
U.S. Cl. 65—374.11 18 Claims

1. A mold for press-molding glass elements comprising:
a base member made of a compound material comprising a ceramic and an active metal;
a platinum group metal alloy layer for forming a mold surface; and
at least one intermediate layer provided between said base member and said platinum group metal alloy layer for preventing said active metal from diffusing to said mold surface.

4,721,519
STABLE AMMONIUM POLYPHOSPHATE LIQUID FERTILIZER FROM MERCHANT GRADE PHOSPHORIC ACID

William P. Thomas, Winter Haven, and William S. Lawton, Lakeland, both of Fla., assignors to American Petro Mart, Inc., Bartow, Fla.

Filed Mar. 20, 1986, Ser. No. 841,873
Int. Cl.[4] C05B *7/00*
U.S. Cl. 71—34 13 Claims

1. A stable ammonium polyphosphate liquid fertilizer prepared by reaction of ammonia with concentrated wet-process phosphoric acid having a P205 concentration of 54 to 62 weight percent with substantially all of the P205 therein being in ortho form, said wet-process phosphoric acid prior to concentration having been contacted with a cation exchange resin to remove magnesium and calcium without appreciable reduction of iron and aluminum, said concentrated acid still containing on a weight percent basis referenced to 60% P205: (i) 1.0% or greater iron and aluminum calculated as Fe203 and Al203, (ii) less than 0.3% magnesium calculated as MgO, and (iii) less than 0.15% total of sodium, potassium and calcium calculated as Na20, K20, and CaO, said liquid fertilizer being further characterized by remaining substantially sludge-free when stored at 25° C. for 6 months without addition of any sequestering or suspending agent.

4,721,520
AGRICULTURAL SULFONAMIDES

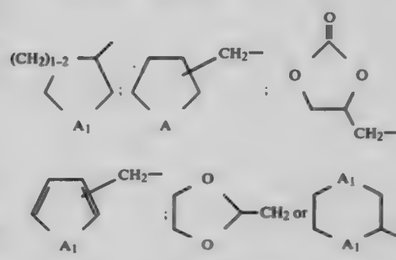
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 452,106, Dec. 22, 1982, Pat. No. 4,592,978, which is a division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Mar. 27, 1986, Ser. No. 826,918
Int. Cl.[4] C07D *239/69, 409/12, 407/12;* A01N *43/54*
U.S. Cl. 71—91 17 Claims

1. A compound selected from

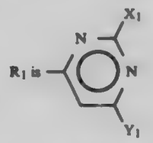


wherein
Q is O;
R is C_1–C_5 alkyl; C_3–C_5 alkenyl; C_3–C_5 alkynyl; C_2–C_5 alkyl substituted with 1–4 substituents selected from (a) 0–3 atoms of F, Cl or Br, (b) 0–2 OCH_3 groups or (c) 0–1 cyano groups;
R is also CH_2CN; $CH(R_7')CO_2CH_3$; $CH(R_7')CO_2C_2H_5$; C_3–C_5 alkenyl substituted with 1–3 atoms of F, Cl or Br;
R is also C_3–C_5 alkynyl substituted with one of F, Cl or Br;
R is also C_5 cycloalkyl; C_5 cycloalkenyl; C_5 cycloalkyl substituted with F, Cl or Br;
R is also C_4–C_5 cycloalkylalkyl; C_4 cycloalkylalkyl substituted with 1 CH_3 group;



R is also H; M; $CH_2CH_2OR_7$; $CH_2CH_2CH_2OR_7$; $CH(CH_3)CH_2OR$ CH_2OR_8,; $(CH_2CH_2O)_nR_8$;CH_2CH_2-$S(O)_{0,2}R_{12}$; $CH_2CH_2CH_2S(O)_{0,2}R_{12}$;
R_7' is H or CH_3;
A is O or S;
A_1 is O, S or SO_2;
R_7 is CH_2CH_3, $CH(CH_3)_2$, CH_2CH_2Cl or CH_2CCl_3;
R_8, is CH_3, CH_2CH_3, $CH(CH_3)_2$, CH_2CH_2Cl, CH_2CCl_3, $CH_2CH_2OCH_3$ or $CH_2CH_2OCH_2CH_3$;

R_8 is CH_3;
n, is 2;
R_{12} is CH_3, CH_2CH_3, or $CH(CH_3)_2$;



R_2 is H, Cl, Br, F, C_1–C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN;
R_3 is H, Cl, Br, F or CH_3;
R_4 is H;
R_5 is H;
M is an alkali metal;
W is O or S;
Y_1 is H, OCH_3 CH_3 or OCH_2CH_3
X_1 is H, Cl, OCH_3, OCH_2CH_3 or CH_3;
provided that
(a) X_1 and Y_1 are not simultaneously hydrogen and
(b) the total number of carbon atoms of R is less than or equal to 5.

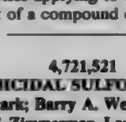
16. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,721,521
HERBICIDAL SULFONAMIDES

James V. Hay, Newark; Barry A. Wexler, Wilmington, both of Del., and Donna F. Zimmerman, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

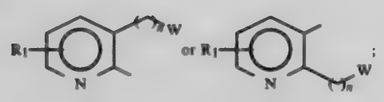
Continuation-in-part of Ser. No. 768,158, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,549, Dec. 11, 1984, abandoned. This application Oct. 10, 1986, Ser. No. 917,930
Int. Cl.[4] C07D *401/12, 401/14;* A01N *43/66, 43/68*
U.S. Cl. 71—92 **24 Claims**

1. A compound of the formula



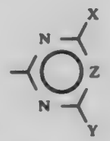
I

wherein
L is



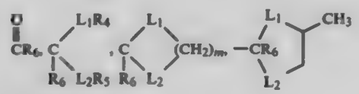
L-1 L-2

R is H or CH_3;
W_3 is O or S;
n is O or 1;
R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, CH_2CN, CH_2OCH_3, CH_2SCH_3, CN, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or CO_2R^{III};
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R^I and R^{II} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_4 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
W is W_1;
W_1 is C_2–C_8 alkenyl substituted with 1–3 atoms of F, Cl or Br;
A is



A-1

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl,



or $N(OCH_3)CH_3$;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_4 and R_5 are independently C_1–C_2 alkyl;
R_6 is H or CH_3; and
Z is CH;
and their agriculturally suitable salts; provided that
(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;
(b) when W_3 is S, then R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$; and
(c) when the total number of carbon atoms or X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two and the number of carbons of W must be less than or equal to four.

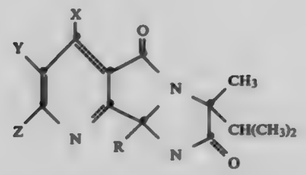
9. An agriculturally suitable composition for controlling the growth of undesired vegetation comprising an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,721,522
1H-IMIDAZO [1',2':1,2]PYRROLO[3,4-B]PYRIDINES AND THEIR USE AS HERBICIDAL AGENTS

Dieter Dürr, Bottmingen; Hans-Georg Brunner, Lausen, and Henry Szczepanski, Wallbach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 837,977, Mar. 10, 1986, abandoned. This application Nov. 3, 1986, Ser. No. 926,925
Claims priority, application Switzerland, Mar. 12, 1985, 1111/85; Dec. 20, 1985, 5451/85
Int. Cl.[4] A01N *43/48;* C07D *471/14*
U.S. Cl. 71—92 **16 Claims**

1. A pyridine compound of formula I



(I)

wherein each of X, Y and Z independently of one another is hydrogen or a C_1–C_4alkyl group, or two adjacent substituents together also form a saturated or unsaturated 3- or 4-membered alkylene chain or alkenylene chain, each of which chains may in turn be substituted by one to four C_1–C_4alkyl groups; R is the hydroxyamino group, a C_1–C_4alkoxyamino, C_3–C_4alkenyloxyamino or C_3–C_4alkynyloxyamino group, a $—PO(OC_1$–$C_4alkyl)_2$ or $—PO(CH_3)OC_1$–C_4alkyl radical or a hydrazino radical $—NR_1NR_2R_3$, in which R_1 is hydrogen or C_1–C_4alkyl, R_2 is hydrogen, C_1–C_4alkyl or benzyl and R_3 is hydrogen, C_1–C_4alkyl, benzoyl, carbamoyl, thiobenzoyl, thiocarbamoyl, C_1–C_4alkylcarbamoyl, di(C_1–C_4alkyl)carbamoyl, C_1–C_4alkylthiocarbamoyl, di(C_1–C_4alkyl)-thiocarbamoyl, anilido, thioanilido, C_1–C_4alkoxycarbonyl, C_1–C_4alkylcarbonyl, C_1–C_4alkylthiocarbonyl or benzoyloxy, the phenyl rings being unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4haloalkyl or C_1–C_4alkoxy, or R_3 is another 3H-imidazo[1',2':1,2]pyrrolo[3,4-b]pyridine-2,5-dion-12-yl radical or a thiazolylcarbamoyl radical.

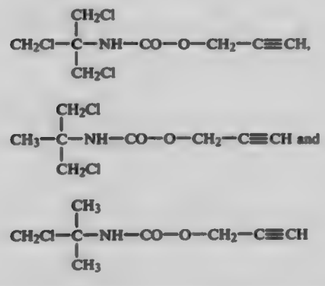
11. A method of controlling undesired plant growth, which method comprises the use of a herbicidally effective amount of a compound according to claim 1, or of a herbicidal composition containing such a compound.

4,721,523
HERBICIDAL AGENTS CONTAINING PHOTOSYNTHESIS-INHIBITING HERBICIDES IN COMBINATION WITH CARBAMATE DERIVATIVES

Michael Schwamborn, Cologne; Gerhard Heywang, Bergisch-Gladbach; Karlfried Dickoré, Leverkusen; Winfried Lunkenheimer, Wuppertal, and Carl Feitke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,270
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433541
Int. Cl.[4] A01N *43/707*
U.S. Cl. 71—93 **8 Claims**

1. In the combating of weeds in the growing of a cereal or soy beans by applying to the cereal, soy beans or to the field in which they are growing or are to be grown an amount of metribuzin effective to combat the weeds, the improvement which comprises also applying a carbamate selected from the group consisting of



in an amount sufficient to synergize with the metribuzin and at a weight ratio of 1:3 to 20:1 based upon carbamate to metribuzin.

4,721,524
NON-PYROPHORIC SUBMICRON ALLOY POWDERS OF GROUP VIII METALS

Zachary D. Sheldon, Buffalo, and Peter T. B. Shaffer, Grand Island, both of N.Y., assignors to PDP Alloys, Inc., Grand Island, N.Y.

Filed Sep. 19, 1986, Ser. No. 909,167
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—0.5 A **23 Claims**

1. An ultrafine non-pyrophoric magnetic metal alloy powder the particle size of which is less than one micron, consisting of at least one Group VIII base metal and at least one Group VIII noble metal, the at least one noble metal being in a concentration sufficient to have induced spontaneous nucleation, the x-ray diffraction pattern of the metal alloy powder exhibiting essentially the pattern of the at least one base metal phase, but wherein the at least one noble metal is homogeneously dispersed in the at least one base metal structure.

4,721,525
EXTRACTION PROCESS FOR REMOVING METALLIC IMPURITIES FROM ALKALIDE METALS

Lamar T. Royer, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

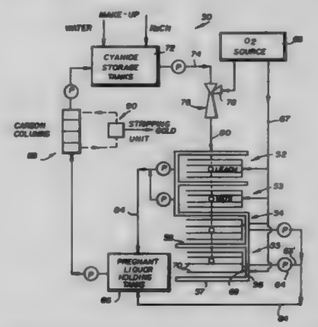
Filed Mar. 20, 1987, Ser. No. 28,267
Int. Cl.[4] C22B *26/10, 26/12*
U.S. Cl. 75—63 **4 Claims**

1. A method for removing impurities from alkali metals except for sodium and lithium, comprising the steps of contacting molten lithium with a molten alkali metal containing impurities miscible in molten lithium metal for extracting essentially all of said impurities into the molten lithium metal, and thereafter separating the alkali metal from the lithium metal containing the extracted impurities.

4,721,526
HEAP LEACHING WITH OXYGEN

Carl L. Elmore; Phillip Mitchell, both of Glens Falls, N.Y., and Robert J. Brison, Golden, Colo., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Aug. 13, 1986, Ser. No. 895,977
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R **19 Claims**



1. A method for increasing the total amount of gold or silver recoverable in pile leaching gold or silver ore comprising the steps of:
(a) piling leachable gold or silver ore into a pile;
(b) applying a cyanide leaching liquid to the pile adjacent the

top thereof to leach gold or silver from the ore into a pregnant liquor;

(c) supplying gas to the pile, the gas containing an amount of oxygen greater than in ambient air, said gas being supplied adjacent the bottom of the pile such that at least part of the gas flows countercurrently to the cyanide leaching liquid and remains in gaseous form thereby to increase the total leached yield or amount of gold or silver recovered at the completion of the leaching process in comparison with the total leached yield or amount of gold or silver recovered using air as the supplied gas; and

(d) recovering gold or silver from the pregnant liquor.

4,721,527

COLORED AUTO WAX

Wayne E. Beckley, P.O. Box 13031, El Paso, Tex. 79912

Continuation-in-part of Ser. No. 691,856, Jan. 16, 1985, abandoned. This application Jul. 11, 1986, Ser. No. 892,435

Int. Cl.⁴ C09G *1/08*

U.S. Cl. 106—10 **4 Claims**

1. A pigmented wax product comprising in combination:

at least one wax;

at least one liquid solvent and carrier for said wax; and

at least one colored ink containing a pigment suspended in a liquid carrier, said ink comprising the following composition: 65% Precipitated Chalk; 14.8% White Spirit; 10% Varnish; 6.5% Stand Oil; 3.5% Iron Blue; and 0.2% Naphthenates.

4,721,528

LOCKING COMPOUND FOR LOCKING FASTENERS IN PLACE

Jimmy A. Aldridge, Inglewood, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Continuation-in-part of Ser. No. 878,543, Jun. 25, 1986. This application Mar. 19, 1987, Ser. No. 27,912

Int. Cl.⁴ C04B *14/00*; C09D *1/00*

U.S. Cl. 106—84 **4 Claims**

1. A compound for locking a fastener in place and, thereafter, providing a visual indication that it has remained properly torqued comprising:

72.5% to 77.5% by weight of a first mixture substantially comprising, on a weight basis, 18.3% Al_2O_3, 29.5% Al_2SiO_3 and 41.4% Na_2SiO_3;

1.3% to 1.7% by weight of a second mixture of substantially, on a weight basis, 80% Al_2O_3 fiber and 20% SiO_2 particles;

0.4% to 0.6% by weight of a third mixture of substantially 88% Zr_2O_3 and 12% Y_2O_3 on a weight basis; and

20% to 23% by weight of H_2O.

4,721,529

ASPHALTIC COMPOSITIONS

Troy E. Mullins, Casper, Wyo., assignor to Unichem International, Inc., Hobbs, N. Mex.

Filed Jan. 27, 1986, Ser. No. 822,782

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—281 N **12 Claims**

1. An asphaltic composition comprising an asphalt admixed with an aggregate and at the interface between said asphalt and said aggregate the reaction product of an amine antistrip and an acid salt in an amount sufficient to bind said asphalt to said aggregate; said acidic salt being a divalent or trivalent metal salt of an inorganic acid.

4,721,530

METHOD FOR INCREASING THE THICKENING ACTION OF PYROGENICALLY PRODUCED SILICON DIOXIDE

Manfred Ettlinger, Karlstein; Johann Mathias, Maintal, and Guenter Stadtmueller, Alzenau-Hoerstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 30, 1986, Ser. No. 924,668

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542240

Int. Cl.⁴ C08C *1/28*

U.S. Cl. 106—308 N **12 Claims**

1. A method for increasing the thickening action of an aqueous dispersion of pyrogenically produced silicon dioxide comprising adding to an aqueous dispersion of pyrogenically produced silicon dioxide a sufficient amount of an ethoxylated polyethyleneamine.

4,721,531

PIGMENT DISPERSIONS EXHIBITING IMPROVED COMPATIBILITY IN POLYURETHANE SYSTEMS

George F. Wildeman, Ashtabula, and Allen J. Virant, Geneva, both of Ohio, assignors to Plasticolors, Inc., Ashtabula, Ohio

Filed Jul. 8, 1986, Ser. No. 883,329

Int. Cl.⁴ C09C *3/00*

U.S. Cl. 106—309 **26 Claims**

1. A method for improving the compatibility of pigments in the polyol-containing component of a two-component polyurethane system comprising

(A) preparing a dispersion comprising at least one pigment in at least one glycol, and

(B) blending said dispersion with the polyol component.

4,721,532

REMOVAL OF IRON FOULING IN COOLING WATER SYSTEMS

Vincent R. Kuhn, Twin Lakes, Wis.; Philip R. Engelhardt, Lake Zurich, and Wayne A. Mitchell, Crystal Lake, both of Ill., assignors to W. R. Grace & Co., New York, N.Y.

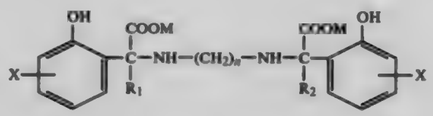
Continuation-in-part of Ser. No. 762,229, Aug. 5, 1985, abandoned. This application Jul. 22, 1986, Ser. No. 885,340

Int. Cl.⁴ C23G *1/02*

U.S. Cl. 134—3 **50 Claims**

1. A method of removing iron fouling from heat transfer surfaces of cooling water systems which comprises

(a) contacting said surfaces with an aqueous solution containing an effective amount, totalling at least 0.1 ppm, of at least one compound of the group of alkylene amine carboxyl polyacids consisting of compounds having the formula



wherein R_1, R_2, and each X may be the same or different and are each selected from the group consisting of hydrogen, methyl and ethyl, wherein each M is selected from the group consisting of hydrogen, sodium or potassium, and wherein n is an integer from 2 to 5;

(b) maintaining the solution at a pH of at least about 5, but below about 9 during removal.

4,721,533

PROTECTIVE STRUCTURE FOR AN IMMERSION PYROMETER

R. Michael Phillippi, Highland, Md.; David C. Greenspan, Vienna, and Ernie Tokay, Reston, both of Va., assignors to System Planning Corporation, Arlington, Va.

Filed Aug. 1, 1986, Ser. No. 891,847

Int. Cl.⁴ H01L *35/02*

U.S. Cl. 136—234 **20 Claims**



1. Temperature-sensing apparatus comprising, in combination,

(a) a sheath for enclosing a temperature-sensing element, said sheath comprising a closed-end metal tube;

(b) a temperature-sensing element disposed within said sheath near the closed end thereof; and,

(c) a casing having an outer surface for contacting high temperature molten media, and an inner cavity for holding said sheath, said inner cavity having an inner surface, an outer opening, and an inner closed end, said casing comprising a refractory metal oxide and graphite, and said graphite being present in a concentration from about 10 percent to about 35 percent. to provide good heat conductivity between said outer surface of said casing and inner surface of said cavity.

4,721,534

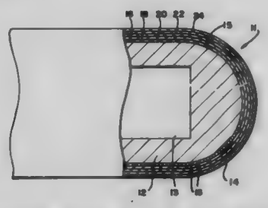
IMMERSION PYROMETER

R. Michael Phillippi, Highland, Md.; David C. Greenspan, Vienna, Va.; Richard T. Ellis, Columbia, Md.; Tadeusz M. Drzewiecki, Silver Spring, Md.; Taki Negas, Frederick, Md.; Ernie Tokay, Reston, and James R. Bush, Alexandria, both of Va., assignors to System Planning Corporation, Arlington, Va.

Filed Sep. 12, 1985, Ser. No. 775,183

Int. Cl.⁴ G01K *1/12*; H01L *35/02*

U.S. Cl. 136—234 **32 Claims**



1. A protective sheath for a temperature sensing device comprising:

(a) a metal tube having one closed end to provide a cavity for a temperature sensing device;

(b) a series of protective layers comprising at least two cermet layers consisting essentially of Al_2O_3—Cr_2O_3—Mo covering the outer surface of said metal tube, the concentration of molybdenum in the at least two cermet layers decreasing in proceeding from the inner to the outer layers, and each of said cermet layers having a porosity of from about 4% to about 33%;

(c) a ceramic layer of substantially pure Al_2O_3—Cr_2O_3 covering the outermost of the at least two cermet layers, said ceramic layer having a porosity of from about 4% to about 33%.

4,721,535

SOLAR CELL

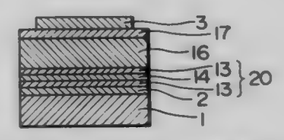
Haruo Itoh, Hino; Toshikazu Shimada, Kokubunji; Shin-ichi Muramatsu, Higashiyamato; Sunao Matsubara, Tokorozawa, and Nobuo Nakamura, Hachioji, all of Japan, assignors to Director-General of the Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,286

Claims priority, application Japan, Aug. 7, 1985, 60-172511

Int. Cl.⁴ H01L *31/06*

U.S. Cl. 136—258 **1 Claim**



1. A solar cell comprising at least a thin film having p-type conductivity, wherein said thin film is realized in a multi-layer structure including at least one non-doped layer formed of amorphous silicon carbide or nitride and having a thickness of 10 to 300 Å and at least one p-type doped amorphous silicon carbide or nitride layer of a given thickness, said p-type doped amorphous silicon carbide or nitride layer being stacked such that at least one face thereof is brought into contact with said non-doped layer or amorphous silicon carbide or nitride so that said thin film of multi-layer structure exhibits, in effect, p-type conductivity.

4,721,536

METHOD FOR MAKING STEEL TUBES OR PIPES OF INCREASED ACIDIC GAS RESISTANCE

Heinz Grob, Dortmund; Friedrich-Otto Koch, Unna-Massen; Adolf Peeck, Hamm, and Werner Wenzemann, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,405

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520702

Int. Cl.⁴ C21D *8/10*

U.S. Cl. 148—12 F **24 Claims**



1. Method of making welded steel pipes which can be used for conveying acidic gas and/or oils, with compressive stresses present on the inner side facing the acidic gas and/or oil, characterized by the combination of the following method steps:

a. provided and thermomechanically rolling a steel having a composition of

0.02 to 0.20% C.

0.10 to 0.60% Si

0.60 to 1.50% Mn

max. 0.02% P

max. 0.005% S

0.01 to 0.16% Al

0.001 to 0.01% Ca,

The ratio Ca: S being greater than 2.25 and the product Ca×S equal to or smaller than 0.001, and depending on the required strength characteristics of the finished steel pipe, at least one alloy elements of the following group:

max. 0.35% CR

max. 1.0% Mo

max. 0.03% B

max. 0.70% Ni or Cu and Ni

max. 0.15% V and/or
max. 0.15% Nb,
the balance iron and unavoidable impurities, forming a strip with pearlitic-ferritic and/or bainitic structure:

b. forming a pipe out of this strip with a ratio of wall thickness to diameter of 1 to 25 to 1 to 160 and welding the strip edges together;

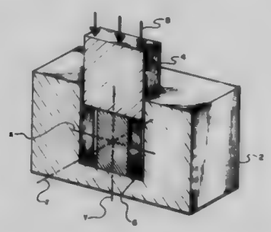
c. and heating the outer side of the welded pipe remote from the acidic oil and/or gas or the weld seam region in max. 400 mm width to a temperature of 300° to 680 degrees C., higher by at least 100 degrees C. than the temperature of the inner side and thereafter cooling from the inside with water or air in an amount of 1 to 2000 liters per meter tube length, with a tube feed in the seam direction during the heating and subsequent cooling of 0.4 to 30 m/min.

4,721,537

METHOD OF PRODUCING A FINE GRAIN ALUMINUM ALLOY USING THREE AXES DEFORMATION

Amit K. Ghosh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1985, Ser. No. 787,201
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **11 Claims**



1. A method of reducing the recrystallized grain size of a precipitation hardening aluminum alloy having fine dispersoids comprising the steps of:

forming precipitates in said alloy;

deforming said alloy within a temperature range at which simultaneous precipitation and dynamic recovery occur, and along each of its three principal axes in consecutive, successive stages for a cummulative true strain sufficient to provide a grain size of about 5 μm or less; and

cooling said alloy.

4,721,538

PERMANENT MAGNET ALLOY

Kalathur S. V. L. Narasimhan, Monroeville, and Bao-Min Ma, Pittsburgh, both of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Division of Ser. No. 629,384, Jul. 10, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,664
Int. Cl.[4] C22C *38/00*
U.S. Cl. 148—302 **1 Claim**

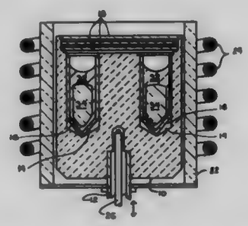
1. A permanent magnet alloy consisting essentially of, in atomic percent, mischmetal 12 to 20, boron 4 to 14 and balance iron.

4,721,539

LARGE SINGLE CRYSTAL QUATERNARY ALLOYS OF IB-IIIA-SE_2 AND METHODS OF SYNTHESIZING THE SAME

Theodore F. Ciszek, Evergreen, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 15, 1986, Ser. No. 885,977
Int. Cl.[4] C22C *28/00, 9/00*
U.S. Cl. 148—400 **2 Claims**



2. Quaternary IB-IIIA-Se_2 alloys of high-quality, single-crystal chalcopyrite structure having large single crystal grains greater than about 5 mm and free of cracks and voids of the size which interfere with good optical absorption coefficients and high band-gap energies, said alloy structure being selected from the group consisting of $Cu_xAg_{(1-x)}InSe_2$ and $CuIn_yGa_{(1-y)}Se_2$, where x is in the range of about 0.65 to 0.8, and where y is in the range of about 0.85 to 0.95, produced by the process comprising the steps of:

placing in a refractory container a reaction mixture of Cu, Ag, In, and Se, or a reaction mixture of Cu, In, Ga, and Se, where such reaction mixture is calculated by atomic percent to produce and desired alloy;

placing B_2O_3 in said container in a quantity sufficient for said B_2O_3 to completely cover and encapsulate said reaction mixture when said B_2O_3 is melted;

placing said container and its said reaction mixture and B_2O_3 contents in an enclosed chamber;

creating an environment of pressurized inert or nonreactive gas in said enclosed chamber and over said container and its contents;

while containing said environment of pressurized gas, heating said container and its said contents to a temperature to at least completely melt the said contents of said container, and holding such temperature for a sufficient period of time to equilibrate the melt and synthesize and alloy; and then

lowering the temperature of the melt in a controlled manner to solidify it as a quaternary IB-IIIA-Se_2 alloy of high-quality, single-crystal chalcopyrite structure.

4,721,540

LOW DENSITY SINGLE CRYSTAL SUPER ALLOY

Kenneth Harris, Spring Lake, and Gary L. Erickson, Muskegon, both of Mich., assignors to Cannon Muskegon Corporation, Muskegon, Mich.

Filed Dec. 4, 1984, Ser. No. 677,797
Int. Cl.[4] B22B *27/06*
U.S. Cl. 148—404 **4 Claims**

1. A single crystal turbine engine blade or vane characterized by its resistance to creep and microstructural stability when operated under high temperature, high stress conditions and capability of being heat treated to effect total solutioning of the gamma prime while maintaining a thermal differential of approximately 20° F. (11° C.) between the final solutioning temperature and the incipient melting temperature, cast from an alloy consisting essentially of the nominal composition (wt/% or wt ppm):



Cr	9.8	C	33 ppm
Co	5.0	V	<10 ppm
Mo	3.0	B	<30 ppm
Al	4.85	Zr	<75 ppm
Ti	4.75	Hf	.11
Ta	2.0	Al + Ti	9.60
W	<.02	Ni	Balance

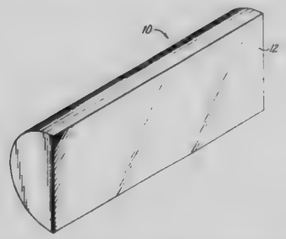
and having a density of 0.288 lbs/cu. in. (7.98 gms/cc).

4,721,541

CERAMIC DIFFUSION BONDING METHOD

L. Reese Hodges, Clearwater, Fla., assignor to Trak Microwave Corporation, Tampa, Fla.

Filed Sep. 26, 1985, Ser. No. 780,690
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—89 **18 Claims**



1. A process for forming a ceramic member having a desired cavity configuration comprising the steps of:

firing first and second bulk ceramic masses to the point of optimum density;

forming a flat surface on each of said masses;

polishing said flat surfaces;

forming in at least one of said polished, flat surfaces a desired cavity configuration;

placing said polished, flat surfaces of said bulk ceramic masses against each other; and

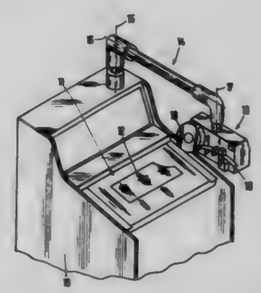
firing the ceramic masses to their maturing temperature; whereby an integral ceramic member having a desired cavity configuration is formed.

4,721,542

APPARATUS FOR BONDING SHEET-LIKE TEXTILE ARTICLES

Hans J. Schäublin, Richen, Switzerland, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Jan. 23, 1986, Ser. No. 824,397
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1985, 3503164
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—353 **16 Claims**



1. In an apparatus for bonding sheet-like textile articles, especially those for outer clothing, comprising:

means including platens movable relative to one another for bonding textile articles, interlining material and outer fabric, to one another under heat and pressure,

a feed station at which the textile articles to be bonded together are manually laid on one another, said feed station being disposed on the operator's side of the apparatus, and

a holder for a stock of interlining material and disposed in the region of the feed station,

the improvement comprising:

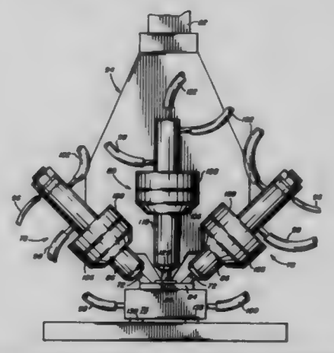
interlining dispenser means (13) for supporting rolled-up, essentially strip-shaped interlining material (21, 19) and for cutting said interlining material to a fixed dimension.

4,721,543

HERMETIC SEALING DEVICE

Sumner H. Wolfson, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Continuation of Ser. No. 428,593, Sep. 30, 1982, abandoned. This application Oct. 24, 1985, Ser. No. 792,164
Int. Cl.[4] B29C *65/30, 65/34*
U.S. Cl. 156—380.2 **1 Claim**



1. An apparatus for effecting a seal between a sealing area of

an electronic component package and a sealing area of a package cover, wherein a conductive heater layer is bonded to one of the sealing areas, comprising:

(a) stage means for mounting and supporting the package, said stage means being further mounted on a support base and having spring means disposed therebetween for providing a constant force on said stage means thereby maintaining a constant contact force between the electronic component package and the package cover;

(b) means for holding, transporting and aligning the package cover including (i) a mount, (ii) hold-down means retained within the mount for transporting the cover to the package, aligning the sealing area of the cover with the sealing area of the package, and holding the cover with the sealing area of the package, and holding the cover in contact with the package during a sealing operation and (iii) means for controlling the temperature of the hold-down means;

(c) electrode means for electrically contacting the conductive heater layer, said electrode means comprising: (i) a mount, (ii) an electrode retained with the mount and having a contact face for contacting the conductive heater layer; (iii) means for absorbing impact of the electrode with the conductive heater layer; (iv) means for aligning a plane of the electrode contact face with the conductive heater layer; and (v) means for controlling the temperatures of the electrode; and

(d) means for inducing an electric current to pass through the electrodes to the conductive heater layer.

4,721,544

WRAP-AROUND HOT-MELT LABELLING MACHINE

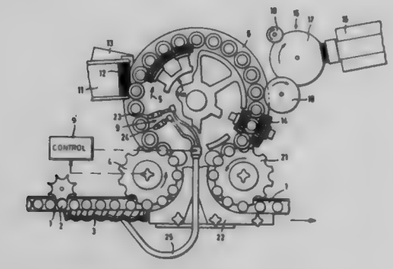
Rudolf Zodrow, Düsseldorf; Wolfgang Rogall, Wuppertal, and Hans-Werner Molin, Kaarst, all of Fed. Rep. of Germany, assignors to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,581

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515324

Int. Cl.[4] B65C *9/04, 9/16, 9/20*

U.S. Cl. 156—456 **7 Claims**



1. A labelling machine, comprising:

a turntable rotatable in a given direction and formed with a multiplicity of stations for respective containers to be labelled angularly equispaced about an axis of rotation of said turntable, each of said stations being provided with a respective rotary plate upon which a respective container is to be received, said stations forming an array surrounding said axis of rotation of said turntable;

a label box positioned along said turntable and outwardly of said array provided with a magazine for applying individual wrap-around labels from a stack thereof contained in said magazine to individual ones of said containers as they are rotatably entrained by said turntable past said box and are rotated on their respective plates concurrently with their rotatable entrainment by said turntable past said box;

a first gluing device upstream of said label box in said direction inwardly of said array along said turntable and including at least one hot-melt glue-spray nozzle located within a path of said containers entrained by said turntable and trained outwardly and directly upon the containers entrained along said path for applying a hot-melt glue to each container, the hot-melt glue on each container causing a leading end of a respective wrap-around label from said label box to adhere to the container when each container reaches said label box;

a second gluing device downstream of said label box in said direction along said turntable and positioned to apply glue to a trailing end of a label adapted to adhere last to the respective container to bond to a leading end of the label whereby said trailing end can overlap and bond to said leading end; and

means downstream of said second gluing device along said path for pressing said labels against said containers as said containers are rotated on the respective plates and are entrained along said path beyond said second gluing device.

4,721,545

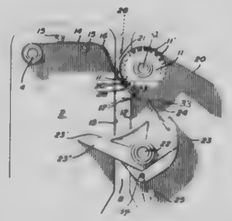
BALLOON SEALER

Christos Santorineos, 5643 Woodbury Ave., Montreal, Quebec, Canada H3T 1S6

Filed Sep. 2, 1986, Ser. No. 902,618

Int. Cl.[4] B65B *51/08*

U.S. Cl. 156—468 **11 Claims**



1. A balloon sealer comprising: a casing defining a width narrower than the length of a balloon neck; said casing provided with a transverse vertical channel open at its upper end; a toothed wheel rotatably mounted in the interior space of said casing and arranged to partially project into said channel; a resilient guide strip anchored at one end to said frame, having its main portion biased against the teeth of said wheel and freely extending transversely of said channel; said guide strip having a free end portion defining a curved end flange, bent back toward said channel and extending partly therthrough, said main portion, cooperatively defining with said wheel a V-shape notch in said channel; a spool carrying pressure-adhesive tape further mounted in said interior space; said spool dispensing said tape with the adhesive side of the tape facing outwardly; said tape extending around said wheel and adhering to said main portion of said strip; further comprising a cutting member having a main body, a pivot axle pivotally connecting said main body transversely to said casing, said pivot axle parallel to the rotating axis of both said toothed wheel and said spool, said main body coplanar with said toothed wheel, a cutting blade fixedly mounted to an outer end of said main body, said cutting blade lying in a plane substantially parallel to said pivot axle and having a leading cutting edge movable through an arc of a circle intersecting said free end portion of said guide strip, said main body further defining an elongated edge bounded at one end by said cutting blade and having an opposite free end; the distance between the leading edge of said cutting blade and said main body pivot axle being substantially longer than the distance between said pivot axle and the section of said main body elongated edge closest to said pivot axle; biasing means to bias said main body to a first limit retracted position, in which said elongated edge thereof projects transversely of said casing vertical channel; said main body pivotable against the bias of said biasing means to an intermediate position, in which the leading edge of said cutting blade shears against the exterior face of said guide strip curved end flange to cut a section of said adhesive tape thereagainst, and to a second limit position; wherein the free end of said elongated edge clears said vertical channel; wherein said balloon neck of an inflated balloon is adapted to engage said casing vertical channel upper end and, successively, to be manually forcibly lowered through same channel to engage between two teeth and rotate said wheel, to be surroundingly adhered by a portion of said adhesive tape, to engage said main body elongated edge, to thereafter pivot said cutting member between said two limit positions thereof by sliding along said main body elongated edge away from said cutting blade and thus cause said leading edge tu cut said tape against said guide strip free end portion, said ballon neck finally clearing said elongated edge free end at said second limit position.

4,721,546

SPIN-WELDING APPARATUS

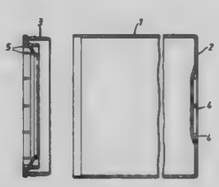
Kenneth R. Clark, Oxfordshire, and John P. Bilko, Wiltshire, both of England, assignors to Metal Box p.l.c., Reading, England

Filed May 16, 1986, Ser. No. 864,141

Claims priority, application United Kingdom, May 24, 1985, 8512240

Int. Cl.[4] B29C *65/06*

U.S. Cl. 156—567 **10 Claims**



1. Spin welding apparatus for welding together two parts of an article comprising a feed mechanism for successively feeding pre-assembled articles to a work station on the apparatus, a spin welding head for spinning one of the parts relative to the other at the work station to form a weld, and a ram assembly for moving articles at the work station into engagement with the spin welding head, wherein the feed mechanism and the ram assembly are driven in timed relation from a first motor-driven shaft and wherein the spin welding head is driven by a servo motor the drive of which is timed by a switch unit driven from the first shaft.

4,721,547

PROCESS FOR PRODUCING SINGLE CRYSTAL OF GARNET FERRITE

Shunji Nomura, Yokohama; Seiji Shimazuki, Atsugi; Susumu Hashimoto, Tokyo, and Tomohiro Yamashita, Yamato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 23, 1986, Ser. No. 877,522

Claims priority, application Japan, Jun. 28, 1985, 60-140165; Sep. 27, 1985, 60-212605; Feb. 17, 1986, 61-30953

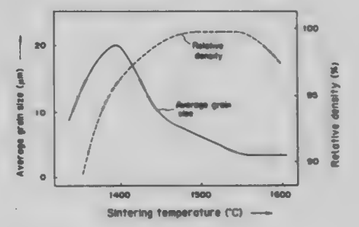
Int. Cl.[4] C30B *1/10*

U.S. Cl. 156—603 **13 Claims**

1. A process for producing a single crystal of garnet ferrite, consisting essentially of the step of subjecting raw materials for the garnet ferrite, said raw materials comprising an admixture of simple oxides, to sintering at a temperature between 1350° and 1550° C., such that unequal grain growth results in a conversion of said raw materials into a crystalline structure comprising a few grains which are much larger than surrounding grains, said crystalline structure having the formula:

$$Ca_xM_{3-x}N_5O_{12}$$

wherein (i) M is at least one of yttrium and a rare earth element, (ii) x satisfies the relationship:



$$0.01 \leq x \leq 1.0,$$

and (iii) N is a component comprised of iron, an a-site element and a d-site element, said a-site and d-site elements being present in amounts, respectively, such that electrical neutrality is maintained in said structure.

4,721,548

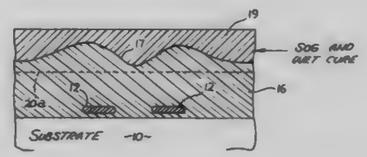
SEMICONDUCTOR PLANARIZATION PROCESS

Seiichi Morimoto, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 13, 1987, Ser. No. 49,100

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—657 **10 Claims**



1. In the fabrication of a semiconductor integrated circuit, a process for planarizing a glass layer comprising the steps of:

covering said glass layer with a spin-on-glass layer;

curing said spin-on-glass layer in an atmosphere of steam;

wet etching said layers; whereby a planarized glass layer is formed.

4,721,549

METHOD AND APPARATUS FOR TREATING AT LEAST ONE CERAMIC OBJECT IN AN ALKALI HYDROXIDE MELT

August F. Bogenschütz, Oberdischingen; Josef L. Jostan, and Robert Ostwald, both of Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 2, 1986, Ser. No. 881,100

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523961

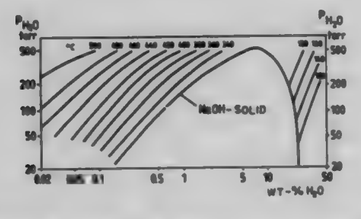
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—663 **20 Claims**

13. A method for treating ceramic objects in an apparatus which includes a heatable crucible that contains an alkali hydroxide melt, a heatable housing that is connected in a substantially gas-tight manner to the crucible to provide a preheating chamber above the melt, the heatable housing having an opening and a removable cover for the opening, and a nozzle ar-

rangement disposed in the heatable housing, said method comprising the steps of:

(a) continuously maintaining the water content of the melt at a predetermined constant value while simultaneously shielding the melt from carbon dioxide by flooding the preheating chamber with a heated mixture of inert gas that is introduced via the nozzle arrangement at a predetermined constant rate and water vapor that is introduced via the nozzle arrangement at a predetermined constant rate;
(b) placing a ceramic object on a holder;
(c) moving the holder into the preheating chamber;



(d) keeping the holder in the preheating chamber for a predetermined preheating period;
(e) moving the holder into the crucible to expose the ceramic object to the melt;
(f) keeping the holder in the crucible for a predetermined etching period;
(g) removing the holder from the apparatus;
(h) replacing the ceramic object on the holder with another ceramic object; and
(i) repeating steps (c) through (g).

4,721,550

PROCESS FOR PRODUCING PRINTED CIRCUIT BOARD HAVING IMPROVED ADHESION

John E. Schumacher, III, Boulder, Colo., assignor to New West Technology Corporation, Boulder, Colo.

Filed May 5, 1986, Ser. No. 859,834
Int. Cl.[4] C25D 5/02, 5/54
U.S. Cl. 204—15 15 Claims

1. A method for forming a printed circuit board, said method comprising:
providing an electrically non-conductive surface;
sputtering a thin layer of electrically conductive material onto said surface so that said conductive material adheres to said surface;
creating a crystalline structure in said sputtered layer suitable for electroplating without appreciable loss of adhesion of said sputtered layer to said surface; and
electroplating a layer of electrically conductive material having tensile deposit stress onto said created crystalline structure in said sputtering layer to thereby form an electrically conductive coating that is strongly adhered to said surface.

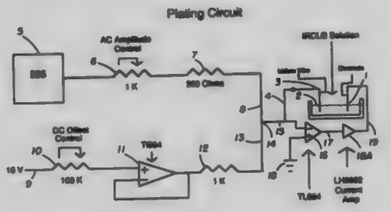
4,721,551

IRIDIUM TREATMENT OF NEURO-STIMULATING ELECTRODES

Charles L. Byers, Canyon Country; Peter Zimmerman, San Francisco; Paul Feinstein, Berkeley, and Mitchell Sutter, Emeryville, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 6, 1986, Ser. No. 927,809
Int. Cl.[4] C25D 3/50
U.S. Cl. 204—47 23 Claims

1. A method for electroplating iridium metal onto the surface of a metallic microelectrode for use in a biomedical prosthetic device, which method comprises:
(a) placing the metallic microelectrode into an aqueous solution of iridium ion of between about 1 and 10 percent by weight iridium; and



(b) electroplating the microelectrode of step (a) using a current of between about 0.5 and 15 milliamperes wherein said current is controlled by a current controller.

4,721,552

TWO-STEP METHOD FOR ELECTROLYTICALLY GRAINING LITHOGRAPHIC METAL PLATES

Jen-Chi Huang, Mt. Kisco, and Daniel Bourgeois, Mahopac, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Apr. 27, 1987, Ser. No. 43,567
Int. Cl.[4] C25F 3/04
U.S. Cl. 204—129.4 7 Claims

1. A method of electrolytically graining an aluminum sheet suitable for use as a lithographic plate to obtain a substantially non-directional honeycomb topography which comprises the following sequential steps:
(a) immersing the aluminum sheet in a first aqueous electrolyte solution consisting of from 0.5 to 10% by weight of hydrochloric acid and then applying an alternating current of from 5 to 100 amps per square decimeter for less than about 10 seconds at a temperature of from 25° to 60° C.;
(b) washing the electrolytically treated aluminum sheet obtained from step (a) with an alkaline solution, then with water, followed by drying; and
(c) immersing the dried, electrolytically grained aluminum sheet in a second aqueous electrolytic solution comprising of from 0.5 to 10% by weight of nitric acid and then applying an alternating current of from 5 to 100 amps per square decimeter for less than about 10 seconds at temperature of from 25° to 60° C. to obtain an electrolytically grained aluminum sheet with a surface having a substantially non-directional honeycomb topography.

4,721,553

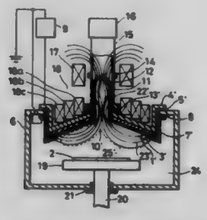
METHOD AND APPARATUS FOR MICROWAVE ASSISTING SPUTTERING

Hiroshi Saito, Fujisawa; Yasunichi Suzuki, Yokohama; Shuuzoo Sano, Yokohama; Tamotsu Shimizu, Yokohama, and Susumu Aiuchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 769,505
Claims priority, application Japan, Aug. 31, 1984, 59-180532; Oct. 4, 1984, 59-207058; Oct. 26, 1984, 59-223944; Feb. 22, 1985, 60-32604
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[4] C23C 14/34
U.S. Cl. 204—192.12 33 Claims

1. A microwave assisting sputtering apparatus comprising:
a cathode having a target composed of a material that is to be sputtered positioned adjacent thereto and having a surface facing a depositing surface of a sample substrate, and a magnetic device positioned at the periphery of said cathode so as to generate a magnetic field that penetrates through said target with lines of force that are directed from the target surface toward the cathode and parallel to at least a portion of the target surface;
a power source connected to a voltage to said cathode;
a substrate holder which holds said sample substrate in a manner to face said target across a gas containing space, and which is provided with a magnetic device positioned at the periphery thereof so as to generate a magnetic field that penetrates through said substrate with lines of force that are directed into the depositing surface of said sample substrate and parallel at least a portion of said depositing surface; and
a microwave source and a microwave introducing window through which microwaves from said microwave source are introduced into said gas containing space in a direction parallel to said target and said substrate holder to generate a plasma in said gas containing space for sputtering said target.

20. A microwave assisting sputtering method comprising the steps of:



introducing microwaves onto a planar target which is placed under a predetermined reduced pressure condition, which is opposed to a depositing surface of a sample substrate, and which is composed of a material that is to be sputtered, said microwaves being introduced in a direction parallel to and along the surface of said target;
generating a plasma in a gas containing space between said target and said sample substrate by means of magnetic fields which penetrate through said target and said substrate, so that said plasma is confined by said magnetic fields;
applying an electric field to a cathode to accelerate said plasma toward said target, said cathode holding said target and being provided with a first magnetic device to generate a magnetic field that penetrates through said target; and
sputtering said target to emit sputtered particles that consist of a material to be deposited on said substrate, such that the sputtered particles to be deposited on the substrate held by a substrate holder which is opposed to said target and which has a second magnetic device to generate a magnetic field that penetrates through said substrate.

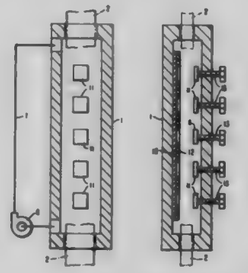
4,721,554

ELECTROPLATING APPARATUS

Erwin A. Sauter, Neulingen-Göbrichen, Fed. Rep. of Germany, assignor to Inovan-Stroehe GmbH & Co. KG., Birkenfeld, Fed. Rep. of Germany

Continuation of Ser. No. 792,308, Oct. 28, 1985, abandoned.
This application Oct. 31, 1986, Ser. No. 926,818
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439750
Int. Cl.[4] C25D 7/06, 17/10
U.S. Cl. 204—206 4 Claims

1. An apparatus for electrolytically depositing metallic layers on an elongated ribbon-like strip, said apparatus comprising a hollow guide rail having a free interior cross-section so as to be adapted to receive and closely surround said strip, said hollow guide rail forming a container for receiving an electrolyte solution containing metal ions to be deposited on said strip, an anode sstructure affixed to an inner surface of said hollow guide rail, a circulating conduit structure connected to opposite ends of said hollow guide rail, and a circulating pump arranged in said circulating conduit structure for circulating said electrolyte solution through said guide rail along the surfaces of a section of the strip extending through said guide rail, said anode structure comprising sections projecting



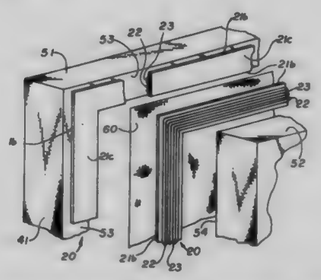
toward said strip so as to be disposed in closely spaced relationship to the surface of said strip so as to form a patterned metallic layer deposit on said strip, each section being independently adjustably supported within said hollow guide rail so as to permit independent adjustment of the spacing of said anode structure sections from the strip surface, said sections being associated with different power supply circuits.

4,721,555

ELECTROLYSIS CELL SEAL MEANS

Sandor Grosshandler, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1985, Ser. No. 761,923
Int. Cl.[4] C25B 9/00, 13/00
U.S. Cl. 204—252 99 Claims



5. An electrolysis cell assembly comprising at least a first seal means interposed between at least two adjacent electrode frames, said first seal means comprising a substantially solid member having parallel side walls, a generally planar top wall contacting one electrode frame, and a bottom wall defined by an uneven surface contacting the other electrode frame.

6. The cell assembly of claim 5 including a separator with a first and second side interposed between the first seal means and a first electrode frame wherein the top wall of the first seal means is in contact with the first side of the separator and the bottom wall of the first seal means is in contact with a second electrode frame.

VOL 1086 ISS 4 JA 26 1988 UMI

4,721,556

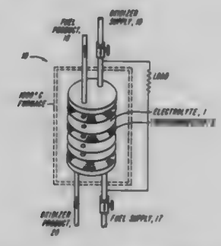
ELECTROCHEMICAL CONVERTERS AND COMBINED CYCLE SYSTEMS

Michael S. Hsu, Roundhill Rd., Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 735,441, May 17, 1985, Pat. No. 4,629,537. This application May 9, 1986, Ser. No. 861,433

Int. Cl.[4] C25B *9/00, 9/04;* **H01M** *2/08;* **B05D** *5/06*

U.S. Cl. 204—258 **21 Claims**



10. An electrochemcial converter comprising:

(a) a set of solid-oxide electrolyte plates formed by suspending a solid oxide powder in a gas, passing the suspension through an arc discharge to generate a plasma spray and deposit the solid oxide until plates of about 50 to about 750 microns in thickness are deposited, removing the plates from the substrate; and then coating said electrolyte plates with a fuel electrode material on one surface of each plate and an oxidizer electrode material on a second surface of each plate; and

(b) a set of interconnector plates having corrugated structures, comprising at least one material chosen from the group of platinum and nickel alloys and silicon carbide composites, the metal plate having a thickness ranging from about 100 to about 1000 microns in the case of nickel alloy, having a thickness ranging from about 50 to 300 microns in the case of silicon carbide, and having a thickness ranging from about 25 to about 250 microns in the case of platinum alloys, the corrugated structure defining groove networks for the passage of gases and ridges for gas seals and electrical contact with the electrode coatings of the electrolyte plates said interconnector plates having a greater coefficient of thermal expansion than said electrolyte plates;

wherein the converter is assembled by stacking alternating layers of the electrolyte and interconnector plates together at an elevated assembly temperature to fuse the adjacent plates to each other such that upon cooling the electrolyte plates experience in-plane compression.

4,721,557

COMBINATION PROCESS FOR THE CONVERSION OF A RESIDUAL ASPHALTENE-CONTAINING HYDROCARBONACEOUS STREAM TO MAXIMIZE MIDDLE DISTILLATE PRODUCTION

Darrell W. Staggs, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 8, 1986, Ser. No. 916,754

Int. Cl.[4] C10G *49/00*

U.S. Cl. 208—68 **20 Claims**

1. A process for the conversion of a residual asphaltene-containing hydrocarbonaceous charge stock to selectively produce large quantities of high quality middle distillate while minimizing hydrogen consumption which process comprises the steps of:

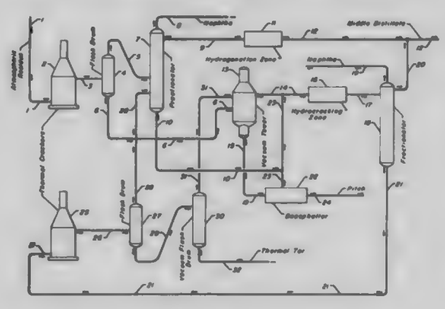
(a) reacting said residual asphaltene-containing hydrocarbonaceous charge stock in a first non-catalytic thermal reaction zone at thermal cracking conditions including an elevated temperature from about 700° F. (371° C.) to about 950° F. (510° C.), a pressure from about 15 psig (103 kpa gauge) to about 100 psig (689 kPa gauge) and an equivalent residence time at 900° F. (482° C.) from about 2 to about 30 seconds to provide a first non-catalytic thermal reaction zone effluent;

(b) passing said first non-catalytic thermal reaction zone effluent into a first separation zone operated at conditions which result in the separation of entering hydrocarbonaceous compounds to provide a first middle distillate stream having olefinic hydrocarbonaceous compounds, a first distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) and a first non-distillable hydrocarbonaceous stream;

(c) hydrotreating said first middle distillate stream having olefinic hydrocarbonaceous compounds recovered in step (b) in a catalytic hydrotreating reaction zone at hydrotreating conditions to saturate at least a portion of said olefinic hydrocarbonaceous compounds to provide a first high quality middle distillate product stream;

(d) reacting said first distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) with hydrogen, in a catalytic hydrocracking reaction zone, at hydrocracking conditions including a maximum catalyst bed temperature in the range of about 600° F. (315° C.) to about 850° F. (454° C.) selected to convert at least a portion of said first distillate hydrocarbonaceous stream to lower-boiling hydrocarbonaceous products;

(e) deasphalting said first non-distillable hydrocarbonaceous stream in a deasphalting zone at deasphalting conditions to produce a deasphalted oil stream and a pitch stream;



(f) reacting said deasphalted oil stream in said catalytic hydrocracking reaction zone of step (d);

(g) separating a hydrocarbonaceous effluent stream produced in said catalytic hydrocracking zone of step (d) to provide a second high quality middle distillate product stream and a hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) and comprising non-distillable deasphalted oil;

(h) reacting said hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) and comprising non-distillable deasphalted oil in a second non-catalytic thermal reaction zone at thermal cracking conditions including an elevated temperature from about 700° F. (371° C.) to about 950° F. (510° C.), a pressure from about 50 psig (345 kPa gauge) to about 400 psig (2756 kPa gauge) and an equivalent residence time at 900° F. (482° C.) from about 5 to about 90 seconds to provide a second non-catalytic thermal reaction zone effluent;

(i) passing said second non-catalytic thermal reaction zone effluent into a second separation zone operated at conditions to provide a thermal tar stream, a second middle distillate stream having olefinic hydrocarbonaceous compounds, and a second distillate hydrocarbon stream boiling at a temperature greater than about 700° F. (371° C.);

(j) passing at least a portion of said second middle distillate stream having olefinic hydrocarbonaceous compounds into said first separation zone; and

(k) passing at least a portion of said second distillate hydrocarbon stream boiling at a temperature greater than about 700° F. (371° C.) into said first separation zone.

4,721,558

HYDROTREATING CATALYSTS COMPRISING A MIXTURE OF A SULFIDE OF A PROMOTER METAL AMORPHOUS SULFIDE OF TRIVALENT CHROMIUM AND MICROCRYSTALLINE MOLYBDENUM OR TUNGSTEN SULFIDE

Allan J. Jacobson, Princeton; Teh C. Ho, Bridgewater; Russell R. Chianelli, Somerville; John J. Steger, Pittstown, and Angelo A. Montagna, Summit; all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 656,088, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 567,882, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 454,384, Dec. 29, 1982, abandoned. This application May 30, 1986, Ser. No. 871,152

Int. Cl.[4] C10G *45/08, 45/60, 47/06*

U.S. Cl. 208—108 **27 Claims**

1. A hydrorefining process for reducing the contents of sulfur and nitrogen compounds in a hydrocarbon feed comprising contacting a hydrocarbon feed at elevated temperature of at least about 100° C. and in the presence of hydrogen, with a catalyst consisting essentially of a mixture of (i) an amorphous sulfide of trivalent chromium, (ii) microcrystallites of metal sulfide of a metal selected from the group consisting of Mo, W and mixture thereof and (iii) a sulfide of at least one promoter metal sulfide of a metal selected from the group consisting of Ni, Co, Mn, Zn, Cu and mixture thereof and mixture thereof with Fe, said contacting occurring for a time sufficient to hydrorefine at least a portion of said feed.

12. A process for hydrocracking a hydrocarbon feed which comprises contacting said feed at an elevated temperature of at least about 150° C. and in the presence of hydrogen with a catalyst consisting essentially of a mixture of (i) an amorphous metal sulfide of trivalent chromium, (ii) microcrystallites of metal sulfide of a metal selected from the group consisting of Mo, W and mixture thereof and (iii) a sulfide of at least one promoter metal selected from the group consisting of Ni, Co, Mn, Zn, Cu and mixture thereof, and mixture thereof with Fe, said contacting occurring for a time sufficient to hydrocrack at least a portion of said feed and wherein said catalyst exhibits no crystallinity for the chromium sulfide when measured by X-ray diffraction.

16. A process for improving the oxidation stability of a nitrogen and sulfur containing lube oil feed which comprises contacting said feed at an elevated temperature of at least about 150° C. and in the presence of hydrogen with a catalyst consisting essentially of a mixture of (i) an amorphous sulfide of trivalent chromium, (ii) microcrystallites of metal sulfide of a metal selected from the group consisting of Mo, W and mixture thereof and (iii) a sulfide of at least one promoter metal selected from the group consisting of Ni, Co, Mn, Zn, Cu and mixture thereof and mixture thereof with Fe, said contacting occurring for a time sufficient to improve the oxidation stability of said lube oil.

4,721,559

BORON, ALUMINUM AND GALLIUM PERFLUORO ALKANESULFONATE AND RESINSULFONATE CATALYSTS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Filed Oct. 17, 1986, Ser. No. 920,329

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—135 **10 Claims**

1. A process for effecting hydrocarbon reforming which comprises contacting a C_4 to C_{30} hydrocarbon with a Friedel-Crafts catalyst comprising a boron, aluminum, or gallium perfluoroalkane sulfonate at suitable reforming temperature and pressure conditions and for a time sufficient to effect said hydrocarbon reforming.

4,721,560

STATIC MIXER RETORTING OF OIL SHALE

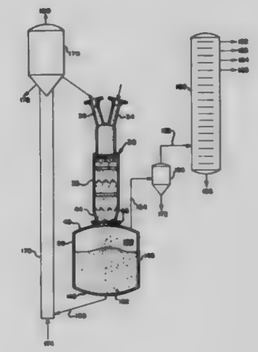
Earl D. York, Englewood, Colo.; Jay C. Knepper, Lisle, and John M. Forgac, Elmhurst, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 782,204, Sep. 30, 1985, Pat. No. 4,597,852. This application Feb. 27, 1986, Ser. No. 833,191

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—411 **8 Claims**



1. A process for mixing and retorting raw oil shale, comprising the steps of:

feeding raw oil shale to an upper free-fall section of a generally upright static mixer having a vertical axis, said raw oil shale being fed to the top of said upper free-fall section at an angle of inclination ranging from about 5 degrees to about 45 degrees relative to said vertical axis;

feeding solid heat carrier material to said upper free-fall section of said static mixer at a sufficient retorting temperature to retort said raw oil shale, said solid heat carrier material being selected from the group consisting of fully combusted spent oil shale, partially combusted spent oil shale, retorted oil shale, retorting catalyst, cracking catalyst, ceramic balls, metal balls, and combinations thereof, said solid heat carrier material being fed to the top of said upper free-fall section at an angle of inclination ranging from about 5 degrees to about 45 degrees relative to said vertical axis and at an acute angle of inclination relative to said raw shale feed;

intersecting and colliding said raw oil shale and said solid heat carrier material in said upper free-fall section and moving said shale and said solid heat carrier material generally downwardly through said free-fall section in a free-fall flow pattern by gravity flow;

substantially completely mixing and randomly distributing said raw oil shale and said solid heat carrier material together by flowing and deflecting said raw oil shale and said solid heat carrier material generally downwardly in a generally zigzag flow pattern over and upon at least six vertically spaced tiers of stationary triangular-shaped baffles with upwardly pointing apexes in an elongated deflector section of said static mixer retort having a greater diameter than and positioned substantially below said free-fall section, such that alternate tiers are spaced substantially parallel to each other and substantially per-

pendicular to adjacent tiers as viewed in top plan view, said tiers extending laterally across said static mixer and including two inlet tiers and at least four other tiers positioned below said inlet tiers, said other tiers having similarly sized triangular-shaped baffles;

gravitatingly moving said shale and said solid heat carrier material substantially downwardly in a dilute-phase free-fall flow pattern in an upper portion of a surge bin positioned below said static mixer retort and in a dense-phase moving bed in the bottom portion of said bin at said retorting temperature for a sufficient time to substantially completely retort said raw oil shale so as to liberate hydrocarbons therefrom leaving retorted shale;

heating and recycling said solid heat carrier material for use in said static mixer; and

separating at least one fraction of shale oil from said hydrocarbons.

4,721,561

CENTRIFUGAL FORCE SEPARATOR

Hans Oetiker, Gallen, and Franz Reichmuth, Flawil, both of Switzerland, assignors to Gebruder Buhler AG, Uzwil, Switzerland

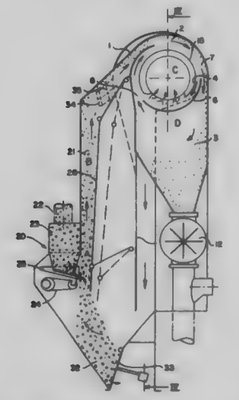
PCT No. PCT/EP85/00167, § 371 Date Nov. 26, 1985, § 102(e) Date Nov. 26, 1985, PCT Pub. No. WO85/04823, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 15, 1985, Ser. No. 805,476

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414344

Int. Cl.⁴ B01D *45/12*

U.S. Cl. 209—144 **12 Claims**



1. In a centrifugal force separator for extracting particulate impurities from air, the separator being of the type including a housing, means in the housing defining an interior wall in the shape of a circumferential segment of a cylinder and a tangential raw gas inlet, cylindrical deflecting means extending within the housing in opposed relationship to the interior wall, the deflecting means being hollow, having an air inlet and serving as an exhaust conduit for cleaned air to a clean gas outlet, and collecting means for the particulate impurities provided in the housing below the deflecting means, the improvement comprising:

said deflecting means having a peripheral opening facing toward said collecting means;

an arcuate deflecting wall positioned opposite said opening in the cylindrical deflecting means and curving around said cylindrical deflecting means, said deflecting wall having upstream and downstream ends each extending circumferentially beyond a respective extreme of said opening and each spaced from said interior wall so as to form an air circulation space for the passage of circulating air between each end of the deflecting wall and the interior wall;

the space between the interior wall and said cylindrical deflecting means in the vicinity of said upstream end of said deflecting wall defining a pre-separating chamber; and

means defining a channel extending between the air circulation space at the downstream end of said deflecting wall and the raw gas inlet for returning circulating air to said preseparating chamber.

4,721,562

AERATING APPARATUS

Wolfgang Barnscheidt, Dormagen-Straberg; Horst von Borries, Krefeld; Robert Rautenbach, Aachen; August Schiffermüller, Erkrath; Hubert Zimmermann, Aachen, all of Fed. Rep. of Germany, and Jean-Pierre Lamort, Vitry-le-Francois, France, assignors to Feldmuöle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany and E. et. M. Lamort S.A., Vitry-le-Francois, France

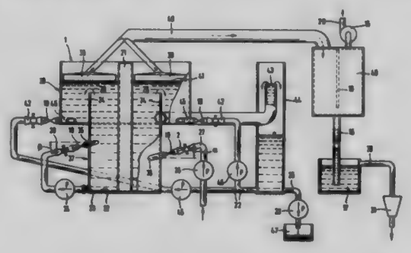
PCT No. PCT/EP85/00138, § 371 Date Nov. 20, 1985, § 102(e) Date Nov. 20, 1985, PCT Pub. No. WO85/04432, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 30, 1985, Ser. No. 805,471

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412431; May 17, 1984, 3418328; Feb. 13, 1985, 3504780

Int. Cl.⁴ B03D *1/24*; B01D *47/02*

U.S. Cl. 209—170 **19 Claims**



1. In an apparatus for the aeration of dispersions, which comprises a flotation cell having at least one ring injector associated with it, said ring injector comprising:

an outer tubular casing defining an axis and having two ends and including a dipersion feed section at one end, a mixing section and a discharge section at the other end and a center core located inside and extending substantially the length of the tubular casing thereby defining said sections as an annular gap,

support arm means in said feed section for mounting the center core in the casing, the feed section having an inlet and an outlet and the center core forming with the outlet of the feed section an annular gap portion having a first cross section,

the outer casing being expanded in the form of a step in relation to the outlet of the feed section and the center core having a decrease in thickness at the same point along the axis thereby forming the inlet of the mixing section having a second cross section,

the center core than having a further decrease in thickness in the form of a groove in the area of the mixing section,

air ducts extending into the step at the inlet of the mixing section and into the groove of the center core,

the mixing section having an inlet and an outlet and the cross section at the outlet of the mixing section being greater than the cross section at the inlet of the mixing section,

the discharge section having an outlet and the cross section at the outlet of the discharge section being greater than the cross section at the outlet of the mixing section.

4,721,563

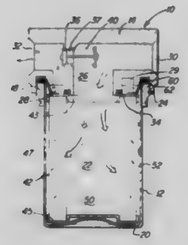
FLUID FILTERING DEVICE

Borje O. Rossen, P.O. Box 1085, 5741 Jackson Rd., Ann Arbor, Mich. 48106

Filed Sep. 11, 1986, Ser. No. 905,655

Int. Cl.⁴ B01D *35/14*

U.S. Cl. 210—85 **21 Claims**



1. A fluid filtering device comprising:

a housing defining an interior fluid chamber;

a filter head securable to said housing, said filter head having an inlet port and an outlet port and fluid passageways connecting said ports and said fluid chamber;

filter means removably insertable into said housing chamber, said filter means comprising a filter element and sealing means secured to said filter element, wherein said sealing means is disposed between said housing and said filter head when said filter head is secured to said housing and wherein removal of said filter means causes removal of said sealing means; and

means for indicating the absence of filter means in said housing, said indicating means comprising means for enabling the leakage of fluid between said filter head and said housing.

4,721,564

APPARATUS FOR THE FILTRATION OF PLASMA FROM BLOOD

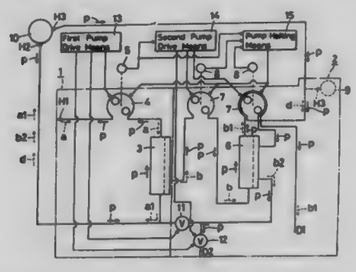
Yoshimichi Harada; Akiyoshi Nakano, and Takuichiro Watanabe, all of Okayama, Japan, assignors to Kuraray Co., Ltd., Okayama and Kawasumi Laboratories Inc., Tokyo, both of, Japan

Filed Oct. 15, 1986, Ser. No. 919,127

Claims priority, application Japan, Oct. 22, 1985, 60-236205; Nov. 20, 1985, 60-262108

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—88 **5 Claims**



1. A plasma filtration apparatus which comprises:

a blood circulating circuit means including a plasma filter for separating whole blood, extracted from a subject of interest through a blood inlet, into a blood plasma component and a blood corpuscle component and for supplying the blood corpuscle component to a blood outlet for the return thereof to the subject of interest;

a plasma circulating circuit means for draining at least a portion of the blood plasma component, which has been separated from the whole blood, and for supplying a physiologically compatible fluid substitute in a quantity substantially equal to the amount of said portion of the blood plasma component, which has been drained, to a portion of the blood circulating circuit means downstream of the plasma filter and then to the blood outlet;

a first pumping means disposed on the blood circulating circuit means;

a second pumping means disposed on the plasma circulating circuit means;

a source of priming fluid adapted to be fluid-connected with the blood outlet and a fluid intake for receiving the fluid substitute into the plasma circulating circuit means;

a first detector for detecting the flow through the blood circulating circuit means;

a second detector for detecting the flow through the plasma circulating circuit means;

a first valve means for selectively establishing and interrupting a first fluid circuit between a downstream portion of the plasma circulating circuit means adjacent the blood outlet and said portion of the blood circulating circuit means downstream of the plasma filter;

a second valving means for selectively establishing and interrupting a second fluid circuit between said portion of the plasma circulating circuit means adjacent the blood outlet and the outside of the apparatus;

a first drive means operable to cause the first and second valving means to interrupt the respective first and second fluid circuits and for driving the first pumping means to cause the priming fluid to flow through the blood circulating circuit means;

a second drive means operable in response to an output signal from the first detector for causing the second valving means to establish the second fluid circuit and, at the same time, driving the second pumping means to cause the priming fluid to flow through the plasma circulating circuit means when the flow through the blood circulating circuit means attains a first predetermined value; and

means operable in response to respective output signals from the first and second detectors for bringing the first and second pumping means to a halt when both of the flows through the blood circulating circuit means and the plasma circulating circuit means attain a second predetermined value.

4,721,565

APPARATUS FOR HANDLING MIXTURES

Noel Carroll, Sherbrooke Road, Sherbrooke, Victoria, Australia

PCT No. PCT/AU85/00322, § 371 Date Aug. 12, 1986, § 102(e) Date Aug. 12, 1986, PCT Pub. No. WO86/03696, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 20, 1985, Ser. No. 903,564

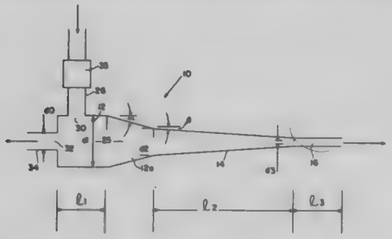
Claims priority, application Australia, Dec. 20, 1984, PG8657; Feb. 7, 1985, PG9192

Int. Cl.⁴ B01D *17/038*

U.S. Cl. 210—251 **6 Claims**

1. Apparatus for treating a mixture which contains at least oil and water components, the apparatus comprising a cyclone separator comprising elements, designed, sized and arranged for separating a more dense component of the mixture from a less dense component, said separator comprising an elongated separating chamber with a larger cross-sectional dimension end and a smaller cross-sectional dimension end, at least one feed inlet at said larger end and first and second outlet means, the apparatus further including means for facilitating the removal of globs of oil present in the mixture before the mixture

enters the cyclone separator, said means comprising a static mixer device operatively connected to the separator and in the flow path of the mixture to be admitted to the separating chamber through said feed inlet, said static mixer device being



effective to homogeneously mix the components of the mixture passing therethrough before admission to the separation chamber so as to facilitate removal of any globs of oil present in the mixture.

4,721,566

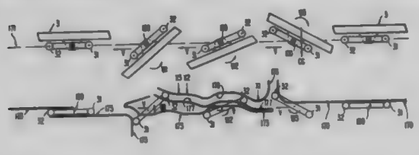
TILTING PAN FILTERS AND CAM THEREFOR

Donald L. Chamberlain, Baton Rouge, and Robert J. Sweeney, Gonzales, both of La., assignors to Freeport Minerals Company, Belle Chasse, La.

Continuation-in-part of Ser. No. 754,410, Jul. 12, 1985, Pat. No. 4,675,107. This application Nov. 14, 1985, Ser. No. 797,967

Int. Cl.⁴ B01D *35/08*

U.S. Cl. 210—328 **20 Claims**



1. A control device for a filter pan for use in a continuous filter system to discharge filter cake, wherein each filter pan has:

(i) a pan body having a tilt axis, a first end wall, a second end wall, a leading side wall and a trailing side wall forming an enclosure for retaining particulate material above a filtering medium wherein a cross-section of said filter pan is a parallelogram;

(ii) a liquid collection region for collecting liquid filtered by said filtering medium;

(iii) an outlet for liquid collected by said filtering medium; and

(iv) an axis of rotation, said leading side wall being oriented at an angle of at least 8° to the direction of travel of said leading side wall, said trailing side wall being disposed at said angle to the direction of travel of said trailing side wall, comprising:

a first cam surface being in contact with a leading cam-contacting element on a tilting filter pan;

a second cam surface disposed beneath said first cam surface said second cam surface being in contact with a leading cam-contacting element on a tilting filter pan;

a third cam surface being in contact with a trailing cam-contacting element on a tilting filter pan;

said first cam surface having a pan inversion region, a pan return region for rotating a pan to avoid collision with an adjacent leading pan, a pan advance region for rotating a pan back toward an inverted position following clearing of a leading pan, and a pan tighting region for rotating the pan to an upright position;

said second cam surface cooperating with said first cam surface and being generally parallel thereto;

said third cam surface having a pan inversion region, a pan return region for rotating a pan to avoid collision with an adjacent leading pan, a pan advance region for rotating a pan back toward an inverted position following clearing of a leading pan, and a pan righting region;

whereby a plurality of pans are rotated simultaneously by said first, said second, and said third cam surfaces such that each rotated pan is in a different stage of rotation, such that filter cake is discharged from each pan consecutively and the pans are righted consecutively without collisions between adjacent pans.

4,721,567

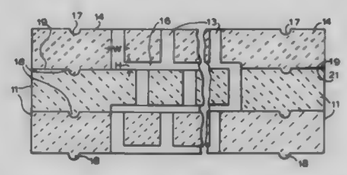
CERAMIC POURING FILTER WITH TORTUOUS FLOW PATHS

Stuart Z. Uram, Alpine, N.J., assignor to Certech Inc., Wood-Ridge, N.J.

Filed Jun. 6, 1984, Ser. No. 617,909

Int. Cl.⁴ B01D *25/08;* **C04B** *38/00*

U.S. Cl. 210—489 **4 Claims**



1. A ceramic filter for molten metal comprising a first frustro-conical and a second frustro-conical ceramic element positioned adjacent to each other and arranged to receive a stream of molten metal to flow therethrough, means maintaining a fixed position of said ceramic elements relative to each other, said first ceramic element having a first face and said second ceramic element having a second face, said ceramic elements being positioned with said first and second faces parallel and opposed to and spaced apart from each other, the distance between said faces defining a filter distance, each of said first and second ceramic elements having a plurality of slots formed therein defining flow passageways at an angle to said faces for the flow of molten metal therethrough, said slots in each of said ceramic elements being separated from adjacent slots by solid ceramic portions between said slots, said slots of each said ceramic element being offset relative to said slots of said other ceramic element and aligned with said solid portions of said other ceramic element, the width of said slots being greater than the filter distance between said faces, the space between said faces forming a plurality of filter passages of restricted height preventing movement through said filter passages of particles of a dimension larger than said filter distance, said first and second ceramic elements forming a flow path for the flow of molten metal through a slot in said first ceramic element which flow path turns and divides after it passes through said first ceramic element and then flows in two generally opposite directions through said filter passages between said ceramic elements and then turns again and flows through slots in said second ceramic element, said filter passages having the smallest transverse dimension of any part of the flow path of molten metal through said filter.

4,721,568

SEMIPERMEABLE COMPOSITE MEMBRANE

Henricus C. W. M. Buys, 146, Franciscushoff, Vianen; Aart J. Naaktgeboren, 109, Langewijk, Dedemsvaart; Aris van Elven, 35,Hittekamp, Leersum, and Dirk A. Noordegraaf, 13, Loozermars, Gramsbergen, all of Netherlands

Filed Aug. 30, 1985, Ser. No. 771,015

Claims priority, application Netherlands, Aug. 30, 1984, 8402647

Int. Cl.⁴ B01D *13/00*

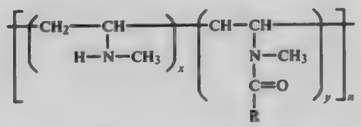
U.S. Cl. 210—500.37 **10 Claims**

1. A semipermeable composite membrane having a flux of at least 40 l/m².h and a salt retention of more than 89%, said composite membrane comprising a microporous substrate having on its surface a semipermeable membrane comprising a crosslinked polymer which comprises the reaction product of a mixture of

(a) a water-soluble organic polymer with reactive amino groups;

(b) a polyamine and

(c) a crosslinking agent containing a polyfunctional group reacted with the amino groups of the organic polymer and with the polyamine, wherein the water-soluble polymer is a polymer of formula I



(1)

wherein R represents hydrogen or a C_1–C_5 alkyl group, x has a value of between 50 and 99.9 mol.% and y is 100−x mol.% and n is an integer such that the molecular weight of the polymer is more than 10,000.

4,721,569

PHOSPHORUS TREATMENT PROCESS

Jere Northrop, North Tonawanda, N.Y., assignor to Zablon, Ltd., North Tonawanda, N.Y.

Filed Apr. 17, 1987, Ser. No. 39,969

Int. Cl.⁴ C02F *3/30*

U.S. Cl. 210—607 **15 Claims**

1. A process for the treatment of an aqueous influent stream containing bacteria, phosphorus and biodegradable substrates, comprising adding to said stream aerobically enhanced and anaerobically stressed bacteria; dividing said influent stream into at least two separate streams; treating at least one of said separate streams in an aerobic zone in the presence of sufficient oxygen and for a time sufficient to cause the bacteria contained in the stream to take-up phosphorus in excess of their growth requirement; treating another of said separate streams in an anaerobic zone, under oxygen deficient conditions, for a time sufficient to stress the bacteria contained therein and cause release of phosphorus held by the bacteria; intimately mixing at least a part of the aerobically and anaerobically treated streams; holding said intimately mixed streams for a time sufficient to attain separation of bacteria containing solids from the aqueous stream; removing low bacteria and phosphorus solids content effluent from the held stream; removing high solids containing sludge from the held stream; and, recycling at least a portion of anaerobically stressed and aerobically enhanced bacteria containing sludge from said held stream to said aqueous influent stream.

4,721,570

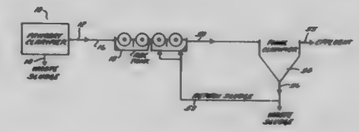
RBC WITH SOLIDS CONTACT ZONE

Raymond J. Aukaitis, Walnut Creek, Calif., assignor to Envirex, Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 826,657, Feb. 6, 1986, abandoned. This application May 4, 1987, Ser. No. 45,444

Int. Cl.⁴ C02F *3/18*

U.S. Cl. 210—619 **6 Claims**



3. In a method for treating wastewater, a method of increasing solids contact and thus enhancing solids settling comprising:

providing a source of effluent wastewater containing suspended solid matter from a primary clarifying means;

transporting the effluent wastewater into a sequentially chambered tank equipped with at least one rotating biological contactor unit in each chamber, the chambers including a first chamber and a last chamber; at least a portion of the rotating biological contactor units in the last chamber extending above the surface of the wastewater in the last chamber;

providing means in the sequentially chambered tank for causing effluent to sequentially pass from the first chamber to the last chamber;

maintaining a dissolved oxygen content of at least 0.5 milligrams/liter in the wastewater in the last chamber to provide for aerobic biodegration of the waste material in the wastewater;

transporting the effluent from the last chamber to a secondary clarifier;

separating settleable solids from the effluent in the form of a sludge;

collecting the sludge in a portion of the secondary clarifier;

conveying the majority of the collected sludge to a waste sludge disposal means; and

diverting the remaining portion of the collected sludge directly to at least the last chamber of the tank to thereby enhance the flocculation of the suspended solids in the wastewater and to effect increased setteability of the solids in the secondary clarifier.

4,721,571

METHOD FOR DISPERSING TWO PHASES AND FOR SETTING THE DISPERSED PHASES

Bror G. Nyman; Stig-Erik Hultholm, both of Pori; Raimo J. Leimala, Harjavalta; Leuno L. Lilja, and Valto J. Mäkitalo, both of Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 194,060, Oct. 6, 1980, abandoned, which is a continuation of Ser. No. 50,684, Jun. 21, 1979, abandoned. This application Dec. 23, 1983, Ser. No. 564,770

Claims priority, application Finland, Jun. 28, 1978, 782069

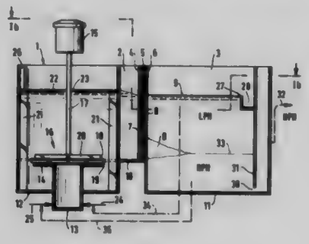
Int. Cl.⁴ B01D *11/04*

U.S. Cl. 210—634 **6 Claims**

1. A method for mixing two different phases of a liquid-liquid extraction with each other to form a dispersion and for settling of said dispersion at least in two steps, whereby both a heavy liquid phase and a light liquid phase are directed from below upwards to a mixing zone under a mixer, for causing flowing mixing motion in a lower section of the mixing zone and turbulent mixing motion; directing the resulting dispersion to a pre-settling zone surrounding at least partially the mixing zone through an opening or openings directed away from a settling zone, and thereby directing the dispersion to flow in

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two partial flows around the mixing zone to retard the velocity of flow of the dispersion without fully stopping the flow of the dispersion to cause partial separation of the phases in the pre-settling zone, and causing the partial flows to impinge against each other, producing a combined partially settled phase dispersion; causing said partially settled phase dispersion to flow to the settling zone through means defining several vertical rows of openings arranged higher than the bottom of the settling zone, said rows of openings being unaligned in relation to each other; and directing the settled phases separately away from the settling zone.



4,721,572

PURFICATION OF BLOOD CLOTTING FACTORS AND OTHER BLOOD PROTEINS ON NON-CARBOHYDRATE SULFATED MATRICES

Robert E. Jordan, Walnut Creek, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 12, 1985, Ser. No. 754,569
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **7 Claims**

1. In a method of isolating and purifying at least one of the group of blood coagulation factors and proteins selected from the group consisting of factors IX, X, II, VII, VIII, protein C, protein S, prothrombin, and tissue plasminogen activator, from a source of said blood coagulation factors and proteins selected from blood, blood plasma, plasma concentrates, and tissue culture fluids, obtained by means of biotechnology techniques, by the steps of

(a) contacting the blood, blood plasma, plasma concentrates, and tissue culture fluids with at least one affinity chromatography adsorbing agent,

(b) separating the non-adsorbed solution from the non-adsorbing agent, and

(c) eluting the adsorbed blood coagulation factors and proteins from the adsorbing agent using an eluant effective to elute the desired factor(s) and protein(s),

the improvement comprising using as the adsorbing agent a sulfated, synthetic, non-carbohydrate affinity chromatography gel matrix adsorbing agent comprising a sulfatable polymer, said sulfatable polymer selected from the group consisting of

(i) a synthetic organic affinity chromatography gel matrix prepared by polymerization of at least one polymerizable organic monomer, and

(ii) polymeric silica particles,

said sulfatable polymer having been treated by a process consisting essentially of treating with a sulfating agent so as to provide a multiplicity of sulfate groups bound directly to the polymer backbone.

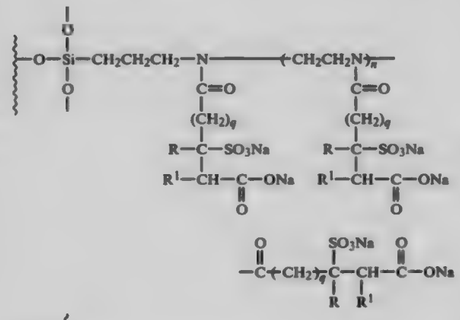
4,721,573

USE OF SULFONIC DERIVATIVES OF ACYLATED POLYETHYLENEIMINE BONDED PHASE SILICA PRODUCTS

Hugh E. Ramsden, Scotch Plains, and David R. Nau, Lebanon, both of N.J., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 837,051, Mar. 6, 1986, Pat. No. 4,661,248. This application Dec. 22, 1986, Ser. No. 943,954
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **27 Claims**

1. In a solid phase extraction process for the purification and separation of protein from a sample the improvement comprising employing as the solid phase a sulfonic derivative of covalently bound, non-crosslinked polyethyleneimine bonded phase silica of the formula



wherein

is the backbone of a silica gel or glass, n is an integer such that the polyethyleneiminopropyl silane group has an average molecular weight of from about 400 to about 1800; q is an integer of zero or one; R is selected from the group consisting of hydrogen, $-(CH_2)_xH$ or $-(CH_2)_mCOOH$ where x is an integer of 1 or 2 and m is an integer of zero or 1; when R is hydrogen or $-(CH_2)_2H$ then R^1 is $-(CH_2)_pCOOH$ where p is an integer of zero or 1, and when R is $-(CH_2)_mCOOH$ then R^1 is selected from the group consisting of hydrogen or $-(CH_2)_yH$ where y is an integer of zero or 1.

4,721,574

WATER TREATMENT

George McGrow, West Yorkshire, England, assignor to Allied Colloids Ltd., England

Filed May 21, 1986, Ser. No. 866,071
Claims priority, application United Kingdom, May 22, 1985, 8512937
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—734 **17 Claims**

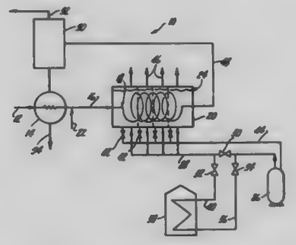
1. A process for flocculating suspended solids from an aqueous medium containing the suspended solids comprising adding an effective amount of a polymeric flocculating agent substantially soluble in water, to said aqueous medium, flocculating said suspended solids and separating the flocculated solids from the aqueous medium to produce a clarified aqueous medium, in which the flocculating agent, during part at least of the process is dissolved in an aqueous solution containing above 0.5 ppm free chlorine, and in which the polymer has at least 5% by weight of recurring units derived from monomers of th formula $CH_2{=}C(R^1)CONHR^2NR^3R^4$ wherein R^1 is hydrogen or methyl, R^2 is straight or branched chain C_{2-8} alkylene having at least 2 carbon atoms in the backbone between the two nitrogen atoms to which it is attached and R^3 and R^4 are independently selected from C_{1-4} alkyl, the polymer having a molecular weight of above one million.

4,721,575

METHOD AND APPARATUS FOR CONTROLLED CHEMICAL REACTIONS

Jack E. Binning, Broomfield; Francis M. Ferraro, Westminster, and Franklin B. Carlson, Broomfield, all of Colo., assignors to VerTech Treatment Systems, Inc., Denver, Colo.

Filed Apr. 3, 1986, Ser. No. 847,965
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—761 **24 Claims**



1. In a method of effecting chemical reactions the steps of:

flowing an influent fluid stream containing reactants through a long thin walled tubular coil horizontally positioned within a containment vessel, said step of flowing being controlled to provide a selected flow rate to cause plug or slug flow of said influent fluid stream through said coil;

circulating a heat-exchange medium through said containment vessel and in contact with said tubular coil;

controlling the temperature of the fluid stream within said tubular coil by adding heat to said fluid stream when the temperature of the fluid is below a predetermined temperature and removing heat from said fluid stream when the temperature of the fluid is above a predetermined temperature wherein a chemical reaction of said reactants in the fluid stream occurs to form an effluent fluid stream and reaction products; and

flowing the effluent fluid stream and reaction products from said tubular coil.

4,721,576

WELL DRILLING FLUIDS AND PROCESS FOR DRILLING WELLS

Arthur H. Hale, and Gordon T. Rivers, both of P.O. Box 370, Sand Springs, Okla. 74003

Filed Dec. 13, 1985, Ser. No. 808,716
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.51 **6 Claims**

1. A composition comprised of

(a) an aqueous base,

(b) a clayey material suspended in said aqueous base, and

(c) a water-soluble sulfonated styrene-itaconic acid copolymer having a pre-sulfonation molecular weight in the range of about 500 to about 10,000,

the total weight of the polymer of (c) present in the composition being in the range of about 0.05 to 10.0 pounds per barrel of composition.

4,721,577

STABILIZED FRACTURING FLUID AND METHOD OF STABILIZING FRACTURING FLUID

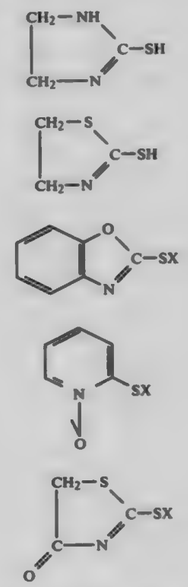
Shoichi Kanda, Kanagawa; Makoto Yanagita, Tokyo, and Yukihiko Sekimoto, Saitama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,624
Claims priority, application Japan, May 31, 1985, 60-116506
Int. Cl.[4] E21B *43/26*
U.S. Cl. 252—8.551 **10 Claims**

1. A stabilized aqueous fracturing fluid containing:

(A) at least one of guar gum and derivatives thereof, and

(B) a stabilizing amount of at least one stabilizing compound selected from the thiol derivatives of heterocyclic compounds, wherein said thiol derivatives of heterocyclic compounds are selected from the group consisting of 2-thioimidazolidone (formula (1)), 2-mercaptothiazoline (formula (2)), benzooxazole-2-thiol (formula (3)), N-pyridineoxide-2-thiol (formula (4)), and 4-ketothiazolidine-2-thiol (formula (5)):



(1)

(2)

(3)

(4)

(5)

wherein X is a hydrogen atom, an alkali metal or ammonium.

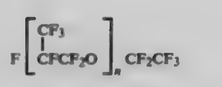
4,721,578

PERFLUORINATED POLYPROPYLENE OXIDE COMPOUNDS FOR VAPOR PHASE HEAT TRANSFER PROCESSES

Kenneth T. Dishart, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1986, Ser. No. 915,415
Int. Cl.[4] C09K *5/04*
U.S. Cl. 252—78.1 **12 Claims**

1. A process for transferring heat to a workpiece comprising contacting said workpiece with a vapor phase heat transfer medium comprising fully fluorinated hexafluoropropylene oxide oligomers having the formula:



where n is 1 to 9, and, thereafter,

removing said workpiece from contact with said vapor phase heat transfer medium.

4,721,579

SODIUM CARBOXYMETHYL DERIVATIVES OF POLYOXYALKYLENE GLYCOLS, THEIR PRODUCTION, AND USE IN FUNCTIONAL FLUIDS

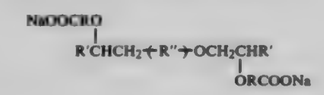
Bongsub Kim, Grosse Ile, Mich., assignor to BASF Corporation, Parsippany, N.J.

Filed Aug. 15, 1980, Ser. No. 178,267

Int. Cl.⁴ B01J *13/00*; **C07C** *59/245*; **C09K** *5/00*

U.S. Cl. 252—79 **9 Claims**

1. A 4000 to, 20,000 molecular weight polyoxyalkylene polymer thickener characterized by the following formula:



wherein R is a methylene or lower polymethylene group, R′ is a higher alkyl group, and R″ is a chain of lower oxyalkylene groups.

4. In an aqueous functional fluid the improvement wherein said functional fluid includes an effective thickening amount of the polymeric product of claim 1.

4,721,580

ANIONIC END-CAPPED OLIGOMERIC ESTERS AS SOIL RELEASE AGENTS IN DETERGENT COMPOSITIONS

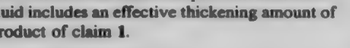
Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 7, 1987, Ser. No. 1,137

Int. Cl.⁴ C07C *143/10*; **C08G** *63/68*; **D06M** *13/30, 15/507*

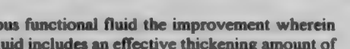
U.S. Cl. 252—90 **18 Claims**

1. Oligomeric esters having at least one anionic substituent group, said esters having the formula



I

or



II

or mixtures thereof; wherein Q, Q′ and Q″ may be the same or different anionic substituents selected from the group consisting of $MO_3S(CH_2CH_2O)_n$—, MO_3S—$(L)_q(YO)_m(CH_2CH_2O)_r$, and mixtures thereof, wherein M is H or a salt-forming cation, L is phenoethoxy, phenoxypropoxy or C_1–C_6 alkoxy, Y is $-CH_2CH(CH_3)-$ or $-CH(CH_3)CH_2-$, n is an integer from 1 to 30, q is 1 or 0, m is an integer from 0 to 15 provided that m+q is at least 1 and r is an integer from 0 to 30; x and y may be the same or different and are each integers with x selected from 0 to 20 and y selected from 1 to 20; the R-substituents may be the same or different alkylene substituents selected from the group consisting of $-CH_2CH_2-$, $-CH_2CH(X)-$ and $-CH(X)CH_2-$ wherein X is methyl, ethyl, methoxymethyl, or C_1–C_4-alkylpoly(oxyalkylene)oxymethyl, or mixtures thereof; and the Z-substituents may be the same or different aryldicarbonyl substituents selected from the group consisting of



and mixtures thereof with aryl-1,3-dicarbonyl or substituted aryl-1,3-dicarbonyl or substituted aryl-1,4-dicarbonyl groups.

9. A laundering and fabric care composition comprising from about 0.1% to about 50% by weight of a soil release component comprising anionic oligomeric esters and mixtures of anionic oligomeric esters of claim 1.

4,721,581

ALKYL ETHOXYLATE SULFATE DETERGENT LAUNDRY BARS AND PROCESSES FOR MANUFACTURE THEREOF

Pallassana N. Ramachandran, Robbinsville, and Patrizia Barone, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,908

Int. Cl.⁴ C11D *17/00*

U.S. Cl. 252—135 **14 Claims**

1. A built synthetic organic detergent laundry bar consisting essentially of 15 to 40% of higher fatty alcohol ethoxylate sulfate, 10 to 50% of builder(s) for the sodium higher fatty alcohol ethoxylate sulfate, 5 to 40% of bentonite, and 5 to 20% of water, which water includes water removable from any hydrate components of such detergent laundry bar when said bar is subjected to heating at 105° C. for two hours.

4,721,582

TOXIC GAS ABSORBENT AND PROCESSES FOR MAKING SAME

Sidney G. Nelson, Hudson, Ohio, assignor to Sanitech, Inc., Twinsburg, Ohio

Continuation-in-part of Ser. No. 838,354, Mar. 11, 1986, abandoned. This application Feb. 3, 1987, Ser. No. 10,449

Int. Cl.⁴ C09K *3/00*; **B01J** *20/04*

U.S. Cl. 252—189 **13 Claims**

1. A solid acceptor for sulfur oxides, nitrogen oxides, hydrogen halides, and/or other noxious components of a gas at temperature below 250° C. wherein water-moistened exfoliated or expanded mineral support particles are coated with a divalent metal oxide or hydroxide, the support being selected from the group consisting of exfoliated vermiculite and expanded perlite, said acceptor being characterized by the coated support particles' having been heated before use at a temperature of least about 400° until conditioned for the accepting purpose.

4,721,583

FIRE-RESISTANT POLYCARBONATES

Pierre Poisson, Bernay, and Philippe Potin, Billere, both of France, assignors to Atochem, France

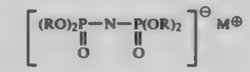
Filed Jul. 15, 1986, Ser. No. 886,200

Claims priority, application France, Jul. 17, 1985, 85 10959

Int. Cl.⁴ C09K *21/00*; **C08K** *5/34, 5/48*

U.S. Cl. 252—609 **4 Claims**

1. A fire-resistant polycarbonate composition comprising a polycarbonate and for each one thousand parts by weight thereof from about 0.1 to 10 parts by weight of a salt of the formula:



in which R is a C_1 to C_6 alkyl radical or an aryl radical, unsubstituted or substituted aryl radical and M is an alkali metal selected from Li, Na, or K.

4,721,584

METHOD OF CONCENTRATION AND SEPARATION OF UNSATURATED FATTY ACID ESTERS

Makoto Arai, and Hideki Fukuda, both of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1986, Ser. No. 931,100

Claims priority, application Japan, Nov. 21, 1985, 60-262262; Apr. 2, 1986, 61-76062; Aug. 22, 1986, 61-197884

Int. Cl.⁴ C11C *1/08*

U.S. Cl. 260—428.5 **20 Claims**

1. A method of concentrating and separating γ-linolenic acid esters and/or arachidonic acid esters in which their adsorption and desorption are performed in batch operation by bringing in contact with crystalline aluminosilicate zeolites a fatty acid ester mixture containing γ-linolenic acid ester and/or arachidonic acid ester, the method comprising the steps of:

(a) stirring a fatty acid ester mixture containing γ-linolenic acid ester and/or arachidonic acid ester dissolved in a nonpolar solvent and crystalline aluminosilicate zeolites to obtain a fatty acid ester mixture adsorbed by the zeolites, said nonpolar solvent being at least one nonpolar hydrocarbon compound,

(b) separating the zeolites which have adsorbed the fatty acid ester mixture, from the nonpolar solvent, and

(c) stirring a polar solvent and the zeolites to obtain γ-linolenic acid ester and/or arachidonic ester desorbed from the zeolites, said polar solvent being at least one member selected from the group consisting of alcohols, ketones, halogenated hydrocarbon compounds, ethers and acetate esters.

11. A method of concentrating and separating γ-linolenic acid esters and/or arachidonic acid esters characterized in that their adsorption and desorption are performed in column operation by bringing in contact with crystalline aluminosilicate zeolites a fatty acid ester mixture containing γ-linolenic acid ester and/or arachidonic acid ester, using zeolites containing at least one member selected from the group consisting of the following cations: K^+, Cs^+, Rb^+, NH_4^+, $CH_3NH_3^+$, $(CH_3)_2NH_2^+$ and $C_2H_5NH_3^+$ wherein the operation comprises the steps of:

(a) passing a fatty acid ester mixture containing γ-linolenic acid ester and/or arachidonic acid ester dissolved in a nonpolar solvent through a column filled with said crystalline aluminosilicate zeolites, whereby the fatty acid ester mixture is adsorbed by the zeolites, said nonpolar solvent being at least one nonpolar hydrocarbon compound, and

(b) passing a polar solvent, or a mixed solvent of a polar solvent and a nonpolar solvent in a ratio of 1–1000:1 by volume, through the crystalline aluminosilicate zeolites to desorb the γ-linolenic acid ester and/or arachidonic acid ester, said polar solvent being at least one member selected from the group consisting of alcohols, ketones, halogenated hydrocarbon compounds, ethers and acetate esters.

4,721,585

PROCESS FOR THE BIOLOGICAL TREATMENT OF SEWAGE

Ulderico Melchiorri Santolini, Arizzano; Roberto Antonietti, Parma; Pierluigi Viaroli, Fiorenzzola d'Arda; Caterina Della Sala Merigo, Verbania Pallanza; Gianpaola Malara, Omegna, and Mario Contesini, Verbania Trobaso, all of Italy, assignors to Consiglio Nazionale Delle Richerche and Universita Degli Studi Di Parma, both of, Italy

PCT No. PCT/IT86/00006, § 371 Date Sep. 11, 1986, § 102(e) Date Sep. 11, 1986, PCT Pub. No. WO86/04321, PCT Pub. Date Jul. 13, 1986

PCT Filed Jan. 24, 1986, Ser. No. 912,248

Claims priority, application Italy, Jan. 25, 1985, 40008 A/85

Int. Cl.⁴ C02F *3/08, 3/34*

U.S. Cl. 210—616 **6 Claims**

1. Process for the biological treatment and purification of sewage water containing phosphorus and nitrogen pollutants comprising the steps of

contacting the sewage water with cellulose materials under aerobic conditions for a predetermined length of time, in the presence of cellulose-devouring heterotrophic micro-organisms, to trigger heterotrophic decomposition and absorption of nitrogen and phosphorus, and

separating the sewage water from the cellulose materials and the micro-organisms, to obtain treated water depleted of said phosphorus and nitrogen pollutants.

4,721,586

METHOD OF MOLDING PLUGS FOR OPTICAL FIBER CABLES

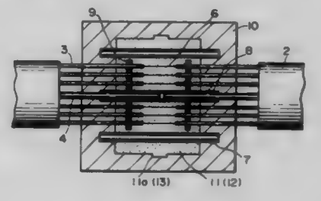
Toshiaki Kakii; Naoshi Hakamata, and Shuzo Suzaki, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 14, 1986, Ser. No. 839,394

Claims priority, application Japan, Mar. 15, 1985, 60-52956

Int. Cl.⁴ B29D *11/00*; **G02B** *6/44*

U.S. Cl. 264—1.5 **11 Claims**



1. A method for manufacturing optical fiber cable plugs from a longitudinally extending optical fiber cable containing a plurality of coated optical fibers and a tensile strength member, said method comprising the steps of:

removing a protective cover layer (2) of said optical fiber cable (1) from a middle part thereof to expose portions of said coated optical fibers (3) and said tensile strength member (4);

cutting said tensile strength member into two parts;

inserting said parts of said tensile strength member into a pipe (8);

providing positioning coupling members (7) along said exposed portions of said optical fibers, wherein said positioning coupling members comprise a plurality of metal pipes, inner circumferential walls of which are machined with high precision;

molding said positioning coupling members and said coated optical fibers including said exposed portions thereof, and said two parts of said strength member and said pipe, with resin to provide a single molding member (12); and

cutting said molding member along a plane perpendicular to

a longitudinal axis thereof into two substantially equal parts.

4,721,587

PROCESS OF MAKING HEAT-STRENGTHENED YARN

Thomas E. Carney, Wilmington, and Abraham Matthews, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 12, 1985, Ser. No. 743,902
Int. Cl.[4] D01D *10/02*
U.S. Cl. 264—130 4 Claims

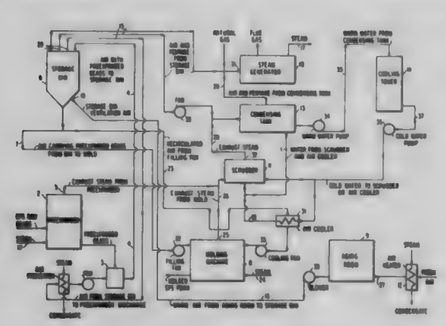
1. In a method for heat-strengthening a yarn spun from an anisotropic-melt forming polyester wherein a yarn comprising one or more filaments is subjected to a heat treatment in a substantially inert atmosphere at temperatures below the filament melting point for a time sufficient to increase the yarn tenacity, the improvement compriaing coating the yarn before the heat treatment with a dispersion of hydrophobic silica having an average primary particle size less than about 50 nanometers in a liquid carrier whereby interfilament and intrafilament fusion is substantially eliminated.

4,721,588

CLOSED CIRCUIT PROCESS FOR THE PRODUCTION OF EXPANDED POLYSTYRENE FOAM

Edgar Burchard, Morelia; Arturo Echeverria, Mexico City; Ignacio G. Sancho, Mexico City, and Otto F. Plettner, Mexico City, all of Mexico, assignors to Epsilon Holdings, N.V., Netherlands

Filed Jun. 9, 1986, Ser. No. 871,745
Int. Cl.[4] B29B *17/00*; C08J *9/22*
U.S. Cl. 264—37 21 Claims



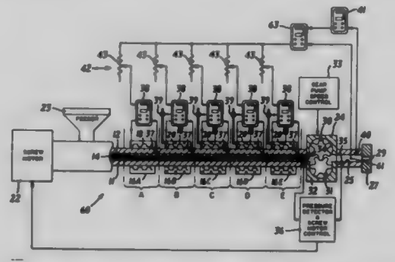
1. A closed circuit process for the production of expanded polystyrene foam comprising the steps of:
(a) pre-expanding raw polystyrene beads containing a blowing agent in a closed pre-expansion vessel;
(b) storing said beads in one or more closed storage bins;
(c) molding said expanded beads to a desired configuration in a closed mold with steam; and
(d) removing the thus-formed article from the mold and placing such in an aging room,
wherein during each of said steps the blowing agent released from the beads is recovered, avoiding release of the blowing agent into the surrounding atmosphere, and
(e) separating the recovered blowing agent from any residual steam by means of a condensing system.

4,721,589

EXTRUDER VISCOSITY CONTROL SYSTEM AND METHOD

Holton E. Harris, Westport, Conn., assignor to Harrel, Inc., East Norwalk, Conn.

Filed Sep. 22, 1983, Ser. No. 534,641
Int. Cl.[4] B29B *7/72*
U.S. Cl. 264—40.1 26 Claims



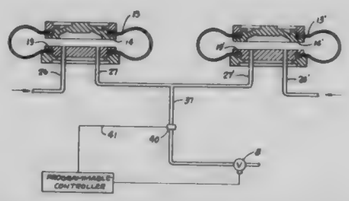
1. A method of extruder viscosity control for an extruder used in the manufacture of continuously extruded articles including the steps of providing a controlled volumetric flow of thermoplastic material to be extruded to a die by provision of a controlled volumetric flow means upstream of the die with respect to the flow of the material to be extruded, detecting pressure variations in the flowing material intermediate the controlled volumetric flow means and the die, and altering the temperature of the material flowing to the die to be extruded to hold the pressure relatively constant, whereby the viscosity of the material to be extruded is held substantially constant at the die.

4,721,590

PRESSURE-DETERMINED BLOWDOWN PERIOD FOR EACH OF MULTIPLE, COMMONLY MANIFOLDED CURING PRESSES

Dennis L. Trapp, Akron, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Jul. 24, 1986, Ser. No. 888,896
Int. Cl.[4] B29C *35/04, 35/00*
U.S. Cl. 264—40.5 6 Claims



1. In a curing room containing plural curing presses for tires, each of which presses is provided with an elastomeric curing bladder deployed within separable upper and lower mold halves, and a blowdown conduit through which a blowdown fluid is to be blown down from within said curing bladder, near the end of a curing cycle, into a common manifold which places two or more bladders in pressure-sensing, relationship with each other during a portion of the blowdown period, the improvement comprising,
pressure transducer means distally located relative to said halves but in pressure sensing communication with the interior of said bladder so as to generate a first signal correlatable with an instantaneous pressure within said bladder during the blowdown period;

programmable controller means including
(i) means for storing and executing a sequence of instructions determinative of fixed intervals of time for shaping said tire and thereafter curing it with a curing fluid at adequate temperature and sufficient pressure for the purpose;
(ii) means for comparing said first signal generated during the blowdown period with a second signal corresponding to a preselected low pressure within the range from about 1 to about 10 psig; and,
(iii) means to actuate the separation of said halves when said first and second signals are matched; and,
mechanical pressure safety switch means in pressure sensing relationship with the interior of said bladder preset for a preselected pressure at which the press may be safely opened;
whereby the blowdown time for each said press is variable from one curing cycle to another, depending upon the difference in pressure between said interior of the bladder and the common manifold, but said mold halves are separable at the end of a blowdown cycle soon after said first and second signals are matched.

4. In a process for shaping and curing a tire including storing and executing with programmable controller means a sequence of instructions determinative of fixed intervals of time for shaping said tire and thereafter curing said tire with a curing fluid at adequate temperature and pressure, said process including blowing down a curing fluid near the end of said curing cycle from within a bladder used to cure said tire disposed between mold halves in a curing press equipped with a mechanical pressure safety switch to prevent the press from opening when the pressure of curing fluid in said bladder is greater than 10 psig, the improvement comprising,
electronically sensing the instantaneous pressure within the bladder during said blowdown at a location distally located relative to said mold halves so as to generate a first signal correlatable with said instantaneous pressure; setting a preselectable press-opening pressure within the range from about 1 to about 10 psig and generating a second signal corresponding thereto in said programmable controller means; comparing said first signal with said second signal; and, actuating separation of said halves with said programmable controller means when said first and second signals are matched.

4,721,591

METHOD FOR THE PREPARATION OF CROSS-LINKED POLYETHYLENE FOAMS AND FOAMS PRODUCED BY THE METHOD

John S. Cheng-Shiang, Madrid, Spain, assignor to Dow Chemical Iberica S.A., Madrid, Spain

Filed Jul. 1, 1986, Ser. No. 880,998
Claims priority, application United Kingdom, Jul. 3, 1985, 8516825
Int. Cl.[4] B23K *7/04*
U.S. Cl. 264—54 10 Claims

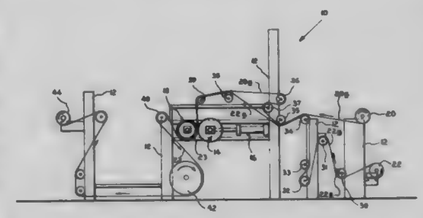
1. A method for the preparation of a cross-linked microcellular foam of a low density polyethylene or a blend of low density polyethylene with one or more other polymer(s), the method comprising the steps of mixing the low density polyethylene, a blowing agent, a cross-linking initiator, and if employed, other polymer(s) and additives, forming the resulting mixture into a sheet material without substantially cross-linking the olefinic polymer(s) and without substantial decomposition of the blowing agent, thereafter continuously producing from the sheet material a significantly cross-linked microcellular foam by pre-heating the sheet material at a temperature of from 150° C. to less than 180° C. for a period of less than 15 minutes, and subsequently heating the pre-heated sheet at a second and higher temperature, for a period of less than 15 minutes to produce the significantly cross-linked microcellular foam wherein the cross-linking agent has a ten hour half-life temperature of more than 80° C. and less than 110° C.

4,721,592

FILM EMBOSSING PROCESS

Vernon P. Fruehauf, Salt Springs, Fla.; Albert H. Hoefling, Hockessin, Del., and William S. Schlegel, Williamsville, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 844,960, Mar. 27, 1986, abandoned. This application Jan. 23, 1987, Ser. No. 2,979
Int. Cl.[4] B29C *59/04, 63/02*
U.S. Cl. 264—171 2 Claims



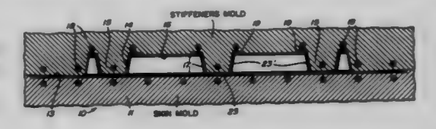
1. A process for embossing and fusing two layers of polyvinyl fluoride films without adhesive comprising: passing two separate sheets of such film, each being about 0.002 to about 0.004 inch thick between the nip of a heated embossing roll and a backup roll at a speed of about 1 to 1.5 yards per minute, maintaining a pressure between the rolls of from about 400 to 430 lbs per linear inch of film width, maintaining the temperature of the embossing roll in the range of from 360°–390° F. while maintaining the temperature of the backup roll below 170° F. and then cooling and winding said film.

4,721,593

PROCESS FOR MOLDING AND CURING A COMPOSITE SKIN-STIFFENERS ASSEMBLY

William Koval, St. Leonard, Canada, assignor to Canadair Inc., Montréal, Canada

Filed May 15, 1986, Ser. No. 863,369
Int. Cl.[4] B29C *43/10, 43/20*
U.S. Cl. 264—258 8 Claims



1. A process for molding and curing a composite skin-stiffeners assembly of the single-skin type, comprising the steps of:
(i) providing a stiffener mold part having a corrugated curing face formed with at least one stiffener-shaping ridge and valleys formed on the opposite sides of each ridge;
(ii) laying a piece of stiffener forming composite material in stiffener shape of open cross-section over each ridge against the opposite sides thereof to form a stiffener upon each said ridge with interspacing gaps between the laid pieces of stiffener forming composite material;
(iii) placing an expandable molding device in each valley formed by the corrugated curing face of the stiffener mold part and over the gaps between the laid pieces of stiffener forming material;
(iv) laying a skin of composite material over a skin curing face of a skin mold part;
(v) positioning the skin curing face of the skin mold part and the corrugated stiffener curing face of the stiffener mold part in face to face juxtaposition, with said valleys defining longitudinal mold enclosures along each side of each ridge, with at least a portion of the skin material on the

skin mold part coming in molding contact with at least a portion of each piece of the stiffener forming composite material laid over each ridge;

(vi) expanding said expandable molding devices to apply appropriate molding pressure against the skin material and the stiffener forming composite material extending into the mold enclosures to press the same in position against the corresponding curing face; and

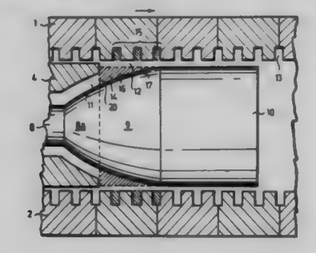
(vii) co-curing said skin and stiffener composite material under appropriate heat and pressure.

4,721,594

METHOD AND AN APPARATUS FOR THE PRODUCTION OF RIBBED PIPES

Jyri Järvenkylä, Salpakangas, Finland, assignor to Uponor N.V., Sint Marteen, Netherlands

Filed Sep. 23, 1986, Ser. No. 910,617
Claims priority, application Finland, Mar. 20, 1986, 861172
Int. Cl.[4] B29C *47/20*
U.S. Cl. 264—508 **19 Claims**



1. An apparatus for the production of an outwardly-ribbed, plastic pipe having a smooth inner face, the appartus comprising:

an extrusion sleeve having an end face;

a core positioned on the center line of the extrusion sleve and spaced therefrom, the core comprising a spindle within the extrusion sleeve, a mandrel having an outer surface and one end on one end of the spindle, protruding from the end face of the extrusion sleeve to an opposite end and enlarging substantially conically away from the spindle, and a kernel having an outer surface of sub-stantially constant diameter extending from the opposite end of the mandrel, whereby the core and extrusion sleeve form a tubular channel for communicating with a device for feeding plastic material therefrom; and

moulding means surrounding the extrusion sleeve and core at the end face of the extrusion sleeve for moulding an outwardly-ribed pipe having a smooth inner face from the plastic material from the tubular channel of the latter, the moulding means comprising at least two endless rows of chill moulds moving along the extrusion sleeve and core in a direction of production from the extrusion sleeve toward the kernel, the inner surfaces of the cill moulds having rib-forming grooves uniformly spaced therealong for forming the outward ribs of the pipe, the volume of an annular space defined by a plane extending transversely to the center line of the extrusion sleeve at the end face of the extrusion sleeve, the outer surface of the mandrel, and a cylindrical plane projection thereabout from the outer surface of the kernel corresponding substantailly to the combined filling volume of those rib-forming grooves of the molding means positioned at the mandrel at each particular moment.

16. A method of producing outwardly-ribbed plastic having a smooth inner face, themethod comprising:

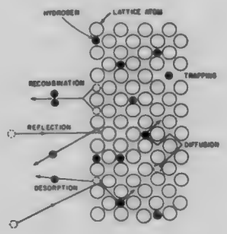
feeding plastic material through a tubular channel defined between an extrusion sleeve and a core on the centerline thereof into a moulding space defined between an end face of the extrusion sleeve, a substantially-conically enlarging mandrel of the core projecting from the end face of the extrusion sleeve, and moulding means having rib-forming grooves, sur-rounding the extrusion sleeve and core at the end face of the extrusion sleeve and moving post the latter for moulding plastic pipe having an outwardly-ribbed pipe wall with a smooth inner surface, the volume of the plastic material fed through the tubular channel per unit time being at least substantially equal to, but not substantially more than the sum of the volume of the pipe wall and the filling volume of those grooves of the moulding means which pass the end face of the extrusion sleeve during the unit of time.

4,721,595

FIRST WALL FOR POLARIZED FUSION REACTORS

Henry S. Greenside, Cranbury; Robert V. Budny, Princeton, both of N.J., and Douglass E. Post, Jr., Buttonwood, Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1985, Ser. No. 696,273
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—150 **8 Claims**



1. A fusion reactor comprising:

a plasma fuel having polarized nuclei; and a first wall, said first wall including a coating formed of a material selected from the group consisting of a hydrogenated amorphous semiconductor and a deuterated amorphous semiconductor and wherein said coating has a varied porosity and further including small amounts of a nitrogen dopant in said coating.

4,721,596

METHOD FOR NET DECREASE OF HAZARDOUS RADIOACTIVE NUCLEAR WASTE MATERIALS

Richard Marriott, Detroit, Mich.; Frank S. Heavey, San Diego, and Adolf R. Hochstim, La Jolla, both of Calif., assignors to Perm, Inc., La Jolla, Calif.

Continuation of Ser. No. 455,046, Jan. 3, 1983, abandoned, which is a continuation of Ser. No. 100,658, Dec. 5, 1979, abandoned. This application May 22, 1984, Ser. No. 613,013
Int. Cl.[4] G21G *1/02, 1/06*
U.S. Cl. 376—189 **15 Claims**

1. A method of decreasing the amount of relatively long lived fission products in radioactive waste materials in excess of that due to their natural radioactive decay by producing relatively short lived radioactive nuclides and stable nuclides from said relatively long lived fission products comprising the steps of:

(a) separating said fission products into at least (1) a plurality of physically separate groups, each of said groups having at least one relatively long lived fission product nuclide selected from the group comprising Se^{79}, Kr^{85}, Sr^{90}, Zr^{93}, Tc^{99}, Pd^{107}, Sb^{125}, Sn^{126}, I^{129}, Cs^{135}, Cs^{137}, Pm^{147}, Sm^{151}+Eu, and actinides, and (2) relatively short lived fission product radioactive nuclides and stable nuclides;

(b) storing said relatively short lived radioactive nuclides and stable nuclides;

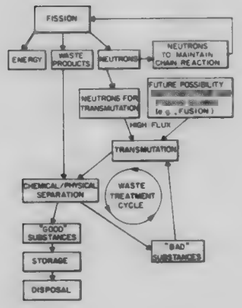
(c) exposing at least the groups containing Kr^{85}, Sr^{90}, Zr^{93}, Tc^{99}, Pd^{107}, I^{129}, Cs^{135}, Sm^{151}+Eu, and actinides, to a high thermal neutron flux for separate, different predetermined periods of time selected in accordance with the long lived fission product nuclide in said corresponding group for inducing predetermined transformations of said relatively long lived fission product nuclides to produce relatively short lived radioactive nuclides and stable nuclides;

(d) removing each exposed group containing said produced relatively short lived radioactive nuclides and stable nuclides from said high thermal neutron flux;

(e) separating said removed group into (1) said produced short lived radioactive nuclides and stable nuclides, and (2) a plurality of further groups having long lived fission product nuclides respectively corresponding to at least some of the long lived fission product nuclides or said plurality of groups of step (a);

(f) storing said produced short lived radioactive nuclides and stable nuclides;

(g) joining at least one of said plurality of further groups to at least one of said plurality of groups of step (a) having a corresponding long lived fission product nuclide;



(h) repeating steps (c)–(f) at least one time;

(i) for at least one other further group, maintaining same separate from said plurality of groups of step (a) while re-exposing same to a high thermal neutron flux for a predetermined period of time selected in accordance with said long lived fission product nuclide contained therein for inducing predetermined transformations of said long lived nuclide to further produce relatively short lived radioactive nuclides and stable nuclides;

(j) removing said at least one other further group containing said further produced relatively short lived radioactive nuclides and stable nuclides from said high thermal flux;

(k) separating said removed other further group into (1) said further produced short lived radioactive nuclides and stable nuclides, and (2) yet another group containing said long lived fission product nuclides of step (i);

(l) storing said further produced short lived radioactive nuclides and stable nuclides; and

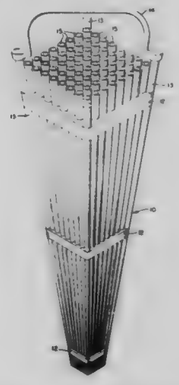
(m) storing said long lived radioactive nuclides of steps (e) and (k) after they have reached a reduced level of radioactivity over their natural decay.

4,721,597

METHOD AND APPARATUS FOR COMPACTING SPENT NUCLEAR REACTOR FUEL RODS

William J. Wachter, Wexford, Pa., assignor to U.S. Tool & Die, Allison Park, Pa.

Continuation-in-part of Ser. No. 291,230, Aug. 10, 1981. This application Sep. 13, 1985, Ser. No. 775,534
Int. Cl.[4] G21C *19/10*
U.S. Cl. 376—261 **11 Claims**



1. In a nuclear reactor system requiring periodic physical manipulation of spent fuel rods, the method of compacting fuel rods from a fuel rod assembly comprising the steps of:

(1) removing the top end from said fuel rod assembly;

(2) passing multiple fuel rod pulling members having electrodes of weld elements in leading ends thereof in sequence through a fuel rod container and thence through respective consolidating passages in a fuel-rod directing chamber;

(3) welding said weld elements of said pulling members to the top end of respective said fuel rods corresponding to the respective pulling members;

(4) drawing each of said pulling members axially to draw the respective engaged fuel rods in one axial direction through the respective said passages in said chamber to thereby consolidate said fuel rods into a compacted configuration of a cross-sectional area smaller than the cross-sectional area occupied thereby within said fuel rod assembly; and

(5) drawing all of said engaged fuel rods concurrently and substantially parallel to one another to said one axial direction into said fuel rod container while maintaining said compacting configuration in a fuel rod density which is greater than that of the fuel rod density of said fuel rod assembly.

4,721,598

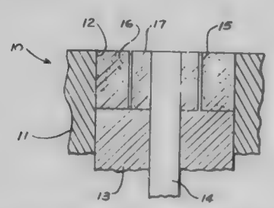
POWDER METAL COMPOSITE AND METHOD OF ITS MANUFACTURE

Peter W. Lee, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Feb. 6, 1987, Ser. No. 11,751
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 **8 Claims**

1. A composite metal article comprising a first body of a base powder metal; a second body of a high performance alloy powder metal; and a divider ring; said first and said second bodies being in concentric relationship and in powder form with said divider ring isolating the powder form of said first

and second bodies, and said first and second bodies and siad divider ring being first simultaneously compacted and subse-



quently simultaneously sintered to form the said composite metal article.

4,721,599

METHOD FOR PRODUCING METAL OR ALLOY ARTICLES

Hideki Nakamura, Yonago, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Apr. 24, 1986, Ser. No. 855,333
Claims priority, application Japan, Apr. 26, 1985, 60-90339
Int. Cl.⁴ B22F *1/00*
U.S. Cl. 419—23 **6 Claims**

1. A method for producing a metal or alloy article which comprises mixing and kneading a metal or alloy powder with an organic binder, injection molding said kneaded mixture into a shape similar to that of the desired final product, removing the organic binder, and sintering the injected product to give a metal or alloy article with high density, the organic binder comprising (a) as an adhesive agent a kind of methylcellulose having three OH groups in glucose residue contained in the cellulose, about 2 of said three OH groups being substituted with methoxy (-OCH_3) groups in a weight range of 27.5 to 31.5%, in an amount of 0.5 to 3.0% by weight, (b) as a plasticizer at least one of esters of polyhydric alcohol ether compounds, propylene glycol and polyethylene oxide in an amount of 0.5 to 3.0% by weight, (c) as a lubricant or a mold release agent at least one of a wax emulsion, a stearic acid emulsion, a water-soluble acrylic resin and microcrystalline wax in an amount of 0.5 to 3.0% by weight, and (d) as a solvent for the organic binder water in an amount of 4.0 to 12% by weight, all percents by weight of the components (a) to (d) being based on the weight of the metal or alloy powder.

4,721,600

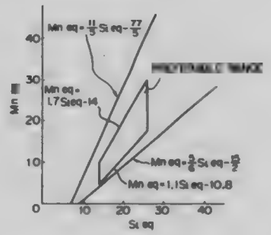
SUPERPLASTIC FERROUS DUPLEX-PHASE ALLOY AND A HOT WORKING METHOD THEREFOR

Yasuhiro Maehara, Kobe, and Yoshio Tarutani, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1986, Ser. No. 844,661
Claims priority, application Japan, Mar. 28, 1985, 60-064163; Apr. 19, 1985, 60-084067
Int. Cl.⁴ C22C *38/02, 38/04*
U.S. Cl. 420—57 **10 Claims**

1. A superplastic duplex-phase ferrous alloy which exhibits an ($\alpha+\gamma$) duplex-phase structure at temperatures in the range of 700°–1200° C., and which consists essentially of, by weight, at least one of Si and Mn in an amount of not less than 0.5% and not less than 1.7%, respectively, and not more than 20.0 and 30.0%, respectively,

N: at least 0.01% and up to 0.3% in solid solution,	
Ni: 0–5.0%,	Cr: 0–20.0%,
Mo: 0–6.0%,	Cu: 0–1.0%,
Ti: 0–0.5%,	Zr: 0–0.5%,
Nb: 0–0.5%,	V: 0–0.5%,
W: 0–1.0%,	



the balance being Fe and incidental impurities including C in an amount of from 0–0.5%, wherein Si eq and Mn eq which are defined as

$$Si\ eq = Si + (\tfrac{1}{5})(Cr + Mo),$$

and

$$Mn\ eq = Mn + 2Ni + 60C + 50N$$

satisfy the formula

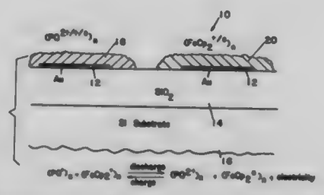
$$(5/6)(\text{Si eq}) - 15/2 \leqq \text{Mn eq} \leqq (11/5)(\text{Si eq}) - 77/5.$$

4,721,601

MOLECULE-BASED MICROELECTRONIC DEVICES

Mark S. Wrighton, Winchester; Henry S. White, Jr., Somerville, and Gregg P. Kittlesen, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 23, 1984, Ser. No. 674,410
Int. Cl.⁴ G01N *27/22, 27/26*
U.S. Cl. 422—68 **13 Claims**



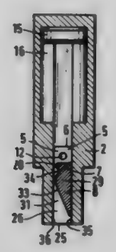
1. A microelectronic device comprising at least two electrically conductive electrodes, separated by less than two microns and on an insulating substrate overlaid with at least one electroactive polymer, wherein said device is responsive to a signal that changes the state of charge of the electronic polymer which results in a net change in the concentration of ionic species in said polymer.

4,721,602

MIXING HEAD FOR THE MIXING OF AT LEAST TWO COMPONENTS FORMING A SYNTHETIC MATERIAL

Heinz Woltzel, Ibbenbüren, Fed. Rep. of Germany, assignor to IBW Ingenieur-Büro Woltzel GmbH, Ibbenbüren, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,054
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521236
Int. Cl.⁴ B01F *5/04*
U.S. Cl. 422—133 **27 Claims**



1. A mixing head for mixing components forming a synthetic material comprising a housing having a guide channel, said guide channel having a rectangular cross-sectional configuration formed by four side walls and a longitudinal axis, a discharging piston reciprocably disposed in said guide channel, one portion of said guide channel defining a mixing chamber and another portion of said guide channel forming an outlet channel, said outlet channel having an outlet opening, inlet means for the components leading to said mixing chamber, said piston having a withdrawn position, said piston having an end face which defines a boundary of said mixing chamber when said piston is in said withdrawn position, a throttle means mounted on said housing at said outlet channel and movable between a throttle position within said outlet channel and a withdrawn position withdrawn from said outlet channel, said throttle means when in said throttle position defining another boundary of said mixing chamber, said throttle means when in said throttle position forming a throttle passage in said outlet channel which extends substantially the entire length of said outlet channel, said throttle passage having a throttle slit and a diffusor-like flared portion which progressively increases in cross-sectional area as the outlet opening of the outlet channel is approached.

4,721,603

SEPARATION OF REACTED HYDROCARBONS AND CATALYST IN FLUIDIZED CATALYTIC CRACKING

Russell R. Krug, San Rafael, and Peter C. Schmidt, Walnut Creek both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 503,781, Jun. 13, 1983, Pat. No. 4,500,423, which is a continuation-in-part of Ser. No. 238,380, Feb. 26, 1981, abandoned. This application Jan. 9, 1985, Ser. No. 689,956
Int. Cl.⁴ B01J *8/18*
U.S. Cl. 422—147 **18 Claims**

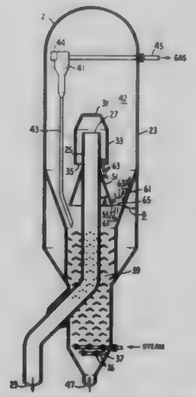
1. In a fluidized catalytic cracking system for the conversion of a hydrocarbon feedstock to lower boiling fractions, a reactor-separator vessel having a cylindrical external shell and an inlet reactor riser conduit extending upwardly therethrough for discharging the catalytically cracked reaction mixture of hydrocarbon vapors and catalyst into said shell above a catalyst stripper, the improvement comprising means for improving the separation of such converted hydrocarbon vapors from the catalyst above said catalyst stripper, comprising in combination:

a shroud surrounding an upper end of said riser defining an annulus for discharging the entire flow of said mixture of hydrocarbon conversion products and catalyst particles coaxially downwardly into said shell around said riser,

a first annular catalyst disengaging baffle on the outside of said riser and directly adjacent said discharge annulus for deflecting said mixture outwardly and downwardly from said riser toward said cylindrical shell, said baffle being at an angle of about 10° to 30°, with respect to said riser,

a second annular disengaging baffle on the inside wall of said shell for further deflecting the hydrocarbon vapor and catalyst mixture form said riser disengaging baffle, said baffle being at an angle of about 10° to 30°, with respect to said inside wall,

said first baffle and said second baffle positioned with respect to each other so as to define complementing frusto-



conical surfaces and adapted to act in tandem with said discharge annulus to define a partial cyclone separating zone, said partial cyclone having a substantially circular axis of rotation generally concentric with said annulus and above said stripper whereby the efficiency of separating catalyst from hydrocarbon vapor is increased,

the radial distance between the lower end of said catalyst disengaging riser baffle and said riser being more than 1 and less than 4 times the radial distance between the inner wall of said discharge shroud and said riser, and

the annular opening between the lower end of said first baffle and said second baffle having a cross-sectional area approximately the same as that of any cross-sectional area for catalyst flow within said catalyst stripper.

4,721,604

THERMAL CRACKING FURNACE FOR PRODUCING VINYL CHLORIDE

Marco Simonetta, Milan, and Giacomo Di Claudio, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Aug. 15, 1986, Ser. No. 897,107
Claims priority, application Italy, Sep. 5, 1985, 22068 A/85
Int. Cl.⁴ F27B *17/00*; F27D *7/00*
U.S. Cl. 422—189 **10 Claims**

1. Apparatus for the production of vinyl chloride monomer by the thermal cracking of dichloroethane comprising:

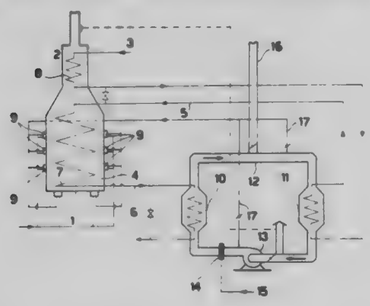
(a) an oven comprising a convective heating space and a radiant heating space;

(b) means for supplying liquid dichloroethane to the convective heating space wherein the liquid dichloroethane is heated to a temperature below its melting point;

(c) a first indirect heat exchange means for receiving the heated liquid dichloroethane from the convective heating space and for converting the heated liquid dichloroethane to gaseous dichloroethane;

(d) means connected to the first heat exchange means for conveying the gaseous dichloroethane to the radiant heating space wherein the gaseous dichloroethane is further heated and thermally cracked to produce vinyl chloride monomer;

(e) a second indirect exchange means for receiving the heated vinyl chloride monomer from the radiant heating space for recovering the vinyl chloride monomer; and



(f) means for supplying a heat transfer fluid from said first heat exchange means to said second heat exchange means to thereby transfer heat from the heated vinyl chloride monomer to the heat transfer fluid in said second heat exchange means for use as the heat transfer fluid in the first heat exchange means.

4,721,605

SELECTIVE REMOVAL OF METALS FROM AQUEOUS SOLUTIONS WITH DITHIOPHOSPHINIC ACIDS

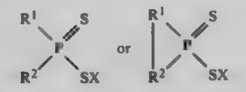
Timothy J. Brown; William A. Rickelton, both of Niagara Falls, Canada, and Richard J. Boyle, Somerset, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 24, 1985, Ser. No. 758,603

Int. Cl.⁴ C01G *3/00, 51/00, 53/00*

U.S. Cl. 423—24 **21 Claims**

1. A process for the extraction of metals selected from the group consisting of zinc (II), silver (I), cadmium(II), mercury (II), nickel (II), cobalt (II), and copper (II) from an aqueous solution containing, in addition to said metals, metals selected from the group consisting of calcium (II) and magnesium (II) comprising contacting said solution having an equilibrium pH within the range of about 0.2 to about 3.0 with an extractant comprising an organicsoluble dithiophosphinic acid or ammonium, alkali or alkaline earth metal salt thereof represented by the formula:



wherein R^1 and R^2 are the same or different and are selected from the group consisting of substituted or unsubstituted alkyl, cycloalkyl, alkoxyalkyl, alkylcycloalkyl, aryl, alkylaryl, aralkyl and cycloalkylaryl radicals having from about 2 to about 24 carbon atoms and X is either hydrogen or an ammonium, alkali or alkaline earth metal salt forming radical.

4,721,606

RECOVERY OF METAL VALUES FROM SPENT CATALYSTS

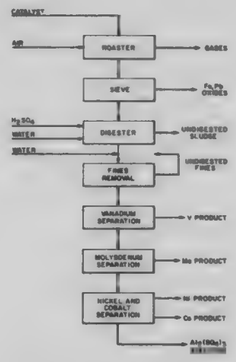
George L. Tilley, Costa Mesa, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 409,846, Aug. 20, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,241

Int. Cl.⁴ C01G *39/00, 31/00, 53/00, 51/00*

U.S. Cl. 423—54 **29 Claims**

1. A method for the recovery of valuable components from a particulate catalyst material which contains compounds of



metals on a support comprising aluminum oxide, which method comprises:

(a) roasting the catalyst in the presence of oxygen;

(b) reacting the roasted catalyst with sulfuric acid, in a single counter current digester, to produce a solution comprising aluminum and other metal ions;

(c) separating other metals from aluminum; and

(d) recovering a solution containing sulfate at approximately 1.5 times the molarity of aluminum.

4,721,607

PROCESS FOR THE PRODUCTION OF BORONAARONATE MOLECULAR SIEVE USING ETHYLENEDIAMINE AND QUINOLINE OR ISOQUINOLINE

Muin S. Haddad, Naperville, and John J. Schimandle, Coal City, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jan. 31, 1986, Ser. No. 824,422

Int. Cl.⁴ C01B *33/20, 33/28;* **B01J** *29/28, 21/02*

U.S. Cl. 423—277 **8 Claims**

1. A method for preparing a crystalline molecular sieve composition having in terms of mole ratios of oxides:

$$0.9\pm0.2M_{2/n}O:B_2O_3:ySiO_2:zH_2O$$

wherein M is a cation of valence n, y is between 2 and about 700, and z is between 0 and about 200 and having the X-ray diffraction pattern substantially as shown in Table I which method comprises reacting under crystallization conditions an aqueous mixture containing an oxide of boron, ethylenediamine, an oxide of silicon, and an organic material selected from the group consisting of quinoline and isoquinoline in the substantial absence of alkali or alkaline earth metal ions wherein the mole ratio of said material to silica is between about 0.2 and about 3.0 the mole ratio of silica to oxide of boron is between about 5 and about 150, and the mole ratio of water to silica is between about 15 and about 80.

4,721,608

SPHEROIDAL ALKALI METAL POLYPHOSPHATES OF LOW APPARENT DENSITY, AND PROCESS FOR MAKING THEM

Werner Kowalski, Weilerswist; Hans Haas, Swisttal; Theo Dahmen, Brühl, and Markus Erpenbach, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,485

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513743

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.⁴ C01B *15/16, 25/26*

U.S. Cl. 423—315 **3 Claims**

1. A process for making hollow spheroidal alkali metal polyphosphates in a spray tower which comprises: forcing an alkali metal orthophosphate solution under a pressure of 6 to 40 bars into a fluidization zone arranged inside the spray tower and flow-connected to a plurality of single medium spray nozzles, injecting a finely dispersed permanent gas selected from the group consisting of compressed air, carbon dioxide, nitrogen and mixtures thereof into the fluidization zone, maintaining the finely dispersed permanent gas under a pressure at least 20% higher than that selected for the solution, and spraying the solution containing the finely dispersed permanent gas via the plurality of single medium nozzles through a flame zone produced inside the spray tower with the resultant formation of alkali metal polyphosphates having a bulk density of 200 to 320 g/l and an alkali metal polyphosphate content of at least 98%.

4,721,609

PROCESS FOR PREPARING A PENTASIL ZEOLITE

Michael Baacke, and Peter Kleinschmit, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 903,625

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532748

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—329 **1 Claim**

1. A method for the preparation of a zeolite of the pentasil type which is represented by the formula:

$$(0.4–0.2)Na_2O/(0.3–0.6)Q_2O/Al_2O_3/(30–80)SiO_2/-(4–10)H_2O$$

wherein Q is an organic cation and by the x-ray diffraction pattern:

d (Å)	I/Io
11.0 ± 0.2	10–70
10.0 ± 0.2	10–80
4.4 ± 0.1	10–20
4.3 ± 0.1	10–30
3.85 ± 0.05	100
3.74 ± 0.05	40–65
3.66 ± 0.05	20–40
3.43 ± 0.03	15–25
2.01 ± 0.02	5–15
1.99 ± 0.02	5–15.

comprising suspending precipitated silica in water and adding thereto an aqueous solution of sodium aluminate and sodium hydroxide in water, providing a solution of a templating compound represented by the formula:

$$(HO—C_2H_4)_3N^{\oplus}—(CH_2)_n—N^{\oplus}(C_2H_4—OH)_32Br^{\ominus}$$

wherein n equals 3, 4, or 5 in water, and combining said solutions for the preparation of a reaction mixture with a composition (1.0–4.0) templating compound: (5–10)Na_2O:Al_2O_3:(30–90)SiO_2:(900–3000)H_2O, subjecting the reaction mixture to autogeneous pressure at a temperature range of 100° to 180° C. within a time period of 1 to 20 days, isolating the product so obtained, drying and then calcining at a temperature ranging from 300° to 600° C.

4,721,610

PROCESS FOR PRODUCING METAL OXIDE PARTICLES HAVING A VERY SMALL AND UNIFORM SIZE

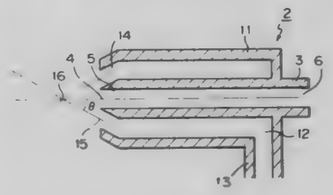
Kozaburo Yoshida; Akio Nishida, and Akira Ueki, all of Ube, Japan, assignors to UBE Industries, Ltd., Japan

Filed Nov. 18, 1985, Ser. No. 798,887

Claims priority, application Japan, Nov. 19, 1984, 59-243871

Int. Cl.⁴ C01F *5/04*

U.S. Cl. 423—636 **6 Claims**



1. A process for producing magnesium oxide particles having a very small and uniform size, comprising (A) ejecting separately a stream of a magnesium vapor-containing gas into a stream of a molecular oxygen-containing gas into a magnesium-oxidizing region through a core-in-sheath type composite nozzle whereby said magnesium vapor-containing gas is ejected through said core nozzle to form a magnesium vapor-containing core gas stream, and said molecular oxygen-containing gas is ejected through said sheath nozzle in the form of a hollow tube surrounding the core nozzle and having an ejecting front end portion thereof directed at an angle of 90 degrees or less to the longitudinal axis of the core nozzle to form a molecular oxygen-containing gas sheath stream; and (B) causing said ejected molecular oxygen-containing sheath gas stream to be converged into and to come into contact with said magnesium vapor-containing core gas stream to generate a turbulent flow diffusing flame having a length of from 0.5 to 5 cm in which flame the magnesium vapor is immedietly converted into very small and uniform magnesium opxide particles having an average size of from 0.01 to 0.1 μm.

4,721,611

HYDROGEN PRODUCTION

Alwyn Pinto, Middlesbrough, and Ian C. Jeffery, Billingham, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 703,531, Feb. 20, 1985, Pat. No. 4,695,442. This application Aug. 20, 1986, Ser. No. 896,401

Claims priority, application United Kingdom, Mar. 2, 1984, 8405591; Jul. 4, 1984, 8417016; Jul. 4, 1984, 8417017; Oct. 9, 1984, 8425508; Aug. 30, 1985, 8521649

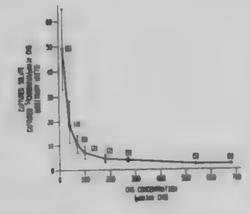
Int. Cl.⁴ C01B *2/10*

U.S. Cl. 423—655 **10 Claims**

1. A process for the production of a hydrogen containing gas stream comprising subjecting a raw gas containing steam, carbon dioxide, hydrogen, and carbon monoxide, and having a carbon monoxide content of at least 8% by volume on a dry basis, to the catalytic shift reaction at superatmospheric pressure and elevated temperature in a single stage in the presence of a catalyst containing copper metal and at least one oxidic support material in indirect heat exchange with a coolant whereby to reduce the carbon monoxide content to less than 1% by volume on a dry basis, characterised in that

(a) the process is operated at an outlet temperature in the range 230° to 280° C.,
(b) the catalyst bed is equipped with heat exchange tubes and/or plates providing 30 to 200 m^2 of heat exchange surface contacted by the gas stream within the catalyst bed per m^3 of catalyst and the coolant on the cold side of such tubes and/or plates is boiling water, and
(c) the gas flow rate through the catalyst is in the range 200 to 800 kg mol per hour per m^3 of catalyst.

4,721,612
STEROIDAL LIPOSOMES
Andrew S. Janoff, Yardley, Pa.; Mircea C. Popescu, Plainsboro, N.J.; Alan L. Weiner, Plainsboro, N.J.; Lois E. Bolcsak, Lawrenceville, N.J., and Paul S. Tremblay, Hamilton, N.J., assignors to The Liposome Company, Inc., Princeton, N.J.
Continuation-in-part of Ser. No. 599,691, Apr. 12, 1984, abandoned. This application Apr. 10, 1985, Ser. No. 721,630
Int. Cl.[4] A61J *3/07*; **A61K** *9/52, 43/00*; **B01J** *13/02*
U.S. Cl. 424—1.1 **57 Claims**



1. A method for administering a compound in vivo comprising, administering to a host the compound entrapped in a liposome, the bilayers of which comprise a salt form of an organic acid derivative of a sterol.

23. The method according to claim 1 or 20 in which the bioactive agent is selected from the group consisting of: dyes, radiolabels, radio-opaque compounds, and fluorescent compounds.

48. Steroidal liposomes comprising completely closed bilayers comprising a salt form of an organic acid derivative of a sterol.

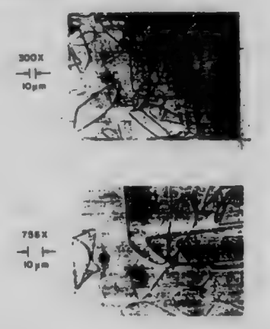
4,721,613
DELIVERY SYSTEM COMPRISING MEANS FOR SHIELDING A MULTIPLICITY OF RESERVOIRS IN SELECTED ENVIRONMENT OF USE
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Continuation of Ser. No. 448,956, Dec. 13, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,408
Int. Cl.[4] A61K *9/00, 9/22, 9/24, 9/26*
U.S. Cl. 424—19 **1 Claim**

1. An oral delivery system for delivering a beneficial drug, the delivery system comprising:
(a) means for shielding a multiplicity of reservoirs from an environment of use having a pH up to 3.5 inclusive, including the stomach, said means a member selected from the group consisting of a cellulose acetate phthalate composition and a hydroxypropyl methylcellulose phthalate composition that substantially maintains its physical and chemical integrity in an environment having a pH up to 3.5 inclusive;
(b) a multiplicity of reservoirs in the means, the reservoirs consisting essentially of:
(1) a beneficial gastrointestinal administrable drug;
(2) a wall surrounding the beneficial drug comprising a different composition than the means, which will composition is a member selected from the group consisting of an innocuous cellulose ester composition and an innocuous cellulose ether composition that release the beneficial drug in an environment having a pH greater than 3.5, including the intestine; and,
(c) wherein, when the delivery system is in operation in (d) the environment of use having pH up to 3.5 inclusive, the delivery system maintains its physical and chemical integrity, and when the delivery system enters (e) the environment having a pH greater than 3.5, the means of the delivery system releases the multiplicity of reservoirs in response to this environment wherein the reservoirs deliver the beneficial drug over a prolonged period of time.

4,721,614
SODIUM BICARBONATE CONTAINING TOOTHPASTE
Anthony E. Winston, East Brunswick; Raymond Brown, Bridgewater; Norman Usen, Marlboro, and Anthony Ansaldi, Mt. Arlington, all of N.J., assignors to Church & Dwight Co., Inc., Piscataway, N.J.
Division of Ser. No. 744,497, Jun. 13, 1985, Pat. No. 4,623,536. This application Jun. 27, 1986, Ser. No. 879,609
Int. Cl.[4] A61K *7/16, 7/18*
U.S. Cl. 424—52 **15 Claims**

1. In a toothpaste containing an abrasive, a humectant, a thickening agent, and a fluoridating agent, the improvement comprising sodium bicarbonate as the sole abrasive, the sodium bicarbonate being incorporated in the toothpaste in an amount of at least 60% by weight, and at least 30% by weight of the sodium bicarbonate having a particle size of less than 25 microns.

4,721,615
CALCIUM PHOSPHATES
Edward J. Griffith, Manchester, and William C. McDaniel, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 861,615, May 5, 1986, abandoned, which is a continuation of Ser. No. 567,720, Jan. 3, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 871,341
Int. Cl.[4] C01B *25/32*
U.S. Cl. 424—57 **37 Claims**



2. A process for producing platelike crystalline dicalcium phosphate dihydrate comprising adding phosphoric acid to an aqueous slurry of lime.

9. Plate-like crystalline dicalcium phosphate dihydrate produced by the addition of an aqueous phosphoric acid solution to an aqueous slurry of lime wherein sufficient acid is employed to provide an acidic reaction medium.

20. Dicalcium phosphate dihydrate comprising substantially uniform platelike crystals, said crystals having a ratio of surface area to thickness of at least about 200.

4,721,616
TREATMENT OF VERNAL CONJUNCTIVITIS
Alfred Hässig, Stettlen, and Urs E. Nydegger, Herrenschwanden, both of Switzerland, assignors to Swiss Red Cross, Bern, Switzerland
Continuation of Ser. No. 689,396, Jan. 7, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 20,048
Claims priority, application United Kingdom, Mar. 13, 1984, 8406560
Int. Cl.[4] A61K *39/395*
U.S. Cl. 424—85 **6 Claims**

1. A method of treatment of vernal conjunctivitis, which method comprises administering an effective amount of an intravenously injectable form of a polyvalent, intact immunoglobulin (IgG).

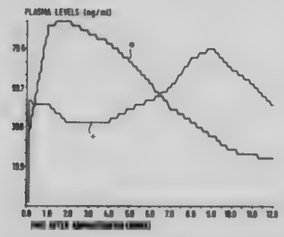
4,721,617
VACCINE AGAINST LYME DISEASE
Russell C. Johnson, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Aug. 14, 1986, Ser. No. 896,665
Int. Cl.[4] A61K *39/02*
U.S. Cl. 424—92 **6 Claims**

1. A vaccine comprising an immunogenic amount of inactivated *Borrelia burgdorferi* spirochetes dispersed in a physiologically-acceptable, non-toxic liquid vehicle, which amount is effective to immunize a susceptible mammal against Lyme borreliosis.

4,721,618
METHOD FOR CONTROLLING BLEEDING
Alan R. Giles, Kingston, Canada, and Kenneth G. Mann, Burlington, Vt., assignors to Queen's University at Kingston, Kingston, Canada
Continuation-in-part of Ser. No. 808,213, Jan. 27, 1983, Pat. No. 4,536,392. This application Aug. 9, 1985, Ser. No. 763,959
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] A61K *35/16*
U.S. Cl. 424—101 **6 Claims**

1. A method for controlling bleeding in mammals comprising administering intravenously to said mammal a synergistic mixture of phospholipid vesicles and mammalian blood Factor Xa in relative proportions and in an amount just sufficient to arrest bleeding.

4,721,619
CONTROLLED ABSORPTION DILTIAZEN PHARMACEUTICAL FORMULATION
Donald E. Panoz, Whale Bay, Bermuda, and Edward J. Geoghegan, Athlone, Ireland, assignors to Elan Corporation p.l.c., Ireland
Filed Dec. 20, 1984, Ser. No. 684,661
Claims priority, application Ireland, Dec. 22, 1983, 3057/83
Int. Cl.[4] A61K *9/50, 9/58*
U.S. Cl. 424—459 **10 Claims**



1. A controlled absorption diltiazem formulation for oral administration, comprising a pellet having a core of diltiazem or a pharmaceutically acceptable salt thereof in association with an organic acid and a lubricant, and a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film forming, water insoluble polymer and a minor proportion of a pharmaceutically acceptable film forming, water soluble polymer, the number of layers in said membrane and the ratio of said water soluble polymer to water insoluble polymer being effective to permit release of said diltiazem from said pellet at a rate allowing controlled absorption thereof over a twelve hour period following oral administration, said rate being measured in vitro as a dissolution rate of said pellet which is substantially pH independent, which when measured in a basket assembly according to U.S. Pharmacopoeia XX substantially corresponds to the following dissolution pattern:
(a) from 0 to 10% of the total diltiazem is released after 2 hours of measurement;
(b) from 10 to 30% of the total diltiazem is released after 4 hours of measurement;
(c) from 20 to 40% of the total diltiazem is released after 6 hours of measurement;
(d) from 50 to 80% of the total diltiazem is released after 8 hours of measurement; and
(e) from 85 to 100% of the total diltiazem is released after 12 hours of measurement.

4,721,620
POLYVINYLACETATE BUBBLE GUM BASE COMPOSITION
Subraman R. Cherukuri, Towaco, N.J., and Gul Maasukhani, Staten Island, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 1, 1986, Ser. No. 846,690
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—6 **34 Claims**

1. A bubble gum base composition, which comprises in weight percent:
(a) about 0.5% to about 30% non-SBR elastomer selected from the group consisting of synthetic gums, synthetic elastomers, natural gums, natural elastomers and mixtures thereof,
(b) an effective amount of a combination of two polyvinyl acetate polymeric materials selected from:
(1) not more than 14% of a polyvinyl acetate having a low molecular weight of about 12,000 to about 16,000; and
(2) not more than 35% of a polyvinyl acetate having a medium molecular weight of about 35,000 to 55,000;
wherein the polyvinyl acetate polymeric materials are present in a mole ratio of 1:2 to 1:45 based on the low molecular weight polyvinyl acetate to the medium molecular weight polyvinyl acetate; and
(c) about 5% to about 12% acetylated monoglyceride having a sponification value above about 400.

4,721,621
PROCESS FOR THE PRODUCTION OF HIGH EXTRACT-TO-ALCOHOL BEERS
Kenneth H. Geiger, London, Canada, assignor to Labatt Brewing Company Limited/La Compagnie de Brassage Labatt Limitee, London, Canada
Filed Nov. 2, 1984, Ser. No. 667,561
Int. Cl.[4] C12C *11/04*
U.S. Cl. 426—16 **16 Claims**

1. A process consisting essentially of the steps of:
preparing an all malt wort by mashing the malt in at a temperature of about 65°–80° C., and upwardly adjusting the pH of the mash to not more than about 7.0, said temperature and pH being selected so as to produce a fermentable wort having a degree of fermentability of substantially less than about 70%;
maintaining said temperature throughout mashing;
continuing to mash the malt for a time sufficient to substantially complete the conversion of the starch into fermentable and unfermentable sugars;
hopping the wort to taste and kettle boiling the resulting hopped wort;
and fermenting the boiled hopped wort to completion in a fermentor to thereby produce a brewed malt beverage having a high residual, unfermentable malt extract-to-alcohol ratio.

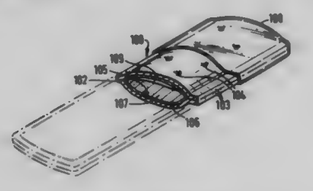
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,622

SHELF STABLE, FILLED FOOD AND METHOD OF MANUFACTURE

Clive G. Kingham, Amersham; Malcolm Caine, Cookham, and Valerie J. Duffin, Marlow Bottom, all of England, assignors to United Biscuits (UK) Limited, Edinburgh, Scotland

Filed May 21, 1985, Ser. No. 736,317
Claims priority, application United Kingdom, May 25, 1984, 8413398; Feb. 16, 1985, 8504040
Int. Cl.[4] A21D *13/08*
U.S. Cl. 426—94 22 Claims



1. A snack food product comprising:
(a) an outer casing of a bread material having a water activity in the range from 0.60 to 0.95;
(b) a filling component wholly enclosed by said casing and having a water activity in the range from 0.90 to 0.99, said casing and said enclosed filling having been rendered temporarily sterile; and
(c) a sterile moisture-proof wrapping wholly enclosing said casing and said filling contained therein;
said product being microbially stable and having a long shelf life at ambient temperature, said casing and said enclosed filling being microbially unstable when devoid of said wrapping.

8. A method of manufacture of a storage-stable snack food product comprising a filling wholly enclosed in an outer casing component, comprising the steps of:
(a) forming an outer casing by shaping a piece of bread dough;
(b) subjecting said shaped dough piece to a proving step;
(c) depositing a filling composition upon said shaped dough piece;
(d) closing said dough piece such that said filling composition is wholly enclosed within said casing;
(e) heating said casing and enclosed filling to ensure their temporary sterilization and to impart to said enclosed filling a water activity in the range from 0.90 to 0.99, said casing having a water activity in the range from 0.60 to 0.95; and
(f) wholly enclosing said casing and enclosed filling in a sterile moisture-proof wrapping, said wrapped product thus being microbially stable and having a long shelf life at ambient temperature, said casing and enclosed filling being microbially unstable when devoid of said wrapping.

4,721,623

METHOD OF IMPARTING AN OVEN ROASTED COLOR TO A MEAT PRODUCT

Thomas H. Coffey, and Gene G. Suess, both of Madison, Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Aug. 20, 1984, Ser. No. 642,014
Int. Cl.[4] A23L *1/275*
U.S. Cl. 426—250 7 Claims

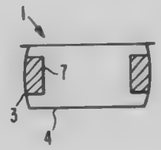
1. A method of imparting an oven-roasted coloration to a meat product comprising the steps of:
cooking said meat product,
atomizing an aqueous solution of caramel coloring, said aqueous solution comprising 12–50 weight percent caramel coloring, in an environment sufficiently humid to prevent spray drying of the atomized solution,
contacting said cooked meat product with the atomized caramel coloring solution in said humid environment, and
exposing the surface of said cooked meat product in an oven to a temperature sufficiently high to bind the caramel coloring to the surface of said meat product.

4,721,624

PROCESS FOR REMOVING HARMFUL RESIDUES FROM FOOD DURING COOKING

Franz W. Schumann, Bad Nauheim, Fed. Rep. of Germany, assignor to FIBEG Beteiligungsgesellschaft mbH, Idar-Oberstein, Fed. Rep. of Germany

Continuation of Ser. No. 532,052, Sep. 14, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,567
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236784
Int. Cl.[4] A23L *1/01, 1/00*
U.S. Cl. 426—286 2 Claims



1. A process for removing harmful residues from food during cooking comprising:
placing food in a cooking pot having a lid, an extracting substance for extracting harmful residues selected from the group consisting of pesticides, herbicides, synthetic fertilizers, hormones and combinations thereof from liquids or a vapor phase and a fluid permeable means separating said food from said extracting substance
heating said food to cook said food and drive said residues from said food into a preparation liquid or vapor formed from heating said food;
said preparation liquid or vapor passing through said fluid permeable means to contact said extracting substance while said means maintains the separation of said food from said extracting substance;
said extracting substance extracting said residues in situ from said preparation or vapor to purify said preparation liquid or vapor in contact with said food.

4,721,625

PROCESS FOR PREPARING LOW OIL POTATO CHIPS

Yanlen Lee, Manlius, N.Y.; Edward E. Bretch; Clifford K. Bath, both of Berwick, Pa., and Carleton G. Merritt, Phoenix, N.Y., assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 793,740, Nov. 1, 1985, abandoned, which is a continuation of Ser. No. 568,621, Jan. 6, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 936,922
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—438 5 Claims

1. A process for preparing potato chips consisting esentially of:
(a) in a partial frying step, frying peeled potato slices, having a thickness suitable for making potato chips, in hot oil at a temperature of about 290° F. to 330° F. for a time sufficient to produce partially fried potato slices having an average moisture content of 10% to 25% by weight, and an oil content, based on the weight of the slices when dried to a moisture content of 2% by weight, of less than about 25% by weight;

(b) transferring the partially fried potato slices from the hot oil directly into an essentially oxygen-free zone without exposure to the atmosphere;
(c) in said zone removing substantially all of the oil from the surfaces of said partially fried slices by blasts of saturated steam; and
(d) while still in said zone, drying the resulting potato slices in an atmosphere of superheated steam, to reduce their moisture content to about 1.5% to 2.0%, to produce a fully cooked potato chip product having no more than about 23% oil by weight, in the unsalted state.

4,721,626

FAT COMPOSITIONS

Arthur W. T. Rule, Westbourne, Near Emsworth, England, assignor to John Wyeth & Brothers Limited, Maidenhead, England

Division of Ser. No. 730,269, May 3, 1985, Pat. No. 4,614,663, which is a continuation of Ser. No. 619,868, Jun. 12, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 886,862
Claims priority, application United Kingdom, Jun. 24, 1983, 8317248
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] A23D *5/00*
U.S. Cl. 426—601 11 Claims

1. A food product adapted for human infant nutrition containing protein source, a carbohydrate, and a fat composition comprising:
(a) palm oil
(b) olive oil or oleic oil;
(c) an oil selected from a group consisting of coconut oil, babassu oil and palm kernel oil;
(d) at least 22% calculated on the weight of the fat composition, of one or two oils selected from a group consisting of soybean oil, corn oil, sunflower seed oil, cottonseed oil and safflower oil, and
(e) 0 to 2%, calculated on the weight of the fat composition, of a lecithin; the amounts of the oils being such that the fat composition contains, per 100 parts by weight of fatty acids,
(i) 18 to 20 parts by weight of linoleic acid;
(ii) 28 to 44 parts by weight of oleic acid;
(iii) 7 to 25 parts by weight of the sum of lauric and myristic acids; and
(iv) 18 to 26 parts by weight of the sum of palmitic and stearic acids.

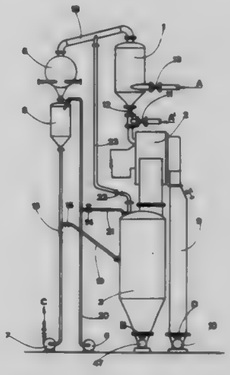
4,721,627

PROCESS FOR REFINING FOODSTUFFS

Camillo Catelli, Parma, Italy, assignor to Rossi & Catelli S.p.A., Parma, Italy

Filed Jan. 29, 1986, Ser. No. 823,769
Claims priority, application Italy, Apr. 24, 1985, 40042 A/85
Int. Cl.[4] A23P *1/00*
U.S. Cl. 426—478 4 Claims

1. A process for refining foodstuff comprising the steps of:
conveying an unrefined foodstuff into a depressurized environment;
refining said unrefined foodstuff within said depressurized environment by refining means so as to produce a refined foodstuff having a consistency different from the consistency of said unrefined foodstuff;
separating any remaining unrefined foodstuff from said refined foodstuff within said depressurized environment;



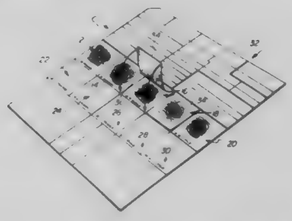
collecting said refined foodstuff within said depressurized environment; and
separately drawing off said refined foodstuff and said separated unrefined foodstuff from within said depressurized environment.

4,721,628

METHOD OF CORRECTING UNCLEAR FINGERPRINTS

Oscar R. Pieper, 135 Meadowood Dr., Portola Valley, Calif. 94025

Filed Feb. 25, 1986, Ser. No. 832,976
Int. Cl.[4] A61B *5/10*
U.S. Cl. 427—1 2 Claims



1. A method of correcting smudged or unclear fingerprints on a fingerprint card having separate uniform areas for the prints of each of the fingers comprising:
(a) examining the prints placed on the card to determine which prints are defective;
(b) selecting one of a plurality of uniform substantially non-transparent sheets having an adhesive material on one side thereof and configured to match one of said areas, said sheets having a thickness of about 0.002 inch;
(c) placing the sheet with the adhesive side down over the area containing the defective print; and

VOL 1086 ISS 4 JA 26 1988 UMI

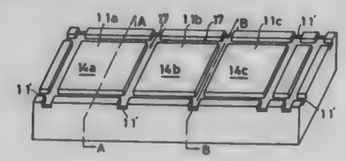
(d) placing a fingerprinting chemical on the finger for which the defective print was made and rolling the finger over the sheet to provide a new fingerprint.

4,721,629

METHOD OF MANUFACTURING PHOTOVOLTAIC DEVICE

Souichi Sakai; Shoichi Nakano, and Yukinori Kuwano, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 613,520, May 23, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 778,377
Claims priority, application Japan, Jun. 21, 1983, 58-112093
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—35 10 Claims



1. A method of manufacturing a photovoltaic device comprising the steps of:

(a) preparing a substrate having an insulating surface whereon a plurality of photoelectric converting regions are formed;

(b) forming a first electrode film including a transparent conductive film on substantially all of said insulating surface of said substrate;

(c) removing said first electrode film surrounding an entire periphery of each of said first electrode film to form island regions by irradiating an energy beam onto a part of said first electrode film substantially equivalent to an entire periphery of each of said photoelectric converting regions to divide said first electrode film into first electrode film parts corresponding to a plurality of said photoelectric converting regions;

(d) forming a semiconductor film on said first electrode film parts said semiconductor film being divided corresponding to each of said photoelectric converting regions;

(e) forming a plurality of second electrode film parts on said semiconducter film corresponding to each of said photoelectric converting regions; and

(f) electrically connecting said first electrode film parts and said second electrode film parts of adjacent photoelectric converting regions to each other.

4,721,630

PAINTING PROCESS FOR INNER PANEL REGION OF MOTORCAR VEHICLE BODY AND APPARATUS THEREFOR

Tadashi Takeo, Sakado, and Toru Yamamoto, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,583
Claims priority, application Japan, Jul. 31, 1985, 60-167542; Sep. 18, 1985, 60-204393; Oct. 4, 1985, 60-220426; Oct. 9, 1985, 60-223487; Nov. 28, 1985, 60-182182; Dec. 3, 1985, 60-185621; Dec. 4, 1985, 60-186045
Int. Cl.[4] B05B 13/04, 15/12, 1/02
U.S. Cl. 427—421 10 Claims

1. A method of painting an inner panel region of a 4-door type motorcar vehicle body comprising the steps in the following sequence:

conveying a motorcar vehicle body with its doors closed into a painting stage;

opening a front hood of said vehicle body using a lid opening and closing means provided in the front of said painting stage;

opening a rear hood of a said vehicle body using a lid opening and closing means provided in the rear of said painting stage;

painting a half of an inner panel portion of a front region of said vehicle body using a front painting robot on one side portion of said painting stage, said inner panel portion of said front region including an inner surface of a front lid;

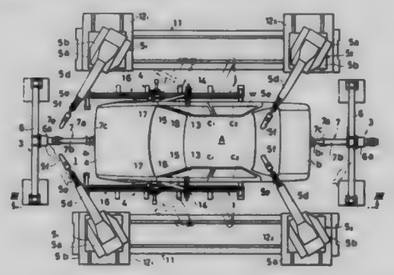
opening a rear door on one side of said vehicle body using a door opening and closing means on the said one side;

painting an inner panel portion of the rear door region on said one side of said vehicle body using a rear painting robot on said one side, said inner panel portion of said rear door region including an inner surface of a door and a door trim portion;

opening a front door on the other side of said vehicle body using a door opening and closing means on the said other side;

painting an inner panel portion of a front door region on the said other side of said vehicle body using a front painting robot on said other side, said inner panel portion of said front door region including an inner surface of said front door and said front door trim portion;

painting a half of an inner panel portion of a rear region of said vehicle body using said rear painting robot on said other side, said inner panel portion of said rear region includes an inner surface of a rear lid;



closing said open rear door on said one side of said vehicle body using said door opening and closing means on said one side;

closing said front door on said other side of said vehicle body using said door opening and closing means on said other side;

moving said painting robots forwards and rearwards to individual respective positions;

opening a front door on said one side of said vehicle body using said door opening and closing means on said one side;

painting the inner panel portion of said front door region on said one side of said vehicle body using said front painting robot on said one side;

painting the remaining half of the inner panel portion of said rear region of said vehicle body using said rear painting robot on said one side;

painting the remaining half of said inner panel portion of said front region of said vehicle body using said front painting robot on said other side;

opening a rear door on said other side of said vehicle body using said door opening and closing means on said other side; and

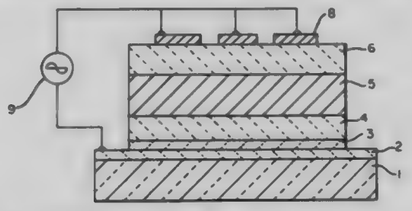
painting an inner panel portion of said rear door region on said other side of said vehicle body using said rear painting robot on said other side.

4,721,631

METHOD OF MANUFACTURING THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL

Yoshihiro Endo, Nara; Takuo Yamashita, Tenri, and Ikuo Ogawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 818,008, Jan. 13, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,912
Claims priority, application Japan, Feb. 14, 1985, 60-28105; Feb. 15, 1985, 60-29052
Int. Cl.[4] B05D 5/06
U.S. Cl. 427—66 20 Claims



1. In a method of manufacturing a thin-film electroluminescent display panel which comprises a structure including a luminescent layer with characteristics of electroluminescence in response to an applied electric field and dielectric layers covering said luminescent layer and a pair of electrodes sandwiching said structure, step of forming a silicon nitride film over a luminescent layer by a plasma chemical vapor deposition method with an ammonium-free mixture of silane and nitrogen gases.

4,721,632

METHOD OF IMPROVING THE CONDUCTIVITY AND LOWERING THE EMISSIVITY OF A DOPED TIN OXIDE FILM

Franklin I. Brown, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 25, 1986, Ser. No. 900,469
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—108 2 Claims

1. A method of improving the conductivity and lowering the emissivity of a doped tin oxide film on the surface of a soda lime silica glass sheet which comprises the steps of:

heating the glass sheet to a temperature in a range from 1000° F. to 1250° F.;

applying to a surface of said heated glass sheet ammonium fluoride which reacts with said surface to form a film in which divalent oxygen atoms and hydroxyl ions are replaced with monovalent fluorine atoms whereby said surface of the glass sheet is brought closer to a state of electro-neutrality and whereby said monovalent fluorine atoms form a more stable bond with soda and silica atoms of said surface of the glass sheet; and

applying to said film formed on said heated glass sheet a doped tin oxide film to a thickness required to give said doped tin oxide film the desired conductivity and emissivity characteristics.

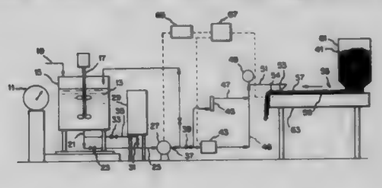
4,721,633

PROCESS FOR MANUFACTURING SPECKLED DETERGENT COMPOSITION

Carol A. Baldassin, Smithtown, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,464
Int. Cl.[4] B05D 7/00
U.S. Cl. 427—212 11 Claims

1. A process for manufacturing a particulate detergent composition which is speckled in appearance, which comprises spraying a surface of a bed of alkaline detergent composition particles with an aqueous coloring medium comprising effective amount of water, colorant and polyacrylic acid, so that the coloring medium colors less than 10% of the particles and penetrates less than 10% of the distance through the bed of particles, whereby a coherent colored surface section of detergent composition particles is formed, and breaking up such colored surface section and mixing the colored particles therefrom with the uncolored particles.



4,721,634

SIMULATED MARBLE

Gordon McKinnon, 190 Blanca, Tampa, Fla. 33606

Filed May 7, 1986, Ser. No. 861,233
Int. Cl.[4] B05D 3/12, 5/02, 1/36
U.S. Cl. 427—263 12 Claims



1. A process for covering a substrate with a simulated marble surface comprising:

mixing cement and sand to form a first mixture;

adding an aqueous solution of an acrylic resin to the first mixture to create a first liquid mortar;

mixing cement and sand to form a second mixture;

adding an aqueous solution of an acrylic resin to the second mixture to create a second liquid mortar;

adding and mixing a contrasting pigment to one of the first and second mortars such that the first and second mortars have contrasting colors;

applying the first liquid mortar onto the substrate to form a first textured coat on the substrate;

applying the second liquid mortar onto randomly spaced portions of the first coating prior to the complete curing of the first coating enabling the first and second coatings to form a unitary textured covering for the substrate with the contrasting pigment being randomly spaced in the textured unitary covering with the textured unitary coating having a lower layer and an upper layer with the lower layer comprising the first and second liquid mortars and the upper layer comprising the second liquid mortar;

allowing the contrasting pigment in the one of the first and second liquid mortars to commingle with the other of the first and second liquid mortars to enable the pigmented areas to blend with the non-pigmented areas; and

lightly troweling substantially only the blended upper layer of the unitary textured covering on the substrate to simulate a marble surface.

4,721,635

COLOR PRINTED RECORD AND METHOD

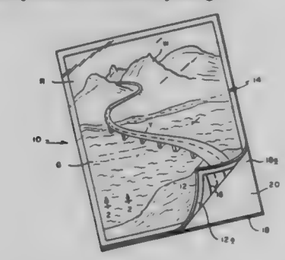
Richard R. Heliński, Hudson, N.H., assignor to Howtek, Inc., Hudson, N.H.

Continuation-in-part of Ser. No. 796,223, Nov. 8, 1985, Pat. No. 4,666,757. This application Dec. 17, 1986, Ser. No. 942,615
Int. Cl.[4] B41M 5/00
U.S. Cl. 428—15 5 Claims

1. A method of making a printed record in color comprising the steps of:

A. dimensioning a flexible, transparent sheet according to the dimensions of the desired record;
B. applying an ink in one or more more layers and in one or more colors as a liquid onto selected portions of said sheet so that the ink forms on said portions solid, well defined, optically clear adherent printing composed of one or more different color ink layers; and,
C. positioning a flexible opaque backing sheet flush against the inked surface of said transparent sheet so as to reflect ambient light back through said one or more ink layers and said transparent sheet whereby to produce by a subtractive color process visible through the transparent sheet a color record that is characterized by high color density and brightness.

5. A color printed record comprising:



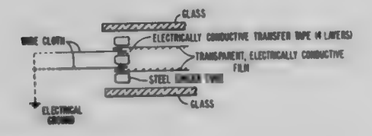
A. a sheet of flexible transparent material;
B. one or more superimposed thin layers of an optically clear, subtractive color ink adhered to selected surface portions of the transparent sheet, the ink in the layer closest to the sheet having a well-defined planar suface in intimate contact with the surface of said sheet;
C. a flexible opaque backing sheet that is reflective to ambient light; and
D. means for affixing said backing sheet flush to the inked surface of said transparent sheet so that the backing sheet reflects ambient light back through each ink layer and the transparent sheet whereby to produce a color image visable through the transparent sheet that is characterized by high color density and brightness.

4,721,636

MULTIPLE PANE GLASS UNIT WITH ELECTRICALLY CONDUCTIVE TRANSPARENT FILM FOR USE AS RADIATION SHIELD

Thomas G. Hood, San Francisco; Steve M. Vincent, Palo Alto, and Dennis Hollars, Mountain View, all of Calif., assignors to Southwall Technologies, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 667,234, Nov. 1, 1984. This application Dec. 9, 1985, Ser. No. 806,733
Int. Cl.[4] E06B *3/24*; B44C *5/08*; E04C *2/54*; H05B *3/06*
U.S. Cl. 428—38 **14 Claims**



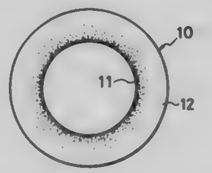
1. A glass unit comprising:
a pair of glass panes,
a pair of transparent, electrically conductive films having outer peripheral margins;
means coupled with said films for mounting the films in spaced relationship adjacent to and spaced from respective panes; and
means coupled with the films for electrically connecting the films to ground.

4,721,637

HIGHLY ORIENTED RESIN-MADE REINFORCING MEMBER

Fumio Suzuki; Nobuhiro Akasaka, and Makoto Honjo, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 6, 1986, Ser. No. 826,698
Claims priority, application Japan, Feb. 6, 1985, 60-15781[U]; Feb. 6, 1985, 60-15782[U]
Int. Cl.[4] B32B *1/08*
U.S. Cl. 428—36 **15 Claims**



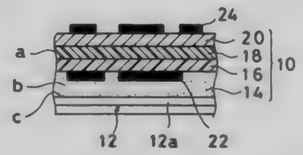
3. A highly oriented resin-made reinforcing member that contains a highly oriented resin as the principal component and which has a continuous change in the cross-sectional distribution in the degree of orientation, wherein said reinforcing member is in the form of a hollow pipe wherein the degree of orientation decreases from the inner surface of the solid portion of said pipe to its outer surface.

4,721,638

STICKING MATERIAL FOR PREVENTING RESTICKING

Tadashi Matsuguchi, Saita, and Noboru Matsuguchi, Ashiya, both of Japan, assignors to Daimatsu Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,796
Claims priority, application Japan, Oct. 1, 1984, 59-206770; Nov. 12, 1984, 59-238085
Int. Cl.[4] C09J *7/02*; B32B *3/10*
U.S. Cl. 428—40 **15 Claims**



1. A sticking material for preventing resticking comprising:
a resin second layer,
a peeling agent layer formed on one main surface of said resin second layer,
a surface first layer formed on said peeling agent layer, and
an adhesive layer formed on another main surface of said resin second layer, in which the formula:

$$a<d<b$$

is satisfied,
wherein (a) represents the force required to peel the surface first layer from said second layer where said peeling agent layer is present, (d) represents the force required to peel the surface first layer from said resin second layer where said peeling agent layer is absent, and (b) represents the adhesion between the adhesive layer and a material to be labeled.
2. The sticking material of claim 1, which further comprises a release sheet formed on the adhesive layer.

4,721,639

BIS-MALEIMIDE RESIN SYSTEMS AND STRUCTURAL COMPOSITES PREPARED THEREFROM

David A. Shimp, Prospect, Ky., and Jack D. Boyd, Westminster, Calif., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 839,893, Mar. 14, 1986, Pat. No. 4,644,039.
This application Nov. 24, 1986, Ser. No. 934,263
Int. Cl.[4] A61F *13/02*
U.S. Cl. 428—40 **23 Claims**

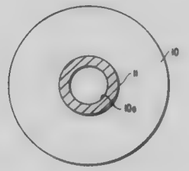
1. A release paper backed, heat-curable prepreg, comprising:
(a) a heat-curable resin comprising
(i) a maleimide-group-containing resin, and
(ii) an effective amount of a catalyst selected from the group consisting of organophosphines, organophosphonium salts, or complexes thereof;
(b) a fiber support selected from the group consisting of
(i) a fine denier carrier web comprising woven or nonwoven polyamide, polyurea, polyurethane, polybenzimidazole, polyacrylic, or polyester fibers, and
(ii) fiber-reinforcement comprising woven or unidirectional reinforcing fibers selected from the group consisting of carbon/graphite, glass, boron, and aramid fibers;
wherein said fiber support is impregnated by said heat curable resin, and
(c) a release-paper backing strippably adherent to at least one side of said heat-curable resin impregnated fiber support.

4,721,640

FLEXIBLE MAGNETIC DISK SHEET

Mikihiko Kato; Shigeo Komine, and Kazuhiko Morita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 21, 1984, Ser. No. 673,640
Claims priority, application Japan, Nov. 21, 1983, 58-219107
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—65 **12 Claims**



1. A flexible magnetic disc sheet having a central circular hole therein and having a protective layer only on a surface portion surrounding the edge of the central circular hole, said protective layer being prepared by coating (a) a compound having an acrylate bond or a methacrylate bond at the end of at least one of a main chain and a side chain of molecules thereof, and (b) a solid lubricating agent, and exposing the coated layer to radiation for polymerizing and hardening, wherein the thickness of the coated layer after polymerization and hardening is from 1 to 50 μm.

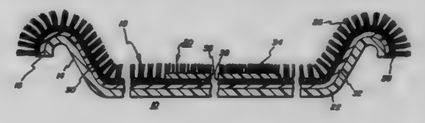
4,721,641

AUTO ACCESSORY FLOOR MAT

Bob Bailey, R.D. #3, Maple Ave., Ballston Lake, N.Y. 12019

Filed May 3, 1985, Ser. No. 730,192
Int. Cl.[4] B05D *5/12*
U.S. Cl. 428—88 **23 Claims**

1. A readily removable, slip-resistant accessory floor mat for protecting a carpeted floor well of an automobile or other vehicle comprising:
a rigid composite carpet struture preformed into a tray configuration with raised borders, the raised borders having the same general contour as the periphery of the carpeted well, at least some of said raised borders being provided with outwardly extending down-turned edges to eliminate the need for edge finishing, the carpet structure being dimensioned so as to fit within said well and rest upon the floor of the well with said raised borders abutting the periphery of the well, the composite carpet structure comprising a layer of carpet and a substantially unpliable layer of thermoformable material attached to the underside of said layer of carpeting, and the carpet structure possessing sufficient rigidity to remain stationary and not shift under foot-exerted lateral forces experienced during use of the automobile by the mat when so positioned in the well and to maintain its tray configuration while being removed from the well.

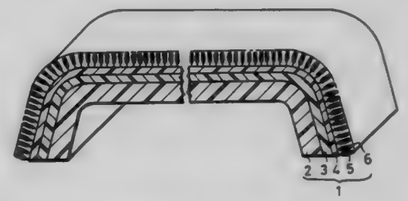


4,721,642

ARTICLE HAVING ADHERED, VELVETY POLYURETHANE RESIN FOAM-COATED PILE AS A SURFACE DECORATION

Takaharu Yoshimi; Shoji Sakaida, both of Aichi, and Yasuyuki Mitsutome, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 5, 1986, Ser. No. 927,234
Claims priority, application Japan, Nov. 30, 1985, 60-270420
Int. Cl.[4] B32B *33/00*
U.S. Cl. 428—90 **12 Claims**



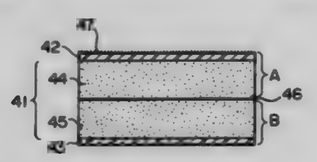
1. A velvety-surfaced article, comprising:
a base having a surface;
a layer of adhesive provided on said surface;
a plurality of lengths of pile having opposite ends, said lengths of pile being attached to said surface by having one ends of said lengths of pile adhered to said layer of adhesive to provide a pile on said surface; and
said lengths of pile, externally of said layer of adhesive, being coated with foamed polyurethane resin, at least some of said coated lengths of pile being separate from one another externally of said layer of adhesive so as to provide a velvety touch.

VOL 1086 ISS 4 JA 26 1988 UMI

4,721,643
LAMINATED STRUCTURE FOR INTERIOR FINISHING MATERIALS, AND METHOD OF PRODUCTION THEREOF

Hiroshi Harayama, Kasetsu; Hideo Nishimura; Satoshi Ohmura, both of Toyota; Yutaka Yoshino; Rikizou Tanaka, both of Okazu, and Fuminaga Kano, Hazuda, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka and Toyota Jidosha Kabushiki Kaisha, Aichi, both of, Japan

Filed Jan. 28, 1987, Ser. No. 7,866
Claims priority, application Japan, Jan. 28, 1986, 61-16190; Jan. 28, 1986, 61-16191; Jan. 28, 1986, 61-19192; Jan. 28, 1986, 61-10742[u]; Jan. 28, 1986, 61-10743[u]; Apr. 12, 1986, 61-84799
Int. Cl.[4] B32B *3/26, 5/32, 31/06, 31/26*
U.S. Cl. 428—90 13 Claims



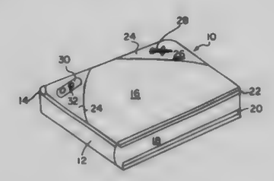
1. A laminated structure comprising a laminated foamed sheet material composed of two cured foamed sheets each comprising a propylene-type polymer and an ethylene-type polymer and being laminated to each other through a substantially non-foamed or lowly foamed heat-fused layer, and non-foamed surface skin layers composed of a propylene-type polymer and laminated respectively to both surfaces of said laminated foamed sheet material, the ratio of the thickness Ts of each of said surface skin layer to the solid thickness Tf of each of the cured foamed sheets, Ts/Tf, being from 1 to 50, the thickness Tl of the heat-fused layer being 0.1 to 0.5 mm, and the thickness Tl being 1 to 25% of the thickness of each of the cured foamed sheets.

7. The laminated structure of claim 1 wherein fibers are implanted in the outside surface of at least one of the surface skin layers.

4,721,644
BULLETIN BOARD

Steve I. Mayo, New York, N.Y., assignor to Artistic Desk Pad & Novelty Co. Inc., Bronx, N.Y.

Filed Sep. 19, 1966, Ser. No. 909,642
Int. Cl.[4] B32B *33/00*
U.S. Cl. 428—91 7 Claims

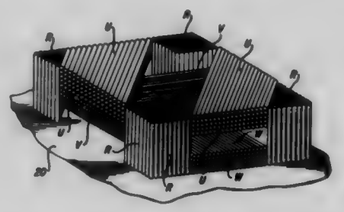


1. A bendable and shippable bulletin board comprising front and rear layers heat seals to one another, a foam core between the front and rear layer, and including two stiffening layers, one between the core and front layer and the other between the core and the rear layer wherein the front layer is sueded, and wherein means are provided for attaching the rear layer to a wall and wherein the board is for use with push pins having a pin at most approximately equal in length to the thickness of the core.

4,721,645
MATERIAL FOR FOUR DIRECTIONAL REINFORCEMENT OF CONICAL SHAPED OBJECT, METHOD FOR FABRICATING SAME AND OBJECT FORMED THEREWITH

James P. Brazel, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 22, 1986, Ser. No. 944,172
Int. Cl.[4] B32B *5/12, 9/00*; B29B *7/00*; D02G *3/00*
U.S. Cl. 428—113 9 Claims

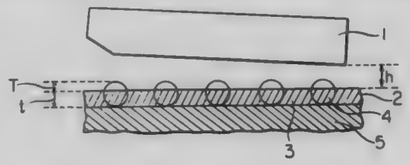


1. A material for reinforcing a conical surface, comprising:
a plurality of first fiber elements, a respective one of the plurality of first fiber elements disposed at a respective vertex of a plurality of contiguous congruent isosceles triangles; and
second, third and fourth fiber elements, the third fiber element overlaying the second fiber element, the fourth fiber element overlaying the third fiber element, and the second, third and fourth fiber elements skewedly disposed with respect to each other and the second, third and fourth fiber elements further disposed between predetermined vertices of the plurality of triangles such that the second, third and fourth fiber elements intersect within a predetermined triangle of the plurality of triangles,
wherein the second, third and fourth fiber elements are conformable to the conical surface such that the fiber volume fraction of the second, third and fourth fiber elements along the axis and circumference of the conical surface is invariant, and the respective one of the plurality of first fiber elements disposed substantially perpendicular to a respective localized portion of the conical surface when the second, third and fourth fiber elements are conformed to the conical surface.

4,721,646
MAGNETIC RECORDING MEDIUM

Keigo Iechika; Fuzio Maeda; Masa-aki Imamura, all of Odawara; Yoshiki Kato, Tokyo; Eiichi Takasuna, Odawara, and Youichi Kawakubo, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,292
Claims priority, application Japan, Aug. 28, 1985, 60-187423
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—143 14 Claims



1. A magnetic recording medium in which a magnetic film containing a nonmagnetic reinforcing agent is formed on a substrate,
wherein there is a relation of $h/4<T<h$ between a minimum flying height h of a magnetic head which is lifted up over said magnetic recording medium and a projection height T of said nonmagnetic reinforcing agent from a flat surface of said magnetic recording medium.

4,721,647
ABSORBENT ARTICLE

Minoru Nakanishi; Akira Sakurai, both of Utsunomiya, and Takatoshi Kobayashi, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,241
Claims priority, application Japan, May 29, 1985, 60-116267
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—283 10 Claims



1. An absorbent article comprising a base material of fibers wherein an effective amount of said fibers are hydrophobic, and a water-absorbent polymer, wherein an effective amount of said water absorbent polymer is in the form of substantially spherical particles wherein said spherical particles wrap around and bond to said fibers.

4,721,648
METHOD FOR PRODUCTION OF COMPOSITE GLASS PANES AND ADHESIVE THEREFOR

Wolfgang Kleine-Doepke, Darmstadt; M. Reinhold Martin, Bad Koenig; Helmer Raedisch, and Gerhard Holzer, both of Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

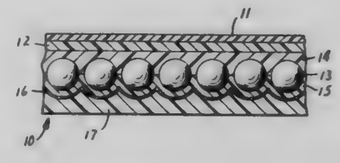
Filed Jun. 23, 1986, Ser. No. 877,346
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523140
Int. Cl.[4] B32B *7/12*
U.S. Cl. 428—317.7 16 Claims

1. Method for the production of a composite glass pane from at least one silicate glass pane and at least one layer of a transparent plastic material, comprising placing the glass pane and the plastics layer one upon the other with an adhesive layer between them consisting of a homogeneous solution of photopolymerisable acrylic monomers (component A), a polymer (component B) and a photoinitiator (component C), and subjecting the resulting article to a UV-irradiation for hardening the adhesive layer, wherein component (A) consists of a mixture of at least
(a_1) one α, β-unsaturated carboxylic acid and
(a_2) at least one monofunctional α, β-unsaturated carboxylic acid ester, of an alcohol comprising 2 to 10 C-atoms,
and component (B) consists of
polyvinylchloride or vinylchloride-vinylacetate copolymer consisting predominantly of vinyl chloride, which optionally is after-chlorinated.

4,721,649
RETROREFLECTIVE SHEETING

Louis C. Belisle; Thomas R. Borden, both of Oakdale, and Raymond E. Granzinger, Jr., New Scandia Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 732,346, May 8, 1985, which is a continuation of Ser. No. 414,547, Sep. 2, 1982, abandoned. This application Jun. 8, 1987, Ser. No. 59,003
Int. Cl.[4] G02B *5/12*
U.S. Cl. 428—325 4 Claims



1. A method for preparing embedded-lens retroreflective sheeting comprising:
(a) applying a layer of an uncured homogeneous polymeric bead bond composition onto a carrier web, said bead bond composition comprising:
(1) an isocyanate-functional polymeric compound which has a substantial portion of its free isocyanate groups masked by agents that can be removed by heating; and
(2) a crosslinking agent;
(b) presenting a mass of transparent microspheres against said layer of uncured bead bond;
(c) heating at least the exterior stratum of said uncured bead bond layer to a temperature sufficient to soften said bead bond layer, but not so high as to thermoset said layer, and applying sufficient pressure to said microspheres to partially embed a dense monolayer of said microspheres in said bead bond layer;
(d) heating said bead bond layer to a temperature and for a period of time sufficient to thermoset said layer;
(e) covering the monolayer of microspheres wtih a layer of transparent binder material having an exterior surface cupped around said microspheres to form a spacing layer; and
(f) applying a specularly reflective layer to the cupped surface of the layer of transparent binder material.

4,721,650
PARTIALLY ORIENTED NYLON YARN AND PROCESS

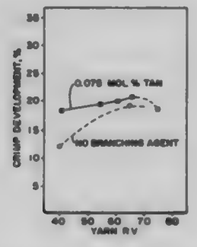
Walter J. Nunning, Pensacola, Fla.; LeMoyne W. Pliechke, Lillian, Ala.; Dror Selivansky, Pensacola, Fla.; John H. Southern, Pensacola, Fla., and Chester C. Wu, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 690,705, Jan. 11, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,888
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—369 22 Claims

1. An apparel yarn suitable for use as a feed yarn for draw-texturing, said yarn having an elongation betwee 45% and 150% and comprising filaments consisting essentially of nylon 66 polymer containing between 0.01 and 1 mole percent of a branching agent and having an elongation at least 5% greater than that of an otherwise identical yarn containing no branching agent.

16. An apparel yarn suitable for use as a feed yarn for draw-texturing, said yarn having an elongation between 45% and

150%, comprising filaments consisting essentially of nylon 66 polymer containing between 0.01 and 1 mole percent branching agent and having a normalized crimp development of at least 1.05.



4,721,651
MICROCAPSULES HAVING CAPSULE WALLS FORMED OF ALIPHATIC DIISOCYANATE AND DIAMINE

Kurt Riecke, Kempen, Fed. Rep. of Germany, assignor to Feldmuehle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 680,738, Dec. 12, 1984, Pat. No. 4,622,267.
This application Jan. 16, 1986, Ser. No. 874,551
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346601
Int. Cl.⁴ B01J 13/02; B32B 27/14, 27/40
U.S. Cl. 428—402.21 3 Claims

1. In microcapsules of the type used for pressure-sensitive carbonless copy papers, having walls formed from aliphatic diisocyanate and diamine and containing a solvent mixture with a dye precursor dissolved therein, the solvent comprising a component which easily dissolves the dye precursor and the aliphatic diisocyanate and a component which only poorly dissolves the dye precuror and the aliphatic diisocyanate, the improvement comprising:

the poorly dissolving component being an alkylbenzene having from 8 to 14 carbon atoms in the alkyl moiety;

the easily dissolving component being diisopropylnaphthalene; and

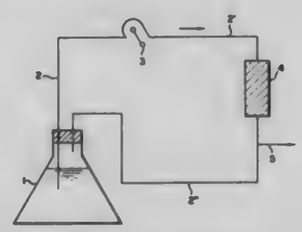
the ratio of easily dissolving component to poorly dissolving component ranging from 15:85 to 75:25 vol. %, and being adjusted within this range so that a solution of the wall-forming aliphatic diisocyanate is just at the turbidity point in the mixture of easily dissolving and poorly dissolving components.

4,721,652
COMPOSITE FOR DECOMPOSING AND ADSORBING UREA DISSOLVED IN LIQUID

Nobuharu Takai, Tokyo, and Sumio Saitoh, Yokohama, both of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,082
Claims priority, application Japan, Jan. 25, 1985, 60-13020
Int. Cl.⁴ B32B 5/16; C12N 11/14
U.S. Cl. 428—403 13 Claims

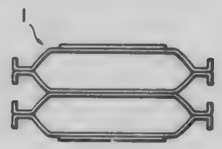
1. A particulate composite for decomposing urea dissolved in a liquid into ammonia and carbon dioxide, and adsorbing the ammonia, which comprises: relatively large size urease-containing core particles covered with relatively small size fine zeolite powder.



4,721,653
VACUUM BRAZING SHEET FOR USE IN ALUMINUM HEAT EXCHANGER

Hidetaka Oda; Akio Fukuda, both of Kasuga; Kikuo Toyose, Tochigi; Jun Takigawa, Tochigi, and Masao Takamoto, Tochigi, all of Japan, assignors to Kobushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 25, 1986, Ser. No. 911,452
Claims priority, application Japan, Sep. 28, 1985, 60-211276
Int. Cl.⁴ D06N 7/04; B62B 9/00
U.S. Cl. 428—472.2 1 Claim



1. A clad sheet of aluminum or aluminum alloy having on one or both of its surfaces a brazing alloy consisting essentially of about 11–13 wt. % silicon, 1.0–2.0 wt. % Mg, and the balance aluminum.

4,721,654
HOLLOW, MOLECULARLY ORIENTED COPOLYAMIDE ARTICLE

John C. Richardson, St. Louis, Mo., and Morris Salame, Windsor, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 20, 1984, Ser. No. 602,319
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.⁴ B32B 27/08; C08G 69/08
U.S. Cl. 428—474.4 5 Claims

1. A new article of manufacture comprising a hollow, biaxially oriented, article formed of a composition comprising a copolyamide of hexamethylene terephthalamide and hexamethylene isophthalamide, the ratio of terephthalic acid to isophthalic acid used in forming the copolyamide being between about 1.0 to about 1.9, the molecularly oriented walls of said article being heat set, optically clear and having an oxygen permeability no greater than

$$0.6 \frac{\text{(cc) (mil)}}{\text{(100 sq. in.) (atm) (day)}}.$$

measured at 23° C., 50% relative humidity.

4,721,655
PAPER SIZE COMPOSITIONS

Peter T. Tsunoka, Plainsboro; Martin M. Tessler, Edison; Ralph Trivisonno, Manville, and Wadyn Jarowenko, Green Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 811,969, Dec. 20, 1985, Pat. No. 4,687,519.
This application Apr. 30, 1987, Ser. No. 44,171
Int. Cl.⁴ B31B 27/08
U.S. Cl. 428—530 20 Claims

1. Paper or paperboard prepared by a method comprising the steps of:

(a) providing a paper stock system;

(b) forming in the absence of high shearing forces and under normal pressures, a sizing emulsion consisting essentially of water and 0.1 to 15% by weight of at least one hydrophobic sizing agent selected from the group consisting of alkyl ketene dimers, anhydrides of fatty acids, maleated triglycerides, maleated alpha-olefins, maleated fatty acids and substituted linear or cyclic dicarboxylic acid anhydrides and 0.4 to 30% by weight of a jet cooked dispersion of a hydrophobic starch ether or ester derivative wherein the ether or ester substituent comprises a saturated or unsaturated hydrocarbon chain of at least 5 carbon atoms in the alkyl chain or a dispersion of a corresponding derivative gum;

(c) forming a web from the paper stock system;

(d) dispersing said emulsion within the paper stock either before or after formation of said web but prior to passing said web through the drying stage of the paper making operation in an amount sufficient to provide a concentration of the sizing agent of from 0.01% to 2%, based on dry fiber weight.

4,721,656
ELECTROPLATING ALUMINUM ALLOYS FROM ORGANIC SOLVENT BATHS AND ARTICLES COATED THEREWITH

Christopher J. Vance, Geneva, and Thinh Nguyen, Onex Geneva, both of Switzerland, assignors to Eltech Systems Corporation, Boca Raton, Fla.

PCT No. PCT/EP85/00471, § 371 Date May 16, 1986, § 102(e) Date May 16, 1986, PCT Pub. No. WO86/01840, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 14, 1985, Ser. No. 879,233
Claims priority, application Austria, Sep. 17, 1984, B4810453.5
Int. Cl.⁴ C25D 3/56
U.S. Cl. 428—680 5 Claims

1. A metallic substrate coated with a coating of an aluminum-manganese alloy, characterized in that the coating is a homogeneous, amorphous alloy of aluminum-manganese containing 95 to 5 w% manganese and a balance of aluminum, and having a grain size smaller than 1 micrometer, said homogeneous, amorphous aluminum-manganese alloy coating having been obtained by electroplating onto the substrate from an essentially water-free electrolyte comprising 0.1–0.3 mole of an alkali halide, 0.1 to 0.5 mole of an aluminum halide and 0.005–0.05 mole of a manganese halide per mole of an aromatic hydrocarbon solvent, said homogeneous amorphous aluminum-manganese alloy coating having a thermally metastable state which is stable under the conditions of preparation but can be converted to a crystalline state by heating to a critical temperature.

3. A method of electroplating a metallic substrate with a coating of an aluminum-manganese alloy, comprising the steps of:

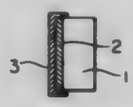
(a) preparing an essentially water-free electrolyte comprising 0.1–0.3 mole of an alkali halide, 0.1 to 0.5 mole of an aluminum halide and 0.005 to 0.5 mole of a manganese halide per mole of an aromatic hydrocarbon solvent and

(b) cathodically polarizing the metallic substrate in the electrolyte to deposit a coating of a homogeneous, amorphous alloy of aluminum-manganese containing 95 to 5 w% manganese and a balance of aluminum, and having a grain size smaller than 1 micrometer, said homogeneous, amorphous aluminum-manganese alloy coating having a thermally metastable state which is stable under the conditions of preparation but can be converted to a crystalline state by heating to a critical temperature.

4,721,657
ANTI-REFLECTION COATING FOR AN INFRARED TRANSMITTING MATERIAL

Kenichi Takahashi, and Noriyuki Yoshida, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 673,175, Nov. 19, 1984, abandoned.
This application Apr. 29, 1986, Ser. No. 858,835
Claims priority, application Japan, Dec. 12, 1983, 58-232647
Int. Cl.⁴ B32B 9/00, 19/00
U.S. Cl. 428—689 1 Claim



1. An infrared transmitting material provided with an anti-reflective material, consisting essentially for an inner layer of an alkali metal halide and an outer layer, provided on the inner layer, of an infrared transmitting material, the inner layer and outer layer being provided on a substrate of an infrared transmitting material and having refractive indexes in the range of the shaded portions in FIG. 2, said refractive indexes of the inner and outer layers in FIG. 2, being based upon the refractive index n of the infrared transmitting substrate, and wherein the infrared transmitting material of the substrate is one member selected from the group consisting of silver bromide, silver chloride and mixed crystals thereof, said alkali metal halide of the inner layer being one member selected from the group consisting or potassium bromide, potassium chloride, sodium chloride, sodium fluoride and mixed crystals thereof; and said infrared transmitting material of the outer layer is one member selected from the group consisting of silver bromide, silver chloride and mixed crystals thereof, lead fluoride, zinc sulfide, zinc selenide, cadmium telluride and gallium arsenide.

4,721,658
AMORPHOUS MAGNETO OPTICAL RECORDING MEDIUM

Richard N. Gardner, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 599,669, Apr. 12, 1984, Pat. No. 4,615,944, which is a continuation-in-part of Ser. No. 495,175, May 17, 1983, abandoned. This application Jan. 13, 1986, Ser. No. 874,083
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.⁴ G11B 7/24
U.S. Cl. 428—694 3 Claims

1. A magneto-optical recording medium comprising a substrate and a passivated magnetizable amorphous film comprising a rare earth-transition metal alloy having a magnetic anisotropy perpendicular to the film surface and characterized by an oxygen concentration less than one atom percent, said magneto-optic recording medium having a Kerr rotation angle for polarized light reflected from the recording medium of at least

1.1° measured with a helium neon laser at a wavelength of 6328 angstroms and at least 1.1° measured with a laser diode at a wavelength of about 7800 to 8500 angstroms.

4,721,659

PROCESS FOR APPLYING A CEMENTITIOUS MATERIAL TO A STRUCTURAL BASE AND ARTICLE PRODUCED THEREFROM

Robert H. Tieckelmann, Ossining, and Fawzy G. Sherif, Stony Point, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 12, 1985, Ser. No. 796,686
Int. Cl.⁴ C04B 29/02
U.S. Cl. 428—701 **18 Claims**

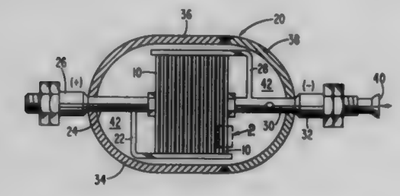
1. A laminated structure having improved internal bond strength comprising a base material, a coating thereon of a passivating agent capable of reducing the pH of the surface of the base material, and a magnesium phosphate cementitious material overlying and adhering to the coating.

4,721,660

ELECTRICALLY REGENERATABLE FUEL CELL

Erich F. Kujas, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1986, Ser. No. 853,758
Int. Cl.⁴ H01M 4/86
U.S. Cl. 429—40 **12 Claims**



1. In an electrically regeneratable fuel cell having a positive electrode, a negative electrode, a porous dielectric separating means and a supply of an electrolyte; the improvement wherein said positive electrode comprises a mixture of silver and indium.

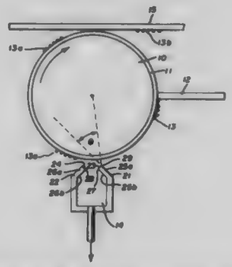
4,721,661

SELECTIVELY REMOVING UNWANTED MAGNETIC TONER FROM MAGNETIC MEMBER TO PROVIDE UNIFORM HIGH RESOLUTION IMAGE

Richard A. Olson, Newark, and Frederick W. Saunders, III, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 10, 1986, Ser. No. 827,442
Int. Cl.⁴ G03G 21/00, 19/00
U.S. Cl. 430—39 **11 Claims**

1. In a process of applying magnetic toner to a rotating magnetic member held in a circular configuration, said member having magnetized and nonmagnetized areas whereby a toner image is formed on the magnetized areas, passing air adjacent the magnetic member to remove excess toner and thereafter transferring by pressure contact the toner image to a substrate wherein the improvement comprises minimizing tangential air flow to the magnetic member by employment of a suction device terminating in lips whose terminal faces along an edge thereof are parallel to one another and parallel to the axis of rotation of the magnetic member with at least one of the lips having a terminal face which forms two separate substantially perpendicular edges and wherein the plane of the one lip perpendicular to its terminal face intersects a plane extending from the axis of rotation of the magnetic member to the closest



edge of the one lip to the magnetic member forming an angle in the range from 5° to 60°.

4,721,662

ELECTROPHOTOGRAPHIC IMAGE FORMING METHOD TO PRODUCE MULTICOLOR IMAGES

Satoshi Haneda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 923,396
Claims priority, application Japan, Nov. 5, 1985, 60-248593
Int. Cl.⁴ G03G 13/01
U.S. Cl. 430—42 **16 Claims**

1. An image forming method comprising the steps of:
providing a photoreceptor having a photoconductive layer on a conductive member and an insulating layer including a filter layer having groups of fine filters distrubuted therein, each of said groups being capable of passing a specific color to said insulating layer on said photoconductive layer,
charging said photoreceptor with a charging means whereby a first substantially uniform charge is placed thereon,
imagewise exposing the surface of said photoreceptor in the presence of an alternating current or a charge opposite to said uniform charge,
exposing said surface with light corresponding to said specific color, a quantity of said light L is expressed by a following formula for a light quantity Lo indicating that a potential generated substantially saturated:

$$0.7Lo \leq L \leq 5Lo$$

whereby a potential pattern is formed on portions of said photoreceptor corresponding to said specific color,
developer said potential pattern by a toner of appropriate color, and
repeating said exposing and developing.

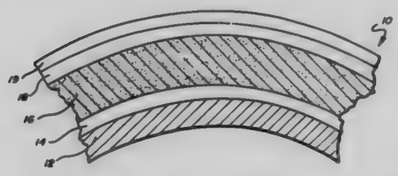
4,721,663

ENHANCEMENT LAYER FOR NEGATIVELY CHARGED ELECTROPHOTOGRAPHIC DEVICES

Annette Johncock, Royal Oak, and Stephen J. Hudgens, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 769,106, Aug. 26, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,202
Int. Cl.⁴ G03G 5/14
U.S. Cl. 430—65 **10 Claims**

1. An electrophotographic medium comprising:
an electrically conductive substrate;
a bottom layer overlying the substrate, the bottom layer adapted to block the free flow of charge carriers from the substrate;
a photoconductive layer overlying the bottom layer, the photoconductive layer adapted to discharge an electrostatic charge;
an enhancement layer fabricated from a semiconductor alloy material selected from the group consisting of: amorphous silicon alloys, amorphous germanium alloys, and amorphous silicon-germanium alloys; said enhancement layer overlying the photoconductive layer and adapted to substantially reduce the number of charge carriers caught in deep mid-gap traps for preventing charge fatigue; said semiconductor alloy material is intentionally boron-doped so as to move the Fermi level thereof to within about 0.75



to 0.45 eV of the valence band to avoid said deep trapping and prevent image flow;
the semiconductor alloy material from which said enhancement layer is formed having the Fermi level thereof pinned by the addition of boron and phosphorous; and
a top protective layer overlying the enhancement layer, said protective layer adapted to protect the photoconductive layer from ambient conditions.

3. A medium as in claim 1, wherein the bottom blocking layer is formed of a doped microcrystalline semiconductor alloy material.

4,721,664

SILICON FILM DEPOSITION FROM MIXTURE OF SILANES

Izumu Shimizu, Yokohama; Kyosuke Ogawa, and Eiichi Inoue, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 674,722, Nov. 26, 1984, abandoned, which is a continuation of Ser. No. 350,613, Feb. 22, 1982, abandoned. This application May 27, 1986, Ser. No. 867,624
Claims priority, application Japan, Mar. 9, 1981, 56-33566; Mar. 9, 1981, 56-33567; Mar. 16, 1981, 56-37440
Int. Cl.⁴ G03G 5/085
U.S. Cl. 430—128 **15 Claims**

1. A process for producing a photoconductive member, which comprises forming a photoconductive layer on a substrate for formation of a photoconductive layer by introducing starting substances for formation of a photoconductive layer under gaseous state into a deposition chamber maintained under a desired reduced pressure and exciting discharging under the gas atmosphere of said starting substances, characterized in that said starting substances are constituted of at least two compounds selected from the group consisting of the compounds of the formula:

$$Si_nH_{2n+2} \quad (A)$$

wherein n is a positive integer and the compounds of the formula:

$$Si_mH_lX_k \quad (B)$$

wherein m and k are positive integers, l is 0 or a positive integer, $l+k=2m+2$, and X represents a halogen atom, n and m being called "order number" hereinafter, and said starting substances to be introduced into said deposition chamber being controlled in amounts such that the proportion of the total of high order compounds is from about 20–99 vol. % based on the total of the minimum order compounds, the minimum order compound being one whose order number is the minimum among order numbers of said at least two compounds, the high order compound being one whose order number is higher than the order number of the minimum order compound.

4,721,665

METHOD FOR NEUTRALIZING ACIDIC NOVOLAK RESIN IN A LITHOGRAPHIC COATING COMPOSITION

Thomas Dooley, Teaneck, N.J., and James Shelnut, Carmel, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,866
Int. Cl.⁴ G03C 1/495, 1/52
U.S. Cl. 430—169 **9 Claims**

1. A method of preparing a lithographic coating composition wherein an aqueous alkali-soluble novolak resin is rendered substantially acid-free in situ, comprising the steps of:
(a) neutralizing an acidic novolak resin in solution to render said acidic resin substantially acid-free; and
(b) directly forming an admixture of said neutralized resin solution with a positive acting, radiation sensitive diazo oxide, a color changing dye which upon exposure to acidic or free radical substances becomes colorless or lighter, and a light activated acid-releasing compound.

6. A method of preparing a lithographic coating composition wherein an aqueous alkali-soluble resin is rendered substantially acid-free in situ, comprising the steps of:
(a) forming a solution of at least one novolak resin with a solvent compatible with other compounds of said lithographic composition;
(b) neutralizing said solution with a tertiary amine to render said novolak-containing solution substantially acid-free; and
(c) directly forming an admixture of said neutralized solution with a positive acting, radiation sensitive diazo oxide, a color changing dye which upon exposure to acidic or free radical substances becomes colorless or lighter, and a light activated acid-releasing compound.

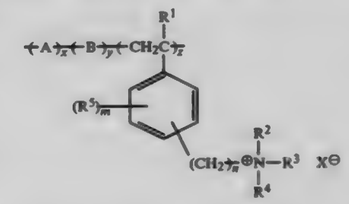
4,721,666

PHOTOGRAPHIC ELEMENT

Junichi Yamanouchi, and Masaharu Toriuchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1986, Ser. No. 894,544
Claims priority, application Japan, Aug. 8, 1985, 60-174734
Int. Cl.⁴ G03C 5/54, 1/84
U.S. Cl. 430—213 **18 Claims**

1. A photographic element comprising at least one layer containing a polymeric mordant represented by formula (I)



(I)

wherein
A represents a repeating unit derived from a copolymerizable monomer having at least two ethylenically unsaturated groups;
B represents a repeating unit derived from a copolymerizable ethylenically unsaturated monomer other than the repeating unit of A and the repeating unit having the copolymerization ratio of z;
R^1 represents a hydrogen atom or a lower alkyl group;
R^2, R^3, and R^4 each represents an unsubstituted or substituted alkyl or aralkyl group, or two or more of R^2, R^3, and

R^4 are bonded to form a cyclic structure together with the adjacent nitrogen atom, and the total number of carbon atoms of R^2, R^3 and R^4 is 12 or more;

R^5 represents an unsubstituted or substituted alkyl, alkoxy, or acylamino group having 1 to 20 carbon atoms, or a halogen atom;

m is 0, 1, or 2, and n is an integer of from 1 to 12;

$X^{\ominus}$ represents an anion; and

x is from 30 to 80 mol%, y is from 0 to 60 mol%, and z is from 10 to 70 mol%.

4,721,667

COLOR LIGHT-SENSITIVE MATERIAL

Keso Sato; Tadahisa Sato, and Takeshi Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1986, Ser. No. 864,061

Claims priority, application Japan, May 16, 1985, 60-102730

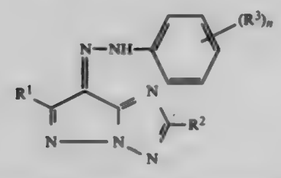
Int. Cl.[4] G03C *1/40, 5/54, 7/26*

U.S. Cl. 430—562 **20 Claims**

1. A color light-sensitive material having at least one image forming compound of the following formula (I) on a support

$$(Dye\text{-}X)_q\text{-}Y \qquad (I)$$

wherein Dye represents a yellow dye residue or a dye precursor residue represented by the following formula (II); X represents a bond or a binding group; Y represents a group capable of yielding a difference of diffusibility of a dye component before and after the reaction with a photographic silver salt imagewise having a latent image, corresponding to or reversely corresponding to said photographic silver salt; q is 1 or 2, and when q is 2, Dye-X may be the same or different;



(II)

wherein R^1, R^2 and R^3 may be the same or different and each represents a group selected from a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a carboxyl group, or a substituted or unsubstituted alkyl, aralkyl, cycloalkyl, aryl, heterocyclic, alkoxy, aryloxy, amino, acylamino, sulfonylamino, acyl, sulfonyl, carbamoyl, sulfamoyl, ureido, alkylthio or arylthio group; n is an integer selected from 0 to 4, and when n is an integer of from 2 to 4, said R^3 may be the same or different; Dye and X are bound to each other via any of said R^1, R^2 and R^3 in the formula (II).

4,721,668

PRE-ELECTROPHORETIC NUCLEIC ACID HYBRIDIZATION

Frederick S. Jones, III, New York, N.Y.; Jacob I. Grimberg, Passaic, N.J., and John P. Ford, Tappan, N.Y., assignors to Lifecodes Corporation, Elmsford, N.Y.

Filed Jul. 25, 1984, Ser. No. 634,301

Int. Cl.[4] C12Q *1/68*

U.S. Cl. 435—6 **15 Claims**

1. In a method for the detection of nucleic acids by hybridization the improvement comprising:

providing a discrete RNA probe;

contacting said discrete RNA probe with the nucleic acid to be detected in solution under hybridizing conditions; forming a hybrid; and detecting the hybrid after electrophoresis.

4,721,669

CHEMICAL PROBES FOR LEFT-HANDED DNA AND CHIRAL METAL COMPLEXES AS Z-SPECIFIC ANTI-TUMOR AGENTS

Jacqueline K. Barton, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jan. 18, 1985, Ser. No. 693,023

Int. Cl.[4] C12Q *1/68*; C07H *21/00*; C07D *471/04*; A61K *33/24*

U.S. Cl. 435—6 **10 Claims**

1. A method for detecting in a sample the presence of double-stranded DNA comprising contacting the sample with a complex of the formula $(R)_3$—Co (III), wherein R comprises 1,10-phenanthroline or a substituted derivative thereof and R is bound to Co(III) by a coordination bond, the contacting being effected under conditions such that the complex binds to double-stranded DNA present in the sample by intercalation and thereby labels the double-stranded DNA with the complex, detecting DNA labeled with the complex, and thereby detecting the presence of double-stranded DNA in the sample.

7. A method for nicking double-stranded DNA by effecting breakage of at least one phosphodiester bond along the DNA which comprises contacting the DNA with a coordination complex or salt thereof having the formula $(R)_3$—Co (III), wherein R comprises 1,10-phenanthroline or a substituted derivative thereof and R is bound to Co by a coordination bond, under conditions such that the complex binds to the DNA by intercalation to form an adduct and irradiating the adduct so formed with ultraviolet radiation of a wavelength which is absorbed by the ligand bands of the complex so as to nick the DNA at the site(s) of intercalation.

4,721,670

ANALYTICAL REAGENT, ANALYTICAL METHOD, AND MULTILAYER CHEMICAL-ANALYTICAL ELEMENT

Chiaki Ooeda, and Harumi Katsuyama, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

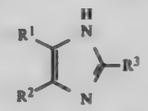
Filed Jun. 18, 1985, Ser. No. 745,914

Claims priority, application Japan, Jun. 19, 1984, 59-124412

Int. Cl.[4] C12Q *1/28*; C07D *403/00*; G01N *33/00*

U.S. Cl. 435—28 **17 Claims**

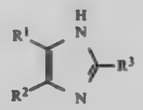
1. A reagent for analysis of hydrogen peroxide, which comprises an imidazole derivative having the formula (I):



(I)

wherein R^1 and R^2 may be the same or different and are 4-(dimethylamino)phenyl or 4-(diethylamino)phenyl, and R^3 is 2-phenyl-3-indolyl or 5-chloro-3-indolyl.

10. A method of analysis of peroxidase which comprises reacting an imidazole derivative having the formula (I) and hydrogen peroxide in the presence of peroxidase:



(I)

wherein R^1 and R^2 may be the same or different and are 4-(dimethylamino)phenyl or 4-(diethylamino)phenyl, and R^3 is 2-phenyl-3-indolyl or 5-chloro-3-indolyl.

4,721,671

EFFICIENT PROKARYOTIC EXPRESSION SYSTEM USING PORTIONS OF THE *E. COLI* βGLUCURONIDASE GENE

Algis Anilionis, and John L. Palmer, both of Arlington, Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Dec. 26, 1984, Ser. No. 686,344

Int. Cl.[4] C12P *21/00*; C12N *15/00, 9/26, 1/20, 7/00*; C07H *15/12*; C07K *13/00*

U.S. Cl. 435—68 **27 Claims**

1. A recombinant DNA high level expression vector comprising a first DNA segment consisting essentially of the following nucleotide sequence or equivalent nucleotide sequences containing bases whose translated region codes for the same amino acid sequence:

GATCTGACCT	ACGGTGTACT	GGCCGATATC
GAAGCGGAAG	ACCTGGCGCG	TGAAGCGTCG
TTTGCTCAGG	GATTACGCGC	GATGATTGGC
GGTATCTTAA	CCGCATCCTG	ATTCTCTCTC
TTTTTCGGCG	GGCTGGTGAT	AACTGTGCCC
GCGTTTCATA	TCGTAATTTC	TCTGTGCAAA
AATTATCCTT	CCCGGCTTCG	GAGAATTCCC
CCCAAAATAT	TCACTGTAGC	CATATGTCAT
GAGAGTTTAT	CGTTCCCAAT	ACGCTCGAAC
GAACGTTCGG	TTGCTTATTT	TATGGCTTCT
GTCAACGCTG	TTTTAAAGAT	TAATCCGATC
TATATCACGC	TGTGGGTATT	GCAGTTTTTG
GTTTTTTGAT	CGCGGTGTCA	GTTCTTTTTA
TTTCCATTTC	TCTTCCATGG	GTTTCTCACA
GATAACTGTG	TGCAACACAG	AATTGGTTAA
CTAATCAGAT	TAAAGGTTGA	CCAGTATTAT
TATCTTAATG	AGGAGTCCCT	

```
1                                                  10
T ATG TTA CGT CCT GTA GAA ACC CCA ACC CGT
                                                   20
GAA ATC AAA AAA CTC GAC GGC CTG TGG GCA TTC
                                                   30
AGT CTG GAT CGC GAA AAC TGT GGA ATT GAT
                                                   40
CAG CGT TGG TGG GAA AGC GCG TTA CAA GAA
                                                   50
AGC CGG GCA ATT GCT GTG CCA GGC AGT TTT
                                                   60
AAC GAT CAG TTC GCC GAT GCA GAT ATT CGT
                                                   70
AAT TAT GCG GGC AAC GTC TGG TAT CAG CGC
                                                   80
GAA GTC TTT ATA CCG AAA GGT TGG GCA GGC
                                                   90
CAG CGT ATC GTG CTG CGT TTC GAT GCG GTC
                                                  100
ACT CAT TAC GGC AAA GTG TGG GTC AAT AAT
                                                  110
CAG GAA GTG ATG GAG CAT CAG GGC GGC TAT
                                                  120
ACG CCA TTT GAA GCC GAT GTC ACG CCG TAT
                                                  130
GTT ATT GCC GGG AAA AGT GTA CGT ATC ACC
                                                  140
GTT TGT GTG AAC AAC GAA CTG AAC TGG CAG
                                                  150
ACT ATC CCG CCG GGA ATG GTG ATT ACC GAC
                                                  160
GAA AAC GGC AAG AAA AAG CAG TCT TAC TTC
    CAT GAT TTC TTT AAC TAT GCC GGG ATC
```

and wherein said first segment is operably linked to a DNA sequence heterologous to said first segment.

23. A process for preparing useful hybrid proteins which comprises culturing a gram negative prokaryotic microbe hosting a recombinant DNA transfer vector comprising all or part of the *E. coli* β-glucuronidase structural gene DNA or promoter DNA.

4,721,672

CDNA AND GENE FOR HUMAN ANGIOGENIN (ANGIOGENESIS FACTOR) AND METHODS OF EXPRESSION

Bert L. Vallee, Brookline, Mass., and Kotoku Kurachi, Seattle, Wash., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 770,657, Aug. 28, 1985. This application Sep. 20, 1985, Ser. No. 778,547

Int. Cl.[4] C12P *21/02*; C12N *15/00, 5/00*; C07H *15/12*; H61K *37/02*

U.S. Cl. 435—70 **12 Claims**

```
1                                                  15
<Glu-Asp-Asn-Ser-Arg-Tyr-Thr-His-Phe-Leu-Thr-Gln-His-Tyr-Asp-
                                                   30
Ala-Lys-Pro-Gln-Gly-Arg-Asp-Asp-Arg-Tyr-Cys-Glu-Ser-Ile-Met-
                                                   45
Arg-Arg-Arg-Gly-Leu-Thr-Ser-Pro-Cys-Lys-Asp-Ile-Asn-Thr-Phe-
                                                   60
Ile-His-Gly-Asn-Lys-Arg-Ser-Ile-Lys-Ala-Ile-Cys-Glu-Asn-Lys-
                                                   75
Asn-Gly-Asn-Pro-His-Arg-Glu-Asn-Leu-Arg-Ile-Ser-Lys-Ser-Ser-
                                                   90
Phe-Gln-Val-Thr-Thr-Cys-Lys-Leu-His-Gly-Ser-Pro-Trp-Pro-
                                                  105
Pro-Cys-Gln-Tyr-Arg-Ala-Thr-Ala-Gly-Phe-Arg-Asn-Val-Val-Val-
                                                  120
Ala-Cys-Glu-Asn-Gly-Leu-Pro-Val-His-Leu-Asp-Gln-Ser-Ile-Phe-
                                                  123
Arg-Arg-Pro-OH.
```

1. A plasmid identical to ATCC Deposit No. 40192.

4,721,673

RECOVERY AND ACTIVATION PROCESS FOR MICROBIALLY PRODUCED CALF PROCHYMOSIN

Jack R. Urea, Gaithersburg; Douglas E. Robinson, Frederick, both of Md., and Carl J. Scandella, Oakland, Calif., assignors to Genex Corporation, Gaithersburg, Md.

Continuation-in-part of Ser. No. 528,421, Sep. 1, 1983, abandoned. This application Mar. 6, 1984, Ser. No. 587,029

Int. Cl.[4] C12N *9/00, 9/52*

U.S. Cl. 435—183 **7 Claims**

4. A process for converting microbially produced bovine prochymosin into pseudochymosin, which process comprises:

(a) solubilizing a preparation of microbially produced bovine prochymosin in a solution of a base, said solution having a pH of at least 12.0;

(b) reducing the pH of said solution to between 8.5 and 10.5;

(c) maintaining said preparation of microbially produced bovine prochymosin in said solution, thereby converting said preparation of microbially produced bovine prochymosin into a renatured form of prochymosin which is capable of conversion of pseudochymosin at a pH of about 2.0; and

(d) reducing the pH of said solution to below 2.5, thereby converting said microbially produced bovine prochymosin into pseudochymosin.

4,721,674

PROCESS FOR OBTAINING LYSOZYME BY A MICRO FILTRATION FROM A STARTING MATERIAL BASED ON WHITE OF EGG

Alain Lepienne, Chartres; Jean-Louis Maubois, Pacé ; Michel Thireau, Bethune, and Michel Piot, Rennes-Saint Grégoire, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Aug. 26, 1985, Ser. No. 769,380

Claims priority, application France, Aug. 28, 1984, 84 13305

Int. Cl.[4] C12N *9/36*; A61K *37/54*; A23J *1/08*

U.S. Cl. 435—206 **11 Claims**

1. A process for obtaining lysozyme containing filtrate from a fluid starting material based on white of egg, comprising microfiltering said starting material, under pressure and in tangential flow, through a membrane capable of passing only particles having a size of between about 0.02 micron and 10 microns, to produce said lysozyme-containing microfiltrate.

4,721,675

PRODUCTION OF HEPATITIS A VIRUS IN VITRO UTILIZING A PERSISTENTLY VIRUS INFECTED CELL CULTURE SYSTEM

Emerson W. Chan, Bolingbrook, and Joel R. Mitchen, Winthrop Harbor, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 344,683, Feb. 1, 1982, abandoned. This application Feb. 4, 1985, Ser. No. 697,703

Int. Cl.[4] C12N *7/02, 7/00, 5/00;* **A61K** *39/29*

U.S. Cl. 435—239 **19 Claims**

1. A tissue culture method for propagating hepatitis A virus in a hepatitis A virus-infected cell culture comprising the steps of:

(a) infecting a susceptible cell culture with a hepatitis A virus;

(b) growing the infected cells in the culture in a nutrient media until the cell culture reaches confluency;

(c) transferring some of the live, infected cells to a fresh nutrient media wherein the cells are maintained in log phase growth;

(d) repeating steps (b) and (c) until essentially all of the cells in the culture become infected and a persistently-infected hepatitis A virus-producing cell line is established; and,

(e) harvesting the hepatitis A virus.

4,721,676

NOVEL THERMOPHILE ISOLATE HAVING THERMOSTABLE HYDROLYTIC ACTIVITY

Joseph G. Zeikus, Madison, Wis., assignor to Genencor, Inc., South San Francisco, Calif.

Division of Ser. No. 449,716, Dec. 14, 1982, Pat. No. 4,572,898. This application Oct. 28, 1985, Ser. No. 791,680

Int. Cl.[4] C12N *1/20;* **C12R** *1/145*

U.S. Cl. 435—253 **4 Claims**

1. A biologically pure culture consisting essentially of the microorganism *Clostridium thermosulfurogenes* as an isolate from natural source.

4,721,677

IMPLANTABLE GAS-CONTAINING BIOSENSOR AND METHOD FOR MEASURING AN ANALYTE SUCH AS GLUCOSE

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Division of Ser. No. 777,234, Sep. 18, 1985, Pat. No. 4,680,268. This application May 7, 1987, Ser. No. 47,013

Int. Cl.[4] C12M *1/34*

U.S. Cl. 435—291 **28 Claims**

1. A device for sensing a product or reactant of an enzyme reaction with an analyte as a measure of the analyte comprising

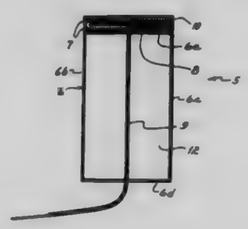
a gas and enzyme permeable membrane having opposed sides,

an enzyme on one side of said membrane for permeation through said membrane and enzymatic reaction with the analyte in presence of oxygen to provide the product or reactant,

a closed container for containing oxygen on the enzyme side of said membrane to supply oxygen through said membrane for the enzymatic reaction, and

means for sensing the product or reactant as a function of the analyte.

23. A device for sensing a product or reactant of an enzyme reaction with an analyte in presence of oxygen which functions as a measure of the analyte comprising



an enclosed chamber adapted for containing oxygen and enzyme comprising a wall structure defining a hollow interior, a portion of the wall structure being adapted for allowing oxygen and enzyme to permeate therethrough to supply oxygen and enzyme for the enzymatic reaction,

an analyte permeable membrane overlying said portion of the wall structure and connected to said chamber for allowing the analyte to permeate therethrough to supply the analyte for the enzymatic reaction, and

means for sensing the product or reactant of the enzymatic reaction which functions as a measure of the analyte.

4,721,678

TRIPHASIC MYCOPLASMATALES CULTURE DEVICE

Gerald K. Masover, Palo Alto, and Milton G. Drysdale, Concord, both of Calif., assignors to Hana Biologics, Inc., Alameda, Calif.

Division of Ser. No. 703,627, Feb. 19, 1985, Pat. No. 4,598,045, which is a continuation of Ser. No. 411,293, Aug. 25, 1982, abandoned. This application Mar. 24, 1986, Ser. No. 842,921

Int. Cl.[4] C12M *1/24, 1/16;* **C12Q** *1/04;* **C12N** *1/20*

U.S. Cl. 435—296 **5 Claims**

1. A triphasic Mycoplasmatales culture device comprising a container having first and second, opposed, transparent sidewalls, an opening and a closure means for sealing the opening, the inner wall surface of the first sidewall being covered with an adherent layer of Mycoplasmatales nutrient agar medium, the container also containing a Mycoplasmatales liquid nutrient medium and a gas phase, the nutrient agar medium being spaced apart from the liquid nutrient medium with the gas phase in between the mediums when the first sidewall is positioned in a horizontal plane above the second sidewall, the combined thickness of the agar medium and the first sidewall not exceeding 8 mm, the distance between the outer surfaces of the first and second sidewalls not exceeding 20 mm, the first and second sidewalls each having a width of from 22 to 40 mm and a length of from 70 to 85 mm, and the surface quality of the first sidewall permitting microscopic examination of the nutrient agar medium through the first sidewall without significant distortion.

4,721,679

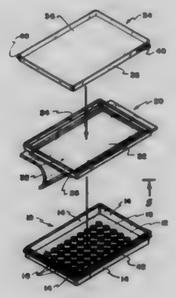
TISSUE TYPING TRAY

Felix H. F. Yiu, 8600 Mason Ave., Canoga Park, Calif. 91306, and Jimmy Loos, 6931 Garden Grove Ave., Reseda, Calif. 91335

Filed Oct. 23, 1986, Ser. No. 922,207

Int. Cl.[4] C12Q *1/20*

U.S. Cl. 435—301 **11 Claims**



1. A well cover in combination with a tissue typing tray, said tray comprising a box-like construction of conjoining side walls and a bottom, with a plurality of wells provided in an array on said bottom and extending upwardly therefrom to a predetermined height, said cover comprising a flat cover member having two opposed major surfaces, with a downwardly depending, continuous ridge member inwardly spaced around the perimeter of a second major surface, said ridge member terminating in a substantially flat surface coated with an adhesive, the height of said ridge member being substantially equal to that of said wells, said adhesive-coated surface of said ridge member being designed for sealable contact with said bottom of said tray around said array of said wells, and said second major surface of said well cover being designed for contact with the tops of said wells in sealing configuration.

4,721,680

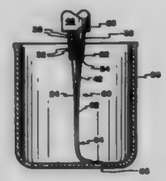
METHODS OF USING MICRO PIPETTE TIPS

David H. Jeffs, and Paul M. Jessop, both of Salt Lake City, Utah, assignors to Multi-Technology, Inc., Salt Lake City, Utah

Division of Ser. No. 895,104, Aug. 11, 1986. This application Nov. 13, 1986, Ser. No. 930,203

Int. Cl.[4] B01L *3/02;* **G01N** *1/14*

U.S. Cl. 436—180 **2 Claims**



1. A method of withdrawing liquid to be tested from a container, such as a vial or test tube, comprising the steps of:

providing a micro pipette tip having a flexible distal end portion and a central passageway therein;

inserting the distal end portion of the micro pipette tip into a container containing liquid to be tested and forcibly deflecting the distal end portion including said central passageway of the micro pipette tip against a bottom of the container into an angular configuration without occlusion of the central passageway of the micro pipette tip;

withdrawing substantially all of the liquid from the container into the micro pipette tip through the angularly disposed central passageway.

4,721,681

IMMUNOASSAY IN CENTRIFUGAL FIELD WITH COMPLEMENTARY PARTICLES OF DIFFERING SPECIFIC GRAVITIES

Brian B. Leatrichia, Mahwah, N.J.; Michael F. Turanchik, Stony Point, and Linda A. Kish, Larchmont, both of N.Y., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed May 14, 1985, Ser. No. 733,689

Int. Cl.[4] G01N *33/557, 33/543, 33/551, 33/546*

U.S. Cl. 436—523 **18 Claims**

1. A method for the detection of a target binding pair member in a biological sample which comprises:

(a) reacting in a liquid phase in a chamber in a centrifugal field

(i) the sample to be analyzed,

(ii) a plurality of first particles bearing on their surface a binding pair member complementary to target binding pair member, and

(iii) a plurality of second particles bearing on their surface a binding pair member competitive with the target binding pair member for binding sites on the complementary binding pair member;

the specific gravity of the first and second particles being sufficiently different with respect to the centrifugal field and the specific gravity and viscosity of the liquid phase to cause detectively different rates of migration in the centrifugal field for first particles, for second particles and for first particles bound to second particles;

(b) detecting the concentration of particles at a locus in the chamber after a specified time of reaction and centrifugation; and

(c) correlating the concentration of particles over time with the concentration measured after samples of known target binding member amount are reacted in the centrifugal field with the plurality of first particles and plurality of second particles.

4,721,682

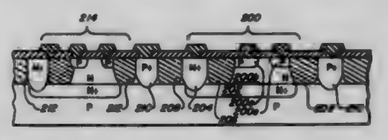
ISOLATION AND SUBSTRATE CONNECTION FOR A BIPOLAR INTEGRATED CIRCUIT

Scott O. Graham; Lawrence Y. Lin, both of Cupertino, and Hua T. Chua, Los Altos Hills, all of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Sep. 25, 1985, Ser. No. 780,062

Int. Cl.[4] H01L *21/22, 21/20, 21/26*

U.S. Cl. 437—33 **5 Claims**



1. A method for forming a transistor comprising:

forming an epitaxial layer of a first conductivity type on a substrate of a second conductivity type opposite to said first conductivity type;

forming a transistor in said epitaxial layer;

forming a nonconductive region laterally surrounding said transistor, said nonconductive region extending from the surface of said epitaxial layer to said substrate; and

doping a portion of said epitaxial layer so that said doped portion is of said second conductivity type, said doped portion contacting said subtrate, said doped portion of

said epitaxial layer laterally surrounding said nonconductive region.

4,721,683

USE OF ALKYLPHOSPHINES AND ALKYLARSINES IN ION IMPLANTATION

Jack E. Ward, Long Beach, Calif., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 21, 1987, Ser. No. 52,810
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—20 **7 Claims**

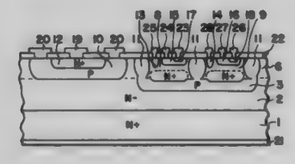
1. In a method for ion implantation to modify properties of semiconductor material which method comprises steps of forming P^+ or As^+ ions by ionization of an organic phosphorus or arsenic compound and directing a high energy ion beam of said ions to the material to be modified, the improvement wherein the organic phosphorus or arsenic compound that is ionized to make the ion beam is a compound defined by the formula $R_1R_2R_3P$ or $R_1R_2R_3As$ wherein R_1 is alkyl having two to five carbon atoms and each of R_2 and R_3 is hydrogen or alkyl having two to five carbon atoms.

4,721,684

METHOD FOR FORMING A BURIED LAYER AND A COLLECTOR REGION IN A MONOLITHIC SEMICONDUCTOR DEVICE

Salvatore Musumeci, Riposto, Italy, assignor to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Dec. 20, 1985, Ser. No. 811,754
Claims priority, application Italy, Dec. 20, 1984, 6633 A/84
Int. Cl.⁴ H01L *21/20*
U.S. Cl. 437—30 **4 Claims**



1. A method for the manufacture of a semiconductor device comprising at least one power transistor and a control circuit integrated on a same chip of semiconductor material comprising the following steps:

preparing a first layer of monocrystalline silicon of a first type of conductivity;

forming, by doping of the first layer with a first doping agent, of a first region of a second type of conductivity which is opposite to the first type of conductivity;

forming at least a second region in the first region by doping with impurities of the first type of conductivity;

forming, by epitaxial growth, of a second layer of the first type of conductivity and having a high resistivity, the second layer completely covering the first layer and the first region;

forming at least one isolation region of the second type of conductivity which passes through the second layer until it reaches the first region and includes within itself at least one portion of the second layer lying above one of the second regions;

forming at least one region of the second type of conductivity in the second layer, this at least one region forming a base of a power trnsistor;

forming a region of the first type of conductivity in the base region, this region forming an emitter of the power transistor;

forming, within the portions of the second layer confined by the isolation regions, of additional regions forming active and passive components of the integrated circuit;

forming electrodes on surfaces of the chip and metal interconnection paths between the active and passive components of the integrated circuit and the power transistor;

wherein the formation of the second region includes the pre-deposition or implantation and the subsequent diffusion of a second and a third doping agent of the same type of conductivity and having diffusion coefficients which are respectively higher and lower than the coefficient of the first doping agent;

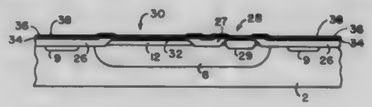
wherein in at least one of the portions of the second layer bounded by an isolation region lying above one of the second regions, atoms of phosphorus are deposited or implanted and then caused to diffuse such that the concentration of all of the doping agents in the portion forming the collector region of a transistor of the integrated circuit is substantially constant and higher in value than the concentration of the single doping agent in the first layer and in the second layer of high resistivity forming the collector region of the power transistor.

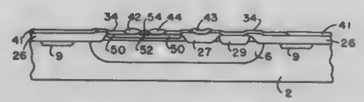
4,721,685

SINGLE LAYER POLY FABRICATION METHOD AND DEVICE WITH SHALLOW EMITTER/BASE JUNCTIONS AND OPTIMIZED CHANNEL STOPPER

Timothy M. Lindenfelser, Eagan, and David A. Hanson, Apple Valley, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,792
Int. Cl.⁴ H01L *21/265, 21/20, 21/425*
U.S. Cl. 437—31 **21 Claims**





1. In a process for forming a transistor, the steps of:

(a) depositing a layer of a polycrystalline silicon over a semiconductor substrate including a plurality of transistor sites isolated from one another by a surrounding electrical insulator wherein each transistor site includes an epitaxial layer and a lower-lying sub-collector region;

(b) thermally forming a silicon dioxide layer over said polycrystalline silicon layer;

(c) depositing a silicon nitride layer over said silicon dioxide layer;

(d) exposing portions of the silicon dioxide layer over said epitaxial layer;

(e) oxidizing the exposed silicon dioxide layer through the underlying polycrystalline silicon layer to the epitaxial layer to electrically define a base area and an emitter area within said epitaxial layer and such that the thus grown oxide and the unetched sandwiched layers of silicon nitride, silicon oxide and polycrystalline silicon over said epitaxial layer exhibit substantially similar resistances to ion implant; and

(f) ion implanting a dopant into said epitaxial layer through the overlying grown oxide and the sandwiched layers of silicon nitride silicon oxide and polycrystalline silicon

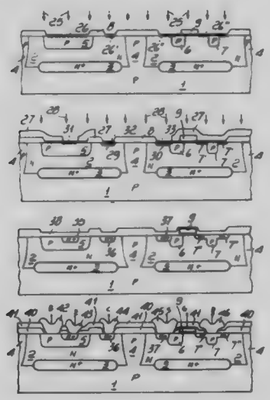
whereby a uniform vertical doping profile is obtained over the implant area.

4,721,686

MANUFACTURING INTEGRATED CIRCUITS CONTAINING P-CHANNEL MOS TRANSISTORS AND BIPOLAR TRANSISTORS UTILIZING BORON AND ARSENIC AS DOPANTS

Claudio Contiero, Bacciasco; Paola Galbiati, Monza, and Antonio Andreini, Milan, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Jan. 22, 1987, Ser. No. 6,037
Claims priority, application Italy, Jan. 24, 1986, 19173 A/86
Int. Cl.⁴ H01L *21/38, 21/425*
U.S. Cl. 437—31 **4 Claims**



1. Method for manufacturing integrated electronic devices, in particular high voltage P-channel MOS transistors by forming an epitaxial layer defining a device's main surface, at least a first P-type region in said epitaxial layer and at least a second N-type region in said epitaxial layer, characterized in that for forming said first P-type region a boron implant is performed on said main surface, without masking, and for forming said second N-type region an arsenic implant is performed on selective portions of said device main surface, through a mask, and subsequently a thermal treatment phase is carried out to diffuse implanted boron and arsenic, thereby in said selective portions an interaction between said boron and said arsenic and inhibition of boron diffusion by arsenic occur.

4,721,687

METHOD OF INCREASING THE THICKNESS OF A FIELD OXIDE

Masakazu Kakuma, Yokohama, and Sigeru Morita, Toyko, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 6, 1987, Ser. No. 11,892
Claims priority, application Japan, May 31, 1986, 61-126348
Int. Cl.⁴ H01L *21/94, 21/95*
U.S. Cl. 437—69 **19 Claims**

1. A method of manufacturing a semiconductor device, which comprises the steps of:

depositing a surface-protecting layer on a semiconductor substrate;

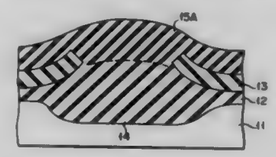
forming an acid-resisting layer on said surface-protecting layer;

selectively eliminating said acid-resisting layer;

oxidizing said semiconductor substrate, with the retained acid-resisting layer being used as a mask, thereby to provide an oxidized layer;

depositing a silicon layer on said oxidized layer and said retained acid-resisting layer;

oxidizing the silicon layer to provide an insulation layer;



eliminating said oxidized silicon layer until said retained acid-resisting layer is exposed; and

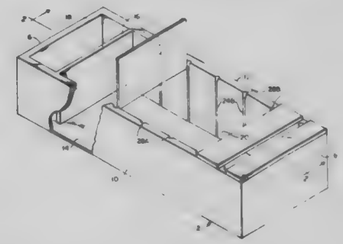
eliminating all the retained acid-resisting layer.

4,721,688

METHOD OF GROWING CRYSTALS

Richard W. Stormont, Warwick, R.I., and Chang C. Chao, Lexington, Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Sep. 18, 1986, Ser. No. 908,588
Int. Cl.⁴ H01L *31/00*; C30B *15/34*
U.S. Cl. 437—115 **10 Claims**



1. A method of growing a silicon ribbon from a silicon melt comprising the steps of:

(a) providing a crucible made of graphite or quartz and having first and second opposed side walls, at least one pair of first and second mutually confronting grooves formed in the inner faces of said first and second opposed side walls, said grooves being of capillary dimensions and extending to the top of the crucible;

(b) providing a supply of molten silicon in said crucible so that molten silicon will rise in said grooves by action of capillary rise, introducing a seed into said supply of molten silicon between each first and second mutually confronting grooves, withdrawing each seed so as to establish a sheet of molten, silicon between said grooves that is a continuum with the melt in said grooves, and growing at least one silicon ribbon from said melt by pulling each seed upwardly away from said crucible so that the sheet of melt attached to each seed will crystallize and form a continuous solid extension of each seed in the form of a ribbon.

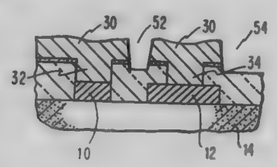
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,689

METHOD FOR SIMULTANEOUSLY FORMING AN INTERCONNECTION LEVEL AND VIA STUDS

Paul N. Chaloux, Jr., Wappingers Falls; Thomas F. Houghton, Beacon, and Richard K. West, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1986, Ser. No. 901,492
Int. Cl.[4] C23F 1/02; C03C 15/00, 25/06
U.S. Cl. 437—189 15 Claims



1. A method for forming simultaneously a level of interconnection conductors over and inter-level via studs through an insulating layer of a semiconductor chip, comprising the steps of:

forming a plurality of via holes in a surface of said insulating layer disposed on said semiconductor chip;

high-mobility sputtering a conductive material on to said surface of said insulating layer and into said via holes and including the steps of:

substantially eliminating non-mobile sputter species in the vicinity of said surface of said insulating layer;

sputtering at a sputter pressure of less than 7 microns,

maintaining a chip bias level at a value that is above that needed for planarization of said conductive material but below the bias level where material focusing into the via holes occurs, and

maintaining said surface of said insulating layer at a temperature above the temperature where conductive material planarization occurs, but below the temperature where phase changes occur for said conductive material or where device breakdown or hillock growth occurs;

forming a mask over said sputtered surface to define areas of sputtered conductive material to be removed; and

directing a particle beam on to said masked surface to remove conductive material from said areas defined by said mask.

4,721,690

HIGH PBO-CONTENT GLASSES IN THE SYSTEM SiO_2—PBO—M_2O WITH INCREASED CHEMICAL STABILITY

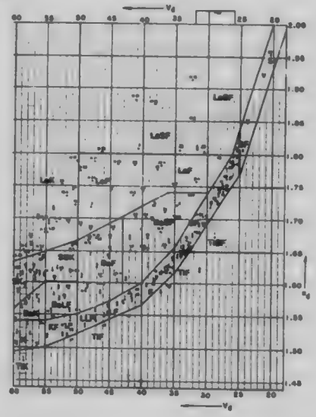
Ludwig Roos; Danuta Grabowski; Burkhard Speit, and Volkmar Geiler, all of Hattenbergstrasse 10, 6500 Mainz, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 698,330
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404363
Int. Cl.[4] C03C 3/102, 13/02, 3/07, 4/00
U.S. Cl. 501—60 7 Claims

1. A high PbO-content optical glass with optical properties of the heavy flint (SF) region of the Abbe—diagram of FIG. 2 wherein the glass has a refractive index n_d of 1.65–1.85, an Abbe number v_d of 35–25, an acid resistance of SR class 1–2 and consists essentially of the following composition, in weight%:

SiO_2 15–60
PbO 30–80
M_2O 0.5–15 (M_2O=Na_2O, K_2O, Cs_2O)
ZrO_2 0.9–4
TiO_2 0.6–2

wherein ZrO_2+TiO_2=1.5–6 and TiO_2:ZrO_2=0.3–2.0,
As_2O_3 0.1–0.5
F^- 0–0.5



and up to 20 wt.% of the following further components:

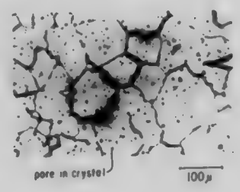
alkaline earth metal oxides + ZnO	0.5–5
B_2O_3	0.5–8
Al_2O_3	1–3
GeO_2	0.1–2
La_2O_3	0.5–4
Bi_2O_3	0.5–8
TeO_2	0.1–2
CeO_2	0.1–2
WO_3	0.1–2
Y_2O_3	0.5–5
Gd_2O_3	0.5–10
Ta_2O_5	0.2–2
Nb_2O_5	0.5–3.

4,721,691

MAGNESIA CLINKER AND METHOD OF PRODUCING THE SAME

Fusao Kawano, Minamata, Japan, assignor to Shin Nihon Chemical Industry Co., Ltd., Osaka, Japan

Filed Oct. 9, 1984, Ser. No. 658,820
Claims priority, application Japan, Oct. 31, 1983, 58-202842; Oct. 31, 1983, 58-202843
Int. Cl.[4] C04B 35/04
U.S. Cl. 501—108 4 Claims



1. A magnesia clinker, characterized by:
(a) having a purity of MgO of 97 wt. % or higher;
(b) containing 2.0 wt. % or less of CaO;
(c) containing 0.01 wt. % or more of B_2O_3;
(d) containing 0.3 wt. % less of SiO_2;
(e) containing imputites of 2 wt. % or less;
(f) having a bulk density of 3.35 (g/cc) or higher and an apparent porosity of 3.0 (vol. %) or less;
(g) having a mean crystal size of magnesia of 100 μm or larger; and
(h) containing 0.05 to 0.5 wt % ZrO_2.

4,721,692

DIELECTRIC CERAMIC COMPOSITION

Goro Nishioka, Ibaraki, and Yukio Sakabe, Kyoto, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 20, 1987, Ser. No. 52,542
Claims priority, application Japan, May 27, 1986, 61-121965
Int. Cl.[4] C04B 35/46, 35/10
U.S. Cl. 501—134 2 Claims

1. A dielectric ceramic composition consisting essentially of Al_2O_3 and additives composed of TiO_2, MnO_2 and at least one member selected from the group consisting of $BaZrO_3$, $CaTiO_3$ and $SrTiO_3$, the contents of said additives per 100 parts by weight of Al_2O_3 being 0.5 to 10.0 parts by weight for TiO_2, 0.5 to 6.0 parts by weight for MnO_2 and not more than 20 parts by weight for said at least one member selected from the group consisting of $BaZrO_3$, $CaTiO_3$ and $SrTiO_3$.

4,721,693

SILICATE RAW MATERIAL FOR CERAMICS, PROCESS FOR PREPARING SAME AND USE THEREOF

Siegfried Lenk, Seik; Karl-Heinz Ulbrich, and Willi Backhaus, both of Goslar, all of Fed. Rep. of Germany, assignors to Zinkweiss-Forschungsgesellschaft mit beschrankter Haftung, Goslar, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 865,366
Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518372
Int. Cl.[4] C03C 8/02
U.S. Cl. 501—21 4 Claims

1. Silicate raw materials for manufacture of ceramics consisting essentially of alkali oxides selected from the group consisting of sodium oxide and potassium oxide, zinc oxide and silicon dioxide, wherein the three components alkali oxide, zinc oxide and silicon dioxide are calcined at a temperature of 900°–1000° C. and comminuted into powders of three-component silicates in an integral molar ratio of from 1:1:2 to 1:2:6.

4,721,694

PLATINUM-BARIUM-TYPE L ZEOLITE

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 405,837, Aug. 6, 1982, Pat. No. 4,634,518, which is a continuation-in-part of Ser. No. 344,570, Feb. 1, 1982, abandoned. This application Jul. 24, 1986, Ser. No. 889,977
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] B01J 29/32
U.S. Cl. 502—66 19 Claims

1. A composition comprising:
(a) an L zeolite;
(b) at least one Group VIII metal; and
(c) an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

2. A composition according to claim 1 wherein said alkaline earth metal is barium and wherein said Group VIII metal is platinum.

3. A composition according to claim 2 wherein said composition has from 0.1% to 5% by weight platinum and from 0.1% to 35% by weight barium.

4,721,695

PLATINUM-BARIUM-ZEOLITE OF L FAMILY

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 392,907, Jun. 28, 1982, Pat. No. 4,645,588, which is a continuation-in-part of Ser. No. 344,570, Feb. 1, 1982, abandoned. This application Jul. 24, 1986, Ser. No. 889,984
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] B01J 29/32
U.S. Cl. 502—66 5 Claims

4. A composition consisting essentially of:
(a) a zeolite of the L family;
(b) an inorganic oxide binder;
(c) platinum; and
(d) barium.

5. A composition according to claim 4 wherein said zeolite of the L family has from 0.1% to 5% by weight platinum and 0.1% to 40% by weight barium.

4,721,696

SILICA-MODIFIED ALUMINA AND PROCESS FOR ITS PREPARATION

Dennis R. Kidd, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1987, Ser. No. 24,506
Int. Cl.[4] B01J 21/04, 21/08
U.S. Cl. 502—210 39 Claims

1. A process for preparing a composition of matter comprising alumina as the major component and silica as a minor component, said process comprising the steps of

(a) mixing a portion of a first solution comprising water and at least one dissolved aluminum salt with a suitable portion of a second solution comprising water and at least one dissolved alkali metal aluminate under such conditions as to obtain a dispersion of precipitated alumina hydrogel in an aqueous solution having a pH of about 8 to about 10;

(b) adding a suitable amount of said first solution to said dispersion of precipitated alumina hydrogel in an aqueous solution having a pH of about 8 to about 10 obtained in step (a), so as to obtain a dispersion of precipitated alumina hydrogel in an aqueous solution having a pH of about 2 to about 4;

(c) adding a suitable amount of said second solution to said dispersion of precipitated alumina hydrogel in the aqueous solution having a pH of about 2 to about 4 obtained in step (b), so as to obtain a dispersion of precipitated alumina hydrogel in an aqueous solution having a pH of about 8 to about 10;

(d) repeating steps (b) and (c) at least once;

(e) adding a third solution comprising water and at least one dissolved alkali metal silicate to the dispersion of precipitated alumina hydrogel in an aqueous solution having a pH of about 8 to about 10 obtained at the end of step (d), under such conditions and at such proportion as to obtain a dispersion of alumina-silica hydrogel in an aqueous solution;

(f) separating said alumina-silica hydrogel from the aqueous solution in which said hydrogel is dispersed;

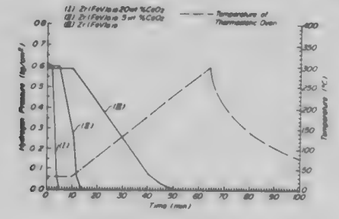
(g) heating the separated alumina-silica hydrogel obtained in step (f) under such conditions as to substantially dehydrate said hydrogel and to obtain a composition of matter comprising alumina as the major component and silica as a minor component.

4,721,697

SUBSTANCE FOR REVERSIBLY ABSORBING AND DESORBING HYDROGEN

Jo Suzuki; Kimihiko Hironawa; Tamotu Yamaguchi; Takuya Saito, and Shotaro Terazawa, all of Tokyo, Japan, assignors to Suzuki Shokan Co., Ltd., Tokyo, Japan

Filed May 27, 1987, Ser. No. 54,701
Claims priority, application Japan, May 31, 1986, 61-126810
Int. Cl.[4] C01B *6/00, 6/24*
U.S. Cl. 502—400 9 Claims



1. A substance for reversibly absorbing and desorbing hydrogen, comprising a complex dispersing 0.8–20% by weight of one or more than two oxides selected from La, Ce, Nd, Pr, Sm and Eu into $Zr(FeV)_x$ $(0.01 \leqq x \leqq 0.88)$.

4,721,698

HIGH POROSITY SILICOCALCAREOUS MASS

Maurice Bruni, Tremblay-les-Gonesse; Georges Delode, Champigny-sur-Mrne, and Rolland Perraudin, Bagnolet, all of France, assignors to L'Air Liquide—Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 629,252, Jul. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 377,185, May 11, 1982, Pat. No. 4,467,041, which is a continuation-in-part of Ser. No. 330,450, Dec. 14, 1981, Pat. No. 4,467,040. This application Apr. 4, 1986, Ser. No. 848,852
Claims priority, application France, May 13, 1981, 81 09538
Int. Cl.[4] B01J *20/10*
U.S. Cl. 502—407 16 Claims

1. A gas storage bottle for storing gases therein, said gas storage bottle being filled with a dried and fired homogeneous silicocalcareous mass having a high porosity of about 89–92% and a resistance to crushing of between 10 and 35 kg/cm^2 and constituting the fired product of an aqueous paste consisting essentially of lime, water, 3–15% based on solids of synthetic fibers, and silica made up at least in part of ultrafine synthetic silica, said aqueous paste containing at least 50%, based on total silica, of ultrafine synthetic silica with a large specific surface of 150–500 m^2 per gram, the total amount of silica being slightly greater than the amount of lime in a proportion of 10–30% excess and the water being present in amount of at least three times greater than that of the solids, said synthetic fibers being selected from the group consisting of alumina silicate fibers, carbonaceous fibers and aromatic polyamide fibers.

4,721,699

CATALYST FOR THE SEPARATION OF NITROGEN OXIDES FROM COMBUSTION EXHAUST GASES

Dietrich Wagener, Essen; Karl H. Laue, Hattingen; Egmar Wunderlich, Mülheim; Theo Sander, Essen; Claus Flockenhaus, Essen; Erich Hackler, Essen; Blagoje Levkov, Wiesbaden; Daniel Grimm, Schlangenbad-Bärstadt; Hartmut Kainer, Wiesbaden, and Hermann Stein, Bad Dürkheim, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Didier Engineering GmbH, Essen, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 768,508, Aug. 22, 1985, Pat. No. 4,672,052. This application Aug. 27, 1986, Ser. No. 900,824
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 3530544
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] B01J *35/04*
U.S. Cl. 502—439 18 Claims

1. A catalytic structure for removal of nitrogen oxides from combustion exhaust gas containing dust, said catalytic structure comprising:

a plurality of plates, said plurality of plates being disposed to form a plurality of individual structures of plates which are disposed one from the other to form spaces thereinbetween for the exhaust gases to flow therethrough;

at least a portion of said plates having openings therein;

said openings in said plates being formed at least when said structures are assembled, such that said openings connect the spaces between at least one side of one of said structures of plates to another side of said one of said structures of plates;

said plates comprising a catalytic ceramic material;

said plates having surfaces exposing catalyst to said gas;

said combustion exhaust gas having a known dust content entrained therein; and

said catalytic material being formulated from components selected with regard to said known dust content of said exhaust gas, to provide said catalytic material with a wear characteristic to abrasion by said dust entrained in said exhaust gas thereby reactivating said catalytic action of said catalytic ceramic material, by wearing away at said surfaces of said plates being fouled in use, at a rate related to said wear characteristic of said catlytic ceramic material and said dust content of said exhaust gas, whereby said abrasion of said surfaces of said plates proceeds at a given rate in use, sufficient to abrade away a substantial portion of said surfaces fouled in use, whereby fresh catalyst surface is continuously exposed to said exhaust gas, and further whereby material abraded from said surfaces of said plates of said catalytic ceramic material is at least partially carried away by said exhaust gas.

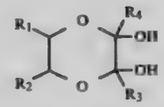
4,721,700

HEAT-SENSITIVE RECORDING MATERIAL

Noriyuki Hosoi; Akihiro Shimomura, and Yuichi Itabashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1986, Ser. No. 899,353
Claims priority, application Japan, Aug. 22, 1985, 60-184484
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 9 Claims

1. A heat sensitive recording material comprising at least one heat sensitive layer containing a normally colorless or slightly colored dye precursor and a compound capable of reacting with the dye precursor to form color, interlayer and protective layer, with at least one heat sensitive layer, wherein said interlayer is interposed between the heat sensitive layer and the protective layer and wherein at least one of the heat sensitive layer, an interlayer, and a protective layer contains polyvinyl alcohol as an adhesive and a hardener represented by formula (I)



(I)

wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom, a halogen atom, a saturated or unsaturated hydrocarbon group containing from 1 to 6 carbon atoms, or a saturated or unsaturated hydrocarbon group containing from 1 to 20 carbon atoms and at least one ether bond.

4,721,701

THERMOSENSITIVE RECORDING SHEET

Toshimi Satake; Toshiaki Minami; Tomoaki Nagai, all of Tokyo, and Fumio Fujimura, Okuniya, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,921
Claims priority, application Japan, Jan. 9, 1985, 60-1868; Jan. 17, 1985, 60-6515; Feb. 13, 1985, 60-25739
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 19 Claims

1. A thermosensitive recording sheet having a thermosensitive color developing layer containing a basic leuco dye and an organic color developer, said organic color developer consisting at least partly of a halogen-substituted benzoic acid zinc salt wherein the halogen-substituted benzoic acid zinc salt is selected from the group consisting of zinc p-chlorobenzoate, zinc m-chlorobenzoate and zinc 3,4-dichlorobenzoate.

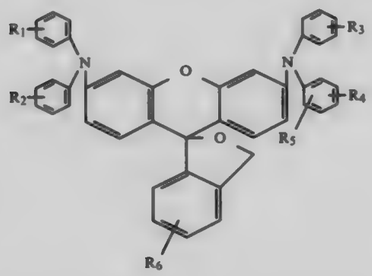
4,721,702

PRESSURE-SENSITIVE RECORDING MATERIAL

Ken Iwakura, Kanagawa; Hiroyuki Kawasaki, and Shojiro Sano, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

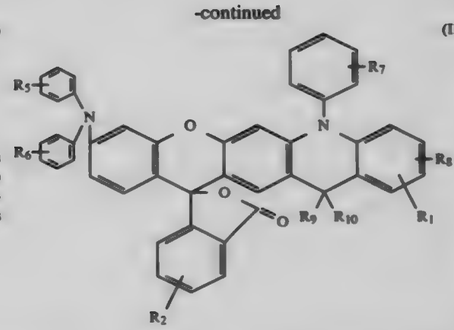
Filed Mar. 20, 1986, Ser. No. 841,962
Claims priority, application Japan, Mar. 20, 1985, 60-56570
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 503—217 8 Claims

1. A pressure-sensitive recording material comprising, on a support, an electron-accepting compound, and at least one electron-donating colorless dye represented by formula (I) or formula (II)



(I)

-continued



(II)

wherein R_1, R_2, R_3, R_4, R_5, R_5, R_7, and R_8 each represents a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkoxy group, or a halogen atom; and R_9 and R_{10} each represents a hydrogen atom or a lower alkyl group, provided that for formula II at least one of R_1, R_2, R_3, and R_4 represents a lower alkyl group or a lower alkenyl group, and for formula I at least one of R_3, R_2, R_3, and R_4 represents a branched lower alkyl group or a branched lower alkenyl group.

4,721,703

SUBLIMATION TRANSFER SYSTEM COLOR HARD COPY PRINTING PAPER

Naotake Kobayashi; Tetsuya Abe, and Yoshio Fujiwara, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00184, § 371 Date Feb. 7, 1984, § 102(e) Date Feb. 7, 1984, PCT Pub. No. WO83/04395, PCT Pub. Date Dec. 22, 1983
PCT Filed Jun. 6, 1983, Ser. No. 589,090
Claims priority, application Japan, Jun. 7, 1982, 57-97346
Int. Cl.[4] B41M *5/26*
U.S. Cl. 503—227 6 Claims

1. A printing paper for use in a sublimation transfer system hard copy in which a dye carrier ribbon having a dye having sublimation property upon heating and a printing paper are put in contact with each other, and selectively heated to transfer said dye to said printing paper to make a hard copy on said printing paper, said printing paper comprising a base material and a coating formed on said base material receiving said dye, said coating consisting essentially of 20 to 98 parts by weight of thermoplastic resin having a dyeing property relative to said dye and being selected from the group consisting of a saturated linear polyester resin, an epoxy resin, a cellulose acetate resin, and a nylon resin, and 80 to 2 parts by weight of a compound having two or more free radical polymerizable ethylenically unsaturated double bonds in one molecule, and said coating being cross-linked, said coating being substantially non-heat bondable to said ribbon by virtue of the cross-linked polymer present therein.

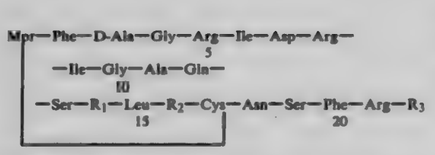
4,721,704

POTENT SYNTHETIC ATRIAL PEPTIDE ANALOGS

Jaw-Kang Chang, and Ding Chang, both of San Carlos, Calif., assignors to Peninsula Laboratories, Inc., Belmont, Calif.

Filed May 9, 1986, Ser. No. 861,528
Int. Cl.[4] A61K *37/24*; C07K *7/10*
U.S. Cl. 514—11 11 Claims

1. An atrial peptide analog having the structure



wherein Mpr is a β-mercaptopropanoic acid derivative, R_1 is Gly or D-Ala, R_2 is Gly or D-Ala, and R_3 is OH, NH_2, Tyr-OH, or Tyr-NH_2.

4,721,705

SKIN TREATMENT COMPOSITIONS

Johannes C. P. Schreuder, Baarn, Netherlands, assignor to Chemisch Adviesbureau Drs. J.C.P. Schreuder B.V., Netherlands

Filed Sep. 20, 1984, Ser. No. 652,831

Claims priority, application Netherlands, Sep. 26, 1983, 8303283

Int. Cl.⁴ A61K *31/715*

U.S. Cl. 514—54 **20 Claims**

1. A composition effective for treating sun eczema and dyshidrosis of skin comprising (a) 0.1 to 5% by weight of panthenol, (b) 0.1 to 3% by weight of at least one member of the group consisting of methionine, N-acyl-cysteine and S-acyl-cysteine, said acyl being derived from an alkanoic acid of 1 to 7 carbon atoms, or cystine in an amount of at most 0.009% by weight, (c) 0.25 to 4% by weight of carraghenate, (d) 0.1 to 5% by weight of sodium chloride, (e) 0.1 to 2% by weight of a preservative and (f) sufficient water for 100% by weight, all weights based on the weight of the total composition.

4,721,706

CONTROLLING GRAIN INSECTS WITH PHOSPHATIDES

Terry R. Bessler; Nathan Kessler, and Frank T. Orthoefer, all of Decatur, Ill., assignors to A.E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 28, 1983, Ser. No. 470,828

Int. Cl.⁴ A01N *57/26*

U.S. Cl. 514—78 **3 Claims**

1. A method of controlling insect infestation of stored grain which comprises applying to a surface of the vessel in which the grain is to be stored a liquid composition containing about 10 to about 90 weight percent phosphatides and having a viscosity at 77° F. of about 0.05 to 100 poise.

4,721,707

COMPLEX SALT

Henning Cierpke, Stockackerstrasse 1 a, 4153 Reinach, Switzerland

Continuation-in-part of Ser. No. 456,128, Jan. 6, 1983. This application Jul. 23, 1984, Ser. No. 633,243

Claims priority, application Switzerland, Jan. 22, 1982, 389/82; Jan. 22, 1982, 389/82

Int. Cl.⁴ A61K *31/555*

U.S. Cl. 514—184 **31 Claims**

1. A composition comprising a concentrated solution, in aqueous ethanol, of a pharmaceutically effective amount of a nitroprusside of a short acting ganglionic blocking agent selected from the group consisting of sulfonium salts and ammonium salts.

4,721,708

CYCLIZED N-SUBSTITUTED-TETRAHYDROPYRIDINE COMPOUNDS AND CARDIOVASCULAR USE

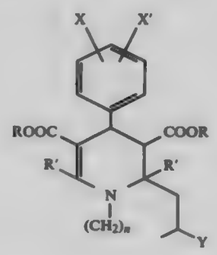
George D. Hartman, Lansdale, and Brian T. Phillips, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 26, 1985, Ser. No. 802,128

Int. Cl.⁴ C07D *471/06*; A61K *31/55, 31/455*

U.S. Cl. 514—214 **7 Claims**

1. A compound having the formula:



wherein

X and X' are independently hydrogen, halogen, lower alkyl, lower alkoxy, nitro or trifluoromethyl;

R is lower alkyl;

R' is lower alkyl;

Y is halogen; and

n is 2 or 3;

or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition suitable for treating cardiovascular disorders caused by a high cellular concentration of Ca^{++} comprising at least a therapeutically effective amount of a compound having the formula of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

4,721,709

NOVEL PHARMACEUTICAL COMPOSITIONS CONTAINING HYDROPHOBIC PRACTICALLY WATER-INSOLUBLE DRUGS ADSORBED ON PHARMACEUTICAL EXCIPIENTS AS CARRIER; PROCESS FOR THEIR PREPARATION AND THE USE OF SAID COMPOSITIONS

Pyare Seth, Krebsenbachweg 8, Aesch 4147, Switzerland, and Pawan Seth, 11 Guru Sarday Road, Calcutta 700019, India

Continuation-in-part of Ser. No. 759,052, Aug. 27, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 893,106

Claims priority, application Switzerland, Jul. 26, 1984, 3623/84

Int. Cl.⁴ A61K *31/55*

U.S. Cl. 514—221 **28 Claims**

1. A pharmaceutical composition for oral administration comprising a hydrophobic practically water-insoluble benzodiazepene drug adsorbed onto a pharmaceutical carrier having an average particle size of less than 40 microns wherein the drug is present in particulate form and the particles of the drug have a mean particle size of less than 10 microns and a particle size distribution such that at least 95% of the particles are less than 15 microns.

4,721,710

DERIVATIVES OF PIPERIDINEDIONE FOR PROTECTING THE MYOCARDIUM PRESENTING AN ANTI-ARRYTHMIC ACTIVITY, AND PHARMACEUTICAL COMPOSITIONS

Claude Bernhart, Saint Gely du Fesc; Werner Cautreels, Castelnau le Lez, and Patrick Gautier, Cournonterral, all of France, assignors to Sanofi

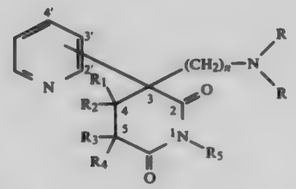
Continuation of Ser. No. 545,507, Oct. 26, 1983, abandoned. This application Mar. 10, 1986, Ser. No. 838,255

Claims priority, application France, Nov. 8, 1982, 82 18706

Int. Cl.⁴ A61K *31/45, 31/538*; C07D *401/04, 413/04*

U.S. Cl. 514—234 **9 Claims**

1. Derivatives of piperidinedione represented by the formula:



in which:

R represents a straight or branched alkyl group having from 2 to 5 atoms of carbon;

or the group



represents a morpholino or piperidino group possibly substituted by 1 to 4 methyl groups;

n=2 or 3;

R_1 and R_2 considered independently represent an atom of hydrogen or a lower alkyl group,

R_3 and R_4 considered independently represent hydrogen or a lower alkyl group;

R_5 designates hydrogen or a lower alkyl group;

the piperidinedione substitutes the pyridyl group in the 2' position; or salts of said derivatives with pharmaceutically acceptable acids, and wherein at least one of R_1, R_2, R_3 or R_4 is other than hydrogen.

9. A pharmaceutical composition for protection of the myocardium containing a myocardium protecting amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,721,711

PYRIDAZINE DERIVATIVES ACTIVE ON THE CENTRAL NERVOUS SYSTEM, AND MEDICAMENTS IN WHICH THEY ARE PRESENT

Jean-Pierre Chambon, Montarnaud; Kathleen Bizière, Clapiers, and Camille-Georges Wermuth, Strasbourg, all of France, assignors to Sanofi

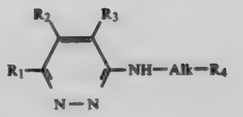
Continuation of Ser. No. 571,697, Jan. 18, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,686

Claims priority, application France, Jan. 27, 1983, 8301234

Int. Cl.⁴ C07D *413/12*; A61K *31/535*

U.S. Cl. 514—247 **21 Claims**

1. A pyridazine compound having a formula:



in which:

R_1 denotes hydrogen, a lower alkyl group, a phenyl group, a phenyl group monosubstituted by a halogen, a nitro group, a lower alkyl group, a lower alkoxy group, a hydroxyl group or a trifluoromethyl group; a phenyl group disubstituted by halogen; a naphthyl group, a cyclohexyl group, a thien-2-yl group, a thien-3-yl group or an indol-3-yl group;

R_2 represents hydrogen, a lower alkyl group or a phenyl group;

R_3 represents a cyano group;

Alk represents a group $(CH_2)_n$, in which n is an integer equal to 2, 3 or 4, or a 1,2-propynyl group $—CH_2C{\equiv}C—$; and

R_4 represents:

—COOH

—COO-alkyl

$—CONH_2$

—C≡N

wherein alkyl is lower alkyl; and the addition salts of said derivatives with acids.

4,721,712

1,3-DISUBSTITUTED 2-OXINDOLES AS ANALGESIC AND ANTI-INFLAMMATORY AGENTS

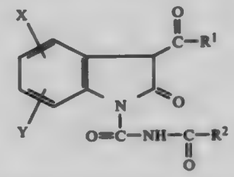
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 619,861, Jun. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 577,983, Feb. 7, 1984, abandoned. This application Nov. 13, 1984, Ser. No. 670,697

Int. Cl.⁴ A61K *31/495, 31/40*; C07D *241/12, 209/34*

U.S. Cl. 514—253 **45 Claims**

27. A method of treating an inflammatory disease in a mammalian subject, which comprises administering to said mammalian subject an inflammatory disease treating amount of a 2-oxindole compound of the formula



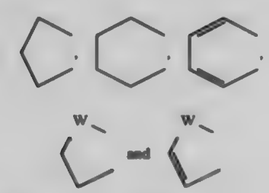
or a pharmaceutically-acceptable base salt thereof; wherein

X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;

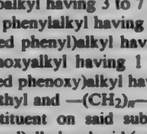
or X and Y when taken together are a 4,5-, 5,6- or 6,7-methylenedioxy group or a 4,5-, 5,6- or 6,7-ethylenedioxy group;

or X and Y when taken together and when attached to

adjacent carbon atoms, form a divalent radical Z, wherein Z is selected from the group consisting of

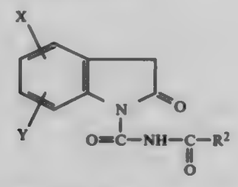


wherein W is oxygen or sulfur;
R^1 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, phenyl, substituted phenyl, phenylalkyl having 1 to 3 carbons in said alkyl, (substituted phenyl)alkyl having 1 to 3 carbons in said alkyl, phenoxyalkyl having 1 to 3 carbons in said alkyl, (substituted phenoxy)alkyl having 1 to 3 carbons in said alkyl, naphthyl and $-(CH_2)_n-Q-R'$;
wherein the substituent on said substituted phenyl, said (substituted phenyl)alkyl and said (substituted phenoxy)alkyl is selected from the group consisting of fluoro, chloro, alkyl having 1 to 3 carbons, alkoxy having 1 to 3 carbons and trifluoromethyl; n is zero, 1 or 2; Q is a divalent radical derived from a compound selected from the group consisting of furan, thiophene, pyrrole, thiazole, isothiazole, oxazole, isoxazole, 1,2,3-thiadiazole, 1,2,5-thiadiazole, tetrahydrofuran, tetrahydrothiophene, pyridine, pyrimidine, pyrazine, benzo[b]furan and benzo[b]thiophene; and R' is hydrogen or alkyl having 1 to 3 carbons;
and R^2 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, phenoxymethyl, furyl, thienyl, pyridyl and

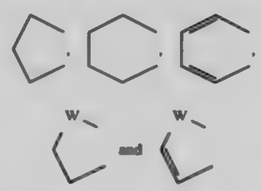


wherein R^3 and R^4 are each selected from the group consisting of hydrogen, fluoro, chloro, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl.

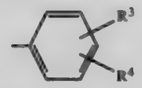
38. A compound of the formula



and the base salts thereof; wherein
X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;
or X and Y when taken together are a 4,5-, 5,6- or 6,7-methylenedioxy group or a 4,5-, 5,6- or 6,7ethylenedioxy group;
or X and Y when taken together and when attached to adjacent carbon atoms, form a divalent radical Z, wherein Z is selected from the group consisting of



wherein W is oxygen or sulfur;
and R^2 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, phenoxymethyl, furyl, thienyl, pyridyl and



wherein R^3 and R^4 are each selected from the group consisting of hydrogen, fluoro, chloro, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl.

4,721,713

PROCESS FOR INHIBITING BLOOD PLATELET AGGREGATION AND PROMOTING VASODILATION

Eiichi Hayashi; Noriyasu Takayanagi; Katsumi Nishimura; Masao Yaso, and Yukio Suzuki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 5, 1987, Ser. No. 58,890
Claims priority, application Japan, Feb. 20, 1986, 61-36197
Int. Cl.[4] A61K *31/495*
U.S. Cl. 514—255 6 Claims

1. A method of inhibiting blood platelet aggregation in humans, comprising administering to a human in the need of the same an effective amount of 2-hydroxy-3-isopropyl-5,6-dimethylpyrazine or a hydrate or a pharmaceutically acceptable non-toxic salt thereof, said amount being effective to inhibit blood platelet aggregation in a human.

4,721,714

ANTI-VERTIGO DRUG

Ryuichi Ishida, Suita, and Yukitsuka Kudo, Kyoto, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 26, 1986, Ser. No. 878,602
Claims priority, application Japan, Jul. 12, 1985, 60-154932
Int. Cl.[4] A61K *31/505*; A61V *31/505*
U.S. Cl. 514—258 7 Claims

1. A method for the prophylaxis and treatment of vertigo, which comprises administering to a patient suffering from vertigo a prophylactically or therapeutically effective amount of 6-amino-2-fluoromethyl-3-(o-tolyl)-4(3H)-quinazolinone or a pharmaceutically acceptable acid addition salt thereof.

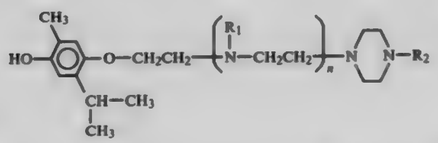
4,721,715

DERIVATIVES OF 4-(ARYLPIPERAZINYL-ETHYLAMINOETHOXY) PHENOL USEFUL FOR EFFECTING HYPOLIPIDEMIC THERAPY OR CARDIOVASCULAR THERAPY

Marie-Hélène Creuzet, Bordeaux; Claude Fenioux, Pessac; Francoise Guichard, Bordeaux; Henri Poutagnier, Pessac, and Gisèle Prat, Talence, all of France, assignors to Societe Cortial, S.A., Paris, France

Filed Aug. 7, 1985, Ser. No. 763,257
Claims priority, application France, Aug. 7, 1984, 84 12580
Int. Cl.[4] A61K *31/495*; C07D *241/04, 401/04*
U.S. Cl. 514—255 8 Claims

1. Compounds of the formula (I):



(I)

wherein n is 0 or 1, R_1 is H or a lower alkyl of 1 to 6 carbon atoms, R_2 is an unsubstituted phenyl group or a phenyl group substituted by one or two of the same or different substituents selected from the group consisting of hydroxy, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, chloro, fluoro, trifluoromethyl or a 2-, 3- or 4- pyridyl ring, in the form of a free base or a pharmaceutically acceptable acid addition salt thereof.

7. A method of effecting cardiovascular therapy which comprises administering an effective amount of at least one compound of claim 1.

8. A method of effecting hypolipidemic therapy which comprises administering an effective amount of at least one compound of claim 1.

4,721,716

METHOD FOR DESENSITIZING THE GASTROINTESTINAL TRACT FROM FOOD ALLERGIES

Torben E. Neesby, 2842 E. Griffith, Fresno, Calif. 93726

Continuation of Ser. No. 638,061, Aug. 6, 1984, abandoned. This application May 28, 1985, Ser. No. 738,883
The portion of the term of this patent subsequent to Jun. 26, 2003, has been disclaimed.
Int. Cl.[4] A61K *31/19, 31/525*
U.S. Cl. 514—251 22 Claims

1. A method for treating food allergies in a human host having human food allergies comprising the oral administration of a composition comprised of an effective amount of butyric acid.

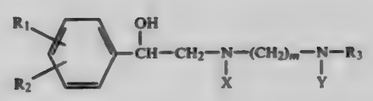
4,721,717

α-(AMINOALKYLAMINOMETHYL)PHENYLMETHANOLS, COMPOSITION CONTAINING THEM, AND USE THEREOF TO TREAT CERTAIN HEART AND CIRCULATORY DISEASES

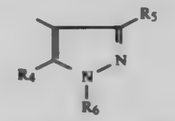
Walter-Gunar Friebe, Darmstadt; Wolfgang Kampe, Heddesheim; Erwin Böhm, Schriesheim, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,128
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428526
Int. Cl.[4] A61K *31/415, 31/505*; C07D *235/30, 239/10*
U.S. Cl. 514—274 15 Claims

1. An aminoalcohol of the formula:



wherein
R_1 and R_2 are individually selected from the group consisting of hydrogen, hydroxyl, C_1–C_4 alkoxy, benzyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanesulphonamido;
m is 2, 3 or 4;
X is hydrogen or benzyl;
Y is hydrogen or benzyl; and
R_3 is phenyl substituted twice by C_1–C_6-alkyl, nitrophenyl, aminophenyl, 1,3,5-tri-C_1–C_6-alkyl-2,4-dioxo-1H,3H-pyrimidin-6-yl, indolyl, indazolyl, benzimidazolyl, 1,4-di-C_1–C_6-alkyl pyrazol-5-yl or a group of the formula



wherein R_4 is C_1–C_4 alkyl, R_5 is C_1–C_4-alkyl and R_6 is a C_1–C_6-alkyl, C_2–C_6 alkenyl, phenyl or benzyl or a pharmacologically acceptable salt thereof.

12. A method for treating heart and circulatory diseases which are susceptible to an increase in the deformability of erythrocytes in the blood or to a positive inotropic action comprising administering an amount of the aminoalcohol of claim 1 sufficient to increase the deformability of erythrocytes in the blood or to induce a positive inotropic action.

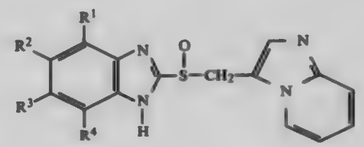
4,721,718

2-[(IMIDAZO[1,2-A]PYRIDIN-3-YLMETHYL)SULFINYL]-1H-BENZIMIDAZOLES USEFUL IN THE TREATMENT AND PREVENTION OF ULCERS

Gilbert W. Adelstein, Evanston; Alan E. Moormann, Skokie, and Chung-Hwai Yen, Prospect Heights, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 18, 1986, Ser. No. 897,687
Int. Cl.[4] A61K *31/44*; C07D *471/04*
U.S. Cl. 514—300 12 Claims

1. A compound of the formula;



or a pharmaceutically acceptable addition salt thereof; wherein R^1, R^2, R^3 and R^4 are independently:
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) C_1 –C_6 alkyoxy;
(d) fluorinated C_1–C_4 alkyl; or
(e) halogen.

10. A method for treating ulcers in mammals comprising administering a therapeutically effective amount of at least one compound of claim 1 to a mammal in need of such treatment.

VOL 1086 ISS 4 JA 26 1988 UMI

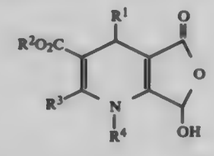
4,721,719

DIHYDROPYRIDINELACTOLS AND THEIR USE AS MEDICAMENTS WHICH INFLUENCE BLOOD SUGAR

Siegfried Goldmann; Friedrich Boesert; Hans J. Ahr; Hilmar Bischoff; Walter Puls, all of Wuppertal; Dieter Petzinna, Wesel; Klaus Schlossmann, and Joachim Bender, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,866
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601226
Int. Cl.[4] A61K *31/44*; C07D *495/04*
U.S. Cl. 514—302 11 Claims

1. A dihydropyridinelactol of the formula



in which

R^1 represents a phenyl, naphthyl, thienyl, pyridyl, chromonyl, thiochromonyl or thiochromenyl radical, the stated radicals optionally containing 1 or 2 identical or different substituents from the group consisting of fluorine, chlorine and bromine, alkyl, alkoxy and alkylthio, each having 1 to 6 carbon atoms, and fluoroalkyl or fluoroalkoxy, each having up to 3 carbon atoms and 3 fluorine atoms, and nitro and cyano,

R^2 represents a straight-chain, branched or cyclic alkyl having up to 12 carbon atoms which is optionally interrupted by 1 or 2 oxygen or sulphur atoms and which is optionally substituted by fluorine, chlorine, phenyl, cyano, hydroxyl, amino, C_1–C_3-alkylamino, di-C_1–C_3-alkylamino or N-benzylmethylamino,

R^3 represents cyano or straight-chain or branched alkyl which has up to 4 carbon atoms and is optionally interrupted in the chain by N-C_1–C_1-alkyl and/or oxygen,

R^4 represents straight-chain, branched or cyclic alkyl which has up to 6 carbon atoms and is optionally interrupted by 1 or 2 oxygen atoms and is optionally substituted by one or more radicals from amongst fluorine, chlorine, hydroxyl, phenyl, amino, carboxyl and C_1–C_6-alkoxycarbonyl,

or a physiologically acceptable salt thereof.

10. A method of reducing the amount of sugar in the blood of a patient in need thereof which comprises administering to such patient an amount effective therefor of a dihydropyridinelactol or salt thereof according to claim 1.

4,721,720

METHOD OF TREATING EMESIS, ANXIETY AND/OR IBS

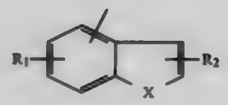
Gordon Wootton, and Gareth J. Sanger, both of Sawbridgeworth, England, assignors to Beecham Group p.l.c., Brentford

Filed Mar. 12, 1986, Ser. No. 838,904
Claims priority, application United Kingdom, Mar. 14, 1985, 8506642; Apr. 9, 1985, 8509039; Dec. 23, 1985, 8531614
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—304 12 Claims

1. A method of treatment of emesis, anxiety and/or IBS in mammals, which method comprises administering to a mammal in need of such treatment an effective amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof

Ar—CO—Y—I (I)

wherein Ar is a group of formula (a):



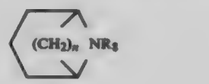
(a)

wherein:

R_1 and R_2 are independently selected from hydrogen, halogen, C_{1-6} alkyl, C_{1-4} alkoxy, hydroxy, amino optionally substituted by one or two C_{1-4} alkyl groups, thiol, C_{1-4} alkylthio; X is CH_2, NR_3, —O— or —S— wherein R_3 is hydrogen C_{1-4} alkyl, C_{3-5} alkenyl, phenyl or phenyl C_{1-4} alkyl;

Y —O— or —NH—; and

Z is a group of formula (c), (d) or (e):

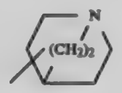


(c)

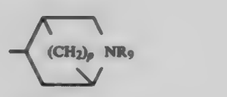
wherein

n is 2, 3 or 4;

R_8 is hydrogen, C_{1-7} alkyl, C_{3-5} alkenyl or phenyl C_{1-4} alkyl optionally substituted by one or two halogen, C_{1-4} alkoxy or C_{1-4} alkyl;



(d)



(e)

wherein:

P is 1, 2, or 3; and

R_9 is as defined above for R_8.

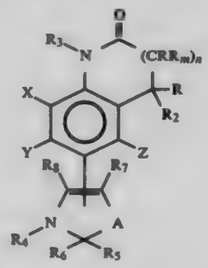
4,721,721

6-(4-THIAZOLE) COMPOUNDS, CARDIOTONIC COMPOSITIONS INCLUDING THE SAME, AND THEIR USE

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Dec. 18, 1984, Ser. No. 683,204
Int. Cl.[4] A61K *31/47*; C07D *215/22*
U.S. Cl. 514—312 22 Claims

1. A compound according to the formula



wherein:

m is 1;

n is 1;

R_m is R_1;

A is S;

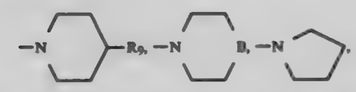
X, Y and Z are each independently hydrogen, alkyl, alkoxy, alkylmercapto, alkylsulfinyl or alkylsulfonyl;

R and R_3 are each independently hydrogen or lower alkyl;

R_1 and R_2 are each independently hydrogen, lower alkyl or both R_1 and R_2 form a carbon-carbon double bond;

R_4 and R_5 together form a carbon-nitrogen double bond;

R_6 is hydrogen, alkyl, amino, mono- or di-alkylamino, 3,4-dimethoxy benzylamino, guanidino, amidino, hydroxyl, hydroxyalkyl, hydroxyalkylamino, aminoalkylamino, di-alkylaminoalkylamino, aminoalkyl, mono- or di-alkylaminoalkyl,

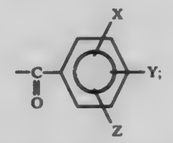


one of R_7 or R_8 is hydrogen or lower alkyl, and one of R_7 or R_8 represents the carbon-carbon single bond to the position on the fused bicycle ring ortho to the Y and Z groups;

R_9 is H or alkyl;

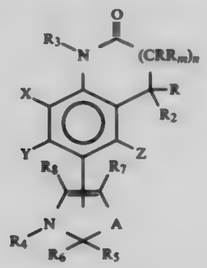
B is NR_{10}, oxygen or sulfur; and

R_{10} is H, alkyl, or



or a pharmaceutically acceptable salt thereof.

8. A compound according to the formula:



wherein:

m is 1;

n is 1;

R_m is R_1;

A is N or S, provided that A is N only when A and R_6 together form a double bond in an imidazo[2.1-b]thiazole ring system;

X, Y and Z are each independently hydrogen, alkyl, alkoxy, hydroxy, alkylmercapto, alkylsulfinyl or alkylsulfonyl;

R and R_3 are each independently hydrogen or lower alkyl;

R_1 and R_2 are each independently hydrogen, lower alkyl or both R_1 and R_2 form a carbon-carbon double bond;

R_4 and R_5 together with the atoms to which they are attached form an imidazo[2.1-b]thiazole ring system including two additional carbon atoms and either one sulfur atom or one additional nitrogen atom;

R_6 together with either R_5 or A form a carbon-nitrogen double bond in said imidazo[2.1-b]thiazole ring system;

one of R_7 or R_8 is hydrogen or lower alkyl, and one of R_7 or R_8 represents the carbon-carbon single bond to the position on the fused bicycle ring ortho to the Y and Z groups;

or a pharmaceutically acceptable salt thereof.

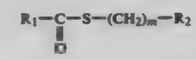
4,721,722

ANTI-SPASMODIC AGENTS CONTAINING QUATERNARY NITROGEN

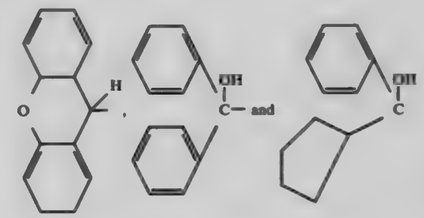
William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Inc., Tucson, Ariz.

Filed Jul. 12, 1985, Ser. No. 754,815
Int. Cl.[4] A61K *31/445*; C07D *401/12*
U.S. Cl. 514—317 9 Claims

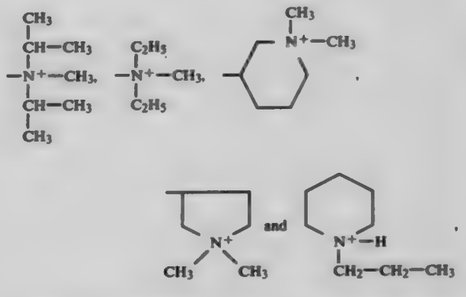
1. A compound of the formula



where R_1 is selected from the group consisting of



and R_2 is selected from the group consisting of



and m is an integer from 0 to 3.

5. A method of treating a patient suffering smooth muscle spasm comprising administering to the patent an effective amount of the compound defined in claim 1.

4,721,723

ANTI-DEPRESSANT CRYSTALLINE PAROXETINE HYDROCHLORIDE HEMIHYDRATE

Roger D. Barnes, Betchworth; Marian W. Wood-Kaczmar, Harlow; Alan D. Carsons, Worthing; Ian R. Lynch, Epsom; John E. Richardson, Harlow, and Philip C. Buxton, Epsom, all of England, assignors to Beecham Group p.l.c., Brentford, England

Filed Oct. 23, 1986, Ser. No. 922,530
Claims priority, application United Kingdom, Oct. 25, 1985, 8526407; Oct. 25, 1985, 8526408
Int. Cl.[4] A61K *31/445*; C07D *405/12*
U.S. Cl. 514—321 6 Claims

6. A method of treatment of depression in mammals, which

method comprises administering an effective amount of crystalline paroxetine hydrochloride hemihydrate.

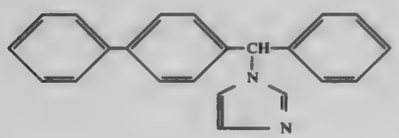
4,721,724

FORMULATIONS CONTAINING AZOLE DERIVATIVES, AND THEIR USE FOR ATRAUMATIC NAIL REMOVAL

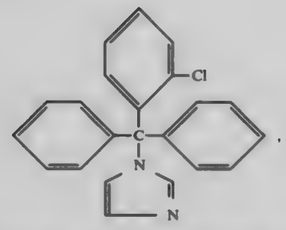
Sigrid Stettendorf, Wuppertal, and Karlheinz Adams, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,407
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520098
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—396 3 Claims

1. A method for atraumatic nail removal comprising applying to a nail an effective amount of a formulation containing 0.05–1.5 parts by weight of an azole derivative of the formula



or the formula



urea in the amount of 5 to 60 parts by weight, lipophilic wetting agent in an amount of 0 to 40 parts by weight, factor conferring consistency in an amount of 0 to 30 parts by weight, spreading agent in an amount of 0 to 40 parts by weight, stabilizer selected from the group consisting of tocopherol, butylhydroxyanisole and butylhydroxytoluene in an amount of 0 to 0.2 parts by weight and a pharmaceutically acceptable vehicle in an amount of 20 to 60 parts by weight and subsequently removing said nail.

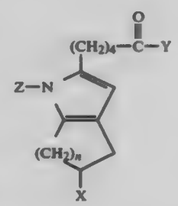
4,721,725

ARYL-CYCLOALKYL[B]PYRROLE DERIVATIVES

Scott A. Biller, Lawrenceville, and Donald S. Karanewsky, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 27, 1986, Ser. No. 823,172
Int. Cl.[4] C07D *209/52;* A61K *31/405, 31/40*
U.S. Cl. 514—412 14 Claims

1. A compound having the structure



wherein n is 1 or 2;

X is —OR^1 or —NR^2R^3 wherein R^1 is H, lower alkyl, cycloalkyl, aryl, aralkyl or cycloalkylalkyl, and R^2 and R^3 may be the same or different and are H, lower alkyl, cycloalkyl, aryl, aralkyl or cycloalkylalkyl;

Y is —OR^4 or —NR^5R^6 wherein R^4 is H or lower alkyl, and R^5 and R^6 are the same or different and are H or lower alkyl; and Z is aryl; wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl, the term aryl or "ar" by itself or as part of another group refers to monocyclic or bicyclic aromatic groups containing from 6 to 10 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups, and the term cycloalkyl by itself or as part of another group refers to saturated cyclic hydrocarbon groups containing 3 to 8 carbons in the ring and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups.

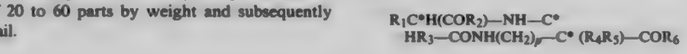
4,721,726

SUBSTITUTED DIPEPTIDES AS INHIBITORS OF ENKEPHALINASES

Joel G. Berger, Cedar Grove, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 621,021, Jun. 15, 1984, Pat. No. 4,610,816, which is a continuation-in-part of Ser. No. 483,463, Apr. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 444,761, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,485, Apr. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 217,621, Dec. 18, 1980, abandoned. This application Jul. 25, 1986, Ser. No. 890,667
Int. Cl.[4] A61K *31/195, 31/24, 31/34*
U.S. Cl. 514—464 15 Claims

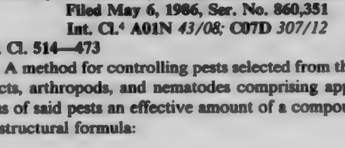
1. A method for inhibiting the action of enkephalinases in a mammal to thereby elicit an analgesic effect in said mammal, which method comprises administering an enkephalinase inhibitory effective amount of a compound having structural formula I



or a racemate, enantiomer and diasterioisomer thereof or a pharmaceutically acceptable salts thereof to said mammal wherein:

R_1 is alkyl having from 1to 6 carbon atoms, adamantylmethyl, cycloakylmethyl having from 4 to 8 carbon atoms or A—X_m—C_nH_{2n}—wherein X is oxygen or sulfur, A is phenyl which may be substituted with the group, Y, wherein Y is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, alkyl having from 1 to 6 carbon atoms, 2- and 3-furanyl, 2- and 3-thienyl, or phenyl {which may be substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms) benzyl {the phenyl ring of which may be substituted with the group, Y, as defined herein}, 1- and 2-naphthyl, 2-and 3-furanyl or 2- and 3-thienyl; m is 0 or 1 and n is 0, 1, 2, 3, or 4;

R_2 and R_6 may be the same or different and are hydroxy, alkoxy having from 1 to 8 carbon atoms, B—X_m—C_nH_{2n}—O—wherein B is phenyl {which may be substituted with the group, Y, as defined herein}or 1- and 2-naphthyl, X, m, and n are as defined herein provided that when n=0, m=0, —OCH_2OCO-alkyl having from 3 to 8 carbon atoms, —OCH_2CO-phenyl {the phenyl ring of which may be substituted with the group, Y, as defined herein}, 1-glyceryl,



wherein $R_{6\,7}$ is hydrogen, alkyl having from 1 to 6 carbon atoms, or phenyl which may be substituted with the group, Y, as defined herein, and R_8 is hydrogen or alkyl having from 1 to 6 carbon atoms;

R_2 may also —NR_7R_8 wherein R_7 and R_8 are as defined herein;

R_3 is alkyl having from 1 to 6 carbon atoms, cyclo-alkylmethyl having from 4 to 8 carbon atoms, 2- and 3-thienylmethyl, 2- and 3-furanylmethyl, 1- and 2-naphthylmethyl, or benzyl the phenyl ring of which may be substituted with the group, Y, as defined herein;

R_4 is D—C_nH_{2n}—O_m—wherein D is hydrogen, alkyl having from 1 to 4 carbon atoms or phenyl which may be substituted with the group, Z, wherein Z is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, or alkyl having from 1 to 6 carbon atoms; m and n are as defined herein;

R^4 may also be —NR_5COR_7 {wherein R_5 and R_7 are defined herein}, and —$NR_5CO_2R_9$ {wherein R_5 is defined herein and R_9 is alkyl having from 1 to 6 carbon atoms or phenyl which may be substituted with the group Y, as defined herein} provided that p is 1 or 2;

R_5 is hydrogen or alkyl having from 1 to 6 carbon atoms; and p is 0, 1 or 2.

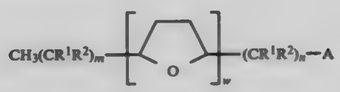
4,721,727

CONTROL OF PESTS WITH ANNONACEOUS ACETOGENINS

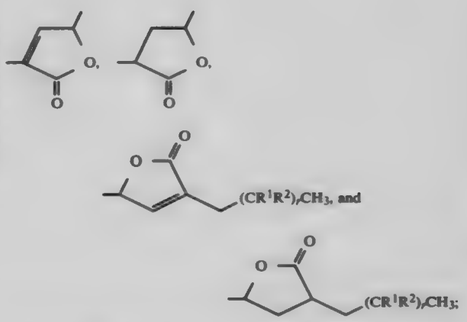
Kenneth L. Mikolajczak, Dunlap, Ill.; Jerry L. McLaughlin, West Lafayette, Ind., and James K. Rupprecht, Midland, Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 6, 1986, Ser. No. 860,351
Int. Cl.[4] A01N *43/08;* C07D *307/12*
U.S. Cl. 514—473 13 Claims

1. A method for controlling pests selected from the group of insects, arthropods, and nematodes comprising applying to a locus of said pests an effective amount of a compound having the structural formula:



wherein A is selected from:



wherein R^1R^2 is selected from:
H, H; H, OH; H, OAc; and =O,
with the proviso that the total number of oxy substituents for R^1 and R^2 does not exceed 6; and
wherein:
m=9–15
n=10–18
r=1
w=1 or 2
with the proviso that:
when w=1, m+n+2r is in the range of 25–29; and
when w=2, m+n+2r is in the range of 21–25.

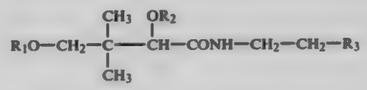
4,721,728

PANTOTHENYL DERIVATIVES

Tiberio Bruzzese; Franco Ottoni, and Holger H. Van Den Heuvel, all of Milan, Italy, assignors to SpA Societa' Prodotti Antibiotici S.p.A., Milan, Italy

Filed Oct. 7, 1986, Ser. No. 916,105
Claims priority, application Italy, Oct. 8, 1985, 22392 A/85
Int. Cl.[4] C07C *101/18;* A61K *31/22*
U.S. Cl. 514—547 5 Claims

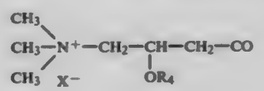
1. Compounds of the following general structure (I)



(I)

where

R_1 stands for an acyl radical of the following structure (II)



(II)

where

X^- is a halogen atom and R_4 is an acyl radical C_1–C_4 or a hydrogen atom

R_2 for an R_1 radical as defined above or for a hydrogen atom

R_3 stands for a substituted hydroxymethyl CH_2OR_1 group, where R_1 has the same value as defined above, or for a carboxyl group.

4,721,729

NOVEL CARBACYCLINS, PROCESS FOR THE PREPARATION THEREOF, AND THEIR USE AS MEDICINAL AGENTS

Werner Skuballa; Bernd Radüchel; Helmut Vorbrueggen; Robert Nickolson; Martin Haberey; Olaf Loge, and Claus-Steffen Stuerzebecher, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

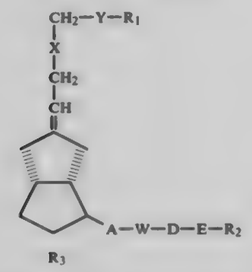
Filed Feb. 8, 1985, Ser. No. 702,092

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3405181

Int. Cl.⁴ C07C *177/00*; A61K *31/557*

U.S. Cl. 514—691 **16 Claims**

1. A carbacyclin of the formula



wherein

R_1 is (a) C_{1-10} alkyl, (b) C_{1-10} alkyl substituted by C_{6-10} aryl, or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (c) C_{2-10}-alkenyl, (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms,

Y is —CO—,

X is $—CH_2—$or oxa,

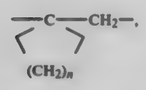
A is $—CH_2—CH_2—$, trans—CH=CH—or —C≡C—,

W is —CH(OR)—or



wherein in the OR-group can be in the alpha- or beta-position,

is



alkylene of 1–10 carbon atoms, alkenylene of 2–10 carbon atoms, each of which can be substituted by 1–2 fluorine,

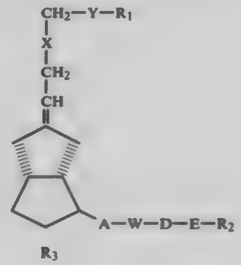
n is 1, 2 or 3,

E is —C≡C—

R_2 is (a) C_{1-10} alkyl, (b) C_{1-10} alkyl substituted by C_{6-10} aryl, or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (c) C_{2-10}-alkenyl, (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, and

is H tetrahydropyranyl, tetrahydrofuranyl, alphaethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{2-10}-hydrocarbon carboxylic or sulfonic acid.

16. A carbacyclin of the formula



wherein

R_1 is (a) C_{1-10} alkyl substituted by C_{6-10} aryl, or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (b) C_{2-10}-alkenyl, (c) C_{3-10} cycloalkyl, (d) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-1}- aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromenthyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (g) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms,

Y is —CO—or —CH(OR)—,

X is $—CH_2—$or oxa,

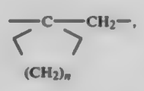
R^3 is OR,

A is $—CH_2—CH_2—$, trans—CH=CH—or —C≡C—,

W is —CH(OR)—or



wherein the OR-group can be in the alpha- or beta-position, is



alkylene of 1–10 carbon atoms, alkenylene of 2–10 carbon atoms, each of which can be substituted by 1-fluroine,

n is 1, 2 or 3,

E is a direct bond, —C≡C—or $—CR_4=CR_5—$, wherein R_4 is hydrogen or alkyl of 1–5 carbon atoms and R_5 is hydrogen, halogen or alkyl of 1–5 carbon atoms,

R_2 is (a) C_{1-10} alkyl, (b) C_{1-10} alkyl substituted by C_{6-10} aryl, or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluromethyl, trifluromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (c) C_{2-10}-alkenyl, (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group 1–3 C_{1-4} alkyl groups or a chloromethyl, fluromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, and

R is H, tetrahydropyranyl, tetrahydrofuranyl, alphaethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{2-10} -hydrocarbon carboxylic or sulfonic acid.

4,721,730

ADSORBENT FOR β_2-MICROGLOBULIN AND IMMUNOGLOBULIN L-CHAIN

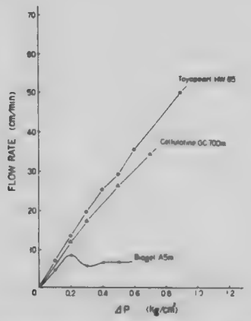
Shigeo Furuyoshi; Eiji Ogino, both of Kobe, and Nobutaka Tani, Osaka, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 29, 1987, Ser. No. 55,387

Claims priority, application Japan, May 30, 1986, 61-126000; Sep. 19, 1986, 61-222287; Sep. 19, 1986, 61-222288; Sep. 19, 1986, 61-222289

Int. Cl.⁴ C08J *9/36*

U.S. Cl. 521—53 **3 Claims**



1. An adsorbent for β_2-microglobulin and immunoglobulin L-chain suitable for use in an extracorporeal circulation treatment, which comprises a porous water-insoluble carrier, and carrier having molucular weight of the exclusion limit measured with a globular protein from 1×10^4 to 6×10^5, and a compound immobilized onto said carrier, said compound satisfying that the value of log P, in which P is a partition coefficient in an octanol-water system, is not less than 2.5.

4,721,731

PROCESS FOR PREPARING EXPANDABLE PARTICLES OF VINYL CHLORIDE RESIN COMPOSITION

Kiyoshi Mori, Kakogawa, and Masao Nakagawa, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1986, Ser. No. 904,594

Claims priority, application Japan, Sep. 9, 1985, 60-199051

Int. Cl.⁴ C08J *9/18*

U.S. Cl. 521—59 **4 Claims**

1. A process for preparing expandable particles of a vinyl chloride resin composition suitable for beads-foaming, comprising steps of:

melting 100 parts by weight of a vinyl chloride resin having a difference between T_1 and T_2 of not higher than 45° C. with 1 to 30 parts by weight of an acrylic resin to form a gelled composition,

pelletizing said composition, and

impregnating the resulting pellets with an easily volatile organic blowing agent and an organic compound capable of dissolving or swelling said vinyl chloride resin; said T_1 and T_2 being measured by a Koka Shiki Flow A-method under conditions of 1 mm in nozzle diameter, 1 mm in nozzle length, 6° C./minute in temperature rise rate and 100 kg/cm² in load.

4,721,732

POLYMERIC ARTICLES AND METHODS OF MANUFACTURE THEREOF

Robert S. Dubrow, Redwood City, and Michael F. Froix, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 611,665, May 18, 1984. This application Apr. 30, 1986, Ser. No. 858,484

Int. Cl.⁴ C08J *9/26*

U.S. Cl. 521—62 **19 Claims**

1. A method for preparing a microporous article which comprises

(a) forming a blend comprising a thermoplastic first polymer and a thermoplastic second polymer, which are molecularly compatible with each other and are selected from the following first and second polymer combinations;

(i) poly(vinylidene fluoride) first polymer and poly(-methyl methacrylate) second polymer,

(ii) poly(vinyl chloride) first polymer and polycaprolactone second polymer,

(iii) polystryrene first polymer and poly(phenylene oxide) second polymer, and

(iv) polyetherimide first polymer and poly(aryl ether ketone) second polymer;

(b) forming the blend into a shaped article of predetermined dimensions; and

(c) treating the shaped article with a solvent which is a non-solvent for one of the molecularly compatible polymers and a solvent for the other.

4,721,733

POLYMER POLYOL DISPERSION FROM α,β ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ANHYDRIDES

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 9, 1987, Ser. No. 23,499

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—157 **22 Claims**

1. A polymer polyol suitable for reaction with an isocyanate to form a polyurethane comprising the reaction product prepared at a temperature within the range of from about 70° C. to about 150° C. under free radical conditions from a minor proportion of a monomer mixture and a major proportion of an organic polyol medium wherein:

(a) the monomer mixture comprises at least one α,β-ethylenically unsaturated dicarboxylic acid anhydride and at least one monomer which is polymerizable with the acid anhydride;

(b) the organic polyol medium consists essentially of secondary hydroxyl terminated polyol, and wherein in the reaction product the acid anhydride is grafted to the polyol through the double bonds of the α,β-ethylenically unsaturated dicarboxylic acid anhydride and not through the hydroxyl groups of the polyol under said reaction conditions.

VOL 1086 ISS 4 JA 26 1988 UMI

4,721,734

PHOTOSENSITIVE HYDROXYLALKYLPHENONES

Juergen Gehlhaus, Heppenheim, and Manfred Kieser, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 408,576, Aug. 16, 1972, Pat. No. 4,477,681, which is a continuation-in-part of Ser. No. 99,792, Nov. 26, 1979, Pat. No. 4,347,111, which is a continuation of Ser. No. 906,505, May 16, 1978, abandoned. This application Aug. 31, 1984, Ser. No. 646,285

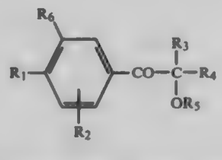
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722264

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.[4] C08F *2/50, 4/00, 4/40*

U.S. Cl. 522—8 **11 Claims**

1. In a method of photopolymerizing a photopolymerizable composition comprising at least one photopolymerizable unsaturated compound and a photosensitizingly effective amount of at least one photosensitizer, comprising irradiating the photopolymerizable composition with effective radiation, the improvement wherein the photosensitizer comprises at least one compound of the formula



wherein R_1 is hydrogen, chlorine, phenyl, dialkylamino of 2–4 C-atoms or alkyl or alkoxy each of up to 18 C-atoms; R_2 is hydrogen, chlorine, bromine or alkyl or alkoxy each of up to 4 C-atoms; R_3 and R_4 which can be the same or different, each is alkyl of up to 6 C-atoms; and R_5 is alkyl or alkanoyl each of up to 4 C-atoms and R_6 is hydrogen or methyl.

4,721,735

FRANGIBLE LIGHT CURED COMPOSITIONS

Richard J. Bennett, Milford, and Robert V. Hare, Georgetown, both of Del., assignors to Dentsply Research and Development Corporation, Milford, Del.

Filed Jan. 23, 1986, Ser. No. 821,774

Int. Cl.[4] C08J *6/10;* **A61K** *6/08;* **C08F** *20/54;* **C08L** *39/00*

U.S. Cl. 522—71 **27 Claims**

1. An actinic light curable composition, frangible when cured, comprising:

a major proportion of inert filler, and

polymerizable resin blend comprising:

from about 15% to about 85% by weight of the blend of urethane acrylic resin;

from about 15% to about 85% by weight of the blend of urethane polyether resin; and

a photosensitizing system capable of curing the composition upon irradiation with actinic light; and

from about 5% to about 15% by weight of the composition of a frangibility enhancing material comprising particulate organic polymer.

4,721,736

MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nuno M. Rei, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 619,092, Jun. 11, 1984, Pat. No. 4,663,077. This application May 1, 1987, Ser. No. 44,879

Int. Cl.[4] C08K *5/46, 5/34*

U.S. Cl. 523—122 **16 Claims**

1. A process for imparting microbiocidal properties to a polymer composition comprising adding to the polymer composition a comprising a polymer processing aid and, in an amount at least sufficient to impart microbiocidal properties to the polymer composition, a microbiocidal compound which is present in the polymer processing aid as the solute in an aryl alkanol solvent, said microbiocidal compound being selected from the group consisting of phenoxarsines, phenarsazines, maleimides, isoindole dicarboximides having a sulfur atom bonded to the nitrogen atom of the dicarboximide group and isothiazolinone compounds.

4,721,737

IRRADIATED COLOR STABILIZED POLYSULFONE COMPOSITIONS

Linda H. Nelson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 28, 1986, Ser. No. 935,825

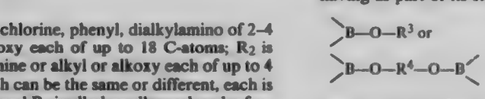
Int. Cl.[4] C08K *5/55*

U.S. Cl. 523—136 **22 Claims**

1. A composition sufficiently irradiated to achieve sterilization comprising:

(i) at least one polysulfone resin; and

(ii) an anti-yellowing upon exposure to sterilizing irradiation effective amount of at least one organoboron compound having as part of its structure at least one



group wherein R^3 is selected from monovalent hydrocarbon radicals, substituted monovalent hydrocarbon radicals, monovalent hydrocarbonoxy radicals, or halogen radicals, and R^4 is selected from divalent hydrocarbon radicals or substituted divalent hydrocarbon radicals.

4,721,738

POLYMERIC COMPOSITIONS INCLUDING MICROWAVE ENERGY SENSITIZING ADDITIVES

Jeffrey R. Ellis, East Windsor, N.J., and Martin B. Dines, deceased, late of Laguna Beach, Calif. (by Elaine Dines, legal representative), assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed Oct. 7, 1985, Ser. No. 785,206

Int. Cl.[4] G21F *1/10*

U.S. Cl. 523—137 **18 Claims**

1. A composition of matter including a polymer sensitized to the heating effects of microwave energy which comprises said polymer and microwave sensitizing amount of a particulate, layered compound represented by the general formula: $M(O_3ZO_xR)_n$ wherein M is, selected from the group consisting of Zr, W, U, Ti, Th, Te, Sn, Si, Ru, Pu, V, Pr, Pb, Os, Nb, Mo, Mn, Ir, Hf, Ge, Ce and mixtures thereof; Z is selected from the group consisting of elements of Group V of the Periodic Table of the Elements, and having an atomic weight of greater than 30; x varies from 0 to 1; R is selected from the group consisting of hydrogen and organo radicals and n is 1 or 2, provided that n is 1 when R is terminated with a tri-or tetraoxy pentavalent atom, dispersed throughout said polymer.

4,721,739

ERASABLE INK COMPOSITIONS

Richard S. Breuneman, Natick; Paul M. Drennan, W. Newton; Irving J. Arons, Peabody; Alice H. Pincus, Andover, all of Mass., and Chaudhary M. Ramzan, Milford, Conn., assignors to BIC Corp., Milford, Conn.

Continuation of Ser. No. 550,211, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 394,124, Jul. 1, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 779,305

Int. Cl.[4] C09D *11/18;* **C08L** *53/00*

U.S. Cl. 523—161 **35 Claims**

1. An erasable ink composition comprising:

(a) a thermoplastic-elastomer block copolymer selected from the group consisting of styrene-butadiene-styrene, styrene-isoprene-styrene, styrene-polyolefin-styrene, and styrene-ethylene/butylene-styrene, said copolymer present in an amount from about 8% to about 30% by weight of the composition;

(b) a plasticizer which is incompatible or of limited compatibility with the thermoplastic-elastomer copolymer in the absence of a solvent, said plasticizer being present in an amount from about 10% to about 35% by weight of the composition;

(c) a solvent which acts as a solvent for the copolymer and is at least compatible with the plasticizer to produce a uniformly dispersed composition that flows on application of a small amount of force, said solvent having a Hildebrand solubility range from about 6.9 to 7.8 $(cal./cm^3)^{\frac{1}{2}}$ and being present in an amount from about 10% to about 40% by weight of the composition;

(d) a colorant comprising a pigment or pigment dispersion in an amount from about 10% to about 60% by weight of the composition;

(e) a resin in an amount of less than about 12% by weight of the composition;

(f) a lubricant in an amount of less than about 8% by weight of the composition; and

(g) an alkylated polyvinyl pyrrolidone or non-ionic surfactant-dispersant in an amount of less than about 2% by weight of the composition;

said composition having a weight ratio of thermoplastic elastomer to plasticizer of about 0.1 to about 3 and a viscosity between about 48 and about 500 poise, and, when applied to a porous substrate as an ink, causing evaporation of said solvent without significant penetration of the composition into the porous substrate to produce a colored script comprising the copolymer and the incompatible plasticizer which script is erasable without smearing and in which the plasticizer gradually bleeds out of the copolymer due to their incompatibility with the copolymer physically crosslinking in time to form a non-erasable permanent colored script.

4,721,740

DISPERSION-IMPROVED CARBON BLACK COMPOUNDED RUBBER COMPOSITION

Michitaka Takeshita, Koganei; Mitsuo Kiboku, Hiroshima; Seishiro Ito, Ikoma, and Tatsuhiko Ihara, Kure, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,225

Claims priority, application Japan, Jul. 8, 1985, 60-149831

Int. Cl.[4] C08K *9/00*

U.S. Cl. 523—215 **8 Claims**

1. A rubber composition comprising

(1) a rubber component selected from a group consisting of

(a) natural rubber,

(b) synthetic isoprene rubber,

(c) a mixture thereof and

(d) a blend therewith of a diene base synthetic rubber other than said rubbers (a) and (b) and

(2). a reinforcing carbon black in an amount of from 30 to 150 parts by weight with respect to 100 parts by weight of the rubber component, said carbon black having a specific surface area of from 70 to 200 m^2/g when measured by a nitrogen adsorption method and a DBP value of from 80 to 130 m /100 g and being obtained by introducing mainly phenolic hydroxyl groups into the surface of the carbon black through plasma treatment at low temperatures.

4,721,741

HEAT-HARDENABLE BINDER MIXTURE

Michael Geist, Münster, Fed. Rep. of Germany, assignor to BASF Lacke+Farben AG, Muenster, Fed. Rep. of Germany

Division of Ser. No. 764,620, Aug. 12, 1985, Pat. No. 4,661,410, which is a division of Ser. No. 679,062, Dec. 6, 1984, Pat. No. 4,581,294, which is a division of Ser. No. 425,528, Sep. 28, 1982, Pat. No. 4,505,981. This application Oct. 1, 1986, Ser. No. 913,978

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145714

Int. Cl.[4] C08L *33/04, 33/08, 33/10*

U.S. Cl. 523—400 **6 Claims**

1. A heat-hardenable binder mixture based on organic resins, comprising:

(A) 50% to 95% by weight of an organic resin having amino groups selected from the group consisting of primary groups, secondary groups and mixtures thereof, a number average molecular weight of 500 to 20,000 and an amine equivalent weight of 150 to 7,500; and

(B) 5% to 50% by weight of a cross-linking agent based on an organic compound containing at least two carbalkoxymethyl groups, a number average molecular weight of 200 to 10,000, said organic compound selected from the group consisting of polyester resins and compounds containing free carboxyl groups to which said carboxymethyl can be attached, the total amount of components (A) and (B) being 100%.

4,721,742

AMIDE MODIFIED EPOXY RESINS FROM A DIALKANOLAMINE, A MONOALKANOLAMINE, AN ANHYDRIDE AND (AN) UNSATURATED MONOMER(S)

James L. Bertram, Lake Jackson, and Willie L. Myles, Sweeny, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1986, Ser. No. 928,485

Int. Cl.[4] C08G *59/58*

U.S. Cl. 523—417 **23 Claims**

7. A curable amide modified epoxy resin prepared by polymerizing (I) the reaction product of (A) the reaction product of (1) an epoxy resin having an average of more than one 1,2-epoxy group per molecule and (2) (a) a dialkanolamine and (b) a monoalkanolamine; wherein components (a) and (b) are added as a mixture or sequentially with component (a) being added first; with (B) an anhydride of an unsaturated dicarboxylic acid; with (II) a polymerizable ethylenically unsaturated monomer or mixture of monomers; wherein

(i) the ratio of moles of component (I-A-2-a) to epoxy equivalent contained in in component (I-A-1) is from about 0.5:1 to about 0.95:1;

(ii) the ratio of moles of component (I-A-2-b) to epoxy equivalent contained in in component (I-A-1) is from about 0.05:1 to about 0.5:1;

(iii) the ratio of total moles of components (I-A-2-a) and (I-A-2-b) per epoxy equivalent contained in in component (I-A-1) is from about 0.9:1 to about 1.5:1;

(iv) the ratio of moles of component (I-B) to moles of component (I-A-2-b) is from about 0.75:1 to about 1.25:1); and
(v) component (II) is present in a quantity which provides from about 5 to about 75 percent by weight of component (II) based upon the combined weight of components (I) and (II).

4,721,743
NON-THERMOSET THERMALLY STABLE CAPPED EPOXY RESIN COMPOSITIONS

Michael B. Cavitt, Lake Jackson, Tex., and Christopher V. Beasley, Chicago, Ill., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 715,305, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,781, Dec. 4, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,455
Int. Cl.[4] C08K 7/20; C08L 63/00, 63/02
U.S. Cl. 523—427 10 Claims

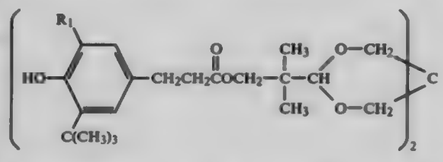
1. A paint formulation comprising
(I) a thermally stable, non-thermoset resin having a Mettler softening point of from about 75° C. to about 110° C. and a Brookfield Thermosel viscosity at 450° F. of from about 150 cps to about 260 cps prepared by reacting in the presence of an effective quantity of a suitable catalyst
(A) a mixture comprising
(1) from about 65 to about 80 percent by weight of a relatively high molecular weight epoxy resin having an average of more than one vicinal epoxide group per molecule and an epoxide equivalent weight (EEW) of from about 1600 to about 2300; and
(2) from about 35 to about 20 percent by weight of a relatively low molecular weight epoxy resin having an average of more than one vicinal epoxide group per molecule and an EEW of from about 180 to about 225;
wherein the equivalent weight of components (1) and (2) are calculated on the basis that the epoxy resin contains only carbon, oxygen and hydrogen atoms even though it may contain other atoms; with
(B) at least one monofunctional material selected from monohydric phenols, aliphatic alcohols having from about 3 to about 8 carbon atoms, aliphatic monocarboxylic acids having from about 12 to about 20 carbon atoms, anhydrides of aliphatic monocarboxylic acids, said anhydrides having from about 4 to about 8 carbon atoms, aromatic substituted aliphatic monocarboxylic acids having from about 8 to about 10 total carbon atoms and combinations thereof and
wherein components (A) and (B) are employed in quantities which provide an equivalent ratio of component (B) to component (A) of from about 0.87:1 to about 1.1:1) except that when component (B) is an aliphatic alcohol, then the equivalent ratio of component (B) to component (A) is from about 3.5:1 to about 20:1; with the proviso that the amount of components (A-1) and (A-2) and the ratio of components (A) and (B) are such that the desired Mettler softening point and Brookfield Thermosel viscosity are obtained; and
(II) at least one of
(a) one or more pigments;
(b) one or more dyes;
(c) one or more fillers; or
(d) any combination thereof.

4,721,744
STABILIZED POLYURETHANE COMPOSITIONS

Tamaki Ishii, Saito; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Haruki Okamura, Osaka, and Masahisa Shionoya, Izumi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 31, 1986, Ser. No. 846,050
Claims priority, application Japan, Apr. 4, 1985, 60-71442
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] C08K 5/34, 5/49
U.S. Cl. 524—91 4 Claims

1. A polyurethane composition which comprises a polyurethane having incorporated therein a phenolic type compound represented by the general formula (I),



(I)

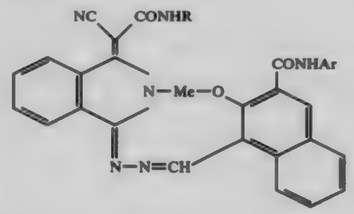
wherein R_1 represents a C_1–C_3 alkyl group, in an amount of 0.05 to 10% by weight based on the polyurethane and at least one member selected from a benzotriazole type light stabilizer and a hindered amine type stabilizer in an amount of 0 to 10% by weight based on the polyurethane.

4,721,745
PIGMENTS BASED ON METAL COMPLEXES

Rütger Neeff, deceased, late of Leverkusen (by Käte Neeff, heiress); Meinhard Rolf, and Walter Müller, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,092
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3537625
Int. Cl.[4] C08K 5/34; C09D 5/00
U.S. Cl. 524—94 10 Claims

1. A pigment of the formula



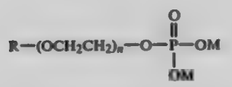
in which
Me=Zn, Cu, Co or Ni,
R=Alkyl, cycloalkyl, aralkyl, aryl or hetaryl, where the aryl or aralykyl radicals are optionally substituted by halogen, —NO_2, —CN, —CF_3, C_1–C_4-alkyl, C_1–C_4-alkoxy, carbamoyl, mono- and di-C_1–C_4-alkyl-carbamoly or C_1–C_4-alkylamino, or acetylamino,
Ar=aryl or aryl substituted by halogen, —NO_2, —CN, —CF_3, C_1–C_4-alkyl, C_1–C_4-alkoxy, carbamoyl, mono- and di-C_1–C_4-alkylcarbamoyl or C_1–C_4-alkylamino, or acetylamino.

4,721,746
FLAMEPROOFING SYNTHETIC FIBER

Mikio Tashiro; Nobuo Sakashita, both of Matsuyama; Yasunori Tatsuoka, Nagaokakyo; Tamio Mitamura, Kobe, and Kazunori Orii, Kusatsu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 22, 1986, Ser. No. 899,144
Claims priority, application Japan, Aug. 29, 1985, 60-191375
Int. Cl.[4] C08K 5/52
U.S. Cl. 524—145 6 Claims

1. A flameproofing synthetic fiber comprising a synthetic fiber, a halogenated cycloalkane compound (A), and a phosphorus compound (B) represented by the general formula (I):



wherein R is an alkyl group having 6 to 30 carbon atoms on an average, each of M and M', which may be the same or different, is an alkali metal, and n is an integer of 0 to 30, and wherein said halogenated cycloalkane compound (A) and said phosphorus compound (B) represented by the general formula (I) defined hereinbefore are applied to said synthetic fiber. in an amount of 0.5 to 7% by weight of the synthetic fiber.

4,721,747
HIGH SOLID COATINGS CONTAINING TITANATES AND SILANES

Jyotindra K. Doshi, Aisip, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 4, 1985, Ser. No. 772,965
Int. Cl.[4] C08K 5/24
U.S. Cl. 524—261 13 Claims

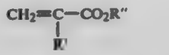
1. A pigmented high solid coating composition having a pigment volume concentration of at least 20%, and which comprises in percent by weight, 10–50% of an inert, volatile solvent component, and 50–90% of a non-volatile component; wherein the non-volatile component consists essentially of:
(a) an organic film-forming vehicle having hydroxyl functionality;
(b) an aminoplast crosslinker for the film-forming vehicle;
(c) at least one extender pigment;
(d) an effective viscosity reducing amount of at least one hydrolyzable silane; and
(e) an effective viscosity reducing amount of at least one titanate ester.

4,721,748
COLLOID STABILIZED LATEX ADHESIVES

Carmine P. Iovine, Bridgewater; Yen-Jer Shih, Somerset, and Paul B. Foreman, Somerville, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 762,651, Aug. 5, 1985, Pat. No. 4,668,730.
This application Nov. 17, 1986, Ser. No. 931,585
Int. Cl.[4] C08F 2/16
U.S. Cl. 524—460 15 Claims

1. A process for the preparation of latex adhesive composition having a Tg of −60° to 0° C. comprising the steps of:
(i) solution polymerizing
(a) 50 to 85% by weight of a monomer of the formula:



where R' is hydrogen or methyl and R'' is a C_1–C_{12} straight or branched chain alkyl group;
(b) 10 to 50% by weight of an ethylenically unsaturated mono- or dicarboxylic acid;
(c) 5 to 30% by weight of an acrylic or methacrylic ester of a polyalkylene oxide; and
(d) 0 to 30% by weight of an ethylenically unsaturated copolymerizable monomer selected from the group consisting of hydroxyalkyl acrylates or methacrylates; acrylamide, methacrylamide and their N-substituted derivatives; with the proviso that components a–d total 100% by weight; to form an alkali soluble polymer having a Tg of −40° to 0° C. and a number average molecular weight of 2,000 to 10,000;
(ii) neutralizing the solution polymer of (i) with a fugitive alkali to give a water-soluble polymer salt; and
(iii) polymerizing an acrylate or methacrylate monomer or mixture thereof in an aqueous medium in the presence of a free radical catalyst and 10 to 35% by weight of the solids of the total latex of the polymeric colloid of (ii).

4,721,749
TIRE TREAD COMPOUNDS BASED ON VINYL POLYBUTADIENE

Joseph Odar, South Euclid, Ohio, and Walter Von Hellens, Bright's Grove, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sep. 29, 1986, Ser. No. 912,508
Int. Cl.[4] C08L 7/00, 9/00, 9/06; C08K 3/04
U.S. Cl. 524—526 11 Claims

1. A sulfur vulcanizable blend of a first rubbery polymer and a second rubbery polymer,
said first rubbery polymer comprising a substantially amorphous polybutadiene having at least 70 and not more than about 90 mole percent 1,2 units in its microstructure and having a weight average molecular weight of from about 300,000 to about 550,000;
said second rubbery polymer comprising a substantially amorphous polybutadiene having from about 92 to about 99 mole percent cis-1,4 units in its microstructure and having a weight average molecular weight of from about 350,000 to about 550,000;
the relative proportions of said first and second polymers being such that the overall 1,2 unit content of the blend is from about 35 percent to about 65 percent on a molar basis;
the molecular weight distribution, as determined by gel permeation chromatography, of the first rubbery polymer being characterized by Mw/Mn being from about 1.1 to about 1.8, of the second rubbery polymer being characterized by Mw/Mn being from about 2.5 to about 3.5 and of the blend being characterized by Mw/Mn being from about 2 to about 3.5;
the first and second polymers being sufficiently intimately and homogeneously blended together that the resultant blend exhibits a substantial absence of a glass transition temperature.

9. A process for preparing the sulfur vulcanizable rubbery polymer blend of claim 1 which comprises mixing together solutions of said first and second polymers in mutually compatible solvents, in relative proportions and concentrations so as to obtain a blend of rubbery polymer having a 1,2 unit content of from about 35 to about 65 percent on a molar basis and a molecular weight distribution characterized by Mw/Mn being from about 2 to about 3.5;
and co-agglomerating and recovering the rubbery polymers from solution as an imtimate, homogeneous blend.

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4,721,750

PRIMER COMPOSITION

Nobuo Nakamura; Tsuneo Motegi, and Yasuji Matsumoto, all of Ohta, Japan, assignors to Toshiba Silicone Company, Ltd., Japan

Filed Mar. 13, 1987, Ser. No. 25,538
Int. Cl.[4] C08K 5/10; C08F 230/08, 130/08, 8/42
U.S. Cl. 524—533 7 Claims

1. A primer composition comprising:

(A) 100 parts by weight of copolymer obtained by reacting

(1) an acrylic compound represented by the following general formula:



wherein R^1 and R^2 respectively represent groups selected from the group consisting of a hydrogen atom and monovalent substituted or non-substituted hydrocarbon group; with

(2) a silane compound represented by the following formula:



wherein R^3 represents a group selected from the group consisting of a hydrogen atom and monovalent substituted or non-substituted hydrocarbon groups, R^4 represents a monovalent substituted or non-substituted hydrocarbon group, and Q^1 represents a divalent hydrocarbon group having 1 to 6 carbon atoms,

in the weight ratio of 0.1 to 1,000 wt% with respect to the component (1), in the presence of a free-radical initiator;

(B) 0.1 to 500 parts by weight of at least one compound selected from the group consisting of titanium alkoxides, titanium chelate compounds, aluminum alkoxides, aluminum chelate compounds, and iron salts of organic acids;

(C) 0.1 to 500 parts by weight of organo silicon compound having at least one unsaturated carbon, attached to a silicon atom, in a molecule;

(D) a platinum, palladium, or rhodium catalyst in an amount of 0.1 to 10,000 ppm in terms of each element of said platinum, palladium and rhodium with respect to the component (A); and

(E) an organic solvent in an amount of 250 to 3,500 parts by weight with respect to the total amount of (A) through (D) converted into 100 parts by weight.

4,721,751

POLYUREA-POLYURETHANE ACRYLATE DISPERSIONS

Raymond F. Schappert, Pittsburgh; Joseph M. Makhlouf, Mars, and Michael M. Chau, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1987, Ser. No. 30,309
Int. Cl.[4] C08L 75/12
U.S. Cl. 524—773 34 Claims

1. A polymerizable ethylenically unsaturated urea urethane polymer dispersed in a polymerizable ethylenically unsaturated compound which is prepared by a process which comprises:

(a) reacting a polyisocyanate, at least a portion of which is a diisocyanate, with a polyfunctional amine containing primary and/or seconadary amino groups in the presence of a polyol, at least a portion of which is a polymeric polyol containing ethylenic unsaturation and having a carbon to oxygen ratio of at least 4/1, and a diluent which is an ethylenically unsaturated compound free of active hydrogens, under conditions sufficient to form an NCO group containing polyurea polyurethane dispersed in an ethylenically unsaturated compound; and

(b) reacting the NCO group containing polyurea polyurethane dispersion with an active hydrogen containing polymerizable ethylenically unsaturated compound under conditions sufficient to react the NCO functionality with the active hydrogens thereby forming the polymerizable ethylenically unsaturated urea urethane polymer dispersion.

4,721,752

PROCESS FOR PREPARING AN IMPACT-RESISTANT THERMOPLASTIC MOULDING COMPOUND

Herman A. J. Schepers, Stein, and Wilhelmus A. M. Debets, Sittard, both of Netherlands, assignors to Stami Carbon BV, Geleen, Netherlands

Continuation of Ser. No. 656,464, Oct. 1, 1987, abandoned. This application Jan. 2, 1986, Ser. No. 815,636
Claims priority, application Netherlands, Oct. 1, 1983, 8303377
Int. Cl.[4] C08L 51/04, 35/06
U.S. Cl. 525—74 9 Claims

1. Process for preparing an impact resistant and U.V. resistant thermoplastic moulding compound based on a copolymer consisting of styrene and/or α-methylstyrene and maleic anhydride comprising

mixing:

(A) about 50 about 95 wt. % of a copolymer consisting of:

(i) about 50 to about 95 wt. % styrene and/or α-methylstyrene,

(ii) about 50 to about 5 wt. % maleic anhydride,

(iii) 0 to about 20 wt. % acrylate,

(iv) 0 to about 20 wt. % acrylonitrile;

(B) about 5 to about 50 wt. % of a rubber selected from the group consisting of:

a rubber modified with hydroxyl groups, said modified rubber being obtained by grafting thereto, by solution polymerization, a compound having hydroxyl groups selected from the group consisting of 2-hydroxyethylacrylate, 2-hydroxypropylacrylate, 2-hydroxyethylmethacrylate, 2-hydroxypropylmethacrylate, allyl alcohol and vinyl benzyl alcohol, the hydroxyl modified rubber containing about 0.05 to 10 wt. of hydroxyl groups,

a rubber modified with amine groups, said modified rubber being obtained by grafting thereto, by solution polymerization, a compound having amine groups, and

a rubber modified with amide groups, said modified rubber being obtained by grafting thereto, by solution polymerization, a compound having amide groups; and

(C) about 0 to about 30 wt. % unmodified rubber, wherein said rubber is ethylene-propylene rubber, ethylene-propylene-diene rubber, polyacrylate, polybutyldiene, polybutylene, polyethylene-vinyl acetate or a mixture thereof;

said mixing being conducted in the presence of about 0.01 to about 10 parts by weight of a reaction accelerator, calculated on 100 parts by weight copolymer and modified rubber, at a temperature between about 160° C. and about 290° C. wherein said reaction accelerator is (a) an organic metal compound, the metal component of which is a group II, III and/or IV metal or (b) an organometal compound.

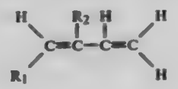
4,721,753

DIENE POLYMER COMPOSITION CONTAINING COPOLYMER DERIVED FROM 2,3-DIMETHYL BUTADIENE

Mitsuhiko Sakakibara; Kaoru Nakako, both of Yokkaichi, and Tatsuo Fujimaki, Higashimurayama, all of Japan, assignors to Bridgestone Corporation and Japan Synthetic Rubber Co., Ltd., both of, Japan

Continuation of Ser. No. 660,994, Oct. 15, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 850,439
Claims priority, application Japan, Oct. 14, 1983, 58-192202
Int. Cl.[4] C08L 9/00, 15/00
U.S. Cl. 525—99 6 Claims

1. A diene polymer composition comprising at least 5% by weight of a copolymer composed of at least one conjugated diene (component A) having the following general formula:



wherein R_1 and R_2 are a hydrogen atom or a methyl group, and 2,3-dimethyl butadiene (component B), wherein said copolymer is produced by polymerizing components A and B at a weight ratio of component A/component B of 95/5–10/90 in the presence of a catalyst system consisting of:

(A) a lanthanum series compound having the following general formula: L_nY_3, wherein L_n is a lanthanum series element having an atomic number of 57–71, Y is a halogen atom, a carboxylic acid residue or

(B) an organo-aluminum compound having the following general formula: R_3Al, R_mAlX_{3-m} or R_nAlH_{3-n} wherein R is an alkyl group having 1–18 carbon atoms, X is a halogen atom, m is 1, 1.5 or 2, and n is 1 or 2, and

(C) a Lewis acid or Lewis base, wherein said copolymer has a cis-1,4-bond content of not less than 80% and a Mooney viscosity of 20–150.

4,721,754

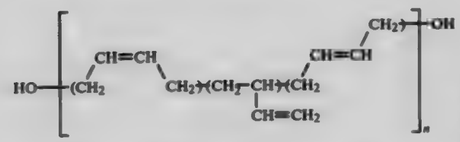
POLYHYDROXYBUTADIENE AND AMINE TERMINATED POLYBUTADIENE BLENDS

Jamil Baghdadchi, 219 Sugartown Rd., Wayne, Pa. 19087

Continuation-in-part of Ser. No. 789,996, Oct. 22, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 888,653
Int. Cl.[4] C08G 18/62
U.S. Cl. 525—194 11 Claims

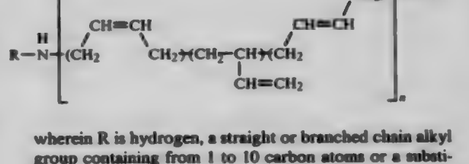
1. A composition useful for the preparation of polyurea and/or polyurethane elastomers, sealants, coatings and binders which comprises a blend of

(a) about 2 to about 98 parts by weight, based on the total weight of the composition, of a polyhydroxybutadiene homopolymer having the formula



wherein n is an integer of from about 5 to about 1500, and

(b) about 98 to about 2 parts by weight based on the total weight of the composition of an amine terminated polybutadiene having the formula



wherein R is hydrogen, a straight or branched chain alkyl group containing from 1 to 10 carbon atoms or a substituted or unsubstituted aryl or aralkyl group containing one or more benzenoid rings which may be fused or joined by single valency bonds and n is an integer of from about 5 to about 1500.

4,721,755

FIBERS AND YARNS FROM A BLEND OF AROMATIC POLYAMIDES

Hendrik Maatman, Arnhem, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Aug. 22, 1986, Ser. No. 899,082
Claims priority, application Netherlands, Aug. 23, 1985, 8502318
Int. Cl.[4] C08L 77/00
U.S. Cl. 525—432 3 Claims

1. Fibers entirely or substantially consisting of a blend of aromatic polyamides, characterized in that the blend is composed of poly-p-phenylene terephthalamide and, based on the blend, up to 50% by weight of a second polyamide containing diaminobenzanilide units to an extent such that at least 0,1% by weight thereof is present in the blend, said second polyamide being derived from aromatic monomers selected from the group comprising terephthalic acid, 4,4'-diaminobenzanilide, p-phenylene diamine and p-aminobenzoic acid.

4,721,756

MOLDED RUBBER PRODUCTS

Ming K. Louie, Royersford, and William R. Sheehan, Phoenixville, both of Pa., assignors to The West Company, Phoenixville, Pa.

Filed Sep. 25, 1986, Ser. No. 911,518
Int. Cl.[4] C08L 9/00, 15/02; C08K 5/34, 3/22
U.S. Cl. 525—245 17 Claims

1. A method of producing a molded rubber product for use in the pharmaceutical industry, comprising the steps of:

mixing a rubber formulation including a halogenated butyl rubber and a curing system of from 0.5 to 3.0 parts by weight of zinc oxide and from 0.5 to 3.0 parts by weight of m-phenylene bismaleimide, said parts being based upon 100 parts of halogenated butyl rubber;

forming a premold from said mixture;

molding said premold into a molded rubber product at a pressure of at least 1000 psi and at a temperature of up to 375° F. for up to 5 minutes; and

removing said formed product.

11. A molded rubber product suitable for use in a pharmaceutical product, comprising a halogenated butyl rubber admixed with a curing system having from 0.5 to 3.0 parts by weight of zinc oxide and 0.5 to 3.0 parts by weight of m-phenylene bis-maleimide, said parts being based on 100 parts of halogenated butyl rubber, and said mixture having been formed into a premold and thereafter molded into a desired shape by molding at a pressure of at least 500 psi at a temperature of up to 375° F. for up to 5 minutes.

VOL. 1086 ISS. 4 JA 26 1988 UMI

4,721,757
VINYL MONOMER COMPOSITIONS WITH ACCELERATED SURFACE CURE
Frederick J. Schindler, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Continuation of Ser. No. 669,699, Nov. 8, 1984, abandoned. This application Jul. 17, 1986, Ser. No. 888,090
Int. Cl.[4] C08F 4/00
U.S. Cl. 525—245 23 Claims

1. A vinyl monomer composition exhibiting improved cure in an oxygen-containing environment comprising (1) a deinhibiting amount of diolefin rubber dispersed in monomer comprising at least one low volatility vinyl monomer having a partial pressure less than about 1 millimeter of mercury at 50° C., (2) a multifunctional monomer selected from the group consisting of diacrylates, triacrylates, dimethacrylates, and (3) a catalyst consisting of at least one polyvalent cobalt salt, wherein (a) said diolefin rubber is polymerized in at least two stages including an initial stage and a subsequent stage, said initial stage comprising polymerizing a diolefin monomer selected from the group consisting of 1,3-butadiene, 2-chloro-1,3-butadiene, 2,3-dichloro-1,3-butadiene, 2-cyano-1,3-butadiene, 1,2,3,4,-tetrachlorobutadiene, isoprene, 1,4,-hexadiene and dicyclopentadiene, and said subsequent stage comprising polymerizing a monomer selected from the group of consisting of styrene, methyl methacrylate and (C_2–C_8)alkyl acrylate, and (b) said diolefin rubber is insoluble in said vinyl monomer.

4,721,758
BINDERS FOR CATHODIC ELECTROCOATING WHICH CONTAIN NON-TERTIARY BASIC AMINO GROUPS IN ADDITION TO PHENOLIC MANNICH BASES
Eberhard Schupp, Schwetzingen; Rolf Osterloh, Grunstadt; Werner Loch, Erpolzheim, and Klaus Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jun. 13, 1985, Ser. No. 744,200
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422457
Int. Cl.[4] C08L 61/14, 61/34, 61/00, 33/08
U.S. Cl. 525—490 13 Claims

1. A binder for cathodic electrocoating which is rendered water-dilutable by the addition of an acid, contains non-tertiary basic amino groups in addition to phenolic Mannich bases and consists of a mixture precondensate of

(A) 50 to 90 percent by weight of an addition polymer, a condensation polymer or a polymer adduct having a mean molecular weight of 800 to 8,000 and a content of basic primary and secondary or only secondary amino groups of 0.8 to 8 equivalents per 1,000 molecular weight units and

(B) 10 to 50 percent by weight of one or more phenolic Mannich bases, prepared from

(a) one or more polynuclear polyphenols which have at least two phenol nuclei and carry in the molecule at least two hydrogen atoms ortho to different hydroxyl groups,

(b) formaldehyde or a formaldehyde donor and

(c) one or more secondary aliphatic amines,

the sum of the percentages stated under (A) and (B) being 100, wherein not more than about one equivalent of a secondary amine (c) and not more than 2 equivalents of formaldehyde (b) are employed per equivalent of phenolic hydroxyl groups of the polyphenol (a) for the preparation of the component (B).

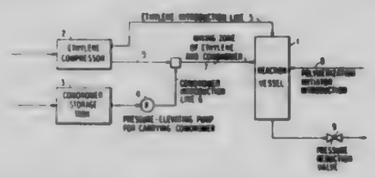
4,721,759
RESIN COMPOSITION FOR LIGHTWEIGHT FOAM CONCRETE REINFORCING STEEL STRUCTURE
Takeyuki Tanaka, Chigasaki, Japan, assignor to Nippon Oil and Fats Co., Ltd., Tokyo, Japan
Filed Jan. 23, 1987, Ser. No. 6,229
Claims priority, application Japan, Jan. 24, 1986, 61-13429
Int. Cl.[4] C08G 18/30
U.S. Cl. 525—528 12 Claims

1. A resin composition for a steel structure for reinforcing a lightweight foam concrete, comprising 60 to 95% by weight of a phenoxy resin and 5 to 40% by weight of a hardening agent having a blocked isocyanate group.

4,721,760
WATER-SOLUBLE SACCHARIDE POLYMERS
Tomas Graafland, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 15, 1987, Ser. No. 38,672
Claims priority, application United Kingdom, May 1, 1986, 8610719
Int. Cl.[4] C08F 1/00
U.S. Cl. 526—238.23 9 Claims

1. A water-soluble vinyl saccharide copolymer derived from a water-soluble monovinyloxy- or minivinylcarbonyloxymono-or di-saccharide monomer and a water-soluble cationic monomer selected from a vinyl, vinyloxy, vinylcarbonyl and vinylcarbonyloxy group-containing cationic monomer.

4,721,761
PROCESS FOR THE PREPARATION OF ETHYLENE COPOLYMER
Tadayuki Omae; Noboru Yamaguchi; Akira Kondo, and Takayuki Okada, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
PCT No. PCT/JP85/00652, § 371 Date Jul. 28, 1986, § 102(e) Date Jul. 28, 1986, PCT Pub. No. WO86/03207, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 25, 1985, Ser. No. 892,030
Claims priority, application Japan, Nov. 27, 1984, 59-251097
Int. Cl.[4] C08F 2/42, 210/02
U.S. Cl. 526—64 4 Claims



1. A process for the preparation of an ethylene copolymer which comprises introducing ethylene and one or more comonomers having a Q value (copolymerization reactivity index) of 0.1 or more, which are copolymerizable with ethylene, into a tank-shaped or tubular reaction vessel by means of an ultrahigh pressure pump and copolymerizing the comonomer or comonomers with ethylene at a pressure of 500 to 3,000 kg/cm^2 and at a temperature of 100° to 350° C. using an initiator in the presence or absence of a chain transfer agent, characterized in that (1) a gap between a packing and a retainer in the ultrahigh pressure pump for the comonomer is filled with a grease having incorporated thereinto 2 to 20% by weight of a polymerization inhibitor, and that (2) the comonomer or comonomers and a part or the whole of ethylene which has been compressed by a compressor are previously mixed with each other at the point where heat transfer from the reaction vessel is negligible before being introduced into the reaction vessel.

4,721,762
PROCESS FOR MANUFACTURING AN ETHYLENE-1-BUTENE COPOLYMER FROM ETHYLENE
Dominique Commereuc, Meudon; Francois Hugues, Nanterre; Nhuong Le Quan, Asnieres-sur-Seine, and Adberrahim Taouli, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Jan. 7, 1985, Ser. No. 742,442
Claims priority, application France, Jan. 8, 1984, 84 00179
Int. Cl.[4] C08F 4/64, 210/02
U.S. Cl. 526—75 19 Claims

1. In a process for manufacturing an ethylene-1-butene copolymer, comprising:

(a) dimerizing ethylene to 1-butene by contacting ethylene with a catalyst solution obtained by interaction of at least one alkyltitanate with at least one aluminum compound,

(b) contacting at least one portion of the effluent from step (a), wherein at least a part of the dimerization catalyst is dissolved, with at least one inorganic magnesium or aluminum compound, said inorganic compound being at least partly insoluble, so as to obtain an insoluble mixture formed of said inorganic compound impregnated with the dimerization catalyst elements,

(c) contacting said insoluble mixture with at least one halogenated aluminum compound of formula $Al_2R'_{6-n}X_n$ wherein R' is a hydrocarbyl radical, X a halogen atom and n a number in the range of 3–6, when the insoluble mixture obtained in step(b) does not already contain a halogenated aluminum compound,

(d) contacting the product obtained in step (c) or the product obtained in step (b), formed of at least one partly insoluble inorganic compound, at least one aluminum halogenated compound and at least one titanium compound, with the ethylene and 1-butene from Step 2),

the improvement wherein in step (a) the dimerization catalyst is a product of the reaction of: (1) a solution, in a hydrocarbon solvent, consisting essentially of at least one aluminum compound of the formula AlR_3 or AlR_2H wherein each of the radicals R represents hydrocarbyl, with (2) a preformed solution consisting essentially of a hydrocarbon solvent, at least one ether and at least one alkyltitanate, the ether/Ti molar ratio in step (a) being about 1:1–30:1 and the Al/Ti molar ratio in step (a) being about 2:1–5:1.

4,721,763
PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF ALPHA-OLEFINS IN FLUIDIZED BED
Jean C. Bailly; Laszlo Havas, both of Martigues; Stylianos Sandis, Lavera; Alain Biaya, and Pierre Crouzet, both of Martigues, all of France, assignors to BP Chemicals Limited, London, England
Continuation of Ser. No. 904,982, Jun. 16, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 920,930
Claims priority, application France, Jun. 24, 1982, 82 11057; Jun. 24, 1982, 82 11053; Jun. 24, 1982, 82 11055; Jun. 24, 1982, 82 11056
Int. Cl.[4] C08F 2/34, 10/00
U.S. Cl. 526—88 19 Claims

1. Process for the manufacture of polyolefins directly in the form of a powder consisting of particles having a mean diameter by mass comprised between 300 and 1,500 microns, a content of inorganic residues of less than 350 ppm and a content per gramme of less than 5×10^{-4} gramme-milliatoms of transition metal and a particle size distribution such that the ratio of the mean diameter by mass, Dm, to the mean diameter by number, Dn, is less than or equal to 3.5 comprising

in a prepolymerization contacting one or more alpha-olefins with a Ziegler catalyst system comprising a solid catalyst in the form of particles containing essentially atoms of halogen, magnesium and a transition metal of Groups IV, V and VI of the Periodic Table of Elements, and, a cocatalyst consisting of an organometallic compound of a metal of Groups I and III of the Periodic Table, to obtain a prepolymer in a form of particles,

wherein said prepolymerization is carried out in two stages, said first stage being a catalyst coating stage which is effected by the polymerization or copolymerization of alpha-olefins in suspension in a liquid medium, with this stage continuing until the coated catalyst obtained contains from 0.1 to 10 g of polymer or copolymer per gramme-milliatom of transition metal,

said second stage of prepolymerization taking place in the gas phase, and this stage continuing while preserving a suitable activity in the catalyst, until the prepolymer contains, per gramme, between 2×10^{-3} and 10^{-1} gramme-milliatom of transition metal,

then, in a final polymerization contacting the said prepolymer with one or more alpha-olefins under continuous polymerization or copolymerization conditions in the gas phase by means of a fluidized bed, to produce continuously the alpha-olefin polymer or copolymer particles, characterized in that:

(a) the prepolymer contains, per gramme, between 2×10^{-3} and 10^{-1} gramme-milliatoms of transition metal and is in the form of particles having a mean diameter by mass comprised between 80 and 300 microns and a particle size distribution such that the ratio of the mean diameter by mass, Dm, to the mean diameter by number, Dn, is less than or equal to 3, and

(b) the particles of prepolymer and polymer or copolymer are maintained in the fluidized state solely by means of an ascending gas flow containing the alpha-olefin or alpha-olefins to be polymerized and having a velocity between 40 and 80 cm/sec.

4,721,764
CURABLE ORGANOPOLYSILOXANE COMPOSITION
Hironao Fujiki, Takasaki, and Hiroyuki Tanaka, Annaka, both of Japan, assignors to Shin Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Mar. 25, 1987, Ser. No. 30,713
Claims priority, application Japan, Apr. 2, 1986, 61-76397
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—15 7 Claims

1. A curable organopolysiloxane composition which comprises:

(A) 100 parts by weight of an organopolysiloxane represented by the average unit formula

$$R^1_aR^2_bSiO_{(4-a-b)/2}$$

in which R^1 is a monovalent organic group having at least one ethylenically unsaturated linkage, R^2 is a monovalent hydrocarbon group free from aliphatic unsaturation, the subscript a is a positive number in the range from 0.0001 to 0.3 and the subscript b is a positive number larger than 1.8 but smaller than 2.5 with the proviso that a+b is in the range from 1.8 to 2.5, each of the silicon atoms at the molecular chain ends having at least one group denoted by R^1 bonded thereto, and the overall number of the ethylenically unsaturated linkages in the group or groups denoted by R^1 bonded to each of the silicon atoms at the molecular chain ends being at least two;

(B) an organohydrogenpolysiloxane represented by the average unit formula

$$R^2_cH_dSiO_{(4-c-d)/2}$$

in which R^2 has the same meaning as defined above, the subscript c is a positive number in the range from 0.5 to 2.5 and the subscript d is a positive number in the range from 0.015 to 2.0 with the proviso that c+d is in the range from 1.5 to 2.5, having at least three hydrogen atoms directly bonded to the silicon atoms in a molecule in such an

amount as to be sufficient to provide from 0.4 to 4.0 moles of the hydrogen atoms directly bonded to the silicon atoms per mole of the ethylenically unsaturated linkages in the groups denoted by R^1 in the component (A);

(C) from 1 to 15 parts by weight of an organopolysiloxane compound having, in a molecule, two hydrogen atoms directly bonded to the silicon atoms and at least one functional group selected from the class consisting of hydrolyzable groups bonded directly to the silicon atom or atoms and oxirane groups bonded to the silicon atoms either directly or through a carbon atom or carbon atoms; and

(D) a platinum compound in an amount of 1 to 100 ppm by weight as platinum based on the component (A).

4,721,765

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue; Masatoshi Arai, both of Annaka, and Koji Yokoo, Tomioka, all of Japan, assignors to Shin Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 30,693
Claims priority, application Japan, Apr. 2, 1986, 61-76396
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—18 **8 Claims**

1. A room temperature-curable organopolysiloxane composition which comprises: (A) a combination composed of

(A-1) 100 parts by weight of a diorganopolysiloxane having a substantially linear molecular structure, of which each of the silicon atoms at the molecular chain ends has a hydroxy group or two alkoxy groups directly bonded thereto,

(A-2) from 1 to 400 parts by weight of a filler,

(A-3) from 0.1 to 5 parts by weight of an alkenyloxy silane compound represented by the general formula

$$R^1_nSiX_{4-n},$$

in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, vinyl, phenyl and 3,3,3-trifluoropropyl groups, X is an alkenyloxy group represented by the general formula

$$-O-C(CH_2R^3)=CHR^2,$$

R^2 and R^3 each being a hydrogen atom or an alkyl group selected from the class consisting of methyl, ethyl and propyl groups, and n is zero or 1, or a partial hydrolyzate thereof, and

(A-4) from 0.01 to 10 parts by weight of an organosilane or organopolysiloxane compound having, in a molecule, at least one substituted or unsubstituted guanidino group represented by the general formula

$$-N=C(NR^4_2)_2,$$

in which R^4 is a hydrogen atom or a monovalent hydrocarbon group;

(B) an amino-containing organosilane compound represented by the general formula

$$R^1Si[NR^2-C_2H_4-NH)_xR^5-Si(OR^4)_3]_3,$$

in which R^1, R^2 and R^4 each have the same meaning as defined above, R^5 is a divalent hydrocarbon group having 1 to 9 carbon atoms and x is zero, 1 or 2, in an amount in the range from 0.1 to 5.0% by weight based on the component (A); and

(C) an organic tin compound in an amount in the range from 0.01 to 10% by weight based on the component (A).

4,721,766

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue; Masatoshi Arai, both of Annaka, and Koji Yokoo, Tomioka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,857
Claims priority, application Japan, Aug. 16, 1985, 60-180346
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—18 **3 Claims**

1. A room temperature-curable organopolysiloxane composition which comprises:

(a) 100 parts by weight of a diorganopolysiloxane terminated at both molecular chain ends each with a silyl group having a silanolic hydroxy group or two alkoxy groups;

(b) from 1 to 400 parts by weight of a filler;

(c) an alkenyloxy-containing organosilane compound represented by the general formula

$$R^1_nSiX_{4-n},$$

in which R^1 is a monovalent halogen-substituted or unsubstituted hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, vinyl, phenyl and 3,3,3-trifluoropropyl groups, X is an alkenyloxy group represented by the general formula

$$-O-C(=CH-R^2)(-CH_2-R^2),$$

each R^2 being a hydrogen atom or an alkyl group selected from the class consisting of methyl, ethyl and propyl groups, and n is zero or 1, or a partial hydrolysis product thereof in an at least equimolar amount to the overall content of the silanolic hydroxy groups in the component (a) and the water contained in the component (b);

(d) from 0.01 to 10 parts by weight of an organosilane or organopolysiloxane compound having, in a molecule, at least one guanidino group represented by the general formula

$$(R^3_2N)_2C=N-,$$

in which R^3 is a hydrogen atom or a monovalent hydrocarbon group;

(e) an organic tin compound in an amount in the range from 0.01 to 10% by weight based on the total amount of the components (a) to (d);

(f) an alcohol represented by the general formula R^4OH, in which R^4 is a monovalent hydrocarbon group, in an amount not exceeding 10% by weight based on the total amount of the components (a) to (d); and

(g) an alkoxysilane compound represented by the general formula $R^5_mSi(OR^6)_{4-m}$, in which R^5 is a monovalent hydrocarbon group, R^6 is an alkyl group or an alkoxy-substituted alkyl group and m is zero or 1, or a partial hydrolysis product thereof in an amount not exceeding 50% by weight based on the total amount of the components (a) to (d).

4,721,767

PROCESS FOR COPOLYMERIZATION OF BICYCLIC AMIDE ACETALS AND POLYISOCYANATES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 20, 1987, Ser. No. 4,738
Int. Cl.[4] C08G *18/30*
U.S. Cl. 528—55 **20 Claims**

1. The process for the copolymerization of a mixture of a bicyclic amide acetal and a polyisocyanate comprising carrying out the copolymerization at a temperature in the range of from about ambient temperature up to about 200° C. in the presence of a catalytic amount of a salt of a metal selected from the group consisting of bismuth, lead, mercury, copper, vanadium, cobalt, nickel, potassium, zinc and antimony.

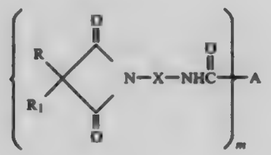
4,721,768

AZETIDINEDIONE-MONOCARBONAMIDE CAPPED PREPOLYMER

Edward F. Cassidy, Madison; David J. Goldwasser, Cheshire, and Kemal Onder, North Haven, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

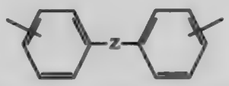
Division of Ser. No. 800,239, Nov. 21, 1985, Pat. No. 4,668,756.
This application Feb. 9, 1987, Ser. No. 12,418
Int. Cl.[4] C08G *18/28*; C08D *207/40*
U.S. Cl. 528—69 **8 Claims**

1. An azetidine-2,4-dione monocarbonamide capped prepolymer having the formula (III)



(III)

wherein A is the residue of a polycarboxylic acid having a molecular weight of from about 500 to about 8000 and a functionality m of from about 2 to about 6, R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, and X is selected from the group consisting of lower alkylene, cycloalkylene, arylene, and divalent radicals having the formula



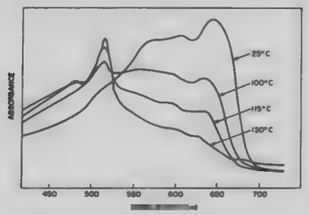
wherein Z is selected from the group consisting of —CO—, —O—, $—SO_2—$, and alkylene having 1 to 4 carbon atoms, inclusive.

4,721,769

DIACETYLENE SEGMENTED COPOLYMERS

Michael F. Rubner, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 788,759, Oct. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 750,533, Jun. 28, 1985, abandoned. This application May 27, 1986, Ser. No. 867,484
Int. Cl.[4] C08G *18/32*
U.S. Cl. 528—75 **26 Claims**



1. A segmented copolymer comprising first and second segments, said first segment containing at least one diacetylene unit and said second segment being a low molecular weight polymer containing no diacetylene units.

4,721,770

EPOXY RESIN COMPOSITIONS CONTAINING N-CYANOCARBOXYLIC ACID AMIDES AS HARDENERS

Friedrich Stockinger, Hölstein; Friedrich Lohse, Oberwil, and Roland Moser, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 466,457, Feb. 15, 1983, Pat. No. 4,618,712.
This application Jun. 24, 1986, Ser. No. 877,913
Claims priority, application Switzerland, Feb. 23, 1982, 1107/82
Int. Cl.[4] C08G *59/40, 65/00*
U.S. Cl. 528—109 **3 Claims**

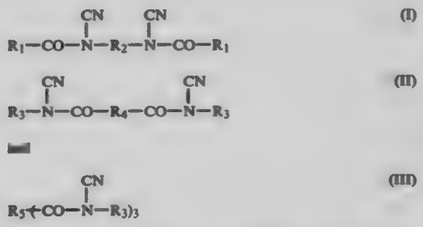
1. A curable epoxy resin composition which comprises

(a) an epoxy resin having more than one epoxy group per molecule, and

(b) an effective amount of an N-cyanocarboxylic acid amide derivative which contains two or three



groups in the molecule and has one of the formulae I to III



(I)

(II)

(III)

in which R_1 is alkyl having 1 to 8 carbon atoms, said alkyl substituted by chlorine, by bromine or by nitro, cycloalkyl having 5 to 8 carbon atoms, aryl having 6 or 10 ring carbon atoms or said aryl substituted by 1 or 2 chlorine, by 1 or 2 bromine, by 1 or 2 nitro, by 1 or 2 alkyl of 1 to 4 carbon atoms or by 1 or 2 alkoxy of 1 to 4 carbon atoms,

R_2 is alkylene having 2 to 12 carbon atoms, said alkylene interrupted by O or S atoms, but-2-enylene, but-2-ynylene, phenylenedimethylene or a radical of the formula

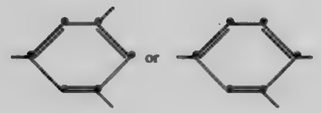


in which —A— is $—CH_2—$, $—SO_2—$ or —O—,

R_3 is alkyl having 1 to 8 carbon atoms, said alkyl substituted by chlorine, by bromine or by nitro, cycloalkyl having 5 to 8 carbon atoms, allyl methallyl, phenyl, phenyl substituted by 1 or 2 chlorine, by 1 or 2 bromine, by 1 or 2 nitro, by 1 or 2 alkyl of 1 to 4 carbon atoms or by 1 or 2 alkoxy of 1 to 4 carbon atoms or R_3 is aralkyl having not more than 12 carbon atoms, or said aralkyl substituted on the ring by 1 or 2 chlorine, by 1 or 2 bromine, by 1 or 2 nitro or by 1 or 2 alkyl of 1 to 4 carbon atoms,

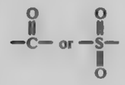
R_4 is a direct bond, alkylene having 1 to 12 carbon atoms, said alkylene interrupted by O or S atoms, 1,3-cyclohexylene, 1,4-cyclohexylene, 1,3-phenylene or 1,4-phenylene, and

R_5 is a radical of the formula



4,721,771
PREPARATION OF AROMATIC POLYMERS
Viktors Jansons, Los Gatos, and Heinrich C. Gors, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 772,182, Aug. 30, 1985, abandoned, which is a continuation of Ser. No. 659,741, Oct. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 594,503, Mar. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 481,083, Mar. 31, 1983, abandoned. This application Oct. 22, 1985, Ser. No. 790,030
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.
Int. Cl.[4] C08G *2/00, 4/00*
U.S. Cl. 528—222 23 Claims

1. A method for the preparation of an arylene ketone or an arylene sulfone oligomer which comprises reacting, in the presence of free Lewis acid and a complex between a Lewis acid and a Lewis base, a monomer system comprising at least one self reacting monomer of the formula wherein A1 is a divalent aromatic moiety, H is a hydrogen displaceable under Friedel-Crafts conditions, B is



and X is a group displaceable under Friedel-Crafts conditions; said reaction being conducted under such conditions as to produce an oligomer having an inherent viscosity of less than 0.6 and having at least 2 repeat units.

4,721,772
PROCESS FOR PRODUCING AROMATIC POLYAMIDE WITH POLAR SOLVENT CONTAINING SULFOLANE
Katsuji Ueno; Kenji Nagaoka, both of Hirakata, and Akira Miyashita, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Jun. 27, 1983, Ser. No. 508,146
Claims priority, application Japan, Jul. 6, 1982, 57-118081
Int. Cl.[4] C08G *69/28*
U.S. Cl. 528—336 16 Claims

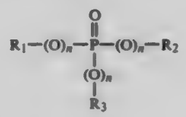
1. A process for producing a high molecular weight aromatic polyamide comprising heating and polycondensing reactants selected from the group consisting of (a) an aromatic aminocarboxylic acid, (b) a mixture of an aromatic dicarboxylic acid and an aromatic diamine and (c) a mixture of (a) and (b) in a polar solvent in contact with a dehydrating catalyst at a reaction temperature of about 160° C. or higher, said polar solvent being at least one organic solvent and containing about 20% by weight or more of sulfolane.

4,721,773
PROCESS FOR PRODUCING GRANULAR VINYL CHLORIDE POLYMER
Hiroshi Yoshida, Takaoka; Shiro Imaizumi, Yokohama, and Masaaki Nishina, Takaoka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 676,877, Nov. 30, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 27,119
Claims priority, application Japan, Dec. 2, 1983, 58-228075
Int. Cl.[4] C08F *6/24*
U.S. Cl. 528—491 6 Claims

1. A process for producing a granular vinyl chloride polymer, which comprises mixing, at a temperature of 20° to 70° C., an aqueous dispersion of a vinyl chloride polymer with an organic liquid being difficultly soluble in water and incapable of dissolving or swelling the vinyl chloride polymer to prepare an aggregate of particles of the vinyl chloride polymer, dehydrating the aggregate and then drying it, said drying being carried out by using a fluidized drying machine under such conditions that the temperature of the vinyl chloride polymer is not more than 40° C. in the constant rate period of drying and not more than 50° C. in the falling rate period of drying, the superficial velocity of the drying air in an empty fluidized drying machine in the falling rate period of drying being lower than that in the constant rate period of drying, and the drying in said constant rate period is carried out until the moisture content of the vinyl chloride polymer reaches 3–7% and the drying in said falling rate period is carried out until the moisture content of the vinyl chloride polymer reaches not more than 1%.

4,721,774
THERMOPLASTIC MOULDING COMPOSITIONS WITH FLAME-RESISTANT PROPERTIES
Gert Tödtemann; Klaus Reinking, both of Wermelskirchen, and Otto Koch, Cologne, all of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 797,409, Nov. 12, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 27,796
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442571; Dec. 8, 1984, 3444867
Int. Cl.[4] C08K *5/51, 5/52*
U.S. Cl. 324—139 11 Claims

1. A thermoplastic moulding composition consisting of
(A) 50 to 90 parts by weight of a thermoplastic, halogen-free, aromatic polycarbonate of 2,2-bis-(4-hydroxyphenyl)-propane or 1,1-bis-(4-hydroxyphenyl-cyclohexane,
(B) 10 to 50 parts by weight of a halogen-free copolymer of random structure, comprising 95 t 70% by weight, of styrene, α-methylstyrene or nuclear-alkylated styrene(s), or mixtures of these vinyl aromatics, and 5 to 30% by weight, of maleic anhydride,
(C) 5 to 15 parts by weight, based on 100 parts of the total weight of (A)+(B), of a halogen-free phosphorus compound of the general formula



(I)

in which
R_1, R_2 and R_3, independently of one another, denote a C_1–C_8-alkyl or an optionally alkyl-substituted C_6–C_{20}-aryl, and n is 0 or 1, and
(D) 0.05–5 parts by weight, again based on 100 parts of the total weight of (A)+(B), of a tetrafluoroethylene polymer.

4,721,775
EFFECTIVE PEPTIDES RELATED TO THE LUTEINIZING HORMONE RELEASING HORMONE FROM L-AMINO ACIDS
Karl Folkers, Austin, Tex.; Cyril Y. Bowers, New Orleans, La.; Pui-Fun L. Tang, and Minoru Kubota, both of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.
Filed Aug. 26, 1985, Ser. No. 771,546
Int. Cl.[4] C07K *7/20*
U.S. Cl. 530—313 10 Claims

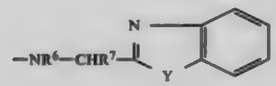
1. p-Glu His Trp Ser His Gly Trp Gln Pro Gly-NH_2.

4,721,776
AMINO ACID DERIVATIVES
Peter Raddatz, Darmstadt; Günter Hölzemann, Seeheim; Claus J. Schmitges, Umstadt, and Klaus O. Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany
Filed Nov. 14, 1986, Ser. No. 930,483
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540495
Int. Cl.[4] A61K *37/64;* C07C *103/52;* C12Q *1/36*
U.S. Cl. 530—323 17 Claims

1. An amino acid derivative of the formula

X—Z—NR^2—CHR^3—CHR^4—$(CHR^5)_m$—CO—
B—D

in which
X is H, R^1—O—C_mH_{2m}—CO—, R^1—C_mH_{2m}—O—CO—, R^1—C_mH_{2m}—CO—, R1—SO_2—, (R^1—C_mH_{2m})—L(-R^1—C_pH_{2p}— C_rH_{2r}—CO—, H—$(NHCH_2CH_2)_m$—NH—CH_2CO— or 9-fluorenyl-C_mH_{2m}—O—CO—,
Z is 0 to 4 amino acid residues which are bonded together in the manner of a peptide, each being Abu, Ada, Ala, Arg, Asn, Bia, Cal, Dab, Gln, Gly, His, N(im)-alkyl-His, Ile, Leu, tert.-Leu, Lys, Met, αNal, βNal, Nbg, Nle, Orn, Phe, Pro, Ser, Thr, Tic, Trp, Tyr or Val,
B is absent or is Abu, Ala, Cal, Gly, Ile, Leu, Met, Nle or Val,
D is



or the latter in which one or more CH groups in the benzene ring are replaced by N,
Y is NH, O or S,
R^1 and R^3 are each independently A; Ar; Ar-alkyl; A, Ar, or Ar-alkyl each substituted by A, AO, Hal, or a combination thereof; cycloalkyl with 3–7C atoms; cycloalkyl-alkyl with 4–11C atoms; bicycloalkyl or tricycloalkyl, each of 7–14C atoms; or bicycloalkylalkyl or tricycloalkylalkyl, each of 8–18C atoms,
R^2, R^5 and R^6 are each independently H or A,
R^4 is OH or NH_2,
R^7 is H, A, cycloalkylalkyl or Ar-alkyl,
L is CH or N,
m, p and r are each independently 0, 1, 2, 3, 4 or 5,
n is 1 or 2,
Ar is naphthyl, phenyl, or phenyl substituted by A, AO, Hal, CF^3, OH, NH^2, or a combination thereof,
Hal is F, Cl, Br or I, and
A is alkyl of 1–8C atoms,
wherein A, Ar, Hal and alkyl are each chosen independently, and
wherein one or more —NH—CO groups are replaced by —NA—CO— groups,
or a pharmacologically acceptable salt thereof.

4,721,777
PROCESS FOR THE VIRUS-INACTIVATION OF IMMUNOGLOBULIN
Yahiro Uemura, Hirakata; Katuhiro Uriya, Sakurai; Tsuyoshi Takahashi, Toyonaka; Takashi Goto, Kyoto; Masahiro Funayama, Hirakata; Masayuki Nishida, Nagaokakyo, and Tadakazu Sayama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan
Filed Sep. 23, 1985, Ser. No. 778,708
Claims priority, application Japan, Sep. 25, 1984, 59-200241
Int. Cl.[4] C07K *3/12*
U.S. Cl. 530—389 14 Claims

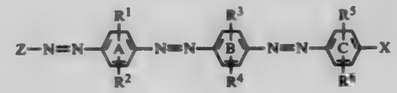
1. A process for virus-inactivating immunoglobulin comprising heating a composition containing the immunoglobulin in a substantially dry state at a temperature of 30° to 100° C. for a period of time sufficient to inactivate virus contained in the composition without destroying the activity of the immunoglobulin itself.

4,721,778
AMMONIUM LIGNOSULPONATES
Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.
Division of Ser. No. 679,901, Dec. 10, 1984, Pat. No. 4,642,336. This application Oct. 21, 1985, Ser. No. 789,316
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] C07G *1/00*
U.S. Cl. 530—501 6 Claims

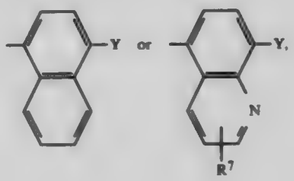
1. An ammonium salt of a low-electrolyte containing sulfomethylated lignin particularly suited for use as a dye or a coal-water slurry additive having about 1 mole or less sulfonation per 1,000 grams of lignin and an inorganic electrolyte content in an aqueous medium of from about 0.5 to 3.0% by weight based on the dry weight of the lignin.

4,721,779
TRISAZO DYES CONTAINING NAPHTHALENE OR QUINOLINE UNITS AND THEIR USE IN LIQUID CRYSTAL MATERIALS
Karl-Heinz Etzbach, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 5, 1986, Ser. No. 893,268
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3529958
Int. Cl.[4] C09B *31/16, 33/22;* C09K *3/34;* G02F *1/13*
U.S. Cl. 534—577 8 Claims

1. An asymmetric trisazo compound of the formula



where Z is



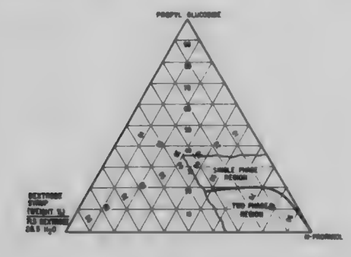
X and Y independently of one another are each C_1–C_{24}-alkoxy, benzyloxy, phenylethoxy, mono-C_1–C_{24}-alkylamino, monobenzylamino, monophenylethylamino, monophenylamino, bis-C_1–C_{24}-alkylamino, N-C_1–C_{12}-alkyl-N-benzylamino, N-C_1–C_{12}-alkyl-N-phenylethylamino or N-C_1–C_{12}-alkyl-N-phenylamino, where the benzene rings are unsubstituted or substituted by C_1–C_{12}-alkyl, cyclohexyl, 4-C_1–C_{12}-alkylcyclohexyl, C_1–C_{24}-alkoxy, phenoxy or C_1–C_{24}-alkanoyloxy, R^1, R^2, R^3, R^4, R^5 and R^6 independently of one another are each hydrogen, methyl, methoxy or chlorine and R^7 is hydrogen or methyl, and each of the rings A or B is a single ring or has fused thereto a benzene ring.

4,721,780

GLYCOSIDE PREPARATION DIRECTLY FROM AQUEOUS SACCHARIDE SOLUTIONS OR SYRUPS

Robert S. McDaniel, Jr., and Donald L. Johnson, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 6, 1985, Ser. No. 698,717
Int. Cl.[4] C07H *15/04, 15/00, 17/00*
U.S. Cl. 536—18.6 19 Claims



1. A process for preparing a glycoside product by reacting a water soluble monosaccharide reactant with a C_2 to C_6 monohydric aliphatic alcohol reactant, which process comprises:

a. admixing an aqueous solution containing, on a total aqueous solution weight basis, from about 20 to about 90 weight percent of said monosaccharide reactant with the alcohol reactant to provide a homogeneous, single phase aqueous reaction medium which comprises said monosaccharide and alcohol reactants and water and which is free of any separate and distinct aqueous phase consisting essentially of only water and the monosaccharide reactant; and

b. reacting said monosaccharide reactant with said alcohol reactant by contacting said homogeneous aqueous reaction medium with an acid catalyst at a temperature of from about 60° to about 200° C. while removing water from the reaction mixture at a rate sufficient to prevent the formation of a separate and distinct aqueous monosaccharide solution phase during the course of said reaction.

4,721,781

METHOD FOR LOWERING REDUCING SUGAR CONTENT OF GLYCOSIDE COMPOSITIONS

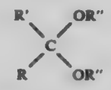
Richard L. Rowton, Austin, Tex., assignor to ARCO Chemical Company, Newtown Square, Pa.

Filed Jan. 18, 1984, Ser. No. 571,768
Int. Cl.[4] C07H *1/00*
U.S. Cl. 536—4.1 7 Claims

1. A process for the preparation of glycoside mixtures low in reducing sugars comprising

a. reacting a starch hydrolysate selected from the group consisting of the hydrolysates of potato starch, corn starch, tapioca starch, wheat starch and rice starch with polyols selected from the group of diols and triols having 5 or less carbon atoms in the presence of an acid catalyst at a temperature in the range from about 75° to 125° C. to give crude glycoside mixtures containing 1 to 3 wt% reducing sugars, and

b. treating the crude glycoside mixtures from step a. with 1 to 10 wt% of a compound having the formula



where R is hydrogen or lower alkyl of 1 to 4 carbon atoms, R′ is lower alkyl of 1 to 4 carbon atoms or —OR″ and where R″ is lower alkyl of 1 to 4 carbon atoms, at a temperature in the range from 75° to 125° C. to give glycoside mixtures containing 0.05 to 0.3 wt% reducing sugars.

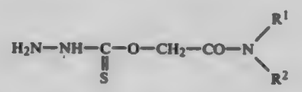
4,721,782

METHOD OF PREPARING HYDRAZINE-THIOCARBOXYLIC ACID O-CARBAMOYLMETHYL ESTERS

Fritz Maurer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 684,568, Dec. 21, 1984. This application Oct. 10, 1985, Ser. No. 786,252
Int. Cl.[4] C07D *211/70, 211/60, 233/54, 231/10*
U.S. Cl. 540—607 6 Claims

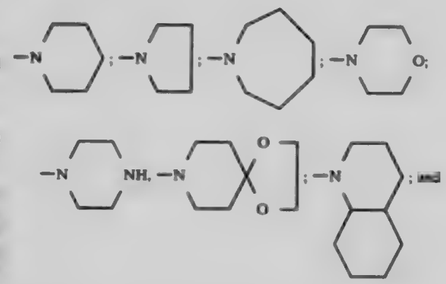
1. A process for the preparation of a hydrazine-thiocarboxylic acid O-carbamoyl ester of the formula



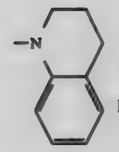
in which

R^1 and R^2 each independently is hydrogen, alkyl, alkenyl or alkynyl with up to 8 carbon atoms, cycloalkyl or cycloalkenyl each of which has 3 to 7 carbon atoms and is optionally substituted by alkyl with 1 to 4 carbon atoms, alkoxy or alkoxyalkyl with 1 to 8 carbon atoms, halogenoalkyl with 1 to 8 carbon atoms and 1 to 5 halogen atoms, aralkyl with 6 to 10 carbon atoms in the aryl part and 1 or 2 carbon atoms in the alkyl part, or aryl which has 6 to 10 carbon atoms and is optionally substituted by halogen, alkyl, alkoxy or alkylthio with in each case 1 to 4 carbon atoms, halogenoalkyl, halogenoalkoxy or halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 halogen atoms, or nitro; or

R^1 and R^2, together with the nitrogen atom to which they are bonded, form a radical selected from the group consisting of



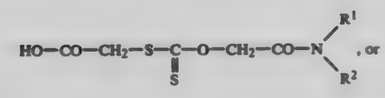
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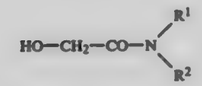
optionally substituted up to three times by methyl, ethyl and/or phenyl,

comprising reacting hydrazine hydrate with

(a) an O-carbamoylmethyl S-carboxymethyl dithiocarbonate of the formula



(b) with the successive reaction product of a hydroxyacetamide of the formula



with carbon disulphide in the presence of a base, and then of an alkali metal chloroacetate.

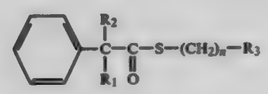
4,721,783

ANTI-SPASMODIC AGENTS HAVING A HETEROCYCLIC RING

William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Inc., Tucson, Ariz.

Filed Jan. 9, 1986, Ser. No. 817,443
Int. Cl.[4] C07D *265/30, 279/12*
U.S. Cl. 544—58.1 2 Claims

1. An antispasmodic agent having the formula



(I)

wherein:

n is an integer from 0 to 2;

R_1 is aryl or cycloalkyl;

R_2 is hydrogen or hydroxyl; and

R_3 is a heterocyclic nitrogen ring connected via carbon linkage to the main chain and is selected from the group consisting of 1-methyl-imidazolinyl, 1-ethyl-imidazolinyl, 1-n-propyl-imidazolinyl, 1-iso-propyl-imidazolinyl, 1-methyl-imidazolyl, 1-ethyl-imidazolyl, 1-n-propyl-imidazolyl, 1-isopropyl-imidazolyl, 1-methyl-morpholinyl, 1-ethyl-morpholinyl, 1-n-propyl-morpholinyl, 1-iso-propyl-morpholinyl, 1-methylpiperazinyl, 1-ethyl-piperazinyl, 1-n-propyl-piperazinyl, 1-isopropyl-piperazinyl, 1-methyl-piperidinyl, 1-ethyl-piperidinyl, 1-n-propyl-piperidinyl, 1-iso-propyl-piperidinyl, 1-methylpyrazolyl, 1-ethyl-pyrazolyl, 1-n-propyl-pyrazolyl, 1-iso-propyl-pyrazolyl, 1-methyl-pyrrolidinyl, 1-ethyl-pyrrolidinyl, 1-n-propyl-pyrrolidinyl, 1-iso-propyl-pyrrolidinyl, 1-methyl-3-pyrrolinyl, 1-ethyl-3-pyrrolinyl, 1-n-propyl-3-pyrrolinyl, 1-isopropyl-3-pyrrolinyl, 1-methyl-thiomorpholinyl, 1-ethylthiomorpholinyl, 1-n-propyl-thiomorpholinyl, 1-iso-propylthiomorpholinyl, 4-methyl-1,2,4-triazolyl, 4-ethyl-1,2,4-triazolyl, 4-n-propyl-1,2,4-triazolyl, 4-iso-propyl-1,2,4-triazolyl.

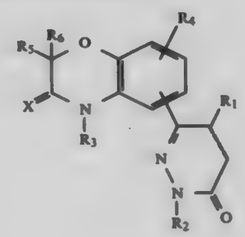
4,721,784

6-BENZOXAZINYL-2,3,4,5-TETRAHYDROPYRIDAZIN-3-ONES

Donald W. Combs, Piscataway, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 22, 1986, Ser. No. 944,316
Int. Cl.[4] C07D *413/04*
U.S. Cl. 544—105 16 Claims

1. A compound of the formula



where

X is H, H or O;

R_1 is H, C_{1-6} unbranched alkyl, C_{3-6} branched-chain alkyl or C_{3-6} cycloalkyl;

R_2 is H, C_{1-6} unbranched alkyl, C_{3-6} branched-chain alkyl, C_{3-6} cycloalkyl or C_{2-6} alkenyl;

R_3 is H, C_{1-6} unbranched alkyl, C_{3-6} branched-chain alkyl or C_{3-6} cycloalkyl, and when X is 2H, R_3 may also be acyl or alkanesulfonyl;

R_4 is H, halogen, C_{1-6} unbranched alkyl, C_{3-6} branched-chain alkyl, C_{3-6} cycloalkyl or C_{1-6} alkoxy;

R_5 and R_6 are independently H, C_{1-6} unbranched alkyl, C_{3-6} branched-chain alkyl C_{3-6} cycloalkyl; and C_{3-6} branched-chain alkyl C_{3-6} cycloakyl; and

the dotted line is a single or double bond between C4 and C5 of the pyridazine ring.

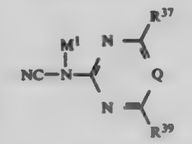
4,721,785

INTERMEDIATE 2-CYANOAMINO-PYRIMIDINE AND TRIAZINE DERIVATIVES

Koichi Moriya, Hachioji, Japan; Theodor Pfister, Mosbeim, Fed. Rep. of Germany; Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Ludwig Eue, Leverkusen, Fed. Rep. of Germany; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 578,345, Feb. 9, 1984, Pat. No. 4,602,938. This application Apr. 18, 1986, Ser. No. 853,822
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307679; Sep. 23, 1983, 3334455
Int. Cl.[4] C07D *239/47, 239/52*
U.S. Cl. 544—194 12 Claims

1. A compound of the formula



in which

Q is N or CH,

M^1 is hydrogen, C_1–C_6-alkyl (which is optionally substituted

by fluorine, chlorine or cyano), C_3–C_6-alkenyl, C_3–C_6-alkinyl or benzyl,
R^{37} is hydrogen or C_1–C_4-alkoxy, and
R^{39} is C_1–C_4-alkyl or C_1–C_4-alkoxy.

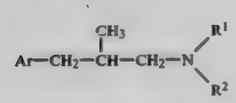
4,721,786

β-NAPHTHYLALKYLAMINES

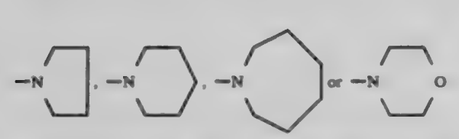
Joachim Weissmüller, Wuppertal; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,128
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413897
Int. Cl.⁴ C07D *40/06, 251/18;* H01N *31/00*
U.S. Cl. 71—88 **6 Claims**

1. A β-naphthylalkylamine of the formula



in which
Ar represents β-naphthyl which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising halogen and alkyl and alkoxy with in each case 1 to 6 carbon atoms, and
R^1 and R^2, together with the nitrogen atom to which they are bonded, represent a heterocyclic radical of the formula



which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising in each case straight-chain or branched alkyl and hydroxyalkyl with in each case 1 to 4 carbon atoms,
or a plant-tolerated acid addition salt thereof.

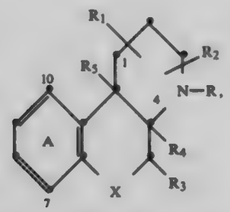
4,721,787

PROCESS FOR THE PREPARATION OF BENZO-(PYRANO AND THIOPYRANO)-PYRIDINES

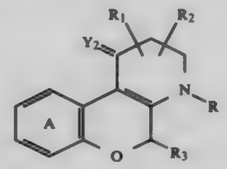
Alan J. Hutchison, Verona, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 609,037, May 10, 1984, abandoned. This application Sep. 26, 1985, Ser. No. 780,711
Int. Cl.⁴ C07D *491/052, 495/04*
U.S. Cl. 546—89 **12 Claims**

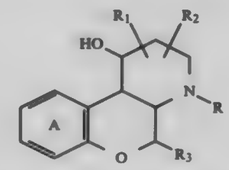
1. A process for the preparation of a compound of the formula



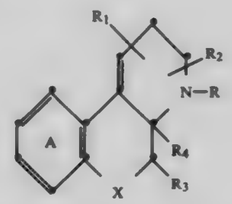
having a trans 4a,10b-ring junction wherein X represents oxygen; ring A is substituted by lower alkoxy or hydroxy; R represents lower alkyl; R_1–R_5 represent hydrogen; which comprises condensing the corresponding lower alkoxy substituted 2H[1]-benzopyran-3-one with the corresponding carboxy-protected 3-aminopropanoic acid to yield a compound of formula XVIII



wherein Y_2 represents oxygen; ring A is substituted by lower alkoxy, R, R_1–R_3 are as defined for formula I; reducing said compound to a corresponding compound of the formula XIX,



dehydrating the said compound of formula XIX to a corresponding compound of formula Ia



wherein ring A is substituted by lower alkoxy, X, R and R_1–R_4 have meaning as defined for formula I; reducing the resulting double bond therein; optionally converting a said compound of formula I wherein ring A is substituted by lower alkoxy to a corresponding compound of formula I wherein ring A is substituted by hydroxy and isolating the trans-4a,10b-isomer of a said compound of formula I.

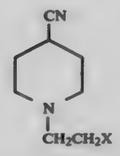
4,721,788

4-CYANOPIPERIDINE DERIVATIVES

Hiroshi Yamauchi; Seiichiro Nomoto, both of Ibaraki; Isao Sugiyama; Yuuki Komatu, both of Ibaraki; Takeo Kasai, Chiba; Keizo Takayanagi, Gunma; Yasuhide Tanaka, Saitama; Atsushi Koiwa, Chiba, and Shinichi Endoh, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,697
Claims priority, application Japan, Jul. 12, 1985, 60-152439
Int. Cl.⁴ C07D *211/26*
U.S. Cl. 546—246 **5 Claims**

1. A 4-cyanopiperidine derivative represented by the following general formula (I):



wherein X represents a halogen atom, or a medicinally acceptable acid addition salt thereof.

4,721,789

OXIDATIVE CYCLIZATION OF 2-METHYLGLUTARONITRILE TO 3-CYANOPYRIDINE

Robert DiCosimo, Shaker Heights; James D. Burrington, Richmond Heights, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 5, 1984, Ser. No. 678,433
Int. Cl.⁴ C07D *213/85*
U.S. Cl. 546—250 **5 Claims**

1. A process for making 3-cyanopyridine by the vapor phase catalytic reaction of 2-methylglutaronitrile with molecular oxygen.

4,721,790

NUCLEOPHILIC SUBSTITUTION PROCESS FOR FLUORONITROARALKYLOXAZOLINE

Kenneth C. Lilje, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 469,726, Feb. 25, 1983, Pat. No. 4,540,795. This application Nov. 13, 1984, Ser. No. 671,101
Int. Cl.⁴ C07D *263/08*
U.S. Cl. 548—237 **14 Claims**

1. A process which compriaes reacting a fluoronitroaromatic compound with an alpha-substituted 2-alkyloxazoline by mixing the reactants under substantially anhydrous conditions in an inert solvent and in the presence of a base so as to form a fluoronitroaralkyloxazoline.

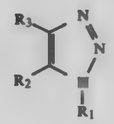
4,721,791

5-AMINO OR SUBSTITUTED AMINO 1,2,3-TRIAZOLES

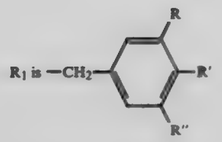
Richard J. Bochis, East Brunswick; Elbert Harris, Westfield, and Richard L. Tolman, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 576,302, Feb. 2, 1984, abandoned. This application May 19, 1986, Ser. No. 864,651
Int. Cl.⁴ C07D *249/06;* A61K *31/41*
U.S. Cl. 548—255 **10 Claims**

1. A compound having the formula:



wherein:



wherein one of R, R′ and R″ is trichlorovinyl and the other two of R, R′ and R″ are selected from hydrogen, halogen, cyano, trifluoromethyl, loweralkanoyl, nitro, loweralkyl, loweralkoxy, carboxy, carbalkoxy, trifluoromethoxy, acetamido, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, trichlorovinyl, trifluoromethylthio, trifluoromethylsulfinyl, or trifluoromethylsulfonyl;
R_2 is amino, mono or diloweralkyl amino, acetamido, acetimido, ureido, formamido, formimido or guanidino; and
R_3 is carbamoyl, cyano, carbazoyl, amidino or N-hydroxycarbamoyl.

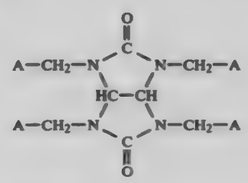
4,721,792

N,N′,N″,N‴-TETRAKIS(SUBSTITUTED BENZYL)-ACETYLENECARBAMIDE DERIVATIVES

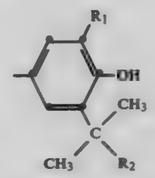
Manji Sasaki, Ibaraki; Chinchito Ebina, Minoo; Haruki Okamura, Osaka; Shinichi Yachigo, Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 30, 1986, Ser. No. 825,559
Claims priority, application Japan, Feb. 13, 1985, 60-27325
Int. Cl.⁴ C07D *235/00*
U.S. Cl. 548—304 **2 Claims**

1. An acetylenecarbamide derivative represented by the formula (I),



wherein A represents



in which R_1 represents a hydrogen atom or a C_1–C_4 alkyl group, and R_2 represents a C_3–C_9 alkyl group.

4,721,793

AZETIDINE-3-CARBOXYLIC ACID DERIVATIVES

Ronald F. Mason, Ashford, and Paul H. Briner, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 18, 1985, Ser. No. 756,430
Claims priority, application United Kingdom, Jul. 26, 1984, 8419084
Int. Cl.⁴ C07D *205/04*
U.S. Cl. 548—953 **1 Claim**

1. N-Benzylazetidine-3-carboxylic acid methyl ester.

4,721,794

5SUBSTITUTED THIOPHENE-2-SULFONAMIDE ANTIGLAUCOMA AGENTS

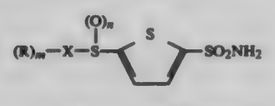
Kenneth L. Shepard, North Wales, and Samuel L. Graham, Harleysville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 667,666, Nov. 2, 1984, abandoned. This application Jul. 30, 1986, Ser. No. 890,576

Int. Cl.[4] C07D *333/22, 241/04, 265/30*

U.S. Cl. 549—65 **5 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein

X is a straight or branched, saturated or unsaturated hydrocarbon, or a saturated cyclic hydrogen, of 1 to 10 carbon atoms;

m is 1 or 2;

n is 0, 1 or 2;

R is

(1) hydroxy

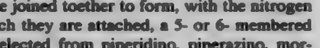


(2)



(3)

(4) $—N(R^1)_2$ wherein the R^1 groups are the same or different, or can be joined toether to form, with the nitrogen atom to which they are attached, a 5- or 6- membered hetrocycle selected from piperidino, piperazino, morpholino and 1-pyrrolyl



(5)



(6)

wherein R^1 is

(a) hydrogen,

(b) C_{1-4}alkyl,

(c) hydroxy-C_{1-4}alkyl,

(d) C_{1-4}alkoxy-C_{1-4}alkyl,

(e) phenyl,

(f) pridyl,

(g) carboxy-C_{1-4}alkyl,

(h) ω-amino-ω-carboxy-C_{1-4} alkyl.

4,721,795

FLUOROPOLYETHERS CONTAINING END GROUPS ENDOWED WITH ANCHORING CAPACITY

Gerardo Caporiccio, Milan; Ezio Strepparola, Bergamo, and Mario A. Scarati, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 31, 1984, Ser. No. 687,844

Claims priority, application Italy, Jun. 19, 1984, 21481 A/84

Int. Cl.[4] C07D *319/18, 319/20, 317/52*

U.S. Cl. 549—445 **3 Claims**

1. A compound having a formula selected from

(I) $RO(C_3F_6O)_m—(CFXO)_n—CFX—L$, and

(II) $R''CFXO—(C_3F_6O)_x—(CFXO)_y—(C_2F_4O)_z—CFX—L$, in which

R is selected from the group consisting of $—CF_3$, $—C_2F_5$, and $—C_3F_7$;

X is selected from the group consisting of F and $—CF_3$;

R' is selected from the group consisting of F, $—CF_3$ and $—C_2F_5$ and, when x is zero; R'' is L as defined hereinafter

m is an integer from 3 to 100;

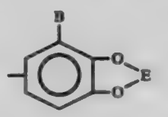
n is zero or a finite integer wherein m+n ranges from 3 to 100, provided that, when n is finite, m/n ranges from 5 to 20 and R is $—CF_3$, and when n is zero, R is selected from the group consisting of $—C_2F_5$ and $—C_3F_7$;

x is zero or a finite integer;

y,z are finite integers such that x+y+z ranges from 5 to 200, and x+z ranges from 5 to 0.5, provided that when x is zero, z/y ranges from 1 to 0.5, y+z ranges from 5 to 200, and X is F;

L is an orgnic non-polymerizable group A-Y, in which A is selected from the group consisting of $—CH_2O—$, $—CH_2O—CH_2—$, $—CF_2—$ and $—CF_2O—$; and

Y is an organic radical having formula (b):



(b)

where

E is slected from the group consisting of $—CHR_3$ and $—CH_2—CHR_3—$;

R_3 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; and

B is selected from the group consisting of hydrogen and a radical $—OR_3$.

4,721,796

NITRATES OF D-ISOIDIDE

Lloyd D. Hayward, 2041 West 29th Avenue, Vancouver, British Columbia V6J 2Z9, Canada

Continuation of Ser. No. 635,277, Jul. 27, 1984, abandoned. This application Nov. 14, 1986, Ser. No. 931,904

Claims priority, application Canada, Aug. 5, 1983, 434018

Int. Cl.[4] C07D *493/04*

U.S. Cl. 549—464 **3 Claims**

1. A nitrate ester of D-isoidide.

4,721,797

PROCESS FOR THE PREPARATION OF N-ACYL-N-ALKYL-2,6-DIALKYL-3-CHLOROANILINES

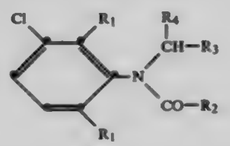
Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Hans Süess, Möhlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,626

Int. Cl.[4] C07C *102/00;* **C07D** *307/16*

U.S. Cl. 549—493 **27 Claims**

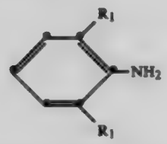
1. A process for the preparation of an N-acyl-N-alkyl-2,6-dialkyl-3-chloroaniline of formula I



(I)

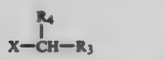
wherein R_1 is methyl or ethyl, R_2 is alkoxymethyl, chloromethyl or 2-tetrahydrofuryl, R_3 is alkoxymethyl, carboxy or alkoxycarbonyl and R_4 is hydrogen or methyl and, if R_3 is carboxy or alkoxycarbonyl, R_4 is also 2-alkoxyethyl and 2-

alkoxypropyl, and R_3 and R_4, together with the carbon atom to which both radicals are attached, may also form a 2-oxotetrahydro-3-furyl radical or a 2-oxo-5-methyltetrahydro-3-furyl radical, which process comprises reacting a 2,6-dialkylaniline of formula II



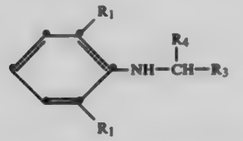
(II)

wherein R_1 is as defined for formula I, with a halide of formula III



(III)

wherein R_3 and R_4 are as defined for formula I and X is chlorine or bromine, to give an N-alkyl-2,6-dialkylaniline of formula IV

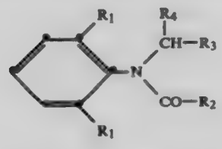


(IV)

wherein R_1, R_3 and R_4 are as defined for formula I, then reacting the N-alkyl-2,6-dialkylaniline of formula IV with an acylating agent formula V

$$X_1—CO—R_2 \quad (V)$$

wherein R_2 is as defined for formula I and X_1 is chlorine, bromine or $—O—CO—R_2$, and subsequently converting the resultant N-acyl-N-alkyl-2,6-dialkylaniline of formula VI



(VI)

wherein R_1, R_2, R_3 and R_4 are as defined for formula I, by reaction with chlorine into an N-acyl-N-alkyl-2,6-dialkyl-3-chloroaniline of formula I.

4,721,798

PROCESS FOR EPOXIDATION OF OLEFINICALLY-UNSATURATED COMPOUNDS

Albertus J. Mulder, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 615,410, May 30, 1984, abandoned. This application Feb. 18, 1986, Ser. No. 830,484

Claims priority, application United Kingdom, Jun. 1, 1983, 8315060

Int. Cl.[4] C07D *301/06*

U.S. Cl. 549—533 **27 Claims**

1. A process for epoxidizing an olefinic double bond in an olefinically-unsaturated compound other than an α,β-unsaturated carboxylic acid or a compound having a six-membered ring of carbon atoms wherein 3 or 4 of the ring atoms have sp^2 hybrid orbitals, which comprises contacting a liquid phase mixture containing the olefinically-unsaturated compound, an aldehyde having at least two carbon atoms in a quantity of at least about one mol of said aldehyde per mol of olefinically-unsaturated compound, and a solvent with molecular oxygen in the presence of a catalyst which comprises a praseodymium compound in solution in the said liquid phase.

4,721,799

EPOXY RESINS BASED ON TETRAGLYCIDYL DIAMINES

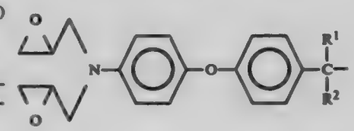
Richard H. Newman-Evans, Somerville, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 3, 1986, Ser. No. 835,735

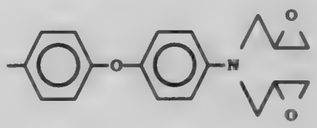
Int. Cl.[4] C07D *303/08, 303/36*

U.S. Cl. 549—552 **3 Claims**

1. A tetraglycidate of the formula



(I)



wherein

R^1 and R^2 are independently hydrogen, alkyl of 1 to 8 carbon atoms, perfluoroalkyl, or



taken together form a cycloalkylidene ring of 5 to 7 carbon atoms.

4,721,800

BIOCOMPATIBLE SURFACES

Dennis Chapman, Buckinghamshire, and Aziz A. Durrani, London, both of England, assignors to Biocompatibles Ltd., London, United Kingdom

PCT No. PCT/GB85/00025, § 371 Date Sep. 18, 1985, § 102(e) Date Sep. 18, 1985, PCT Pub. No. WO85/03295, PCT Pub. Date Aug. 1, 1985

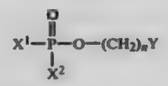
PCT Filed Jan. 18, 1985, Ser. No. 778,185

Claims priority, application United Kingdom, Jan. 20, 1984, 8401534

Int. Cl.[4] C07F *7/08, 7/10, 7/18*

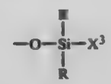
U.S. Cl. 556—405 **10 Claims**

1. A compound of formula



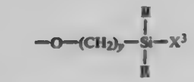
I

in which X^1 is



-continued

or



in which each R, which may be the same or different, is a C_1–C_4 alkyl group, y is an integer from 1 to 10 and X^3 is a reactive group that can react to form a covalent bond with a reactive group on the surface of a material to be rednered bicompatible, X^2 is a group $-O^{\ominus}$ or precursor of such a group, n is 2, 3 or 4, Y is a group $-N^{\oplus}R_3A^{\ominus}$ wherein each R, which may the the same or diffreent, is a C_1–C_4 alkyl group and $A^{\ominus}$ is an anion present when X^2 is an electrically neutral group or Y is



wherein R^1 together with X^2 forms a direct bond between the nitrogen and phosphorus atoms.

4,721,801

PROCESS FOR THE PREPARATION OF ORGANOHALOSILANES

Lutz Röuch, Kempten; Günter Kratel, Durach-Bechen, and Anton Strob, Munich, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,337

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610267

Int. Cl.⁴ C07F *7/08, 7/12*

U.S. Cl. 550—478 **19 Claims**

1. A process for the preparation of an organohalosilane of the formula:

$$X_{4-n}SiR_n$$

wherein

R represents a functional group selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, phenyl and tolyl;

X represents a halogen selected from the group consisting of chlorine and bromine; and

n is an integer from 1 to 3, inclusive,

comprising the steps of:

subjecting to a heat treatment an SiO_2-containing material, iron powder, carbon and a catalyst, said heat treatment being at a temperature of 800° to 1400° C.; and

thereafter reacting the SiO_2-containing material with a hydrocarbon halide of the formula RX wherein R and X are defined as above in the presence of the iron powder, the carbon and the catalyst.

4,721,802

DITHIOPHOSPHORUS/AMINE SALTS

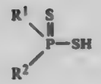
John W. Forsberg, Mentor-On-The-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 7, 1983, Ser. No. 456,219

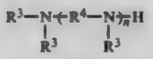
Int. Cl.⁴ C07F *9/165*

U.S. Cl. 558—207 **14 Claims**

1. A composition comprising a continuous aqueous phase, (A) at least one phosphorus acid/amine salt perpared by reaction (I) at least one dithiophosphorus acid compound of the formula



wherein R^1 and R^2 are individually selected from the group consisting of hydrocarbyl radicals containing from 1 to about 30 carbon atoms and hydrocarbyloxy compounds containing from 1 to about 30 carbon atoms with (II) at least one amino compound selected from the group consisting of cyclic polyamines, alkylene polyamines of the general formula



wherein each of R^3 is individually selected from the group consisting of hydrogen atoms, hydrocarbyl radicals containing from about 1 to about 40 carbon atoms and hydroxy-substituted hydrocarbyl radicals containing from 1 to about 40 carbon atoms, R^4 is a divalent hydrocarbyl radical containing from 1 to about 18 carbon atoms and n is an integer ranging from 1 to about 10 and, optionally, (B) at least one surface active agent selected from the group consisting of emulsifiers, surfactants and detergents.

4,721,803

METHOD OF MAKING A DIASTEREOMERIC MIXTURE CONTAINING TWO DIASTEREOMERIC N-ACYL-AMINO ACID ESTERS

Mark C. Cesa, South Euclid; Robert A. Dubbert, Solon, and James D. Burrington, Richmond Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 29, 1985, Ser. No. 792,375

Int. Cl.⁴ C07C *103/46*; C07D *207/16*

U.S. Cl. 560—41 **7 Claims**

1. In the process of hydrocarboxylating an α-enamide with CO and an organic hydroxyl compound to produce a N-acyl-α-amino acid ester whose alpha C atom is chiral, the improvement comprising using as the organic hydroxyl compound reactant, an organic hydroxyl compound which also has a chiral C atom that is essentially all L or D, thereby producing a reation mixture having essentially no enantiomeric pairs and containing diastereomeric N-acyl-α-amino acid esters having two chiral centers, said hydrocarboxylating simultaneously creating (1) said ester, the chirality of said alpha C atom in L, D form and (2) the second chiral center in said ester in essentially all L or all D form.

4,721,804

PROCESS FOR THE PREPARATION OF Δ 3-TETRAHYDROBENZOIC ACID- Δ 3-TETRAHYDROBENZYL ESTER

Guenter Prescher, Hanau; Andreas Grund, Darmstadt; Heinrich Petsch, Hanau, and Georg Boehme, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,689

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514938

Int. Cl.⁴ C07C *67/44*

U.S. Cl. 560—128 **11 Claims**

1. A process for the preparation of Δ3-tetrahydrobenzoic acid-Δ3-tetrahydrobenzyl ester comprising

continuously feeding at least 90 weight percent liquid 3-cyclohexene-1-carboxaldehyde and 0.1 to 5 weight percent, based on the aldehyde, of a catalyst consisting essentially of liquid aluminum alcoholate or a liquid aluminum mixed alcoholate, at 20° to 100° C., to a reactor or a cascade of 2 to 3 reactors with recirculation of a portion of the reactor contents with essentially complete backmixing to obtain a reaction mixture, feeding said reaction mixture into a flow tube reactor at 20° to 100° C., whereby the residence time is reduced such that the conversion of 3-cyclohexene-1-carboxaldehyde downstream of the cascade is greater than 90%, and downstream of the flow tube reactor greater than 96% wherein the ratio of volume per unit of time which flows through the reactor to the volume per unit of time which is recirculated through the reactor ranges from 10 to 20.

4,721,805

PREPARATION OF ACYLOXY BENZENE SULFONATE

Marvin Nussbaum, Northfield, Ill., assignor to Stepan Company, Northfield, Ill.

Continuation of Ser. No. 723,217, Apr. 15, 1985. This application Nov. 28, 1986, Ser. No. 936,057

Int. Cl.⁴ C07C *67/02*

U.S. Cl. 560—254 **18 Claims**

1. A storable aqueous composition having an APHA color which is less than about 150 and which comprises on a 100 weight percent total composition basis from about 10 to 40 weight percent of an acyloxybenzene sulfonate salt, from about 1.0 to 12.0 weight percent of by-products, and from about 48 to 89 weight percent water, and wherein, in said salt, the cation is selected from the group consisting of alkali metals, alkaline earth metals, and ammonium, and wherein said acyl group incorporates a saturated aliphatic radical containing from 2 through 19 carbon atoms, said composition being produced by the steps of sequentially:

(A) contacting substantially pure acyloxy benzene with SO_3 at a temperature ranging from about −20° to 50° C. to produce an intermediate reaction product which comprises about a 1:1 molar adduct of said SO_3 and said acyloxy benzene,

(B) maintaining said intermediate reaction product at an average temperature in the range from about 25° to 75° C. for a time inversely ranging from about 4 to 0.1 hours sufficient to produce a product composition containing at least about 80 weight percent of the corresponding acyloxy benzene sulfonic acid, and

(c) admixing the resulting said acyloxy benzene sulfonic acid with an aqueous solution of a base of said cation.

4,721,806

PROCESS FOR SEPARATING 2,4-TOLUENE DIISOCYANATE FROM ISOMERS OF TOLUENE DIISOCYANATE

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 915,826, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 781,561, Sep. 30, 1985, abandoned. This application May 8, 1987, Ser. No. 47,953

Int. Cl.⁴ C07C *143/00*

U.S. Cl. 560—352 **4 Claims**

1. A process for separating 2,4-toluene diisocyanate from a feed mixture comprising 2,4-toluene diisocyanate and 2,6-toluene diisocyanate, said process comprising contacting said mixture at adsorption conditions with an adsorbent comprising a Y- type zeolite, cation exchanged with a cation from the group Na, Ca, Li and Mg, thereby selectively adsorbing said 2,4-toluene diisocyanate-, removing the remainder of said mixture from said adsorbent, and then recovering said adsorbed 2,4-toluene diisocyanate by desorption at desorption conditions with a desorbent material comprising toluene.

4,721,807

PROCESS FOR SEPARATING 2,6-TOLUENE DIISOCYANATE FROM ISOMERS OF TOLUENE DIISOCYANATE

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 915,826, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 781,561, Sep. 30, 1985, abandoned. This application May 8, 1987, Ser. No. 47,341

Int. Cl.⁴ C07C *143/00*

U.S. Cl. 560—352 **4 Claims**

1. A process for separating a feed mixture comprising 2,4-toluene diisocyanate and 2,6-toluene diisocyanate, said process comprising contacting said mixture at adsorption conditions with an adsorbent comprising a Y-type zeolite, cation exchanged with K, thereby selectively adsorbing said 2,6-toluene diisocyanate isomer, removing the remainder of said mixture from said adsorbent, and then recovering said adsorbed 2,6-toluene diisocyanate by desorption at desorption conditions with a desorbent material comprising toluene.

4,721,808

PROCESS FOR PURIFICATION OF CRUDE P-HYDROXYMETHYLBENZOIC ACID

Lawrence D. Lillwitz, Glen Ellyn, and Steven A. Cerefice, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 21, 1987, Ser. No. 40,887

Int. Cl.⁴ C07C *65/00*

U.S. Cl. 562—473 **12 Claims**

1. A process for purification and decolorization of a crude p-hydroxymethylbenzoic acid compound containing 4-carboxybenzaldehyde and color bodies by hydrogenation to prepare purified p-hydroxymethylbenzoic acid which process comprises:

(a) preparing a basic solution of said crude p-hydroxymethylbenzoic acid compound in a polar solvent wherein pH of said solution is greater than 7 to solubilize said compound;

(b) passing hydrogen through said solution to hydrogenate said crude p-hydroxymethylbenzoic acid compound containing 4-carboxybenzaldehyde and color bodies to hydrogenate said 4-carboxybenzaldehyde and said color bodies, in the presence of a platinum catalyst, at a temperature less than 75° C., said 4-carboxybenzaldehyde being hydrogenated to a p-hydroxymethylbenzoic acid compound, wherein said solution after hydrogenation is characterized by a color of less than Gardner 1; and

(c) separating p-hydroxymethylbenzoic acid compound from said 4-carboxybenzaldehyde in said solution by neutralizing and cooling said solution to effect crystallization.

4,721,809

ALKYLSULFONAMIDO OR PERFLUOROALKYLSULFONAMIDO BENZENESULFONAMIDES

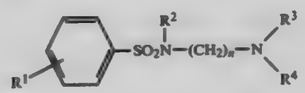
George C. Buzby, Jr., Blue Bell, and Thomas J. Colatsky, Paoli, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 18, 1986, Ser. No. 909,133

Int. Cl.⁴ C07C *143/72*

U.S. Cl. 564—82 **10 Claims**

1. A compound of the formula:



in which

R^1 is alkylsulfonamido of 1 to 6 carbon atoms or perfluoroalkylsulfonamido of 1 to 6 carbon atoms;
R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;
R^3 is hydrogen or alkyl of 1 to 6 carbon atoms;
R^4 is alkyl of 1 to 6 carbon atoms; and
n is one of the integers 2, 3 or 4;
or a pharmaceutically acceptable salt thereof.

4,721,810
CATALYTIC ALKYLATION OF AROMATIC AMINES WITH ETHERS

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 6, 1984, Ser. No. 618,005
Int. Cl.[4] C07C *89/02, 85/24*
U.S. Cl. 564—399 **13 Claims**

1. A process for alkylating aromatic amines comprising the step of reacting at a temperature within the range of from about 300°–400° C. (a) an aromatic amine having at least one primary amino group on an aromatic ring and having a replaceable hydrogen atom on the ring in at least an ortho or para position relative to such amino group, with (b) an acyclic ether, in the presence of a mixed metal oxide alkylation catalyst consisting essentially of between about 70 to 100 mole % of a Group IV-B metal oxide and between 0 to about 30 mole % of (i) a Group VI-B metal oxide, or (ii) a Group VIII metal oxide, or (iii) a mixture of (i) and (ii) so that alkylation of the aromatic amine occurs.

4,721,811
SYNTHESIS OF ALIPHATIC POLYAMINES

Martin B. Sherwin, Potomac; Shu-Chieh P. Wang, Columbia, and Stewart R. Montgomery, Ashton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,286
Int. Cl.[4] C07C *85/12*
U.S. Cl. 564—491 **25 Claims**

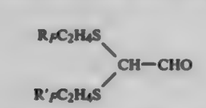
1. A process of converting polynitriles to non-cyclic, aliphatic compounds having a plurality of primary amino groups comprising, in a fixed-bed reactor maintained at a temperature of from about 50° C. to about 150° C. and having granular Raney cobalt packing therein, introducing into the reactor an aliphatic polynitrile having cyano groups directly separated by from 2 to 3 atoms in conjunction with at least about 5 weight percent based on the polynitrile of a liquid primary or secondary amine containing compound, contacting the polynitrile with the Raney cobalt in the presence of hydrogen pressure of from about 2000 to 10,000 psi for a time sufficient to produce non-cyclic, aliphatic compounds having a plurality of primary amino groups as the dominant product and recovering said aliphatic polyamines.

4,721,812
2,2-BIS-(2-PERFLUOROALKYLETHYLTHIO)-ACETALDEHYDES AND PROCESS FOR PRODUCTION THEREOF

Brigitte Bertaina; Aimé Cambon, both of Nice, and André Lantz, Vernaison, all of France, assignors to Atochem, France Division of Ser. No. 801,791, Nov. 26, 1985. This application May 5, 1987, Ser. No. 46,168

Claims priority, application France, Nov. 28, 1984, 84/18106
Int. Cl.[4] C07C *151/00, 148/00*
U.S. Cl. 568—41 **4 Claims**

1. A process for the preparation of 2,2-bis-(2-perfluoroalkylethylthio)acetaldehydes having the formula:



(II)

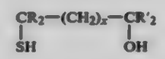
wherein R_F and R'_F are the same or different and are a straight or branched perfluorinated chain, C_nF_{2n+1}, n being from one to 20, which comprises reacting a 2-perfluoroalkylethanethio or a mixture of such thiols with glyoxal in the presence of an acid catalyst.

4,721,813
METHOD FOR THE OXIDATION OF MERCAPTOALKANOLS TO DITHIODIGLYCOLS

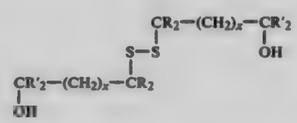
Harold W. Mark, and John S. Roberts, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1986, Ser. No. 900,214
Int. Cl.[4] C07C *148/00*
U.S. Cl. 568—22 **7 Claims**

1. A method for the conversion of a mercaptoalkanol having the structure:



wherein each R and R′ is independently either H or a C_1 to C_3 alkyl radical and x is a whole number ranging between 0 and 3, to a dithiodiglycol having the structure:



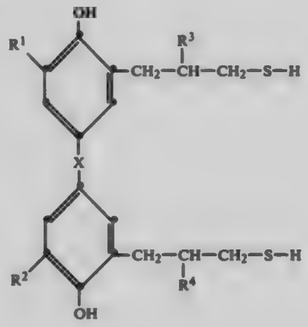
which comprises contacting said mercaptoalkanol with an oxygen-containing gas and anhydrous ammonia, wherein the mole ratio of ammonia to said mercaptoalkanol is maintained below about 0.01:1.

4,721,814
MERCAPTAN-CONTAINING POLYPHENOLS

Sheik A. Zahir, Oberwil, and Karl Mechera, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

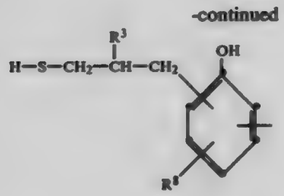
Filed Jan. 16, 1987, Ser. No. 3,962
Claims priority, application Switzerland, Jan. 23, 1986, 253/86
Int. Cl.[4] C07C *148/00, 149/00*
U.S. Cl. 568—62 **6 Claims**

1. A compound of formula I or II

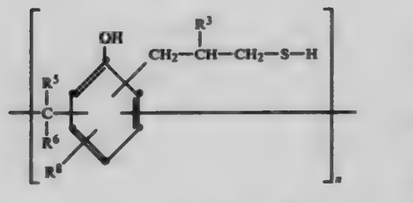


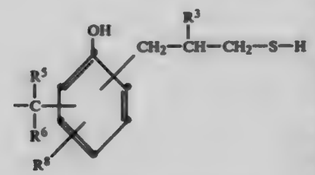
(I)

-continued



(II)





in which formulae R^1 and R^2 are each independently of the other hydrogen, C_1–C_{18}alkyl, C_3–C_{18}alkenylmethyl, cyclohexyl, phenyl, benzyl or tolyl, or are a —CH_2—CHR^3—CH_2—S—H group, R^3 and R^4 are each independently of the other hydrogen or methyl, X is —CR^5R^6—, —S—, —SO—, —SO_2— or —$(CH_3)C[-(CH_2)_m$—$COOR^7]$—, R^5 and R^6 are each independently of the other hydrogen or C_1–C_6alkyl, R^7 is C_1–C_{18}-alkyl, R^8 is hydrogen, C_1–C_{18}alkyl, C_3–C_{18}alkenylmethyl or phenyl, m is 1 or 2 and n is an integer from 1 to 10.

4,721,815
PREPARATION OF SUBSTITUTED BENZOPHENONES

Gregory P. Hausmann, Warrenville, and Carl A. Udovich, Joliet, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1986, Ser. No. 944,516
Int. Cl.[4] C07C *45/65*
U.S. Cl. 568—312 **5 Claims**

1. A process for preparing a benzophenone from a 3-cyclohexene carboxylic acid, which process comprises contacting a feed containing a 3-cyclohexene carboxylic acid selected from the group consisting of 3-cyclohexene carboxylic acid, 4-methyl-3-cyclohexene carboxylic acid, 3,4-dimethyl-3-cyclohexene carboxylic acid and mixtures thereof in the vapor phase and at a temperature within the range of about 250° C. to about 500° C., a pressure within the range of about 5 psia to about 200 psia, and a contact time within the range of about 1 sec to 10 sec with a catalyst selected from the group consisting of MnO_2, ThO_2, ZrO_2/Al_2O_3 and MnO_2/Al_2O_3 to convert said carboxylic acid into a benzophenone.

4,721,816
PREPARATION OF NONIONIC SURFACTANTS

Charles L. Edwards, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1985, Ser. No. 812,604
Int. Cl.[4] C07C *41/03*
U.S. Cl. 568—618 **19 Claims**

1. A process for the preparation of an alkanol alkoxylate product characterized by a narrow-range alkylene oxide adduct distribution and by a low content of residual alcohol, which comprises contacting and reacting an alkylene oxide reactant comprising one or more C_2 to C_4 vicinal alkylene oxides with an alkanol reactant comprising one or more C_6 to C_{30} alkanols in the presence of a catalytically effective amount of a catalyst prepared by contacting (i) one or more sulfur-containing acids selected from the group consisting of sulfuric acid, sulfur trioxide, and C_1 to C_{30} alkyl sulfuric acids, and (ii) one or more aluminum compounds selected from the group consisting of aluminum alcoholates and aluminum phenolates, the molar ratio of (i) to (ii) being in the range from about 0.1:1 to 2:1.

4,721,817
PREPARATION OF NONIONIC SURFACTANTS

Charles L. Edwards, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1986, Ser. No. 948,378
Int. Cl.[4] C07C *41/03*
U.S. Cl. 518—618 **24 Claims**

1. A process for the preparation of an alkanol alkoxylate product characterized by a narrow-range alkylene oxide adduct distribution and by a low content of residual alkanol, which comprises contacting and reacting an alkylene oxide reactant comprising one or more C_2 to C_4 vicinal alkylene oxides with an alkanol reactant comprising one or more C_6 to C_{30} alkanols in the presence of a catalytically effective amount of a catalyst prepared by contacting (i) one or more phosphorus-containing acids selected from the group consisting of the ortho-, hypo-,and pyro-forms of both phosphoric and phosphorous acid, the alkali and alkaline earth metal and alkyl, aryl, arylalkyl, and alkylaryl dihydrogen phosphates, and the alkyl, aryl, arylalkyl, and alkylaryl phosphinic and phosphonic acid and (ii) one or more aluminum compounds selected from the group consisting of aluminum alcoholates and aluminum phenolates, the molar ratio of (i) to (ii) being in the range from about 0.1:1 to 2.5:1

4,721,818
PURIFICATION OF POLYOLS PREPARED USING DOUBLE METAL CYANIDE COMPLEX CATALYSTS

Stephen D. Harper, and Stephen H. Harris, both of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 20, 1987, Ser. No. 28,530
Int. Cl.[4] C07C *41/34, 41/44, 41/13*
U.S. Cl. 568—120 **12 Claims**

1. A method for removing double metal cyanide complex catalyst residue from polyols which comprises after polyol formation the steps of:
(a) incorporating into the catalyst residue-containing polyol an effective amount of an alkali metal hydride to convert the double metal cyanide complex catalyst into an insoluble ionic metal species separable from the polyol wherein the polyol hydroxyl groups are also converted to alkoxide groups; and
(b) separating the insoluble ionic metal species from the polyol.

4,721,819
PROCESS FOR THE PREPARATION OF HIGHER ALLYLIC ETHERS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1986, Ser. No. 947,771
Int. Cl.[4] C07C *41/05*
U.S. Cl. 568—675 **11 Claims**

1. In a process for the preparation of allylic ethers which comprises contacting and reacting an allylic alcohol alcohol reactant comprising one or more C_6 to C_{20} allylic alcohols with a glycol reactant which comprises one or more C_2 or C_3 alkylene glycols and their polyalkylene glycols in the presence of a cuprous salt catalyst and an acidic cocatalyst, the improvement

which comprises contacting the allylic alcohol and alkylene glycol reactants in an agitated reaction mixture containing a solvent for the allylic alcohol reactant and the ether product which is substantially immiscible with the alkylene glycol reactant, said solvent being present and maintained in the reaction mixture in a quantity by weight which is at least about three times the weight of the allylic alcohol reactant and as the reaction proceeds, of the allylic ether product.

4,721,820

PROCESS FOR THE ISOMERIZATION OF ALLYLIC ETHERS

Ronnie M. Hanes, Milford, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,081
Int. Cl.⁴ C07C *41/32*
U.S. Cl. 568—689 **21 Claims**

1. A process for isomerizing an allylic ether comprising contacting a compound having the structural formula

$$CH_2{=}CH{-}CH(OR){-}R^1$$

where R is hydrocarbyl and R^1 is an organo group with a hydroxy-containing compound and a catalytically effective amount of a catalyst selected from the group consisting of cupric chloride, cupric bromide, a mixture of cupric chloride and palladium chloride, a mixture of cupric chloride and palladium bromide, a mixture of cupric bromide and palladium chloride and a mixture of cupric bromide and palladium bromide whereby a product, having the structural formula

$$RO{-}CH_2{-}CH{=}CH{-}R^1$$

where R and R^1 have the meanings given above, is formed.

4,721,821

METHOD FOR PREPARING NITROBIBENZYL SYSTEMS

Sven G. B. Andersson, Malmö, Sweden, assignor to Chemical Dynamics Development AB, Skara, Sweden

PCT No. PCT/SE85/00533, § 371 Date Aug. 14, 1986, § 102(e) Date Aug. 14, 1986, PCT Pub. No. WO86/03743, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 19, 1985, Ser. No. 899,293
Claims priority, application Sweden, Dec. 20, 1984, 8406497
Int. Cl.⁴ C07C *79/10*
U.S. Cl. 568—931 **12 Claims**

1. Method for preparing bibenzyl systems, substituted with nitro groups, comprising oxidatively coupling toluene derivatives with nitro groups in methanolic KOH or NaOH solution in the presence of a catalyst selected from the group consisting of metal acetylacetonates, metal acetylacetonates and crown ether, metal salts and crown ether, and metal tetraphenylprophins.

4,721,822

PROCESS FOR PREPARING 2,6-DICHLOROTOLUENE

Andrea Leone-Bay, Ridgefield, Conn.; Peter E. Timony, Valley Cottage, and Laurel Glaser, Buchanan, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 14, 1986, Ser. No. 862,934
Int. Cl.⁴ C07C *17/12*
U.S. Cl. 570—201 **7 Claims**

1. A process for preparing 2,6-dichlorotoluene comprising:
(a) reacting liquid para-toluenesulfonyl chloride and chlorine gas in the absence of a solvent and in a molar ratio of the chloride to gas from about 0.5:1 to about 1.5:1 at a temperature from about 70° C. to about 100° C. in the presence of a catalytic amount of a Lewis Acid catalyst;
(b) adding sulfuric acid to the reaction mixture of step (a) then heating the mixture; and
(c) cooling the reaction mixture of step (b) to about room temperature then neutralizing by adding at least one equivalent, based on the added sulfuric acid, of ammonium hydroxide to yield 2,6-dichlorotoluene.

4,721,823

LUBRICANTS COMPRISING NOVEL CYCLOPENTANES, CYCLOPENTADIENES, CYCLOPENTENES, AND MIXTURES THEREOF AND METHODS OF MANUFACTURE

Clifford G. Venier, and Edward W. Casserly, both of The Woodlands, Tex., assignors to Pennzoil Products Company, Houston, Tex.

Filed Sep. 19, 1986, Ser. No. 909,305
Int. Cl.⁴ C07C *13/11, 13/08, 13/12, 13/19*
U.S. Cl. 585—20 **7 Claims**

1. A cyclopentane of the following formula:



wherein each R_1 is individually and independently selected from alkyl groups of from 1 to 4 carbon atoms, each R_2 is individually and independently selected from C_8–C_{36} straight or branch chained hydrocarbyl groups, z is 0, 1, 2 or 3, and y is an integer ranging from 3 to 6.

4,721,824

GUARD BED CATALYST FOR ORGANIC CHLORIDE REMOVAL FROM HYDROCARBON FEED

John P. McWilliams, Woodbury; Margaret I. Nemet-Mavrodin, Robbinsville; Catherine T. Sigal, Lawrenceville, and Robert C. Wilson, Jr., Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 908,916, Sep. 18, 1986, abandoned, which is a continuation of Ser. No. 653,275, Sep. 24, 1984, abandoned. This application Mar. 12, 1987, Ser. No. 23,896
Int. Cl.⁴ C07C *2/64, 5/22*; C10G *17/00*
U.S. Cl. 585—448 **26 Claims**

1. A method of removing substantially all organic chlorides from hydrocarbon feedstocks comprising passing an organic chloride-containing feedstock in contact with catalyst particles at a space velocity from about 1 to about 34 WHSV, wherein said particles are obtained by mixing magnesium oxide with a binder substantially inert with respect to said feedstock and shaping said mixture to produce shaped catalyst particles.

4,721,825

PROCESS FOR THE PRODUCTION OF XYLENE

Sumihiro Oda, and Haruhito Sato, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,461
Claims priority, application Japan, Jun. 17, 1983, 58-107890; Jul. 13, 1983, 58-126225
The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.
Int. Cl.⁴ C07C *2/68*
U.S. Cl. 585—462 **20 Claims**

1. In an improved process for producing xylene by contacting toluene or benzene with a methylating agent in the presence of a catalyst whereby said toluene or benzene is methylated to form xylene, said methylation being carried out at a temperature of from 200° C. to 650° C., the improvement comprising using as said catalyst (i) a fluorine-containing crystalline borosilicate or (ii) a fluorine-containing crystalline aluminosilicate having a silica/alumina molar ratio of at least 12/1 and a Constraint index of from 1 to 12.

4,721,826

PROCESS FOR RESTORING OR MAINTAINING THE ACTIVITY OF HETEROGENEOUS CATALYSTS FOR REACTIONS AT NORMAL AND LOW PRESSURES

Helmut Tiltscher, Munich; Helmut Wolf, Garching; Joachim Scheichshorn, and Kurt Dialer, both of Munich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 731,348, May 6, 1985, Pat. No. 4,605,811, which is a continuation of Ser. No. 268,387, May 9, 1981, abandoned. This application Apr. 7, 1986, Ser. No. 849,131
Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020698
Int. Cl.⁴ C07C *2/68*; B01J *21/20, 29/38*
U.S. Cl. 585—467 **9 Claims**

1. A process for reactivating or maintaining the activity of an oxide contact catalyst useful for catalytic alkylation of benzene with an olefin at atmospheric or low pressure wherein the oxide contact catalyst tend to decrease in activity by deposition, physisorption or chemisorption of organic or inorganic deactivating substances present at the start of said catalytic alkylation or formed during said alkylation, which comprises conducting said catalytic alkylation at an operating pressure above the critical pressure and a temperature of at least equal to the critical temperature of the fluid benzene and olefin reactants for a period of time at least sufficient to remove any deactivating substances on said catalyst and to avoid formation, deposition, physisorption or chemisorption thereof on said catalyst.

3. The process of claim 1 wherein the effective critical pressure and temperature of said benzene and olefin reactants is lowered by addition of an effective amount of a compatible reaction auxiliary inert to said catalytic alkylation.

6. A process for reactivating or maintaining the activity of an oxide contact catalyst useful for catalytic alkylation of benzene with an olefin at atmospheric or low pressure wherein the oxide contact catalyst tends to decrease in activity by deposition, physisorption or chemisorption of organic or inorganic substances present at the start of said catalytic alkylation or formed during said alkylation, which comprises conducting said catalytic alkylation at an operating pressure and temperature at least equal to the critical pressure and temperature of the fluid benzene and olefin reactants for a period of time at least sufficient to remove any deactivating substances on said catalyst and to avoid formation, deposition, physisorption or chemisorption thereof on said catalyst.

4,721,827

CRYSTALLINE MAGNESIA-SILICA COMPOSITES AND PROCESS FOR PRODUCING SAME

Leonard A. Cullo, Hempfield Township, Westmoreland County; Edward F. Restelli, Jr., Oakmont Borough, and Francis J. Shiring, III, Hampton Township, Allegheny County, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 703,568, Feb. 20, 1985, Pat. No. 4,623,530. This application Aug. 22, 1986, Ser. No. 899,569
Int. Cl.⁴ C07C *2/68*
U.S. Cl. 585—467 **6 Claims**

1. Method of alkylating a single-ring aromatic compound comprising contacting the aromatic compound and an alkylating agent selected from olefins and mono-alcohols having 1–3 carbon atoms, under alkylating conditions, with a crystalline magnesium silicate catalyst having its strongest X-ray diffraction peaks at d-spacings of about 4.08, 3.38, and 10.08 made by (1) forming an aqueous reaction mixture consisting essentially of about 0.05 to about 0.225 mole % magnesium salt, about 0.22 to about 0.24 mole % tetrapropyl ammonium halide templating material, about 0.5 to 1 mole % alkali metal oxide, about 2 to 2.5 mole % SiO_2, and about 3 to about 3.5 mole % alkali metal halide, in deionized water to form 100 mole %, in a container to form a precipitate, (2) stirring the reaction mixture of step (1) and heating it at a temperature of about 175° C. to about 195° C. to form a crystallized product, and (3) calcining the product of step (2).

4,721,828

METHANE CONVERSION

Howard P. Withers, Douglasville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,730, Apr. 16, 1984, abandoned. This application Oct. 31, 1984, Ser. No. 666,694
Int. Cl.⁴ C07C *2/00*
U.S. Cl. 585—500 **9 Claims**

1. A method for synthesizing hydrocarbons from a methane source which comprises:
(a) contacting at a temperature within the range of about 500°–1000° C. a gas comprising methane and a solid comprising: (1) a reducible oxide of Fe and (2) at least one member of the group consisting of alkali metals, alkaline earth metals, and compounds thereof in an amount sufficient to improve the selectivity to higher hydrocarbons, said contacting producing C_2+ hydrocarbons, coproduct water and solids comprising a reduced Fe oxide, provided that when said solid comprises an alkaline earth metal or compound thereof, said contacting is carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof;
(b) recovering C_2+ hydrocarbons;
(c) at least periodically contacting the solids comprising reduced Fe oxide with an oxygen-containing gas to produce a solid comprising a reducible Fe oxide; and
(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

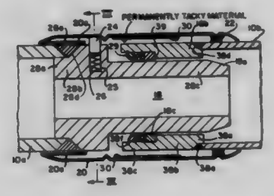
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,829

GAS INSULATED TRANSMISSION LINE WITH SHIELDED ELECTRICAL JOINT ASSEMBLY

Jeffry R. Meyer, Penn Hill Township, Allegheny County, Pa.; Melvyn D. Hopkins, N. Grafton, and Gary K. Bowman, Westboro, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1986, Ser. No. 938,910
Int. Cl.[4] H02G 5/06
U.S. Cl. 174—21 JS **5 Claims**



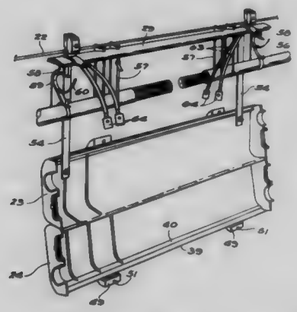
1. A gas insulated transmission line comprising:
first and second inner conductor segments supported within an outer sheath, each having a major portion of a hollow cylindrical configuration with substantially uniform inner and outer dimensions, said first segment having a plug end bonded to said major portion thereof and said second segment having a socket end bonded to said major portion thereof within which said plug end of said first segment fits;
contact means attached to an inside extremity of said socket end for making a sliding electrical joint between said socket end and said plug end; and,
a shield for covering and electrostatically shielding said electrical joint, said shield comprising a metal member encircling said joint and held in place on said plug end of said first segment, said shield having a folded under portion over said bond between said plug end and said major portion of said first segment, said shield also being formed to fit on a seal ring located in close relation to said socket end.

4,721,830

CABLE ENCLOSURE

Gideon B. Dugan, Santa Monica, and Charles W. Wans, Huntington Beach, both of Calif., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed Jun. 25, 1987, Ser. No. 66,309
Int. Cl.[4] H02G 15/113, 7/08
U.S. Cl. 174—41 **23 Claims**



1. In a cable enclosure for enclosing electrical cable splices, the combination of:
an elongate housing having first and second housing members each having first and second spaced edges, with said housing members joined together along said first edges for movement between a housing closed condition and a housing open condition;
an elongate header having attachment means for attaching said header to a messenger cable;
said housing members further including closure means for joining said housing members together adjacent said second edges with said header therebetween; and
suspension means connected between said header and one of said housing members for supporting said housing members from said header when in said open condition.

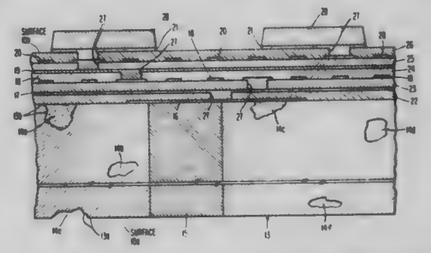
17. In a cable enclosure for enclosing electrical cable splices, an elongate housing having first and second housing members each having first and second spaced edges, with said housing members joined together along said first edges for movement between a housing closed condition and a housing open condition,
said housing members having end sections which cooperate to close an end of said housing when in said closed condition, said cooperating end sections including replaceable end plates with a pair of end plates having openings defining a cable passage.

4,721,831

MODULE FOR PACKAGING AND ELECTRICALLY INTERCONNECTING INTEGRATED CIRCUIT CHIPS ON A POROUS SUBSTRATE, AND METHOD OF FABRICATING SAME

Harshadrai Vora, Eden Prairie, Minn., assignor to Unisys Corporation, Detroit, Mich.

Filed Jan. 28, 1987, Ser. No. 7,766
Int. Cl.[4] H05K 1/00
U.S. Cl. 174—68.5 **12 Claims**

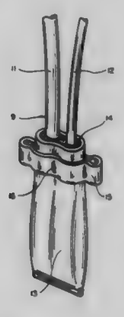


8. A module comprising: a ceramic substrate which has a surface that is pitted by a plurality of pores; a filler material filling the pores in said pitted surface and yet exposing the remainder of said pitted surface to form a pit free surface which is part ceramic and part filler material; and said filler material being of a type which resists abrasion substantially less than said ceramic substrate.

9. A method of fabricating a module, for packaging and electrically interconnecting integrated circuits; said method including the steps of:
providing a substrate of a porous material which has a surface that is pitted by a plurality of pores;
coating said pitted surface and filling said pores therein with a liquid film of a material which has a solid state that resists abrasion substantially less than said substrate;
solidifying said film on said surface and in said filled pores;
wearing down said solidified film with an abrasive member which is soft enough to contact said surface of said porous material without wearing said surface down;
stopping said wearing down step after said film is removed entirely off of said pitted surface but not out of the pores themselves to thereby obtain a pit free surface; and
disposing metal lines over said pit free surface for interconnecting circuits.

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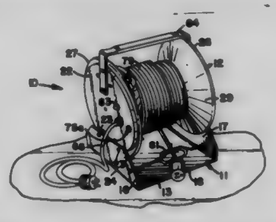
4,721,832
ELECTRICAL CONNECTION SEALING DEVICE
Lester T. Toy, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 730,407, May 2, 1985, abandoned. This application May 2, 1986, Ser. No. 859,161
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—87 33 Claims



9. An Article comprising:
(A) an exposed portion of an electrical connection of two or more cables;
(B) an envelope, having an opening at one end, of a material having a flexural modulus of at least 1,000 psi at 23° C.;
(C) the envelope containing a polymeric gel having a cone penetration value of about 30 to about 400 (10^{-1} mm) and an elongation of from about 25% to about 850%;
(D) the envelope and polymeric gel positioned such that it encloses the exposed portion of the electrical connection; and
wherein the polymeric gel comprises a crosslinked non-silicone polymer having an olefinic unsaturated content of less than 10 mole percent and having dispersed therein a liquid in an amount of from about 20% to about 95% by weight based on the weight of the liquid and polymer and from 0 to 0.3 volume fraction of a filler, said cross-linked polymer
(a) if derived from a solid, relatively high molecular weight polymer, having a gel fraction of at least about 50%, or
(b) if derived from a liquid, relatively low molecular weight polymer, having at least about 0.1 crosslinks per weight average molecule;
said composition having a storage modulus of $(1+2.5v+14.1v^2)x$ dynes/cm^2 wherein x is less than 5×10^5 at 30° C. and greater than 5×10^2 at 90° C., and v is the volume fraction of the filler, with the proviso that if the crosslinked polymer is prepared from a solid high molecular weight polymer, the storage modulus at 140° C. is at least about 70% of the storage modulus at 70° C.; and a dynamic viscosity of $(1+2.5v+14.1v^2)y$ poises wherein y is less than 1×10^5 at 30° C. and greater than 5×10^2 at 90° C. and v is the volume fraction of the filler, said composition exhibiting first degree blocking.

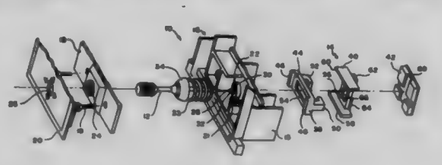
4,721,833
RETRIEVABLE ELECTRIC CORD REEL
Frank X. Dubay, 5515 Ridgewood Cove, Mound, Minn. 55364
Filed Nov. 15, 1985, Ser. No. 798,732
Int. Cl.[4] H02G *11/02*; B65H *75/00*
U.S. Cl. 191—12.4 12 Claims

2. A retractable electric cord reel comprising a base, a rotatable reel supported on said base and a motor including a drive shaft for providing a rotatable drive between said base and said reel, said base including a pair of upstanding end walls, said rotatable reel being disposed between said end walls, a pair of support brackets, one of said support brackets being secured to a first of said upstanding end walls, said one bracket carrying at least a pair of rotatable drive gears for drivingly supporting a first end of said reel, said one bracket further including means for supporting a first end of said motor, the second of said support brackets being secured to the other of said end walls, said second bracket including means for transmitting electric current across the rotating interface between said base and said reel thereby providing current to cord on said reel, said second



bracket including means to support said reel and the second end of said motor, said motor including means to thrust the drive shaft outwardly into engagement with said drive gears upon actuating said motor, said drive shaft carrying a tapered cone and said drive gears carrying a tapered circumferential portion for mating with said tapered cone, and wherein said means to thrust said drive shaft includes the armature of said motor.

4,721,834
LEVER CONTROL SYSTEM
Charles H. Mark, Lafayette, and Ellis P. Lipp, Charlottesville, both of Ind., assignors to Embart Industries, Inc., Indianapolis, Ind.
Filed Apr. 30, 1986, Ser. No. 857,496
Int. Cl.[4] H01H *21/00*; G05G *13/00*
U.S. Cl. 200—6 A 2 Claims

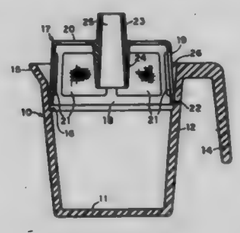


1. A joystick operated system comprising
(a) a holder,
(b) a spring biased lever carried in said holder,
(c) slot means in said holder permitting said lever to be moved in a complete circle, sideways, up and down,
(d) a carriage coupled to said lever to be responsive to movement of said lever, said carriage including overlying, intersecting sliders having openings to receive a distal end of said lever, rails carried by said intersecting sliders and a movable platform having intersection channels mating said rails,
(e) electrical contacts carried by said platform of said carriage, and
(f) said electrical contacts engaging associated fixed contacts adjacent to said carriage.

4,721,835
MICROWAVE BREWING CUP
Helmut Welker, R.D. 2 Horton Rd., Jamestown, N.Y. 14701
Filed Oct. 6, 1986, Ser. No. 915,141
Int. Cl.[4] H05B *6/64*; A23F *3/00*
U.S. Cl. 219—10.55 E 8 Claims

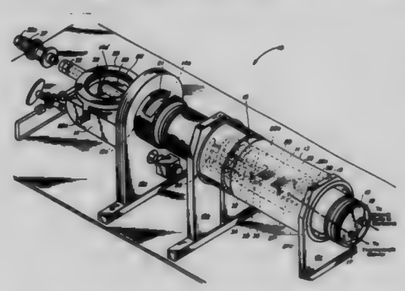
1. A microwave transparent brewer assembly for brewing coffee or the like within the confines of a microwave oven, said assembly comprising:

a cup having a bottom wall and a side wall terminating in an open mouth for receiving ground coffee or the like and water to be heated to a brewing temperature for producing brewed coffee or the like; and
a lid removably fixed to said cup for covering said mouth and straining said brewed coffee incident to pouring thereof from said cup, said lid having a top surface and a side wall depending therefrom and terminating in a bottom rim bounding an open bottom of said lid, said rim removably engaging and forming a fluid seal with said



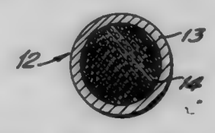
side wall of said cup inwardly of said mouth, at least one of said top surface and said side wall of said lid having filtering openings extending therethrough for straining said brewed coffee, and said top surface having a vent means opening therethrough, said vent means including an extension depending from said top surface and cooperating with said top surface and said side wall of said lid to define a retainer for said grounds when said cup is tipped for pouring said brewed coffee through said filtering openings, while preventing escape of said brewed coffee and said grounds through said vent means.

4,721,836
APPARATUS FOR TRANSIENT ANNEALING OF SEMICONDUCTOR SAMPLES IN A CONTROLLED AMBIENT
Carl R. Zeisse, and Edward R. Schumacher, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 14, 1986, Ser. No. 862,952
Int. Cl.[4] H05B *6/10*
U.S. Cl. 219—10.67 8 Claims



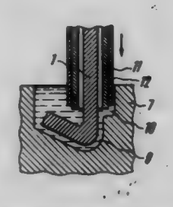
1. An apparatus for annealing a semiconductor sample at a precise temperature for a specific duration comprising:
means stationary mounted for inductively heating a contained volume to the precise temperature;
means extending through the heated contained volume of the inductively heated means enclosing a chamber therein;
a thin edged support rack disposed in the enclosed chamber;
means disposed adjacent said enclosed chamber for selectively extending therein in a moveable relationship with respect to the stationary mounted inductively heating means;
means connected to the selectively extending means and in sealing isolation with the enclosed chamber having fingers pivotable about the thin edged support rack
for carrying the semiconductor sample thereon; and
means disposed within the selectively extending means for rotating the pivotable fingers of the carrying means upward as the selectively extending means brings the semiconductor sample to the thin edged support rack
and for rotating the pivotable fingers downward when the fingers coextend with the thin edged support rack to deposit the semiconductor sample theron for the annealing thereof for the specific duration and the withdrawal of the selectively extending means and carrying means.

4,721,837
CORED TUBULAR ELECTRODE AND METHOD FOR THE ELECTRIC-ARC CUTTING OF METALS
Edward R. Gamberg, Severna Park, Md., assignor to Eutectic Corporation, Flushing, N.Y.
Filed Sep. 25, 1985, Ser. No. 780,033
Int. Cl.[4] B23K *35/368*
U.S. Cl. 219—69 R 19 Claims



1. A cored tubular metallic arc electrode for use in gas-assisted cutting and gouging of metal substrates comprising a wrought drawn metal tube with a core composition consisting essentially of particulate carbonaceous material drawn and compacted therein by reduction of said metal tube, said carbonaceous material containing at least about 75% carbon, said tube containing 0 to about 20% by weight of an additive based on the total weight of the core composition, the additive being selected from the group consisting of arc stabilizers, fluxing agents, and gas formers, said electrode characterized in use by reduced dross formation.

4,721,838
TOOL FOR ELECTRICAL DISCHARGE PIERCING OF INTRICATELY-SHAPED HOLES AND METHOD OF USING SAME
Erkin T. Abdukarimov, To-I, 52, kv. 6; Pavel M. Vetchinkin, ulitsa B. Khmelnitskogo, 10, kv. 1, and Mukhtar S. Saidov, ulitsa Timiryazeva 2a, kv. 9, all of Tashkent, U.S.S.R.
Filed Oct. 29, 1984, Ser. No. 665,635
Int. Cl.[4] B23H *1/04*
U.S. Cl. 219—69 E 7 Claims



1. A tool electrode for electrical discharge piercing of workpieces, comprising a shell having a working end; a one piece central electrode made of metal arranged inside said shell, said central electrode being mounted in a spaced relation to said shell and having a protruding portion which protrudes beyond

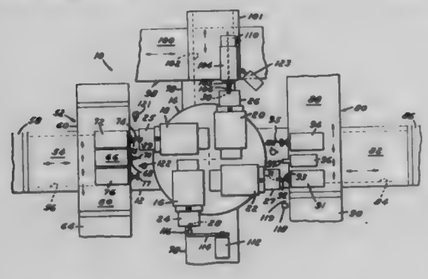
said working end of said shell in the direction toward said workpiece, said protruding portion of said central electrode being bent at a fixed angle α, the end of said bent portion protruding beyond the limits of the periphery of said shell.

4,721,839

COMBINED BORE SEAT FACE GRINDING, EDM AND LAPPING METHOD FOR FINISHING FUEL INJECTOR NOZZLE BODIES

Victor F. Daswaltowski; James Halvorsen, both of Springfield, Vt., and John M. Chuck, Chelsea, Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 22, 1986, Ser. No. 866,000
Int. Cl.[4] B23H *1/00, 9/10*
U.S. Cl. 219—69 M 6 Claims



1. A method for concentrically forming a valve guide bore and a valve seat in respective fuel injector nozzle body blanks having a center-cut bore terminating in a blind hole defined in part by a pre-formed cone shaped surface to locate a needle valve component therein so as to reduce the fuel dribble capacity of the nozzle body, said method comprising the steps of alternately grinding and lapping the center cut bore surfaces to the blind hole of one blank, concurrently respectively alternately concentrically lapping and gaging a valve seat surface of a second blank, and non-contact machining a valve seat surface of a third blank by use of electrode means concentric with the valve guide bore during the time period that the other operations are being performed.

4,721,840

COATED RESISTANCE WELDING SENSOR

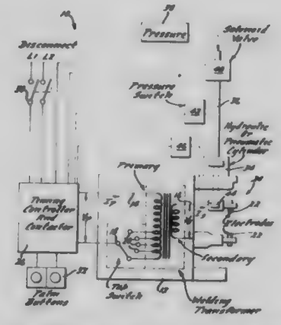
Ralph H. Fielding, Troy, Mich., assignor to Weltronic Company, Novi, Mich.

Filed Jan. 17, 1986, Ser. No. 820,528
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—109 12 Claims

11. A method of sensing current in a resistance welding system, comprising:

providing a Hall effect device;

coating said Hall effect device with a saturable magnetic coating; and



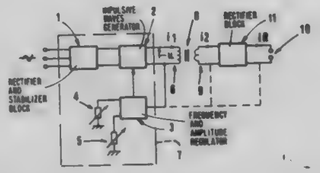
positioning said coated device in a resistance welding apparatus where said device can receive magnetic energy from a current carrying component of said apparatus.

4,721,841

CONTROL DEVICE FOR RESISTANCE WELDING POWER SUPPLY

Luigi Pazzaglia, Bologna, Italy, and Zelimir Belamaric, Pully, Switzerland, assignors to Cefin S.p.A., Bologna, Italy

Filed Sep. 9, 1986, Ser. No. 905,761
Claims priority, application Italy, Oct. 25, 1985, 3581 A/85
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—110 5 Claims



1. Control device for resistance welding power supply, in particular as used in metal box construction, comprising:

a single frequency converter comprising a rectifier and a stabilizer block supplying direct output voltage to the input of a fully transistorized impulsive wave generator, said impulsive wave generator in turn supplies a primary winding of a welding transformer with a low output impulsive voltage, the single impulsive waves of which alternate between positive and negative;

a rectifier block located at a secondary winding of the transformer supplying welding rollers with a high frequency welding current having a pronounced ripple of steady current intensity that is a function of the frequency and of the amplitude of the impulsive wave generator output voltage; and

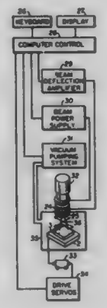
an electronic regulator which compares the amplitude and frequency of the welding current ripple with its own respective preset reference sources and is feedback connected to the impulsive wave generator so that its output voltage will be of an amplitude and frequency such as to produce said welding current ripple.

4,721,842

BEAM POSITION CORRECTION DEVICE

William J. Farrell, Flossmoor, Ill., assignor to Ferranti Sciaky, Inc., Chicago, Ill.

Filed Aug. 29, 1986, Ser. No. 901,947
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EU 7 Claims



1. A method of positioning an electron beam upon a given reference point on a detector comprising a 270° sector and a 90° sector of a cylinder separated by a fixed gap between the straight portions of the sectors towards which the beam is directed, comprising the steps of:

generating an electron beam of a desired current intensity;

directing the said beam towards and focusing the said beam upon the surface of the said sectors, the radial portions of which are aligned along coordinate axes which are mutually perpendicular;

causing the beam to impinge upon a series of closely spaced points upon a heat sink proximate to said sectors along a line parallel to one of said axes;

causing the beam to be directed at right angles intermittently along the second of said coordinate axes and onto the said sectors so as to sample the currents collected by each of said sectors;

determining the difference in the electron beam current reaching each sector;

causing the electron beam to be deflected in a direction towards the sector which has collected the lesser current;

repeating the above series of steps until the said difference in current reaches zero; and

repeating the process of sampling the current reaching the two sectors along the line parallel to the second axis until the currents reaching the sectors are equal along both axes.

4,721,843

METHOD AND APPARATUS FOR CONTROLLING AN ARC WELDING ENERGY SOURCE DURING AN ARC WELDING OPERATION

Peter Bodin, and Ulf Lagerqvist, both of LaxÅ , Sweden, assignors to Esab AB, Sweden

Filed Feb. 6, 1987, Ser. No. 11,808
Claims priority, application Sweden, Feb. 17, 1986, 8600680
Int. Cl.[4] B23K *9/09*
U.S. Cl. 219—130.33 10 Claims

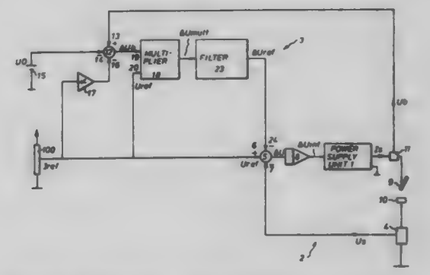
5. An apparatus for controlling a source of energy throughout an arc welding operation having alternating periods during which electrode material is fused and during which fused electrode material is transferred from the electrode to a workpiece, said apparatus comprising:

a first signal transducer for sensing a first parameter of the welding operation and generating a first electric signal representative of the first parameter,

a second signal transducer for sensing a second parameter of the welding operation and generating a second electric signal representative of the second parameter,

a first circuit connected to the output of said second transducer for generating a third signal dependent on the second signal, said first circuit including a band-pass filter having a pass band including a predetermined short-circuiting frequency for receiving and filtering the third signal to provide a filtered signal as the third signal,

a second circuit connected to said second transducer by said



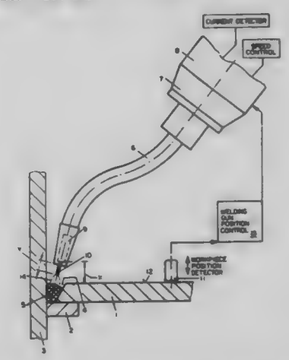
first circuit and having a first input connected to receive the filtered signal, a second input connected to receive a reference signal and an output adapted to be connected to the energy source, said second circuit forming a desired value signal from the filtered signal and the reference signal, generating an error signal representing a difference between the desired value signal and the first signal, and supplying the error signal from said second circuit output for controlling the source of energy in response to the error signal.

4,721,844

ELECTRIC ARC WELDING PROCESS FOR FILLING A WELD GROOVE TO A PREDETERMINED EXTENT

Franz Vokurka, Minorgasse 60, 1140 Wien, Austria

Filed Mar. 5, 1986, Ser. No. 836,444
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—137 PS 6 Claims



1. Process for electric arc welding in which a surface of a pool of welding material is kept at a constant level in a weld seam with differing seam width and differing seam volume as a welding apparatus moves along a workpiece to be welded, comprising: establishing a predetermined value of welding current for said welding apparatus, corresponding to a desired degree of filling of a weld seam; measuring the actual welding current of said apparatus during a welding operation on a said

seam; comparing the measured value of said actual welding current with said predetermined value, the measured value of the welding current directly varying with the height of filling of the weld seam; varying the speed of movement of said apparatus parallel to said seam in direct proportion to said actual welding current and thus the height of welding material in the groove, so that when the measured value of current is less than said predetermined value, the speed is decreased and when the measured value is greater than the predetermined value the speed is increased; continuously effecting the detection of the position of only a single portion at a time, of the surface of said workpiece as the apparatus moves therealong; continuously providing a control signal responsive to said detection; and continuously utilizing said control signal to keep the spacing of said apparatus from said weld seam constant.

4,721,845

ELECTRICALLY HEATABLE VEHICLE GLASS PANE

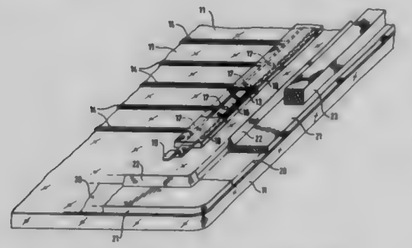
Heinz Kunert, Cologne; Gerd Sauer, Stolberg-Venegen, and Hans Ohlenforst, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courvevoie, France

Filed Sep. 10, 1986, Ser. No. 905,459

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532119

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—203 **16 Claims**



1. An electrically heatable glass pane comprising:

a glass pane member;

printed-on and baked-in thin heating electrical conductors disposed on one face of said pane member;

printed-on and baked-in collecting electrical conductors disposed on said one face and connected with said heating conductors;

metal strips disposed on, and electrically conductingly connected with, said collecting conductors; and

a plastic coating covering said collecting conductors and metal strips and bonded to said collecting conductors, metal strips and glass pane, wherein said plastic coating comprising a hardenable adhesive material applied on said collecting conductors and metal strips, and hardened in place.

4,721,846

CANISTER HEATER WITH PTC WAFER

Peter J. Lapoli, Hamden; Donald J. Mattis, Norwalk, and Robert S. Miller, Stratford, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Jul. 2, 1986, Ser. No. 881,811

Int. Cl.[4] F24H *3/04*; F02M *33/02, 31/00*

U.S. Cl. 219—381 **15 Claims**

1. An electric heater assemblage for attachment to the air intake opening of a fuel vapor recovery canister of the type containing material adapted to alternately adsorb and store, or release fuel vapor, comprising in combination:

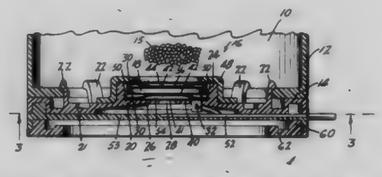
(a) a wafer of electric resistance heating material, and means for making electrical connection thereto for effecting energization of the same,

(b) said wafer having opposite expansive surfaces,

(c) a first wall located at one side of said wafer and having an expansive surface coextensive with one wafer surface,

(d) a second wall located at the opposite side of said wafer and having an expansive surface coextensive with the other wafer surface,

(e) said first wall and wafer defining a first chamber and said second wall and wafer defining a second chamber in



communication with the first chamber at the periphery of the wafer, and

(f) means for directing air from the exterior of the canister into the first chamber, past one side of said wafer and the periphery of the wafer into the second chamber, past the opposite side of said wafer and thereafter to the interior of the canister, for imparting heat to the said material contained in the canister.

4,721,847

MULTIPLE ZONED RUNNER DISTRIBUTOR HEATER

David Leverenz, Elk Grove Village, Ill., assignor to Fast Heat Element Mfg. Co., Inc., Elmhurst, Ill.

Filed Jan. 8, 1986, Ser. No. 817,020

Int. Cl.[4] H05B *3/48*

U.S. Cl. 219—421 **11 Claims**



1. An electric heater comprising a metal casing having an exposed surface over which a fluid material may be directed at an elevated temperature, said casing being formed with an internal bore, a plurality of unsheathed electrical heating element disposed in respective zones of said casing bore, said heating elements each including an elongated insulating core and an associated resistance wire assembled thereon, heat transmitting material compacted in the bore and surrounding each heating element for electrically insulating the heating element from the casing and filling all air voids between said casing and heating element to effect direct heat transfer to the casing from the heating element, a plurality of lead pins extending through the core of each heating element with the resistance wire of each heating element being coupled between a respective separate pair of said lead pins such that the resistance wire of each heating element is in an electrical circuit that is isolated from the electrical circuit of the residence wire of each other heating element, means connecting said respective separate pairs of lead pins to a power source for conducting current through the resistance wire connected between each said respective pair of lead pins for heating the respective heating element, and controlling means for controlling the temperature of each said heating element independently of the temperature of each other heating element and thus the temperature of separate zones on the exposed surface of said casing corresponding to the location of the individual heating elements.

4,721,848

ELECTRICAL HEATER

Neil S. Malone, Flixton, and Paul M. Boxhell, Stockport, both of United Kingdom, assignors to Heat Trace Limited, Cheshire, United Kingdom

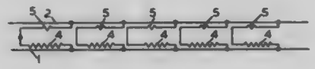
PCT No. PCT/GB85/00329, § 371 Date Mar. 20, 1986, § 102(e) Date Mar. 20, 1986, PCT Pub. No. WO86/01064, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 25, 1985, Ser. No. 858,442

Claims priority, application United Kingdom, Aug. 1, 1984, 8419619

Int. Cl.[4] H05B *3/00*; H01C *7/00*

U.S. Cl. 219—504 **11 Claims**



1. An electrical heater comprising first and second power conductors, at least one elongate resistance heating element, an elongate resistor extending side by side with and along the full length of said at least one heating element, a first end of said resistor being connected to a first end of said at least one heating element, a second end of said resistor being connected to said first power conductor, and a second end of said at least one heating element being connected to said second power conductor, wherein the resistor has a positive temperature coefficient such that its electrical resistance is substantially less than that of the heating element when the temperature of the resistor does not substantially exceed a predetermined temperature equal to the temperature at which the electrical heater is intended to operate, and such that its electrical resistance increases substantially when the resistor temperature substantially exceeds the said predetermined termperature.

4,721,849

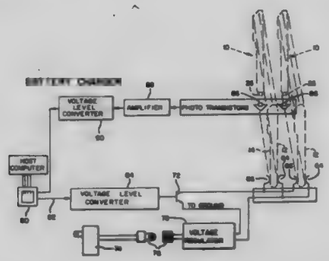
PORTABLE PROGRAMMABLE OPTICAL CODE READER

Paul R. Davis, and Michael J. Brorby, both of Corvallis, Oreg., assignors to Videx, Inc., Corvallis, Oreg.

Filed Oct. 2, 1985, Ser. No. 782,970

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—472 **19 Claims**



1. An optical sensing device for reading data codes, comprising a thin, generally planar housing of polygonal shape having multiple elongate edges joined at angled corners of said housing, said elongate edges extending longitudinally in multiple directions in the same plane, said housing having means mounted thereon for reading said data codes including light source means communicating with one of said corners of said housing for directing light in an oblique direction relative to the longitudinal directions of the respective edges of said housing joined at said one of said corners, for illuminating an area immediately adjacent to and exterior of said one of said corners, and light sensor means communicating with said one of said corners for receiving light reflected from said area.

4,721,850

OPTICAL PICKUP DEVICE HAVING A DETECTOR FOR DETECTING THE LIGHT EMITTING INTENSITY VARIATION OF A SEMICONDUCTOR LIGHT EMITTING ELEMENT

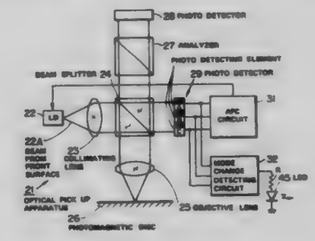
Mitsugu Sakai, and Nobuhide Matsubayashi, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,697

Claims priority, application Japan, Mar. 6, 1985, 60-32574; Mar. 20, 1985, 60-58026; May 31, 1985, 60-117858

Int. Cl.[4] G01J *1/20*; G11B *7/00*

U.S. Cl. 250—201 **14 Claims**



1. An optical pickup device using a semiconductor light emitting element, comprising:

a semiconductor light emitting element emitting a light beam from at least one end surface thereof;

a beam splitting element for splitting said beam into a reflected beam and a passing beam;

an objective lens for collecting one of said reflected beam and said passing beam from said beam splitting element and projecting said one beam onto an optical recording medium;

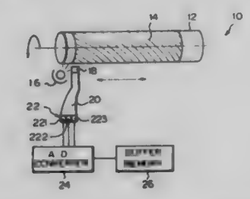
an information photodetector means for receiving a beam reflected from said recording medium and reproducing the information recorded in said recording medium;

a plurality of photodetecting means, receiving the other one of said reflected beam from said beam and said passing beam splitting element, for detecting the change in the intensity distribution of the light beam radiated from the semiconductor light emitting element, each photodetecting means outputting a photoelectric conversion signal;

a mode change detecting circuit means, operatively coupled with said photodetecting means, for detecting the change in the intensity distribution of the light beam radiated from said semiconductor light emitting element by comparing the photoelectric conversion signals from said plurality of photodetecting means, and outputting a mode change signal; and

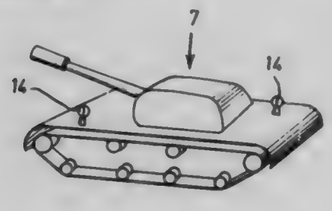
a photo-output controlling means, operatively coupled with said photodetecting means and said light emitting element for controlling the photo-output of said semiconductor light emitting element in response to the photoelectric conversion output signals from said photodetecting means.

4,721,851
IMAGE READING DEVICE USING FIBER OPTIC BUNDLES CONFIGURED DIFFERENTLY AT EACH END
Masaaki Kogure, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 28, 1986, Ser. No. 856,355
Claims priority, application Japan, Apr. 30, 1985, 60-92767; Mar. 6, 1986, 61-45373
Int. Cl.[4] H04N 3/02
U.S. Cl. 250—227 4 Claims



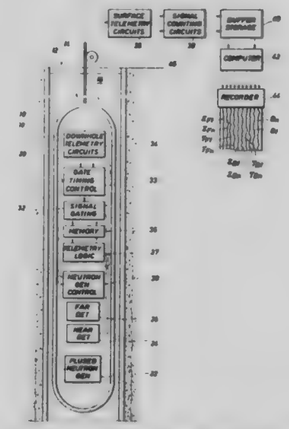
1. A method of spatial processing of an image comprising the steps of:
scanning the image with an optical fiber means which is constructed with a plurality of concentric layers at the inlet end thereof;
converting the light received at the outlet end of said optical fiber means into discrete electrical signals one for each of said plurality of concentric layers of said optical fiber means;
quantizing each of the electrical signals produced from the conversion of said light into said singal; and
applying spatial filter processing to said quantized signals.

4,721,852
LASER-WARNING DEVICE FOR MILITARY VEHICLES
Gerhard Muller, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany
Filed Dec. 19, 1985, Ser. No. 810,750
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446464
Int. Cl.[4] G01J 5/08
U.S. Cl. 250—227 12 Claims



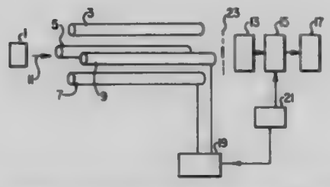
1. A passive warning device for external mounting on a military vehicle for indicating the existence of invisible hostile infrared-sighting radiation which is incident upon the device and therefore incident upon the vehicle to which the warning device is mounted, said device comprising:
a wound light-guide fiber having a core zone of a material which visibly fluoresces when exposed to invisible infrared radiation;
an outer zone continuously cladding said core zone, the material of said outer zone being opaque to visble light but transparent to invisible infrared radiation, whereby fluorescent action in said core zone will be not be externally apparent via said outer zone; and
at least one photodetector for the fluorescent radiation, said photodetector being mounted for response to fluorescent radiation at exit from at least one end of said fiber.

4,721,853
THERMAL DECAY TIME LOGGING METHOD AND APPARATUS
Peter D. Wraight, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.
Continuation of Ser. No. 825,182, Jan. 31, 1986. This application Jan. 7, 1987, Ser. No. 4,764
Int. Cl.[4] G01V 5/00
U.S. Cl. 250—269 42 Claims



1. In a logging system having a fast neutron generating means and detecting means for detecting indications of thermal neutrons, a method for determining thermal neutron decay characteristics of borehole materials and the surrounding earth formation comprising the steps of
irradiating the borehole materials and earth formations with a first burst of fast neutrons,
detecting count rates of indications of the concentration of thermal neutrons in the formation and borehole materials following said first burst and generating first signals representative thereof,
said first burst being of a first duration, such that after a first delay from the end of the first burst, the thermal neutron count rate component due to borehole materials predominates in the total thermal neutron count rate,
irradiating the borehole materials and earth formation with a second burst of fast neutrons,
detecting count rates of indications of the concentration of thermal neutrons in the formation and borehole materials following said second burst and generating second signals representative thereof,
said second burst being of a second duration such that after a second delay from the end of the second burst, the thermal neutron count rate component due to the formation predominates in the total thermal neutron count rate, and
determining from said first and second signals the thermal decay constant of the formation τ_F.

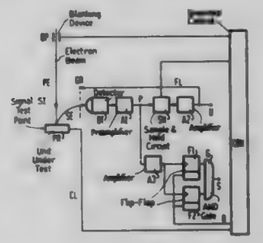
4,721,854
QUADRUPOLE MASS SPECTROMETER
Peter H. Dawson, Ottawa, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada
Filed Jan. 23, 1986, Ser. No. 877,166
Claims priority, application Canada, Dec. 11, 1985, 497422
Int. Cl.[4] B01D 59/44
U.S. Cl. 250—290 10 Claims



1. In a vacuum quadrupole mass spectrometer having:
quadrupole rod electrodes mutually arrranged in parallel with each other,
an RF control unit connected to the said quadrupole rod electrodes to generate an RF field for mass filtering of ions in the RF-only mode within the stability boundary of the (a,q) values,
an ion source near one end of the quadrupole rod electrodes to introduce to the RF field a beam of ions to be analyzed; and
detector near the other end of the quadrupole rod electrodes to detect ions transmitted through the RF field and to produce a detector signal; the invention being characterized in that
a modulation voltage source for producing a modulation voltage of a low frequency whose period is long compared to the flight time of the ions in the RF field;
superimposing means for superimposing the modulation voltage on the RF field so that the (a,q) values will pass alternately through the stability boundary and the ions will be transmitted with the said low frequency; and
a lock-in amplifier connected to the detector for amplifying the detector signal in synchronism with the said low frequency.

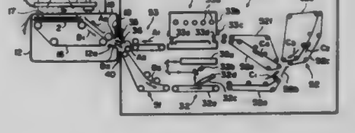
4,721,855
METHOD AND APPARATUS FOR RAPID MEASUREMENTS OF ELECTRICAL SIGNALS AT CIRCUIT NODES OF INTEGRATED CIRCUITS IN WHICH NOISE SIGNALS ARE ALSO DETECTED
Peter Fazekas, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 19, 1984, Ser. No. 632,474
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334530
Int. Cl.[4] G01R 31/26
U.S. Cl. 250—310 6 Claims

1. A method for measuring electrical signals at a point within an integrated circuit, comprising the steps of:
applying a pulse train at a basic pulse rate to the integrated circuit to cause potentials at a selected point within the integrated circuit;
sampling the point with a pulse electron beam to cause emission of secondary electrons representing potential at the selected point;
converting the secondary electron emission into a measured signal representing the signal at the selected point; and



detecting signals appearing between two successive samples as noise signals.

4,721,856
MAMMOGRAPHIC RADIATION IMAGE RECORDING AND READ-OUT APPARATUS
Shigeru Sasotome, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 29, 1985, Ser. No. 792,386
Claims priority, application Japan, Oct. 29, 1984, 59-227838
Int. Cl.[4] G03C 5/16; A61B 6/00
U.S. Cl. 250—327.2 3 Claims



1. A mammographic radiation image recording and read-out apparatus comprising:
(i) a mammographic image recording section (10) provided with a radiation source (11) for emitting radiation through a human breast onto a stimulable phosphor sheet (2) and an image recording case (12) having therein a sheet holding means (17) for holding the stimulable phosphor sheet stationary in an image recording position during exposure, opposite to and facing the radiation source,
(ii) an image read-out and erasing section (30) provided with (a) an image read-out means comprising a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying a mammographic radiation image stored thereon in the mammographic image recording section and a photoelectric read-out means for detecting light emitted from said stimulable phosphor sheet scanned with said stimulating rays to obtain an electric image signal, and (b) an erasing means for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted in said image read-out section, releasing the radiation energy remaining on the stimulable phosphor sheet; and
(iii) a circulation and conveyance system for conveying the stimulable phosphor sheet from the image recording case of the mammographic image recording section through the image recording means and the erasing means and back to the image recording case, wherein the mammographic image recording section is attached to the read-

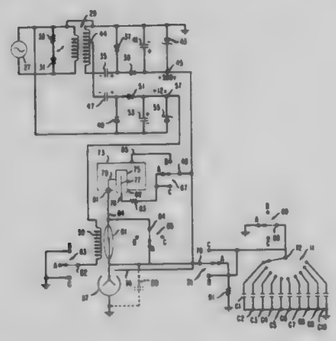
out and erasing section so as to be moveable with respect thereto.

4,721,857

SAMPLING AND RECORDING DOSE RATE METER

Stanley Kronenberg, Skillman, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 597,305, Apr. 6, 1984, Pat. No. 4,617,464. This application May 1, 1986, Ser. No. 861,463
Int. Cl.[4] G01T *1/18*; H01J *47/02, 47/06, 47/08*
U.S. Cl. 250—374 9 Claims



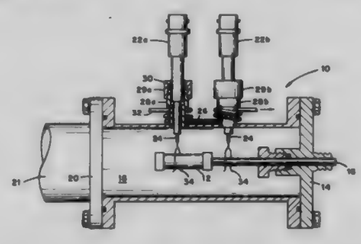
1. A hand-held dosimeter comprising:
a hand cranked generator;
radiation detector means including a first Geiger-Mueller tube detector filled with a first type of gas mixture and a second ion chamber detector filled with a second type of gas mixture, said Geiger-Mueller tube having an enclosure which contains said first type of gas mixture and separates said first type of gas mixture from said second type of gas mixture;
first switching means for selectively connecting the output of said generator to one of said first and second detectors;
timing circuit means energized by said generator for providing a precise predetermined sampling interval;
an electrometer connected to said timing circuit means;
second switching means for selectively connecting the output of said first and second detectors to said electrometer and said timing circuit means to selectively energize said electrometer;
a plurality of storage capacitors selectively coupled in parallel with said electrometer for receiving the charge accumulated thereon;
said dosimeter having three modes of operation, the first mode being a charge and continuous counting mode in which the output of said Geiger-Mueller tube is continuously applied via said second switching means to said electrometer, the second mode being a high sensitivity dose rate measuring mode in which the output of said Geiger-Mueller tube is applied via said second switching means to said electrometer and to said plurality of storage capacitors, and the third mode being a low sensitivity dose rate measuring mode in which the output of said ion chamber is applied via said second switching means to said electrometer and to said plurality of storage capacitors.

4,721,858

VARIABLE PRESSURE IONIZATION DETECTOR FOR GAS CHROMATOGRAPHY

Michelle V. Buchanan, Knoxville, and Marcus B. Wise, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 21, 1986, Ser. No. 854,236
Int. Cl.[4] G01N *27/70*
U.S. Cl. 250—379 6 Claims



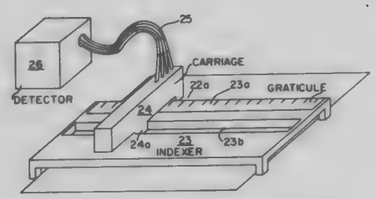
1. A method for measuring a zero-crossing pressure for an organic compound, comprising the steps of:
(a) injecting a sample of a gaseous mixture containing at least one organic compound into an electron capture detector cell;
(b) maintaining a discrete pressure in said cell, said pressure being atmospheric pressure or below;
(c) detecting the variation in electrical current in said cell due to one of capture and emission of electrons by said organic compound;
(d) repeating the sequence of steps (a) through (c), wherein the pressure in said cell is adjusted in each succeeding sequence to be higher or lower than the preceding sequence depending on which of emission or capture respectively is detected in step (c), said sequence being repeated until the detected variation of said electrical current is minimized and the zero-crossing pressure thereby obtained.

4,721,859

PROCESSING OF OPTICAL INFORMATION BY INDEXING WITH A GRATICULE SCALE

John Lewis, 55 Linkside Avenue, Oxford, Oxfordshire, England

Continuation of Ser. No. 358,978, Mar. 17, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 709,349
Claims priority, application United Kingdom, Mar. 25, 1981, #109337
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—566 15 Claims



1. Apparatus for enabling recognition of the shape of a character, comprising:
a graticule scale for overlying said character;
at least one optical information conveying means having input and output ends, said graticule scale comprising spaced apart markers for being seen by said input end of said at least one optical information conveying means to provide indexed optical information when one of said markers overlies at least a portion of said character and to provide non-indexed information when an interval between two of said markers overlies the character such that said optical information conveying means can receive said indexed and non-indexed information for discharge from said output end thereof;
at least one scan means for moving said input end of said optical information conveying means so that said input end will scan said indexed information and said non-indexed information; and
detector means for receiving from said output end of said optical information conveying means said discharged indexed and non-indexed optical information, said detector means being adapted to provide from said received indexed and non-indexed optical information at least one output signal appropriate to said recognition of character shape.

4,721,860

LASER SCANNER FOR BAR CODE READER

Dale Trocadle, Skaneateles, N.Y., assignor to Skan-A-Matic Corp., Elbridge, N.Y.

Continuation of Ser. No. 652,909, Sep. 20, 1984, abandoned. This application Sep. 23, 1986, Ser. No. 912,745
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—568 12 Claims



1. Scanning apparatus for reading bar code comprising a source of laser light, a series of optical lenses for converting the laser light into the shape of an ellipse as the laser light is directed to a bar code, a photodetector, and a laser light receiving system, whereby the signal to noise ratio of the light received by the photodetector is maximized, and distortions caused by printing errors in the focal plane are reduced.

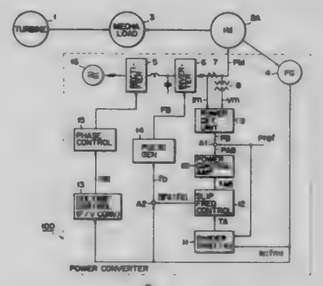
4,721,861

TURBINE HELPER DRIVE APPARATUS

Suzuo Saito; Teruo Nakagawa; Akio Hirata; Tadao Mose; Kohsaku Ichikawa; Kazuto Kawakami, all of Tokyo, and Tsugunori Kuga, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1986, Ser. No. 943,766
Claims priority, application Japan, Dec. 24, 1985, 60-289144; May 27, 1986, 61-120126; Jun. 2, 1986, 61-125638
Int. Cl.[4] F16H *37/08*
U.S. Cl. 290—4 R 15 Claims

1. A turbine helper drive apparatus comprising:
a turbine;
a load device mechanically coupled to said turbine and driven thereby;
an alternating-current motor, mechanically coupled to said load device, for driving said load device in cooperation with said turbine, to thereby partially share a load of said load device; and
control means for controlling said alternating-current motor in accordance with a power reference that determines a load sharing ratio of said turbine and said alternating-current motor, so that a mechanical output from said alternating-current motor corresponds to the power reference.

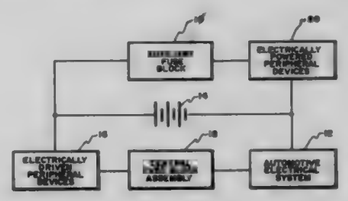


4,721,862

AUXILIARY FUSE BLOCK

Gershon N. Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.

Filed Mar. 12, 1987, Ser. No. 24,963
Int. Cl.[4] H02B *1/18*
U.S. Cl. 307—10 R 5 Claims



1. An auxiliary fuse block located in an automotive electrical system having a battery and an integral fuse block, comprising, in combination:
a housing of electrically non-conductive material having disposed therein an electrically conducting bus bar and a plurality of recesses, each of said recesses releasably retaining therein a fuse, each of said fuses having a first end electrically connected to said bus bar and a second opposite end electrically connected to an electrically isolated binding post, and
means coupling said bus bar to said battery in parallel with the integral fuse block;
said housing including means releasably attaching it to the automobile.

4,721,863

CIRCUIT FOR PROVIDING DC ISOLATION BETWEEN A PULSE GENERATOR AND A LOAD

Oséas Bercy, Verrieres le Buisson, France, assignor to U.S. Philips Corporation, New York, N.Y.

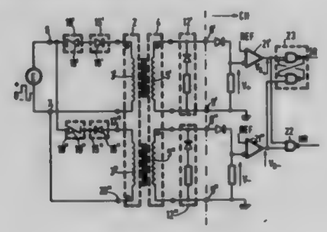
Filed May 30, 1985, Ser. No. 739,356
Claims priority, application France, Jun. 15, 1984, 84 09410
Int. Cl.[4] H03K *5/00*
U.S. Cl. 307—89 4 Claims

1. A circuit for providing DC isolation between a pulse generator and a load comprising a primary circuit and a secondary circuit coupled to each other by mutual inductance, and including at least one magnetization current elimination circuit connected to the secondary circuit, further comprising at least one unidirectional transmission circuit which is con-

nected between the pulse generator and the primary circuit, passing pulses of said generator and which opposes the discharge of magnetization currents, whereby said magnetization current is dissipated rapidly and solely through the secondary circuit, and a circuit in series with said unidirectional transmission circuit for attenuating transient currents due to commutations.

4. A circuit for providing DC isolation between a pulse generator and a load comprising:

a single source of bipolar pulses;



a primary magnetic circuit including first and second primary windings, and a secondary circuit including first and second secondary windings magnetically coupled to said primary magnetic circuit; each of said secondary windings connected to an individual load, and to an individual magnetizing current elimination circuit;

first and second unidirectional transmission circuits for coupling opposite polarity pulses to said first and second primary windings; and

first and second attenuating circuits for reducing commutation transients in said first and second primary windings.

4,721,864

INDUCTIVE PULSE GENERATOR

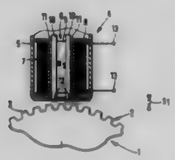
Andre Goossens, Ruset, Belgium, assignor to Alfred Teves GmbH & Co. OHG, Bergenstadt, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,501

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3542961

Int. Cl.[4] H03K *3/00*

U.S. Cl. 307—106 **4 Claims**



1. An inductive pulse generator for converting a rotary movement into a frequency proportional therewith, said pulse generator having a measuring wheel provided with poles of magnetic material evenly distributed over the circumference of said measuring wheel, and said pulse generator having a stator provided with a magnet core with plate-shaped pole shoes in a coil carrier out of which end portions of the pole shoes project, said end portions facing the measuring wheel, and with a coil surrounding the magnet core, at which coil a pulsating voltage can be picked off with a frequency proportional to the number of revolutions of the measuring wheel, wherein outside the area of the pole shoe (10) end portions (12) facing the measuring wheel (1), the thickness of the pole shoes (10) is increased by a predetermined amount of additional magnetic material.

4,721,865

ANALOG SIGNAL LEVEL DETECTOR

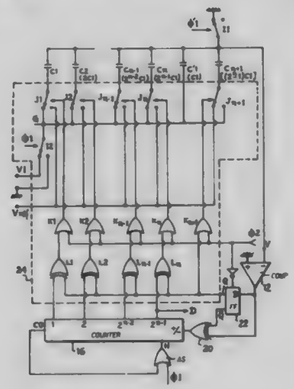
Louis Tallaron, Egreve, and Jean C. Bertails, Coublevie, both of France, assignors to Societe pour l'Etude et la Fabrication de Circuits Integres Specieux - Efcis, Grenoble, France

Filed Sep. 18, 1985, Ser. No. 777,303

Claims priority, application France, Sep. 21, 1984, 84 14567

Int. Cl.[4] H03K *5/153*

U.S. Cl. 307—350 **6 Claims**



1. An analog signal detector comprising:

an up/down counter, said counter having a clock input, an up/down control input, and weighted outputs defining a content of the counter;

clock means for applying to said clock input a clock signal having a frequency such that the duration of increase of the counter content from zero to its maximum value significantly exceeds the mean period of an analog signal to be detected;

a comparator having an input and having an output for controlling said up/down control input of the counter;

a group of switched capacitors each having a first and a second plate, said first plates being connected to the input of the comparator, and a switching control circuit for controlling the switching of said capacitors according to a periodic cycle at the clock signal frequency, said cycle having several phases, and said capacitors having respective values corresponding to the weighted outputs of the counter;

a reference voltage source;

a multiplexing circuit for applying to each individual capacitor either said analog signal to be detected, or the voltage of said voltage reference source, or an earth potential, said multiplexing circuit being controlled by the switching control circuit and by the outputs of the counter so that it assumes various configurations according to the following conditions:

(a) in a precharging phase of said periodic cycle, said capacitors each receive on their second plate the analog signal to be detected, while their first plate is connected to the earth potential;

(b) at the end of said precharging phase, the first plates are disconnected from the earth potential so as to avoid any loss of charges stored on these first plates during the precharging phase;

(c) in a comparison phase, the second plate of each respective capacitor is connected either to the reference voltage or to the earth potential, depending on whether that

output of the counter which has the same weight as the respective capacitor has a value 0 or 1.

4,721,866

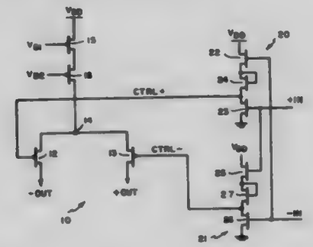
CMOS CURRENT SWITCHING CIRCUIT

Kuang K. Chi, Shrewsbury, and Barbara M. Sullivan, Boston, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 21, 1985, Ser. No. 800,644

Int. Cl.[4] H03K *19/094, 3/01, 17/687*

U.S. Cl. 307—451 **2 Claims**



1. A switch circuit for receiving differential input signals and transmitting output signals in response thereto comprising:

A. current steering switch means comprising two MOS transistors each including a drain terminal, the drain terminals of both said MOS transistors being connected to a current input node means, a source terminal, each source terminal of said respective MOS transistors being connected to a respective output terminal and a gate terminal,

B. current source means connected to said current input node means for supplying a constant current to said current input node means; and

C. a pair of buffer means each receiving one of the differential input signals and each connected to the gate terminal of one of said MOS transistors, each said buffer means generating a control signal for controlling the respective MOS transistor, each said buffer means includes pull-up transistor means having a drain terminal connected to a positive power supply, pull-down transistor means having a source terminal connected to ground, and resistor means connected between the source terminal of the pull-up transistor means and the drain terminal of the pull-down transistor means, the respective control signal being taken from the drain terminal of said pull-down transistor means, each of the differential input signals controlling the gate of the pull-up transistor means of one said buffer means and the gate of the pull-down transistor means of the other of said buffer means, the resistor means reducing the positive level of the respective control signal so that the gate-to-drain voltage levels of the MOS transistors do not turn them both off when the input signals are switching signal levels.

4,721,867

HIGH SPEED LOGIC GATE WITH SIMULATED OPEN COLLECTOR OUTPUT

William E. Headen, Jr., and Stephen S. Yole, both of West Warwick, R.I., assignors to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Apr. 16, 1986, Ser. No. 852,833

Int. Cl.[4] H03K *19/088, 19/084, 19/00, 3/01*

U.S. Cl. 307—456 **2 Claims**

1. A logic gate comprising:

an input for receiving a high or low signal;

threshold setting means for determining when the signal from said input has changed;

a current switch transistor having a base, a collector and an emitter, the base of said transistor being connected to said threshold setting means;

an output transistor having a collector, an emitter connected to ground and a base connected to the emitter of said current switch transistor;

a resistor connected between the emitter of said current switch transistor and ground;

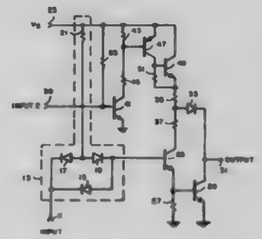
a diode having an anode and a cathode, the cathode being connected to the collector of said output transistor;

a resistor connected between the anode of said diode and the collector of said current switch transistor;

a source voltage input for receiving a source voltage;

a current limiting resistor connected at one end to the anode of said diode and having an other end;

a logic gate output connected to the collector of said output transistor;



a second input for receiving a high or low signal;

a switching transistor having a collector, an emitter connected to ground and a base connectd to said second input;

resistor means for limiting the current through said switching transistor, said resistor means connected between said source voltage and the collector of said switching transistor;

a first transistor having a base connected to said resistor means and an emitter connected to said source voltage; and

a second transistor having a base connected to the collector of said first transistor, an emitter connected to the other end of said current limiting resistor and a collector connected to said source voltage.

4,721,868

IC INPUT CIRCUITRY PROGRAMMABLE FOR REALIZING MULTIPLE FUNCTIONS FROM A SINGLE INPUT

Barry S. Cornell, Santa Clara, and M. Clifford Diggers, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 23, 1986, Ser. No. 910,595

Int. Cl.[4] H03K *17/94*

U.S. Cl. 307—465 **15 Claims**

1. A programmable input circuit for an integrated circuit chip, comprising:

(a) a plurality of digital logic circuits, each having:

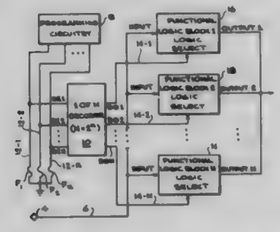
(1) an output connected to a function circuit on said chip to provide a binary signal output;

(2) a first input terminal coupled to a circuit input terminal; and

(3) a second input terminal;

(b) a plurality of decoder means, each having an output connected to said second input terminal of said digital logic circuits; and each having input means; and

(c) programmable means connected to each of said input means on each of said decoder means for providing an



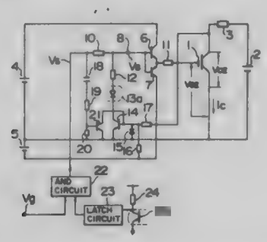
input signal to said decoder means, which signal is indicative of said digital logic means to be selected.

4,721,869

PROTECTION CIRCUIT FOR AN INSULATED GATE BIPOLAR TRANSISTOR UTILIZING A TWO-STEP TURN OFF

Chihiro Okado, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 6, 1986, Ser. No. 826,771
Claims priority, application Japan, Feb. 8, 1985, 60-23334; Apr. 30, 1985, 60-92870
Int. Cl.[4] H03K *17/08, 17/28*
U.S. Cl. 307—570 15 Claims



1. A protection circuit for an insulated gate bipolar transistor (IGBT) comprising:

(a) a gate voltage input circuit for generating a gate voltage, and for supplying same to a gate of said IGBT;

(b) a load connected in series with said IGBT;

(c) a first detecting circuit means connected in circuit with said load for detecting an abnormality in said load;

(d) adjusting circuit means responsive to said first detecting circuit means and connected to said gate voltage input circuit for adjusting said gate voltage of the IGBT;

(e) a second detection circuit means for detecting whether an operation time of the adjusting circuit means exceeds a predetermined period, said second detection circuit means connected to said adjusting circuit means; and

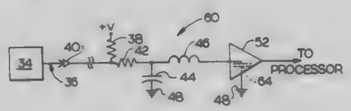
(f) wherein said adjusting circuit means first adjusts the gate voltage to a low voltage which is no less than a gate threshold voltage of the IGBT to decrease a fault current of said IGBT when the collector to emitter voltage of the IGBT is increased and, after elapse of said predetermined period adjusts the gate voltage to a voltage less than the threshold level to cut off the fault current.

4,721,870

FILTERING OF ELECTROMAGNETIC INTERFERENCE FROM A DIGITAL SIGNAL

Stephen W. Rector, Washington, and Gwenne A. E. Henricks, East Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Oct. 3, 1986, Ser. No. 915,214
Int. Cl.[4] H03B *1/00;* H03H *7/01, 7/02*
U.S. Cl. 307—520 11 Claims



1. An apparatus for filtering a digital input signal, comprising:

a current limiting resistor having first and second terminals, said first terminal for receiving said digital signal;

an inductor having first and second terminals, said first terminal being connected to the second terminal of said resistor and forming a junction;

a capacitor having a first terminal connected to the junction of said resistor and inductor, and having a second terminal connected to a circuit ground; and

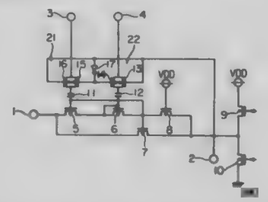
a metal oxide semiconductor gate having an input connected only to the second terminal of said inductor.

4,721,871

HIGH VOLTAGE MOS SWITCH CIRCUIT WITH ISOLATION

Akio Kiji; Kazuo Aoki, and Seiichirou Asari, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 9, 1986, Ser. No. 917,222
Claims priority, application Japan, Oct. 11, 1985, 60-227561
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—571 3 Claims



1. A high voltage switch circuit having a plurality of MOS transistors each having a source, a gate and a drain, wherein the source of a first MOS transistor is connected to the gate of a second MOS transistor,

the source of the second MOS transistor is connected to the gate of the first MOS transistor, the drain of a third MOS transistor and the gate of a fourth MOS transistor,

the drains of the first and fourth MOS transistors are connected to a high voltage input terminal,

the sources of the third and fourth MOS transistors are connected to an output terminal,

a voltage for turning the third MOS transistor ON is applied to the gate of the third MOS transistor,

a first of two electrodes of two independent capacitors are connected to the gates of the first and second MOS transistors, and

a clock is applied through transmission gates to the second electrodes of said two capacitors,

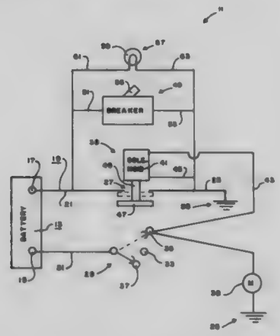
the transmission gates being selectively enabled or disabled by active or nonactive states of the high voltage switch circuit, respectively.

4,721,872

SAFETY GROUND SYSTEM

George W. Simmons, Rte. 2, Box 240, Buchanan, Tenn. 38222

Filed Jul. 6, 1987, Ser. No. 69,778
Int. Cl.[4] F02N *11/00*
U.S. Cl. 307—10 R 4 Claims



1. A ground cable system in combination with the electrical circuit of a vehicle including a battery having first and second terminals, an ignition switch electrically coupled to said first terminal and having a start contact and having a start position in which said start contact is electrically coupled to said first terminal, a ground, and a starting motor electrically coupled to said start contact of said ignition switch and to said ground; said system comprising:

(a) ground cable means including a first section electrically coupled to said second terminal, including a second section electrically coupled to said ground, and having a gap between said first and second sections;

(b) solenoid means electrically coupled to said start contact of said ignition switch and to said ground for movement from a first position to a second position when said ignition switch is moved to said start postion, for remaining in said second position as long as said ignition switch is in said start position, and for movement back to said first position when said ignition switch is moved from said start position;

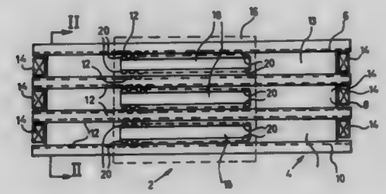
(c) electrical connector means coupled to said solenoid means for electrically closing said gap between said first and second sections of said ground cable means when said solenoid means is in said second position.

4,721,873

LINEAR STEPPING MOTOR

Sven G. W. Stenudd, Lidingö , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 16, 1986, Ser. No. 852,636
Claims priority, application Sweden, Apr. 29, 1985, 8502066
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 12 Claims



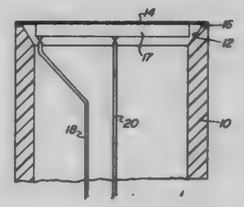
1. A linear stepping motor including an armature and a stator relative to which the armature is movably mounted, the stator having at least two stator elements that are arranged substantially parallel to each other in a direction transverse to the direction of movement of the armature, each stator element being provided with pole teeth rows extending in the travelling direction of the armature, said armature also having armature elements arranged parallel to each other and provided with pole teeth rows arranged adjacent the pole teeth rows of the stator elements such as to close magnetic flux paths transverse to the armature travelling direction in coaction with the pole teeth rows of said stator elements, said pole teeth rows of the elements of one of said stator and armature being mutually displaced such that when the pole teeth of one armature element are in register with the pole teeth of the corresponding stator element, the pole teeth of the remaining armature elements are displaced in the direction of travel of the armature relative to the pole teeth of the stator element corresponding to the respective armature element, and wherein each stator element has a substantially groove-shaped space extending in the armature travelling direction, said pole teeth rows of each stator element being situated on side walls of said groove-shaped space and facing towards each other, and wherein the armature has an armature element in each groove-shaped space with a tooth row on either side of the armature element facing towards a corresponding pole tooth row of the stator element, and wherein the armature elements are carried by a common carrying body of non-magnetic material.

4,721,874

APPARATUS AND METHOD FOR DETERMINING THE VISCOSITY OF A FLUID SAMPLE

Sans W. Emmert, 3057 Ship Rock Rd., Willow Street, Pa. 17584

Filed Oct. 6, 1986, Ser. No. 916,784
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—333 8 Claims



1. Apparatus for determining the viscosity of a fluid sample comprising:

an electromechanical transducer having a face capable of vibrating in shear mode when excited by an alternating electrical current;

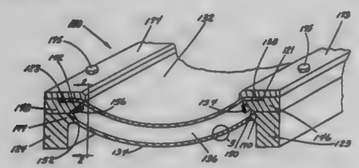
electrical current generating means connected to said transducer for applying an alternating electrical current of predetermined frequency to the transducer and thereby exciting the transducer into shear vibration;

a solid coupling layer of substantially uniform thickness having one face in contact with said face of the transducer and having its opposite face free to come into contact with a fluid sample; and

means, connected to the current generating means, for measuring the magnitude of the impedance of the system consisting of the transducer, coupling layer and fluid sample as presented to the generator;

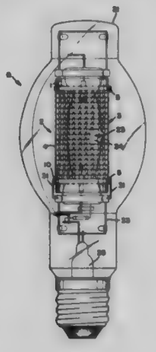
wherein the thickness and shear impedance of the coupling layer are chosen so that, at least at one viscosity of a fluid sample in contact with said opposite face of the coupling layer, and at the frequency of said alternating electrical current, the magnitude of the shear wave reflected into the transducer through the interface between the coupling layer and the transducer is substantially zero.

4,721,875
RADIATION-EMITTING DEVICES
Paul R. Goudy, Jr., Bayside, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.
Filed Feb. 10, 1986, Ser. No. 827,549
Int. Cl.[4] H01J 61/30, 61/33, 61/52
U.S. Cl. 313—15 30 Claims



1. In a radiation-emitting envelope of the type for containing a gas and an electron flow therein between electrodes, the improvement comprising:
first and second separate elongated principal members in fixed relative position defining a volume of substantially constant cross-section along its length, said members configured and located such that said volume is less than that of a cylinder of diameter equal to the largest cross-dimension of said volume;
the first principal member being radiation-transmissive to form a radiation-transmitting portion;
said radiation-transmitting portion being under compression and substantially free of discontinuities;
first and second mounting means separate from and secured by the principal members and having inward portions facing each other across said volume; and
first and second electrode means mounted along the inward portions of the first and second mounting means, respectively.

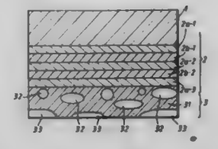
4,721,876
LIGHT-SOURCE CAPSULE CONTAINMENT DEVICE AND LAMP EMPLOYING SUCH DEVICE
Philip J. White, Georgetown; Robert S. White, Jr., Beverly, and William M. Keeffe, Rockport, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 744,645, Jun. 13, 1985, abandoned, which is a continuation of Ser. No. 422,312, Sep. 23, 1982, abandoned. This application Jun. 5, 1986, Ser. No. 873,292
Int. Cl.[4] H01J 17/28, 61/34
U.S. Cl. 313—25 12 Claims



1. A double-enveloped arc discharge lamp comprising:
(a) an outer envelope;
(b) an arc tube mounted within said outer envelope, said arc tube being subject to burst on rare occasions;
(c) a light-transmissive shield mounted within said outer envelope and substantially surrounding said arc tube, said shield being subject to being shattered by a burst of said arc tube;
(d) containment means substantially surrounding said shield, said containment means being capable of containing shards with mass large enough to be likely to cause a rupture of the outer envelope, said containment means being capable of withstanding a temperature of approximately 300° C. and a pressure of approximately 30 atmospheres, said containment means being imbedded in the body of said shield; and
(e) means for structurally and electrically completing said lamp.

4,721,877
LIGHT DIFFUSIVE COATING AND A LAMP HAVING THE COATING
Akira Kawakatsu, Yokohama; Toshio Karino, Zushi, and Yooji Yuge, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 20, 1985, Ser. No. 778,001
Claims priority, application Japan, Sep. 28, 1984, 59-203672; Sep. 28, 1984, 59-203673
Int. Cl.[4] H01K 1/26, 1/50, 1/32
U.S. Cl. 313—111 4 Claims

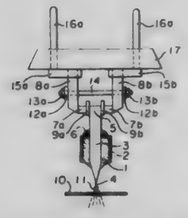




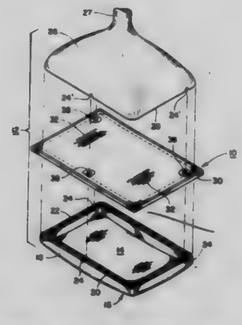
1. A light diffusive coating comprising a layer of solidified metal oxide containing a plurality of discontinuous air-containing void spaces formed by evaporation at approximately 600° C. of occluded solvent droplets with said layer, such that said void spaces are sufficient in number and size to enhance light diffusion by said coating.

4,721,878
CHARGED PARTICLE EMISSION SOURCE STRUCTURE
Hirotoshi Hagiwara; Akio Rokugawa; Naoyuki Okamoto, all of Machida, and Tsunemasa Inoue, Atsugi, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 4, 1986, Ser. No. 870,530
Claims priority, application Japan, Jun. 4, 1985, 60-119777; Dec. 14, 1985, 60-281767
Int. Cl.[4] H01J 1/30; H05H 1/00
U.S. Cl. 313—362.1 20 Claims

1. A charged particle emission source structure comprising a needle-like electrode for emission of charged particles, a reservoir for a liquid metal for wetting the surface of the needle-like electrode, heat-generating support members for heating the liquid metal and holding the reservoir or the needle-like electrode, and an extraction electrode for applying an electric field as between it and the needle-like electrode, which is characterized in that conductive partitions hardly wettable with the liquid metal are provided between the heat-generating support members and the reservoir or the needle-like electrode,
wherein the reservoir and the needle-like electrode are bonded by a material hardly wettable with the liquid metal, and the base portion of the needle-like electrode is held by the heat-generating support members with the partitions interposed between the base portion and the heat-generating support member.

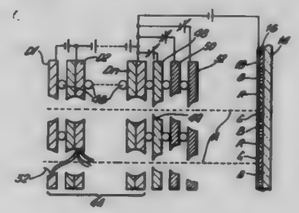


4,721,879
TENSED MASK CATHODE RAY TUBE
Kazimir Palac, Carpentersville, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Continuation of Ser. No. 538,003, Sep. 30, 1983, abandoned. This application Mar. 3, 1986, Ser. No. 835,428
Int. Cl.[4] H01J 29/80, 31/00
U.S. Cl. 313—402 4 Claims



1. A color cathode ray tube comprising:
a funnel having a sealing land;
a faceplate comprising a target surface having a pattern of luminescent primary color elemental phosphor areas deposited thereon and a sealing land circumscribing said target surface and geometrically matching said funnel sealing land, said faceplate sealing land having a plurality of alignment grooves selectively located and oriented thereon;
a color selection electrode affording selection of said phosphor areas by a scanning beam of electrons comprising:
a planar tensed foil, having a predetermined pattern of color selection apertures and having a temperature coefficient of expansion greater than that of said funnel and said faceplace, the periphery of said foil extending across said sealing lands;
indexing means comprising a like plurality of rounded elements geometrically fixedly associated with said foil and individually cooperable with an assigned one of said alignment grooves of said faceplate to form a like plurality of two-point contacts between said faceplate and said color selection electrode for establishing a precise kinematic registration between said foil apertures and said elemental phosphor areas of said target surface; and
devitrifying frit means disposed between said funnel sealing land and said faceplate sealing land and in intimate contact with said foil periphery for bonding said funnel to said faceplate, for securing said foil between said sealing lands and for maintaining said foil in tension.

4,721,880
COLOR CATHODE RAY TUBE INCLUDING A CHANNEL PLATE ELECTRON MULTIPLIER
John R. Mansell, Eastgrinstead; Derek Washington, Wallington, both of Great Britain, and Willem M. van Alphen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 24, 1986, Ser. No. 822,176
Claims priority, application United Kingdom, Feb. 13, 1985, 8503677
Int. Cl.[4] H01J 29/70, 29/72
U.S. Cl. 313—422 19 Claims



1. A color cathode ray tube including an envelope having therein an electron gun, a screen comprising at least two sets of cathodoluminescent stripes of different colors, a channel plate electron multiplier formed by a stack of juxtaposed substantially planar apertured dynodes arranged so that the apertures therein form channels having respective axes, at least one apertured extractor electrode mounted on an output side of said electron multiplier and at least one foraminous deflector electrode carried by said extractor electrode, apertures in the foraminous deflector electrode having the same pitch as the channels of the electron multiplier and being offset relative to the axes of the channels by an amount which enables the emerging electron beams to pass therethrough, whereby in operation a potential difference is provided between the extractor electrode and the deflector electrode to deflect an electron beam emerging from a channel laterally of the cathodoluminescent stripes.

4,721,881
NEUTRALIZING ELECTRODE FOR SCHLIEREN DARK FIELD LIGHT VALVE
Howard E. Towboa, Baldwinsville, N.Y., assignor to General Electric Company, Princeton, N.J.
Filed Jan. 24, 1986, Ser. No. 877,903
Int. Cl.[4] H01J 29/12
U.S. Cl. 313—465 8 Claims

1. In a light valve of the Schlieren dark field type having a transparent electrode on a rotatable disk spaced from an output window, means for applying a first potential to said electrode on said rotatable disk, the space between said rotatable disk and the output window being filled with a fluid, the improvement comprising:
a neutralizing electrode on said output window; and

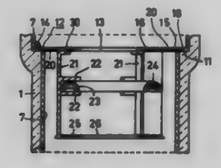
VOL 1086 ISS 4 JA 26 1988 UMI

means for connecting said neutralizing electrode to a second potential substantially equal to the potential on said rotatable disk, to provide a field-free region therebetween to reduce erratic rotation of said disk.

4,721,882
CATHODE RAY TUBE

Henri J. G. M. Van Dueren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 310,668, Oct. 13, 1981, abandoned. This application May 14, 1984, Ser. No. 610,172
Claims priority, application Netherlands, Nov. 10, 1980, 8006123
Int. Cl.[4] H01J 31/00
U.S. Cl. 313—481 4 Claims

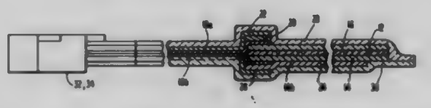


1. A cathode ray tube comprising an evacuated glass envelope having a tubular envelope portion containing an electron gun, an annular metallic getter holder positioned to enable an axially-directed electron beam produced by the gun to pass therethrough, and an arrangement for mounting said getter holder in the tube such that it is mechanically, electrically and thermally isolated from the gun, said arrangement comprising;
- a. a step-shaped surface formed on the inner periphery of the tubular envelope portion,
- b. an annular, metallic supporting member having a peripheral portion thereof resting on the step-shaped surface and having a radially-directed discontinuity for minimizing induced current in the member during inductive heating of the getter holder, said member being positioned to enable the electron beam to pass therethrough; and
- c. a plurality of metallic axially-directed arms extending from the supporting member to the getter holder for supporting said getter holder in the tube.

4,721,883
ELECTROLUMINESCENT DISPLAY AND METHOD OF MAKING SAME

Sidney Jacobs, 2607 Mimi Circle, Philadelphia, Pa. 19131, and John S. Peluso, 70 Lady Diana Circle, Marlton, N.J. 08053

Filed Jan. 2, 1986, Ser. No. 869,437
Int. Cl.[4] H05B 33/04; B05D 5/12
U.S. Cl. 313—505 9 Claims



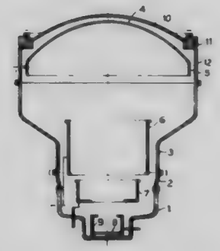
1. A method for making an electroluminescent display comprising the steps of:
- providing an electroluminescent panel having an electroluminescent material on a first surface of a non-conducting substrate and a transparent conductor covering said electroluminescent material;
- attaching a non-conducting carrier strip to an edge of said electroluminescent panel;
- applying a first unitary metallic conductor to said transparent conductor and to a surface of said carrier strip adjacent said transparent conductor, said first unitary metallic conductor having:
  - (a) a bus bar on said transparent conductor, and
  - (b) a first lead segment on said carrier strip extending across the junction of said carrier strip and said electroluminescent panel to said bus bar;
- applying a second unitary metallic conductor to a second surface of said substrate opposite from said first surface and to a surface of said carrier strip adjacent said second surface of said substrate, said second unitary metallic conductor having:
  - (a) a plate on said second surface of said substrate defining an area of excitation of said electroluminescent material, and
  - (b) a second lead segment on said carrier strip extending across the junction of said carrier strip and said electroluminescent panel to said plate, said second lead segment offset from said first lead segment in the plane of said carrier strip;
- enclosing said electroluminescent panel, said carrier strip and said unitary metallic conductors within a non-conducting envelope having a transparent surface extending over said transparent conductor and said bus bar;
- and attaching first and second terminals to said first and second lead segments, respectively.

6. An electroluminescent display comprising:
- an electroluminescent panel having an electroluminescent material on a first surface of a non-conducting substrate and a transparent conductor covering said electroluminescent material;
- a non-conducting carrier strip attached to an edge of said electroluminescent panel;
- a first unitary metallic conductor on said transparent conductor and on a surface of said carrier strip adjacent said transparent conductor, said first unitary metallic conductor having:
  - (a) a bus bar on said transparent conductor, and
  - (b) a first lead segment on said carrier strip extending across the junction of said carrier strip and said electroluminescent panel to said bus bar;
- a second unitary metallic conductor on a second surface of said substrate opposite from said first surface and on a surface of said carrier strip adjacent said second surface of said substrate, said second unitary metallic conductor having:
  - (a) a plate on said second surface of said substrate defining an area of excitation of said electroluminescent material, and
  - (b) a second lead segment on said carrier strip extending across the junction of said carrier strip and said electroluminescent panel to said plate, said second lead segment offset from said first lead segment in the plane of said carrier strip;
- a non-conducting envelope enclosing said electroluminescent panel, said carrier strip and said unitary metallic conductors and having a transparent surface extending over said transparent conductor and said bus bar;
- and first and second terminals attached to said first and second lead segments, respectively.

4,721,884
VACUUM JACKET FOR X-RAY IMAGE INTENSIFIER TUBE

Gilbert Colomb, Voiron, and Maurice Verat, St. Martin le Vinoux, both of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 7, 1986, Ser. No. 816,715
Claims priority, application France, Jan. 15, 1985, 85 00524
Int. Cl.[4] H01J 43/28; G01T 1/28
U.S. Cl. 313—525 10 Claims



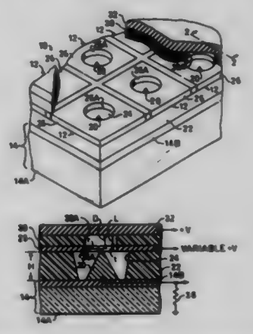
1. A vacuum jacket for an X-ray image intensifier tube having an input port made from an alloy of aluminum and magnesium integral with a central ferrous alloy body, wherein an intermediate non allied aluminum part is provided for connecting the input port and the central body, said aluminum part being brazed with an aluminum compound brazing coating to said central ferrous alloy body, and said input port being fitted in said aluminum part and welded to it.

4,721,885
VERY HIGH SPEED INTEGRATED MICROELECTRONIC TUBES

Ivor Brodie, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Feb. 11, 1987, Ser. No. 13,560
Int. Cl.[4] H01J 1/30, 7/06, 17/48
U.S. Cl. 313—576 20 Claims

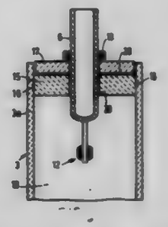
1. An array of microelectronic tubes comprising a substrate,
- an array of sharp needle-like cathode electrodes each with at least one tip carried by the substrate,
- each tube including an anode electrode spaced from the tip of a cathode electrode for receiving electrons emitted by field emission from said cathode electrode,
- insulating means separating and insulating said cathode electrodes from said anode electrodes, said insulating means including a plurality of through apertures into which the cathode electrodes extend,
- each tube containing a gas at a pressure of between about 1/100 and 1 atmosphere, and
- means for supplying operating voltages to the tubes whereby the mean free path of electrons travelling in said gas between said cathode and anode electrodes is equal to or greater than the spacing between the tip of the cathode electrode and the associated anode electrode and the maximum energy gained by the electrons is less than the ionization potential of the constituent gas.



4,721,886
HIGH-PRESSURE DISCHARGE LAMP WITH PRECISION END SEAL STRUCTURE

Joris J. C. Ooms; Jacobus M. M. Claassens, and Jan W. Rouwendal, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1985, Ser. No. 804,703
Claims priority, application Netherlands, Dec. 18, 1984, 8403830
Int. Cl.[4] H01J 61/36, 9/40
U.S. Cl. 313—623 9 Claims



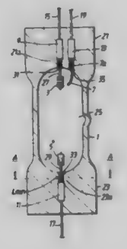
1. A high-pressure discharge lamp provided with a discharge vessel enclosing a discharge space and having a ceramic wall, this vessel being provided at at least one end with a ceramic end plug in which a current-supply member of a main electrode is arranged in a gas-tight manner by means of a sealing ceramic connection, the end plug being connected by means of a sintered joint to the wall of the discharge vessel in a sunken position with respect to the end of the vessel, which sintered joint between the end plug and the wall of the vessel is covered by sealing ceramic on the side facing the end of the vessel, characterized in that the discharge vessel is provided outside the discharge space with a ceramic filling piece for defining a capillary intermediate space between the filling piece and the wall of the discharge vessel, the end plug and the current-supply member, the capillary space being effective for controlling the flow of melted sealing ceramic during lamp manufacture, the capillary space being filled substantially entirely with sealing ceramic and the discharge space within the discharge vessel being substantially free of sealing ceramic.

4,721,887

METAL HALIDE ARC LAMP HAVING PINCH SEAL WITH ELONGATED SPACE

Shinji Inukai, Yokohama, and Kazuo Honda, Zushi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 2, 1986, Ser. No. 869,333
Claims priority, application Japan, Jun. 14, 1985, 60-88814[U]
Int. Cl.[4] H01J 61/30, 61/36
U.S. Cl. 313—623 8 Claims



1. A metal halide arc lamp comprising:
a quartz arc tube containing a fill including mercury and metal halide material;
a first electrode, arranged at one of the ends of said quartz arc tube, which extends along the elongated axis of said quartz arc tube;
a second electrode, arranged at the other end of said quartz arc tube, which extends along the elongated axis of said quartz arc tube;
a first squeezed portion, formed at one end of said quartz arc tube, which seals the one end of said quartz arc tube and supports said first electrode, said first squeezed portion including a first elongated space, which extends along said first electrode, the minimum value (L_1) of the width, in the direction perpendicular to said first electrode, of which satisfies:

$$0.1\ mm < L_1 < 0.3\ mm$$

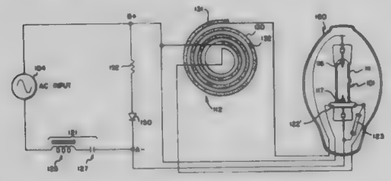
when the diameter (D_1) of said first electrode is 0.4 mm or less;
a second squeezed portion, formed at the other end of said quartz arc tube, which seals the other end of said quartz arc tube and supports said second electrode.

4,721,888

ARC DISCHARGE LAMP WITH ULTRAVIOLET ENHANCED STARTING CIRCUIT

Joseph M. Proud, Wellesley Hills; Wojciech W. Byszewski, Concord, and Charles N. Fallier, Jr., Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 27, 1984, Ser. No. 686,975
Int. Cl.[4] H01J 7/44, 17/34
U.S. Cl. 315—60 11 Claims



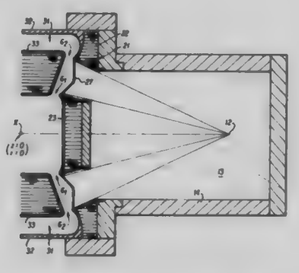
1. A light source comprising:
(a) a lamp having a lamp envelope and a discharge tube within said envelope having not more than two electrodes sealed within an envelope of said tube, said electrodes being located at opposite ends of said tube and a fill material enclosed within said tube which emits light during discharge wherein said lamp discharges at a predetermined normal discharge voltage; and
(b) a starting circuit including a spiral line pulse generator including two conductors and two insulators in a spiral configuration having a plurality of turns, said spiral line pulse generator including an output terminal coupled to one of said electrodes of said tube and a pair of input terminals, one of said input terminals and the other of said electrodes of said tube being adapted for coupling to a source of lamp operating power and for delivering lamp operating power, received from the source, through said spiral line pulse generator to said lamp;
(c) means for applying A.C. voltage between the conductors of said spiral line pulse generators, said AC voltage having a peak voltage; and
(d) a spark gap switch within said lamp envelope coupled between the conductors of said spiral line generator and arranged to short circuit said conductors at a firing selected to be less than the peak of said A.C. voltage, and higher than the normal discharge voltage of said lamp whereupon said spiral line pulse generator provides at said output terminal a high voltage, short duration pulse of sufficient energy to initiate discharge in said lamp causing said A.C. voltage to drop below said firing voltage and UV radiation to be emitted by said spark gap switch to illuminate the discharge path in said tube to enhance the probability of such discharge occurring.

4,721,889

UNIFORM INSULATION APPLIED-B ION DIODE

David B. Seidel, and Stephen A. Slutz, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 11, 1986, Ser. No. 850,455
Int. Cl.[3] H01J 7/24, 27/00; H05H 7/04
U.S. Cl. 315—111.81 7 Claims



1. In an extraction applied-B ion diode having:
cathode means for generating electrons, said cathode means comprising a ring symmetrically arranged about a center line;
anode surface means for releasing ions, said anode surface means comprising an annular disk extending from an inner edge to an outer edge coaxial with said cathode means, the radius from said centerline to said inner edge being less than the radius from said centerline to said outer edge, said cathode means being axially spaced from said anode means adjacent one of said edges;
applied-B field means for providing a magnetic field parallel to said anode surface and between said anode surface and said cathode,
wherein the improvement comprises:
means for providing uniform insulation along said anode, said means satisfying the condition: $\Psi_a = G(V)r_a + \Psi_c$

wherein Ψ_a and Ψ_c are the magnetic stream functions at the anode and cathode, respectively, and r_a is the radius of the anode and

$$\frac{\Delta\Psi}{r_a} = \frac{mc}{e}\left[\left(\frac{e}{mc^2}V + 1\right)^2 - 1\right]^{\frac{1}{2}} = G(V)$$

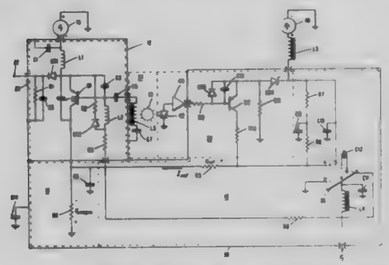
where ϕ_a is the scalar anode potential, m and $-e$ are, respectively, the mass and charge of an electron, and c is the speed of light in vacuum.

4,721,890

POWER SUPPLY CIRCUIT FOR AN ALKALI VAPOR SPECTRAL LAMP

William J. Riley, Jr., Hamilton, Mass., assignor to EG&G, Inc., Wellesley, Mass.

Filed Jun. 18, 1982, Ser. No. 389,929
Int. Cl.[4] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—224 8 Claims



1. A power supply circuit for an electrodeless alkali vapor spectral lamp comprising:
a. radio frequency oscillator means for exciting an electrodeless alkali vapor spectral lamp;
b. means for sampling D.C. supply current to said oscillator means;
c. feedback means responsive to said means for sampling for regulating said D.C. supply current to said oscillator means by controlling the operation of said oscillator means to thereby effect stabilization of the output of said lamp;
d. detector means for sensing excitation of said lamp, and wherein said feedback means includes means responsive to said detector means for permitting more current to pass through said oscillator means before said lamp is lit than after said lamp is lit.

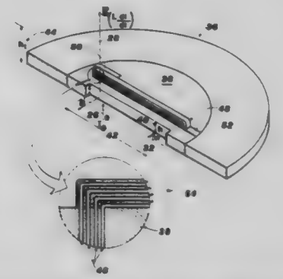
4,721,891

AXIAL FLOW PLASMA SHUTTER

George J. Krausse, Fort Collins, Colo., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 17, 1986, Ser. No. 853,103
Int. Cl.[4] H01J 17/14
U.S. Cl. 315—340 17 Claims

5. A switch for controlling a flow of charged particles including electrons through internal volumes of a cascading ionization device, comprising:
shutter means placeable to intercept said flow of charged particles and defining an aperture substantially normal to said charged particle flow, said aperture further defining an internal volume relatively small in comparison with adjacent ones of said internal volumes accepting said charged particles; and
coil means adjacent said aperture effective for producing a magnetic field within said aperture and perpendicular to said charged particle flow having a strength effective for creating a circular path of said electrons about said magnetic field with a circumference functionally related to a



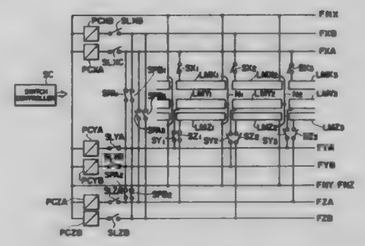
mean free path of said electrons for trapping said electrons in said aperture to quench said cascading ionization in said device.

4,721,892

POWER SUPPLY APPARATUS FOR LINEAR MOTOR

Kiyoshi Nakamura, Katsuta; Masayoshi Isaka, Hitachi, and Toyoharu Uchiyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 645,170, Aug. 28, 1984, Pat. No. 4,689,530.
This application Feb. 5, 1987, Ser. No. 11,001
Claims priority, application Japan, Aug. 31, 1983, 58-157857
Int. Cl.[4] H02K 41/00
U.S. Cl. 318—38 8 Claims



1. A power supply apparatus for a linear motor transportation system having a number of discrete linear motor units serially arranged along a track to generate a moving magnetic field for driving vehicle, said apparatus comprising:
said linear motor units being divided into two power supply systems each subdivided into two groups such that each of said power supply systems includes a series of ones of said linear motor units, the series of said linear motor units in each of said power supply systems being successively allotted to different ones of said groups;
four feeders provided respectively correspondingly to said two groups in each of said two power supply systems;
feeder section switches for connecting respective one ends of said linear motor units in each of said groups with corresponding ones of said feeders;
four power supply means provided respectively correspondingly to said groups in each of said power supply systems;
four output side switches provided for connecting the respective outputs of said power supply means with corresponding ones of said feeders;
four return path switches provided between return path side terminals of said respective four power supply means and said return feeders; and
four switches for serial excitation provided in each of said

two groups in each of said two power supply systems and each disposed between a feeder side terminal of said output side switch belonging corresponding one of said groups of corresponding one of said power supply systems and a return path side terminal of the power supply means belonging to said one group of the other power supply system;

in which a neutral point of each of said linear motor units of each of said groups of one of said power supply systems is connected with a neutral point of an adjacent one of said linear motor units of the corresponding group of the other power supply system, each linear motor unit of each group of one of said power supply systems is opposite in polarity to an adjacent one of said linear motor units of the correponding group of the other power supply system, and the respective other ends of said linear motor units are connected with return path feeders, whereby in each of said power supply systems, the series of linear motor units are successively excited by corresponding one of said plurality of power supply means as said vehicle runs.

4,721,893

PROCESS AND APPARATUS FOR CONTROLLING THE ELECTRIC MOTOR DRIVE OF A UNIT FOR THE MANUFACTURE OF MOLDINGS FROM MULTI-COMPONENT PLASTICS

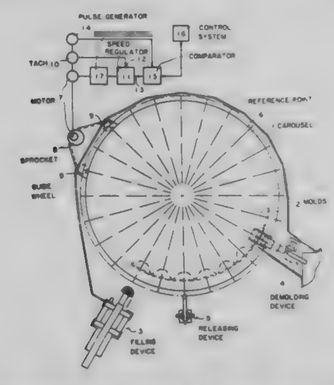
Günter Rehmann, Schoenrain; Gerhard Koeniges, Ounsbrueck, and Werner Mackert, Munich, all of Fed. Rep. of Germany, assignors to Elastogran Maschinenbau GmbH, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,088

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3421429

Int. Cl.⁴ G05B *13/00*

U.S. Cl. 318—332 **2 Claims**



2. An apparatus for controlling the electric motor drive for the intermittent movement of a conveyor belt or carousel, fitted with molds, in a unit for the manufacture of moldings from multi-component plastics, which apparatus comprises: a tachogenerator which is connected to a controllable electric motor wherein a signal voltage of the tachogenerator is fed to the actual value input of a speed controller, along with a signal corresponding to the position of the molds being applied to the intended value input of the speed controller, wherein the tachogenerator is coupled to a pulse generator, the pulses of which are adjusted by means of a comparator circuit with a preprogrammed pulse number, generated by a control system for the unit, so as to provide the signal to be applied to the intended value input of the speed controller.

4,721,894

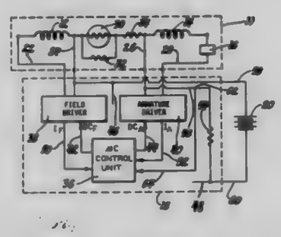
TEMPERATURE MONITOR SYSTEM FOR AN INTERMITTENT DUTY WOUND FIELD MOTOR

David W. Graber, Millington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1987, Ser. No. 56,437

Int. Cl.⁴ G05D *23/24*

U.S. Cl. 318—473 **10 Claims**



1. In a system including an intermittent duty motor having armature and field windings, and a motor controller adapted to separately supply current to the armature and field windings via an armature conductor pair and a field conductor pair, apparatus for obtaining a motor temperature indication without the use of an additional conductor connected between the motor and the motor controller, comprising:

temperature responsive means located at the motor and connected between one conductor of said armature conductor pair and one conductor of said field conductor pair, the temperature responsive means having a measurable parameter that varies with the temperature of a temperature responsive device thereof, such temperature responsive device being mounted in relation to a motor element it is desired to monitor the temperature of so that said measurable parameter varies in relation to the temperature of said motor element; and

monitoring means located at the motor controller and connected to said temperature responsive means through said one conductor of the armature conductor pair and said one conductor of the field conductor pair, said monitoring means being effective whenever the armature winding current and the field winding current are substantially zero for obtaining a sample of the measurable parameter of said temperature responsive means as an indication of the motor element temperature.

4,721,895

MULTI-SPEED ANALOG SERVO

Kenneth W. Cocksedge, Livermore, and William N. Thanos, San Jose, both of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed Nov. 22, 1983, Ser. No. 554,421

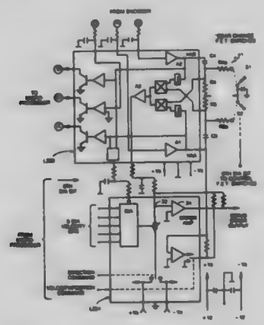
Int. Cl.⁴ G05B *5/01*

U.S. Cl. 318—618 **2 Claims**

1. In an analog tachometer circuit for generating a tachometer signal in response to a sinusoidally varying encoder signal whose frequency is proportional to the speed being measured and which includes analog differentiating means responsive to said encoder signal and a predetermined time constant to generate a differential signal whose magnitude is representative of said speed, the improvement comprising:

first means for establishing a first time constant corresponding to a first speed range;

second means for establishing a second time constant corresponding to a second speed range; and



switching means responsive to an external command for selectively providing said first or said second time constant to said analog differentiating means.

4,721,896

DRIVE CONTROLLED BY A SEQUENCE OF PULSES

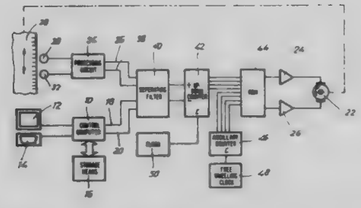
Hermann Klinger, Im Gehren 12, D-7300 Esslingen, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,489

Claims priority, application Fed Rep. of Germany, Aug. 24, 1985, 3530271

Int. Cl.⁴ G05B *19/40*

U.S. Cl. 318—685 **5 Claims**



1. Drive control system for a continuous displacement motor operated by a sequence of control pulses of which each pulse is representative of an incremental displacement of the motor comprising: a displacement sensor coupled with the motr and adapted to produce a sensed pulse for a movement of the motor corresponding to an incremental displacement of the motor; means for generating control pulses; subtraction circuit means, having a first input adapted to receive pulses corresponding to said control pulses, and a second input adapted to receive pulses corresponding to said sensed pulses, for generating a digital signal representing the difference between said control pulses and said sensed pulses, said digital signal corresponding to the difference between the desired and true positions of the motor; signal processing means for insuring that each control pulse and each sensed pulse may lead to a change in a distinct output signal of said subtraction circuit means when said control pulses and said sensed pulses are received simultaneously; a ROM having drive characteristics stored therein, and connected to be partially addressed by an output signal of said subtracting circuit, said ROM producing a driving digital signal bit; and, power stage means connected to said ROM for powering the motor based on said driving digital signal bit.

4,721,897

REACTIVE POWER PROCESSING CIRCUIT FOR A CURRENT SOURCE GTO INVERTOR

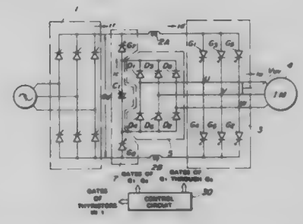
Koki Matsuse, Tama, and Hisao Kubota, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 5,646

Claims priority, application Japan, Jan. 24, 1986, 61-13482

Int. Cl.⁴ H02M *5/45*

U.S. Cl. 318—767 **3 Claims**



1. A reactive power processing circuit for a current source invertor, comprising:

(a) a power rectifier which carries out a gate phase control of a plurality of switching elements to convert an alternating current derived from an alternating current source into a corresponding direct current;

(b) a smoothing circuit having at least one direct current reactor for smoothing the direct current derived from the power rectifier so as to produce a smoothed direct current;

(c) an invertor main circuit having a plurality of bridge-connected gate turn off thyristors (GTO thyristors) for inverting the direct current derived from the smoothing circuit into an alternating current and for deriving a load with the alternating current at output sides thereof;

(d) a fly wheel circuit having a plurality of bridge-connected diodes whose alternating current sides are connected to the corresponding output sides of the invertor main circuit, for rectifying a reactive current derived from the load;

(e) a capacitor, connected across a direct current side of the fly wheel circuit, for storing a commutation surge voltage generated in the load;

(f) a pair of GTO thyristors, connected to the capacitor in their forward directions, for operatively discharging a charge across the capacitor toard positive and negative poles of the power rectifier; and

(g) a control circuit for triggering the pair of GTO thyristors to discharge the excessive charge across the capacitor and for continuing to send triggering pulses to the switching elements of the power rectifier for an interval required for a power rectifying operation of the power rectifier so that the switching elements are retriggered when a discharge operation of the pair of GTO thyristors is completed.

4,721,898

WOUND ROTOR MOTOR CONTROL

Robert S. F. Carter, Thorold, Canada, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 930,932

Int. Cl.⁴ H02P *7/40*

U.S. Cl. 318—827 **5 Claims**

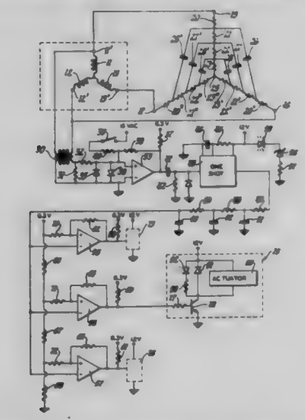
1. An acceleration and deceleration control for a wound rotor induction motor of the type including an AC powered multi-phase stator and a multi-phase rotor connected to a wye connected secondary having a plurality of shorting switches activatable in groups to decrease the secondary resistance as successive such groups of shorting switches are closed in a predetermined order and increase the secondary resistance as

the successive groups are opened in the reverse order, the control comprising, in combination:

an input comparator having an input circuit adapted to receive the rotor voltage and including voltage limiting means across the input comparator inputs effective to limit the rotor voltage applied thereto, the input comparator thereby generating an amplitude limited rectangular voltage wave at the frequency of the rotor voltage;

a pulse generator responsive to the input comparator to generate voltage pulses of predetermined constant duration at a frequency proportional to the frequency of the rectangular voltage wave;

a low pass filter effective to filter the output of the pulse



generator and thus generate a DC voltage inversely related to rotor speed;

a DC power supply effective to generate a plurality of DC reference voltages;

a plurality of switch control comparators, each receiving the output of the low pass filter on one input and one of the DC reference voltages on the other input; and

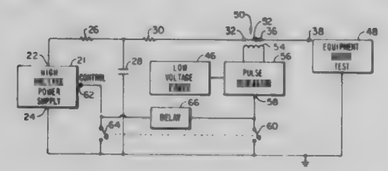
a plurality of switch actuators, each switch actuator being responsive to the output of one of the switch control comparators to activate one of the groups of shorting switches to close the shorting switches in the predetermined order as rotor speed increases during acceleration and open the groups of shorting switches in the reverse order as rotor speed decreases during motor deceleration.

4,721,899

COMBINED AIR-DIRECT TESTING SIMULATOR

Geoffrey M. Well, Cambridge, Mass., assignor to KeyTek Instrument Corp., Wilmington, Mass.

Filed Feb. 20, 1987, Ser. No. 17,142
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—1 8 Claims



1. In apparatus for applying a test static-electric discharge from a test tip to equipment under test, said apparatus including electrically chargeable capacitive storage means for storing electrical energy, and electrically actuatable switching means for connecting and disconnecting said tip to and from said capacitive storage means, the improvement wherein:

said switching means are normally in a mode wherein said tip is connected to said capacitive storage means, and

said improvement comprises:

means for first electrically actuating said switching means to disconnect said capacitive storage means from said tip for a first period of time, and to reconnect said capacitive storage means to said tip at the end of said first period of time, and

means for delaying charging said capacitive storage means for a second period of time following actuation of said switching means to disconnect said storage means from said tip, said second period being shorter than said first period.

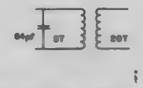
4,721,900

SELF-GENERATED CONVERTER FILTER

Charles S. Kerfoot, Pasadena, and Walter E. Milberger, Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1986, Ser. No. 893,831
Int. Cl.[4] H01F 27/42
U.S. Cl. 323—356 4 Claims





1. A process of reducing non-linearities in output signals in high-power applications of a transformer which produces an output voltage signal using a primary winding and n secondary windings, wherein n is an integer, said secondary windings having a total of N turns, wherein N is an integer, said process comprising the steps of:

removing said n secondary windings; and

replacing said n secondary windings with a replacement winding configuration which has a total of about N turns, and comprises m replacement secondary windings where m is an integer ranging from 1 to M and wherein M is an integer which is less than n, said replacing step thereby allowing said replacement winding configuration to produce an improved output voltage signal which has an amplitude which is approximately equal to that of said output voltage signal, said improved output voltage signal having reduced non-linearities produced by stray capacitances and inductance leakage compared to said output voltage signal.

4,721,901

METHOD AND APPARATUS FOR REFLECTION COEFFICIENT MEASUREMENTS

James R. Ashley, Tampa, Fla., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 24, 1986, Ser. No. 843,312
Int. Cl.[4] G01R 27/06, 25/04
U.S. Cl. 324—58 B 9 Claims

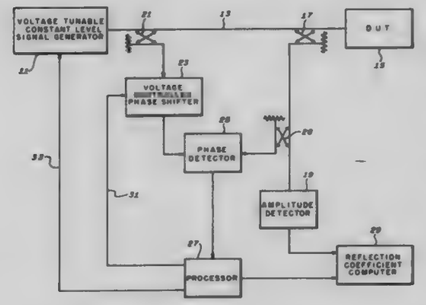
1. A reflection coefficient measuring apparatus of the type including transmission means for signal propagation having

signal input port means to receive signals for propagation, end port means adapted for coupling to devices to be tested, reflected signal sampling means coupled to the transmission means for providing samples of signals reflected from the end port means and detector means coupled to the reflected signal sampling means for determining reflected signal amplitudes further comprising:

incident signal sampling means coupled to said transmission means for providing samples of signals incident to said end port means;

phase detector means having first input means coupled to receive samples of said reflected signals from said reflected signal sampling means and second input means for providing a null at an output terminal thereof when a predetermined phase angle relationship is achieved between signals coupled to said first and second input means, a signal with a positive polarity at said output terminal when a phase angle of one of said signals is greater than a phase angle said signal other than said one by said predetermined phase angle relationship, and a signal with a negative polarity at said output terminal when said one signal is less than said signal other than said one by said predetermined phase angle relationship;

phase shift means coupled between said incident signal sampling means and said second input means of said phase detector means and having phase shift control terminals



for phase angle shifting signals propagating between said incident signal sampling means and said second input means of said phase detector means in accordance with phase angle incrementing signals coupled to said phase shift control terminals, whereby a phase relationship between said signals incident to and reflected from said end port means is determinable from a phase angle setting of said phase shift means when said predetermined phase relationship is achieved;

processor means coupled to said output terminal of said phase detector means, said phase shift control terminals of said phase shift means, and said reflection coefficient determining means for providing said phase angle incrementing signals until a null crossover is indicated by a signal polarity change at said output terminal of said phase detector means and for providing a final phase angle increment signal representative of said phase shift means phase angle setting for a null at said output terminal of said phase detector means to said reflection coefficient determining means by interpolating for a crossover between a signal polarity change when no increment signal produces said null; and

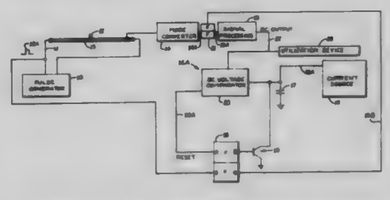
means coupled to receive said final phase angle incrementing signal from said processor means and to receive said reflected signal amplitude from said detector means for determining magnitude and phase angle of said reflection coefficient of a device coupled to said end port.

4,721,902

NOISE REJECTION IN A SONIC TRANSDUCER

Jacob Tellerman, Bayside; Carl A. Pedersen, Elmont, and Boris Goldfeld, Rego Park, all of N.Y., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jul. 8, 1985, Ser. No. 752,715
Int. Cl.[4] G01R 27/04; H03K 5/22
U.S. Cl. 324—58.5 B 9 Claims



1. A method of noise rejection in a circuit providing time information from the time of applying a first electrical pulse and which comprises the steps of:

applying periodic first electrical pulses to the circuit at an origination time and originating a second electrical pulse at the same origination time;

generating electrical signals in response to each first electrical pulse as a function of time of an occurrence;

receiving the electrical signals and stopping each corresponding second electrical pulse when such electrical signal is received to result in a second electrical pulse time period;

the second electrical pulse time period thereby indicating the time interval between application of each of the first electrical pulse and reception of the corresponding electrical signals;

preventing reception of electrical signals during a substantial portion of the time interval between application of a first electrical pulse and reception of the corresponding electrical signals; and

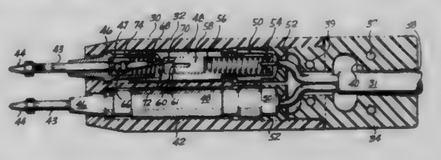
updating and varying the length of time that reception of electrical signals is prevented after each first electrical pulse is applied as a function of time periods of previous second electrical pulses.

4,721,903

PROBE AND METHOD FOR ELECTRICALLY CONTACTING SURFACES WITH PROTECTIVE COATINGS

Franklin D. Harsch, Renton, and Luis J. Lazaro, Jr., Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1985, Ser. No. 705,991
Int. Cl.[4] G01R 31/02, 1/067
U.S. Cl. 324—72.5 7 Claims



4. A method of making good electrical contact with a conductive body having a protective coating of a predetermined thickness while minimizing damage to the coating, comprising:

providing probe means mounted for sliding axial movement and having an axially outer pointed tip portion, and providing resilient means for exerting an axially outward biasing force on the probe means;

pressing said tip portion against the coating to slide the

probe means axially inwardly against said biasing force of the resilient means;

while continuing to press said tip portion against the coating, allowing the inward movement of the probe means to automatically cause an axially outward force of a predetermined magnitude to be abruptly applied to the probe means to in turn cause said tip portion to penetrate the coating and make good electrical contact with said body while minimizing damage to the coating.

4,721,904

DIGITAL PHASE DIFFERENCE DETECTING CIRCUIT

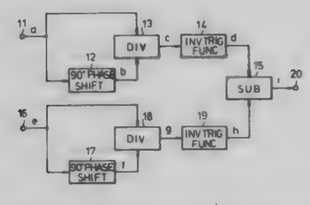
Kaoru Kobayashi, Yokohama, and Hidetoshi Ozaki, Chofu, both of Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 17, 1985, Ser. No. 810,067

Claims priority, application Japan, Dec. 25, 1984, 59-281703; Dec. 25, 1984, 59-281704; Dec. 25, 1984, 59-201613

Int. Cl.⁴ G01R *25/00*

U.S. Cl. 324—83 R **12 Claims**



1. A digital phase difference detecting circuit comprising:

first phase shifting means for shifting by +90° or −90° a phase of an input signal which has been sampled with a predetermined sampling period;

first dividing means for performing a division with an output signal of said first phase shifting means and said input signal;

first operation means for performing an inverse trigonometric function operation on an output signal of said first dividing means; and

subtracting means for obtaining a difference between an output signal of said operation means and a phase of a reference signal so as to obtain a phase difference between said reference signal and said input signal.

4,721,905

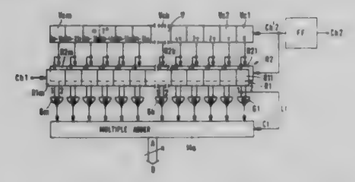
DIGITAL PHASE METER CIRCUIT

Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Intermetall, division of Ditti, Freiburg, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,592

Int. Cl.⁴ G01R *25/00*

U.S. Cl. 324—83 D **2 Claims**



1. A digital phase meter circuit for determining the phase differences between the edge of a pulse of a first clock signal and the edge of a pulse of a second clock signal within the sampling interval of two pulses of said second clock signal, said circuit comprising:

a frequency-divider circuit having an input receiving said second clock signal, and having an output;

a delay line comprising a row of m delay elements, said delay line having its input coupled to said frequency divided output;

a second register containing a row of m cells (R21 . . . R2m) each of which is clocked by the signal provided at the output of said frequency-divider circuit;

a first register containing a row of m cells clocked by said first clock signal;

a row of m XOR gates in which the first input of the kth XOR gate is connected to the output of the corresponding kth cell of said first register, and the second input to the output of the corresponding kth cell of said second register whereas the inputs of the kth cells of both said first register and said second register are connected to the output of the corresponding kth delay element;

a multiple adder having m inputs each connected to the output of one of said XOR gates having a control-input and generating an n-bit output signal; and

a connection between the output of the first cell of said first register and said control input of said multiple adder.

4,721,906

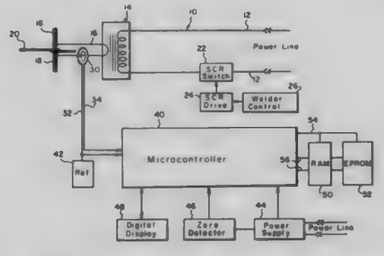
ONE STEP RMS SYSTEM

Hugo S. Ferguson, Averill Park, and David L. Hollinger, East Greenbush, both of N.Y., assignors to Duffers Scientific, Inc., Troy, N.Y.

Filed Aug. 6, 1985, Ser. No. 763,095

Int. Cl.⁴ G01R *19/02*

U.S. Cl. 324—132 **20 Claims**



1. Apparatus for determining the root mean square value of a pulsatile signal having an absolute value and generated from a power line signal, said power line signal having a known substantially fixed period, and wherein the absolute value of said pulsatile signal has a period substantially equal to half the period of said power line signal and a time duration equal to less than said half period, said apparatus comprising:

means for producing samples of the pulsatile signal at predefine substantially equal sampling intervals beginning at substantially the onset of a pulse in said pulsatile signal and continuing thereafter for substantially the entire duration of said half period to generate corresponding sampled values;

means, reponsive to said sample producing means, for squaring each of said sampled values to generate corresponding squared values;

means, operative in reponse to said squaring means, for accumulating each of said squared values to produce a totalized value;

means, reponsive to said squaring means, for dividing said totalized value by a number, wherein said number equals the total number of separate samples taken and accumulated during said half period to yield an intermediate value; and

means, reponsive to said dividing means, for determining the square root of said intermediate value to yield said root means square value of said pulsatile signal.

4,721,907

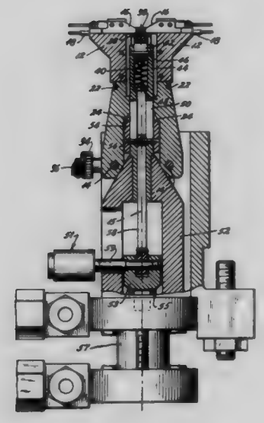
APPARATUS FOR AUTOMATED TESTING OF SURFACE MOUNTED COMPONENTS

Welbley J. Dean; Paul M. Overby, both of Binghamton, and Robert R. Robbs, Apalachin, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Jan. 23, 1985, Ser. No. 693,987

Int. Cl.⁴ G01R *1/06, 31/02*

U.S. Cl. 324—158 F **3 Claims**



1. A tester for testing electrical functioning of surface mounted-type electrical components prior to mounting of said components on a circuit board, each of said components comprising a body and electrically conductive connectors, said tester having a longitudinal axis and comprising:

means for orienting said component body angularly about and transverse to said longitudinal axis in preparation for said testing, and said orienting means comprising a pair of arms closeable upon said component body and each having a component body engaging surface sufficient for rotating said body about an axis generally parallel to said longitudinal axis in order to provide said angular and transverse orienting of said body;

means, operatively associated with said orienting means, for engaging said electrical connectors conductively in order to perform electrical functioning testing thereof; and

means for actuating said body orienting and electrical connector engaging means;

whereby said electrical connectors are elements of a set, said elements comprising conductive pads which are generally flush with a surface of the component body, conductive pads which are slightly out of flush with the component body surface, and electrically conductive leads protruding from at least one surface of a component body so as to provide lead tips generally coplanar with and spaced from another surface of said body, and said engaging means are adapted for engaging said elements.

4,721,908

APPARATUS FOR ELECTRONICALLY TESTING PRINTED CIRUCIT BOARDS OR THE LIKE

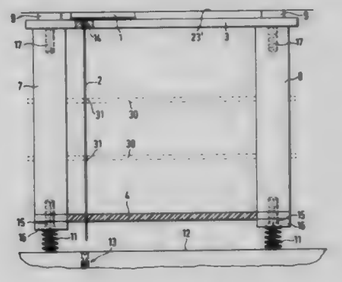
Hubert Driller; Edmund Krause, and Paul Maag, all of Schmitten, Fed. Rep. of Germany, assignors to Mania Elektronik Automatisation Entwicklung und Geritebau GmbH, Schmitten, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 886,639

Claims priority, application European Pat. Off., Sep. 16, 1985, 85111700.2

Int. Cl.⁴ G01R *1/06*

U.S. Cl. 324—158 F **19 Claims**



1. In an apparatus for electronically testing printed circuit boards, said apparatus including a plurality of substantially parallel test pins for making electrical contacts between contact areas of a printed circuit board being tested and respective of a plurality of resilient contact elements disposed in an array plate in accordance with a grid thereof, and a mask plate extending transversely to said test pins and having through-bores through which extend said test pins, such that when the circuit board being tested is urged toward said array plate the contact areas of the circuit board being tested engage first tip ends of respective said test pins and urge said test pins axially thereof such that second tip ends of said test pins engage respective said resilient contact elements, the improvement comprising:

said test pins being longitudinally rigid, and each said test pin being uncontoured with a substantially uniform configuration longitudinally between said first and second tip ends thereof; and

means for retaining said test pins in parallel alignment in said apparatus with said test pins extending through respective said through-bores in said mask plate, said means comprising an elastic plate formed of elastic material and mounted at a position spaced from said mask plate and extending parallel thereto, said test pins extending through said elastic plate in a manner such that said elastic material elastically contacts and grasps said test pins, whereby said test pins are maintained in said alignment due to the elasticity of said material.

4,721,909

APPARATUS FOR PULSING ELECTRON BEAMS

Neil Richardson, Mountain View, Calif., assignor to Schlumberger Technology Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 766,905, Aug. 16, 1985. This application Feb. 10, 1986, Ser. No. 828,157

Int. Cl.⁴ H01J *37/147*

U.S. Cl. 324—158 R **6 Claims**

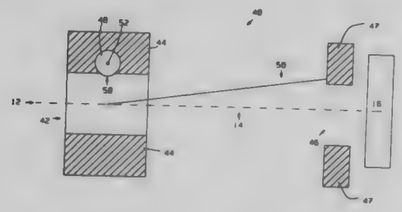
1. In an electron beam test probe system for measuring the potential of a selected region on the surface of a specimen, said electron beam test probe system having a means for generating an electron beam, an apparatus for producing a pulsed electron beam comrising:

beam blocking means including an aperture means defining a

region through which said electron beam must pass to reach said specimen;

means for defining a beam channel through which said electron beam passes prior to passing through the region of space defined by said aperture means and a second channel intersecting said beam channel to form a region common to both said channels, the walls of said beam and second channels being made of a conducting material;

a linear conductor coaxial with said second channel, said linear conductor and said second channel forming a coaxial transmission line wherein the axis common to said second channel and said linear conductor being positioned



such that said electron beam does not intersect said common axis; and

transmission line driving means coupled to said linear conductor and said second channel for generating a potential between said linear conductor and said second channel;

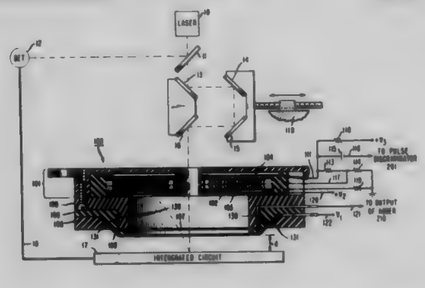
wherein an electrostatic deflection field is generated in said first channel when a potential is generated between said linear conductor and said second channel, said electron beam being prevented from passing through said region of space defined by said aperture means unless the potential generated between said linear conductor and said second channel is between predetermined first and second potential values.

4,721,910

HIGH SPEED CIRCUIT MEASUREMENTS USING PHOTOEMISSION SAMPLING

Jeffrey Bokor, Holmdel; Anthony M. Johnson, Spotswood, and Ralph H. Storz, Colts Neck, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 12, 1986, Ser. No. 906,306
Int. Cl.[4] G01N *23/225*
U.S. Cl. 324—158 R **4 Claims**



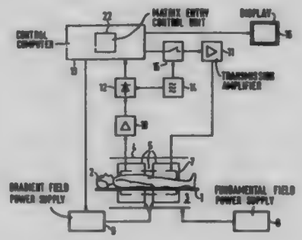
1. Apparatus for measuring a voltage waveform on an integrated circuit by using photoemission sampling comprising laser means for generating a pulsed laser beam directed toward an integrated circuit to be measured, means responsive to said laser means for generating an electrical signal which is coupled to the integrated circuit to be measured, an electron energy analyzer means positioned in the path of said pulsed laser beam adjacent to the integrated circuit to be measured for generating output pulses in response to electrons emitted from said integrated circuit, said electron energy analyzer means including an extraction grid made of a uniform grid of conductive wires and positioned as the most remote element in said electron energy analyzer means such that the extraction grid can be positioned immediately adjacent to said integrated circuit, and means responsive to the output pulses from said electron energy analyzer means for generating an output voltage whose value represents the voltage present in the voltage waveform being measured.

4,721,911

NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Helmut Neumann, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 884,283
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526870
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **2 Claims**



1. A nuclear magnetic resonance tomography apparatus for generating an image of a selected layer of an examination subject comprising:

means for generating a fundamental magnetic field in which said examination subject is disposed;

means for generating a plurality of gradient fields for selectively varying said fundamental field;

excitation and measuring means for exciting nuclear spins in said selected layer of said examination subject and for acquiring a plurality of echo sequences each consisting of a selected plurality of successive echoes corresponding to said nuclear spins after excitation in the form of Fourier lines;

a measuring matrix having a central zero line and opposite edges spaced from said zero line for storing said Fourier lines for constructing said image; and

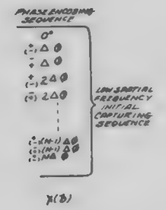
means for controlling insertion of said Fourier lines into said measuring matrix such that the first of the successive echoes in each sequence are entered in said measuring matrix alternatingly above and below said zero line at respective increasing distances therefrom until all of the first of the successive echoes in each sequence have been entered, said means for controlling thereafter entering the next-successive echoes in each sequence alternatingly above and below said zero line until all of the successive echoes in all of the echo sequences have been entered in said measuring matrix.

4,721,912

APPARATUS AND METHOD FOR INITIALLY CAPTURING MOST SIGNIFICANT LOW SPATIAL FREQUENCY NMR IMAGING DATA

Leon Kaufman, San Francisco; Lawrence E. Crooks, Richmond, and Douglas A. Ortendahl, Berkeley, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 30, 1985, Ser. No. 781,735
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **2 Claims**



1. An NMR imaging apparatus comprising:

NMR excitation means for eliciting plural successive NMR responses from an object to be imaged during a complete NMR image data acquisition cycle;

NMR detection means for detecting and processing said NMR responses into digital signals representing an image of at least a portion of said object;

said NMR excitation means including sequence control means for eliciting responses in a predetermined order which provides lowe spatial frequency image data during an initial part of a data acquisition cycle and higher spatial frequency image data thereafter during the remaining part of said data acquisition cycle;

said means for detecting and processing using a succession of phase-encoded NMR responses in a Fourier-transform reconstruction technique;

said excitation means eliciting successive NMR responses using relative phase-encoding which alternates in polarity and progressively increases in magnitude; and

said means for detecting and processing including image reconstruction means for accepting the NMR responses which occur during said initial part of the data acquisition cycle and for reconstructing an initial NMR image based thereon.

4,721,913

NMR LOCAL COIL NETWORK

James S. Hyde, Dousman, Wis.; Wojciech Froncisz, Krakow, Poland; Andrzej Jesmanowicz, Wauwatosa, Wis., and Thomas M. Grist, Milwaukee, Wis., assignors to MCW Research Foundation, Inc., Milwaukee, Wis.

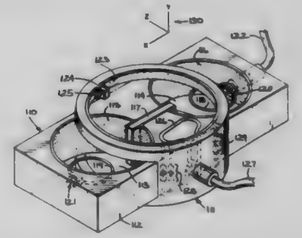
Continuation-in-part of Ser. No. 731,923, May 8, 1985. This application Aug. 15, 1986, Ser. No. 897,177
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **11 Claims**

1. An NMR quadrature probe comprising:

a first coil having a first reception pattern which couples to magnetic fields of a first orientation; and

a second local coil having a second reception pattern which couples to magnetic fields of a second orientation which is substantially orthogonal to the first orientation;

wherein the first and seond reception patterns substantially coincide in spatial coverage, and at least one of the first or



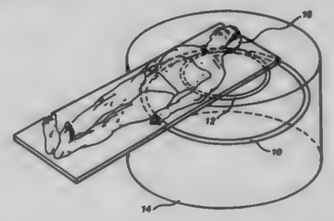
second local coils is intrinsically isolated with respect to a uniform magnetic field.

4,721,914

APPARATUS FOR UNILATERAL GENERATION OF A HOMOGENEOUS MAGNETIC FIELD

Eiichi Fukushima, Los Alamos, N. Mex.; Alan R. Rath, San Diego, and Stephen B. W. Roeder, La Mesa, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 1, 1984, Ser. No. 605,950
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 **11 Claims**



1. Apparatus for generating within a selected volume a magnetic field having a uniform strength to a selected tolerance, comprising:

a first electromagnet coil having a first number of turns N_1 at a first radius R_1 with a center of said first coil spaced axially a first distance from said selected volume;

a second electromagnet coil axially concentric with and parallel to said first coil and having a second number of turns N_2 at a second radius R_2 greater than R_1 and spaced unilateral of said volume with said first coil a second distance greater than said first distance from said selected volume;

said first radius and first distance and said second radius and second distance being functionally related to enable said first and second electromagnet coils to produce first and second magnetic fields, respectively, having substantially linear gradients within said selected volume;

N_1 and N_2 being effective when energized with predetermined first and second currents, respectively, to produce equal and opposite gradients of said respective first and second magnetic fields in said unilateral volume and a net magnetic field having a strength within said selected volume effective for nuclear magnetic resonance determinations.

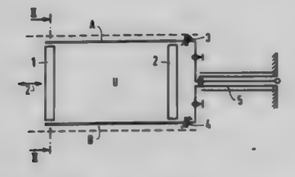
VOL 1086 ISS 4 JA 26 1988 UMI

4,721,915

HIGH FREQUENCY ANTENNA SYSTEM FOR NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY DEVICES

Joachim Kestler, Pretzfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,464
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507946
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 9 Claims



1. A high-frequency antenna system for use in a nuclear magnetic resonance tomography device having a longitudinally extending examination chamber and an RF transmitter, said system comprising:

at least two isolated members supplied with high-frequency current of opposite polarity by said RF transmitter to generate a magnetic high-frequency field, said conductor members having a predetermined length and surrounding said examination chamber on an imaginary cylindrical surface, said conductor members extending parallel to a longitudinal axis of said cylindrical surface and each conductor member terminating in opposite ends; and

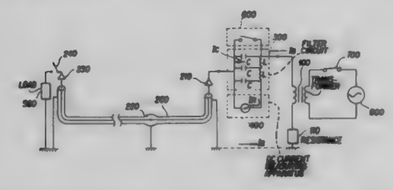
an electrode disposed at each end of each conductor member for maintaining the elcetrical field generated at the respective ends of said conductor members away from said examination chamber and limiting said magnetic high-frequency field substantially to said examination chamber between said electrodes.

4,721,916

METHOD FOR DIAGNOSING AN INSULATION DETERIORATION OF A POWER CABLE

Kazuhiko Hanasawa, Tokyo; Kenichiro Soma, Ibaraki, and Kazuo Kotani, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,604
Claims priority, application Japan, Apr. 19, 1985, 60-84723
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—544 4 Claims



1. A method for diagnosing an insulation deterioration of a power cable having AC charging current supplied to one end thereof from a power source comprising the steps of,

detecting between said power source and said one end of said power cable a DC current component caused by the insulation deterioration and which is contained in said AC charging current flowing into said power cable through said one end portion thereof from said power source,

measuring the polarity and magnitude of said DC current component, and

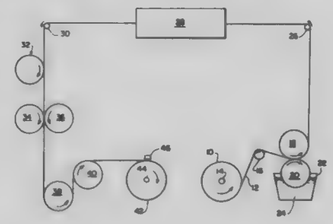
estimating the insulation deterioration of said power cable as a function of said polarity and magnitude of said DC current component.

4,721,917

COATING CONTINUITY DETECTOR

Robert L. Boegershausen, Chesterfield County, and Joachim W. Illig, deceased, late of Hearico County, both of Va. (by Ann G. Illig, administrator), assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 660,293, Oct. 12, 1984. This application Mar. 21, 1986, Ser. No. 843,856
Int. Cl.[4] G01R *31/12, 31/08*
U.S. Cl. 324—558 23 Claims



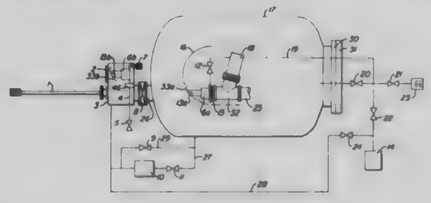
1. A method for determining the continuity of a nonconductive coating material on a conductive material web comprising electrically grounding said web, electrically grounding a means for measuring electrical resistance, forming an electrical circuit by passing the coated side of said web against an ungrounded conductive surface and electrically connecting said means for measuring electrical resistance to said ungrounded conductive surface, masking a portion of said ungrounded conductive surface to permit a region of coating discontinuity on said web to pass thereacross without detection, applying electrical voltage through said electrical circuit and measuring the electrical resistance in said circuit.

4,721,918

PROCESS AND APPARATUS FOR THE EXCHANGE OF EMISSION SOURCES

Renée Koudijs, Amersfoort, Netherlands, assignor to High Voltage Engineering Europa B.V., Amersfoort, Netherlands

Filed Jul. 5, 1985, Ser. No. 752,120
Claims priority, application Netherlands, Jul. 19, 1984, 8402284
Int. Cl.[4] H05H *15/00*; H01J *1/92*; G21F *5/02*
U.S. Cl. 328—233 17 Claims



1. A process for the exchange of an emission source of a particle accelerator located in an accelerator vessel filled with a gaseous insulating medium with a replacement emission source comprising the steps of:

connecting an external gastight container to the accelerator vessel, said container capable of having a gaseous state independent from that of the accelerator vesel, and defining therein an exchange chamber for housing at least one replacement emission source;

filling said container with the same gaseous insulating medium at the same pressure as that in the accelerator vessel;

transferring the emission source to be exchanged in the accelerator vessel to the gastight container; and

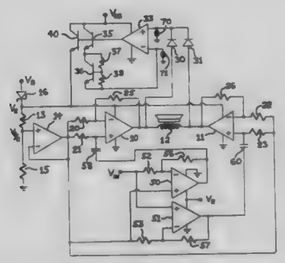
moving one of the replacement emission source from the gastight container to a desired position in the accelerator vessel.

4,721,919

CLASS G BRIDGE AMPLIFIER WITH UNIPOLAR SUPPLIES

David A. LaRosa, and David W. Osburn, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1986, Ser. No. 944,059
Int. Cl.[4] H03F *3/20*
U.S. Cl. 330—146 3 Claims



1. A bridge audio amplifier comprising, in combination:

first and second unipolar supplies of electrical power at first and second voltages, respectively, the second voltage being greater than the first;

a voltage divider powered through first unidirectional current means from the first unipolar supply, the voltage divider having full and half voltage outputs;

first and second amplifiers having outputs with a load connected thereacross and individual output voltage ranges determined by the full voltage output of the voltage divider, the first and second amplifiers obtaining a DC operating voltage from the half voltage output of the voltage divider;

an input amplifier means adapted to receive an input voltage signal for amplification and further having differential outputs with output ranges determined by the full voltage output of the voltage divider and connected in opposite phase to the inputs of the first and second amplifiers, the input amplifier means obtaining a DC operating voltage from the half voltage output of the voltage divider;

a peak detector responsive to the outputs of the first and second amplifiers to generate a peak voltage varying with the greater;

a voltage follower having an output voltage range determined by the second supply and responsive to the output of the peak detector to maintain its own output voltage a predetermined voltage above the peak voltage; and

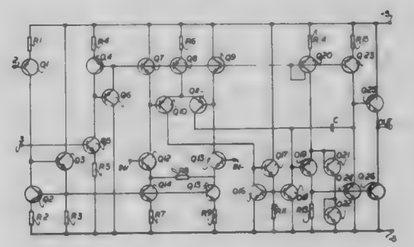
second unidirectional current means connecting the output of the voltage follower to the full voltage output of the voltage divider in a highest wins configuration with the first unipolar supply, the second unidirectional current means being effective, when forward biased, to supply current from the second unipolar supply, whereby class G bridge operation is obtained without distortion from unipolar supplies.

4,721,920

BROAD-BAND INTEGRATOR

Vanni Poletto, Camino, and Marco Siligoni, Vittuone, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Aug. 27, 1986, Ser. No. 901,301
Claims priority, application Italy, Sep. 23, 1985, 67809 A/85
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—255 2 Claims



2. A broad-band integrator for the implementation of an electrical filter with a programmable gain-bandwidth product and implemented as a bipolar-element integrated circuit, comprising:

an input differential amplifier having a pair of differential-amplifier transistors with bases respectively connectable to an inverting input and to a noninverting input, and a differential-amplifier resistor connecting emitters of said differential-amplifier transistors;

a first current mirror feeding the emitters of said differential-amplifier transistors;

a first transistor connected to and driving said first current mirror;

a current multiplier including:

a pair of first current-multiplier transistors having respective bases connected to said differential-amplifier transistors, and mutually connected emitters,

a second transistor forming a current generator and connected to the emitters of said first current-multiplier transistors, and

a pair of second current-multiplier transistors having bases connected to the base of said second transistor, and emitters connected to the bases of said first current-multiplier transistors and to collectors of said differential-amplifier transistors;

a second current mirror connected to and driving said pair of second current-multiplier transistors;

a third transistor connected to and driving said second current mirror;

a third current mirror connected to said pair of first current-multiplier transistors and operating as an active load therefor;

an amplifying stage connected to said pair of first current-multiplier transistors and to said second current mirror, said amplifying stage including:

a fourth transistor having a base connected to a collector of one of said pair of first current-multiplier transistors, and a collector fed by said second current mirror,

a reference voltage generator connected to said collector of said fourth transistor,

a fifth transistor having a base connected to an emitter of said fourth transistor, a common emitter and a collector fed by said second current mirror,

a sixth transistor having a base connected to the collector of said fifth transistor, a common collector and an emitter directly connected to an output terminal,

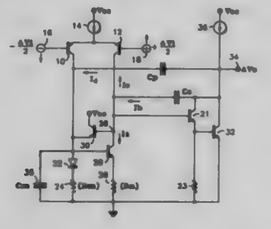
a seventh transistor having a base connected to an emitter of said fourth transistor, a common emitter and a collector connected to the emitter of said sixth transistor; and

a capacitor connected between the base of the fourth transistor and the base of said sixth transistor.

4,721,921
AMPLIFIER HAVING IMPROVED GAIN/BANDWIDTH PRODUCT

Robert L. Vyne, and William F. Davis, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1986, Ser. No. 944,048
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—260 **6 Claims**

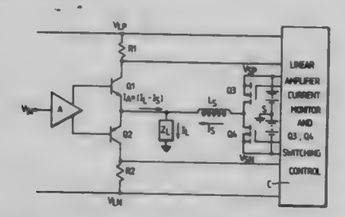


1. An amplifier circuit, comprising:
first and second differentially coupled input transistors each having base, emitter and collector terminals, said emitter terminals for coupling to a first source of supply voltage, and the base terminals of said first and second input transistors being coupled to receive first and second input signals respectively;
current mirror means for coupling between the collector terminals of said first and second input transistors and a second source of supply voltage;
an output transistor having base, emitter and collector terminals, said emitter for coupling to said second source of supply voltage, said base coupled to the collector of said second input transistor, and said collector for coupling to said first source of supply voltage, said collector of said output transistor forming the amplifier's output at which an output current is generated in response to relative magnitudes of said first and second input signals;
a compensation capacitor coupled between the collector of said output transistor and the collector of said second input transistor; and
positive feedback means coupled between the collector of said output transistor and the collector of said first input transistor.

4,721,922
ELECTRIC SIGNAL AMPLIFIERS

Martin W. Redfern, Maidstone, England, assignor to Gec Avionics Limited, England

Filed Mar. 31, 1986, Ser. No. 846,252
Claims priority, application United Kingdom, Apr. 3, 1985, 8509655
Int. Cl.[4] H03F *3/30*
U.S. Cl. 330—263 **9 Claims**

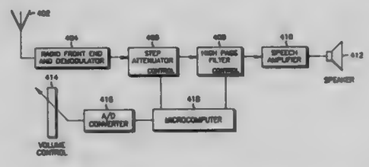


1. An electric signal amplifier comprising: an output stage arranged to control the voltage supplied to a load in dependence on an input signal applied to the amplifier; means for separately supplying to said load a current which changes at a rate faster than a maximum required rate of change of current in the load thereby to produce a corresponding change in the current required to be supplied by the output stage to the load in order to maintain the voltage across the load at the value required by said input signal; and switching means included in said supplying means, said switching means being operated in dependence on the value of the current supplied to the load by said output stage so as to control the sense in which said changing current changes, thereby to restrict the current supplied to the load by the output stage to values less than the total peak current required by the input signal; and including the improvement that said output stage is a push-pull stage and said switching means causes the sense in which the changing current changes tor reverse only when said current supplied by said output stage exceeds a single predetermined positive value or a single predetermined negative value, which predetermined values are less than the total peak current required by the input signal to be supplied to the load, thereby to cause the current supplied to the load by the output stage to oscillate between said predetermined values.

4,721,923
RADIO RECEIVER SPEECH AMPLIFIER CIRCUIT

Jaromir R. Bares, Lighthouse Point; Bakulesh B. Patel, Coral Springs, both of Fla., and James H. Stangel, Wiesbaden, Fed. Rep. of Germany, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1987, Ser. No. 923
Int. Cl.[4] H03G *3/18*
U.S. Cl. 330—284 **2 Claims**

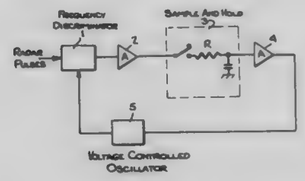


1. A speech amplifier circuit for a battery powered radio receiver, comprising in combination:
variable gain means for varying the amplitude of an electrical speech signal, said variable gain means having a control input for selecting the amplitude of said electrical speech signal;
a high pass filter coupled to said variable gain means, said filter having active and bypass modes and a control input for selecting one of said modes;
a speech amplifier coupled to said filter;
a speaker coupled to said amplifier;
volume selecting means for selecting the volume of speech emitted from said speaker; and
controlling means, coupled to said volume selecting means, for controlling said variable gain means and said filter;
whereby, said active mode of said filter is selected by said controlling means when said volume selecting means is advanced to a predetermined level and, simultaneously, said variable gain means is adjusted by said controlling means to have a step increase in the amplitude of said electrical speech signal.

4,721,924
DEVICE FOR TUNING A VCO TO THE CARRIER FREQUENCY OF EACH RADAR PULSE

Arturo Maudea, Pomezia; Pietro Bartolini, Rome; Gianfranco Colavito, Rome, and Filippo Neri, Rome, all of Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

PCT No. PCT/IT85/00014, § 371 Date May 12, 1986, § 102(e) Date May 12, 1986, PCT Pub. No. WO86/00768, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 3, 1985, Ser. No. 852,955
Int. Cl.[4] H03L *7/06*
U.S. Cl. 331—1 R **5 Claims**

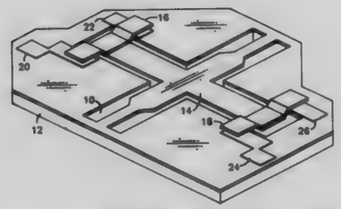


1. A device for rapidly tuning the frequency of a voltage controlled oscillator to the carrier frequency of each pulse of a radar, comprising:
a frequency discriminator having two inputs and adapted to receive radar pulses directly to one of the two inputs;
a first amplifier coupled to the output of the frequency discriminator;
a sample-and-hold circuit coupled to the output of the first amplifier;
a second amplifier coupled to the output of the sample-and-hold circuit; and
a voltage controlled oscillator coupled to the output of the second amplifier, the output of which voltage controlled oscillator is in turn coupled to the second input of the frequency discriminator.

4,721,925
MICROMECHANICAL ELECTRONIC OSCILLATOR

Louis P. Farace, Mesa, and Adrian S. King, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1986, Ser. No. 932,851
Int. Cl.[4] H03B *5/30*
U.S. Cl. 331—154 **9 Claims**

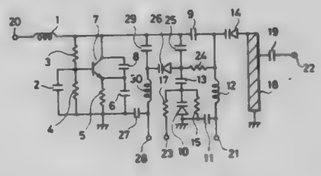


1. An electromechanical oscillator comprising:
a silicon wafer;
a cavity formed within said silicon wafer;
a cross-shaped micromechanical structure suspended over said cavity wherein said micromechanical structure has a first end and a second end positioned opposite to each other and attached to said wafer and said micromechanical structure also has a third end and a fourth end positioned opposite to each other and free from said wafer;
first and second bridging contacts with said first contact placed on said third end and said second contact placed on said fourth end;
a plurality of bonding pads positioned on locations of said silicon wafer where said first and second contacts bridge said cavity; and
electrical circuitry capable of inducing oscillations in said micromechanical structure.

4,721,926
VOLTAGE-CONTROLLED-OSCILLATOR WITH MODULATOR

Toshio Aota, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 3, 1987, Ser. No. 10,560
Claims priority, application Japan, May 7, 1986, 61-68482[U]
Int. Cl.[4] H03C *3/22*
U.S. Cl. 332—16 T **1 Claim**

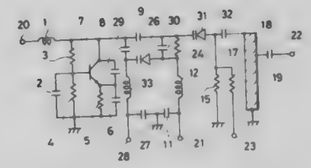


1. A voltage-controlled-oscillator with a modulator, comprising a first variable capacitance diode, a second variable capacitance diode, and a third variable capacitance diode, said second variable capacitance diode being connected in series with said third variable capacitance diode to form a serial connection member, said first variable capacitance diode being connected in parallel to said serial connection member to form a resonance device, wherein capacitance of said first variable capacitance diode is controlled by applying an oscillation frequency control voltage to said first variable capacitance diode, and capacitance of said second variable capacitance diode is controlled by applying a modulation signal to said second variable capacitance diode, and capacitance of said third variable capacitance diode is controlled in a reverse direction to changes in the capacitance of said first variable capacitance diode by applying a reverse bias voltage and the oscillation frequency control voltage to said third variable capacitance diode to thereby provide a frequency modulated wave.

4,721,927
VOLTAGE-CONTROLLED-OSCILLATOR WITH MODULATOR

Toshio Aota, Soma, and Toshiki Baba, Odaka, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 4, 1987, Ser. No. 10,805
Claims priority, application Japan, May 7, 1986, 61-68483[U]
Int. Cl.[4] H03C *3/22*
U.S. Cl. 332—16 T **1 Claim**



1. A voltage-controlled-oscillator with a modulator, comprising a first variable capacitance diode and a second variable

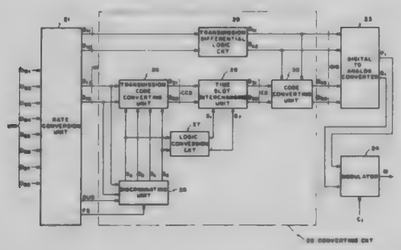
capacitance diode, said first variable capacitance diode being connected in series with said second variable capacitance diode to form a resonance device, wherein capacitance of said first variable capacitance diode is controlled by applying a reverse bias voltage and an oscillation frequency control voltage to both ends of said first variable capacitance diode, and capacitance of said second variable capacitance diode is controlled in a reverse direction to changes in the capacitance of said first variable capacitance diode with respect to said oscillation frequency control voltage by applying said oscillation frequency control voltage and a modulation signal to both ends of said second variable capacitance diode to thereby provide a frequency modulated wave.

4,721,928

MULTILEVEL MODULATOR CAPABLE OF PRODUCING A MULTILEVEL QUADRATURE AMPLITUDE MODULATED SIGNAL HAVING $(2^n+\alpha)$ OUTPUT SIGNAL POINTS

Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 20, 1986, Ser. No. 933,024
Claims priority, application Japan, Nov. 21, 1985, 60-262846; Nov. 21, 1985, 60-262847
Int. Cl.[4] H03C *5/00*
U.S. Cl. 332—31 R 6 Claims



1. A multilevel modulator for modulating a binary input signal into a multilevel quadrature amplitude modulated signal, said binary input signal comprising a main data signal represented by first through n-th bits, each in a time slot where n represents a first predetermined number, and a subdata signal represented by one of a first and a second binary value in each succession of first through m-th time slots where m represents a second predetermined number which is not less than two, wherein the improvement comprises:

converting means responsive to said main data signal and said subdata signal for converting said main data signal into a binary intermediate signal in accordance with said subdata signal, said binary intermediate signal being represented by first through (n+X)-th intermediate signal bits which specify $2^{(n+X)}$ intermediate signal points where X is equal to two when said first predetermined number is an even number, and equal to unity when said first predetermined number is an odd number;

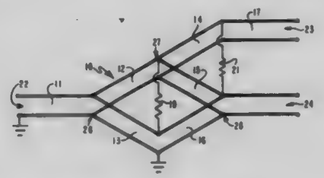
processing means coupled to said converting means for processing said binary intermediate signal into said multilevel quadrature amplitude modulated signal to reduce said $2^{(n+X)}$ intermediate signal points to $(2^n+\alpha)$ output signal points where α represents an integer which is not less than zero and is not greater than $2^n/m$, said multilevel quadrature amplitude modulated signal being specified on a phase plane which has an origin and real and imaginary axes orthogonally crossing at said origin and which is divisible into a main region having a center point at said origin and an outside region placed outside of said main region, 2^n main signal points among said output signal points being in said main region, said main signal points being in one-to-one correspondence to 2^n signal values represented by said main data signal only when said subdata signal has said first binary value, α outside signal points among said output signal points being in said outside region.

4,721,929

MULTI-STAGE POWER DIVIDER

Michel W. Schaetzer, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 17, 1986, Ser. No. 920,098
Int. Cl.[4] H03H *7/48*
U.S. Cl. 333—127 11 Claims



1. A two-stage power divider, comprising:

a power input and first and second power outputs;

a plurality of radio frequency transmission lines connected between the input and the plurality of outputs, said connected radio frequency transmission lines providing a first power-dividing junction to divide power into a first radio frequency pathway to said first power output and a second radio frequency pathway to said second power output, and further providing a second power-dividing junction to divide a portion of the power from the first radio frequency pathway and direct it into a third radio frequency pathway that connects to the second radio frequency pathway at a power-combining junction; and

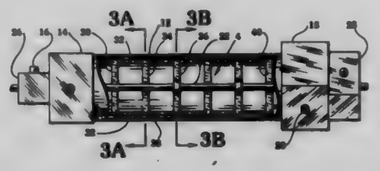
a first resistive element connecting said second power-dividing junction to said second pathway, and a second resistive element connecting said power-combining junction to said first radio frequency pathway.

4,721,930

SUSPENSION AND DRIVE SYSTEM FOR A MECHANICAL RF ENERGY POWER DIVIDER INTENDED FOR SPACECRAFT APPLICATIONS

Nathaniel L. Cohen, San Diego, Calif., assignor to General Dynamics Corp., Space Systems Div., San Diego, Calif.

Filed May 21, 1986, Ser. No. 868,924
Int. Cl.[4] H01P *5/12*; B65H *59/10*; F16F *1/14*; B60T *13/04*
U.S. Cl. 333—137 16 Claims



1. A suspension and drive system for a variable microwave power divider including a first orthomode transducer means, a second orthomode transducer means spaced from the first transducer means and rotated a predetermined angular amount therefrom, a hollow circular waveguide means coupling the first and second transducer means, means to inject and extract RF energy into and from each transducer means, septum means positioned within the waveguide means and variable to a predetermined configuration to control the polarization of RF energy flowing through the waveguide means from one transducer means to another, and variable control rod means extending longitudinally through the power divider for controlling the configuration of the septum means, said system comprising:

torsion spring means connecting each end of the control rod means to fixed surfaces,

selectively energizeable friction brake means surrounding at least a portion of the control rod means for holding the control rod means in a predetermined angular position, and

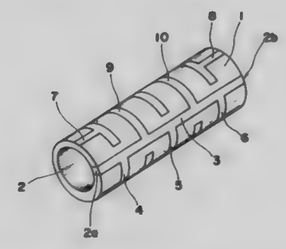
electric motor means coupled to the control rod means and operable to rotate the control rod means a predetermined angular amount.

4,721,931

STRIPLINE FILTER

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, Kyoto; Jun Hattori, Nagaokakyo, and Hideyuki Kato, Ootsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 30, 1987, Ser. No. 44,817
Claims priority, application Japan, May 2, 1986, 61-102809
Int. Cl.[4] H01P *1/203, 7/08*
U.S. Cl. 333—203 8 Claims



1. A stripline filter comprising:

a substrate made of a dielectric material and arranged in a shape of cylinder having inner and outer surfaces with opposite ends thereof opened;

a ground electrode deposited on said inner surface;

a runner electrode deposited on said outer surface and extending between opposite ends of said cylindrical substrate, said runner electrode being electrically connected at opposite ends thereof with said ground electrode;

first resonance electrodes extending from said runner electrode along said outer surface circumfe[illegible] the cylindrical substrate with a predetermined [illegible] d terminating away from said runner electrode;

second resonance electrodes extending, in a direction opposite to said first resonance electrodes, from said runner electrode along said outer surface circumference of the cylindrical substrate and terminating away from said runner electrode such that said first and second resonance electrodes are interdigitated.

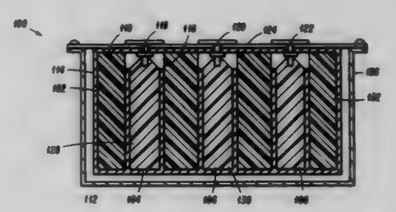
4,721,932

CERAMIC TEM RESONATOR BANDPASS FILTERS WITH VARACTOR TUNING

James B. West, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1987, Ser. No. 19,399
Int. Cl.[4] H01P *1/205, 7/04*
U.S. Cl. 333—207 5 Claims

1. An improved varactor tuned ceramic TEM resonator bandpass filter of the type having a metallic plated ceramic block with extending therethrough metallic plated resonator bore holes, each having a top end and a bottom end, wherein



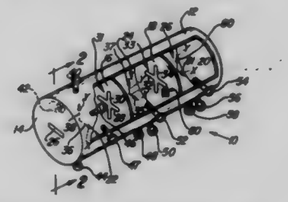
the improvement comprises a varactor diode fixed within an unplated portion of a resonator bore hole at its top end.

4,721,933

DUAL MODE WAVEGUIDE FILTER EMPLOYING COUPLING ELEMENT FOR ASYMMETRIC RESPONSE

Craig Schwartz, Lawndale; Louis Hendrick, Hermosa Beach, and Joseph Elliott, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 2, 1986, Ser. No. 902,810
Int. Cl.[4] H01P *1/208, 7/06*
U.S. Cl. 333—212 15 Claims



1. For use in an electromagnetic waveguide filter of the type having a plurality of mutually adjacent resonant waveguide cavities, said cavities being electromagnetically coupled with each other through an iris defined in a septum which separates adjacent cavities, a device for coupling first and second mutually orthogonal, electromagnetic fields respectively in said adjacent cavities, comprising:

a bent metal rod coupling element mounted on and extending through said septum.

4,721,934

AXIAL STRAP SUSPENSION SYSTEM FOR A MAGNETIC RESONANCE MAGNET

Lee E. Stacy, Florence, S.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1987, Ser. No. 33,293
Int. Cl.[4] H01F *5/00*
U.S. Cl. 335—300 11 Claims

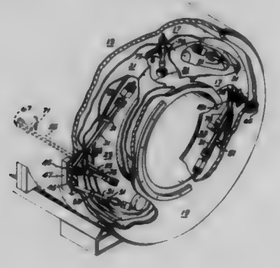
1. A cryostat comprising:

an outer closed cylindrical vacuum vessel;

an inner cylindrical helium vessel situated inside said vacuum vessel, said helium vessel having on its outside surface four radially extending trunnions situated on a horizontal plane passing through the center of the helium vessel, said trunnions symmetrically spaced on either side of the helium vessel, about the helium vessel's axial midplane; and

four straps, one end of each of said straps looping about a

respective one of said four trunnions, the other end of each of said straps rotatably secured to the circular end



faces of said vacuum vessel, with two straps from the trunnions closest to an end face secured to that end face.

4,721,935

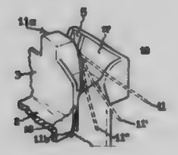
BOBBINS COILS WITH TERMINAL HOUSING

William F. Gunsels, Hendersonville; Candler A. Willis, and Mitchell M. Ottens, both of Zirconia, all of N.C., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 652,233, Mar. 28, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 912,676

Int. Cl.⁴ H01F *15/10*

U.S. Cl. 336—192 **5 Claims**



1. A coil assembly including a bobbin of insulating material for supporting an electrical coil wound thereon comprising:

a drum-like coil support portion comprising part of said bobbin, said support portion having side flanges and surrounding a winding axis, said flanges extending radially outward relative to said axis,

one of said flanges comprising an outboard terminal housing having walls projecting outward beyond the flange's rim and a slot located in the flange's rim at a position which leads into the first layer of the wound electrical coil on said support portion said slot having a bottom in said flange and an outwardly extending side which is continuously curved into an end all which is perpendicular to said flange, said terminal housing having spaced apart inner walls which are downwardly sloped toward each other to define an inwardly extending terminal-receiving cavity,

a wire having a section constituting the initial portion of said first layer of the wound coil disposed in said cavity and coiled about said support portion, the sloped walls of said cavity disposing said initial portion of said wire in a substantial circumferential direction about said axis and said initial portion of said wire being an excursion beyond said flange in a manner corresponding generally to a turn of coiling around said support portion, and

a pressure-applying terminal, accommodated by said cavity in coupling relationship to said wire.

4,721,936

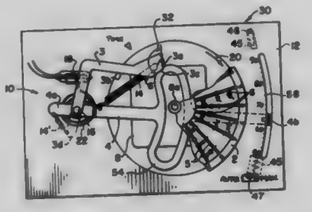
DOUBLE ARM TIME VARIABLE THERMOSTAT

Edward Williams, Manlius, N.Y., and Frank Martucci, 360 Tom Hunter Rd., Fort Lee, N.J. 07024, assignors to Frank Martucci, Fort Lee, N.J.

Filed May 4, 1987, Ser. No. 46,526

Int. Cl.⁴ H01H *37/62*

U.S. Cl. 337—302 **6 Claims**



1. A time variable thermostat comprising:

a housing;

a clock motor connected to said housing and having a shaft which is rotatable with time;

a disc connected to said shaft for rotation with said shaft, said disc having a plurality of circumferentially spaced slots each extending at a common angle with respect to radii of said disc;

temperature responsive switch means having an actuator movable with change of temperature, said switch means including contacts which are closed and open depending on a position of said actuator;

an indicator arm connected to said actuator and movable with respect to said housing about a center of rotation;

a control arm pivotally mounted to said indicator arm;

a spring means connected between said arms to engaged portions of said arms to each other for co-rotation of said arms; and

a pin slidably mounted to each slot and having a stop portion extending beyond said disc against which said control arm is engagable to influence closing and opening of said contacts.

4,721,937

TEMPERATURE RESPONSIVE SWITCH

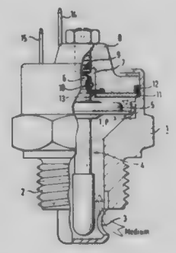
Günter Plesche, Uhstadt-Weiher, Fed. Rep. of Germany, assignor to Ranco Incorporated, Dublin, Ohio

Continuation of Ser. No. 601,557, Apr. 18, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,014

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 8312296

Int. Cl.⁴ H01H *37/40, 35/34*

U.S. Cl. 337—321 **1 Claim**



1. A device for producing an indication of excessive coolant temperature in an automotive vehicle engine through a predetermined range of superatmospheric coolant pressures comprising:

(a) a support housing fixed with respect to said engine, said support housing defining structure for detachably engaging said engine for positioning said housing with an end portion projecting into coolant in said engine, a port defined in said housing end portion for admitting engine coolant to an internal portion of said housing, and with said housing defining a chamber portion separate from said internal housing portion communicated with said coolant;

(b) a hermetic bellows-capillary unit supported by said housing, said unit comprising:

(i) a bellows comprising a rigid peripheral portion defining an axially extending flange, said flange engaged and supported by said housing, said bellows supported in a position where coolant in said internal housing portion substantially surrounds said bellows so that changes in coolant pressure result in extension and retraction of said bellows, said bellows comprising an extension element projecting from said bellows into said chamber;

(ii) a capillary tube extending from said bellows oppositely from said extension element into engine coolant in said internal housing portion in the vicinity of said port, said capillary tube being substantially axially aligned with said housing end portion such that said tube is substantially surrounded by coolant so that the temperature of said capillary tube is substantially the same as the temperature of the engine coolant in the vicinity of said housing;

(iii) a vaporizable fluid in said bellows and capillary tube, said fluid exhibiting a vapor pressure of about 1.2 bar at 96° C. and 1.8 bar at 110° C. so that increasing fluid vapor pressure in said bellows-capillary unit created by increasing coolant temperature adjacent said capillary tube tends to extend said bellows in opposition to the coolant pressure exerted on said bellows by coolant surrounding said bellows in said housing;

(c) switch means actuatable by said bellows for providing an indication of excessive engine coolant temperature, said switch means disposed in said housing chamber portion adjacent said bellows; and,

(d) sealing means for sealing said housing chamber portion against ingress of engine coolant from the vicinity of said bellows-capillary unit, said sealing means comprising a flexible sealing ring including a peripheral portion sealingly clamped to said housing and extending from said housing and sealingly clamped to said bellows extension element, said sealing ring allowing relative axial movement betwen said housing and said bellows extension member without the need for sliding engagement between said extension member, said sealing ring or said housing, whereby hysteresis is minimized;

(e) said bellows-capillary unit responding to the pressure of engine coolant surrounding said bellows and coolant temperature to actuate said switch means for providing an excessive temperature indication dependent upon engine coolant temperature and pressure conditions.

4,721,938

PROCESS FOR PORMING A SILICON PRESSURE TRANSDUCER

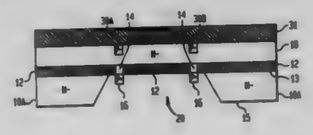
Paul E. Stevenson, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 22, 1986, Ser. No. 943,956

Int. Cl.⁴ G01L *1/22;* **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 338—4 **8 Claims**

8. A chip suitable for use in a pressure transducer comprising a silicon chip which has a central region which is considerably thinner than a surrounding border region to be flexible, the thinner region of the chip including essentially monocrystalline portions embedded in a polycrystalline matrix which is of high resistivity material, each said portion including a separate diffused resistor and means at the bottom of the central region including an apertured layer of an etch-resistant material with



the apertures filled with heavily doped silicon to be etch-resistant.

4,721,939

ROTARY OR SLIDE POTENTIOMETER (SELECTOR SWITCH), AND METHOD FOR PRODUCING THE SAME

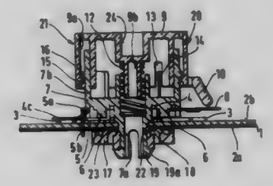
Fritz Prestel, Hausen a. Tann, Fed. Rep. of Germany, assignor to BSG-Schaltteknik GmbH & Co. KG, Balingen, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,833

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511872

Int. Cl.⁴ H01C *10/32*

U.S. Cl. 338—162 **10 Claims**



1. A potentiometer selector switch adapted to be mounted on a planar circuit board having an upper surface and a lower surface having conducting elements thereon, said potentiometer having a collector, a wiper in sliding and electrical contact with said collector and having a portion thereof in spaced and parallel relationship to the upper surface of the circuit board, and actuating means for moving said wiper relative to the circuit board; characterized in that said actuating means includes mounting means for mounting said actuating means on the upper surface of said circuit board, and a plurality of mutually insulated longitudinally extending contacts on the upper surface of said circuit board positioned to be sequentially engaged by said wiper in response to the operation thereof, each of said plurality of contacts having at least one end thereof extending through said board and being electrically connected to a selected conducting element.

4,721,940

THIN TYPE VARIABLE RESISTOR

Takeshi Otani, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 16, 1986, Ser. No. 908,409

Claims priority, application Japan, Sep. 19, 1985, 60-141978[U]

Int. Cl.⁴ H01C *10/32*

U.S. Cl. 338—163 **5 Claims**

1. A thin type variable resistor comprising:

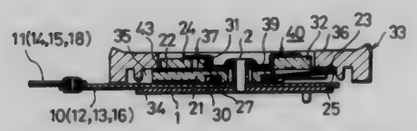
a metallic mounting plate having a projection at its center;

an insulating base plate mounted on said mounting plate provided with a central hole through which said mounting plate projection is inserted and formed with a resistor pattern on an upper surface thereof;

a slider receiver placed rotatably on said insulating base

plate provided with a central hole through which said mounting plate projection is inserted, and having sliders integrally attached thereto in contact with said resistor pattern on said upper surface of said base plate and at least one mounting portion projecting a small distance above an upper surface of said slider receiver;

a rotatable knob having a flat shape mounted on said upper surface of said slider receiver provided with a central opening and at least one hole into which said at least one



mounting portion of said slider receiver is received for securing said slider receiver for rotation with said knob; and

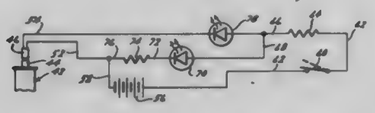
a knob holder having a flat shape mounted on said knob provided with an indented recess which fits in said central opening of said knob and a central hole through which said mounting plate projection is received for rotatably securing said knob holder to said mounting plate with said slider receiver and knob held therebetween.

4,721,941

OIL GAUGE ACCESSORY FOR AUTOMOTIVE VEHICLES

Paul Robine, Jr., 22641 Beech St., Dearborn, Mich. 48124, and Benson L. Hoffman, 13726 Minock St., Detroit, Mich. 48223

Filed May 19, 1986, Ser. No. 864,310
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 340—59 **1 Claim**



1. An oil gauge accessory for automotive vehicles and the like of the type having an engine provided with a crankcase oil pan in which lubricant oil normally is maintained at a predetermined level and from which lubricant oil is circulated through the engine comprising

a casing adapted to be mounted adjacent to said oil pan with upper and lower portions thereof extending respectively above and below said predetermined level of oil in said pan;

conduit means carried by and communicating interiorly with the lower portion of said casing and adapted to be attached to and to communicate with said oil pan below the level of oil therein whereby oil from said oil pan flows into said casing substantially to the level of oil in said pan;

a float actuated switch in said casing, said switch including a float member buoyantly supported on the oil in said casing and adapted to be closed when the oil level in said casing is at or above said predetermined level and to be open when the oil in said casing is at a low level below said predetermined level, at which oil should be added to said crankcase;

a normally open, manually operable switch;

an electrical power source;

a first signal member for indicating when the oil level in said casing and said oil pan is above said low level;

first circuit means including said power source, said manually operable switch, said float actuated switch, and said first signal member, adapted to be disabled by opening of said float actuated switch;

a second signal member for indicating when the oil level in said oil pan and in said casing is at or below said low level;

second circuit means including said power source, said manually operated switch, and said second signal member;

said first signal member being connected in series with said power source and said manually actuatable switch member through said float actuated switch, and said second signal member being connected in series with said power source and said manually actuatable switch member independently of said float actuated switch; relatively low resistance means in said first circuit means; and

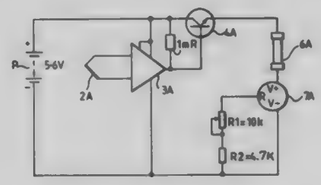
relatively high resistance means in said second circuit means, said relatively high resistance means being sufficiently greater than said relatively low resistance means to disable said second signal means when said float actuated switch is closed but adapted to permit current from said power source to energize said second signal means when said first circuit means is disabled by opening of said float actuated switch.

4,721,942

CALIBRATION WARNING APPARATUS

Robin A. Benedek, 75 Woodstock Road, Bedford Park, Chiswick, London, W4 1EE, and Ralph G. Hollister, 46 The Warren, Chartridge, Near Chesham, Buckinghamshire, both of England

Filed Mar. 9, 1984, Ser. No. 588,033
Claims priority, application United Kingdom, Mar. 11, 1983, 8306764
Int. Cl.⁴ G08B *21/00*; G04F *10/10*; G01R *35/04*
U.S. Cl. 340—309.15 **19 Claims**



1. Calibration warning apparatus for providing a warning when an electrical sensor requires recalibration, said sensor providing an electrical output signal over an elapsed time, comprising, said output signal varying in accordance with a sensed parameter:

analogue driving circuit means adapted for receiving said electrical output signal from said electrical sensor and providing an analogue signal having a value corresponding thereto, said analogue signal value varying in accordance with said varying sensor output signal; and

analogue indicating means for (a) receiving said analogue signal from said analogue driving circuit means, (b) integrating said analogue signal over the elapsed time said sensor is providing said output signal thus providing an integration value which is a function of both said varying analogue signal value and said elapsed time, and (c) providing a recalibration warning when said integration value exceeds a predetermined value.

4,721,943

DIGITAL-TO-ANALOG CONVERTER FOR VIDEO APPLICATION

Richard W. Stallkamp, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

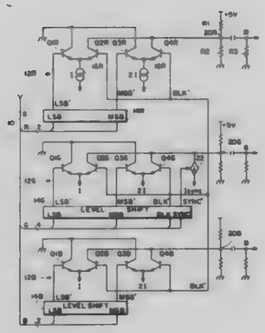
Filed Oct. 11, 1985, Ser. No. 786,447
Int. Cl.⁴ H03M *1/66*
U.S. Cl. 340—347 DA **10 Claims**

1. A digital-to-analog converter (DAC) for converting a digital signal of at least a first binary digit to analog form, comprising:

a first level shifting circuit having an input terminal at which it receives the first binary digit and also having an output terminal, the first level shifting circuit being operative to generate a first outpt voltage level when the first binary digit has a first value and a second output voltage level when the first binary digit has a second value,

a second level shifting circuit having an input terminal at which it receives a second digital signal of one binary digit and also having an output terminal, the second level shifting circuit being operative to generate a first output voltage level, outside the range of output voltage levels provided by the first level shifting circuit, when the binary digit of the second digital signal has a first value, and to generate a second output voltage level, within the range of output voltage levels provided by the first level shifting circuit, when the binary digit of the second digital signal has a second value,

a current source for supplying a current of predetermined magnitude to a circuit node, and



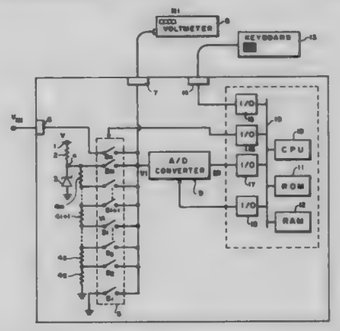
a comparator connected to the circuit node and defining a first current path leading from the circuit node to a reference potential terminal and a second current path leading from the circuit node to an output terminal of the DAC, the comparator having a signal input terminal connected to the output terminal of the first level shifting circuit and also having a reference terminal connected to the output terminal of the second level shifting circuit, and having a first condition, when the output voltage of the second level shifting circuit is at its first level and regardless of whether the output voltage of the first level shifting circuit is at its first or second level, in which the current supplied to the circuit node is delivered to the output terminal of the DAC, a second condition, when the output voltage of the second level shifting circuit is at its second level and the output voltage of the first level shifting circuit is at its first level, in which the current is delivered to the output terminal, and a third condition, when the output voltage of the second level shifting circuit is at its second level and the output voltage of the first level shifting circuit is at its second level, in which the current is delivered to the reference potential terminal.

4,721,944

ANALOG-TO-DIGITAL CONVERSION METHOD AND AN ANALOG-TO-DIGITAL CONVERTER UTILIZING THE SAME

Masumi Kikuniya; Mamoru Mackawa, both of Kanagawa, and Shinichi Mori, Yokohama, all of Japan, assignors to Yamatake-Honeywell Co. Ltd., Tokyo, Japan

Filed Jul. 21, 1986, Ser. No. 887,855
Claims priority, application Japan, Jul. 31, 1985, 60-167491
Int. Cl.⁴ H03M *1/12*
U.S. Cl. 340—347 CC **5 Claims**



1. An A/D conversion method including the steps of

storing digital voltage values obtained through an A/D conversion of divided voltages obtained by dividing an analog voltage in a predetermined voltage range into a predetermined number of different dividing ratios by an A/D converter and digital data for calculating digital output data for the A/D conversion of an input voltage in combination with the digital voltage values in a memory,

converting the input voltage into a corresponding digital input value through A/D conversion,

deciding upon a voltage division including the digital input value among divisions demarcated by the digital voltage values by sequentially comparing the digital voltage values with the digital input value,

deciding which of a pair of the digital voltage values demarcating the division selected through the prior decision is the approximate value of the digital input value,

updating the divided voltage corresponding to the digital voltage value through A/D conversion to provide a representative demarcating value,

deciding upon a division including the digital input value by comparing the updated representative demarcating value and the digital input value to update one of the divided voltages corresponding to one of the demarcating values paired with the representative demarcating value through A/D conversion, and

providing a digital signal corresponding to a digital output value through linear interpolation on the basis of the digital input value, the updated demarcating value, and an appropriate data corresponding to the updated demarcating value of the selected division among the digital data.

4,721,945

SIMULATED TARGETS FOR DETECTION SYSTEMS

Melvin C. Maki, Kanata; Roger G. Pither, Nepean, and James H. Chalmers, Kanata, all of Canada, assignors to 501 Control Data Canada Limited, Ottowa, Canada

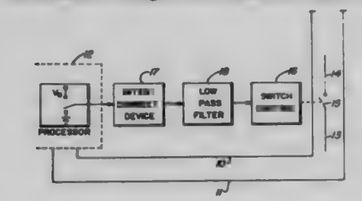
Filed Nov. 14, 1985, Ser. No. 798,084
Claims priority, application Canada, Nov. 19, 1984, 468141
Int. Cl.⁴ G01B *29/00*
U.S. Cl. 340—515 **20 Claims**

16. In an RF intrusion detection system operating at a first RF frequency,

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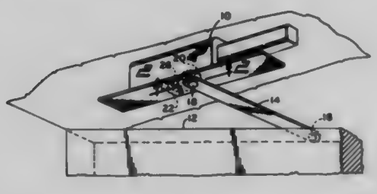
at least one transmission line radiating an RF field into a detection zone;

means responsive to said radiated RF field to provide a return signal having a stationary RF response profile in the absence of a target in said detection zone; and



a simulated target consisting of electrical conductor means having known effective electrical characteristics located in said detection zone to produce predetermined markers in said return signal response profile.

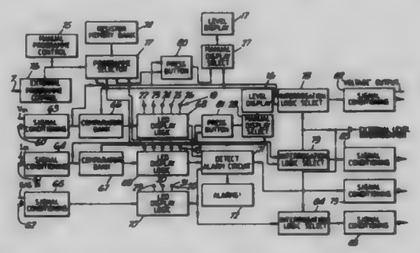
4,721,946
DOOR CONTROL DEVICE WITH ALARM SWITCH
Richard L. Zankel, 218 Leon Ct., Foster City, Calif. 94404
Filed Aug. 11, 1986, Ser. No. 895,306
Int. Cl.[4] G08B 19/00, 13/08
U.S. Cl. 340—521 26 Claims



5. Apparatus for monitoring the condition of a door which is biased toward a closed position by a closer arm connected to and biased by a door closer comprising a switch means responsive to the position of the closer arm for establishing a signal indicative of the position of the closer arm, and signaling means connected to said switch means for indicating the position of the closer arm, said switch means being operable to establish said signal indicative of the condition of the closer arm in responsive to the closer arm being disconnected from the door closer.

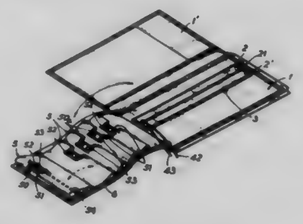
4,721,947
WELDING MONITOR
Kenneth W. Brown, Cambridge, England, assignor to The Welding Institute, Cambridge, England
Filed Mar. 14, 1986, Ser. No. 839,874
Claims priority, application United Kingdom, Mar. 19, 1985, 8507094
Int. Cl.[4] B23Q 17/00
U.S. Cl. 340—540 30 Claims

1. A welding monitor for connection to welding parameter sensing means, the monitor comprising storage means for storing at least two sets of predetermined acceptable ranges for one or more welding parameters; comparison means adapted to compare an operating value of said the or each parameter, determined by said sensing means, with said corresponding at least one range; and display means for displaying information relating to said stored ranges and operating values and responsive to said comparison means to indicate the relationship between an operating value of at least one of said parameters and said corresponding predetermined range wherein said



storage means stores two sets of ranges for at least one of said parameters.

4,721,948
WALLET WITH MISSING-CARD REMINDER
Wen-Tsung Lin, P.O. Box 74-9, Taipei, Taiwan
Filed Mar. 26, 1987, Ser. No. 30,088
Int. Cl.[4] G08B 7/00, 21/00
U.S. Cl. 340—568 1 Claim



1. A wallet with missing-card reminder comprising:

a pair of leaves foldable upon each other having a pair of longitudinal conductive metallic strips spaced with an aperture therebetween parallelly adhered on a rectangular soft thin-layer magnet strip by a non-conductive adhesive and then fixed on a right leaf of the pair of leaves;

a pluralilty of card bags adapted for inserting credit cards, life card or other cards therein and consecutively fixed on a carrier cover which is overlain on said right leaf to define said bags between said cover and said right leaf, each card bag formed with a lower small opening on the lower edge of the front layer of the bag facing the two longitudinal metallic strips, a metallic foil chip adhered on the front side of a rear layer of the bag facing the lower small opening and operatively contacting said two metallic strips on the right leaf, a ferrous chip fixed on a rear side of the rear layer of the bag corresponding to said foil chip and magnetically attracted to said magnet strip on said right leaf, and an upper opening formed on the top edge of each bag adapted for inserting a card therein; and

an alarm circuit including a sounding integrated circuit electrically and operatively connected to a power source, a first wire connected between the negative pole of said power source and one strip of the two longitudinal metallic strips on the right leaf, a second wire connected between the other strip and the sounding integrated circuit (IC) of said alarm circuit, a light-emitting diode (LED) formed on the right leaf and connected in parallel between a positive and a negative pole of the power source, a sensitive photoresistor formed on the right leaf aside from the LED and having a resistance range ranging from 10 kilo-ohms to 100 kilo-ohms from its light resistance to its dark resistance electrically connected between the negative pole of the power source and a trigger pin only charged by positive voltage of the sounding IC, an inert photoresistor formed on a left leaf of the two leaves corresponding to the LED adapted to be under light exposure of the LED when closing the two leaves having a resistance range from 20 kilo-ohms to 120 kilo-ohms and electrically connected between the positive pole and the trigger pin of said sounding IC, and a buzzer electrically actuated by the sounding IC,

whereby upon the folding or closing of the two leaves and without reinserting a card into any card bag, the foil chip of said card bag is contacted with the longitudinal strips on the right leaf as magnetically attracted by the magnet strip and the ferrous chip to complete the alarm circuit and light the LED to increase the positive voltage through the inert photoresistor to thereby start the sounding IC for sounding an alarm for reminding the wallet owner about his or her possible missing of a card.

4,721,949
SYSTEM FOR MEASURING GLAZE-ICE BY MICROPROCESSOR WITH NEW RELEASE MECHANISM INCORPORATED
Gilles Provencal, St-Bruno de Montarville, and Yvon Côté, Longueuil, both of Canada, assignors to Hydro-Quebec, Montreal, Canada
Filed Nov. 26, 1985, Ser. No. 801,857
Claims priority, application Canada, Jul. 4, 1985, 486319
Int. Cl.[4] G08B 19/02
U.S. Cl. 340—580 16 Claims

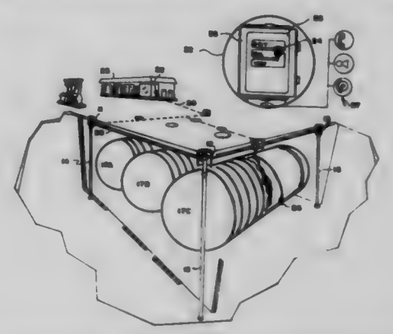


1. A system of measuring glaze-ice comprising a glaze-ice detector, means connected to said detector for generating a signal indicative of the formation of a specific quantity of glaze-ice on said detector, heating means responsive to said signal to heat said detector to melt the glaze-ice formed thereon, wherein said system comprises means to remove the water formed on said detector following the melting of glaze-ice resulting from the heating of said detector, before a new specific quantity of glaze-ice is formed and detected on said detector.

4,721,950
FLUID DETECTOR
Raymond J. Andrejasich, Carmel; Roy F. Kidd, Clayton, and Ford C. Jefferson, Beech Grove, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.
Filed Dec. 22, 1986, Ser. No. 944,587
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—603 6 Claims

1. In a fluid detector of the type comprising a plurality of probe means for sensing their fluid environment and for providing a hydrocarbon signal indicative of the presence of hydrocarbon in the probe environment, a water signal indicative of the presence of water in the probe environment, and a dry signal indicative that the probe environment is dry, and a controller means responsive to said signals from said probe means for providing an alarm, the improvement wherein said controller means includes:

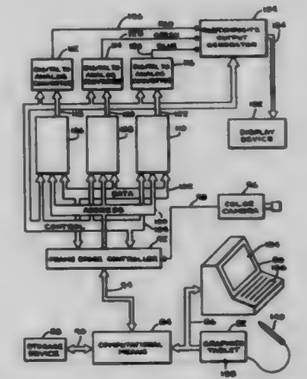
a means for selecting between a first alarm mode in which said alarm is provided only in response to a hydrocarbon signal from one or more of said probes and a second alarm



mode in which said alarm is provided both in response to a hydrocarbon signal from one or more of said probes and also to a water signal from one or more of said probes; and

means for providing a first audible alarm in response to said hydrocarbon signal and a second audible alarm in response to said water signal.

4,721,951
METHOD AND APPARATUS FOR COLOR SELECTION AND PRODUCTION
Peter B. Heller, San Mateo, Calif., assignor to Aspex Corporation, Redwood City, Calif.
Filed Apr. 27, 1984, Ser. No. 605,023
Int. Cl.[4] G09G 1/16, 1/28
U.S. Cl. 340—701 36 Claims



1. Apparatus for selecting a color as a function of a first set of color characteristics for implementation as a function of a second set of color characteristics, said apparatus comprising:

first display means for generating a display indicative of a plurality of values of one color characteristic included in said first set and a constant value of at least one other color characteristic of said first set;

means for selecting a value of said displayed one color characteristic;

second display means for generating a display indicative of a relationship between values of an other color characteris-

tic included in said first set and said selected value of said one color characteristic;
means for selecting a value of said displayed other color characteristic;
means for converting said selected values to values of said second set of color characteristics defining said color; and
means for implementing said color as a function of the values of said second set of color characteristics.

4,721,952

APPARATUS AND PROCESS FOR GRAPHICALLY REPRESENTING THREE-DIMENSIONAL OBJECTS IN TWO-DIMENSIONS

Josef Huber, Engelsberg, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 3, 1985, Ser. No. 688,605
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403678
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—729 **11 Claims**



1. A process for controlling a display device to represent a three-dimensional object such as a workpiece wherein the representation is based upon data and commands stored in a computing device such as a computer, the computing device of the type comprising means for storing data and commands, a graphic processor responsive to the stored data and commands to generate graphic data representing the object, and a display means for the visible representation of the graphic data, the improvement comprising:
generating coordinate data of the contours of a plurality of cross-sections through the object in dependence upon the stored data and commands, each contour defining a closed polygon, wherein the cross-sections are formed substantially parallel to one another and parallel to a plane defined by two coordinate axes of a three-dimensional coordinate system;
adding a respective offset value to each of at least selected ones of a sequence of the contours of the object cross-sections such that the position of each contour is shifted along at least one of the two coordinate axes by a selected amount and comparing portions of each of the contours to determine the portions of each shifted contour which extend beyond preceding shifted contours; and
displaying the sequence of contours such that only the portions of each shifted contour which extend beyond the contours of the preceding shifted contours are visibly represented.

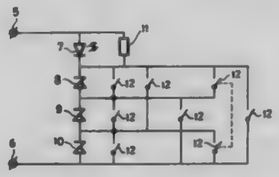
4,721,953

REMOTE CONTROL SYSTEM

Jurianus de Pauw, Emmen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands

Filed Jan. 21, 1986, Ser. No. 820,618
Claims priority, application Netherlands, Jan. 25, 1985, 8500203
Int. Cl.[4] G05B *23/02*; G08C *19/00*; H03K *19/23*
U.S. Cl. 340—825.17 **9 Claims**

1. Remote-control system comprising a main unit and, connected at a distance via a pair of conductors to the main unit, an operating unit which is provided with a series circuit of a number of diodes connected between the conductors and a number of switches which are each connected parallel to a group of one or more diodes, the main unit being provided with a supply circuit connected to the conductors and a voltage detection circuit connected to the conductors in a manner such that the voltage detection circuit generates a detection signal which is dependent on a state of the switches, wherein



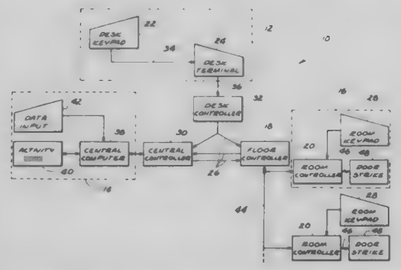
the supply circuit consists of a current source circuit which delivers to the conductor pair a current which is determined by a control signal delivered to a control input by a control circuit and the operating unit further including a signalling circuit which is connected to the series circuit of the diodes, the signalling circuit providing signalling which is dependent on the current through the series circuit.

4,721,954

KEYPAD SECURITY SYSTEM

Barbara J. Mauch, Inglewood, Calif., assignor to Marlee Electronics Corporation, Inglewood, Calif.

Filed Dec. 18, 1985, Ser. No. 811,962
Int. Cl.[4] G06F *7/04*; G06K *5/00*
U.S. Cl. 340—825.31 **35 Claims**



1. A system for seouring a complex having a desk location and a plurality of lockable access points, comprising:
at least one disk station at the desk location, each desk station having first and second desk keypad means;
a remote station at each of said access points, each remote station having a remote station keypad, said remote stations being divided into a plurality of groups;
means for providing bidirectional communcation between the desk station and the remote stations;
the desk station comprisnig: means for receiving an access code entered on the first desk keypad means and a location code entered on the second desk keypad means; means for generating and transmitting serial messages containing the access code and the location code over the communication means;
each remote station having local storage and data processing means comprising: means responsive to messages containing a preselected location code characteristic of the remote station to receive and store access codes contained within said messages; means for receiving access data entered on the keypad of the remote station and comparing the access data to the access codes stored at the remote station; means for generating a signal to unlock the access

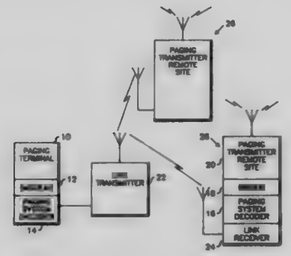
point at which the remote station is located if the access data matches one of the access codes; and
a plurality of controller stations, each controller station being associated with one of the groups of remote stations and being responsive to messages containing preselected location codes which identify remote stations within said one group to relay the messages to the identified remote stations.

4,721,955

PAGING UNIVERSAL REMOTE CONTROL SYSTEM

Stephen H. Dunkerton, Riverwoods, Ill.; David R. Petreye, Margate, Fla.; Scott G. Chapman, Schaumburg, Ill.; Gary R. Reynolds, Oakwood Hills, Ill., and Gary D. Erickson, Mt Prospect, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1983, Ser. No. 487,482
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.47 **13 Claims**



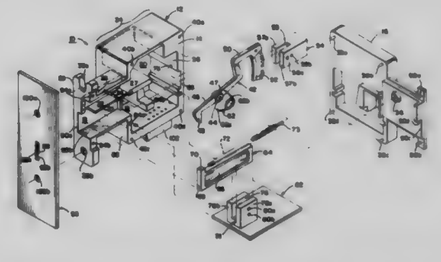
1. A method for communicating binary information signals and analog information signals in a paging system having at least one paging terminal, a paging system encoder, a paging system decoder, a paging system transmitter and a means for coupling said paging system encoder to said paging system decoder, wherein said paging system encoder, at separate times, generates either analog or binary signalling formats in response to analog or binary requests from said paging terminal, and further wherein said paging system decoder being coupled to said paging transmitter controls the transmission format of said paging transmitter, said method including the steps of:
(a) in response to an analog or binary paging request from said paging terminal, transmitting first and second control tones from said paging system encoder to said paging system decoder for a first predetermined period of time;
(b) in response to an analog paging request input, enabling an audio signal path from said paging system encoder to said paging system decoder, and transmitting an analog information signal followed by a pause and then, in response to a binary paging request input, enabling a binary signal path from said paging system encoder to said paging system decoder and transmitting a binary information signal;
(c) in the absence of said analog paging request input and in response to a binary paging request input, generating a pause for a second predetermined period following said second control tone, and transmitting from said paging system encoder to said paging system decoder, a binary information signal;
(d) sequentially detecting the first and second control tones, with said paging system decoder, and thereupon providing a path from said paging system decoder to said paging transmitter for the transmission of analog information signals from said paging system decoder to the paging transmitter;
(e) searching for a binary information signal with said paging system decoder, if the analog information signal is not received within a second predetermined period of time;
(f) interrupting said analog signal path, and enabling a binary signal path in response to detecting a binary information signal after said second predetermined period of time; and
(g) repeatedly searching for one of said control tones and, in response to detecting same, enabling either said analog signal path or said binary signal path without dekeying the transmitter.

4,721,956

APPARATUS FOR CONVERTING KEY TOPOGRAPHY INTO ELECTRICAL SIGNALS TO EFFECT KEY EVALUATION

Stanley J. Demster, 3907 Timber Ridge Rd., Midlothian, Va. 23113

Continuation of Ser. No. 531,392, Sep. 12, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 872,626
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.56 **45 Claims**



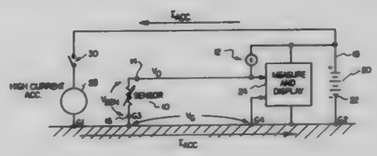
1. Key evaluating apparatus for receiving a key having a coded surface extending along a first key axis thereof, the coded surface being of variable amplitude as taken along a second, distinct key axis, said apparatus comprising:
(a) key follower means for abutting and following a discrete portion of the coded surface as the key is moved along the first key axis relatively with respect to said key follower means, for providing a signal proportional to the varying amplitude of the discrete portion; and
(b) means for sampling said signal to provide a set of sampled proportional signals taken at a series of the discrete portions along the first key axis.

4,721,957

GROUND SHIFT COMPENSATED PARAMETER MEASUREMENT SYSTEM

Donald R. Buttle, Bolingbrook, Ill., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 6, 1984, Ser. No. 617,689
Int. Cl.[4] G01R *19/00*
U.S. Cl. 340—870.39 **10 Claims**



1. Apparatus comprising:
a signal source;
a variable impedance sensor having one end connected to an electrically conductive member and its other end connected to said signal source;

switch means for selectively turning said signal source on and off;

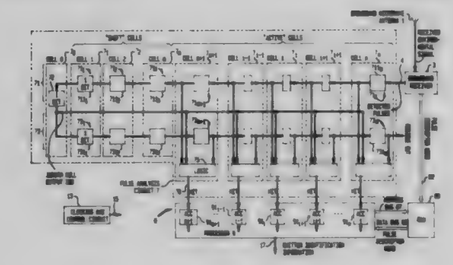
measuring means having a first terminal connected to said other end of said sensor and a second terminal connected to a point on said electrically conductive member different than the point to which said sensor is connected, said measuring means including first means for providing a first signal indicative of the voltage developed across said sensor when said signal source is on, second means for providing a second signal indicative of the voltage developed across said sensor when said signal source is off, said measuring means providing an output signal indicative of the difference between said first signal and second signal.

4,721,958

REAL-TIME PULSE PROCESSOR

Keith R. Jenkin, San Marcos, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 23, 1985, Ser. No. 790,699
Int. Cl.⁴ G01S 7/44; H03K 5/26
U.S. Cl. 342—13 **53 Claims**



1. A system for de-interleaving an input signal, having successively occurring input pulses, into a plurality of constituent pulse trains and for identifying at least one emitter that produced an associated one of said constitutent pulse trains, wherein the improvement comprises:

de-interleaving means, responsive to said input signal, for determining the pulse repetition interval of each of said input pulses, and for routing each of said input pulses to a respective one of a plurality of "hit" output leads, wherein each of said "hit" output leads corresponds to a different group pulse repetition interval, and wherein said de-interleaving means comprises

n-1 separate cells, each of said cells having first and second shift elements, in said first shift elements are serially interconnected together to form a first leg of a shift register and said second shift elements are serially interconnected together to form a second leg of a shift register, and said input pulses are applied as input to a first end of said first leg,

a central cell, having a shift element and connected to said first and second legs, wherein the central cell shift element receives, as input thereto, bits shifted out from a second end of said first leg and applies, to an input of said second leg and to a central cell output lead, bits shifted out of said central cell, and

a logic circuit, associated with each of a plurality of said n-1 cells to form a corresponding plurality of "active" cells, wherein each of said logic circuits is connected to the output of the first and second shift elements located in a respective cell and to said central cell output lead and provides an associated one of said "hit" output leads, and wherein each logic circuit detects the occurrence of a triplet pulse comprising separate pulses having a predetermined group pulse repetition interval and appearing in said first and second shift elements in the respective cell and on said central cell output lead

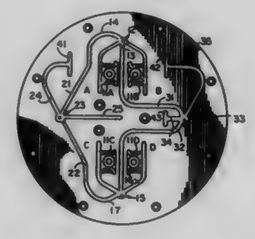
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4,721,959

MONOPULSE COMPARATOR FORMED IN A MILLED CHANNEL PLATE STRUCTURE

Harry D. Syrigos, Malden, Mass., assignor to Alpha Industries, Inc., Woburn, Mass.

Filed Dec. 7, 1984, Ser. No. 679,379
Int. Cl.⁴ H01P 5/16; G01S 13/00
U.S. Cl. 342—153 **9 Claims**



5. Microwave apparatus having a plurality of beam radiators for propagating microwave energy comprising,

first and second conducting plates,

at least one of said first and second conducting plates being formed with a plurality of grooves therein to coact with the other of said plates to define a plurality of waveguide channels, at least four hybrid junctions, and a plurality of ports,

a plurality of cavities formed beside respective grooves in said at least one plate for imparting controllable phase shift to microwave energy propagating in an adjacent groove,

mechanically adjustable means for selectively penetrating into each of said cavities for controlling the phase shift imparted thereby,

said hybrid junctions each having a pair of side branches, a series branch and a parallel branch,

at least four of said ports for exchanging microwave energy with respective ones of said beam radiators,

at least three others of said ports for providing summation, azimuth differential and elevation differential information from the microwave energy,

first and second ones of said at least four ports coupled by respective ones of said waveguide channels to respective side branches of a first one of said hybrid junctions,

third and fourth ones of said at least four ports coupled by respective ones of said waveguide channels to respective side branches of a second one of said hybrid junctions,

series branches of said first and second hybrid junctions coupled by respective ones of said waveguide channels to series and parallel branches respectively of a third one of said hybrid junctions,

one of the side branches of said third hybrid junction being coupled by one of said waveguide channels to a termination, the other side branch of said third hybrid junction being coupled by one of said waveguide channels to one of said elevation differential and azimuth differential ports,

said waveguide channels coupling the parallel branches of said first and second hybrid junctions to respective side branches of the fourth one of said hybrid junctions,

the parallel branch of said fourth hybrid junction being coupled by one of said waveguide channels to the other of said azimuth differential and elevation differential ports,

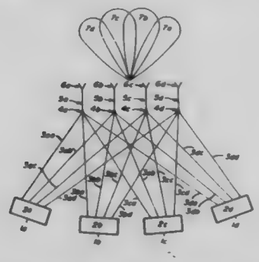
the series branch of said fourth hybrid junction being coupled by one of said waveguide channels to said sum port.

4,721,960

BEAM FORMING ANTENNA SYSTEM

Andrew J. Lait, Kanata, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Jul. 15, 1986, Ser. No. 886,182
Int. Cl.⁴ H01Q 3/22
U.S. Cl. 342—368 **10 Claims**



1. A beam forming antenna system, comprising:

an antenna array comprising a plurality of N antenna array elements, each antenna array element having associated therewith a signal transmission line;

a second plurality M of beam forming networks, each of said beam forming networks having a first terminal on one side thereof and a plurality of N second terminals, equal to said first plurality, on the other side thereof;

a signal transmission line connected to each of said second terminals;

the transmission line of all Nth terminals of each said beam forming networks being connected to the Nth antenna array element through a simple junction means;

said simple junction means comprising a junction point, said signal transmission line associated with said respective antenna array element being connected to one side of said junction point, said signal transmission lines from the Nth terminals of all beam forming networks being connected to the other side of said junction point, all of said signal transmission lines having the same characteristic impedance;

whereby, application of a signal to any one of said beam forming means to the first terminal thereof will form a beam which is radiated by said array in a predetermined direction, which predetermined direction is different and isolated from other predetermined directions of the beams formed by application of said signal to any other ones of said beam forming network, such isolation being achieved by the mathematical orthogonality of the signals applied at the simple junction means; and

whereby, signals received from one of said predetermined directions will be applied only to the beam forming network associated with that direction; signals received from a direction different from said predetermined directions being divided proportionately amongst all of said beam forming networks.

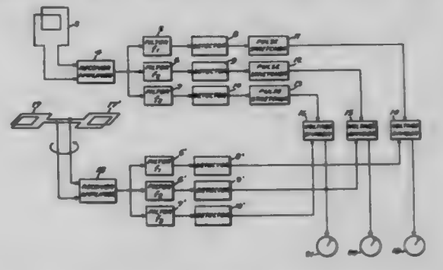
4,721,961

SUBMARINE DETECTION SYSTEM

Henri G. Busignies, Montclair, and Louis A. Deross, Upper Montclair, both of N.J., assignors to ITT Avionics, Nutley, N.J.

Filed Nov. 3, 1959, Ser. No. 851,934
Int. Cl.⁴ G01S 3/02
U.S. Cl. 342—458 **16 Claims**

1. In a system for detecting the location of an object submerged in a medium having radiation transmission characteristics substantially different from that of the atmosphere; means adapted to receive an incident radiation of a source of electromagnetic energy propagated in a first electric field, means adapted to receive the reflection of said electromagnetic energy propagated in a different electric field caused by the presence of an object submerged in said medium, and means to compare the field strength of the incident radiation with the



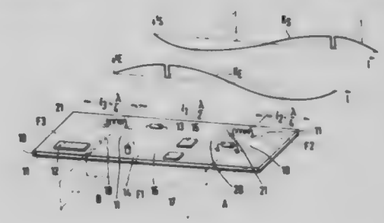
field strength of the reflected radiation to determine the relation therebetween, said relation being a measure corresponding substantially to the range of said object.

4,721,962

ANTENNA FOR A TRANSCEIVER, PARTICULARLY PORTABLE TELEPHONE

Herbert Gorzel, Berlin, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 27, 1986, Ser. No. 868,150
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3520983
Int. Cl.⁴ H01Q 1/12; H04B 1/44
U.S. Cl. 343—702 **20 Claims**



1. Antenna for a transceiver having

a board of insulating material (10);

a metallic layer, subdivided to form electrically conductive tracks and surfaces (11), applied to said board,

said board forming a support surface for electrical circuit components (12–17),

wherein, in accordance with the invention,

the metallic layer (11) is formed with two separating slits (18,19) positioned in respective separating planes (A,B), subdividing the metallic layer into three adjacent regions (F3, F2, F1), defining a first end region (F2) adjacent a first slit (18), a second end region (F3) adjacent a second slit (19) and an intermediate region (F1) between said slits;

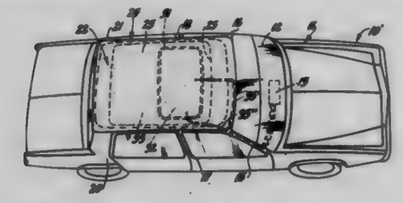
high-frequency impedance elements (20,21) are provided, each connecting a respective one of said first and second end regions (F2, F3) to the intermediate region (F1);

a transmitter output stage being connected to a first end region (F2) to form a radiating antenna element, a second end region and an intermediate region respectively forming director and reflector elements (F3, F1) for said radiating antenna element,

wherein a receiver input stage is coupled to the second end region (F3), to form a receiving antenna, the first end region and the intermediate region (F2, F1) respectively forming director and reflector elements for the receiving antenna; and

said transmitter output stage and said receiver input stage, respectively, are each connected to the respective antenna element, close to the respective separating slit, by a minimum-length connector (30,35) bridging said slit.

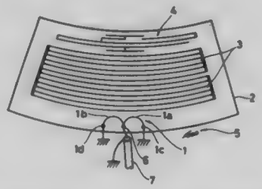
4,721,963
VEHICLE ROOF MOUNTED SLOT ANTENNA WITH SEPARATE AM AND FM FEEDS
Louis L. Nagy, and Paul W. Wood, both of Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 25, 1986, Ser. No. 889,183
Int. Cl.[4] H01Q 1/32
U.S. Cl. 343—712 **3 Claims**



1. Slot antenna apparatus for a motor vehicle comprising, in combination:
- a vehicle body made of an electrically conducting material and having a lower body portion, a plurality of vertical pillars defining window openings and a horizontal roof portion with a central portion made of electrically non-conducting material;
- a horizontal sheet of electrically conducting material attached to the roof portion, the horizontal sheet including a looped slot adjacent the central portion of the roof portion dividing the sheet into inner and outer portions, the slot having a total loop length of substantially one wavelength in the commercial FM broadcasting band;
- FM feed means connected to the inner portion of the horizontal sheet at the front center of the slot to provide signals in the commercial FM band to FM receiver apparatus;
- AM feed means connected to the inner portion of the horizontal sheet at the side center of the slot essentially 90 degrees rotated from the front center of the slot to provide signals in the commercial AM band to AM receiver apparatus; and
- means effective to ground the outer portion of the horizontal sheet to the vehicle body at DC and at radio frequencies in the commercial AM and FM bands.

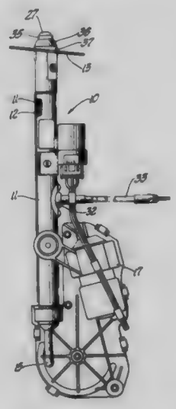
4,721,964
WINDOW ANTENNA FOR A VEHICLE
Gentei Sato, Urawa, and Haruo Kawakami, Yokohama, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Yokohama, Japan
Filed Sep. 15, 1986, Ser. No. 906,943
Claims priority, application Japan, Sep. 21, 1985, 60-209670
Int. Cl.[4] H01Q 1/32
U.S. Cl. 343—713 **13 Claims**

1. A window antenna arranged on a window glass of a vehicle, comprising:
- a pair of antenna elements branching from a feed point adjacent to a grounded conductor portion laterally therealong in both directions,
- each antenna element comprising at least one semiloop element of a length of λ/2 having an opening facing the grounded conductor portion, and



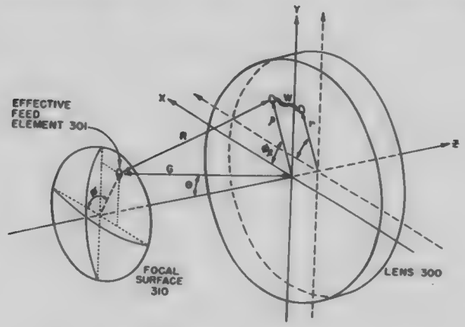
- terminals of said antenna elements being grounded and said feed point being provided with unbalance feeding.

4,721,965
AM-FM-CELLULAR TELEPHONE MULTIBAND ANTENNA FOR MOTOR VEHICLE
James O. Elliott, Beavercreek, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 22, 1986, Ser. No. 821,437
Int. Cl.[4] H01Q 1/10
U.S. Cl. 343—715 **2 Claims**



1. An AM-FM-cellular telephone multiband antenna adapted for mounting in a protective fashion on a motor vehicle fender, the antenna comprising, in combination:
- a first mast section having a length of one quarter wavelength at a first frequency near 835 MHz in the cellular telephone band;
- a phasing coil connected collinearly above the first mast section and having an effective electrical length of three halves wavelength at the first frequency; and
- a second mast section connected collinearly above the phasing coil and having a length of one half wavelength at the first frequency, whereby the phasing coil and second mast section substantially increases the gain of the total assembly compared to a quarter wavelength antenna for cellular telephone operation at frequencies near the first frequency and further tune the antenna to resonance at a second frequency in the FM radio band while providing substantial reception at frequencies in the AM radio band when the antenna is in an extended position.

4,721,966
PLANAR THREE-DIMENSIONAL CONSTRAINED LENS FOR WIDE-ANGLE SCANNING
Daniel T. McGrath, Bedford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed May 2, 1986, Ser. No. 861,465
Int. Cl.[4] H01Q 19/06, 13/10
U.S. Cl. 343—754 **3 Claims**

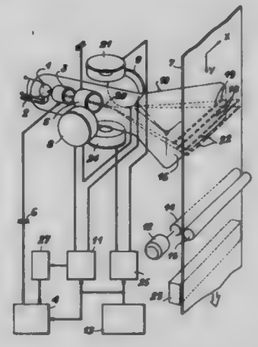


1. A planar microwave array beamforming lens system comprising:
- a planar lens which has an aperture side and a feed side, and which houses a ground plane;
- a plurality of aperture antenna elements which are housed upon said aperture side of said planar lens, said aperture antenna elements being regularly distributed over said aperture side;
- a plurality of feed antenna elements which are housed upon said feed side of said planar lens with a distribution that varies as a function of radius to provide a first degree of freedom to said microwave array beamforming lens system; wherein said distribution of said plurality of feed antenna elements is given by the equation:

$$\rho = r\left(\frac{F^2 - r^2\sin^2\theta_o}{F^2 - r^2}\right)^{\frac{1}{2}}$$

where
- r equals the distribution of an aperture antenna element in terms of its radial location on the aperture side of the planar lens;
- θ_o equals a focal angle of the planar lens;
- ρ equals the distribution of a feed antenna element in terms of its radial location on the feed side of the planar lens; and F is the local length of the planar lens, which is the distance from the optical center of the lens to its focus;
- a plurality of aperture side transmission lines with lengths that vary as a function of radius of said planar lens to help provide a second degree of freedom in said planar microwave array beamforming lens, each of said plurality of aperture side transmission lines being electrically connected to one of said aperture side antenna elements;
- a plurality of feed side transmission lines with lengths that vary as a function of radius of said planar lens to help provide said second degree of freedom, each of said plurality of feed side transmission lines being electrically connected to one of said feed side antenna elements; and
- a plurality of feed through pins, each of which are electrically connected between one of said aperture transmission lines and one of said feed antenna elements.

4,721,967
ELECTRON GUN PRINTER HAVING WINDOW-SEALING CONDUCTIVE PLATES
Michel Roche, Dijon, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed Apr. 24, 1986, Ser. No. 855,794
Claims priority, application France, Apr. 26, 1985, 85 06451
Int. Cl.[4] G01D 9/42, 15/06; H01J 33/00
U.S. Cl. 346—110 V **12 Claims**



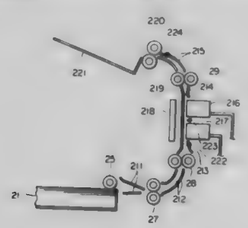
1. An electron gun printer comprising an electrically insulating evacuated enclosure which encloses an electron gun for emitting an electron beam toward a printing medium positioned outside said enclosure and means for modulating the intensity of said beam, one wall of said enclosure facing said printing medium and arranged adjacent thereto having formed therein first and second rows of windows arranged in parallel to the scanned lines, each window being closed by a corresponding conductive plate which is transparent to electrons, the windows of said first row being staggered with respect to the windows of said second row, means for controlling an alternating movement of said beam whereby said beam performs a line scan of said printing medium, means for controlling a displacement of said printing medium whereby said beam performs a raster or frame scan of said medium, means for synchronizing said line scanning means and said frame scanning means, and beam deflecting means connected to said synchronization means for deflecting said beam to alternately scan said rows of windows during displacement of said printing medium, wherein each window is in the form of a narrow port elongated in the direction of the scan lines, each conductive plate is shaped like a channel with a semicircular cross-section, the convex side of each plate facing towards the inside of said enclosure, and each plate has a thickness adequate to withstand the pressure difference between the inside and outside of said enclosure.

4,721,968
INK JET TRANSPARENCY-MODE RECORDER
Ryuichi Arai; Shigeo Toganoh, both of Tokyo, and Kunitaka Ozawa, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 13, 1984, Ser. No. 650,245
Claims priority, application Japan, Sep. 22, 1983, 58-174323; Sep. 22, 1983, 58-174324; Nov. 15, 1983, 58-213256
Int. Cl.[4] G01D 18/00, 15/18; H04N 1/21; B41J 11/50
U.S. Cl. 346—136 **2 Claims**

1. An apparatus for recording, which apparatus comprises first recording means for recording an image in a first recording mode by depositing droplets of recording liquid to form image elements on a reflective recording material and second recording means for recording an image in a second recording mode by depositing droplets of recording liquid to form image elements on a light-transmitting recording material, wherein

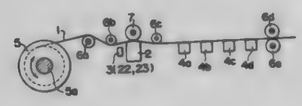
VOL 1086 ISS 4 JA 26 1988 UMI

image elements are formed in the recording made in a single recording operation and image elements are formed in the second recording mode in a plurality of recording operations



so that at least two droplets of the same color recording liquid are deposited per image element on the light-transmitting recording material.

4,721,969
PROCESS OF CORRECTING FOR COLOR MISREGISTERING IN ELECTROSTATIC COLOR RECORDING APPARATUS
Masashi Asano, Tokyo, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan
Filed May 8, 1986, Ser. No. 861,093
Claims priority, application Japan, May 28, 1985, 60-115160
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—157 4 Claims

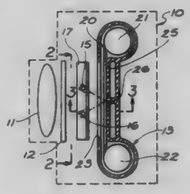


1. A process of correcting for a color misregistering in an electrostatic color recording apparatus including an electrostatic record head, the apparatus producing a color record by repeating a monochromatic electrostatic recording step a number of times which corresponds to the number of colors used, the monochromatic electrostatic recording step comprising forming an image to be recorded in the form of a plurality of dot signals on a record paper by using the electrostatic record head, developing and fixing a resulting electrostatic image; the process comprising the steps of

successively reading markers formed on the record paper to enable a synchronization of a record position and utilizing a marker output to determine any offset of a record paper from a normal position and the magnitude of any shrinkage or elongation of the record paper in mutually perpendicular directions;

and applying a processing operation upon the dot signal which is supplied to the record head in accordance with the result determined in response to the marker output with the result determined in response to the marker output so as to add or remove a selected one or ones of the dot signal, thereby controlling the position where a dot of the monochromatic color signal is to be recorded, thus correcting for any color misregistering without the need for moving the record head.

4,721,970
END OF FILM DETECTION DEVICE
Richard C. Beaver, Inglewood, Calif., assignor to American Electronics, Inc., Fullerton, Calif.
Filed Jul. 1, 1986, Ser. No. 881,046
Int. Cl.[4] G03B *1/00*
U.S. Cl. 354—21 15 Claims



1. In a camera having means for moving film along a film path past an exposure opening, an end of film detection device comprising in combination;

a reflecting surface within the boundaries of the exposure opening;

a radiation emitter, with the wavelength of the emitted radiation limited to a range which does not cause actinic activity on the film used in the camera;

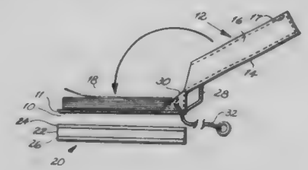
a detector for the radiation of said emitter;

mounting means carried in the camera for supporting said emitter and detector in a radiation path from said emitter to said reflecting surface to said detector, with said reflecting surface on one side of said film path and said emitter and detector on the other side of said film path;

indicator means; and

electrical circuit means connecting the output of said detector to said indicator means in controlling relation for providing an end of film indication when there is no film in said film path between said reflecting surfacse and said emitter and detector.

4,721,971
PHOTOGRAPH LOGGING APPARATUS AND METHOD
Joel E. Scott, 445 S. Palm Ave., Apt. 1, Sarasota, Fla. 33577
Filed Apr. 7, 1986, Ser. No. 848,816
Int. Cl.[4] G03B *17/24, 17/02*
U.S. Cl. 354—105 17 Claims



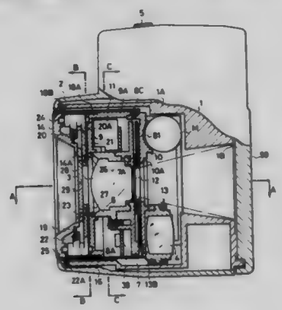
10. Photograph logging aparatus for removeably containing a pad of logging sheets comprising:

a container having a base portion and a lid portion;

hinge means for permitting said lid portion to mvoe between closed and open positions with respect to said base portion and for releasably holding said lid in said open position; and

securing means for making said container captive to another object.

4,721,972
CAMERA HAVING A PHOTO-TAKING LENS BARREL MOVABLE IN THE DIRECTION OF THE OPTIC AXIS
Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan
Filed May 21, 1986, Ser. No. 865,386
Claims priority, application Japan, May 25, 1985, 60-112752
Int. Cl.[4] G03B *3/10, 17/00, 9/24*
U.S. Cl. 354—195.1 12 Claims



1. A camera having a photo-taking lens barrel displaceable in the direction of an optic axis, said lens barrel including:

a photo-taking optical system having said optic axis;

a lens barrier blade member disposed forwardly of said optical system and movable in a lane orthogonal to said optic axis between a closed position for covering the front of said optical system and an opened position for exposing the front of said optical system;

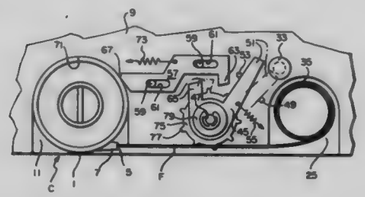
a shutter blade member serving also as a diaphragm, said shutter blade member being disposed rearwardly of said optical system and opened and closed to expose a film to light;

an outer shell member surrounding said optical system, said barrier blade member and said shutter blade member; and

a shutter blade driving device disposed in a space rearward of said barrier blade member when in said opened position and surrounding said optical system, said driving device driving said shutter blade member;

said barrier blade member having an outer edge portion adapted to bear against an inner peripheral surface of said outer shell member when said barrier blade member is in said opened position.

4,721,973
CAMERA WITH FILM TAKE-UP CONFIRMING MECHANISM
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 12, 1987, Ser. No. 2,470
Int. Cl.[4] G03B *1/04, 17/18, 17/38*
U.S. Cl. 354—215 6 Claims

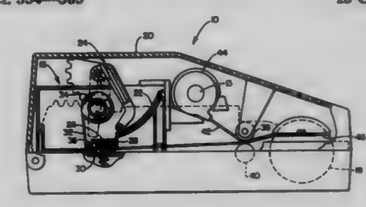


1. A improved photographic camera of the type adapted for use with a film cartridge containing a perforated filmstrip wherein (a) film take-up means takes up the filmstrip from the cartridge, (b) a film sprocket engageable with successive perforations in the filmstrip is rotated in a predetermined direction in response to the filmstrip being taken up by said take-up means, and (c) a shutter release is moved to initiate exposure of the filmstrip, and wherein the improvement comprises:

means for preventing movement of said shutter relase, said preventing means capable of being disabled to permit movement of the shutter release; and

means operatively coupling said sprocket and said preventing means for disabling the preventing means in response to rotation of the sprocket in the predetermined direction, whereby when the sprocket is not rotated a warning will be provided of a film take-up malfunction by preventing movement of said shutter release.

4,721,974
FILM PROCESSING KIT
Frank M. Czumak, Salem, N.H., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 17, 1987, Ser. No. 26,689
Int. Cl.[4] G03D *5/06*
U.S. Cl. 354—303 13 Claims



1. A disposable kit configured to be placed within a film processing apparatus wherein it is adapted for use in the processing of a photographically exposed roll of instant type transparency film, said kit comprising:

a housing having a container of processing liquid mounted therein, said container including a nozzle configured to dispense said liquid onto a strip of sheet material;

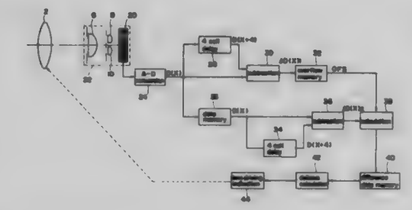
a roller rotatably supported within said housing;

a length of sheet material wound on said roller with a first end secured thereto and a second end extending (1) into engagement with said nozzle to receive a coating of said liquid and, (2) thence to the exterior of said housing, said sheet material being adapted to be partially withdrawn from the housing with a coating of liquid on one surface and to be pressed against an exposed length of film to form a laminate;

means coupled to one end of said roller and adapted to be driven in a direction for retracting said sheet material into the housing past said nozzle; and

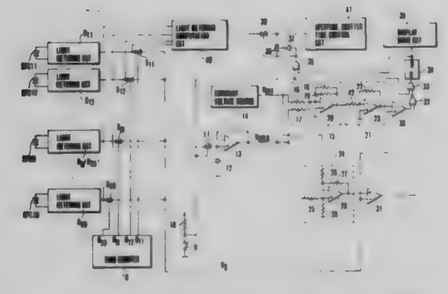
a rotatable idler roller supported within said housing for engaging the coated surface of said sheet material and facilitating a change in direction of movement of said sheet material, said idler roller being located intermediate said roller upon which said sheet material is wound and said nozzle, said idler roller having an axis about which it rotates, means on said idler roller for minimizing the flow of processing liquid in the axial direction when said idler roller is in contact with the coated surface.

4,721,975
FOCUS DETECTING DEVICE
Masataka Hamada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 18, 1985, Ser. No. 810,199
Claims priority, application Japan, Dec. 19, 1984, 59-269126
Int. Cl.[4] G03B 3/10
U.S. Cl. 354—408 28 Claims



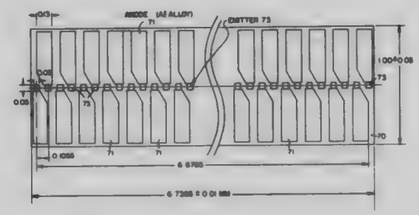
1. A focus detecting device for detecting focusing condition of an objective lens comprising:
means for receiving light having passed through said objective lens, including a plurality of picture elements arranged in sequence, said picture elements each producing an output corresponding to light received thereby, said picture element outputs collectively forming image data;
means for calculating a difference between said image data and data formed by shifting said image data by a unit of one or more picture elements to produce difference data;
means for discriminating whether said difference data is over a predetermined signal range, and to produce an overflow signal when said difference data is over the predetermined signal range; and
means for calculating defocus of said objective lens in accordance with data formed by reduction of said diifference data in response to said overflow signal.

4,721,976
AE LOCK DEVICE FOR CAMERA
Yoshihiko Aihara; Shuichi Kiyohara, and Akira Yamada, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 24, 1986, Ser. No. 890,079
Int. Cl.[4] G03B 7/08
U.S. Cl. 354—441 8 Claims



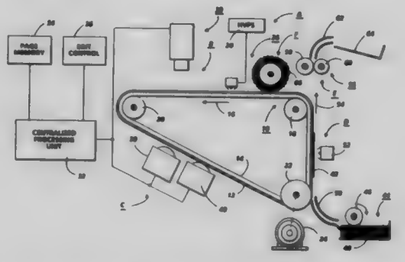
1. A camera in which information representing brightness from a light metering circuit is memorized when an AE lock is actuated, and the exposure is controlled in accordance with said memorized brightness, comprising:
(a) detecting means for detecting information corresponding to the brightness from said light metering circuit upon change of said detected information corresponding to the brightness from the memorized value at the time of actuation of the AE lock by more than a prescribed value to produce an output; and
(b) indicating means responsive to the output of said detecting means for producing a warning indication.

4,721,977
ELECTROGRAPHIC PRINTER WITH ABUTTING CHIPS EACH HAVING AN ARRAY OF CHARGE-DISCHARGING ELEMENTS
Kensuke Fukae, Monsey, N.Y., assignor to Kentek Information Systems, Inc., Allendale, N.J.
Filed Nov. 26, 1984, Ser. No. 674,592
Int. Cl.[4] G03G 15/04; H01L 33/00
U.S. Cl. 355—3 R 6 Claims



1. A linear array of semiconductor chips, each of said chips having defined thereon a linear array of semiconductor elements arranged along a common axis, each of said elements having a dimension X along said axis, said elements having a separation S along said axis between adjacent ones thereof, each of said chips having first and second end elements respectively adjacent first and second opposite edges thereof, said second element of one of said chips being spaced apart from said first end element of the next adjacent chip along said axis by said separation S, the edge of each chip in the array that is not at an end of the array having a two-sided bevel.

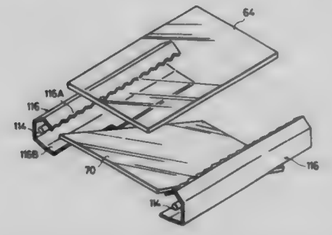
4,721,978
COLOR TONER CONCENTRATION CONTROL SYSTEM
James A. Herley, Hearietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 31, 1986, Ser. No. 925,578
Int. Cl.[4] G03G 15/01
U.S. Cl. 355—4 18 Claims



1. An apparatus for controlling the concentration of toner particles used to form highlight color documents, including:
means for determining the percentage of the document arranged to have highlight color portions thereon and generating a first signal corresponding thereto;
means for transmitting a second signal corresponding to the rate of toner particle usage per document;

means for producing a third signal corresponding to the total number of documents being produced; and
means for multiplying the first, second and third signals with one another to generate a control signal corresponding to the required dispense rate for the toner particles forming the highlight color portion of the document.

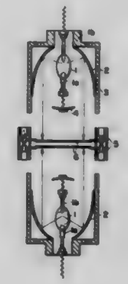
4,721,979
DOCUMENT ILLUMINATING APPARATUS
Yutaka Kohrogi, and Shuichi Ohtsuka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 24, 1986, Ser. No. 934,572
Claims priority, application Japan, Nov. 27, 1985, 60-182376[U]
Int. Cl.[4] G03G 15/04
U.S. Cl. 355—11 10 Claims



1. A document illuminating apparatus wherein a document disposed on a document table is illuminated with an illuminating lamp, and the light reflected from said document is made incident on an optical path changing mirror to change the course of the reflected light, said mirror being disposed in such a manner as to face said document diagonally, said apparatus comprising:
said illuminating lamp having the shape of a rod and disposed at a position intermediate between said document table and said optical path changing mirror in such a manner that said lamp extends along one lateral side of side document table and said optical path changing mirror; and
a reflecting plate disposed in such a manner as to extend in the longitudinal direction of said illuminating lamp to reflect the light from said lamp before it is incident on said document, said reflecting plate being varied in reflecting area in the longitudinal direction of said illuminating lamp in such a manner that the side of said reflecting plate on which the distance between said document and said optical path changing mirror is relatively great has a larger reflecting area than that of the side of said reflecting plate on which said distance is relatively short,
whereby the illuminance of the reflected light from said document which is incident on said optical path changing mirror is made uniform in the longitudinal direction of said illuminating lamp.

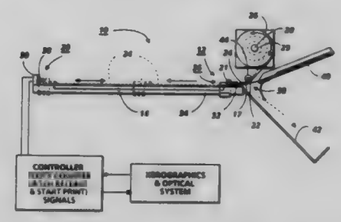
4,721,980
TRANSFER TYPE EACH-SIDE EXPOSURE APPARATUS
Yoshio Yazaki, Tokyo, Japan, assignor to ORC Manufacturing Co., Ltd., Chofu, Japan
Filed Jan. 4, 1986, Ser. No. 870,357
Claims priority, application Japan, Mar. 14, 1986, 61-56643
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—26 7 Claims

1. A transfer type each-side exposure apparatus comprising light sources which oppose each other, transfer means which are intended to transfer materials to be exposed between said light sources, light shielding means which are intended to permit the light rays from said light sources to pass for irradiation or to prevent the passage of said light rays for irradiation of said materials to be exposed, and control means which controls said light shielding means so that said light shielding means may permit the passage of said light rays when exposure



is made of said materials to be exposed and so that said light shielding means may prevent the passage of said light rays when no exposure is made of said materials to be exposed.

4,721,981
LOW-COST DOCUMENT FEEDER FOR COPIERS
David F. Rasea, Ontario, and Donald W. Tates, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 3, 1986, Ser. No. 926,305
Int. Cl.[4] G03B 27/62
U.S. Cl. 355—75 10 Claims



1. An original document sheet handling apparatus for a copier for sequentially feeding document sheets on to and off of the copying platen of the copier, for making selected numbers of plural copies of document sheets, comprising:
document sheet input means adjacent a first side of said platen for inserting a document sheet into said document sheet handling apparatus,
document sheet feeding means normally positioned adjacent said document sheet input means,
said document sheet feeding means having frictional document engagement means for frictionally engaging a document sheet inserted in said document sheet input means,
means for moving said document sheet feeding means over said platen to transport a document sheet over said platen therewith by continued engagement of the document sheet with said frictional document engagement means,
flexible platen cover means integrally connected adjacent one end thereof to said document sheet feeding means for movement therewith,
reel means, including retracting spring means, for compactly reeling up said flexible platen cover means into a scroll adjacent said first side of said platen and above said document sheet input means, so that a document sheet may be fed under said scroll from said document sheet input means by said document sheet feeding means,
said flexible platen cover means being unreeled from said

reel means to extend over said platen by said movement of said integral document sheet feeding means over said platen,

said flexible platen cover means being adapted to overly said platen and provide an opaque and light reflective platen cover when so unreeled,

releasable latching means mounted adjacent an opposite side of said platen from said first side of said platen and said document sheet input means,

said releasable latching means being adapted to engage and latch said document sheet feeding means and said flexible platen cover means with said flexible platen cover means being latched overlying said platen and the document sheet overlying the platen in a copying position, and

release means for automatically releasing and unlatching said releasable latching means in response to the completion of the selected number of copies of the document sheet being copied,

said document sheet feeding means and said flexible platen cover means being automatically returned to said first side of said platen by being moved theretowards by said retracting spring means of said reel means upon said automatic releasing of said releasable latching means by said release means, for automatically returning the document sheet therewith to said first side of said platen while still being overlaid by said flexible platen cover means,

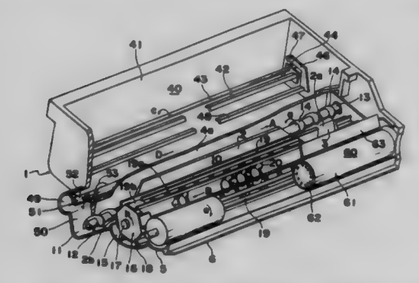
and document sheet output means including means for ejecting the document sheet from said first side of said platen with said automatic return of said document sheet feeding means.

4,721,962

ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS

Masahide Ueda, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1986, Ser. No. 839,985
Claims priority, application Japan, Mar. 22, 1985, 60-59067
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **8 Claims**



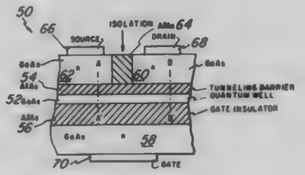
1. An electrostatic latent image developing apparatus which comprises a first feeding passage for feeding developing material in a first direction, a second feeding passage provided side by side, adjacent to first feeding passage for feeding the developing material in a direction opposite to the first direction, each of said feeding passages having an upstream side end portion and a downstream side end portion, a passage means for communicating said first and second feeding passages at opposite ends thereof, a developing sleeve having a magnet roller incorporated therein and capable of holding the developing material on its peripheral surface, and a supplying means for supplying part of the developing material circulated for feeding within said first and second feeding passages onto said developing sleeve, the downstream passages being located in a position higher than the corresponding upstream side end portion of the adjacent feeding passage.

4,721,983

THREE TERMINAL TUNNELING DEVICE

Gary A. Frazier, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1986, Ser. No. 824,701
Int. Cl.⁴ H01L *27/12, 45/00, 49/02*
U.S. Cl. 357—4 **18 Claims**



1. A semiconductor three terminal tunneling device, comprising:

(a) a planar quantum well;

(b) a planar tunneling barrier abutting said well on a first planar surface of said well;

(c) adjacent planar source and drain regions abutting said barrier on the planar surface of said barrier opposite said well, said source and drain separated by an isolation region;

(d) an insulation layer abutting the second planar surface of said well; and

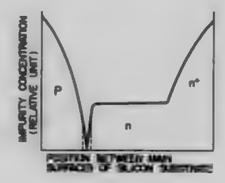
(e) a gate abutting said insulation layer opposite said well; whereby bias applied between said source and gate determines resonant tunneling of carriers from said source into said well, and bias applied between said source and drain determines tunneling of said carriers out of said well into said drain.

4,721,984

VOLTAGE REGULATOR DIODE

Hirotoshi Totta; Toshiyuki Hidaka, and Hisashi Sakamoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,846
Claims priority, application Japan, Oct. 28, 1983, 58-200827
Int. Cl.⁴ H01L *29/90*
U.S. Cl. 357—13 **11 Claims**



1. A voltage regulator diode comprising:

a semiconductor substrate sequentially including between a pair of main surfaces thereof a first semiconductor layer of one conductivity type, a second semiconductor layer of the other conductivity type having a maximum impurity concentration which is lower than a maximum impurity concentration of said first semiconductor layer, and a third semiconductor layer of said other conductivity type having an impurity concentration higher than the maximum impurity concentration of said second semiconductor layer, said first and second semiconductor layers forming therebetween a pn junction which extends parallel to said main surfaces of said semiconductor substrate and has its end exposed to a side surface of said semiconductor substrate extending between said main surfaces thereof, one of said main surfaces of said semiconductor substrate on the side of said first semiconductor layer being smaller than the other main surface on the side of said third semiconductor layer, each of said first and second semiconductor layers having a profile of impurity concentration in which barrier layers produced in said first and second semiconductor layers immediately before when a Zener break-down takes place extend so as to have substantially the same width on both sides of the pn junction;

a pair of electrodes in low resistance contact with said one and other main surfaces of said semiconductor substrate, respectively; and

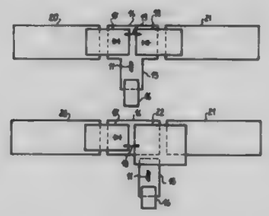
a sealing member extending between said electrodes to enclose said semiconductor substrate.

4,721,985

VARIABLE CAPACITANCE ELEMENT CONTROLLABLE BY A D.C. VOLTAGE

Dimitrios Pavlidis, Paris; Erhard Kohn, Orsay; Ernesto Perea, Paris, and John Magarshack, Rueil Malmaison, all of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 1, 1985, Ser. No. 750,478
Claims priority, application France, Jul. 3, 1984, 84 10521
Int. Cl.⁴ H01L *29/40, 29/48, 29/20*
U.S. Cl. 357—15 **11 Claims**



1. A variable capacitance element controllable by a d.c. voltage, which does not interfere with an ultra-high frequency voltage modulated by said element, and whose variable capacitance is formed by one or two diodes connected as a common cathode, and reversed biased by a control voltage applied across a resistor, wherein the said element comprises, formed in a semiinsulating material substrate:

an active zone doped at 10^{17} at $\cdot cm^{-3}$, having a rectangular projection whose dimensions determine the value of said resistor,

a first and a second metallizations, partly covering said active zone, whereof at least one metallization forms a Schottky diode with the active zone,

a third metallization, partly covering and in ohmic contact with said projection of said active zone, a control voltage being applied across said third metallization,

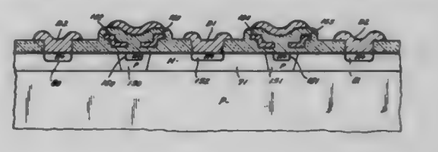
a first microstrip in contact with the first metallization and a second microstrip in contact with the second metallization forming the access terminals to the variable capacitance element.

4,721,986

BIDIRECTIONAL OUTPUT SEMICONDUCTOR FIELD EFFECT TRANSISTOR AND METHOD FOR ITS MAUFACTURE

Daniel M. Kinzer, Riverside, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Division of Ser. No. 581,785, Feb. 21, 1984, abandoned. This application Jun. 25, 1986, Ser. No. 878,196
Int. Cl.¹ H01L *29/78, 27/04, 29/52, 31/00*
U.S. Cl. 357—23.4 **28 Claims**



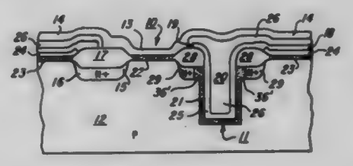
1. A bidirectional conduction insulated gate field effect transistor; said transistor comprising a high resistivity body of one of the conduction types; a shallow high resistivity implanted region of the other of the conductivity types formed by implantation and drive into one surface of said body; first and second laterally displaced drain regions of said other conductivity type formed in said implanted region; a central region of said one of the conductivity types formed in said implanted region and located centrally between and spaced from said drain regions, and extending completely through said implanted region; a source region means of said other conductivity type formed in the surface of said central region and defining two opposed channel means in said central region which can be inverted from said one conductivity type to said other conductivity type; insulated gate means disposed above the surface of said central region and aligned with said two opposed channel means, and a gate insulation layer disposed between said two opposed channel means and said gate means; first and second drain electrode means connected to said first and second drain regions, respectively; and source electrode means connected to said source region means, to provide a biasing reference for said gate means, and to said central region, said source electrode means being disposed adjacent said gate means and insulated therefrom, whereby current can flow bidirectionally between said drain electrode means and through said source electrode when said channel means is inverted by a voltage on said gate means.

4,721,987

TRENCH CAPACITOR PROCESS FOR HIGH DENSITY DYNAMIC RAM

David A. Baglee, Houston, and Ronald Parker, Stafford, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 3, 1984, Ser. No. 627,372
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.6 **7 Claims**



1. A dynamic memory cell formed in a face of a semiconductor body, said cell comprising:

an access transistor having a source-to-drain path at a chan-

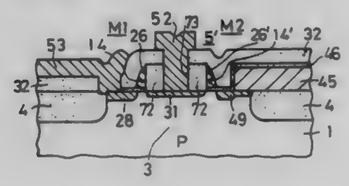
nel area of said face, and a metal gate over said channel area separated therefrom by a thin gate oxide;
a bit line including an elongated N+ region of said face, the drain of said transistor being an edge of said N+ region;
a metal word line extending along said face perpendicular to said bit line, said metal gate being a part of said word line;
said N+ region of said bit line being insulated from said word line by thick thermal field oxide overlying said bit line;
a capacitor area at said face including a trench etched into said face and N+ region surrounding said trench, with a thick thermal field oxide overlying said N+ region;
a region of thermal field oxide encircling said trench inset into said N+ region surrounding said trench,
a field plate including a conductive layer covering said face overlying said capacitor area, said bit line and all areas except said channel area of said transistor, and extending down into said trench to provide the upper plate of the capacitor, insulated from the silicon in said trench by a thin oxide.

4,721,988

SELF-ALIGNED DUAL-GATE IGFET ASSEMBLY

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 304,882, Sep. 23, 1981. This application Aug. 26, 1985, Ser. No. 769,339
Claims priority, application Japan, Sep. 24, 1980, 55-132528; Sep. 24, 1980, 55-132529; Sep. 24, 1980, 55-132530
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] H01L 29/78, 29/52, 29/08
U.S. Cl. 357—23.14 1 Claim



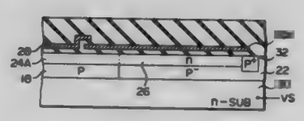
1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a first insulating layer formed in a predetermined pattern on the major surface of the semiconductor substrate and having a window exposing the semiconductor surface;
a second insulating layer formed on the major surface of the semiconductor substrate and extending from a first side surface of the first insulating layer;
a third insulating layer formed on the major surface of the semiconductor substrate and extending from a second side surface of the first insulating layer;
a first conductive layer formed on the second insulating layer in contact with the first side surface of the first insulating layer, the first conductive layer having a marginal edge extending upwardly from said second insulating layer, and the first conductive layer having a length which extends substantially parallel to the first side surface of the first insulating layer and a width which extends in a direction substantially perpendicular to the first side surface, the width extending only from the marginal edge to the first side surface of the first insulating layer;
a second conductive layer formed on the third insulating layer in contact with the second side surface of the first insulating layer, the second conductive layer having a marginal edge extending upwardly from said third insulating layer, and the second conductive layer having a length which extends substantially parallel to the second side surface of the first insulating layer and a width which extends in a direction substantially perpendicular to the second side surface, the width extending only from the marginal edge to the second side surface of the first insulating layer;
a first semiconductor region of a second conductivity type reverse from the first conductivity type, formed in the semiconductor substrate from the side of its major surface and having a marginal edge extending downwardly from the major surface such that the marginal edge is substantially aligned with the marginal edge of the first conductive layer, the first semiconductor region extending from its marginal edge away from the first conductive layer;
a second semiconductor region of the second conductivity type formed in the semiconductor substrate from the side of its major surface and having a marginal edge extending downwardly from the major surface such that the marginal edge is substantially aligned with the marginal edge of the second conductive layer, the second semiconductor region extending from its marginal edge away from the second conductive layer;
a third semiconductor region of the second conductivity type formed in the semiconductor substrate from the side of its major surface and having first and second marginal edges extending downwardly from the major surface of the semiconductor substrate such that the first and second marginal edges are substantially aligned with the first and second side surfaces of the first insulating layer, respectively, the third semiconductor region extending between its first and second marginal edges and underlying the first insulating layer and the window of the first insulating layer;
a third conductive layer formed in the window of the first insulating layer in contact with the third semiconductor region;
wherein a first insulated gate field effect transistor is constituted using the first conductive layer as its gate electrode, that region of the second insulating layer underlying the gate electrode as its gate insulating layer, the first semiconductor region as either one of its source and drain regions, the third semiconductor region as the other of its souce and drain regions, and the third conductive layer as its electrode or lead of the other of its source and drain regions; and
wherein a second insulated gate field effect transistor is constituted using the second conductive layer as its gate electrode, that region of the third insulating layer underlying the gate electrode as its gate insulating layer, the gate electrode as its gate insulating layer, the second semiconductor region as either one of its source and drain regions, the third semiconductor region as the other of its source and drain, and the third conductive layer as its electrode or lead of the other of its source and drain.

4,721,989

CCD WITH TRANSFER CHANNEL AT LOWER POTENTIAL THAN SUPPLY CHANNEL

Tetsuo Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 810,220, Dec. 18, 1985. This application Jan. 4, 1987, Ser. No. 57,304
Claims priority, application Japan, Dec. 19, 1984, 59-267708
Int. Cl.[4] H01L 29/78, 27/14, 31/00; G11C 19/28
U.S. Cl. 357—24 9 Claims



1. A charge transfer device comprising:

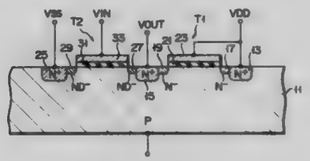
a semiconductor substrate;
charge supplying means including a plurality of supply channels of a second conductivity type of uniform impurity concentration formed in the surface area of the substrate and extending in a first direction for supplying charge through said supply channels;
a charge coupled device, including a transfer channel having a control region of the second conductivity type of uniform impurity concentration having the same impurity concentration as each of the supply channels and formed in the surface area of the substrate in direct contact with a contiguous portion of each of the supply channels and extending in a second direction different from the first direction, a plurality of first and second electrodes arranged in the second direction, and voltage applying means for selectively applying a control voltage to the first and second electrodes to transfer charge in the second direction, each of said first electrodes being insulatively formed to extend over a portion of said control region and over said contiguous portion of a corresponding one of the supply channels, each of said second electrodes being insulatively formed to extend over a portion of said transfer channel; and
potential control means including a first embedded layer of a first conductivity type and uniform impurity concentration underlying the control region of the transfer channel and a second embedded layer of the first conductivity type and uniform impurity concentration underlying the contiguous portion of the corresponding supply channel, the impurity concentration of said first embedded layer underlying the control region being different than that of said second embedded layer underlying the contiguous portion of the corresponding supply channel, for keeping the electrostatic potential energy of the control region and the contiguous portion of the corresponding supply channel at respective first and second levels, with the first level lower than the second level, wherein charge is transferred from the supply channels to the transfer channel when the control voltage is applied to each of the first electrodes.

4,721,990

MOS TYPE INTEGRATED CIRCUIT HAVING CHARGING AND DISCHARGING TRANSISTORS

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1985, Ser. No. 804,622
Claims priority, application Japan, Dec. 6, 1984, 59-257928
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—41 16 Claims



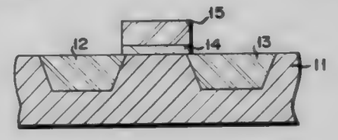
1. MOS type semiconductor integrated circuit comprising:
at least one charging transistor including a semiconductor substrate of a first conductivity type, a first layer of a second conductivity type formed in said semiconductor substrate, said first layer serving as a drain, a second layer of the second conductivity type formed in said semiconductor substrate, said second layer serving as a source, and a third layer provided in at least a surface region of said semiconductor substrate and in contact with said first layer, said third layer being of the second conductivity type and having a lower impurity concentration than that of said first layer,
said charging transistor receiving at one end of its current path a predetermined voltage for charging the other end of the current path substantially to the predetermined voltage,
at least one discharging transistor including a semiconductor substrate substrate of the first conductivity type, a first layer of the second conductivity type formed in said semiconductor substrate, said first layer serving as a drain, a second layer of the second conductivity type formed in said semiconductor substrate, said second layer serving as a source, and a third layer provided in at least the surface region of said semiconductor substrate and in contact with said first layer, said third layer of said discharging transistor being of the second conductivity type and having an impurity concentration lower than that of said first layer of said discharging transistor, but higher than that of said third layer of said charging transistor,
one end of the current path of said discharging transistor being coupled to the other end of the current path of said charging transistor, the other end of the current path of said discharging transistor being connected to a predetermined second voltage for discharging the end of the current path of said discharging transistor to said predetermined second voltage.

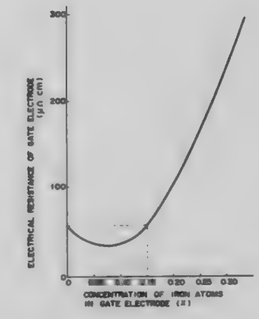
4,721,991

REFRACTORY SILICIDE CONDUCTOR CONTAINING IRON

Reiji Ohtaki, Yokohama; Masanobu Ogino, Yokosuka, and Yuuichi Mikata, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 6, 1985, Ser. No. 730,852
Claims priority, application Japan, May 7, 1984, 59-89497
Int. Cl.[4] H01L 29/46, 29/40
U.S. Cl. 357—67 8 Claims



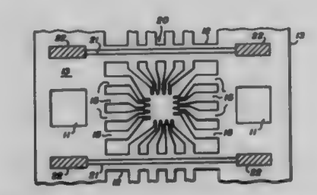


1. A semiconductor device comprising:
(a) a silicon substrate,
(b) an insulating layer formed on the silicon substrate, and
(c) an interconnecting wiring layer formed on the insulating layer, the interconnecting wiring layer being formed of a multi-component alloy represented by the following compositional formula:

$M\text{-}Fe_x\text{-}Si_y$

wherein $0.001<x<0.17$ and $2\leq y\leq 3$ and M represents a metal element selected from Groups IV, V and VI of the periodic table.

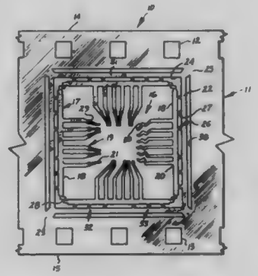
4,721,992
HINGE TAPE
Ali Enamejoush, Sunnyvale, and Richard Pice, Los Altos Hills, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Jun. 26, 1986, Ser. No. 878,930
Int. Cl.[4] H01L *23/48, 29/52, 29/44, 29/60*
U.S. Cl. 357—70 5 Claims



1. In an assembly tape having side rails which extend along both longitudinal edges of said tape, having a row of locater holes extending along at least one side rail thereof for indexing and transport and having a plurality of individual metal finger patterns spaced apart along the length of said tape and indexed to said locater holes, each of said metal finger patterns including an array of fingers extending in cantilever fashion from the edges of a personality window inwardly to form an array that mates with and is bonded to the bonding pad pattern on a semiconconductor device which is thereby attached to said tape and, after bonding, substantially decreases the flexibility of said tape, said individual patterns being separated from each other by a dam bar that extends laterally across said tape to join said side rails together and acting to define the transverse edge of said personality window, the improvement comprising:
a slot pattern formed in said tape and extending transverse to said tape across said dam bar and substantially across said side rails whereby said finger patterns in adjacent personality windows are isolated mechanically from each other and the flexure of said tape is enhanced.

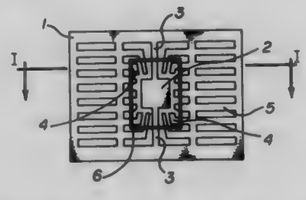
4,721,993
INTERCONNECT TAPE FOR USE IN TAPE AUTOMATED BONDING
Jackie A. Walter, Sunnyvale, Calif., assignor to Olin Corporation, Virginia, Conn.
Filed Jan. 31, 1986, Ser. No. 824,894
Int. Cl.[4] H01L *23/48, 21/88*
U.S. Cl. 357—70 18 Claims

1. An interconnect tape for use in tape automated bonding comprising:
a carrier member for supporting at least one pattern of interconnect leads;
at least one first frame member having a plurality of sides, with each of said sides supporting a plurality of elongated interconnect leads extending inwardly of said frame member, said at least one frame member further including yieldable portion connecting each said side to adjacent said sides, said yieldable portions including means for allowing movement of each said side relative to adjacent said sides in any direction in a plane of said tape; and
first means for reducing stresses in said leads and for reducing thermal dissipation during bonding of inner portions of said leads to an electronic device, said first means comprising a plurality of spaced apart yieldable members connecting each said side of said first frame member to said carrier member;



whereby each said side can yield relative to said carrier member over substantially its entire length.

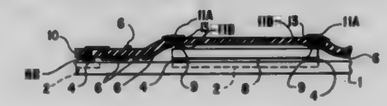
4,721,994
LEAD FRAME FOR SEMICONDUCTOR DEVICES
Katsuhiki Mine, and Kazumi Nakayoshi, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan
Filed Jun. 12, 1986, Ser. No. 873,577
Claims priority, application Japan, Jun. 25, 1985, 60-138821
Int. Cl.[4] H01L *23/50;* B32B *15/08;* C09J *3/12, 5/06*
U.S. Cl. 357—70 9 Claims

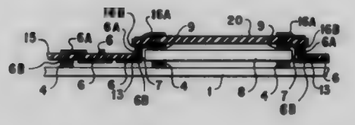


1. A lead frame for a semiconductor device comprising a mounting tab for a semiconductor chip located within the body of said frame, at least one supporting member extending from the perimeter of said tab to the perimeter of said frame, a plurality of inner leads extending from the body of said frame inwardly to the area immediately adjacent to the perimeter of said tab, and means for stabilizing the configuration of said inner leads with respect to one another and with respect to said tab during installation of said chip, said means consisting essentially of a heat resistant, dielectric film that is bonded to at least a portion of said inner leads or to the tips of said leads and said tab by a heat cured silicone adhesive comprising a vinyl-containing polyorganosiloxane, a polyorganohydrogensiloxane and a platinum compound catalyst.

4,721,995
INTEGRATED CIRCUIT SEMICONDUCTOR DEVICE FORMED ON A WAFER
Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Oct. 4, 1985, Ser. No. 784,439
Claims priority, application Japan, Oct. 5, 1984, 59-209236
Int. Cl.[4] H01L *23/14, 23/54, 27/01*
U.S. Cl. 357—80 13 Claims

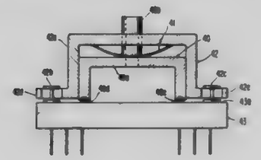
1. An integrated circuit semiconductor device comprising:
a semiconductor wafer having a plurality of circuit blocks formed therein and an intermediate area formed in said semiconductor wafer between said circuit blocks, electrically isolating said circuit blocks from each other, each of said circuit blocks has a plurality of first bonding means having a predetermined layout pattern thereon; and
an interconnecting film comprising an insulating film and an interconnecting circuit formed on a surface of said insulative film, said interconnecting circuit has a plurality of second bonding means on a surface of said insulative film arranged corresponding to said first bonding means,

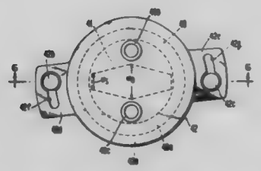




said interconnecting film being placed in alignment on said semiconductor wafer and said interconnecting circuit being connected to said circuit blocks to complete said integrated circuit semiconductor device by said second bonding means being bonded to said corresponding first bonding means.

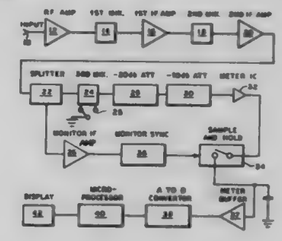
4,721,996
SPRING LOADED MODULE FOR COOLING INTEGRATED CIRCUIT PACKAGES DIRECTLY WITH A LIQUID
Jerry I. Tustaniwskyj, Mission Viejo, and Kyle G. Halkola, San Diego, both of Calif., assignors to Unisys Corporation, Detroit, Mich.
Filed Oct. 14, 1986, Ser. No. 918,054
Int. Cl.[4] H01L *25/04;* H02B *1/00*
U.S. Cl. 357—82 10 Claims





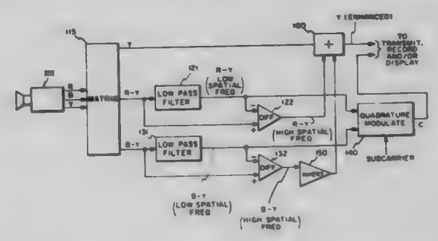
1. A liquid cooled circuit module, comprising:
an integrated circuit package;
a cover having a rim which lies against said integrated circuit package, said cover being shaped to form a passage for said liquid between said integrated circuit package and said cover;
a retaining means, which is fastened to said integrated circuit package, and which includes a member that extends above said cover; and
a spring, which is held in compression between said cover and said retaining means member; said spring being adapted to press said rim against said integrated circuit package with at least a predetermined minimal force that prevents leaks and at the same time not exceed a stress limit in said spring.

4,721,997
SIGNAL TO NOISE RATIO MEASUREMENT BY SAMPLING NOISE OUTSIDE CARRIER FREQUENCY
Glen Wittrock, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.
Filed Jun. 2, 1986, Ser. No. 869,729
Int. Cl.[4] H04N *17/00, 17/02*
U.S. Cl. 358—10 7 Claims



1. A method of measuring the ratio of visual signal level to system noise in a standard color television signal having a video modulated video carrier, a color subcarrier and control signals including sync signals modulated on the video carrier, comprising the steps of
measuring the noise level of said television signal only during the occurrence of said sync signal within a frequency band spaced from said video carrier and from said color subcarrier,
measuring the level of the modulated video carrier during the sync signal period,
computing the ratio of the measured noise level to the measured modulated video carrier level, and
displaying a visual representation of the computed ratio.

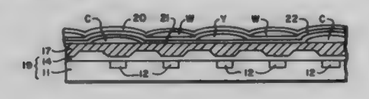
4,721,998
METHOD AND APPARATUS FOR PROCESSING COLOR VIDEO SIGNALS
William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.
Filed Apr. 11, 1986, Ser. No. 851,121
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—37 29 Claims



1. A method for generating a video luminance signal, comprising the steps of:

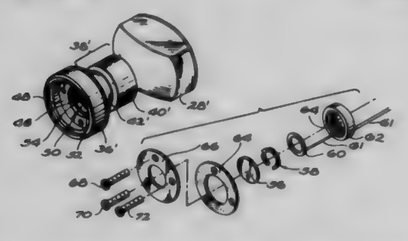
deriving a plurality of color-representative signals, representative of an image;
processing at least one of said plurality of color-representative signals to emphasize the high spatial frequency portion thereof with respect to the low spatial frequency portion thereof; and
combining the processed at least one color-representative signal with the other color-representative signals to obtain an output luminance signal.

4,721,999
COLOR IMAGING DEVICE HAVING WHITE, CYAN AND YELLOW CONVEX LENS FILTER PORTIONS
Yasuo Takemura, Tokyo; Masataka Miyamura, Kamakura, and Yoshinori Takizawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 23, 1984, Ser. No. 602,689
Claims priority, application Japan, Apr. 26, 1983, 58-72104
Int. Cl.[4] H04N *9/077, 5/335, 9/04*; G03F *7/26*
U.S. Cl. 358—44 7 Claims



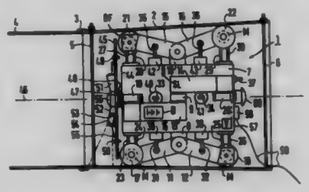
1. A solid-state color imaging device comprising:
a solid-state image sensor formed with a plurality of picture elements arrayed on one surface thereof in a two-dimensional array; and
a color filter array integrally formed on said solid-state image sensor to have focusing color filter portions in one-to-one correspondence with said picture elements, said focusing color filter portions acting as lenses to focus incident light onto said picture elements and including cyan focusing color filter portions C, yellow focusing color filter portions Y and full-color light-transmitting focusing color filter portions W.

4,722,000
ADAPTER FOR ENDOSCOPIC CAMERA
David Chatenever, Santa Barbara, Calif., assignor to Medical Concepts Incorporated, Santa Barbara, Calif.
Filed Oct. 1, 1986, Ser. No. 914,055
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 20 Claims



1. An adapter for coupling the proximal end of an endoscope to the head of a camera comprising, in combination;
(a) a forward portion for engaging the proximal end of the endoscope;
(b) a rearward portion for engaging the camera head, said rearward portion being arranged adjacent to said forward portion;
(c) said forward and rearward portion being hollow throughout their entire axial lengths to define an inner aperture, for providing an unobstructed optical path between the camera head and the endoscope;
(d) an optical window disposed inside said rearward portion of the adapter;
(e) means for mounting fixedly said optical window inside said rearward portion, distally from the inner periphery of said rearward portion;
(f) said means for mounting includes means for sealing said inner aperture around said optical window;
(g) said sealing means being detachable and reusable; and
(h) means for preventing substantially the occurrence of moisture condensation on the surface of said optical window, said means for preventing being detachable secured to said optical window.

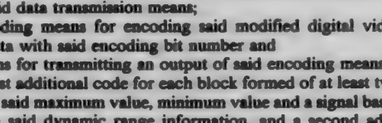
4,722,001
SELF-PROPELLED INSPECTION VEHICLE
Heinz Röhrich, Nürnberg; Clemens Dippold, Bamberg, and Georg Gebald, Kirchehrenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/-Ruhr, Fed. Rep. of Germany
Filed May 13, 1985, Ser. No. 733,531
Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417865
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—100 20 Claims



1. Self-propelled inspection vehicle for piping systems, comprising a vehicle body in the form of a rigid, tightly-sealed housing having forward and rearward end faces as seen in a given insertion direction of the vehicle into the piping, a power supply disposed in said housing, a propulsion mechanism for resiliently bracing said housing against the inner surface of the piping, at least one motor connected to said power supply and to said propulsion mechanism for driving said propulsion mechanism, a television camera optical system having a given field of view being supported on said forward end face of said housing, at least one light source associated with said given field of view being supported on said forward end face of said housing, at least one sensor connected to said housing for detecting obstacles, and a switching device connected to said sensor for reversing propulsion direction of the vehicle.

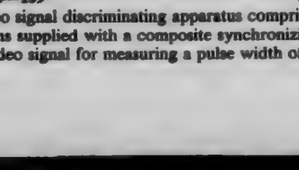
4,722,002
METHOD AND APPARATUS FOR ENCODING/DECODING IMAGE SIGNAL
Takashi Mochizuki; Kouichi Shibagaki, and Shoji Mizuno, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 24, 1985, Ser. No. 813,302
Claims priority, application Japan, Dec. 25, 1984, 59-278051; Dec. 26, 1984, 59-277292; Feb. 14, 1985, 60-27102; Apr. 24, 1985, 60-87923; Apr. 24, 1985, 60-87924
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—133 15 Claims

1. A method of encoding/decoding an image signal, wherein a pulse sequence for minimizing a difference between an input image signal and a synthesized signal obtained by supplying the pulse sequence to a transmitting synthesizing filter is calculated and coded, and the coded pulse sequence is transmitted at a transmission side; and the coded pulse sequence is decoded, the decoded pulse sequence is supplied to a receiving synthesizing filter to generate a synthesized signal, and the synthesized



signal is generated as a decoded image signal corresponding to the input image signal at a receiving side.

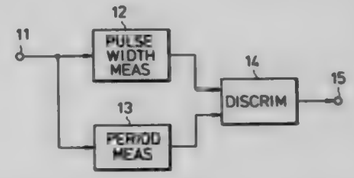
4,722,003
HIGH EFFICIENCY CODING APPARATUS
Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 19, 1986, Ser. No. 932,274
Claims priority, application Japan, Nov. 29, 1985, 60-268817
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—135 6 Claims



1. A highly efficient coding apparatus for coding digital video in a block format allowing video data compression for transmission by data transmission means having a predetermined transmission capacity, comprising:
first detecting means for detecting a maximum value of the digital video data of plural picture elements in a block;
second detecting means for detecting a minimum value of said digital video data of plural picture elements in said block;
means for subtracting said minimum value from the digital video data for each of said picture elements to generate modified digital video data;
means for generating a distribution table of said dynamic range informatin during a predetermined period;
means for determining an encoding bit number for each block during said predetermined period from said distribution table and said predetermined transmission capacity of said data transmission means;
encoding means for encoding said modified digital video data with said encoding bit number and
means for transmitting an output of said encoding means, a first additional code for each block formed of at least two of said maximum value, minimum value and a signal based on said dynamic range information, and a second additional code for each said predetermined period.

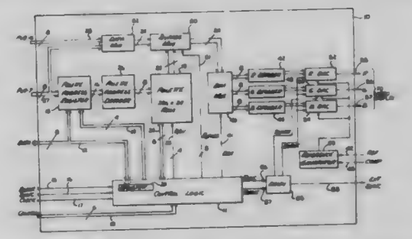
4,722,004
VIDEO SIGNAL DISCRIMINATING APPARATUS
Fumitaka Miyamoto, Yachiyo, and Kenji Kaneko, Iwai, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Nov. 25, 1986, Ser. No. 934,738
Claims priority, application Japan, Nov. 27, 1985, 60-266619; Jan. 20, 1986, 61-9691
Int. Cl.[4] H04N *17/00, 5/08*
U.S. Cl. 358—139 12 Claims

1. A video signal discriminating apparatus comprising:
first means supplied with a composite synchronizing signal of a video signal for measuring a pulse width of one of a vertical synchronizing signal and a horizontal synchronizing signal of the composite synchronizing signal, and for producing a measured pulse width;
second means supplied with the composite synchronizing signal for measuring a period of said one of the vertical synchronizing signal and the horizontal synchronizing signal having the pulse width thereof measured by said first means, and for producing a measured period; and



third means supplied with the measured pulse width and the measured period for discriminating whether or not the measured pulse width and the measured period respectively are within first and second predetermined ranges, said third means producing a discrimination signal indicating that the video signal exists only when the measured pulse width and the measured period are respectively within said first and second predetermined ranges.

4,722,005
SOFTWARE CONTROLLABLE HARDWARE CRT DIMMER
Gregory W. Ledenbach, Orangevale, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Sep. 12, 1986, Ser. No. 906,800
Int. Cl.[4] H04N *5/57, 5/68*
U.S. Cl. 358—168 15 Claims



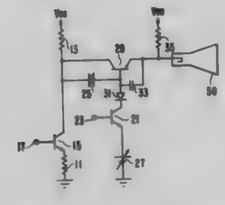
1. An apparatus for controlling a video display comprising:
a memory for storing digital signals representative of video data;
a dimming circuit coupled to receive an output from said memory, said dimming circuit passing said stored digital signals from said memory as first output digital signals representing a video image when a dimming function is not used and said dimming circuit converting said stored digital signals by shifting said stored digital signals a predetermined number of bit position, wherein said shifted stored digital signals provide second output digital signals representing a lower intensity image when said dimming function is used;
a digital-to-analog converter (DAC) coupled to said dimming circuit for receiving and converting said output digital signals to analog video signals;
control means coupled to control said memory, dimming circuit and DAC, and to activate said dimming function;
whereby said video display shows said lower intensity image when said dimming function is activated.

4,722,006

CLAMP CIRCUIT FOR A VIDEO SIGNAL PROCESSOR

Yuichiro Kimura, Yokohama, and Michitaka Osawa, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,502
Claims priority, application Japan, Mar. 27, 1985, 60-60570; Mar. 27, 1985, 60-60572
Int. Cl.[4] H04N 5/18
U.S. Cl. 358—171 28 Claims



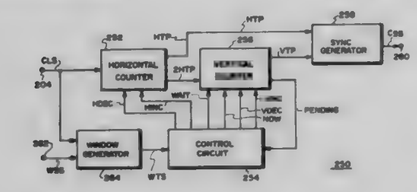
1. Clamp circuit for a video signal processor comprising:
a signal source providing a video signal;
means for processing said video signal supplied thereto;
a capacitor coupled between said signal source and said processing means for passing said video signal from said signal source to said processing means;
a D.C. voltage source;
switching means coupled between said D.C. voltage source and the side of said capacitor coupled to said processing means, for operatively connecting said D.C. source to said capacitor side during a horizontal retrace period and establishing a clamped D.C. restorer level and for disconnecting said D.C. source from said capacitor during a horizontal scan period; and
current control means connected across said capacitor for reducing the current flowing through an output impedance of said signal source during said horizontal retrace period.

4,722,007

TV RECEIVER HAVING ZOOM PROCESSING APPARATUS

Russell T. Fling, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 2, 1986, Ser. No. 936,696
Int. Cl.[4] H04N 3/22, 5/262, 5/06
U.S. Cl. 358—180 10 Claims



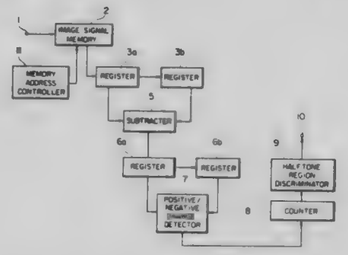
1. A signal processing apparatus comprising:
a source of an incoming video signal including recurring horizontal and vertical sync pulses;
a source of clock pulses occurring at a rate that is substantially greater than the rate of occurrence of said horizontal sync pulses;
means coupled to said incoming video signal source, and responsive to said horizontal and vertical sync pulses, for generating window timing pulses occurring between successive vertical sync pulses;
a first clock pulse counting means coupled to said source of clock pulses for generating a horizontal timing pulse HTP everytime the clock pulse count reaches a horizontal count limit HCL; said first counting means further providing a train of one-half horizontal period timing pulses having twice the rate of occurrence as said horizontal timing pulses;
a second counting means coupled to said first counting means for counting said one-half horizontal period timing pulses and outputting a vertical timing pulse VTP everytime the one-half horizontal period pulse count reaches a vertical count limit VCL during the occurrence of said window timing pulses; and
control means coupled to at least one of said first and second counting means and responsive to said window timing pulses for incrementing and decrementing at least one of said horizontal and vertical count limits HCL and VCL in a manner causing said second counting means to reach said vertical count limit VCL during said occurrence of said window timing pulses.

4,722,008

HALFTONE PICTURE PROCESSING APPARATUS

Hisashi Ibaraki; Makoto Kobayashi, and Hiroshi Ochi, all of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Corporation, Japan

Filed Jan. 8, 1986, Ser. No. 817,046
Claims priority, application Japan, Jan. 10, 1985, 60-2453; Feb. 23, 1985, 60-33696; Apr. 15, 1985, 60-79874; Dec. 23, 1985, 60-287696
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—283 22 Claims



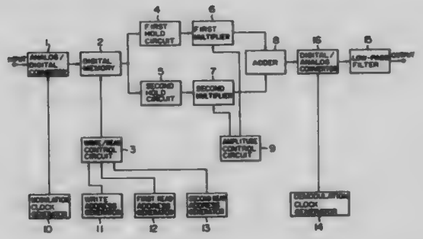
1. A halftone picture processing apparatus for scanning an original that may contain a halftone picture, obtaining a gray scale image signal, dividing the gray scale image signal into blocks each of which has a plurality of pixels, and processing said blocks, said apparatus comprising:
means for storing blocks each of which has a plurality of pixels;
means for sequentially reading out pixel signals in units of blocks in accordance with at least one predetermined access path for detecting a distribution complexity in the blocks;
change count detecting means for detecting a change in signal level between succeeding pixel signals read out along said access path and counting the number of times there are changes in signal levels; and
means for discriminating in accordance with the number of changes which occur whether or not a block corresponding to the change in signal level is a halftone region.

4,722,009

TONE RESTORING APPARATUS

Yasutoshi Nakama, Katano; Masayuki Misaki, Neyagawa, and Seiichi Ishikawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 1, 1986, Ser. No. 846,907
Claims priority, application Japan, Apr. 2, 1985, 60-69445; Nov. 8, 1985, 60-251403; Nov. 8, 1985, 60-251406
Int. Cl.[4] G11B 5/00
U.S. Cl. 360—8 9 Claims



1. A tone-restoring apparatus comprising:
an analog-to-digital converter circuit for converting an input signal to a digital signal by sampling said input signal at a period satisfying a sampling rule, and supplying said digital signal to a digital memory in which said digital signal is stored;
a write/read control circuit for producing a write/read control signal to specify a write/read address to said digital memory and to control said digital memory to write and read in response to input address data generated from a write address generator and first and second read address generator circuits;
first and second hold circuits for latching at a period of 2T signals read from said digital memory in response to first and second read addresses to said digital memory;
first and second multiplier circuits for multiplying said signals latched in said first and second hold circuits by a monotonically increasing weighting function W1(x) ($0 \leq x \leq NT$, $0 \leq W1(x) \leq 1$) or a monotonically decreasing weighting function W2(x) ($0 \leq x \leq NT$, $0 \leq W2(x) \leq 1$);
an adder circuit for adding the output signals from said first and second multiplier circuits; and
a digital-to-analog converter circuit for converting the output signal from said adder circuit to an analog signal.

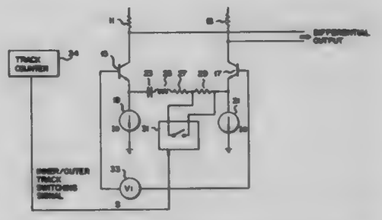
4,722,010

READ CIRCUIT FOR FLOPPY DISK DRIVE

Hiroshi Suzuki, and Shouji Nakajima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 28, 1986, Ser. No. 856,174
Claims priority, application Japan, Apr. 30, 1985, 60-93246; Jun. 28, 1985, 60-142154
Int. Cl.[4] G11B 5/09, 15/14
U.S. Cl. 360—46 4 Claims

1. A read circuit for a floppy disk drive, for receiving an analog signal read by a magnetic head from a disk on which data is written such that a recording density of inner tracks is higher than that of outer tracks, and which outputs pulse data, comprising:
inner/outer track detecting means for detecting if the magnetic head has accessed an inner or outer track of the disk;
a low-pass filter for eliminating a high-frequency component of the analog signal;
a differentiator having a pair of current control elements connected differentially, and a series circuit of a capacitor, an inductor and first and second resistors connected in series between said pair of current control elements, said differentiator being arranged to differentiate the analog signal from said low-pass filter;
resistor short-circuiting means for short-circuiting both terminals of one of said first and second resistors so as to decrease a damping value of said differentiator when a signal supplied from said inner/outer track detecting means is an active signal representing the inner track; and
a zero-cross comparator for generating a pulse synchronized with the zero-crossing of a differentiated analog signal from said differentiator.

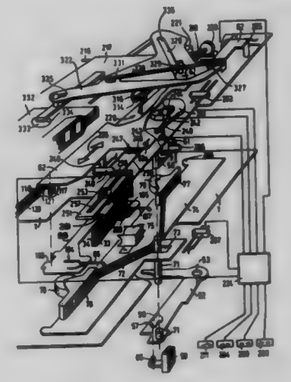


4,722,011

CASSETTE LOADING/EJECTION AND LIFT MECHANISM

Karl Klos-Isele, Ratterlinnen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 749,148, Jun. 26, 1985, abandoned.
This application Oct. 8, 1986, Ser. No. 917,263
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424234
Int. Cl.[4] G11B 15/00, 17/00
U.S. Cl. 360—93 10 Claims



1. A control device for a cassette loading/ejection and lift mechanism in a magnetic-tape-cassette apparatus, comprising
a servo member which has a guide surface and which is movable rectilinearly between a first end position, in which a cassette loaded in the apparatus is ejected, and a second end position, in which the cassette is drawn in and lowered,
a loading/ejection lever having an elongated slot formed therein,
means for pivoting said lever in response to movement of said servo member, and for providing a spring force opposing pivoting of the lever at least during a part of the lever pivotable movement,
a cassette lift which can be lowered and raised via a lowering and lifting path on said guide surface,

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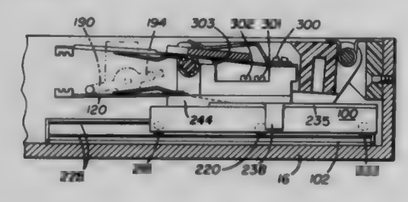
a connecting element on said servo member for guiding the loading/ejection lever via said slot, and
a guide element on the cassette lift, arranged to engage said guide surface,
characterized in that said means for pivoting comprises a spring element arranged such that said spring element engages said connecting element only during engagement of said cassette lift with an initial portion of said guide surface while said servo member is at and is adjacent said first end position, said guide surface further comprising a first guide surface having a lowering portion, and a second guide surface having a raising portion for raising the lift, the lowering portion of the first guide surface being arranged at a greater distance from the initial portion than the location on the raising portion of the second guide surface where raising of the lift begins, and
means for causing said guide element to cooperate with said first guide surface during loading movement of said lever, and until said lift is lowered; and at the beginning of movement of the servo member from the second end position, for causing said guide element to cooperate with said second guide surface until said lift is raised.

4,722,012

DISC DRIVE ARRANGEMENT FOR A HARD DISC CARTRIDGE HAVING A CARRIAGE FOR ACCURATELY POSITIONING A HEAD RELATIVE TO THE CARTRIDGE

George Toldi, Santa Clara; Anil Nigam, Cupertino; Ronald Crain, and Dominic Mercurio, both of San Jose, all of Calif., assignors to SyQuest Technology, Fremont, Calif.

Division of Ser. No. 520,256, Aug. 4, 1983, Pat. No. 4,683,506.
This application May 5, 1987, Ser. No. 47,038
Int. Cl.[4] G11B *5/54, 21/22, 5/012, 5/016*
U.S. Cl. 360—97 2 Claims



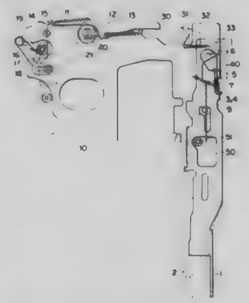
1. A disc drive arrangement for accessing information from and recording information onto a disc retained in a cartridge, which cartridge is insertable into the disc drive, comprising:
at least one head;
a carriage means for mounting and transporting said head;
motor means for positioning at least a portion of said carriage means relative to said housing;
wherein said carriage means includes:
a track secured to said housing;
a base upon which said head is mounted;
and roller means for interconnecting said base to said track;
said roller means includes at least first and second pairs of cylindrical rollers mounted on said base;
wherein said cylindrical rollers ride on a plurality of rods mounted on said track;
wherein said first pair of cylindrical rollers includes first and second cylindrical rollers mounted side by side;
wherein said second pair of cylindrical roller is located adjacent the first pair of cylindrical rollers and said second pair of cylindrical rollers includes third and fourth cylindrical rollers mounted side by side;
wherein said first and third cylindrical rollers are mounted side by side, and said second and fourth cylindrical rollers are mounted side by side, with either the first and fourth rollers, or the second and third cylindrical rollers being disposed at an angle with respect to the other of the first and fourth rollers, or the second and third cylindrical rollers and with respect to said track in order to stabilize the base relative to the track; and
wherein said cylindrical rollers describe substantially a line as said cylindrical rollers roll on said rods so that any contaminants accumulated on said rods are not crushed between said cylindrical rollers and said rods but are urged to one or the other side of said rods so that such contaminants do not interfere with the accurate positioning of said base and head mounted thereon.

4,722,013

LOCK MECHANISM FOR LOCKING A HEAD PLATE AND FAST-FORWARDING AND REWINDING LEVERS

Hideki Hayashi, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,883
Claims priority, application Japan, Apr. 5, 1985, 60-72266
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—105 6 Claims



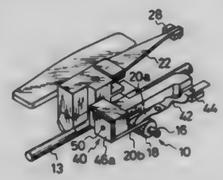
1. A tape player which is adapted to play a tape having thereon plural musical selections separated by non-signal portions, comprising:
a head plate supported for movement between a withdrawal position and an advance position, and having a head thereon which is respectively engaging and spaced from a tape when said head plate is respectively in said advance and withdrawal positions;
shift means for effecting movement of said head plate from said withdrawal position to said advance position;
a manually actuable lever which is supported for movement between first and second positions and can be manually moved from said first position to said second position, wherein when said head plate is in said advance position and said lever is moved to said second position, a tape engaging said head is moved therepast at a high speed;
a selectively energizeable plunger and means responsive to energization of said plunger for causing said shift means to releasably hold said head plate against movement to said withdrawal position from said advance position in which said head plate is spaced from said withdrawal position and in which said head contacts a tape, and wherein said plunger is temporarily de-energized when said head plate is in said advance position and said lever is in said second position and in response to a signal produced by said head when said head detects a non-signal portion between two selections of music on a tape, said means responsive to said plunger causing said shift means to release said head plate in response to said de-energization of said plunger so as to permit movement of said head plate back to its withdrawal position;
an engagement portion provided on said lever;
a lock member supported for movement between locking and release positions in which it respectively engages and is spaced from said engagement portion of said lever when said lever is in said second position, wherein when said lock member is engaging said engagement portion of said lever said lock member prevents movement of said lever from its second to its first position;
a spring biasing said lock member toward its locking position; and
an unlocking portion which is provided on said head plate and which engages said lock member and moves said lock member away from its locking position as said head plate moves to its withdrawal position following said temporary de-energizing of said plunger, whereby said lock member becomes disengaged from said engagement portion of said lever to thereby permit movement of said lever from its second position to its first position.

4,722,014

HEAD POSITIONING MECHANISM FOR MAGNETIC DISK DEVICE

Shigeru Takekado, Tokyo, Japan, assignor to Kabushiki Kaish Toshiba, Kawasaki, Japan

Filed Feb. 27, 1986, Ser. No. 833,232
Claims priority, application Japan, Aug. 23, 1985, 60-184039
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 17 Claims



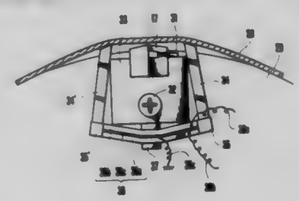
1. A head positioning mechanism for accessing the magnetic read/write heads to the desired positions on the magnetic disk surfaces of magnetic disks, comprising:
(a) a carriage member for holding the magnetic read/write mechanism and having ends adapted to secure the ends of a flexible band;
(b) a guiding mechanism for guiding said carriage member in the direction of motion of the magnetic heads;
(c) a motor with rotation axis for moving said carriage member;
(d) a pulley whioh is fixed to the rotation axis of said motor;
(e) a flexible band whose mid section is fixed to said pullley and is wound around it, for transmitting the rotational force of said pulley to said carriage member;
(f) a first and a second attachments for attaching both ends of said flexible band to the respective ends of said carriage member so as to move said carriage member in the direction of motion of the heads due to rotation of said pulley; and
(g) said first and second attachments having respective elastic elements for giving a predetermined tension to said flexible band and a discrete damping element affixed to either of said first or second attachments for damping vibration of the head positioning mechanism.

4,722,015

RECORDING AND REPRODUCING APPARATUS USING A PLURALITY OF KINDS OF MAGNETIC HEADS

Tatsuzo Ushiro, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,235
Claims priority, application Japan, Jul. 19, 1982, 57-125266
Int. Cl.[4] G11B *5/40*
U.S. Cl. 360—128 5 Claims



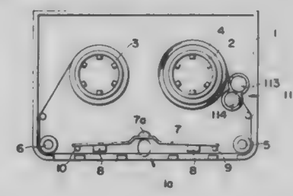
1. A rotary head assembly, comprising:
two cylinder members which are arranged to have their bottom faces opposed to each other and to guide a magnetic tape by their peripheral surfaces;
a rotary head interposed in between said two cylinder members, said head being arranged to protrude from said peripheral surfaces;
a cover member arranged to be operative for covering said rotary head; and
control means arranged to drive said cover member to move in the diametrical direction of the cylinder members and to control the contact of said head with the magnetic tape which is being guided by said peripheral surfaces of the cylinder members.

4,722,016

TAPE CASSETTE FOR CLEANING USE

Hideo Shirako, Tokyo, and Kazuhide Ishikawa, Chofu, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Sep. 12, 1984, Ser. No. 649,730
Claims priority, application Japan, Sep. 19, 1983, 58-145440[U]; Jun. 18, 1984, 59-091039[U]
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 23 Claims



1. A tape cassette for cleaning use comprising:
a housing having an opening formed on one side thereof;
supply and winding tape hubs which are rotatably disposed within said housing;
a cleaning tape having first and second opposed surfaces, said tape being coupled to each of said tape hubs so as to be wound on said tape hubs;
guide means for guiding said tape from said supply tape hub along said opening and then to the said winding tape hub; and
cleaning liquid supply means for applying a cleaning liquid to both said surfaces of said cleaning tape, said cleaning liquid supply means having a pair of liquid retaining members which are in contact with said first and second surfaces of said cleaning tape, respectively, whereby when

the cleaning tape is placed in a tape recorder, cleaning liquid on one side surface of the cleaning tape cleans a magnetic head and pinch roller of the tape recorder and cleaning liquid on the opposite said surface of said cleaning tape cleans a capstan shaft of the tape recorder.

4,722,017

STATIC REDUCTION IN MAGNETIC RECORD DISK ASSEMBLIES

Wayne H. Vennot, Oakdale; John D. Haksanoa, South St. Paul, and Gerald J. Niles, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 9, 1986, Ser. No. 817,395

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.⁴ G11B *23/03*

U.S. Cl. 360—133 **20 Claims**

1. A magnetic record assembly including:

a magnetic disk of highly electrically insulating, flat, uniform thickness sheet material,

a jacket of highly electrically insulating material enclosing said disk and having a central opening through it by means of which the disk may be rotatably driven within the jacket and having a slot therein for receiving a magnetic transducer to have a data transferring relationship with the disk and having flat internal faces adjacent to and extending along the faces of said disk,

a layer of a porous low friction dusting fabric within said jacket and in wiping contact with the faces of said disk as the disk rotates within the jacket, and

on at least one major surface of the jacket a coating of between 0.5 to 250 micrograms per square inch of a nonvolatile, electrically conductive, organic composition thereon.

4,722,018

BLOCKED CONDENSER AIRFLOW PROTECTION FOR REFRIGERATION SYSTEMS

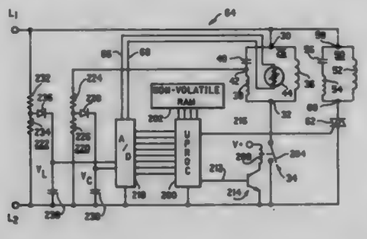
Walter J. Pohl, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1985, Ser. No. 806,608

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.⁴ H02H *3/07, 7/08*

U.S. Cl. 361—22 **4 Claims**



1. A self-calibrating method used in protecting a refrigerant compressor in a closed-circuit refrigeration system against excessive loading caused by either a high operating load or insufficient condenser airflow, independent of compressor and system size, the compressor being driven by a single-phase induction motor supplied from an AC power line and of the type including a capacitor-run winding, the refrigeration system having a condenser and an evaporator connected in series with the compressor, and the refrigeration system being cycled ON and OFF during operation, said method comprising:

determining, as an indicator of motor loading, a compressor motor reference ratio at a relatively early time during a compressor ON cycle by allowing a stabilization interval to elapse during which the refrigeration system stabilizes and the compressor motor is still lightly loaded, then sensing the ratio of capacitor-run winding voltage to line voltage, and storing at least a representation of the sensed ratio as the compressor motor reference ratio; and

thereafter, during each ON cycle, at least periodically sensing the prevailing ratio of capacitor-run winding voltage to line voltage, comparing the prevailing ratio to the compressor motor reference ratio, and in the event the prevailing ratio is below a high-load threshold ratio established as a predetermined fraction of the reference ratio, recognizing a condition of excessive loading and de-energizing the motor/compressor;

in the event the motor/compressor has been de-energized due to a recognized condition of excessive loading, allowing a cooling-off time interval to elapse and then re-starting the motor/compressor;

maintaining a count of the number of times the motor/compressor is de-energized due to a recognized condition of excessive loading and terminating operation in the event the count exceeds a predetermined number; and

measuring the the time the motor/compressor is running and resetting the count when continuous run time exceeds a predetermined time duration indicating that the recognized condition of excessive loading was due to a cause other than insufficient condenser airflow.

4,722,019

PROTECTION METHODS AND SYSTEMS FOR REFRIGERATION SYSTEMS SUITABLE FOR A VARIETY OF DIFFERENT MODELS

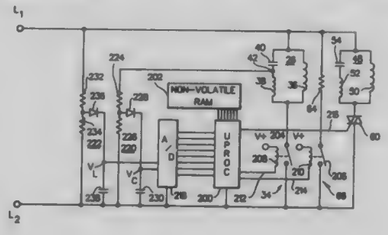
Walter J. Pohl, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 20, 1985, Ser. No. 778,075

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.⁴ H02H *7/08*

U.S. Cl. 361—22 **6 Claims**



1. A calibrated method used in protecting a refrigerant compressor in a closed-circuit refrigeration system against loss of refrigerant and overload conditions independent of compressor and system size, the compressor being driven by a single-phase induction motor supplied from an AC power line and of the type including a capacitor-run winding, the refrigeration system having a condenser and an evaporator connected in series with the compressor, and the refrigeration system being cycled ON and OFF during operation, said method comprising:

establishing a permanent compressor motor reference ratio when the refrigeration system has a known correct refrigerant charge and the motor/compressor has a known load by sensing the ratio of capacitor-run winding voltage to line voltage, and storing at least a representation of the sensed ratio as the permanent compressor motor reference ratio; and

thereafter, during each ON cycle, at least periodically sensing the prevailing ratio of capacitor-run winding voltage to line voltage, recognizing a low load condition indicative of a loss of refrigerant or of insufficient evaporator airflow if the prevailing ratio exceeds a low load threshold ratio established as a first predetermined function of the permanent reference ratio, and recognizing a high load condition indicative of an excessive load on the motor/compressor if the prevailing ratio is less than a high load threshold ratio established as a second predetermined function of the permanent reference ratio.

4,722,020

BRUSHLESS D.C. MOTOR HAVING ABNORMAL DRIVING CURRENT CUT-OFF CIRCUIT

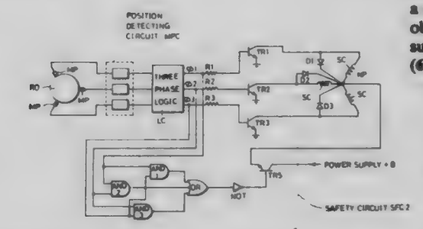
Masaaki Nomura; Satoshi Kondoh, and Shingo Nakanishi, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Aug. 8, 1986, Ser. No. 894,125

Claims priority, application Japan, Sep. 27, 1985, 60-148709[U]

Int. Cl.⁴ H05H *7/085*

U.S. Cl. 361—31 **2 Claims**



1. In a brushless three phase D.C. motor having a plurality of stator coils for driving a rotor, circuit means for generating a rotating magnetic field in said stator coils, said circuit means including a common D.C. power supply connected to said stator coils, stator switching means in circuit with each stator coil to energize and deenergize said stator coils, and a drive control circuit responsive to rotor position for generating switching signals for operating said stator switching means in a predetermined serial phase sequence for generating said rotating magnetic field, the improvement comprising, a motor protection circuit coupled to said drive control circuit to sense any spurious simultaneously generated switching signals, said motor protection circuit including protective switching means operable to interrupt current flow to said stator coils upon said motor protection circuit sensing any of said spurious simultaneous signals and a logic circuit comprising three AND gates and an output OR gate, said AND gates being connected to said drive control circuit to sense the said spurious simultaneous signals, said stator switching means and said protective switching means comprise transistors, the output of said logic circuit being connected to said protective switching transistor to deenergize said stator coils upon sensing of said simultaneous signals, and wherein the collector of said protective switching transistor is connected to said D.C. power supply while the emitter thereof is connected to said stator coils, the output of said logic circuit being connected to a NOT gate in circuit with the base of said protective switching transistor whereby the sensing of simultaneous signals in the drive control circuit results in the logic circuit turning the protective switching transistor "off" thereby interrupting the power supply to said motor.

4,722,021

SAFETY CIRCUIT FOR HAND TOOLS, AND METHOD FOR SAFE OPERATION THEREOF

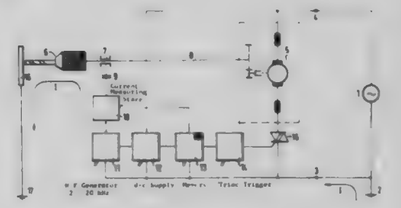
Friedrich Hornung, Stuttgart; Fritz Schädlich, Leinfelden; Martin Gerackmer, Leinfelden-Echterdingen, and Klaus Günther, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 524,606, Aug. 19, 1983, abandoned. This application Oct. 3, 1986, Ser. No. 915,919

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235194

Int. Cl.⁴ H02H *3/17*

U.S. Cl. 361—49 **15 Claims**



4. Safety circuit used in power tools, particularly hand tools, used in deenergizing the power tool upon contact of a bit with a metallic object (16, 17), regardless of whether said metallic object is grounded, said power tool having a two-wire power supply connection and an electrically conductive bit holder (6), comprising

a source of electrical test energy having a frequency elevated substantially above power line frequency and a test voltage substantially below power line voltage, said source having two test energy output terminals;

a capacitor (9) applying said test energy from one terminal of the electrical test energy source to the bit holder (6), said capacitor (9) having a coupling impedance which is high with respect to power line frequency and an impedance which is low with respect to the elevated frequency of electric test energy;

coupling means (34; 22–25, 26) for high frequency coupling the other terminal of the test energy source to at least one wire of the two-wire power supply connection;

a test current measuring circuit (10, 30, 31) connected between the electrical test energy source and the capacitor (9) and sensing change of current to said bit and bit holder; and

a disconnect circuit connected to and controlled by the test current measuring circuit (10) and disconnecting energization from said two-wire power supply connection to the power tool when the test current measuring circuit (10) detects change in test current above a predetermined level, upon contact of the bit with said metallic object (16, 17).

4,722,022

SHIELDED LINE TERMINATOR ENCLOSURE

Earl C. Myers, and Mark H. Waters, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1986, Ser. No. 913,184

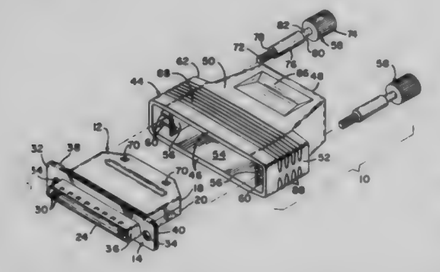
Int. Cl.⁴ H05K *9/00*

U.S. Cl. 361—424 **14 Claims**

9. A shielded line terminator assembly including a removable dielectric boot assembly, comprising:

a shielded line terminator having an insulative housing having a front mating face, a rear face and contact receiving passages extending therebetween with contacts secured therein, metal shell means mounted on the periphery of said housing between said faces, said shell means having a mounting aperture, a line terminator engaging the contacts proximate the rear face of the housing, and a

metal shield encompassing the line terminator, said shield being electrically connected with the metal shell means; and



a dielectric housing defining a cavity and having an opening for receiving the shielded line terminator.

4,722,023

LAMP ASSEMBLY FOR EMITTING A BEAM OF LIGHT AT AN ANGLE TO ITS OPTICAL AXIS

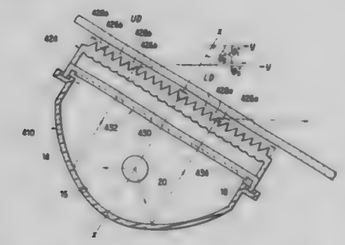
Kenji Arima; Syoji Kobayashi, and Hideski Satsukawa, all of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,573

Claims priority, application Japan, May 15, 1984, 59-97340; Dec. 27, 1984, 59-201606

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 362—80 **8 Claims**



1. A high mounted stop lamp assembly adapted to be mounted along the inside surface of an inclined rear window of a motor vehicle, said lamp assembly comprising:

(a) a lamp body having an open front end;

(b) a light source mounted within the lamp body for producing light;

(c) a reflector provided inside of the lamp body with the configuration thereof being such that the light produced by the light source is reflected by the reflector as rays of light parallel to the optical axis of the lamp assembly;

(d) a lens assembly covering the open end of the lamp body and extending generally along a plane perpendicular to the optical axis of the lamp assembly, said lens assembly including generally parallel inner and outer lenses;

(e) said inner lens having a plurality of diverging lens elements for diverging the rays of light reflected by the reflector into sidewise directions with respect to the motor vehicle;

(f) said outer lens directing said rays of light to the direction rearwards of the motor vehicle;

(g) a plurality of spaced parallel, linearly and horizontally extending prism elements being integrally formed on the outer surface of said outer lens, each of said prism elements having a generally triangular cross-section with one side thereof acting as a light reflecting surface; and

(g) a plurality of light converging elements integrally formed on the inner surface of said outer lens for converging said rays of light onto the reflecting surfaces of said prism elements.

4,722,024

DEVICE FOR DETECTING EXCESS-CURRENT IN A DIRECT-CURRENT GENERATOR WITH CONTROLLED RECTIFIER

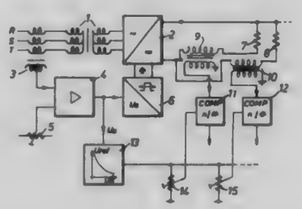
Wilfried Eisenberg, and Edmund Zok, both of Remscheid, Fed. Rep. of Germany, assignors to AEG-Elotherm GmbH, Remscheid-Hasten, Fed. Rep. of Germany

Continuation of Ser. No. 695,828, Jan. 28, 1985, abandoned. This application May 26, 1987, Ser. No. 54,055

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402954

Int. Cl.⁴ H02H *3/08*

U.S. Cl. 361—95 **5 Claims**



1. An apparatus for monitoring and switching off the current delivered to a load comprising:

AC-DC transformer means for receiving an AC current input and delivering DC load current;

controlling means for receiving an AC-input current signal proportional to the AC current input received by said AC-DC transformer means and for generating a corresponding control signal for controlling said AC-DC transformer means;

signal generator means for receiving said control signal and generating therefrom a reference signal in accordance with preset characteristic curves relating the shape of the load current to said control signal; and

comparison means for comparing instantaneous load current and said reference signal and generating a switch-off signal to said AC-DC transformer means, such that the load current is switched off when said comparison means determines that the instantaneous load current exceeds said reference signal.

4,722,025

GROUND LATCH AND CASE

Will B. Robinson, 38 Bernard Avenue, Toronto, Ontario, Canada M5R 1R2

Filed Sep. 22, 1986, Ser. No. 909,644

Int. Cl.⁴ H05F *3/02*

U.S. Cl. 361—212 **7 Claims**

1. An electrically conductive container, having:

a body portion;

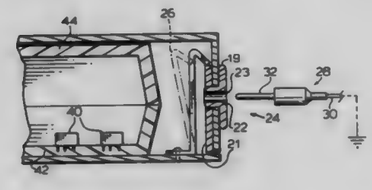
a lid closure portion therefor;

latch means for retaining the lid portion in secured relation to the body portion, making electrical contact with said body portion and said lid;

key means for releasing the latch means,

said key means making electrical contact with the latch means;

ground cable means connected with the key means to remove any charge above ground potential, and



whereby upon insertion of said key in said latch means to open said container said container is effectively grounded and any electrostatic charge thereon is removed.

4,722,026

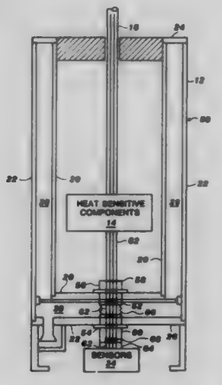
THERMAL PROTECTION APPARATUS

Gloria A. Bennett, and Troy K. Moore, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 20, 1986, Ser. No. 898,083

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—380 **17 Claims**



8. An apparatus for thermally protecting heat sensitive components of tools, said apparatus comprising:

a. a Dewar holding the heat sensitive components, said Dewar having an open top end, a bottom end, an inside wall and an outside wall, the inside wall being spaced apart from the outside wall, wherein said Dewar inside wall has portions defining an inside wall aperture located at the bottom end of said Dewar, and wherein the outside wall of said Dewar has portions defining an outside wall aperture located at the bottom end of said Dewar, said apparatus further comprising a bottom connector having inside and outside components, said inside component sealably engaging the inside wall aperture, said outside component sealably engaging the outside wall aperture, wherein said inside component is operatively connected to said outside component and to the heat sensitive components;

b. an evacuated chamber disposed in the top end for providing a thermal seal to the top end of said Dewar, said chamber having a top wall, a bottom wall and a side wall, the side wall sealably engaging the inside wall of said Dewar, the top wall having portions defining a top wall aperture, the bottom wall having portions defining a bottom wall aperture;

c. a top connector having first and second components, the first component sealably engaging the top wall aperture, the second component sealably engaging the bottom wall aperture, said second component being operatively connected to said first component and to the heat sensitive components; and

d. means removably connecting said chamber to said Dewar.

4,722,027

HYBRID CIRCUIT DEVICE

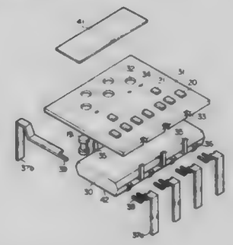
Yasumitsu Hayakawa, Saitama, Japan, assignor to Toko Inc., Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,141

Claims priority, application Japan, Aug. 9, 1985, 60-123057[U]; Aug. 21, 1985, 60-127409[U]; Aug. 21, 1985, 60-127410[U]; Aug. 27, 1985, 60-130647[U]

Int. Cl.⁴ H03H *7/32*

U.S. Cl. 361—400 **2 Claims**



1. A hybrid circuit device comprising: a base plate on which a circuit including coils is provided, and a flat package of an integrated circuit having a smaller flat area than said base plate; said base plate and said flat package being superimposed upon each other; said two circuits being connected to each other through terminals of said flat package; external terminals being connected to at least one of said two circuits; said hybrid circuit device being encapsulated with plastics as a whole, with said external terminals being exposed outside the encapsulation; on that part of the base plate which does not overlap the flat package, circuit components constituting the circuit provided on said base plate being securely mounted at lateral positions with respect to said flat package; said terminals of said flat package being terminals which engage a marginal portion of said base plate and also terminals which are inserted in apertures formed through that part of said base plate which does not overlap said flat package; said external terminals including terminals bent at one end portion so as to extend along an outer surface of said flat package and being connected, on an outer face of the flat package opposite to said base plate, to terminals of said flat package extending along said outer surface of the flat package opposite to said base plate.

4,722,028

NIGHT VISION COMPATIBLE AND SUNLIGHT READABLE, LIGHTED, WORD INDICATING PUSHBUTTON SWITCH AND INDICATOR

William E. Branson, Buena Park; James F. Gust, Temecula, and Henry Castro, Santa Ana, all of Calif., assignors to Staco Switch, Costa Mesa, Calif.

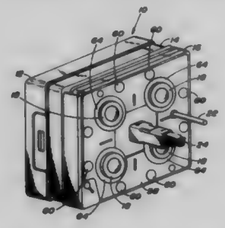
Filed Jun. 10, 1986, Ser. No. 872,560

Int. Cl.⁴ G01D *11/28*; F21V *13/00, 21/14*

U.S. Cl. 362—29 **13 Claims**

1. An apparatus for selectively illuminsting a display for compatible unassisted night vision illumination and illumination for a night vision imaging system, comprising:

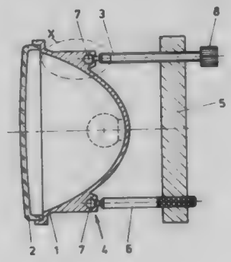
a light box;
a plurality of three-dimensional filter elements disposed in said light box, said light box disposed behind said display, at least one of said three-dimensional filter elements having a predetermined spectral transmissivity compatible with said night vision imaging system;
wherein at least one other one of said plurality of three-dimensional filter elements has a spectral transmissivity in a

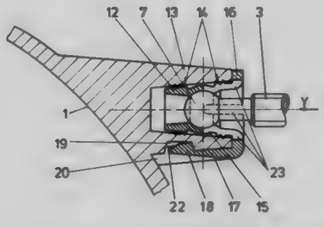


wavelength range compatible with uanssisted night vision, and
means for selectively illuminating said plurality of said three-dimensional filter elements, including selectively illuminating all of said plurality of filter elements for daytime vision,
whereby said apparatus illuminates said display in compatible manner with night vision imaging systems unassisted night vision and daytime vision.

4,722,029
VEHICLE HEADLIGHT
Bernhard Ahle, Warstein; Hubert Marks, Geseke; Gerd Pokraks; Konrad Schmitz, both of Lippstadt; Josef Sellman, Erwitte; Hermann-Josef Wigger, Lippstadt-Esbeck, and Franz Kathmann, Lippstadt, all of Fed. Rep. of Germany, assignors to Hella HG Hueck & Co., Lippstadt, Fed. Rep. of Germany
Filed Nov. 20, 1986, Ser. No. 933,079
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543563
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—66 **8 Claims**

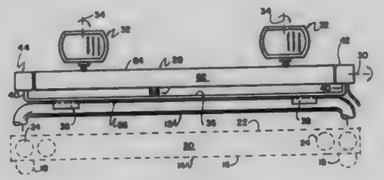
1. A vehicle headlight with a reflector comprised of a plastic with a high content of filler to increase the plastic's thermal stability; said reflector being mounted adjustably in an accommodating component; two ball-and-socket like pivot joints, said reflector being adjustable around at least one axis comprised of said two ball-and-socket joints; an articulating bushing for each ball-and-socket joint, said bushing being sleeve-shaped and being inserted into a sleeve-shaped extension shaped onto said reflector; said sleeve-shaped articulating bushing having an outer surface substantially lightly tensioned against an inner surface of said sleeve-shaped extension by readily deforming sections; said sleeve-shaped extension having a surface facing opposite in direction to that in which the sleeve-shaped articulating bushing is inserted; an outer flange on said bushing, said surface on said extension functioning as a supporting surface for said outer flange on said sleeve-shaped articulating bushing; a resilient arm with an end having a sleeve with an axis, said articulating bushing having at least one resilient snap-in nose mounted radially in relation to the axis of said sleeve on the end of said resilient arm and engaging an undercut in a wall of said sleeve-shaped extension; said resilient





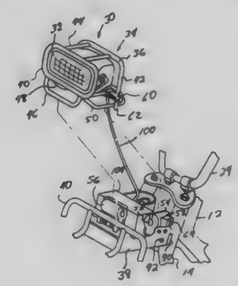
arm having a wall thickness and length exceeding the wall thickness by a multiple factor.

4,722,030
VEHICULAR LIGHT BAR
Scott R. Bowden, Harlingen, Tex., assignor to Friebele & Mardis Investments, Harlingen, Tex., a part interest
Continuation-in-part of Ser. No. 711,848, Mar. 14, 1985, abandoned. This application Jul. 11, 1986, Ser. No. 884,550
Int. Cl.[4] B60Q *1/08*
U.S. Cl. 362—69 **20 Claims**



1. A light bar comprising
a support for attachment to an object;
a member rotatably mounted on the support for selective movement about a horizontal axis;
a lamp fixture;
means mounting the lamp fixture on the member for selective movement about a vertical axis;
means for selectively moving the member about the horizontal axis including a first electric motor and means connecting the first electric motor and the member;
means for selectively moving the lamp fixture about the vertical axis including a second electric motor carried by the member and means connecting the second electric motor and the lamp fixture; and
means for simultaneously energizing the first and second electric motors for simultaneously rotating the lamp fixture about the vertical axis and rotating the member about its horizontal axis.

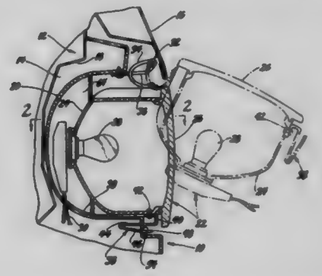
4,722,031
HEADLIGHT DEVICE FOR A VEHICLE
Yoji Matsuyama, Tokyo; Azusa Noda, and Kozo Yamada, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 728,010, Apr. 29, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,925
Claims priority, application Japan, Apr. 27, 1984, 59-85569
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—72 **7 Claims**



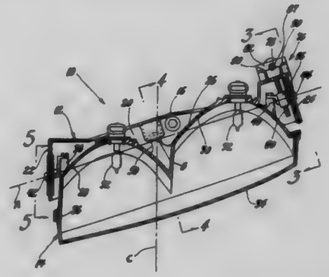
1. A headlight assembly for a handlebar-type vehicle, comprising:
a headlight mount secured to said vehicle;
shock absorbing resilient means for releasably attaching said headlight to said headlight mount;
an electrical case housing a coupling stand attached to said headlight mount subjacent said headlight;
a container fixedly positioned adjscent said electrical case; and
means for supplying electric power between said vehicle and said headlight including a wire harness extending between said vehicle and said case and having one end connected to said coupling stand and an electric cord of extended length adapted for coiled disposition in said container, said electrical cord having one end connected to said coupling stand in electrical contact with said wire harness and its other end connected to said headlight.

4,722,032
VEHICLE TAIL LAMP ASSEMBLY
Frederick C. Kulka, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 13, 1987, Ser. No. 25,598
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—80 **3 Claims**

1. A tail lamp assembly for a vehicle comprising a support housing adapted to be attached to the rear of said vehicle,
a tail lamp structure including a reflector body having a lens connected thereto,
hinge means connecting said tail lamp structure to said support housing so as to allow said tail lamp structure to be moved between a closed position wherein said tail lamp structure is located within said support housing and an open position wherein said tail lamp structure is swung outwardly relative to said support housing to provide access to said reflector for servicing,
spring means formed with said support housing so as to contact the rear of said reflector body and bias the tail lamp structure outwardly towards said open position when said tail lamp structure is in the closed position,
and manually releaseable fastener means located between said tail lamp structure and said support housing for maintaining said tail lamp structure in said closed position against the bias of said spring means.



4,722,033
VEHICLE HEADLAMP ASSEMBLY
Paul D. VanDuyn; Carey D. Marks, both of Anderson, and Michael E. O'Shaughnessey, Fort Wayne, all of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 20, 1987, Ser. No. 39,924
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—80 **3 Claims**



3. A headlamp assembly adapted to be mounted on the front end of a motor vehicle and to be selectively adjusted in a horizontal plane and a substantially vertical plane, said headlamp assembly including a support frame adapted to be fixedly secured to said front end of said motor vehicle and having a back wall and a pair of laterally spaced side walls, a rectangular reflector member formed with a pair of curved parabolic cavities located side by side having a pair of light bulbs for projecting a pair of light beams forwardly of the motor vehicle substantially parallel to the longitudinal axis thereof, the rear portion of said reflector member having a pair of oppositely extending trunion members connected thereto and located above the lower margin of said reflector member, each of said side walls of said support frame having a horizontally extending slot formed therein accommodating one of said pair of trunion members along an aim axis located in said horizontal plane but inclined relative to said longitudinal axis of said motor vehicle, cooperating means located along said aim axis and carried by said back wall of said support frame and by the rear portion of said reflector member between said pair of parabolic cavities for universally pivotally connecting said reflector member to said support frame to permit simultaneous adjustment of said pair of light bulb beams, said cooperating means comprising a projection integrally formed with said reflector member and a spherical depression formed in said

VOL 1086 ISS 4 JA 26 1988 UMI

back wall, first and second adjustment screw means rotatably mounted on said support frame and respectively connected to one of said pair of trunion members and to an upper portion of said reflector member above and rearwardly of said cooperating means for selectively adjustably moving said reflector member about said cooperation means to adjust said pair of light beams together in either said vertical plane or said horizontal plane, and a tension spring connected between said lamp body and said support frame below said cooperating means for firmly maintaining said cooperating means together and for removing all slack at the points of connection between said first and second adjustment screw means and said reflector member.

4,722,034

STORAGE CONTAINER FOR RECORDING MEDIA

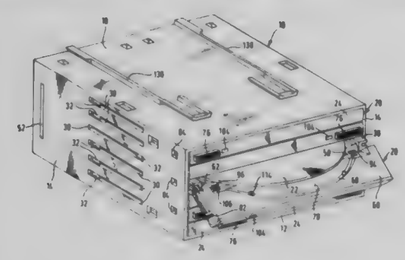
Peter Ackeret, Kuesnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Filed Dec. 12, 1986, Ser. No. 940,954

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544055

Int. Cl.⁴ H04M *1/22*

U.S. Cl. 362—86 **49 Claims**



1. Storage container for recording media for installation in a motor vehicle having an electrical system, comprising:

a housing;

a plurality of holders received in the housing, each holder defining a storage chamber for respective recording media, and having a front wall for covering the storage chamber and means for transporting the media out of the housing into position to be removed therefrom;

means carried by the container exterior to the housing for supplying electricity to the housing from the vehicle electrical system;

means electrically connected to said means for supplying electricity, for generating light outside the holders;

a plurality of feed outlets carried by the housing for transmitting light from the means for generating light to each holder;

at least one feed inlet carried by each holder and arranged such that said feed inlet is in light transmitting contact with one of said feed outlets when the holder is fully inserted in the housing; and

means associated with the front wall of each holder and with said at least one feed inlet, for illuminating at least a portion of the front wall when generated light is transmitted through said feed inlet.

4,722,035

DRUMSTICK WITH LIGHT EMITTING DIODE

Carmen C. Rapisarda, 1715 Edgecomb, Covina, Calif. 91724

Filed May 19, 1986, Ser. No. 864,540

Int. Cl.⁴ F21V *33/00*

U.S. Cl. 362—109 **7 Claims**

1. An improved illuminated drumstick of the type having a light emitting diode having two terminals in the tip thereof, one or more batteries held in the shaft thereof, each of said batteries having a cathode and an anode collector and a first end and a second end, a pair of conductors connected between the light emitting diode and the batteries, a switch and a transparent tip, wherein the improvement comprises:

switch means comprising a longitudinally movable, electrically conductive shaft in contact with a conductor leading to one terminal of said light emitting diode;

a flexible, conductive strap affixed to the cathode collector of one of said one or more batteries and extending over the second end thereof;



a resilient pad positioned between said conductive strap and the second end of said battery, whereby when said longitudinally movable, electrically conductive shaft is moved inwardly to contact said conductive strap, said conductive strap is deformed inwardly while being urged outwardly by the deformation of said resilient pad thereby maintaining a continuous contact in spite of the impact caused by the use of said drumstick.

4,722,036

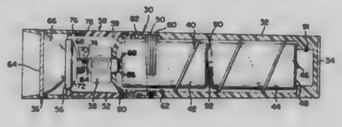
FLASHLIGHT

Kenneth T. Hastings, St. Albans Town, Vt., assignor to Eveready Battery Company, St. Louis, Mo.

Filed Feb. 12, 1987, Ser. No. 13,810

Int. Cl.⁴ F21L *7/00*

U.S. Cl. 362—203 **11 Claims**



1. A flashlight comprising a lens and reflective unit and a lamp holder adapted to accommodate a lamp having a first terminal member and a second terminal member; a battery casing having a closed end, an open end, and a cavity defined within said casing for accommodating battery means having a first polarity terminal and a second polarity terminal; switch means operable between a first position where said first polarity terminal is electrically connected to said first terminal member of said lamp and said second polarity terminal is electrically connected to said second terminal member of said lamp, and a second position for interrupting the electrical continuity between one of the terminal members of the lamp and one of the polarity terminals of the battery means; a conductive coil spring defining an internal cavity sufficient to accommodate said battery means, a first end of said coil spring projected within said cavity of said coil spring to at least partially block said cavity and being adapted to contact one polarity terminal of said battery means and a second end of said coil spring which has at least a portion formed to provide an external inscribed circular diameter that is larger than the external inscribed circular diameter at said first end of said coil spring and larger than said internal inscribed circular diameter of said cross-sectional area near the open-end of said battery casing, and said coil spring being adapted to provide an electrical path to said switch means or to a terminal of said lamp, said coil spring disposed within said battery casing such that said first end is positioned closer to said closed end and said second end is seated at a portion of said battery casing near the open end where said internal inscribed circular diameter of said battery casing is smaller than the external inscribed circular diameter of said second end of said coil spring, and said coil spring

operable such that when said battery means are inserted within said casing one of its polarity terminals contacts said first end of said coil spring and forces said end further into said casing thereby maintaining good physical and electrical contact between said first end and said polarity terminal while said second end of said coil spring remains secure at the portion of said casing nearer its open end thereby providing an electrical path from said polarity terminal near the closed end of said casing to an area near the opening end of said casing where it is adapted to electrically contact said switch means or a terminal of said lamp.

4,722,037

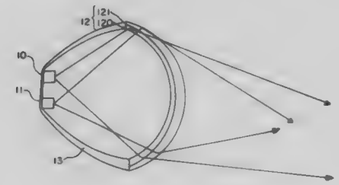
HOLOGRAPHIC DEVICE FOR GENERATING MULTIPLE BEAMS OF LIGHT

Charles S. Davis, 51 Wooster St., New York, N.Y. 10012

Filed Aug. 15, 1986, Ser. No. 897,296

Int. Cl.⁴ F21V *9/00, 11/00*

U.S. Cl. 362—231 **7 Claims**



1. An optical assembly for providing illumination comprising:

(a) a first artificial light source providing light at a first wavelength;

(b) a second artificial light source providing light at a second wavelength different from said first wavelength; and

(c) a holographic optical element adapted to diffract light of said first and second wavelengths in different beam patterns, and positioned such that light from said first and second light sources is diffracted in said different beam patterns to provide illumination of two different regions in space.

4,722,038

EASILY LOCATABLE NIGHT LIGHT/HOLDER

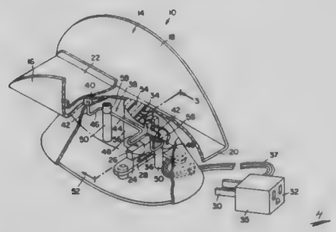
Richard A. Comfort, 6444 Aldea Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 652,100, Sep. 19, 1984, Pat. No. 4,584,633. This application Jan. 2, 1986, Ser. No. 815,527

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

Int. Cl.⁴ F21V *33/00*

U.S. Cl. 362—253 **23 Claims**



1. A holder for use by a blind or partially blind individual in order to locate an item placed in the holder, comprising:

holder means for holding the item;

power inlet and power outlet means;

locating means for identifying the location of the item;

first switch means connecting said power inlet to said power outlet, said first switch means opening in response to the placement of the item in said holder means to cut off power to said outlet;

second switch means connected between said locating means and said power inlet means, said second switch means closing in response to the placement of the item in said holder means to supply power to an internal appliance thereby to facilitate retrieval of the item;

said first and second switch means returning to their equilibrium states upon removal of the item from said holder means.

4,722,039

SHADED BEAM VEHICULAR DISCHARGE-TYPE HEAD LAMP

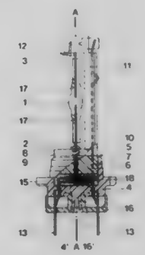
Manfred Gaugel, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Patent Treuhand Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,685

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603743

Int. Cl.⁴ F21V *7/12*; H01J *61/02*

U.S. Cl. 362—296 **12 Claims**



1. Automotive head lamp, particularly high-pressure discharge head lamp, having

an elongated lamp bulb (1);

a pair of electrodes extending outwardly of said bulb from terminal ends thereof and inwardly of the bulb towards an intermediate region thereof, said electrodes being sealed into said terminal ends;

a base sleeve (4) secured to one end of the lamp;

a bulb holder (5) secured to the base sleeve (4);

at least two base terminals (13, 13) being respectively electrically connected to the electrodes;

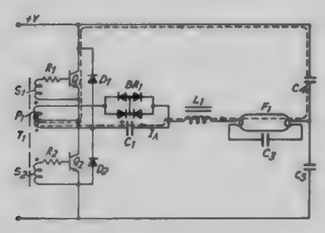
means for holding the other end of the bulb in position such that the elongated bulb extends axially from the base; and

light distribution control means in the form of a shield element (11) made of electrically insulating high-temperature resistant material for controlling the direction and distribution of light emitted from the lamp,

wherein

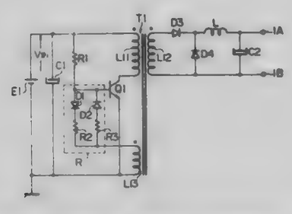
the shield element (11) comprises an elongated trough or groove element, the concave or groove side (14) of which is directed to face the lamp bulb, and a support plate (9) attached to the shield element (11) is connected to the bulb holder (5) by connection means (8), and wherein the light distribution and control means form part of said means (5) for holding the other end of the lamp bulb in position.

4,722,040
SELF-RESONANT INVERTER CIRCUIT
David P. Ball, Auckland, New Zealand, assignor to Thorn EMI Lighting (NZ) Limited, Auckland, New Zealand
Filed Jul. 7, 1986, Ser. No. 882,178
Claims priority, application New Zealand, Jul. 8, 1985, 212682
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—17 11 Claims



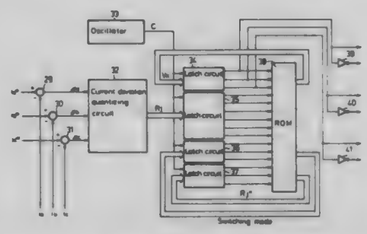
1. An inverter circuit comprising two input terminals for connecting a unidirectional current supply therebetween,
two switching means connected in series across said input terminals,
a transformer having two secondary windings, each of the secondary windings being arranged to control the operation of a respective said switching means, and a primary winding, the primary winding having two end connections and a tap connection, the tap connection being intermediate the end connections,
said end connections being connected by parallel branches to an input of a resonant circuit adapted to receive a load, one of said branches containing bidirectional threshold means and the other of said branches containing capacitive means, an output of said resonant circuit being connected to said two input terminals via respective further capacitive means,
the arrangement being such that, in use, the switching means operate essentially alternately.

4,722,041
SWITCHING REGULATOR
Hiroichi Ishikawa, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan
Filed Oct. 28, 1986, Ser. No. 924,018
Claims priority, application Japan, Oct. 31, 1985, 60-244997; Dec. 24, 1985, 60-291552
Int. Cl.[4] H02M 3/338
U.S. Cl. 363—18 4 Claims



1. An on-on type switching regulator comprising:
a blocking oscillator including a transformer having a collector winding, base winding and secondary winding, and a transistor;
a rectifying-smoothing circuit comprising a rectifier diode, flywheel diode, choke coil, and smoothing capacitor, said rectifying-smoothing circuit being connected to said secondary winding; and
a voltage drop circuit connected in a closed circuit formed between said base winding and the base-emitter of said transistor, said voltage drop circuit being arranged to block any forward or backward current when the voltage thereacross is in a micro-voltage range which may occur before excitation energy in said choke coil is discharged.

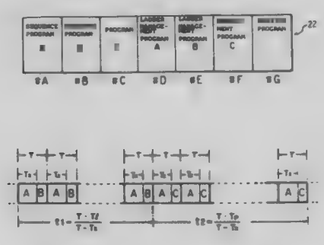
4,722,042
METHOD OF CONTROLLING CURRENT OF INVERTER FOR OPTIMUM SETTING OF SWITCHING MODES
Katsuhiro Asano, Nagoya, and Norio Iwama, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Oct. 3, 1986, Ser. No. 915,051
Claims priority, application Japan, Oct. 7, 1985, 60-223182
Int. Cl.[4] H02M 7/44
U.S. Cl. 363—98 20 Claims



1. A method of controlling current of a multi-phase inverter in which switching elements of said multi-phase inverter are ON/OFF controlled so that instantaneous values of output currents of said multi-phase inverter are coincident with output current command values, respectively, said method comprising the steps of:
(a) defining a plurality of voltage vectors in accordance with the magntiude and direction of an output voltage of said multi-phase inverter on a complex plane wherein an axis corresponding to each phase in said multi-phase inverter is set based on a phase angle of said each phase, said output voltage being determined in accordance with a magnitude of a DC power supply source in said multi-phase inverter and a combination of ON/OFF states of the switching elements;
(b) defining a plurality of voltage vector groups each comprising a plurality of voltage vectors including at least one voltage vector of magnitude zero, the directions of which are within 180° with respect to each other, and setting switching modes in correspondence with said voltage vector groups, respectively, each switching mode allowing selection of the voltage vectors within the corresponding group when it is set;
(c) obtaining current deviations of detected output current values from their respective output current command values, and detecting a direction of change of the position of the end of the current deviation vector on a complex plane;
(d) making a judgement as to whether or not said detected direction of change belongs to a reference change direction range which is determined by both a presently output voltage vector and one of said switching modes which is presently set;
(e) maintaining said presently set switching mode when the answer of the judement is affirmative, but changing said presently set switching mode to a switch mode involving a reference change direction range to which said detected change direction belongs and which is determined by the presently selected voltage vector when the answer of the judgement is negative; and

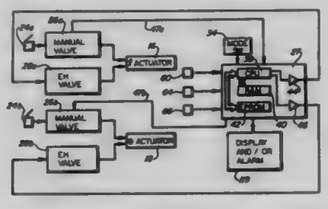
(f) selecting a voltage vector from the voltage vectors which are allowed to be selected in the switching mode which is maintained or newly set, said voltage vector being capable of converging said current deviations within a predetermined range including the origin on said complex plane.

4,722,043
CONTROL SYSTEM WITH CHANGABLE TIME-SHARED EXECUTION OF LADDER AND NON-LADDER PROGRAMS
Tsuyoshi Nagamine; Fumio Kawamura, both of Hachioji, and Shuji Toriyama, Setagaya, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP85/00415, § 371 Date Mar. 26, 1986, § 102(e) Date Mar. 26, 1986, PCT Pub. No. WO86/01012, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 22, 1985, Ser. No. 849,459
Claims priority, application Japan, Jul. 27, 1984, 59-157007
Int. Cl.[4] G05B 19/02
U.S. Cl. 364—147 2 Claims



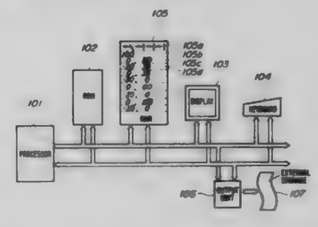
1. A control system for a programmable controller of a stored program system that prestores a program in a memory and effects sequence control for a numerically-controlled machine tool in accordance with the program stored in the memory, comprising:
the memory storing a first program of the ladder type and a second program described in a program language;
first setting means for setting the execution time for processing by the first program;
second setting means for setting the execution time for processing by the second program; and
management means for controlling the first and second programs, wherein the management means causes execution of, on a time-shared basis, the processing by the first and second programs alternatively for period of time set by the first and second setting means.

4,722,044
BOOM CONTROL SYSTEM
Richard K. Heiser, Wayzata; Thomas R. Fulkerson, Watertown, and Royal R. Hawkins, Bloomington, all of Minn., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Mar. 19, 1985, Ser. No. 713,442
Int. Cl.[4] G06F 15/20; E02F 3/72
U.S. Cl. 364—167 33 Claims



1. A control system for a member which is movable by first and second actuators that control the angle of the member relative to a reference and the length of the member, respectively, comprising:
first means for independently controlling each of the two actuators while in a first mode of operation;
second means for simultaneously controlling the actuators to effect straight line movement of the end of the member while in a second mode of operation to thereby simultaneously control angle and length; and
means coupled to the first and second controlling means for manually selecting one of the two modes of operation.

4,722,045
INPUT DATA SIGN DETERMINING METHOD
Hajime Kishi; Masaki Seki, and Takashi Takegahara, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP84/00054, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04608, PCT Pub. Date Nov. 22, 1984
PCT Filed Feb. 20, 1984, Ser. No. 694,382
Claims priority, application Japan, May 18, 1983, 58-087265
Int. Cl.[4] G06F 15/46; G05B 19/18
U.S. Cl. 364—171 1 Claim



1. In a method of creating NC machining data by entering a direction for each block of a part profile through use of a profile symbol key selected from the set of ↑, ↗, →, ↘, ↓, ↙, ←, , thereby to specify said part profile, followed by entering a dimension for each block of said part profile and using these entered data to create the NC machining data, an input data sign determining method having steps of:
(a) entering, in the form of an incremental quantity along each axis, a part profile dimension in a predetermined block;
(b) determining the sign of an entered incremental quantity on the basis of the direction of the part profile in said block by:
determining the sign of an entered horizontal-axis incremental quantity as being plus if the part profile is directed rightward along a horizontal axis,
determining the sign of an entered-horizontal-axis incremental quantity as being minus if the part profile is directed leftward along a horizontal axis,
determining the sign of an entered vertical axis incremental quantity as being plus if the part profile is directed upwardly along a vertical axis, and
determining the sign of an entered vertical axis incremental quantity as being minus if the part profile is directed downwardly along the vertical axis;
determining the signs of entered vertical- and horizontal-axis incremental quantities as being plus if the part profile is directed upwardly toward the right,
determining the signs of entered vertical- and horizontal-axis incremental quantities as being minus and plus respectively, if the part profile is downwardly toward the right,
determining the signs of entered vertical- and horizontal-axis incremental quantities as being plus and minus, respectively, if the part profile is directly upwardly toward the left,

determining the signs of entered vertical- and horizontal-axis incremental quantities as being plus if the part profile is directed downwardly toward the left; and

(c) converting the incremental quantity into a signed quantity.

4,722,046

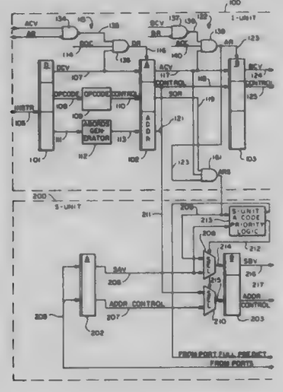
CACHE STORAGE PRIORITY

Mehrzad Kasrazadeh, Palo Alto; Michael D. Taylor, San Jose; Jeffrey A. Thomas, Cupertino; Christopher D. Finan, Santa Clara, and Joseph A. Petolino, Palo Alto, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 900,640, Aug. 27, 1986. This application Oct. 17, 1986, Ser. No. 920,803

Int. Cl.[4] G06F *13/14*

U.S. Cl. 364—200 **6 Claims**



1. A data processing apparatus comprising:

storage means for storing data at data locations identifiable by addresses;

instruction processing means for processing a sequence of instructions including

means, connected to receive the sequence of instructions, for decoding an instruction in the sequence to generate control signals including a request for storage of resulting data to the storage means for storing the resulting data at a data location and an address identifying the data location, and other requests for access to a data location and corresponding addresses,

means, connected to receive a subset of the control signals, for executing decoded instructions to generate the resulting data; and

storage port means, connected to receive resulting data from the executing means and having at least one register for holding the address and resulting data from the execution of an instruction when allocated to the instruction, for generating a request for access to the storage means for storing the resulting data at a data location identified by the address in the at least one register, the at least one register being in a free state if it is not allocated;

access control means, connected to receive a plurality of requests for access to the storage means including the requests for storage of resulting data and corresponding addresses from the storage port means and the decoding means, for processing a sequence of requests for access to the storage means including

means for allocating the at least one register in the storage port means if it is free to the requesting instruction in response to a request from the decoding means to store resulting data to,

means for accessing the storage means in response to other requests for access to the storage means, and

means for selecting from the plurality of received requests one request for processing next in the sequence by the access control means in response to a priority signal; and

priority logic means, connected to the decoding means, the storage port means and the access control logic, for generating the priority signal indicating the request for selection by the selecting means including

means for predicting whether at the time of a request for storage of resulting data from the decoding means, whether at least one register in the storage port means will be free at the time of allocation and if the predicted state of at least one register is not free, then increasing the priority of a request from the storage port means.

4,722,047

PREFETCH CIRCUIT AND ASSOCIATED METHOD FOR OPERATION WITH A VIRTUAL COMMAND EMULATOR

Kazun K. Chan, Del Mar; Truc D. Y. Nguyen, San Diego, and Chiman R. Patel, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 29, 1985, Ser. No. 770,459

Int. Cl.[4] G06F *12/08*

U.S. Cl. 364—200 **12 Claims**

1. A prefetch circuit for fetching prefetch commands from a memory which includes registers arranged in pages having page frame numbers, said prefetech circuit comprising:

real address storage means for storing the real address of a first register which is located in said memory, said real address containing a page frame number;

virtual address storage means for storing the virtual address of said first register which is located in said memory, said virtual address containing a virtual page number;

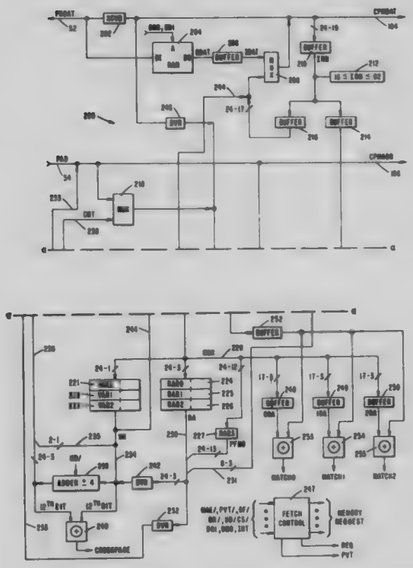
adder means having an input and an output, said adder means for adding an offset to an address on its input;

virtual address bus means connected between said virtual address storage means and the input of said adder means, said virtual address bus means for transmitting said virtual address to the input of said adder means to obtain a new virtual address having a new virtual page number contained therein;

comparator means connected to said real address storage means and the output of said adder means, said comparator means including an output having a first state when a least significant portion of the page frame number contained in said real address is the same as a least significant portion of the new virtual page number contained in said new virtual address, and a second state when the least significant portion of the page frame number contained in said real address is not the same as the least significant portion of the new virtual page number contained in said new virtual address;

real address bus means connected between said real address storage means and the input of said adder means, said real address bus means for transmitting said real address to said adder means to obtain a prefetch real address when the output of said comparator means is in its first state; and

fetch means connected between the output of said adder means and the memory for fetching a prefetch command from a second register in the memory at the location indicated by said prefetch real address.



4,722,048

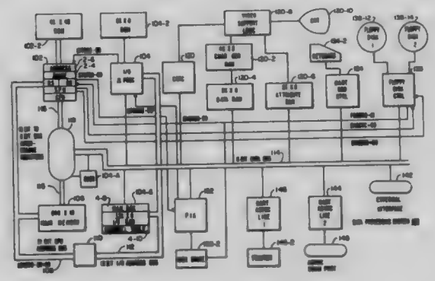
MICROCOMPUTER SYSTEM WITH INDEPENDENT OPERATING SYSTEMS

Thomas S. Hirsch, Bedford; James W. Stouter, Chelmsford, and Thomas O. Holtey, Newton, all of Mass., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Filed Apr. 3, 1985, Ser. No. 719,771

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **5 Claims**



1. A semaphore arrangement for use in a computer system to indicate availability of a system resource, said semaphore arrangement comprised of:

(a) a bus;

(b) a main memory having a predetermined band-width coupled to said bus;

(c) a first and second processor coupled to said bus, said first processor operating under a first operating system and said second processor operating under a second operating system, said first and second processors communicating with each other and with said main memory via said bus;

(d) a semaphore connected to said bus and responsive to said first processor for indicating to said second processor when said main memory is not being utilized by said first processor;

(e) first means for storing information indicating a time period for sequentially checking said semaphore with said second processor;

(f) second means for storing information indicating the number of times said semaphore is to be checked by said second processor before checking is temporarily halted to be restarted at a later time when said second processor is idle,

said second processor being responsive to said information stored in said first storing means and said second storing means to check the contents of said semaphore said number of times to determine when said main memory is idle and available to be used by said processor, said period and said number of times being selected to increase the amount of time said second processor has to perform other processing tasks.

4,722,049

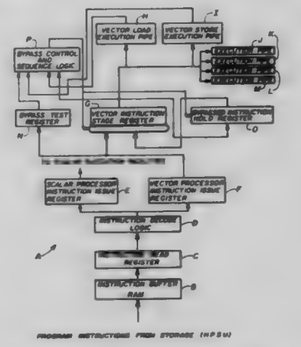
APPARATUS FOR OUT-OF-ORDER PROGRAM EXECUTION

Archie E. Lahti, Fridley, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 11, 1985, Ser. No. 786,934

Int. Cl.[4] G06F *9/40*

U.S. Cl. 364—200 **12 Claims**



1. A high performance computer apparatus for out-of-order program execution comprising:

instruction buffer means for receiving program instructions, said instructions including a first load vector instruction signal V1, a second load vector instruction signal V2 and a store vector instruction signal S1;

an instruction read register connected to receive instruction signals V1, V2, S1 from said instruction buffer means;

instruction decode logic means connected for decoding instruction signals V1, V2, S1 received from said instruction read register;

scalar and vector processor instruction issue registers connected for receiving decoded instruction signals V1, V2, S1 from said instruction decode logic means;

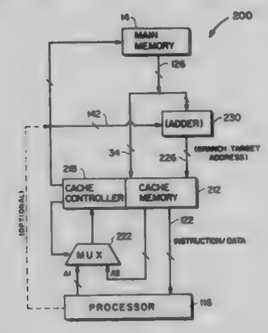
a vector instruction stage register connected to receive

instruction signals V1, V2 from said vector processor instruction issue register;
- a vector load execution pipe connected to receive instruction signal V1 from said vector instruction stage register;
- a bypassed instruction hold register coanected to receive said instruction signal V2 from said vector instruction stage register;
- a bypass control and sequence logic connected to control routing instruction signal V2 from said vector instruction stage register to said bypassed instruction hold register and again to said vector instruction stage register;
- a bypass test register connected to receive instruction signal S1 from said vector processor instruction issue register and for holding said signal S1 to be tested by said bypass control and sequence logic; and
- a vector store execution pipe connected to receive said instruction signal S1 from said vector instruction stage register.

4,722,050
METHOD AND APPARATUS FOR FACILITATING INSTRUCTION PROCESSING OF A DIGITAL COMPUTER

Ruby B. Lee, Cupertino; Allen J. Baum, and Russell Kao, both of Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 27, 1986, Ser. No. 845,213
Int. Cl.[4] G06F *13/00, 9/30*
U.S. Cl. 364—200 18 Claims



1. In a computer, an improvement for facilitating processing of an instruction in a processor having associated therewith a main memory and a cache memory, the cache memory, the cache memory for receiving information units stored in the main memory in order to make said information units more readily available for use by the processor, the improvement comprising:

cache control means coupled to the processor and to the cache memory for requesting at least one unit of information from the main memory; and

means coupled to receive information units from the main memory for transforming at least a portion of said at least one information unit to produce at least one transformed unit of information and for directing said at least one transformed unit for storage in the cache memory for potential use by the processor, wherein said transforming means comprises means identifying whether said at least one unit is a branch instruction and calculating with said transformation element a branch target address.

10. In a computer, a method for facilitating processing of an instruction in a processor having associated therewith a main memory and a cache memory, the cache memory for receiving information units stored in the main memory for order to make said information units more readily available for use by the processor, the method comprising: requesting at least one unit of information from the main memory by the processor;

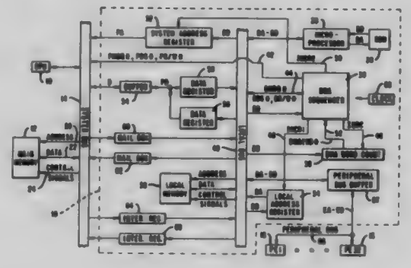
transforming at least a portion of said at least one unit with a transformation element to produce at least one transformed unit of information, wherein said transforming step comprises identifying whether said at least one unit is a branch instruction; and calculating with said transformation element a branch target address; and

storing said at least one transformed unit in the cache memory for potential use by the processor.

4,722,051
COMBINED READ/WRITE CYCLE FOR A DIRECT MEMORY ACCESS CONTROLLER

Sandip Chattopadhya, Setauket, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 26, 1985, Ser. No. 759,373
Int. Cl.[4] G06F *13/28*
U.S. Cl. 364—200 21 Claims



1. In a data processing system having a plurality of peripheral devices and a main memory, a direct memory access controller for controlling a transfer of data between the main memory and the peripheral devices comprising:

a local memory connected to the peripheral devices for storing data written to and read from the periperal devices;

sequencer means for controlling the transfer of data between the main memory and said local memory;

local address register means connected to said sequencer means for providing the local memory address for memory operations of said local memory;

system address register means connected to said sequencer means for providing the main memory address for memory operations of said main memory;

data register means connected between said main memory and said local memory for holding data transferred between the main memory and said local memory;

control means in said sequencer means and connected to said main memory, said local memory and said data register means, said control means for generating control signals in control cycles for controlling the transfer of words of data between the main memory and said local memory comprising:

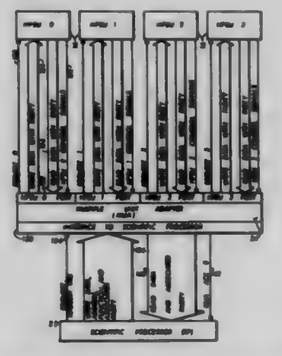
first control signal generating means in said control means for generating a first control signal for the transfer of a first data word out of said data register means; and

second control signal generating means in said control means for generating a second control signal subsequent to, and in the same control cycle as, the generation of said first control signal for the transfer of a second data word into said data register means.

4,722,053
MULTIPLE UNIT ADAPTER

James H. Scheuneman, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 596,205, Apr. 2, 1984, abandoned. This application May 5, 1987, Ser. No. 47,579
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 8 Claims



1. In a multiprocessing digital data processing system having a plurality of high performance storage units, a plurality of instruction processors, each of said instruction processors being individually coupled to each of said high performance storage units, a plurality of input/output processors, each of said input/output processors being individually coupled to each of said high performance storage units and a scientific processor with a repetitive cycling clock means and having a single high performance storage unit port, a multiple unit adapter for coupling the scientific processor to the plurality of high performance storage units, said multiple unit adapter comprising:

a single bidirectional scientific process port for coupling said multiple unit adapter to said single high performance storage unit port of the scientific processor;

a plurality of bidirectional high performance storage unit ports for individually coupling said multiple unit adapter to the plurality of high performance storage units;

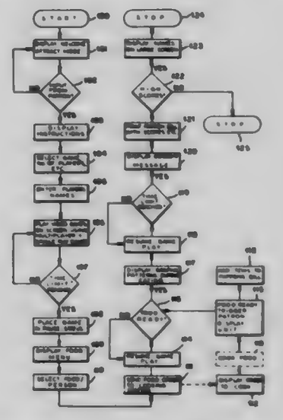
a first direction communication means coupled between the single bidirectional scientific processor port and the plurality of bidirectional high performance storage unit ports, said first direction communication means further including a first-in, first-out memory stack means having a plurality of n+1 memory locations for sequentially receiving as many as n successive high performance storage unit requests from said scientific processor during n clock cycles of the repetitive cycling clock means of the scientific processor without receiving an acknowledgement signal from said single bidirectional scientific processor port and further for sequentially receiving a continuous successive string of high performance storage unit requests from said scientific processor during successive clock cycles of the repetitive cycling clock means of the scientific processor so long as an acknowledgement signal is received at least once every n cycles and the high performance storage unit requests are to the same storage unit, to provide a first path for writing information emanating from the single storage unit port of the scientific processor into selected individual high performance storage units of said plurality; and

a second direction communication means coupled between the plurality of high performance storage unit ports and the single storage unit port of the scientific processor to provide a second path for returning information read from selected individual high performance storage units of said plurality to the scientific processor via said single storage unit port to thereby provide a digital data processing system capable of storage expansion while maintaining a scientific processor design having a single storage unit port.

4,722,053
FOOD SERVICE ORDERING TERMINAL WITH VIDEO GAME CAPABILITY

Michael Dubno, 5938 Liebig Ave., Riverdale, N.Y. 10471, and Daniel Dubno, 261 W. 11th St., New York, N.Y. 10014

Filed Dec. 29, 1982, Ser. No. 454,152
Int. Cl.[4] G06F *15/24, 15/44;* A63F *9/22*
U.S. Cl. 364—401 6 Claims



1. A food service installation comprising:

a plurality of patron stations, each comprising a dining table and seating means at said table for accommodating a plurality of patrons;

a computer facility at each of said stations, each computer facility comprising at least one video display terminal, and a plurality of game-playing implements adapted to enable patrons at said station to play a game displayed on said terminal;

means connected to said terminals for displaying thereon food service items adapted to be selected by the patrons;

a further terminal operatively connected to the terminals at said station for displaying food service items selected by the patrons at the respective stations to enable the preparation of said food items;

means connected to said terminals at said stations for permitting the playing of selected games at each terminal before and after the display of food service items at least for a limited time;

a central computer connected to said terminals and feeding information to and receiving information from said terminals, said central computer being programmed to terminate games played at the terminals of said station upon the lapse of a selected time period subsequent to food service, each of said stations being provided with a plurality of joysticks connected to the respective terminals for enabling the playing of the game thereon, said joysticks being connected to the respective terminals to enable the selection of games from a game menu and food service items from a food service menu displayed on the respective terminals by the respective joysticks;

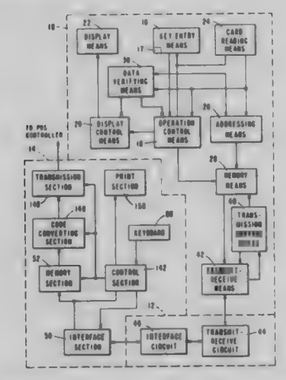
a printer connected to said further terminal for printing out a patron's bill, said printer being connected to print-out indicia relating to the games played by the respective patrons on the respective bills; and

a central display common to all of said stations and means

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for activating said display upon the attainment of a high score in a game by one of said patrons.

4,722,054
INPUT SYSTEM FOR POS TERMINAL
Shin-ichi Yoroza, Chofu, and Masahiko Fukushima, Urayasu, both of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 10, 1985, Ser. No. 753,488
Claims priority, application Japan, Oct. 31, 1984, 59-228040
Int. Cl.[4] G06K *5/00*
U.S. Cl. 364—401 **12 Claims**



1. An information system for use with a point of sale terminal comprising a

portable input device having means for reading information recorded on a credit card, means for entering indicia idnetifying the holder of the credit card, memory means for storing such information and indicia, such information and indicia being transmitted from the memory means to the POS terminal in response to a request to send signal from the POS terminal, and

means connected to the POS terminal and operably associated with the input device dependent upon demand of sales transactions during a specified period of time for sequentially transmitting the information and the indicia from the transmitting means of the input device to the POS terminal in response to hte request to send signal.

4,722,055
METHODS AND APPARATUS FOR FUNDING FUTURE LIABILITY OF UNCERTAIN COST
Peter A. Roberts, New York, N.Y., assignor to College Savings Bank, Princeton, N.J.
Continuation of Ser. No. 587,568, Mar. 8, 1984, Pat. No. 4,642,768. This application Feb. 6, 1987, Ser. No. 12,051
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—408 **52 Claims**

7. A data processing method for administering a program to provide a future return adequate to meet payouts for funding the uncertain cost of a service or commodity at a future date, which determines payments required for participation in the program and manages a portfolio of assets purchased with the participation payments, said method comprising the steps of:

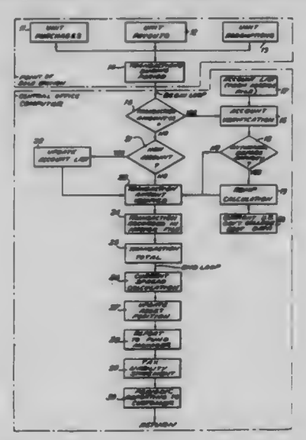
determining the payment required for participation in the program based on the cost of the service or commodity at time of payment, data concerning the expected time rate of change of the cost of said service or commodity, and the time period from the present to said future date;

entering participation payment data;

storing an asset position list including information concerning the portfolio of assets purchased with the participation payments;

periodically processing said participation payment data to determine the total of said participation payment data for a period for which said periodic processing is performed;

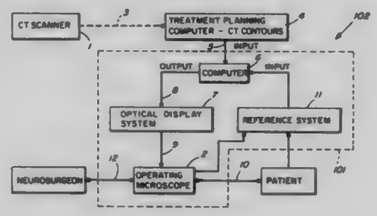
providing portfolio management data in response to said total participation payment data and to information from said asset position list, so that assets can be selectively



purchased or sold to provide that the cash flow from the portfolio is adequate for funding program payments and to provide that the yield of the portfolio at least matches the expected time rate of change from the present to said future date of the present cost of the service or commodity; and

generating a management report including said portfolio management data and said information in said asset position list.

4,722,056
REFERENCE DISPLAY SYSTEMS FOR SUPERIMPOSING A TOMAGRAPHIC IMAGE ONTO THE FOCAL PLANE OF AN OPERATING MICROSCOPE
David W. Roberts, Hanover, N.H.; John W. Strobbehn, Norwich, Vt., and John F. Hatch, Shrewsbury, Mass., assignors to Trustees of Dartmouth College, Hanover, N.H.
Filed Feb. 18, 1986, Ser. No. 830,140
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413 **33 Claims**



1. A method of integrating image information from an imaging device and an operating microscope during an operative procedure on body parts of a patient comprising:

positioning an operating microscope in the course of said operative procedure at an operative location relative to the patient;

establishing the spatial relationship among the image information, the patient, and the focal plane of the microscope;

introducing the image information and spatial relationship to a computer and reformatting the image information to generate a computer-generated image of the body part at a determined plane related to the focal plane of the microscope; and

projecting the computer-generated image into the optics of the operating microscope for coordinated viewing of the computer-generated image and the patient.

6. A method of referencing for integrating information received from an imaging device and an operating microscope during an operative procedure on a body part of a patient, that comprises:

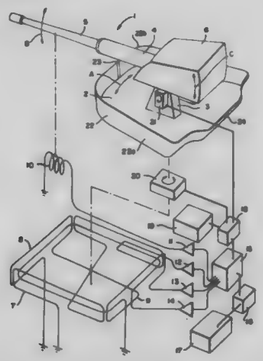
introducing said information to a computer which is operable to reformat the received information which is then presented as a computer-generated image of the body part at a determinable place;

positioning an operating microscope in the course of said operative procedure at an operative location relative to the patient, the focal plane of the microscope being at said determinable plane;

establishing the spatial relationship among the computer-generated image, the patient and the focal plane of the microscope; and

projecting the computer-generated image into the optics of the operating microscope.

4,722,057
METHOD AND APPARATUS FOR REDUCTION OF THE MAGNETIC IDENTITY FOR SHIP PARTS WHICH ARE MOVABLE FOR THEIR BEARING AND ELEVATION
Lars-Göran Gustavsson, Vårbovägen 14, S-702 30 Örebro; Hans Kindroth, Box 911 B, S-688 00 Storfors, and Roland Åhs, Pl 8057, S-693 00 Degerfors, all of Sweden
Filed Sep. 4, 1985, Ser. No. 772,521
Claims priority, application Sweden, Sep. 4, 1984, 8404402
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—423 **4 Claims**



1. A method of reducing magnetic identity for a ship provided with movable ship parts such as artillery guns and cranes having large irons lengths, and being movable transversely and in elevation relative to a zero point, comprising the steps of:

providing a computer unit continuouly with input data concerning the latitude of the ship, local irregularities in the terrestrial magnetic field, ship's course, speed, pitching and rolling position from the ship's log through interface units;

simultaneously providing said computer unit with input data concerning angles of elevation and transverse of said movable ship parts with respect to said zero position from gyro reference units coordinated with said ship parts through interface units; and,

feeding magnetic coils which are built into the ship or arranged on said ship parts with electric current continuously calculated and controlled by said computer unit for every coil based on said input data from continuous compensation of the magnetic identity of the ship.

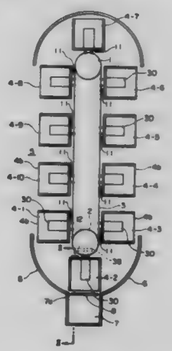
3. An apparatus for reduction of the magnetic identity of the ship provided with parts having large iron lengths such as artillery guns and cranes and being movable transversely and in elevation with respect to a zero point comprising:

a plurality of electromagnetic coils disposed on said parts for controlling said reduction of said magnetic identitiy with continuously calculated, predetermined electrical current;

a plurality of amplifiers connected to said coil for supplying said coils with electrical current; and,

a computer unit for receiving input data through interface units from log of the ship, gyro units and angle transducers concerning latitude of the ship, rolling and pitching angles, terrestrial irregularities, and angle of transverse and elevation of said parts, to continuously calculate electric control signals based on said received input data and supply said signals to said amplifiers.

4,722,058
CONTROL SYSTEM FOR A VENDING MACHINE USING ARTICLE FRESHNESS DATA
Nobuo Nakayama; Yukio Makita; Haruo Kawasaki; Yoshihiro Sashikawa; Satoru Umino; Shinsuke Tajiri; Tetsuya Miyao, and Shozo Iwamoto, all of Kanagawa, Japan, assignors to Fuji Electric Company Ltd., Kanagawa, Japan
Filed May 30, 1985, Ser. No. 739,436
Int. Cl.[4] G07F *11/00*
U.S. Cl. 364—479 **9 Claims**



1. A control system for an article vending machine having a plurality of article storage bins mounted on a circulatory moving member for selective bidirectional rotation past an article discharge position and a device for making article selections, the control system comprising:

indicator means an each of the article storage bins for providing bin diacription data indicating whether or not an article is present in the associated article storage bins and if so the type of article in the associated article storage bin and freshness data for the article;

sensing means for reading said bin description data and for generating corresponding bin reference data;

a memory for storing said bin reference data; and

delivery control means, responsive to the selection of an article and in accordance with said stored bin reference data, for controlling the circulatory moving member to move through the minimum displacement to position a selected aricle storage bin to the article discharge position to inable the discharge of the selected article on a first

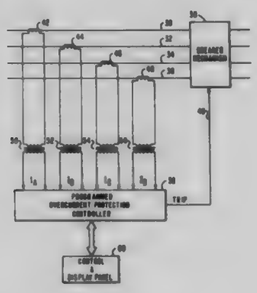
in-first out basis if an article corresponding to the selected article is stored in one of the article storage bins.

4,722,059

PROGRAMMED OVERCURRENT PROTECTION CONTROL APPARATUS AND METHOD OF OPERATING THE SAME

Joseph C. Engel, Monroeville Boro; Leonard C. Vercellotti, Oakmont; Richard A. Johnson; Seymour Salowe, both of Murrysville, and William R. Verbanets, Jr., Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1985, Ser. No. 725,195
Int. Cl.[4] H02H *3/08*; G06F *15/46*
U.S. Cl. 364—483 **25 Claims**



1. Programmed overcurrent protection control apparatus adaptable for use in a power system including a power line to govern the interruption of current through said power line based on a derived overcurrent time-to-trip associated with an overcurrent condition of said power line, said control apparatus comprising:

a programmed digital signal processor;

memory means, coupled to said programmed processor, for storing a plurality of digitally coded signals representative of predetermined derivation constants;

means for setting a plurality of derivation parameters;

means for measuring the current of said power line and generating a signal representative thereof;

means governed by said programmed processor to sample said current measurement signal at a plurality of first predetermined times during each frequency cycle of the power line current to effect sampled signals and to digitize said sampled signals;

said programmed processor operative over predetermined time intervals to derive for each predetermined time interval a digital signal, representative of a current value I_m of a frequency cycle of the current contemporaneous with the corresponding predetermined time interval m, from the sampled signals digitized over the corresponding predetermined time interval;

said programmed processor operative at second predetermined times corresponding to said predetermined time intervals to read said derivation parameter settings;

said programmed processor operative to select certain of said digitally coded derivation constants from said memory means corresponding to said read parameter settings;

said programmed processor operative to detect an overcurrent condition from said derived digital current value signals;

said programmed processor operative, in response to the detection of an overcurrent condition, to derive an overcurrent time-to-trip based on the following relationship:

$$\left[\sum_{m=1}^{N-G\cdot C2}(I_m - C1)^P\right] \geq G \cdot C3,$$

where m from 1 to N−G·C2 represent the predetermined time intervals during which said detected overcurrent condition persists;

where G, P, C1, C2 and C3 represent digitally coded derivation constants based on said read parameter settings for each corresponding predetermined time interval m;

where N represents the number of predetermined time intervals which may elapse for the time-to-trip and G·C2 represents a minimum number of predetermined time intervals for the time-to-trip;

where I_m represents the digital current value signal derived for the corresponding predetermined time interval m; and

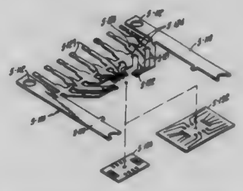
means for governing the interruption of current through said power line if said overcurrent condition persists for the duration of said time-to-trip derivation.

4,722,060

INTEGRATED-CIRCUIT LEADFRAME ADAPTED FOR A SIMULTANEOUS BONDING OPERATION

Daniel J. Quinn; Robert H. Bond, both of Carrollton; Wayne A. Mulholland, Plano; Steven Swendrowski, The Colony; Michael A. Olla, Flower Mound; Jerry S. Cupples; Barbara R. Mondzen, both of Carrollton; Linda S. Wilson, Pilot Point, and Lisa Garrison, Garland, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Mar. 22, 1984, Ser. No. 592,144
Int. Cl.[4] H01R *9/09*; H01L *23/00*
U.S. Cl. 364—490 **5 Claims**



1. A leadframe for an integrated circuit comprising: at least one array of electrically conductive leads, each of said leads having an external portion for connection to devices external to said integrated circuit and an attachment portion for providing a connection to a contact on a semiconductor chip; and

at least two positioning members, each attached to at least one lead of said array of electrically conductive leads between said external portion and said attachment portion, for connecting and positioning said array of electrically conductive leads, whereby said attachment portions of said array of leads are maintained in predetermined positions prior to attachment to a semiconductor chip and said external portions of said array of leads are maintained in a configuration adapted for external attachment; characterized in that:

said attachment portion of said at least one lead comprises a connector member extending from said positioning member to a contact tip;

each connector member of said attachment portions extends along a predetermined path such that said contact tip of each of said attachment portions is positioned in a predetermined position in a contact tip array; and

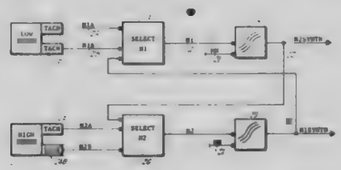
each of said connector members has a predetermined spring constant which is substantially the same as each other of said connector members characterizing deflection of each of said attachment portions along a line perpendicular to a first plane defined by said at least two positioning members, each of said attachment portions being bent in two steps whereby each contact tip extends out of said first plane and said contact tip array lies in a second plane substantially parallel to said first plane.

4,722,061

ESTABLISHING SYNTHESIS VALIDITY BETWEEN TWO SIGNAL SOURCES

Larry B. Carlisle, Vernon, and Wayne R. Spock, Canton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1984, Ser. No. 683,905
Int. Cl.[4] G05B *9/03*; G06F *15/46*
U.S. Cl. 364—494 **3 Claims**



1. A method of synthesizing signals, comprising:

providing a first signal (N1) indicative of and in response to a sensed first parameter;

providing a second signal (N2) indicative of and in response to a second parameter related to the first parameter;

monitoring the veracity of the first signal and the second signal;

providing a first synthesized signal (N1SYNTH) if the veracity of the first signal is less than the veracity of the second signal;

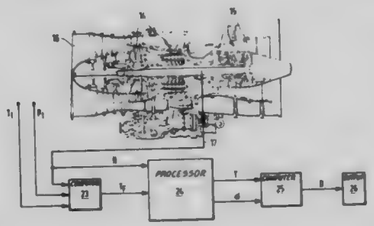
providing a second synthesized signal (N2SYNTH) if the veracity of the first signal has at least the veracity of the second signal.

4,722,062

METHOD AND APPARATUS FOR THE CONTROL OR MONITORING OF THERMAL TURBOMACHINES BASED ON MATERIAL STRESSES

Guenter Breitkopf, and Thomas Speer, both of Munich, Fed. Rep. of Germany, assignors to Motoren-und Turbine-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,089
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415165
Int. Cl.[4] F01D *19/02*
U.S. Cl. 364—508 **18 Claims**



1. In an apparatus for the control or monitoring of thermal turbomachines, based on material stresses of rotating and thermally stressed components, when these components prevent direct measurement of the respective prevailing temperatures and of the thermally induced stresses and in which rapid variations in operating parameters take place which cause non-linear dependence of the component on the operating conditions, on the one hand, and on the temperature, on the other hand, the improvement comprising means for determining in the real time the instantaneous temperature distribution prevailing in the rotating component at successive intervals from the temperature distribution prevailing in said component at the beginning of each interval and from an actual temperature variation rate, means for determing thermal stresses and material fatigue in said component from said temperature distribution, and means for determining said actual temperature variation rate including:

(a) comparing means for comparing the temperature distribution prevailing in the component at the beginning of an interval with a set of previously determined standard temperature distributions under particular operating conditions,

(b) selector means for selecting from the set of standard temperature distributions, those that are closest to the temperature distribution prevailing in the component at the beginning of an interval,

(c) means for determining temperature variation rates determined from said standard temperature distributions and for modifying said temperature variation rates in accordance with the difference between the actual operating conditions and corresponding operating conditions at the time of obtaining the standard temperature distributions, and

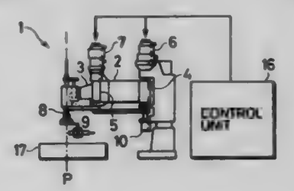
(d) means for obtaining the actual temperature variation rate for the respective interval from the modified temperature variation rates by weighted averaging.

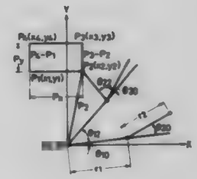
4,722,063

METHOD OF CALCULATING ACTUAL ARM LENGTHS AND COMPENSATING FOR ANGULAR ERRORS

Kazuyoshi Yasukawa, and Yasuyuki Kitahara, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Oct. 31, 1985, Ser. No. 793,418
Claims priority, application Japan, Oct. 31, 1984, 59-231032
Int. Cl.[4] G05B *19/42*
U.S. Cl. 364—513 **4 Claims**





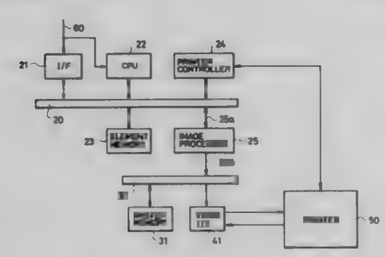
1. A method of positioning a planar multi-joint robot operated with polar coordinates, comprising the steps of:

causing the coordinate system of a measuring plate to agree with one axis of the coordinate system of the robot;

teaching the coordinates of four points on said measuring plate to said robot;

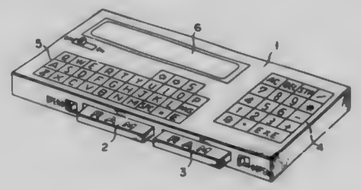
obtaining actual arm lengths r_1 and r_2 of a first and a second arm of said robot and an angle $\Delta\Theta_2$ of said second arm relative to an extension of said first arm on the basis of the coordinates of said four points;
setting said robot at a working position and positioning an object;
operating said robot on the basis of said actual arm lengths r_1 and r_2 and said angle $\Delta\Theta_2$, and teaching two reference points of said object to said robot;
calculating an inclination Θ_p between the respective coordinate systems of said object and said robot on the basis of the two reference points of said object;
correcting said coordinate system of said robot with said inclination Θ_p to thereby obtain the position p_0 (x_0, y_0) of said object; and
storing, in a control unit of said robot, said actual arm lengths r_1 and r_2, said inclination Θ_p and position coordinates x_0 and y_0 as correction values to be used in positioning said robot to a predetermined position on the basis of input data in said coordinate system of said object.

4,722,064
DRAWING OUTPUT UNIT
Kazuhiro Suzuki, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Nov. 4, 1985, Ser. No. 794,853
Claims priority, application Japan, Nov. 27, 1984, 59-248704; Apr. 17, 1985, 60-80093; Apr. 17, 1985, 60-80094
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 364—518 **10 Claims**



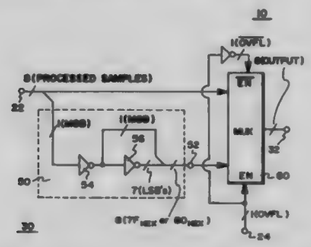
1. A drawing output unit wherein a prescribed amount of element information consisting of at least one code datum for preparing a pattern is stored, said element information is converted into raster information composed of a picture signal corrsponding to an actually recorded image, and the converted raster information is transferred to a printer to obtain the recorded image, comprising a general bus, a first raster information dedicated bus and a scond raster information dedicated bus,
said general bus being connected to an element memory for storing a prescribed amount of said element information, to a central processing unit controlling operations of the respective parts of said drawing output unit involving conversion of element information into raster information as well as transfer of raster information to the printer, to an input terminal of an image processor receiving element information from said selement memory through said general bus and converting the received information into raster information to output the converted information to said first raster information dedicated bus, and to a printer controller executing control of said printer,
said first raster information dedicated bus being connected to an output terminal of said image processor and input terminals of at least two raster memories, each of which has a capacity for storing such raster information for at least one patge of said recorded image, saids raster information dedicated bus being connected to output terminals of these raster memories and to an input terminal of a video interface receiving such raster information read from either of said raster memories to transfer the received information to said printer, and
said printer being connected to said video interface wherein the central processing unit effects the controlling operation in such a manner that the video interface receives raster information from either of said raster memories to transfer the received inforamtion to the printer while outputting the raster information to another raster memory by means of the image processor.

4,722,065
ELECTRONICALLY PROGRAMMABLE CALCULATOR WITH MEMORY PACKAGE
Kiyoshi Ogawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 22, 1985, Ser. No. 715,016
Claims priority, application Japan, Mar. 30, 1984, 59-62764; Mar. 30, 1984, 59-62765
Int. Cl.⁴ G06F *12/02*
U.S. Cl. 364—709 **8 Claims**



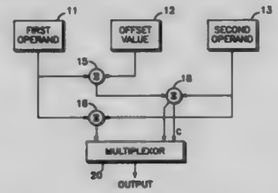
1. An electronic programmable calculator comprising:
a plurality of memory package means, each containing at least one memory chip and with each including means for storing one of program data and variable data;
housing means containing a plurality of electronic components of said calculator and having an insertion portion adapted for accommodating said plurality of memory package means;
data processing means provided in said housing means for performing at least an arithmetic operation and connected to said plurality of memory package means inserted in said housing means;
input means provided in said housing means and connected to said data processing means for inputting said program data and variable data into said plurality of memory package means inserted in said housing means;
first memory means for storing data related to memory capacity of at least one of said plurality of package means inserted in said housing means;
second memory means for storing data which indicates memory capacity of another of said plurality of memory package means inserted in said housing means to replace said one of said plurality of memory package means;
calculating means for calculating a difference between the dat stored in said first memory means and the data stored in said second memory means;
means for renewing absolute address data of said another of the plurality of memory package means inserted in said housing means in accordance with said difference calculated by said calculating means.

4,722,066
DIGITAL SIGNAL OVERFLOW CORRECTION APPARATUS
John Armor, Middlesex, and Erwin J. Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, Princeton, N.J.
Filed Jul. 30, 1985, Ser. No. 760,382
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—745 **9 Claims**



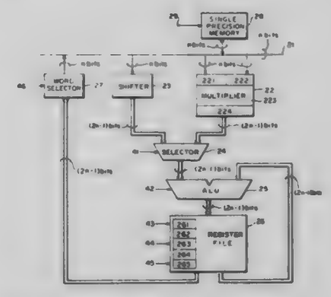
1. Digital signal processing system for generating substitute values associated with n-bit potentially erroneous, processed input samples in the two's complement system: said system having means for providing a control signal indicative of the overflow in said n-bit processed samples; said system further including overflow correction apparatus comprising:
means responsive to the MSB of said potentially erroneous, processed input samples for generating the respective, n-bit substitute values; said substitute value generating means including a pair of inverters connected to each other in series: the respective outputs of the first and second inverters defining the MSB and the n−1 LSB's of said n-bit substitute values; and
a two-input switch responsive to said control signal; one input of said two-input switch having coupled thereto said potentially erroneous, processed input samples; the second input of said switch being provided with said associated substitute values: said switch passing to the output thereof either said processed input samples or said associated substitute values depending upon the absence of or the presence of an overflow in said processed input samples.

4,722,067
METHOD AND APPARATUS FOR IMPLEMENTING MODULO ARITHMETIC CALCULATIONS
Tim A. Williams, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 25, 1985, Ser. No. 715,865
Int. Cl.⁴ G06F *7/72*
U.S. Cl. 364—746 **8 Claims**



1. A modulo M arithmetic unit for providing a sum of first and second numbers, said numbers being integers of a number system having X bits and being within a predetermined range having an upper boundary and a lower boundary of zero relative to M, where M is a selected one of a plurality of predetermined modulae and M and X are integers, comprising:
first adder means for selectively receiving and adding the first and second numbers to provide a first output sum;
second adder means for selectively receiving and adding the first number and an offset value,
said offset value being equal to $(2^X - M)$, and for providing an intermediate modulo value;
third adder means for selectively receiving and adding the intermediate modulo value and the second number to provide a second output sum and an output carry bit; and
logic means for providing, in response to a logic state of the output carry bit, a selected one of the first and second output sums as a sum of the first and second numbers which has a value within the predetermined range.

4,722,068
DOUBLE PRECISION MULTIPLIER
Ichiro Kuroda; Takao Nishitani; Hideo Tanaka, and Yuichi Kawakami, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Apr. 25, 1985, Ser. No. 727,020
Claims priority, application Japan, Apr. 26, 1984, 59-84578
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—757 **5 Claims**

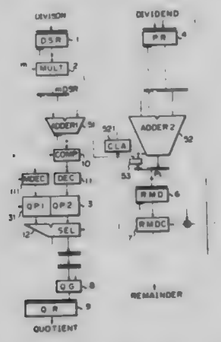


1. A double precision multiplier including:
2's complement single precision multiplication means responsive to two input data, each of which has a predetermined word length of n bits where n bits corresponds to single precision data, for performing the multiplication of said two data to produce one (2n−1)-bit double precision data, each double precision data having an upper word and a lower word;
double precision register means having plural double precision registers for storing said double precision data from said multiplication means into one of the registers;
word selecting means for selecting either one single precision data obtained by taking out the upper word of said double precision data stored in one of the registers of said register means or one single precision data obtained by adding one "0" bit before the most significant bit (MSB) of the remaining lower word of said double precision data stored in one of the registers of said register means;
shift means connected to receive said selected one single precision data for shifting said one single precision data selected by said selecting means to convert it to one double precision data by expending the MSB of the selected one single precision data; and
double precision arithmetic and logic operation means connected to receive said one double precision data with the MSB expanded from said shift means and said double precision data stored in said double precision registers of said register means for executing an arithmetic and logic operation of said double precision data with the MSB expanded and said double precision data stored in one of the registers to feed a result of the arithmetic and logic operation to said register means.

4,722,069
NONRESTORING DIVIDER

Masayuki Ikeda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 2, 1985, Ser. No. 719,014
Claims priority, application Japan, Apr. 9, 1984, 59-070353; Jun. 22, 1984, 59-128610
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—767 13 Claims



7. An apparatus for dividing a dividend by a divisor having upper digits, said apparatus comprising:

a partial remainder register for storing a partial remainder, for receiving the dividend as an initial partial remainder and for supplying upper and lower digits of the partial remainder;

multiplier means, for multiplying the divisor by a selected predicted partial quotient to produce a divisor multiple having upper and lower digits;

adder means for determining differences between the upper digits of the divisor multiple and the upper digits of the partial remainder to produce a first result having a sign and for determining differences beween the lower digits of the divisor multiple and the lower digits of the partial remainder to produce a second result including a carry signal indicating when a carry will be produced as part of the second result and for combining the first and second results to produce a new partial remainder; and

predictor means for generating a first predicted partial quotient from the upper digits of the divisor and the first result, for producing a corrected first result in dependence upon the sign of the first result, for producing a second predicted partial quotient from the upper digits of the divisor and the corrected first result and for selecting one of the first and second predicted partial quotients to be supplied as the selected predicted partial quotient to said multiplier means for multiplication with the divisor.

4,722,070
MULTIPLE OSCILLATION SWITCHING CIRCUIT

Thomas A. Dye, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 451,986, Dec. 21, 1982, abandoned.
This application Jul. 3, 1986, Ser. No. 882,019
Int. Cl.[4] G06F 1/04
U.S. Cl. 364—900 5 Claims

1. A digital processing system comprising:

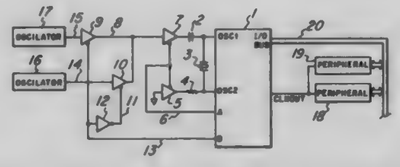
a plurality of peripheral devices, each peripheral device having an independent internal timing cycle;

a plurality of oscillator means, each having an output consisting of an independent internal frequency corresponding to the internal timing of at least one peripheral device;

a central processing unit connected to said plurality of peripheral devices, having at least one clock signal input, a first internal timing cycle corresponding to the frequency of the signal received on said at least one clock signal input, and at least one oscillator selection output;

an oscillator switching circuit connected to said central processing unit and the output of each of said oscillator means for providing a single oscillator output to said at least one clock signal input of said central processing unit in response to said oscillation selection output from the central processing unit so as to conform the internal timing of said central processing unit to that of at least one of said peripheral devices;

said at least one oscillator selection output includes a first oscillator selection output for choosing between a primary oscillator signal and said plurality of oscillator means and



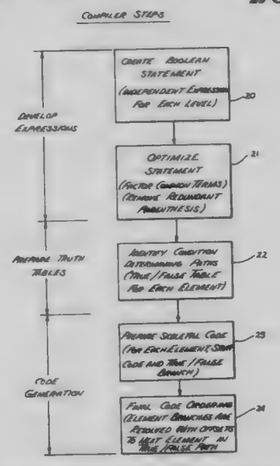
at least one second oscillator selection output for selecting a secondary oscillator signal from among said plurality of oscillator means; and

said oscillator switching circuit includes a primary oscillator connected to said at least one clock signal input for generating said primary oscillator signal, primary switching means connected to said first oscillator selection output for enabling or disabling said primary oscillator and secondary switching means connected to said at least one second oscillator selection output for coupling the output of one of said plurality of oscillator means to said at least one clock signal input in accordance with said at least one second oscillation selection output.

4,722,071
COMPILER FOR EVALUATING BOOLEAN EXPRESSIONS

Dirk I. Gates, Chatsworth; David B. Rosea, Canoga Park, and Gary A. Jones, Chatsworth, all of Calif., assignors to Pertron Controls, Corporation, Chatsworth, Calif.

Filed Apr. 19, 1985, Ser. No. 725,084
Int. Cl.[4] G06F 9/44; G05B 11/01
U.S. Cl. 364—900 25 Claims



1. In a process where the condition of a plurality of logic

elements, including a first logic element and a last logic element, controls an action, a method for preparing a computer program for determining said action, said program being for execution in a digital computer having a processor and a memory, said method comprising the steps of:

developing an expression for storage in said memory, said expression defining the effect said logic elements have on said action;

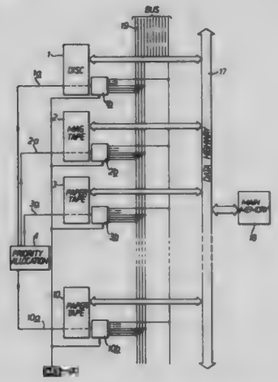
for each condition for each logic element, using said processor for examining said expression to determine another logic element within said expression which controls said action, thereby defining condition determining control paths;

generating code for execution by said computer for examining the conditions of only those logic elements necessary to determine the action in an order directed by said condition determining control paths.

4,722,072
PRIORITY RESOLUTION IN BUS ORIENTATED COMPUTER SYSTEMS

Simon M. Price, Haywards Heath, England, assignor to National Research Development Corporation, London, England

Filed Jun. 12, 1984, Ser. No. 620,328
Claims priority, application United Kingdom, Jun. 16, 1983, 16453
Int. Cl.[4] G06F 13/36
U.S. Cl. 364—900 6 Claims



1. A digital computer system for resolving priority between a plurality N of subsystems which require access to a shared resource, the priority being determined by an n-bit priority code, where $n>1$, ascribed to each subsystem, and where the n bits of each priority code each possess a different significance, the system comprising:

an open-collector bus having n lines, each said line adapted to have assume a state representing a logic value, each one of said n lines corresponding to each of said n bits of the priority code;

a plurality N of logic circuits, one of which being connected to each of the N subsystems and each of which having n stages, each said stage corresponding to a bit of a priority code and connected to a line of the open collector bus corresponding to a same bit of the priority code, the stages being connected in series with one another in a descending order of significance; and

means for applying each bit of the priority code of each subsystem to a corresponding stage of an associated logic circuit of said subsystem, bits of the priority code addressing said logic circuit such that a most significant bit of the priority code is addressable to a first stage of the logic circuit and a least significant bit of the priority code is addressable to a nth stage;

wherein a first stage of each said subsystem comprises means for applying said most significant bit to a corresponding line of the open collector bus, means for comparing a value of said most significant bit with a logic value of said corresponding line and means for selectively inhibiting-/enabling, according to a pre-determined criterion, the next stage of the logic circuit, to apply a next most significant bit to a corresponding line of the open-collector bus;

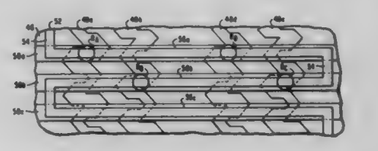
and wherein each stage subsequent to said first stage of each said subsystem comprises means for comparing, when enabled by said inhibiting/enabling means of a previous stage, logic values of a corresponding priority code bit and a corresponding line of the open-collector bus and means for inhibiting/enabling a next stage of the logic circuit,

enable/inhibit instructions thereby rippling through each logic circuit to said nth stage, after which only one circuit is enabled, and the subsystem connected to said logic circuit gaining access to the shared resource.

4,722,073
MAGNETORESISTIVE RANDOM ACCESS CROSS-TIE MEMORY ARCHITECTURE AND SIGNAL PROCESSING SYSTEM

Donald R. Lampe, Ellicott City, Md.; Mark A. Mentzer, Lititz, Pa., and Eric H. Navinsky, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 5, 1985, Ser. No. 795,284
Int. Cl.[4] G11C 19/08
U.S. Cl. 365—87 4 Claims



1. A magnetoresistive random access cross-tie memory array comprising:

(a) an insulating subtrate;

(b) a plurality of spaced columns of thin film magnetoresistive material disposed upon said substrate, which thin film columns are symmetrically patterned and shaped to provide only two stable magnetic domain states at spaced memory elements which form an X-Y array of spaced apart memory elements which are magnetically addressable to one of two possible stable states, and wherein a single binary digital bit is written and stored at four memory elements which are defined on four spaced adjacent columns of magnetoresistive material, with one memory element of the four being located along each of the four columns of magnetoresistive material;

(c) row conductors aligned over row aligned pairs of memory elements, with two of the four memory elements aligned under a first row conductor, and the other two memory elements are aligned under a second row conductor;

(d) serpentine shaped column conductors having columnar extending portions interconnecting row aligned extending portions arranged so that adjacent row extending portions conduct current in opposed directions over row adjacent memory elements whereby a single binary digit can be stored in complementary fashion in a pair of adjacent memory elements, and wherein all four memory elements for a single binary digital bit are aligned under a single serpentine column conductor, with the two memory elements aligned under the first row conductor aligned under a first row conductor aligned portion of the serpentine

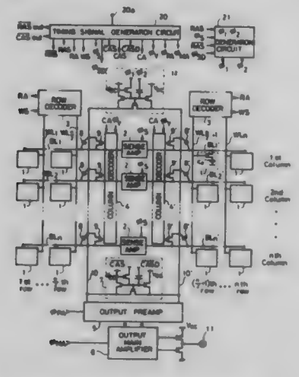
column conductor, and the other two memory elements aligned under the second row conductor are aligned under a second row conductor aligned portion of the serpentine column, with the signals in the first and second row conductor aligned portions of the serpentine columns being complementary signals.

4,722,074

SEMICONDUCTOR STORAGE UNIT WITH I/O BUS PRECHARGING AND EQUALIZATION

Kazuyasu Fujishima; Masaki Kumazoya; Hideshi Miyatake; Hideto Hidaka; Katsumi Dosaka, and Tsutomu Yoshihara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,358
Claims priority, application Japan, Oct. 31, 1984, 59-231606
Int. Cl.[4] G11C *7/00, 13/00, 11/40*
U.S. Cl. 365—203 **6 Claims**



1. A semiconductor storage unit comprising:
a plurality of memory cells arranged in the form of a matrix along directions of rows and columns;
a plurality of word lines commonly connected with every row of said memory cells;
a plurality of bit lines commonly connected with every column of said memory cells;
sense amplifers for detecting and amplifying cell information transmitted from said memory cells to said bit lines in response to selection of said word lines;
I/O buses connected to selected ones of said bit lines in response to selection of said bit lines;
first precharge means for precharging said I/O buses by the supply voltage prior to said selection of said bit lines; and
second precharge means for precharging said holding potentials of said I/O buses for supply voltage during driving operation of said sense amplifiers.

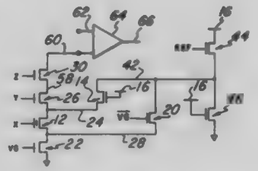
4,722,078

EQUALIZED BIASED ARRAY FOR PROMS AND EPROMS

Jeffrey K. Kaszubinski, Houston; David D. Wilmoth; Timmie M. Coffman, both of Sugar Land, and John F. Schreck, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1985, Ser. No. 786,991
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—226 **12 Claims**

1. A biasing network for an array of semiconductor memory transistors coupled between associated bit and secure lines, comprising:
a bias line;
biasing means coupled to said bias line for biasing the latter to a preselected voltage V_{bias} lower than a supply voltage V_{cc};
bit means coupled between said bias line and said bit lines for transmitting the voltage V_{bias} during a read cycle to said bit lines;



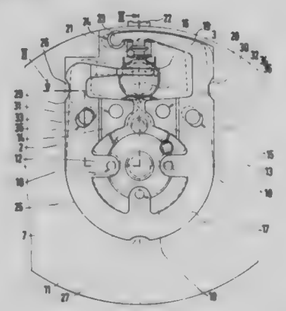
source means coupled between said bias line and said source lines for transmitting the voltage V_{bias} to each source line when its corresponding memory transistor is not selected.

4,722,076

ARRANGEMENT FOR LIMITING THE AXIAL PLAY OF GEARS OF A WATCH TIME INDICATING MECHANISM

Hans-Georg Schnell, Keltern, Fed. Rep. of Germany, assignor to Pforzheimer Uhren-Rohwerke PORTA GmbH, Pforzheim, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 12,184
Int. Cl.[4] G04B *19/02, 29/00*
U.S. Cl. 368—220 **8 Claims**



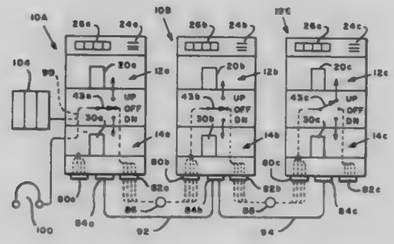
1. An arrangement for limiting the axial play of gears of a watch time indicating mechanism, which gears are all rotatably supported on a support plate, said gears including drive gears with axes extending normal to said support plate and also an adjustment shaft with a gear having an axis extending in a plane normal to the axis of said drive gears, said arrangement including a cover plate mounted on said support plate and overlaying said drive gears, said cover plate abutting said drive gears so as to limit their axial play and having a retaining arm provided with a section bent-over to extend into engagement with said adjustment shaft so as to limit axial movement of said adjustment shaft.

4,722,077

TRANSCRIPTION CONTROL OVER PLURAL INTERCONNECTED MODULES

Emil F. Jachmann, Greenwich; Robert L. Rubenstein, Norwalk, and Joseph A. Howells, Brookfield Center, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Continuation-in-part of Ser. No. 771,298, Aug. 30, 1985. This application Nov. 20, 1985, Ser. No. 799,909
Int. Cl.[4] H04M *1/64*; G11B *19/00*
U.S. Cl. 369—25 **10 Claims**



6. Dictate/transcribe apparatus comprising at least first and second modules, each module including at least two record/-playback decks for recording dictation on and reproducing dictation from a record medium, switch means for selecting one or the other or neither deck in a module as a transcribe deck, power connecting means for receiving and passing on electrical power supplied to a module, an input connector and an output connector wherein said dictate/transcibe apparatus further comprises; transducer means connected to said first module to reproduce audio sounds from a transcribe deck; transcribe control means connected to said first module for controlling the operation of a transcribe deck; power coupling means for interconnecting the power connecting means of said first and second modules; transcribe coupling means for connecting said output connector of said first module to said input connector of said second module; and selecting means included in each module and ganged with said switch means for interconnecting said input and output connectors therein when said switch means selects neither deck in said module as a transcribe deck; whereby dictation reproduced from a transcribe deck in said second module is supplied from the input connector of said second module to the output connector of said first module and thence to said transducer means, and transcribe control signals from said transcribe control means are supplied to said first module and thence from said output connector of said first module to said input connector of said second module for controlling said transcribe deck.

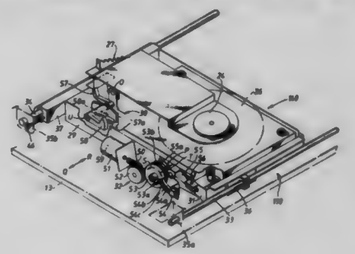
4,722,078

DISC PLAYER

Hiromi Nakanishi, and Masahiro Nakamura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1985, Ser. No. 780,797
Claims priority, application Japan, Sep. 28, 1984, 59-203582
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—39 **10 Claims**

10. A disc player, comprising:
a. a plurality of horizontally spaced disc compartments each including means for holding a disc horizontally in said disc compartment;
b. a disc playback module horizontally movable between and alignable with said disc compartments for playing a disc held in any of said disc compartments, said disc playback module including a rotatable turntable;
c. playback module transport means for transporting said disc playback module horizontally between said disc compartments and for aligning said disc playback module with any of said disc compartments;
d. playback module lifting means for raising said disc playback module to a playing position where said disc playback module is able to play a disc held in any of said disc compartments and for lowering said disc playback module from said playing position to a position where said disc playback module can move horizontally between said disc compartments;
e. means for clamping a disc to said turntable of said disc



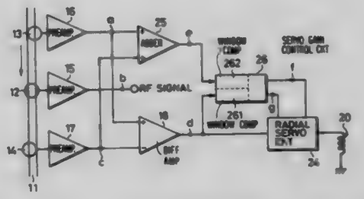
playback module when said disc playback module is aligned with any of said disc compartments, said clamping means including a plurality of vertically movable disc clampers each positioned within an individual disc compartment; and
f. linking means for lowering said disc clamper positioned within said disc compartment aligned with said disc playback module in response to said disc playback module being raised by said playback module lifting means to clamp a disc between said disc clamper and said turntable of said playback module.

4,722,079

OPTICAL DISK PLAYER CAPABLE OF DISTINGUISHING EXTERNAL DISTURBANCES AND LOCAL DEFECTS AND ADJUSTING SERVO GAIN ACCORDINGLY

Kelichi Matsumoto, Saitama, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Jul. 31, 1985, Ser. No. 760,858
Claims priority, application Japan, Jul. 31, 1984, 59-159301
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **10 Claims**



1. A three-beam type optical data disk player in which front, main and rear beams are directed onto a recorded track and respective first, second and third signals are produced in response to light reflected by said track from said front, main and rear beams, comprising: a servo circuit for controlling a position of said main beam in response to said first and third signals; means operating in response to said first and third signals for separately detecting the existence of an external disturbance or a local defect; and means operating in response to said detecting means for increasing a gain of said servo circuit above a normal gain level in the case of an external disturbance and

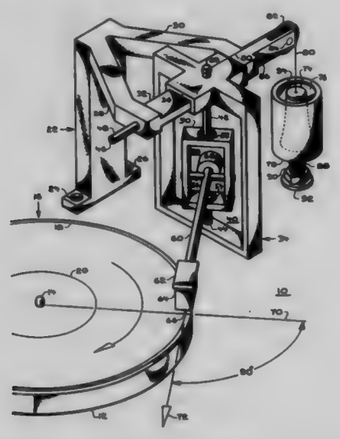
reducing said servo gain below said normal value in the case of a local defect.

4,722,080

TRANSDUCER ARM ASSEMBLY FOR DISK PLAY-BACK MACHINES

Ralf E. Dieckmann, 1C Spruce La., Danbury, N.H. 03230

Filed Dec. 6, 1984, Ser. No. 679,124
Int. Cl.[4] G11B *21/16*
U.S. Cl. 369—254 15 Claims



1. A disk play-back machine comprising

a base plate supporting, a platform rotatable about a first axis in a plane parallel to said base plate, a record disk resting upon said platform for concentric rotation about said first axis in a plane parallel to said base plate, and a first plane, containing the uppermost spirally grooved surface of said record disk, a transducer arm defining a second plane which is perpendicular to said base and having a transducer, supporting a stylus at a first end and having second axis means at a second end wherein said transducer arm is adapted for pivoting and sliding movement from a first acute angle position to a second acute angle position parallel to said platform wherein said pivoting movement takes place about said second axis means and wherein said second axis means is adapted to slide in a third plane which is parallel to and intersects said first axis and wherein said first and second acute angles are formed by said transducer arm and said third plane,

a transducer arm support carriage and low friction guide means therefor adapted to enable said second axis means to slide from a first position to a second position in said third plane and in a first direction toward said first axis in direct response to a product force which is defined as the product of the cosine of any acute angle formed by said transducer arm and said third plane and the frictional pulling force generated between said rotating record disk and said stylus at the instant in time when said second plane is tangent to any groove radius at the point where said stylus contacts said rotating record disk,

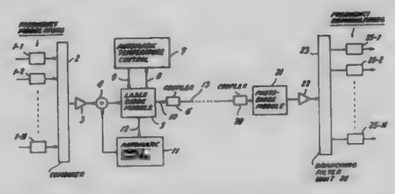
and wherein the improvement comprises second force applying means acting parallel to said first plane in said third plane and in a second direction in direct opposition to said product force and wherein said second force is always substantially equal to said product force, as the latter varies in response to the movement of said transducer arm in a plane which is parallel to said first plane.

4,722,081

ANALOG OPTICAL TRANSMISSION SYSTEM

Katsuyuki Fujito; Yoshiki Nishino, and Takeshige Ichida, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 10, 1985, Ser. No. 753,620
Claims priority, application Japan, Jul. 11, 1984, 59-143503; Apr. 22, 1985, 60-85731
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 16 Claims



1. An optical transmission system comprising:

a laser diode for emitting a long-wavelength laser beam;

means for multiplexing a plurality of analog signals respectively upon different frequency carriers to generate a frequency division multiplexed signal and modulating the intensity of said laser beam with said frequency division multiplexed signal;

a single mode optical fiber transmission medium having at a proximal end thereof a first inclined end face inclined at an angle to the perpendicular to the length of the medium and at a distal end thereof a second inclined end face inclined at an angle to the perpendicular to the length of said medium;

coupling means for coupling said intensity modulated laser beam to said proximal end of said transmission medium, said coupling means including a single mode optical fiber connecting medium having one end optically connected to said laser diode and an opposite end having a third end face complementary to said first inclined end face at said proximal end of said transmission medium and a coupler for coupling said first and third inclined end face in abutment relation; and

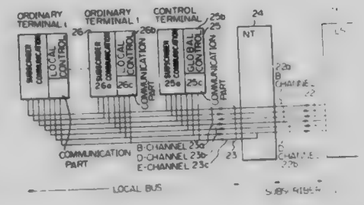
an optoelectrical transducer means having a light receiving face parallel with said second inclined face at said distal end of said transmission medium.

4,722,082

ISDN SUBSCRIBER TERMINAL CONTROL SYSTEM

Nobuo Furuya; Yoshikazu Ikeda, and Masanobu Fujioka, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,716
Claims priority, application Japan, Mar. 4, 1985, 60-41184
Int. Cl.[4] H08J *3/02, 3/12*
U.S. Cl. 370—85 6 Claims



1. ISDN subscriber terminal control system comprising:

a subscriber line coupled with a subscriber location,

a local bus installed in the subscriber location,

a network termination unit for terminating and for connecting both said subscriber line and said local bus,

a plurality of terminal equipment coupled with said local bus,

plurality of two-way communication channels, said channel providing communication between any terminal equipment in said subscriber location with terminal equipment in another subscriber location,

one of said communication channels being a control channel,

another one of said communication channels being an echo channel which sends a copy of a control channel signal from said terminal equipment to said network termination unit, and said echo channel being from said network termination channel to said terminal equipment;

a control terminal which is one of said terminal equipment, having a global control and communication parts,

said control terminal being physically connected with said local bus, said control terminal communicates with said terminal equipment within said subscriber location without sending any significant signal to said subscriber line, said control terminal establishes and releases a local control phase among said plurality of terminal equipment, and said control terminal controlling ordinary terminal equipment communication with another subscriber location cooperatively by the transference of a terminal control signal between said control terminal and the ordinary terminal equipment, and

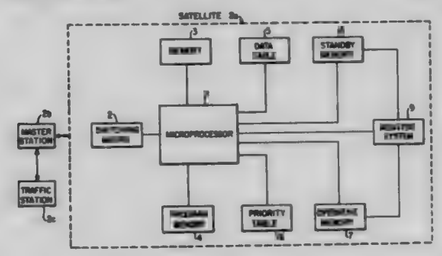
said control terminal operates as an ordinary terminal equipment when it is not in a local contorl phase.

4,722,083

SATELLITE TELECOMMUNICATIONS SYSTEM FEATURING MULTI-BEAM COVERAGE AND DYNAMICALLY CONTROLLED ALLOCATION OF THE SATELLITE TRANSMISSION CAPACITY

Sebastiano Tirrò, and Arduino Paiocchini, both of Rome, Italy, assignors to Consiglio Nazionale Delle Richerche, Italy

Filed Nov. 4, 1985, Ser. No. 794,650
Claims priority, application Italy, Nov. 2, 1984, 23438 A/84
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—95 8 Claims



1. A micro-processor controlled satellite telecommunications system featuring multi-beam coverage and dynamically controlled allocation of satellite transmission capacity, wherein a number of earth stations are linked by a modular beam switching pattern to a satellite which provides on board regeneration of the earth-to-satellite signal, said system comprising

at least one satellite and a plurality of earth stations each comprising a sending and receiving station, one each of said sending and receiving stations being at least a digital speech interpolation station.

asynchronous type protocol procedures adopted for allocation of the satellite transmission capacity between the various earth stations,

a master station,

signal bursts exchanged between earth traffic stations and with said master station according to said asynchronous protocols, wherein recognition and recovery of bursts transmitted by a given digital speech interpolation station can be achieved by the digital speech interpolation receiving station with control retained by the same transmitting station, according to a remote control signal in the form of a preamble attached to each said burst, and

an on-board switching matrix remotely controlled according to said bursts and preambles, with reference to said asynchronous protocols, and which in turn controls the overall system

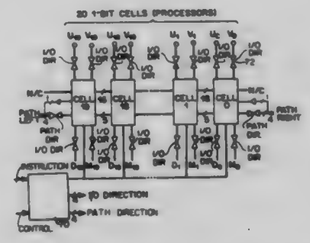
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4,722,084

ARRAY RECONFIGURATION APPARATUS AND METHODS PARTICULARLY ADAPTED FOR USE WITH VERY LARGE SCALE INTEGRATED CIRCUITS

Steven G. Morton, Oxford, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 2, 1985, Ser. No. 782,850
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 22 Claims



1. Array configuration apparatus for use in reconfiguring large integrated circuit systems of the type including arrays of distinct logic circuits arranged in rows, with each row consisting of N identical circuits for connecting to N identical circuits in another row by means of bidirectional data lines, wherein in order to provide an operative array, there is required that connection be made between N-X operational circuits in one row and N-X operational circuits in the next row, with said connections being made by N-X data lines, where X is the number of defects plus unused spares and is a positive integer less than N and where N-X is the number of data bits to be coupled between said rows, comprising:

first means operative to select N-X operational circuits in each of said rows,

second means operative to select N-X operational data lines for connecting said rows to each other, and

control means responsive to the selection of said first and second means to bidirectionally connect said N-X operational circuits in each row selected by said first means to one another via said N-X data lines selected by said second means to enable the bidirectional transfer of said N-X bits from row to row.

4,722,085

HIGH CAPACITY DISK STORAGE SYSTEM HAVING UNUSUALLY HIGH FAULT TOLERANCE LEVEL AND BANDPASS

Laurence P. Flora, Covina, and Gary V. Ruby, Pasadena, both of Calif., assignors to Unisys Corp., Detroit, Mich.

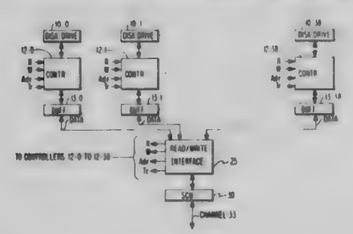
Filed Feb. 3, 1986, Ser. No. 825,174
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—38 17 Claims

1. A high capacity disk storage system comprising:

a relatively large plurality of independently operable disk subsystems, each disk subsystem comprising disk means containing stored data, wherein data is stored on the disk means of said disk subsystems in the form of data words,

each data word comprising a plurality of data digits along with a plurality of associated error check digits, each disk means storing one digit from each data word;

means coupled to said disk subsystems for reading a data word from the disk means thereof and for producing data word electrical signals corresponding thereto; and



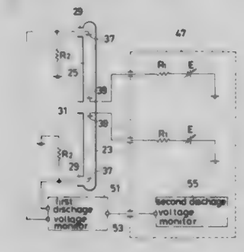
error circuit means to which said data word electrical signals are applied, said error circuit means being operable to produce electrical signals corresponding to the data digits of a data word read from said disk means, in a manner such that an error in a data digit will be detected and corrected by said error circuit means using the associated error check digits of the data word.

4,722,086

DEVICE FOR MONITORING DISCHARGE VOLTAGE OF LASER GENERATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., La Mirada, Calif.

Filed Oct. 4, 1985, Ser. No. 784,621
Int. Cl.[4] H01S *3/00, 3/097*
U.S. Cl. 372—33 **9 Claims**



1. A device for monitoring the discharge voltage of a laser generator comprising:

a plurality of laser tubes positioned in series, each said laser tube containing a positive and negative electrode, wherein said positive electrode is grounded through a detector resistance and said negative electrode is connected to the negative side of a DC power source through a ballast resistance with the positive side of the DC power source grounded; and

a monitor means connected to each positive electrode for detecting differences in voltage between the neighboring laser tubes at each said positive electrode to monitor the discharge of the generator.

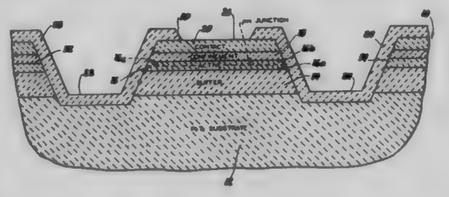
4,722,087

LEAD-STRONTIUM-CHALCOGENIDE DIODE LASER

Dale L. Partin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1986, Ser. No. 895,286
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **3 Claims**

2. A large optical cavity quantum well double heterojunction semiconductor infrared diode laser having an active region layer sandwiched between two contiguous layers of monocrystalline semiconductive material, said laser exhibiting current carrier and optical confinement for its active region layer but also exhibiting increased operating temperature due to close lattice matching of face centered cubic monocrystalline layers forming the double heterojunctions, said laser comprising a monocrystalline buffer layer of a given conductivity-type lead salt semiconductor containing strontium, selenium that has an energy band gap greater than, an index of refraction



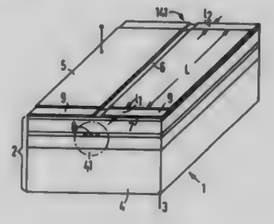
lesser than, and a lattice constant substantially equal to predetermined values of the active region layer, a monocrystalline active region layer on the buffer layer of a lead salt semiconductor containing a pn junction that has said predetermined energy and gap, index of refraction and lattice constant, and a confinement layer on the active region layer an opposite conductivity type lead salt semiconductor containing lesser amounts and smaller proportions of strontium and selenium that has an energy band gap greater than, an index of refraction smaller than, and a lattice constant substantially equal to said predetermined values.

4,722,088

SEMICONDUCTOR LASER FOR HIGH OPTICAL OUTPUT POWER WITH REDUCED MIRROR HEATING

Hans D. Wolf, Hohenbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,034
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 34339027
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **12 Claims**



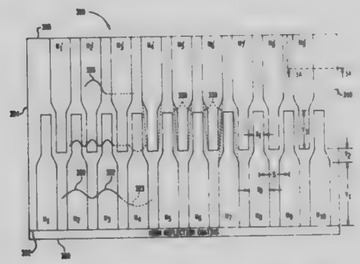
1. In a semiconductor strip laser having a semiconductor body with a layer format, said body having resonator mirror structures being provided on opposite end surfaces of the body and a laser active zone generating a laser radiation in response to pumping being disposed between the mirror structures and having ends spaced inward at a distance from each mirror structure, the improvements comprising the layer format of the seimiconductor body comprising a quantum well structure and the respective distances between the ends of the laser active zone and the respective mirror structures in the semiconductor body being in a range of 5 to 30 μm.

4,722,089

PHASE LOCKED DIODE LASER ARRAY

Dan Botez, Randolph, and Eugene I. Gordon, Convent Station, both of N.J., assignors to Lytel, Incorporated, Somerville, N.J.

Filed Dec. 16, 1985, Ser. No. 809,580
Int. Cl.[4] H01S *3/19, 3/082;* H01L *33/00*
U.S. Cl. 372—50 **15 Claims**



1. A semicodnuctor laser diode array comprising:

a substrate,

a plurality of layers fabricated on said substrate, said layers including an active layer capable of emitting radiation when a pumping current is applied thereto, said active layer terminating in first and second end facets,

contact means for applying said pumping current,

a first set of parallel spaced apart active waveguides defined in said active layer, said first set of active waveguides extending from said first end facet and terminating before said second end facet,

a second set of parallel spaced apart active waveguides defined in said active layer, said second set of active waveguides extending from said second end facet and termianting before said first end facet,

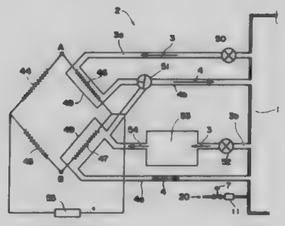
said first and second sets of active waveguides being interdigitated with one another in a coupling region wherein there is optical coupling between adjacent active waveguides in the first and second sets, said coupling providing feedback paths for supporting laser oscillations in said first and second sets of active waveguides, the threshold current for lasing being lowest when all of said active waveguides in said first and second sets oscillate in phase.

4,722,090

EXCIMER LASER EQUIPMENT

Kenyu Haruta; Hitoshi Wakats; Yukio Sato, and Haruhiko Nagai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 839,145
Claims priority, application Japan, Mar. 18, 1985, 60-52467; Apr. 29, 1985, 60-92627
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—57 **13 Claims**



1. In an excimer laser which uses a mixture of a rare gas, halogen gas and a buffer gas as a lasing medium, the mixture including respective concentrations of each of the rare, halogen and buffer gases, an apparatus for controlling the concentration of the halogen gas in the mixture, comprising:

means for measuring the concentration of the halogen gas in the mixture used as the lasing medium, wherein the measuring means generates a signal corresponding to the halogen concentration;

means for regenerating the mixture used as the lasing medium; and

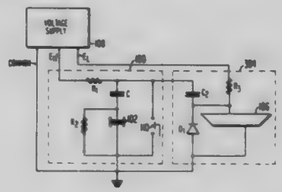
means for controlling the regenerating means in accordance with the signal from the measuring means.

4,722,091

HYBRID LASER POWER SUPPLY

Stephen E. Taylor, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 24, 1986, Ser. No. 832,223
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—83 **11 Claims**



1. In a power supply for use in energizing the respective low-pressure and high-pressure laser tubes of a hybrid laser; wherein said power supply includes (1) first means for intermittently applying an energizing pulse to said high-pressure laser tube thereby permitting said high-pressure laser tube to generate a high-energy pulse of coherent wave energy of a certain duration in response thereto, and (2) second means for normally continuously energizing said low-pressure laser tube thereby permitting said low-pressure laser tube to normally continuously generate low-energy coherent wave energy; the improvement wherein:

said second means includes third means coupled to said first means and responsive to the application of an energizing pulse to said high pressure laser tube for de-energizing said low-preasure laser tube for only a given time interval from the beginning of said energizing pulse, said given time interval being longer than said certain duration of said high-energy pulse, whereby said low-preasure laser tube generates no coherent wave energy during said given time interval.

4,722,092

GAINASP/INP DISTRIBUTED FEEDBACK LASER

Zong-Long Liau, Arlington; Dale C. Flanders, Lexington, and James N. Walpole, Concord, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 30, 1985, Ser. No. 696,648
Int. Cl.[4] H07S *3/19*
U.S. Cl. 372—96 **37 Claims**

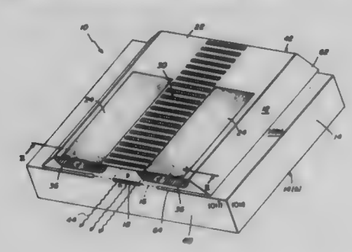
1. A double heterostructure distributed feedback type laser comprising:

(a) a first body of semiconductor material having a major surface and a first type conductivity;

(b) a second body of semiconductor material having a conductivity opposite said first type conductivity and formed in the shape of a mesa with an external plateau surface and an adjacent surface opposite said plateau surface;

(c) a strip of active semiconductor material of narrower bandgap than the bandgap of the first and second bodies and embedded between said first and second bodies;

(d) a periodic structure formed in the plateau of the second body and extending in parallel proximity with the strip of active semiconductor material; and



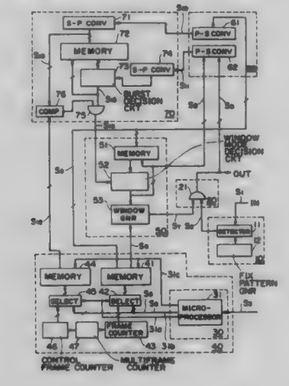
(e) at least one ohmic contact strip formed on said plateau adjacent the periodic structure; and
(f) contact means on said first body.

4,722,093

ARRANGEMENT FOR DETECTING BURSTS

Shunichiro Tejima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 28, 1985, Ser. No. 791,693
Claims priority, application Japan, Oct. 29, 1984, 59-227175
Int. Cl.⁴ H04B *1/10*
U.S. Cl. 375—75 **2 Claims**



1. In an arrangement for detecting bursts in a communications system, which arrangement includes a correlation detector for producing a correlation signal by correlating an incoming signal with a predetermined pattern and further includes a window superimposer for generating a burst detection signal by superimposing the correlating signal on a window;

first means for labelling the bursts according to burst time plan signal applied to the arrangement, said first means producing a burst discriminating signal;

second means for storing a burst position signal indicating the position of each of the bursts according to said burst time plan signal such that each burst is specified by said burst discriminating signal;

third means for storing burst information of each of the bursts by referring to a stored burst discriminating signal derived from said second means;

fourth means for storing the window mode of each of the burst in accordance with said stored burst discriminating signal;

fifth means for receiving said window mode and said burst information to determine the latest window mode by referring to said stored burst discriminating signal, said fifth means applying said latest window mode to said fourth means to renew the window mode stored therein;

sixth means for generating a window at a position specified by said burst position signal applied from said second means using said window mode, said window being applied to said window superimposer; and

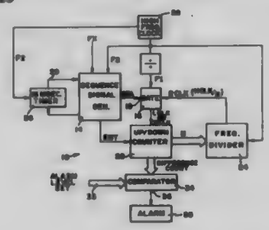
seventh means supplied with said correlation signal and said window mode and said burst discriminating signal for generating information which is used to renew the content of said third means.

4,722,094

DIGITAL RATE DETECTION CIRCUIT

Gregory P. Goodzey, Mishawaka, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 16, 1985, Ser. No. 809,378
Int. Cl.⁴ H03K *21/00, 23/00*
U.S. Cl. 377—23 **10 Claims**



1. A device for measuring the rate of change of speed of a machine which includes means for generating a speed signal having a frequency proportional to the operating speed of the machine comprising: sequence signal generating means for generating a sequence of timing signals having time periods inversely proportional to engine speed, means for generating a variable frequency signal having a frequency proportional to the speed of said machine at the beginning of a measurement cycle, counter means connected to receive said variable frequency signal and said sequencing signals for counting the number of cycles of said variable frequency signal for a first period inversely proportionl to the speed of said machine during said counting period and for decrementing said count beginning at a predetermined interval following the beginning of said first counting period and for a second period inversely proportional to engine speed and generating an output signal corresponding to the difference therebetween, and comparator means connected to and responsive to the difference in said count for generating an output signal when said difference exceeds a predetermined maximum value.

4,722,095

METHOD FOR IDENTIFYING POROSITY AND DRILLING MUD INVASION OF A CORE SAMPLE FROM A SUBTERRANEAN FORMATION

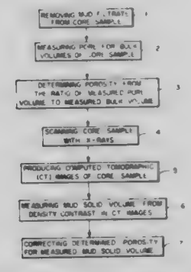
Ernest L. Muegge, Grand Prairie; Jorge J. Fax, Dallas, and Eve S. Sprunt, Farmers Branch, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 9, 1986, Ser. No. 872,341
Int. Cl.⁴ G01N *23/06*; G01V *5/00*
U.S. Cl. 378—4 **4 Claims**

4. A method of determining the porosity and drilling mud invasion of a core sample from a subterranean formation comprising the steps of:

(a) supplying gas to said core sample at a first pressure,
(b) allowing said gas to expand from said core sample until equilibrium is reached,
(c) measuring gas volume that expands from said core sample,

(d) measuring a second pressure in the core sample after said gas has expanded,
(e) determining pore volume of said core sample from said first and second pressures and measured volume,
(f) measuring bulk volume of said core sample,
(g) determining the porosity of said core sample from a ratio of said pore volume to said bulk volume,



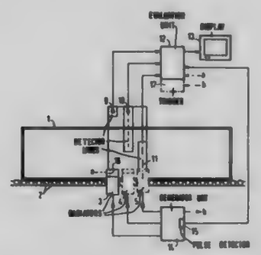
(h) producing computed tomographic images of said core sample,
(i) identifying a concentration of drilling mud solid in said core sample based on a density effect of said drilling mud solid on said computed tomographic images, and
(j) correcting the porosity determination for volumetric concentration of said mud solids in pore spaces of said core sample.

4,722,096

APPARATUS FOR TRANSRADIATING OBJECTS ON A CONVEYOR PATH

Rolf Dietrich, Hofheim; Gerhard Doesgen, Heidenrod-Kemel, and Thomas Herwig, Eltville, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,465
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507611
Int. Cl.⁴ G01N *23/10, 23/04*
U.S. Cl. 378—57 **11 Claims**



9. An apparatus for transradiating an object moving on a conveyor path comprising:

a plurality of radiation generators for generating radiation for permeating said object, each radiation generator being offset with respect to the other generators along an axis parallel to the direction of conveyance of objects on said conveyor path, and each generator being oriented by rotation about said axis for directing a fan-shaped radiation beam at a portion of said object substantially perpendicularly to said conveyor path, each beam irradiating a respective portion of said object and the beams in combination completely irradiating said object;

a like plurality of line-shaped radiation detectors disposed offset with respect to each other by distances equal to the offset of said radiation generators for respectively receiving radiation from said radiators after passing through said respective portions of said objects, radiation passing through one of the respective portions of said object being received by only one of said detectors, and all of said detectors in combination receiving the radiation passing through all of said respective portions of said object; and

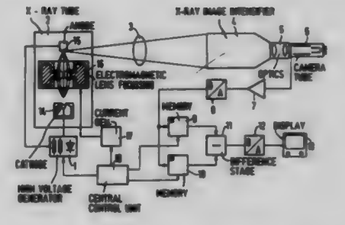
an evaluator means connected to said detectors for evaluating and combining signals therefrom to construct a complete overall image of said object.

4,722,097

X-RAY DIAGNOSTICS INSTALLATION WITH SPATIAL FREQUENCY HIGH-PASS FILTERING

Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 25, 1986, Ser. No. 934,811
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545348
Int. Cl.⁴ G03B *41/02*
U.S. Cl. 378—99 **3 Claims**



3. An X-ray diagnostics installation comprising:

means for generating an X-ray beam for penetrating a patient, said means including a cathode for emitting electrons and an anode having a surface with a focal spot on which said electrons are incident so as to limit said X-ray beam;

means for detecting an X-ray image from said X-ray beam after penetrating said patient and for generating electrical signals corresponding to said image;

first and second image memories to which said electrical signals are respectively supplied;

means for subtracting the contents of one of said image memories from the contents of the other of said image memories for generating a difference signal;

means for visually displaying said difference signal;

an electromagnetic lens disposed in said means for generating an X-ray beam surrounding the path of said electrons between said cathode and anode;

a focussing current generator means for supplying current to said electromagnetic lens so as to control the electromagnetic field generated thereby; and

a central control means connected to said focussing current generator means and to said first and second memories for selectively switching said focussing current generator means between different currents for respectively alternatingly generating focal spots of two different sizes on said anode and simultaneously controlling write-in of said electrical signals to said first and second memories such that signals corresponding to exposures made using one size focal spot are entered in one of said memories and signals corresponding to exposures made using the other size focal spot are entered in the other of said memories.

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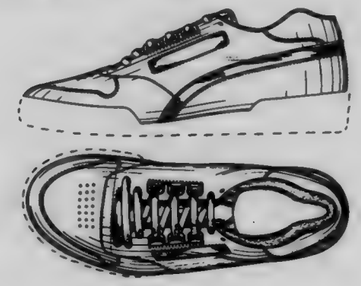
293,845
COAT
David Leinoff, 208 W. 29th St., New York, N.Y. 10001
Filed Aug. 14, 1985, Ser. No. 765,597
Term of patent 14 years
U.S. Cl. D2—199



293,847
ATHLETIC SHOE UPPER
Tuan N. Le, Cohasset, Mass., and Paul D. Brown, Bolton, England, assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 20, 1985, Ser. No. 805,943
Term of patent 14 years
U.S. Cl. D2—314



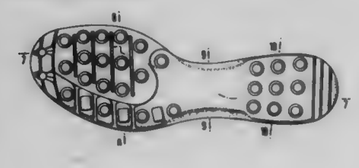
293,846
SHOE UPPER
Jeffrey P. Bua, Duxbury, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Jul. 31, 1985, Ser. No. 761,094
Term of patent 14 years
U.S. Cl. D2—314



293,848
ATHLETIC SHOE UPPER
Paul D. Brown, Bolton, England; Tuan N. Le, Cohasset, and Jeffrey P. Bua, Duxbury, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 20, 1985, Ser. No. 805,945
Term of patent 14 years
U.S. Cl. D2—314



293,849
SPORTS SHOE SOLE
Simon J. Peel, Huddersfield, England, assignor to Benjamin Crook & Sons Limited, England
Filed Sep. 24, 1985, Ser. No. 779,623
Claims priority, application United Kingdom, Mar. 22, 1985, 8510257S2
Term of patent 14 years
U.S. Cl. D2—320



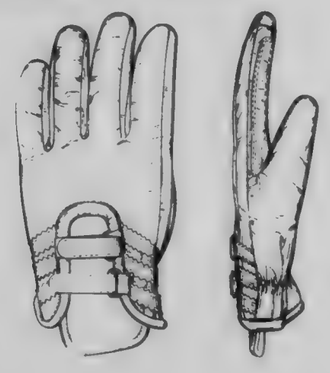


293,851
INSULATED COOLER COMPARTMENT FOR A GOLF BAG
James W. Cannon, and Alvin H. Taylor, both of Jasper, Ala., assignors to Burton Manufacturing Co., Inc., Jasper, Ala.
Filed Jun. 3, 1985, Ser. No. 740,517
Term of patent 14 years
U.S. Cl. D3—37

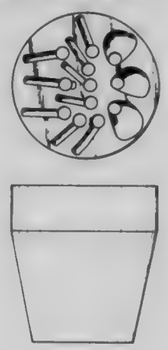




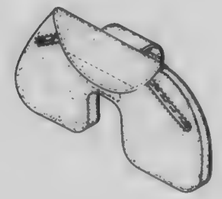
293,850
GLOVE
William Dzierson, Jr., Wyckoff, N.J., assignor to Elmer Little & Sons, Johnstown, N.Y.
Filed May 21, 1985, Ser. No. 736,546
Term of patent 14 years
U.S. Cl. D2—619



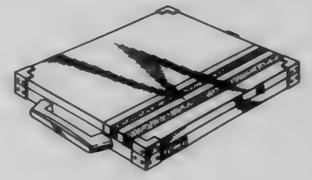
293,852
GOLF CLUB SEPARATOR FOR A GOLF BAG OR SIMILAR ARTICLE
Larry D. Scroggins, 1136 Highland Dr., Naples, Fla. 33940
Filed May 3, 1985, Ser. No. 729,922
Term of patent 14 years
U.S. Cl. D3—37



293,853
PURSE OR SIMILAR ARTICLE
Thomas Cooper, 9515 Flower Ave., Silver Spring, Md. 20901, assignor to Thomas Cooper
Filed Nov. 26, 1984, Ser. No. 675,320
Term of patent 14 years
U.S. Cl. D3—42



293,855
MAGAZINE FOR COLLECTING FILM FOR A PRINTER
Masatoki Satou, Okazaki; Yutaka Maeda, Machida, both of Japan; Walter F. Anderson, Jr., Minneapolis, and James W. Kochever, Shoreview, both of Minn., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan and Minnesota Mining and Manufacturing Company (3M), St. Paul, Minn.
Filed May 22, 1985, Ser. No. 736,717
Claims priority, application Japan, Nov. 22, 1984, 59-48257
Term of patent 14 years
U.S. Cl. D3—35

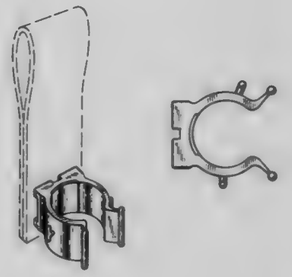




293,854
SUITCASE
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Dec. 2, 1985, Ser. No. 803,833
Term of patent 14 years
U.S. Cl. D3—71



293,856
BELT MOUNTED CLIP FOR POLICE NIGHT STICK OR THE LIKE
Alan C. Evans, 16446 Blackhawk St., Granada Hills, Calif. 91344
Filed Apr. 24, 1985, Ser. No. 726,714
Term of patent 14 years
U.S. Cl. D3—100



VOL 1086 ISS 4 JA 26 1988 UMI

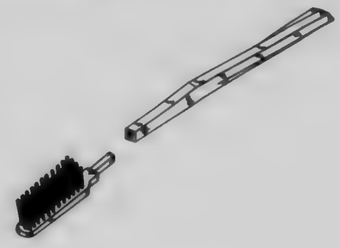
293,857
HOLSTER FOR PHARMACEUTICAL BOTTLE
James G. Stout, and Brian D. Oyster, both of Alliance, Ohio, assignors to Coastal Pet Products, Inc., Alliance, Ohio
Filed Jun. 7, 1985, Ser. No. 742,530
Term of patent 14 years
U.S. Cl. D3—106



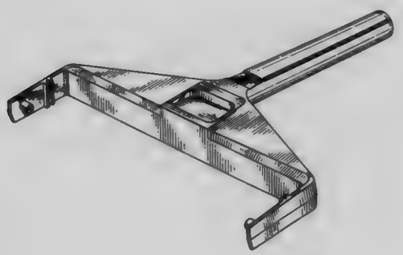
293,858
COMBINED INTERDENTAL BRUSH CAP THEREFOR
Emanuel B. Tarrson; Dane Maric, both of Chicago, and Thomas P. Kelly, Palatine, all of Ill., assignors to John O. Butler Company, Chicago, Ill.
Filed Feb. 21, 1985, Ser. No. 703,748
The portion of the term of this patent subsequent to Aug. 25, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104



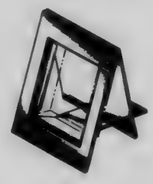
293,859
TOOTHBRUSH
Borgtor Gjerde, Ovre Fastoftaaen 36, N-5032 Minde, Norway
Filed Apr. 29, 1986, Ser. No. 857,040
Claims priority, application Norway, Oct. 31, 1985, 66.728
Term of patent 14 years
U.S. Cl. D4—104



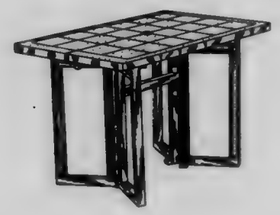
293,860
PAINT ROLLER FRAME
Morley L. Smith, 297 London Drive, Beaconsfield, Que., Canada (H9W 5Z1)
Filed Apr. 23, 1986, Ser. No. 857,595
Term of patent 14 years
U.S. Cl. D4—122



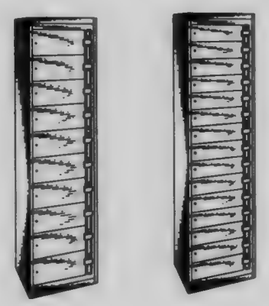
293,861
DISPLAY
Paul A. Harwood, Rte. 1, Box 742-4, Springtown, Tex. 76082
Division of Ser. No. 858,504, Apr. 30, 1986, Pat. No. Des. 290,554. This application Jan. 20, 1987, Ser. No. 4,691
Term of patent 14 years
U.S. Cl. D6—311



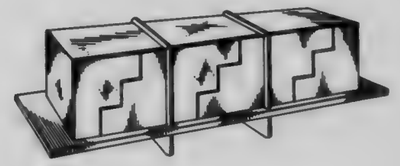
293,862
DROP LEAF TABLE
Manfred Hubert, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Jul. 2, 1985, Ser. No. 751,228
Claims priority, application Hague, Feb. 25, 1985, DM/004829
Term of patent 14 years
U.S. Cl. D6—430



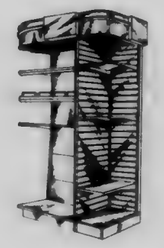
293,863
MULTIPLE COMPARTMENT CABINET HAVING REAR ACCESS TO INDIVIDUAL COMPARTMENTS
Richard J. Chester, Kennedy, N.Y., assignor to American Locker Group Incorporated, Jamestown, N.Y.
Filed Jun. 17, 1985, Ser. No. 745,146
Term of patent 14 years
U.S. Cl. D6—445



293,864
CABINET
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc, Long Island City, N.Y.
Filed Jul. 3, 1985, Ser. No. 752,502
Term of patent 14 years
U.S. Cl. D6—446

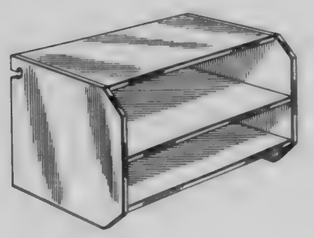


293,865
MERCHANDISING DISPLAY UNIT
J. David Robertson, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Sep. 9, 1985, Ser. No. 773,606
Term of patent 14 years
U.S. Cl. D6—478

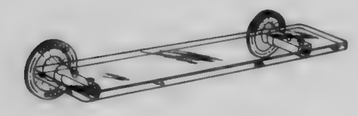


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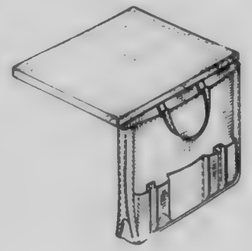
293,866
MODULAR HANGING SHELF AND ROD UNIT
Harold M. Marsh, 17202 Montero Rd., San Diego, Calif. 92128
Filed May 1, 1985, Ser. No. 729,175
Term of patent 14 years
U.S. Cl. D6—570

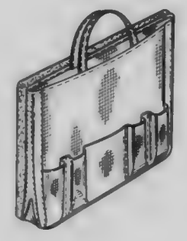


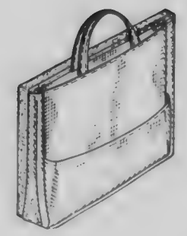
293,867
WALL SHELF
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,176
Term of patent 14 years
U.S. Cl. D6—572



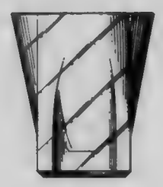
293,868
COMBINED CUSHION AND CARRYING BAG
Helen Paletta, and John R. Paletta, both of 6720 Oakwood Rd., Parma Heights, Ohio 44130
Filed May 20, 1985, Ser. No. 736,103
Term of patent 14 years
U.S. Cl. D6—596

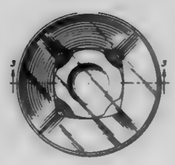




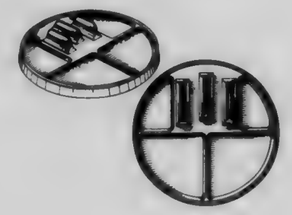


293,869
TUMBLER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Aug. 29, 1985, Ser. No. 770,521
Term of patent 14 years
U.S. Cl. D7—6



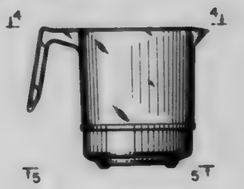


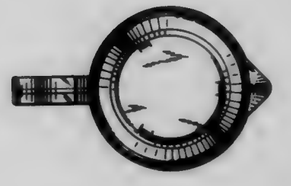
293,870
TACO PLATE
James A. Conrady, and Robert H. McPherson, both of 20211 14th Ave. South, Seattle, Wash. 98148
Filed May 6, 1985, Ser. No. 730,589
Term of patent 14 years
U.S. Cl. D7—27



293,871
BEVERAGE DECANTER
Donald R. Turner, Shelbyville, Ind., and Slawko Yadlowsky, Manville, N.J., assignors to General Foods, White Plains, N.Y. and William Industries, Inc., Shelbyville, Ind.
Filed Jan. 24, 1985, Ser. No. 748,283
Term of patent 14 years
U.S. Cl. D7—318

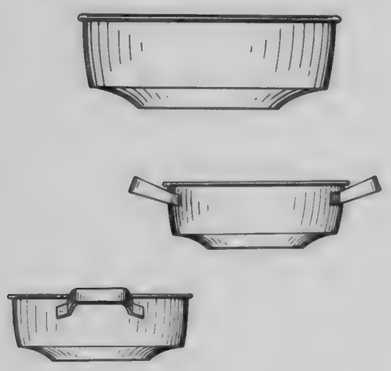




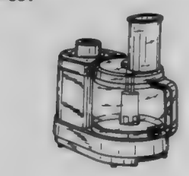


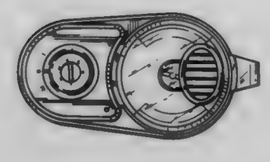
VOL 1086 ISS 4 JA 26 1988 UMI

293,872
COOKING UTENSIL OR SIMILAR ARTICLE
Gung H. Wang, 8200 Indiana Ave., Chicago, Ill. 60643
Filed May 8, 1985, Ser. No. 731,774
Term of patent 14 years
U.S. Cl. D7—354



293,873
FOOD PROCESSOR
Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jul. 29, 1985, Ser. No. 760,283
Term of patent 14 years
U.S. Cl. D7—384

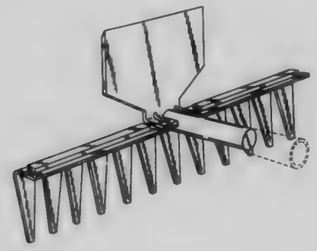




293,874
AGRICULTURAL SUPPORT STAKE
Yuichi Onoue, Kamagaya, Japan, assignor to Dainippon Plastics Co., Ltd., Osaka, Japan
Filed Jun. 13, 1985, Ser. No. 744,404
Claims priority, application Japan, Dec. 17, 1984, 59-51717
Term of patent 14 years
U.S. Cl. D8—1



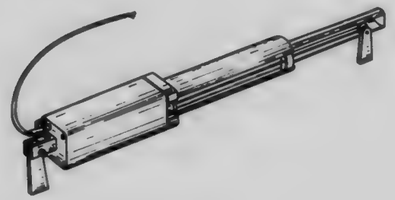
293,875
COMBINED HOE AND RAKE HEAD ASSEMBLY
Harold G. Roper, P.O. Box 107, Marble, Cherokee County, N.C. 28901
Filed Apr. 2, 1985, Ser. No. 719,217
Term of patent 14 years
U.S. Cl. D8—6



293,876
STRAP HINGE
Ernest F. Thomson, Jupiter, Fla., assignor to The Stanley Works, New Britain, Conn.
Division of Ser. No. 765,203, Aug. 13, 1985. This application Jun. 8, 1987, Ser. No. 59,386
Term of patent 14 years
U.S. Cl. D8—328



293,877
HYDRAULIC PISTON FOR THE OPENING OF GATES OR THE LIKE
Luigi Fadini, Via Fresca 68, 37053 Cerea (Verona), Italy
Filed Jul. 16, 1984, Ser. No. 631,001
Claims priority, application Italy, Jan. 17, 1984, 20537/84[U]
Term of patent 14 years
U.S. Cl. D8—330

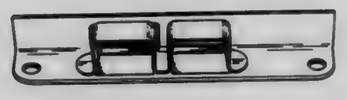


293,878
LOCKING BOLT UNIT FOR SECURING WINDOWS AND DOORS
Edward Kayser, Croydon, Australia, assignor to Lok-Safe Distributors Pty. Ltd., New South Wales, Australia
Filed Jun. 26, 1985, Ser. No. 749,013
Claims priority, application Australia, Jan. 14, 1985, 0082/85
Term of patent 14 years
U.S. Cl. D8—339

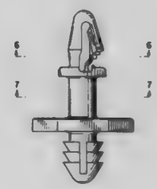


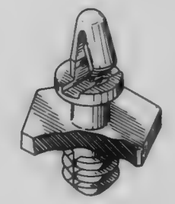
293,879
STRIKE PLATE
Bo Sundberg, and Hans Jonasson, both of Sundsvall, Sweden, assignors to Sune Sandh Marketing HB, Eskilstuna, Sweden
Filed Apr. 23, 1985, Ser. No. 726,339
Claims priority, application Sweden, Oct. 24, 1984, 84-2844
Term of patent 14 years
U.S. Cl. D8—343





293,880
SPACER AND SECURING UNIT
Katsumasa Takahashi, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed Sep. 12, 1985, Ser. No. 775,270
Claims priority, application Japan, Mar. 13, 1985, 60-10036
Term of patent 14 years
U.S. Cl. D8—354

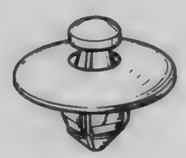




293,881
MARINE BLOCK OR SIMILAR ARTICLE
Greg W. Hartimeier, Milwaukee, and Peter O. Harken, Pewaukee, both of Wis., assignors to Vanguard, Inc., Pewaukee, Wis.
Filed Apr. 22, 1985, Ser. No. 726,002
Term of patent 14 years
U.S. Cl. D8—360



293,882
PANEL FASTENER OR THE LIKE
Atsushi Takahashi, Tokyo, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Dec. 10, 1985, Ser. No. 808,521
Claims priority, application Japan, Jan. 26, 1985, 60-27058
Term of patent 14 years
U.S. Cl. D8—386





293,884
FASTENER OR THE LIKE
Toshio Hirohata, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Dec. 10, 1985, Ser. No. 807,280
Claims priority, application Japan, Jun. 13, 1985, 60-24573
Term of patent 14 years
U.S. Cl. D8—386

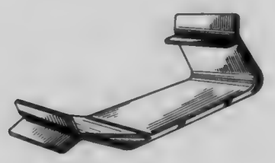


293,885
CLIP
Rolf Carlmark, P.O. Box 756, S-89200 Domsjo, Sweden
Filed Jul. 9, 1985, Ser. No. 753,131
Claims priority, application Sweden, Jan. 14, 1985, 850066
Term of patent 14 years
U.S. Cl. D8—395

293,886
FASTENER OR THE LIKE
Toshio Hirohata, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Dec. 10, 1985, Ser. No. 807,338
Claims priority, application Japan, Jun. 13, 1985, 60-24572
Term of patent 14 years
U.S. Cl. D8—386

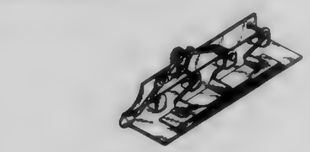






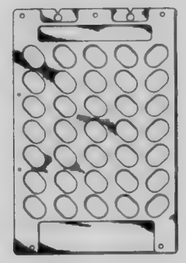


293,886
LOCKING CLIP
Ming S. Chang, 509 N. Charlotte, Lombard, Ill. 60148
Filed Apr. 8, 1985, Ser. No. 702,803
Term of patent 14 years
U.S. Cl. D8—395





293,887
DISPENSING CONTAINER FOR PHARMACEUTICAL TABLETS OR THE LIKE
John H. Webster, Winnipeg, Canada
Filed Jan. 18, 1985, Ser. No. 692,703
Term of patent 14 years
U.S. Cl. D9—341



293,888
CONTAINER
William C. Rogler, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,649
Term of patent 14 years
U.S. Cl. D9—349



293,889
LIQUID DISPENSING CONTAINER
Rudy R. Proctor, Costa Mesa, Calif., assignor to Turbo Tek Enterprises, Inc., Los Angeles, Calif.
Filed Mar. 21, 1985, Ser. No. 714,511
Term of patent 14 years
U.S. Cl. D9—375



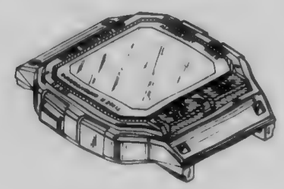
293,890
CONTAINER
William C. Rogler, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,647
Term of patent 14 years
U.S. Cl. D9—390



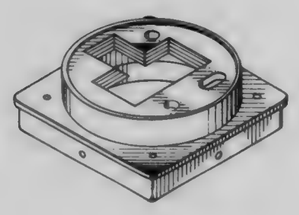
293,891
CONTAINER FOR A BINGO CARD DAUBER OR THE LIKE
Donald M. Molvik, and Patricia F. Graden, both of 24005 74th West, Edmonds, Wash. 98020
Filed May 6, 1985, Ser. No. 731,079
Term of patent 14 years
U.S. Cl. D9—396



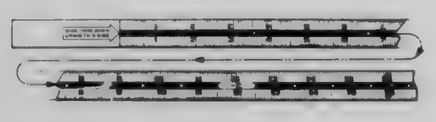
293,892
WRISTWATCH
Shinpei Ichikawa, Newbury Park, Calif., assignor to Timex Corporation, Waterbury, Conn.
Filed Aug. 30, 1985, Ser. No. 771,540
Term of patent 14 years
U.S. Cl. D10—38



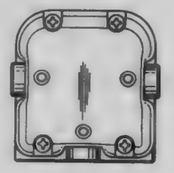
293,893
BEZEL FOR A TEMPERATURE INDICATING INSTRUMENT OR SIMILAR ARTICLE
Joseph E. Polizzotto, 9621 Bay Meadow Dr., Huntington Beach, Calif. 92646
Filed Nov. 26, 1984, Ser. No. 674,947
Term of patent 14 years
U.S. Cl. D10—60



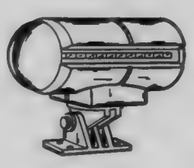
293,894
COILABLE MEASURING BLADE FOR TOP READING COILABLE RULES
Mark A. Drechsler, Southington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 27, 1985, Ser. No. 750,072
Term of patent 14 years
U.S. Cl. D10—71



293,895
RESISTANCE INSULATION METER
Ake Gustafsson, Gyttorp, and Sune Hallin, Nora, both of Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden
Filed Jul. 17, 1985, Ser. No. 756,063
Claims priority, application Sweden, Jan. 17, 1985, 85-0112
Term of patent 14 years
U.S. Cl. D10—78



293,896
FUEL GAUGE FOR DUAL-FUEL AUTOMOBILES
Rubens Bassaglia, and Ezio Bollina, both of Bologna, Italy, assignors to B & B Engineering S.r.l., Bologna, Italy
Filed Oct. 30, 1984, Ser. No. 666,461
Claims priority, application Italy, May 11, 1984, 4890/84[U]
Term of patent 14 years
U.S. Cl. D10—101



293,897
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 18, 1985, Ser. No. 724,400
Term of patent 14 years
U.S. Cl. D11—27



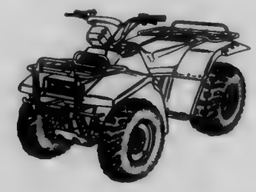
293,898
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Jan. 4, 1985, Ser. No. 741,147
Term of patent 14 years
U.S. Cl. D11—27



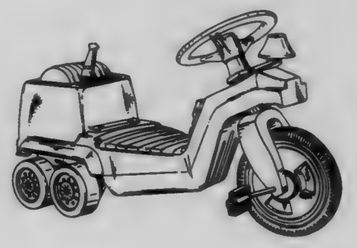
293,899
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 18, 1985, Ser. No. 724,413
Term of patent 14 years
U.S. Cl. D11—43



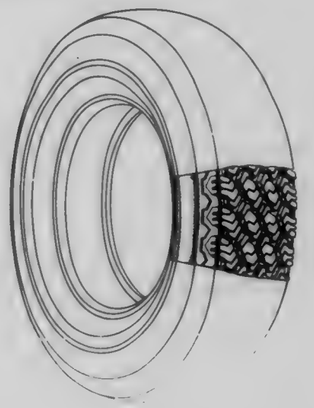
293,900
FOUR WHEELED MOTORCYCLE
Tsuyoshi Murakami, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed May 30, 1985, Ser. No. 739,223
Claims priority, application Japan, Mar. 29, 1985, 60-13091
Term of patent 14 years
U.S. Cl. D12—107



293,901
CHILDREN'S RIDE-ON SIMULATED FIRE TRUCK
Michael J. Clarke, Plantsville; Paul S. Santarsiero, Avon, and John P. Kearney, West Suffield, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.
Filed Feb. 11, 1985, Ser. No. 700,400
Term of patent 14 years
U.S. Cl. D12—108



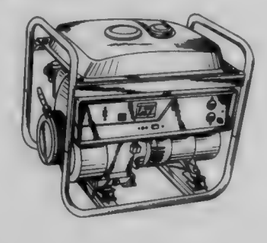
293,902
TIRE
Ronald L. Messer, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Continuation-in-part of Ser. No. 673,878, Nov. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 534,191, Sep. 21, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 755,110
Term of patent 14 years
U.S. Cl. D12—147



293,903
VEHICLE SURVEILLANCE MIRROR
Robert T. Kolenda, P.O. Drawer 1170, Mission, Tex. 78572, and James P. Kahl, Taylor, Mich., assignors to Robert T. Kolenda, Mission, Tex.
Filed May 7, 1985, Ser. No. 731,277
Term of patent 14 years
U.S. Cl. D12—187

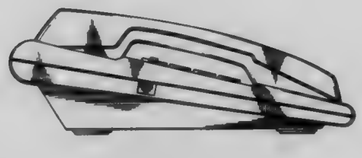


293,904
POWER GENERATOR
Osamu Murakami; Akira Ishii; Hisato Katoh; Masakazu Shiotsuki, and Kenzi Ueno, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Nov. 15, 1985, Ser. No. 805,624
Term of patent 14 years
U.S. Cl. D13—1

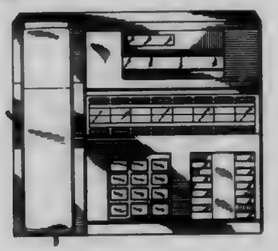


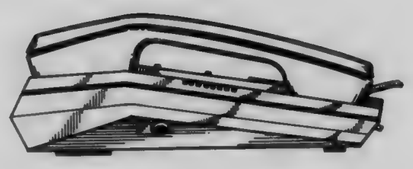
293,905
TELEPHONE BASE WITH COMBINATIVE KEYBOARD, DISPLAY PANEL, SPEAKERPHONE, AND HANDSET THEREFOR
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Feb. 14, 1985, Ser. No. 701,866
Term of patent 14 years
U.S. Cl. D14—58





293,906
COMBINED FEATURE TELEPHONE STAND AND HANDSET
Akira Sekiguchi, Tokyo, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Sep. 9, 1986, Ser. No. 905,323
Claims priority, application Japan, May 26, 1986, 61-19983; May 26, 1986, 61-19984
Term of patent 14 years
U.S. Cl. D14—58





293,907
TELEVISION RECEIVER
Toshiyuki Matsuo, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 4, 1985, Ser. No. 719,812
Claims priority, application Japan, Oct. 12, 1984, 59-42203
Term of patent 14 years
U.S. Cl. D14—81

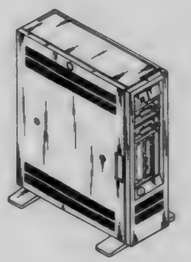


293,908
MICROWAVE RECEIVING ANTENNA
John F. Fuhrman; Paul K. Shumaker, both of Olathe, and Dennis A. Falls, Gardner, all of Kans., assignors to Maxon Systems, Incorporated, Kansas City, Mo.
Continuation-in-part of Ser. No. 668,510, Nov. 5, 1984, abandoned. This application Jul. 11, 1985, Ser. No. 754,002
Term of patent 14 years
U.S. Cl. D14—86

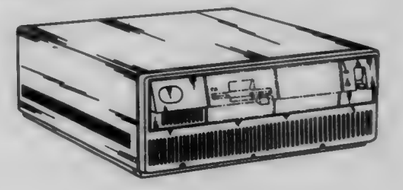




293,909
FLOOR STANDING COMPUTER
Myron F. Davis, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 20, 1987, Ser. No. 12,851
Term of patent 14 years
U.S. Cl. D14—100



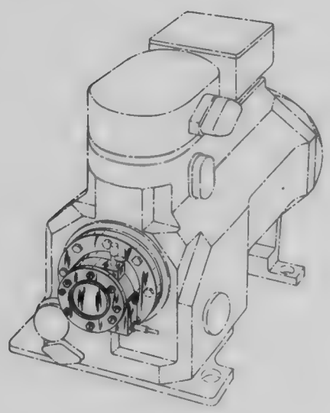
293,910
PERSONAL COMPUTER HOUSING
Pedro M. Alfonso, Delray Beach; Hunter T. Foy, and Ted F. Kelley, Jr., both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 20, 1987, Ser. No. 12,855
Term of patent 14 years
U.S. Cl. D14—100



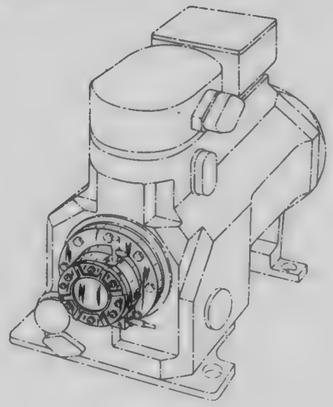
293,911
COMPUTER KEYBOARD
Craig Lynar, San Jose; Richard Redelfs, Menlo Park, and Charles King, San Mateo, all of Calif., assignors to Televideo Systems, Inc., Sunnyvale, Calif.
Filed Feb. 20, 1985, Ser. No. 703,376
Term of patent 14 years
U.S. Cl. D14—100

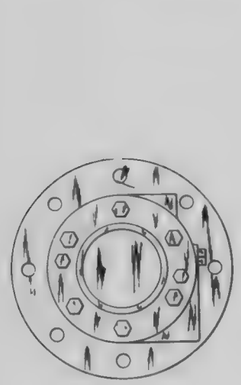


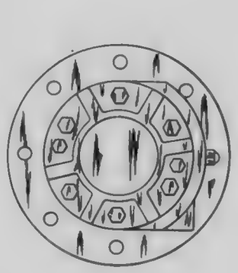
293,912
OIL PUMP
Mitchell L. Wilgus, Akron, and Roger H. Ramsey, Copeley, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio
Filed Jan. 17, 1986, Ser. No. 820,414
Term of patent 14 years
U.S. Cl. D15—7



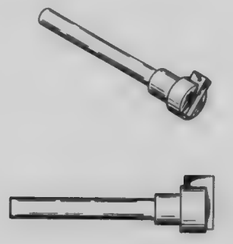
293,913
OIL PUMP
Mitchell L. Wilgus, Akron, and Roger H. Ramsey, Copeley, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio
Filed Jan. 17, 1986, Ser. No. 820,413
Term of patent 14 years
U.S. Cl. D15—7



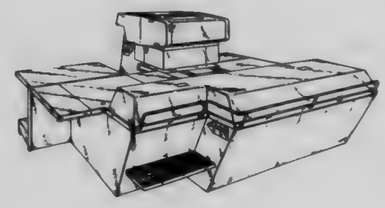




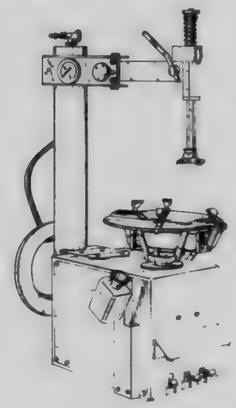
293,914
TOOL HOLDER FOR A CARVING BIT
Virgil E. Hudson, 940 Fairview, Box 605, Blossom, Tex. 75416
Filed May 2, 1985, Ser. No. 729,670
Term of patent 14 years
U.S. Cl. D15—139



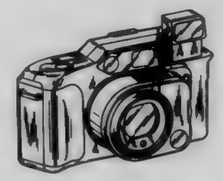
293,915
SHEARING MACHINE
Tadashi Hirata, Kanagawa, Japan, assignor to Amada Company, Limited, Japan
Filed Mar. 26, 1985, Ser. No. 716,159
Term of patent 14 years
U.S. Cl. D15—129



293,916
RIM CLAMP TIRE CHANGER
Charles L. Cunningham, Nashville, and Robert E. Gwaltney, Brentwood, both of Tenn., assignors to Hennessy Industries, Inc., LaVergne, Tenn.
Filed Nov. 27, 1985, Ser. No. 806,843
Term of patent 14 years
U.S. Cl. D15—199



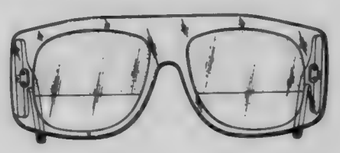
293,917
CAMERA
Noboru Tanaka, Kawasaki, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1985, Ser. No. 754,453
Claims priority, application Japan, Jan. 16, 1985, 60-911
Term of patent 14 years
U.S. Cl. D16—5



293,918
SUNGLASS LENS
Jeffrey Maron, 248 Lafayette St., New York, N.Y. 10012
Filed Apr. 29, 1985, Ser. No. 728,703
Term of patent 14 years
U.S. Cl. D16—101

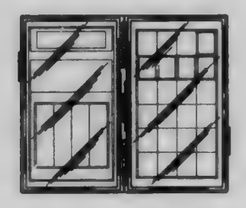


293,919
EYEWEAR FOR USE WITH VIDEO DISPLAY TERMINALS
Stuart M. Podell, Oceanside, N.Y., assignor to Panache Eyewear, Bayside, N.Y.
Filed Jun. 26, 1986, Ser. No. 879,185
Term of patent 14 years
U.S. Cl. D16—102



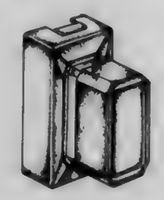
VOL 1086 ISS 4 JA 26 1988 UMI

293,920
ELECTRONIC CALCULATOR
Takahisa Yshisui; Hiroshi Sakaguchi, and Katsuhiro Iida, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 27, 1985, Ser. No. 806,849
Claims priority, application Japan, Jun. 3, 1985, 60-23480
Term of patent 14 years
U.S. Cl. D18—7

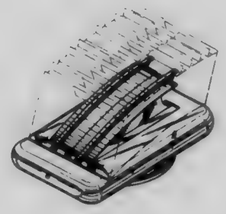


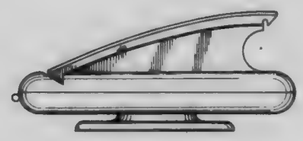


293,921
HAND STAMP MOUNT
James E. Harris, Hermitage, Tenn., assignor to Porelon, Inc., Cookeville, Tenn.
Filed Jun. 17, 1985, Ser. No. 845,103
Term of patent 14 years
U.S. Cl. D18—15

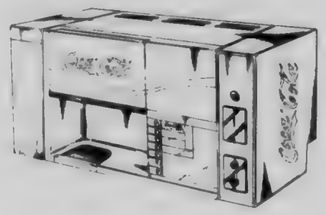


293,922
COMBINED CARD-INDEX STAND AND DRAWER
Lan-Hsiung Wen, No. 31, 8th Lin, Yun Nan Li, Hsin Pu Chen, Hsin Chu, Taiwan
Filed Mar. 4, 1985, Ser. No. 707,818
Term of patent 14 years
U.S. Cl. D19—76





293,923
BEVERAGE DISPENSER
Karlheinz A. A. Faerber; Herbert Zott; Matthias Aschberger, all of Giengen; Anton K. Deininger, Backhagel, all of Fed. Rep. of Germany, and Wolfgang Fischer, Stone Mountain, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 27, 1984, Ser. No. 625,027
Term of patent 14 years
U.S. Cl. D20—5



293,924
STACKABLE GAME PIECE
William W. Burkett, and Glenda S. Burkett, both of 28½ Spring St., Eureka, Kans. 72632
Filed May 6, 1985, Ser. No. 730,504
Term of patent 14 years
U.S. Cl. D21—51



293,925
PLAY SHELTER
Joseph C. Roy, Columbia, S.C., assignor to J. C. Roy Company, Columbia, S.C.
Filed Apr. 15, 1985, Ser. No. 723,343
Term of patent 14 years
U.S. Cl. D21—114



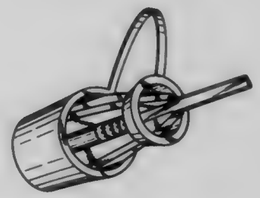
293,926
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,529
Term of patent 14 years
U.S. Cl. D21—217



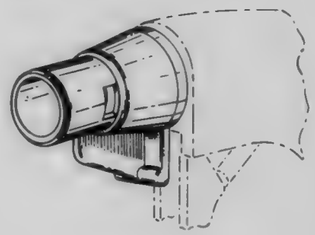
293,927
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,711
Term of patent 14 years
U.S. Cl. D21—218



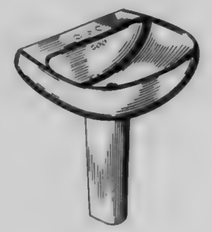
293,928
SIGNAL TRANSMISSION DEVICE FOR BLASTING ASSEMBLY
Lars-Gunnar Lofgren, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden
Filed Sep. 27, 1984, Ser. No. 655,332
Claims priority, application Sweden, Mar. 27, 1984, 84-1669; Mar. 27, 1984, 84-1010
Term of patent 14 years
U.S. Cl. D22—112



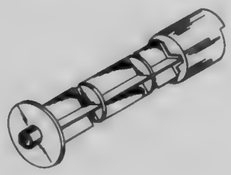
293,929
FOAM NOZZLE FOR HAND OPERATED TRIGGER SPRAYER
Matheus H. F. Verbeek, CN Asten, Netherlands, assignor to Waynesboro Textiles Inc., Forest City, N.C.
Filed May 24, 1985, Ser. No. 738,122
Term of patent 14 years
U.S. Cl. D23—213



293,930
PEDESTAL LAVATORY
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed May 14, 1985, Ser. No. 733,875
Term of patent 14 years
U.S. Cl. D23—292



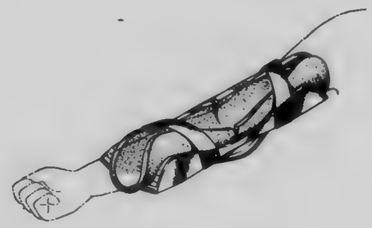
293,931
SYRINGE PUMP INSERT
Robert S. Schlaupitz, Ingleside, and Con A. Lasaitis, Waukegan, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 7, 1984, Ser. No. 607,882
Term of patent 14 years
U.S. Cl. D24—14



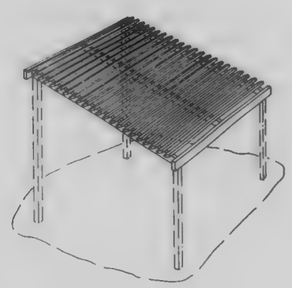
293,932
MASSAGING HEAD AND FACE MASK
Keith Y. Ramseyer, P.O. Box 409, Magalia, Calif. 95954
Filed Jul. 5, 1985, Ser. No. 752,269
Term of patent 14 years
U.S. Cl. D24—36



293,933
ANTECUBITAL I.V. BOARD
Vance M. Hubbard; Welton K. Brunson, and Darrell S. Caldwell, all of Bedford, Tex., assignors to Tecnol, Inc., Fort Worth, Tex.
Filed Sep. 6, 1985, Ser. No. 773,135
Term of patent 14 years
U.S. Cl. D24—64



293,934
SUN CONTROL PERGOLA TOP
Daryl J. Lambert, 391-401 Martins Road, Parafield Gardens, Australia (5107); Dennis J. Paul, Campbelltown, and William Chandler, Belair, both of Australia, assignors to John Daryl Lambert, Parafield Gardens, Australia
Continuation of Ser. No. 493,002, May 9, 1983, abandoned. This application Aug. 11, 1986, Ser. No. 895,517
Claims priority, application Australia, Nov. 12, 1982, 2112/82
Term of patent 14 years
U.S. Cl. D25—57

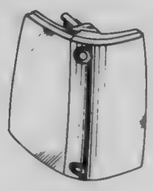


293,935
COMBINED SMOKE GASKET AND INTUMESCENT EXPANDING SEAL DEVICE FOR SWINGING DOORS
George A. Allen, Jr., 8011 Whitebark Ter., Richmond, Va. 23237
Filed Feb. 11, 1985, Ser. No. 701,071
Term of patent 14 years
U.S. Cl. D25—164



293,936
AUTOMOBILE REAR COMBINATION LAMP
Norihiko Kawaoka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 23, 1985, Ser. No. 812,856
Term of patent 14 years
U.S. Cl. D26—28

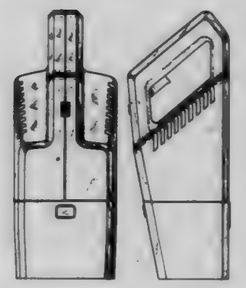
293,937
AUTOMOBILE FRONT COMBINATION LAMP
Ryoichi Soma, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 26, 1985, Ser. No. 813,761
Term of patent 14 years
U.S. Cl. D26—28



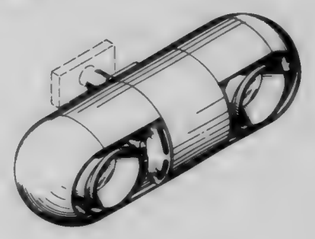
293,938
AUTOMOBILE REAR COMBINATION LAMP
Ryoichi Soma, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 23, 1985, Ser. No. 812,855
Term of patent 14 years
U.S. Cl. D26—28



293,939
FLASHLIGHT OR THE LIKE
Howard L. Rauch, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Mar. 7, 1985, Ser. No. 709,156
The portion of the term of this patent subsequent to Sep. 3, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—48

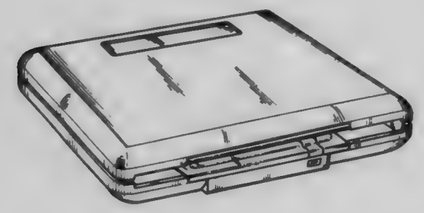


293,940
ADJUSTABLE DIRECTIONAL LIGHTING UNIT OR SIMILAR ARTICLE
Martin L. Lasker, Edison, N.J., assignor to Prescolite, Inc., San Leandro, Calif.
Filed Oct. 8, 1985, Ser. No. 783,838
Term of patent 14 years
U.S. Cl. D26—65



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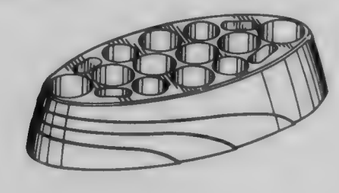
293,941
DEPILATORY APPLIANCE
Francis Elie, Paris, France, assignor to Calor S.A., Lyons, France
Filed Oct. 8, 1985, Ser. No. 785,562
Claims priority, application France, Apr. 17, 1985, 85 1761
Term of patent 14 years
U.S. Cl. D28—10



293,942
COSMETICS CONTAINER
John C. White, Easton, and Martin M. Vasas, Fairfield, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Filed Nov. 4, 1985, Ser. No. 794,421
Term of patent 14 years
U.S. Cl. D28—76



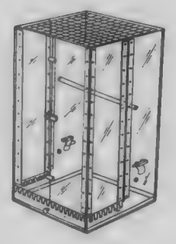
293,943
COSMETIC HOLDER
Ronald Wadsworth, Diamond Bar; Carl A. Meisterlin, Long Beach; Richard K. O'Neill, Pomona, and Richard P. Grogan, Downey, all of Calif., assignors to La Shea Corporation, Costa Mesa, Calif.
Filed Oct. 3, 1985, Ser. No. 783,780
Term of patent 14 years
U.S. Cl. D28—76



293,944
COSMETIC AND PERFUME BOTTLE
Roberto Trabattoni, 70, route du Pont-Butin 1213, Petit-Lancy, Switzerland
Filed Nov. 8, 1985, Ser. No. 803,942
Claims priority, application United Kingdom, Jul. 18, 1985, 1027996
Term of patent 14 years
U.S. Cl. D28—76



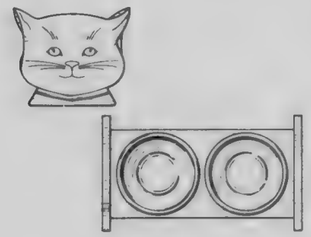
293,945
BIRD CAGE
Ken Grant, 782 West End Ave., #113, New York, N.Y. 10025
Filed Sep. 30, 1985, Ser. No. 781,534
Term of patent 14 years
U.S. Cl. D30—114



293,946
BIRD CAGE
Ken Grant, 782 West End Ave., #113, New York, N.Y. 10025
Filed Sep. 30, 1985, Ser. No. 781,535
Term of patent 14 years
U.S. Cl. D30—115



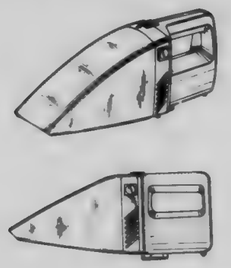
293,947
PET FEEDER
Richard R. Younker, 2984 Allshore, Memphis, Tenn. 38118
Filed May 1, 1986, Ser. No. 858,307
Term of patent 14 years
U.S. Cl. D30—129



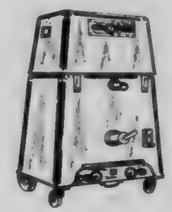
293,948
ALL PURPOSE FEEDER FOR LIVESTOCK
Thomas N. DePew, 10 Sunningdale, St. Louis, Mo. 63124
Filed Jul. 30, 1986, Ser. No. 890,516
Continuation-in-part of Ser. No. 627,461, Jul. 13, 1984
Term of patent 14 years
U.S. Cl. D30—131



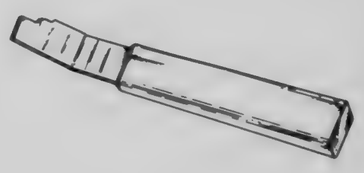
293,949
PORTABLE VACUUM CLEANER
Toyomi, Arita, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Oct. 28, 1985, Ser. No. 791,780
Claims priority, application Japan, May 13, 1985, 60-19585
Term of patent 14 years
U.S. Cl. D32—18



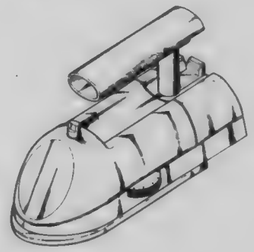
293,950
PORTABLE MACHINE FOR WET OR DRY VACUUM EXTRACTION
Stanley D. Ogden, and Douglas A. Hemke, both of Clovis, Calif., assignors to Rug Doctor, Inc., Fresno, Calif.
Filed Feb. 1, 1985, Ser. No. 697,505
Term of patent 14 years
U.S. Cl. D32—21



293,951
PAINT SCRAPER FOR WINDOWS
Stephen B. Harvey, 1039 Pearl St., Santa Monica, Calif. 90405
Filed Jul. 16, 1986, Ser. No. 886,116
Term of patent 14 years
U.S. Cl. D32—49

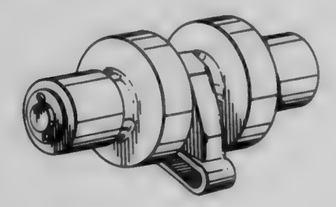


293,952
IRON
Ting L. Hsu, No. 103, Cherng Gong Road, Taizan, Taiwan
Filed Jun. 30, 1986, Ser. No. 856,788
Term of patent 14 years
U.S. Cl. D32—69

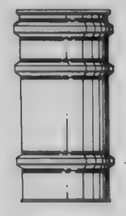


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293,953
PUSHER ROLLER UNIT
Daniel J. MacNeil, 3205 Swansea Cres., Gloucester City, Ontario, Canada K16 3W5
Filed Feb. 8, 1985, Ser. No. 699,639
Term of patent 14 years
U.S. Cl. D34—35



293,954
STEEL DRUM
Richard L. Moore, Fairhope, Ala., assignor to Sirco Systems, Inc., Birmingham, Ala.
Filed Jun. 13, 1985, Ser. No. 744,421
Term of patent 14 years
U.S. Cl. D34—39



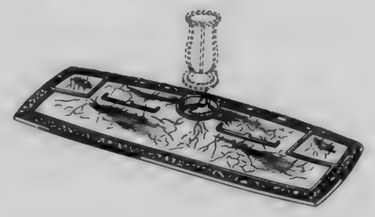
293,955
CEMETERY MARKER OR THE LIKE
Joseph Miller, Richmond, Minn., assignor to Cold Spring Granite Company, Cold Spring, Minn.
Filed Apr. 18, 1985, Ser. No. 724,477
Term of patent 14 years
U.S. Cl. D99—17



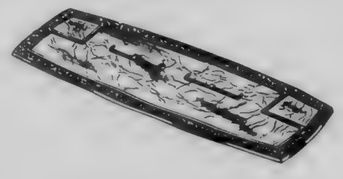
293,956
CEMETERY MARKER OR THE LIKE
Joseph Miller, Richmond, Minn., assignor to Cold Spring Granite Company, Cold Spring, Minn.
Filed Apr. 18, 1985, Ser. No. 724,479
Term of patent 14 years
U.S. Cl. D99—17



293,957
CEMETERY MARKER OR THE LIKE
Joseph Miller, Richmond, Minn., assignor to Cold Spring Granite Company, Cold Spring, Minn.
Filed Apr. 18, 1985, Ser. No. 724,478
Term of patent 14 years
U.S. Cl. D99—17



293,958
CEMETARY MARKER OR THE LIKE
Joseph Miller, Richmond, Minn., assignor to Cold Spring Granite Company, Cold Spring, Minn.
Filed Apr. 18, 1985, Ser. No. 724,565
Term of patent 14 years
U.S. Cl. D99—17



293,959
BANK
David L. Allen, 447 W. Sunset Cir., Mesa, Ariz. 85201
Filed Jun. 24, 1985, Ser. No. 747,897
Term of patent 14 years
U.S. Cl. D99—39



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TO WHOM

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Akiyama, Hitoshi, 4,721,414, Cl. 405-212.000.
Fukushima, Hironobu; and Takayama, Masahiro, 4,721,143, Cl. 152-454.000.
Hara, Hideo; Bundo, Motonori; and Makino, Yoshihiro, 4,721,144, Cl. 152-541.000.
Ichikawa, Seizo, 4,721,446, Cl. 425-44.000.
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Moate, Richard P., 4,721,042, Cl. 102-343.000.
Salkeld, David, 4,721,270, Cl. 244-3.110.

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Greig, Colin C.; Baker, Richard R.; Dashley, Frederick J.; and McCormack, Anthony D., 4,721,120, Cl. 131-365.000.

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Naganuma, Nobuyuki; Horie, Fujio; and Matsubara, Kenji, 4,721,050, Cl. 112-315.000.

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Czech, James I.; Bruce, Creston J.; and Griffith, Onavie L., 4,720,925, Cl. 34-82.000.

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Hesterberg, William G.; Pagel, Wilfred A.; and Stiller, Gordon L., 4,721,149, Cl. 164-244.000.

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Budai, Peter; and Lagerqvist, Ulf, to Esab AB. Method and apparatus for controlling an arc welding energy source during an arc welding operation. 4,721,843, Cl. 219-130.330.

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Bullock, Michael K.; and Miller, Frederick C., to International Business Machines Corp. Line illumination system. 4,721,093, Cl. 362-308.000.

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Burke, Roland A., Jr. Safety shroud for an electrical connector. 4,721,475, Cl. 439-133.000.

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Busignies, Henri G.; and Derosa, Louis A., to ITT Avionics. Submarine detection system. 4,721,961, Cl. 342-458.000.

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Buttle, Donald R., to TRW Inc. Ground shift compensated parameter measurement system. 4,721,957, Cl. 340-870.390.
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Buzby, George C., Jr.; and Colatsky, Thomas J., to American Home Products Corporation. Alkylsulfonamido or perfluoroalkylsulfonamido benzenesulfonamides. 4,721,809, Cl. 564-82.000.
Byers, Charles L.; Zimmerman, Peter; Feinstein, Paul; and Sutter, Mitchell, to University of California, The Regents of the. Iridium treatment of neuro-stimulating electrodes. 4,721,551, Cl. 204-47.000.
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Campbell, John F. Well clean out apparatus. 4,721,156, Cl. 166-99.000.
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Canadian Microcool Corporation: *See*—
Kennedy, John; and Watson, Eric, 4,721,250, Cl. 239-383.000.
Canadian Patents & Development Ltd.: *See*—
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Harris, Kenneth; and Erickson, Gary L., 4,721,540, Cl. 148-404.000.
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Arai, Ryuichi; Toganoh, Shigeo; and Ozawa, Kunitaka, 4,721,968, Cl. 346-136.000.
Hattori, Jun; Suda, Shigeyuki; and Aruna, Rohra, 4,721,369, Cl. 350-411.000.
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Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,721,664, Cl. 430-128.000.
Ushiro, Tatsuzo, 4,722,015, Cl. 360-128.000.
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Caporiccio, Gerardo; Strepparola, Ezio; and Scarati, Mario A., to Montedison S.p.A. Fluoropolyethers containing end groups endowed with anchoring capacity. 4,721,795, Cl. 549-445.000.
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DuFault, Robert A.; and Wilcox, Ann C., 4,721,114, Cl. 128-696.000.
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Carlson, John A., to Teleflex Incorporated. Turning cord. 4,721,469, Cl. 439-13.000.
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Carney, Thomas E.; and Matthews, Abraham, to Du Pont de Nemours, E. I., and Company. Process of making heat-strengthened yarn. 4,721,587, Cl. 264-130.000.
Carrier Corporation: *See*—
Gray, Kenneth P., 4,720,902, Cl. 29-157.30C.
Carroll, Noel. Apparatus for handling mixtures. 4,721,565, Cl. 210-251.000.
Carter, Robert S. F., to General Motors Corporation. Wound rotor motor control. 4,721,898, Cl. 318-827.000.
Casco Products Corporation: *See*—
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Cesa, Mark C.; Dubbert, Robert A.; and Burrington, James D., to Standard Oil Company, The. Method of making a diastereomeric mixture containing two diastereomeric N-acyl-amino acid esters. 4,721,803, Cl. 560-41.000.
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Chang-Diaz, Franklin R., to United States of America, National Aeronautics & Space Administration. Infusion extractor. 4,721,035, Cl. 99-297.000.
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Chatenever, David, to Medical Concepts Incorporated. Adapter for endoscopic camera. 4,722,000, Cl. 358-98.000.
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Friebe, Walter-Gunar; Kampe, Wolfgang; Bohm, Erwin; and Strein, Klaus, to Boehringer Mannheim GmbH. α-(aminoalkylaminomethyl)phenylmethanols, composition containing them, and use thereof to treat certain heart and circulatory diseases. 4,721,717, Cl. 514-274.000.

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Nishikawa, Toshio; Ishikawa, Youhei; Hattori, Jun; and Kato, Hideyuki, 4,721,931, Cl. 333-203.000.

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Osada, Chiaki; and Katsuyama, Harumi, 4,721,670, Cl. 435-28.000.

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Kawabata, Chouji, to Nittoseiki Kabushiki Kaisha. Pressure vessel having pressure releasing mechanism. 4,721,224, Cl. 220-89.00A.

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Nakata, Masaru; Sato, Kenichi; Kawai, Isamu; Ohishi, Katsumi; Obe, Mitsuhiko; Nishikawa, Takao; Shimizu, Yoshiburo; and Hinoue, Kenji, 4,721,031, Cl. 98-2.090.

Kawai, Masao: *See*—
Harada, Yoshiharu; Taga, Yutaka; Nishikawa, Seiichi; Hayakawa, Yoichi; and Kawai, Masao, 4,721,018, Cl. 74-866.000.

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Sato, Gentei; and Kawakami, Haruo, 4,721,964, Cl. 343-713.000.

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Saito, Suzuo; Nakagawa, Teruo; Hirata, Akio; Mose, Tadao; Ichikawa, Kohsaku; Kawakami, Kazuto; and Kuga, Tsugunori, 4,721,861, Cl. 290-4.00R.

Kawakami, Yuichi: *See*—
Kuroda, Ichiro; Nishitani, Takao; Tanaka, Hideo; and Kawakami, Yuichi, 4,722,068, Cl. 364-757.000.

Kawakatsu, Akira; Karino, Toshio; and Yuge, Yooji, to Kabushiki Kaisha Toshiba. Light diffusive coating and a lamp having the coating. 4,721,877, Cl. 313-111.000.

Kawakubo, Youichi: *See*—
Iechika, Keigo; Maeda, Fuzio; Imamura, Masa-aki; Kato, Yoshiki; Takasuna, Eiichi; and Kawakubo, Youichi, 4,721,646, Cl. 428-143.000.

Kawamura, Fumio: *See*—
Nagamine, Tsuyoshi; Kawamura, Fumio; and Toriyama, Shuji, 4,722,043, Cl. 364-147.000.

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Yamaguchi, Ken; Kawano, Akio; and Ono, Keiji, 4,721,179, Cl. 180-219.000.

Kawano, Fusao, to Shin Nihon Chemical Industry Co., Ltd. Magnesia clinker and method of producing the same. 4,721,691, Cl. 501-108.000.

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Kawasaki, Hiroyuki: *See*—
Iwakura, Ken; Kawasaki, Hiroyuki; and Sano, Shojiro, 4,721,702, Cl. 503-217.000.

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Fujita, Yoshitada; and Hanada, Sadashi, 4,721,429, Cl. 414-458.000.

Kawasaki Steel Corporation: *See*—
Yuasa, Hiroyasu; and Suganuma, Namio, 4,721,241, Cl. 228-5.700.

Kawashima, Hiroshi: *See*—
Okawa, Kazuyoshi; Moriya, Kazumasa; Kashiwazaki, Tomoyuki; Kawashima, Hiroshi; and Murakawa, Yoshitaka, 4,721,045, Cl. 104-290.000.

Kawasumi Laborstories Inc.: *See*—
Harada, Yoshimichi; Nakano, Akiyoshi; and Watanabe, Takuichiro, 4,721,564, Cl. 210-88.000.

Keeffe, William M.: *See*—
White, Philip J.; White, Robert S., Jr.; and Keeffe, William M., 4,721,876, Cl. 313-25.000.

Keeler, Brian G.; and Whitley, George J., to RCA Corporation. Pneumatic insulation displacement terminal wire insertion tool. 4,720,906, Cl. 29-566.100.

Keene, Wayne H.: *See*—
Jelalian, Albert V.; Keene, Wayne H.; Sonnenschein, Charles M.; Harris, Clarke E.; and Morrow, Clifford E., 4,721,385, Cl. 356-5.000.

Keller, William F.; and Sibley, Richard D., to Koso International, Inc. Double acting linear actuator. 4,721,027, Cl. 91-387.000.

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Frait, John S.; Warner, Michael D.; and Ayers, David T., 4,721,344, Cl. 303-20.000.

Kennedy, James D.; McCardy, Scott G.; and Ruggio, Stanley R., to True Grid, Ltd. Printed circuit board and process for its manufacture. 4,720,915, Cl. 29-847.000.

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Kentek Information Systems, Inc.: *See*—
Fukae, Kensuke, 4,721,977, Cl. 355-3.00R.

Kerfoot, Charles S.; and Milberger, Walter E., to United States of America, Air Force, The. Self-generated converter filter. 4,721,900, Cl. 323-354.000.

Kerler, Rudolf: *See*—
Kaiser, Juergen; and Kerler, Rudolf, 4,721,261, Cl. 242-4.00B.

Kessels, Winfried; Muller, Klaus; and Telgmann, Martinus, to Gesellschaft fur Strahlen- und Umweltforschung mbH. Method and apparatus for the detectable release of gases. 4,720,994, Cl. 73-49.300.

Kessler, Nathan: *See*—
Bessler, Terry R.; Kessler, Nathan; and Orthoefer, Frank T., 4,721,706, Cl. 514-78.000.

Kestler, Joachim, to Siemens Aktiengesellschaft. High frequency antenna system for nuclear magnetic resonance tomography devices. 4,721,915, Cl. 324-322.000.

KeyTek Instrument Corp.: *See*—
Weil, Geoffrey M., 4,721,899, Cl. 320-1.000.

Khoe, Giok D.; and Hoovers, Andreas H. M., to U.S. Philips Corporation. Optical transmission system comprising a monomode optical transmission fibre having a tapered end portion. 4,721,353, Cl. 350-96.180.

Kiboku, Mitsuo: *See*—
Takeshita, Michitaka; Kiboku, Mitsuo; Ito, Seishiro; and Ihara, Tatsuhiko, 4,721,740, Cl. 523-215.000.

Kidd, Dennis R., to Phillips Petroleum Company. Silica-modified alumina and process for its preparation. 4,721,696, Cl. 502-210.000.

Kidd, Roy F.: *See*—
Andrejasich, Raymond J.; Kidd, Roy F.; and Jefferson, Ford C., 4,721,950, Cl. 340-603.000.

Kieser, Manfred: *See*—
Gehlhaus, Juerges; and Kieser, Manfred, 4,721,734, Cl. 522-8.000.

Kiikuniya, Masumi; Maekawa, Mamoru; and Mori, Shinichi, to Yamatake-Honeywell Co. Ltd. Analog-to-digital conversion method and an analog-to-digital converter utilizing the same. 4,721,944, Cl. 340-347.0CC.

Kiji, Akio; Aoki, Kazuo; and Asari, Seiichirou, to Mitsubishi Denki Kabushiki Kaisha. High voltage MOS switch circuit with isolation. 4,721,871, Cl. 307-571.000.

Kikuchi, Kenichi; Suzuki, Akio; and Mochizuki, Tetsuro, to Nippon Kokan Kabushiki Kaisha. Coal gasification method using coal powder. 4,721,514, Cl. 48-202.000.

Kikuchi, Shoji, to Tenaho Electric Industrial Co., Ltd. Hard disk container. 4,721,207, Cl. 206-334.000.

Kim, Bongsub, to BASF Corporation. Sodium carboxymethyl derivatives of polyoxyalkylene glycols, their production, and use in functional fluids. 4,721,579, Cl. 252-79.000.

Kim, Myung K.; and Lee, Se E., to Kim, Myung Kyooa. Method of power generation and its apparatus utilizing gravitation force and buoyancy. 4,720,976, Cl. 60-495.000.

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Kim, Myung K.; and Lee, Se E., 4,720,976, Cl. 60-495.000.

Kimball, Thomas; and Pfeiffer, Harold, to Unex Conveying Systems, Inc. Powered accumulating conveyor apparatus. 4,721,203, Cl. 198-781.000.

Kimberly-Clark Corporation: *See*—
Hathaway, John M., 4,721,295, Cl. 270-52.500.

Kimura, Katsuhiko: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Muroya, Minoru; Kimura, Katsuhiko; Kushida, Noritaka; and Hasebe, Hiroshi, 4,721,084, Cl. 123-440.000.

Kimura, Yuichirou; and Osawa, Michitaka, to Hitachi, Ltd. Clamp circuit for a video signal processor. 4,722,006, Cl. 358-171.000.

Kinder, Bobby L. Holder for drinks and the like. 4,721,216, Cl. 215-100.500.

Kindroth, Hans: *See*—
Gustavsson, Lars-Goran; Kindroth, Hans; and Åhs, Roland, 4,722,057, Cl. 364-423.000.

King, Adrian S.: *See*—
Farace, Louis P.; and King, Adrian S., 4,721,925, Cl. 331-154.000.

King, Robert D.; and Jennings, Steven G., to King, Robert D. Offshore safety escape platform. 4,721,412, Cl. 405-195.000.

Kingham, Clive G.; Caine, Malcolm; and Duffin, Valerie J., to United Biscuits (UK) Limited. Shelf stable, filled food and method of manufacture. 4,721,622, Cl. 426-94.000.

Kinoshita, Hiroyuki, to Kabushiki Kaisha Toshiba. MOS type integrated circuit having charging and discharging transistors. 4,721,990, Cl. 357-41.000.

Kinzenbaw, Jon E. Agricultural implement with raisable lift frame rotatable about vertical axis. 4,721,168, Cl. 172-311.000.

Kinzer, Daniel M., to International Rectifier Corporation. Bidirectional output semiconductor field effect transistor and method for its maufacture. 4,721,986, Cl. 357-23.400.

Kioritz Corporation: *See*—
Nagashima, Akira, 4,721,193, Cl. 192-17.00R.

Kish, Linda A.: *See*—
Lentrichia, Brian B.; Turanchik, Michael F.; and Kish, Linda A., 4,721,681, Cl. 436-523.000.

Kish, William C.: *See*—
Dougan, Donald R.; Peters, Gerald W.; and Kish, William C., 4,721,258, Cl. 241-57.000.

Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, to Fanuc Ltd. Input data sign determining method. 4,722,045, Cl. 364-171.000.

Kitahara, Yasuyuki: *See*—
Yasukawa, Kazuyoshi; and Kitahara, Yasuyuki, 4,722,063, Cl. 364-513.000.

Kitano, Masayasu: *See*—
Ohkochi, Katsutoshi; Shinozaki, Mamoru; Ohshita, Toshiyuki; Kitano, Masayasu; and Kamata, Seizo, 4,721,159, Cl. 166-286.000.

Kitaue, Masaaki: *See*—
Hata, Yasuhisa; Akamatsu, Osamu; and Kitaue, Masaaki, 4,721,515, Cl. 55-162.000.

Kittlesen, Gregg P.: *See*—
Wrighton, Mark S.; White, Henry S., Jr.; and Kittlesen, Gregg P., 4,721,601, Cl. 422-68.000.

Kiyohara, Shuichi: *See*—
Aihara, Yoshihiko; Kiyohara, Shuichi; and Yamada, Akira, 4,721,976, Cl. 354-441.000.

Kleine-Doepke, Wolfgang; Martin, M. Reinhold; Raedisch, Helmer; and Holzer, Gerhard, to Saint-Gobain Vitrage. Method for production of composite glass panes and adhesive therefor. 4,721,648, Cl. 428-317.700.

Kleinschmit, Peter: *See*—
Baecke, Michael; and Kleinschmit, Peter, 4,721,609, Cl. 423-329.000.

Klepper, Alain: *See*—
Collette, Jean; and Klepper, Alain, 4,721,141, Cl. 152-209.00A.

Klinger, Hermann. Drive controlled by a sequence of pulses. 4,721,896, Cl. 318-685.000.

Klinger, Roger L., to Brubaker Tool Corporation. Cutting tool with chip breakers. 4,721,421, Cl. 407-63.000.

Klinner, Wilfred E., to National Research Development Corporation. Apparatus for picking up and conveying crop or other material. 4,720,962, Cl. 56-10.200.

Klockner-Becorit GmbH: *See*—
Oldengott, Michael; and Schaffer, Klaus, 4,721,201, Cl. 198-535.000.

Klomp, Jacques P.: *See*—
Faber, Johannes W.; and Klomp, Jacques P., 4,721,358, Cl. 350-96.210.

Klos-bein, Karl, to U.S. Philips Corporation. Cassette loading/ejection and lift mechanism. 4,722,011, Cl. 360-93.000.

Knepper, Jay C.: *See*—
York, Earl D.; Knepper, Jay C.; and Forgac, John M., 4,721,560, Cl. 208-411.000.

Knight, Michael W.; and Feil, Paul G., to AMF Inc. Method of manufacturing miniature power switching relays. 4,720,909, Cl. 29-606.000.

Knizia, E. H. Klaus. Method and apparatus for driving an electrical power plant. 4,720,968, Cl. 60-39.020.

Knudsen, Soren E., to Dansk Industri Syndikat A/S. Moulding system for making mould parts. 4,721,148, Cl. 164-187.000.

Knutar, Alf, to Oy Fluid-Bag AB. Flexible receptacle for fluids. 4,721,397, Cl. 383-70.000.

Kobayashi, Kaoru, to Victor Company of Japan, Ltd.; and Ozaki, Hidetoshi. Digital phase difference detecting circuit. 4,721,904, Cl. 324-83.00R.

Kobayashi, Makoto: *See*—
Ibaraki, Hisashi; Kobayashi, Makoto; and Ochi, Hiroshi, 4,722,008, Cl. 358-283.000.

Kobayashi, Naotake; Abe, Tetsuya; and Fujiwara, Yoshio, to Sony Corporation. Sublimation transfer system color hard copy printing paper. 4,721,703, Cl. 503-227.000.

Kobayashi, Satoru. Anchor device. 4,721,054, Cl. 114-299.000.

Kobayashi, Syoji: *See*—
Arima, Kenji; Kobayashi, Syoji; and Satsukawa, Hideaki, 4,722,023, Cl. 362-80.000.

Kobayashi, Takatoshi: *See*—
Nakanishi, Minoru; Sakurai, Akira; and Kobayashi, Takatoshi, 4,721,647, Cl. 428-283.000.

Koch, Friedrich-Otto: *See*—
Grob, Heinz; Koch, Friedrich-Otto; Peeck, Adolf; and Wennemann, Werner, 4,721,536, Cl. 148-12.00F.

Koch, Otto: *See*—
Todtemann, Gert; Reinking, Klaus; and Koch, Otto, 4,721,774, Cl. 324-139.000.

Koeniges, Gerhard: *See*—
Rehmann, Gunter; Koeniges, Gerhard; and Mackert, Werner, 4,721,893, Cl. 318-332.000.

Kogure, Masaaki, to Ricoh Company, Ltd. Image reading device using fiber optic bundles configured differently at each end. 4,721,851, Cl. 250-227.000.

Kohn, Erhard: *See*—
Pavlidis, Dimitrios; Kohn, Erhard; Perea, Ernesto; and Magarshack, John, 4,721,985, Cl. 357-15.000.

Kohrogi, Yutaka; and Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Document illuminating apparatus. 4,721,979, Cl. 355-11.000.

Koichi, Fukuo; and Masatoshi, Chosa, to Honda Giken Kogyo Kabushiki Kaisha. Crankshaft supporting structure for multicylinder internal combustion engines. 4,721,077, Cl. 123-195.00R.

Koide, Akio: *See*—
Hanyu, Susumu; and Koide, Akio, 4,721,049, Cl. 112-168.000.

Koito Seisakusho Co., Ltd.: *See*—
Arima, Kenji; Kobayashi, Syoji; and Satsukawa, Hideaki, 4,722,023, Cl. 362-80.000.

Koiwa, Atsushi: *See*—
Yamauchi, Hiroshi; Nomoto, Seiichiro; Sugiyama, Isao; Komatu, Yuuki; Kanai, Takeo; Takayanagi, Keizo; Tanaka, Yasuhide; Koiwa, Atsushi; and Endoh, Shinichi, 4,721,788, Cl. 546-246.000.

Kojima, Yoshio: *See*—
Takagi, Yusuke; Kojima, Yoshio; Moriguti, Kazuo; and Takakusagi, Tsunehiko, 4,721,388, Cl. 356-376.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Furuya, Nobuo; Ikeda, Yoshikazu; and Fujioka, Masanobu, 4,722,082, Cl. 370-85.000.

Komatu, Yuuki: *See*—
Yamauchi, Hiroshi; Nomoto, Seiichiro; Sugiyama, Isao; Komatu, Yuuki; Kanai, Takeo; Takayanagi, Keizo; Tanaka, Yasuhide; Koiwa, Atsushi; and Endoh, Shinichi, 4,721,788, Cl. 546-246.000.

Komine, Shigeo: *See*—
Kato, Mikihiko; Komine, Shigeo; and Morita, Kazuhiko, 4,721,640, Cl. 423-63.000.

Komura, Masaru: *See*—
Ito, Masazumi; Oyabu, Masaaki; Sawada, Shigeru; and Komura, Masaru, 4,721,382, Cl. 355-14.0SH.

Konakorp: *See*—
Gibbs, Samuel C., III; Bishop, Bradley S.; and O'Brien, James B., 4,721,239, Cl. 224-322.000.

Kondo, Akira: *See*—
Omae, Tadayuki; Yamaguchi, Noboru; Kondo, Akira; and Okada, Takayuki, 4,721,761, Cl. 526-64.000.

Kondo, Nobuaki, to Nissan Motor Co., Ltd. Arresting device for rear seat back. 4,721,338, Cl. 297-379.000.

Kondo, Tetsujiro, to Sony Corporation. High efficiency coding apparatus. 4,722,003, Cl. 358-135.000.

Kondo, Yasuo; Miura, Koji; Maeda, Osamu; Kuroyanagi, Makoto; and Oshiro, Takao, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Fluid dispersal device. 4,721,251, Cl. 239-412.000.

Kondoh, Satoshi: *See*—
Nomura, Masaaki; Kondoh, Satoshi; and Nakanishi, Shingo, 4,722,020, Cl. 361-31.000.

Koniecka, Edmund T. Tree seat. 4,721,183, Cl. 182-182.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi, 4,721,662, Cl. 430-42.000.

Kontron Holding A.G.: *See*—
Muller, Paul, 4,721,137, Cl. 141-65.000.

Konwal, Ignatius. Boring bar. 4,721,422, Cl. 408-233.000.

Korber AG: *See*—
Ludszeweit, Dieter; and Gomann, Jurgen, 4,721,119, Cl. 131-69.000.

Koseki, Ryoji, to Amada Engineering Service Co., Inc. Device for monitoring discharge voltage of laser generator. 4,722,086, Cl. 372-31.000.

Koso International, Inc.: *See*—
Keller, William F.; and Sibley, Richard D., 4,721,027, Cl. 91-387.000.

Kotani, Kazuo: *See*—
Hanasawa, Kazuhiko; Soma, Kenichiro; and Kotani, Kazuo, 4,721,916, Cl. 324-544.000.

Koudija, Renee , to High Voltage Engineering Europa B.V. Process and apparatus for the exchange of emission sources. 4,721,918, Cl. 328-233.000.

Kovalchick, Joseph S.; Palmquist, John M.; and Treder, Ralph A., Jr., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Methods of and apparatus for reconfiguring optical fiber connector components and products produced thereby. 4,721,357, Cl. 350-96.200.

Kowal, William, to Canadair Inc. Process for molding and curing a composite skin-stiffeners assembly. 4,721,593, Cl. 264-258.000.

Kowalski, Werner; Haas, Hans; Dahmen, Theo; and Erpenbach, Markus, to Hoechst AG. Spheroidal alkali metal polyphosphates of low apparent density, and process for making them. 4,721,608, Cl. 423-315.000.

Kozlowska, Jadwiga, legal representative: *See*—
Curry, Francis R.; Pumfrey, Joan; Glasson, Edwin L.; Kozlowski, Romuald, deceased; and Kozlowska, Jadwiga, legal representative, 4,720,918, Cl. 30-346.550.

Kozlowski, Romuald, deceased: *See*—
Curry, Francis R.; Pumfrey, Joan; Glasson, Edwin L.; Kozlowski, Romuald, deceased; and Kozlowska, Jadwiga, legal representative, 4,720,918, Cl. 30-346.550.

Kraftwerk Union Aktiengesellschaft: *See*—
Rohrich, Heinz; Dippold, Clemens; and Gebald, Georg, 4,722,001, Cl. 358-100.000.

Kratel, Gunter: *See*—
Rosch, Lutz; Kratel, Gunter; and Stroh, Anton, 4,721,801, Cl. 530-471.000.

Kratt, Alfred; Nusser, Hermann; Plapp, Gunther; and Schwarz, Helmut, to Robert Bosch GmbH. Actuating device for throttle valve. 4,721,281, Cl. 251-54.000.

Krauja, Ziedonis I.; Krieger, Jeffrey J.; Shafer, Scott F.; and Kroeger, Craig A., to Caterpillar Inc. Flame incubating and propagating apparatus for a fuel combustion system. 4,721,081, Cl. 123-298.000.

Krause, Edmund: *See*—
Driller, Hubert; Krause, Edmund; and Mang, Paul, 4,721,908, Cl. 324-158.00F.

Krauss-Maffei A.G.: *See*—
Bauer, Adolf, 4,721,391, Cl. 366-171.000.

Krauss, Werner: *See*—
Bolg, Ulrich; Krauss, Werner; and Wurster, Helmut, 4,721,107, Cl. 128-328.000.

Krausse, George J., to University of California, The Regents of the. Axial flow plasma shutter. 4,721,891, Cl. 315-340.000.

Kreider, Edward W., to Babcock & Wilcox Company, The. Termination for boiler casing expansion element. 4,721,069, Cl. 122-511.000.

Krenek, Paul, Jr. Puller for fence posts or the like. 4,721,335, Cl. 294-104.000.

Krieger, Jeffrey J.: *See*—
Krauja, Ziedonis I.; Krieger, Jeffrey J.; Shafer, Scott F.; and Kroeger, Craig A., 4,721,081, Cl. 123-298.000.

Kritselis, George N., to Remline Tool Storage Company, Inc., The. Cabinet drawer locking system. 4,721,347, Cl. 312-219.000.

Kroeger, Craig A.: *See*—
Krauja, Ziedonis I.; Krieger, Jeffrey J.; Shafer, Scott F.; and Kroeger, Craig A., 4,721,081, Cl. 123-298.000.

Kronenberg, Stanley, to United States of America, Army. Sampling and recording dose rate meter. 4,721,857, Cl. 250-374.000.

Krug, Russell R.; and Schmidt, Peter C., to Chevron Research Company. Separation of reacted hydrocarbons and catalyst in fluidized catalytic cracking. 4,721,603, Cl. 422-147.000.

Kuah, Leong P., to Borg-Warner Industrial Products. Fluid flow control means for pumps and the like. 4,721,435, Cl. 415-143.000.

Kubo, Haruaki, to Daishowa Seiki Kabushiki Kaisha. Chuck. 4,721,423, Cl. 409-234.000.

Kubo, Seitoku; Taga, Yutaka; and Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Four wheel drive power transmission system with front propeller shaft including no universal joints connecting transfer device to front differential. 4,721,011, Cl. 74-665.00T.

Kubota, Hisao: *See*—
Matsuse, Koki; and Kubota, Hisao, 4,721,897, Cl. 318-767.000.

Kubota, Ltd.: *See*—
Hayashi, Tetsuaki; Itatani, Hiroshi; Bando, Niro; Yuki, Mikio; Yamashita, Nobuyuki; Ogasawara, Hiroyuki; Miyata, Mitsuaki; Kurohara, Kazuaki; Ikeda, Fumihiro; and Nakata, Yutaka, 4,721,494, Cl. 474-88.000.
Horii, Yasuyuki, 4,721,002, Cl. 74-329.000.
Nakata, Masaru; Sato, Kenichi; Kawai, Isamu; Ohishi, Katsumi; Obe, Mitsuhiko; Nishikawa, Takao; Shimizu, Yoshaburo; and Hinoue, Kenji, 4,721,031, Cl. 98-2.090.

Kubota, Minoru: *See*—
Folkers, Karl; Bowers, Cyril Y.; Tang, Pui-Fun L.; and Kubota, Minoru, 4,721,775, Cl. 530-313.000.

Kucera, Eugenia H.: *See*—
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NCR Corporation: *See*—
Chan, Kasun K.; Nguyen, Truc D. Y.; and Patel, Chiman R., 4,722,047, Cl. 364-200.000.
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Neeff, Kate, heiress: *See*—
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Neeff, Rutger, deceased (by Neeff, Kate, heiress); Rolf, Meinhard; and Muller, Walter, to Bayer Aktiengesellschaft. Pigments based on metal complexes. 4,721,745, Cl. 524-94.000.

Neesby, Torben E. Method for desensitizing the gastrointestinal tract from food allergies. 4,721,716, Cl. 514-251.000.

Negas, Taki: *See*—
Phillippi, R. Michael; Greenspan, David C.; Ellis, Richard T.; Drzewiecki, Tadeusz M.; Negas, Taki; Tokay, Ernie; and Bush, James R., 4,721,534, Cl. 136-234.000.

Negro, Guido, to bielomatik Leuze GmbH & Co. Binding comb shaping device. 4,721,136, Cl. 140-71.00R.

Nelson, Linda H., to General Electric Company. Irradiated color stabilized polysulfone compositions. 4,721,737, Cl. 523-136.000.

Nelson, Sidney G., to Sanitech, Inc. Toxic gas absorbent and processes for making same. 4,721,582, Cl. 252-189.000.

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Neri, Filippo: *See*—
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Neuerburg, Horst: *See*—
Ermacora, Rino; and Neuerburg, Horst, 4,720,964, Cl. 56-13.600.

Neumann, Helmut, to Siemens Aktiengesellschaft. Nuclear magnetic resonance tomography apparatus. 4,721,911, Cl. 324-309.000.

New West Technology Corporation: *See*—
Schumacher, John E., III, 4,721,550, Cl. 204-15.000.

New York Institute of Technology: *See*—
Glenn, William E., 4,721,998, Cl. 358-37.000.

Newman-Evans, Richard H., to Amoco Corporation. Epoxy resins based on tetraglycidyl diamines. 4,721,799, Cl. 549-552.000.

Newman, William E., Sr.; and Farrow, Desmond J., Sr., to Newman, William E., Sr. Self-adjusting fail safe friction heater system. 4,721,066, Cl. 122-26.000.

Nguyen, Thinh: *See*—
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Nguyen, Truc D. Y.: *See*—
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Nickolson, Robert: *See*—
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Nieto, Robert L.; Camacho, Joseph B.; and Devine, David J., to Benson, Inc. Mounting assembly for a roll of material. 4,721,267, Cl. 242-56.400.

Nigam, Anil: *See*—
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Nippon Kogaku K. K.: *See*—
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Nishimura, Norihisa, to Canon Kabushiki Kaisha. Electronic device including panels with electrical alignment means. 4,721,365, Cl. 350-334.000.

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Oda, Sumihiro; and Sato, Haruhito, to Idemitsu Kosan Company Limited. Process for the production of xylene. 4,721,825, Cl. 585-462.000.

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Rapp, Werner, to Euchner & Co. Identification system. 4,720,907, Cl. 29-568.000.

Rasmussen, David H., to Ag-Bag Corporation. Agricultural storage bag folding apparatus and method. 4,721,503, Cl. 493-413.000.

Rath, Alan R.: *See*—
Fukushima, Eiichi; Rath, Alan R.; and Roeder, Stephen B. W., 4,721,914, Cl. 324-320.000.

Rauen, David F.; and Tates, Donald W., to Xerox Corporation. Low-cost document feeder for copiers. 4,721,981, Cl. 355-75.000.

Rautenbach, Robert: *See*—
Barnscheidt, Wolfgang; von Borries, Horst; Rautenbach, Robert; Schiffermuller, August; Zimmermann, Hubert; and Lamort, Jean-Pierre, 4,721,562, Cl. 209-170.000.

Raychem Corporation: *See*—
Dubrow, Robert S.; and Froix, Michael F., 4,721,732, Cl. 521-62.000.
Jansons, Viktors; and Gora, Heinrich C., 4,721,771, Cl. 528-222.000.
Toy, Lester T., 4,721,832, Cl. 174-87.000.

Raymond Corporation, The: *See*—
Riddle, Ernest J., 4,721,187, Cl. 187-9.00E.

Raytheon Company: *See*—
Jelalian, Albert V.; Keene, Wayne H.; Sonnenschein, Charles M.; Harris, Clarke E.; and Morrow, Clifford E., 4,721,385, Cl. 356-5.000.

RCA Corporation: *See*—
Arner, John; and Wittmann, Erwin J., 4,722,066, Cl. 364-745.000.
Fling, Russell T., 4,722,007, Cl. 358-180.000.

Keeler, Brian G.; and Whitley, George J., 4,720,906, Cl. 29-566.100.
Kujas, Erich P., 4,721,660, Cl. 429-40.000.
Nosker, Richard W., 4,721,366, Cl. 350-345.000.
Taylor, Stephen E., 4,722,091, Cl. 372-83.000.
Wright, Andrew K.; and Forberger, Steven C., 4,720,958, Cl. 53-157.000.

Re-Top International Limited: *See*—
Vallak, Enn; Vallak, Hannes; and Childs, Charles B., Jr. (said Enn Vallak and Hannes Vallak assors. to), 4,721,278, Cl. 249-106.000.

Re-Top USA, Inc.: *See*—
Vallak, Enn; Vallak, Hannes; and Childs, Charles B., Jr. (said Charles B. Childs, Jr. assors. to), 4,721,278, Cl. 249-106.000.

Regents of the University of California, The: *See*—
Kaufman, Leon; Crooks, Lawrence E.; and Ortendahl, Douglas A., 4,721,912, Cl. 324-309.000.

Recalde, Carlos E., to Santa Fe International Corporation. Reel pipe coating and laying vessel and process. 4,721,410, Cl. 405-166.000.

Recalde, Carlos E., to Santa Fe International Corporation. Multi-reel operational lines laying vessel. 4,721,411, Cl. 405-168.000.

Rector, Stephen W.; and Hesricks, Gweane A. E., to Caterpillar Inc. Filtering of electromagnetic interference from a digital signal. 4,721,870, Cl. 307-520.000.

Redfern, Martin W., to Gec Avionics Limited. Electric signal amplifiers. 4,721,922, Cl. 330-263.000.

Reemet, Olev G.: *See*—
Shagarova, Bella U.; Reemet, Olev G.; Purga, Aare P.; and Tikhonov, Oleg N., 4,721,259, Cl. 241-57.000.

Rees, Jeffrey P., to Duo-Fast Corporation. Fastener driving tool. 4,721,170, Cl. 173-13.000.

Rehmann, Gunter; Koeniges, Gerhard; and Mackert, Werner, to Elastogran Maschinenbau GmbH. Process and apparatus for controlling the electric motor drive of a unit for the manufacture of moldings from multi-component plastics. 4,721,893, Cl. 318-332.000.

Rei, Nuno M.; and Wilson, Ronald C., to Morton Thiokol, Inc. Microbiocidal compositions comprising an aryl alkanol and a microbiocidal compound dissolved therein. 4,721,736, Cl. 523-122.000.

Reichelt, Wolfgang; Schwerdtfeger, Klaus; and Voss-Spilker, Peter, to Mannesmann AG. Apparatus for continuous casting. 4,721,152, Cl. 164-429.000.

Reichmuth, Franz: *See*—
Oetiker, Hans; and Reichmuth, Franz, 4,721,561, Cl. 209-144.000.

Reif, Peter M.: *See*—
Casto, Leo V.; and Reif, Peter M., 4,721,394, Cl. 366-343.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Erckmann, Bernhard, 4,721,447, Cl. 425-141.000.

Reil, Wilhelm, to Tetra Pak Finance & Trading S.A. Pack for liquids having edge protection, process for the production thereof and apparatus for carrying out the process. 4,721,242, Cl. 229-48.00R.

Reinecke, Paul: *See*—
Weissmuller, Joachim; Brandes, Wilhelm; Hassler, Gerd; and Reinecke, Paul, 4,721,786, Cl. 71-88.000.

Reinking, Klaus: *See*—
Todtemann, Gert; Reinking, Klaus; and Koch, Otto, 4,721,774, Cl. 324-139.000.

Remline Tool Storage Company, Inc., The: *See*—
Kritselis, George N., 4,721,347, Cl. 312-219.000.

Rendamax AG: *See*—
Bassols Rheinfelder, Juan; Bednarek, Norbert; and Marijnen, Jacob J., 4,721,068, Cl. 122-367.00C.

Rennecker, David B.; and Hill, Clyde E., to Hoover Company, The. Member with deformable brush retaining tabs. 4,720,891, Cl. 15-371.000.

Repligen Corporation: *See*—
Anilionis, Algis; and Palmer, John L., 4,721,671, Cl. 435-68.000.

Restelli, Edward F., Jr.: *See*—
Cullo, Leonard A.; Restelli, Edward F., Jr.; and Shiring, Francis J., III, 4,721,827, Cl. 585-467.000.

Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, to Centre National de la Recherche Scientifique. Device for controlling the flow of a fluid and a prosthetic organ equipped with this device. 4,721,095, Cl. 128-1.00R.

Reynolds, Gary R.: *See*—
Dunkerton, Stephen H.; Petreye, David R.; Chapman, Scott G.; Reynolds, Gary R.; and Erickson, Gary D., 4,721,955, Cl. 340-825.470.

Reynolds Metals Company: *See*—
Boegershausen, Robert L.; and Illig, Joachim W., deceased, 4,721,917, Cl. 324-558.000.

Richard Wolf GmbH: *See*—
Bolg, Ulrich; Krauss, Werner; and Wurster, Helmut, 4,721,107, Cl. 128-328.000.
Kurtze, Gunther; and Riedlinger, Rainer, 4,721,106, Cl. 128-328.000.

Richardson, John C.; and Salame, Morris, to Monsanto Company. Hollow, molecularly oriented copolyamide article. 4,721,654, Cl. 428-474.400.

Richardson, John E.: *See*—
Barnes, Roger D.; Wood-Kaczmar, Marian W.; Curzons, Alan D.; Lynch, Ian R.; Richardson, John E.; and Buxton, Philip C., 4,721,723, Cl. 514-321.000.

Richardson, Neil, to Schlumberger Technology Corporation. Apparatus for pulsing electron beams. 4,721,909, Cl. 324-158.00R.

Richardson, William C.; Whittington, Lawrence E.; and Morrow, Lawrence R., to Texaco Inc. Method for decreasing permeability around a wellbore. 4,721,161, Cl. 166-295.000.

Richter, Johan C. F. C., to Kamyr, Inc. Chips bin blockage preventing. 4,721,231, Cl. 222-146.400.

Rickelton, William A.: *See*—
Brown, Timothy J.; Rickelton, William A.; and Boyle, Richard J., 4,721,605, Cl. 423-24.000.

Ricoh Company, Ltd.: *See*—
Kogure, Masaaki, 4,721,851, Cl. 250-227.000.

Riddle, Ernest J., to Raymond Corporation, The. Lift truck mast structure. 4,721,187, Cl. 187-9.00E.

Ridley, Michael G.; and Will, Peter M. Ball projectile machine. 4,721,091, Cl. 124-26.000.

Riebel, Hans-Jochem: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,721,785, Cl. 544-194.000.

Riecke, Kurt, to Feldmuehle Aktiengesellschaft. Microcapsules having capsule walls formed of aliphatic diisocyanate and diamine. 4,721,651, Cl. 428-402.210.

Riedlinger, Rainer: *See*—
Kurtze, Gunther; and Riedlinger, Rainer, 4,721,106, Cl. 128-328.000.

Riley, William J., Jr., to EG&G, Inc. Power supply circuit for an alkali vapor spectral lamp. 4,721,890, Cl. 315-224.000.

Ringspann Albrecht Maurer K.G.: *See*—
Maurer, Ruprecht, 4,721,492, Cl. 464-38.000.

Risei, Notsu; Hideki, Ooike; and Mitsuhiro, Kaneko, to Fuji System Machines Co., Ltd. Hammer unit for printers. 4,721,400, Cl. 400-137.100.

Rivers, Gordon T.: *See*—
Hale, Arthur H.; and Rivers, Gordon T., 4,721,576, Cl. 252-8.510.

Robert Bosch GmbH: *See*—
Conrad, Hans-Jurgen, 4,721,458, Cl. 432-205.000.
Gorzel, Heribert, 4,721,962, Cl. 343-702.000.
Hesse, Horst; Schwerin, Gunther; and Steprath, Werner, 4,721,001, Cl. 73-862.570.
Hornung, Friedrich; Schadlich, Fritz; Gerschner, Martin; and Gunther, Klaus, 4,722,021, Cl. 361-49.000.
Kratt, Alfred; Nusser, Hermann; Plapp, Gunther; and Schwarz, Helmut, 4,721,281, Cl. 251-54.000.
Leroy, Andre; and Flamme, Jean M., 4,720,885, Cl. 15-250.210.
Weigle, Dieter, 4,721,185, Cl. 184-6.120.

Roberts, David W.; Strohbehn, John W.; and Hatch, John F., to Dartmouth College, Trustees of. Reference display systems for superimposing a tomagraphic image onto the focal plane of an operating microscope. 4,722,056, Cl. 364-413.000.

Roberts, John S.: *See*—
Mark, Harold W.; and Roberts, John S., 4,721,813, Cl. 568-22.000.

Roberts, Peter A., to College Savings Bank. Methods and apparatus for funding future liability of uncertain cost. 4,722,055, Cl. 364-408.000.

Robine, Paul, Jr.; and Hoffman, Benson L. Oil gauge accessory for automotive vehicles. 4,721,941, Cl. 340-59.000.

Robinson, Chris E.; and McGill, Robert W., to Figgie International. Continuous case packer. 4,720,959, Cl. 53-247.000.

Robinson, Douglas E.: *See*—
Uren, Jack R.; Robinson, Douglas E.; and Scandella, Carl J., 4,721,673, Cl. 435-183.000.

Robinson, Will B. Ground latch and case. 4,722,025, Cl. 361-212.000.

Roche, Michel, to Commissariat A L'Energie Atomique. Electron gun printer having window-sealing conductive plates. 4,721,967, Cl. 346-110.00V.

Rockwell International Corporation: *See*—
Ghosh, Amit K., 4,721,537, Cl. 148-12.70A.
Goede, Philip J., 4,721,370, Cl. 350-418.000.
Loberg, Grant M.; and Gross, Rodney R., 4,721,405, Cl. 403-2.000.
West, James B., 4,721,932, Cl. 333-207.000.

Roden, Mack L.; and Adams, Steven D. Method and apparatus for making a dental model. 4,721,464, Cl. 433-74.000.

Roeder, Stephen B. W.: *See*—
Fukushima, Eiichi; Rath, Alan R.; and Roeder, Stephen B. W., 4,721,914, Cl. 324-320.000.

Rogall, Wolfgang: *See*—
Zodrow, Rudolf; Rogall, Wolfgang; and Mohn, Hans-Werner, 4,721,544, Cl. 156-456.000.

Rogers, John P.: *See*—
Fryer, Melvyn T.; and Rogers, John P., 4,721,202, Cl. 198-725.000.

Rogers, Richard B.; and Goodrich, Robert D., to Pacific Sod, Ltd. Sod-growing composition and method of using it. 4,720,935, Cl. 47-56.000.

Rohde, Robert R.: *See*—
Dean, Weibley J.; Overby, Paul M.; and Rohde, Robert R., 4,721,907, Cl. 324-158.00F.

Rohm and Haas Company: *See*—
Schindler, Frederick J., 4,721,757, Cl. 525-245.000.

Rohrer, Daniel F.: *See*—
Rohrer, David C.; and Rohrer, Daniel F., 4,721,428, Cl. 414-439.000.

Rohrer, David C.; and Rohrer, Daniel F., to Double D Corporation. Tennis ball retriever. 4,721,428, Cl. 414-439.000.

Rohrich, Heinz; Dippold, Clemens; and Gebald, Georg, to Kraftwerk Union Aktiengesellschaft. Self-propelled inspection vehicle. 4,722,001, Cl. 358-100.000.

Rokugawa, Akio: *See*—
Hagiwara, Hirotoshi; Rokugawa, Akio; Okamoto, Naoyuki; and Inoue, Tsunemasa, 4,721,878, Cl. 313-362.100.

Rolf, Meinhard: *See—*
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Rollyson Aluminum Products, Incorporated: *See—*
Sturman, William S., 4,721,332, Cl. 292-128.000.
Rolt, Anthony P. R.: *See—*
Sheldon, Anthony J.; and Rolt, Anthony P. R., 4,721,010, Cl. 74-630.000.
Rorer Pharmaceutical Corporation: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,721,721, Cl. 514-312.000.
Rosaen Borje O. Fluid filtering device. 4,721,563, Cl. 210-85.000.
Rosch, Lutz; Kratel, Gunter; and Stroh, Anton, to Wacker-Chemie GmbH. Process for the preparation of organohalosilanes. 4,721,801, Cl. 550-478.000.
Rosen, David B.: *See—*
Gates, Dirk I.; Rosen, David B.; and Jones, Gary A., 4,722,071, Cl. 364-900.000.
Ross, Ludwig; Grabowski, Danuta; Speit, Burkhard; and Geiler, Volkmar. High PbO-content glasses in the system SiO_2—PbO—M_2O with increased chemical stability. 4,721,690, Cl. 501-60.000.
Rossi & Catelli S.p.A.: *See—*
Catelli, Camillo, 4,721,627, Cl. 426-478.000.
Rourke, John K.; Schwab, Gerhart; and Shackle, Dale R., to MHB Joint Venture. Method for preparing encapsulated cathode material. 4,720,910, Cl. 29-623.500.
Rouwendal, Jan W.: *See—*
Oomen, Joris J. C.; Claassens, Jacobus M. M.; and Rouwendal, Jan W., 4,721,886, Cl. 313-623.000.
Rowton, Richard L., to ARCO Chemical Company. Method for lowering reducing sugar content of glycoside compositions. 4,721,781, Cl. 536-4.100.
Royer, Lamar T., to United States of America, Energy. Extraction process for removing metallic impurities from alkalide metals. 4,721,525, Cl. 75-63.000.
Rubenstein, Robert L.: *See—*
Jachmann, Emil F.; Rubenstein, Robert L.; and Howells, Joseph A., 4,722,077, Cl. 369-25.000.
Rubner, Michael F., to GTE Laboratories Incorporated. Diacetylene segmented copolymers. 4,721,769, Cl. 528-75.000.
Ruby, Gary V.: *See—*
Flora, Laurence P.; and Ruby, Gary V., 4,722,085, Cl. 371-38.000.
Ruggio, Stanley R.: *See—*
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Rule, Arthur W. T., to John Wyeth & Brothers Limited. Fat compositions. 4,721,626, Cl. 426-601.000.
Rupprecht, James K.: *See—*
Mikolajczak, Kenneth L.; McLaughlin, Jerry L.; and Rupprecht, James K., 4,721,727, Cl. 514-473.000.
Sahm, Jurgen. Brushing and drying apparatus for hair. 4,721,122, Cl. 132-9.000.
Saidov, Mukhtar S.: *See—*
Abdukarimov, Erkin T.; Vetchinkin, Pavel M.; and Saidov, Mukhtar S., 4,721,838, Cl. 219-69.00E.
Saint-Gobain Vitrage: *See—*
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Kunert, Heinz; Sauer, Gerd; and Ohlenforst, Hans, 4,721,845, Cl. 219-203.000.
Saito, Hiroshi; Suzuki, Yasumichi; Sano, Shuuzoo; Shimizu, Tamotsu; and Aiuchi, Susumu, to Hitachi, Ltd. Method and apparatus for microwave assisting sputtering. 4,721,553, Cl. 204-192.120.
Saito, Masami: *See—*
Fukuda, Tadanori; Sakamoto, Sadayuki; and Saito, Masami, 4,721,377, Cl. 351-159.000.
Saito, Siro, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mounting structure. 4,721,292, Cl. 267-140.100.
Saito, Suzuo; Nakagawa, Teruo; Hirata, Akio; Mose, Tadao; Ichikawa, Kohsaku; Kawakami, Kazuto; and Kuga, Tsugunori, to Kabushiki Kaisha Toshiba. Turbine helper drive apparatus. 4,721,861, Cl. 290-4.00B.
Saito, Tadao: *See—*
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,721,345, Cl. 303-113.000.
Saito, Takuya: *See—*
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Saitoh, Sumio: *See—*
Takai, Nobuharu; and Saitoh, Sumio, 4,721,652, Cl. 428-403.000.
Sakabe, Yukio: *See—*
Nishioka, Goro; and Sakabe, Yukio, 4,721,692, Cl. 501-134.000.
Sakai, Mitsugu; and Matsubayashi, Nobuhide, to Olympus Optical Co., Ltd. Optical pickup device having a detector for detecting the light emitting intensity variation of a semiconductor light emitting element. 4,721,850, Cl. 250-201.000.
Sakai, Mituya; Hagimori, Kenji; and Asahi, Toshinori, to Okumura Corporation. Rock crushing device and a method thereof. 4,721,339, Cl. 299-1.000.
Sakai, Souichi; Nakano, Shoichi; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Method of manufacturing photovoltaic device. 4,721,629, Cl. 427-35.000.
Sakaida, Shoji: *See—*
Yoshimi, Takaharu; Sakaida, Shoji; and Mitsutome, Yasuyuki, 4,721,642, Cl. 428-90.000.
Sakakibara, Mitsuhiko; Nakako, Kaoru; and Fujimaki, Tatsuo, to Bridgestone Corporation; and Japan Synthetic Rubber Co., Ltd. Diene polymer composition containing copolymer derived from 2,3-dimethyl butadiene. 4,721,753, Cl. 525-99.000.
Sakamoto, Haruo; and Kawai, Fumihisa, to Du Pont de Nemours, E. I., and Company. Integrated circuit package with terminals having receptacles with elastic contacts. 4,721,484, Cl. 439-842.000.
Sakamoto, Hisashi: *See—*
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Sakamoto, Sadayuki: *See—*
Fukuda, Tadanori; Sakamoto, Sadayuki; and Saito, Masami, 4,721,377, Cl. 351-159.000.
Sakamoto, Toshinori, to Mazada Motor Corporation. Arrangements for forming automobile cowl structures. 4,721,032, Cl. 98-2.160.
Sakashita, Nobuo: *See—*
Tashiro, Mikio; Sakashita, Nobuo; Tatsuoka, Yasunori; Mitamura, Tamio; and Orii, Kazunori, 4,721,746, Cl. 524-145.000.
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Nakanishi, Minoru; Sakurai, Akira; and Kobayashi, Takatoshi, 4,721,647, Cl. 428-283.000.
Salame, Morris: *See—*
Richardson, John C.; and Salame, Morris, 4,721,654, Cl. 428-474.400.
Salkeld, David, to British Aerospace plc. Missile guidance systems. 4,721,270, Cl. 244-3.110.
Salley, Gordon L.; and Landphair, Donald K., to Deere & Company. Hitch flexing hinge. 4,721,167, Cl. 172-311.000.
Salowe, Seymour: *See—*
Engel, Joseph C.; Vercellotti, Leonard C.; Johnson, Richard A.; Salowe, Seymour; and Verbanets, William R., Jr., 4,722,059, Cl. 364-413.000.
Sanchez, George, to Clyde Industries Limited. Interchangeable rotary scrub brush nozzle with swivel. 4,720,883, Cl. 15-4.000.
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Sander, Michael C.: *See—*
Denk, Gregory J.; Sander, Michael C.; Bechtold, Harold E.; and Gurganus, Cecil R., 4,721,064, Cl. 119-156.000.
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Sanders, John D.; and Taylor, Jerry A., to Thermco Systems, Inc. Wafer transfer stand. 4,721,427, Cl. 414-417.000.
Sandis, Stylianos: *See—*
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Sano, Shojiro: *See—*
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Sano, Shuuzoo: *See—*
Saito, Hiroshi; Suzuki, Yasumichi; Sano, Shuuzoo; Shimizu, Tamotsu; and Aiuchi, Susumu, 4,721,553, Cl. 204-192.120.
Sano, Yoshikazu; Haga, Michio; and Okitsu, Toshio, to Hitachi Metals, Inc. High-chromium compound roll. 4,721,153, Cl. 164-448.000.
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Bernhart, Claude; Cautreels, Werner; and Gautier, Patrick, 4,721,710, Cl. 514-234.000.
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Sanshin Kogyo Kabushiki Kaisha: *See—*
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Santa Fe International Corporation: *See—*
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Recalde, Carlos E., 4,721,411, Cl. 405-168.000.
Santhanam, Chakra J.; Hanks, Richard W.; and Stickles, R. Peter, to Arthur D. Little, Inc. Pipeline transportation of coarse coal-liquid carbon dioxide slurry. 4,721,420, Cl. 406-197.000.
Santorineos, Christos. Balloon sealer. 4,721,545, Cl. 156-468.000.
Sanyo Electric Co., Ltd.: *See—*
Sakai, Souichi; Nakano, Shoichi; and Kuwano, Yukinori, 4,721,629, Cl. 427-35.000.
Saotome, Shigeru; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Mammographic radiation image recording and read-out apparatus. 4,721,856, Cl. 250-327.200.
Sasaki, Manji; Ebina, Chinchito; Okamura, Haruki; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. N,N',N'',N'''-tetrakis(substituted benzyl)-acetylenecarbamide derivatives. 4,721,792, Cl. 548-304.000.
Sasaki, Manji: *See—*
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Okamura, Haruki; and Shionoya, Masahisa, 4,721,744, Cl. 524-91.000.
Sashikawa, Yoshihiro: *See—*
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Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Thermosensitive recording sheet. 4,721,701, Cl. 503-209.000.

Sato, Gentei; and Kawakami, Haruo, to Nippon Sheet Glass Co., Ltd. Window antenna for a vehicle. 4,721,964, Cl. 343-713.000.
Sato, Haruhito: *See—*
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Sato, Isao: *See—*
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Sato, Kenichi: *See—*
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Sato, Kozo; Sato, Tadahisa; and Shibata, Takeshi, to Fuji Photo Film Co., Ltd. Color light-sensitive material. 4,721,667, Cl. 430-562.000.
Sato, Makoto: *See—*
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Sato, Tadahisa: *See—*
Sato, Kozo; Sato, Tadahisa; and Shibata, Takeshi, 4,721,667, Cl. 430-562.000.
Sato, Yukio: *See—*
Haruta, Kenyu; Wakata, Hitoshi; Sato, Yukio; and Nagai, Haruhiko, 4,722,090, Cl. 372-57.000.
Satsukawa, Hideaki: *See—*
Arima, Kenji; Kobayashi, Syoji; and Satsukawa, Hideaki, 4,722,023, Cl. 362-80.000.
Sauer, Gerd: *See—*
Kunert, Heinz; Sauer, Gerd; and Ohlenforst, Hans, 4,721,845, Cl. 219-203.000.
Sault, Patrick: *See—*
Parcevaux, Philippe; and Sault, Patrick, 4,721,160, Cl. 166-293.000.
Saunders, Charles A. Tree stand bow sight. 4,720,919, Cl. 33-265.000.
Saunders, Frederick W., III: *See—*
Olson, Richard A.; and Saunders, Frederick W., III, 4,721,661, Cl. 430-19.000.
Sauter, Erwin A., to Inovan-Stroebe GmbH & Co. KG. Electroplating apparatus. 4,721,554, Cl. 204-206.000.
Sawada, Shigeru: *See—*
Ito, Masazumi; Oyabu, Masaaki; Sawada, Shigeru; and Komura, Masaru, 4,721,382, Cl. 355-14.0SH.
Sawyer, George N.: *See—*
Helt, Robert W.; and Sawyer, George N., 4,720,981, Cl. 62-113.000.
Sbarra, Joseph: *See—*
Panunzi, Carlo; Grober, Henri; Sbarra, Joseph; and Zenner, Albert, 4,720,989, Cl. 72-221.000.
Scandella, Carl J.: *See—*
Uren, Jack R.; Robinson, Douglas E.; and Scandella, Carl J., 4,721,673, Cl. 435-183.000.
Scanlon, David W., to Instron Corporation. Axial loading material testing. 4,721,000, Cl. 73-833.000.
Scarati, Mario A.: *See—*
Caporiccio, Gerardo; Strepparola, Ezio; and Scarati, Mario A., 4,721,795, Cl. 549-445.000.
Scarnera, Michele; and Ciampolini, Franco, to Weber S.p.A. System for controlling fuel injectors to open asynchronously with respect to the phases of a heat engine. 4,721,086, Cl. 123-478.000.
Schadlich, Fritz: *See—*
Hornung, Friedrich; Schadlich, Fritz; Gerschner, Martin; and Gunther, Klaus, 4,722,021, Cl. 361-49.000.
Schaffer, Klaus: *See—*
Oldengott, Michael; and Schaffer, Klaus, 4,721,201, Cl. 198-535.000.
Schappert, Raymond F.; Makhlouf, Joseph M.; and Chau, Michael M., to PPG Industries, Inc. Polyurea-polyurethane acrylate dispersions. 4,721,751, Cl. 524-773.000.
Schaublin, Hans J., to Herbert Kannegiesser GmbH & Co. Apparatus for bonding sheet-like textile articles. 4,721,542, Cl. 156-353.000.
Schelchshorn, Joachim: *See—*
Tiltscher, Helmut; Wolf, Helmut; Schelchshorn, Joachim; and Dialer, Kurt, 4,721,826, Cl. 585-467.000.
Schepers, Herman A. J.; and Debets, Wilhelmus A. M., to Stami Carbon BV. Process for preparing an impact-resistant thermoplastic moulding compound. 4,721,752, Cl. 525-74.000.
Schering Aktiengesellschaft: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Nickolson, Robert; Haberey, Martin; Loge, Olaf; and Stuerzebecher, Claus-Steffen, 4,721,729, Cl. 514-691.000.
Schering Corporation: *See—*
Berger, Joel G., 4,721,726, Cl. 514-464.000.
Schetina, Otto: *See—*
Wrulich, Herwig; Zitz, Alfred; and Schetina, Otto, 4,721,340, Cl. 299-1.000.
Scheuneman, James H., to Sperry Corporation. Multiple unit adapter. 4,722,052, Cl. 364-200.000.
Schiffermuller, August: *See—*
Barnscheidt, Wolfgang; von Borries, Horst; Rautenbach, Robert; Schiffermuller, August; Zimmermann, Hubert; and Lamort, Jean-Pierre, 4,721,562, Cl. 209-170.000.
Schiller, Harald: *See—*
Bartko, Kristine; Gaebler, Dieter; Heinrich, Peter; and Schiller, Harald, 4,720,988, Cl. 72-105.000.
Schimandle, John J.: *See—*
Haddad, Muin S.; and Schimandle, John J., 4,721,607, Cl. 423-277.000.
Schindler, Frederick J., to Rohm and Haas Company. Vinyl monomer compositions with accelerated surface cure. 4,721,757, Cl. 525-145.000.
Schintgen, Jean-Marie; and Zeitoun, Bruno. Retractable needle biopsy forceps and improved control cable therefor. 4,721,116, Cl. 128-751.000.
Schirmer, Robert M.; Alquist, Henry E.; and Fromm, Ellsworth H., to Phillips Petroleum Company. Method and apparatus for burning nitrogen-containing fuels. 4,721,454, Cl. 431-10.000.
Schlaepfer, Hans-Wister: *See—*
Christ, Alfred; Lehmann, Rolf; and Schlaepfer, Hans-Wister, 4,721,154, Cl. 164-452.000.
Schlegel, William S.: *See—*
Fruehauf, Vernon P.; Hoefling, Albert H.; and Schlegel, William S., 4,721,592, Cl. 264-171.000.
Schlientz, Rainer W., to Ludopark AG. Structure assembled from structural members. 4,721,299, Cl. 272-113.000.
Schlossmann, Klaus: *See—*
Goldmann, Siegfried; Bossert, Friedrich; Ahr, Hans J.; Bischoff, Hilmar; Puls, Walter; Petzinna, Dieter; Schlossmann, Klaus; and Bender, Joachim, 4,721,719, Cl. 514-302.000.
Schlumberger Technology Corporation: *See—*
Richardson, Neil, 4,721,909, Cl. 324-158.00R.
Wraight, Peter D., 4,721,853, Cl. 250-269.000.
Schmidt, Dieter: *See—*
Goppelt, Dieter; and Schmidt, Dieter, 4,721,076, Cl. 123-90.550.
Schmidt, Herbert; Haberland, Wilhelm; and Endler, Wolfgang, to ITT Industries, Inc. Mechanical actuating device for spot-type disc brakes. 4,721,190, Cl. 188-71.900.
Schmidt, Peter C.: *See—*
Krug, Russell R.; and Schmidt, Peter C., 4,721,603, Cl. 422-147.000.
Schmidt, Robert R.: *See—*
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Ese, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,721,785, Cl. 544-194.000.
Schmitges, Claus J.: *See—*
Raddatz, Peter; Holzemann, Gunter; Schmitges, Claus J.; and Minck, Klaus O., 4,721,776, Cl. 530-323.000.
Schmitz, Konrad: *See—*
Ahle, Bernhard; Marks, Hubert; Pokraka, Gerd; Schmitz, Konrad; Sellman, Josef; Wigger, Hermann-Josef; and Kathmann, Franz, 4,722,029, Cl. 362-66.000.
Schnell, Hans-Georg, to Pforzheimer Uhren-Rohwerke PORTA GmbH. Arrangement for limiting the axial play of gears of a watch time indicating mechanism. 4,722,076, Cl. 368-220.000.
Schnetzer, Michel W., to Ball Corporation. Multi-stage power divider. 4,721,929, Cl. 333-127.000.
Schreck, John F.: *See—*
Kaszubinski, Jeffrey K.; Wilmoth, David D.; Coffman, Timmie M.; and Schreck, John F., 4,722,075, Cl. 365-226.000.
Schreiber, Paris H. S. Firearm with foreign matter receiving cavities. 4,720,930, Cl. 42-62.000.
Schreuder, Johannes C. P., to Chemish Adviesbureau Drs. J.C.P. Schreuder B.V. Skin treatment compositions. 4,721,705, Cl. 514-54.000.
Schron, Jack H.; and Seidel, Lawrence H., to Jergens, Inc. Self-locking clamping device. 4,721,293, Cl. 269-32.000.
Schumacher, Edward R.: *See—*
Zeisse, Carl R.; and Schumacher, Edward R., 4,721,836, Cl. 219-10.670.
Schumacher, John E., III, to New West Technology Corporation. Process for producing printed circuit board having improved adhesion. 4,721,530, Cl. 204-15.000.
Schumann, Franz W., to FIBEG Beteiligungsgesellschaft mbH. Process for removing harmful residues from food during cooking. 4,721,624, Cl. 426-384.000.
Schupp, Eberhard; Osterloh, Rolf; Loch, Werner; and Ahlers, Klaus, to BASF Aktiengesellschaft. Binders for cathodic electrocoating which contain non-tertiary basic amino groups in addition to phenolic mannich bases. 4,721,758, Cl. 525-490.000.
Schwab, Gerhart: *See—*
Rourke, John K.; Schwab, Gerhart; and Shackle, Dale R., 4,720,910, Cl. 29-623.500.
Schwamborn, Michael; Heywang, Gerhard; Dickore, Karlfried; Lunkenheimer, Winfried; and Fedtke, Carl, to Bayer Aktiengesellschaft. Herbicidal agents containing photosynthesis-inhibiting herbicides in combination with carbamate derivatives. 4,721,523, Cl. 71-93.000.
Schwartz, Craig; Hendrick, Louis; and Elliott, Joseph, to Hughes Aircraft Company. Dual mode waveguide filter employing coupling element for asymmetric response. 4,721,933, Cl. 333-212.000.
Schwarz, Fritz: *See—*
Grosskurth, Hans; and Schwarz, Fritz, 4,721,399, Cl. 384-448.000.
Schwarz, Helmut: *See—*
Kratt, Alfred; Nusser, Hermann; Plapp, Gunther; and Schwarz, Helmut, 4,721,281, Cl. 251-54.000.
Schwarzmeir, Karl: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeir, Karl, 4,721,450, Cl. 425-405.00H.
Schwerdtfeger, Klaus: *See—*
Reichelt, Wolfgang; Schwerdtfeger, Klaus; and Voss-Spilker, Peter, 4,721,152, Cl. 164-429.000.
Schwerin, Gunther: *See—*
Hesse, Horst; Schwerin, Gunther; and Steprath, Werner, 4,721,001, Cl. 73-862.570.
Sciotronic Limited: *See—*
Muttitt, Raymond I., 4,721,111, Cl. 128-640.000.
Scoones, Albert E., to Hunter Douglas International, N.V. Screen ceiling assembly. 4,720,954, Cl. 52-489.000.

Scot, Incorporated: *See—*
Nordhaus, John P., 4,721,272, Cl. 244-122.0AF.
Scott, Garry E.: *See—*
Quinton, Brian P.; and Scott, Garry E., 4,720,923, Cl. 33-644.000.
Scott, Joel E. Photograph logging apparatus and method. 4,721,971, Cl. 354-105.000.
Seidel, David B.; and Slutz, Stephen A., to United States of America, Energy. Uniform insulation applied-B ion diode. 4,721,889, Cl. 315-111.810.
Seidel, Lawrence H.: *See—*
Schron, Jack H.; and Seidel, Lawrence H., 4,721,293, Cl. 269-32.000.
Seiko Instruments & Electronics Ltd.: *See—*
Hayamizu, Mamoru; and Tsukada, Nobuo, 4,721,058, Cl. 118-663.000.
Seki, Masaki: *See—*
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,722,045, Cl. 364-171.000.
Sekimoto, Yukihiko: *See—*
Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,721,577, Cl. 252-8.551.
Sekiso Co., Ltd.: *See—*
Ohkochi, Katsutoshi; Shinozaki, Mamoru; Ohshita, Toshiyuki; Kitano, Masayasu; and Kamata, Seizo, 4,721,159, Cl. 166-286.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Harayama, Hiroshi; Nishimura, Hideo; Ohmura, Satoshi; Yoshino, Yutaka; Tanaka, Rikizou; and Kuno, Fumimasa, 4,721,643, Cl. 428-90.000.
Selenia Industrie Elettroniche Associate S.p.A.: *See—*
Masdea, Arturo; Bartolini, Pietro; Colavito, Gianfranco; and Neri, Filippo, 4,721,924, Cl. 331-1.00R.
Selivansky, Dror: *See—*
Nunning, Walter J.; Plischke, LeMoyne W.; Selivansky, Dror; Southern, John H.; and Wu, Chester C., 4,721,650, Cl. 428-369.000.
Sellman, Josef: *See—*
Ahle, Bernhard; Marks, Hubert; Pokraka, Gerd; Schmitz, Konrad; Sellman, Josef; Wigger, Hermann-Josef; and Kathmann, Franz, 4,722,029, Cl. 362-66.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,721,988, Cl. 357-23.140.
Senco Products, Inc.: *See—*
Cotta, Gilbert A., 4,721,240, Cl. 227-10.000.
Sencore, Inc.: *See—*
Wittrock, Glen, 4,721,997, Cl. 358-10.000.
Sengewald, Karl-Heinz. Bag and method of manufacturing the same. 4,721,396, Cl. 383-8.000.
Sequa Corporation: *See—*
Cogswell, John; and Fokos, Robert F., 4,721,504, Cl. 493-440.000.
Seth, Pawan: *See—*
Seth, Pyare; and Seth, Pawan, 4,721,709, Cl. 514-221.000.
Seth, Pyare; and Seth, Pawan. Novel pharmaceutical compositions containing hydrophobic practically water-insoluble drugs adsorbed on pharmaceutical excipients as carrier; process for their preparation and the use of said compositions. 4,721,709, Cl. 514-221.000.
SGS Microelettronica S.p.A.: *See—*
Contiero, Claudio; Galbiati, Paola; and Andreini, Antonio, 4,721,686, Cl. 437-31.000.
SGS Microelettronica SpA: *See—*
Musumeci, Salvatore, 4,721,684, Cl. 437-30.000.
Shackle, Dale R.: *See—*
Rourke, John K.; Schwab, Gerhart; and Shackle, Dale R., 4,720,910, Cl. 29-623.500.
Shafer, Scott F.: *See—*
Krauja, Ziedonis I.; Krieger, Jeffrey J.; Shafer, Scott F.; and Kroeger, Craig A., 4,721,081, Cl. 123-298.000.
Shaffer, Peter T. B.: *See—*
Sheldon, Zachary D.; and Shaffer, Peter T. B., 4,721,524, Cl. 75-0.50A.
Shagarova, Bella U.; Reemet, Olev G.; Purga, Aare P.; and Tikhonov, Oleg N. Disintegrator. 4,721,259, Cl. 241-57.000.
Shaker Tinning & Heating Co.: *See—*
Mintz, Alvin, 4,720,983, Cl. 62-259.100.
Sharp Kabushiki Kaisha: *See—*
Deguchi, Toshihisa; Inui, Tetsuya; Fujii, Yoshikazu; and Yamaoka, Hideyoshi, 4,721,368, Cl. 350-377.000.
Endo, Yoshihiro; Yamashita, Takuo; and Ogawa, Ikuo, 4,721,631, Cl. 427-66.000.
Shatto, Howard L., to Shell Offshore Inc. Well base in ocean floor. 4,721,415, Cl. 405-226.000.
Shaw, Herbert J.: *See—*
Sorin, Wayne V; Liu, Karen; and Shaw, Herbert J., 4,721,352, Cl. 350-96.150.
Shawver, Michael J.; and Lobianco, Robert T., to LAM Research Corporation. Vacuum chamber gate valve. 4,721,282, Cl. 251-62.000.
Shee, William S. Package for holding and using ampules. 4,721,204, Cl. 206-210.000.
Sheehan, William R.: *See—*
Louie, Ming K.; and Sheehan, William R., 4,721,756, Cl. 523-145.000.
Sheldon, Anthony J.; and Rolt, Anthony P. R., to Harry Ferguson Limited. Differential drive arrangement. 4,721,010, Cl. 74-650.000.
Sheldon, Zachary D.; and Shaffer, Peter T. B., to PDP Alloys, Inc. Non-pyrophoric submicron alloy powders of Group VIII metals. 4,721,524, Cl. 75-0.50A.
Shell Electric Mfg. (Holdings) Co., Ltd.: *See—*
Yung, Yau, 4,721,480, Cl. 439-527.000.
Shell Offshore Inc.: *See—*
Shatto, Howard L., 4,721,415, Cl. 405-226.000.
Shell Oil Company: *See—*
Edwards, Charles L., 4,721,816, Cl. 568-618.000.
Edwards, Charles L., 4,721,817, Cl. 518-618.000.
Fried, Herbert E., 4,721,819, Cl. 568-675.000.
Graafland, Teunis, 4,721,760, Cl. 526-238.230.
Mason, Ronald F.; and Briner, Paul H., 4,721,793, Cl. 548-953.000.
Mulder, Albertus J., 4,721,798, Cl. 549-533.000.
Shelnut, James: *See—*
Dooley, Thomas; and Shelnut, James, 4,721,665, Cl. 430-169.000.
Shepard, Kenneth L.; and Graham, Samuel L., to Merck & Co., Inc. Substituted thiophene-2-sulfonamide antiglaucoma agents. 4,721,794, Cl. 549-65.000.
Sherif, Fawzy G.: *See—*
Tieckelmann, Robert H.; and Sherif, Fawzy G., 4,721,659, Cl. 428-701.000.
Sherwin, Martin B.; Wang, Shu-Chieh P.; and Montgomery, Stewart R., to W. R. Grace & Co. Synthesis of aliphatic polyamines. 4,721,811, Cl. 564-491.000.
Sherwin-Williams Company, The: *See—*
Doshi, Jyotindra K., 4,721,747, Cl. 524-261.000.
Shewchuk, James G. Hockey safety net. 4,721,306, Cl. 273-127.00B.
Shibagaki, Kouichi: *See—*
Mochizuki, Takashi; Shibagaki, Kouichi; and Mizuno, Shoji, 4,722,002, Cl. 358-133.000.
Shibata, Makoto: *See—*
Kanayama, Hiroshi; Shimasaki, Keiichi; and Shibata, Makoto, 4,721,314, Cl. 277-152.000.
Shibata, Takeshi: *See—*
Sato, Kozo; Sato, Tadahisa; and Shibata, Takeshi, 4,721,667, Cl. 430-562.000.
Shih, Yen-Jer: *See—*
Iovine, Carmine P.; Shih, Yen-Jer; and Foreman, Paul B., 4,721,748, Cl. 524-460.000.
Shimada, Nobuyoshi: *See—*
Yoshiji, Takeo; Uzuyama, Kimitake; Shimada, Nobuyoshi; and Hoshino, Takayuki, 4,721,005, Cl. 74-479.000.
Shimada, Toshikazu: *See—*
Itoh, Haruo; Shimada, Toshikazu; Muramatsu, Shin-ichi; Matsubara, Sunao; and Nakamura, Nobuo, 4,721,535, Cl. 136-258.000.
Shimamuki, Senji: *See—*
Nomura, Shunji; Shimamuki, Senji; Hashimoto, Susumu; and Yamashita, Tomohisa, 4,721,547, Cl. 156-603.000.
Shimasaki, Keiichi: *See—*
Kanayama, Hiroshi; Shimasaki, Keiichi; and Shibata, Makoto, 4,721,314, Cl. 277-152.000.
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, to Canon Kabushiki Kaisha. Silicon film deposition from mixture of silanes. 4,721,664, Cl. 430-128.000.
Shimizu, Keiichirou; and Gotou, Yukifumi, to Kabushiki Kaisha Toshiba. Multi-type air conditioner with optimum control for each load. 4,720,982, Cl. 62-204.000.
Shimizu, Tamotsu: *See—*
Saito, Hiroshi; Suzuki, Yasumichi; Sano, Shuuzoo; Shimizu, Tamotsu; and Aiuchi, Susumu, 4,721,553, Cl. 204-192.120.
Shimizu, Yoshaburo: *See—*
Nakata, Masaru; Sato, Kenichi; Kawai, Isama; Ohishi, Katsumi; Obe, Mitsuhiko; Nishikawa, Takao; Shimizu, Yoshaburo; and Hinoue, Kenji, 4,721,031, Cl. 98-2.090.
Shimomura, Akihiro: *See—*
Hosoi, Noriyuki; Shimomura, Akihiro; and Itabashi, Yuichi, 4,721,700, Cl. 503-200.000.
Shimomura, Nobuo, to Kabushiki Kaisha Toshiba. Coffee maker or like beverage making device. 4,721,034, Cl. 99-280.000.
Shimonosono, Hitoshi: *See—*
Fujigaya, Kazuyuki; Hirano, Yoshinori; and Shimonosono, Hitoshi, 4,721,071, Cl. 123-41.210.
Shimp, David A.; and Boyd, Jack D., to BASF Corporation. Bis-maleimide resin systems and structural composites prepared therefrom. 4,721,639, Cl. 428-40.000.
Shin Etsu Chemical Co., Ltd.: *See—*
Fujiki, Hironao; and Tanaka, Hiroyuki, 4,721,764, Cl. 528-15.000.
Inoue, Yoshio; Arai, Masatoshi; and Yokoo, Koji, 4,721,765, Cl. 528-18.000.
Inoue, Yoshio; Arai, Masatoshi; and Yokoo, Koji, 4,721,766, Cl. 528-18.000.
Shin Nihon Chemical Industry Co., Ltd.: *See—*
Kawano, Fusao, 4,721,691, Cl. 501-108.000.
Shinozaki, Mamoru: *See—*
Ohkochi, Katsutoshi; Shinozaki, Mamoru; Ohshita, Toshiyuki; Kitano, Masayasu; and Kamata, Seizo, 4,721,159, Cl. 166-286.000.
Shionoya, Masahisa: *See—*
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Okamura, Haruki; and Shionoya, Masahisa, 4,721,744, Cl. 524-91.000.
Shirako, Hideo; and Ishikawa, Kazuhide, to Olympus Optical Co., Ltd. Tape cassette for cleaning use. 4,722,016, Cl. 360-128.000.
Shiring, Francis J., III: *See—*
Cullo, Leonard A.; Restelli, Edward F., Jr.; and Shiring, Francis J., III, 4,721,827, Cl. 585-467.000.
Shoemaker, Randy R., to Tex Shoemaker & Sons, Inc. Spring retainer shoulder holster. 4,721,238, Cl. 224-243.000.

Shopsmith, Inc.: *See—*
Bartlett, Robert L.; Legler, John G.; and Folkerth, Harold E., 4,721,023, Cl. 83-100.000.
Shuman, Curtis. Safety jumper cables. 4,721,479, Cl. 439-503.000.
Sibley, Richard D.: *See—*
Keller, William F.; and Sibley, Richard D., 4,721,027, Cl. 91-387.000.
Siekert, John E.: *See—*
Creps, Bruce W.; George, Donald A.; Berry, Peter B.; Siekert, John E.; Nyquist, Robert C.; and Nyquist, Jeffrey B., 4,721,320, Cl. 280-204.000.
Siemens Aktiengesellschaft: *See—*
Dempf, Josef; and Moser, Erich, 4,721,229, Cl. 221-13.000.
Fazekas, Peter, 4,721,855, Cl. 250-310.000.
Goepfert, Wolfgang; Proebster, Walter; and Will, Dieter-Josef, 4,721,351, Cl. 350-96.150.
Haendle, Joerg, 4,722,097, Cl. 378-99.000.
Kaiser, Juergen; and Kerler, Rudolf, 4,721,261, Cl. 242-4.00B.
Kestler, Joachim, 4,721,915, Cl. 324-322.000.
Neumann, Helmut, 4,721,911, Cl. 324-309.000.
Votter, Max, 4,721,206, Cl. 206-334.000.
Wolf, Hans D., 4,722,088, Cl. 372-44.000.
Sigal, Catherine T.: *See—*
McWilliams, John P.; Nemet-Mavrodin, Margaret I.; Sigal, Catherine T.; and Wilson, Robert C., Jr., 4,721,824, Cl. 585-448.000.
Siligoni, Marco: *See—*
Poletto, Vanni; and Siligoni, Marco, 4,721,920, Cl. 330-255.000.
Silvertown House: *See—*
Woodhouse, Ian, 4,721,330, Cl. 285-177.000.
Sim, James W.: *See—*
Smith, James L.; Sim, James W.; and Kucera, Eugenia H., 4,721,513, Cl. 29-623.500.
Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Device for a series-produced sheet-fed offset rotary press. 4,721,041, Cl. 101-230.000.
Simmons, George W. Safety ground system. 4,721,872, Cl. 307-10.00R.
Simon, Michael J. Proofing machine. 4,721,383, Cl. 355-91.000.
Simonazzi, Adriano. Continuously rotating filling device with bottle control means. 4,721,138, Cl. 141-150.000.
Simonetta, Marco; and Di Claudio, Giacomo, to Snamprogetti S.p.A. Thermal cracking furnace for producing vinyl chloride. 4,721,604, Cl. 422-189.000.
Simpson Products, Inc.: *See—*
Simpson, Steven C.; Witt, Ronald D.; and Volkland, Gregory E., 4,720,939, Cl. 51-135.00R.
Simpson, Steven C.; Witt, Ronald D.; and Volkland, Gregory E., to Simpson Products, Inc. Wide belt sander cleaning device. 4,720,939, Cl. 51-135.00R.
Sims, Roger D.: *See—*
Bell, Edward A.; and Sims, Roger D., 4,721,426, Cl. 414-340.000.
Skan-A-Matic Corp.: *See—*
Troendle, Dale, 4,721,860, Cl. 250-568.000.
Skidmore, Michael L.: *See—*
Thorn, John E.; and Skidmore, Michael L., 4,720,951, Cl. 52-208.000.
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Nickolson, Robert; Haberey, Martin; Loge, Olaf; and Stuerzebecher, Claus-Steffen, to Schering Aktiengesellschaft. Novel carbacyclins, process for the preparation thereof, and their use as medicinal agents. 4,721,729, Cl. 514-691.000.
Slautterback Corporation: *See—*
Colton, Douglas E., 4,721,252, Cl. 239-424.500.
Slutz, Stephen A.: *See—*
Seidel, David B.; and Slutz, Stephen A., 4,721,889, Cl. 315-111.810.
SMC Kabushiki Kaisha: *See—*
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Smiley, Malcolm J.; and Groves, Bruce, to Merriman/Yacht Specialties, Inc. Pedestal wheel steering system having universal self-adjusting idler. 4,721,052, Cl. 114-160.000.
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CLASS 273

73 E 4,721,304
73 J 4,721,305
127 B 4,721,306
143 R 4,721,307
148 B 4,721,308
148 R 4,721,309

CLASS 277

22 4,721,311
37 4,721,312
53 4,721,313
152 4,721,314
235 B 4,721,315

CLASS 280

32.6 4,721,316
33.99 F 4,721,317
91 4,721,318
169 4,721,319
204 4,721,320
242 WC 4,721,321
276 4,721,322
433 4,721,323
504 4,721,324
668 4,721,325
673 4,721,326
705 4,721,327
4,721,328
751 4,721,329

CLASS 285

177 4,721,330
305 4,721,331

CLASS 290

4 R 4,721,861

CLASS 292

128 4,721,332

CLASS 293

146 4,721,333

CLASS 294

99.2 4,721,334
104 4,721,335

CLASS 296

97 H 4,721,310
100 4,721,336

CLASS 297

344 4,721,337
379 4,721,338

CLASS 299

1 4,721,339
4,721,340
81 4,721,341

CLASS 301

63 PW 4,721,342

CLASS 303

6 C 4,721,343
20 4,721,344
113 4,721,345
115 4,721,346

CLASS 307

10 R 4,721,862
4,721,872
89 4,721,863
106 4,721,864
350 4,721,865
451 4,721,866
456 4,721,867
465 4,721,868
520 4,721,870
570 4,721,869
571 4,721,871

CLASS 310

12 4,721,873
333 4,721,874

CLASS 312

219 4,721,347

CLASS 313

15 4,721,875
25 4,721,876
111 4,721,877
362.1 4,721,878
402 4,721,879
422 4,721,880
465 4,721,881
481 4,721,882
505 4,721,883
525 4,721,884
576 4,721,885
623 4,721,886
4,721,887

CLASS 315

60 4,721,888
111.81 4,721,889
224 4,721,890
340 4,721,891

CLASS 318

38 4,721,892
332 4,721,893
473 4,721,894
618 4,721,895
685 4,721,896
767 4,721,897
827 4,721,898

CLASS 320

1 4,721,899

CLASS 323

356 4,721,900

CLASS 324

58 B 4,721,901
58.5 B 4,721,902
72.5 4,721,903
83 D 4,721,905
83 R 4,721,904
132 4,721,906
139 4,721,774
158 F 4,721,907
4,721,908
158 R 4,721,909
4,721,910
309 4,721,911
4,721,912
B1 4,506,222
318 4,721,913
320 4,721,914
322 4,721,915
544 4,721,916
558 4,721,917

CLASS 328

233 4,721,918

CLASS 330

146 4,721,919
255 4,721,920
260 4,721,921
263 4,721,922
284 4,721,923

CLASS 331

1 R 4,721,924
154 4,721,925

CLASS 332

16 T 4,721,926
4,721,927
31 R 4,721,928

CLASS 333

127 4,721,929
137 4,721,930
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CLASS 335

300 4,721,934

CLASS 336

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CLASS 337

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321 4,721,937

CLASS 338

4 4,721,938
162 4,721,939
163 4,721,940

CLASS 340

59 4,721,941
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347 CC 4,721,944
347 DA 4,721,943
515 4,721,945
521 4,721,946
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568 4,721,948
580 4,721,949
603 4,721,950
701 4,721,951
729 4,721,952
825.17 4,721,953
825.31 4,721,954
825.47 4,721,955
825.56 4,721,956
870.39 4,721,957

CLASS 341

13 4,721,958
153 4,721,959
368 4,721,960
458 4,721,961

CLASS 343

702 4,721,962
712 4,721,963
713 4,721,964
715 4,721,965
754 4,721,966

CLASS 346

110 V 4,721,967
136 4,721,968
157 4,721,969

CLASS 350

1.7 4,721,349
96.15 4,721,350
4,721,351
4,721,352
96.18 4,721,353
96.20 4,721,354
4,721,355
4,721,356
4,721,357
96.21 4,721,358
96.26 4,721,359
96.34 4,721,360
128 4,721,361
320 4,721,362
331 T 4,721,363
332 4,721,364
336 4,721,365
345 4,721,366
350 S 4,721,367
377 4,721,368
413 4,721,369
418 4,721,370
427 4,721,371
464 4,721,372
482 4,721,373
538 4,721,374
4,721,375
610 4,721,376

CLASS 351

159 4,721,377
205 4,721,378
212 4,721,379

CLASS 353

66 4,721,380

CLASS 354

21 4,721,970
105 4,721,971
195.1 4,721,972
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303 4,721,974
408 4,721,975
441 4,721,976

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3 DD 4,721,982
3 R 4,721,977
4 4,721,978
11 4,721,979
14 R 4,721,381
14 SH 4,721,382
26 4,721,980
75 4,721,981
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5 4,721,385
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445 4,721,389

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13 4,721,984
15 4,721,985
23.14 4,721,988
23.4 4,721,986
23.6 4,721,987
24 4,721,989
41 4,721,990
67 4,721,991
70 4,721,992
4,721,993
4,721,994
88 4,721,995
92 4,721,996

CLASS 358

110 4,721,997
37 4,721,998
44 4,721,999
98 4,722,000
100 4,722,001
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135 4,722,003
139 4,722,004
168 4,722,005
171 4,722,006
180 4,722,007
283 4,722,008

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8 4,722,009
46 4,722,010
93 4,722,011
97 4,722,012
105 4,722,013
106 4,722,014
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4,722,016
133 4,722,017

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22 4,722,018
4,722,019
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212 4,722,025
4,722,026
400 4,722,027
424 4,722,022

CLASS 362

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66 4,722,029
69 4,722,030
78 4,722,031
80 4,722,023
4,722,032
4,722,033
86 4,722,034
109 4,722,035
203 4,722,036
231 4,722,037
253 4,722,038
296 4,722,039
308 4,721,093

CLASS 363

17 4,722,040
18 4,722,041
98 4,722,042

CLASS 364

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167 4,722,044
171 4,722,045
200 4,722,046
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4,722,051
4,722,052
401 4,722,053
4,722,054
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490 4,722,060
494 4,722,061
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746 4,722,067
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767 4,722,069
900 4,722,070
4,722,071
4,722,072

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226 4,722,075

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171 4,721,391
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CLASS 369

25 4,722,077
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254 4,722,080

CLASS 370

3 4,722,081
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95 4,722,083

CLASS 371

9 4,722,084
38 4,722,085

CLASS 372

33 4,722,086
44 4,722,087
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50 4,722,089
57 4,722,090
83 4,722,091
96 4,722,092

CLASS 375

75 4,722,093

CLASS 376

150 4,721,595
189 4,721,596
261 4,721,597

CLASS 377

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99 4,722,097

CLASS 379

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CLASS 383

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99 4,721,398
448 4,721,399

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121 4,721,401
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637 4,721,402

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82 4,721,403
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CLASS 403

2 4,721,405
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212 4,721,414
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227 4,721,416
4,721,417
231 4,721,418

CLASS 406

88 4,721,419
197 4,721,420

CLASS 407

63 4,721,421
233 4,721,422

CLASS 409

234 4,721,423

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298 4,721,425
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316 4,721,438
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371 4,721,440
407 4,721,441
499 4,721,442
539 4,721,443
540 4,721,444

CLASS 418

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CLASS 419

8 4,721,598
23 4,721,599

CLASS 420

57 4,721,600

CLASS 422

68 4,721,601
133 4,721,602
147 4,721,603
189 4,721,604

CLASS 423

34 4,721,605
54 4,721,606
277 4,721,607
315 4,721,608
329 4,721,609
351 Re.32,584
436 4,721,610
655 4,721,611

CLASS 424

1.1 4,721,612
19 4,721,613
52 4,721,614
57 4,721,615
83 4,721,616
92 4,721,617
101 4,721,618
459 4,721,619

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84 4,721,446
94 4,721,453
141 4,721,447
144 4,721,448
187 4,721,449
405 H 4,721,450
503 4,721,451
547 4,721,452

CLASS 426

6 4,721,620
16 4,721,621
94 4,721,622
150 4,721,623
286 4,721,624
418 4,721,625
478 4,721,627
601 4,721,626

CLASS 427

1 4,721,628
35 4,721,629
66 4,721,631
108 4,721,632
212 4,721,633
263 4,721,634
421 4,721,630

CLASS 428

15 4,721,635
36 4,721,637
38 4,721,636
80 4,721,638
4,721,639
65 4,721,640
88 4,721,641
90 4,721,642
4,721,643
91 4,721,644
113 4,721,645
143 4,721,646
283 4,721,647
297 B1 4,543,288
317.7 4,721,648
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369 4,721,650
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463 4,721,652
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650 4,721,656
849 4,721,657
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901 4,721,659

CLASS 429

40 4,721,660

CLASS 430

39 4,721,661
82 4,721,662
85 4,721,663
128 4,721,664
160 4,721,665
213 4,721,666
362 4,721,667

CLASS 431

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295 4,721,455
378 4,721,456

CLASS 432

58 4,721,457
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241 4,721,459
4,721,460
247 4,721,461
253 4,721,462

CLASS 433

34 4,721,463
74 4,721,464
137 4,721,465
171 4,721,466

CLASS 434

187 4,721,467
260 4,721,468

CLASS 435

4 4,721,668
4,721,669
128 4,721,670
168 4,721,671
4,721,672
183 4,721,673
204 4,721,674
239 4,721,675
253 4,721,676
291 4,721,677
296 4,721,678
301 4,721,679

CLASS 436

180 4,721,680
523 4,721,681

CLASS 437

20 4,721,683
30 4,721,684
31 4,721,685
4,721,686
33 4,721,682
69 4,721,687
115 4,721,688
189 4,721,689
192 4,720,458

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13 4,721,469
55 4,721,470
78 4,721,471
79 4,721,472
4,721,473
125 4,721,474
133 4,721,475
142 4,721,476
264 4,721,477
278 4,721,478
328 4,721,348
503 4,721,479
527 4,721,480
561 4,721,481
595 4,721,482
610 4,721,483
842 4,721,484

CLASS 440

77 4,721,485

CLASS 441

6 4,721,486
80 4,721,487

CLASS 442

30 4,721,488

CLASS 446

23 4,721,489
82 4,721,490
222 4,721,491

CLASS 464

18 4,721,492
157 4,721,493

CLASS 474

88 4,721,494
135 4,721,495
205 4,721,496
255 4,721,497
281 4,721,498

CLASS 493

152 4,721,499
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193 4,721,501
4,721,502
413 4,721,503
840 4,721,504

CLASS 494

74 4,721,505

CLASS 501

21 4,721,693
60 4,721,690
108 4,721,691
134 4,721,692

CLASS 502

18 4,721,694
4,721,695

CLASS 504

210 4,721,696
400 4,721,697
407 4,721,698
419 4,721,699

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100 4,721,700
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217 4,721,702
227 4,721,703

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78 4,721,706
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221 4,721,709
234 4,721,710
247 4,721,711
251 4,721,716
253 4,721,712
255 4,721,713
4,721,715
258 4,721,714
274 4,721,717
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302 4,721,719
304 4,721,720
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317 4,721,722
321 4,721,723
396 4,721,724
412 4,721,725
464 4,721,726
473 4,721,727
547 4,721,728
691 4,721,729

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818 4,721,817

CLASS 521

53 4,721,730
59 4,721,731
63 4,721,732
157 4,721,733

CLASS 522

8 4,721,734
71 4,721,735

CLASS 523

122 4,721,736
136 4,721,737
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161 4,721,739
215 4,721,740
400 4,721,741
417 4,721,742
427 4,721,743

CLASS 524

91 4,721,744
86 4,721,745
145 4,721,746
281 4,721,747
460 4,721,748
526 4,721,749
533 4,721,750
773 4,721,751

CLASS 525

74 4,721,752
99 4,721,753
194 4,721,754
245 4,721,756
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432 4,721,755
490 4,721,758
528 4,721,759

CLASS 526

68 4,721,761
75 4,721,762
88 4,721,763
4,721,760

CLASS 528

4,721,764
4,721,765
4,721,766
55 4,721,767
69 4,721,768
75 4,721,769
109 4,721,770
222 4,721,771
336 4,721,772
491 4,721,773

CLASS 530

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323 4,721,776
389 4,721,777
501 4,721,778

CLASS 534

577 4,721,779

CLASS 536

4.1 4,721,781
18.6 4,721,780

CLASS 540

607 4,721,782

CLASS 544

58.1 4,721,783
105 4,721,784
194 4,721,785

CLASS 546

89 4,721,787
246 4,721,788
250 4,721,789

CLASS 548

237 4,721,790
255 4,721,791
288 4,721,792
953 4,721,793

CLASS 549

85 4,721,794
845 4,721,795
864 4,721,796
893 4,721,797
533 4,721,798
552 4,721,799

CLASS 550

878 4,721,801

CLASS 556

405 4,721,800

CLASS 558

807 4,721,802

CLASS 560

41 4,721,803
128 4,721,804
254 4,721,805
352 4,721,806
4,721,807

CLASS 562

473 4,721,808

CLASS 564

82 4,721,809
379 4,721,810
891 4,721,811

CLASS 568

233 4,721,813
81 4,721,812
82 4,721,814
120 4,721,818
312 4,721,815
638 4,721,816
875 4,721,819
889 4,721,820
931 4,721,821

CLASS 570

201 4,721,822

CLASS 580

20 4,721,823
848 4,721,824
462 4,721,825
867 4,721,826
4,721,827
500 4,721,828

CLASS 604

51 4,721,506
100 4,721,507
128 4,721,508

CLASS 623

14 4,721,509
55 4,721,510

D2—	195	293,845		478	293,865		395	293,884		187	293,903	D19—	76	293,922	D28—	10	293,941
	314	293,846		570	293,866			293,885	D13—	1	293,904	D20—	8	293,923		76	293,942
		293,847		572	293,867			293,886	D14—	38	293,905	D21—	51	293,924			293,943
		293,848		596	293,868	D9—	341	293,887			293,906		114	293,925			293,944
	320	293,849	D7—	6	293,869		349	293,888		83	293,907		217	293,926	D30—	114	293,945
	619	293,850		27	293,870		375	293,889		86	293,908		218	293,927		115	293,946
D3—	35	293,851		118	293,871		590	293,890		100	293,909	D22—	112	293,928		129	293,947
	37	293,852		154	293,872		596	293,891			293,910	D23—	213	293,929		131	293,948
		293,853		304	293,873	D10—	38	293,892			293,911		292	293,930	D32—	18	293,949
	42	293,854	D8—	1	293,874		60	293,893	D15—	7	293,912	D24—	18	293,931		21	293,950
	71	293,855		8	293,875		71	293,894			293,913		36	293,932		49	293,951
	100	293,856		328	293,876		78	293,895		129	293,915		84	293,933		69	293,952
	106	293,857		330	293,877		101	293,896		139	293,914	D25—	57	293,934	D34—	35	293,953
D4—	108	293,858		339	293,878	D11—	27	293,897		199	293,916		164	293,935		39	293,954
		293,859		343	293,879			293,898	D16—	5	293,917	D26—	28	293,936	D99—	17	293,955
	122	293,860		354	293,880		43	293,899		102	293,918			293,937			293,956
D6—	311	293,861		360	293,881	D12—	107	293,900		102	293,919			293,938			293,957
	430	293,862		388	293,882		108	293,901	D18—	7	293,920		48	293,939			293,958
	445	293,863			293,883		147	293,902		15	293,921		65	293,940		39	293,959
	446	293,864															

CLASSIFICATION OF PLANTS

P.—	1	6,087		6,088		70	6,089		74	6,090	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,721,056		4,721,424		4,722,000		4,720,947		4,721,718		4,721,837
	4,721,134		4,721,427		4,722,005		4,720,957		4,721,727		4,721,900
04 :	Re.32,584		4,721,435		4,722,012		4,720,961		4,721,747		4,722,073
	4,720,881		4,721,449		4,722,028		4,720,971		4,721,780	25 :	4,721,000
	4,721,264		4,721,455		4,722,035		4,721,051		4,721,805		4,721,030
	4,721,486		4,721,462		4,722,038		4,721,062		4,721,806		4,721,038
	4,721,543		4,721,463		4,722,046		4,721,118		4,721,807		4,721,109
	4,721,722		4,721,467		4,722,047		4,721,124		4,721,808		4,721,210
	4,721,783		4,721,468		4,722,050		4,721,145		4,721,815		4,721,290
	4,721,921		4,721,489		4,722,071		4,721,174		4,721,842		4,721,349
	4,721,925		4,721,491		4,722,085		4,721,275		4,721,847		4,721,385
06 :	4,720,878		4,721,507		4,722,086		4,721,408		4,721,870		4,721,420
	4,720,883		4,721,528	08 :	4,720,913		4,721,434		4,721,879		4,721,487
	4,720,894		4,721,537		4,720,933		4,721,461		4,721,955		4,721,504
	4,720,915		4,721,551		4,721,057		4,721,506		4,721,957		4,721,556
	4,720,917		4,721,559		4,721,140		4,721,519	18 :	4,720,909		4,721,601
	4,720,929		4,721,570		4,721,200		4,721,541		4,720,969		4,721,671
	4,720,935		4,721,572		4,721,225		4,721,592		4,721,064		4,721,672
	4,720,984		4,721,603		4,721,419		4,721,634		4,721,212		4,721,736
	4,720,991		4,721,606		4,721,448		4,721,650		4,721,226		4,721,739
	4,720,999		4,721,613		4,721,539		4,721,901		4,721,230		4,721,769
	4,721,015		4,721,628		4,721,550		4,721,923		4,721,247		4,721,866
	4,721,021		4,721,636		4,721,560		4,721,971		4,721,426		4,721,876
	4,721,022		4,721,678		4,721,575		4,721,998		4,721,737		4,721,888
	4,721,027		4,721,679		4,721,891	13 :	4,720,936		4,721,834		4,721,890
	4,721,063		4,721,682		4,721,929		4,721,085		4,721,919		4,721,899
	4,721,103		4,721,683	09 :	4,721,097		4,721,278		4,721,938		4,721,959
	4,721,117		4,721,694		4,721,155		4,721,418		4,721,950		4,721,966
	4,721,121		4,721,695		4,721,204	17 :	4,720,874		4,722,007		4,722,048
	4,721,129		4,721,704		4,721,208		4,720,875		4,722,033		4,722,092
	4,721,133		4,721,716		4,721,376		4,720,886		4,722,094	26 :	Re.32,583
	4,721,146		4,721,732		4,721,386		4,720,938	19 :	4,721,004		4,720,895
	4,721,213		4,721,771		4,721,433		4,721,016		4,721,147		4,720,925
	4,721,217		4,721,830		4,721,465		4,721,017		4,721,168		4,720,972
	4,721,228		4,721,832		4,721,589		4,721,081		4,721,932		4,720,992
	4,721,232		4,721,836		4,721,712		4,721,142	20 :	4,721,265		4,721,008
	4,721,238		4,721,862		4,721,768		4,721,167	21 :	4,721,383		4,721,040
	4,721,239		4,721,868		4,721,822		4,721,170		4,721,639		4,721,059
	4,721,250		4,721,885		4,721,846		4,721,196		4,722,018		4,721,089
	4,721,252		4,721,895		4,722,061		4,721,215		4,722,019		4,721,269
	4,721,267		4,721,909		4,722,077		4,721,235	22 :	4,721,156		4,721,279
	4,721,268		4,721,912		4,722,084		4,721,272		4,721,205		4,721,289
	4,721,274		4,721,930	10 :	4,721,237		4,721,347		4,721,566		4,721,310
	4,721,282		4,721,933		4,721,520		4,721,380		4,721,790		4,721,311
	4,721,304		4,721,946		4,721,521		4,721,422		4,721,810		4,721,323
	4,721,305		4,721,951		4,721,578		4,721,453	24 :	4,720,976		4,721,325
	4,721,322		4,721,954		4,721,587		4,721,488		4,721,066		4,721,326
	4,721,334		4,721,958		4,721,661		4,721,498		4,721,285		4,721,342
	4,721,352		4,721,970		4,721,735		4,721,513		4,721,362		4,721,344
	4,721,370		4,721,986	12 :	4,720,879		4,721,557		4,721,533		4,721,443
	4,721,405		4,721,992		4,720,941		4,721,607		4,721,534		4,721,457
	4,721,410		4,721,993		4,720,942		4,721,675		4,721,673		4,721,475
	4,721,411		4,721,996		4,720,943		4,721,706		4,721,811		4,721,490

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	4,721,540		4,721,379		4,721,569		4,721,378		4,721,612		4,721,415
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	4,721,579		4,721,476		4,721,633		4,721,403		4,721,660		4,721,417
	4,721,596		4,721,558		4,721,641		4,721,451		4,721,708		4,721,456
	4,721,632		4,721,567		4,721,644		4,721,459		4,721,721		4,721,527
	4,721,663		4,721,573		4,721,659		4,721,531		4,721,733		4,721,555
	4,721,840		4,721,581		4,721,668		4,721,580		4,721,751		4,721,742
	4,721,894		4,721,595		4,721,669		4,721,582		4,721,754		4,721,743
	4,721,941		4,721,614		4,721,689		4,721,590		4,721,756		4,721,775
	4,721,963		4,721,620		4,721,835		4,721,598		4,721,757		4,721,781
	4,722,032		4,721,655		4,721,860		4,721,677		4,721,794		4,721,816
	4,722,087		4,721,665		4,721,881		4,721,749		4,721,809		4,721,817
27 :	4,720,889		4,721,681		4,721,902		4,721,767		4,721,818		4,721,819
	4,720,940		4,721,725		4,721,906		4,721,789		4,721,827		4,721,823
	4,720,980		4,721,726		4,721,907		4,721,802		4,721,828		4,721,853
	4,721,114		4,721,738		4,721,936		4,721,803		4,721,829		4,721,983
	4,721,115		4,721,748		4,721,973		4,721,820		4,721,874		4,721,987
	4,721,123		4,721,784		4,721,977		4,721,965		4,721,883		4,722,030
	4,721,255		4,721,787		4,721,978	40 :	4,720,884		4,722,022		4,722,060
	4,721,444		4,721,791		4,721,981		4,720,892		4,722,059		4,722,067
	4,721,445		4,721,799		4,722,037		4,720,975	43 :	4,721,192		4,722,070
	4,721,508		4,721,824		4,722,051		4,720,995	44 :	4,720,905		4,722,075
	4,721,617		4,721,857		4,722,053		4,721,172		4,721,688		4,722,095
	4,721,649		4,721,910		4,722,055		4,721,454		4,721,867	49 :	4,720,927
	4,721,658		4,721,961		4,506,222		4,721,493	45 :	4,721,778		4,721,479
	4,721,685		4,722,066	37 :	4,721,093		4,721,576		4,721,934		4,721,680
	4,721,831		4,722,089		4,721,184		4,721,696	46 :	4,720,948	50 :	4,720,921
	4,721,833		4,722,091		4,721,249		4,721,813		4,721,997		4,721,020
	4,722,017	35 :	4,720,978		4,721,302	41 :	4,721,139	47 :	4,721,104		4,721,839
	4,722,044		4,721,061		4,721,473		4,721,320		4,721,525		4,722,036
	4,722,049		4,721,889		4,721,935		4,721,324		4,721,858	51 :	4,721,036
	4,722,052		4,721,914	39 :	4,720,887		4,721,393		4,721,872		4,721,355
29 :	4,720,877		4,722,026		4,720,891		4,721,428	48 :	4,720,908		4,721,917
	4,720,888	36 :	4,720,897		4,720,910		4,721,464		4,720,981		4,721,956
	4,720,939		4,720,902		4,720,951		4,721,481		4,720,996	53 :	4,720,901
	4,720,961		4,720,911		4,720,959		4,721,548		4,720,997		4,721,060
	4,721,257		4,720,932		4,720,970		4,721,849		4,720,998		4,721,271
	4,721,466		4,720,946		4,720,983		4,721,943		4,721,007		4,721,273
	4,721,472		4,720,987		4,721,023	42 :	4,720,898		4,721,035		4,721,308
	4,721,615		4,721,003		4,721,028		4,720,920		4,721,127		4,721,903
	4,721,654		4,721,074		4,721,052		4,720,934		4,721,132		4,287,015
30 :	4,721,079		4,721,092		4,721,069		4,720,958		4,721,157	54 :	4,720,904
	4,721,165		4,721,096		4,721,197		4,721,029		4,721,158		4,721,044
31 :	4,720,919		4,721,176		4,721,218		4,721,037		4,721,161	55 :	4,721,072
	4,721,503		4,721,194		4,721,219		4,721,113		4,721,162		4,721,094
33 :	4,721,635		4,721,276		4,721,220		4,721,164		4,721,180		4,721,149
	4,721,974		4,721,296		4,721,221		4,721,166		4,721,181		4,721,183
	4,722,056		4,721,313		4,721,240		4,721,336		4,721,216		4,721,295
	4,722,080		4,721,329		4,721,244		4,721,421		4,721,284		4,721,499
34 :	4,720,903		4,721,432		4,721,258		4,721,460		4,721,286		4,721,500
	4,720,906		4,721,440		4,721,283		4,721,469		4,721,298		4,721,532
	4,720,949		4,721,501		4,721,293		4,721,470		4,721,300		4,721,623
	4,721,203		4,721,502		4,721,309		4,721,471		4,721,319		4,721,676
	4,721,248		4,721,524		4,721,316		4,721,511		4,721,335		4,721,875
	4,721,357		4,721,526		4,721,321		4,721,538		4,721,401		4,721,913
	4,721,366		4,721,552		4,721,332		4,721,597		4,721,412	56 :	4,721,529

DESIGN PATENTS

01 :	293,851		293,951		293,886		293,956		293,919	47 :	293,916
	293,954	09 :	293,894		293,931		293,957		293,945		293,921
04 :	293,959		293,901	18 :	293,852		293,958		293,946		293,947
06 :	293,854		293,905		293,871	29 :	293,888	37 :	293,875	48 :	293,861
	293,856		293,939	20 :	293,908		293,890	39 :	293,857		293,903
	293,889		293,942		293,924		293,948		293,868		293,914
	293,892	12 :	293,876	24 :	293,853	34 :	293,850		293,912		293,933
	293,893		293,909		293,926		293,949		293,913	51 :	293,935
	293,911		293,910		293,927	36 :	293,845	41 :	293,854	53 :	293,870
	293,932	13 :	293,885	25 :	293,846		293,863	42 :	293,867		293,891
	293,943	17 :	293,858		293,847		293,864	45 :	293,902	55 :	293,881
	293,950		293,872	27 :	293,955		293,918		293,925		293,930

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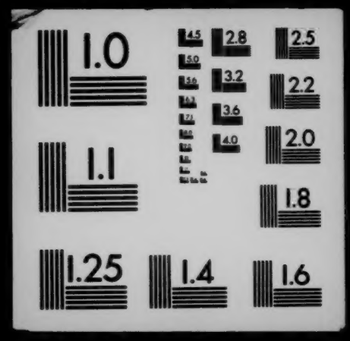
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